norelem

norelem positions.

norelem assembles.

norelem moves.

norelem measures.

norelem clamps.

norelem controls.

norelem transports.

norelem techno shop.

norelem inch.

THE BIG GREEN BOOK

1

EDITION 2022

BOOK **1**

norelem
positions.

Our flexible standard
component system.

norelem
assembles.

Aluminium profiles, connectors,
covers and special elements.

norelem
inch.

You can view our selection of items with dimensions in inches online at www.norelem.com

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All product groups at a glance	P. 4
Image index **BOOK 1**	P. 16
Technical data	P. 1339
Alphabetical index	P. 1356
List of standards	P. 1376

My customer number

Enter your customer number here.
You receive this with your first order.

BOOK **2**

YOU WILL FIND ALL ITEMS IN THESE PRODUCT GROUPS IN BOOK 2.
THE **BIG GREEN** BOOK.

norelem moves.

Systems and components for power transmission in machine and plant construction.

norelem measures.

Devices, fixtures and standard elements for measuring and testing.

norelem clamps.

Vices and accessories with maximum clamping force for machining workpieces.

norelem controls.

Electromechanical standard components for management and control.

norelem transports.

Products for material handling and transport: wheels, castors and ball transfer units.

norelem techno shop.

All other accessories: from adhesives to cylinder cleaners.

norelem inch.

You can view our selection of items with dimensions in inches online at www.norelem.com

minus 52% CO_2

Innovative use of combined heat and power technology when printing this product reduced CO_2 emissions by up to 52% in comparison to conventional methods in Germany.

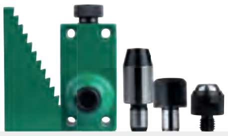
FIND WHAT YOU NEED FASTER:
OUR PRODUCT GROUPS

norelem positions.

01000

Plates
Discs
Profiles

Tombstones
Workholding tower



02000

Self-aligning pads
Fixture feet

Clamp rests
Support elements

03000

Spring plungers
Indexing plungers
Stops

Centring and
locating elements
Fasteners
Slot keys

04000

Clamp straps
Chain clamps
Cam clamps
Swing clamps

Clamping hook
Wedge clamps
Clamp nuts and screws
Side clamps, clamping
elements for grid systems

05000

Toggle clamps
Pneumatic clamps
Clamping accessories

Latches
Quarter-turn locks

06000

Grips and knobs
Handwheels, crank handles
and screw-in handles
Clamping and tension levers

Clamping joints
Pull handles, tubular handles
and recessed handles

07000

Connecting elements
Ball-end thrust screws
Base plates
Ring bolts

Grub screws and thrust pads
Torque screws and
threaded inserts
Hoist rings/lifting bolts

08000

Drilling jig elements
Drill bushes

09000

Magnets

norelem assembles.

10000

Aluminium profiles
Connectors

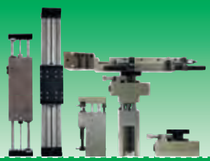
Covers
Special elements

12000

Compressed air technology

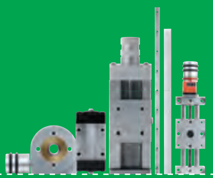
BOOK 1

norelem
moves.



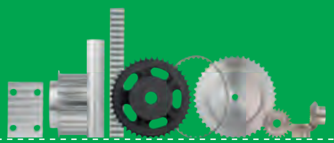
20000

Linear modules
Lifting units
Rotary modules
Grip modules



21000

Carriage guides
Guide rails
Positioning stages
Telescopic slides
Miniature slide guides
Position indicators

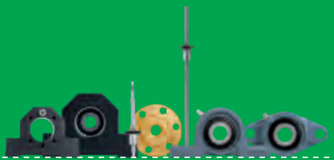


22000

Chains and sprockets
Toothed belt pulleys
Splined shafts and toothed belts
V-belt
V-belt pulleys
Gear wheels and racks
Bevel gears
Worm screws and worm wheels
Transmissions

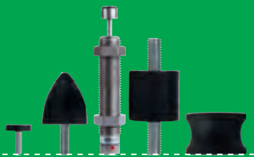
23000

Couplings
Rigid couplings
Keyless locking couplings
Universal joints
Quick-fit couplings
Bearings
Seals



24000

Trapezoidal thread
Spindles
Ball screw linear actuators
Bearing units

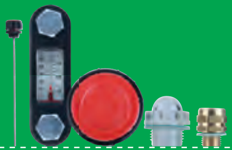


26000

Compression springs
Elastomer buffers
Rubber buffers
Shock absorbers
Gas springs

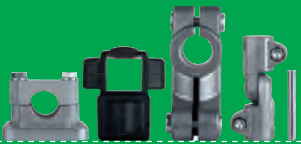
27000

Clevis joints
Rod ends
Angle joints
Brackets
Levelling sets
Levelling wedges, levelling feet, machine feet
Hinges



28000

Oil level gauges
Plugs
Screw plugs
Vent screws
Dipsticks
Filler necks



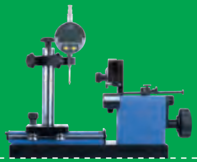
29000

Tube joints
Square washers
Clamping elements
Tubes
Column components
Monitor brackets

norelem
measures.

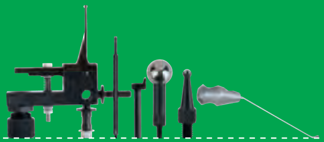
31000

Inspection tables
Gauge stands
Joints



32000

Concentricity gauges
Dial gauges



33000

Standard elements for inspection and test fixtures

norelem
clamps.

41000

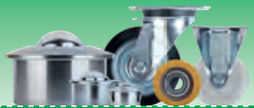
Vices

norelem
controls.

80000

Connectors
Energy chains
Power supply units
Sensors
Cable fittings
Motors, lifting columns

norelem
trans-
ports.



95000

Wheels and rollers
Ball transfer units
Small conveyor belts

norelem
techno
shop.

96000

Feeler gauges
Protective nets
Supercraft soft faced hammers
Mallet inserts
Taper and cylinder cleaners
Coolant hoses
Magnetic labels and magnetic envelopes

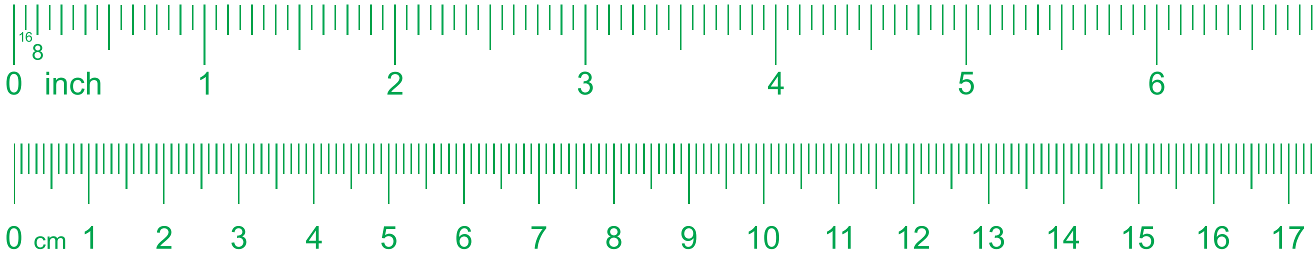
97000

Lubricants
Adhesives
Grease nipples

YOU WILL FIND THE
CONTENTS OF THESE
PRODUCT GROUPS
IN **BOOK 2**

BOOK 2

NEW



INCH

NO MATTER HOW YOU DO YOUR COUNTING, YOU CAN COUNT ON US.

norelem
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elem

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The advantage of standard parts is when a standard component becomes the perfect solution, because it means you can design more quickly and cost-effectively, with less effort and better results.

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98%

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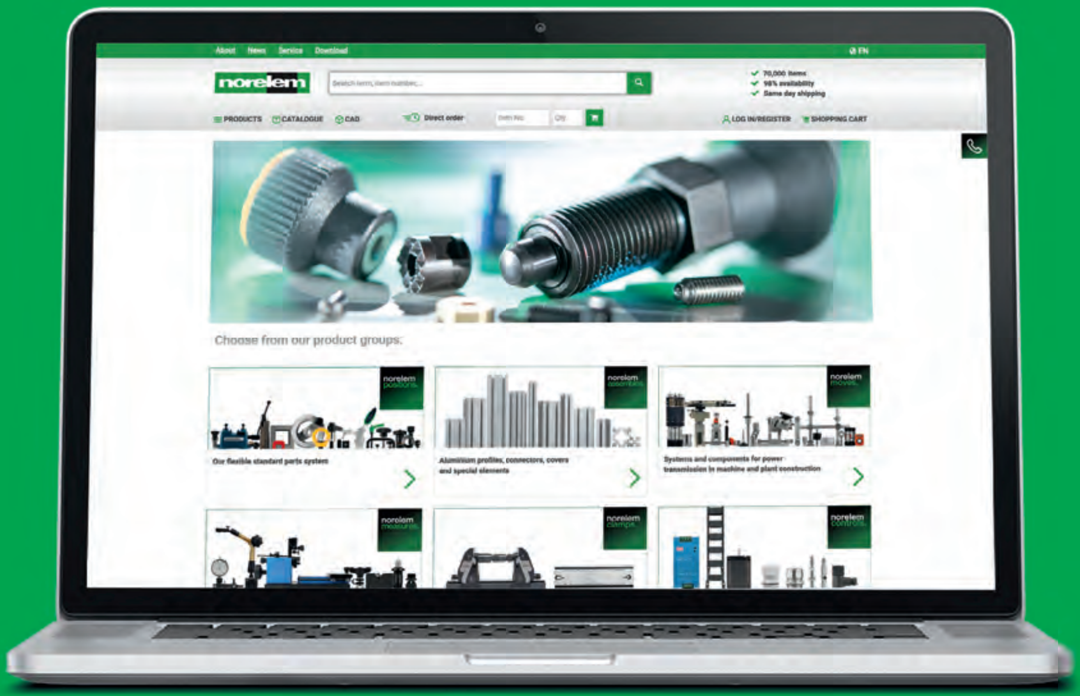

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www.norelem.mx

UNITED KINGDOM

norelem Ltd.
Innovation Centre
1 Devon Way
B31 2TS Birmingham
Tel. +44 121 222 5322
info@norelem.co.uk
www.norelem.co.uk

FRANCE

norelem SAS
5, rue des Libellules
10280 Fontaine-les-Grès
Tel. +33 3 25 71 89 30
info@norelem.fr
www.norelem.fr

SPAIN

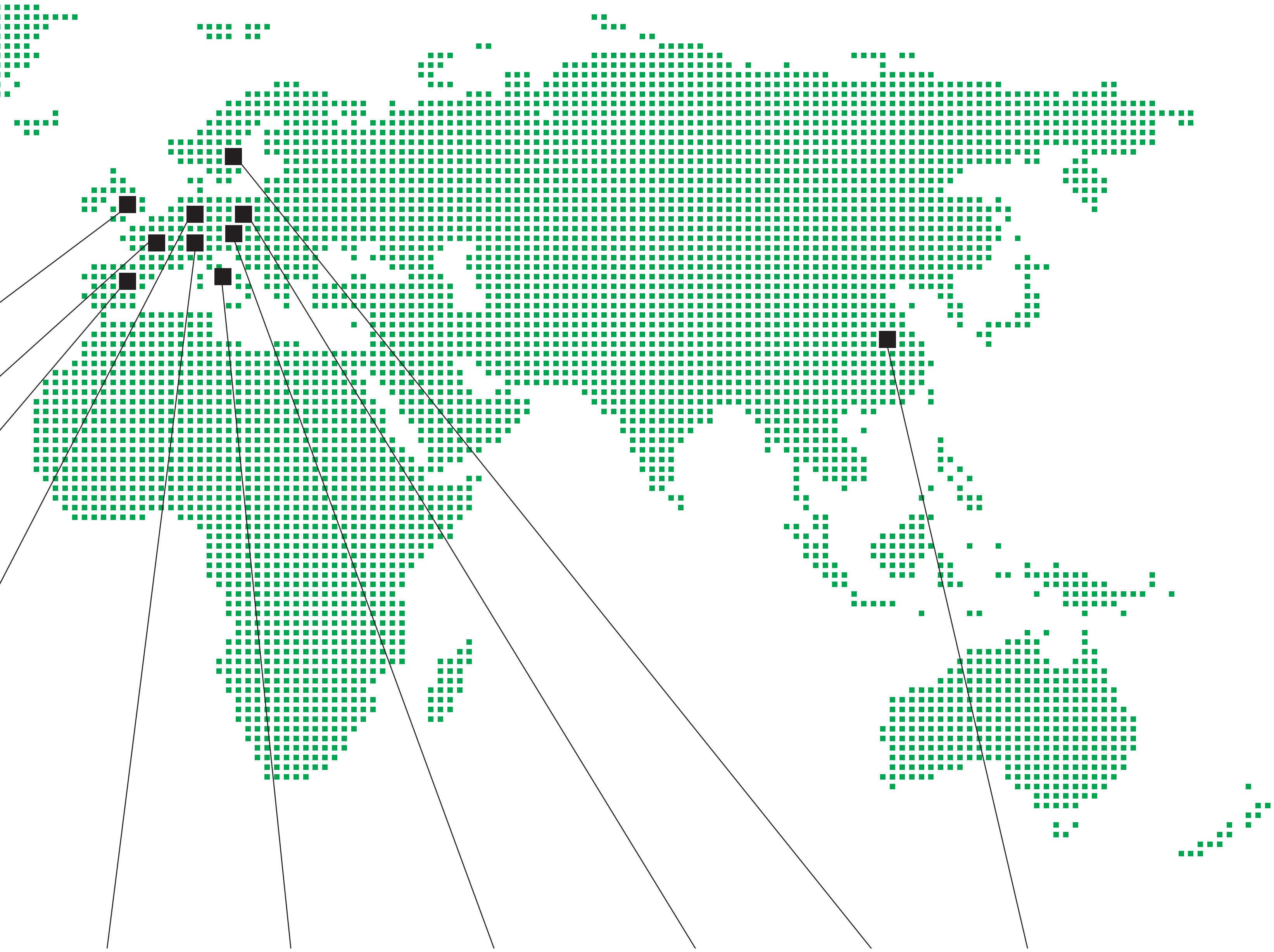
norelem Ibérica S.L.
Despacho D-11B
Carrer del Pla, 166
08980 Sant Feliu de Llobregat
(Barcelona)
Tel. +34 935 227 521
info@norelem.es
www.norelem.es

GERMANY

norelem Normelemente
GmbH & Co. KG
Volmarstrasse 1
71706 Markgröningen
Tel. +49 7145 206-41
info@norelem.de
www.norelem.de

THE BIG GREEN BOOK

Our very first product catalogue was a complete success in machine and plant construction circles and was used intensively. Further trade catalogues followed. One of the most important milestones in the company's history was the consolidation of all products in one main catalogue in 2003: THE BIG GREEN BOOK – since then one of the cornerstones of the norelem brand and the most important reference work for designers.



SWITZERLAND

norelem Normelemente AG
Chli Ebnet 1
6403 Küssnacht am Rigi
Tel. +41 41 833 87 00
info@norelem.ch
www.norelem.ch

ITALY

norelem S.r.l.
Via dei Campi della
Rienza n. 30
39031 - Brunico (BZ)
info@norelem.it
www.norelem.it

AUSTRIA

norelem
Normelemente GmbH
Hannesgrub Nord 31
4911 Tumeltsham
Tel. +43 7752 2311123
info@norelem.at
www.norelem.at

POLAND

norelem Sp. z o.o.
ul. Myśliborska 22
66-400 Gorzów
Wielkopolski
Tel. +48 572 895 704
info@norelem.pl
www.norelem.pl

SWEDEN

norelem AB
Wenngarn 443
193 91 Sigtuna
Tel. +46 814 15 00
info@norelem.se
www.norelem.se

CHINA

norelem Trading (Taicang) Co., Ltd.
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norelem ACADEMY

norelem positions

Flexible standard component system

01000

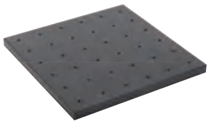
Subplates
Discs
Profiles
Angle plates
Tombstones

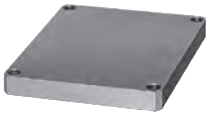
01040
Page 56

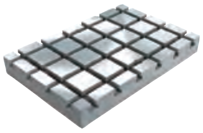
Base plate with T-slots
grey cast iron

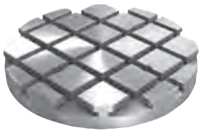
01041
Page 57

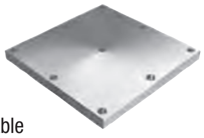
Baseplates aluminium
with T-slot +

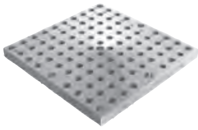
01042
Page 58

Baseplates aluminium
with tapped holes +

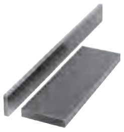
01060
Page 59

Base plates steel

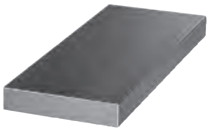
01126
Page 60

Baseplates, grey cast iron
with T-slots +

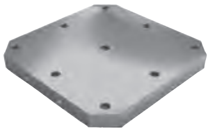
01126-10
Page 61

Baseplates, grey cast iron, round,
with T-slots +

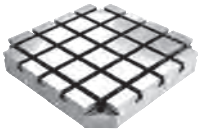
01127
Page 62

Interchangeable
subplates, grey cast iron,
with pre-machined clamping faces +

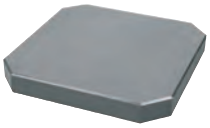
01127
Page 63

Interchangeable subplates,
grey cast iron with grid holes +

01130
Page 64

Rectangular plates
precision steel

01140
Page 65

Plates
grey cast iron or aluminium

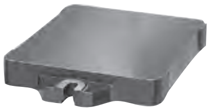
01148
Page 66

Subplates, grey cast iron
with pre-machined clamping faces +

01148
Page 68

Subplates, grey cast iron
with T-slots +

01150
Page 70

Subplates machined all sides
grey cast iron

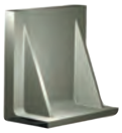
01160
Page 71

Block machined all sides
grey cast iron or aluminium

01180
Page 71

Base plate with flanges
grey cast iron

01250
Page 72

Angle plates
with or without T-slots cast iron

01252
Page 73

Angle plates
aluminium

01265
Page 74

Tombstones,
grey cast iron, double-sided,
with pre-machined clamping faces +

01265
Page 76

Tombstones,
grey cast iron, double-sided,
with T-slots +

01267
Page 78

Tombstone,
grey cast iron, double-sided,
for interchangeable subplates +

01270
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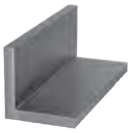
Tombstones double-sided
grey cast iron

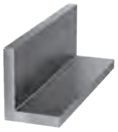
01280
Page 80

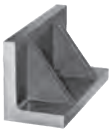
Circular plates
steel

01320
Page 80

Circular plates
grey cast iron or aluminium

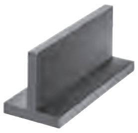
01380
Page 81

L-profiles
grey cast iron or aluminium

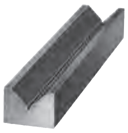
01440
Page 82

L-profiles unequal
grey cast iron or aluminium

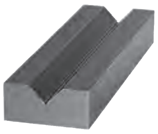
01520
Page 82

L profile with reinforcing ribs
grey cast iron

01560
Page 83

H-profiles
grey cast iron or aluminium

01580
Page 83

T-profiles machined all sides
grey cast iron or aluminium

01640
Page 84

V-block machined all sides
grey cast iron or aluminium

01660
Page 84

V-block machined all sides
extra wide, grey cast iron

01680
Page 85

U-profiles machined all sides
grey cast iron or aluminium

01740
Page 86

Square hollow profiles
grey cast iron

+ New/Expanded Items

01760
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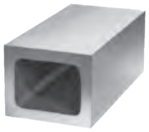

Rectangular hollow profiles
grey cast iron

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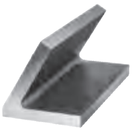

Angle profiles 60°
grey cast iron

01820
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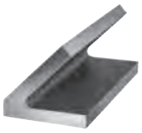


Angle profiles 45°
grey cast iron

01850
Page 88

Workholding cubes, grey cast iron
with pre-machined clamping faces +

01850
Page 90

Workholding cubes, grey cast iron
with T-slots +

01852
Page 92

Tombstones cube
grey cast iron

Self-aligning pads
Fixture feet
Clamp rests
Support elements

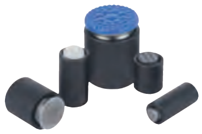
02000
Page 95

Self-aligning pads

02001
Page 97

Self-aligning pads
swivel angle 14° and 20°

02002
Page 99



Self-aligning pads
with O-ring

02003
Page 100

Self-aligning pads
with O-ring and exchangeable inserts

02004
Page 102

Self-aligning pads
self-righting

02005
Page 103

Self-aligning pads
adjustable

02006
Page 105

Self-aligning pads
adjustable with O-ring

02007
Page 107

Self-aligning pads
adjustable with O-ring and exchangeable inserts

02008
Page 111

Self-aligning pads
adjustable with O-ring and hexagon socket

02009
Page 112

Self-aligning pads
adjustable with O-ring, exchangeable inserts and hexagon socket

02010
Page 114, 1220

Rest pads

02010-01
Page 115

Rest pads, ceramic +

02020
Page 116

Locating pins and rest pads
DIN 6321 (Issue 1973)

02020-01
Page 119

Locating pins ceramic
similar to DIN 6321 +

+ New/Expanded Items

norelem positions

Flexible standard component system

02000

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Locating pins
with internal thread ⊞

02026
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Locating bushes
for locating pins ⊞

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Rest pads
pin form, internal thread

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Page 123

Rest pads
pin form, external thread

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Rest pads

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Page 125

Rest pads
with positioning pin

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Feet
with threaded pin,
DIN 6320 (Edition 1971)

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Extension pieces

02035-10
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Extension pieces

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Support bolts

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Positioning feet

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Positioning feet

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Fixture feet
with external thread

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Fixture feet
with internal thread

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Self-aligning pads
swivel 12°

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Self-aligning pads
self-righting

02090
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Locating feet

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Swivel pads

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Page 141

Rest pads

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Page 141

Rest pads adjustable
with locknut

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Rest pads

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Page 143

Jack screws

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Stops adjustable
with end position feedback

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Screw rest
with flat face, steel

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Screw rest
with flat face, stainless steel

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Screw rest
with flat face, aluminium

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Page 146

Screw rest
with flat face and magnetic foot,
aluminium

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Atlas jack
with locknut

02210
Page 148

Screw rest inserts
spherical, centring disc, prism, locating
pin, revolving ball

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Page 150

Step blocks

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Step block sets

02320
Page 151

Wedge supports

02330
Page 151

Support elements cylindrical

02333
Page 152

Workpiece supports
adjustable

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Page 153

Workpiece supports

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Page 154

Workpiece support cylinders

⊞ New/Expanded Items

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Page 155

Support element

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Page 156

Rectangular support elements

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Workpiece supports

02380
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Workpiece supports

02385
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Jack screws

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Inserts

02388
Page 159

Jack screws extended

02390
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Eccentric supports

Spring plungers
Indexing plungers
Stops
Centring/positioning components
Ball lock pins
T-slot nuts

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Spring plungers
with slot and ball, steel

03001
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Spring plungers
with slot and ball, LONG-LOK secured, steel

03004
Page 165

Spring plungers
with slot and POM ball, plastic

03008
Page 165

Spring plungers
with slot and ceramic ball, stainless steel

03010
Page 166

Spring plungers
with slot and ball, stainless steel

03011
Page 167

Spring plungers
with slot and ball, LONG-LOK secured, stainless steel

03014
Page 168

Spring plungers
with slot and stainless steel ball, plastic

03020
Page 169

Spring plungers
with slot and thrust pin, steel

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Spring plungers
with status sensor

03021
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Spring plungers
with slot and thrust pin, LONG-LOK secured, steel

03025
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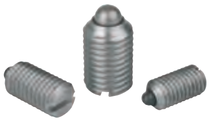

Spring plungers
with slot and thrust pin, stainless steel

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Spring plungers
with slot and thrust pin, LONG-LOK secured, stainless steel

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Spring plungers
with hexagon socket and ball, steel

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Spring plungers
with hexagon socket and ball, LONG-LOK secured, steel

+ New/Expanded Items

norelem positions

Flexible standard component system

03000

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Spring plungers
with hexagon socket and ceramic ball, stainless steel

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Spring plungers
with hexagon socket and ball, stainless steel

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Spring plungers
with hexagon socket and ball, LONG-LOK secured stainless steel

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Spring plungers
with hexagon socket and thrust pin, long version

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with hexagon socket and thrust pin, steel

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Spring plungers
with hexagon socket and flattened thrust pin, steel

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Spring plungers
with hexagon socket and thrust pin, LONG-LOK secured, steel

03041-01
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Spring plungers
with hexagon socket and flattened thrust pin, steel, LONG-LOK lock

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Spring plungers
with hexagon socket and POM thrust pin, steel

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Spring plungers
with hexagon socket and flattened POM thrust pin, steel

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Spring plungers
with hexagon socket and POM thrust pin, LONG-LOK secured, steel

03051-01
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Spring plungers
with hexagon socket and flattened POM thrust pin, steel, LONG-LOK lock

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Spring plungers
with hexagon socket and thrust pin, stainless steel

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Spring plungers
with hexagon socket and flattened thrust pin, stainless steel

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Spring plungers
with hexagon socket and thrust pin, LONG-LOK secured, stainless steel

03056-01
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Spring plungers
with hexagon socket and flattened thrust pin, stainless steel, LONG-LOK lock

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Spring plungers
with hexagon socket and POM thrust pin, stainless steel

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Spring plungers
with hexagon socket and flattened POM thrust pin, stainless steel

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Spring plungers
with hexagon socket and POM thrust pin, LONG-LOK secured, stainless steel

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Spring plungers
with hexagon socket and flattened POM thrust pin, stainless steel, LONG-LOK lock

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Spring plungers
with head

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Spring plungers
with detent ring

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Locators

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Spring plungers
smooth version, stainless steel

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Spring plungers
smooth version, extended, stainless steel

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Page 200

Spring plungers
smooth version, plastic

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Spring plungers
smooth version without collar, stainless steel

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Spring plungers
with head

03074
Page 202

Spring plungers
smooth version, double-sided

03075
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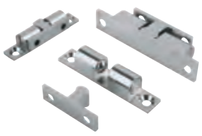

Double ball catches

03075-10
Page 204

Ball catch

03075-10
Page 204

Spacer for ball catch

03075-10
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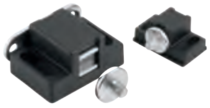
Angle bracket for ball catch

03075-11
Page 206



Magnetic lock

03075-11
Page 207

Angle bracket for magnetic lock

03075-12
Page 208

Door stops plastic
for aluminium profile with buffer or with magnetic catch +

+ New/Expanded Items

norelem positions

Flexible standard component system

03000

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Spring plungers
smooth version, self-clamping, plastic

03077
Page 210

Spring plungers
smooth version

03080
Page 211

Eccentric stops

03081
Page 212

Clamp stops adjustable
for slot profiles

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Page 213

Stops
adjustable

03085
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Screw stops
adjustable

03086
Page 214

Stop screws

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Stop screws

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Stop screws

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5D workpiece stops

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Indexing plungers

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Indexing plungers

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Indexing plungers
with thread lock

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Indexing plungers
with extended indexing pin

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Indexing plungers
short version

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Indexing plungers
short version

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Indexing plungers
short version, with thread lock

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Indexing plungers stainless steel

03089
Page 233

Indexing plungers
for thin-walled parts

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Indexing plungers - Premium
with cylindrical pin

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Page 235

Bushes cylindrical

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Indexing plungers - Premium
with tapered pin

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Bushes tapered

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Spacer rings

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Indexing plungers ECO

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Page 240

Indexing plunger
with lock

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Indexing plungers
with rotation lock and lead-in chamfer

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Indexing plungers

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Indexing plungers
with locked mark

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Indexing plungers
with T-grip

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Indexing plungers ECO
short version

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Indexing plungers

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Indexing plungers

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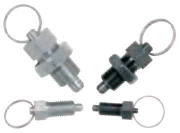

Indexing plungers

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Page 255

Indexing plungers
without collar

03093
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Indexing plungers
without collar, extended indexing pin

+ New/Expanded Items

norelem positions

Flexible standard component system

03000

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Indexing plungers stainless steel
without collar

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Indexing plungers
without collar

03095
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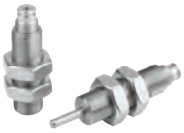

Indexing plungers, pneumatic

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Page 265

Indexing plungers
without collar

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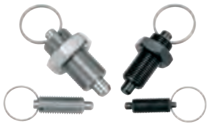
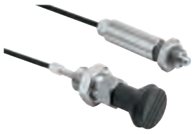
Page 267



Indexing plungers
without collar

03096-10
Page 269



Indexing plunger, stainless steel
with remote actuation +

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Page 271

Indexing plungers
without collar

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Page 273

Indexing plungers
without collar

03098
Page 274

Indexing plungers
without collar

03099
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Cam-action indexing plungers

03099-20
Page 276

Cam action indexing plunger
with stop

03099
Page 278

Cam-action indexing plungers stainless steel

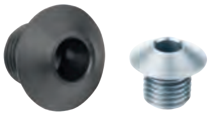
03099-21
Page 279

Cam action indexing plunger
stainless steel, with stop

03099
Page 280

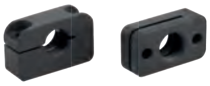
Mounting brackets
steel

03099-50
Page 281



Positioning bushes
for indexing plungers

03099
Page 283



Mounting brackets
aluminium

03099
Page 284

Cam-action indexing plungers

03099
Page 285

Cam-action indexing plungers stainless steel

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Page 286

Barrel slide bolts

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Locating pins removable
Form A and C

03106
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Locating pins removable
Form B and D

03107
Page 292

Locating pins
with ball-end Form A

03107
Page 292

Locating pins
with flattened ball-end Form C

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Locating pins
with ball-end Form B

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Locating pins
with flattened ball-end Form D

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Centring pins
for central hole

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Centring pins
for aligning hole

03114
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Centring pins
for aligning hole

03120
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Positioning pins cylindrical
ground

03130
Page 296

Positioning pins cylindrical
not ground

03140
Page 297

Positioning pins free-milled
ground

03150
Page 297

Positioning pins free-milled
not ground

03151
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Locating pins expanding

03152-10
Page 302

Positioning cones, steel
for centring units +

03152-11
Page 303

Positioning bush steel
for centring units +

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Page 305

Locating cylinder Ball Lock

+ New/Expanded Items

norelem positions

Flexible standard component system

03000

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Page 306

Locating cylinder, stainless steel
Ball Lock +

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Page 307

Locating cylinders
with quick clamping system

03154
Page 308

Centring bushes

03154-02
Page 309

Centring bushes stainless steel +

03155
Page 310

Locating bushes
Form A (pressed in from rear)

03155-02
Page 310

Locating bushes, stainless steel
Form A (pressed in from rear) +

03156
Page 311

Locating bushes
Form B (screwed down from front)

03156-02
Page 311

Locating bushes, stainless steel
Form B (screwed down from front) +

03157
Page 312

Mandrel collets

03157
Page 313

Mandrel collets
with side lock

03157-10
Page 314

Mandrel collet
for small bores

03157-15
Page 315

Mandrel collets, steel
with cam lever +

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Page 317

Centring clamps
with ball or hexagon segments

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Page 319

Centring clamps
with ball or hexagon segments

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Page 320

Centring V

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Locating cylinders
pneumatic

03161-02
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Locating cylinders
pneumatic

03161-03
Page 324

Locating bushes
for pneumatic locating cylinder

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Page 325

Locating bushes
for pneumatic locating cylinder

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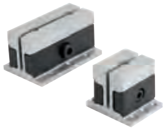
Page 326

Machinable collets, square

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Page 328

Centring clamps
round

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Centring clamps

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Adapter for collet

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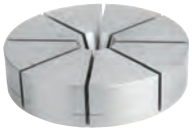
Page 332

Collet
for external clamping

03168
Page 334

Collet
for internal clamping

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Traction cone
for internal clamping collet

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Machinable collets
pneumatic

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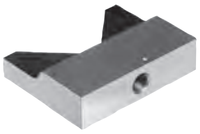
Centring V-plate

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Indexing plungers - Precision
with tapered pin

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Page 343

Bushes tapered

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Page 344

Indexing plungers - Precision
with cylindrical pin

03188
Page 344

Bushes cylindrical

03190
Page 346

Indexing plunger
with five lobe grip

03190-10
Page 349

Indexing and clamping grip +

03191
Page 351

Indexing and clamping grip
with optical locked indicator +

03193
Page 352

Ball lock pins

+ New/Expanded Items

norelem positions

Flexible standard component system

03000

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Ball lock pins
stainless steel

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Page 354

Ball lock pins with mushroom grip +
stainless steel

03194
Page 355

Ball lock pins with grip ring +
stainless steel

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Page 356

Locking pins

03195
Page 357

Locking pins
with key ring

03196
Page 358

Ball lock pins
with T-grip

03196
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Ball lock pins
with L-grip

03197
Page 360

Bushing for ball lock pins

03197
Page 361

Bushing for ball lock pins
with LONG-LOK thread lock

03197-05
Page 362

Locating bushes
with collar, stainless steel +
for ball lock pins

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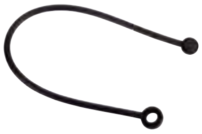

Safety cable

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Page 363

Safety spiral cable

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Page 364

Key rings

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Page 365

Retaining cables

03200
Page 366

Parallel blocks pair
DIN 6346

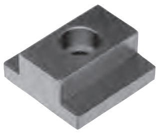
03212
Page 367

Parallel block sets

03220
Page 367

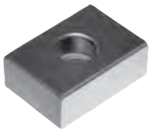
Positioning brackets

03240
Page 368



T-slot keys

03250
Page 368



Slot keys

03252
Page 369

Elastic slot keys
Pat. No. 4200676

03260
Page 370

Slot keys loose
DIN 6323

03270
Page 370

Slot keys
with locating pin

03288
Page 371

Parallel keys
DIN 6885 A

03288-01
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Parallel key, ceramic +
similar to DIN 6885 A

03289
Page 373

Woodruff keys
DIN 6888

03290
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Carrier keys
DIN 2079

03315
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Roll dowel
heavy duty ISO 8752

03320
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Cylindrical pins
DIN 6325

03320-01
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Ceramic dowel pins +
similar to DIN 6325

03325
Page 377

Cylindrical pins with internal thread
DIN EN ISO 8735

03325-01
Page 377

Ceramic dowel pins with +
female thread similar to DIN 7979

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Page 378

Extractor

03330
Page 381

Lateral spring plungers

03330
Page 380-382

Eccentric bushes and assembly tools
for lateral spring plungers

03331
Page 383

Eccentric bushes
with centre bore

03332
Page 384

Lateral spring plungers
without thrust pin

+ New/Expanded Items

norelem positions

Flexible standard component system

03000

03334
Page 386

Lateral spring plungers
with threaded sleeve

03336
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Lateral spring plungers
with threaded sleeve, without thrust pin

03338
Page 389

Push-Pull spring plungers

03339
Page 390

Push-Pull spring plungers
with rotation lock

03340
Page 391

Lateral spring plungers

03350
Page 392

Shaft clamping units

03351
Page 393

Threaded clamping bushes

03400
Page 394

Locking pins
with folding latch

03410
Page 395

Locking pins
with axial locking

03412
Page 396

Locking pins
with magnetic axial lock

03415
Page 397

Ball lock pins
stainless steel

03415
Page 398

Ball lock pins, stainless steel
with high shear strength +

03415-10
Page 399

Ball lock pins
stainless steel, with headend lock +

03418
Page 400

Ball lock pins with mushroom grip
stainless steel

03418
Page 401

Ball lock pins
with mushroom grip stainless steel,
with high shear strength +

03418-10
Page 403

Ball lock pins with mushroom grip
stainless steel, adjustable

03418-10
Page 405

Ball lock pins
with mushroom grip
stainless steel, with high shear
strength, adjustable +

03420
Page 406

Ball lock pins +

03420
Page 408

Ball lock pins
with L-grip +

03420
Page 409

Ball lock pins with L-grip
with high shear strength +

03420
Page 410

Ball lock pins
with T-grip +

03420
Page 411

Ball lock pins with T-grip
with high shear strength +

03420-10
Page 412

Ball lock pins
stainless steel, with headend lock +

03420-10
Page 414

Ball lock pins with T-grip
stainless steel, with head-end lock +

03420-10
Page 413

Ball lock pins with L-grip
stainless steel, with head-end lock +

03422
Page 418

Ball lock pins
with zinc T-grip

03422
Page 419

Ball lock pins with T-grip
with high shear strength +

03422
Page 416

Ball lock pins
with zinc L-grip

03422
Page 417

Ball lock pins with L-grip
with high shear strength +

03425
Page 420

Locating bushes stainless steel
for ball lock pins +

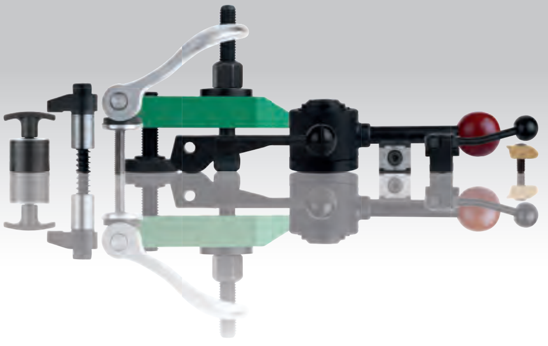
\+ New/Expanded Items

norelem positions

Flexible standard component system

04000

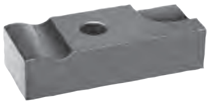
Clamp straps Clamping devices



04010
Page 422

Clamp straps
slotted heel

04030
Page 423



Clamp straps
swivel-heel

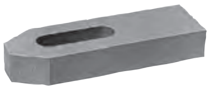
04050
Page 423

Clamp straps
tapped-heel

04070
Page 424

Clamp straps
stepped-heel, steel or aluminium

04080
Page 425



Clamp straps
DIN 6314 straight, steel or aluminium

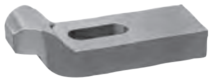
04081
Page 426

Clamp straps
with flattened ball

04088
Page 427

Clamp straps gooseneck
narrow, steel

04090
Page 428

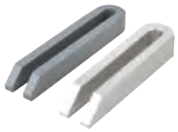


Clamp straps gooseneck
DIN 6316 wide, steel or aluminium

04100
Page 429

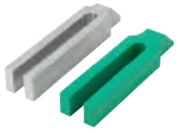
Clamp straps
assorted, long slot

04110
Page 430



Clamp straps open U
DIN 6315, steel or aluminium

04130
Page 431



Clamp straps open U
flat pin, steel or aluminium

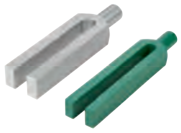
04131
Page 432

Clamp straps open-U
with pin and protective insert

04140
Page 433

Clamp straps pivot
strap only or assembly

04150
Page 434

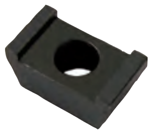


Clamp straps open U
DIN 6315 C, round pin, steel or aluminium

04170
Page 435

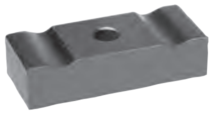
Clamp straps
hinge heel

04185
Page 435



Clamp straps mini
double sided

04190
Page 436



Clamp straps
double sided

04191
Page 437

Clamp straps
double-sided, 90° swivelling

04192
Page 438

Clamp strap assemblies

04193
Page 439

Clamp strap assemblies
goose-neck

04195
Page 439

Clamp springs

04200
Page 440

Clamp strap modules
compact

04203
Page 443

Clamp strap assemblies

04204
Page 444

Adjustable heel supports
for clamp strap assembly

04205
Page 445

Clamp straps pivot
steel

04210
Page 445

Clamp straps hinge heel
with bolt slot

04211
Page 446

Chain clamp sets, steel +

04211-03
Page 447

Roller chains, steel,
for chain clamp sets +

04211-06
Page 448

Turnbuckles, steel,
for chain clamp sets +

04211-09
Page 449

Prisms, steel, for chain clamp sets +

04232
Page 451

Cam levers
internal and external thread, steel or stainless steel

04232
Page 452

Cam levers steel
with internal and external thread

+ New/Expanded Items

norelem positions

Flexible standard component system

04000

04232
Page 455

Cam levers
internal and external thread, stainless steel

04232
Page 456

Cam levers
internal or external thread, stainless steel, thrust washer stainless steel

04232
Page 458

Cam levers with plastic handle
internal and external thread, steel or stainless steel

04233
Page 460

Cam levers adjustable
external thread, steel or stainless steel

04233
Page 461

Cam levers adjustable
steel, with external thread

04233
Page 462

Cam levers adjustable
external thread, stainless steel

04233
Page 463

Cam levers adjustable
external thread, stainless steel, thrust washer stainless steel

04233
Page 464

Cam levers adjustable with plastic handle
external thread, steel or stainless steel

04250
Page 465

Hinge pins

04270
Page 465

Spacer bolts

04290
Page 466

Cam levers single

04310
Page 466

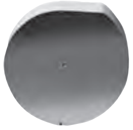
Cam levers double

04330
Page 467

Cam clamps
with end lock

04350
Page 467

Cam clamps
with middle lock

04360
Page 468

Spiral cams

04362
Page 468

Door latch

04363
Page 470

Swing clamps mini,
with cam lever

04364
Page 471

Swing clamps mini

04365
Page 473

Swing clamp
pneumatic

04366
Page 474

Swing clamps

04370
Page 475

Hook clamps

04370
Page 476

Hook clamp
with long clamp strap

04370
Page 477

Hook clamps
with protective insert

04371
Page 478

Hook clamps
with collar

04371
Page 479

Hook clamps
with collar and cam lever

04371
Page 480

Hook clamps
with collar and cam lever

04372
Page 483

Hook clamps
+

04373
Page 484

Hook clamps
with collar

04374
Page 485

Hook clamps
with mounting bracket

04375
Page 486

Hook clamp holders
+

04378
Page 487

Riser bars

04379
Page 488

Hook clamp holders
+

04380
Page 489

Hook clamps precision

04390
Page 489

Swing clamps

04395
Page 490

Clamping bolts

04400
Page 491

Clamping pins

+ New/Expanded Items

norelem positions

Flexible standard component system

04000

04400
Page 491

Clamping pins (high force)

04400
Page 492

Clamping screws

04400
Page 492

Clamping screws (high force)

04400
Page 494

Pull clamps

04400
Page 491-492, 495

Pull clamps (high force)

04403
Page 496

Pull clamps
pneumatic

04403-01
Page 498

Draw bolts
for pneumatic pull clamps

04410
Page 501

Clamping element “actima”

04420
Page 502

Floating clamp +

04421
Page 504

Floating clamp
with separate workpiece clamp and interlock +

04422
Page 506

Clamping jaws
for floating clamps +

04430
Page 508

Clamping element “arness”

04430-10
Page 510

Clamp cam brass

04431
Page 511

Fixture clamps machinable

04431-05
Page 512

Clamping cams +

04432
Page 513

Fixture clamps unequal hexagon

04433
Page 514

Spiral cam screws

04434
Page 515

Cam screws
with knife edge washer

04435
Page 515

Cam screws
with hexagon washer

04436
Page 516

Cam screws
with hexagon washer, for T-slots

04437
Page 517

Cam clamps
with riser

04439
Page 517

Toe clamps for T-slots

04440
Page 518

Talon grips

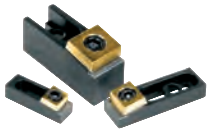
04440
Page 519

Talon grips round

04441
Page 520

Chock clamps

04444
Page 521

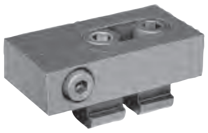


Cam clamps adjustable
with riser

04445
Page 522

Riser stops

04450
Page 523



Low-profile clamps

04460
Page 524

Side clamps

04461
Page 525

Side clamps
with support

04462
Page 526

T-slot clamps

04469
Page 527

T-slot clamp

04470
Page 528

T-slot clamps

04472
Page 529

T-slot clamp
with cam +

04480
Page 530

Side clamps

04485
Page 531

Side clamps
with rest pad

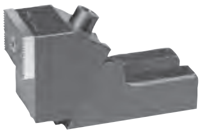
+ New/Expanded Items

norelem positions

Flexible standard component system

04000

04500
Page 532



Side clamps robust

04500-01
Page 533

Fixed jaws for robust side clamps

04509
Page 534

Side clamps

04512
Page 535

Seating blocks adjustable

04515
Page 536

Side clamp
with cam +

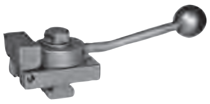
04516
Page 537

Side clamps

04518
Page 538

Side clamps

04520
Page 539

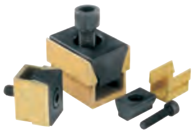


Side clamps

04521
Page 540

Toe clamps compact

04522
Page 541



Wedge clamps

04523
Page 542

Wedge clamps
machinable

04524
Page 543

Wedge clamps
jaw face smooth or serrated

04524
Page 544

Wedge clamps
machinable

04525
Page 545

Wedge clamps
jaw faces serrated

04526
Page 546

Wedge clamps
machinable

04527
Page 547

Wedge clamps double
jaw faces serrated

04530
Page 549

Side clamps

04540
Page 550

Side stops

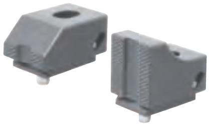
04562
Page 551

Side clamps

04567
Page 553

Wedge clamps

04570
Page 554

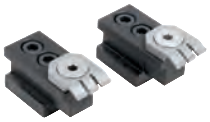


Toe clamps

04571
Page 555

Flat clamps

04571-10
Page 556



Flat clamp, steel
for T-slot +

04575
Page 557

Side clamps

04578
Page 558

Side clamps

04579
Page 559

Side Clamp +

04610
Page 560

Swivel hold-down clamps
mini, with cam lever

04620
Page 561

Down-thrust clamps

04624
Page 562

Hold-down clamps
pneumatic

04625
Page 564

Compact clamps

04626
Page 565

Riser blocks
with draw bolt

04629
Page 567

Power clamp +

04629-10
Page 569

Power clamp 3 stage +

04630
Page 570

Risers
for power clamp +

04631
Page 571

Thrust pads
for power clamp +

04750
Page 572

Clamp nuts

+ New/Expanded Items

04751
Page 573

Clamp nuts with star or T-grip

04752
Page 574

Tightening screws

04753
Page 575

Clamping pin, steel ➕

04754
Page 576

Clamping pin, steel or
stainless steel with washer ➕

04755
Page 577

Clamping pin, steel or stainless
steel with clamping angle ➕

04756
Page 578

Clamping pin, steel or
stainless steel with adapter plate ➕

04757
Page 579

Pivot bearing, steel
with external thread ➕

04758
Page 580

Plate, steel
open ➕

04759
Page 581

Angle, steel
open ➕

Toggle clamps
Pneumatic clamps
Accessories for clamps
Latches
Quarter-turn locks

05020
Page 585

Toggle clamps vertical
with horizontal foot

05020
Page 586

Toggle clamps vertical
with horizontal foot and full clamping lever

05020
Page 587

Toggle clamps vertical
with horizontal foot, large version

05040
Page 588

Toggle clamps vertical
with straight foot

05060
Page 590

Toggle clamps vertical
with angled foot

05080
Page 591

Toggle hook clamps
and catch plate

05120
Page 592

Toggle clamps horizontal
with horizontal foot

05120
Page 592

Toggle clamps horizontal
large version

05130
Page 593

Toggle clamps horizontal
with straight foot

05140
Page 593

Toggle mini clamps

05160
Page 594

Toggle clamps horizontal
with push rod

05170
Page 595

Toggle clamps with push rod
push-pull operation, for bracket mounting

05200
Page 585, 588, 590, 596

Plastic grips

05220
Page 596

Thrust spindles spring mounted

➕ New/Expanded Items

norelem positions

Flexible standard component system

05000

05240
Page 597

Thrust screws
with thrust pad

05241
Page 597

Thrust screws
with thrust pad

05260
Page 598

Thrust screws neoprene

05280
Page 598

Protective caps +

05300
Page 599

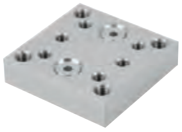
Toggle clamps variable horizontal
with horizontal foot

05302
Page 600

Toggle clamps variable vertical
with horizontal foot

05305
Page 601

Toggle clamps variable
with thrust rod

05310
Page 602

Adapter block
aluminium

05312
Page 603

Adapter plates
round +

05331
Page 605

Pneumatic clamp

05332
Page 607

Pneumatic clamps vertical
with vertical cylinder bracket +

05340
Page 608

Pneumatic clamps push-rod

05350
Page 609

Pneumatic clamps vertical
heavy-duty version

05360
Page 610

Pneumatic clamps vertical
with vertical mounted cylinder

05400
Page 611

Toggle clamps heavy duty
vertical

05420
Page 612

Toggle clamps heavy duty version
straight foot

05520
Page 612

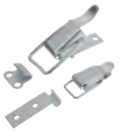
Plastic grips

05526
Page 613

Latches
with spring clip

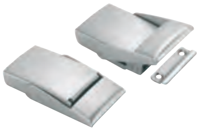
05530-05
Page 614

Latch stainless steel
DIN 3133

05531
Page 615

Latches
with draw bail

05536
Page 616

Latches
with draw bail

05547-05
Page 617

Latches with release
stainless steel

05550
Page 618

Latches adjustable
with swing bail

05552
Page 619

Latches adjustable

05560
Page 620

Adjustable latches
heavy-duty version

05561
Page 621

Quarter-turn locks compact

05561-02
Page 622

Quarter-turn lock, stainless steel

05562
Page 623

Quarter-turn locks compact
with wing grip

05564
Page 624

Quarter-turn locks compact
lockable

05566
Page 626

Quarter-turn locks

05566-03
Page 627

Quarter-turn locks
stainless steel, small version

05566-04
Page 629

Quarter-turn locks, stainless steel
long version

05566-05
Page 630

Quarter-turn locks
stainless steel, small version

05566-06
Page 631

Quarter-turn locks
lockable, stainless steel

05566-07
Page 627, 629-632

Tongue for quarter-turn lock

05567
Page 633

Quarter-turn locks
polyamide

+ New/Expanded Items

norelem positions

Flexible standard component system

05000

05568
Page 635

Quarter-turn locks
long version

05571
Page 636

Quarter-turn locks
with wing grip

05571-02
Page 637

Quarter-turn lock stainless steel
with wing grip

05572
Page 638

Quarter-turn locks
with T-grip

05573
Page 639

Quarter-turn locks
with L-grip

05574
Page 640

Compression latches

05575
Page 641

Compression latches
with adjustable tongue height

05576
Page 642

Quarter-turn locks
with cam tongue

05577
Page 643

Quarter-turn locks
free-turning

05578-02
Page 644

Quarter-turn security locks, stainless steel

05584
Page 645

Dust caps

05585
Page 645

Opening grips

05586
Page 646

Keys
for quarter-turn locks

05587
Page 647

Quarter-turn locks
stainless steel

05588
Page 648

Quarter-turn locks
stainless steel, lockable

05589
Page 649

Quarter-turn locks
stainless steel with wing grip

05593
Page 650

Quarter-turn locks
stainless steel with T-grip

05593-01
Page 651

Quarter-turn locks
stainless steel with T-grip

05593-04
Page 652

Quarter-turn locks
in Hygienic DESIGN
with T-grip +

05594
Page 653

Quarter-turn locks
stainless steel with L-grip

05594-02
Page 654

Quarter-turn locks
stainless steel with L-grip

05595
Page 655

Quarter-turn locks
for sterile areas

05595-01
Page 656

Quarter-turn locks
in Hygienic DESIGN +

05595-02
Page 657

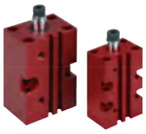
Quarter-turn locks
in Hygienic DESIGN +

05598
Page 658

Slam latches

05599
Page 659

Emergency openers

05610
Page 660

Swing clamps
pneumatic

05620
Page 661

Clamping arm
for swing clamp

05625
Page 661

Adapters
for swing clamp

05650
Page 665

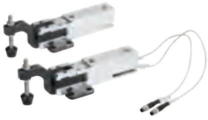
Mini clamps

05652
Page 667

Mini clamp
manual operated

05660
Page 668

Swing screws

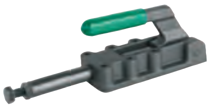
05665
Page 671

Mini clamp
for horizontal installation

05666
Page 672

Manual clamp
vertical with hole pattern on the front

05667
Page 673

Manual clamp
vertical with hole pattern on the front

05840
Page 674

Push-pull clamps
heavy-duty version with handle

\+ New/Expanded Items

norelem positions

Flexible standard component system

05000

05880
Page 675, 679, 689

Angle bracket

05882
Page 675

Plastic grips

05900
Page 679

Toggle clamps horizontal
with flat foot and adjustable clamping spindle

05900
Page 680

Toggle clamps horizontal
with flat foot and adjustable clamping spindle, stainless steel

05900
Page 681

Toggle clamps horizontal with safety interlock with flat foot and adjustable clamping spindle

05900
Page 682

Toggle clamps horizontal with safety interlock with flat foot and adjustable clamping spindle, stainless steel

05904
Page 683

Toggle clamps horizontal
with straight foot and adjustable clamping spindle

05904
Page 684

Toggle clamps horizontal
with straight foot and adjustable clamping spindle, stainless steel

05904
Page 685

Toggle clamps horizontal with safety interlock with straight foot and adjustable clamping spindle

05904
Page 686

Toggle clamps horizontal with safety interlock
with straight foot and adjustable clamping spindle, stainless steel

05908
Page 689

Toggle clamps vertical
with flat foot and adjustable clamping spindle

05908
Page 691

Toggle clamps vertical
with flat foot and adjustable clamping spindle, stainless steel

05908
Page 693

Toggle clamps vertical
with safety interlock
with flat foot and adjustable clamping spindle

05908
Page 695

Toggle clamps vertical
with safety interlock
with flat foot and adjustable clamping spindle, stainless steel

05912
Page 696

Toggle clamps vertical
with straight foot and adjustable clamping spindle

05912
Page 697

Toggle clamps vertical
with straight foot and adjustable clamping spindle, stainless steel

05912
Page 698

Toggle clamps vertical with safety interlock with straight foot and adjustable clamping spindle

05912
Page 699

Toggle clamps vertical with safety interlock with straight foot and adjustable clamping spindle, stainless steel

05990
Page 700

Spherical seating nuts

05990-20
Page 701

Status sensors,
stainless steel with bracket
for toggle clamps +

+ New/Expanded Items

norelem positions

Flexible standard component system

06000

Operating parts

06010
Page 704

Knurled nuts
steel and stainless steel, DIN 6303

06013
Page 705

Knurled nuts
plastic

06014
Page 706

Knurled nuts plastic +

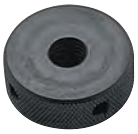
06014
Page 707

Knurled nuts plastic, antistatic +

06030
Page 708

Knurled nuts quick-acting

06070
Page 709



Knurled nuts

06089
Page 709

Knurled screws low head
steel and stainless steel, DIN 653

06090
Page 710

Knurled screws high form
steel and stainless steel, DIN 464

06091
Page 710

Knurled thumb screws
plastic

06091-01
Page 711

Knurled screws plastic +

06091-01
Page 712

Knurled screws plastic, antistatic +

06092
Page 713

Knurled knobs +

06092
Page 714

Knurled knobs antistatic

06094
Page 715

Knurled knobs

06096
Page 716

Knurled knobs
aluminium

06097
Page 717

Knurled knobs

06100
Page 718

Knurled knobs +

06105
Page 719

Knurled knobs
with arrow +

06110
Page 720

Knurled nuts high
steel and stainless steel, DIN 466

06120
Page 720

Knurled nuts flat
steel and stainless steel, DIN 467

06130
Page 721

Knurled screws

06131
Page 722

Knurled knobs
for screws with hex head

06132
Page 723

Knurled heads
for hexagon socket screws

06133
Page 724

Wing grips
for hexagon socket screws

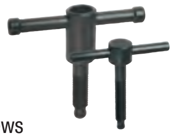
06134
Page 724

Disc grips
for hexagon socket screws

06140
Page 725

Tommy bars
with fixed or sliding T-bar, DIN 6305 or DIN 6307

06150
Page 726



T-thrust screws
with fixed or sliding T-bar, DIN 6304 or DIN 6306

06156
Page 728

Palm grips
aluminium, similar to DIN 6335

06158
Page 731

Palm grips
stainless steel, similar to DIN 6335

06160
Page 732

Palm grips
grey cast iron DIN 6335

06161
Page 733

Palm grips
plastic coated grey cast iron, DIN 6335

06170
Page 733

Palm grips
with threaded spindle

+ New/Expanded Items

norelem positions

Flexible standard component system

06000

06180
Page 734

Palm grips
similar to DIN 6335

06181
Page 735

Palm grips
similar to DIN 6335 metal parts stainless-steel

06190
Page 736

Palm grips quick-acting
grey cast iron

06192
Page 738

Star grips
aluminium, similar to DIN 6336

06194
Page 741

Star grips
stainless steel, similar to DIN 6336

06200
Page 742

Star grips
grey cast iron, DIN 6336

06208
Page 743

Star grips
similar to DIN 6336

06209
Page 744

Star grips
similar to DIN 6336,
metal parts stainless steel ⊞

06209-01
Page 745

Star grips, plastic
with protruding steel bush ⊞

06210
Page 747

Star grips
with projecting steel bush

06210-10
Page 748

Star grips, plastic
with clamping force intensifier ⊞

06211
Page 749

Star grips
with extended collar

06212
Page 750

Star grips
metal parts stainless steel, similar to DIN 6336

06212
Page 751

Star grips
with safety cable metal parts stainless steel, similar to DIN 6336

06220
Page 752

Star grips
similar to DIN 6336

06220
Page 754

Star grips antistatic
similar to DIN 6336

06220
Page 757

Star grips with safety cable
similar to DIN 6336

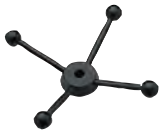
06222
Page 758

Star grips quick-acting

06230
Page 758

Four-spoked nuts

06235
Page 759



Capstan wheel

06237
Page 760

Knobs flat

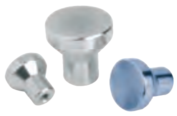
06238
Page 761

Mushroom knobs
internal thread

06239
Page 761

Mushroom knobs
external thread

06240
Page 762



Mushroom knobs
with internal thread

06240-10
Page 763

Mushroom knobs
internal thread

06240-11
Page 763

Mushroom knobs
external thread

06241
Page 764

Mushroom knobs
internal thread ⊞

06242
Page 766

Mushroom knobs
external thread ⊞

06242
Page 767

Mushroom knobs antistatic
external thread

06245
Page 768

Spherical knobs ⊞

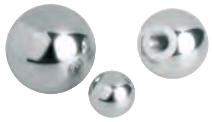
06246
Page 769

Spherical knobs
revolving ⊞

06247
Page 770

Ball knobs
thermoplastic DIN 319 enhanced

06247
Page 771



Ball knobs
stainless steel or aluminium DIN 319

06250
Page 772

Ball knobs smooth
DIN 319 enhanced ⊞

06251
Page 774

Tapered knobs

06252
Page 774

Conical knobs

⊞ New/Expanded Items

norelem positions

Flexible standard component system

06000

06253
Page 775

Five lobe grips

06255
Page 776

Handwheels 2-spoke
plastic

06255
Page 777

Handwheels 2-spoke
plastic, with revolving grip

06255
Page 778

Handwheels 2-spoke
plastic, with folding grip

06262
Page 779

Handwheels

06263
Page 780

Handwheels
with revolving grip

06264
Page 781

Handwheels
with fold-away grip

06265
Page 783

Handwheels
with safety grip

06266
Page 784

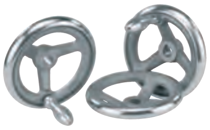
Knurled knobs +

06267
Page 786

Knurled knobs
metal parts stainless steel +

06268
Page 788

Knurled knobs
with grip +

06271
Page 790

Handwheels
DIN 950, grey cast iron

06273
Page 792

Handwheels
DIN 950, aluminium

06274
Page 794

Handwheels
DIN 950, stainless steel

06275
Page 796

Handwheels disc
aluminium

06275
Page 798

Handwheels disc
aluminium

06276-01
Page 800

Handwheels disc stainless steel
with revolving grip

06277
Page 802

Handwheels 2-spoke
aluminium, flat wheel rim

06277
Page 804

Handwheels 2-spoke
flat rim, aluminium

06279
Page 806

Handwheels disc
similar to DIN 950, aluminium

06287
Page 807

Handwheels disc
with revolving grip

06288
Page 808

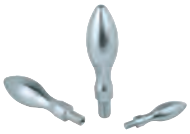
Handwheels disc
without grip

06289
Page 809

Hand wheels, steel, stamped +

06290
Page 810

Machine handles fixed
steel, similar to DIN 39

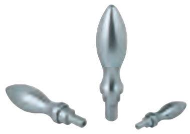
06291
Page 810

Machine handles fixed
steel, DIN 39 Form E

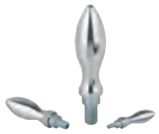
06292
Page 811

Machine handles fixed
aluminium, DIN 39 Form E

06293
Page 811

Machine handles, fixed,
DIN 39 Form E, stainless steel

06308
Page 812

Machine handles revolving
similar to DIN 98 Form E, steel

06309
Page 812

Machine handles revolving
aluminium, similar to DIN 98 Form E

06309-01
Page 813

Machine handles
revolving similar to DIN 98 Form E,
stainless steel

06310
Page 814

Machine handles revolving
steel, similar to DIN 98

06311
Page 814

Machine handles fixed
straight form, similar to DIN 39

06312
Page 815

Machine handles revolving
straight form, similar to DIN 98

06313
Page 815

Machine handles revolving

06314
Page 816

Conical grip
revolving

06315
Page 816

Taper grips
fixed

+ New/Expanded Items

norelem positions

Flexible standard component system

06000

06316
Page 817

Taper grips
revolving

06316
Page 817

Taper grips
revolving

06317
Page 818

Cylindrical grips revolving
stainless steel

06318
Page 818

Conical grips
revolving

06319
Page 819

Taper grips

06320
Page 820

Taper grips

06321
Page 821

Cylindrical grips revolving
with hexagon socket

06322
Page 821

Cylindrical grips revolving

06323
Page 822

Tension levers

06325-01
Page 823

Cylindrical grips, plastic
revolving +

06326-01
Page 824

Cylindrical grips, plastic
fold-down +

06328-01
Page 825

Safety cylindrical grips, plastic
auto-return +

06330
Page 826

Levers 20°
DIN 99

06340
Page 827

Tension lever

06341
Page 828

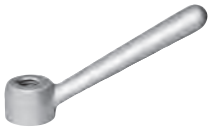
Tension levers stainless steel

06342
Page 829

Tension levers flat

06349
Page 830

Lock grips

06350
Page 830

Tension levers

06353
Page 831

Ball grips revolving

06355
Page 832

Handles screw-in

06357
Page 832

Handles screw-in
with torque limit

06360
Page 833

Handles

06362
Page 834

Clamp hubs

06370
Page 835

Tension levers
internal thread

06371
Page 836

Tension levers
internal thread, stainless steel

06380
Page 837

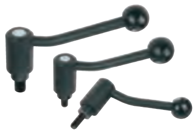
Tension levers
external thread

06381
Page 838

Tension levers
external thread, stainless steel

06382
Page 839

Tension levers safety
internal thread

06383
Page 840

Tension levers safety
external thread

06390
Page 841

Tension levers flat
internal thread

06391
Page 842

Tension levers flat
internal thread, stainless steel

06400
Page 843

Tension levers flat
external thread

06401
Page 844

Tension levers flat
external thread, stainless steel

06410
Page 845

Clamping levers
internal thread

06411
Page 846

Clamping levers
internal thread, steel parts stainless steel

06420
Page 847

Ball handles
DIN 6337

+ New/Expanded Items

norelem positions

Flexible standard component system

06000

06430
Page 847

Clamping levers

06430
Page 848

Clamping levers
external thread

06431
Page 849

Clamping levers
external thread, steel parts stainless steel

06440
Page 850

Clamping levers
internal thread, steel

06440
Page 851

Clamping levers
internal thread, stainless steel

06441
Page 852

Clamping levers
external thread

06441
Page 853

Clamping levers
external thread, stainless steel

06442
Page 854

Clamping levers
internal thread, steel

06443
Page 855

Clamping levers
external thread, steel

06448
Page 856

Clamping levers flat
internal thread

06449
Page 857

Clamping levers flat
internal thread, steel parts stainless steel

06450
Page 858

Clamping levers
internal thread

06450
Page 859

Clamping levers with protective cap
internal thread

06450-05
Page 860

Clamping levers,
zinc with internal thread, steel parts
trivalent blue passivated +

06450-10
Page 863

Clamping levers,
zinc with female thread
and clamping force intensifier +

06451
Page 864

Clamping levers
internal thread, steel parts stainless steel

06451
Page 865

Clamping levers with protective cap
internal thread, steel parts stainless steel

06451-10
Page 867

Clamping levers, zinc
with female thread and
clamping force intensifier +

06454
Page 868

Clamping levers
with internal thread, stainless steel

06454
Page 869

Clamping levers with protective cap
with internal thread, stainless steel

06458
Page 871

Clamping levers flat
external thread

06459
Page 872

Clamping levers flat
external thread, steel parts stainless steel

06460
Page 873

Clamping levers
external thread

06460
Page 874

Clamping levers with protective cap
external thread

06460-05
Page 875

Clamping levers, zinc
with external thread,
steel parts trivalent blue passivated +

06460-10
Page 877

Clamping levers, zinc
with male thread and
clamping force intensifier +

06461
Page 878

Clamping levers
external thread, steel parts stainless steel

06461
Page 879

Clamping levers with protective cap
with external thread, metal parts stainless
steel

06461-10
Page 881

Clamping levers, zinc
with male thread and clamping force
intensifier +

06464
Page 882

Clamping levers
with external thread, stainless steel

06464
Page 883

Clamping levers with protective cap
with external thread, stainless steel

06470
Page 885

Ratchet levers

06480
Page 887

Crank handles offset
similar to DIN 468

06490
Page 888

Crank handles straight
similar to DIN 469

06492
Page 889

Crank handles
aluminium

06500
Page 890

Crank handles
with fold-away grip

+ New/Expanded Items

norelem positions

Flexible standard component system

06000

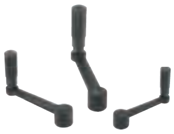
06500
Page 891

Crank handles
with revolving grip

06502
Page 892

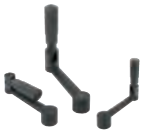
Crank handles
with safety grip

06503
Page 893



Crank handles aluminium
cylindrical revolving grip

06503
Page 894



Crank handles aluminium
with fold-away cylinder grip

06504
Page 895

Crank handles aluminium
with safety cylinder grip

06505
Page 896

Crank handles stainless steel
cylindrical revolving grip

06510
Page 897

Crank handles
balanced

06550
Page 897

Bar knobs

06600
Page 898

Clamping levers with plastic handle
internal thread +

06600
Page 899

Clamping levers with push button
internal thread

06600
Page 900

Clamping levers antistatic
internal thread, plastic grip

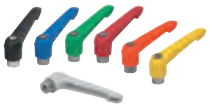
06600-05
Page 901

Clamping levers, plastic
with internal thread,
steel parts trivalent blue passivated +

06600-10
Page 903

Clamping levers, plastic
with female thread and
clamping force intensifier +

06601
Page 904



Clamping levers with plastic handle
internal thread,
metal parts stainless steel +

06601
Page 905

Clamping levers with push button
internal thread, metal parts stainless steel

06601-10
Page 907

Clamping levers, plastic
with female thread
and clamping force intensifier +

06610
Page 908

Clamping levers with plastic handle
external thread +

06610
Page 909

Clamping levers with push button
with external thread

06610
Page 910

Clamping levers antistatic
external thread, plastic grip

06610-05
Page 911

Clamping levers, plastic
with external thread,
steel parts trivalent blue passivated +

06610-10
Page 913

Clamping levers, plastic
with male thread
and clamping force intensifier +

06611
Page 914

Clamping levers with plastic handle
external thread,
metal parts stainless steel +

06611
Page 915

Clamping levers with push button
external thread, metal parts stainless
steel

06611-10
Page 917

Clamping levers, plastic
with male thread
and clamping force intensifier +

06612
Page 919

Clamping levers with thrust pad

06613-10
Page 920

Clamping levers, plastic with safety
function with female thread +

06613-11
Page 921

Clamping levers, plastic with safety
function with male thread +

06620
Page 923

Clamping joints

06621
Page 924

Clamping joints
individually adjustable

06622
Page 925

Multiple connectors

06648
Page 926

T-grips
stainless steel

06649
Page 927

T-grips

06650
Page 928

T-grips

06651
Page 929

Wing grips
internal thread, stainless steel

06652
Page 930

Wing grips

06652
Page 931

Wing grips
with tapped through bush

+ New/Expanded Items

norelem positions

Flexible standard component system

06000

06651-03
Page 932

Wing nuts narrow
in Hygienic DESIGN +

06652
Page 934

Wing grips antistatic

06652
Page 935

Wing grips “Miniwing”

06652
Page 936

Wing grips “Miniwing”
with tapped through bush

06652
Page 937

Wing grips “Miniwing” antistatic

06660
Page 938

Wing grips one-sided

06665
Page 939

Wing grips

06666
Page 940

Grip nuts

06666
Page 941

Grip screws

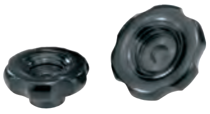
06699
Page 942

Triangular grips

06702
Page 943

Triangular grips
with high collar

06830
Page 944



Handwheels

06850
Page 945

Bouton aster

06851
Page 946

Five lobe grips
with internal thread

06851-01
Page 947

Five lobe grips
with external thread

06852
Page 948

Five lobe grips plastic lockable +

06853
Page 949

Five lobe grips

06895
Page 950

Pull handles

06900
Page 950

Pull handles

06900
Page 951

Pull handles

06901
Page 951

Pull handles

06901-01
Page 952

Pull handles, plastic oval +

06902
Page 953

Pull handles

06903
Page 954

Pull handles +

06903
Page 955

Pull handles
high temperature resistant +

06903
Page 956

Pull handles antistatic +

06904
Page 957

Pull handles

06907
Page 958

Pull handles arch

06909
Page 959

Pull handles arch

06910
Page 959

Pull handles

06911
Page 960

Pull handles arch

06912
Page 960

Pull handles
oblique

06913
Page 961

Pull handles
with soft inner face

06914
Page 962

Pull handles stainless steel

06915
Page 962

Pull handles

06916
Page 963

Pull handles

+ New/Expanded Items

norelem positions

Flexible standard component system

06000

06916-01
Page 964

Pull handles

06916-01
Page 965

Pull handles
high temperature resistant

06917
Page 966

Pull handles round

06918
Page 967

Pull handles oval

06919
Page 968

Pull handles round

06920
Page 969

Pull handles oval

06920
Page 970

Pull handles oval

06920
Page 971

Pull handles oval
detachable

06921
Page 973

Pull handles

06922
Page 973

Pull handles
stainless steel

06923
Page 974

Pull handles angled

06924
Page 974

Pull handles
stainless steel

06925
Page 975

Pull handles tubular

06926
Page 975

Pull handles tubular

06927
Page 976

Pull handles tubular

06928
Page 977

Pull handles tubular
oblique

06929
Page 978

Pull handles

06930
Page 979

Pull handles
high-gloss chromed

06931
Page 980

Pull handles
stainless steel

06932
Page 981

Pull handles

06932
Page 982

Pull handles

06933
Page 983

Pull handles

06933
Page 983

Pull handles

06934
Page 984

Pull handles fold-down

06935
Page 985

Pull handles angled

06936
Page 985

Pull handles tubular angled

06937
Page 986

Pull handles tubular

06938
Page 986

Pull handles tubular

06938-01
Page 987

Tubular handles round,
aluminium +

06938-02
Page 988

Tubular handles oval,
aluminium +

06939
Page 989

Pull handles tubular

06940
Page 990

Pull handles tubular

06941
Page 991

Pull handles tubular

06942
Page 992

Pull handles tubular

06943
Page 993

Pull handles tubular stainless steel

06944
Page 994

Pull handles

+ New/Expanded Items

norelem positions
Flexible standard component system

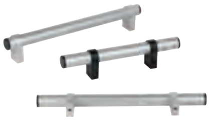
07000

06945
Page 994

Pull handles angled

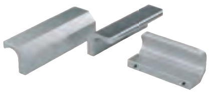
06946
Page 995

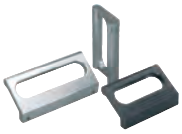
Pull handles

06947
Page 996

Pull handles tubular
adjustable

06948-01
Page 999

Tubular handles “Bighand”

06951
Page 1000

Ledge handles stainless steel

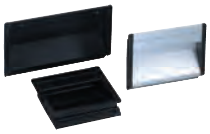
06952
Page 1001

Ledge handles

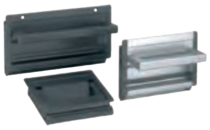
06956
Page 1002

Tubular handles angled

06959
Page 1003

Pull handles
open-ended screw on

06960
Page 1004

Recessed handles

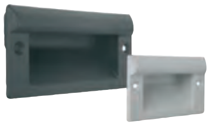
06961
Page 1005

Recessed handles fold-down

06961-01
Page 1006

Recessed handles
fold-down, stainless steel

06962
Page 1007

Recessed handles fold-down

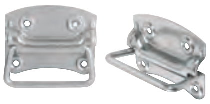
06965
Page 1008

Recessed handles

06966-01
Page 1009

Recessed grips
clip-in

06970
Page 1010

Recessed handles fold-down
stainless steel

06970-01
Page 1011

Recessed handles, fold down
DIN 3136

06975
Page 1012

Pull handles angled

Fasteners
Ball-end thrust screws
Thrust screws and thrust pads
Grippers
Torque bolts
Threaded inserts
Lifting bolts
Swivel bales
Ring bolts

07020
Page 1015

Studs

07030
Page 1016

Studs
DIN 6379

07040
Page 1018

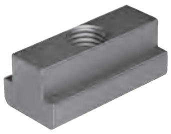
T-slot bolts
DIN 787

07040
Page 1020

T-slot bolts
DIN 787, 12.9

07060
Page 1021

Nuts for T-slots
DIN 508 enhanced

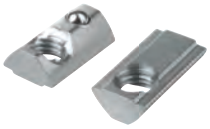
07061
Page 1022

Nuts for T-slots
long

07070
Page 1022

Nuts for T-slots
blanks

07071
Page 1023

Slot nuts
twist-in Type I

07073
Page 1024

Slot nuts
twist-in, keyed Type I

07075
Page 1025

Slot nuts
strong Type I

07076
Page 1025

Slot key profile
type I

07077
Page 1026

Slot nuts
twist-in Type B

07078
Page 1026

Slot nuts
twist-in with spring Type B

07080
Page 1027

Nuts for T-slots
rhombic form

+ New/Expanded Items

norelem positions

Flexible standard component system

07000

07090
Page 1028

T-nuts

07094
Page 1029

Hammer-head screws

07100
Page 1030

Ball-end thrust screws with head

07101
Page 1032

Ball-end thrust screws with head
stainless steel

07105
Page 1033

Ball-end thrust screws without head
with full ball, LONG-LOK secured

07105
Page 1034

Ball-end thrust screws without head
with flattened ball LONG-LOK secured

07109
Page 1035

Ball-end thrust screws without head
short version

07110
Page 1036

Ball-end thrust screws without head
with full ball

07110
Page 1039

Ball-end thrust screws without head
with flattened ball

07110
Page 1040

Ball-end thrust screws without head
with flattened ball and rotation lock

07111
Page 1041

Ball-end thrust screws without head
stainless steel with full ball

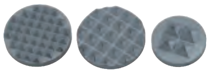
07111
Page 1042

Ball-end thrust screws without head
stainless steel with flattened ball

07111
Page 1043

Ball-end thrust screws without head
stainless steel with flattened ball and
rotation lock

07112
Page 1044



Gripper pads round
carbide

07113
Page 100, 107, 112, 1047

Grippers and inserts round

07113
Page 1048

Grippers and inserts round
with counterbore

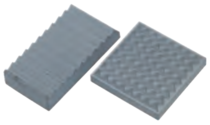
07114
Page 1049

Grippers hexagonal

07115
Page 1050

Grippers square

07116
Page 1051



Gripper pads square
carbide

07117
Page 1052

Grippers adjustable

07119
Page 1053

Thrust screws

07119
Page 1054

Thrust screws stainless steel

07119
Page 1055

Thrust screws
LONG-LOK secured

07120
Page 1056

Grub screws
with thrust point DIN 6332

07121
Page 1056

Grub screws
with ball thrust point

07122
Page 1057

Thrust screws
with point

07123
Page 1058

Thrust screws
with radiused half-dog point

07124
Page 1059

Torque grips
precision version

07125
Page 1060

Knurled torque knobs ➕

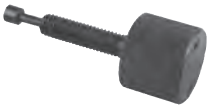
07126
Page 1061

Triangular torque grips

07130
Page 1062

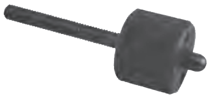
Torque screws
with thrust point

07131
Page 1062



Torque screws
with slot coupling

07132
Page 1063

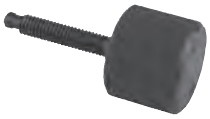


Torque screws
with support pin

07133
Page 1063

Torque grips

07134
Page 1064



Torque screws
with ball thrust points

07138
Page 1064

Thrust pads

➕ New/Expanded Items

norelem positions
Flexible standard component system

07000

07140
Page 1065

Thrust pads
DIN 6311 enhanced

07141
Page 1065

Thrust pads
with retaining pin

07142
Page 1066

Thrust pads

07143
Page 1067

Thrust spindles

07144
Page 1068

Swivel feet

07159
Page 1069

Socket head screws
full thread, DIN 912 / DIN EN ISO 4762

07160
Page 1070

Socket head screws
DIN 912 / DIN EN ISO 4762, steel or stainless steel

07160
Page 1072

Socket head screws
DIN 912/DIN EN ISO 4762

07160
Page 1073

Socket head screws
DIN 912 / EN ISO 4762, LONG-LOK secured

07161
Page 1075

Socket head screws
low head DIN 6912

07165
Page 1076

Grub screws with flat point
hexagon socket DIN 913

07166
Page 1077

Grub screw with hexagon socket and pointed end
DIN 914 / DIN EN ISO 4027

07170
Page 1078

Hexagon head bolts
DIN 931/DIN EN ISO 4014/DIN EN 24014

07170-02
Page 1080

Hexagon bolts with narrow shaft
in Hygienic DESIGN +

07170-15
Page 1082

Hexagon head screws,
stainless steel
in Hygienic DESIGN +

07171
Page 1084

Hexagon head bolts
DIN 933

07172
Page 1086

Hexagon head bolts with flange
EN 1665

07173
Page 1087

Hexagon head bolts
with serrated flange

07174
Page 1088

Button head screws
EN ISO 7380

07175
Page 1090

Screws with countersunk head
hexagon socket DIN EN ISO 10642

07175-02
Page 1091

Ball head screw
in Hygienic DESIGN +

07180
Page 1093

Eye bolts
DIN 444, Form B

07181
Page 1095

Eye bolts DIN 444, Form B
with long thread

07199
Page 1096

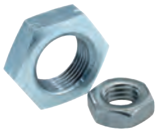
Wing screws

07200
Page 1097

Wing nuts

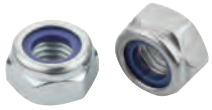
07210
Page 1098

Hexagon nuts
DIN 934/DIN EN ISO 4032/DIN EN 24032

07212
Page 1099

Hexagon nuts
thin type DIN 439

07213
Page 1100

Hexagon nuts with polyamide thread lock
high type, DIN 982 / stainless steel similar to DIN 982

07214
Page 1101

Hexagon nuts with polyamide thread lock
thin type, DIN 985

07215
Page 1102

Hexagon nuts with thread lock
DIN 980

07216
Page 1103

Hexagon nut
with serrated flange

07217
Page 1104

Hexagon nuts with flange
EN 1661

07218
Page 1105

Hexagon nuts with flange

07220
Page 1105

Extension nuts
height 3xD

07221
Page 1106

Turnbuckle nuts
steel tube, closed form DIN 1478

07222
Page 1107

Turnbuckle nuts
hexagonal DIN 1479

+ New/Expanded Items

norelem positions

Flexible standard component system

07000

07240
Page 1108

Hexagon nuts with collar
height 1.5xD, DIN 6331 enhanced

07242
Page 1109

Hexagon nuts
with no-loss washer

07260
Page 1110

Hexagon nuts
height 1.5xD, DIN 6330 enhanced

07265
Page 1111

Hexagon nuts
with spherical seat

07280
Page 1112

Hexagon domed cap nuts
similar to DIN 1587

07280-04
Page 1113

Cap nut compact
in Hygienic DESIGN +

07300
Page 1114

Washers
medium DIN EN ISO 7089 A

07303
Page 1115

Conical spring washers
DIN 6796

07304
Page 1116

Spring washers
DIN 137 B

07305
Page 1117

Washers large OD
DIN 9021

07306
Page 1118

Washers plastic
captive +

07310
Page 1119

Wedge lock washers
DIN 25201

07320
Page 1121

Washers for clamps
steel or aluminium DIN 6340

07330
Page 1123

Circlips for shafts
DIN 471

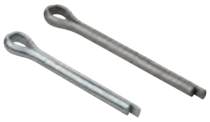
07331
Page 1124

Circlips for bores
DIN 472

07332
Page 1125

Circlips E-type
DIN 6799

07336
Page 1126



Split pins
EN ISO 1234

07337
Page 1127

R-clips
similar to DIN 11024

07360
Page 1128

Disc springs
DIN EN 16983

07375
Page 1129

Handwheel washers

07380
Page 1130

C-washers
DIN 6372 enhanced

07415
Page 1131

Clamping force intensifiers

07420
Page 1132

Spherical washers
DIN 6319, edition 10/01

07460
Page 1134

Spherical levelling washers

07520
Page 1134

C-washers captive
DIN 6371

07522
Page 1135

Shim washers
DIN 988

07523
Page 1136

Spacer washers ground

07530
Page 1136

Shoulder screws with slotted flat head
DIN 923

07533
Page 1137

Shoulder screws Form B

07534
Page 1138

Shoulder screws
similar to DIN ISO 7379

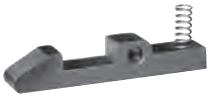
07535
Page 1139

Shoulder screws
with hexagon head similar to DIN 609

07540
Page 1140

Shoulder screws
with slotted domed head

07560
Page 1140



Snapper catch with spring
DIN 6310

07570
Page 1141

Quarter-turn screws

07590
Page 1142

Slotted round nuts
DIN 1804

07590-01
Page 1144

Slotted round nuts,
steel or stainless steel,
DIN 981 +

+ New/Expanded Items

norelem positions

Flexible standard component system

07000

07590-02
Page 1146

Locking plate steel or stainless steel
DIN 5406 +

07590-05
Page 1148

Slotted round nuts, steel,
DIN 70852 +

07595
Page 1149

Slotted nuts
with elastic lock

07598
Page 1150-1151

Adjustment nuts

07620
Page 1152

Clevis
with external thread

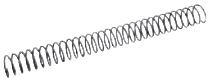
07630
Page 1152

Grub screws
DIN 551

07640
Page 1154

Threaded rods
steel and stainless steel DIN 976-1

07650
Page 1156



Springs
for clamp straps

07645
Page 1157

HeliCoil®plus threaded inserts

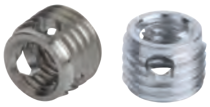
07652
Page 1159

Threaded inserts self-tapping
with cutting slot

07652
Page 1159-1161

Assembly tools
for self-tapping threaded inserts

07653
Page 1161



Threaded inserts self-tapping
with cutting bores

07660
Page 1162

Threaded inserts

07661
Page 1163

Threaded inserts reinforced

07662
Page 1164

Threaded inserts solid body

07663
Page 1165

Threaded inserts
with internal thread, self-locking

07664
Page 1166

Threaded inserts reinforced
internal thread, self-locking

07666
Page 1167

Repair kit

07670
Page 1169

Studs
with screw-in stop for gluing in

07680
Page 1171

Ring bolts
DIN 580 +

07680-01
Page 1172

Ring bolts
similar to DIN 580

07690
Page 1173

Ring nuts
DIN 582 +

07690-01
Page 1174

Ring nuts
similar to DIN 582

07695
Page 1175

Ring bolts rotatable
high-strength grade 10

07710
Page 1176

Ring bolts
swivel and 360° rotatable, grade 8

07715
Page 1177

Bow shackles

07716
Page 1178

D-shackles

07720
Page 1179

Weld-on D-rings

07725
Page 1180

Hoist rings 360° rotation
grade 10

07730
Page 1181

Hoist rings

07735
Page 1182

Hoist rings with Envirolox® coating

07750
Page 1182

Lifting rings

07752
Page 1183

Swivel bales
with axial ring

07770
Page 1184

Hoist rings

07772
Page 1185

Flip-Flop hoist rings

07774
Page 1186

Hoist rings

+ New/Expanded Items

norelem positions

Flexible standard component system

07000

07775
Page 1187

Swivel bales

07780
Page 1188

Lifting pins
self-locking

07780
Page 1189

Lifting pins
self-locking, stainless steel

07781
Page 1190

Receiver bushes
for ball lifting pins, stainless steel

07781
Page 1191

Locating bushes
for ball lifting pins stainless steel, flat

07782
Page 1192

Lifting pins
self-locking, stainless steel

07784
Page 1193

Receiver bush
stainless steel, for lifting pins

07791
Page 1195

Slip hooks
grade 10

07792
Page 1196

Self-locking hooks
grade 10

07793
Page 1197

Shortening hooks
grade 10

07794
Page 1198

Swivel hooks
grade 10

07795
Page 1199

Connecting links
grade 10

07796
Page 1200

Round sling hooks
grade 8

07797
Page 1201

Round sling links
grade 8

07798
Page 1202

Round slings +

07798-02
Page 1203

Lifting slings +

07800
Page 1204

Shaft collars set screw
DIN 705, steel

07800
Page 1206

Shaft collars set screw
DIN 705, stainless steel

07810
Page 1207

Shaft collars one-piece

07810
Page 1208

Shaft collars
one-piece, with clamping lever

07811
Page 1209

Shaft collars one-piece
wide

07812
Page 1210

Shaft collars two-piece

07813
Page 1211

Shaft collars two-piece
wide

07814
Page 1212

Shaft collars
with thread

07820
Page 1215

Ratchet elements
steel or stainless steel +

+ New/Expanded Items

norelem positions

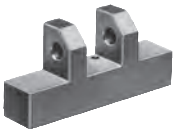
Flexible standard component system

Jig elements
Drill bushes

08050
Page 1218

Hinge blocks
long

08100
Page 1218



Hinge blocks
short

08150
Page 1219

Latch

08180
Page 1220

Thrust washers

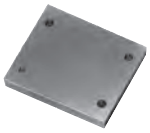
02010
Page 114, 1220

Rest pads

08570
Page 1221

Drilling plates
DIN 6348 enhanced

08580
Page 1222



Base plates
DIN 6348

08600
Page 1223

Extension columns
short

08610
Page 1223

Extension columns
long

08900
Page 1224

Drill bushes cylindrical
DIN 179

08910
Page 1225

Drill bushes flanged
DIN 172

08920
Page 1226

Drill bushes push-in
DIN 173

08920
Page 1227
Page

Drill bushes push-in
DIN 173-1

08926
Page 1228

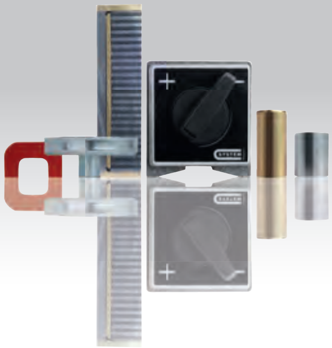
Drill bush clamps
DIN 173-1

08927
Page 1228

Shoulder screws flathead
for DIN 173 drill bushes

+ New/Expanded Items

Magnets

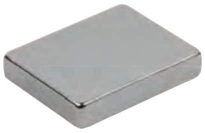


09000
Page 1232

Magnets raw
NdFeB, disc form

09001
Page 1232

Magnets raw with hole
NdFeB, disc form

09002
Page 1233

Magnets raw
NdFeB, block form

09003
Page 1233

Magnets raw
AlNiCo, bar type

09060
Page 1234

Permanent workholding magnets
with fine pole division

09060
Page 1235

Magnets deep pot
AlNiCo with fitting tolerance

09061
Page 1235

Magnets deep pot
AlNiCo without fitting tolerance

09063
Page 1236

Magnets deep pot with pin
AlNiCo

09064
Page 1236

Magnets shallow pot
hard ferrite

09065
Page 1237

Magnets shallow pot with thread
hard ferrite

09065-10
Page 1237

Magnets shallow pot with internal thread
hard ferrite with stainless-steel housing

09066
Page 1238

Magnets shallow pot
SmCo

09067
Page 1238

Magnets deep pot
SmCo

09067-10
Page 1239

Magnets deep pot
NdFeB

09067-11
Page 1240

Magnets
deep pot with machinable magnetic face
NdFeB

09068
Page 1241

Magnets deep pot with internal thread
NdFeB

09069
Page 1242

Magnets shallow pot
NdFeB

09069-10
Page 1243

Magnets shallow pot with hook
NdFeB

09070
Page 1244

Magnets shallow pot with counterbore
hard ferrite

09070-10
Page 1244

Magnets shallow pot with counterbore
SmCo with stainless-steel housing

09071
Page 1245

Magnets shallow pot with countersink
hard ferrite

09071-10
Page 1245

Magnets shallow pot with countersink
hard ferrite with stainless-steel housing

09071-20
Page 1246

Magnets shallow pot with countersink
SmCo

09071-30
Page 1246

Magnets shallow pot with countersink
NdFeB

09072
Page 1247

Magnets shallow pot with internal thread
NdFeB

09072-10
Page 1247

Magnets shallow pot with internal thread
hard ferrite

09094
Page 1248

Magnets deep pot

09096
Page 1248

Magnets shallow pot

09098
Page 1249

Magnets button

09100
Page 1249

Magnets strong

09110
Page 1250

Protective rubber caps
for shallow pot magnets

09112
Page 1250

Magnets shallow pot with internal thread
NdFeB, with rubber protective jacket

+ New/Expanded Items

norelem positions 09000

Flexible standard component system

09112-10
Page 1251

Magnets with internal thread
NdFeB, rectangular, with rubber protective jacket

09114
Page 1252

Magnets shallow pot with tapped pin
NdFeB, with rubber protective jacket

09116
Page 1252

Magnets shallow pot with threaded pin
NdFeB, with rubber protective jacket

09117
Page 1253

Magnets deep pot with threaded pin
NdFeB, rubber magnetic face

09118
Page 1253

Magnets shallow pot with through hole
NdFeB, with rubber protective jacket

09119
Page 1254

Retaining magnets
hard ferrite

09119-10
Page 1254

Retaining magnets
hard ferrite

09150
Page 1255

Magnetic Pickup

09210
Page 1255

Magnetic base, permanent

09230
Page 1256

Magnetic clamping balls +

norelem assembles 10000

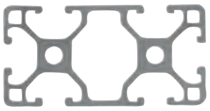
Assembly system

Aluminium profiles
Connectors
Covers
Special elements

10025
Page 1259

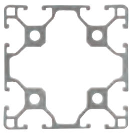
Aluminium profiles 30x30 light
Type I

10025
Page 1259



Aluminium profiles 30x60 light
Type I

10025
Page 1260

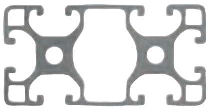


Aluminium profiles 60x60 light
Type I

10045
Page 1261

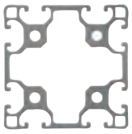
Aluminium profiles 40x40 light
Type I

10045
Page 1261



Aluminium profiles 40x80 light
Type I

10045
Page 1262



Aluminium profiles 80x80 light
Type I

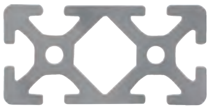
10048
Page 1263

Aluminium profiles 16x40
Type I

10048
Page 1263

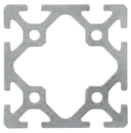
Aluminium profiles 40x40
Type I

10048
Page 1264



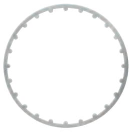
Aluminium profiles 40x80
Type I

10048
Page 1264



Aluminium profiles 80x80
Type I

10050
Page 1265

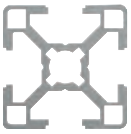


Aluminium profiles D50
Type I, tube

10051
Page 1265

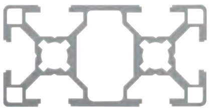
Aluminium profiles 40x40
for roller rails, Type I

10140
Page 1266



Aluminium profiles 30x30
Type B

10140
Page 1266



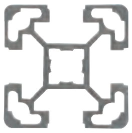
Aluminium profiles 30x60
Type B

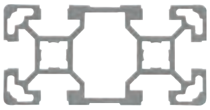
+ New/Expanded Items

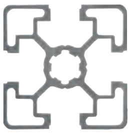
norelem assembles

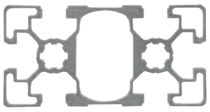
Assembly system

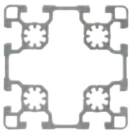
10000

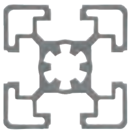
10142
Page 1267

Aluminium profiles 40x40 light
Type B

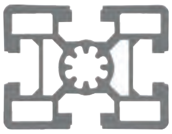
10142
Page 1267

Aluminium profiles 40x80 light
Type B

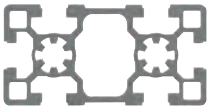
10157
Page 1268

Aluminium profiles 45x45 light
Type B

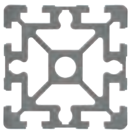
10157
Page 1268

Aluminium profiles 45x90 light
Type B

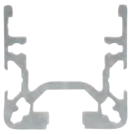
10157
Page 1269

Aluminium profiles 90x90 light
Type B

10160
Page 1270

Aluminium profiles 45x45
Type B

10160
Page 1270

Aluminium profiles 45x60
Type B

10160
Page 1271

Aluminium profiles 45x90
Type B

10160
Page 1271

Aluminium profiles 90x90
Type B

10161
Page 1272

Aluminium profiles 40x40
for roller rails, Type B

10200
Page 1273

Connecting sets standard
Type I

10202
Page 1274

Connecting sets universal
Type I

10204
Page 1275

Connecting sets central
Type I

10205
Page 1276

Connecting sets central
Type B

10206
Page 1277

Connecting sets central
Type B

10210
Page 1278

Connecting sets automatic
Type I

10212
Page 1279

Connecting sets automatic
Type B

10215
Page 1280

Pin connector sets
Type B

10220
Page 1281

Cube connector sets
Type B

10228
Page 1282

Central screws
Type B

10228-01
Page 1283

Threaded insert, steel, self-tapping,
type B +

10228-01
Page 1284

Assembly tool, steel,
for self-tapping threaded inserts
type B +

10230
Page 1285

Butt connector sets automatic
Type I

10240
Page 1286

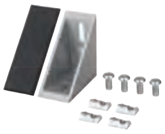
Straps

10242
Page 1286

Angles

10244
Page 1287

Fastening sets
for straps und angles

10250
Page 1288

Angle sets
Type I

10252
Page 1289

Angle sets
Type B

10260
Page 1290

Angle elements T1
Type I

10261
Page 1291

Angle elements T2
Type I

10265
Page 1292

Clamping angles
Type I

10266
Page 1293

Joint angles
Type I

10270
Page 1295

Joints
Type B and Type I

10300
Page 1296

End caps
Type B and Type I

10315
Page 1297

Cover and adapter profiles
Type B and Type I

10320
Page 1298

Cover profiles
Type I

+ New/Expanded Items

norelem assembles

Assembly system

10000

10330
Page 1298

Slide rails
Type I

10347
Page 1300

Foot plates
Type B and Type I

10400
Page 1302

Bearing flange
for feed roller

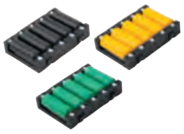
10448
Page 1303

Plastic roller elements
for roller rails

10448-01
Page 1304

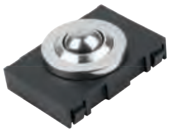
Stainless steel brakes
for roller elements

10448-02
Page 1304



Plastic roller elements, compact
for roller rails

10448-03
Page 1305

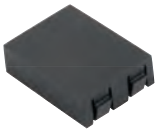


Ball transfer units
for roller rails

10448-04
Page 1305

Brush elements, plastic
for roller rails

10448-05
Page 1306

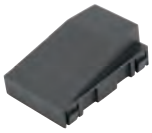


Spacers, plastic
for roller rails

10448-06
Page 1306

Backstop elements, steel
for roller rails

10448-07
Page 1307



Plastic slide ramps
for roller rails

10448-08
Page 1307

Plastic slide rails
for roller rails

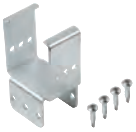
10448-50
Page 1308

End plates, steel
for roller rails

10448-51
Page 1308

Suspension brackets, steel
for roller rails

10448-52
Page 1309



Mounting brackets, steel
for roller rails

10450
Page 1310

Roller elements

10451
Page 1311

Cable tie block

10453
Page 1311

Cable clips

10454
Page 1312

Cable clips with T-slot key

10460
Page 1313

Sensor holders

10470
Page 1314

Earthing terminal
Type I

10471
Page 1314

Potential equaliser
Type I

10500
Page 1316

Eccentric clamp modules

10505
Page 1318

Cam clamps
for eccentric clamp modules +

10550
Page 1320

Clip-in shell bins, plastic
for profile slots type I and type B
and mounting profiles +

10550-05
Page 1322

Clip-in bins, plastic
for type I and type B profile slots
and mounting profiles +

10550-05
Page 1324

Clip-in bins, antistatic plastic
for mounting profiles +

10550-10
Page 1325

Swivel adapter, plastic
for profile slots +

10550-10
Page 1326

Swivel adapter, antistatic plastic
for profile slots +

10550-15
Page 1327

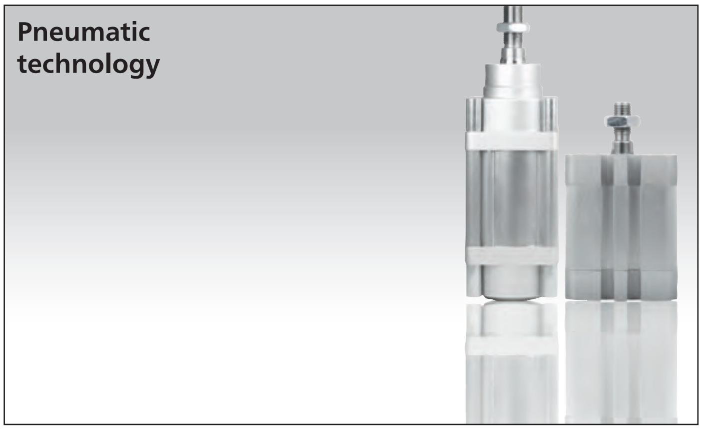
Cup holder plastic
for aluminium profiles,
closed or open +

10550-15
Page 1328

Cup holder plastic, antistatic
for aluminium profiles, closed +

+ New/Expanded Items

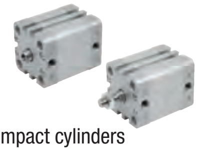
Pneumatic technology



12000
Page 1331-1332

Pneumatic cylinders
DIN ISO 15552 standard cylinder ➕

12001
Page 1335



Pneumatic compact cylinders
DIN ISO 21287, double-acting with magnetic piston ➕

12002
Page 1336-1337

Pneumatic round cylinders
DIN ISO 6432, double-acting with magnetic piston ➕

➕ New/Expanded Items

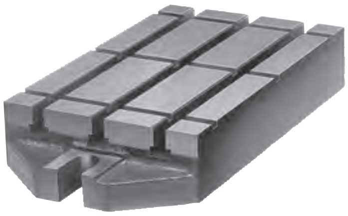
01000

Subplates
Discs
Profiles
Angle plates
Tombstones

01040

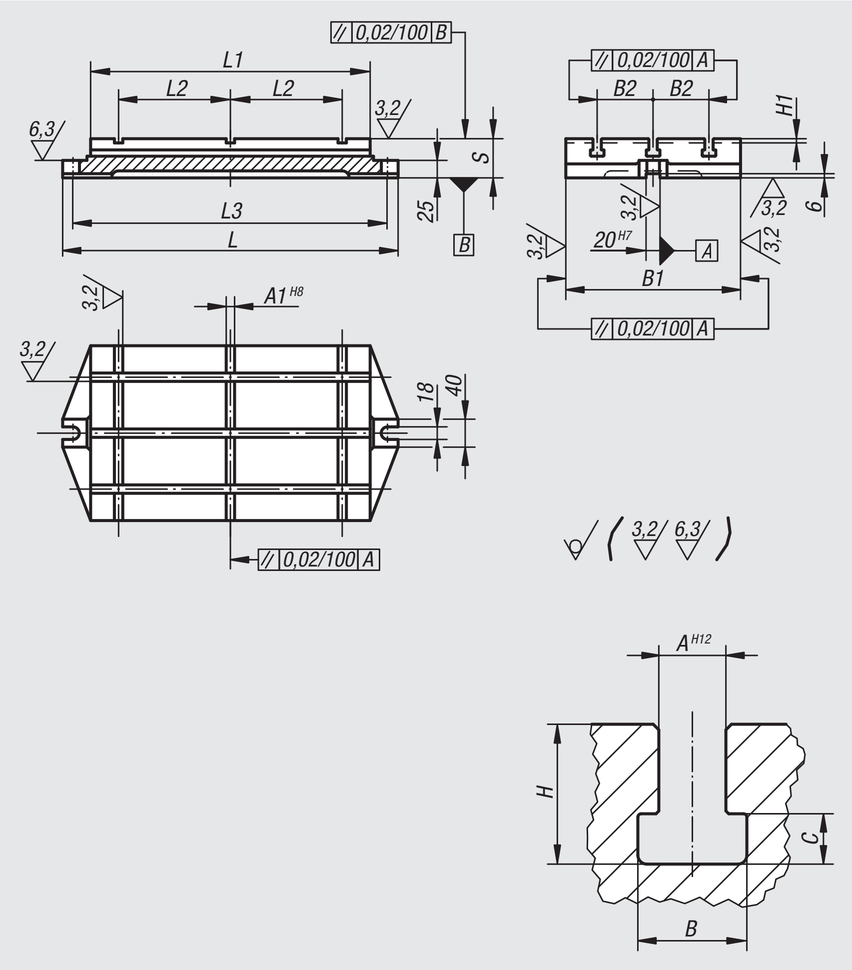
Base plate with T-slots

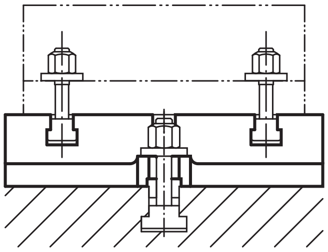
grey cast iron



Material:
GJL 250 annealed.

Sample order:
nlm 01040-04





Order No.	L	L1	L2	L3	B1	B2	H1	S	A1	A	B	C	H
01040-01	280	200	70	250	125	40	4	50	6	10	16,5	7	21
01040-02	330	250	100	300	160	50	4	50	8	10	16,5	7	21
01040-03	395	315	125	365	200	63	4	56	10	12	19,5	8	25
01040-04	480	400	160	450	250	80	6	56	12	12	19,5	8	25
01040-05	580	500	220	550	315	100	6	63	14	14	23	9	28
01040-06	710	630	280	680	400	125	6	63	18	14	23	9	28

Baseplates aluminium

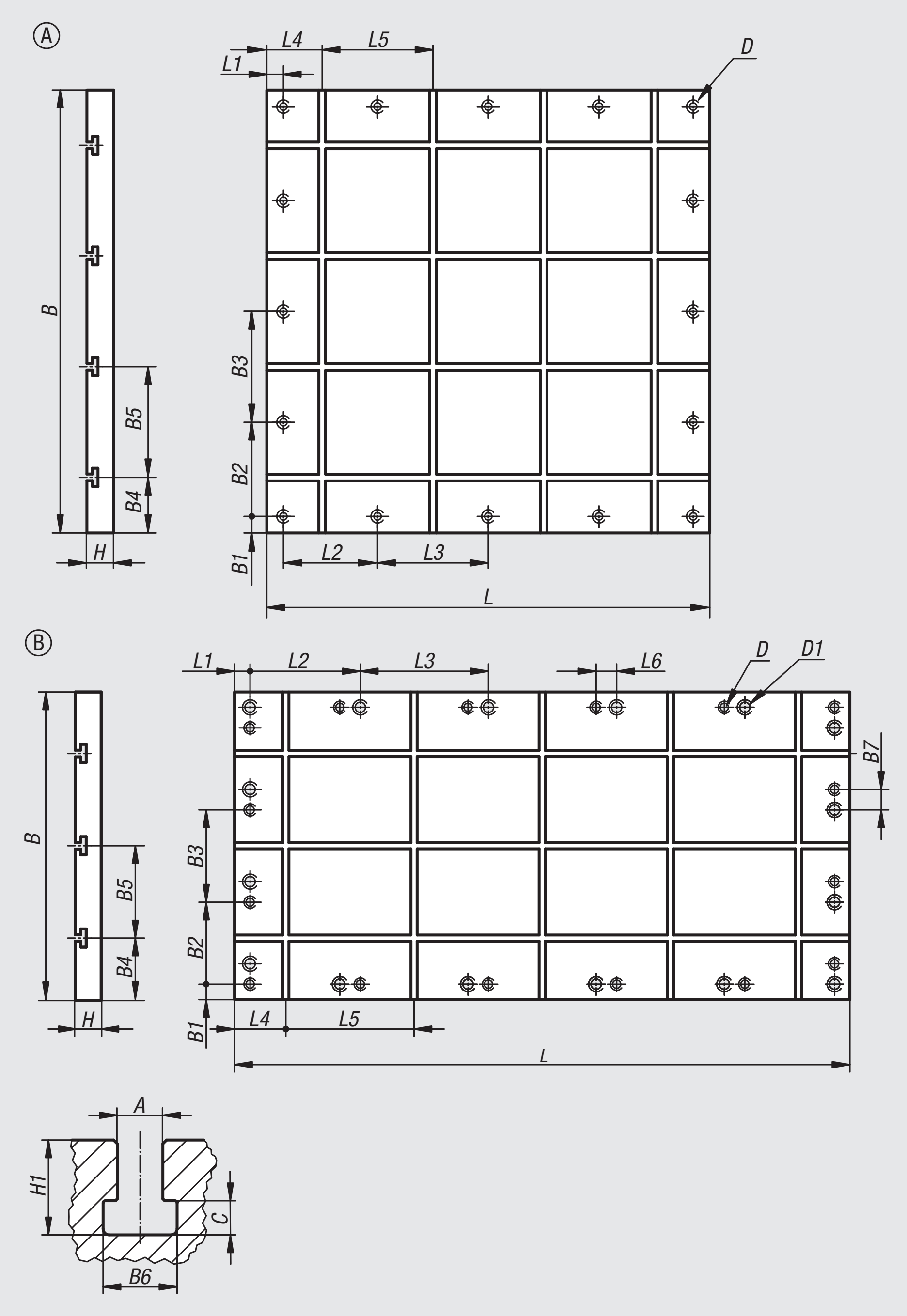
with T-slot

Material:
Baseplates aluminium.
Tapped bushes stainless steel.

Version:
hard-coated.

Sample order:
nlm 01041-50025024

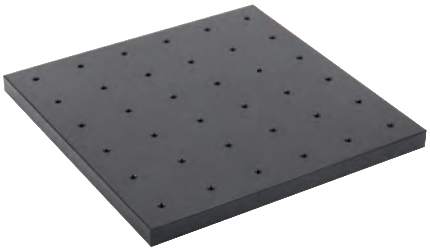
Note:
Baseplates with T-slot and connecting thread. With scaling for exact and repeatable positioning of clamping elements.

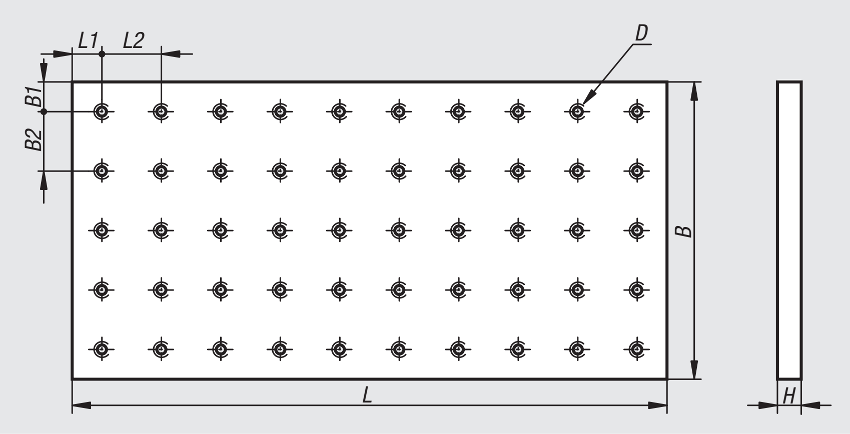


Order No.	Form	A	B	B1	B2	B3	B4	B5	B6	B7	C	D	D1	H	H1	L	L1	L2	L3	L4	L5	L6
01041-40040024	A	6	400	15	85	100	50	100	16,5	-	5	M8	-	24	10	400	15	85	100	50	100	-
01041-50025024	A	6	250	15	110	-	80	90	16,5	-	5	M8	-	24	10	500	15	110	125	62,5	125	-
01041-60030024	B	6	300	25	80	90	60	90	16,5	20	5	M8	M10	24	10	600	15	107,5	125	50	125	20
01041-80040024	B	6	400	15	85	90	65	90	16,5	20	5	M8	M10	24	10	800	15	145	125	87,5	125	20

Baseplates aluminium

with tapped holes





Material:
Aluminium.

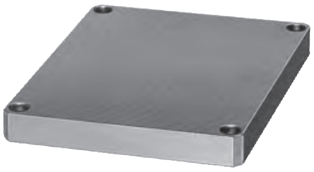
Version:
hard-coated.

Sample order:
nlm 01042-30030020

Note:
Baseplates with M6 connecting threads on a 50 mm grid.

Order No.	B	B1	B2	D	H	L	L1	L2
01042-30030020	300	25	50	M6	20	300	25	50
01042-50025020	250	25	50	M6	20	500	25	50
01042-60030020	300	25	50	M6	20	600	25	50

Base plates steel

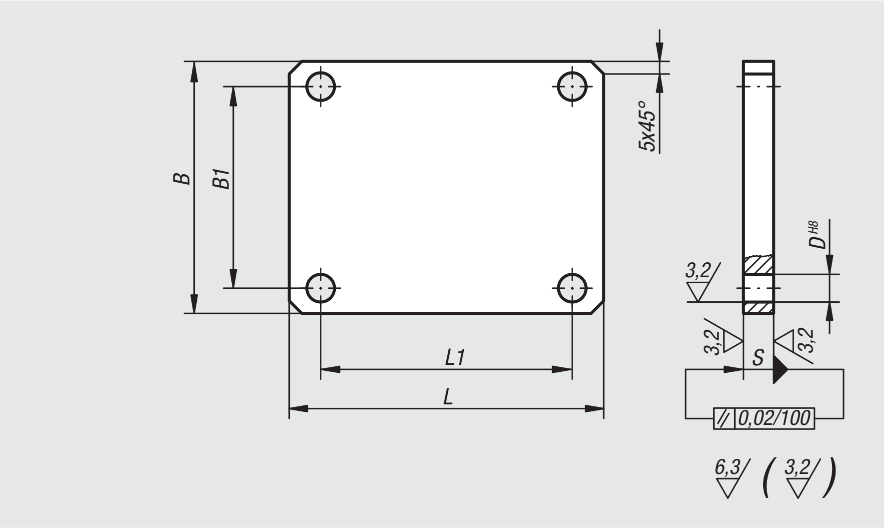


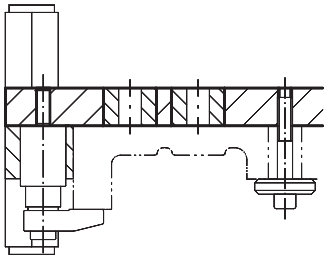
Material:
Carbon steel 1.1181.

Version:
Bright.

Sample order:
nlm 01060-01

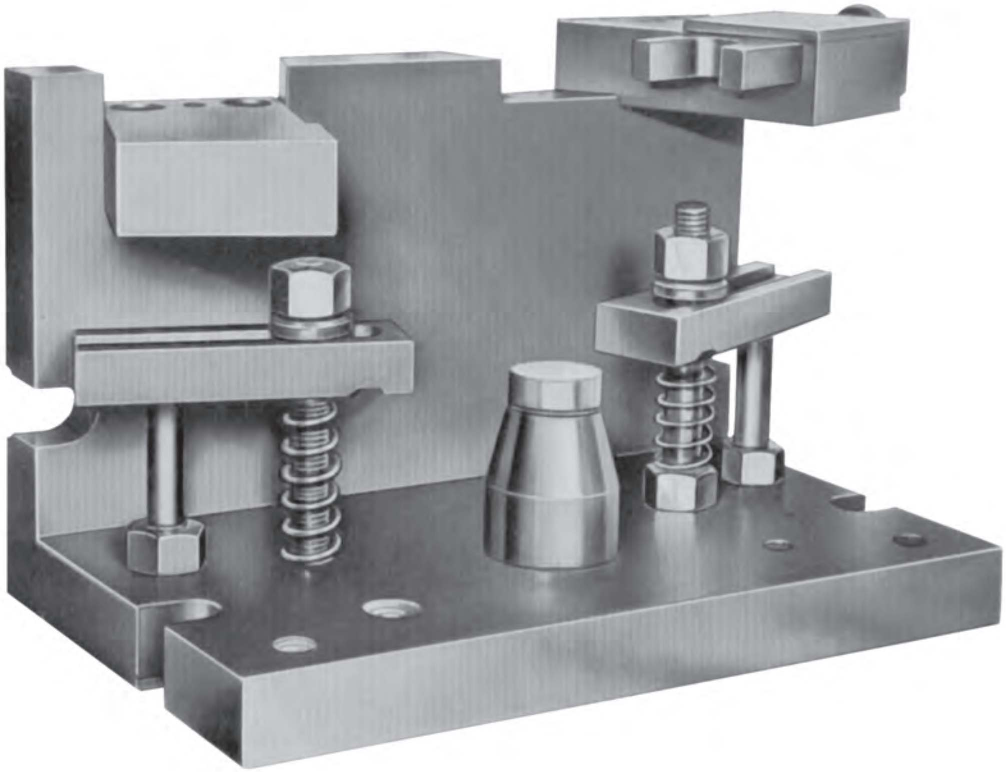
Drawing reference:
machined surfaces: ±0.25 mm
thickness: +0/-0.5 mm
raw surfaces: ±2 mm





Order No.	L	L1	B	B1	S	D
01060-01	125	100	100	80	12	11
01060-02	160	140	125	100	16	11
01060-03	200	180	160	140	20	13
01060-04	250	220	200	180	20	13
01060-05	315	280	250	220	20	13

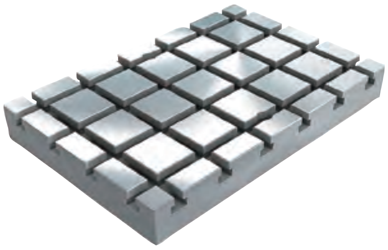
Example of a fixture using almost exclusively norelem parts:

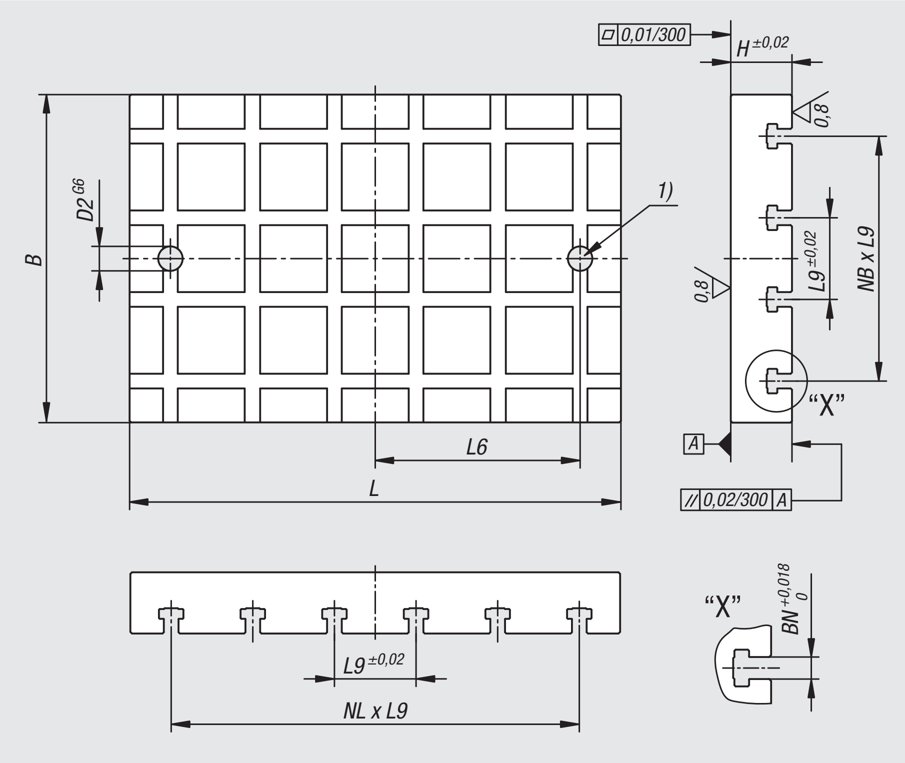


01126

Baseplates, grey cast iron

with T-slots





Material:
GJL 300.

Version:
Support and mounting surfaces ground

Sample order:
nlm 01126-31440060

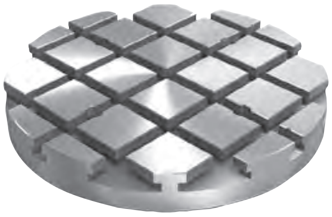
Note:
Baseplates with T-slots are used for constructing modular fixtures. These baseplates are positioned and mounted directly on machine tables.
The precise longitudinal and transverse slot spacing ensures very high repeat clamping accuracy.
The two locating holes are used to align the baseplate on the machine table.
Fastening holes are produced by the customer to suit their machine table.
Please order locating pins to locate the baseplates separately.
Ring bolts with T-nuts for hoisting are supplied.
Other dimensions available on request.

Drawing reference:
1) locating hole

Order No. BN=slot width 14	Order No. BN=slot width 18	L	B	H	D2	L6	L9	NL=No. lengthwise	NB=No. across
01126-31440060	**01126-31840060**	600	400	60/75	30	500	100	5	3
01126-31450060	**01126-31850060**	600	500	60/75	30	500	100	5	4
01126-31460060	**01126-31860060**	600	600	60/75	30	500	100	5	5
01126-31440080	**01126-31840080**	800	400	60/75	30	700	100	7	3
01126-31445090	**01126-31845090**	900	450	60/75	30	800	100	8	3
01126-31450100	**01126-31850100**	1000	500	60/75	30	900	100	9	4
01126-31460120	**01126-31860120**	1200	600	60/75	30	1100	100	11	5

Baseplates, grey cast iron, round,

with T-slots



Material:
GJL 300.

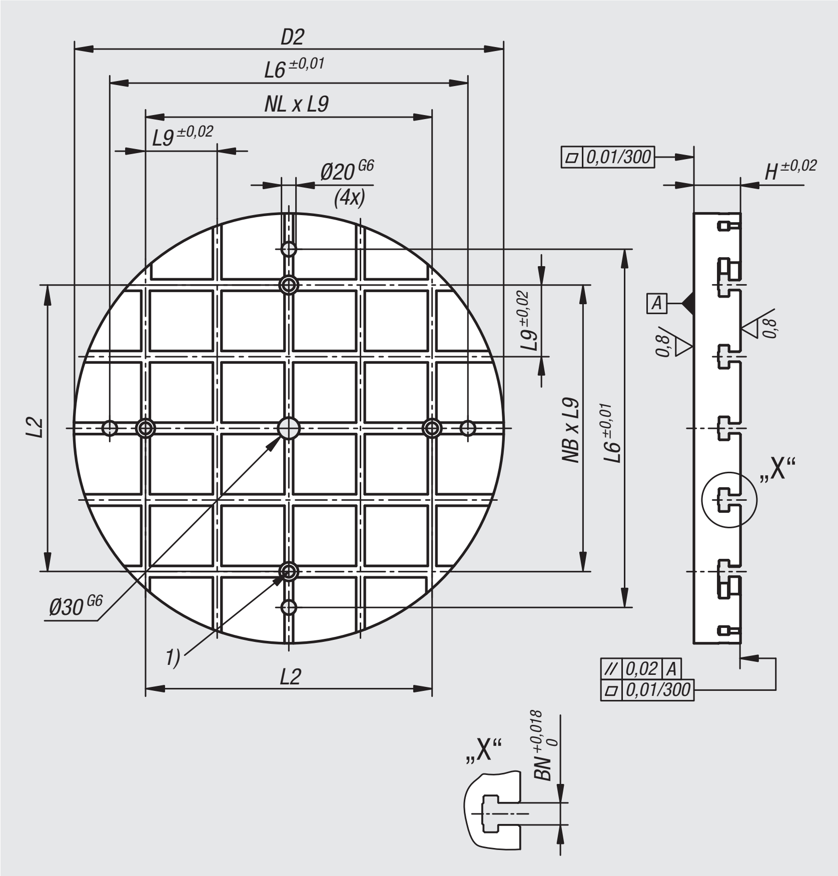
Version:
Support and mounting surfaces ground

Sample order:
nlm 01126-10-31430050

Note:
Round baseplates with T-slots are used for constructing modular fixtures. These baseplates are positioned and mounted directly on machine tables.
The precise longitudinal and transverse slot spacing ensures very high repeat clamping accuracy.
The aligning holes are used to align the baseplate on the machine table.
Please order locating pins to locate the baseplates separately.
Ring bolts with T-nuts for hoisting are supplied.
Other dimensions available on request.

On request:
other dimensions.

Drawing reference:
1) hole for DIN 912 cap screw (D4)

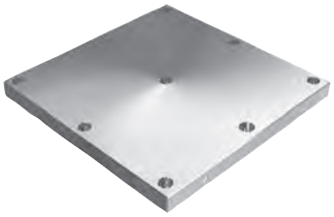


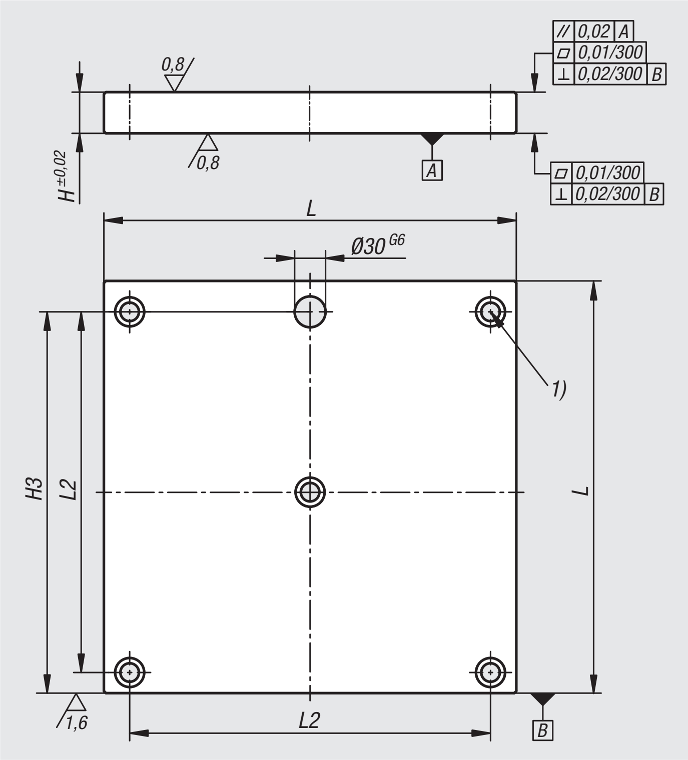
Order No.	D2	H	D4	L2	L6	L9	BN=slot width	NL=No. lengthwise	NB=No. across
01126-10-31430050	300	50	M12	150	250	75	14	2	2
01126-10-31440050	400	50	M12	250	350	75	14	4	4
01126-10-31850065	500	65	M16	300	450	100	18	4	4
01126-10-31860065	600	65	M16	400	550	100	18	4	4

01127

Interchangeable subplates, grey cast iron,

with pre-machined clamping faces





Material:
GJL 300.

Version:
Support and mounting surfaces ground

Sample order:
nlm 01127-1004040

Note:
Interchangeable subplates with pre-machine clamping faces are used double-sided, together with the tombstones. The interchangeable subplates are positioned and mounted on both sides of the tombstone. This means that clamping fixtures can be replaced efficiently. The interchangeable subplates can be machined accordingly by the customer.

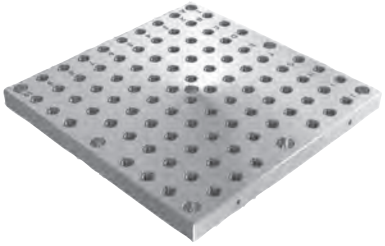
Drawing reference:
1) hole for DIN 912 cap screw, M16

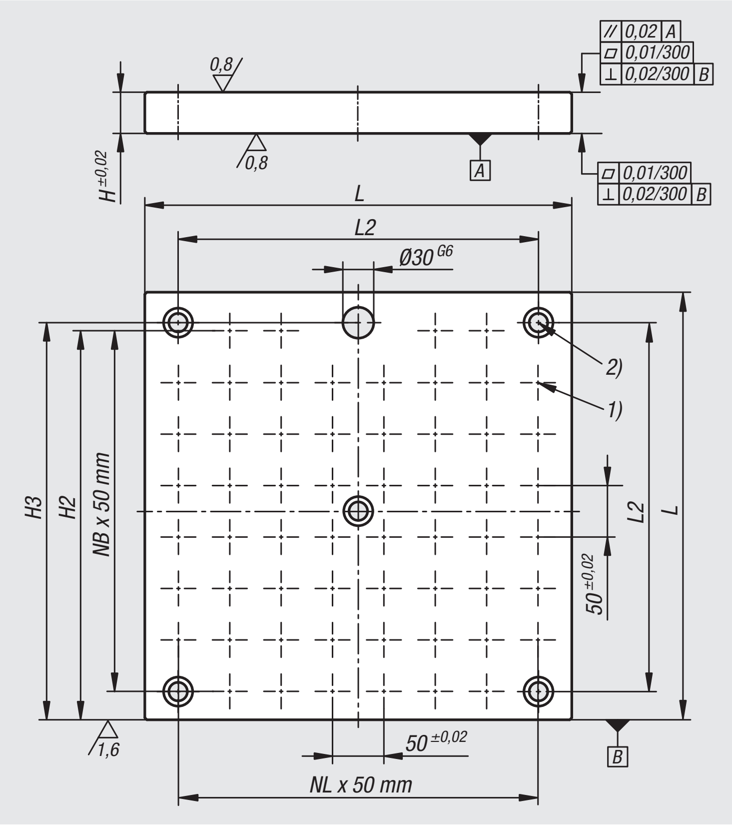
Order No.	L	H	H3	L2	No. of fastening holes
01127-1004040	400	40	370	350	5
01127-1005050	500	40	470	450	7
01127-1006363	630	40	600	580	7
01127-1008080	800	50	770	750	7

01127

Interchangeable subplates, grey cast iron

with grid holes





Material:
GJL 300.

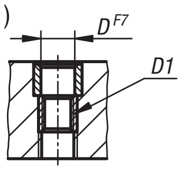
Version:
Mounting surfaces ground

Sample order:
nlm 01127-2124040

Note:
Interchangeable subplates with grid holes are used double-sided, together with the tombstones. The interchangeable subplates are positioned and mounted on both sides of the tombstone. This means that clamping fixtures can be replaced efficiently.
The alphanumerically labelled grid holes mean that the clamping elements can be assigned in a defined manner in the event of repeat setups.
Please order protection plugs to plug unused grid holes separately.

Drawing reference:
1) grid hole
2) hole for DIN 912 cap screw, M16

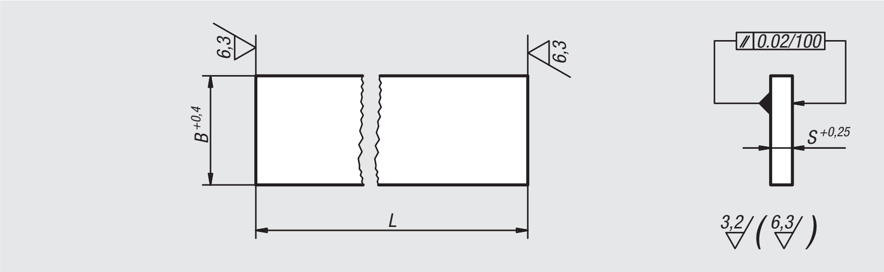
1)



Order No.	L	H	D	D1	H2	H3	L2	N1=No. of grid holes	NL=No. lengthwise	NB=No. across	No. of fastening holes
01127-2124040	400	40	12	M12	370	370	350	58	7	7	5
01127-2125050	500	40	12	M12	470	470	450	94	9	9	7
01127-2126363	630	40	12	M12	585	600	580	138	11	11	7
01127-2128080	800	50	12	M12	770	770	750	250	15	15	7
01127-2164040	400	40	16	M16	370	370	350	58	7	7	5
01127-2165050	500	40	16	M16	470	470	450	90	9	9	7
01127-2166363	630	40	16	M16	585	600	580	138	11	11	7
01127-2168080	800	50	16	M16	770	770	750	246	15	15	7

Rectangular plates

precision steel



Material:
Steel 1.1730

Version:
Bright.

Sample order:
nlm 01130-04X500 (include length L)

Note:
These precision steel plates are suitable for use as base plates in machine, tool and fixture construction. The dimension L is sawn to length and is always supplied oversized.

Order No.	L = length	B	S
01130-01X	250/500/750/1000	40	8
01130-02X	250/500/750/1000	50	10
01130-03X	250/500/750/1000	63	12
01130-04X	250/500/750/1000	80	16
01130-05X	250/500/750/1000	100	16
01130-06X	250/500/750/1000	100	20
01130-07X	250/500/750/1000	125	25
01130-08X	250/500/750/1000	150	25
01130-09X	250/500/750/1000	160	32
01130-10X	250/500/750/1000	200	32
01130-11X	250/500/750/1000	300	40

Plates

grey cast iron or aluminium

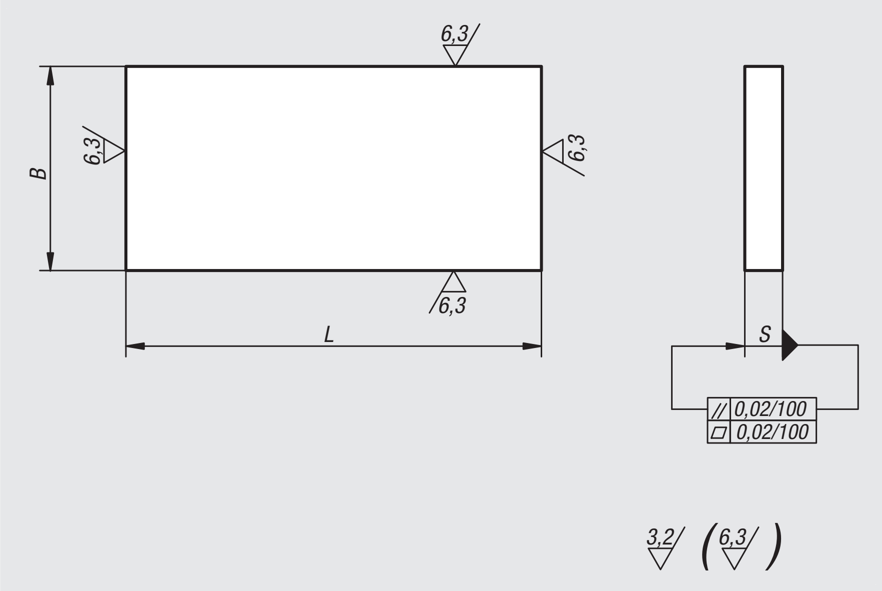
Material:
GJL 250 annealed or EN AW-7075

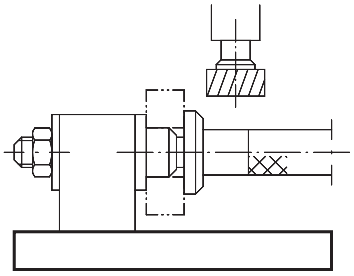
Sample order:
nlm 01140-07X300 (include length L)

Note:
The length L is cut by saw and is always supplied overlong.

Drawing reference:
machined faces:
grey cast iron: +0.2 mm / +0.5 mm
aluminium: ± 0.1 mm

length tolerance:
≤200 mm: +1/+5
>200 mm ≤400 mm: +4/+15
>400 mm: +13/+40

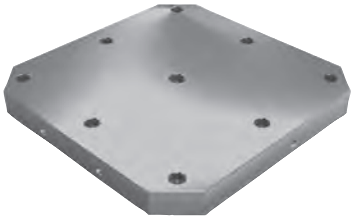


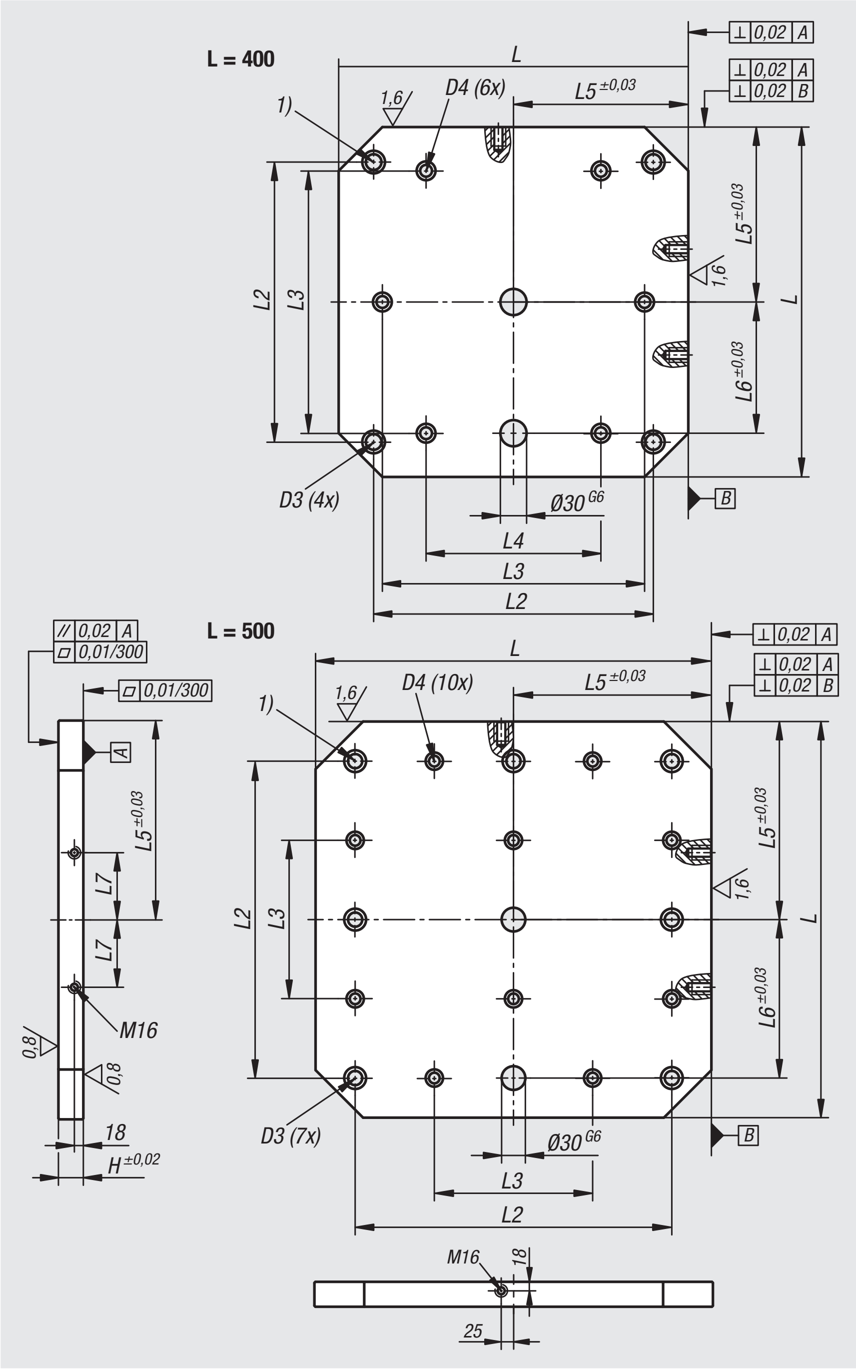


Order No. grey cast iron	Order No. aluminium	L = length	B	S
01140-01X	01140-201X	300	40	10
01140-02X	01140-202X	300	50	12
01140-03X	01140-203X	300	63	16
01140-04X	01140-204X	200/300/400/600/800	80	20
01140-05X	01140-205X	200/300/400/600/800	100	20
01140-06X	01140-206X	200/300/400/600/800	160	20
01140-061X	01140-2061X	200/300/400/600/800	200	20
01140-062X	01140-2062X	200/300/400/600/800	250	20
01140-07X	01140-207X	200/300/400/600/800/1200	125	25
01140-08X	01140-208X	200/300/400/600/800/1200	200	25
01140-081X	01140-2081X	200/300/400/600/800/1200	250	25
01140-082X	01140-2082X	200/300/400/600/800/1200	315	25
01140-09X	01140-209X	200/300/400/600/800/1200	160	32
01140-10X	01140-210X	200/300/400/600/800/1200	250	32
01140-101X	01140-2101X	200/400/600/800/1200	315	32
01140-102X	01140-2102X	200/300/400/600/800/1200	400	32
01140-11X	01140-211X	200/400/600/800/1200	200	40
01140-12X	01140-212X	200/400/600/800/1200	250	40
01140-120X	-	200/400/600/800/1200	315	40
01140-121X	-	200/300/400/600/800/1200	400	40
01140-13X	-	200/400/600/800/1200	315	50
01140-131X	-	200/300/400/600/800/1200	500	50

Subplates, grey cast iron

with pre-machined clamping faces





Material:
GJL 300.

Version:
Support and mounting surfaces ground

Sample order:
nlm 01148-1004040

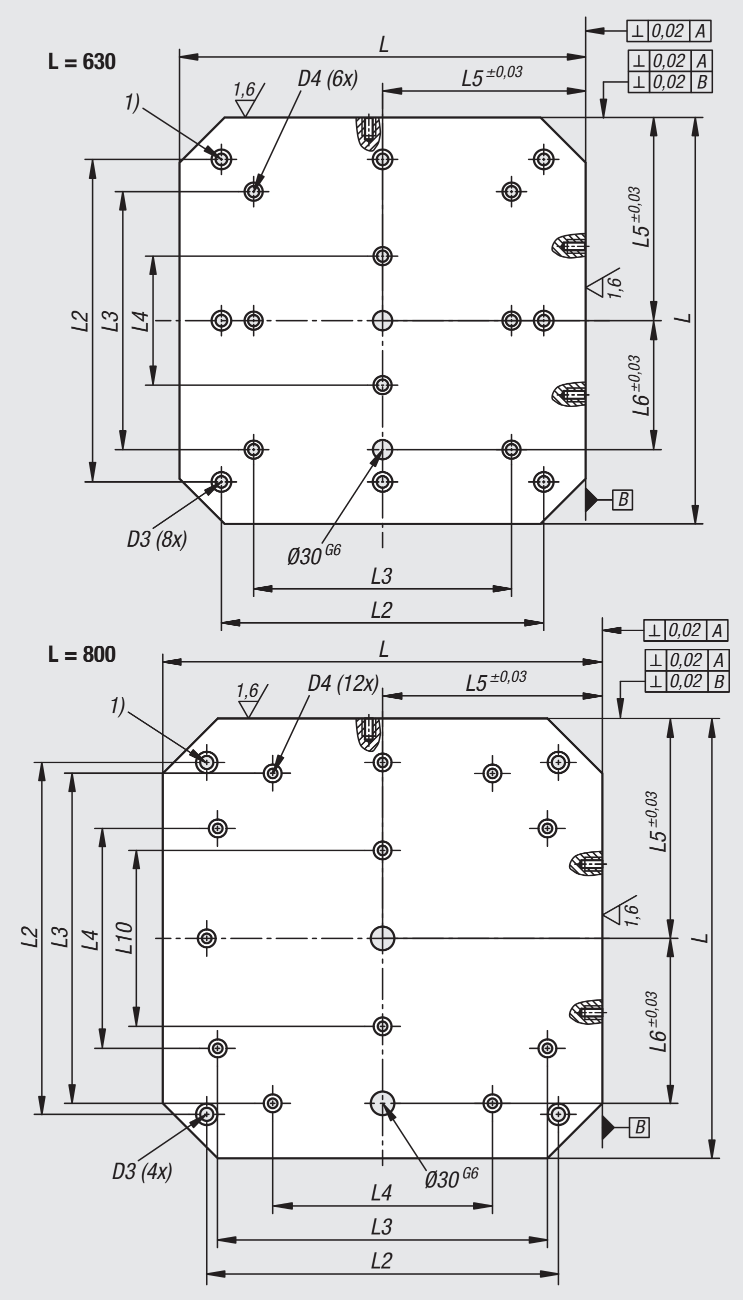
Note:
Subplates with pre-machined clamping faces provide a quick and economic way of producing bodies with specific grid or individual holes. The subplates conform to machine tables for machine tools acc. to DIN 55201 and JIS 6337-1980.
Please order locating pins for positioning subplates on machine tables acc. to DIN 55201 separately.
Ring bolts for hoisting are supplied.
Other dimensions available on request.

Drawing reference:
1) hole for DIN 912 cap screw (D3/D4)

Order No.	L	H	D3	D4	L2	L3	L4	L5	L6	L7	L10
01148-1004040	400	50	M16	M12	320	300	200	200	150	55	-
01148-1005050	500	50	M16	M12	400	200	-	250	200	75	-
01148-1006363	630	50	M16	M16	500	400	200	315	200	100	-
01148-1008080	800	50	M16	M16	640	600	400	400	300	135	320

Subplates, grey cast iron

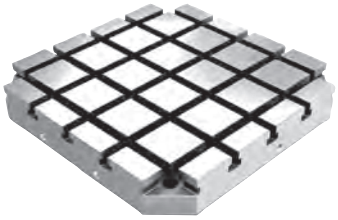
with pre-machined clamping faces



01148

Subplates, grey cast iron

with T-slots



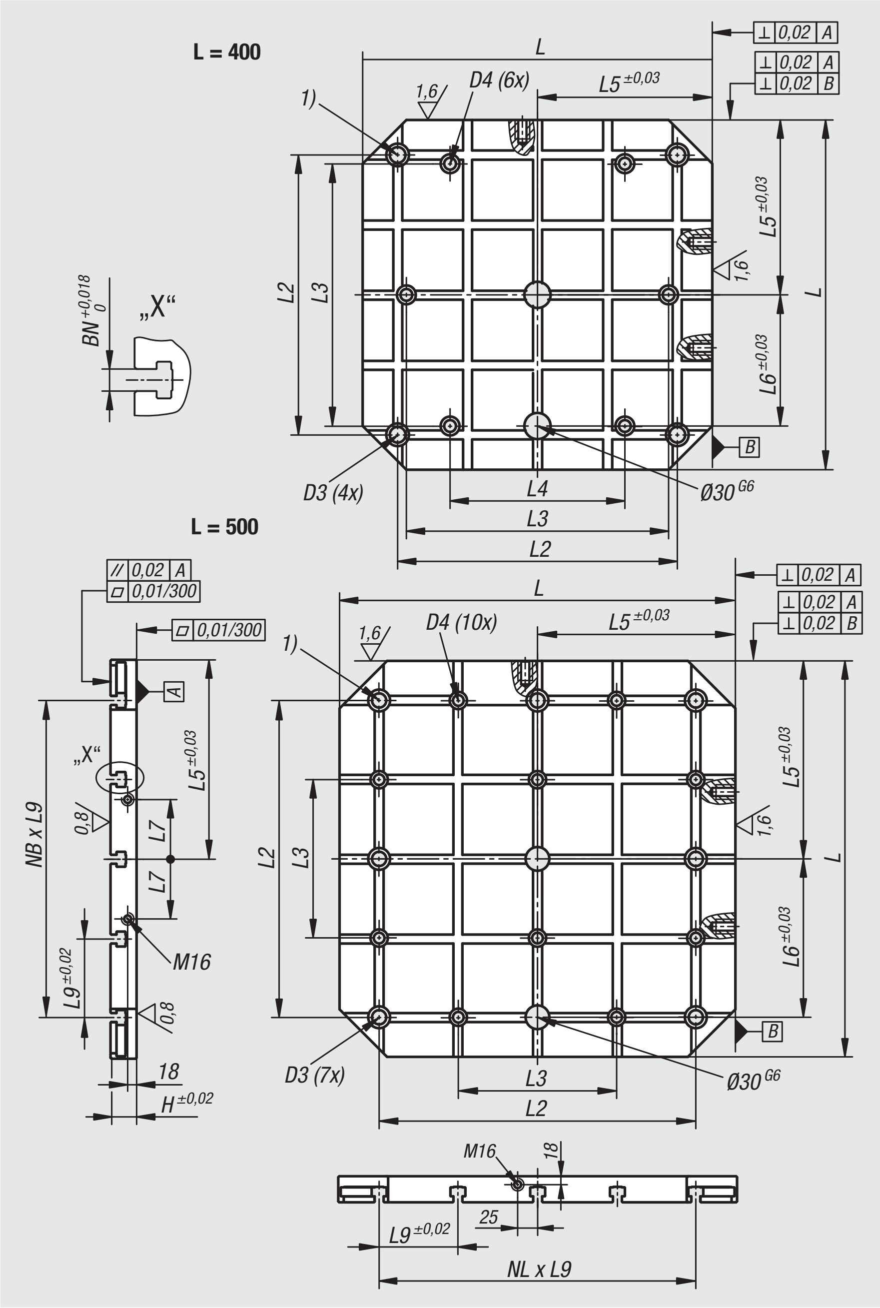
Material:
GJL 300.

Version:
Support and mounting surfaces ground

Sample order:
nlm 01148-3144040

Note:
Subplates with T-slots are used for constructing modular fixtures. These subplates are positioned and fastened directly on machine tables.
The precise longitudinal and transverse slot spacing ensures very high repeat clamping accuracy. The subplates conform to machine tables for machine tools acc. to DIN 55201 and JIS 6337-1980.
Please order locating pins for positioning subplates on machine tables acc. to DIN 55201 separately. Ring bolts with T-nuts for hoisting are supplied.
Other dimensions available on request.

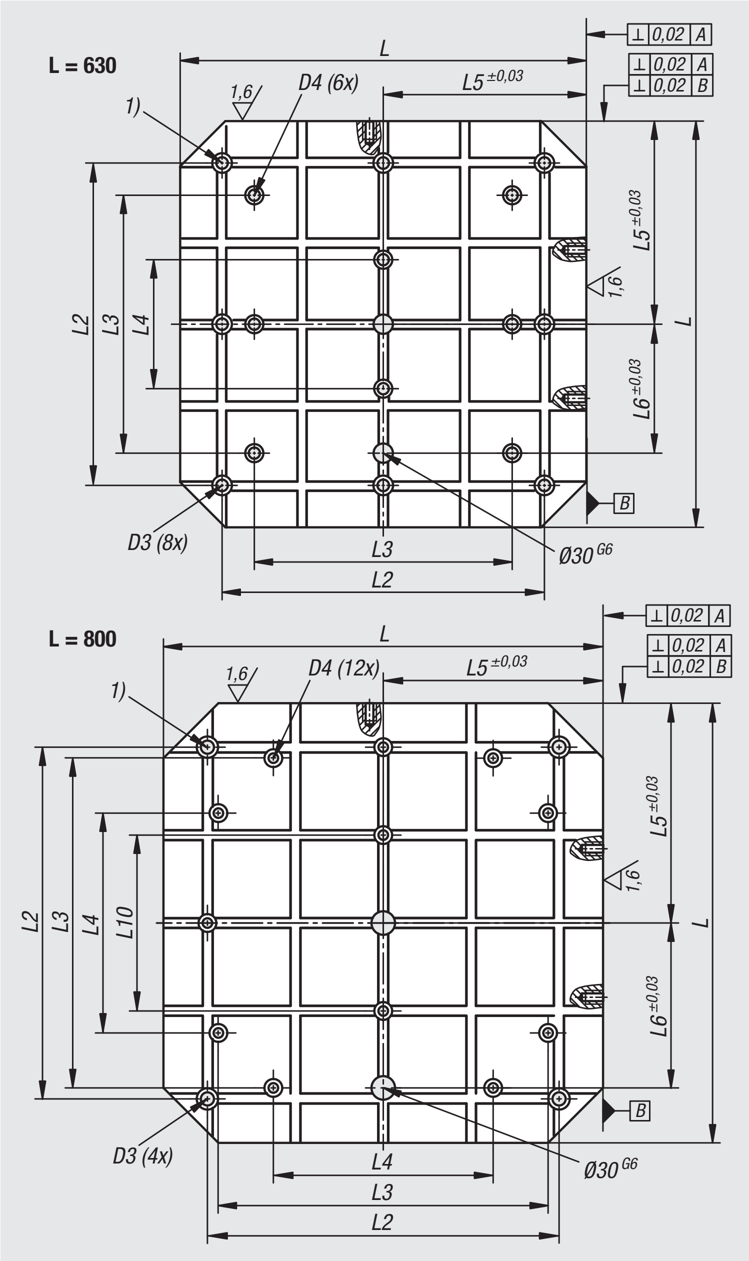
Drawing reference:
1) hole for DIN 912 cap screw (D3/D4)



Order No.	L	H	D3	D4	L2	L3	L4	L5	L6	L7	L9	L10	Slot width	NL=No. lengthwise	NB=No. across
01148-3144040	400	60	M16	M12	320	300	200	200	150	55	80	-	14	4	4
01148-3145050	500	60	M16	M12	400	200	-	250	200	75	100	-	14	4	4
01148-3146363	630	60	M16	M16	500	400	200	315	200	100	125	-	14	4	4
01148-3148080	800	60	M16	M16	640	600	400	400	300	135	160	320	14	4	4
01148-3184040	400	75	M16	M12	320	300	200	200	150	55	80	-	18	4	4
01148-3185050	500	75	M16	M12	400	200	-	250	200	75	100	-	18	4	4
01148-3186363	630	75	M16	M16	500	400	200	315	200	100	125	-	18	4	4
01148-3188080	800	75	M16	M16	640	600	400	400	300	135	160	320	18	4	4

Subplates, grey cast iron

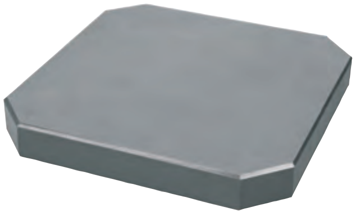
with T-slots



01150

Subplates machined all sides

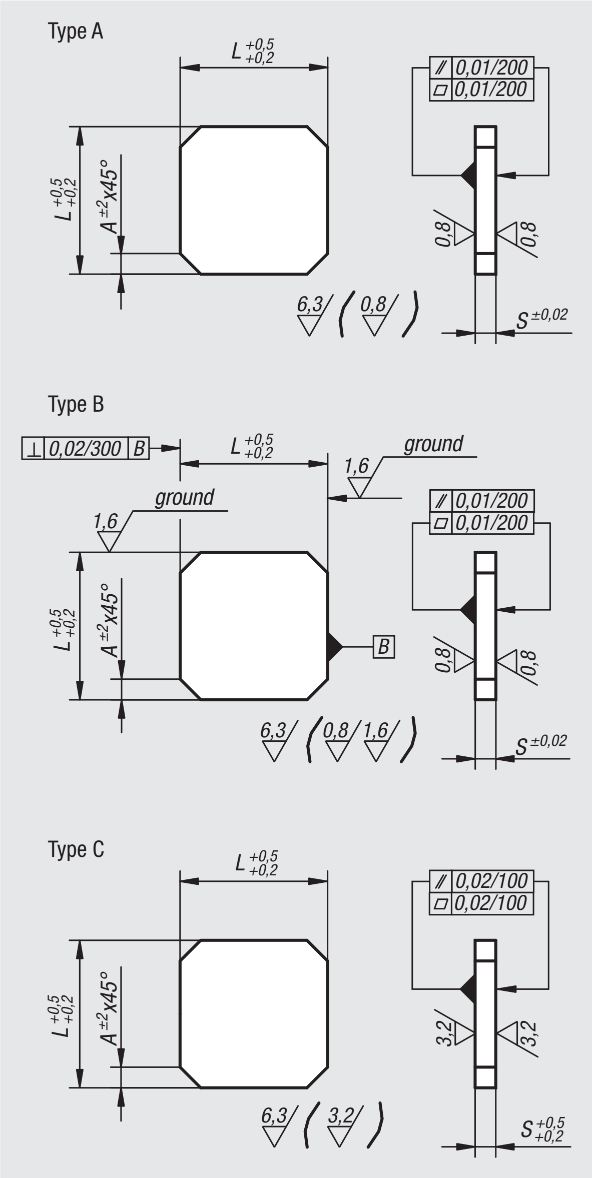
grey cast iron

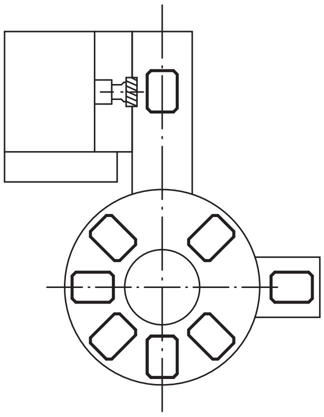


Material:
GJL 250 annealed.

Sample order:
nlm 01150-002

Note:
The plates are also available with slots.
Type A:
ground contact faces (Ra 0.8).
Type B:
ground contact faces (Ra 0.8) and sides (Ra 1.6).
Type C:
milled contact faces and sides (Ra 3.2).



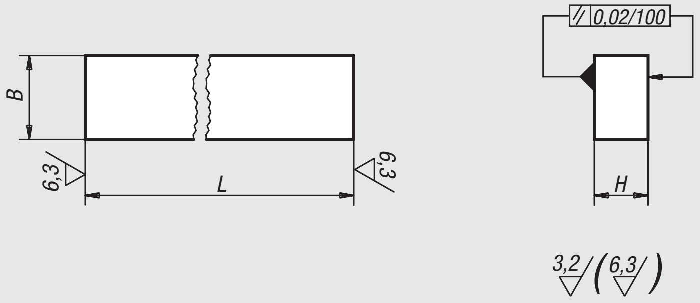


Order No. Type A	Order No. Type B	Order No. Type C	L	S	A
01150-001	01150-0011	01150-00111	200	25	25
01150-002	01150-0021	01150-00211	250	35	35
01150-004	01150-0041	01150-00411	320	40	40
01150-006	01150-0061	01150-00611	400	45	50
01150-008	01150-0081	01150-00811	500	50	60
01150-010	01150-0101	01150-01011	630	63	70
01150-012	01150-0121	01150-01211	800	70	100

01160

Block machined all sides

grey cast iron or aluminium



Material:
GJL 250 annealed or EN AW-7075

Sample order:
nlm 01160-05X300 (include length L)

Note:
The length L is cut by saw and is always supplied overlong.

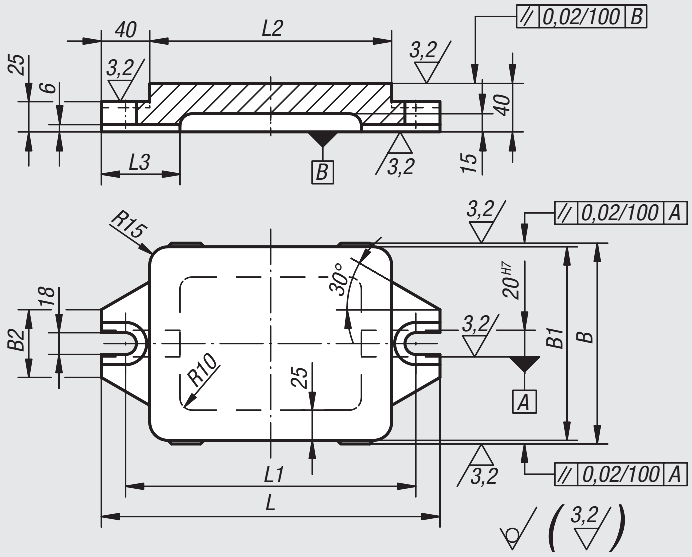
Drawing reference:
machined surfaces:
±0.25 mm
tolerances of lengths:
≤200 mm: +1/+5
from 201 mm to 400 mm: +4/+15
> 400 mm: +13/+40

Order No. grey cast iron	Order No. aluminium	L = length	B	H
01160-02X	**01160-202X**	300	32	20
01160-03X	**01160-203X**	300	40	25
01160-04X	**01160-204X**	300/600/800	50	32
01160-05X	**01160-205X**	300/600/800	63	40
01160-06X	**01160-206X**	300/600/1000	80	50
01160-07X	**01160-207X**	300/600/1000	100	63
01160-08X	**01160-208X**	300/600	125	80

01180

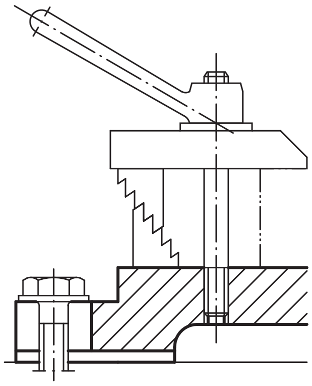
Base plate with flanges

grey cast iron



Material:
GJL 250 annealed.

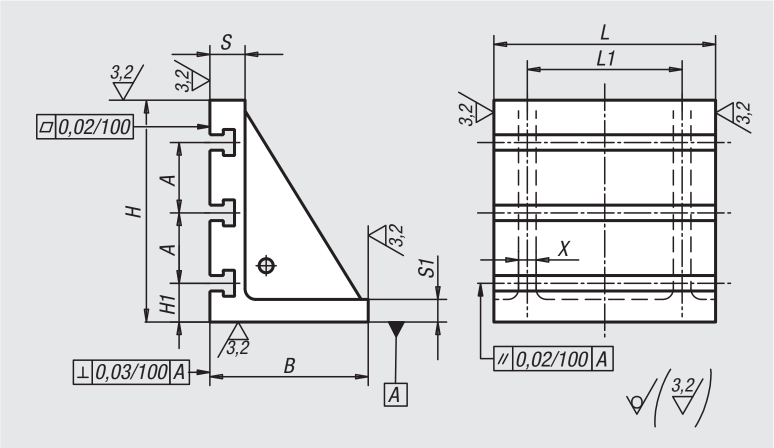
Sample order:
nlm 01180-03



Order No.	L	L1	L2	L3	B	B1	B2
01180-01	240	200	160	65	166	160	56
01180-02	280	240	200	65	166	160	56
01180-03	330	290	250	70	206	200	74
01180-04	395	355	315	75	256	250	74

Angle plates

with or without T-slots cast iron

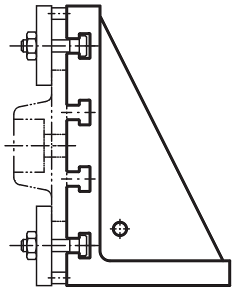


Material:
GJL 250 annealed.

Sample order:
nlm 01250-3203701

On request:
Other slot widths.

Drawing reference:
machined faces: +0.2 mm/ +0.5 mm
unmachined faces: ±2 mm

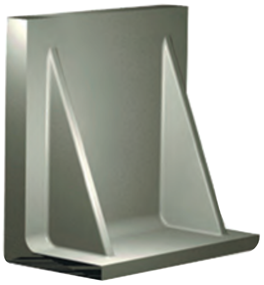


Order No. without slot	Order No. with t-slot	L	L1	B	H	H1	S	S1	A	X	T-slot
01250-100125	-	100	40	100	125	-	20	10	-	10	-
01250-125160	-	125	100	100	160	-	20	10	-	10	-
01250-200250	-	200	120	125	250	-	30	15	-	15	-
01250-250300	-	250	200	150	300	-	40	20	-	20	-
01250-320370	01250-3203701	320	280	200	370	-/65	50	25	-/80	25	-/14
01250-400450	01250-4004501	400	280	265	450	-/75	60	30	-/100	30	-/18
01250-500550	01250-5005501	500	360	315	550	-/75	70	35	-/100	35	-/18
01250-630640	01250-6306401	630	520	350	640	-/80	80	40	-/160	35	-/22
01250-700750	01250-7007501	700	600	400	750	-/135	80	40	-/160	40	-/22

01252

Angle plates

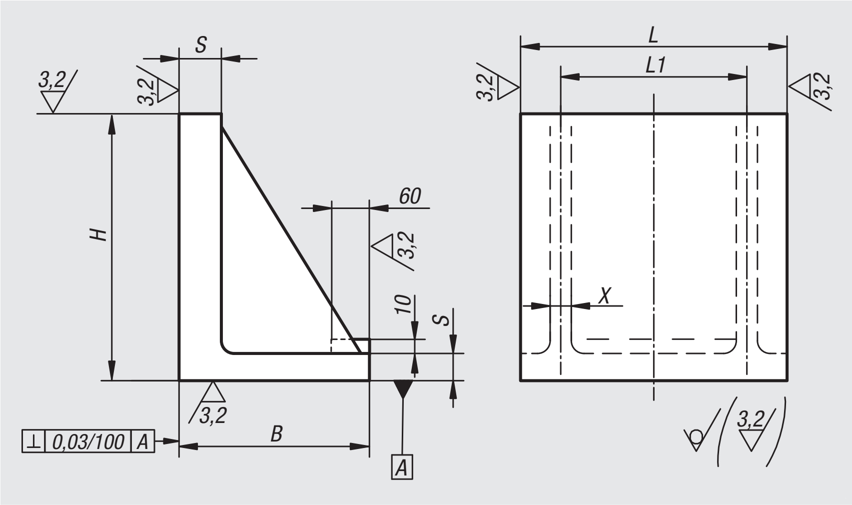
aluminium



Material:
Aluminium (Rm 330 N/mm², 110 HB).

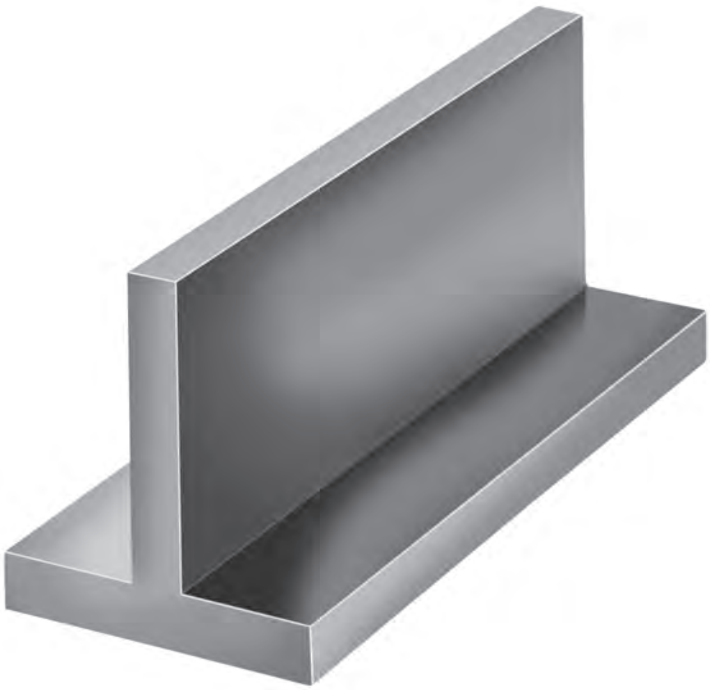
Sample order:
nlm 01252-260250

Drawing reference:
machined faces: +0.2 mm/ +0.5 mm
unmachined faces: ±2 mm



Order No.	B	H	L	L1	S	X
01252-260250	150	250	260	155	20	15
01252-335355	225	355	335	200	25	20
01252-410450	270	450	410	245	30	15

Cost-effective designing and machining with norelem:



norelem basic element: T-profile

Finished product

01265

Tombstones, grey cast iron, double-sided,

with pre-machined clamping faces

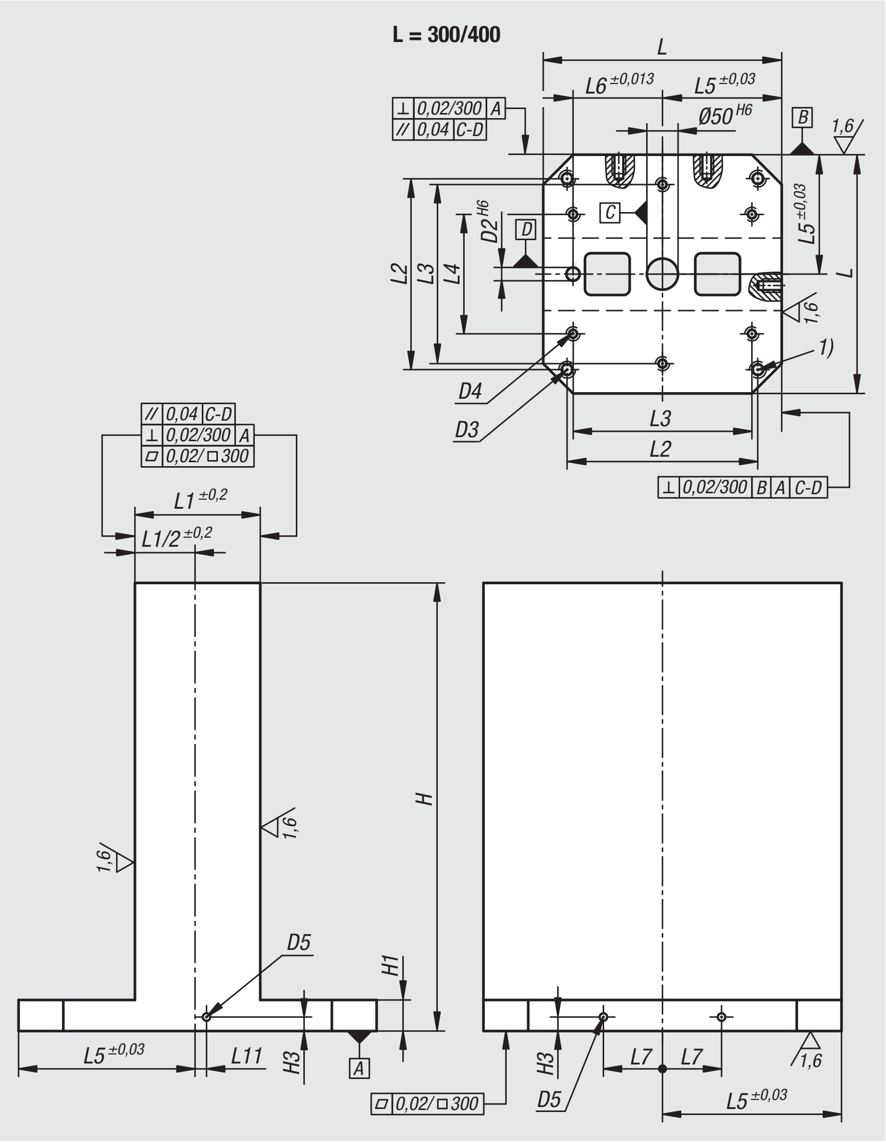
Material:
GJL 300.

Version:
Support and clamping faces are precision-machined.
The clamping faces have a +1 mm allowance.

Sample order:
nlm 01265-100030050

Note:
Tombstones with pre-machined clamping faces provide a fast and economic method of producing a body with specific grid or individual holes. The base is ready for mounting on the machine table. The two clamping faces can be machined to the end dimensions by the user.
The tombstones conform to machine tables for machine tools acc. to DIN 55201 and JIS6337-1980.
Please order locating pins for positioning subplates on machine tables acc. to DIN 55201 separately.
Ring bolts for hoisting are supplied.
Other dimensions available on request.

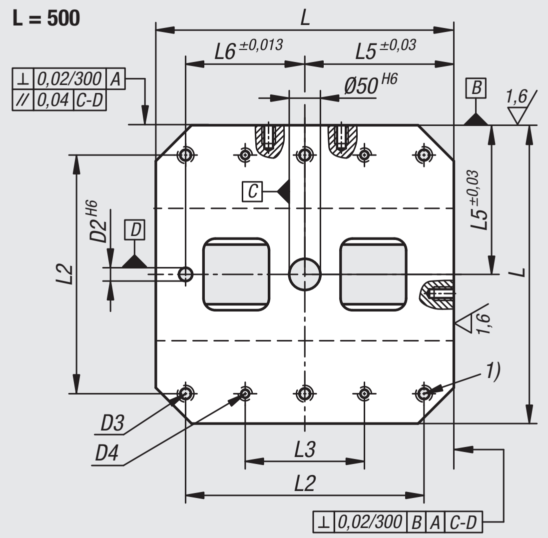
Drawing reference:
1) hole for DIN 912 cap screw (D3/D4)

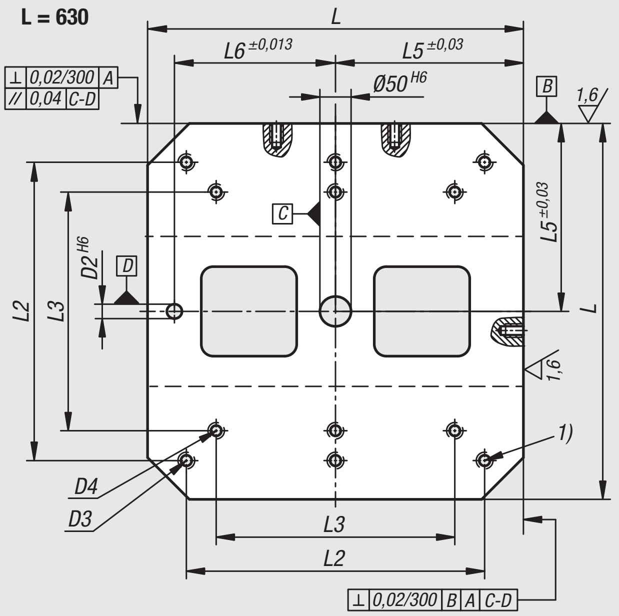


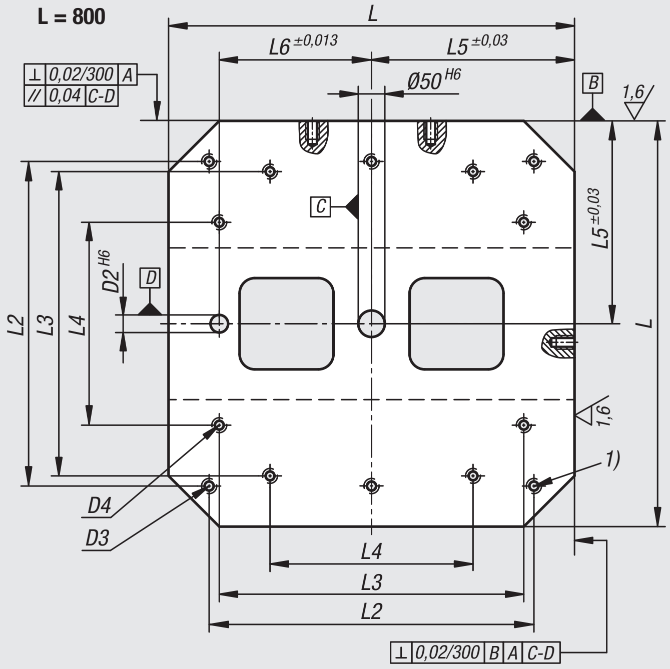
Order No.	L	H	H1	D2	D3	D4	D5	H3	L1	L2	L3	L4	L5	L6	L7	L8	L11
01265-100030050	300	500	50	20	M12	M10	M12	15	81	250	200	-	150	100	40	-	0
01265-100040050	400	500	50	20	M16	M12	M16	18	151	320	300	200	200	150	55	-	25
01265-100040065	400	650	50	20	M16	M12	M16	18	151	320	300	200	200	150	55	-	25
01265-100050060	500	600	50	20	M16	M12	M16	18	201	400	200	-	250	200	75	-	25
01265-100050075	500	750	50	20	M16	M12	M16	18	201	400	200	-	250	200	75	-	25
01265-100063070	630	700	50	25	M16	M16	M16	18	251	500	400	-	315	200	100	-	25
01265-100063085	630	850	50	25	M16	M16	M16	18	251	500	400	-	315	200	100	-	25
01265-100080080	800	800	50	25	M16	M16	M16	18	301	640	600	400	400	300	135	-	25
01265-100080100	800	1000	50	25	M16	M16	M16	18	301	640	600	400	400	300	135	-	25
01265-100100100	1000	1000	55	25	M20	M20	M16	18	351	800	600	200	500	400	165	400	25
01265-100100125	1000	1250	55	25	M20	M20	M16	18	351	800	600	200	500	400	165	400	25

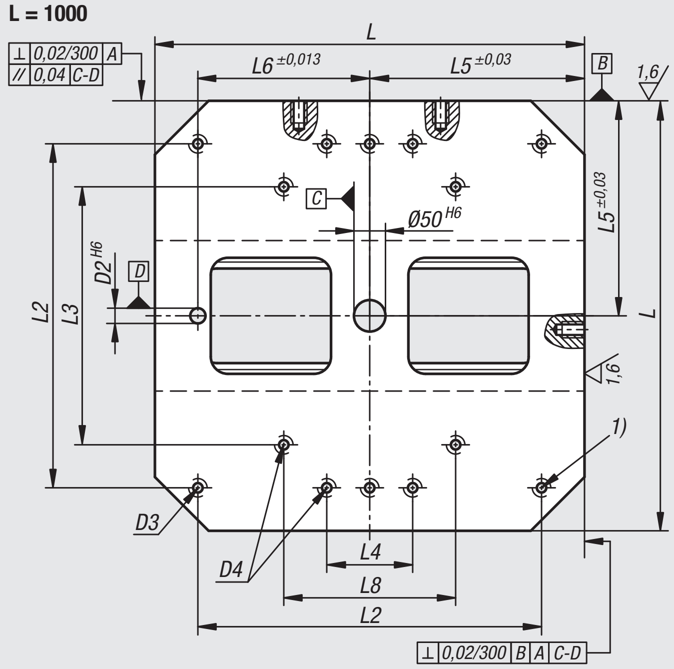
Tombstones, grey cast iron, double-sided,

with pre-machined clamping faces





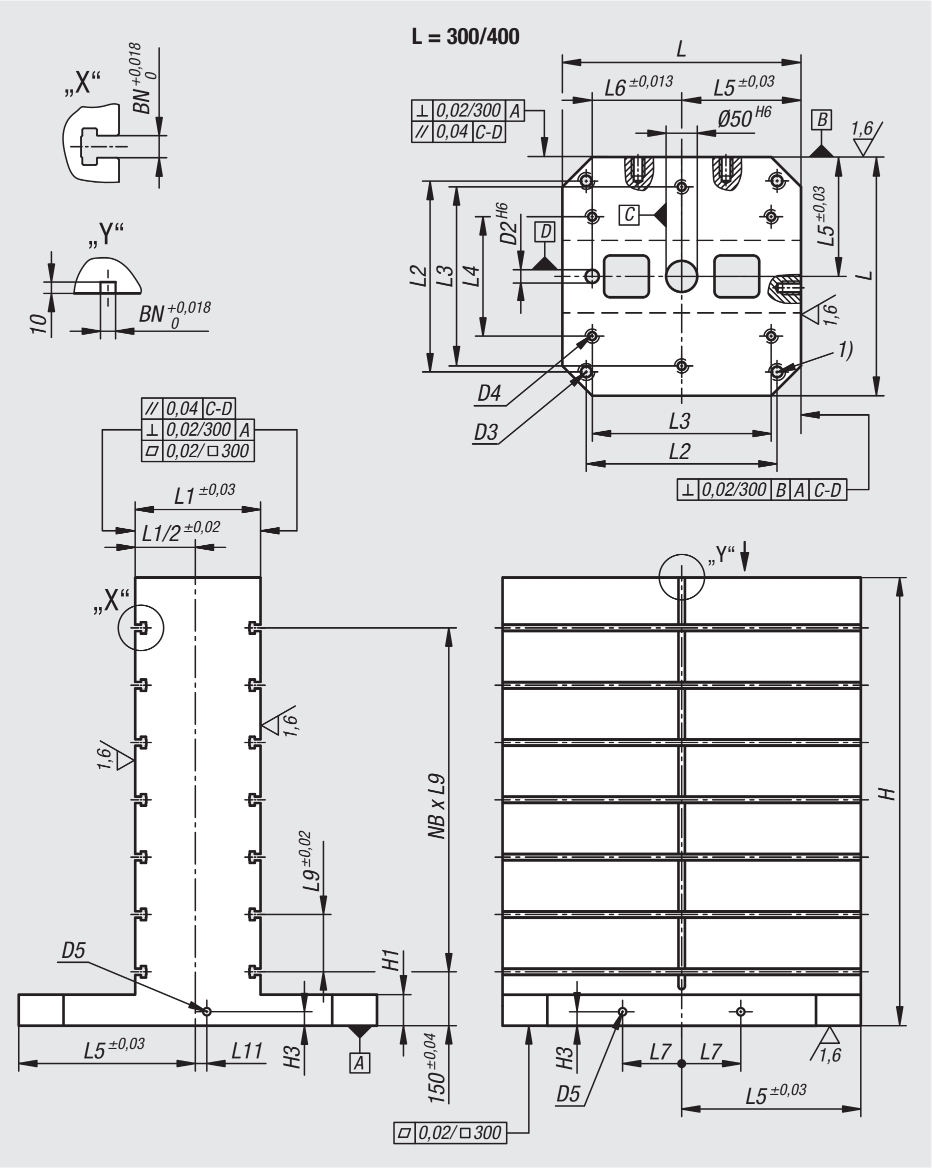




01265

Tombstones, grey cast iron, double-sided,

with T-slots



Material:
GJL 300.

Version:
Support and mounting surfaces precision machined

Sample order:
nlm 01265-314040050

Note:
Tombstones with T-slots are used for constructing modular fixtures on horizontal machines.
The precise longitudinal and transverse slot spacing ensures very high repeat clamping accuracy.
The tombstones conform to machine tables for machine tools acc. to DIN 55201 and JIS 6337-1980.
Please order locating pins for positioning subplates on machine tables acc. to DIN 55201 separately.
Ring bolts for hoisting are supplied.
Other dimensions available on request.

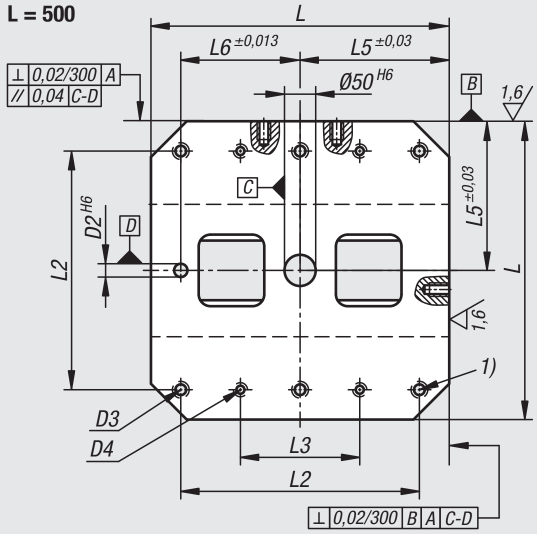
Drawing reference:
1) hole for DIN 912 cap screw (D3/D4)

Order No. BN=slot width 14	Order No. BN=slot width 18	L	H	H1	D2	D3	D4	D5	H3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L11	NB=No. across
01265-314040050	**01265-318040050**	400	500	50	20	M16	M12	M16	18	150	320	300	200	200	150	55	-	100	25	3
01265-314040065	**01265-318040065**	400	650	50	20	M16	M12	M16	18	150	320	300	200	200	150	55	-	100	25	4
01265-314050060	**01265-318050060**	500	600	50	20	M16	M12	M16	18	200	400	200	-	250	200	75	-	100	25	4
01265-314050075	**01265-318050075**	500	750	50	20	M16	M12	M16	18	200	400	200	-	250	200	75	-	100	25	5
01265-314063070	**01265-318063070**	630	700	50	25	M16	M16	M16	18	250	500	400	-	315	200	100	-	125	25	4
01265-314063085	**01265-318063085**	630	850	50	25	M16	M16	M16	18	250	500	400	-	315	200	100	-	125	25	5
01265-314080080	**01265-318080080**	800	800	50	25	M16	M16	M16	18	300	640	600	400	400	300	135	-	150	25	4
01265-314080100	**01265-318080100**	800	1000	50	25	M16	M16	M16	18	300	640	600	400	400	300	135	-	150	25	5
01265-314100100	**01265-318100100**	1000	1000	55	25	M20	M20	M16	18	350	800	600	200	500	400	165	400	160	25	5
01265-314100125	**01265-318100125**	1000	1250	55	25	M20	M20	M16	18	350	800	600	200	500	400	165	400	160	25	6

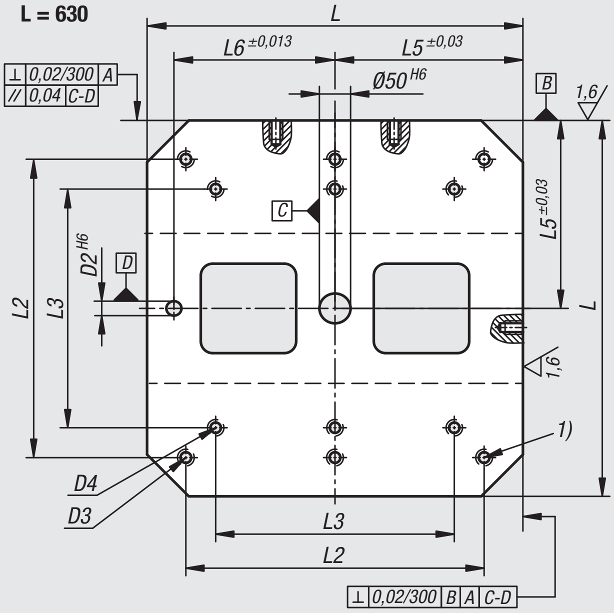
Tombstones, grey cast iron, double-sided,

with T-slots

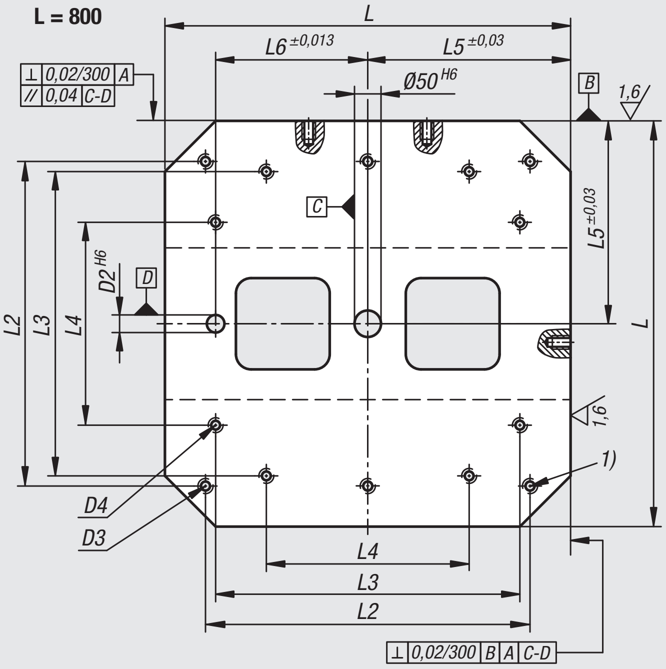
L = 500



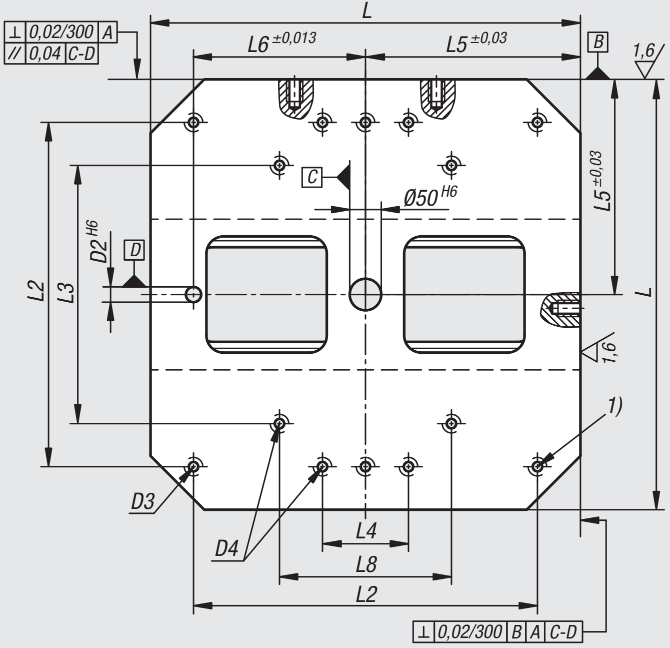
L = 630



L = 800



L = 1000



01267

Tombstone, grey cast iron, double-sided,

for interchangeable subplates

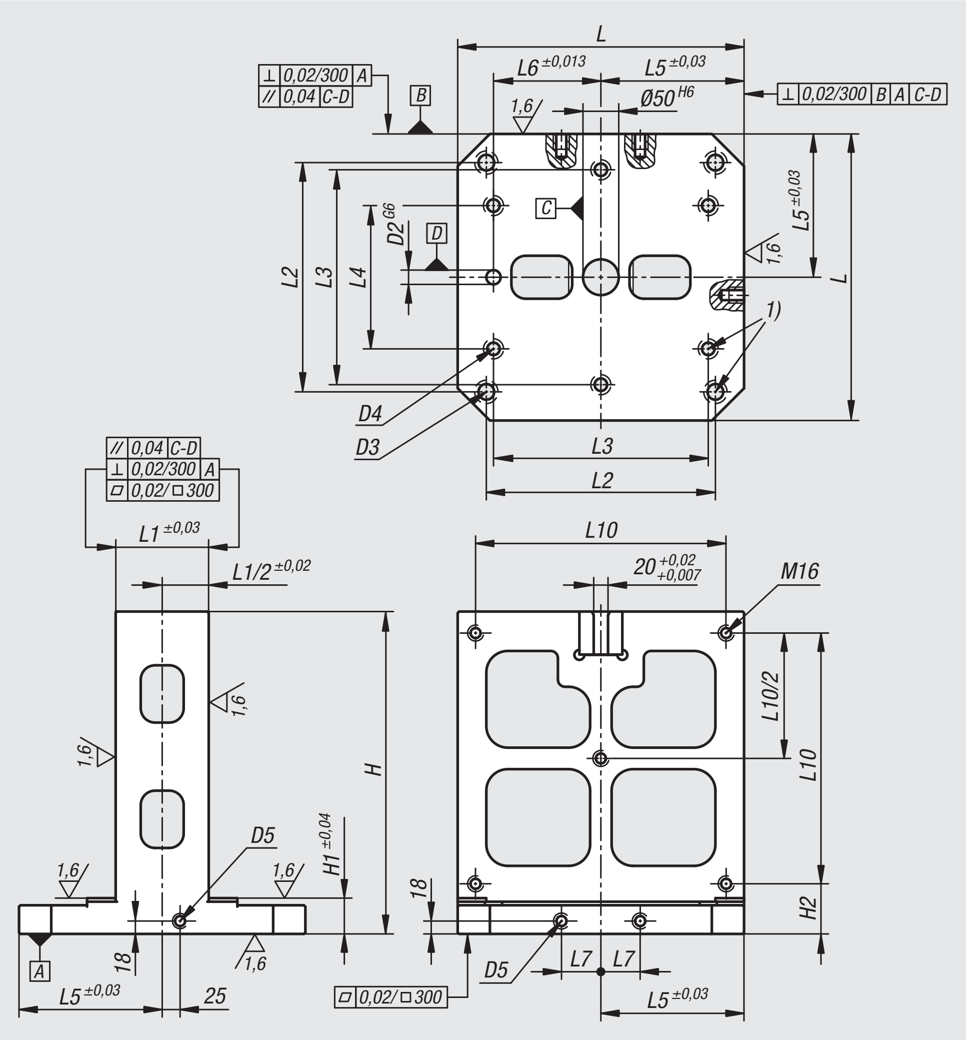
Material:
GJL 300.

Version:
Support and mounting surfaces precision machined

Sample order:
nlm 01267-14045

Note:
Interchangeable subplates can be positioned and mounted on both sides of the tombstone. This means that clamping fixtures can be replaced efficiently. The tombstones conform to machine tables for machine tools acc. to DIN 55201 and JIS6337-1980. Please order locating pins for positioning subplates on machine tables acc. to DIN 55201 separately.
Ring bolts for hoisting are supplied, as well as 2 positioning pins for positioning the interchangeable subplates.

Drawing reference:
1) hole for DIN 912 cap screw



Order No.	L	L1	H	D2	D3	D4	D5	H1	H2	L2	L3	L4	L5	L6	L7	L10
01267-14045	400	130	450	20	M16	M12	M16	50	70	320	300	200	200	150	55	350
01267-15055	500	150	550	20	M16	M12	M16	55	75	400	200	-	250	200	75	450
01267-16369	630	220	690	25	M16	M16	M16	60	80	500	400	-	315	200	100	580
01267-18086	800	250	860	25	M16	M16	M16	60	80	640	600	400	400	300	135	750

01270

Tombstones double-sided

grey cast iron

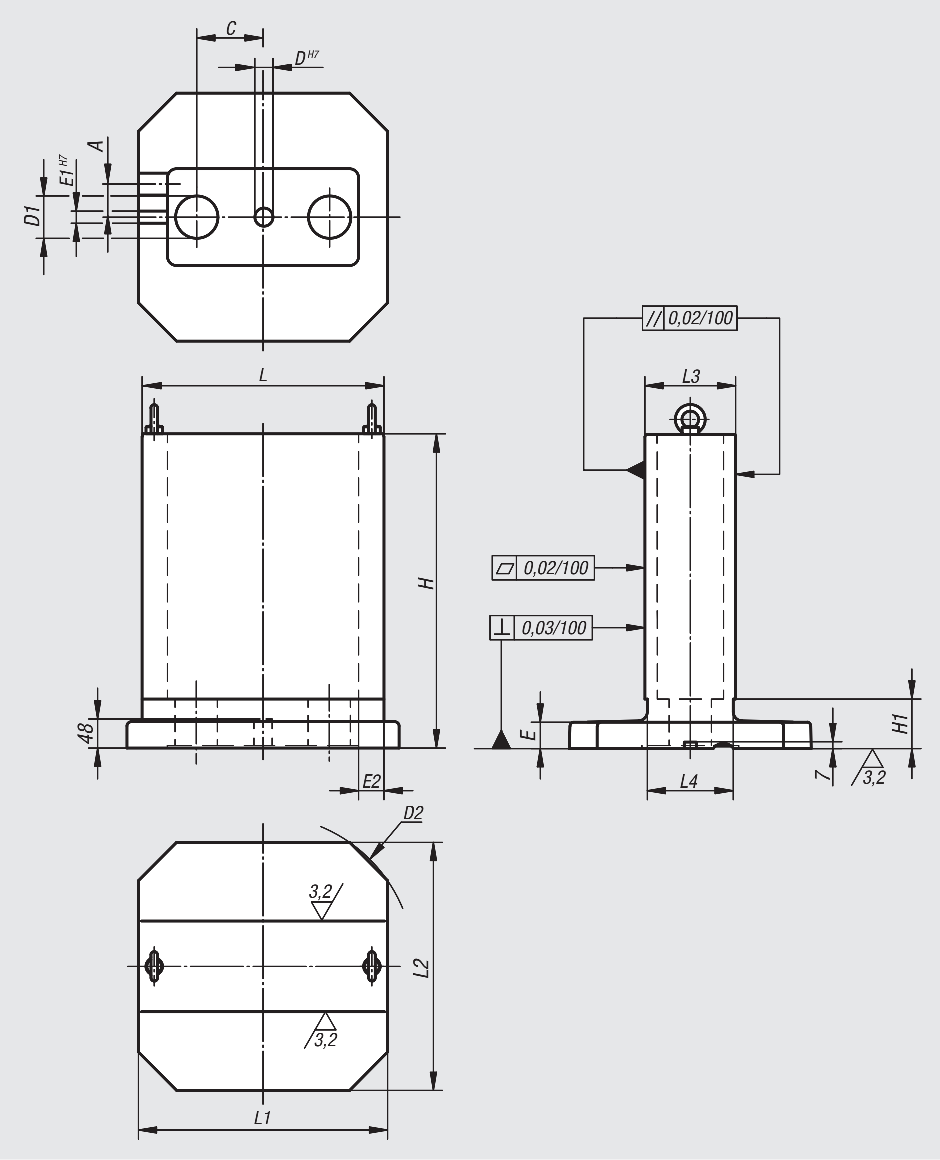
Material:
GJL 250

Version:
Reference surfaces precision machined.

Sample order:
nlm 01270-320125

Note:
Ring bolts for lifting are supplied. A cover prevents the cavities filling up with swarf.

Drawing reference:
machined faces: +0.2 mm/ +0.5 mm
unmachined faces: ±2 mm

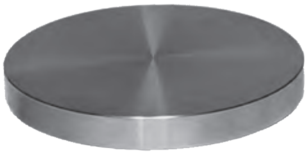


Order No.	A	C	D	D1	D2	E	E1	E2	H	H1	L	L1	L2	L3	L4
01270-320125	32,5	75	30	50	400	40	20	40	378	65	320	332	330	125	115
01270-400150	50	120	30	70	500	40	20	42	485	80	400	412	410	150	142
01270-500200	55	150	30	100	630	40	20	53	603	90	500	512	510	200	190

01280

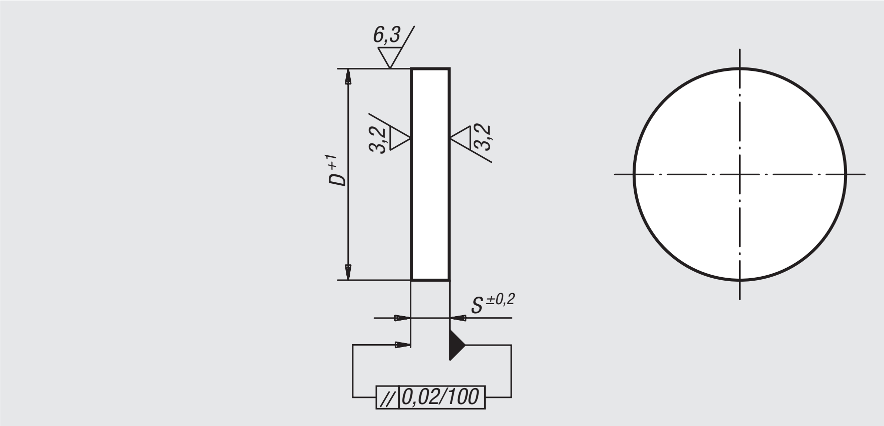
Circular plates

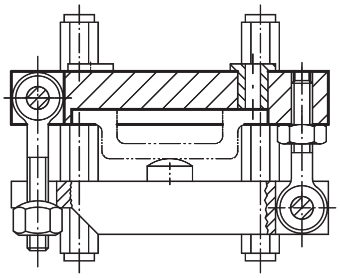
steel



Material:
Carbon steel 1.1181.

Sample order:
nlm 01280-06X25
(include dimension S)



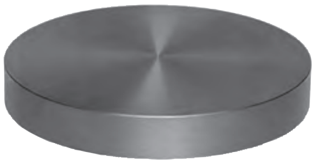


Order No.	S	D
01280-01X	16/20/25	140
01280-02X	16/20/25	180
01280-03X	16/20/25	220
01280-04X	16/20/25	280
01280-05X	20/25/32	355
01280-06X	25/32	400
01280-07X	25/32	450
01280-08X	36	500

01320

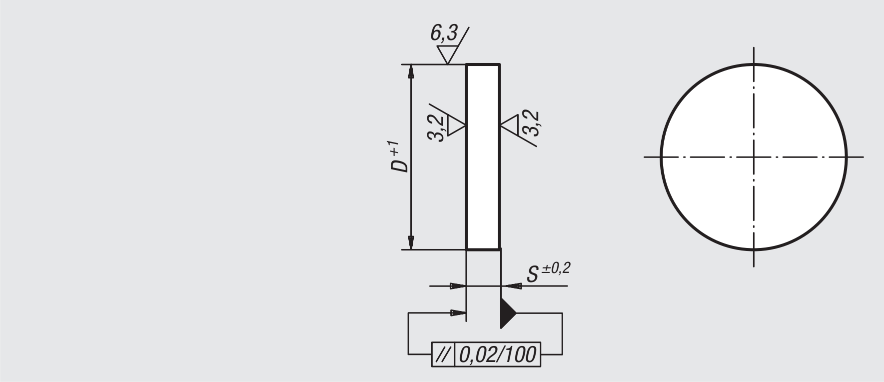
Circular plates

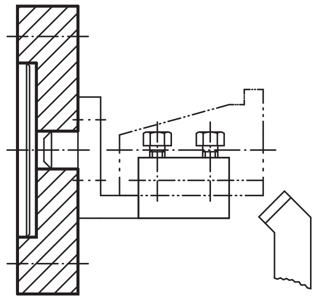
grey cast iron or aluminium



Material:
GJL 250 annealed or EN AW-7075.

Sample order:
nlm 01320-208

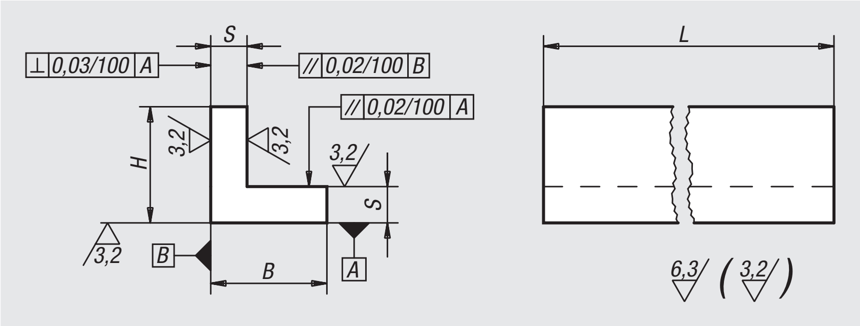




Order No. grey cast iron	Order No. aluminium	D	S
01320-01	**01320-201**	63	14
01320-02	**01320-202**	80	20
01320-03	**01320-203**	100	20
01320-04	**01320-204**	125	25
01320-05	**01320-205**	160	32
01320-06	**01320-206**	200	32
01320-07	**01320-207**	250	36
01320-08	**01320-208**	315	40
01320-09	**01320-209**	400	45
01320-10	**01320-210**	500	50

L-profiles

grey cast iron or aluminium

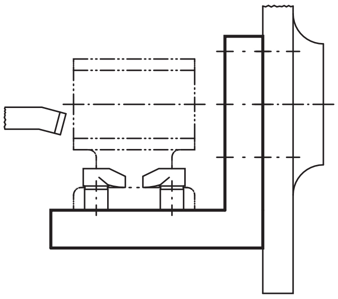


Material:
GJL 250 annealed or EN AW-7075.

Sample order:
nlm 01380-04X300
(include length L)

Note:
The length L is cut by saw and is always supplied overlong.

Drawing reference:
machined faces: ±0.25 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

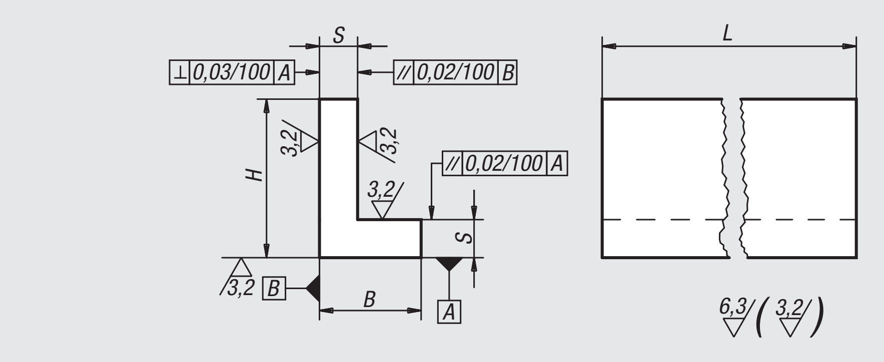


Order No. grey cast iron	Order No. aluminium	L = length	B	H	S
01380-01X	**01380-201X**	150/300	32	32	10
01380-02X	**01380-202X**	150/300	40	40	12
01380-03X	**01380-203X**	150/300	50	50	12
01380-04X	**01380-204X**	150/300	63	63	12
01380-05X	**01380-205X**	200/300/600/800	80	80	16
01380-06X	**01380-206X**	200/300/600/1000	100	100	20
01380-07X	**01380-207X**	200/300/600/1000	125	125	20
01380-08X	**01380-208X**	200/300/600	160	160	25
01380-09X	**01380-209X**	200/300/600	200	200	32
01380-10X	**01380-210X**	300/600	250	250	36
01380-11X	**-**	300/600	315	315	36

01440

L-profiles unequal

grey cast iron or aluminium



Material:
GJL 250 annealed or EN AW-7075.

Sample order:
nlm 01440-03X600
(include length L)

Note:
The length L is cut by saw and is always supplied overlong.

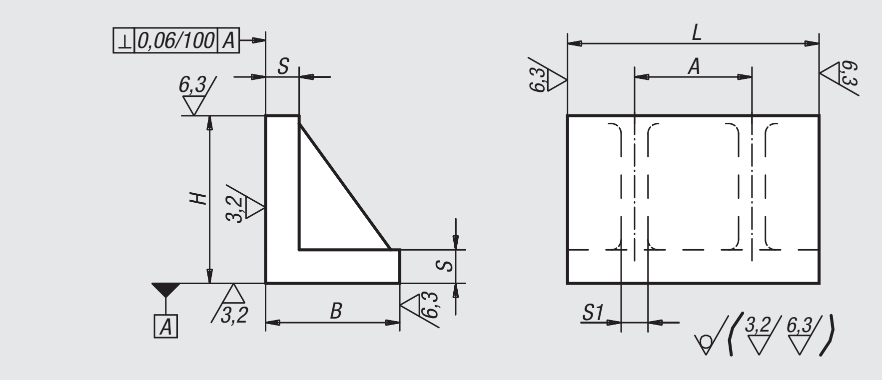
Drawing reference:
machined faces: ±0.25 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

Order No. grey cast iron	Order No. aluminium	L = length	B	H	S
01440-01X	**01440-201X**	150/300	32	50	12
01440-02X	**01440-202X**	150/300	40	63	12
01440-03X	**01440-203X**	200/300/600/800	63	80	16
01440-04X	**01440-204X**	200/300/600/1000	80	100	20
01440-05X	**01440-205X**	200/300/600/1000	100	125	20
01440-06X	**01440-206X**	200/300/600	125	160	25
01440-07X	**01440-207X**	200/300/600	160	200	32
01440-08X	**01440-208X**	300/600	200	250	36
01440-09X	**-**	300/600	250	315	36

01520

L profile with reinforcing ribs

grey cast iron



Material:
GJL 250 annealed.

Sample order:
nlm 01520-04X400
(include length L)

Note:
Angle plates with lengths 150 mm and 200 mm have only one reinforcing rib.
The length L is cut by saw and is always supplied overlong.

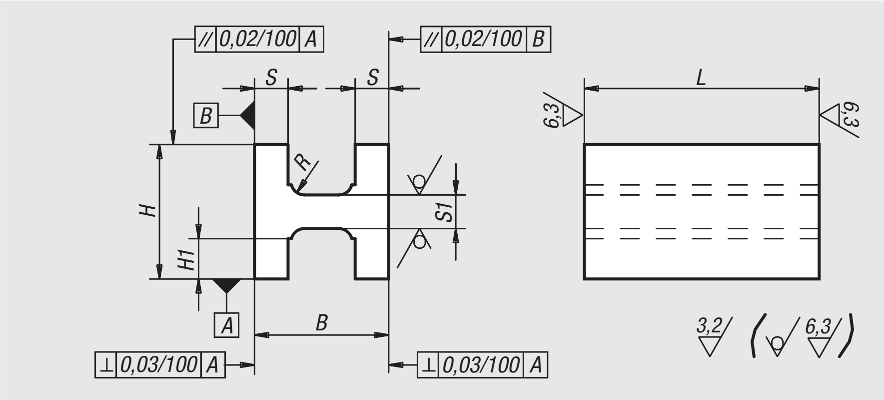
Drawing reference:
machined faces: ±0.25 mm
unmachined faces: ±2 mm
length tolerance:
≤200 mm: +2/+5
>200 mm: +10/+20

Order No.	L = length	B	H	S	S1	A
01520-01X	150/300	80	100	20	16	160
01520-02X	150/300	100	125	22	18	160
01520-03X	150/300	125	160	25	20	160
01520-04X	200/400	160	200	32	22	200
01520-05X	200/400	200	250	36	25	200

01560

H-profiles

grey cast iron or aluminium



Material:
GJL 250 annealed or EN AW-7075.

Sample order:
nlm 01560-04X300
(include length L)

Note:
The length L is cut by saw and is always supplied overlong.

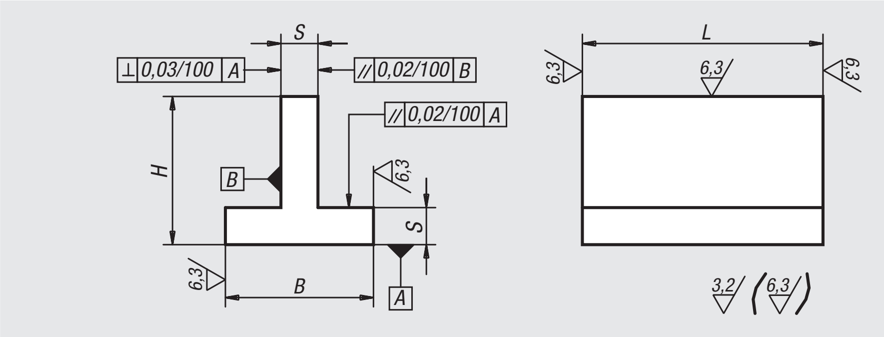
Drawing reference:
machined faces: ±0.25 mm
unmachined faces: ±2 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

Order No. grey cast iron	Order No. aluminium	L = length	B	H	H1	S	S1	R
01560-03X	**01560-203X**	600	80	80	25	16	21	6
01560-04X	**01560-204X**	300/600	100	100	32	20	26	8
01560-05X	**01560-205X**	200/300/600	125	125	45	20	26	8

01580

T-profiles machined all sides

grey cast iron or aluminium



Material:
GJL 250 annealed or EN AW-7075.

Sample order:
nlm 01580-05X300
(include length L)

Note:
The length L is cut by saw and is always supplied overlong.

On request:
Lengths 800 mm and 1000 mm in cast iron.

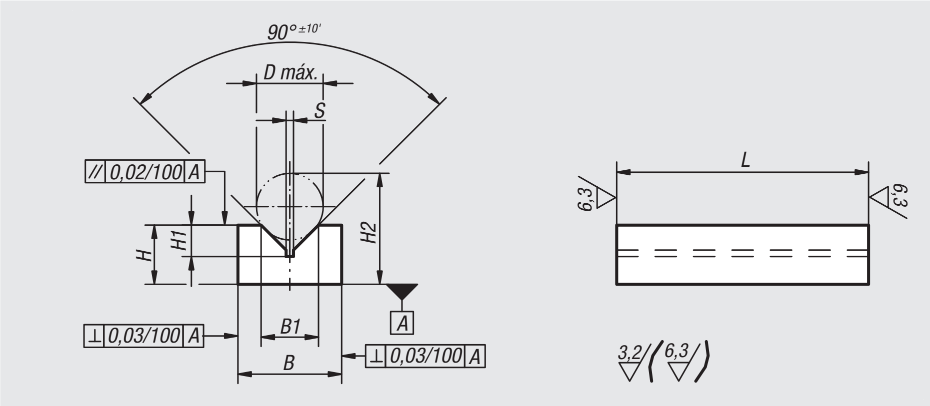
Drawing reference:
machined faces: ±0.25 mm
unmachined faces: ±2 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

Order No. grey cast iron	Order No. aluminium	L = length	B	H	S
01580-01X	**01580-201X**	300	40	40	10
01580-02X	**01580-202X**	150/300	63	63	12
01580-03X	**01580-203X**	300/600/800	80	80	16
01580-04X	**01580-204X**	300/600/1000	100	100	20
01580-05X	**01580-205X**	300/600/1000	125	125	20
01580-06X	**01580-206X**	300/600	160	160	25
01580-07X	**01580-207X**	300/600	200	200	32

01640

V-block machined all sides

grey cast iron or aluminium



Material:
GJL 250 annealed or EN AW-7075.

Sample order:
nlm 01640-05X200
(include length L)

Note:
The length L is cut by saw and is always supplied overlong.

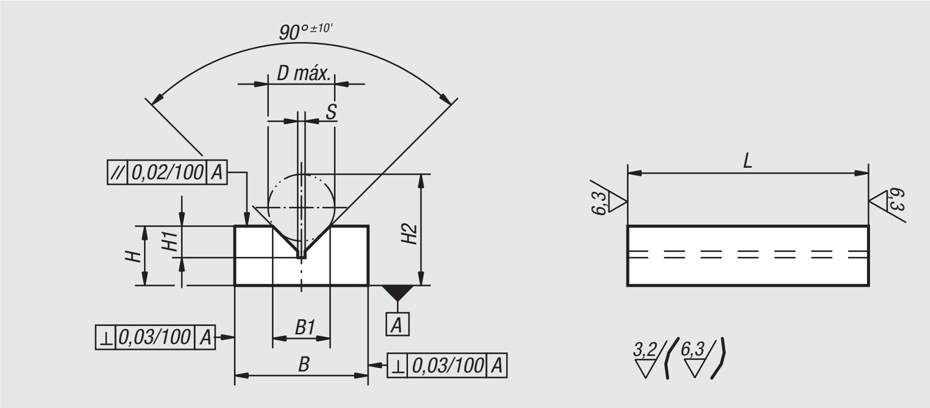
Drawing reference:
machined faces: ±0.25 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

Order No. grey cast iron	Order No. aluminium	L = length	B	B1	H	H1	H2	D max.	S
01640-01X	**01640-201X**	100/200	25	15,5	16	8,5	30	18	2
01640-02X	**01640-202X**	100/200	36	21,9	20	11	38	24	2
01640-03X	**01640-203X**	100/200	40	26	25	13,5	47	29	2,5
01640-04X	**01640-204X**	200/300/600	50	31,7	36	17	66	38	2,5
01640-05X	**01640-205X**	200/300/600	70	50	50	26	95	58	3
01640-06X	**01640-206X**	200/300/600	100	79,3	70	41	139	90	4

01660

V-block machined all sides

extra wide, grey cast iron



Material:
GJL 250 annealed.

Sample order:
nlm 01660-04X00
(include length L)

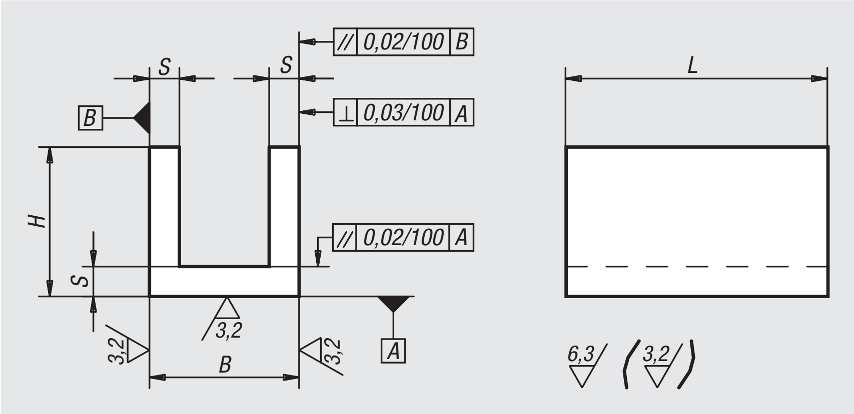
Note:
The length L is cut by saw and is always supplied overlong.

Drawing reference:
machined faces: ±0.25 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

Order No.	L = length	B	B1	H	H1	H2	D max.	S
01660-01X	100/200	36	15,5	16	8,5	30	18	2
01660-02X	100/200	50	21,9	25	11	43	24	2
01660-03X	100/200	63	26	32	13,5	54	29	2,5
01660-04X	200/300/600	100	31,7	40	17	70	38	2,5
01660-05X	200/300/600	125	50	56	26	101	58	3
01660-06X	200/300/600	160	79,3	80	41	149	90	4

U-profiles machined all sides

grey cast iron or aluminium



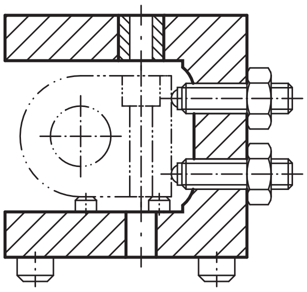
Material:
GJL 250 annealed or EN AW-7075.

Sample order:
nlm 01680-06X300
(include length L)

Note:
The length L is cut by saw and is always supplied overlong.

On request:
Lengths 800 mm and 1000 mm in cast iron.

Drawing reference:
machined faces: ±0.25 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

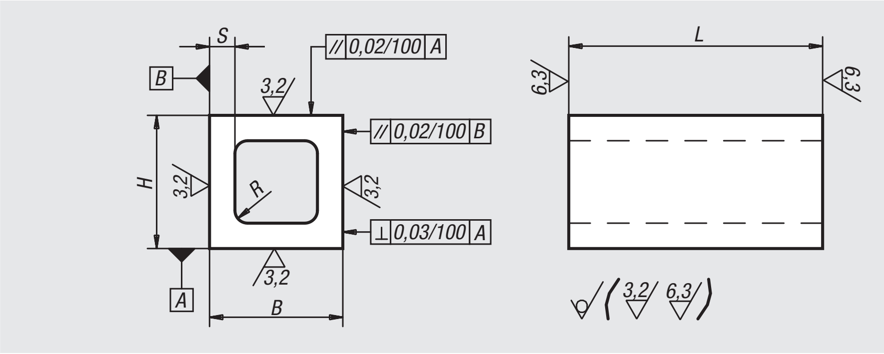


Order No.	Main material	L = length	B	H	S
01680-01X	grey cast iron	150/300	32	32	8
01680-02X	grey cast iron	150/300	40	40	10
01680-03X	grey cast iron	150/300/600	63	63	12
01680-04X	grey cast iron	200/300/600/800	80	80	16
01680-05X	grey cast iron	200/300/600/1000	100	100	20
01680-06X	grey cast iron	200/300/600/1000	125	125	20
01680-07X	grey cast iron	200/300/600	160	160	25
01680-08X	grey cast iron	200/300/600	200	200	32
01680-09X	grey cast iron	300/600	250	250	36
01680-10X	grey cast iron	300/600	250	200	36
01680-11X	grey cast iron	300/600	315	200	36
01680-201X	aluminium	150/300	32	32	8
01680-202X	aluminium	150/300	40	40	10
01680-203X	aluminium	150/300/600	63	63	12
01680-204X	aluminium	200/300/600/800	80	80	16
01680-205X	aluminium	200/300/600/1000	100	100	20
01680-206X	aluminium	200/300/600/1000	125	125	20
01680-207X	aluminium	200/300/600	160	160	25
01680-208X	aluminium	200/300/600	200	200	32
01680-209X	aluminium	300/600	250	250	36
01680-210X	aluminium	300/600	250	200	36
01680-211X	aluminium	300/600	315	200	36

01740

Square hollow profiles

grey cast iron



Material:
GJL 250 annealed.

Sample order:
nlm 01740-06X200 (include length L)

Note:
The length L is cut by saw and is always supplied overlong.

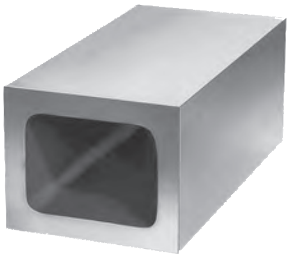
Drawing reference:
machined faces: ±0.25 mm
unmachined faces: ±2 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

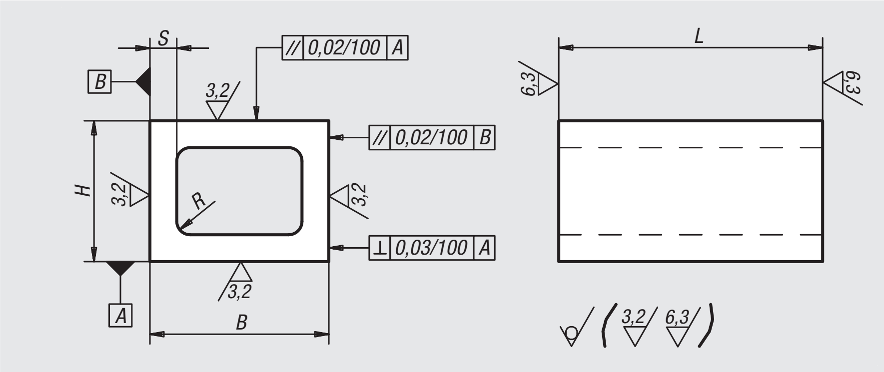
Order No.	L = length	B	H	≈ S	R
01740-04X	100/200	63	63	12	6
01740-05X	200/400	80	80	18	8
01740-06X	200/400	100	100	20	10
01740-07X	200/400/600	125	125	22	12
01740-08X	200/300/600	160	160	25	16
01740-09X	200/300/600	200	200	28	20
01740-12X	600	250	250	36	20
01740-15X	600	315	315	56	20

01760

Rectangular hollow profiles

grey cast iron





Material:
GJL 250 annealed.

Sample order:
nlm 01760-04X300 (include length L)

Note:
The length L is cut by saw and is always supplied overlong.

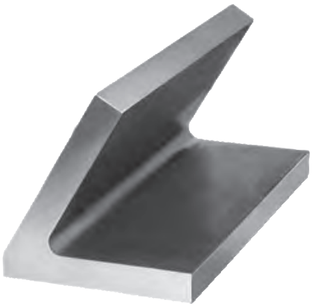
Drawing reference:
machined faces: ±0.25 mm
unmachined faces: ±2 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50

Order No.	L = length	B	H	≈ S	R
01760-01X	100/200	80	63	12	6
01760-02X	200/400	100	80	16	8
01760-03X	200/300/600	160	100	22	10
01760-04X	200/300/600	200	160	25	16
01760-05X	300/600	250	200	28	20

01780

Angle profiles 60°

grey cast iron

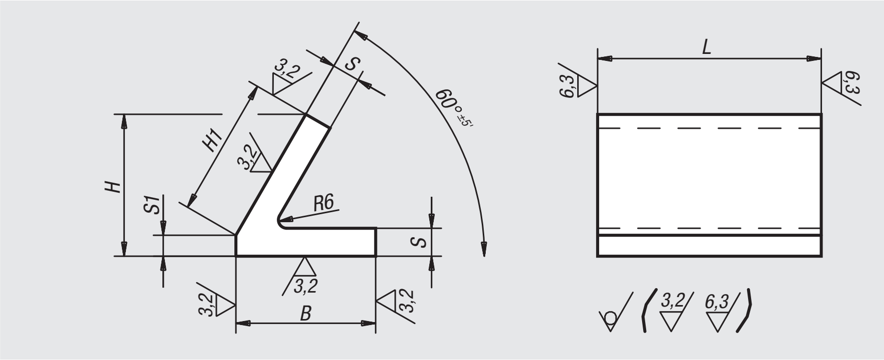


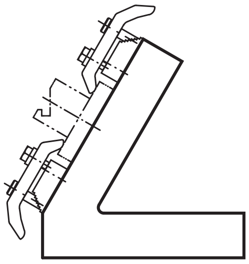
Material:
GJL 250 annealed.

Sample order:
nlm 01780-02X300 (include length L)

Note:
The length L is cut by saw and is always supplied overlong.

Drawing reference:
machined faces: ±0.25 mm
unmachined faces: ±2 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50





Order No.	L = length	B	H	H1	S	S1
01780-02X	300/600	100	101,5	100	20	15
01780-05X	300/600	200	197,5	200	32	24

01820

Angle profiles 45°

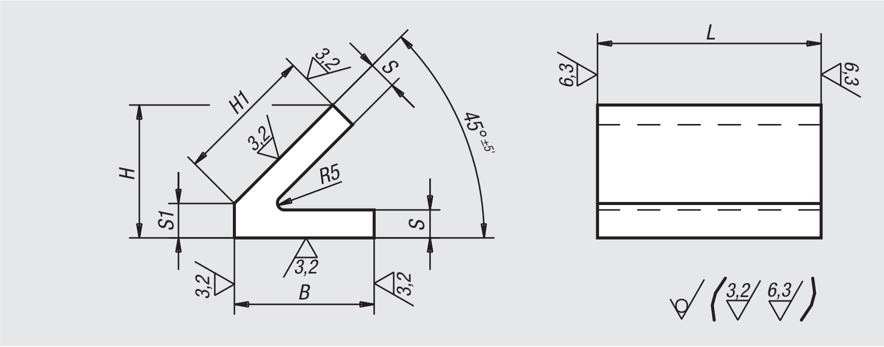
grey cast iron

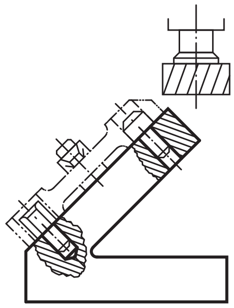
Material:
GJL 250 annealed.

Sample order:
nlm 01820-05X300 (include length L)

Note:
The length L is cut by saw and is always supplied overlong.

Drawing reference:
machined faces: ±0.25 mm
unmachined faces: ±2 mm
length tolerance:
≤200 mm: +3/+10
>200 mm ≤590 mm: +8/+15
≥600 mm: +20/+50



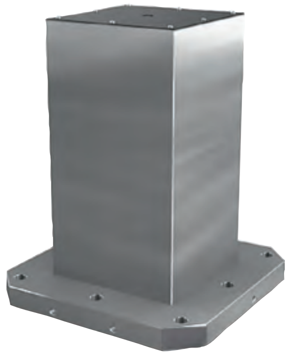


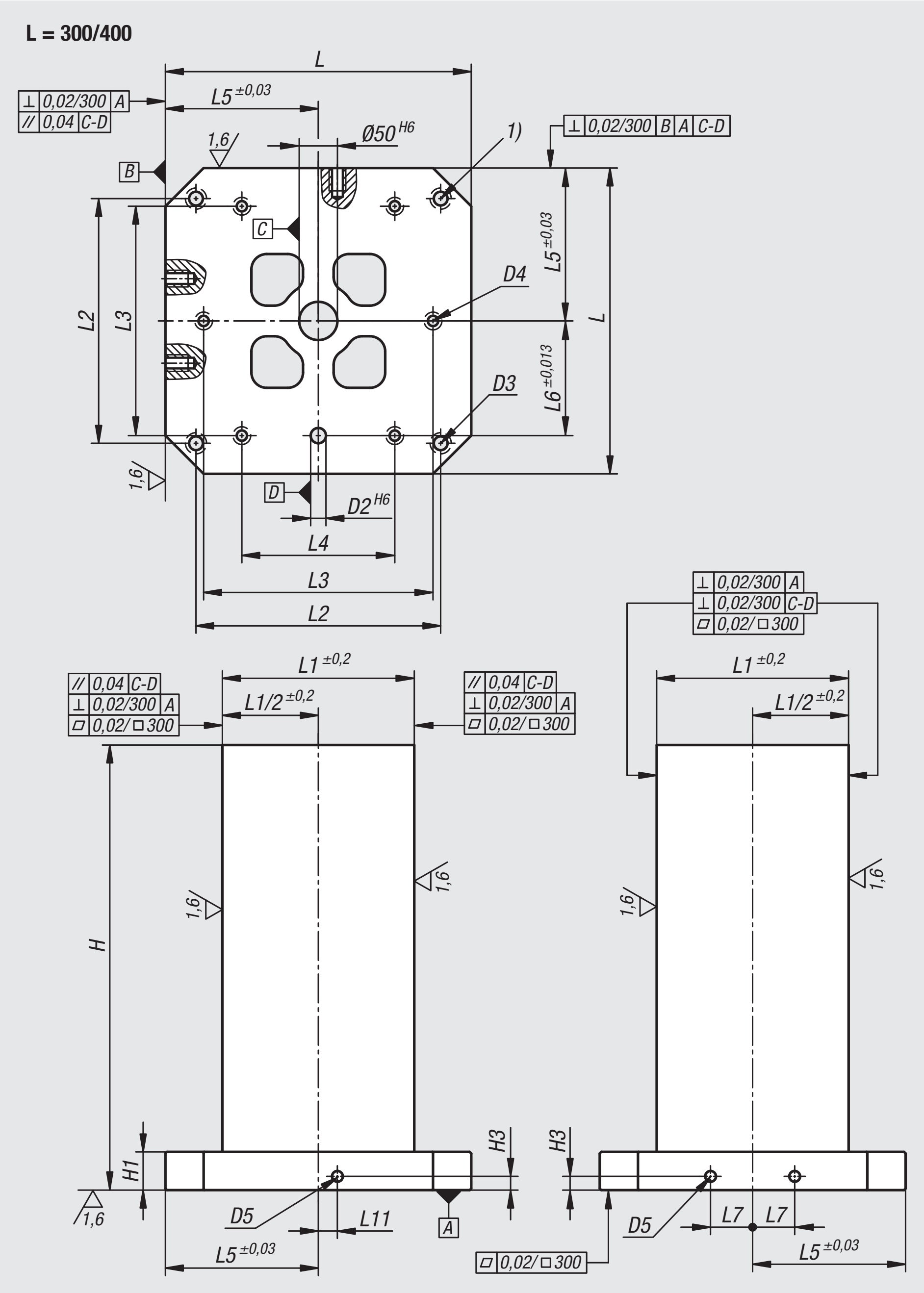
Order No.	L = length	B	H	H1	S	S1
01820-02X	300/600	100	95	100	20	24
01820-05X	300/600	200	181	200	32	40

01850

Workholding cubes, grey cast iron

with pre-machined clamping faces





Material:
GJL 300.

Version:
Support and clamping faces are precision-machined.
The clamping faces have a +0.5 mm allowance.

Sample order:
nlm 01850-100030050

Note:
Workholding cubes with pre-machined clamping faces provide a quick and economic way of producing base elements with specific grid or individual holes. The foot is ready for mounting on the machine table. The four clamping faces can be machined to the end dimensions by the user. The workholding cubes conform to machine tables for machine tools acc. to DIN 55201 and JIS 6337-1980.
Please order locating pins for positioning subplates on machine tables acc. to DIN 55201 separately.
Ring bolts for hoisting are supplied.
Other dimensions available on request.

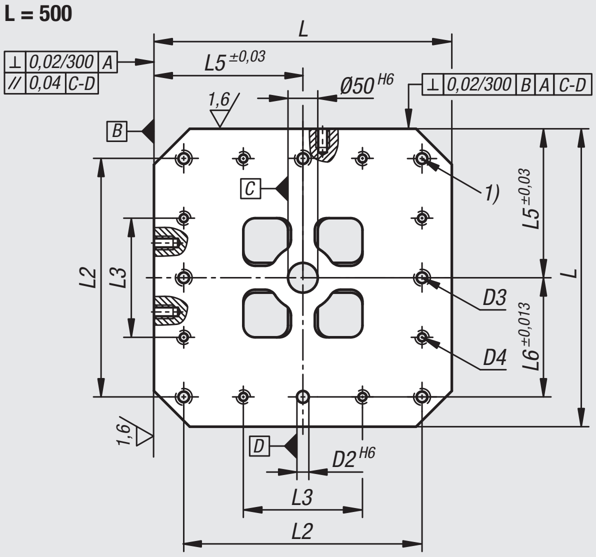
Drawing reference:
1) hole for DIN 912 cap screw (D3/D4)

Order No.	L	H	H1	D2	D3	D4	D5	H3	L1	L2	L3	L4	L5	L6	L7	L11
01850-100030050	300	500	50	20	M12	M10	M12	15	151	250	200	-	150	100	40	0
01850-100040050	400	500	50	20	M16	M12	M16	18	251	320	300	200	200	150	55	25
01850-100040065	400	650	50	20	M16	M12	M16	18	251	320	300	200	200	150	55	25
01850-100050060	500	600	50	20	M16	M12	M16	18	301	400	200	-	250	200	75	25
01850-100050075	500	750	50	20	M16	M12	M16	18	301	400	200	-	250	200	75	25
01850-100063070	630	700	50	25	M16	M16	M16	18	351	500	400	-	315	200	100	25
01850-100063085	630	850	50	25	M16	M16	M16	18	351	500	400	-	315	200	100	25
01850-100080080	800	800	50	25	M16	M16	M16	18	501	640	600	400	400	300	135	25
01850-100080100	800	1000	50	25	M16	M16	M16	18	501	640	600	400	400	300	135	25
01850-100100100	1000	1000	55	25	M20	M20	M16	18	601	800	200	-	500	400	165	25
01850-100100125	1000	1250	55	25	M20	M20	M16	18	601	800	200	-	500	400	165	25

Workholding cubes, grey cast iron

with pre-machined clamping faces

L = 500



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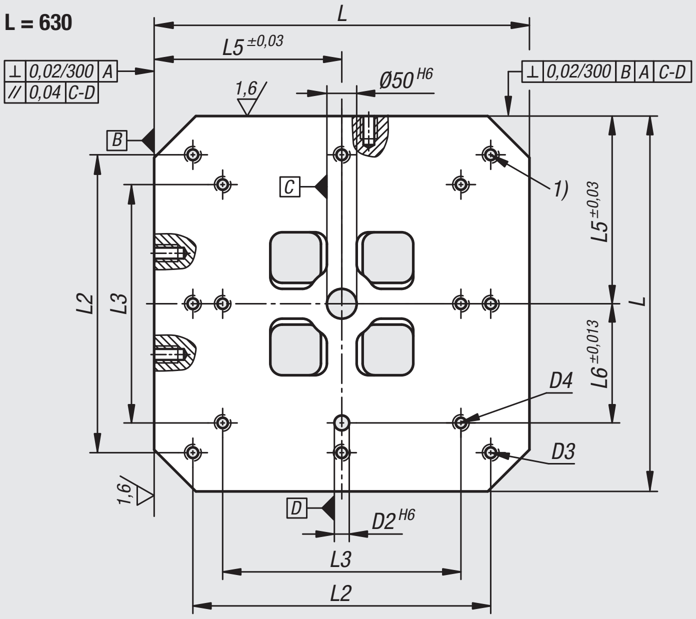

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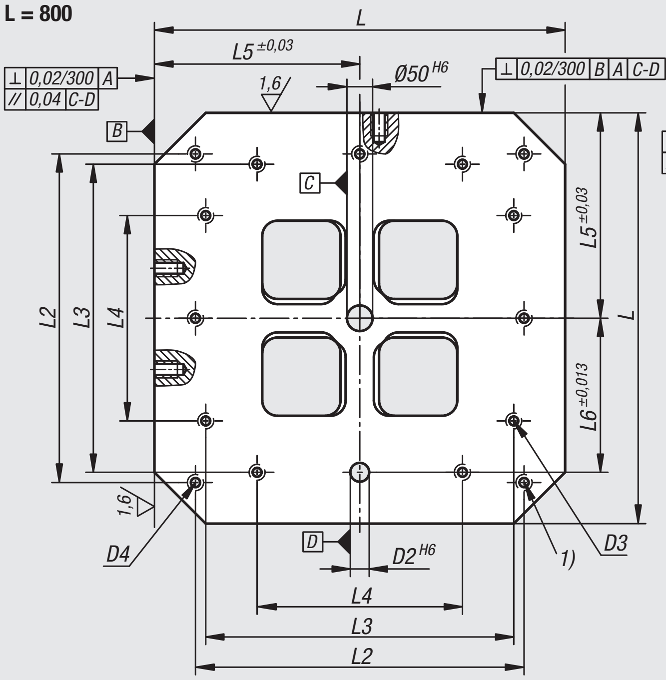

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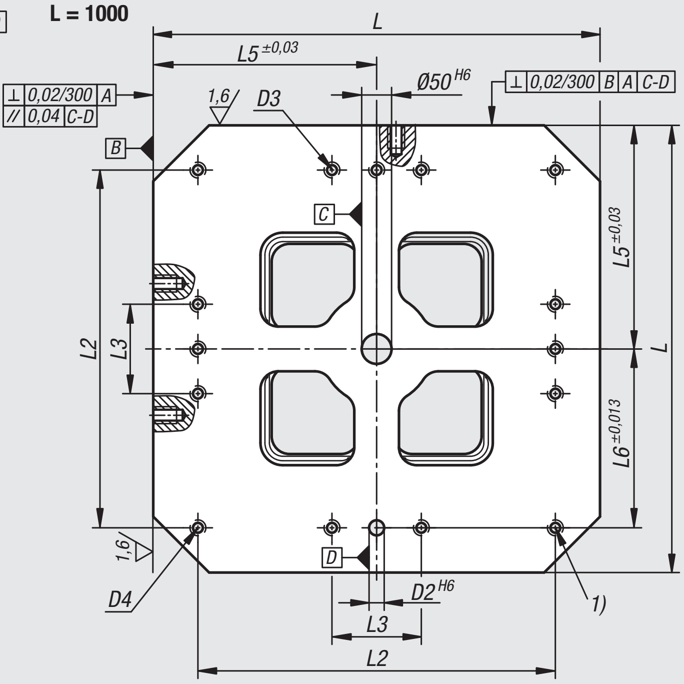


01850

Workholding cubes, grey cast iron

with T-slots

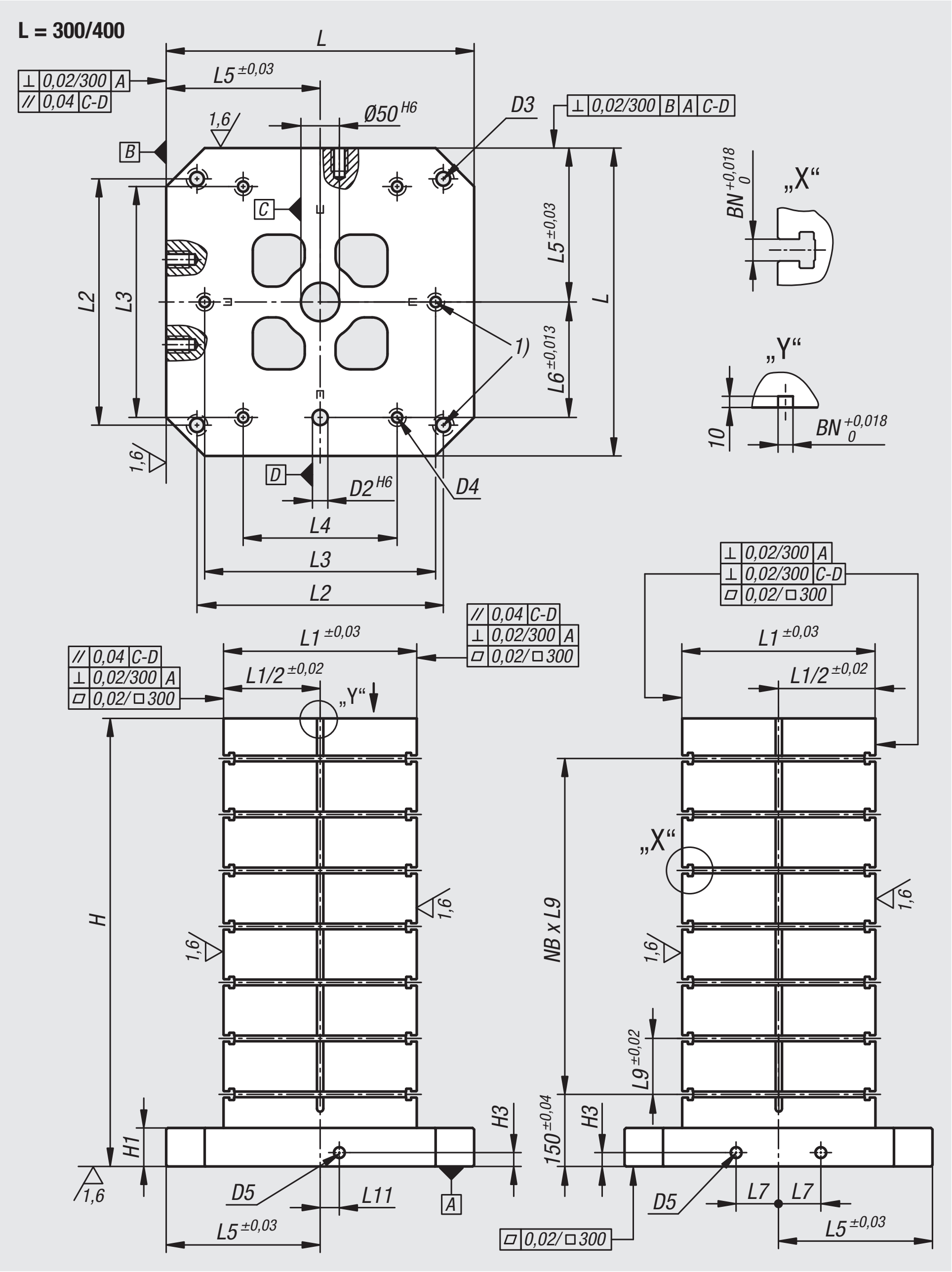
Material:
GJL 300.

Version:
Support and mounting surfaces precision machined

Sample order:
nlm 01850-314040050

Note:
Workholding cubes with T-slots are used for constructing modular fixtures on horizontal machines.
The precise longitudinal and transverse slot spacing ensures very high repeat clamping accuracy.
The workholding cubes conform to machine tables for machine tools acc. to DIN 55201 and JIS 6337-1980.
Please order locating pins for positioning subplates on machine tables acc. to DIN 55201 separately.
Ring bolts for hoisting are supplied.
Other dimensions available on request.

Drawing reference:
1) hole for DIN 912 cap screw (D3/D4)

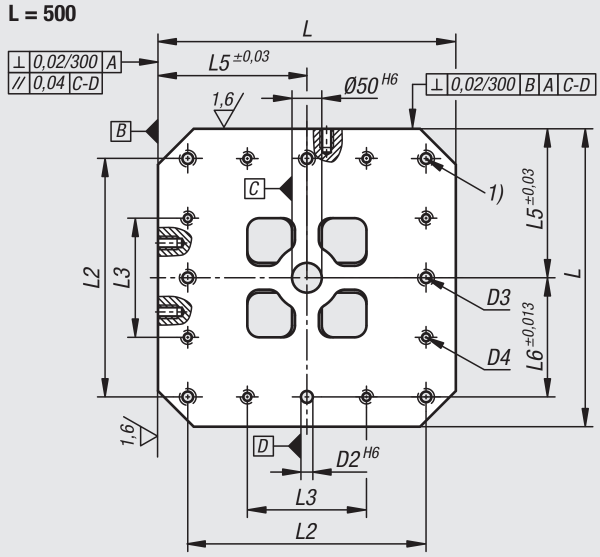


Order No. BN=slot width 14	Order No. BN=slot width 18	L	H	H1	D2	D3	D4	D5	H3	L1	L2	L3	L4	L5	L6	L7	L9	L11	NB=No. across
01850-314040050	**01850-318040050**	400	500	50	20	M16	M12	M16	18	250	320	300	200	200	150	55	100	25	3
01850-314040065	**01850-318040065**	400	650	50	20	M16	M12	M16	18	250	320	300	200	200	150	55	100	25	4
01850-314050060	**01850-318050060**	500	600	50	20	M16	M12	M16	18	300	400	200	-	250	200	75	100	25	4
01850-314050075	**01850-318050075**	500	750	50	20	M16	M12	M16	18	300	400	200	-	250	200	75	100	25	5
01850-314063070	**01850-318063070**	630	700	50	25	M16	M16	M16	18	350	500	400	-	315	200	100	125	25	4
01850-314063085	**01850-318063085**	630	850	50	25	M16	M16	M16	18	350	500	400	-	315	200	100	125	25	5
01850-314080080	**01850-318080080**	800	800	50	25	M16	M16	M16	18	500	640	600	400	400	300	135	150	25	4
01850-314080100	**01850-318080100**	800	1000	50	25	M16	M16	M16	18	500	640	600	400	400	300	135	150	25	5
01850-314100100	**01850-318100100**	1000	1000	55	25	M20	M20	M16	18	600	800	200	-	500	400	165	160	25	5
01850-314100125	**01850-318100125**	1000	1250	55	25	M20	M20	M16	18	600	800	200	-	500	400	165	160	25	6

Workholding cubes, grey cast iron

with T-slots

L = 500



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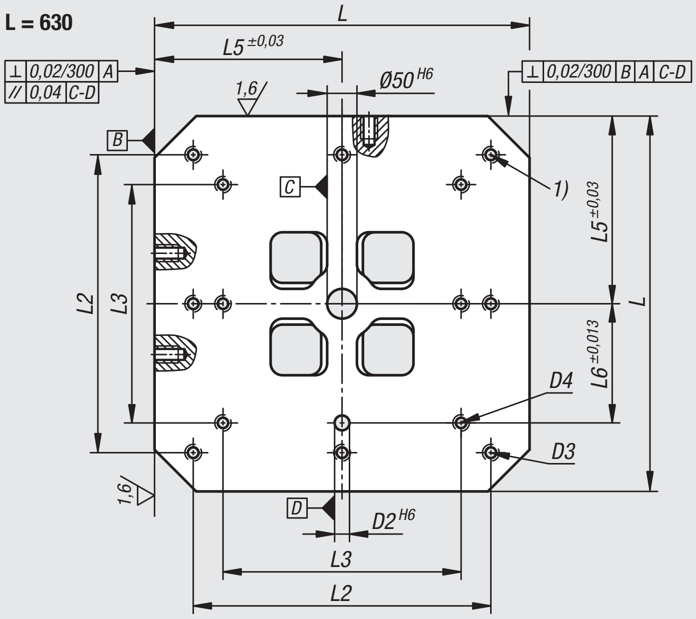

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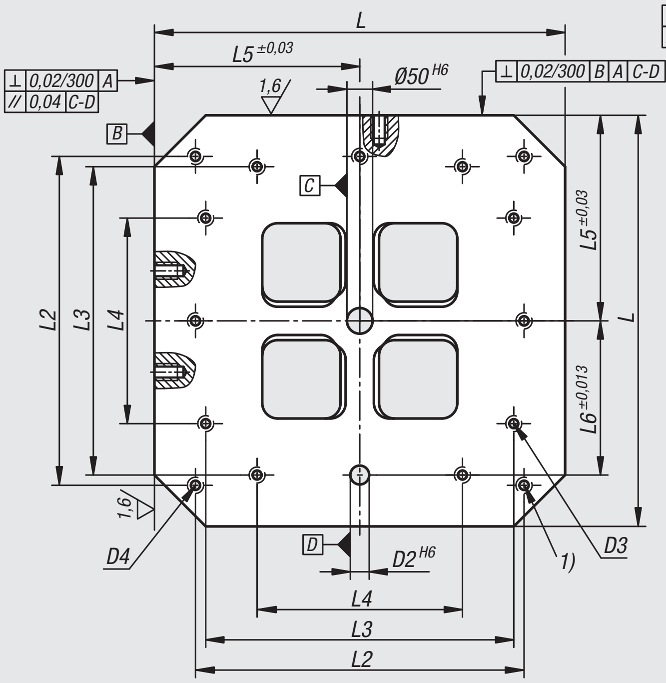

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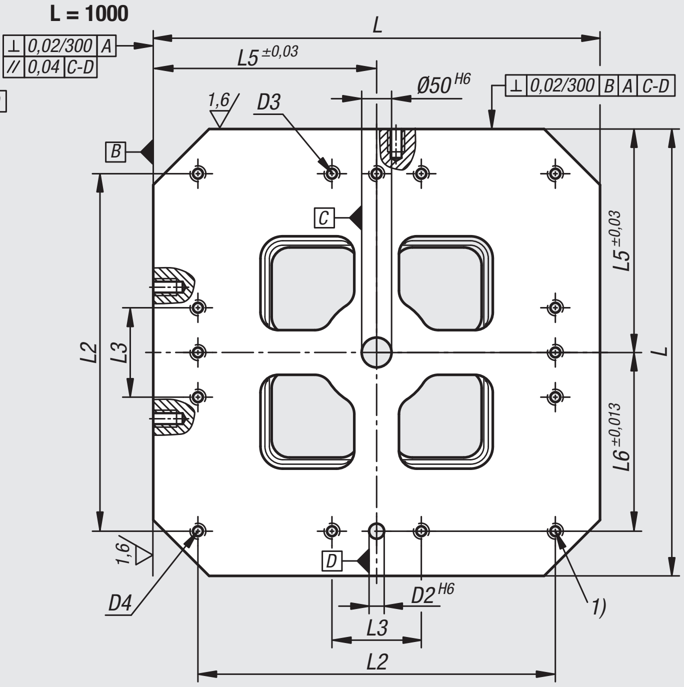
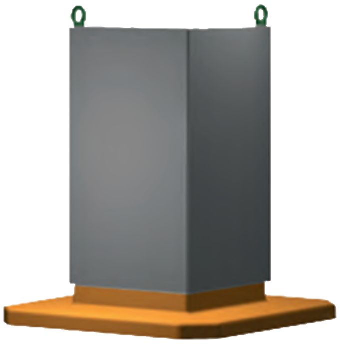
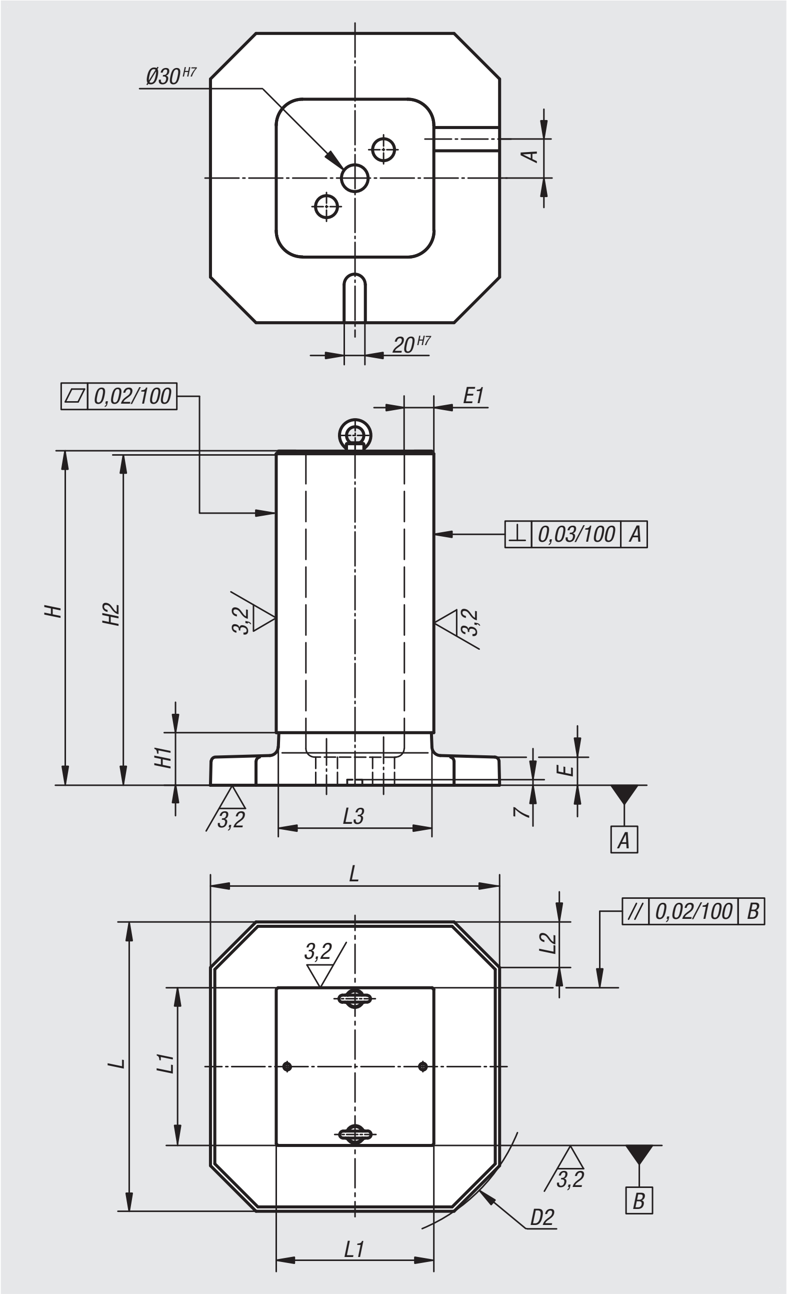


01852

Tombstones cube

grey cast iron





Material:
GJL 250

Version:
Reference surfaces precision machined

Sample order:
nlm 01852-320180

Note:
Ring bolts for lifting are supplied.
A cover prevents the cavities filling with swarf.

Drawing reference:
machined faces: +0.2 mm/ +0.5 mm
unmachined faces: ±2 mm

Order No.	A	D2	E	E1	H	H1	H2	L	L1	L2	L3
01852-320180	32,5	400	32	25	381	80	378	330	180	52	174
01852-400270	50	500	32	32	485	60	482	410	270	62	262
01852-500320	55	630	40	40	603	100	600	510	320	70	312

02000

Self-aligning pads
Fixture feet
Clamp rests
Support elements

Self-aligning pads

Material:
Body carbon steel.
Ball, ball bearing steel 1.2067.
Form D: Ball with POM insert.
Form H: Ball with POM insert.
Form K: Ball with carbide insert.
Form M has a carbide ball.

Version:
Body tempered and phosphated.
Ball hardened.
Form M ball nickel plated.

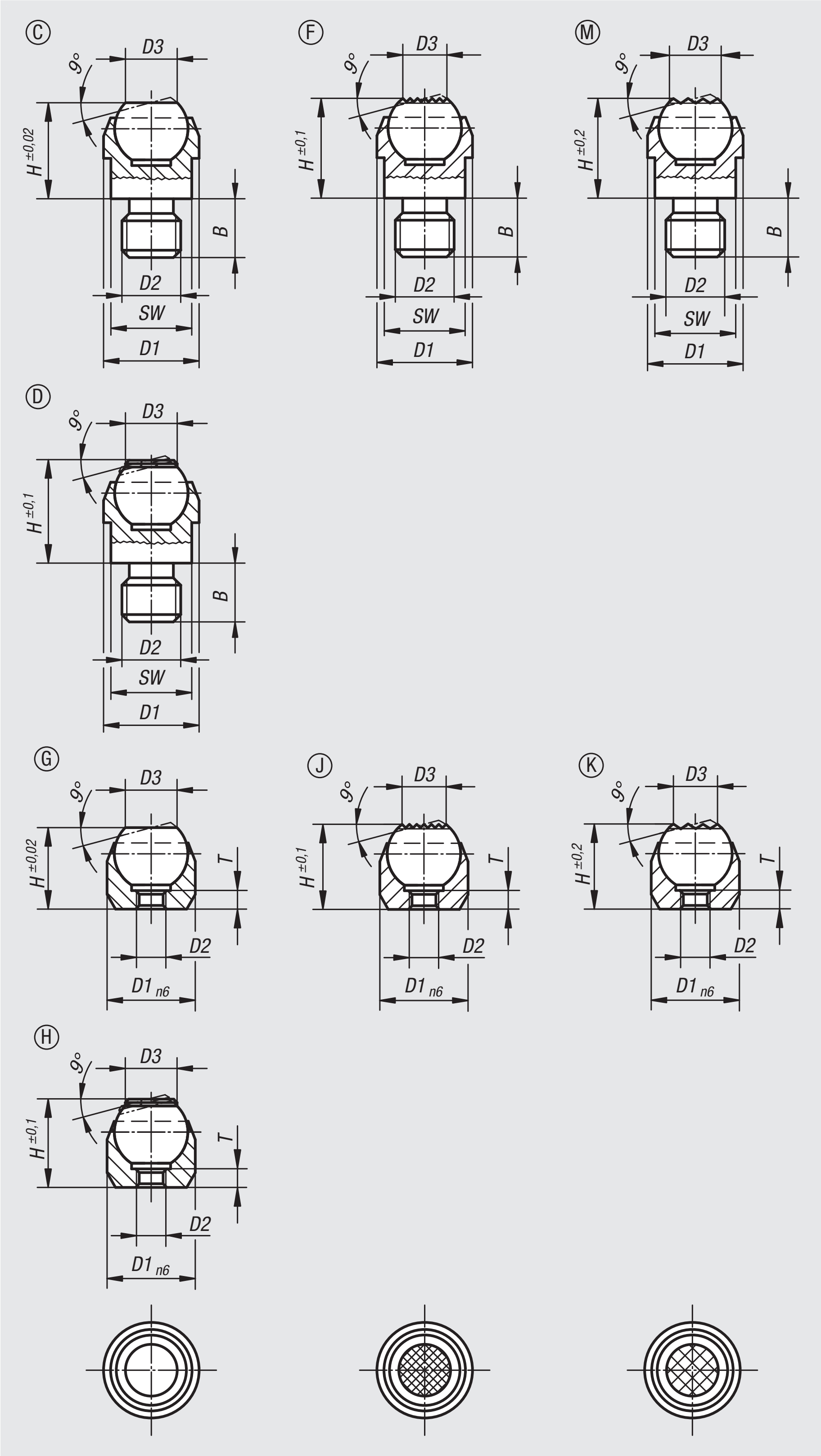
Sample order:
nlm 02000-120

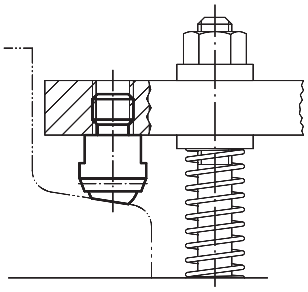
Note:
Self-aligning pads serve as stops, supports and thrust pads in fixture constructions.

Ball secured against rotation.

* Valid only if the minimum bore depth is observed.

Drawing reference:
Form C: with male thread, flattened ball, smooth.
Form D: with male thread, flattened ball, with POM insert.
Form F: with male thread, flattened ball, diamond grip.
Form M: with male thread, flattened ball, with carbide insert.
Form G: press fit, flattened ball, smooth.
Form H: press fit, flattened ball, with POM insert.
Form J: press fit, flattened ball, diamond grip.
Form K: press fit, flattened ball, with carbide insert.





Self-aligning pads

Self-aligning pads

Order No.	Form	B	D1	D2	D3	H	Ball-Ø	SW	Load rating max. kN (static load only)
02000-108	C	8	13	M8	7,2	13	10	11	10
02000-110	C	10	20	M10	10,5	18	16	17	25
02000-112	C	12	20	M12	10,5	18	16	17	25
02000-116	C	16	30	M16	20	27	25	27	90
02000-120	C	20	50	M20	34,5	35	40	41	165

Order No.	Form	B	D1	D2	D3	H	Ball-Ø	SW	Load rating max. kN (static load only)
02000-208	D	8	13	M8	7,9	13	10	11	10
02000-210	D	10	20	M10	12,7	18	16	17	25
02000-212	D	12	20	M12	12,7	18	16	17	25

Order No.	Form	B	D1	D2	D3	H	Ball-Ø	SW	Load rating max. kN (static load only)
02000-308	F	8	13	M8	7,2	13	10	11	10
02000-310	F	10	20	M10	10,5	18	16	17	25
02000-312	F	12	20	M12	10,5	18	16	17	25
02000-316	F	16	30	M16	20	27	25	27	90
02000-320	F	20	50	M20	34,5	35	40	41	165

Order No.	Form	B	D1	D2	D3	H	Ball-Ø	SW	Load rating max. kN (static load only)
02000-908	M	8	13	M8	7,7	13,3	10	11	10
02000-910	M	10	20	M10	12	18	16	17	25
02000-912	M	12	20	M12	12	18	16	17	25

Order No.	Form	D1	D2	D3	H	T	Ball-Ø	Receiving hole	Load rating max. kN (static load only)
02000-403	G	12	M3	7,2	11	3,5	10	ø 12 H7X6 min.	10*
02000-404	G	18	M4	10,5	17	4,4	16	ø 18 H7X8 min.	25*
02000-405	G	28	M5	20	25	6,3	25	ø 28 H7X13 min.	90*

Order No.	Form	D1	D2	D3	H	T	Ball-Ø	Receiving hole	Load rating max. kN (static load only)
02000-503	H	12	M3	7,9	11	3	10	ø 12 H7X6 min.	10*
02000-504	H	18	M4	12,7	17	4	16	ø 18 H7X8 min.	25*
02000-505	H	28	M5	19,05	25	6	25	ø 28 H7X13 min.	90*

Order No.	Form	D1	D2	D3	H	T	Ball-Ø	Receiving hole	Load rating max. kN (static load only)
02000-603	J	12	M3	7,2	11	3,5	10	ø 12 H7X6 min.	10*
02000-604	J	18	M4	10,5	17	4,4	16	ø 18 H7X8 min.	25*
02000-605	J	28	M5	20	25	6,3	25	ø 28 H7X13 min.	90*

Order No.	Form	D1	D2	D3	H	T	Ball-Ø	Receiving hole	Load rating max. kN (static load only)
02000-803	K	12	M3	7,9	11	3	10	ø 12 H7X6 min.	10*
02000-804	K	18	M4	12,7	17	4	16	ø 18 H7X8 min.	25*
02000-805	K	28	M5	19,05	25	6	25	ø 28 H7X13 min.	90*

02001

Self-aligning pads

swivel angle 14° and 20°

Material:
Body steel.
Ball rust and acid resistant steel.
Form M with carbide insert.

Version:
Body black oxidised.
Ball bright.

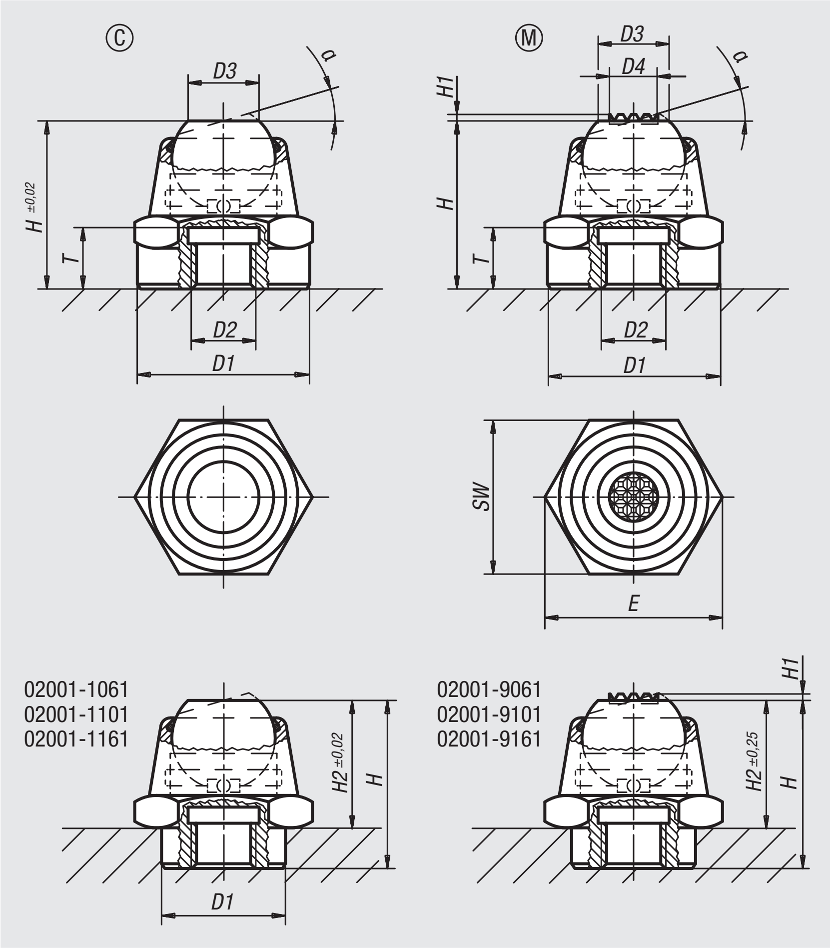
Sample order:
nlm 02001-108

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces. They also serve as stops, supports and thrust pads in fixture and toolmaking.
Grub screws or threaded studs can be screwed and glued into thread D2 making a self-aligning pad with external thread.

Ball secured against rotation.

Advantages:
- Self-aligning pads can be swiveled.
- High load forces can be absorbed.
- The built-in o-ring keeps dirt and foreign particles out, which in turn guarantees reliable operation.

Drawing reference:
Form C: flattened ball, smooth
Form M: flattened ball, with carbide serrations



Self-aligning pads

swivel angle 14° and 20°

Form C, flattened ball, flat face

Order No.	Form	α	D1	D2	D3	H	H2	T	E	SW	Ball-Ø	Load rating max. kN (static load only)
02001-1061	C	14°	12	M6	7	17,5	12,5	6	19,6	17	10	14
02001-106	C	14°	16	M6	7	17,5	-	6	19,6	17	10	14
02001-108	C	20°	22	M8	11	26	-	9	27,7	24	16	34
02001-1101	C	20°	18	M10	11	26	20	9	27,7	24	16	34
02001-110	C	20°	22	M10	11	26	-	9	27,7	24	16	34
02001-112	C	20°	22	M12	11	26	-	9	27,7	24	16	34
02001-1161	C	20°	26	M16	18	40	30	15	41,6	36	25	90
02001-116	C	20°	34	M16	18	40	-	15	41,6	36	25	90
02001-120	C	20°	34	M20	18	40	-	15	41,6	36	25	90

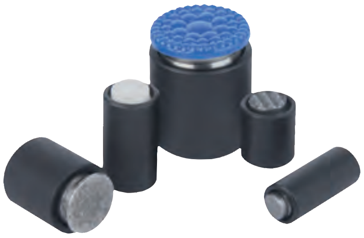
Form M, flattened ball, carbide steel diamond grip

Order No.	Form	α	D1	D2	D3	D4	H	H1	H2	E	T	Ball-Ø	SW	Load rating max. kN (static load only)
02001-9061	M	14°	12	M6	7	5	17,5	0,6	12,5	19,6	6	10	17	14
02001-906	M	14°	16	M6	7	5	17,5	0,6	-	19,6	6	10	17	14
02001-908	M	20°	22	M8	11	7,5	26	0,8	-	27,7	9	16	24	34
02001-9101	M	20°	18	M10	11	7,5	26	0,8	20	27,7	9	16	24	34
02001-910	M	20°	22	M10	11	7,5	26	0,8	-	27,7	9	16	24	34
02001-912	M	20°	22	M12	11	7,5	26	0,8	0,8	27,7	9	16	24	34
02001-9161	M	20°	26	M16	18	13	40	0,9	30	41,6	15	25	36	90
02001-916	M	20°	34	M16	18	13	40	0,9	0,9	41,6	15	25	36	90
02001-920	M	20°	34	M20	18	13	40	0,9	-	41,6	15	25	36	90

02002

Self-aligning pads

with O-ring



Material:
Body carbon steel.
Ball:
Form C, F tool steel.
Form K POM.
Form O stainless steel diamond impregnated.
Form P stainless steel with polyurethane face.

Version:
Body tempered, black oxidised.
Ball:
Form C, F hardened, black oxidised.
Form K POM ball, white.
Form O surface comparable to 100 grade abrasive grit.
Form P polyurethane, hardness 60 Shore.

Sample order:
nlm 02002-704X012

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces.
They also serve as stops, supports and thrust pads in fixtures and toolmaking.

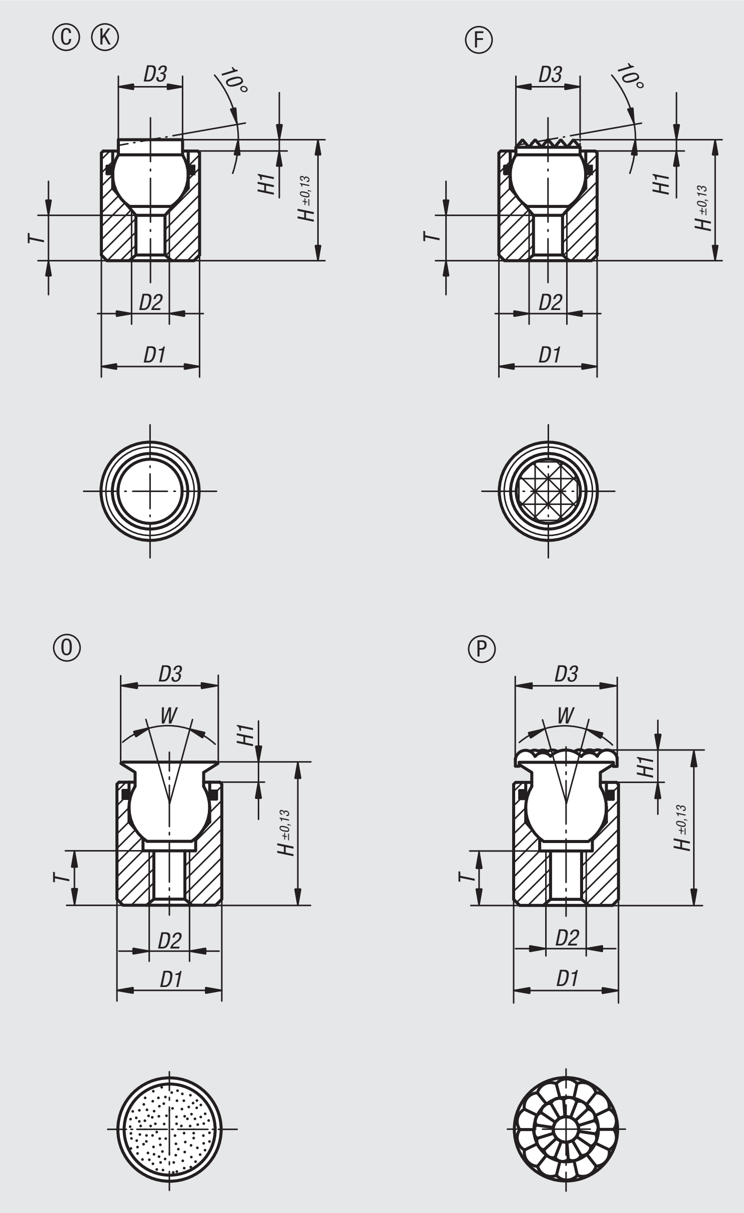
Ball secured against rotation.

Form O: The abrasive diamond surface is fused firmly to the ball. It is ideally suited to supporting smooth or slippery applications with a minimum of clamping pressure. This allows the diamond particles to get a firm grip on a very small area with minimum damage to the surface. The diamond surface offers excellent wear resistance.

Form P: The polyurethane surface is permanently vulcanised on the ball. It is abrasion-resistant and does not discolour. Offers optimum protection against damage to delicate surfaces. The pearl-like surface gives a firm grip and allows air to escape so as to prevent any suction effect between the contact surface and the self-aligning pads.

Advantages:
The built-in O-ring holds the ball in place and keeps dirt and foreign particles out ensuring smooth and even movement.

Drawing reference:
Form C: flattened steel ball, smooth
Form F: flattened steel ball, with serrations
Form K: POM ball, flattened, smooth
Form O: stainless steel ball diamond impregnated
Form P: stainless steel ball with polyurethane surface



Self-aligning pads

with O-ring

Form C, flattened steel ball, smooth

Order No.	Form	D1	D2	D3	H	H1	T	Ball-Ø	Load rating max. kN (static load only)
02002-104X012	C	10	M4	6	12	1,5	4,5	7	12
02002-104X025	C	10	M4	6	25	1,5	12	7	12
02002-105X016	C	13	M5	8,5	16	1,5	5	10	20
02002-105X025	C	13	M5	8,5	25	1,5	12	10	20

Form F, flattened steel ball, diamond grip

Order No.	Form	D1	D2	D3	H	H1	T	Ball-Ø	Load rating max. kN (static load only)
02002-304X012	F	10	M4	6	12	1,5	4,5	7	12
02002-304X025	F	10	M4	6	25	1,5	12	7	12
02002-305X016	F	13	M5	8,5	16	1,5	5	10	20
02002-305X025	F	13	M5	8,5	25	1,5	12	10	20

Form K, flattened POM ball, smooth

Order No.	Form	D1	D2	D3	H	H1	T	Ball-Ø	Load rating max. kN (static load only)
02002-704X012	K	10	M4	6	12	1,5	4,5	7	2
02002-704X025	K	10	M4	6	25	1,5	12	7	2
02002-705X016	K	13	M5	8,5	16	1,5	5	10	4
02002-705X025	K	13	M5	8,5	25	1,5	12	10	4

Form O, stainless-steel ball, diamond impregnated

Order No.	Form	D1	D2	D3	H	H1	T	W	Ball-Ø	Load rating max. kN (static load only)
02002-504X012	O	10	M4	8	12,5	2	3,5	28	7	11,5
02002-504X025	O	10	M4	8	25,5	2	9	28	7	11,5
02002-505X017	O	13	M5	11	17,5	3	6,5	28	10	19,8
02002-505X026	O	13	M5	11	26,5	3	9	28	10	19,8
02002-506X021	O	17	M6	14	21	3	7,5	28	13	27,4
02002-508X024	O	19	M8	19	24	4	8,5	24	15	38,6
02002-510X028	O	24	M10	21	28	4	9	24	20	58,3

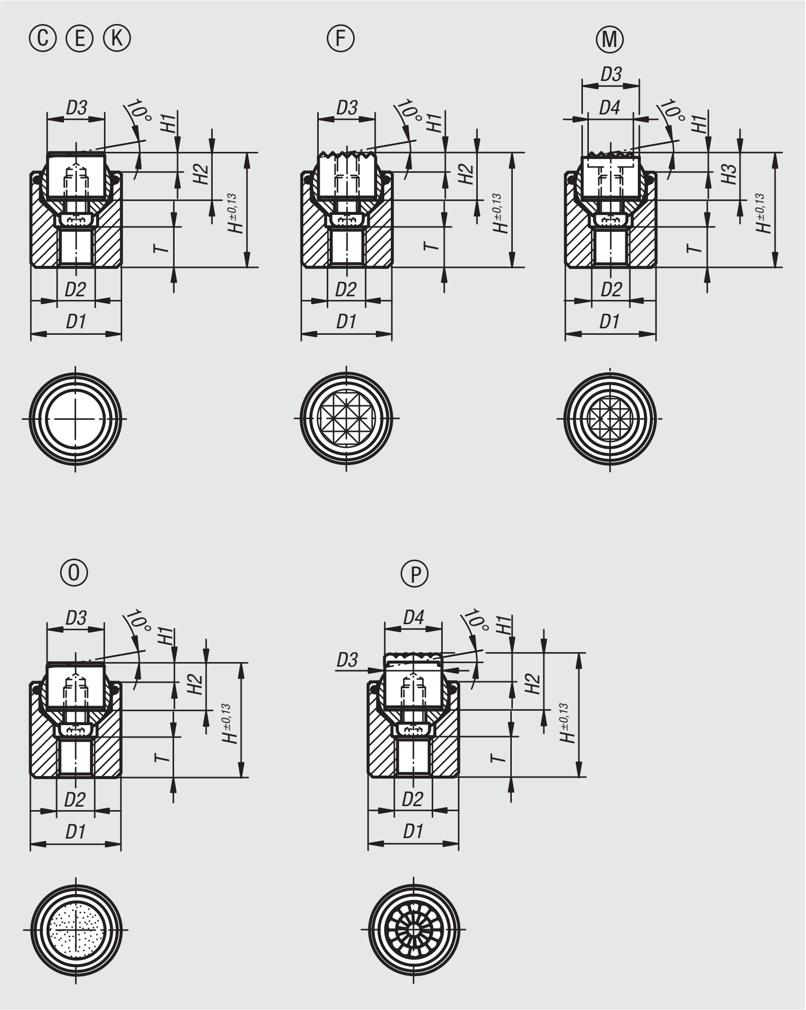
Form P, stainless-steel ball with polyurethane face

Order No.	Form	D1	D2	D3	H	H1	W	T	Ball-Ø
02002-604X014	P	10	M4	10	14,5	4	28	3,5	7
02002-604X027	P	10	M4	10	27,5	4	28	9	7
02002-605X019	P	13	M5	13	19,5	5	28	6,5	10
02002-605X028	P	13	M5	13	28,5	5	28	9	10
02002-606X023	P	17	M6	16	23	5	28	7,5	13
02002-608X026	P	19	M8	21	26	6	24	8,5	15
02002-610X030	P	24	M10	23	30	6	24	9	20

02003

Self-aligning pads

with O-ring and exchangeable inserts



Material:
Body carbon steel.
Ball rust and acid resistant steel.
Inserts:
Form C, F, M tool steel
Form K POM
Form E stainless steel.
Form O stainless steel diamond impregnated.
Form P stainless steel with polyurethane surface.

Version:
Body tempered, black oxidised.
Ball hardened, bright.
Inserts:
Form C, F hardened, black oxidised.
Form M with carbide serrations, black oxidised.
Form K white.
Form E hardened, bright.
Form O diamond impregnated surface comparable to 100 grade abrasive grit.
Form P polyurethane surface, hardness 60 Shore.

Sample order:
nlm 02003-736X036

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces.
In addition, they serve as stops, supports and thrust pads in fixtures and toolmaking.
The ball can be removed from the housing by applying light pressure to the socket head screw.

Ball secured against rotation.

Advantages:
Highly cost-effective as inserts can be exchanged.
The built-in O-ring holds the ball in place and keeps dirt and foreign particles out, ensuring uniform movement.

Drawing reference:
Form C: flattened steel insert, smooth
Form E: flattened stainless steel insert, smooth
Form F: gripper face
Form K: flattened POM insert, smooth
Form M: gripper face, with carbide serrations
Form O: stainless steel insert diamond impregnated
Form P: stainless steel insert with polyurethane surface

Order No.	Form	D1	D2	D3	H	H1	H2	T	Ball-Ø	Load rating max. kN (static load only)	Order No. steel insert
02003-117X022	C	17	M6	10	22	4	10	7	13	28	07113-10108
02003-119X024	C	19	M8	12	24	4	10	8	15	39	07113-12108
02003-124X028	C	24	M10	16	28	4	10	8	20	58	07113-16108
02003-130X030	C	30	M12	20	30	4	10	9	23	95	07113-20108
02003-136X036	C	36	M12	25	36	4	10	11	28	136	07113-25108

Self-aligning pads

with O-ring and exchangeable inserts

Order No.	Form	D1	D2	D3	H	H1	H2	T	Ball-Ø	Load rating max. kN (static load only)	Order No. stainless steel insert
02003-217X022	E	17	M6	10	22	4	10	7	13	28	07113-10102
02003-219X024	E	19	M8	12	24	4	10	8	15	39	07113-12102
02003-224X028	E	24	M10	16	28	4	10	8	20	58	07113-16102
02003-230X030	E	30	M12	20	30	4	10	9	23	95	07113-20102
02003-236X036	E	36	M12	25	36	4	10	11	28	136	07113-25102

Order No.	Form	D1	D2	D3	H	H1	H2	T	Ball-Ø	Load rating max. kN (static load only)	Order No. gripper
02003-317X022	F	17	M6	10	22	4	10	7	13	28	07113-1010
02003-319X024	F	19	M8	12	24	4	10	8	15	39	07113-1210
02003-324X028	F	24	M10	16	28	4	10	8	20	58	07113-1610
02003-330X030	F	30	M12	20	30	4	10	9	23	95	07113-2010
02003-336X036	F	36	M12	25	36	4	10	11	28	136	07113-2510

Order No.	Form	D1	D2	D3	H	H1	H2	T	Ball-Ø	Load rating max. kN (static load only)	Order No. POM insert
02003-717X022	K	17	M6	10	22	4	10	7	13	4	07113-10109
02003-719X024	K	19	M8	12	24	4	10	8	15	7	07113-12109
02003-724X028	K	24	M10	16	28	4	10	8	20	14	07113-16109
02003-730X030	K	30	M12	20	30	4	10	9	23	27	07113-20109
02003-736X036	K	36	M12	25	36	4	10	11	28	47	07113-25109

Order No.	Form	D1	D2	D3	D4	H	H1	H2	T	Ball-Ø	Load rating max. kN (static load only)	Order No. gripper
02003-917X022	M	17	M6	10	7,9	22	4	10	7	13	28	07113-10107
02003-919X024	M	19	M8	12	9,5	24	4	10	8	15	39	07113-12107
02003-924X028	M	24	M10	16	12,7	28	4	10	8	20	58	07113-16107
02003-930X030	M	30	M12	20	15,9	30	4	10	9	23	95	07113-20107
02003-936X036	M	36	M12	25	19	36	4	10	11	28	136	07113-25107

Order No.	Form	D1	D2	D3	H	H1	H2	T	Ball-Ø	Load rating max. kN (static load only)	Order No. stainless steel insert, diamond surface
02003-517X022	O	17	M6	10	22	4	10	7	13	28	07113-10105
02003-519X024	O	19	M8	12	24	4	10	8	15	39	07113-12105
02003-524X028	O	24	M10	16	28	4	10	8	20	58	07113-16105
02003-530X030	O	30	M12	20	30	4	10	9	23	95	07113-20105
02003-536X036	O	36	M12	25	36	4	10	11	28	136	07113-25105

Order No.	Form	D1	D2	D3	D4	H	H1	H2	T	Ball-Ø	Order No. stainless steel insert, polyurethane surface
02003-617X024	P	17	M6	10	10	24	6	12	7	13	07113-10126
02003-619X026	P	19	M8	12	13	26	6	12	8	15	07113-12126
02003-624X030	P	24	M10	16	16	30	6	12	8	20	07113-16126
02003-630X032	P	30	M12	20	21	32	6	12	9	23	07113-20126
02003-636X038	P	36	M12	25	27	38	6	12	11	28	07113-25126

02004

Self-aligning pads

self-righting

Material:
Carbon steel.

Version:
Hardened, black oxidised.

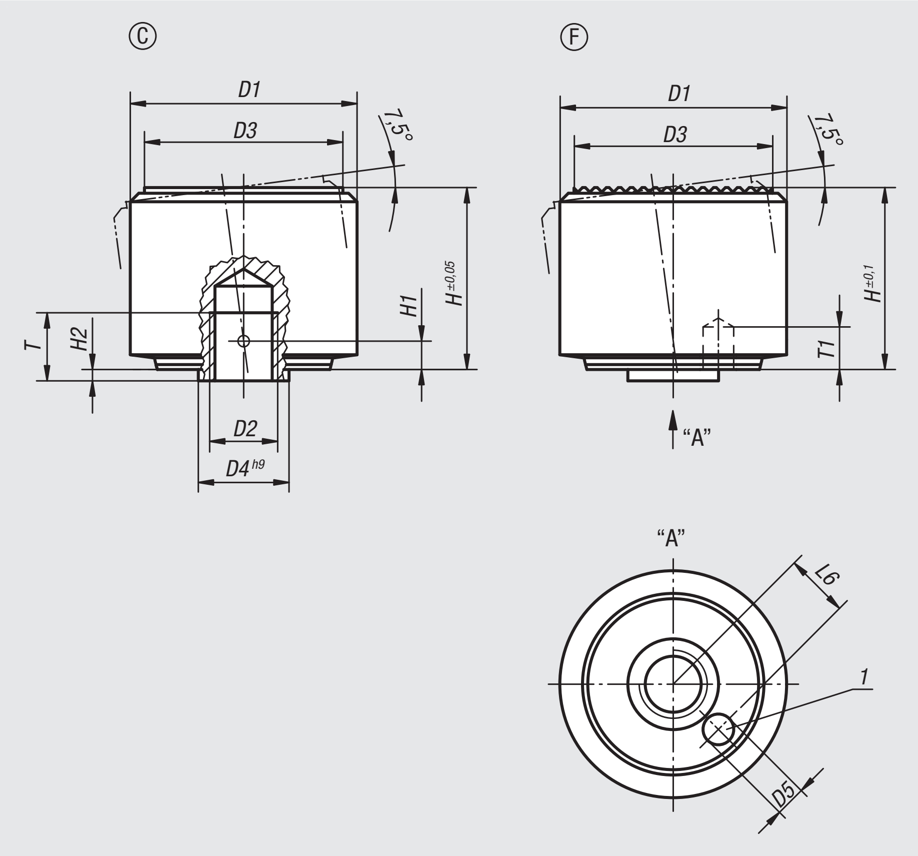
Sample order:
nlm 02004-105

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces.
They also serve as stops, supports and thrust pads in fixtures and toolmaking.

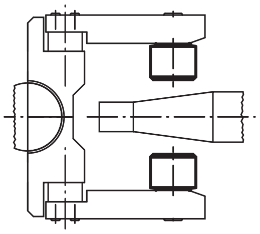
Advantages:
- The built-in O-ring prevents dirt and foreign particles from entering.
- The clamping surface swivels back automatically after clamping.
- High load rating and small size.

Drawing reference:
Form C: smooth face
Form F: serrated face

1) Hole for pin as a rotation lock

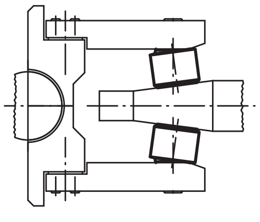


1. bring gripper into position



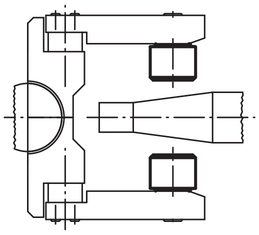
zero-point position of self-aligning pads

2. grip workpiece



self-aligning pads adapt to workpiece contour

3. open gripper



self-aligning pads swivel back automatically

Order No.	Form	D1	D2	D3	D4	D5	H	H1	H2	T	T1	L6	Load rating max. kN (static load only)
02004-105	C	18	M5	15	7	1,8	14	2,1	0,8	5	3	4,6	30
02004-106	C	22	M6	18	8	2,8	16,5	2,5	1	6	4	5,6	50
02004-108	C	28	M8	23	11	3,3	21,5	3,4	1,3	8	5	7,5	90
02004-110	C	34	M10	29	13	4,4	27	4,2	1,6	10	6	9,2	140
02004-112	C	40	M12	35	16	5,4	32	5	2	12	8	11,3	220

Order No.	Form	D1	D2	D3	D4	D5	H	H1	H2	T	T1	L6	Load rating max. kN (static load only)
02004-305	F	18	M5	15	7	1,8	14	2,1	0,8	5	3	4,6	30
02004-306	F	22	M6	18	8	2,8	16,5	2,5	1	6	4	5,6	50
02004-308	F	28	M8	23	11	3,3	21,5	3,4	1,3	8	5	7,5	90
02004-310	F	34	M10	29	13	4,4	27	4,2	1,6	10	6	9,2	140
02004-312	F	40	M12	35	16	5,4	32	5	2	12	8	11,3	220

Self-aligning pads

adjustable

Material:
Steel or stainless steel.

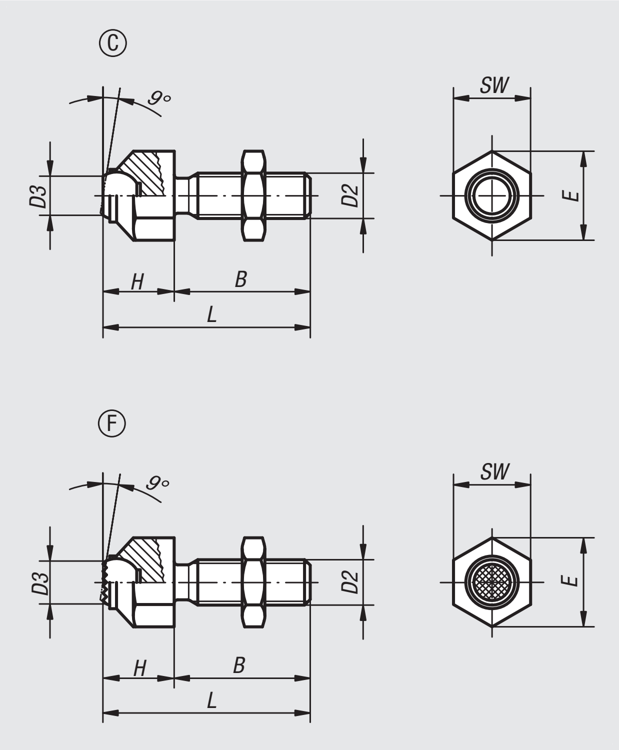
Version:
Steel version:
Housing tempered and manganese phosphated.
Nut black oxidised.

Stainless steel version:
Housing tempered and electropolished.
Nut bright.

Sample order:
nlm 02005-316

Note:
Ball secured against rotation.

Drawing reference:
Form C: flattened ball, smooth
Form M: flattened ball, with serrations



Order No.	Form	Main material	B	D2	D3	H	L	E	SW	Ball-Ø	Load rating max. kN (static load only)
02005-108	C	steel	25	M8	5,8	11,6	36,6	14,5	13	8,5	8
02005-110	C	steel	30	M10	8,6	15,7	45,7	19	17	12	8
02005-112	C	steel	35	M12	8,6	15,7	50,7	19	17	12	15
02005-116	C	steel	40	M16	10,5	20,7	60,7	27	24	16	25
02005-120	C	steel	50	M20	20	27,3	77,3	33	30	25	90
02005-1081	C	stainless steel	25	M8	5,8	11,6	36,6	14,5	13	8,5	8
02005-1101	C	stainless steel	30	M10	8,6	15,7	45,7	19	17	12	8
02005-1121	C	stainless steel	35	M12	8,6	15,7	50,7	19	17	12	15
02005-1161	C	stainless steel	40	M16	10,5	20,7	60,7	27	24	16	25
02005-1201	C	stainless steel	50	M20	20	27,3	77,3	33	30	25	90

Order No.	Form	Main material	B	D2	D3	H	L	E	SW	Ball-Ø	Load rating max. kN (static load only)
02005-308	F	steel	25	M8	5,8	11,6	36,6	14,5	13	8,5	8
02005-310	F	steel	30	M10	8,6	15,7	45,7	19	17	12	8
02005-312	F	steel	35	M12	8,6	15,7	50,7	19	17	12	15
02005-316	F	steel	40	M16	10,5	20,7	60,7	27	24	16	25
02005-320	F	steel	50	M20	20	27,3	77,3	33	30	25	90
02005-3081	F	stainless steel	25	M8	5,8	11,6	36,6	14,5	13	8,5	8
02005-3101	F	stainless steel	30	M10	8,6	15,7	45,7	19	17	12	8
02005-3121	F	stainless steel	35	M12	8,6	15,7	50,7	19	17	12	15
02005-3161	F	stainless steel	40	M16	10,5	20,7	60,7	27	24	16	25
02005-3201	F	stainless steel	50	M20	20	27,3	77,3	33	30	25	90

02006

Self-aligning pads

adjustable with O-ring

Material:
Body carbon steel.
Ball:
Form C, F, tool steel.
Form K POM.
Form O stainless steel diamond impregnated.
Form P stainless steel with polyurethane surface.

Version:
Body tempered, black oxidised.
Ball:
Form C, F hardened, black oxidised.
Form K POM ball, white.
Form O surface comparable to 100 grade abrasive grit.
Form P polyurethane, hardness 60 Shore.

Sample order:
nlm 02006-106X040

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces. They also serve as stops, supports and thrust pads in fixtures and toolmaking.

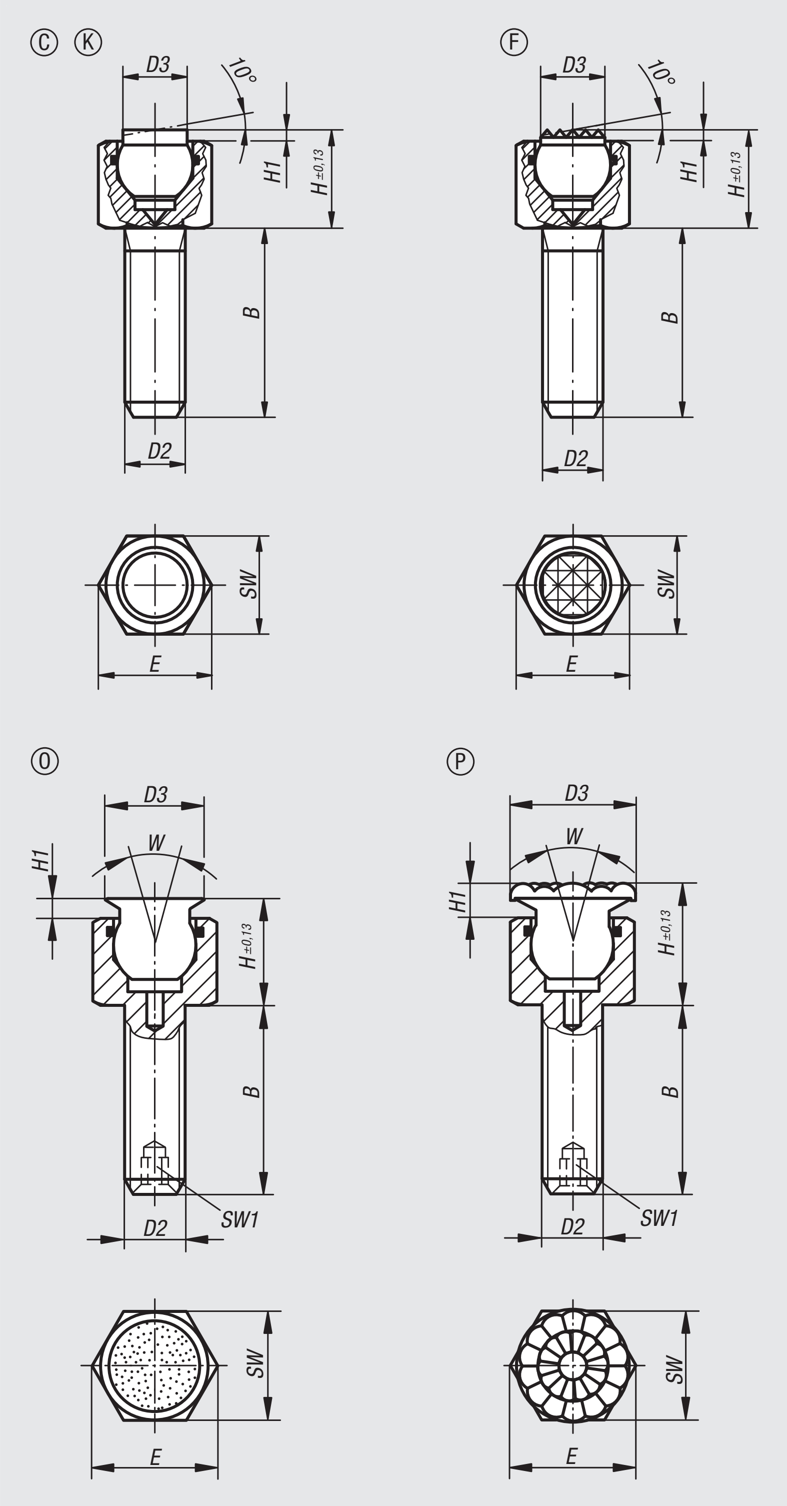
Ball secured against rotation.

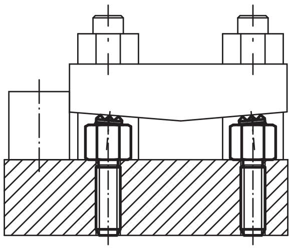
Form O: The abrasive diamond surface is bonded firmly to the ball. It is ideally suited to supporting smooth or slippery applications with a minimum of clamping pressure. This allows the diamond particles to get a firm grip on a very small area with minimum damage to the surface.
The diamond surface offers excellent wear resistance.

Form P: The polyurethane surface is vulcanised firmly to the ball. It is abrasion-resistant and does not discolour.
It offers optimum protection against damage to delicate surfaces. The pearl-like surface gives a firm grip and allows air to escape so as to prevent any suction effect between the contact surface and the self-aligning pads.

Advantages:
The built-in O-ring holds the ball in place and keeps dirt and foreign particles out, ensuring uniform movement.

Drawing reference:
Form C: flattened steel ball, smooth
Form F: flattened steel ball, with serrations
Form K: POM ball, flattened, smooth
Form O: stainless steel ball diamond impregnated
Form P: stainless steel ball with polyurethane surface





Self-aligning pads

adjustable with O-ring

Order No.	Form	B	D2	D3	H	H1	E	SW	Ball-Ø	Load rating max. kN (static load only)
02006-106X012	C	12	M6	6	9,5	1,5	11,5	10	7	9
02006-106X025	C	25	M6	6	9,5	1,5	11,5	10	7	9
02006-106X040	C	40	M6	6	9,5	1,5	11,5	10	7	9
02006-108X012	C	12	M8	8,5	13	1,5	15	13	10	15
02006-108X025	C	25	M8	8,5	13	1,5	15	13	10	15
02006-108X040	C	40	M8	8,5	13	1,5	15	13	10	15

Order No.	Form	B	D2	D3	H	H1	E	SW	Ball-Ø	Load rating max. kN (static load only)
02006-306X012	F	12	M6	6	9,5	1,5	11,5	10	7	9
02006-306X025	F	25	M6	6	9,5	1,5	11,5	10	7	9
02006-306X040	F	40	M6	6	9,5	1,5	11,5	10	7	9
02006-308X012	F	12	M8	8,5	13	1,5	15	13	10	15
02006-308X025	F	25	M8	8,5	13	1,5	15	13	10	15
02006-308X040	F	40	M8	8,5	13	1,5	15	13	10	15

Order No.	Form	B	D2	D3	H	H1	E	SW	Ball-Ø	Load rating max. kN (static load only)
02006-706X012	K	12	M6	6	9,5	1,5	11,5	10	7	2
02006-706X025	K	25	M6	6	9,5	1,5	11,5	10	7	2
02006-706X040	K	40	M6	6	9,5	1,5	11,5	10	7	2
02006-708X012	K	12	M8	8,5	13	1,5	15	13	10	4
02006-708X025	K	25	M8	8,5	13	1,5	15	13	10	4
02006-708X040	K	40	M8	8,5	13	1,5	15	13	10	4

Order No.	Form	B	D2	D3	H	H1	E	SW	SW1	W	Ball-Ø	Load rating max. kN (static load only)
02006-506X	O	12	M6	8	10	2	11,5	10	-	28	7	9,2
02006-508X	O	12	M8	11	14,5	3	15	13	-	28	10	15,5
02006-510X	O	15	M10	14	16	3	19,6	17	3	28	13	18,8
02006-512X	O	20	M12	19	19	4	21,9	19	5	24	15	29,8
02006-516X	O	25	M16	21	23	4	27,7	24	6	24	20	50,3

Order No.	Form	B	D2	D3	H	H1	E	SW	SW1	W	Ball-Ø
02006-606X	P	12	M6	10	12	4	11,5	10	-	28	7
02006-608X	P	12	M8	13	16,5	5	15	13	-	28	10
02006-610X	P	15	M10	16	18	5	19,6	17	3	28	13
02006-612X	P	20	M12	21	21	6	21,9	19	5	24	15
02006-616X	P	25	M16	23	25	6	27,7	24	6	24	20

Self-aligning pads

adjustable with O-ring and exchangeable inserts

Material:
Body carbon steel.
Ball rust and acid resistant steel.
Inserts:
Form C, F, M tool steel
Form K POM
Form E stainless steel.
Form O stainless steel diamond impregnated.
Form P stainless steel with polyurethane surface.

Version:
Body tempered, black oxidised.
Ball hardened, bright.
Inserts:
Form C, F hardened, black oxidised.
Form M with carbide serrations, black oxidised.
Form K white.
Form E hardened, bright.
Form O diamond impregnated surface comparable to 100 grade abrasive grit.
Form P polyurethane surface, hardness 60 Shore.

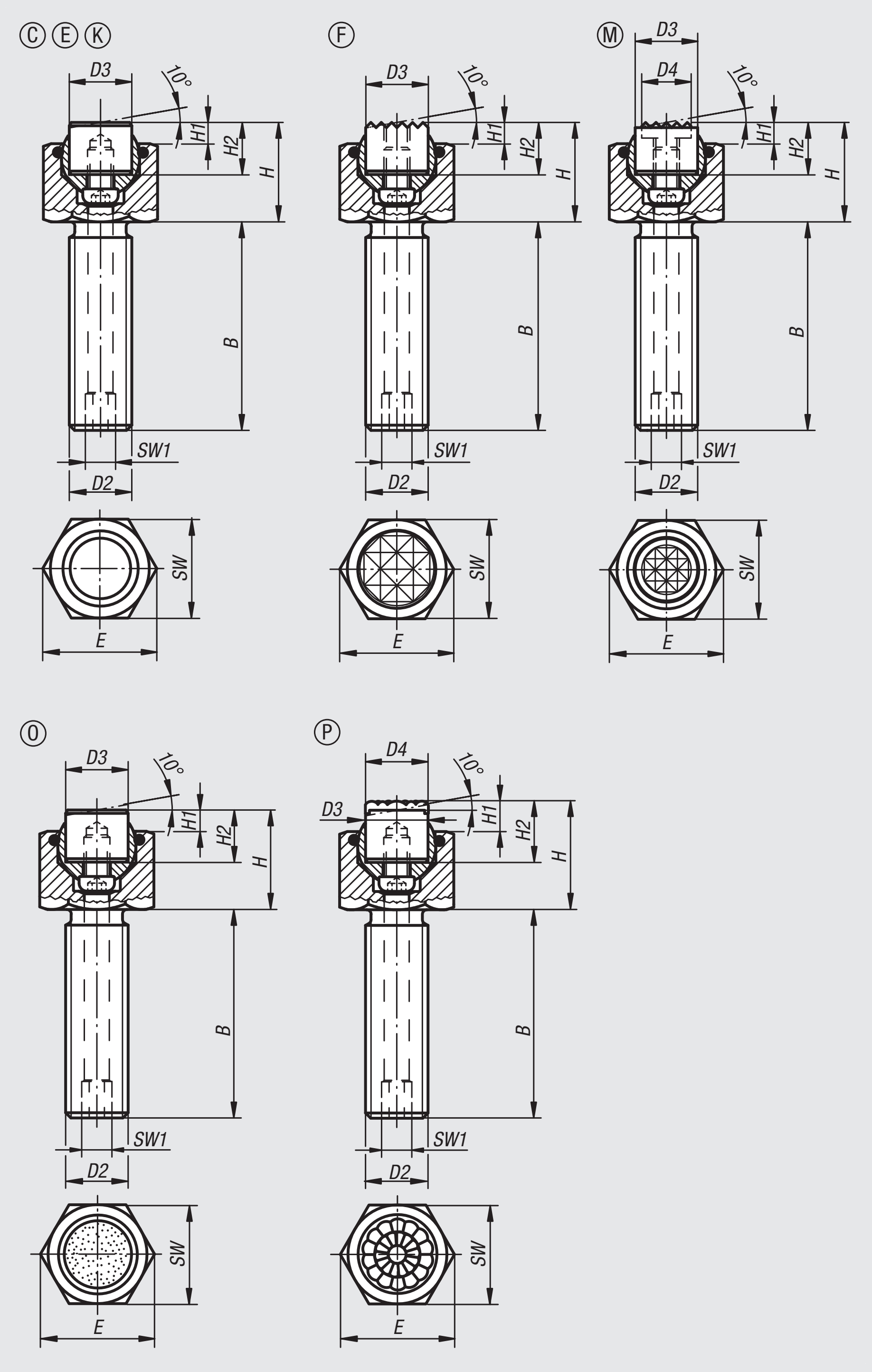
Sample order:
nlm 02007-124X100

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces.
They also serve as stops, supports and thrust pads in fixtures and toolmaking.
The ball can be removed from the housing by applying light pressure to the socket head screw.

Ball secured against rotation.

Advantages:
Highly cost-effective as inserts can be exchanged.
The built-in O-ring holds the ball in place and keeps dirt and foreign particles out, ensuring uniform movement.

Drawing reference:
Form C: flattened steel insert, smooth
Form E: flattened stainless steel insert, smooth
Form F: gripper face
Form K: flattened POM insert, smooth
Form M: gripper, with carbide serrations
Form O: stainless steel insert diamond impregnated
Form P: stainless steel insert with polyurethane surface



02007

Self-aligning pads

adjustable with O-ring and exchangeable inserts

Order No.	Form	B	D2	D3	H	H1	H2	E	SW	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. steel insert
02007-110X015	C	15	M10	10	17	4	10	19,6	17	3	13	19	07113-10108
02007-110X030	C	30	M10	10	17	4	10	19,6	17	3	13	19	07113-10108
02007-110X050	C	50	M10	10	17	4	10	19,6	17	3	13	19	07113-10108
02007-112X020	C	20	M12	12	19	4	10	21,9	19	5	15	30	07113-12108
02007-112X040	C	40	M12	12	19	4	10	21,9	19	5	15	30	07113-12108
02007-112X060	C	60	M12	12	19	4	10	21,9	19	5	15	30	07113-12108
02007-116X025	C	25	M16	16	23	4	10	27,7	24	6	20	50	07113-16108
02007-116X050	C	50	M16	16	23	4	10	27,7	24	6	20	50	07113-16108
02007-116X080	C	80	M16	16	23	4	10	27,7	24	6	20	50	07113-16108
02007-120X030	C	30	M20	20	24	4	10	34,6	30	8	23	85	07113-20108
02007-120X060	C	60	M20	20	24	4	10	34,6	30	8	23	85	07113-20108
02007-120X100	C	100	M20	20	24	4	10	34,6	30	8	23	85	07113-20108
02007-124X040	C	40	M24	25	30	4	10	41,6	36	10	28	121	07113-25108
02007-124X100	C	100	M24	25	30	4	10	41,6	36	10	28	121	07113-25108

Order No.	Form	B	D2	D3	H	H1	H2	E	SW	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. stainless steel insert
02007-210X015	E	15	M10	10	17	4	10	19,6	17	3	13	19	07113-10102
02007-210X030	E	30	M10	10	17	4	10	19,6	17	3	13	19	07113-10102
02007-210X050	E	50	M10	10	17	4	10	19,6	17	3	13	19	07113-10102
02007-212X020	E	20	M12	12	19	4	10	21,9	19	5	15	30	07113-12102
02007-212X040	E	40	M12	12	19	4	10	21,9	19	5	15	30	07113-12102
02007-212X060	E	60	M12	12	19	4	10	21,9	19	5	15	30	07113-12102
02007-216X025	E	25	M16	16	23	4	10	27,7	24	6	20	50	07113-16102
02007-216X050	E	50	M16	16	23	4	10	27,7	24	6	20	50	07113-16102
02007-216X080	E	80	M16	16	23	4	10	27,7	24	6	20	50	07113-16102
02007-220X030	E	30	M20	20	24	4	10	34,6	30	8	23	85	07113-20102
02007-220X060	E	60	M20	20	24	4	10	34,6	30	8	23	85	07113-20102
02007-220X100	E	100	M20	20	24	4	10	34,6	30	8	23	85	07113-20102
02007-224X040	E	40	M24	25	30	4	10	41,6	36	10	28	121	07113-25102
02007-224X100	E	100	M24	25	30	4	10	41,6	36	10	28	121	07113-25102

Order No.	Form	B	D2	D3	H	H1	H2	E	SW	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. gripper
02007-310X015	F	15	M10	10	17	4	10	19,6	17	3	13	19	07113-1010
02007-310X030	F	30	M10	10	17	4	10	19,6	17	3	13	19	07113-1010
02007-310X050	F	50	M10	10	17	4	10	19,6	17	3	13	19	07113-1010
02007-312X020	F	20	M12	12	19	4	10	21,9	19	5	15	30	07113-1210
02007-312X040	F	40	M12	12	19	4	10	21,9	19	5	15	30	07113-1210
02007-312X060	F	60	M12	12	19	4	10	21,9	19	5	15	30	07113-1210
02007-316X025	F	25	M16	16	23	4	10	27,7	24	6	20	50	07113-1610
02007-316X050	F	50	M16	16	23	4	10	27,7	24	6	20	50	07113-1610
02007-316X080	F	80	M16	16	23	4	10	27,7	24	6	20	50	07113-1610
02007-320X030	F	30	M20	20	24	4	10	34,6	30	8	23	85	07113-2010
02007-320X060	F	60	M20	20	24	4	10	34,6	30	8	23	85	07113-2010
02007-320X100	F	100	M20	20	24	4	10	34,6	30	8	23	85	07113-2010
02007-324X040	F	40	M24	25	30	4	10	41,6	36	10	28	121	07113-2510
02007-324X100	F	100	M24	25	30	4	10	41,6	36	10	28	121	07113-2510

Self-aligning pads

adjustable with O-ring and exchangeable inserts

Order No.	Form	B	D2	D3	H	H1	H2	E	SW	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. POM insert
02007-710X015	K	15	M10	10	17	4	10	19,6	17	3	13	4	07113-10109
02007-710X030	K	30	M10	10	17	4	10	19,6	17	3	13	4	07113-10109
02007-710X050	K	50	M10	10	17	4	10	19,6	17	3	13	4	07113-10109
02007-712X020	K	20	M12	12	19	4	10	21,9	19	5	15	7	07113-12109
02007-712X040	K	40	M12	12	19	4	10	21,9	19	5	15	7	07113-12109
02007-712X060	K	60	M12	12	19	4	10	21,9	19	5	15	7	07113-12109
02007-716X025	K	25	M16	16	23	4	10	27,7	24	6	20	14	07113-16109
02007-716X050	K	50	M16	16	23	4	10	27,7	24	6	20	14	07113-16109
02007-716X080	K	80	M16	16	23	4	10	27,7	24	6	20	14	07113-16109
02007-720X030	K	30	M20	20	24	4	10	34,6	30	8	23	27	07113-20109
02007-720X060	K	60	M20	20	24	4	10	34,6	30	8	23	27	07113-20109
02007-720X100	K	100	M20	20	24	4	10	34,6	30	8	23	27	07113-20109
02007-724X040	K	40	M24	25	30	4	10	41,6	36	10	28	47	07113-25109
02007-724X100	K	100	M24	25	30	4	10	41,6	36	10	28	47	07113-25109

Order No.	Form	B	D2	D3	D4	H	H1	H2	E	SW	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. gripper
02007-910X015	M	15	M10	10	7,9	17	4	10	19,6	17	3	13	19	07113-10107
02007-910X030	M	30	M10	10	7,9	17	4	10	19,6	17	3	13	19	07113-10107
02007-910X050	M	50	M10	10	7,9	17	4	10	19,6	17	3	13	19	07113-10107
02007-912X020	M	20	M12	12	9,5	19	4	10	21,9	19	5	15	30	07113-12107
02007-912X040	M	40	M12	12	9,5	19	4	10	21,9	19	5	15	30	07113-12107
02007-912X060	M	60	M12	12	9,5	19	4	10	21,9	19	5	15	30	07113-12107
02007-916X025	M	25	M16	16	12,7	23	4	10	27,7	24	6	20	50	07113-16107
02007-916X050	M	50	M16	16	12,7	23	4	10	27,7	24	6	20	50	07113-16107
02007-916X080	M	80	M16	16	12,7	23	4	10	27,7	24	6	20	50	07113-16107
02007-920X030	M	30	M20	20	15,9	24	4	10	34,6	30	8	23	85	07113-20107
02007-920X060	M	60	M20	20	15,9	24	4	10	34,6	30	8	23	85	07113-20107
02007-920X100	M	100	M20	20	15,9	24	4	10	34,6	30	8	23	85	07113-20107
02007-924X040	M	40	M24	25	19	30	4	10	41,6	36	10	28	121	07113-25107
02007-924X100	M	100	M24	25	19	30	4	10	41,6	36	10	28	121	07113-25107

02007

Self-aligning pads

adjustable with O-ring and exchangeable inserts

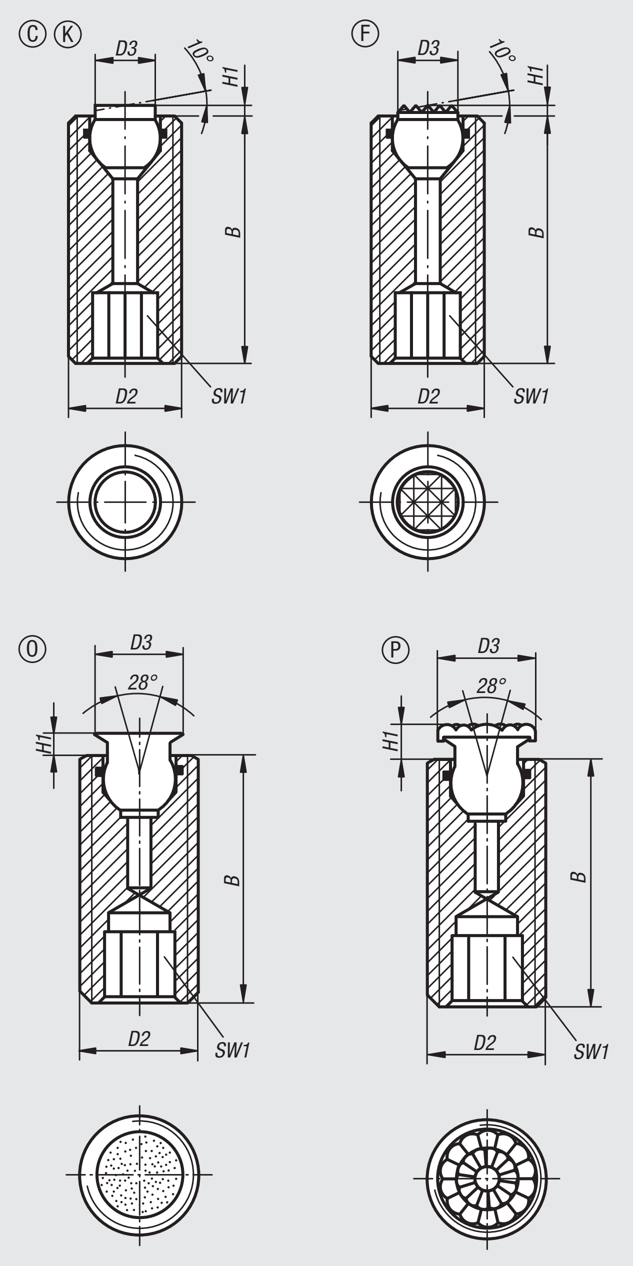
Order No.	Form	B	D2	D3	H	H1	H2	E	SW	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. stainless steel insert, diamond surface
02007-510X015	0	15	M10	10	17	4	10	19,6	17	3	13	19	07113-10105
02007-510X030	0	30	M10	10	17	4	10	19,6	17	3	13	19	07113-10105
02007-510X050	0	50	M10	10	17	4	10	19,6	17	3	13	19	07113-10105
02007-512X020	0	20	M12	12	19	4	10	21,9	19	5	15	30	07113-12105
02007-512X040	0	40	M12	12	19	4	10	21,9	19	5	15	30	07113-12105
02007-512X060	0	60	M12	12	19	4	10	21,9	19	5	15	30	07113-12105
02007-516X025	0	25	M16	16	23	4	10	27,7	24	6	20	50	07113-16105
02007-516X050	0	50	M16	16	23	4	10	27,7	24	6	20	50	07113-16105
02007-516X080	0	80	M16	16	23	4	10	27,7	24	6	20	50	07113-16105
02007-520X030	0	30	M20	20	24	4	10	34,6	30	8	23	85	07113-20105
02007-520X060	0	60	M20	20	24	4	10	34,6	30	8	23	85	07113-20105
02007-520X100	0	100	M20	20	24	4	10	34,6	30	8	23	85	07113-20105
02007-524X040	0	40	M24	25	30	4	10	41,6	36	10	28	121	07113-25105
02007-524X100	0	100	M24	25	30	4	10	41,6	36	10	28	121	07113-25105

Order No.	Form	B	D2	D3	D4	H	H1	H2	E	SW	SW1	Ball-Ø	Order No. stainless steel insert, polyurethane surface
02007-620X030	P	30	M20	20	21	26	6	12	34,6	30	8	23	07113-20126
02007-612X020	P	20	M12	12	13	21	6	12	21,9	19	5	15	07113-12126
02007-610X015	P	15	M10	10	10	19	6	12	19,6	17	3	13	07113-10126
02007-624X100	P	100	M24	25	27	32	6	12	41,6	36	10	28	07113-25126
02007-616X025	P	25	M16	16	16	25	6	12	27,7	24	6	20	07113-16126
02007-616X050	P	50	M16	16	16	25	6	12	27,7	24	6	20	07113-16126
02007-612X060	P	60	M12	12	13	21	6	12	21,9	19	5	15	07113-12126
02007-610X030	P	30	M10	10	10	19	6	12	19,6	17	3	13	07113-10126
02007-620X100	P	100	M20	20	21	26	6	12	34,6	30	8	23	07113-20126
02007-624X040	P	40	M24	25	27	32	6	12	41,6	36	10	28	07113-25126
02007-610X050	P	50	M10	10	10	19	6	12	19,6	17	3	13	07113-10126
02007-616X080	P	80	M16	16	16	25	6	12	27,7	24	6	20	07113-16126
02007-620X060	P	60	M20	20	21	26	6	12	34,6	30	8	23	07113-20126
02007-612X040	P	40	M12	12	13	21	6	12	21,9	19	5	15	07113-12126

02008

Self-aligning pads

adjustable with O-ring and hexagon socket



Material:
Body carbon steel.
Ball:
Form C, F, tool steel.
Form K POM.
Form O stainless steel diamond impregnated.
Form P stainless steel with polyurethane surface.

Version:
Body tempered, black oxidised.
Ball:
Form C, F hardened, black oxidised.
Form K POM ball, white.
Form O surface comparable to 100 grade abrasive grit.
Form P polyurethane, hardness 60 Shore.

Sample order:
nlm 02008-112X050
(Include length B.)

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces.
They also serve as stops, supports and thrust pads in fixtures and toolmaking.

Ball secured against rotation.

Form O: The abrasive diamond surface is bonded firmly to the ball. It is ideally suited to supporting smooth or slippery applications with a minimum of clamping pressure. This allows the diamond particles to get a firm grip on a very small area with minimum damage to the surface.
The diamond surface offers excellent wear resistance.

Form P: The polyurethane surface is vulcanised firmly to the ball. It is abrasion-resistant and does not discolour. Offers optimum protection against damage to delicate surfaces. The pearl-like surface gives a firm grip and allows air to escape so as to prevent any suction effect between the contact surface and the toggle locator.

Advantages:
The built-in O-ring holds the ball in place and keeps dirt and foreign particles out, ensuring uniform movement.
The hexagon socket allows easy adjustment and positioning in through holes.

Drawing reference:
Form C: flattened steel ball, smooth
Form F: flattened steel ball, with serrations
Form K: POM ball, flattened, smooth
Form O: stainless steel ball diamond impregnated
Form P: stainless steel ball with polyurethane surface

Order No.	Form	B	D2	D3	H1	SW1	Ball-Ø	Load rating max. kN (static load only)
02008-112X025	C	25	M12	6	1,5	6	7	15
02008-112X035	C	35	M12	6	1,5	6	7	15
02008-112X050	C	50	M12	6	1,5	6	7	15
02008-116X025	C	25	M16	8,5	1,5	8	10	23
02008-116X035	C	35	M16	8,5	1,5	8	10	23
02008-116X050	C	50	M16	8,5	1,5	8	10	23

Order No.	Form	B	D2	D3	H1	SW1	Ball-Ø	Load rating max. kN (static load only)
02008-312X025	F	25	M12	6	1,5	6	7	15
02008-312X035	F	35	M12	6	1,5	6	7	15
02008-312X050	F	50	M12	6	1,5	6	7	15
02008-316X025	F	25	M16	8,5	1,5	8	10	23
02008-316X035	F	35	M16	8,5	1,5	8	10	23
02008-316X050	F	50	M16	8,5	1,5	8	10	23

Order No.	Form	B	D2	D3	H1	SW1	Ball-Ø	Load rating max. kN (static load only)
02008-712X025	K	25	M12	6	1,5	6	7	2
02008-712X035	K	35	M12	6	1,5	6	7	2
02008-712X050	K	50	M12	6	1,5	6	7	2
02008-716X025	K	25	M16	8,5	1,5	8	10	4
02008-716X035	K	35	M16	8,5	1,5	8	10	4
02008-716X050	K	50	M16	8,5	1,5	8	10	4

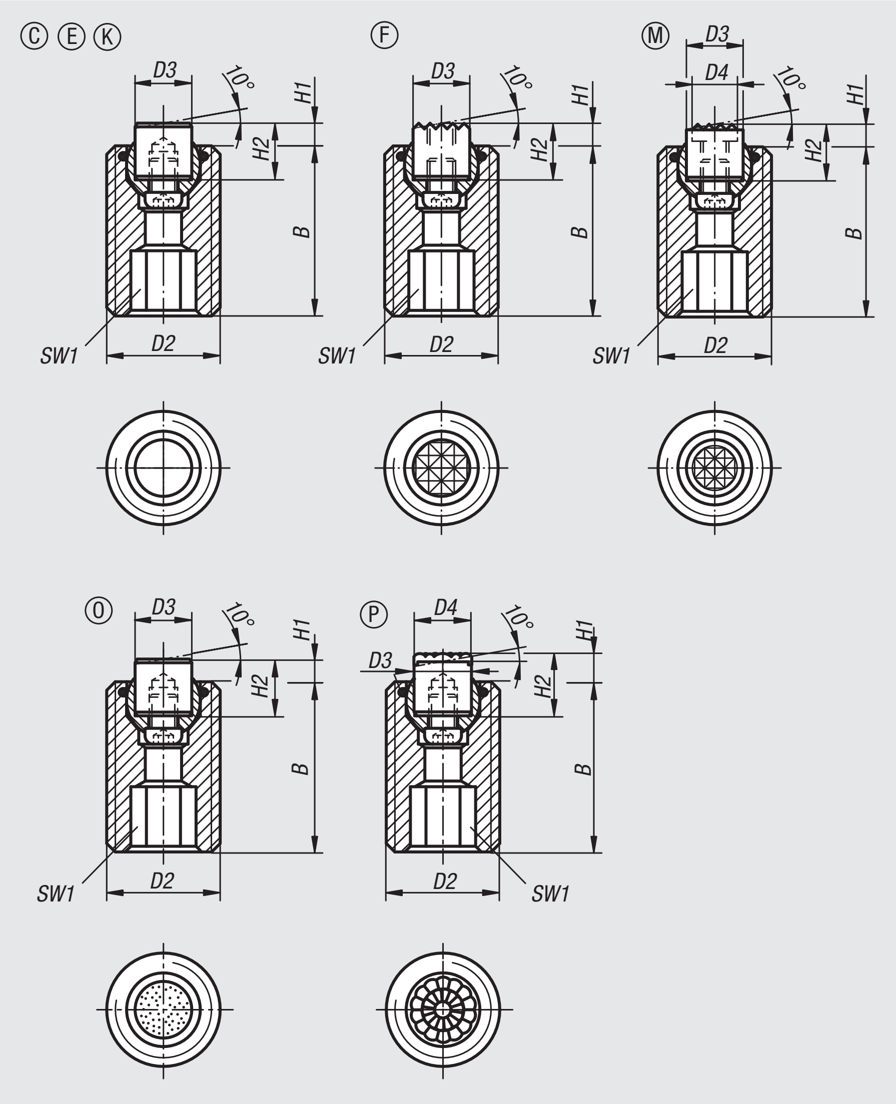
Order No.	Form	B	D2	D3	H1	SW1	Ball-Ø	Load rating max. kN (static load only)
02008-510X	O	25	M10	6	1,5	5	5	-
02008-512X	O	25	M12	8	2	6	7	15,4
02008-516X	O	25	M16	11	3	8	10	23,3
02008-520X	O	30	M20	14	3	10	13	37,7

Order No.	Form	B	D2	D3	H1	SW1	Ball-Ø
02008-610X	P	25	M10	8	3,5	5	5
02008-612X	P	25	M12	10	4	6	7
02008-616X	P	25	M16	13	5	8	10
02008-620X	P	30	M20	16	5	10	13

02009

Self-aligning pads

adjustable with O-ring, exchangeable inserts and hexagon socket



Material:
Body carbon steel.
Ball rust and acid resistant steel.
Inserts:
Form C, F, M tool steel
Form K POM
Form E stainless steel.
Form O stainless steel diamond impregnated.
Form P stainless steel with polyurethane surface.

Version:
Body tempered, black oxidised.
Ball hardened, bright.
Inserts:
Form C, F hardened, black oxidised.
Form M with carbide serrations, black oxidised.
Form K white.
Form E hardened, bright.
Form O diamond impregnated surface comparable to 100 grade abrasive grit.
Form P polyurethane surface, hardness 60 Shore.

Sample order:
nlm 02009-720X070

Note:
Self-aligning pads are used to support and clamp unmachined and machined workpieces.
They also serve as stops, supports and thrust pads in fixtures and toolmaking.
The ball can be removed from the housing by applying light pressure to the socket head screw.

Ball secured against rotation.

Advantages:
Highly cost-effective as inserts can be exchanged.
The built-in O-ring holds the ball in place and keeps dirt and foreign particles out, ensuring uniform movement.

Drawing reference:
Form C: flattened steel insert, smooth
Form E: flattened stainless steel insert, smooth
Form F: gripper face
Form K: flattened POM insert, smooth
Form M: gripper, with carbide serrations
Form O: stainless steel insert diamond impregnated
Form P: stainless steel insert with polyurethane surface

Order No.	Form	B	D2	D3	H1	H2	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. steel insert
02009-120X030	C	30	M20	10	4	10	10	13	37	07113-10108
02009-120X050	C	50	M20	10	4	10	10	13	37	07113-10108
02009-120X070	C	70	M20	10	4	10	10	13	37	07113-10108
02009-124X040	C	40	M24	12	4	10	10	15	55	07113-12108
02009-124X080	C	80	M24	12	4	10	10	15	55	07113-12108

Self-aligning pads

adjustable with O-ring, exchangeable inserts and hexagon socket

Order No.	Form	B	D2	D3	H1	H2	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. stainless steel insert
02009-220X030	E	30	M20	10	4	10	10	13	37	07113-10102
02009-220X050	E	50	M20	10	4	10	10	13	37	07113-10102
02009-220X070	E	70	M20	10	4	10	10	13	37	07113-10102
02009-224X040	E	40	M24	12	4	10	10	15	55	07113-12102
02009-224X080	E	80	M24	12	4	10	10	15	55	07113-12102

Order No.	Form	B	D2	D3	H1	H2	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. gripper
02009-320X030	F	30	M20	10	4	10	10	13	37	07113-1010
02009-320X050	F	50	M20	10	4	10	10	13	37	07113-1010
02009-320X070	F	70	M20	10	4	10	10	13	37	07113-1010
02009-324X040	F	40	M24	12	4	10	10	15	55	07113-1210
02009-324X080	F	80	M24	12	4	10	10	15	55	07113-1210

Order No.	Form	B	D2	D3	H1	H2	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. POM insert
02009-720X030	K	30	M20	10	4	10	10	13	4	07113-10109
02009-720X050	K	50	M20	10	4	10	10	13	4	07113-10109
02009-720X070	K	70	M20	10	4	10	10	13	4	07113-10109
02009-724X040	K	40	M24	12	4	10	10	15	7	07113-12109
02009-724X080	K	80	M24	12	4	10	10	15	7	07113-12109

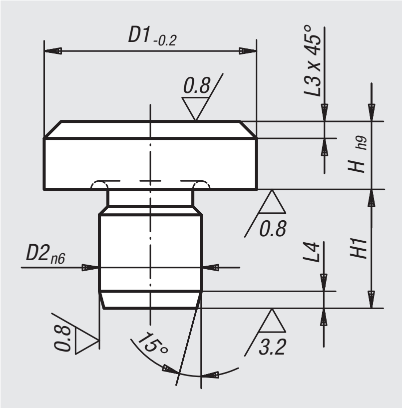
Order No.	Form	B	D2	D3	D4	H1	H2	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. gripper
02009-920X030	M	30	M20	10	7,9	4	10	10	13	37	07113-10107
02009-920X050	M	50	M20	10	7,9	4	10	10	13	37	07113-10107
02009-920X070	M	70	M20	10	7,9	4	10	10	13	37	07113-10107
02009-924X040	M	40	M24	12	9,5	4	10	10	15	55	07113-12107
02009-924X080	M	80	M24	12	9,5	4	10	10	15	55	07113-12107

Order No.	Form	B	D2	D3	H1	H2	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. stainless steel insert, diamond surface
02009-520X030	0	30	M20	10	4	10	10	13	37	07113-10105
02009-520X050	0	50	M20	10	4	10	10	13	37	07113-10105
02009-520X070	0	70	M20	10	4	10	10	13	37	07113-10105
02009-524X040	0	40	M24	12	4	10	10	15	55	07113-12105
02009-524X080	0	80	M24	12	4	10	10	15	55	07113-12105

Order No.	Form	B	D2	D3	D4	H1	H2	SW1	Ball-Ø	Load rating max. kN (static load only)	Order No. stainless steel insert, polyurethane surface
02009-620X030	P	30	M20	10	10	6	12	10	13	37	07113-10126
02009-620X050	P	50	M20	10	10	6	12	10	13	37	07113-10126
02009-620X070	P	70	M20	10	10	6	12	10	13	37	07113-10126
02009-624X040	P	40	M24	12	13	6	12	10	15	55	07113-12126
02009-624X080	P	80	M24	12	13	6	12	10	15	55	07113-12126

02010

Rest pads

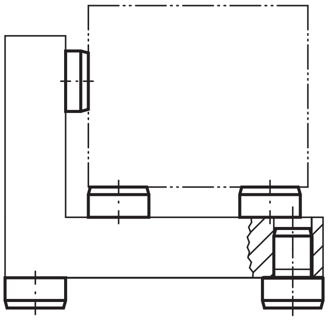


Material:
Tool steel.

Version:
Hardened and ground.
Top face without centerbore.

Sample order:
nlm 02010-041

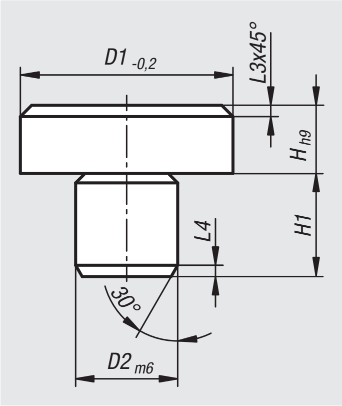
Note:
If more than one rest pad is used, the support height can be reground. Rest pads can also be used as feet for jigs and fixtures.



Order No.	D1	D2	H	H1	L3	L4
02010-041	6	4	2,5	6,5	0,7	1,2
02010-042	6	4	4,5	8,5	0,7	1,2
02010-04	6	4	5	6	0,7	1,2
02010-061	10	6	4,5	8,5	0,9	1,5
02010-06	10	6	8	8,5	0,9	1,5
02010-08	16	8	5	10	2	2
02010-081	16	8	13	10	2	2
02010-10	20	10	6	12	2	2
02010-101	20	10	12	12	2	2
02010-12	25	12	8	14	2	2
02010-122	25	12	20	14	2	2
02010-123	25	12	30	14	2	2
02010-16	30	16	25	20	2,5	2,5
02010-164	30	16	40	20	2,5	2,5
02010-165	30	16	50	20	2,5	2,5
02010-166	30	16	65	20	2,5	2,5
02010-20	30	20	80	20	2,5	2,5
02010-201	30	20	100	20	2,5	2,5
02010-202	40	20	13	20	3,2	3,2
02010-203	40	20	32	20	3,2	3,2

02010-01

Rest pads, ceramic



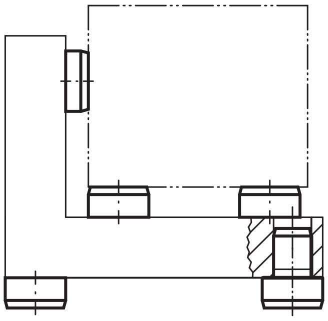
Material:
High-performance ceramic, Cerazur.

Version:
Ground.
Top face without centerbore.

Sample order:
nlm 02010-01-060025

Note:
Rest pads can also be used as feet for jigs and fixtures.

Advantages:
Cerazur is extremely impact and bend resistant. The basis of this material is zirconium oxide. It is a composite metal-ceramic material.



Order No.	D1	D2	H	H1	L3	L4
02010-01-060025	6	4	2,5	6,5	1	1
02010-01-060045	6	4	4,5	8,5	1	1
02010-01-060050	6	4	5	6	1	1
02010-01-100040	10	6	4	8,5	1	1
02010-01-100080	10	6	8	8,5	1	1
02010-01-120060	12	6	6	10	1	1
02010-01-120100	12	6	10	10	1	1
02010-01-160050	16	8	5	10	1	1
02010-01-160130	16	8	13	10	1	1
02010-01-194060	19,4	10	6	12	1	1
02010-01-194120	19,4	10	12	12	1	1
02010-01-250080	25	12	8	14	1	1
02010-01-250200	25	12	20	14	1	1
02010-01-250300	25	12	30	14	1	1
02010-01-300250	30	16	25	20	1	1
02010-01-300400	30	16	40	20	1	1
02010-01-300500	30	16	50	20	1	1
02010-01-300650	30	16	65	20	1	1

Locating pins and rest pads

DIN 6321 (Issue 1973)

Material:
Tool steel.

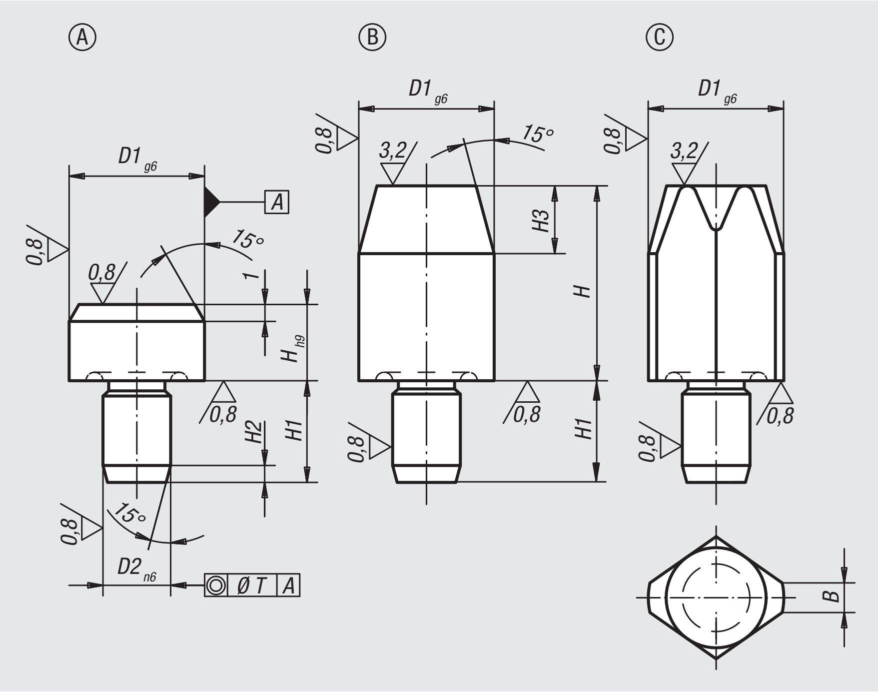
Version:
Hardened and ground.

Sample order:
nlm 02020-212

Note:
Rest pads Form A are supports for workpieces and fixtures.
Locating pins Form B are for positioning workpieces and fixture components in reamed holes.
The flattened Form C can be used to bridge tolerances in hole spacing or to secure the part to be positioned in one direction only.
Form A and B can also be used as hardened stops and as fixture feet.
For similar pins see 03120, 03130, 03140 and 03150.

Drawing reference:
Form A: Rest pad
Form B: Cylindrical locating pin
Form C: Flattened locating pin

For other dimensions see Form A.

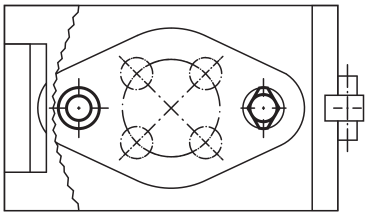


Rest pads, Form A

Order No. without centre bore	D1	D2	H	H1	H2	T
02020-106	6	4	5	6	1,2	0,02
02020-110	10	6	6	9	1,6	0,02
02020-116	16	8	8	12	2	0,04
02020-125	25	12	10	18	2,5	0,04

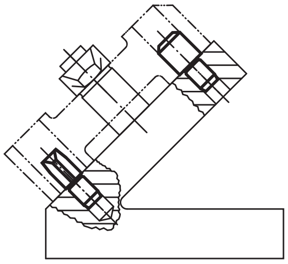
Locating pin cylindrical, Form B

Order No. short	Order No. long	D1	D2	H	H1	H2	H3	T
02020-206	**02020-306**	6	4	7/12	6	1,2	4	0,02
02020-208	**02020-308**	8	6	10/16	9	1,6	6	0,02
02020-210	**02020-310**	10	6	10/18	9	1,6	6	0,02
02020-212	**02020-312**	12	6	10/18	9	1,6	6	0,02
02020-216	**02020-316**	16	8	13/22	12	2	8	0,04
02020-220	**02020-320**	20	12	15/25	18	2	9	0,04
02020-225	**02020-325**	25	12	15/25	18	2,5	9	0,04



Locating pin rhombic, Form C

Order No. short	Order No. long	B	D1	D2	H	H1	H2	H3	T
02020-410	**02020-510**	2,5	10	6	10/18	9	1,6	6	0,02
02020-412	**02020-512**	2,5	12	6	10/18	9	1,6	6	0,02
02020-416	**02020-516**	3,5	16	8	13/22	12	2	8	0,04
02020-420	**02020-520**	5	20	12	15/25	18	2	9	0,04
02020-425	**02020-525**	5	25	12	15/25	18	2,5	9	0,04
02020-406	**02020-506**	1	6	4	7/12	6	1,2	4	0,02
02020-408	**02020-508**	1,6	8	6	10/16	9	1,6	6	0,02

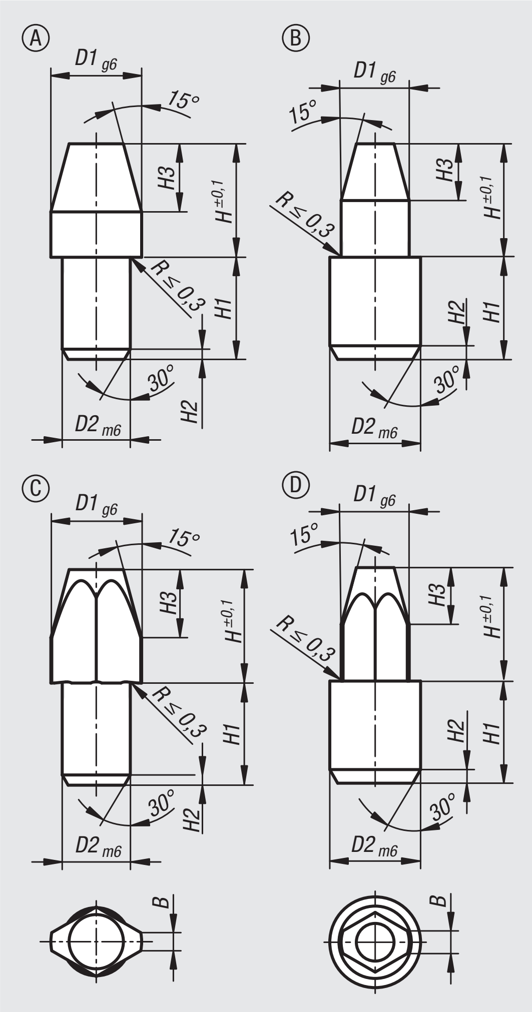


Notes

02020-01

Locating pins ceramic

similar to DIN 6321



Material:
High-performance ceramic, Cerazur.

Version:
Ground

Sample order:
nlm 02020-01-10607

Note:
Form A locating pins are used to position workpieces and fixture parts in reamed holes. The flattened Form C can be used to bridge tolerances in hole spacing or to secure the part to be positioned in one direction only. The Form A locating pins can also be used as limit stops or fixture feet.

Advantages:
Cerazur is extremely impact and bend resistant. The basis of this material is zirconium oxide. It is a composite metal-ceramic material.

Drawing reference:
Form A and B: cylindrical locating pin
Form C and D: flattened locating pin

02020-01

Locating pin ceramic

similar to DIN 6321

Order No.	Form	D1	D2	H	H1	H2	H3
02020-01-10607	A	6	4	7	6	0,6	4
02020-01-10612	A	6	4	12	6	0,6	4
02020-01-10810	A	8	6	10	9	0,9	6
02020-01-10816	A	8	6	16	9	0,9	6
02020-01-11010	A	10	6	10	9	0,9	6
02020-01-11018	A	10	6	18	9	0,9	6
02020-01-11210	A	12	6	10	9	0,9	6
02020-01-11218	A	12	6	18	9	0,9	6
02020-01-11613	A	16	8	13	12	1,2	8
02020-01-11622	A	16	8	22	12	1,2	8

Order No.	Form	D1	D2	H	H1	H2	H3
02020-01-20307	B	3	4	7	6	0,6	3
02020-01-20312	B	3	4	12	6	0,6	3
02020-01-20410	B	4	6	10	9	0,9	4
02020-01-20416	B	4	6	16	9	0,9	4
02020-01-20610	B	6	8	10	9	1,2	5
02020-01-20618	B	6	8	18	9	1,2	5

Order No.	Form	B	D1	D2	H	H1	H2	H3
02020-01-30607	C	1	6	4	7	6	0,6	4
02020-01-30612	C	1	6	4	12	6	0,6	4
02020-01-30810	C	1,6	8	6	10	9	0,9	6
02020-01-30816	C	1,6	8	6	16	9	0,9	6
02020-01-31010	C	2,5	10	6	10	9	0,9	6
02020-01-31018	C	2,5	10	6	18	9	0,9	6
02020-01-31210	C	2,5	12	6	10	9	0,9	6
02020-01-31218	C	2,5	12	6	18	9	0,9	6
02020-01-31613	C	3,5	16	8	13	12	1,2	8
02020-01-31622	C	3,5	16	8	22	12	1,2	8

Order No.	Form	B	D1	D2	H	H1	H2	H3
02020-01-40307	D	1,2	3	4	7	6	0,6	3
02020-01-40312	D	1,2	3	4	12	6	0,6	3
02020-01-40410	D	1,6	4	6	10	9	0,9	4
02020-01-40416	D	1,6	4	6	16	9	0,9	4
02020-01-40610	D	2	6	8	10	9	1,2	5
02020-01-40618	D	2	6	8	18	9	1,2	5

Locating pins

with internal thread

Material:
Steel.

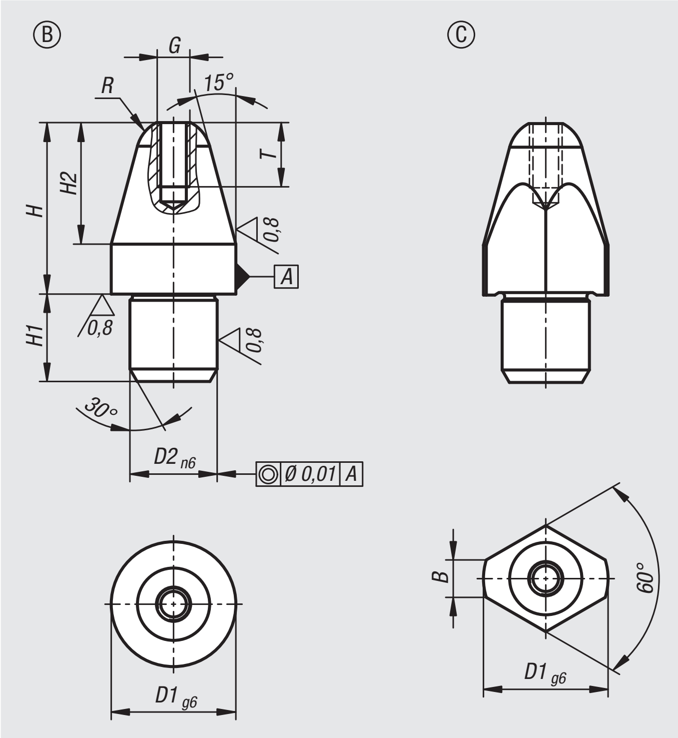
Version:
Hardened and ground (HRC 60 ±2).

Sample order:
nlm 02025-208

Note:
The locating pins are designed to make the joining process easier. Used in combination with hardened locating bushes 02026, they enable exact, low-wear, and fast changes of the workpiece.

Versions D1 = 5 and D1 = 6 do not have an internal thread.

Drawing reference:
Form B: cylindrical pin
Form C: rhomboid pin



Locating pins, short

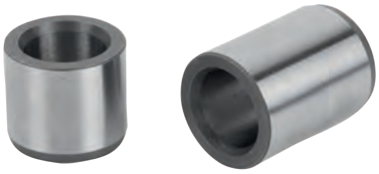
Order No. Form B	Order No. Form C	Version 1	D1	D2	G	H	H1	H2	R	B	T
02025-205	**02025-405**	short	5	3	-	8	3	5	1,50	-/-	-
02025-206	**02025-406**	short	6	4	-	10	4	6	1,80	-/-	-
02025-208	**02025-408**	short	8	6	M2,5	11,4	6	7,4	2,5	-/2,5	5
02025-210	**02025-410**	short	10	7	M2,5	13,7	7	9,7	3	-/3,0	5
02025-212	**02025-412**	short	12	8	M3	16	8	12	3,5	-/3,5	6
02025-216	**02025-416**	short	16	12	M4	20	12	15	5	-/5	8
02025-220	**02025-420**	short	20	14	M5	25,5	14	19,5	6	-/6	10

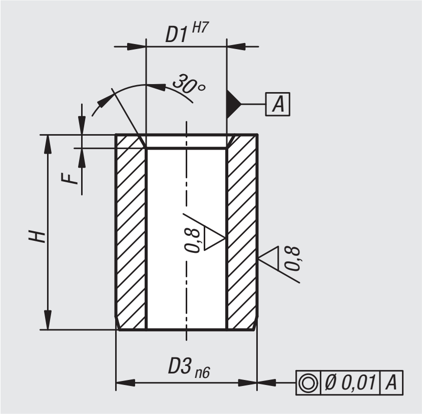
Locating pins, long

Order No. Form B	Order No. Form C	Version 1	D1	D2	G	H	H1	H2	R	B	T
02025-305	**02025-505**	long	5	3	-	10	3	5	1,50	-/-	-
02025-306	**02025-506**	long	6	4	-	12	4	6	1,80	-/-	-
02025-308	**02025-508**	long	8	6	M2,5	17,4	6	7,4	2,5	-/2,5	5
02025-310	**02025-510**	long	10	7	M2,5	21,7	7	9,7	3	-/3,0	5
02025-312	**02025-512**	long	12	8	M3	24	8	12	3,5	-/3,5	6
02025-316	**02025-516**	long	16	12	M4	29	12	15	5	-/5	8
02025-320	**02025-520**	long	20	14	M5	35,5	14	19,5	6	-/6	10

Locating bushes

for locating pins





Material:
Steel.

Version:
Hardened and ground (HRC 60 ±2).

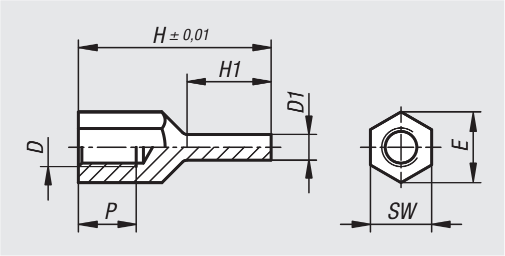
Sample order:
nlm 02026-0812

Order No.	Version 1	D1	D3	F	H
02026-0508	short	5	8	1	8
02026-0610	short	6	10	1	10
02026-0812	short	8	12	1,2	12
02026-1014	short	10	15	1,5	14
02026-1216	short	12	18	1,5	16
02026-1620	short	16	26	1,5	20
02026-2026	short	20	30	2,5	26
02026-0510	long	5	8	1	10
02026-0612	long	6	10	1	12
02026-0818	long	8	12	1,2	18
02026-1022	long	10	15	1,5	22
02026-1224	long	12	18	1,5	24
02026-1630	long	16	26	1,5	30
02026-2036	long	20	30	2,5	36

02027

Rest pads

pin form, internal thread



Material:
Carbon steel.

Version:
Tempered, black oxidised.
Seating face inductively hardened and ground.

Sample order:
nlm 02027-2060420

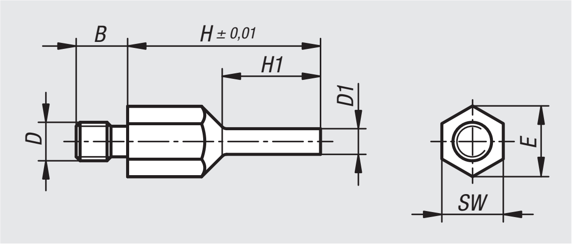
Note:
The rest pads can be used both as a stable and precise support and as a stop.
The pin form of the rest pad also allows it to be used with components with constricted support points.

Order No.	D	D1	E	H	H1	P	SW
02027-2060420	M6	4	11	20	8,5	6	10
02027-2060430	M6	4	11	30	13,5	9	10
02027-2080430	M8	4	14,4	30	13	10	13
02027-2080440	M8	4	14,4	40	18	14	13
02027-2080630	M8	6	14,4	30	13	10	13
02027-2080640	M8	6	14,4	40	18	14	13
02027-2100630	M10	6	19	30	12	10	17
02027-2100650	M10	6	19	50	25	15	17
02027-2100830	M10	8	19	30	12	10	17
02027-2100850	M10	8	19	50	25	15	17
02027-2120640	M12	6	21,2	40	18	12	19
02027-2120660	M12	6	21,2	60	28	18	19
02027-2120840	M12	8	21,2	40	18	12	19
02027-2120860	M12	8	21,2	60	28	18	19

02027

Rest pads

pin form, external thread



Material:
Carbon steel.

Version:
Tempered, black oxidised.
Seating face inductively hardened and ground.

Sample order:
nlm 02027-1060420

Note:
The rest pads can be used both as a stable and precise support and as a stop.
The pin form of the rest pad also allows it to be used with components with constricted support points.

Order No.	B	D	D1	E	H	H1	SW
02027-1060420	8	M6	4	11	20	10	10
02027-1060430	8	M6	4	11	30	15	10
02027-1080430	10	M8	4	14,4	30	15	13
02027-1080440	10	M8	4	14,4	40	20	13
02027-1080630	10	M8	6	14,4	30	15	13
02027-1080640	10	M8	6	14,4	40	20	13
02027-1100630	14	M10	6	19	30	15	17
02027-1100650	14	M10	6	19	50	25	17
02027-1100830	14	M10	8	19	30	15	17
02027-1100850	14	M10	8	19	50	25	17
02027-1120640	14	M12	6	21,2	40	20	19
02027-1120660	14	M12	6	21,2	60	30	19
02027-1120840	14	M12	8	21,2	40	20	19
02027-1120860	14	M12	8	21,2	60	30	19

Rest pads

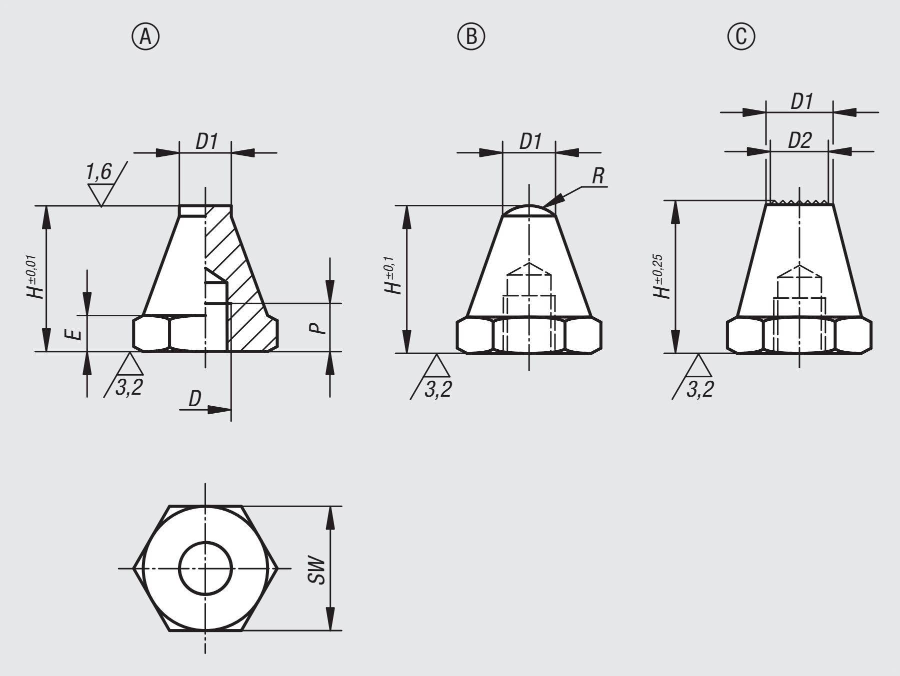
Material:
Body high carbon steel.

Version:
Body tempered and black oxidised.

Sample order:
nlm 02028-106012

Note:
Rest pads are for supporting machined and non-machined parts. They can also be used as stops and thrust pads in fixtures and toolmaking.
Studs or grub screws can be screwed and glued into the tapped hole D to make a rest pad with external thread.

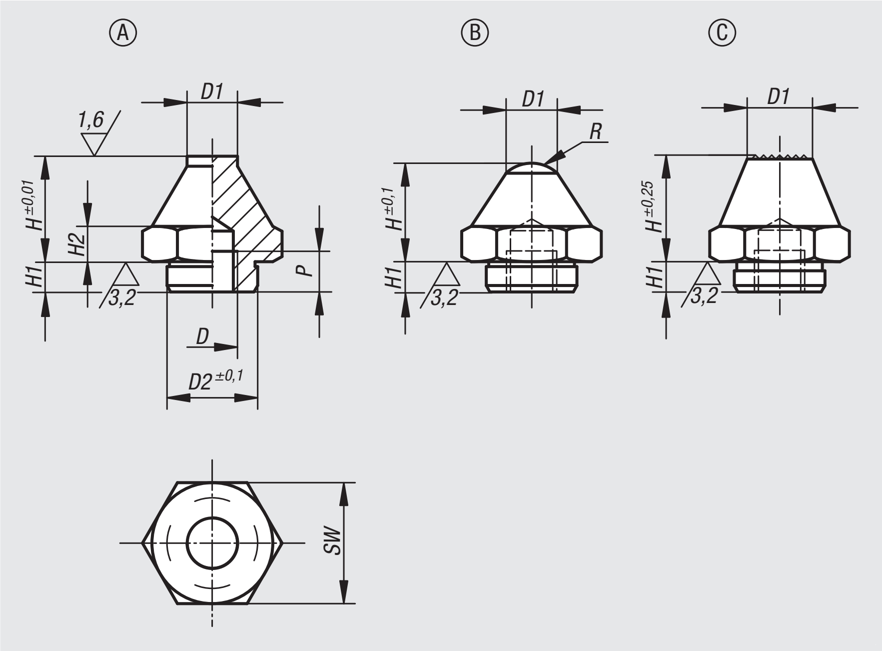
Drawing reference:
Form A: flat face
Form B: ball end
Form C: diamond grip



Order No. Form A	Order No. Form B	Order No. Form C	D	D1	D2	E	H	P	R	SW
02028-106012	**02028-206012**	**02028-306012**	M6	6	-/-/5	3	12,5	4	-/5/-	11
02028-106025	**02028-206025**	**02028-306025**	M6	6	-/-/5	3	25	7	-/5/-	11
02028-108015	**02028-208015**	**02028-308015**	M8	8	-/-/6	4	15	6	-/8,5/-	13
02028-108030	**02028-208030**	**02028-308030**	M8	8	-/-/6	4	30	9	-/8,5/-	13
02028-110020	**02028-210020**	**02028-310020**	M10	10	-/-/8	5	20	9	-/9/-	17
02028-110040	**02028-210040**	**02028-310040**	M10	10	-/-/8	5	40	13	-/9/-	17
02028-112025	**02028-212025**	**02028-312025**	M12	12	-/-/9,5	6	25	11	-/12,75/-	19
02028-112050	**02028-212050**	**02028-312050**	M12	12	-/-/9,5	6	50	16	-/12,75/-	19
02028-116030	**02028-216030**	**02028-316030**	M16	16	-/-/13	8	30	12	-/17/-	24
02028-116060	**02028-216060**	**02028-316060**	M16	16	-/-/13	8	60	20	-/17/-	24

Rest pads

with positioning pin



Material:
Body high carbon steel.

Version:
Body tempered and black oxidised.
Contact faces case-hardened.

Sample order:
nlm 02029-106012

Note:
Rest pads are for supporting machined and unmachined parts. They can also be used as stops and thrust pads in fixtures and toolmaking. Studs or grub screws can be screwed and glued into the tapped hole D to make a support with external thread.

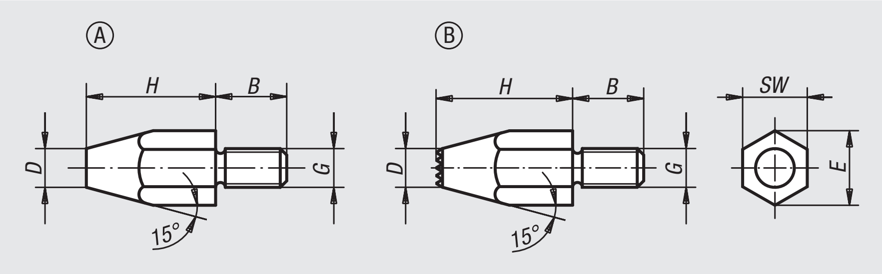
Drawing reference:
Form A: flat face
Form B: ball end
Form C: diamond grip

Order No.	Form	D	D1	D2	H	H1	H2	P	R	SW
02029-106012	A	M6	7	11,9	12,5	4	4	6	-	17
02029-106025	A	M6	7	11,9	25	4	4	6	-	17
02029-110020	A	M10	10	17,8	20	5	7	10	-	24
02029-110040	A	M10	10	17,8	40	6	7	10	-	24
02029-116030	A	M16	20	25,8	30	10	13	16	-	41
02029-116060	A	M16	20	25,8	60	10	13	16	-	41
02029-206012	B	M6	7	11,9	12,5	4	4	6	6	17
02029-206025	B	M6	7	11,9	25	4	4	6	6	17
02029-210020	B	M10	10	17,8	20	5	7	10	7,5	24
02029-210040	B	M10	10	17,8	40	6	7	10	7,5	24
02029-216030	B	M16	20	25,8	30	10	13	16	26	41
02029-216060	B	M16	20	25,8	60	10	13	16	26	41
02029-310020	C	M10	15	17,8	20	5	7	10	-	24
02029-310040	C	M10	10	17,8	40	6	7	10	-	24
02029-316030	C	M16	20	25,8	30	10	13	16	-	41
02029-316060	C	M16	20	25,8	60	10	13	16	-	41

02030

Feet

with threaded pin, DIN 6320 (Edition 1971)



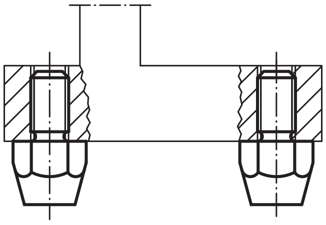
Material:
Carbon steel 1.1172.

Version:
Black oxidised.

Sample order:
nlm 02030-10

Note:
Rest pads 02010 and 02020 can also be used as feet.

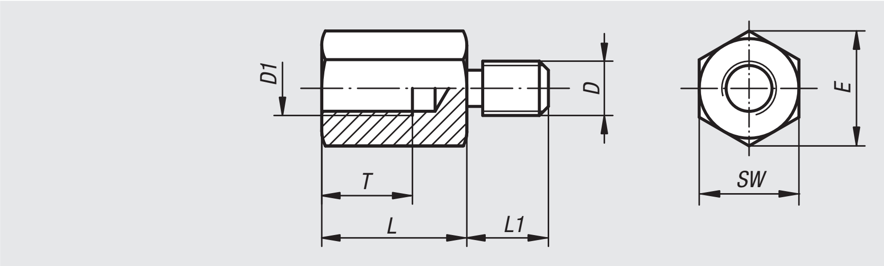
Drawing reference:
Form A: Smooth face
Form B: Carbide tips



Order No.	Form	D	G	H	B	E	SW
02030-06	A	8	M6	10	11	11,5	10
02030-061	A	6	M6	20	11	11,5	10
02030-08	A	10	M8	15	13	15	13
02030-081	A	9	M8	30	13	15	13
02030-10	A	13	M10	20	16	19,6	17
02030-101	A	13	M10	40	16	19,6	17
02030-12	A	15	M12	25	20	21,9	19
02030-121	A	15	M12	50	20	21,9	19
02030-083	B	11,5	M8	15	13	15	13
02030-123	B	15	M12	25	20	21,9	19

02035

Extension pieces



Material:
Carbon steel.

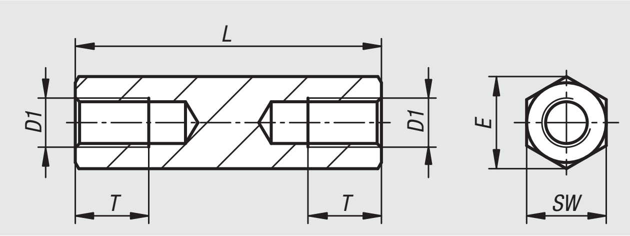
Version:
Black oxidised.

Sample order:
nlm 02035-120750

Note:
Extension pieces are used to extend self-aligning pads, spring plungers, positioning feet, rest pads etc.

Order No.	L	L1	T	D	D1	E	SW
02035-08025	25	13	15	M8	M8	15	13
02035-08032	32	13	15	M8	M8	15	13
02035-08040	40	13	15	M8	M8	15	13
02035-10025	25	15	17	M10	M10	19,6	17
02035-10032	32	15	17	M10	M10	19,6	17
02035-10040	40	15	17	M10	M10	19,6	17
02035-120320	32	18	20	M12	M12	25,4	22
02035-120500	50	18	20	M12	M12	25,4	22
02035-120750	75	18	20	M12	M12	25,4	22
02035-160320	32	25	20	M16	M16	31,2	27
02035-160500	50	25	30	M16	M16	31,2	27
02035-160750	75	25	30	M16	M16	31,2	27

Extension pieces



Material:
Steel 1.0718.

Version:
Trivalent blue passivated.

Sample order:
nlm 02035-10-205025
(include length L e.g. 025 for L = 25 mm.)

Order No.	D1	E	L	SW	T
02035-10-205* **	M5	9,2	25/30/35	8	8
02035-10-206* **	M6	11,5	30/35/40/50/60	10	9
02035-10-208* **	M8	15	30/35/40/50/60/90	13	12
02035-10-210* **	M10	18,5	40/45/55/65/95/115	16	15
02035-10-212* **	M12	20,8	40/45/55/65/95/115	18	18

02037

Support bolts

Material:
Carbon steel, tempered.

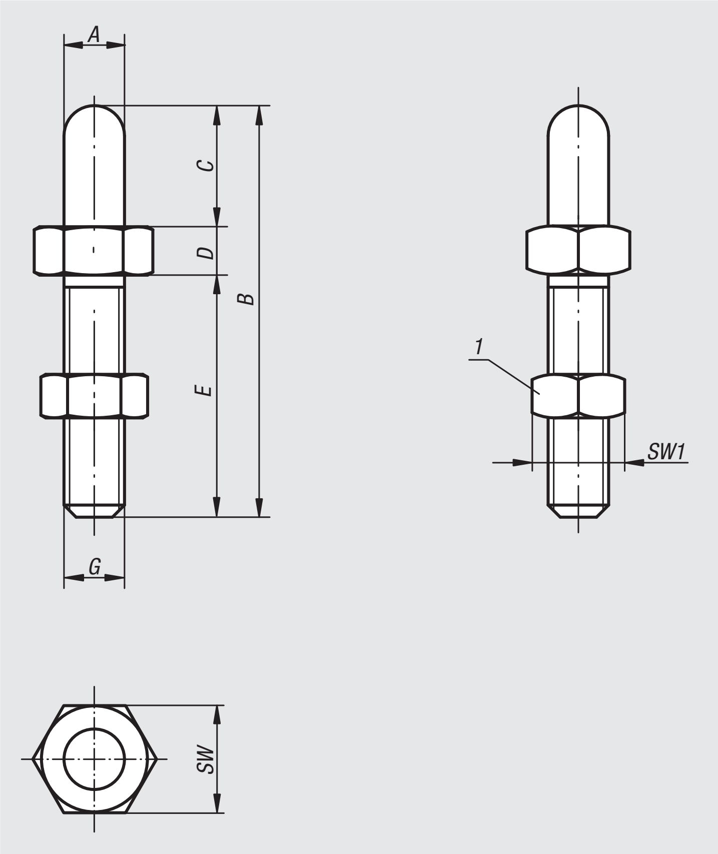
Version:
Black oxidised.

Sample order:
nlm 02037-16016

Note:
The rounded nose also allows support bolts to be used as positioning elements for workpieces with matching holes.

The versions 02037-20020 and 02037-20040 have an octagonal collar.

Drawing reference:
1) locknut

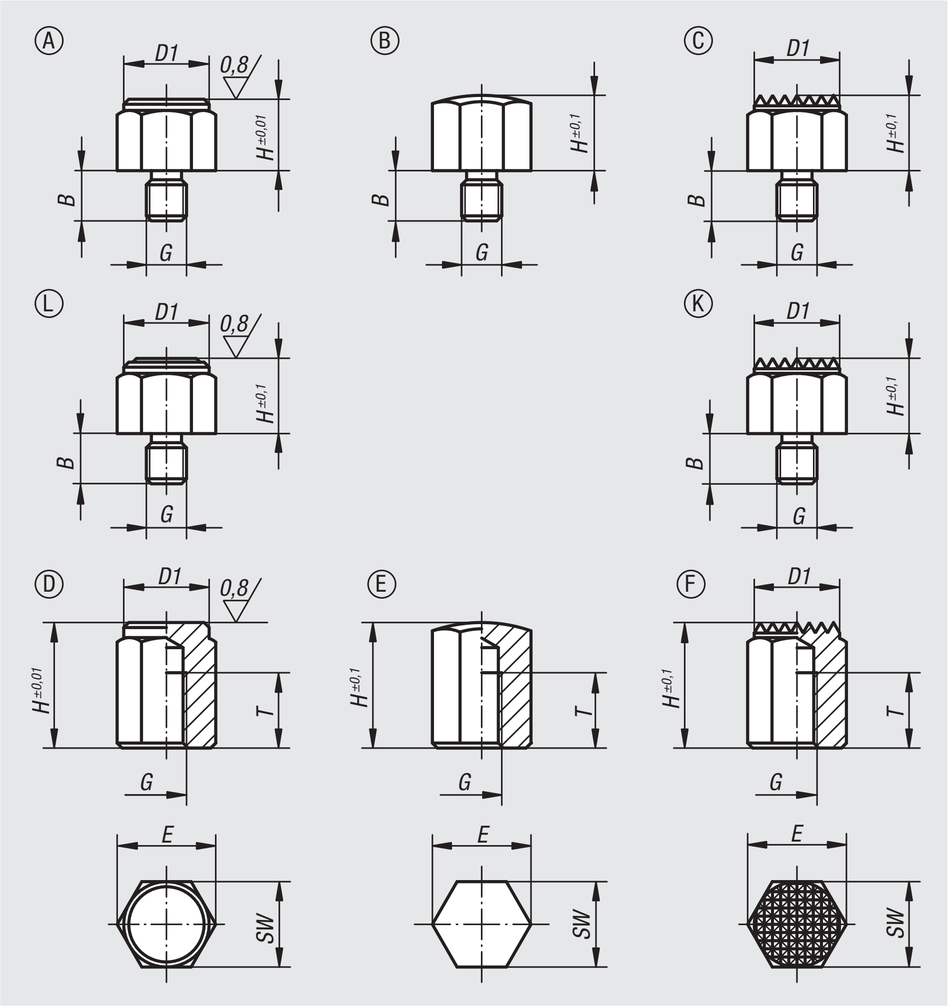


Order No.	A	B	C	D	E	G	SW	SW1
02037-06006	6	37	6	6	25	M6	13	10
02037-06012	6	43	12	6	25	M6	13	10
02037-08008	8	45	8	7	30	M8	13	13
02037-08016	8	53	16	7	30	M8	13	13
02037-10010	10	58	10	8	40	M10	17	17
02037-10020	10	68	20	8	40	M10	17	17
02037-12012	12	72	12	10	50	M12	19	19
02037-12024	12	84	24	10	50	M12	19	19
02037-16016	16	89	16	13	60	M16	24	24
02037-16032	16	105	32	13	60	M16	24	24
02037-20020	20	115	20	15	80	M20	36	30
02037-20040	20	135	40	15	80	M20	36	30

Notes

02040

Positioning feet



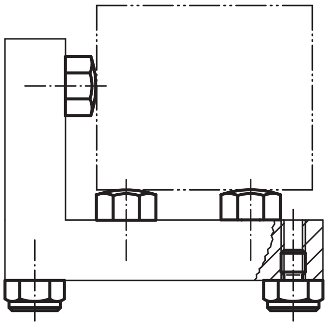
Material:
Steel.

Version:
Case-hardened and black oxidised.

Sample order:
nlm 02040-215

Note:
Positioning feet are used as supports, stops and thrust pads for fixtures and general machine and appliance construction.

Drawing reference:
Form A: External thread and flat face
Form B: External thread and convex face
Form C: External thread and serrated face
Form K: External thread and carbide serrated face
Form L: External thread and POM insert
Form D: External thread and flat face
Form E: External thread and convex face
Form F: External thread and serrated face



Order No.	Form	B	D1	G	H	E	SW	Tightening torque max. Nm
02040-108	A	8	13	M6	8	14,4	13	8,5
02040-1104	A	10	13	M6	10	14,4	13	8,5
02040-1081	A	10	17	M8	8	19,4	17	18
02040-1101	A	10	17	M8	10	19,4	17	18
02040-1103	A	12	19	M10	10	21,1	19	32
02040-1152	A	12	19	M10	15	21,1	19	32
02040-110	A	14	22	M12	10	25,2	22	60
02040-115	A	14	22	M12	15	25,2	22	60
02040-1151	A	19	30	M16	15	33	30	140
02040-1201	A	19	30	M16	20	33	30	140

Positioning feet

Order No.	Form	B	G	H	E	SW	Tightening torque max. Nm
02040-208	B	8	M6	8	14,4	13	8,5
02040-2104	B	10	M6	10	14,4	13	8,5
02040-2081	B	10	M8	8	19,4	17	18
02040-2101	B	10	M8	10	19,4	17	18
02040-2103	B	12	M10	10	21,1	19	32
02040-2152	B	12	M10	15	21,1	19	32
02040-210	B	14	M12	10	25,2	22	60
02040-215	B	14	M12	15	25,2	22	60
02040-2151	B	19	M16	15	33	30	140
02040-2201	B	19	M16	20	33	30	140

Order No.	Form	B	D1	G	H	E	SW	Tightening torque max. Nm
02040-308	C	8	13	M6	8	14,4	13	8,5
02040-3102	C	10	13	M6	10	14,4	13	8,5
02040-3081	C	10	17	M8	8	19,4	17	18
02040-3101	C	10	17	M8	10	19,4	17	18
02040-3103	C	12	19	M10	10	21,1	19	32
02040-3152	C	12	19	M10	15	21,1	19	32
02040-310	C	14	22	M12	10	25,2	22	60
02040-315	C	14	22	M12	15	25,2	22	60
02040-3151	C	19	30	M16	15	33	30	140
02040-3201	C	19	30	M16	20	33	30	140

Order No.	Form	B	D1	G	H	E	SW	Tightening torque max. Nm
02040-7101	K	10	17	M8	10	19,4	17	18
02040-710	K	14	22	M12	10	25,2	22	60
02040-715	K	14	22	M12	15	25,2	22	60
02040-7151	K	19	30	M16	15	33	30	140
02040-7201	K	19	30	M16	20	33	30	140

Order No.	Form	B	D1	G	H	E	SW	Tightening torque max. Nm
02040-8101	L	10	17	M8	10	19,4	17	18
02040-810	L	14	22	M12	10	25,2	22	60
02040-815	L	14	22	M12	15	25,2	22	60
02040-8151	L	19	30	M16	15	33	30	140
02040-8201	L	19	30	M16	20	33	30	140

Positioning feet

Order No.	Form	D1	G	H	T	E	SW
02040-410	D	13	M6	10	6	14,4	13
02040-4151	D	13	M6	15	10	14,4	13
02040-4101	D	17	M8	10	6	19,4	17
02040-415	D	17	M8	15	6	19,4	17
02040-4251	D	17	M8	25	16	19,4	17
02040-4201	D	19	M10	20	10	21,1	19
02040-4302	D	19	M10	30	15	21,1	19
02040-4401	D	19	M10	40	15	21,1	19
02040-420	D	22	M12	20	10	25,2	22
02040-425	D	22	M12	25	15	25,2	22
02040-430	D	22	M12	30	20	25,2	22
02040-440	D	22	M12	40	25	25,2	22
02040-450	D	22	M12	50	25	25,2	22
02040-4301	D	30	M16	30	20	33	30
02040-4501	D	30	M16	50	25	33	30

Order No.	Form	G	H	T	E	SW
02040-510	E	M6	10	6	14,4	13
02040-5151	E	M6	15	10	14,4	13
02040-5101	E	M8	10	6	19,4	17
02040-515	E	M8	15	6	19,4	17
02040-5251	E	M8	25	16	19,4	17
02040-5201	E	M10	20	10	21,1	19
02040-5302	E	M10	30	15	21,1	19
02040-5401	E	M10	40	15	21,1	19
02040-520	E	M12	20	10	25,2	22
02040-525	E	M12	25	15	25,2	22
02040-530	E	M12	30	20	25,2	22
02040-540	E	M12	40	25	25,2	22
02040-550	E	M12	50	25	25,2	22
02040-5301	E	M16	30	20	33	30
02040-5501	E	M16	50	25	33	30

Order No.	Form	D1	G	H	T	E	SW
02040-610	F	13	M6	10	6	14,4	13
02040-6151	F	13	M6	15	10	14,4	13
02040-6101	F	17	M8	10	6	19,4	17
02040-615	F	17	M8	15	6	19,4	17
02040-6251	F	17	M8	25	16	19,4	17
02040-6201	F	19	M10	20	10	21,1	19
02040-6302	F	19	M10	30	15	21,1	19
02040-6401	F	19	M10	40	15	21,1	19
02040-620	F	22	M12	20	10	25,2	22
02040-625	F	22	M12	25	15	25,2	22
02040-630	F	22	M12	30	20	25,2	22
02040-640	F	22	M12	40	25	25,2	22
02040-650	F	22	M12	50	25	25,2	22
02040-6301	F	30	M16	30	20	33	30
02040-6501	F	30	M16	50	25	33	30

Positioning feet

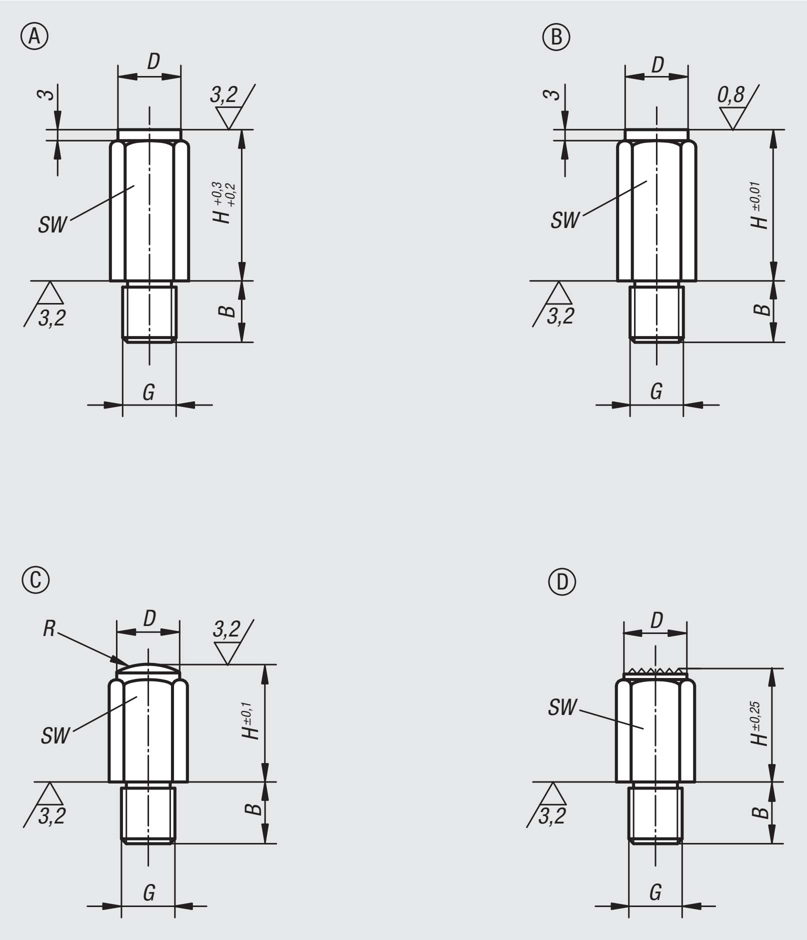
Material:
Body high carbon steel.

Version:
Body tempered and black oxidised.
Contact faces case-hardened.

Sample order:
nlm 02041-106010

Note:
These positioning feet are used as supports for rough and machined parts. They can also be used as stops and thrust pads in fixtures and toolmaking.

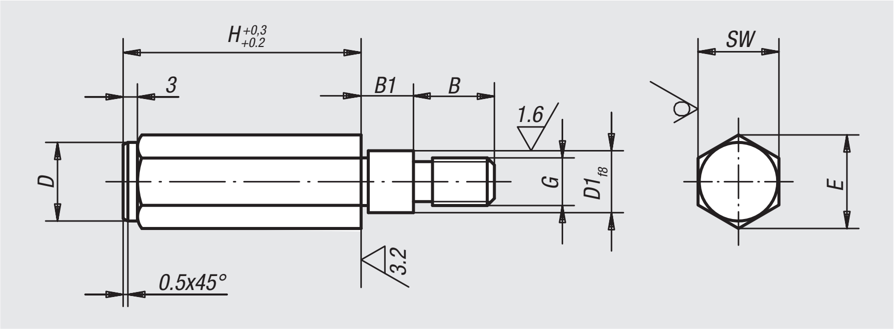
Drawing reference:
Form A: Flat face hardened
Form B: Flat face hardened and ground
Form C: Spherical face hardened
Form D: Serrated face tempered



Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	B	D	G	H	R	SW
02041-106010	**02041-206010**	**02041-306010**	**02041-406010**	11	10	M6	10	-/-/15/-	10
02041-106020	**02041-206020**	**02041-306020**	**02041-406020**	11	10	M6	20	-/-/15/-	10
02041-108010	**02041-208010**	**02041-308010**	**-**	13	13	M8	10	-/-/20	13
02041-108015	**02041-208015**	**02041-308015**	**02041-408015**	13	13	M8	15	-/-/20/-	13
02041-108030	**02041-208030**	**02041-308030**	**02041-408030**	13	13	M8	30	-/-/20/-	13
02041-110010	**02041-210010**	**02041-310010**	**-**	16	17	M10	10	-/-/30	17
02041-110020	**02041-210020**	**02041-310020**	**02041-410020**	16	17	M10	20	-/-/30/-	17
02041-110040	**02041-210040**	**02041-310040**	**02041-410040**	16	17	M10	40	-/-/30/-	17
02041-112010	**02041-212010**	**02041-312010**	**-**	20	19	M12	10	-/-/40	19
02041-112025	**02041-212025**	**02041-312025**	**02041-412025**	20	19	M12	25	-/-/35/-	19
02041-112050	**02041-212050**	**02041-312050**	**02041-412050**	20	19	M12	50	-/-/35/-	19
02041-116015	**02041-216015**	**02041-316015**	**-**	24	27	M16	15	-/-/50	27
02041-116030	**02041-216030**	**02041-316030**	**02041-416030**	24	27	M16	30	-/-/50/-	27
02041-116060	**02041-216060**	**02041-316060**	**02041-416060**	24	27	M16	60	-/-/50/-	27
02041-120040	**02041-220040**	**02041-320040**	**02041-420040**	29	32	M20	40	-/-/60/-	32
02041-120080	**02041-220080**	**02041-320080**	**02041-420080**	29	32	M20	80	-/-/60/-	32

Fixture feet

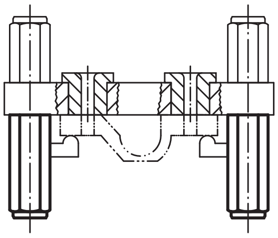
with external thread



Material:
Carbon steel 1.1181.

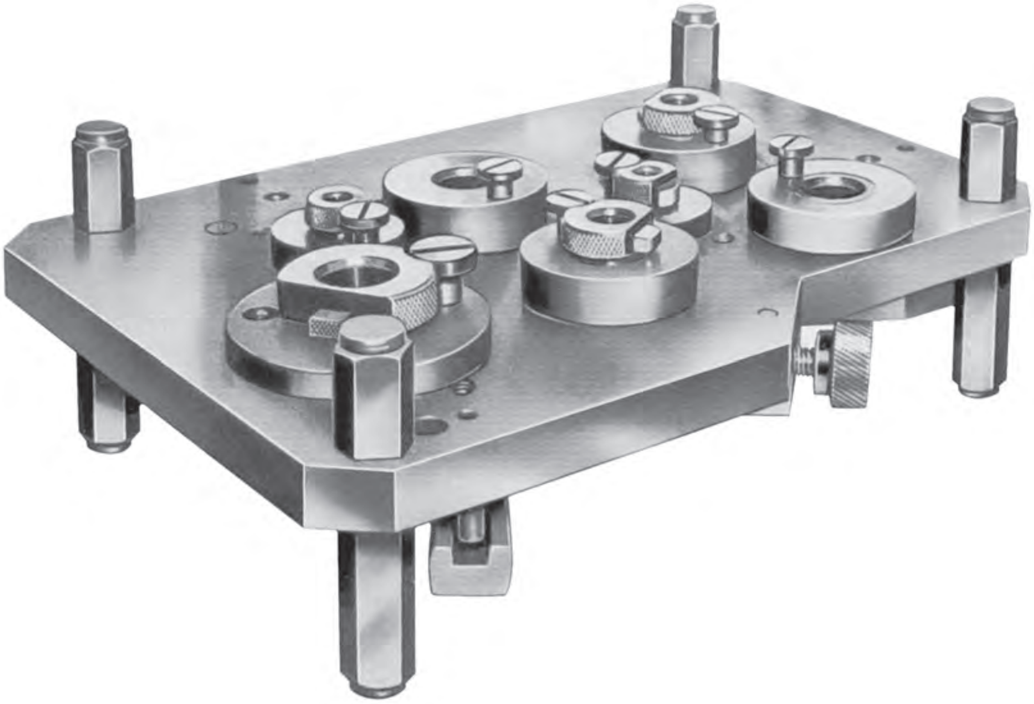
Version:
Black oxidised.

Sample order:
nlm 02050-10X75 (include height H)



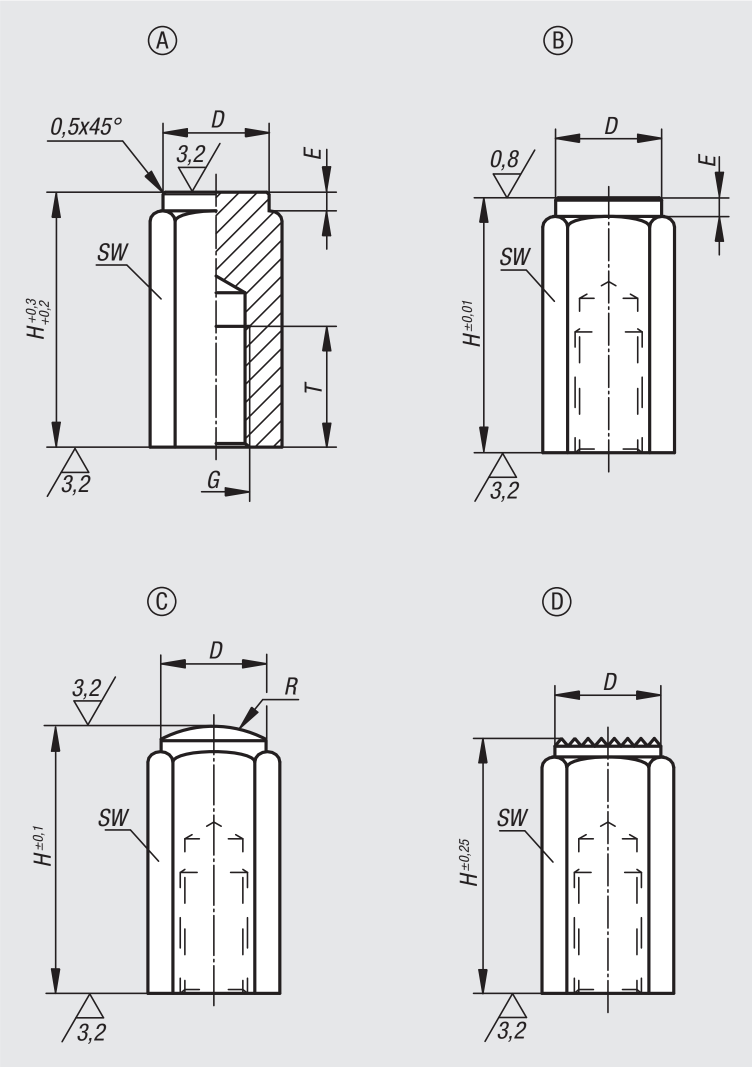
Order No.	B	B1	D	D1	G	H	E	SW
02050-10X	17	11	16,5	11	M10	50/75/100	19,5	17
02050-12X	17	18	18,5	13	M12	50/75/100/125	21,5	19

Application of a drilling jig



Fixture feet

with internal thread



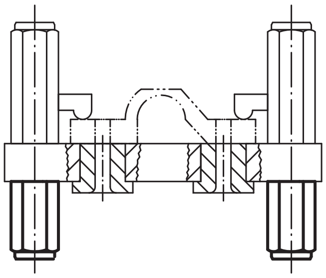
Material:
Body high carbon steel.

Version:
Body tempered and black oxidised.
Contact faces case-hardened.

Sample order:
nlm 02070-106X20

Note:
Fixture feet with internal thread are used as supports for fixtures or rough or machined workpieces. They can also be used as stops or thust pads in fixtures and toolmaking.

Drawing reference:
Form A: Flat face hardened
Form B: Flat face hardened and ground
Form C: Spherical face hardened
Form D: Serrated face tempered



Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	E	G	H	R	T	SW
02070-106X20	**02070-206X20**	**02070-306X20**	**02070-406X20**	9,5	2/2/-/-	M6	20	-/-/15/-	12	10
02070-106X40	**02070-206X40**	**02070-306X40**	**02070-406X40**	9,5	2/2/-/-	M6	40	-/-/15/-	12	10
02070-110X32	**02070-210X32**	**02070-310X32**	**02070-410X32**	16,5	3/3/-/-	M10	32	-/-/30/-	18	17
02070-110X63	**02070-210X63**	**02070-310X63**	**02070-410X63**	16,5	3/3/-/-	M10	63	-/-/30/-	18	17
02070-112X32	**02070-212X32**	**02070-312X32**	**02070-412X32**	18,5	3/3/-/-	M12	32	-/-/35/-	18	19
02070-112X63	**02070-212X63**	**02070-312X63**	**02070-412X63**	18,5	3/3/-/-	M12	63	-/-/35/-	18	19
02070-116X50	**02070-216X50**	**02070-316X50**	**02070-416X50**	23	4/4/-/-	M16	50	-/-/40/-	24	24
02070-116X100	**02070-216X100**	**02070-316X100**	**02070-416X100**	23	4/4/-/-	M16	100	-/-/40/-	24	24

02080

Self-aligning pads

swivel 12°

Material:
Body carbon steel.
Ball, ball-bearing steel 1.3505.

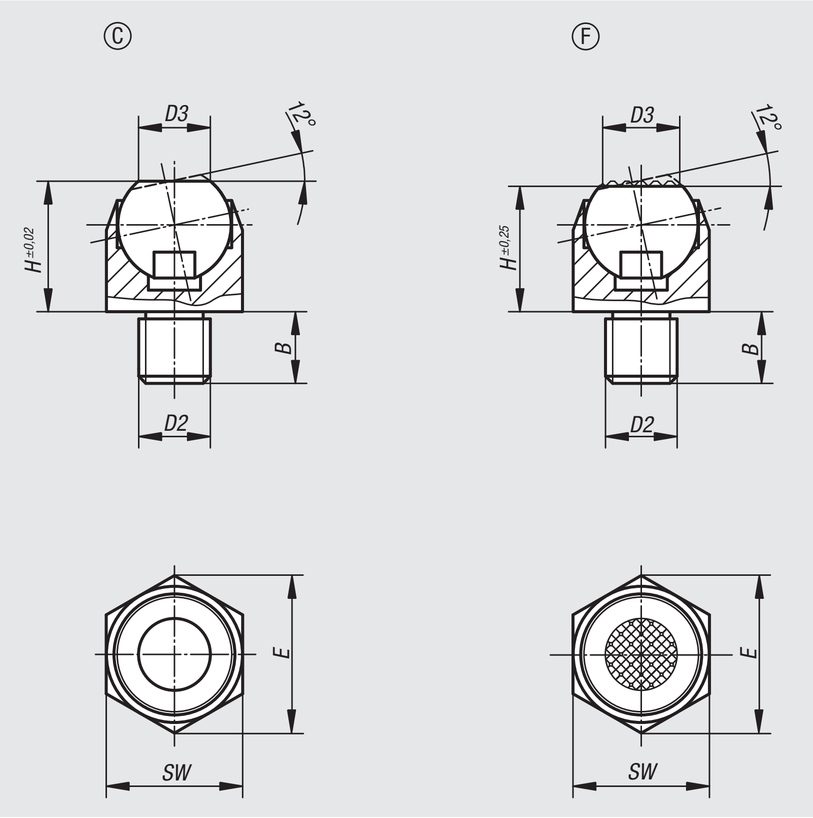
Version:
Body tempered.
Ball hardened (50 - 55 HRC).

Sample order:
nlm 02080-106

Note:
Self-aligning pads serve as stops, supports and thrust pads in fixture construction. They can also be installed in existing clamping devices, e.g. arness clamps.

Ball is secured against rotation.

Drawing reference:
Form C: male thread, smooth flattened ball
Form F: male thread, serrated flattened ball



Order No. Form C	Order No. Form F	B	D2	D3	H	E	SW	Ball-Ø	Load rating max. kN (static load only)
02080-106	**02080-306**	7	M6	6,7	13	14,5	13	10	10
02080-108	**02080-308**	8	M8	6,7	13	14,5	13	10	10
02080-110	**02080-310**	10	M10	10	18	21,9	19	16	25
02080-112	**02080-312**	12	M12	10	18	21,9	19	16	25
02080-116	**02080-316**	16	M16	20	27	33	30	24	90
02080-120	**02080-320**	20	M20	20	27	33	30	24	90

Notes

02081

Self-aligning pads

self-righting

Material:
Form C and F:
Ball steel, ball seat high-carbon steel.
Form G and J:
Ball high-carbon steel, ball seat steel.

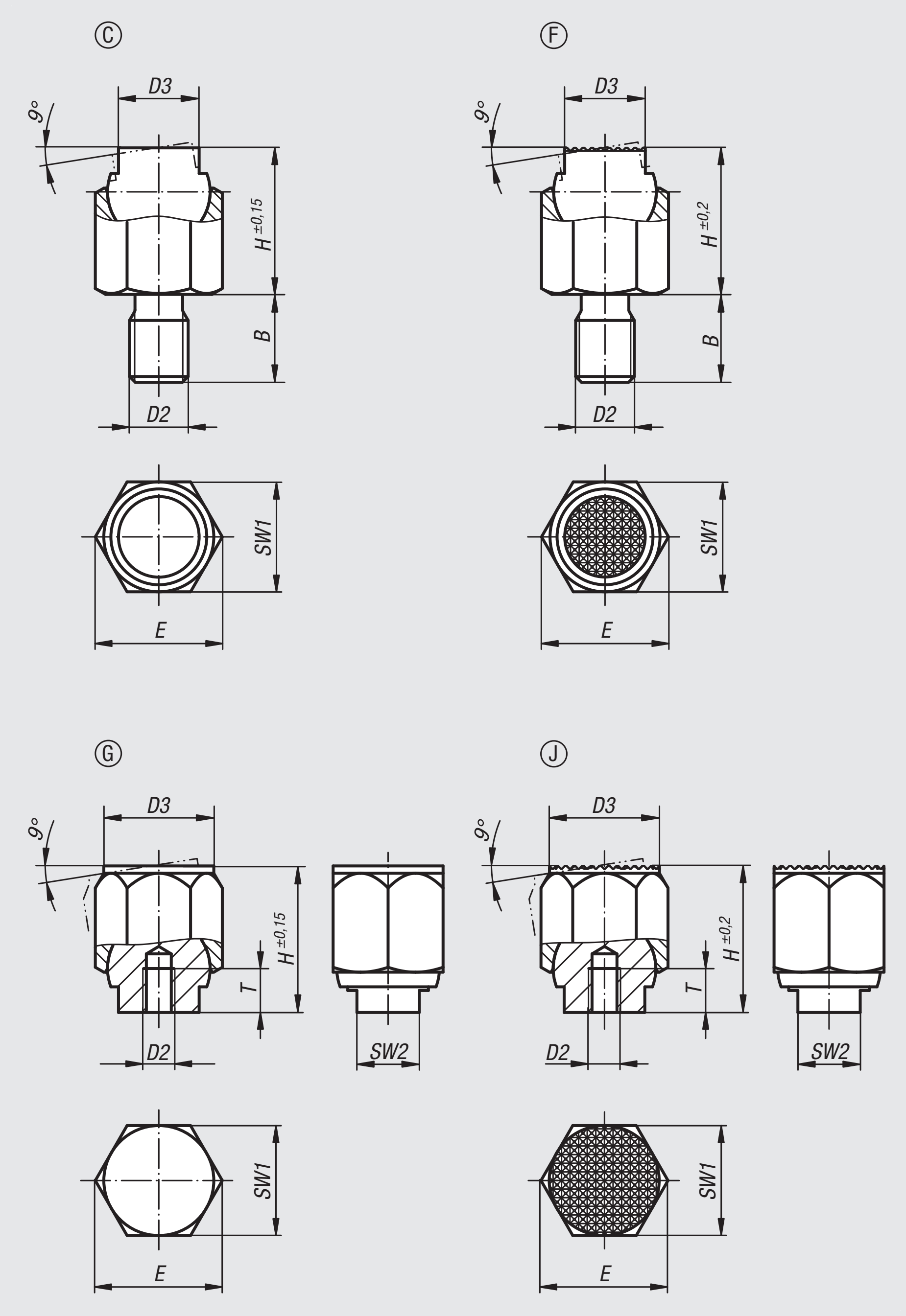
Version:
Form C and F:
Ball hardened and black oxidised, ball seat phosphated.
Form G and J:
Ball phosphated, ball seat hardened and black oxidised.

Sample order:
nlm 02081-106

Note:
The self-aligning pads serve as stops, rests and thrust pads in fixture construction.
The seating face returns to the start position when the load is removed.

Ball secured against rotation.

Drawing reference:
Form C: male thread, flattened ball, smooth
Form F: male thread, flattened ball, diamond grip
Form G: press fit, flattened ball, smooth
Form J: press fit, flattened ball, diamond grip



Self-aligning pads

self-righting

Order No.	Form	B	D2	D3	H	E	SW1	Ball-Ø	Load rating max. kN (static load only)
02081-106	C	9	M6	7	13	11,5	10	9	8
02081-108	C	12	M8	9,5	18	15	13	12	16
02081-110	C	15	M10	14	25	21,9	19	17	32
02081-112	C	18	M12	20	36	31,2	27	25	64
02081-116	C	24	M16	22	40	34,6	30	28	90

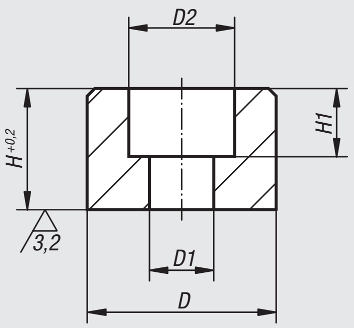
Order No.	Form	B	D2	D3	H	E	SW1	Ball-Ø	Load rating max. kN (static load only)
02081-306	F	9	M6	7	13	11,5	10	9	8
02081-308	F	12	M8	9,5	18	15	13	12	16
02081-310	F	15	M10	14	25	21,9	19	17	32
02081-312	F	18	M12	20	36	31,2	27	25	64
02081-316	F	24	M16	22	40	34,6	30	28	90

Order No.	Form	D2	D3	H	E	T	SW1	SW2	Ball-Ø	Load rating max. kN (static load only)
02081-403	G	M3	9	13	11,5	5	10	6	9	8
02081-404	G	M4	12	18	15	6	13	8	12	16
02081-405	G	M5	18	25	21,9	8	19	10	17	32
02081-406	G	M6	26	36	31,2	10	27	16	25	64
02081-408	G	M8	30	40	34,6	12	30	17	28	90

Order No.	Form	D2	D3	H	E	T	SW1	SW2	Ball-Ø	Load rating max. kN (static load only)
02081-603	J	M3	9	13	11,5	5	10	6	9	8
02081-604	J	M4	12	18	15	6	13	8	12	16
02081-605	J	M5	18	25	21,9	8	19	10	17	32
02081-606	J	M6	26	36	31,2	10	27	16	25	64
02081-608	J	M8	30	40	34,6	12	30	17	28	90

02090

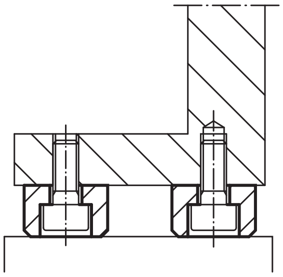
Locating feet



Material:
Steel 1.0718.

Version:
Hardened, black oxidised.

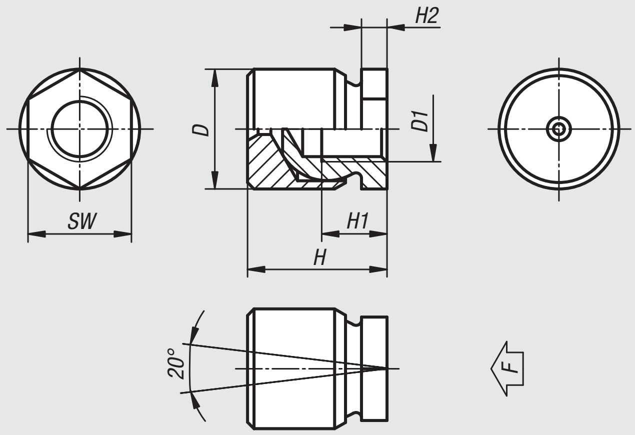
Sample order:
nlm 02090-08



Order No.	D	D1	D2	H	H1
02090-05	16	5,5	10	10	5,7
02090-06	20	6,6	11	12	7
02090-08	25	9	15	16	9
02090-10	32	11	18	20	11
02090-12	36	13,5	20	25	13

02110

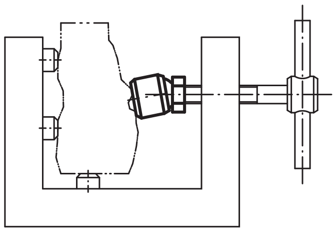
Swivel pads



Material:
Ball element case-hardened steel.
Thrust pad ETG 100 steel.

Version:
Black oxidised.

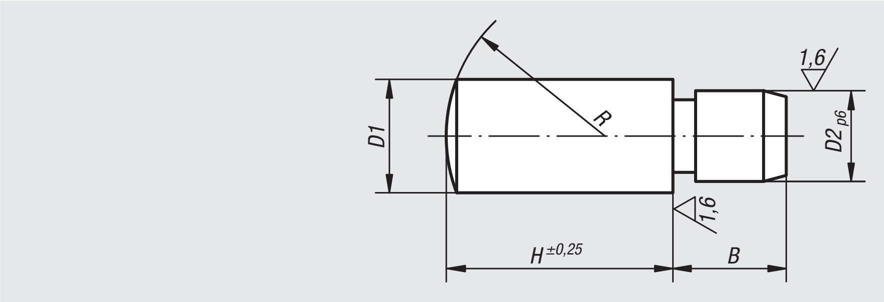
Sample order:
nlm 02110-10



Order No.	D	D1	H	H1	H2	SW	Load rating max. kN
02110-05	13	M5	16,5	6,5	4	10	1,62
02110-06	13	M6	16,5	8,5	4	10	2,33
02110-08	16	M8	21	9	4	13	4,15
02110-10	19	M10	23	10	4	17	6,48
02110-12	22	M12	25,5	12	4,7	19	8,32
02110-16	25	M16	29,5	14	5	24	13,94
02110-20	32	M20	36	18	8,5	30	21

02130

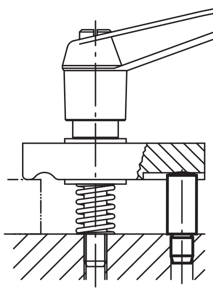
Rest pads



Material:
Steel 1.0301.

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 02130-05X8 (include height H)

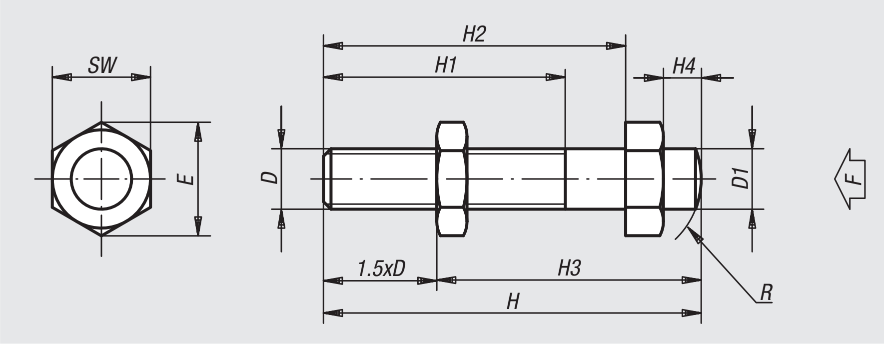


Order No.	H	B	D1	D2	R
02130-05X	8/10/12/16	5	5	4	7
02130-06X	10/12/16/20	6	6	5	8
02130-08X	12/16/20/25	8	8	6	11
02130-10X	16/20/25/32	10	10	8	14
02130-12X	20/25/32/40	12	12	10	16
02130-14X	20/25/32/40	14	14	12	20
02130-16X	25/32/40/50	16	16	14	25
02130-20X	25/32/40/50	20	20	16	28

02150

Rest pads adjustable

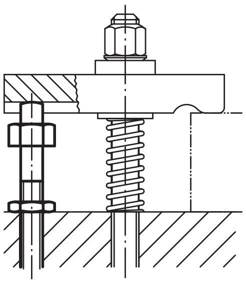
with locknut



Material:
Carbon steel 1.1181.

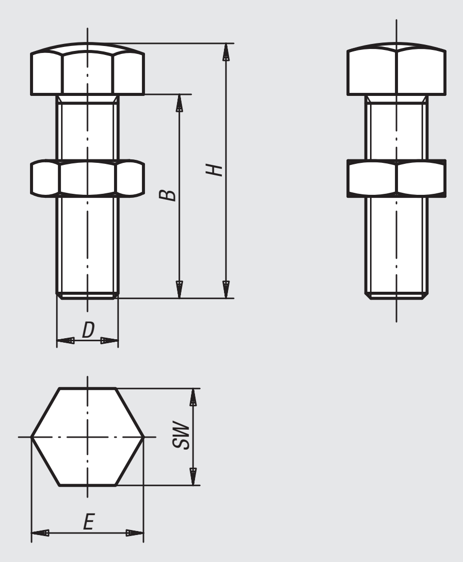
Version:
Surface hardened, black oxidised.

Sample order:
nlm 02150-05



Order No.	D	D1	H	H1	H2	H3 min.	H3 max.	H4	E	SW	R	F ca.N
02150-05	M5	5	50	32	40	20,5	42,5	5	11,5	10	7	1000
02150-06	M6	6	50	32	40	21	41	5	11,5	10	8	1430
02150-08	M8	8	50	32	40	22	38	5	15	13	11	2620
02150-10	M10	10	52	32	40	25	37	5	19,6	17	14	4180
02150-101	M10	10	70	32	56	42	55	6	19,6	17	14	4180
02150-12	M12	12	70	40	56	36	52	6	21,9	19	16	6100
02150-121	M12	12	95	50	80	51	77	6	21,9	19	16	6100
02150-14	M14	14	100	63	80	44	79	8	25,4	22	20	8320
02150-16	M16	16	100	63	80	45	76	8	27,7	24	25	11520
02150-161	M16	16	120	63	100	65	96	8	27,7	24	25	11520
02150-20	M20	20	110	70	88	50	90	10	34,6	30	28	18000

Rest pads



Material:
Carbon steel or brass

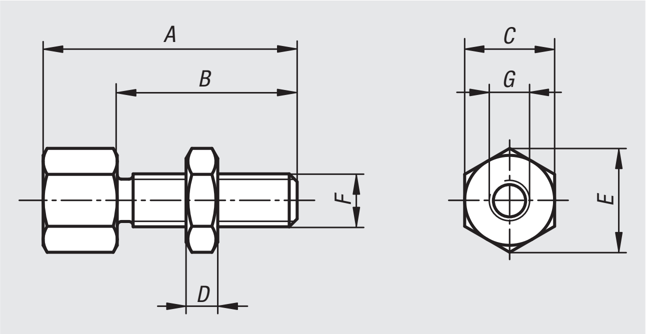
Version:
High-carbon steel tempered and black oxidised.
Brass bright.

Sample order:
nlm 02153-16055

Order No.	Main material	B	D	E	H	SW
02153-06030	high carbon steel	25	M6	11,5	30	10
02153-06040	high carbon steel	35	M6	11,5	40	10
02153-06050	high carbon steel	45	M6	11,5	50	10
02153-08036	high carbon steel	30	M8	15	36	13
02153-08046	high carbon steel	40	M8	15	46	13
02153-08056	high carbon steel	50	M8	15	56	13
02153-10042	high carbon steel	35	M10	19,6	42	17
02153-10048	high carbon steel	40	M10	19,6	48	17
02153-10058	high carbon steel	50	M10	19,6	58	17
02153-10068	high carbon steel	60	M10	19,6	68	17
02153-12048	high carbon steel	42	M12	21,9	50	19
02153-12070	high carbon steel	60	M12	21,9	70	19
02153-12080	high carbon steel	70	M12	21,9	80	19
02153-16055	high carbon steel	45	M16	27,7	55	24
02153-16075	high carbon steel	65	M16	27,7	75	24
02153-16085	high carbon steel	75	M16	27,7	85	24
02153-12148	brass	42	M12	21,9	50	19
02153-16155	brass	45	M16	27,7	55	24

02155

Jack screws



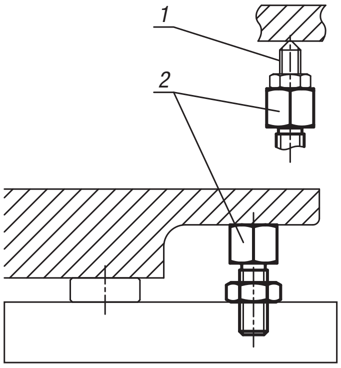
Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 02155-0803006

Note:
Various rests can be mounted on this jack screw.

Drawing reference:
1) screw rest
2) jack screw



Order No.	A	B	C	D	E	F	G
02155-0803006	30	20	13	5	14,4	M8	M6 x 6
02155-0804006	40	30	13	5	14,4	M8	M6 x 6
02155-1003808	38	24	17	6	18,9	M10	M8 x 8
02155-1004808	48	34	17	6	18,9	M10	M8 x 8
02155-1205110	51	33	22	7	24,5	M12	M10 x 10
02155-1206610	66	48	22	7	24,5	M12	M10 x 10
02155-1606212	62	40	27	10	30,1	M16	M12 x 12
02155-1607712	77	55	27	10	30,1	M16	M12 x 12

02160

Stops adjustable

with end position feedback

Material:
Screw and plunger stainless steel 1.4301.
Guide bush stainless steel 1.4112.
Sensor housing stainless steel.

Version:
Screw and plunger, bright.
Guide bushing, bright.
Sensor housing, bright.
Inductive sensor:
Relay (NO)
Operating voltage 10 - 30 V DC
Operating current 100 mA
Switching distance 0.8 mm
Protection class: IP 67
Connection type: 0.3 m PUR cable with connector plug
Temperature range: -25°C - +70°C
Approval: CE, c-UL-us

Sample order:
nlm 02160-080352

Note:
The ensured sensing distance is achieved if the plunger is actuated flush up to the stop surface of the guide bush. The sensor is supplied unassembled.

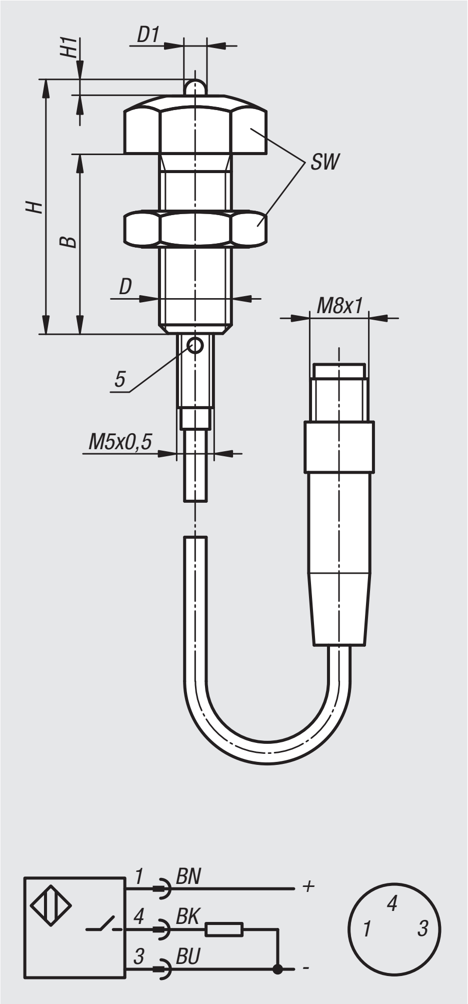
Installation recommendation: glue in with Loctite 638.

Caution: screw sensor in until it comes to a stop.

Safety:
End position feedback stops are not suitable for personal protection.

Drawing reference:
5) LED-indicator

BN = brown
BK = black
BU = blue



Order No.	Size	B	D	D1	H	H1	SW
02160-080352	1	25	M8	3	35,2	2	13
02160-100352	2	25	M10	3	35,2	2	17
02160-120352	3	25	M12	3	35,2	2	19

02170

Screw rest

with flat face, steel

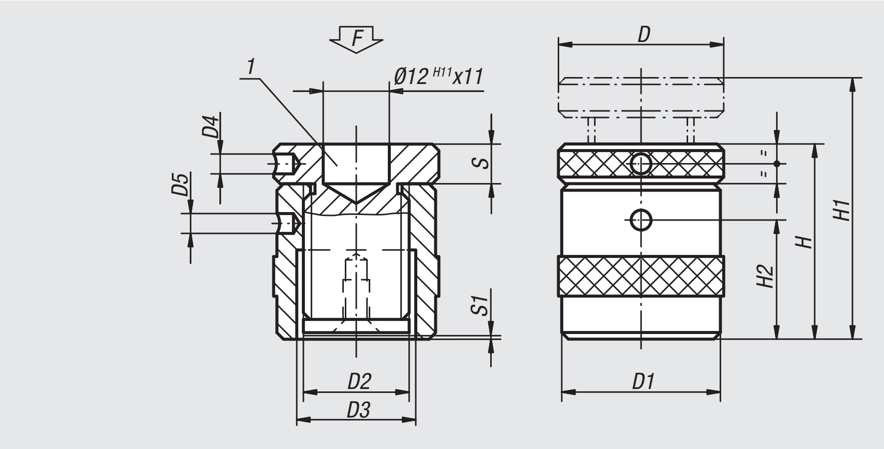
Material:
Carbon steel.

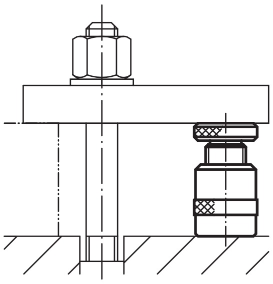
Version:
Painted, trapezoidal thread - self-locking, spindle has end lock

Sample order:
nlm 02170-02

Note:
The version 02170-01 has no Ø 12 centring hole.

Drawing reference:
1) centring hole for 02210





Order No.	D	D1	D2	D3	D4	D5	H	H1	H2	S	S1	F max. kN
02170-01	31	31	Tr 20X4	23	4	4	38	52	23	8	2	15
02170-015	50	49	Tr 30X4	36	6	6	42	52	24	12	2	60
02170-02	50	49	Tr 30X4	36	6	6	50	72	30	12	0,5	60
02170-03	50	49	Tr 30X4	36	6	6	71	102	43	16	1,5	60
02170-04	65	70	Tr 40X7	43	6	6	100	140	58	25	2,5	100
02170-05	70	80	Tr 50X8	55	6	6	140	212	90	30	4	170
02170-06	80	100	Tr 65X10	70	6	8	190	300	126	34	5	350

02171

Screw rest

with flat face, stainless steel

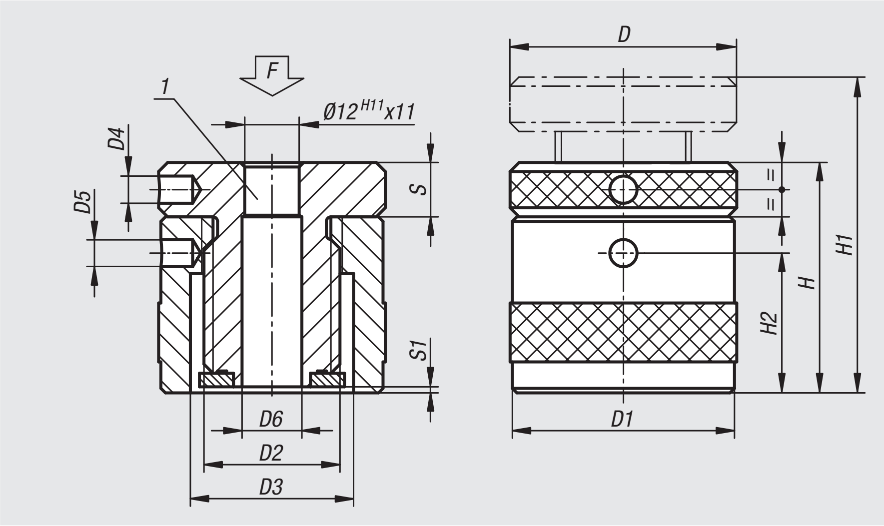
Material:
Stainless steel 1.4305.

Version:
Self-locking trapezoidal thread, spindle has end lock.

Sample order:
nlm 02171-02

Note:
The through hole allows easy clamping and positioning of the workpiece.

Drawing reference:
1) centring hole for 02210



Order No.	D	D1	D2	D3	D4	D5	D6	H	H1	H2	S	S1	F max. kN
02171-015	50	49	Tr 30X4	36	6	6	13	42	52	24	12	2	50
02171-02	50	49	Tr 30X4	36	6	6	13	50	72	30	12	0,5	50
02171-03	50	49	Tr 30X4	36	6	6	13	71	102	43	16	1,5	50

02180

Screw rest

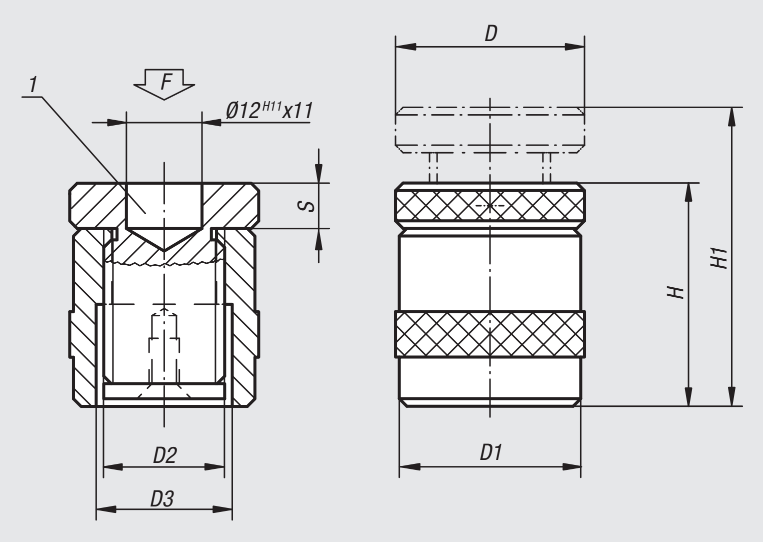
with flat face, aluminium

Material:
Aluminium (400 N/mm² tensile strength).
Spindle carbon steel.

Version:
Self-locking trapezoidal thread, spindle has end lock.

Sample order:
nlm 02180-01

Drawing reference:
1) centring hole for 02210



Order No.	D	D1	D2	D3	H	H1	S	F max. kN
02180-01	50	50	Tr 30X4	36	42	52	12	30
02180-02	50	50	Tr 30X4	36	50	70	12	30
02180-03	50	50	Tr 30X4	36	70	100	12	30

02182

Screw rest

with flat face and magnetic foot, aluminium

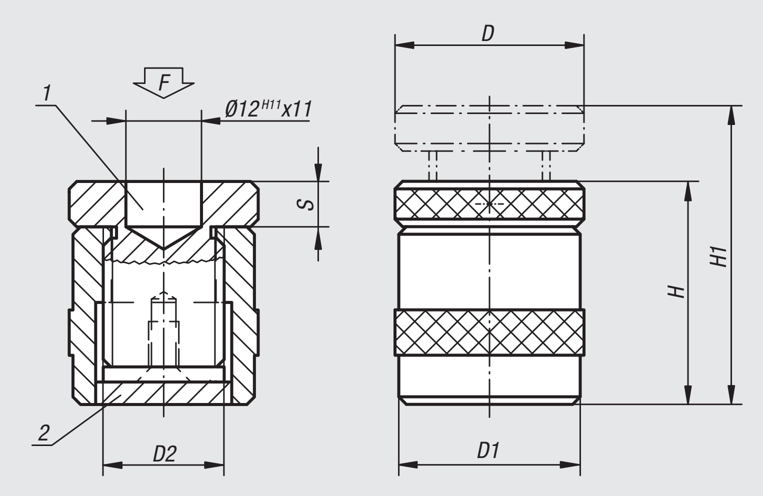
Material:
Aluminium (400 N/mm² tensile strength).
Spindle carbon steel.

Version:
Self-locking trapezoidal thread, spindle has end lock.

Sample order:
nlm 02182-01

Note:
Suitable for horizontal and vertical applications. The magnetic foot allows durable and accurate vertical positioning of the workpiece.

Drawing reference:
1) centring hole for 02210
2) magnetic foot



Order No.	D	D1	D2	H	H1	S	F max. kN
02182-01	50	50	Tr 30X4	52	62	12	30
02182-02	50	50	Tr 30X4	60	80	12	30
02182-03	50	50	Tr 30X4	80	110	12	30

Atlas jack

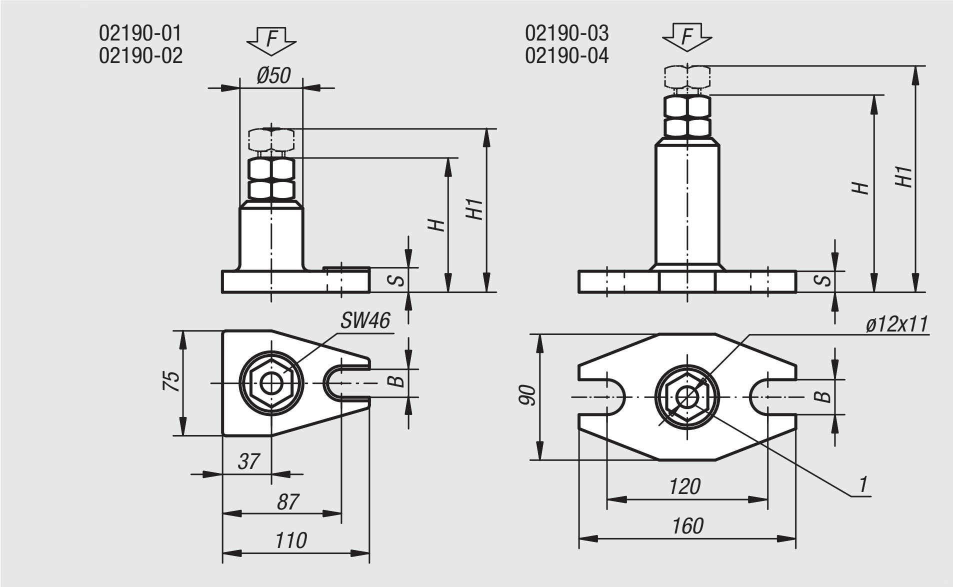
with locknut

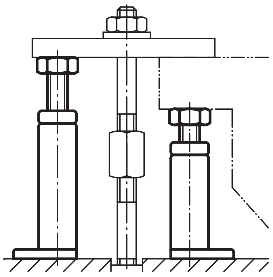
Material:
Carbon steel.

Version:
Hammertone, spindle with 30 x 6 trapezoidal thread.

Sample order:
nlm 02190-03

Drawing reference:
1) centring hole for 02210





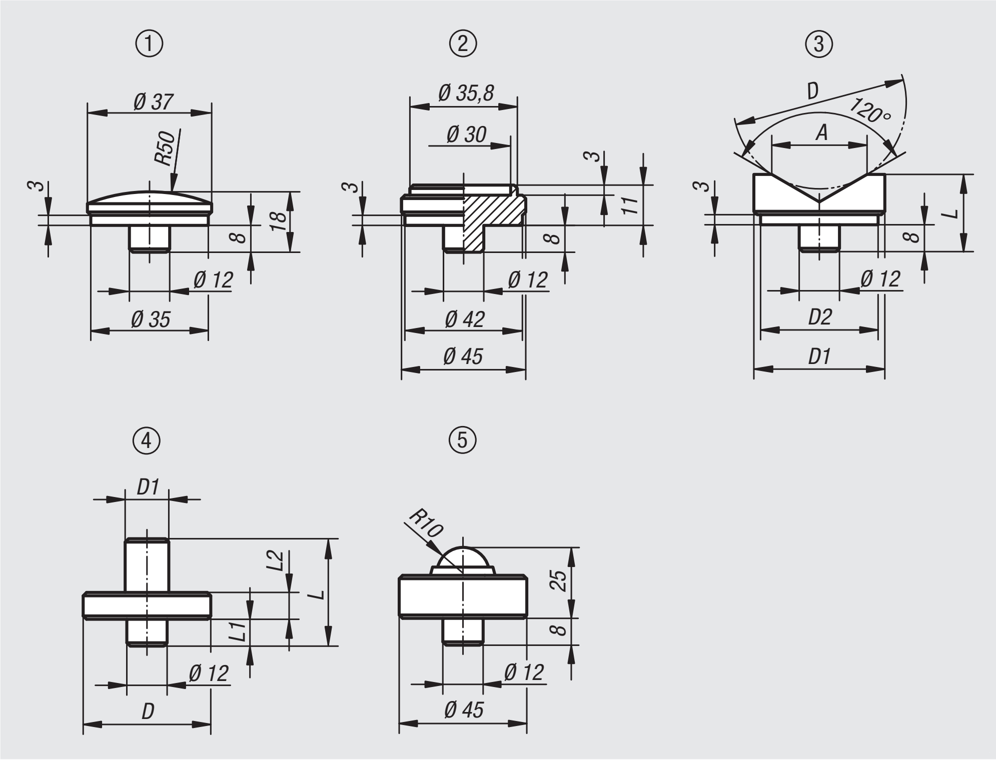
Order No.	Adjustment range	base plate	H	H1	B	S	F kN
02190-01	100 - 140	76x111	100	140	18	17	60
02190-02	140 - 200	76x111	140	200	18	17	60
02190-03	200 - 320	90x160	200	320	22	22	40
02190-04	320 - 540	90x160	320	540	22	25	25

Notes

02210

Screw rest inserts

spherical, centring disc, prism, locating pin, revolving ball



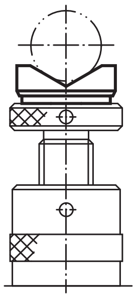
Material:
Carbon steel.

Version:
Tempered and black oxidised.
Ball hardened.

Sample order:
nlm 02210-021

Note:
Can be used with
02170
02180
02182
02190
02320
02330-020
02350-010

Drawing reference:
1) spherical
2) centring disc
3) prism
4) locating pin
5) revolving ball



Order No.	Version
02210-01	spherical
02210-03	centring disc

Order No.	Version	D max.	D min.	D1	D2	L	A
02210-02	prism	50	10	45	42	23	32
02210-021	prism	100	22	65	62	38	56

Order No.	Version	D	D1	L	L1	L2
02210-04	locating pin	63	14	35	8	12
02210-041	locating pin	78	25	53	8	15

Order No.	Version	F max. kN
02210-05	revolving ball	30

Notes

02270

Step blocks

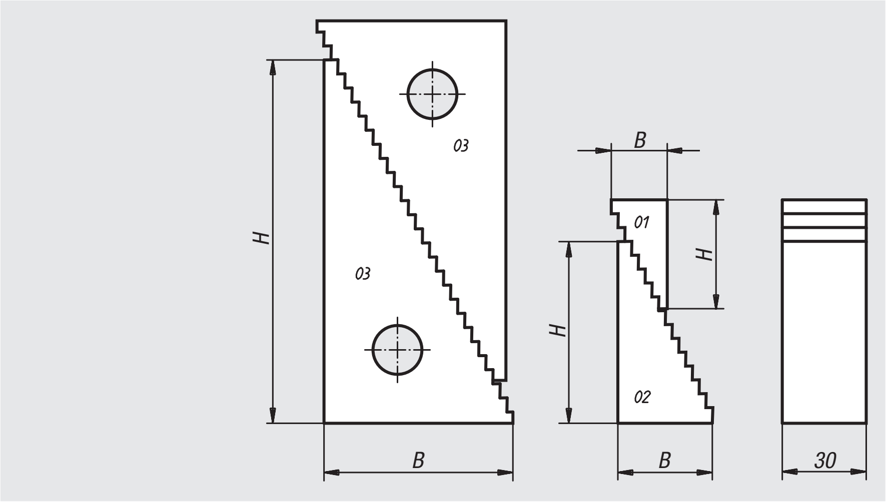
Material:
Carbon steel.

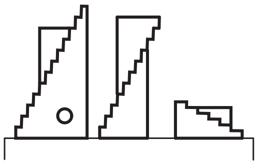
Version:
Painted

Sample order:
nlm 02270-02

Note:
For step block sets, see 02310.
Step blocks can also be used together with stepped-heel clamp straps 04070.

Vertical step height: 4.65 mm
Horizontal step height: 2.3 mm





Order No.	B	H	Support height max.	Support height min.
02270-01	19	32	51	22
02270-02	35,5	65	107	39
02270-03	68	130	208	71

02310

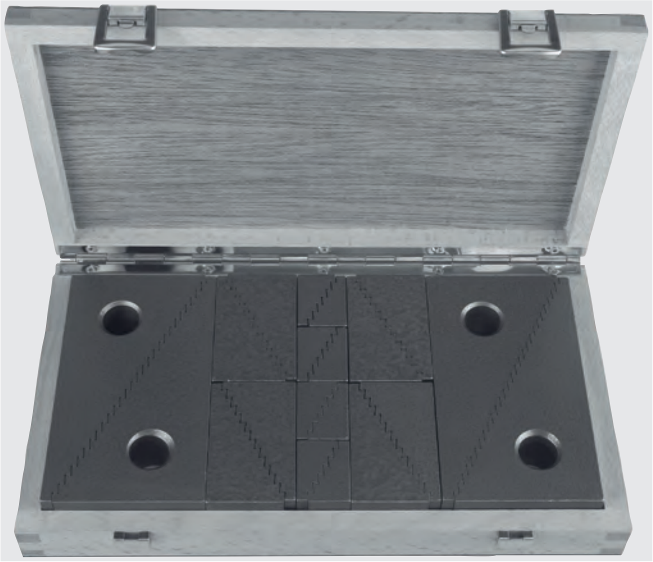
Step block sets

Material:
Carbon steel.

Version:
Painted

Sample order:
nlm 02310-01

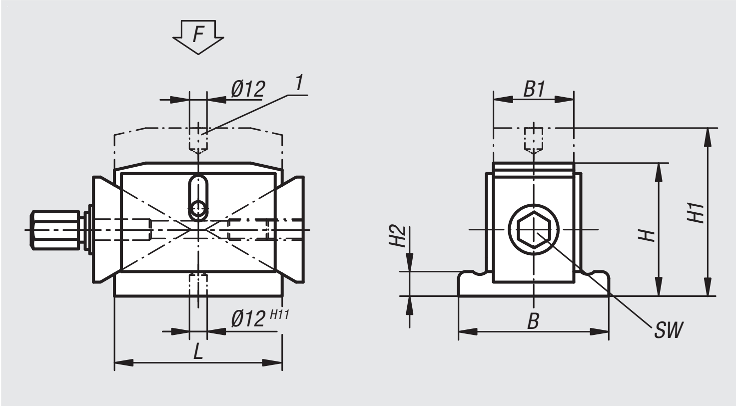
Note:
The special tooth form allow these blocks to be used vertically or horizontally. The complete set in a wooden box comprises 20 parts which are interchangeable and provide many possible uses. These blocks can also be ordered separately, see 02270. Step blocks can also be used together with stepped-heel clamp straps 04070.



Order No.	Content	Support height mm	Box dimensions mm
02310-01	8 ea. No. 01, 8 ea. No. 02, 4 ea. No. 03	from 22 to 208	280 x 155 x 40

02320

Wedge supports



Material:
Carbon steel and ductile iron.

Version:
Tempered and black oxidised.
Wedge faces fine machined.

Sample order:
nlm 02320-50

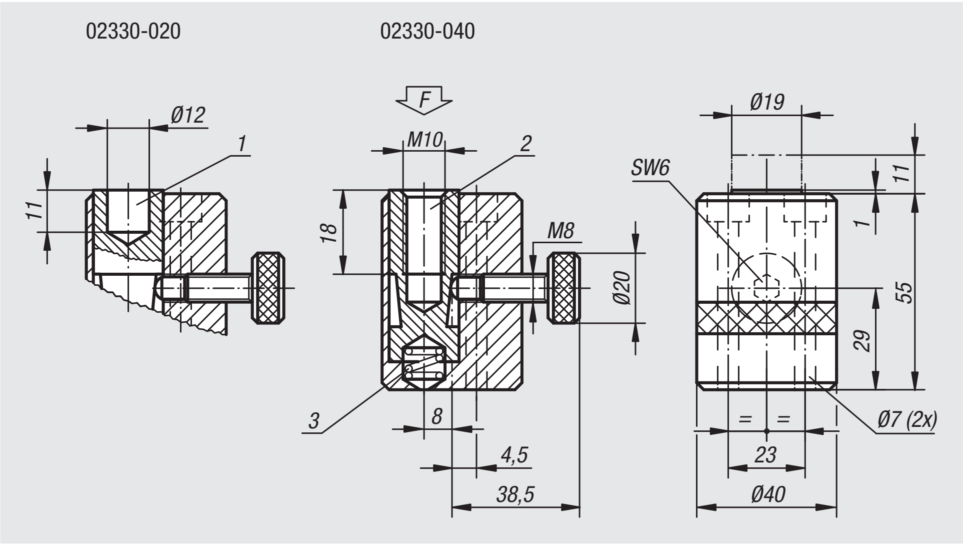
Note:
Fine adjustments made using knurled screw or hexagon key. Vertical movement with no lateral shift. Particularly suited for marking out or machining heavy parts. A spherical insert 02210-01 is included with every support wedge.

Drawing reference:
1) centring hole for 02210

Order No.	Clamp range	B	B1	H	H1	H2	L	SW	travel per spindle rotation	F kN
02320-50	50 - 68	63	40	50	68	7	63	13	0,86	40
02320-100	100 - 125	115	60	100	125	20	125	24	1,16	100

02330

Support elements cylindrical

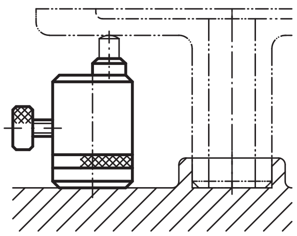


Material:
Carbon steel
1.1181.

Version:
Black oxidised.

Sample order:
nlm 02330-040

Drawing reference:
1) centring hole for 02210
2) tapped hole for: 02000-110, 02000-310, 02000-910, 02030-10, 02030-101
3) spring force 0.8 - 2.1 N



Order No.	F max. N
02330-020	4000
02330-040	4000

02333

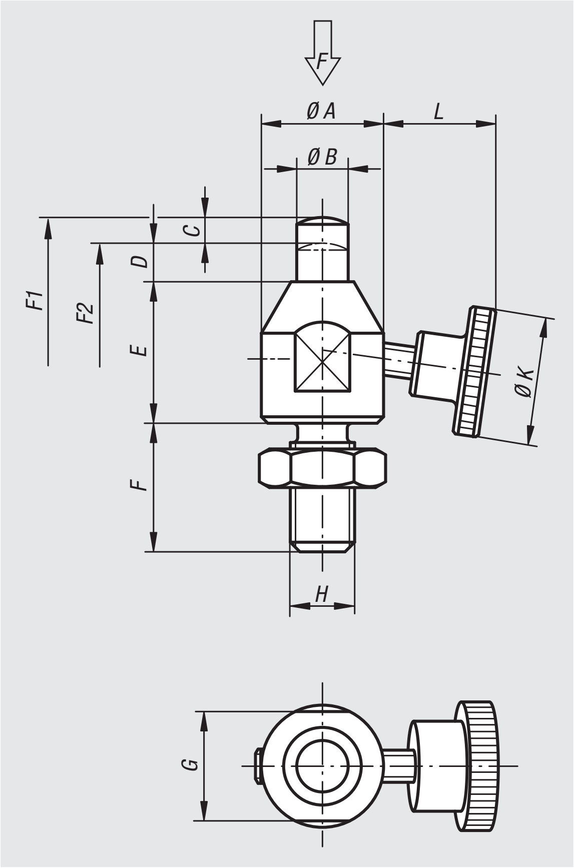
Workpiece supports

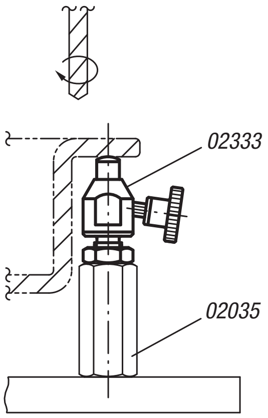
adjustable

Material:
Carbon steel.

Version:
Body black oxidised.
Rest pad hardened and black oxidised.

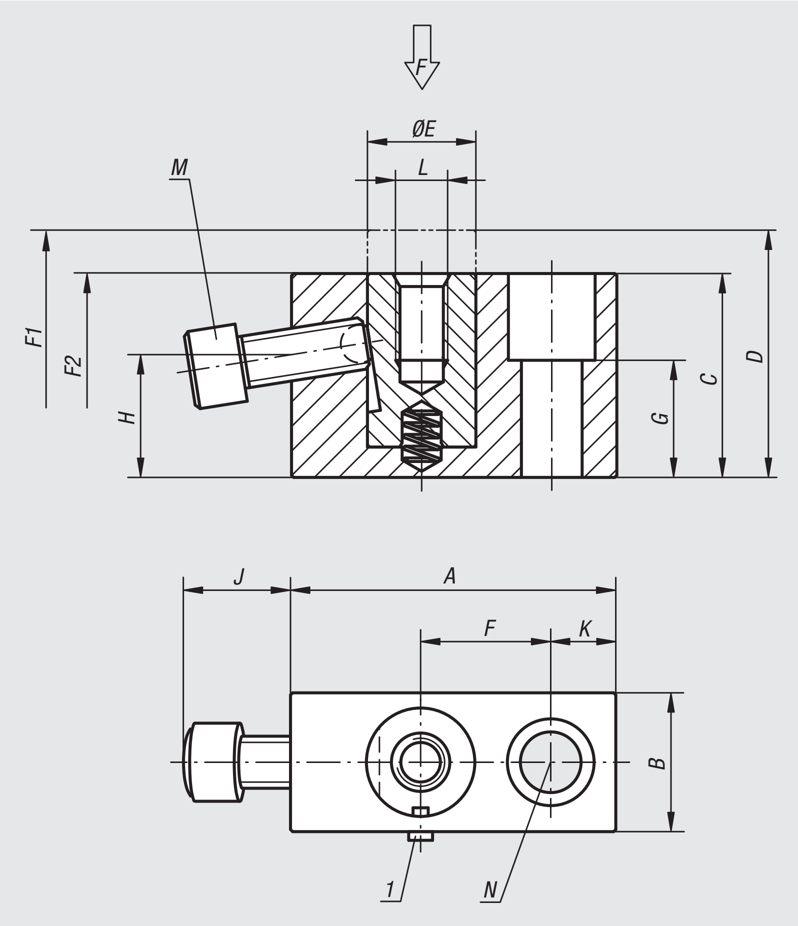
Sample order:
nlm 02333-08023





Order No.	A	B	C (travel)	D	E	F	G	H	K	L	F N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
02333-08023	15	6	3	5	18	16	13	M8	20	13,2	200	1,5	3
02333-10028	19	8	4	6	22	20	17	M10	25	16,3	300	1,8	3
02333-12031	22	10	4	6	25	24	19	M12	28	22,3	400	1,8	3

Workpiece supports



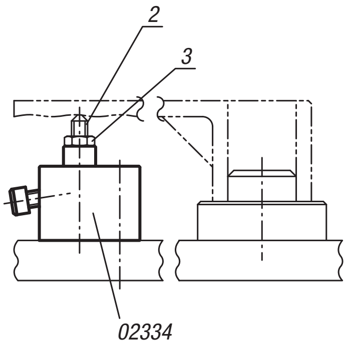
Material:
Carbon steel.

Version:
Body black oxidised.
Thrust pin tempered and black oxidised.

Sample order:
nlm 02334-06029

Drawing reference:
M = ball pressure screw
N = through hole for socket head screw DIN 912

1) rotation lock
2) screw rest
3) hexagonal nut



Order No.	A	B	C	D	E	F	G	H	J	K	L	M	N	F N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
02334-06029	38	19	29	35	12	15	15	17,6	13	8	M6x10	M6x16	M6	4000	0	6
02334-08037	50	22	37	47	16	20	20	21,1	16	10	M8x15	M8x20	M8	6000	0	7
02334-12047	75	32	47	57	25	30	27	28,3	25	15	M12x20	M12x30	M12	9000	1	11

02335

Workpiece support cylinders

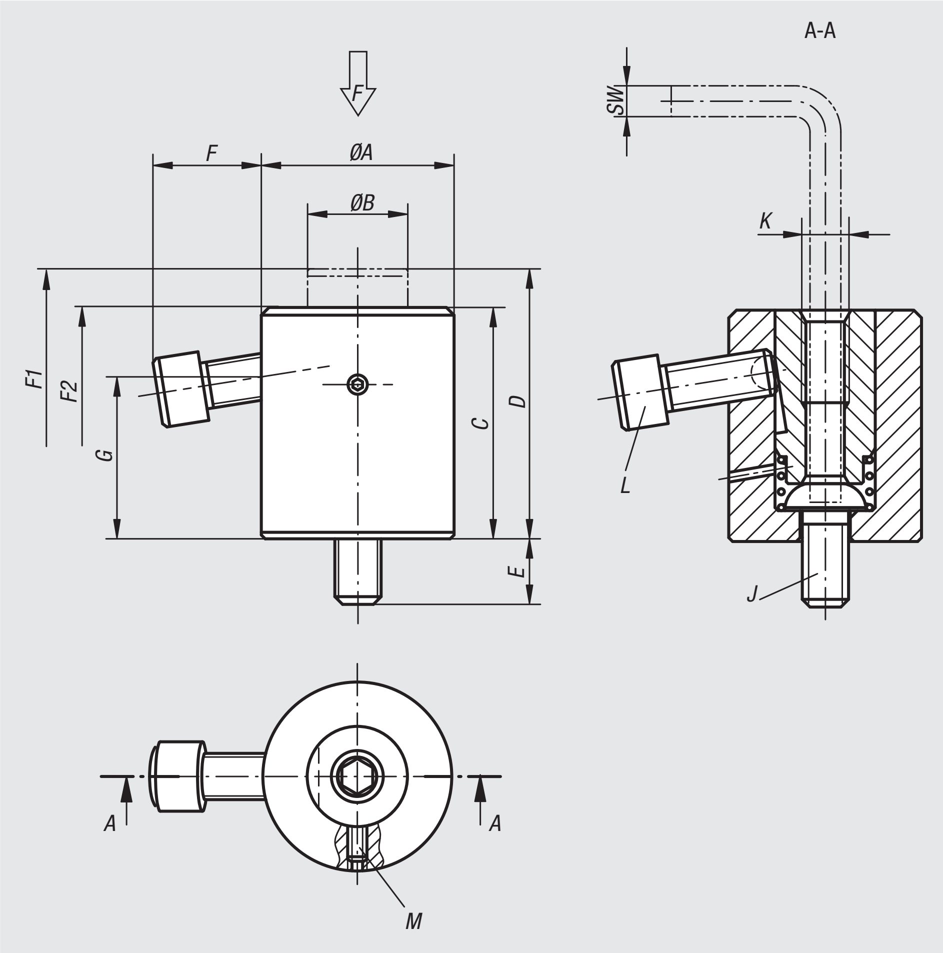
Material:
Carbon steel.

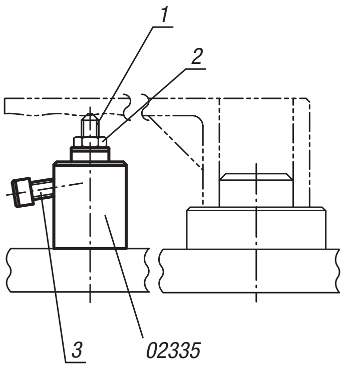
Version:
Body black oxidised.
Thrust pin hardened and black oxidised.

Sample order:
nlm 02335-06039

Drawing reference:
J = mounting screw
L = ball-end thrust screw
M = grub screw

1) screw rest
2) hexagonal nut
3) ball-end thrust screw





Order No.	A	B	C	D	E	F	G	J	K	L	M	SW	F N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
02335-06039	28	14	33	39	10	14,1	22	M6	M6x12	M6x16	M4x8	4	4000	10	22
02335-08052	35	19	42	52	15	18,8	28,5	M8	M8x16	M8x20	M4x8	5	6000	10	27
02335-12070	50	26	60	70	17	28,5	42	M12	M12x24	M12x30	M5x12	8	9000	15	30
02335-16080	60	33	70	80	22	26,5	47	M16	M16x32	M12x30	M5x15	10	9000	15	35

Support element

Material:
Main body hardened steel.
Housing aluminium.

Version:
Main body nitrated, manganese phosphated and ground.
Housing red anodised.

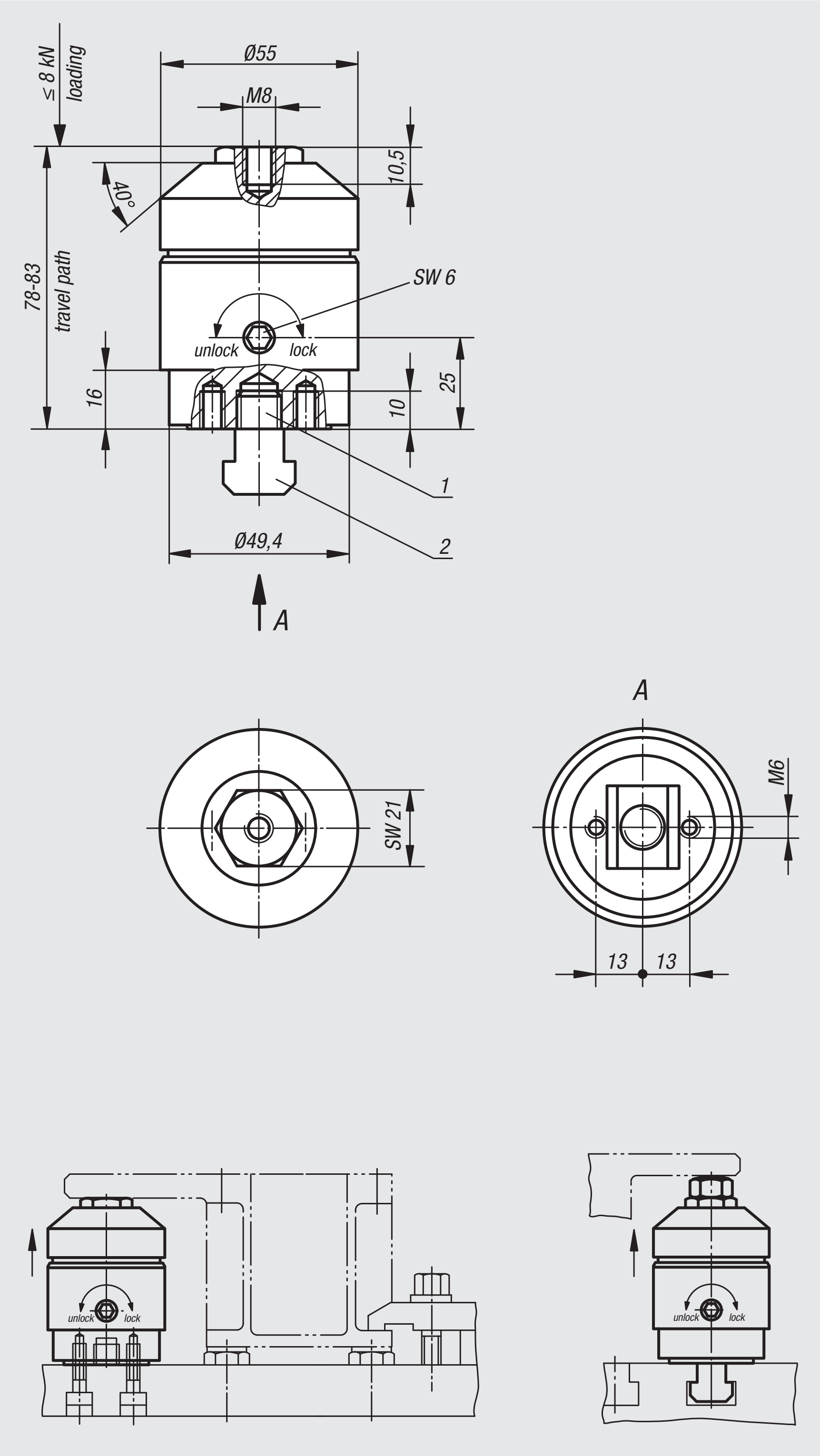
Sample order:
nlm 02340-0508

Note:
The support element is for supporting overhanging workpiece parts. It prevents vibration and bending during machining.

Method of operation:
1. Turn the cam screw (hex. socket SW 6) on the side of the housing, the support bolt will move out under light spring load until it makes contact with the workpiece.
2. Continue to turn to „lock“ position. The support bolt locks without changing position.
3. Turn the cam screw in the opposite direction and the support bolt will unlock. Continue turning to the „unlock“ position and the support bolt will slide back into the body.

Assembly:
Mount the support element to the fixture using the two M6 tapped holes.
Alternatively: Exchange the M12x10 plug screw for a M12x30 grub screw and mount the support directly onto the machine table with a T-nut.
For safe operation the M12 tapped hole must always be filled.
It is possible to countersink the support element by 16 mm.
Various rest pads can be mounted into the M8 tapped hole on the support bolt.
Supplied with M12x30 grub screw and M12 nut for T-slots (DIN 508).

Drawing reference:
1) grub screw M12x30 DIN 913 (exchangeable)
2) nut for T-slots M12x14 DIN 508



Order No.	Load capacity N	Travel path
02340-0508	8000	5 mm

02350

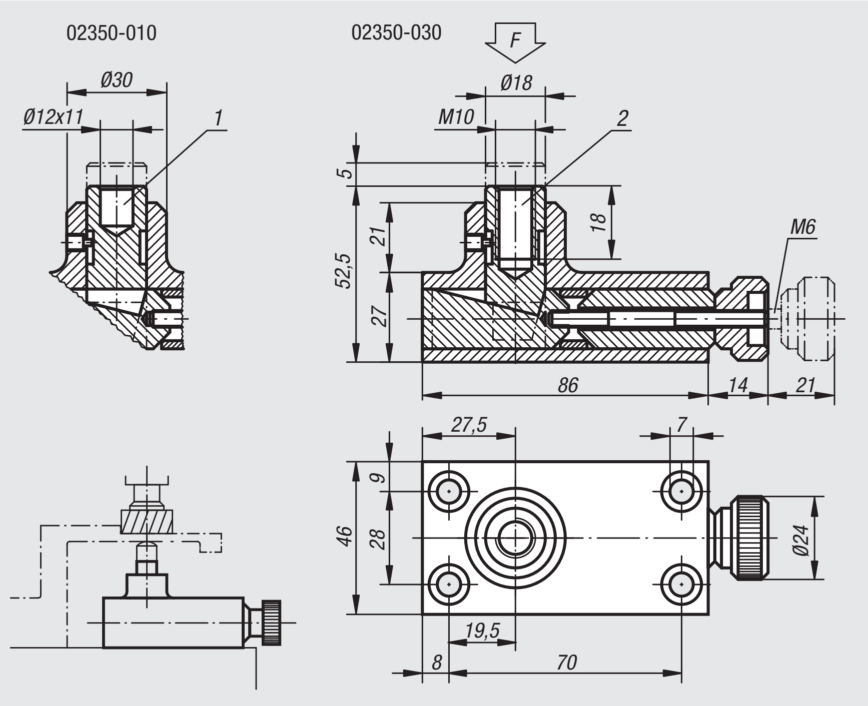
Rectangular support elements

Material:
Housing GJL 250, thrust pads and locking parts carbon steel.

Version:
Housing painted, steel parts black oxidised.

Sample order:
nlm 02350-030

Drawing reference:
1) centring hole for 02210
2) tapped hole for: 02000-110, 02000-310, 02000-910, 02030-10, 02030-101



Order No.	F max. kN
02350-010	30
02350-030	30

02360

Workpiece supports

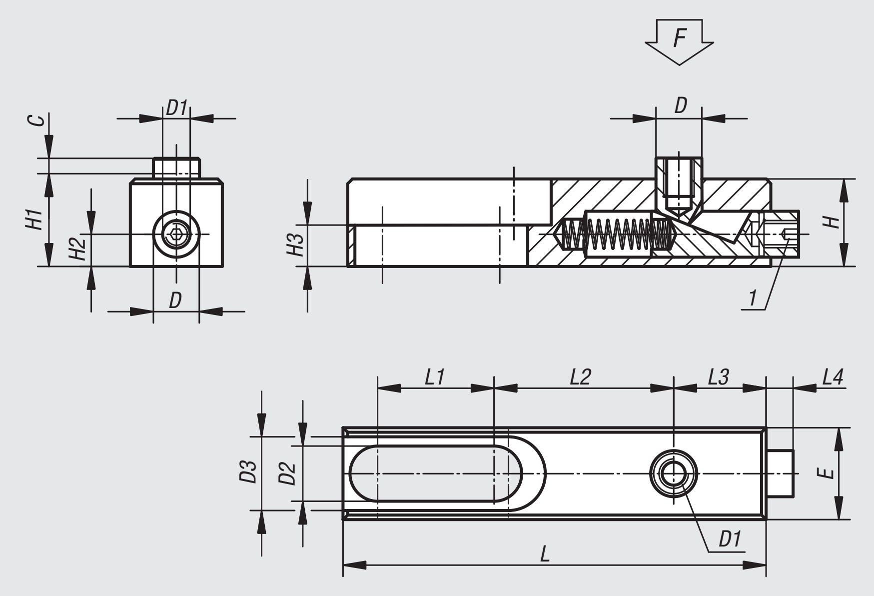
Material:
Steel.

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 02360-006

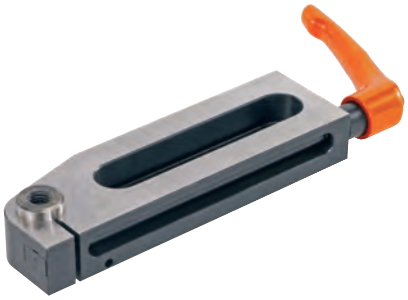
Note:
These supports are placed under long or thin workpieces to prevent vibration or bending during milling, drilling, grinding or shaping operations.

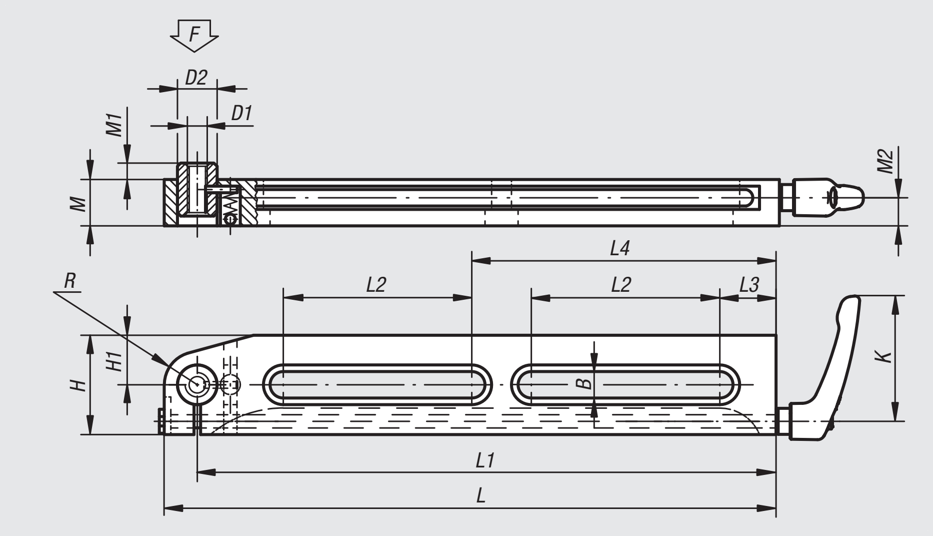
Drawing reference:
1) set screw



Order No.	C	D	D1	D2	D3	E	H	H1	H2	H3	L	L1	L2	L3	L4	F kN
02360-006	4	10	M6	8,2	16,2	20	19	19,5	7	9	92	25,5	39	20	6	3
02360-010	6	16	M10	12,5	24,4	30	30	31	10	10	149	44	61	32	11	15

Workpiece supports





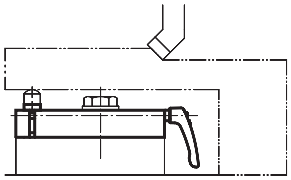
Material:
Steel.

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 02380-150

Note:
These supports are placed under long or thin workpieces to prevent vibration or bending during milling, drilling, grinding or shaping operations. The support can be accurately placed without the need to reach under the workpiece. The support pin contacts the workpiece under light pressure. It can be tightened in any position. Various types of pins can be screwed into the tapped hole in the thrust pin to adapt the support height.

The supports 02380-075, 02380-150 and 02380-170 have only 1 slot.



Order No.	K	L	L1	L2	L3	L4	B	H	H1	D1	D2	M	M1	M2	R	F N
02380-75	65	85	75	35	13	-	8,5	30	10	M8	13	19,5	3	11,5	-	500
02380-150	80	165	150	90	20	-	13	50	25	M10	20	24	6	14	15	2500
02380-170	110	190	170	100	25	-	17	60	20	M16	26	34	11	21,5	-	5000
02380-300	80	315	300	100	30	160	13	50	25	M10	20	24	6	14	15	2500

02385

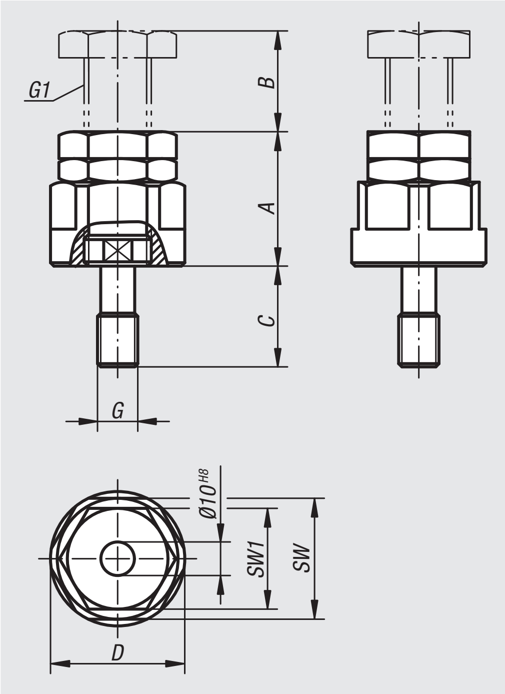
Jack screws

Material:
Carbon steel.

Version:
Black oxidised.
Adjustment spindle tempered.

Sample order:
nlm 02385-16100

Note:
Use the inserts 02387 to adapt the contact face to requirements.



Order No.	A min.	B max.	C	D	SW	SW1	G	G1
02385-12040	40	10	30	40	36	30	M12	M20x1,5
02385-12050	50	20	30	40	36	30	M12	M20x1,5
02385-12070	70	40	30	40	36	30	M12	M20x1,5
02385-12100	100	50	30	50	46	36	M12	M24x2
02385-12150	150	100	30	50	46	36	M12	M24x2
02385-16040	40	10	30	40	36	30	M16	M20x1,5
02385-16050	50	20	30	40	36	30	M16	M20x1,5
02385-16070	70	40	30	40	36	30	M16	M20x1,5
02385-16100	100	50	30	50	46	36	M16	M24x2
02385-16150	150	100	30	50	46	36	M16	M24x2

02387

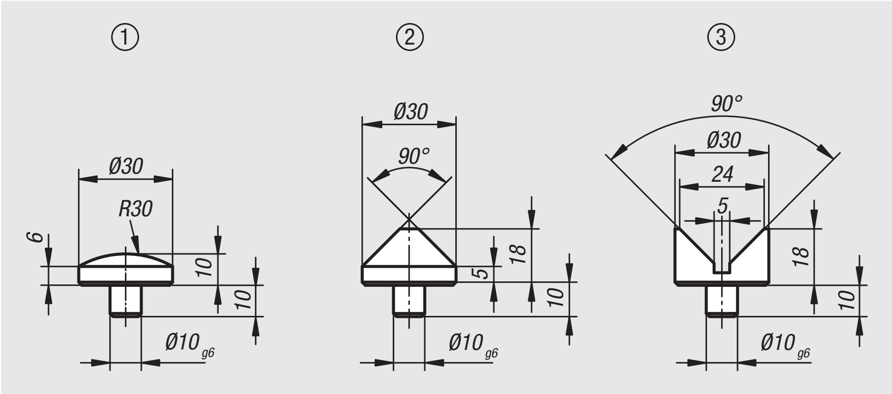
Inserts

Material:
Carbon steel.

Version:
Tempered to 1100-1200 N/mm², black oxidised.

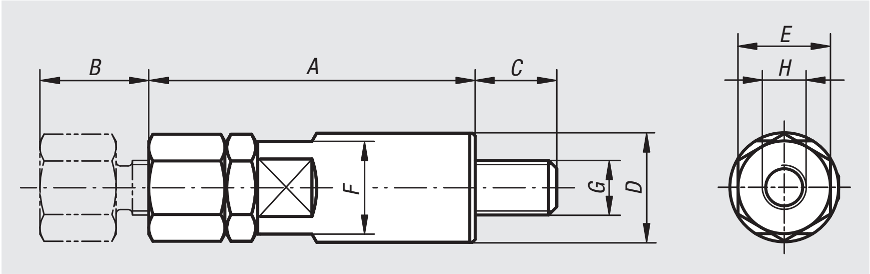
Sample order:
nlm 02387-02

Drawing reference:
1) rounded insert
2) cone insert
3) prism insert



Order No.	Version
02387-01	Rounded Insert
02387-02	Cone Insert
02387-03	Prism Insert

Jack screws extended



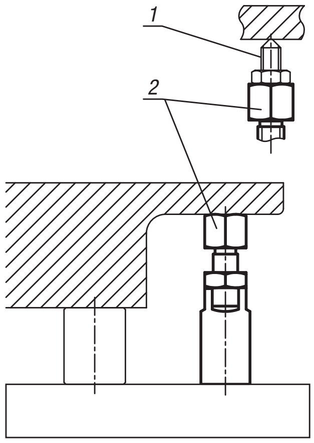
Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 02388-08040

Drawing reference:
1) screw rest
2) jack screw

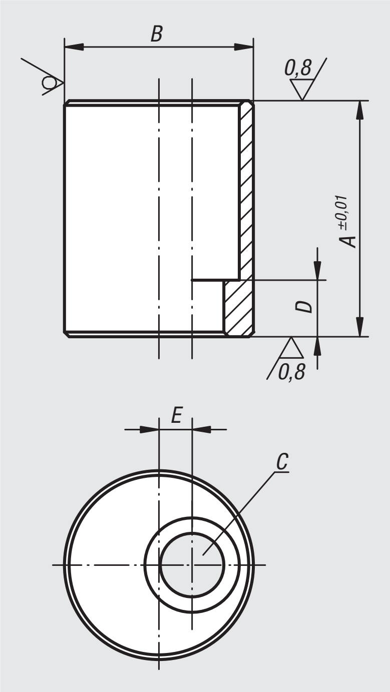
Jack screw for mounting various rests



Order No.	A	B	C	D	E	F	G	H
02388-08040	40	10	12	16	13	13	M8	M6 x 6
02388-08050	50	20	12	16	13	13	M8	M6 x 6
02388-10050	50	10	14	20	17	17	M10	M8 x 8
02388-10060	60	20	14	20	17	17	M10	M8 x 8
02388-12065	65	15	19	24	22	22	M12	M10 x 10
02388-12080	80	30	19	24	22	22	M12	M10 x 10
02388-16080	80	15	24	32	27	27	M16	M12 x 12
02388-16095	95	30	24	32	27	27	M16	M12 x 12

02390

Eccentric supports



Material:
Special steel alloy.

Version:
Tempered, black oxidised.
Contact faces ground.

Sample order:
nlm 02390-10040

Order No.	A	B	C hole for DIN 912 cap screw	D	E
02390-08016	16	25	M8	7	3,5
02390-08020	20	25	M8	7	3,5
02390-08025	25	25	M8	7	3,5
02390-08032	32	25	M8	7	3,5
02390-08040	40	25	M8	7	3,5
02390-08050	50	25	M8	7	3,5
02390-10020	20	32	M10	9	5
02390-10025	25	32	M10	9	5
02390-10032	32	32	M10	9	5
02390-10040	40	32	M10	9	5
02390-10050	50	32	M10	9	5
02390-10063	63	32	M10	9	5
02390-12020	20	40	M12	7	7
02390-12025	25	40	M12	12	7
02390-12032	32	40	M12	12	7
02390-12040	40	40	M12	12	7
02390-12050	50	40	M12	12	7
02390-12063	63	40	M12	12	7
02390-12080	80	40	M12	22	7
02390-12100	100	40	M12	22	7
02390-12125	125	40	M12	22	7
02390-16025	25	50	M16	8	10
02390-16032	32	50	M16	15	10
02390-16040	40	50	M16	15	10
02390-16050	50	50	M16	15	10
02390-16063	63	50	M16	15	10
02390-16080	80	50	M16	35	10
02390-16100	100	50	M16	35	10
02390-16125	125	50	M16	35	10

03000

Spring plungers
Indexing plungers
Stops
Centring/positioning components
Ball lock pins
T-slot nuts

Spring plungers with LONG-LOK thread lock

LONG-LOK, the most advanced thread locking mechanism

With the following crucial advantages:

1. Vibration resistant.

The integrated LONG-LOK thread lock secures spring plungers rationally and economically. No loosening or falling out after impacts, knocks or vibrations.

2. Extremly high loosening torque.

The elastic nylon insert is squeezed like a wedge between the internal and external threads. The nylon locking system pushes the play between the threads to one side causing surface pressure on the thread flanks. The resulting loosening torque is higher than that by most conventional mechanical methods.

3. Secure in every position.

The LONG-LOK thread lock requires neither initial tension nor any defined position. This is ideal for the positioning of the spring plungers.

4. Saves assembly time and stocking space.

The LONG-LOK thread lock is integrated into spring plungers. There are no additional components. No circlips, no spring washers, no locking nuts. As a result, assembly and stocking costs are reduced considerably.

5. For repeated use.

When using the LONG-LOK thread lock for the first time, it requires a slightly higher screw-in torque. After third or fourth use, the last reached value remains nearly constant.

6. Problem solver from M3 to M16.

Light-weight or heavy-weight: name your requirements! We will supply you with the suitable spring plungers with integrated LONG-LOK thread lock.

Spring plungers

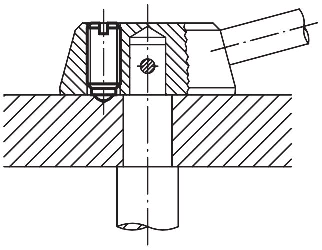
with slot and ball, steel

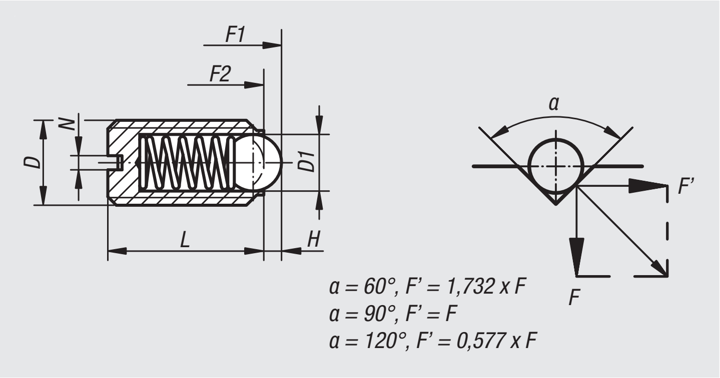
Material:
Sleeve steel grade 5.8.
Ball steel.
Spring grade D steel wire.

Version:
Black oxidised. Ball hardened.

Sample order:
nlm 03000-203

handle indexing





α = 60°, F' = 1,732 x F
α = 90°, F' = F
α = 120°, F' = 0,577 x F

Spring plungers with slot and ball, standard spring

Order No.	D	D1	L	H	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03000-03	M3	1,5	7	0,4	0,4	1,5	3
03000-04	M4	2,5	9	0,8	0,6	4	10
03000-05	M5	3	12	0,9	0,8	6	11
03000-06	M6	3,5	14	1	1	9	13
03000-08	M8	5	16	1,5	1,2	15	30
03000-10	M10	6	19	2	1,6	20	40
03000-12	M12	8	22	2,5	2	30	55
03000-16	M16	10	24	3,5	2,5	65	125
03000-20	M20	12	30	4,5	2,5	80	160

Spring plungers with slot and ball, reinforced spring

Order No.	D	D1	L	H	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03000-203	M3	1,5	7	0,4	0,4	5	7
03000-204	M4	2,5	9	0,8	0,6	12	22
03000-205	M5	3	12	0,9	0,8	19	30
03000-206	M6	3,5	14	1	1	28	40
03000-208	M8	5	16	1,5	1,2	47	73
03000-210	M10	6	19	2	1,6	66	100
03000-212	M12	8	22	2,5	2	66	120
03000-216	M16	10	24	3,5	2,5	90	180
03000-220	M20	12	30	4,5	2,5	115	240

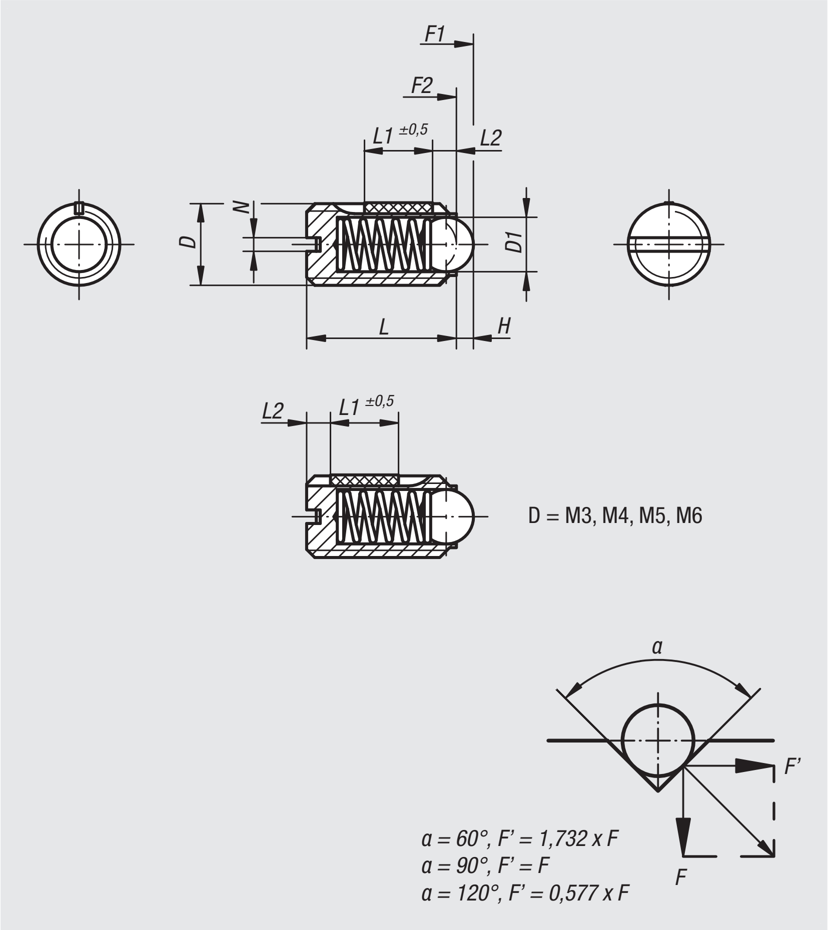
Spring plungers with slot and ball, long version, standard spring

Order No.	D	D1	L	H	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03000-404	M4	2,5	16	0,8	0,6	4	10
03000-405	M5	3	20	0,9	0,8	6	11
03000-406	M6	3,5	25	1	1	9	13
03000-408	M8	5	30	1,5	1,2	15	30
03000-410	M10	6	35	2	1,6	20	40
03000-412	M12	8	40	2,5	2	30	55
03000-416	M16	10	45	3,5	2,5	65	125

03001

Spring plungers

with slot and ball, LONG-LOK secured, steel



Material:
Sleeve steel grade 5.8.
Ball steel.
Spring steel wire grade D.

LONG-LOK thread lock Nylon.

Version:
Black oxidised. Ball hardened.

Sample order:
nlm 03001-12

Drawing reference:
L2 = approx. 2x thread pitch

Spring plungers with slot and ball, standard spring, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03001-03	M3	1,5	0,4	7	4	0,4	1,5	3	0,1	0,07
03001-04	M4	2,5	0,8	9	5	0,6	4	10	0,18	0,12
03001-05	M5	3	0,9	12	6	0,8	6	11	0,12	0,08
03001-06	M6	3,5	1	14	7	1	9	13	0,43	0,21
03001-08	M8	5	1,5	16	8	1,2	15	30	1,09	0,37
03001-10	M10	6	2	19	9	1,6	20	40	1,36	0,62
03001-12	M12	8	2,5	22	10	2	30	55	2,03	1,36
03001-16	M16	10	3,5	24	14	2,5	65	125	3,95	2,95

Spring plungers with slot and ball, reinforced spring, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03001-203	M3	1,5	0,4	7	4	0,4	5	7	0,1	0,07
03001-204	M4	2,5	0,8	9	5	0,6	12	22	0,18	0,12
03001-205	M5	3	0,9	12	6	0,8	19	30	0,12	0,08
03001-206	M6	3,5	1	14	7	1	28	40	0,43	0,21
03001-208	M8	5	1,5	16	8	1,2	47	73	1,09	0,37
03001-210	M10	6	2	19	9	1,6	66	100	1,36	0,62
03001-212	M12	8	2,5	22	10	2	66	120	2,03	1,36
03001-216	M16	10	3,5	24	14	2,5	90	180	3,95	2,95

03004

Spring plungers

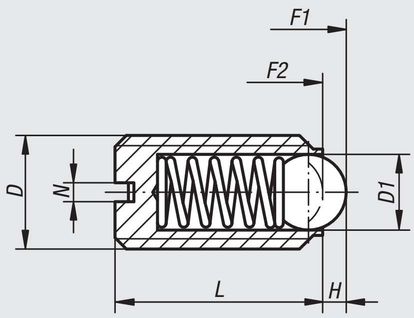
with slot and POM ball, plastic

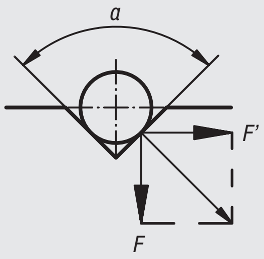
Material:
Sleeve plastic.
Ball POM.
Spring 1.4310 wire.

Version:
Ball, white.

Sample order:
nlm 03004-10

Note:
Spring plungers are used for indexing and positioning. They can also be used as ejectors.





a = 60°, F' = 1,732 x F
a = 90°, F' = F
a = 120°, F' = 0,577 x F

Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03004-06	M6	3,5	1	14	1	9	13
03004-08	M8	5	1,5	16	1,2	15	30
03004-10	M10	6	2	19	1,6	20	40

03008

Spring plungers

with slot and ceramic ball, stainless steel

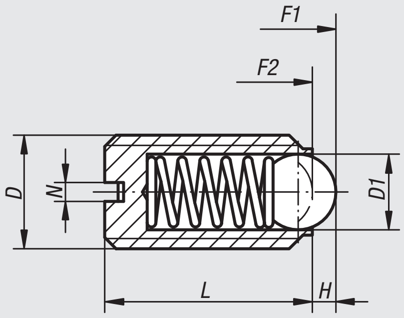
EDELSTAHL Rost frei STAINLESS STEEL

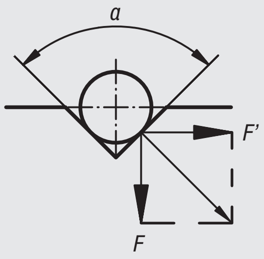
Material:
Sleeve 1.4305.
Ceramic ball Si_3N_4.
Spring 1.4310.

Version:
Bright.

Sample order:
nlm 03008-05

Note:
The combination of excellent material properties is a special feature of silicon nitride (Si_3N_4). These include high resiliance and stability, excellent wear properties and good chemical resistance.





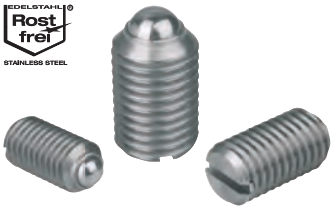
a = 60°, F' = 1,732 x F
a = 90°, F' = F
a = 120°, F' = 0,577 x F

Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03008-05	M5	3	0,9	12	0,8	6	11
03008-06	M6	3,5	1	14	1	9	13
03008-08	M8	5	1,5	16	1,2	15	30
03008-10	M10	6	2	19	1,6	20	35
03008-12	M12	8	2,5	22	2	30	55
03008-16	M16	10	3,5	24	2,5	65	125

03010

Spring plungers

with slot and ball, stainless steel

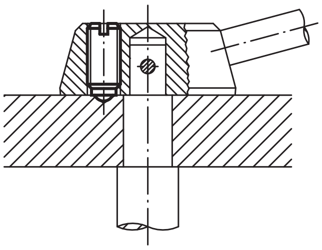


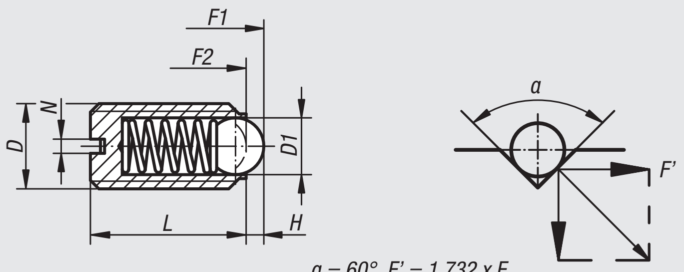
Material:
Sleeve 1.4305.
Ball 1.4034.
Spring 1.4310.

Version:
Bright. Ball hardened.

Sample order:
nlm 03010-203

handle indexing





α = 60°, F' = 1,732 x F
α = 90°, F' = F
α = 120°, F' = 0,577 x F

Spring plungers with slot and ball, standard spring

Order No.	D	D1	L	H	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03010-03	M3	1,5	7	0,4	0,4	1,5	3
03010-04	M4	2,5	9	0,8	0,6	4	10
03010-05	M5	3	12	0,9	0,8	6	11
03010-06	M6	3,5	14	1	1	9	13
03010-08	M8	5	16	1,5	1,2	15	30
03010-10	M10	6	19	2	1,6	20	35
03010-12	M12	8	22	2,5	2	30	55
03010-16	M16	10	24	3,5	2,5	65	125
03010-20	M20	12	30	4,5	2,5	80	160

Spring plungers with slot and ball, reinforced spring

Order No.	D	D1	L	H	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03010-203	M3	1,5	7	0,4	0,4	5	7
03010-204	M4	2,5	9	0,8	0,6	12	22
03010-205	M5	3	12	0,9	0,8	19	30
03010-206	M6	3,5	14	1	1	28	40
03010-208	M8	5	16	1,5	1,2	47	73
03010-210	M10	6	19	2	1,6	66	100
03010-212	M12	8	22	2,5	2	66	120
03010-216	M16	10	24	3,5	2,5	90	180
03010-220	M20	12	30	4,5	2,5	115	240

Spring plungers with slot and ball, long version, standard spring

Order No.	D	D1	L	H	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03010-404	M4	2,5	16	0,8	0,6	4	10
03010-405	M5	3	20	0,9	0,8	6	11
03010-406	M6	3,5	25	1	1	9	13
03010-408	M8	5	30	1,5	1,2	15	30
03010-410	M10	6	35	2	1,6	20	35
03010-412	M12	8	40	2,5	2	30	55
03010-416	M16	10	45	3,5	2,5	65	125

Spring plungers

with slot and ball, LONG-LOK secured, stainless steel

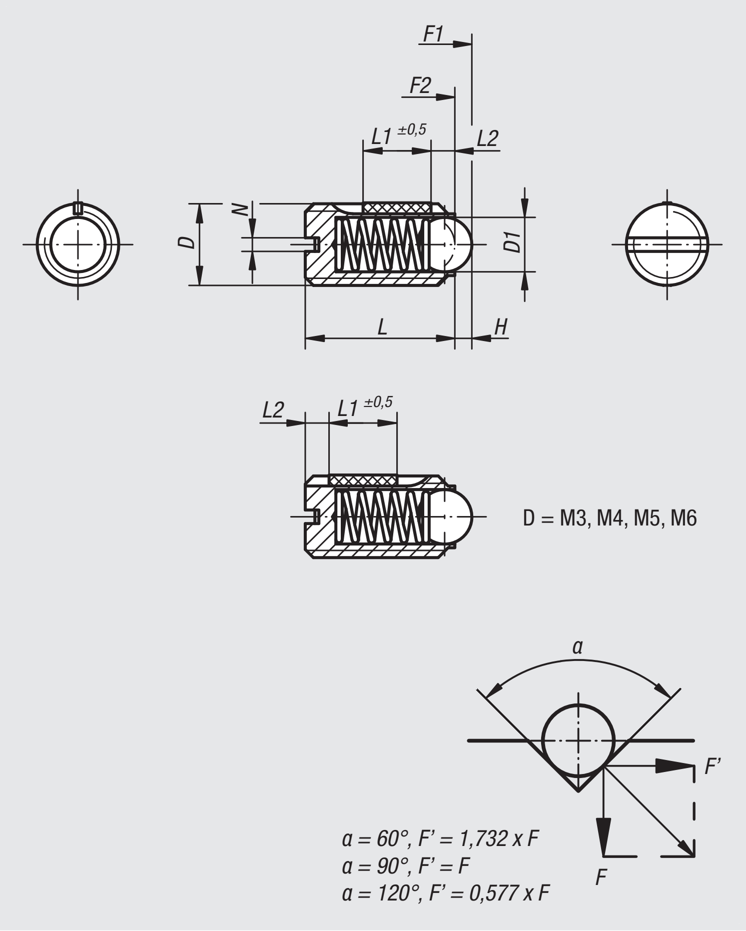
Material:
Sleeve 1.4305.
Ball 1.4034.
Spring 1.4310.

LONG-LOK thread lock, Nylon.

Version:
Bright. Ball hardened.

Sample order:
nlm 03011-12

Drawing reference:
L2 = approx. 2x thread pitch



Spring plungers with slot and ball, standard spring, LONG-LOK secured

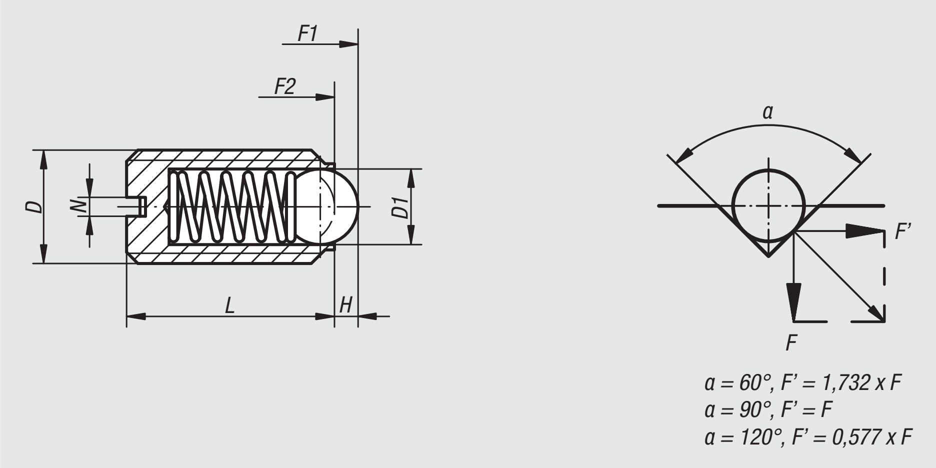
Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03011-03	M3	1,5	0,4	7	4	0,4	1,5	3	0,1	0,07
03011-04	M4	2,5	0,8	9	5	0,6	4	10	0,18	0,12
03011-05	M5	3	0,9	12	6	0,8	6	11	0,12	0,08
03011-06	M6	3,5	1	14	7	1	9	13	0,43	0,21
03011-08	M8	5	1,5	16	8	1,2	15	30	1,09	0,37
03011-10	M10	6	2	19	9	1,6	20	35	1,36	0,62
03011-12	M12	8	2,5	22	10	2	30	55	2,03	1,36
03011-16	M16	10	3,5	24	14	2,5	65	125	3,95	2,95

Spring plungers with slot and ball, reinforced spring, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03011-203	M3	1,5	0,4	7	4	0,4	5	7	0,1	0,07
03011-204	M4	2,5	0,8	9	5	0,6	12	22	0,18	0,12
03011-205	M5	3	0,9	12	6	0,8	19	30	0,12	0,08
03011-206	M6	3,5	1	14	7	1	28	40	0,43	0,21
03011-208	M8	5	1,5	16	8	1,2	47	73	1,09	0,37
03011-210	M10	6	2	19	9	1,6	66	100	1,36	0,62
03011-212	M12	8	2,5	22	10	2	66	120	2,03	1,36
03011-216	M16	10	3,5	24	14	2,5	90	180	3,95	2,95

Spring plungers

with slot and stainless steel ball, plastic



Material:
Sleeve plastic.
Ball 1.4034 stainless steel.
Spring 1.4310.

Version:
Ball, hardened.

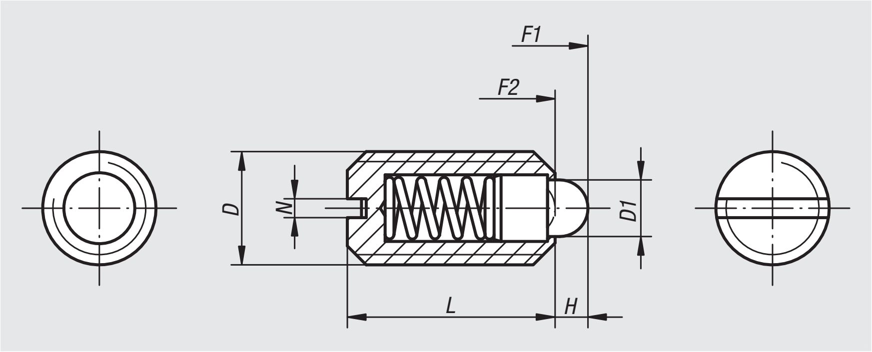
Sample order:
nlm 03014-10

Note:
Spring plungers are used for indexing and positioning. They can also be used as ejectors.

Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03014-06	M6	3,5	1	14	1	9	13
03014-08	M8	5	1,5	16	1,2	15	30
03014-10	M10	6	2	19	1,6	20	40

Spring plungers

with slot and thrust pin, steel



Material:
Sleeve steel grade 5.8.
Thrust pin steel.
Spring steel wire grade D.

Version:
Black oxidised.
Thrust pin hardened.

Sample order:
nlm 03020-10

Spring plungers with slot and thrust pin, standard spring force

Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03020-04	M4	1,8	1,5	9	0,6	6	20
03020-05	M5	2,4	2	12	0,8	6	20
03020-06	M6	2,7	2	14	1	7	20
03020-08	M8	4	2	16	1,2	15	30
03020-10	M10	4,5	2,5	19	1,6	20	35
03020-12	M12	6	3,5	22	2	30	55
03020-16	M16	8,5	4,5	24	2,5	45	100
03020-20	M20	10	6,5	30	2,5	60	120

Spring plungers with slot and thrust pin, light spring force

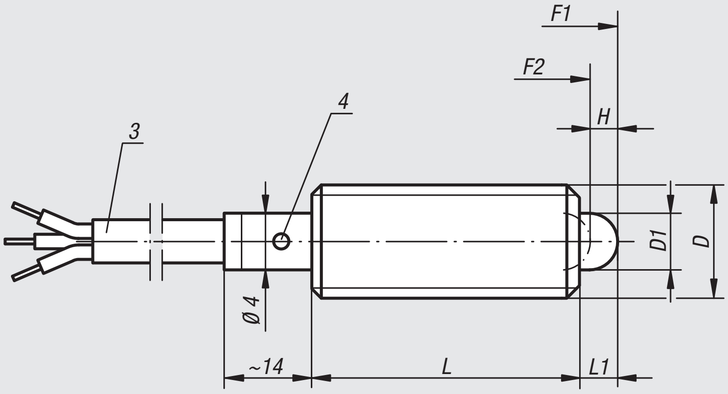
Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03020-104	M4	1,8	1,5	9	0,6	3	10
03020-105	M5	2,4	2	12	0,8	3	10
03020-106	M6	2,7	2	14	1	4	10
03020-108	M8	4	2	16	1,2	7	15
03020-110	M10	4,5	2,5	19	1,6	9	16
03020-112	M12	6	3,5	22	2	14	26
03020-116	M16	8,5	4,5	24	2,5	22	50
03020-120	M20	10	6,5	30	2,5	30	60

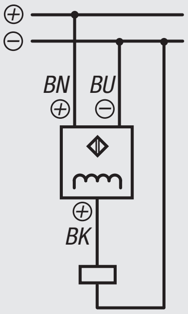
Spring plungers with slot and thrust pin, reinforced spring force

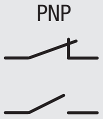
Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03020-205	M5	2,4	2	12	0,8	9	25
03020-206	M6	2,7	2	14	1	11	25
03020-208	M8	4	2	16	1,2	22	43
03020-210	M10	4,5	2,5	19	1,6	20	54
03020-212	M12	6	3,5	22	2	36	94
03020-216	M16	8,5	4,5	24	2,5	60	110

Spring plungers

with status sensor







Material:
Sleeve, thrust pin and spring steel.
Inductive proximity switch.

Version:
Black oxidised.
Thrust pin hardened.

Sample order:
nlm 03020-5081

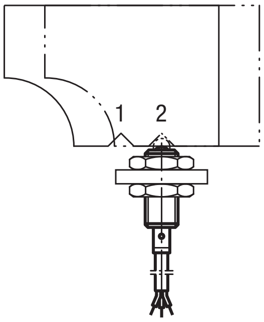
Note:
An electrical control signal can be sent via the built-in end switch.
Voltage: U = 10 – 30 V DC
Current: I max. = 200 mA
Temperature range: -25 °C – +70 °C
Protection class: IP 67

Safety:
Spring plungers with status sensor are not suitable for personal protection.

Drawing reference:
3) cable Ø 3.5 mm; length ca. 2 m
4) LED-indicator

BN = brown
BK = black
BU = blue

Example of position feedback:
Pos. 1: slide engaged
Pos. 2: slide disengaged

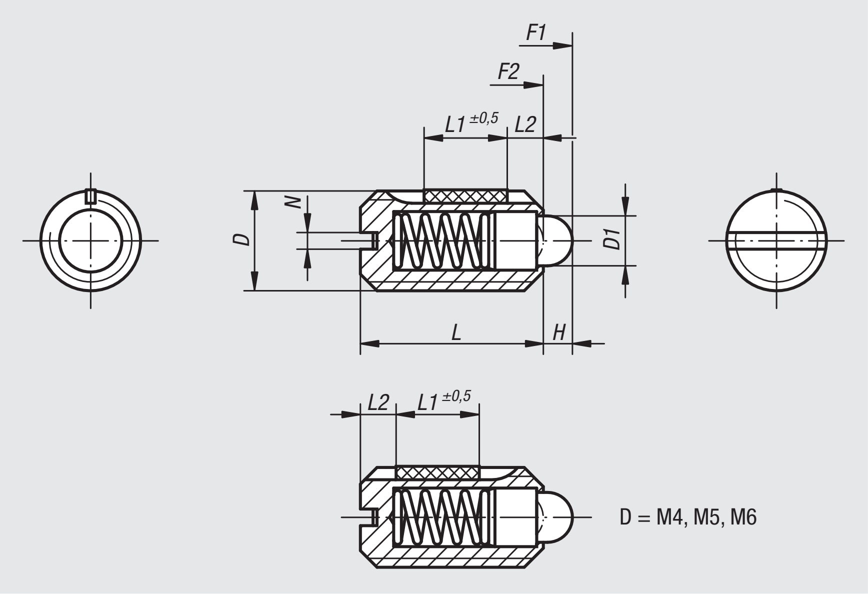


Order No.	Version 2	D	D1	H	L	L1	Switching contact from stroke H1	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03020-5061	normally closed	M6	2,7	2	27	3	1,2 - 1,6	7	20
03020-5081	normally closed	M8	4	2	29	3	1,2 - 1,8	15	30
03020-5101	normally closed	M10	4,5	3	36	4	2,2 - 2,8	26	44
03020-5062	normally open	M6	2,7	2	27	3	1,2 - 1,6	7	20
03020-5082	normally open	M8	4	2	29	3	1,2 - 1,8	15	30
03020-5102	normally open	M10	4,5	3	36	4	2,2 - 2,8	26	44

03021

Spring plungers

with slot and thrust pin, LONG-LOK secured, steel



Material:
Sleeve steel grade 5.8.
Thrust pin steel.
Spring grade D steel wire.

LONG-LOK thread lock Nylon.

Version:
Black oxidised.
Thrust pin hardened.

Sample order:
nlm 03021-10

Drawing reference:
L2 = approx. 2x thread pitch

Spring plungers with slot and thrust pin, standard spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03021-04	M4	1,8	1,5	9	5	0,6	6	20	0,18	0,12
03021-05	M5	2,4	2	12	6	0,8	6	20	0,12	0,08
03021-06	M6	2,7	2	14	7	1	7	20	0,44	0,21
03021-08	M8	4	2	16	8	1,2	15	30	1,1	0,38
03021-10	M10	4,5	2,5	19	9	1,6	20	35	1,36	0,62
03021-12	M12	6	3,5	22	10	2	30	55	2,11	1,41
03021-16	M16	8,5	4,5	24	14	2,5	45	100	3,95	3,05

Spring plungers with slot and thrust pin, light spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03021-104	M4	1,8	1,5	9	5	0,6	3	10	0,18	0,12
03021-105	M5	2,4	2	12	6	0,8	3	10	0,12	0,08
03021-106	M6	2,7	2	14	7	1	4	10	0,44	0,21
03021-108	M8	4	2	16	8	1,2	7	15	1,1	0,38
03021-110	M10	4,5	2,5	19	9	1,6	9	16	1,36	0,62
03021-112	M12	6	3,5	22	10	2	14	26	2,11	1,41
03021-116	M16	8,5	4,5	24	14	2,5	22	50	3,95	3,05

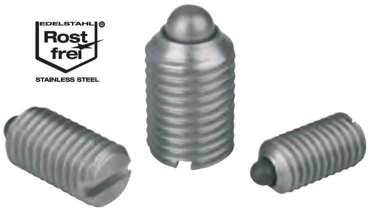
Spring plungers with slot and thrust pin, reinforced spring force, LONG-LOK secured

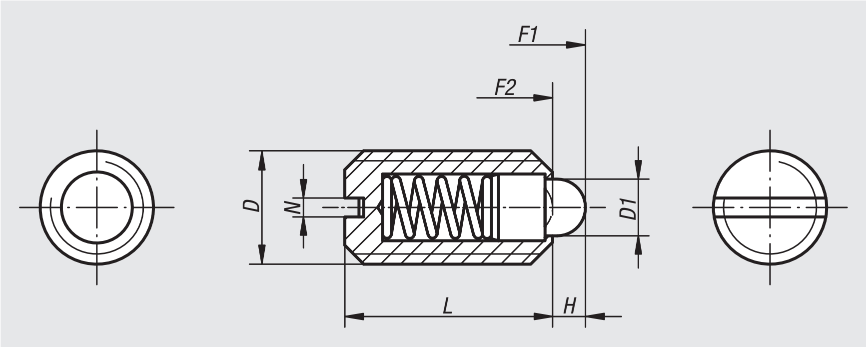
Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03021-205	M5	2,4	2	12	6	0,8	9	25	0,12	0,08
03021-206	M6	2,7	2	14	7	1	11	25	0,44	0,21
03021-208	M8	4	2	16	8	1,2	22	43	1,1	0,38
03021-210	M10	4,5	2,5	19	9	1,6	20	54	1,36	0,62
03021-212	M12	6	3,5	22	10	2	36	94	2,11	1,41
03021-216	M16	8,5	4,5	24	14	2,5	60	110	3,99	3,05

03025

Spring plungers

with slot and thrust pin, stainless steel





Material:
Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

Version:
Bright.
Thrust pin hardened.

Sample order:
nlm 03025-10

Spring plungers with slot and thrust pin, standard spring force

Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03025-04	M4	1,8	1,5	9	0,6	6	20
03025-05	M5	2,4	2	12	0,8	6	20
03025-06	M6	2,7	2	14	1	7	20
03025-08	M8	4	2	16	1,2	15	30
03025-10	M10	4,5	2,5	19	1,6	20	35
03025-12	M12	6	3,5	22	2	30	55
03025-16	M16	8,5	4,5	24	2,5	45	100
03025-20	M20	10	6,5	30	2,5	60	120

Spring plungers with slot and thrust pin, light spring force

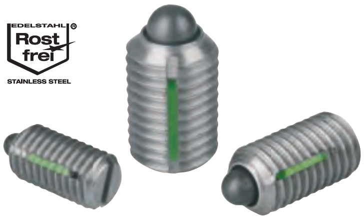
Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03025-104	M4	1,8	1,5	9	0,6	3	10
03025-105	M5	2,4	2	12	0,8	3	10
03025-106	M6	2,7	2	14	1	4	10
03025-108	M8	4	2	16	1,2	7	15
03025-110	M10	4,5	2,5	19	1,6	9	16
03025-112	M12	6	3,5	22	2	14	26
03025-116	M16	8,5	4,5	24	2,5	22	50
03025-120	M20	10	6,5	30	2,5	30	60

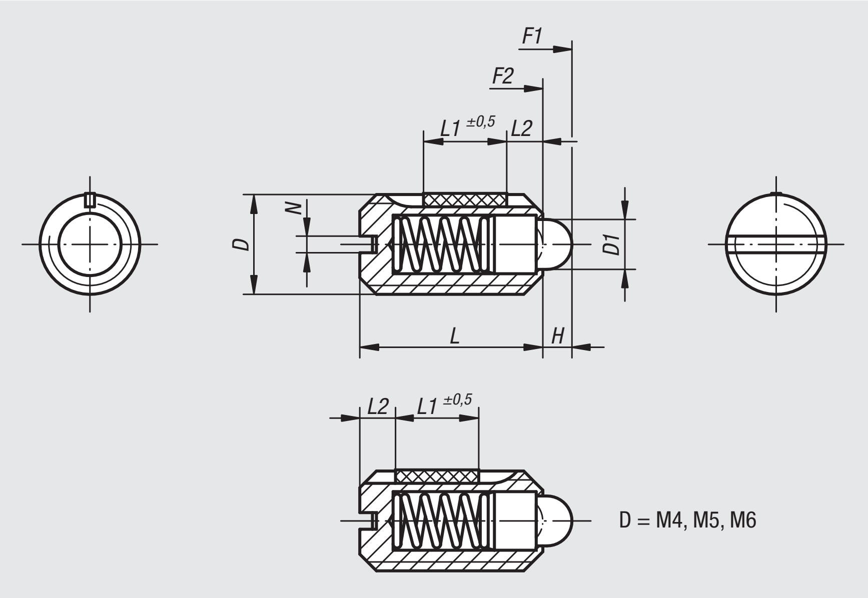
Spring plungers with slot and thrust pin, reinforced spring force

Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03025-205	M5	2,4	2	12	0,8	9	25
03025-206	M6	2,7	2	14	1	11	25
03025-208	M8	4	2	16	1,2	22	43
03025-210	M10	4,5	2,5	19	1,6	20	54
03025-212	M12	6	3,5	22	2	36	94
03025-216	M16	8,5	4,5	24	2,5	60	110

Spring plungers

with slot and thrust pin, LONG-LOK secured, stainless steel





Material:
Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

LONG-LOK thread lock Nylon.

Version:
Bright.
Thrust pin hardened.

Sample order:
nlm 03026-10

Drawing reference:
L2 = approx. 2x thread pitch

Spring plungers with slot and thrust pin, standard spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03026-04	M4	1,8	1,5	9	5	0,6	6	20	0,18	0,12
03026-05	M5	2,4	2	12	6	0,8	6	20	0,12	0,08
03026-06	M6	2,7	2	14	7	1	7	20	0,44	0,21
03026-08	M8	4	2	16	8	1,2	15	30	1,1	0,38
03026-10	M10	4,5	2,5	19	9	1,6	20	35	1,36	0,62
03026-12	M12	6	3,5	22	10	2	30	55	2,11	1,41
03026-16	M16	8,5	4,5	24	14	2,5	45	100	3,95	3,05

Spring plungers with slot and thrust pin, light spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03026-104	M4	1,8	1,5	9	5	0,6	3	10	0,18	0,12
03026-105	M5	2,4	2	12	6	0,8	3	10	0,12	0,08
03026-106	M6	2,7	2	14	7	1	4	10	0,44	0,21
03026-108	M8	4	2	16	8	1,2	7	15	1,1	0,38
03026-110	M10	4,5	2,5	19	9	1,6	9	16	1,36	0,62
03026-112	M12	6	3,5	22	10	2	14	26	2,11	1,41
03026-116	M16	8,5	4,5	24	14	2,5	22	50	3,95	3,05

Spring plungers with slot and thrust pin, reinforced spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03026-205	M5	2,4	2	12	6	0,8	9	25	0,12	0,08
03026-206	M6	2,7	2	14	7	1	11	25	0,44	0,21
03026-208	M8	4	2	16	8	1,2	22	43	1,1	0,38
03026-210	M10	4,5	2,5	19	9	1,6	20	54	1,36	0,62
03026-212	M12	6	3,5	22	10	2	36	94	2,11	1,41
03026-216	M16	8,5	4,5	24	14	2,5	60	110	3,99	3,05

Spring plungers

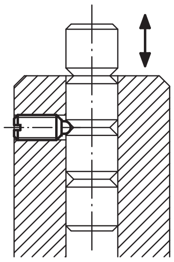
with hexagon socket and ball, steel

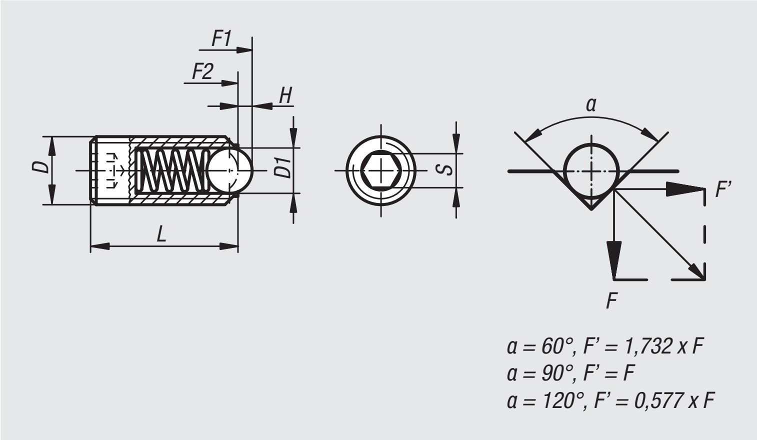
Material:
Sleeve steel grade 5.8.
Ball steel.
Spring grade D steel wire.

Version:
Black oxidised. Ball hardened.

Sample order:
nlm 03030-210

column indexing





α = 60°, F' = 1,732 x F
α = 90°, F' = F
α = 120°, F' = 0,577 x F

Spring plungers with hexagon socket and ball, standard spring

Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03030-03	M3	1,5	0,4	9	1,5	1,5	3
03030-04	M4	2,5	0,8	10	2	4	10
03030-05	M5	3	0,9	14	2,5	6	11
03030-06	M6	3,5	1	15	3	9	13
03030-08	M8	5	1,5	18	4	15	30
03030-10	M10	6	2	23	5	20	40
03030-12	M12	8	2,5	26	6	30	55
03030-16	M16	10	3,5	33	8	65	125
03030-20	M20	12	4,5	43	10	80	160
03030-24	M24	15	5,5	48	12	90	180

Spring plungers with hexagon socket and ball, reinforced spring

Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03030-203	M3	1,5	0,4	9	1,5	5	7
03030-204	M4	2,5	0,8	10	2	12	22
03030-205	M5	3	0,9	14	2,5	19	30
03030-206	M6	3,5	1	15	3	28	40
03030-208	M8	5	1,5	18	4	47	73
03030-210	M10	6	2	23	5	66	100
03030-212	M12	8	2,5	26	6	66	120
03030-216	M16	10	3,5	33	8	90	180
03030-220	M20	12	4,5	43	10	115	240
03030-224	M24	15	5,5	48	12	130	270

Spring plungers with hexagon socket and ball, long version, standard spring

Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03030-404	M4	2,5	0,8	16	2	4	10
03030-405	M5	3	0,9	20	2,5	6	11
03030-406	M6	3,5	1	25	3	9	13
03030-408	M8	5	1,5	30	4	15	30
03030-410	M10	6	2	35	5	20	40
03030-412	M12	8	2,5	40	6	30	55
03030-416	M16	10	3,5	45	8	65	125

03031

Spring plungers

with hexagon socket and ball, LONG-LOK secured, steel

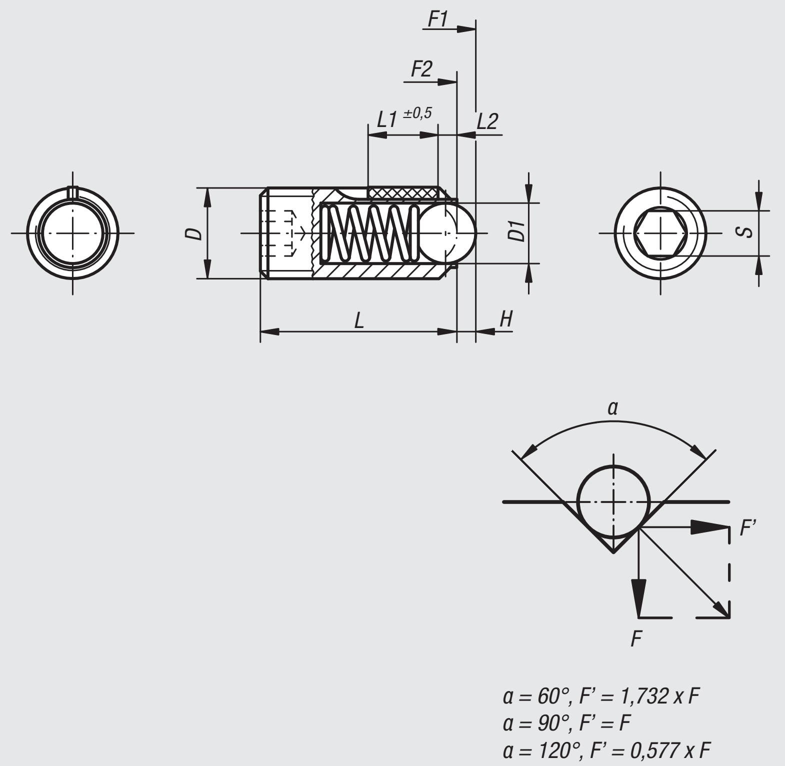
Material:
Sleeve steel grade 5.8.
Ball steel.
Spring grade D steel wire.

LONG-LOK thread lock Nylon.

Version:
Black oxidised. Ball hardened.

Sample order:
nlm 03031-08

Drawing reference:
L2 = approx. 2x thread pitch



a = 60°, F' = 1,732 x F
a = 90°, F' = F
a = 120°, F' = 0,577 x F

Spring plungers with hexagon socket and ball, standard spring, LONG-LOK secured

Order No.	D	D1	H	L	L1	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03031-03	M3	1,5	0,4	9	4	1,5	1,5	3	0,1	0,07
03031-04	M4	2,5	0,8	10	5	2	4	10	0,18	0,12
03031-05	M5	3	0,9	14	6	2,5	6	11	0,12	0,08
03031-06	M6	3,5	1	15	7	3	9	13	0,44	0,21
03031-08	M8	5	1,5	18	8	4	15	30	1,1	0,38
03031-10	M10	6	2	23	9	5	20	40	1,3	0,6
03031-12	M12	8	2,5	26	10	6	30	55	2	1,3
03031-16	M16	10	3,5	33	14	8	65	125	3,9	3

Spring plungers with hexagon socket and ball, reinforced spring, LONG-LOK secured

Order No.	D	D1	H	L	L1	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03031-203	M3	1,5	0,4	9	4	1,5	5	7	0,1	0,07
03031-204	M4	2,5	0,8	10	5	2	12	22	0,18	0,12
03031-205	M5	3	0,9	14	6	2,5	19	30	0,12	0,08
03031-206	M6	3,5	1	15	7	3	28	40	0,44	0,21
03031-208	M8	5	1,5	18	8	4	47	73	1,1	0,38
03031-210	M10	6	2	23	9	5	66	100	1,3	0,6
03031-212	M12	8	2,5	26	10	6	66	120	2	1,3
03031-216	M16	10	3,5	33	14	8	90	180	3,9	3

03033

Spring plungers

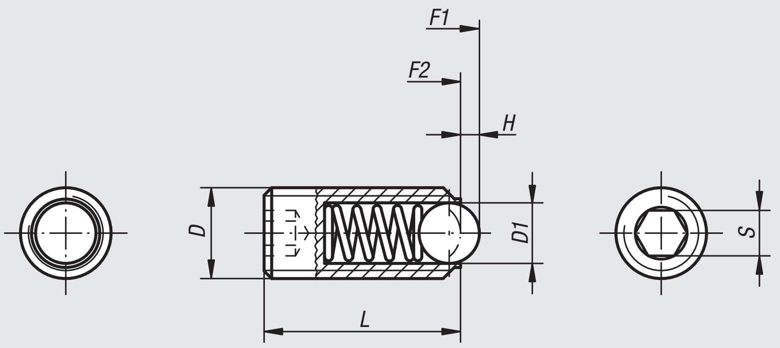
with hexagon socket and ceramic ball, stainless steel

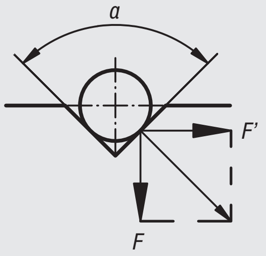
Material:
Sleeve 1.4305.
Ceramic ball Si_3N_4.
Spring 1.4310.

Version:
Bright.

Sample order:
nlm 03033-05

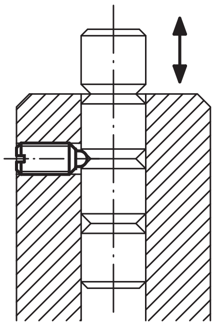
Note:
The combination of excellent material properties is a special feature of silicon nitride (Si_3N_4). These include high resiliance and stability, excellent wear properties and good chemical resistance.





a = 60°, F’ = 1,732 x F
a = 90°, F’ = F
a = 120°, F’ = 0,577 x F

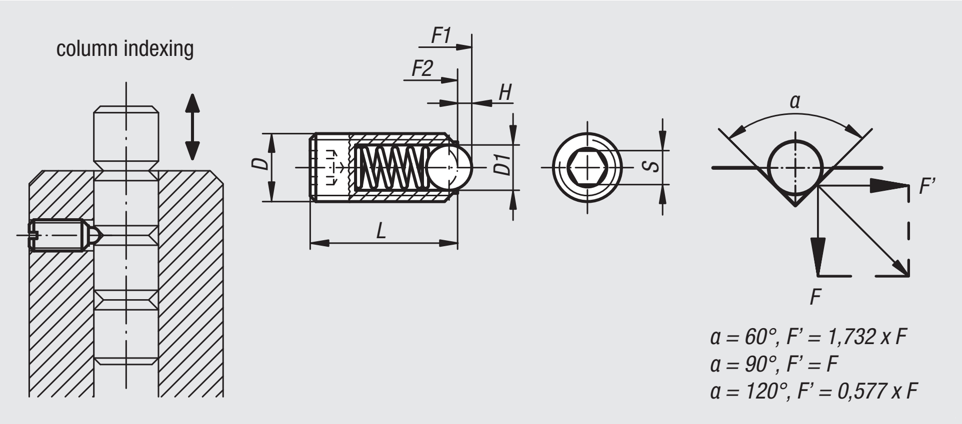
column indexing



Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03033-05	M5	3	0,9	14	2,5	6	11
03033-06	M6	3,5	1	15	3	9	13
03033-08	M8	5	1,5	18	4	15	30
03033-10	M10	6	2	23	5	20	35
03033-12	M12	8	2,5	26	6	30	55
03033-16	M16	10	3,5	33	8	65	125

Spring plungers

with hexagon socket and ball, stainless steel



a = 60°, F' = 1,732 x F
a = 90°, F' = F
a = 120°, F' = 0,577 x F

Material:
Sleeve 1.4305.
Ball 1.4034.
Spring 1.4310.

Version:
Bright. Ball hardened.

Sample order:
nlm 03030-210

Spring plungers with hexagon socket and ball, standard spring

Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03035-03	M3	1,5	0,4	9	1,5	1,5	3
03035-04	M4	2,5	0,8	10	2	4	10
03035-05	M5	3	0,9	14	2,5	6	11
03035-06	M6	3,5	1	15	3	9	13
03035-08	M8	5	1,5	18	4	15	30
03035-10	M10	6	2	23	5	20	35
03035-12	M12	8	2,5	26	6	30	55
03035-16	M16	10	3,5	33	8	65	125
03035-20	M20	12	4,5	43	10	80	160
03035-24	M24	15	5,5	48	12	90	180

Spring plungers with hexagon socket and ball, reinforced spring

Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03035-203	M3	1,5	0,4	9	1,5	5	7
03035-204	M4	2,5	0,8	10	2	12	22
03035-205	M5	3	0,9	14	2,5	19	30
03035-206	M6	3,5	1	15	3	28	40
03035-208	M8	5	1,5	18	4	47	73
03035-210	M10	6	2	23	5	66	100
03035-212	M12	8	2,5	26	6	66	120
03035-216	M16	10	3,5	33	8	90	180
03035-220	M20	12	4,5	43	10	115	240
03035-224	M24	15	5,5	48	12	130	270

Spring plungers with hexagon socket and ball, long version, standard spring

Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03035-404	M4	2,5	0,8	16	2	4	10
03035-405	M5	3	0,9	20	2,5	6	11
03035-406	M6	3,5	1	25	3	9	13
03035-408	M8	5	1,5	30	4	15	30
03035-410	M10	6	2	35	5	20	35
03035-412	M12	8	2,5	40	6	30	55
03035-416	M16	10	3,5	45	8	65	125

Spring plungers

with hexagon socket and ball, LONG-LOK secured stainless steel

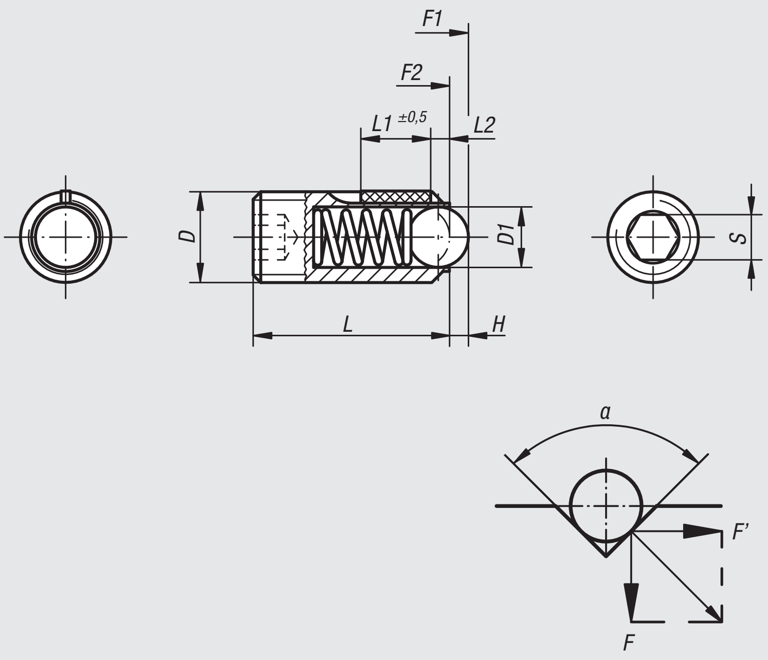
Material:
Sleeve 1.4305.
Ball 1.4034.
Spring 1.4310.

LONG-LOK thread lock, Nylon.

Version:
Bright. Ball hardened.

Sample order:
nlm 03036-08

Drawing reference:
L2 = approx. 2x thread pitch



α = 60°, F' = 1,732 x F
α = 90°, F' = F
α = 120°, F' = 0,577 x F

Spring plungers with hexagon socket and ball, standard spring, LONG-LOK secured

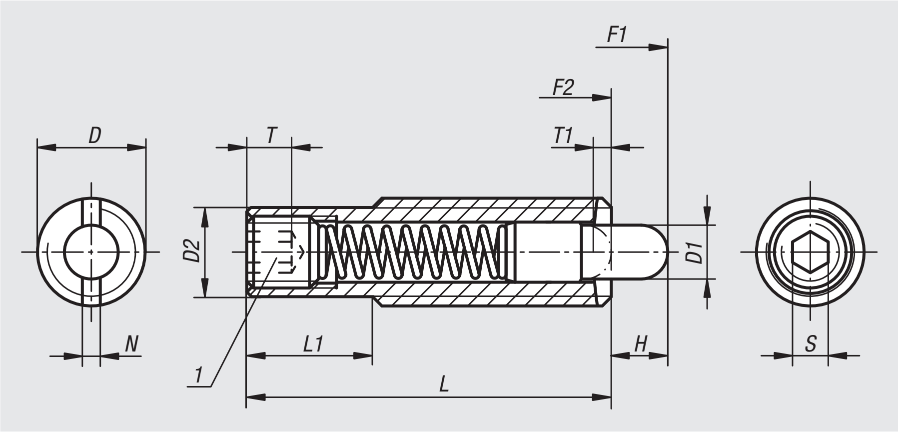
Order No.	D	D1	H	L	L1	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03036-03	M3	1,5	0,4	9	4	1,5	1,5	3	0,1	0,07
03036-04	M4	2,5	0,8	10	5	2	4	10	0,18	0,12
03036-05	M5	3	0,9	14	6	2,5	6	11	0,12	0,08
03036-06	M6	3,5	1	15	7	3	9	13	0,44	0,21
03036-08	M8	5	1,5	18	8	4	15	30	1,1	0,38
03036-10	M10	6	2	23	9	5	20	35	1,3	0,6
03036-12	M12	8	2,5	26	10	6	30	55	2	1,3
03036-16	M16	10	3,5	33	14	8	65	125	3,9	3

Spring plungers with hexagon socket and ball, reinforced spring, LONG-LOK secured

Order No.	D	D1	H	L	L1	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03036-203	M3	1,5	0,4	9	4	1,5	5	7	0,1	0,07
03036-204	M4	2,5	0,8	10	5	2	12	22	0,18	0,12
03036-205	M5	3	0,9	14	6	2,5	19	30	0,12	0,08
03036-206	M6	3,5	1	15	7	3	28	40	0,44	0,21
03036-208	M8	5	1,5	18	8	4	47	73	1,1	0,38
03036-210	M10	6	2	23	9	5	66	100	1,3	0,6
03036-212	M12	8	2,5	26	10	6	66	120	2	1,3
03036-216	M16	10	3,5	33	14	8	90	180	3,9	3

Spring plungers

with hexagon socket and thrust pin, long version



Material:
Sleeve steel grade 5.8.
Thrust pin steel.
Spring steel wire grade D.

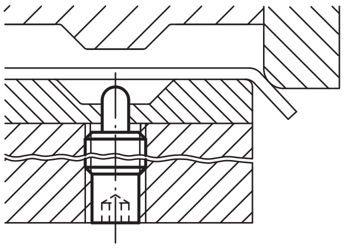
Version:
Black oxidised.
Thrust pin hardened.

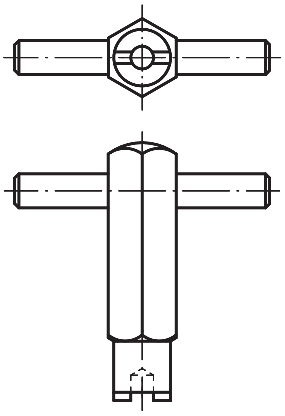
Sample order:
nlm 03040-616X60

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.

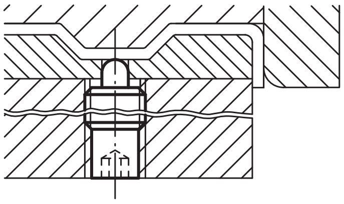
Drawing reference:
1) grub screw glued in

bending





ready to eject

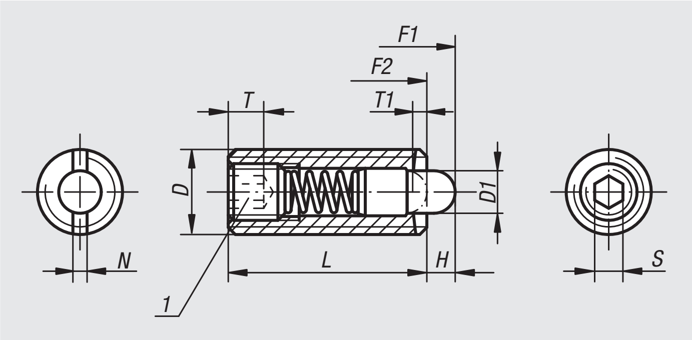


Order No.	D	D1	D2	L	L1	H	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03040-608X30	M8	3,5	6,2	30	10	6	2	1,4	1,2	2,5	8	20	03040-908
03040-608X40	M8	3,5	6,2	40	20	8	2	1,4	1,2	2,5	10	28	03040-908
03040-608X50	M8	3,5	6,2	50	30	10	2	1,4	1,2	2,5	12	38	03040-908
03040-608X60	M8	3,5	6,2	60	40	15	2	1,4	1,2	2,5	15	45	03040-908
03040-610X40	M10	4	8	40	10	8	2	1,4	1,6	3	12	30	03040-910
03040-610X50	M10	4	8	50	20	10	2	1,4	1,6	3	16	46	03040-910
03040-610X60	M10	4	8	60	30	15	2	1,4	1,6	3	20	55	03040-910
03040-610X80	M10	4	8	80	50	20	2	1,4	1,6	3	25	65	03040-910
03040-612X50	M12	6	9,6	50	20	10	3	2	2	4	20	50	03040-912
03040-612X60	M12	6	9,6	60	30	15	3	2	2	4	25	76	03040-912
03040-612X80	M12	6	9,6	80	50	20	3	2	2	4	35	102	03040-912
03040-612X100	M12	6	9,6	100	70	25	3	2	2	4	40	102	03040-912
03040-616X60	M16	7,5	13,4	60	30	12	6	2,5	2,5	5	30	64	03040-916
03040-616X80	M16	7,5	13,4	80	50	20	6	2,5	2,5	5	30	110	03040-916
03040-616X100	M16	7,5	13,4	100	70	30	6	2,5	2,5	5	30	120	03040-916
03040-616X120	M16	7,5	13,4	120	90	40	6	2,5	2,5	5	20	130	03040-916

03040

Spring plungers

with hexagon socket and thrust pin, steel

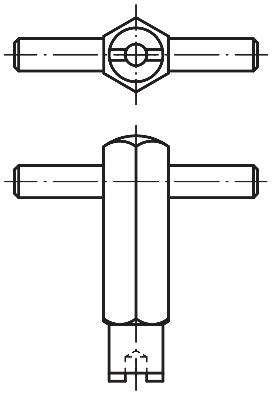


Material:
Sleeve steel grade 5.8.
Thrust pin steel.
Spring steel wire grade D.

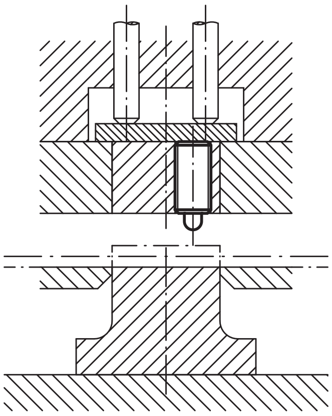
Version:
Black oxidised.
Thrust pin hardened.

Sample order:
nlm 03040-16

Drawing reference:
1) grub screw glued in



application example



Spring plungers with hexagon socket and thrust pin, standard spring force

Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03040-03	M3	1	1,5	10	1,5	1	0,4	0,7	0,5	3	03040-903
03040-04	M4	1,5	1,5	15	2	0,6	0,6	1,3	5	16	03040-904
03040-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	6	20	03040-905
03040-06	M6	2,7	2,5	20	2,5	1	1	2	7	20	03040-906
03040-08	M8	3,5	3	22	3	1,4	1,2	2,5	9	35	03040-908
03040-10	M10	4	3	22	3,5	1,4	1,6	3	9	35	03040-910
03040-12	M12	6	4	28	5	2	2	4	12	55	03040-912
03040-16	M16	7,5	5	32	6	2,5	2,5	5	45	100	03040-916
03040-20	M20	10	7	40	8	3	2,5	6	60	120	-
03040-24	M24	12	10	52	10	3	2,5	8	80	160	-

Spring plungers with hexagon socket and thrust pin, light spring force

Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03040-104	M4	1,5	1,5	15	2	0,6	0,6	1,3	2	7	03040-904
03040-105	M5	2,4	2,3	18	2	0,8	0,8	1,5	3	10	03040-905
03040-106	M6	2,7	2,5	20	2,5	1	1	2	3	9	03040-906
03040-108	M8	3,5	3	22	3	1,4	1,2	2,5	4	16	03040-908
03040-110	M10	4	3	22	3,5	1,4	1,6	3	4	16	03040-910
03040-112	M12	6	4	28	5	2	2	4	5	27	03040-912
03040-116	M16	7,5	5	32	6	2,5	2,5	5	20	45	03040-916

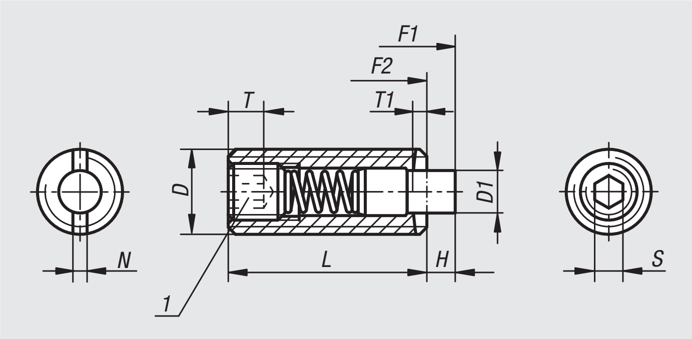
Spring plungers with hexagon socket and thrust pin, reinforced spring force

Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03040-205	M5	2,4	2,3	18	2	0,8	0,8	1,5	11	29	03040-905
03040-206	M6	2,7	2,5	20	2,5	1	1	2	14	37	03040-906
03040-208	M8	3,5	3	22	3	1,4	1,2	2,5	22	65	03040-908
03040-210	M10	4	3	22	3,5	1,4	1,6	3	19	70	03040-910
03040-212	M12	6	4	28	5	2	2	4	25	85	03040-912
03040-216	M16	7,5	5	32	6	2,5	2,5	5	60	150	03040-916
03040-220	M20	10	7	40	8	3	2,5	6	75	190	-
03040-224	M24	12	10	52	10	3	2,5	8	95	240	-

03040-02

Spring plungers

with hexagon socket and flattened thrust pin, steel



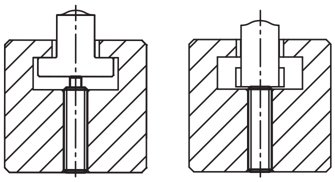
Material:
Sleeve steel grade 5.8.
Thrust pin steel.
Spring steel wire grade D.

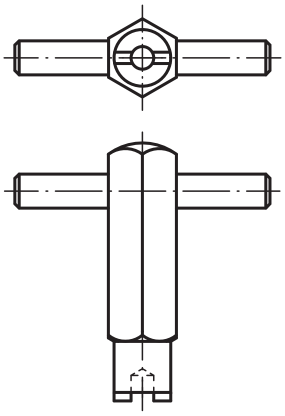
Version:
Black oxidised.
Thrust pin hardened.

Sample order:
nlm 03040-02-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

Drawing reference:
1) grub screw glued in



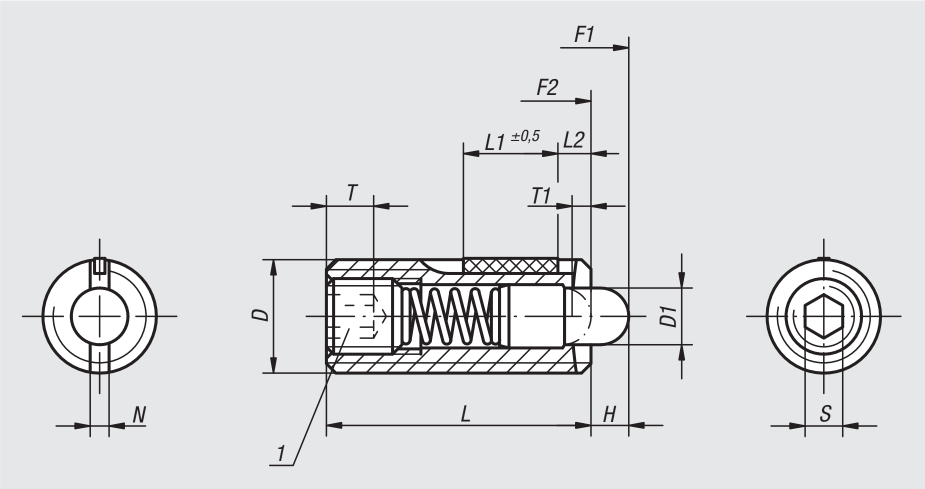


Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03040-02-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	6	20	03040-905
03040-02-06	M6	2,7	2,5	20	2,5	1	1	2	7	20	03040-906
03040-02-08	M8	3,5	3	22	3	1,4	1,2	2,5	9	35	03040-908
03040-02-10	M10	4	3	22	3,5	1,4	1,6	3	9	35	03040-910
03040-02-12	M12	6	4	28	5	2	2	4	12	55	03040-912
03040-02-16	M16	7,5	5	32	6	2,5	2,5	5	45	100	03040-916
03040-02-20	M20	10	7	40	8	3	2,5	6	60	120	-

03041

Spring plungers

with hexagon socket and thrust pin, LONG-LOK secured, steel



Material:
Sleeve steel grade 5.8.
Thrust pin steel.
Spring grade D steel wire.

LONG-LOK thread lock nylon.

Version:
Black oxidised.
Thrust pin hardened.

Sample order:
nlm 03041-12

Drawing reference:
L2 = ca. two full threads

1) grub screw glued-in

Spring plungers with hexagon socket and thrust pin, standard spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03041-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	6	20	0,12	0,08	03040-905
03041-06	M6	2,7	2,5	20	7	2,5	1	1	2	7	20	0,45	0,22	03040-906
03041-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	9	35	1,05	0,37	03040-908
03041-10	M10	4	3	22	9	3,5	1,4	1,6	3	9	35	1,3	0,6	03040-910
03041-12	M12	6	4	28	10	5	2	2	4	12	55	2	1,3	03040-912
03041-16	M16	7,5	5	32	14	6	2,5	2,5	5	45	100	3,9	3	03040-916

Spring plungers with hexagon socket and thrust pin, light spring force, LONG-LOK secured

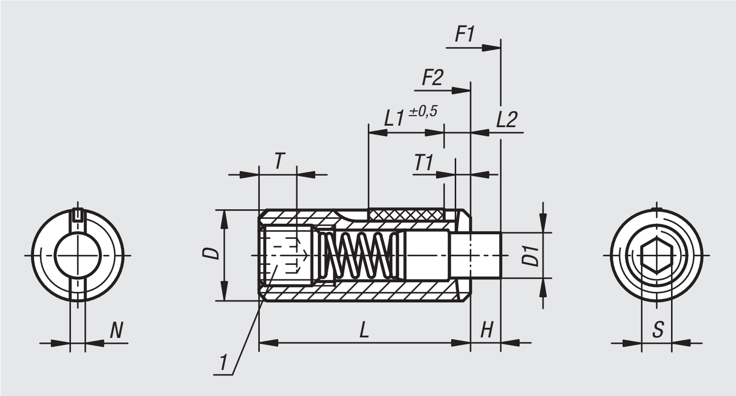
Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03041-105	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	3	10	0,12	0,08	03040-905
03041-106	M6	2,7	2,5	20	7	2,5	1	1	2	3	9	0,45	0,22	03040-906
03041-108	M8	3,5	3	22	8	3	1,4	1,2	2,5	4	16	1,05	0,37	03040-908
03041-110	M10	4	3	22	9	3,5	1,4	1,6	3	4	16	1,3	0,6	03040-910
03041-112	M12	6	4	28	10	5	2	2	4	5	27	2	1,3	03040-912
03041-116	M16	7,5	5	32	14	6	2,5	2,5	5	20	45	3,9	3	03040-916

Spring plungers with hexagon socket and thrust pin, reinforced spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03041-205	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	11	29	0,12	0,08	03040-905
03041-206	M6	2,7	2,5	20	7	2,5	1	1	2	14	37	0,45	0,22	03040-906
03041-208	M8	3,5	3	22	8	3	1,4	1,2	2,5	22	65	1,05	0,37	03040-908
03041-210	M10	4	3	22	9	3,5	1,4	1,6	3	19	70	1,3	0,6	03040-910
03041-212	M12	6	4	28	10	5	2	2	4	25	85	2	1,3	03040-912
03041-216	M16	7,5	5	32	14	6	2,5	2,5	5	60	150	3,9	3	03040-916

Spring plungers

with hexagon socket and flattened thrust pin, steel, LONG-LOK lock



Material:
Sleeve steel grade 5.8.
Thrust pin steel.
Spring grade D steel wire.

LONG-LOK thread lock nylon.

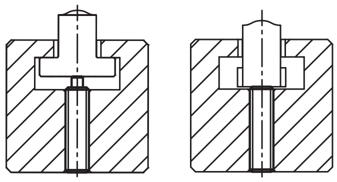
Version:
Black oxidised.
Thrust pin hardened.

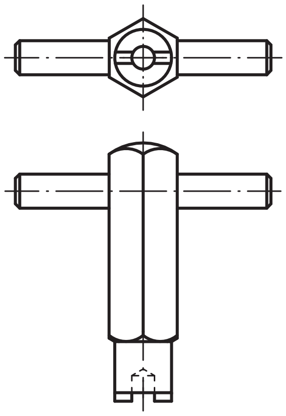
Sample order:
nlm 03041-01-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

Drawing reference:
L2 = ca. two full threads

1) grub screw glued-in



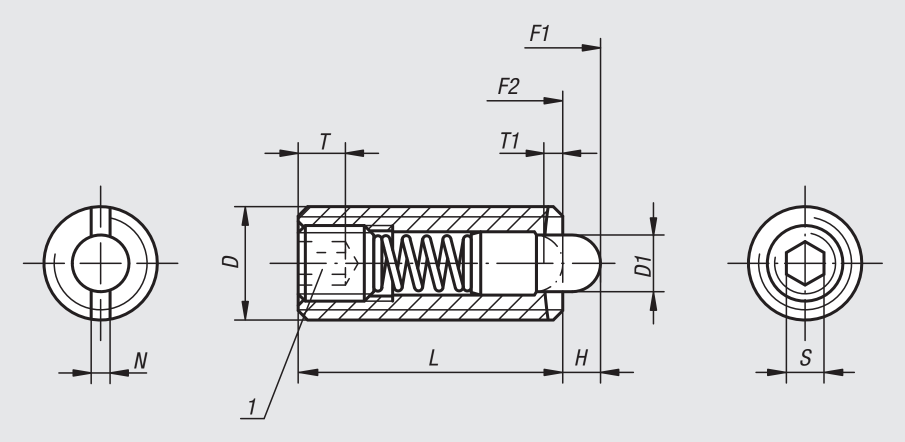


Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03041-01-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	6	20	0,12	0,08	03040-905
03041-01-06	M6	2,7	2,5	20	7	2,5	1	1	2	7	20	0,45	0,22	03040-906
03041-01-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	9	35	1,05	0,37	03040-908
03041-01-10	M10	4	3	22	9	3,5	1,4	1,6	3	9	35	1,3	0,6	03040-910
03041-01-12	M12	6	4	28	10	5	2	2	4	12	55	2	1,3	03040-912
03041-01-16	M16	7,5	5	32	14	6	2,5	2,5	5	45	100	3,9	3	03040-916

03050

Spring plungers

with hexagon socket and POM thrust pin, steel



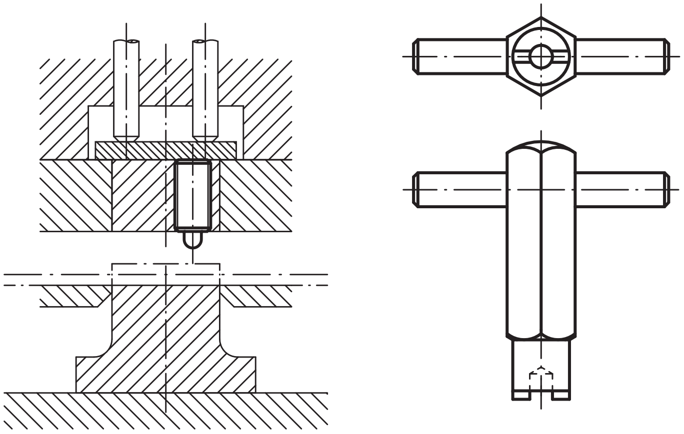
Material:
Sleeve steel grade 5.8.
Thrust pin POM.
Spring grade D steel wire.

Version:
Black oxidised.

Sample order:
nlm 03050-16

Drawing reference:
1) grub screw glued in

application example



Spring plungers with hexagon socket and thrust pin, standard spring force

Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03050-03	M3	1	1,5	10	1,5	1	0,4	0,7	0,5	3	03040-903
03050-04	M4	1,5	1,5	15	2	0,6	0,6	1,3	5	16	03040-904
03050-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	6	20	03040-905
03050-06	M6	2,7	2,5	20	2,5	1	1	2	7	20	03040-906
03050-08	M8	3,5	3	22	3	1,4	1,2	2,5	9	35	03040-908
03050-10	M10	4	3	22	3,5	1,4	1,6	3	9	35	03040-910
03050-12	M12	6	4	28	5	2	2	4	12	55	03040-912
03050-16	M16	7,5	5	32	6	2,5	2,5	5	45	100	03040-916

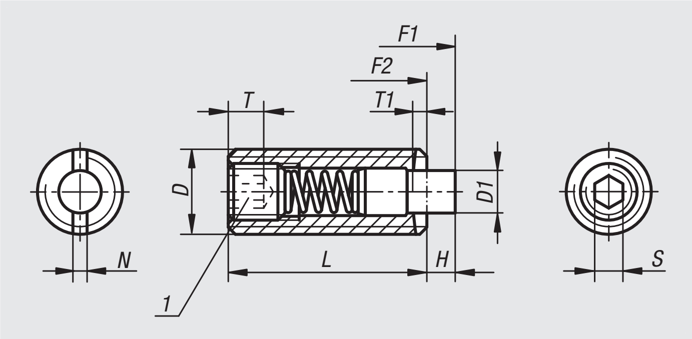
Spring plungers with hexagon socket and thrust pin, light spring force

Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03050-104	M4	1,5	1,5	15	2	0,6	0,6	1,3	2	7	03040-904
03050-105	M5	2,4	2,3	18	2	0,8	0,8	1,5	3	10	03040-905
03050-106	M6	2,7	2,5	20	2,5	1	1	2	3	9	03040-906
03050-108	M8	3,5	3	22	3	1,4	1,2	2,5	4	16	03040-908
03050-110	M10	4	3	22	3,5	1,4	1,6	3	4	16	03040-910
03050-112	M12	6	4	28	5	2	2	4	5	27	03040-912
03050-116	M16	7,5	5	32	6	2,5	2,5	5	20	45	03040-916

03050-01

Spring plungers

with hexagon socket and flattened POM thrust pin, steel



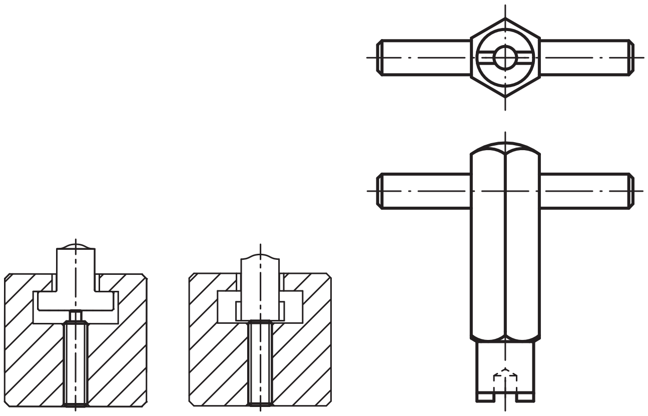
Material:
Sleeve steel grade 5.8.
Thrust pin POM.
Spring grade D steel wire.

Version:
Black oxidised.

Sample order:
nlm 03050-01-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

Drawing reference:
1) grub screw glued in

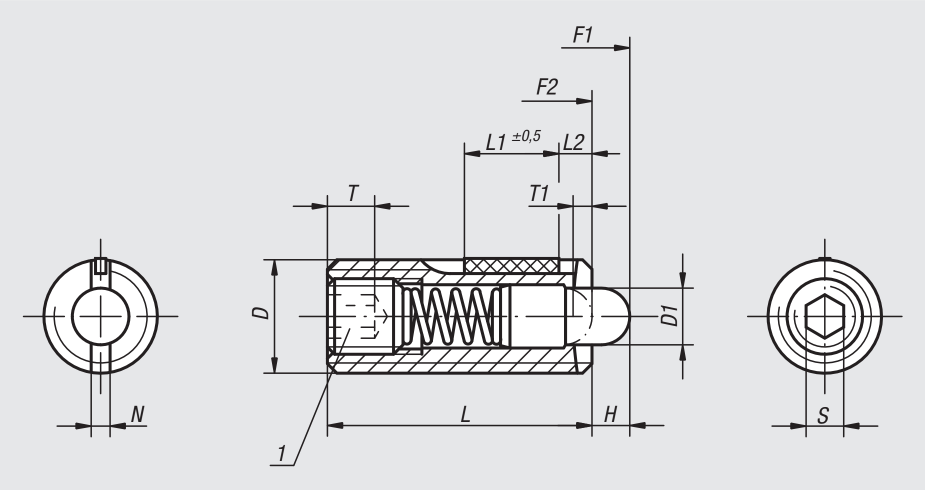


Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03050-01-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	6	20	03040-905
03050-01-06	M6	2,7	2,5	20	2,5	1	1	2	7	20	03040-906
03050-01-08	M8	3,5	3	22	3	1,4	1,2	2,5	9	35	03040-908
03050-01-10	M10	4	3	22	3,5	1,4	1,6	3	9	35	03040-910
03050-01-12	M12	6	4	28	5	2	2	4	12	55	03040-912
03050-01-16	M16	7,5	5	32	6	2,5	2,5	5	45	100	03040-916

03051

Spring plungers

with hexagon socket and POM thrust pin, LONG-LOK secured, steel



Material:
Sleeve steel grade 5.8.
Thrust pin POM.
Spring grade D steel wire.

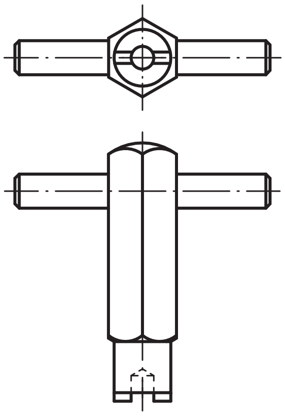
LONG-LOK thread lock Nylon.

Version:
Black oxidised.

Sample order:
nlm 03051-12

Drawing reference:
L2 = ca. two full threads

1) grub screw glued-in



Spring plungers with hexagon socket and thrust pin, standard spring force, LONG-LOK secured

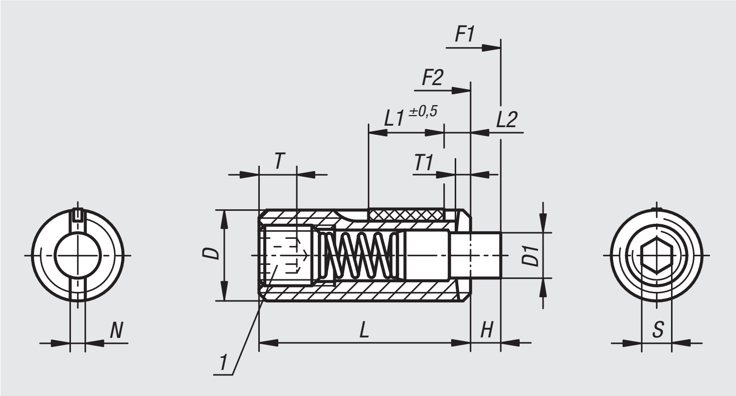
Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03051-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	6	20	0,12	0,08	03040-905
03051-06	M6	2,7	2,5	20	7	2,5	1	1	2	7	20	0,45	0,22	03040-906
03051-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	9	35	1,05	0,37	03040-908
03051-10	M10	4	3	22	9	3,5	1,4	1,6	3	9	35	1,3	0,6	03040-910
03051-12	M12	6	4	28	10	5	2	2	4	12	55	2	1,3	03040-912
03051-16	M16	7,5	5	32	14	6	2,5	2,5	5	45	100	3,9	3	03040-916

Spring plungers with hexagon socket and thrust pin, light spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03051-105	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	3	10	0,12	0,08	03040-905
03051-106	M6	2,7	2,5	20	7	2,5	1	1	2	3	9	0,45	0,22	03040-906
03051-108	M8	3,5	3	22	8	3	1,4	1,2	2,5	4	16	1,05	0,37	03040-908
03051-110	M10	4	3	22	9	3,5	1,4	1,6	3	4	16	1,3	0,6	03040-910
03051-112	M12	6	4	28	10	5	2	2	4	5	27	2	1,3	03040-912
03051-116	M16	7,5	5	32	14	6	2,5	2,5	5	20	45	3,9	3	03040-916

Spring plungers

with hexagon socket and flattened POM thrust pin, steel, LONG-LOK lock



Material:
Sleeve steel grade 5.8.
Thrust pin POM.
Spring grade D steel wire.

LONG-LOK thread lock Nylon.

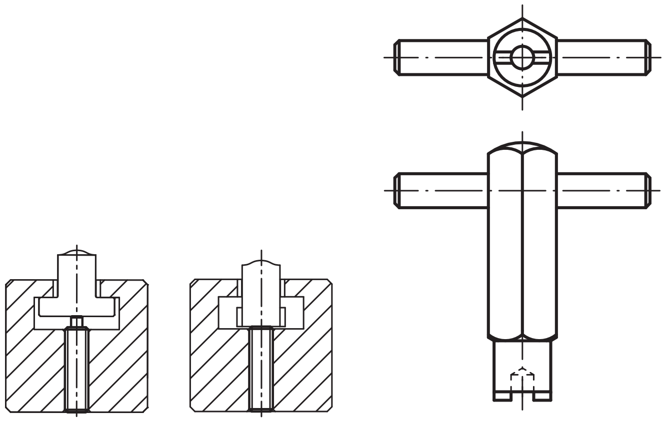
Version:
Black oxidised.

Sample order:
nlm 03051-01-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

Drawing reference:
L2 = ca. two full threads

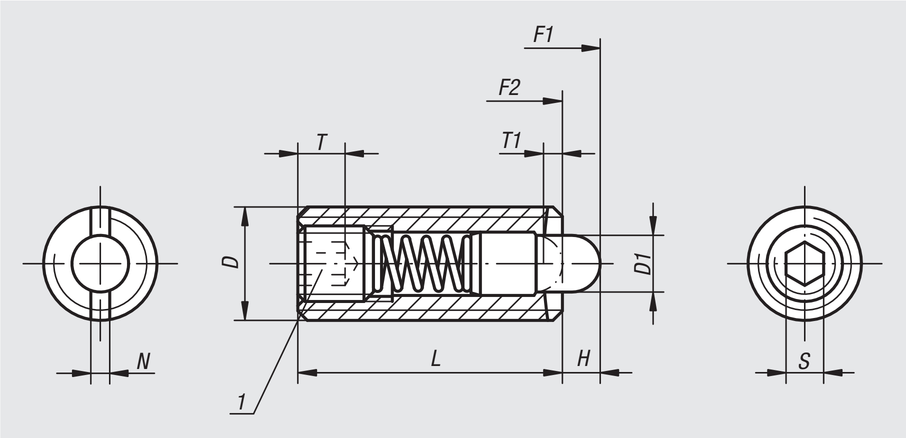
1) grub screw glued-in



Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03051-01-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	6	20	0,12	0,08	03040-905
03051-01-06	M6	2,7	2,5	20	7	2,5	1	1	2	7	20	0,45	0,22	03040-906
03051-01-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	9	35	1,05	0,37	03040-908
03051-01-10	M10	4	3	22	9	3,5	1,4	1,6	3	9	35	1,3	0,6	03040-910
03051-01-12	M12	6	4	28	10	5	2	2	4	12	55	2	1,3	03040-912
03051-01-16	M16	7,5	5	32	14	6	2,5	2,5	5	45	100	3,9	3	03040-916

Spring plungers

with hexagon socket and thrust pin, stainless steel



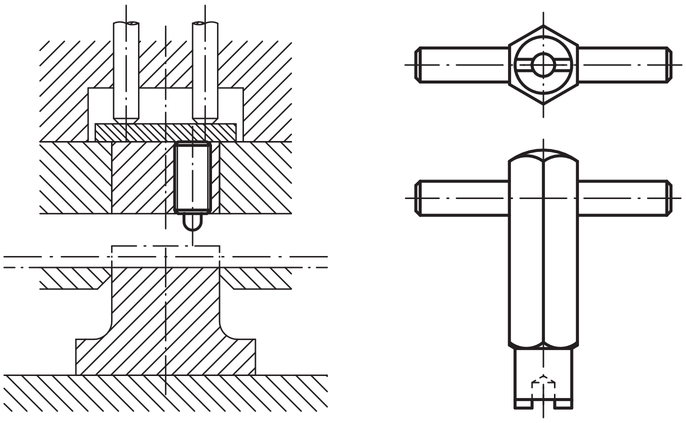
Material:
Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

Version:
Bright.
Thrust pin hardened.

Sample order:
nlm 03055-16

Drawing reference:
1) grub screw glued in

application example



Spring plungers with hexagon socket and thrust pin, standard spring force

Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03055-03	M3	1	1,5	10	1,5	1	0,4	0,7	0,4	2,5	03040-903
03055-04	M4	1,5	1,5	15	2	0,6	0,6	1,3	5	16	03040-904
03055-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	5	17	03040-905
03055-06	M6	2,7	2,5	20	2,5	1	1	2	6	17	03040-906
03055-08	M8	3,5	3	22	3	1,4	1,2	2,5	7	29	03040-908
03055-10	M10	4	3	22	3,5	1,4	1,6	3	8	31	03040-910
03055-12	M12	6	4	28	5	2	2	4	10	47	03040-912
03055-16	M16	7,5	5	32	6	2,5	2,5	5	38	85	03040-916

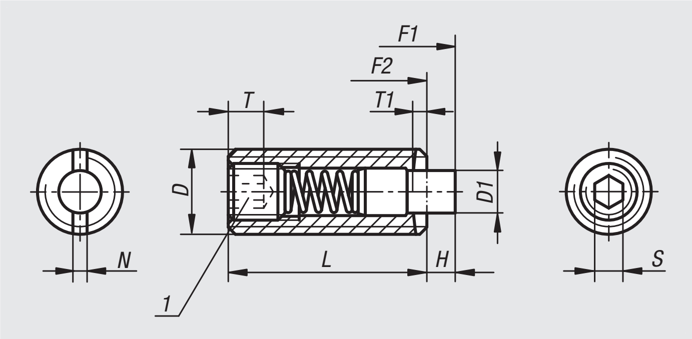
Spring plungers with hexagon socket and thrust pin, reinforced spring force

Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03055-205	M5	2,4	2,3	18	2	0,8	0,8	1,5	9	26	03040-905
03055-206	M6	2,7	2,5	20	2,5	1	1	2	11	35	03040-906
03055-208	M8	3,5	3	22	3	1,4	1,2	2,5	15	48	03040-908
03055-210	M10	4	3	22	3,5	1,4	1,6	3	15	58	03040-910
03055-212	M12	6	4	28	5	2	2	4	19	74	03040-912

03055-01

Spring plungers

with hexagon socket and flattened thrust pin, stainless steel



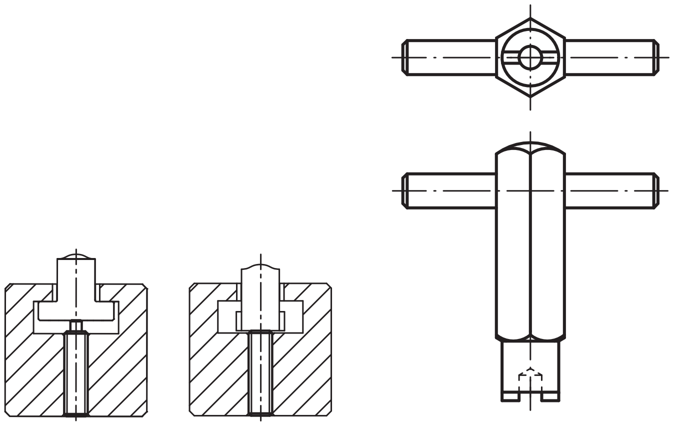
Material:
Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

Version:
Bright.
Thrust pin hardened.

Sample order:
nlm 03055-01-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

Drawing reference:
1) grub screw glued in

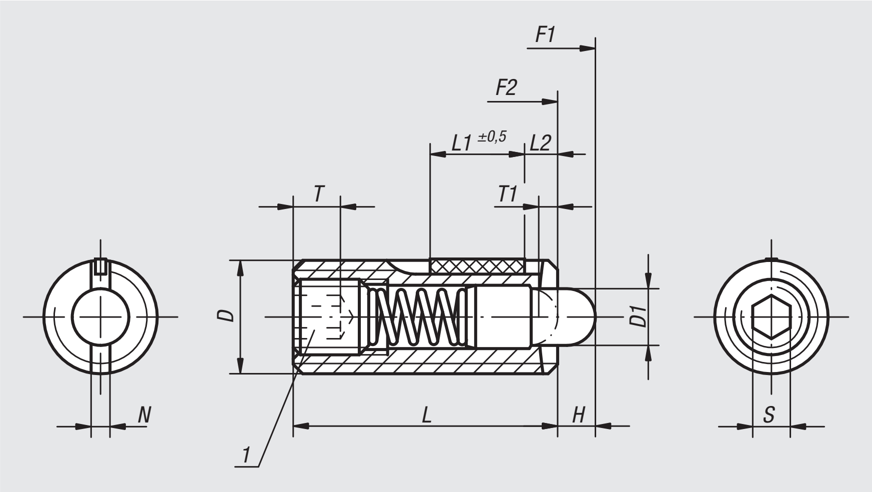


Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03055-01-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	5	17	03040-905
03055-01-06	M6	2,7	2,5	20	2,5	1	1	2	6	17	03040-906
03055-01-08	M8	3,5	3	22	3	1,4	1,2	2,5	7	29	03040-908
03055-01-10	M10	4	3	22	3,5	1,4	1,6	3	8	31	03040-910
03055-01-12	M12	6	4	28	5	2	2	4	10	47	03040-912
03055-01-16	M16	7,5	5	32	6	2,5	2,5	5	38	85	03040-916

03056

Spring plungers

with hexagon socket and thrust pin, LONG-LOK secured, stainless steel



Material:
Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

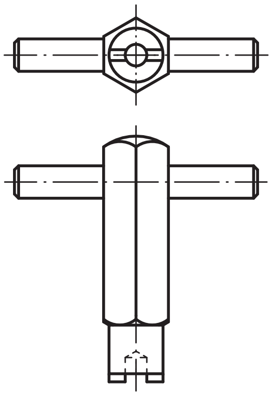
LONG-LOK thread lock Nylon.

Version:
Bright.
Thrust pin hardened.

Sample order:
nlm 03056-12

Drawing reference:
L2 = ca. two full threads

1) grub screw glued-in



Spring plungers with hexagon socket and thrust pin, standard spring force, LONG-LOK secured

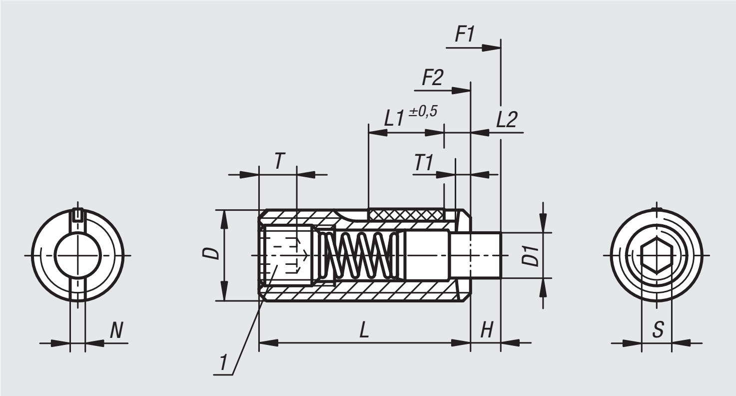
Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03056-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	5	17	0,12	0,08	03040-905
03056-06	M6	2,7	2,5	20	7	2,5	1	1	2	6	17	0,45	0,22	03040-906
03056-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	7	29	1,05	0,37	03040-908
03056-10	M10	4	3	22	9	3,5	1,4	1,6	3	8	31	1,3	0,6	03040-910
03056-12	M12	6	4	28	10	5	2	2	4	10	47	2	1,3	03040-912
03056-16	M16	7,5	5	32	14	6	2,5	2,5	5	38	85	3,9	3	03040-916

Spring plungers with hexagon socket and thrust pin, reinforced spring force, LONG-LOK secured

Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03056-205	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	9	26	0,12	0,08	03040-905
03056-206	M6	2,7	2,5	20	7	2,5	1	1	2	11	35	0,45	0,22	03040-906
03056-208	M8	3,5	3	22	8	3	1,4	1,2	2,5	15	48	1,05	0,37	03040-908
03056-210	M10	4	3	22	9	3,5	1,4	1,6	3	15	58	1,3	0,6	03040-910
03056-212	M12	6	4	28	10	5	2	2	4	19	74	2	1,3	03040-912

Spring plungers

with hexagon socket and flattened thrust pin, stainless steel, LONG-LOK lock



Material:
Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

LONG-LOK thread lock Nylon.

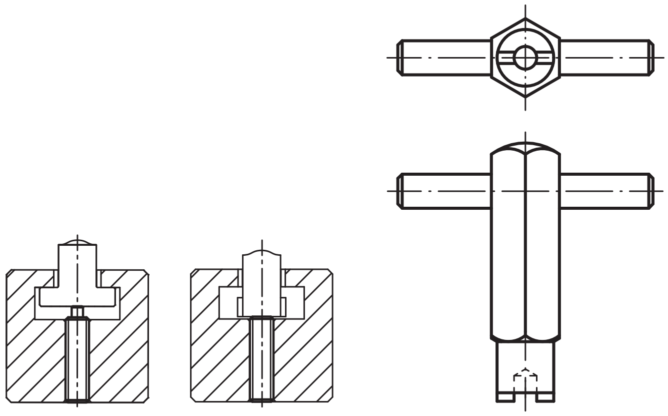
Version:
Bright.
Thrust pin hardened.

Sample order:
nlm 03056-01-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

Drawing reference:
L2 = ca. two full threads

1) grub screw glued-in

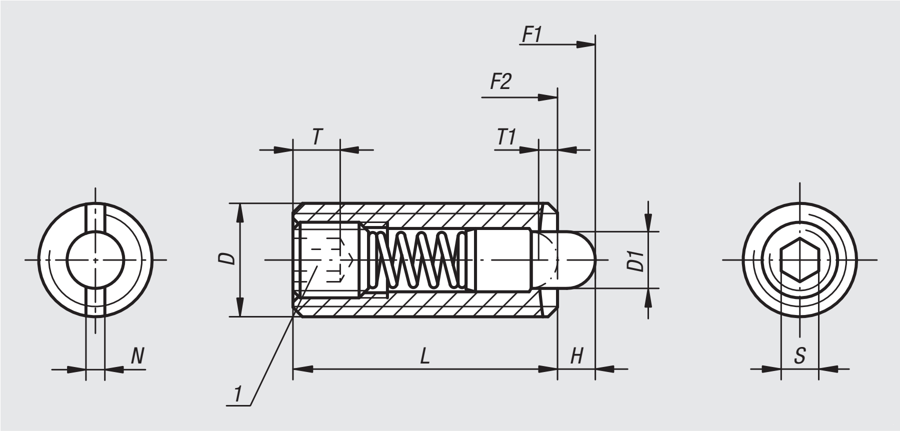


Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03056-01-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	5	17	0,12	0,08	03040-905
03056-01-06	M6	2,7	2,5	20	7	2,5	1	1	2	6	17	0,45	0,22	03040-906
03056-01-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	7	29	1,05	0,37	03040-908
03056-01-10	M10	4	3	22	9	3,5	1,4	1,6	3	8	31	1,3	0,6	03040-910
03056-01-12	M12	6	4	28	10	5	2	2	4	10	47	2	1,3	03040-912
03056-01-16	M16	7,5	5	32	14	6	2,5	2,5	5	38	85	3,9	3	03040-916

03058

Spring plungers

with hexagon socket and POM thrust pin, stainless steel



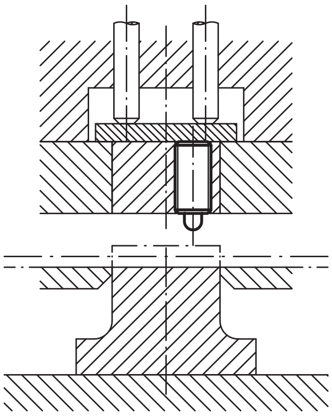
Material:
Sleeve 1.4305.
Thrust pin POM.
Spring 1.4310.

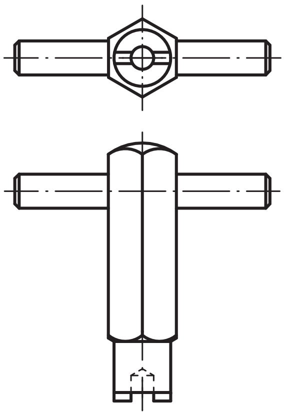
Version:
Bright.

Sample order:
nlm 03058-16

Drawing reference:
1) grub screw glued in

application example



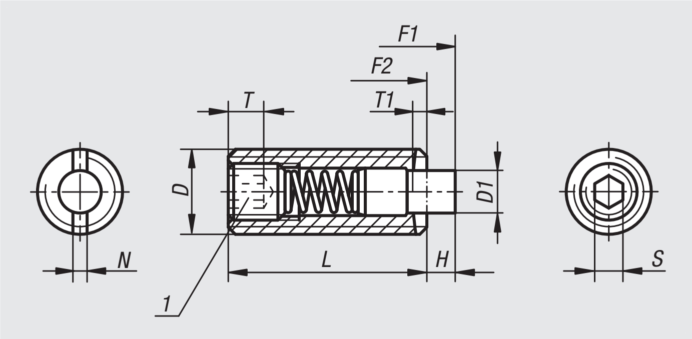


Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03058-03	M3	1	1,5	10	1,5	1	0,4	0,7	0,5	3	03040-903
03058-04	M4	1,5	1,5	15	2	0,6	0,6	1,3	5	16	03040-904
03058-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	5	17	03040-905
03058-06	M6	2,7	2,5	20	2,5	1	1	2	6	17	03040-906
03058-08	M8	3,5	3	22	3	1,4	1,2	2,5	7	29	03040-908
03058-10	M10	4	3	22	3,5	1,4	1,6	3	8	31	03040-910
03058-12	M12	6	4	28	5	2	2	4	10	47	03040-912
03058-16	M16	7,5	5	32	6	2,5	2,5	5	38	85	03040-916

03058-01

Spring plungers

with hexagon socket and flattened POM thrust pin, stainless steel



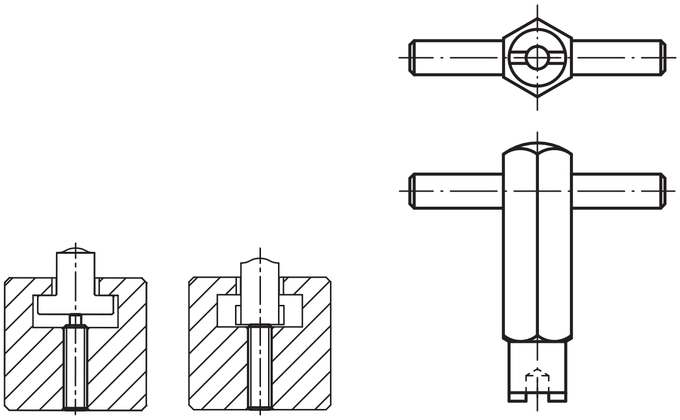
Material:
Sleeve 1.4305.
Thrust pin POM.
Spring 1.4310.

Version:
Bright.

Sample order:
nlm 03058-01-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

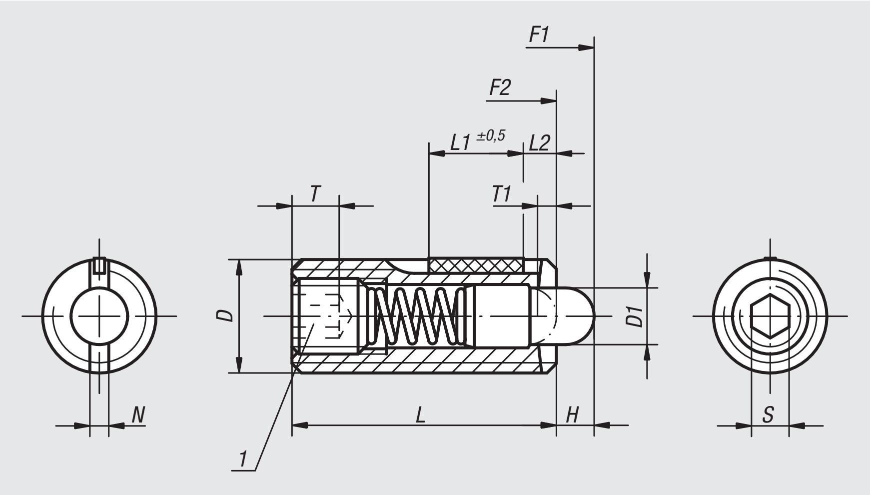
Drawing reference:
1) grub screw glued in



Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03058-01-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	5	17	03040-905
03058-01-06	M6	2,7	2,5	20	2,5	1	1	2	6	17	03040-906
03058-01-08	M8	3,5	3	22	3	1,4	1,2	2,5	7	29	03040-908
03058-01-10	M10	4	3	22	3,5	1,4	1,6	3	8	31	03040-910
03058-01-12	M12	6	4	28	5	2	2	4	10	47	03040-912
03058-01-16	M16	7,5	5	32	6	2,5	2,5	5	38	85	03040-916

Spring plungers

with hexagon socket and POM thrust pin, LONG-LOK secured, stainless steel



Material:
Sleeve 1.4305.
Thrust pin POM.
Spring 1.4310 wire

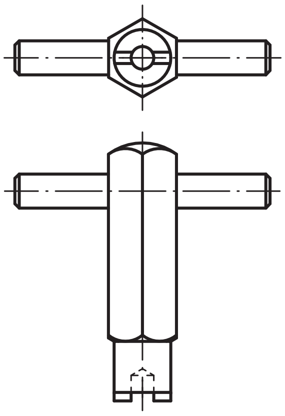
LONG-LOK thread lock Nylon.

Version:
Bright.

Sample order:
nlm 03059-12

Drawing reference:
L2 = ca. two full threads

1) grub screw glued-in

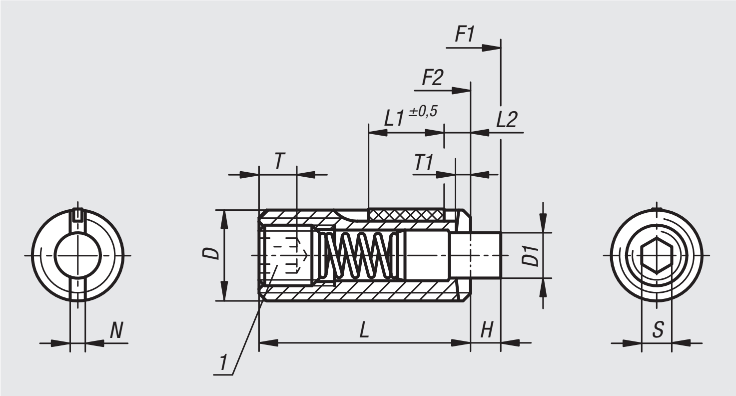


Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03059-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	5	17	0,12	0,08	03040-905
03059-06	M6	2,7	2,5	20	7	2,5	1	1	2	6	17	0,45	0,22	03040-906
03059-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	7	29	1,05	0,37	03040-908
03059-10	M10	4	3	22	9	3,5	1,4	1,6	3	8	31	1,3	0,6	03040-910
03059-12	M12	6	4	28	10	5	2	2	4	10	47	2	1,3	03040-912
03059-16	M16	7,5	5	32	14	6	2,5	2,5	5	38	85	3,9	3	03040-916

03059-01

Spring plungers

with hexagon socket and flattened POM thrust pin, stainless steel, LONG-LOK lock



Material:
Sleeve 1.4305.
Thrust pin POM.
Spring 1.4310 wire

LONG-LOK thread lock Nylon.

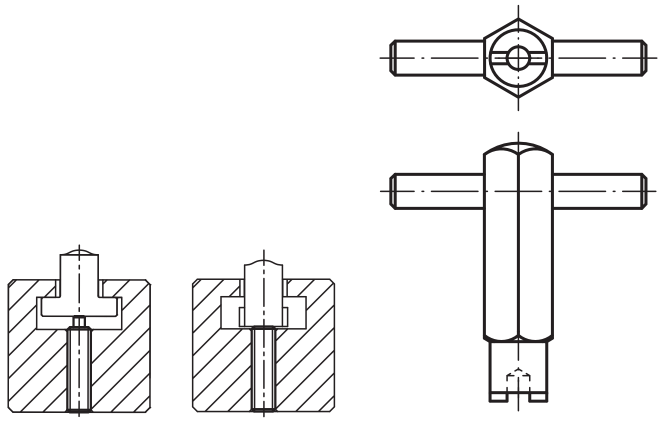
Version:
Bright.

Sample order:
nlm 03059-01-16

Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.
The thrust pin is actuated in the axial direction.

Drawing reference:
L2 = ca. two full threads

1) grub screw glued-in

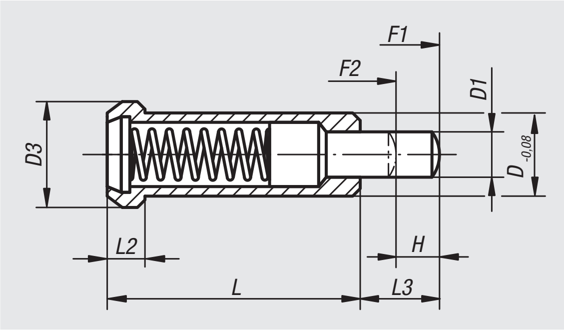


Order No.	D	D1	H	L	L1	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm	Order No. Assembly key
03059-01-05	M5	2,4	2,3	18	7	2	0,8	0,8	1,5	5	17	0,12	0,08	03040-905
03059-01-06	M6	2,7	2,5	20	7	2,5	1	1	2	6	17	0,45	0,22	03040-906
03059-01-08	M8	3,5	3	22	8	3	1,4	1,2	2,5	7	29	1,05	0,37	03040-908
03059-01-10	M10	4	3	22	9	3,5	1,4	1,6	3	8	31	1,3	0,6	03040-910
03059-01-12	M12	6	4	28	10	5	2	2	4	10	47	2	1,3	03040-912
03059-01-16	M16	7,5	5	32	14	6	2,5	2,5	5	38	85	3,9	3	03040-916

03060

Spring plungers

with head

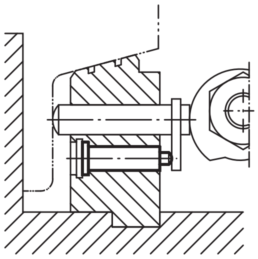


Material:
Steel.

Version:
Black oxidised.
Thrust pin hardened.

Sample order:
nlm 03060-10

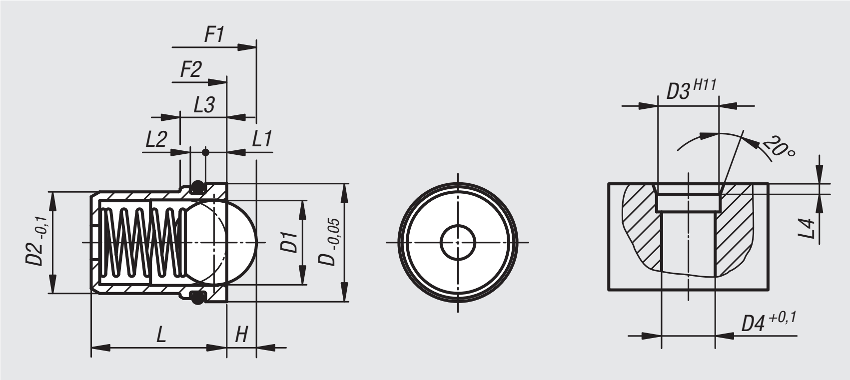
Note:
These spring plungers are chiefly used as ejectors and spring stops in machine construction.



Order No.	D	D1	D3	H	L	L2	L3	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03060-06	6	2,95	8	3,5	20	3,2	6	10	22
03060-08	8	3,95	10	4,5	24	3,2	8	30	90
03060-10	10	5,95	13	5,5	30	4	10	42	110
03060-12	12	7,95	16	6,5	36	5	12	50	130

Spring plungers

with detent ring



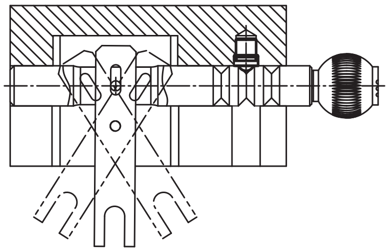
Material:
Sleeve, spring and ball stainless steel.
O-ring NBR.

Version:
Sleeve bright.
Ball hardened, bright.
O-ring black.

Sample order:
nlm 03065-05

Note:
These spring plungers with O-ring are suitable for overhead installation or for installing in difficult to access positions.

They can be pressed into the location hole by hand or using simple assembly tools. The O-ring holds the plunger in place and prevents it falling out. Other components can be easily installed without the need for further assembly aids.



Order No.	D	D1	D2	D3	D4	H	L	L1	L2	L3	L4	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03065-05	4,95	3	4	5	4,1	0,8	5	1	0,7	2,3	0,7	3	7
03065-06	5,95	4	5	6	5,1	1	6	1	0,7	2,3	0,7	4	7
03065-08	7,95	5	6	8	6,1	1,5	7	1,5	1,2	3,7	1	6	12
03065-10	9,95	6,5	8	10	8,1	1,8	9	2	1,2	4,2	1,5	6	12
03065-12	11,95	8	10	12	10,1	2,7	13,5	2,5	1,8	5,3	2	10	20
03065-14	13,95	10	12	14	12,1	3,5	16	2,5	1,8	5,5	2	15	25

03069

Locators

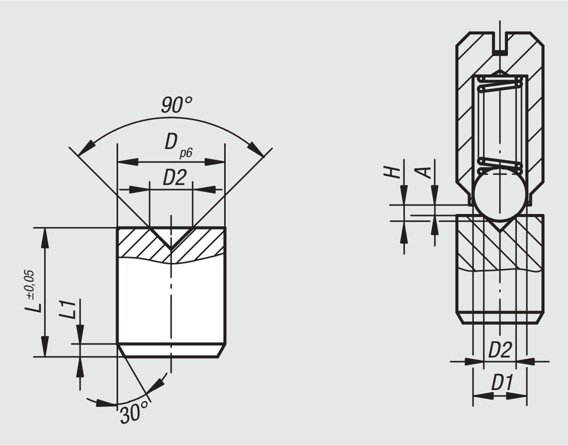
Material:
Steel.

Version:
Bright, hardened.

Sample order:
nlm 03069-05020

Note:
If abrasion-resistant and exact locking is necessary, locators can be used together with spring plungers, especially with strong spring force.

$$A = H - \left(\frac{D1 + D2}{2} - \frac{\sqrt{2}}{2} \times D1\right)$$



Order No.	Suitable for spring plungers with ØD	D	D1	D2	H	L	L1
03069-04015	- / M4	4	see relevant products for dimensions	1,5	see relevant products for dimensions	5	0,5
03069-05020	Ø4 / M5	5	see relevant products for dimensions	2	see relevant products for dimensions	6	0,5
03069-06020	Ø5 / M6	6	see relevant products for dimensions	2	see relevant products for dimensions	8	0,7
03069-08030	Ø6 / M8	8	see relevant products for dimensions	3	see relevant products for dimensions	10	1
03069-10040	Ø8 / M10	10	see relevant products for dimensions	4	see relevant products for dimensions	12	1,2
03069-12060	Ø10 / M12	12	see relevant products for dimensions	6	see relevant products for dimensions	14	1,5
03069-16080	Ø12 / M16	16	see relevant products for dimensions	8	see relevant products for dimensions	18	2

03070

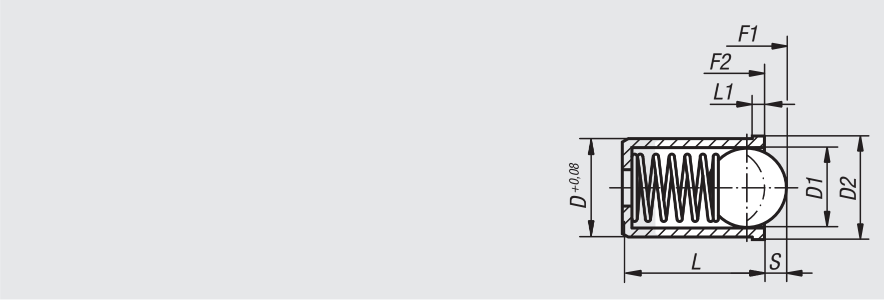
Spring plungers

smooth version, extended, stainless steel

Material:
Sleeve and spring stainless steel.
Ball stainless steel or POM.

Version:
Sleeve bright.
Steel ball hardened and bright.

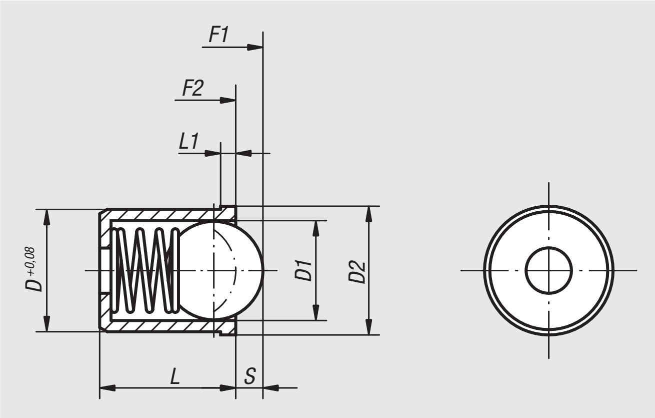
Sample order:
nlm 03070-104



Order No.	Component material	D	D1	D2	L	L1	Travel S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03070-104	stainless steel	4	3	4,6	9	1	0,8	12	22
03070-105	stainless steel	5	4	5,6	12	1	1	19	30
03070-106	stainless steel	6	5	6,5	14	1	1,5	22	40
03070-108	stainless steel	8	6	8,5	16	1	1,8	42	73
03070-110	stainless steel	10	8	12	22	2,5	2,7	54	100
03070-112	stainless steel	12	10	14	24	2,5	3,5	54	122
03070-404	POM	4	3	4,6	9	1	0,6	12	22
03070-405	POM	5	4	5,6	12	1	0,8	19	30
03070-406	POM	6	5	6,5	14	1	1,3	22	40
03070-408	POM	8	6	8,5	16	1	1,6	42	73
03070-410	POM	10	8	12	22	2,5	2,6	54	100
03070-412	POM	12	10	14	24	2,5	3,3	54	122

Spring plungers

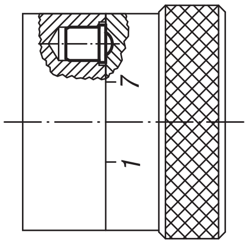
smooth version, stainless steel



Material:
Sleeve and spring stainless steel.
Ball stainless steel or POM.

Version:
Sleeve bright.
Steel ball hardened and bright.

Sample order:
nlm 03070-05

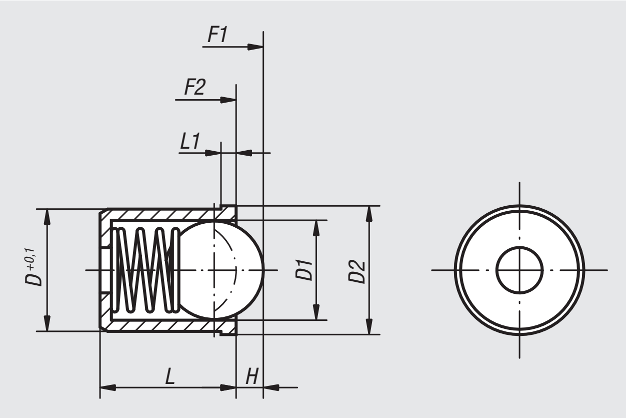


Order No.	Component material	D	D1	D2	L	L1	Travel S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03070-02	stainless steel	2	1,5	2,5	3	0,6	0,4	1,2	2,5
03070-03	stainless steel	3	2,5	3,5	4	0,8	0,65	1,7	3,4
03070-04	stainless steel	4	3	4,6	5	1	0,8	3	7
03070-05	stainless steel	5	4	5,6	6	1	1	4	7
03070-06	stainless steel	6	5	6,5	7	1	1,5	6	12
03070-08	stainless steel	8	6,5	8,5	9	1	1,8	6	12
03070-10	stainless steel	10	8	12	13,5	2,5	2,7	10	20
03070-12	stainless steel	12	10	14	16	2,5	3,5	15	25
03070-304	POM	4	3	4,6	5	1	0,6	3	7
03070-305	POM	5	4	5,6	6	1	0,8	4	7
03070-306	POM	6	5	6,5	7	1	1,3	6	12
03070-308	POM	8	6,5	8,5	9	1	1,6	6	12
03070-310	POM	10	8	12	13,5	2,5	2,6	10	20
03070-312	POM	12	10	14	16	2,5	3,3	15	25

03071

Spring plungers

smooth version, plastic



Material:
Sleeve thermoplastic.
Spring stainless steel.
Ball stainless steel or POM.

Version:
Sleeve black.
Ball hardened, bright.

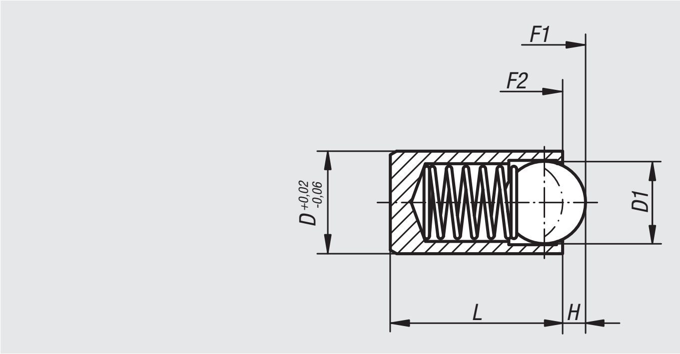
Sample order:
nlm 03071-05

Order No.	Component material	D	D1	D2	H	L	L1	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03071-04	stainless steel	4	3	4,6	0,7	5	1	3	7
03071-05	stainless steel	5	4	5,6	1	6	1	4	7
03071-06	stainless steel	6	5	6,5	1,5	7	1	6	12
03071-08	stainless steel	8	6,5	8,5	1,8	9	1	6	12
03071-10	stainless steel	10	8	12	2,7	13,5	2,5	10	20
03071-12	stainless steel	12	10	14	3,5	16	2,5	15	25
03071-204	POM	4	3	4,6	0,7	5	1	3	7
03071-205	POM	5	4	5,6	1	6	1	4	7
03071-206	POM	6	5	6,5	1,5	7	1	6	12
03071-208	POM	8	6,5	8,5	1,8	9	1	6	12
03071-210	POM	10	8	12	2,7	13,5	2,5	10	20
03071-212	POM	12	10	14	3,5	16	2,5	15	25

03072

Spring plungers

smooth version without collar, stainless steel



Material:
Sleeve and spring stainless steel.
Ball stainless steel or POM.

Version:
Ball hardened, bright.

Sample order:
nlm 03072-208

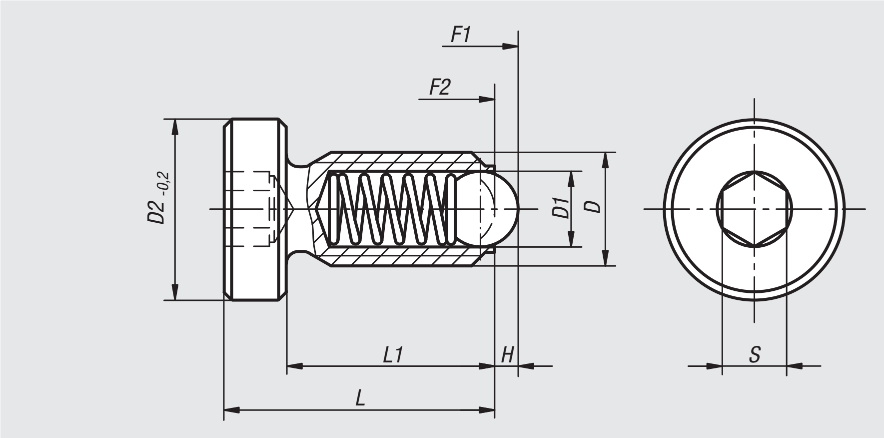
Order No.	Component material	D	D1	H	L	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03072-203	stainless steel	3	2	0,65	7	5	7
03072-204	stainless steel	4	3	0,8	9	12	22
03072-205	stainless steel	5	4	1	12	19	30
03072-206	stainless steel	6	5	1,5	14	22	40
03072-208	stainless steel	8	6	1,8	16	42	73
03072-210	stainless steel	10	8	2,7	22	54	100
03072-212	stainless steel	12	10	3,2	24	54	122

Order No.	Component material	D	D1	H	L	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03072-304	POM	4	3	0,6	9	12	22
03072-305	POM	5	4	0,9	12	19	30
03072-306	POM	6	5	1,3	14	22	40
03072-308	POM	8	6	1,7	16	42	73
03072-310	POM	10	8	2,6	22	54	100
03072-312	POM	12	10	3,1	24	54	122

03073

Spring plungers

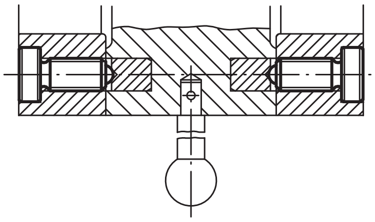
with head



Material:
Steel or stainless steel.

Version:
Steel black oxidised.
Stainless steel bright.
Ball steel or stainless steel, hardened, bright.

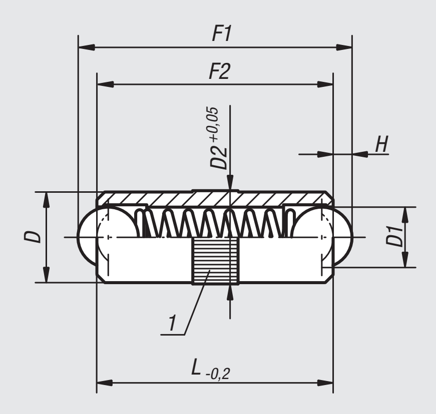
Sample order:
nlm 03073-10



Order No. steel	**Order No. stainless steel**	D	D1	D2	H	L	L1	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03073-04	**03073-041**	M4	2,5	7	0,8	13	10	2	4	10
03073-05	**03073-051**	M5	3	8,5	0,9	17	13	2,5	6	11
03073-06	**03073-061**	M6	3,5	10	1	16	12	3	9	13
03073-08	**03073-081**	M8	5	13	1,5	21	16	4	15	30
-	**03073-101**	M10	6	16	2	26	20	5	20	35
03073-10	**-**	M10	6	16	2	26	20	5	20	40
03073-12	**03073-121**	M12	8	18	2,5	32	25	6	30	55

Spring plungers

smooth version, double-sided

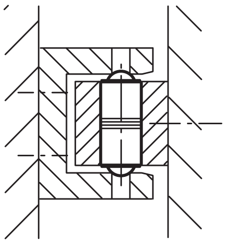


Material:
Sleeve brass.
Ball and spring stainless steel.

Version:
Balls hardened, bright.

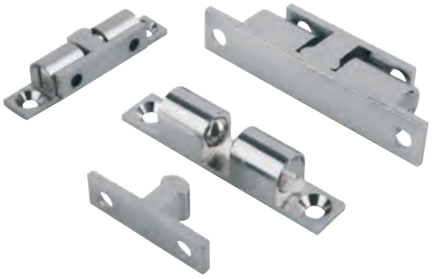
Sample order:
nlm 03074-05

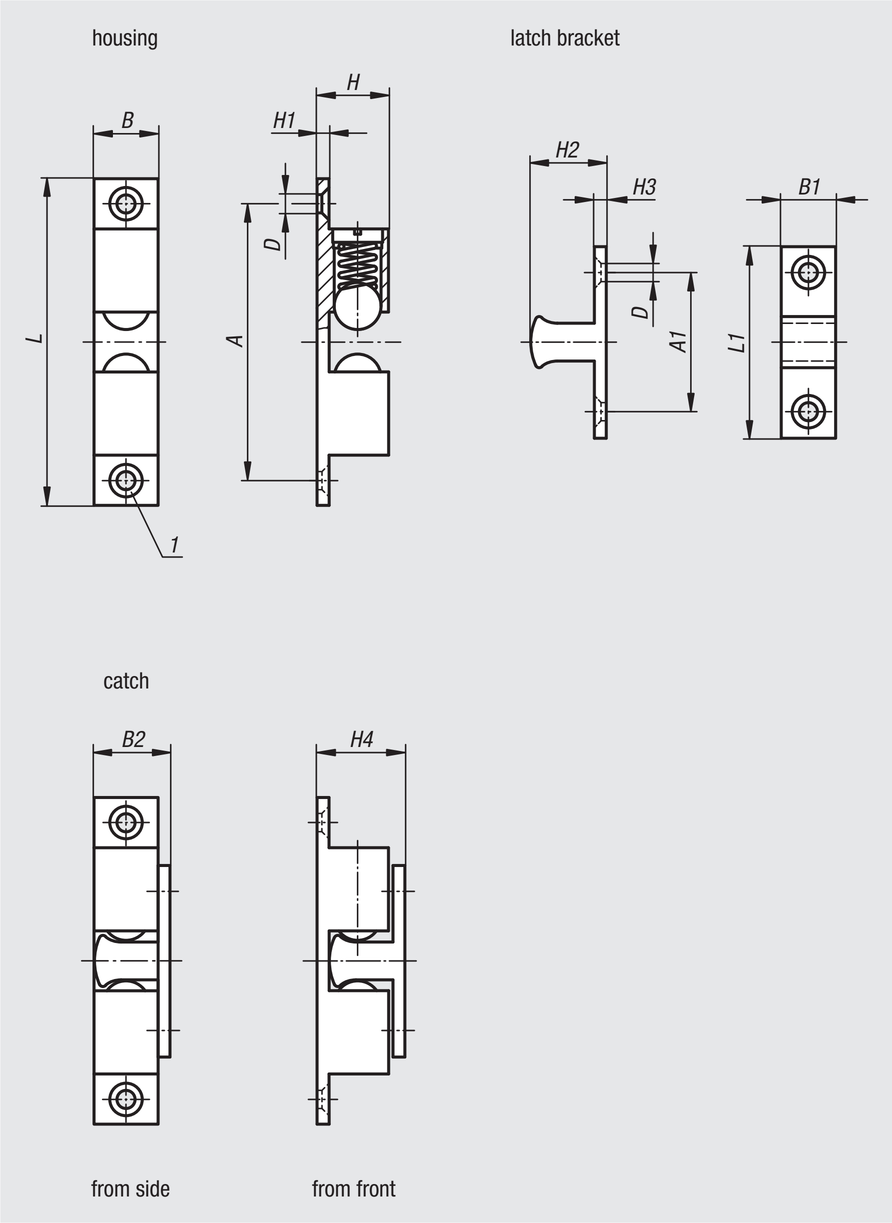
Drawing reference:
1) knurl



Order No.	D	D1	D2	L	H	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03074-025	2,5	2	2,55	6	0,65	1,5	2,8
03074-03	3	2,5	3,05	8	0,8	2,5	6
03074-04	4	3	4,05	10	0,9	3	7
03074-05	5	4	5,05	12	1,2	4	8
03074-06	6	5	6,05	16	1,6	6	10
03074-08	8	6	8,05	20	2	8	12
03074-10	10	8	10,05	24	2,9	10	16

Double ball catches



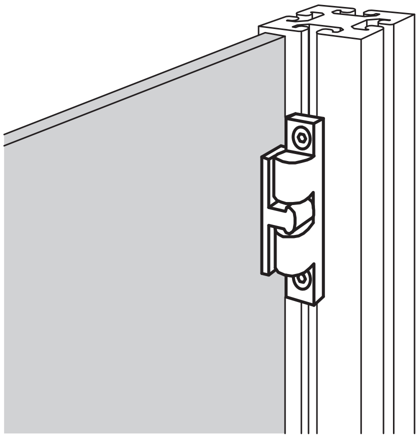


Material:
Housing and latch chrome plated brass.
Balls and springs stainless steel.

Sample order:
nlm 03075-50

Note:
Quick catch for various applications such as holding doors, hatches, screens etc. closed. The double ball catch consists of a housing and a latch bracket that engages between the two balls. The latch bracket can engage from the front or the side. The engagement pressure is adjustable.

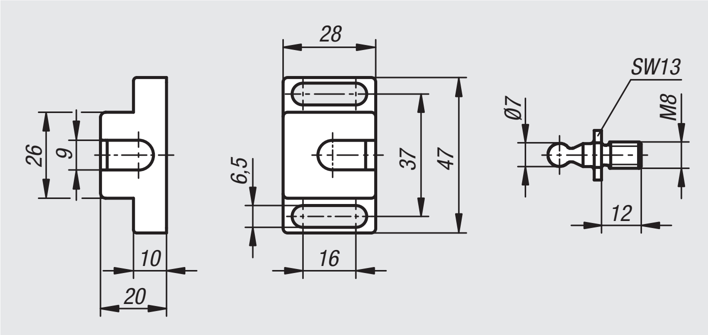
Drawing reference:
1) counterbore DIN 74-A



Order No.	A	A1	B	B1	B2	D	H	H1	H2	H3	H4	L	L1	Clamping force ca. N
03075-50	39,8	19,8	8,8	7,6	10,8	3,8	10,6	2	11,2	2	13,2	49	28,8	35±5
03075-60	50	23,5	11	9	13,5	4,8	13,2	2,4	13,5	2,2	15,5	60	35	30±7
03075-70	58	30	13	12	15,2	4,8	15	2,4	15,7	2,2	18,1	68,4	40,2	25±5

03075-10

Ball catch

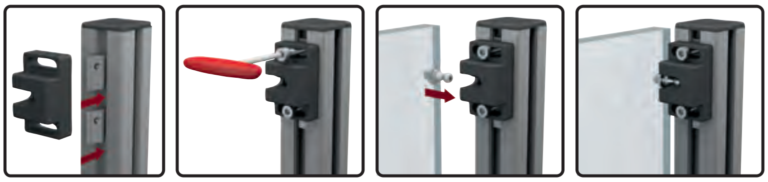


Material:
Fibreglass reinforced polyamide.
Ball pins, steel or stainless steel 1.4301.

Version:
black.

Sample order:
nlm 03075-10-400

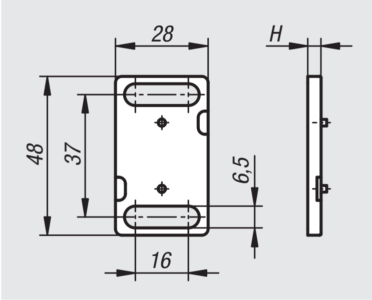
Note:
Quick lock for swing and sliding doors. The elongated holes enable flexible positioning on aluminium profiles and panel elements.



Order No.	Component material	Retaining force F1 N
03075-10-400	steel	40
03075-10-401	stainless steel	40
03075-10-500	steel	50
03075-10-501	stainless steel	50

03075-10

Spacer for ball catch



Material:
Polyamide fibreglass reinforced.

Version:
black.

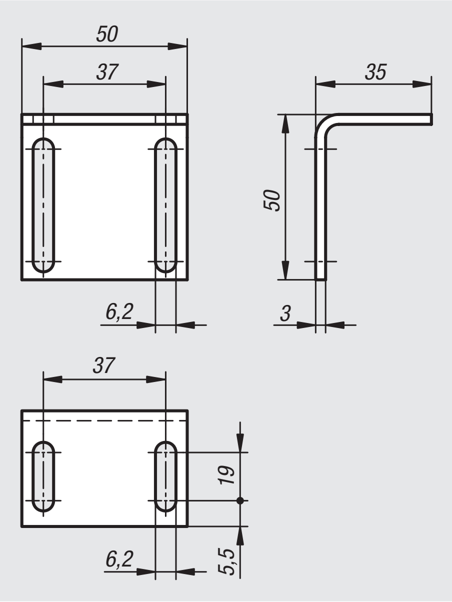
Sample order:
nlm 03075-10-94

Note:
These riser plates enable the height of the ball catch to be increased.

Order No.	H
03075-10-94	4

03075-10

Angle bracket for ball catch



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 03075-10-9503550

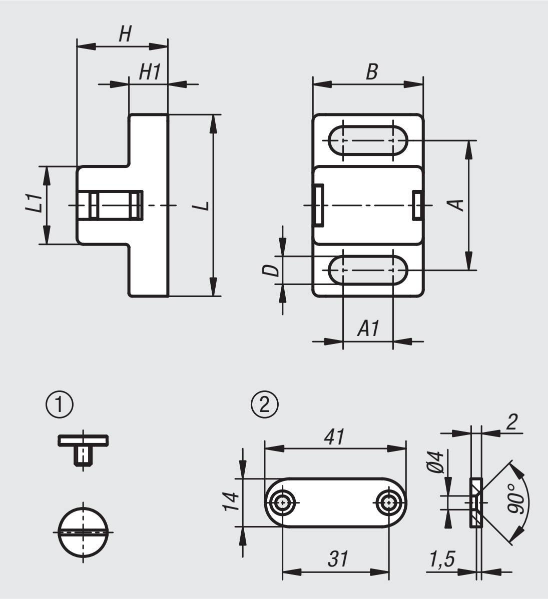
Note:
These angle brackets enable the ball catch to be flexibly positioned.

Order No.	Dimensions
03075-10-9503550	see drawing

Notes

03075-11

Magnetic lock



Material:
Polyamide fibreglass reinforced
DIN 921 pan head screw, steel.
Retaining plate, steel.

Version:
Black.
Pan head screw and retaining plate electro zinc-plated.

Sample order:
nlm 03075-11-17281

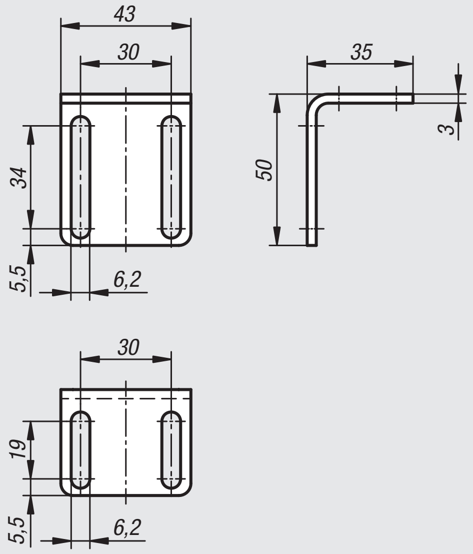
Note:
Magnetic catch for swing and sliding doors. The elongated holes enable flexible positioning on aluminium profiles and panel elements.

Drawing reference:
1) Pan head screw
2) Retaining plate

Order No.	A	A1	B	D	H	H1	L	L1	Retaining force F1 N	Retaining force F2 N	Counterpart
03075-11-17281	20	7,7	17	4,3	14	6	28	12	5	3	M4x5 pan head screw
03075-11-28401	30	13,5	28	6,3	20	10	40	19	20	10	M5x6 pan head screw
03075-11-28402	30	13,5	28	6,3	20	10	40	19	20	10	M5x6 pan head screw and 14x41x2 retaining plate

03075-11

Angle bracket for magnetic lock



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 03075-11-9503543

Note:
These angle brackets enable the magnetic catch to be flexibly positioned.

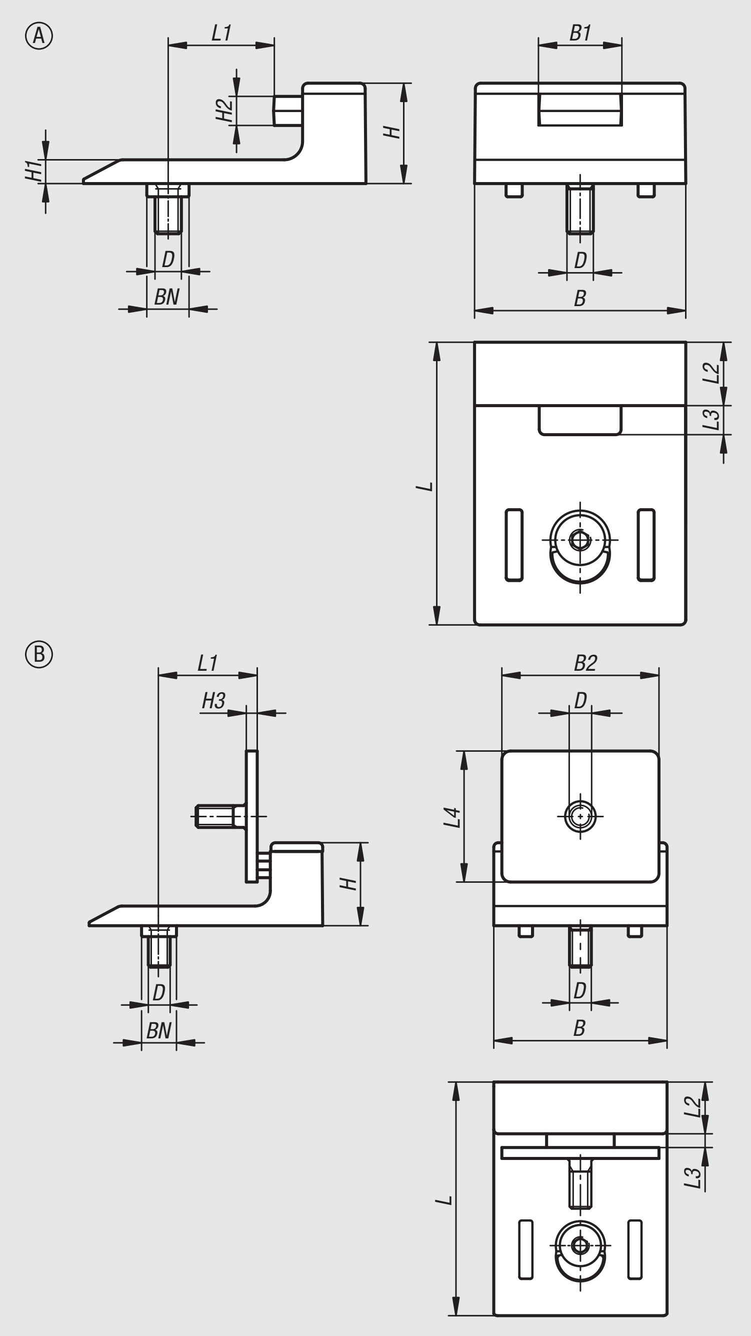
Order No.	Dimensions
03075-11-9503543	see drawing

Notes

03075-12

Door stops plastic

for aluminium profile with buffer or with magnetic catch



Material:
Door stop fibreglass reinforced PA.
Buffer EPDM.
Retaining plate steel.
Slot key die-cast zinc.
Screw steel.
Locking piece fibreglass reinforced PA.

Version:
Steel electro zinc-plated.

Sample order:
nlm 03075-12-0

Note:
These door stops can be used to close doors or hatches mounted on aluminium profiles softly or magnetically.

Supplied with:
Door stop with buffer:
1x door stop,
1x slot key,
1x M5x14 ISO 7991 screw,
1x locking piece.

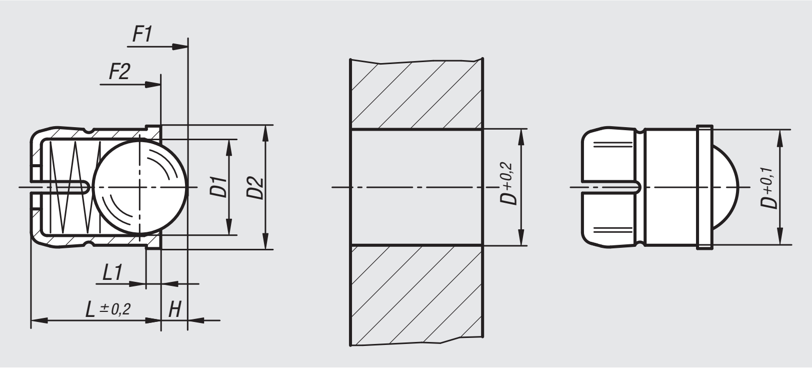
Door stop with magnetic catch:
1x door stop,
1x retaining plate,
1x slot key,
2x M5x14 ISO 7991 screws,
1x locking piece.

Order No.	Version 1	Form	Component material	Surface finish component	B	B1	B2	D	H
03075-12-0	with buffer	A	EPDM	-	40	15	-	M5	19
03075-12-1	with magnetic catch	B	steel	galvanised	40	-	36	M5	19

Order No.	H1	H2	H3	L	L1	L2	L3	L4	BN=Slot width	Shore grade
03075-12-0	4,5	5	-	53,5	20/22,5	12	5	-	8/10	-
03075-12-1	4,5	-	2,5	53,5	20/22,5	12	3	30	8/10	70

Spring plungers

smooth version, self-clamping, plastic



Material:
Sleeve thermoplastic.
Spring stainless steel.
Ball stainless steel or POM.

Version:
Sleeve black.
Ball hardened, bright.

Sample order:
nlm 03076-410

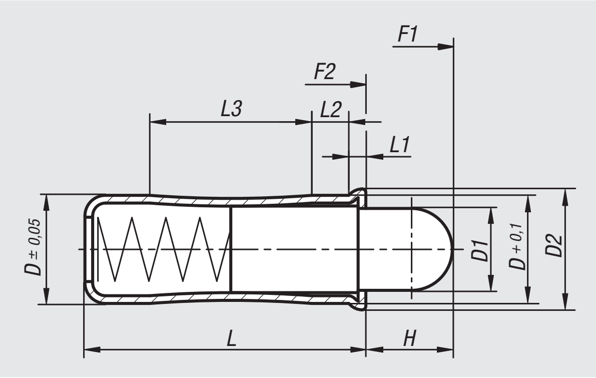
Note:
The self-locking function of the spring plunger enables simple assembly and secure overhead installation.

Order No.	Component material	D	D1	D2	L	L1	H	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03076-04	stainless steel	4	3	4,6	5	1	0,8	3	6,5
03076-05	stainless steel	5	4	5,6	6	1	1	6	9,4
03076-06	stainless steel	6	5	6,5	7	1	1,6	6,2	12,6
03076-08	stainless steel	8	6,5	8,5	9	1	1,9	10	20,4
03076-10	stainless steel	10	8	11	13,5	1,5	2,4	11,9	22,3
03076-204	POM	4	3	4,6	5	1	0,8	3	6,5
03076-205	POM	5	4	5,6	6	1	1	6	9,4
03076-206	POM	6	5	6,5	7	1	1,6	6,2	12,6
03076-208	POM	8	6,5	8,5	9	1	1,9	10	20,4
03076-210	POM	10	8	11	13,5	1,5	2,4	11,9	22,3

03077

Spring plungers

smooth version



Material:
Sleeve and spring stainless steel.
Pin stainless steel or POM.

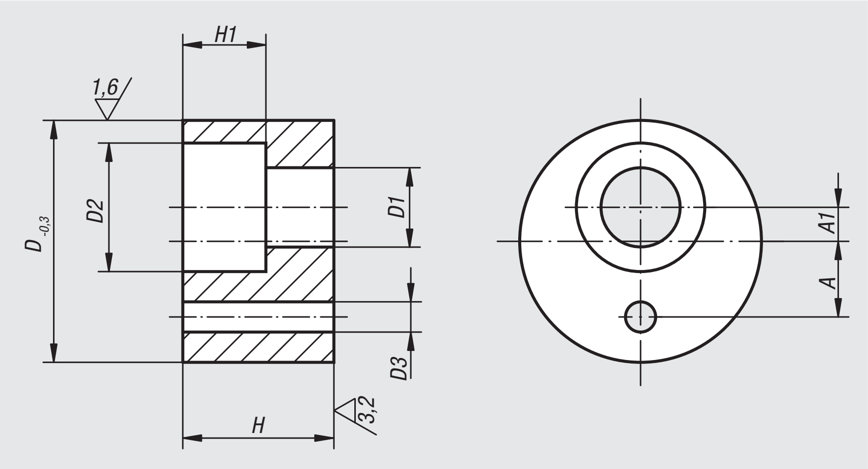
Version:
Pins, white POM, temperature-resistant to +50°C.

Sample order:
nlm 03077-08

Note:
Smooth version to press-in.
A ^{H7} tolerance is recommended for the receiving hole with diameter D.

Order No.	Component material	D	D1	D2	L	L1	L2	L3	H	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03077-04	stainless steel	4	2,8	4,6	10,7	0,9	1,8	5,6	2,7	3	8,2
03077-05	stainless steel	5	3,8	5,6	12	0,9	2,1	6	4	3,3	9
03077-06	stainless steel	6	4,8	6,5	15	1	2,3	8,2	5,5	6,1	12
03077-08	stainless steel	8	6,2	8,5	18	1,1	2,9	9,5	6,5	10,7	17
03077-10	stainless steel	10	8	11	26	1,5	4,2	14,3	8	16,2	29
03077-204	POM	4	2,8	4,6	10,7	0,9	1,8	5,6	2,7	3	8,2
03077-205	POM	5	3,8	5,6	12	0,9	2,1	6	4	3,3	9
03077-206	POM	6	4,8	6,5	15	1	2,3	8,2	5,5	6,1	12
03077-208	POM	8	6,2	8,5	18	1,1	2,9	9,5	6,5	10,7	17
03077-210	POM	10	8	11	26	1,5	4,2	14,3	8	16,2	29

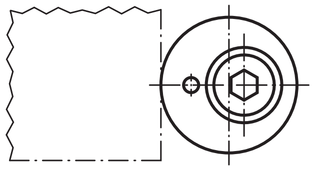
Eccentric stops

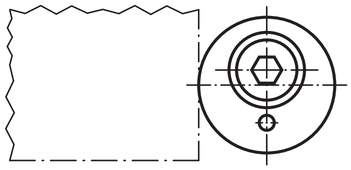


Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 03080-10

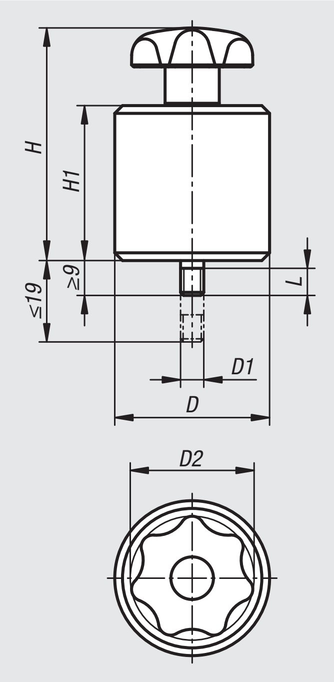




Order No.	D	D1	D2	D3	H	H1	A	A1
03080-05	16	5,5	10	2	10	6	5	1,5
03080-06	20	6,6	11	2	12	7	6	2,5
03080-08	25	9	15	4	16	9	8	3,5
03080-10	32	11	18	4	20	11	10	4,5
03080-12	36	13,5	20	4	25	13	12	5,5

Clamp stops adjustable

for slot profiles



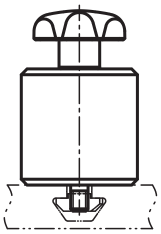
Material:
Body aluminium.
Other metal components steel.
Plastic components PA6.

Version:
Body natural tone anodised.
Other metal components trivalent blue passivated.

Sample order:
nlm 03081-064040

Note:
Sliding stop for profile systems type B, type I, and DIN 650 T-slots. Locked by turning the star grip. Sprung threaded pin ensures smooth sliding without tilting the slot key when loosened.

Accessories:
07071-0806
07073-0606
07073-0806
07075-0806
07077-1006
07078-1006
07060-06
07060-061
07060-806
07060-2061
07060-206

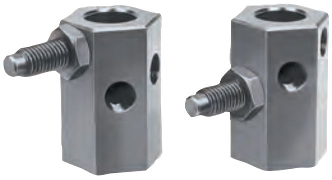


Order No.	D	D1	D2	H	H1	L
03081-064040	40	M6	32	60	40	7

03083

Stops

adjustable

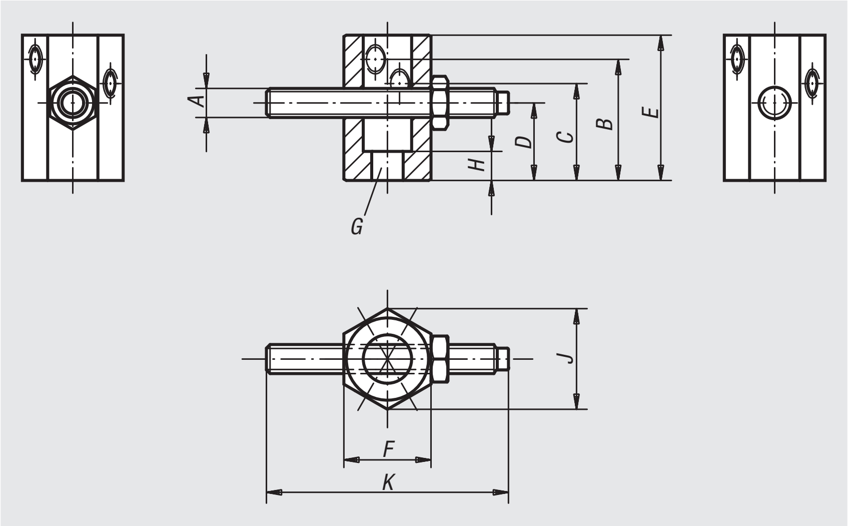


Material:
Body and set screw carbon steel.

Version:
Body black oxidised.
Set screw tempered and black oxidised.

Sample order:
nlm 03083-16063

Note:
The adjustable stops have three tapped holes to accept the set screws.



Order No.	A	B	C	D	E	F	G hole for DIN 912 cap screw	H	J	K
03083-08032	M8	32	25	20	40	21	M8	7	24,3	50
03083-12050	M12	50	40	32	60	36	M12	12	41,6	100
03083-16063	M16	63	50	40	80	46	M16	16	53,1	100

03085

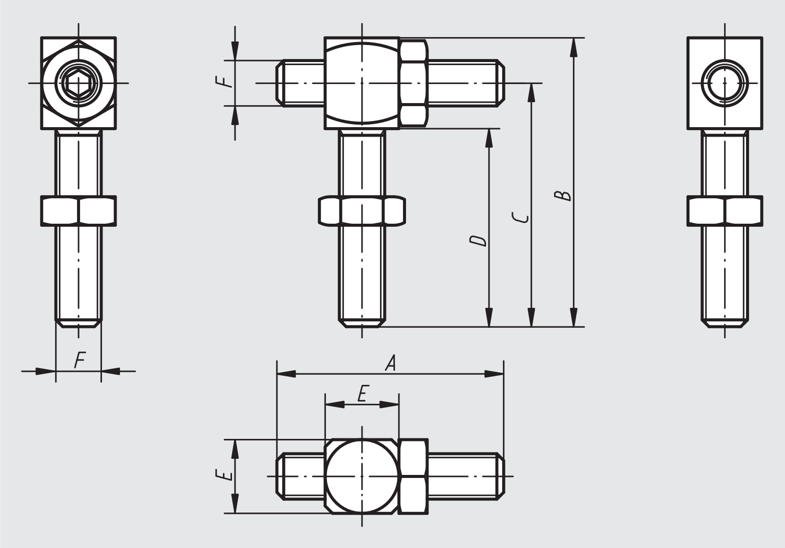
Screw stops

adjustable

Material:
Carbon steel, tempered.

Version:
Black oxidised.

Sample order:
nlm 03085-10



Order No.	A	B	C	D	E	F
03085-06	30	44	37	30	10	M6
03085-08	40	56	48	40	13	M8
03085-10	50	70	60	50	17	M10
03085-12	60	84	72	60	19	M12
03085-16	80	112	96	80	24	M16

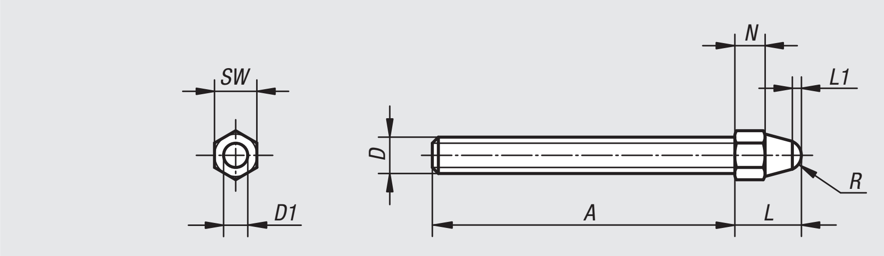
03086

Stop screws

Material:
Steel.

Version:
Black oxidised. Domed head hardened.

Sample order:
nlm 03086-108



Order No.	A	D	D1	L	L1	N	R	SW
03086-106	50	M6	4	10	1,5	4	2,5	7
03086-108	65	M8	6	14	1,5	6	3,75	10
03086-110	85	M10	8	17	2	7	5	11
03086-112	110	M12	10	20	2,5	8	6,25	13
03086-116	130	M16	12	26	3	10	7,5	17

20010

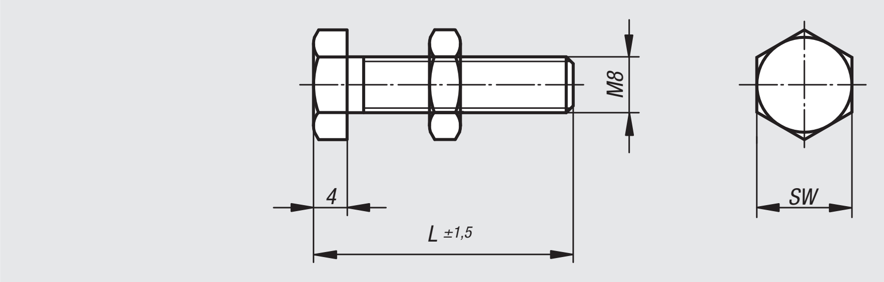
Stop screws

Material:
Steel
grade 8.8.

Version:
Stop screw black oxidised.
Stop face hardened (52 HRC).
Nut electro zinc-plated.

Sample order:
nlm 20010-08017

Note:
The screw heads are machined before being hardened giving a defined and permanently consistent stop face.



Order No.	L	SW
20010-08017	17	13
20010-08022	22	13
20010-08027	27	13
20010-08032	32	13
20010-08035	35	13
20010-08045	45	13
20010-08055	55	13
20010-08065	65	13
20010-08073	73	13
20010-08088	88	13

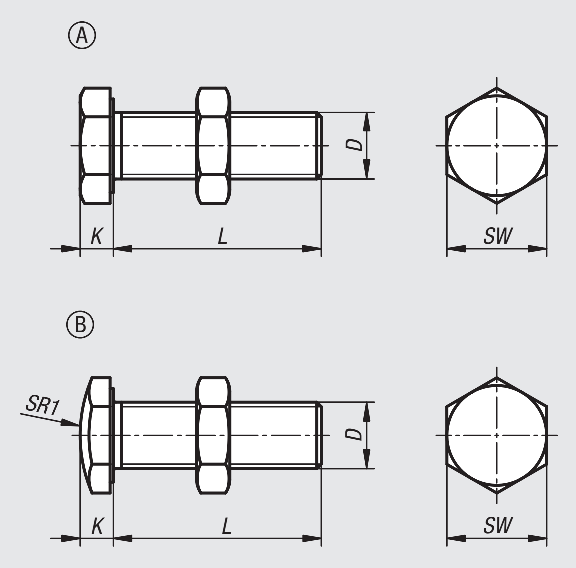
Stop screws

Material:
Steel grade 10.9
(M3 8.8)

Version:
Stop screw black oxidised.
Nut electro zinc-plated.

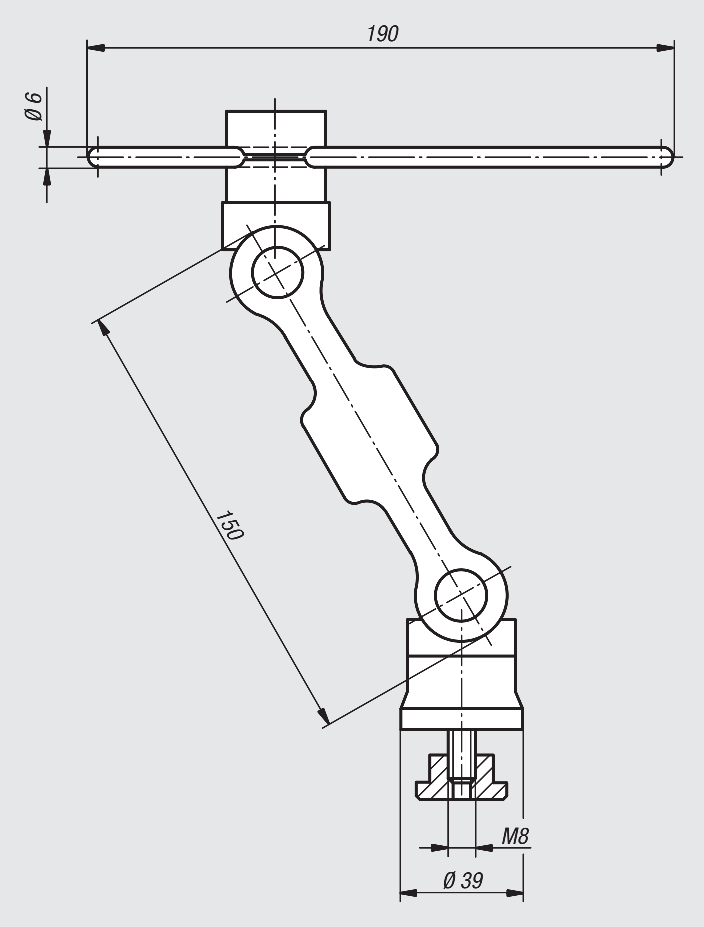
Sample order:
nlm 03087-10820 (include length L)

Note:
Size M3 stop screw only available in grade 8.8.



Order No.	Form	D	L	K	SW	SR1
03087-103**	A	M3	16/25	2	5,5	-
03087-104**	A	M4	16/25/35	2,5	7	-
03087-105**	A	M5	16/25/35	3,5	8	-
03087-106**	A	M6	25/35/40	3,8	10	-
03087-108**	A	M8	12/16/20/25/30/35/40/45/50/55/65/70/85	5	13	-
03087-110**	A	M10	35/40/50/60	6	17	-
03087-112**	A	M12	40/60/70	7	19	-
03087-116**	A	M16	50/60/70	9,5	24	-
03087-203**	B	M3	16/25	2	5,5	10
03087-204**	B	M4	16/25/35	2,5	7	10
03087-205**	B	M5	16/25/35	3,5	8	12
03087-206**	B	M6	25/35/40	3,8	10	15
03087-208**	B	M8	12/16/20/25/30/35/40/45/50/55/65/70/85	5	13	20
03087-210**	B	M10	35/40/50/60	6	17	30
03087-212**	B	M12	40/60/70	7	19	30
03087-216**	B	M16	50/60/70	9,5	24	35

5D workpiece stops



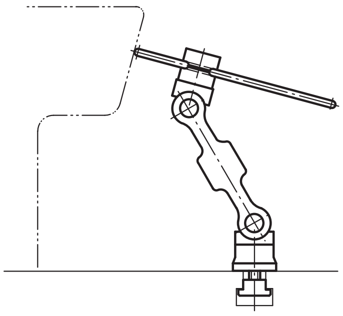
Material:
Clamping joint high-tensile aluminium.
Hinge pin, support plate and stop bar, steel.

Version:
Clamping joint anodised blue and black.
Hinge pins, support plate and stop bar black oxidised.

Sample order:
nlm 03088-15012

Note:
The 5D-swivelling stop serves, among other things, as a versatile instrument for positioning on machining tools or for assembly work. It is infinitely adjustable, quickly and flexibly in 5 axes. Supplied complete with M8x12 T-slot nut and hex key.

On request:
Connecting element for combining several 5D-swivelling stops.



Order No.	Size
03088-15012	150

Notes

03089

Indexing plungers

Material:
Steel version:
Grub screw and indexing pin steel.

Stainless steel version:
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom grip black grey thermoplastic.

Version:
Steel version:
Threaded sleeve, black oxidised.
Indexing pin hardened, ground and black oxidised.

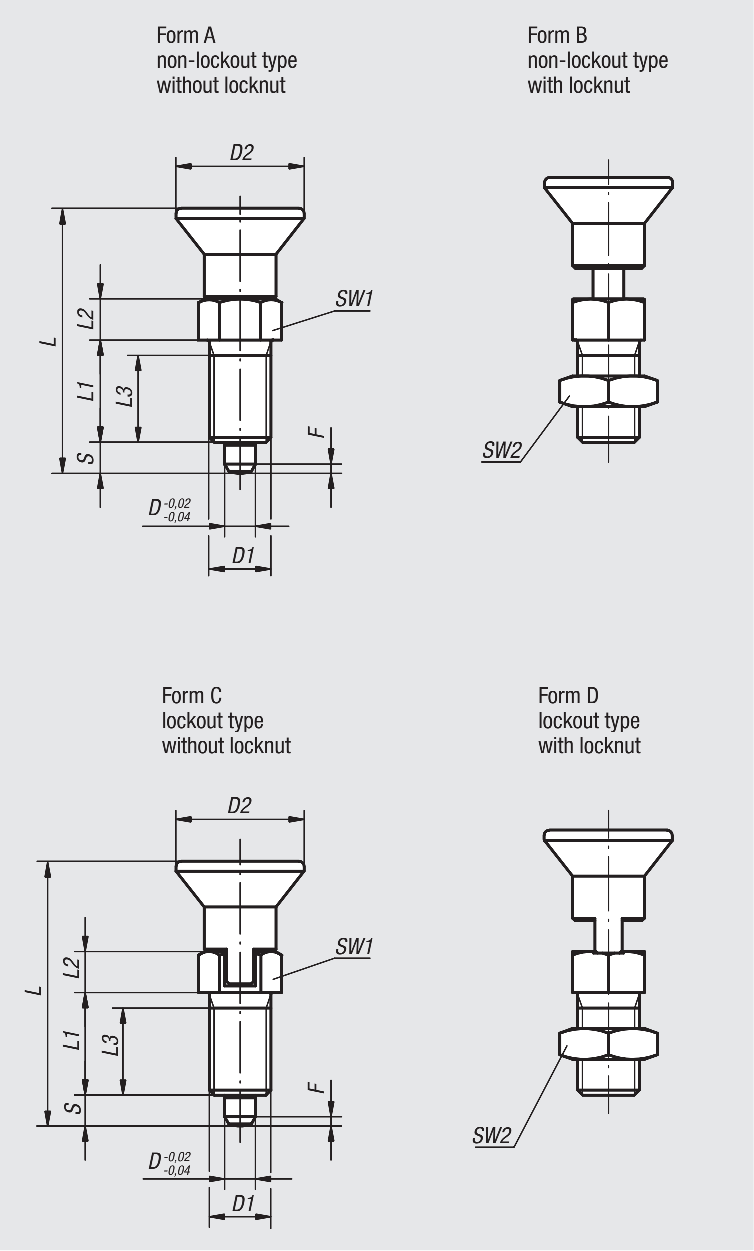
Stainless steel version:
Indexing pin hardened, ground and bright. Threaded sleeve, bright.
Indexing pin not hardened, ground and bright.

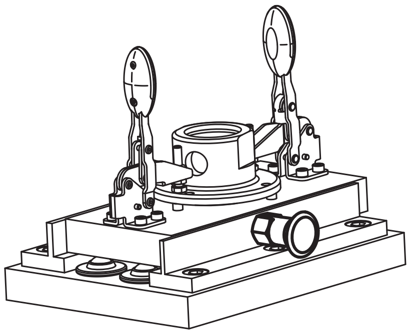
Sample order:
nlm 03089-04206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications where the plunger remains disengaged over a long period and the pin should be prevented from springing back.

On request:
Special versions.

Accessories:
Spacer rings 03089





Indexing plungers

Indexing plungers, steel, indexing pin hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-1903	**03089-2903**	**03089-3903**	**03089-4903**	3	M6x0,75	14	31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-1004	**03089-2004**	**03089-3004**	**03089-4004**	4	M8x1	18	38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-1105	**03089-2105**	**03089-3105**	**03089-4105**	5	M10x1	21	43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-1206	**03089-2206**	**03089-3206**	**03089-4206**	6	M12x1,5	25	51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-1308	**03089-2308**	**03089-3308**	**03089-4308**	8	M16x1,5	33	68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-1410	**03089-2410**	**03089-3410**	**03089-4410**	10	M20x1,5	33	74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-1412	**03089-2412**	**03089-3412**	**03089-4412**	12	M20x1,5	33	78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-1516	**03089-2516**	**03089-3516**	**03089-4516**	16	M24x2	40	96	32	18	28	16	27	-/36/-/36	3,2	20	46

Indexing plungers, stainless steel, indexing pin hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-01903	**03089-02903**	**03089-03903**	**03089-04903**	3	M6x0,75	14	31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-01004	**03089-02004**	**03089-03004**	**03089-04004**	4	M8x1	18	38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-01105	**03089-02105**	**03089-03105**	**03089-04105**	5	M10x1	21	43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-01206	**03089-02206**	**03089-03206**	**03089-04206**	6	M12x1,5	25	51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-01308	**03089-02308**	**03089-03308**	**03089-04308**	8	M16x1,5	33	68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-01410	**03089-02410**	**03089-03410**	**03089-04410**	10	M20x1,5	33	74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-01412	**03089-02412**	**03089-03412**	**03089-04412**	12	M20x1,5	33	78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-01516	**03089-02516**	**03089-03516**	**03089-04516**	16	M24x2	40	96	32	18	28	16	27	-/36/-/36	3,2	20	46

Indexing plungers, stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-11903	**03089-12903**	**03089-13903**	**03089-14903**	3	M6x0,75	14	31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-11004	**03089-12004**	**03089-13004**	**03089-14004**	4	M8x1	18	38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-11105	**03089-12105**	**03089-13105**	**03089-14105**	5	M10x1	21	43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-11206	**03089-12206**	**03089-13206**	**03089-14206**	6	M12x1,5	25	51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-11308	**03089-12308**	**03089-13308**	**03089-14308**	8	M16x1,5	33	68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-11410	**03089-12410**	**03089-13410**	**03089-14410**	10	M20x1,5	33	74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-11412	**03089-12412**	**03089-13412**	**03089-14412**	12	M20x1,5	33	78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-11516	**03089-12516**	**03089-13516**	**03089-14516**	16	M24x2	40	96	32	18	28	16	27	-/36/-/36	3,2	20	46

03089

Indexing plungers

Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305
Indexing pin 1.4034

Indexing pin not hardened:
Threaded sleeve 1.4305
Indexing pin 1.4305

Mushroom knob red thermoplastic.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

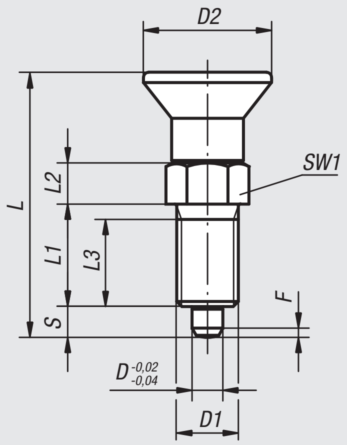
Sample order:
nlm 03089-0420684

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications where the plunger remains disengaged over a long period and the pin should be prevented from springing back.

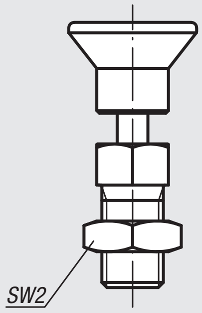
On request:
Special versions.

Accessories:
Spacer rings 03089

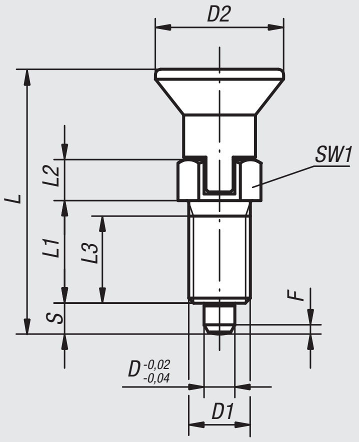
Form A
non-lockout type
without locknut



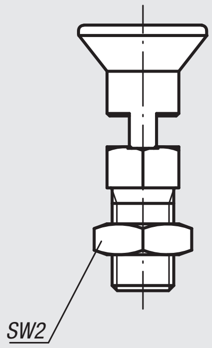
Form B
non-lockout type
with locknut

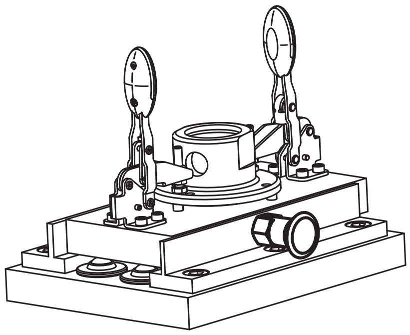


Form C
lockout type
without locknut



Form D
lockout type
with locknut





Indexing plungers

Indexing plungers, steel, indexing pin hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-190384	**03089-290384**	**03089-390384**	**03089-490384**	3	M6x0,75	14	31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-100484	**03089-200484**	**03089-300484**	**03089-400484**	4	M8x1	18	38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-110584	**03089-210584**	**03089-310584**	**03089-410584**	5	M10x1	21	43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-120684	**03089-220684**	**03089-320684**	**03089-420684**	6	M12x1,5	25	51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-130884	**03089-230884**	**03089-330884**	**03089-430884**	8	M16x1,5	33	68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-141084	**03089-241084**	**03089-341084**	**03089-441084**	10	M20x1,5	33	74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-141284	**03089-241284**	**03089-341284**	**03089-441284**	12	M20x1,5	33	78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-151684	**03089-251684**	**03089-351684**	**03089-451684**	16	M24x2	40	96	32	18	28	16	27	-/36/-/36	3,2	20	46

Indexing plungers, stainless steel, indexing pin hardened

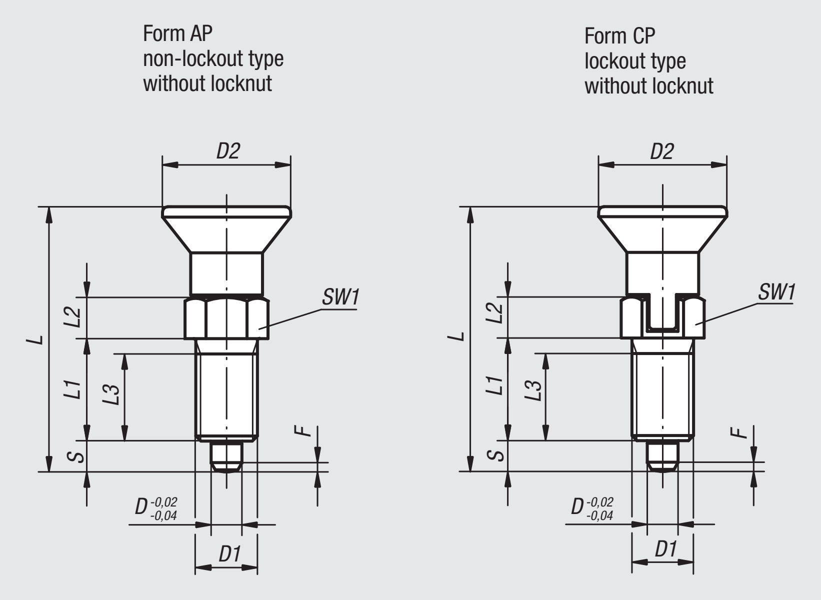
Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-0190384	**03089-0290384**	**03089-0390384**	**03089-0490384**	3	M6x0,75	14	31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-0100484	**03089-0200484**	**03089-0300484**	**03089-0400484**	4	M8x1	18	38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-0110584	**03089-0210584**	**03089-0310584**	**03089-0410584**	5	M10x1	21	43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-0120684	**03089-0220684**	**03089-0320684**	**03089-0420684**	6	M12x1,5	25	51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-0130884	**03089-0230884**	**03089-0330884**	**03089-0430884**	8	M16x1,5	33	68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-0141084	**03089-0241084**	**03089-0341084**	**03089-0441084**	10	M20x1,5	33	74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-0141284	**03089-0241284**	**03089-0341284**	**03089-0441284**	12	M20x1,5	33	78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-0151684	**03089-0251684**	**03089-0351684**	**03089-0451684**	16	M24x2	40	96	32	18	28	16	27	-/36/-/36	3,2	20	46

Indexing plungers, stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-1190384	**03089-1290384**	**03089-1390384**	**03089-1490384**	3	M6x0,75	14	31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-1100484	**03089-1200484**	**03089-1300484**	**03089-1400484**	4	M8x1	18	38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-1110584	**03089-1210584**	**03089-1310584**	**03089-1410584**	5	M10x1	21	43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-1120684	**03089-1220684**	**03089-1320684**	**03089-1420684**	6	M12x1,5	25	51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-1130884	**03089-1230884**	**03089-1330884**	**03089-1430884**	8	M16x1,5	33	68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-1141084	**03089-1241084**	**03089-1341084**	**03089-1441084**	10	M20x1,5	33	74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-1141284	**03089-1241284**	**03089-1341284**	**03089-1441284**	12	M20x1,5	33	78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-1151684	**03089-1251684**	**03089-1351684**	**03089-1451684**	16	M24x2	40	96	32	18	28	16	27	-/36/-/36	3,2	20	46

Indexing plungers

with thread lock



Material:
Steel version:
Indexing pin hardened:
Threaded sleeve and indexing pin free-cutting steel

Stainless steel version:
Indexing pin hardened:
Threaded sleeve 1.4305
Indexing pin 1.4034.

Mushroom knob black grey thermoplastic.
Thread lock blue polyamide.

Version:
Steel version:
indexing pin hardened, ground and black oxidised.

Stainless steel version:
indexing pin hardened, ground and bright.

Sample order:
nlm 03089-091206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form CP is recommended for applications where the plunger remains disengaged over a long period and the pin should be prevented from springing back.
The thread lock enables the plunger to be screwed in to the exact depth required, no spacer ring is required.
The thread lock is a gripping polyamide coating that is applied punctiform (spot).

On request:
Special versions.

Indexing plungers

with thread lock

Indexing plungers, with thread lock, steel, indexing pin hardened

Order No. Form AP	Order No. Form CP	D	D1	D2	L	L1	L2	L3	Travel S	SW1	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-91903	**03089-93903**	3	M6x0,75	14	31,5	12	5	10	3,5	8	0,8	4,5	10
03089-91004	**03089-93004**	4	M8x1	18	38,5	15	6	13	4	10	1	6	12
03089-91105	**03089-93105**	5	M10x1	21	43,5	17	7	15	5	13	1,3	5	12
03089-91206	**03089-93206**	6	M12x1,5	25	51,7	20	8	17	6	14	1,8	6	14
03089-91308	**03089-93308**	8	M16x1,5	33	68	26	10	23	8	19	2,3	15	35
03089-91410	**03089-93410**	10	M20x1,5	33	74	28	12	25	10	22	2,8	15	34
03089-91412	**03089-93412**	12	M20x1,5	33	78	28	14	25	12	22	2,8	15	39
03089-91516	**03089-93516**	16	M24x2	40	96	32	18	28	16	27	3,2	20	46

Indexing plungers, with thread lock, stainless steel, indexing pin hardened

Order No. Form AP	Order No. Form CP	D	D1	D2	L	L1	L2	L3	Travel S	SW1	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-091903	**03089-093903**	3	M6x0,75	14	31,5	12	5	10	3,5	8	0,8	4,5	10
03089-091004	**03089-093004**	4	M8x1	18	38,5	15	6	13	4	10	1	6	12
03089-091105	**03089-093105**	5	M10x1	21	43,5	17	7	15	5	13	1,3	5	12
03089-091206	**03089-093206**	6	M12x1,5	25	51,7	20	8	17	6	14	1,8	6	14
03089-091308	**03089-093308**	8	M16x1,5	33	68	26	10	23	8	19	2,3	15	35
03089-091410	**03089-093410**	10	M20x1,5	33	74	28	12	25	10	22	2,8	15	34
03089-091412	**03089-093412**	12	M20x1,5	33	78	28	14	25	12	22	2,8	15	39
03089-091516	**03089-093516**	16	M24x2	40	96	32	18	28	16	27	3,2	20	46

Indexing plungers

with extended indexing pin

Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob black-grey thermoplastic.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

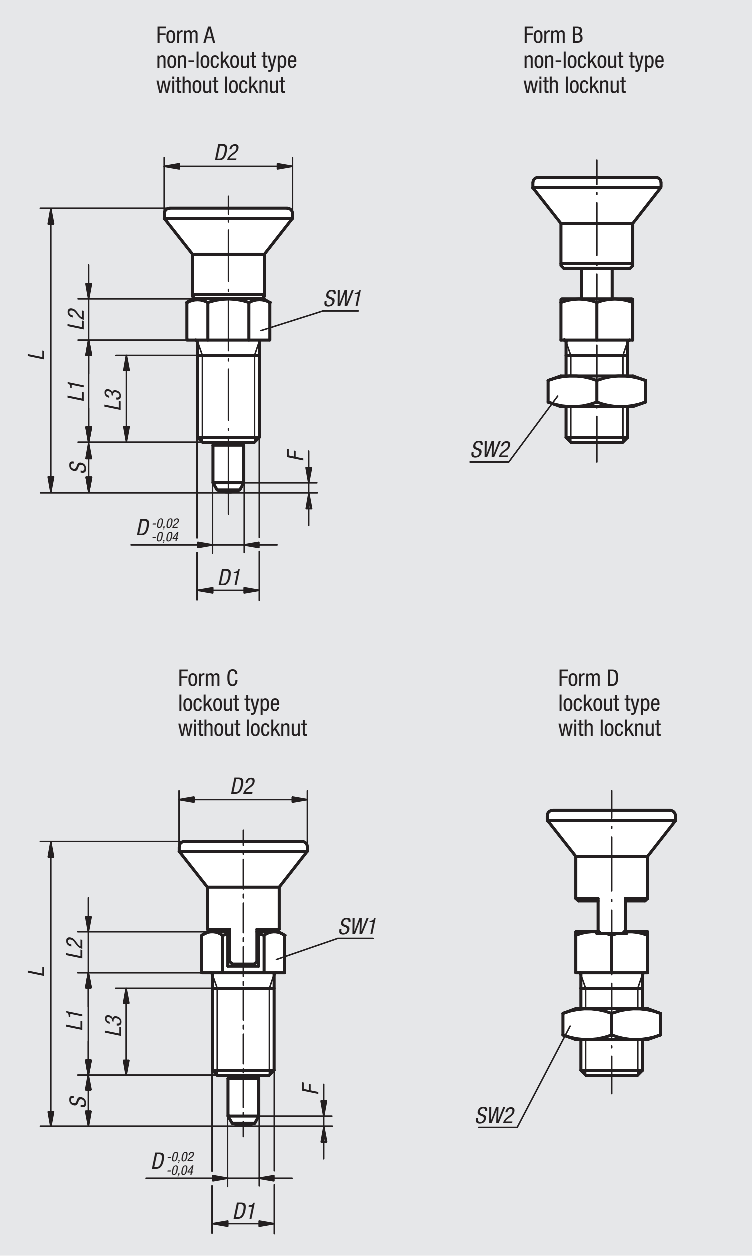
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

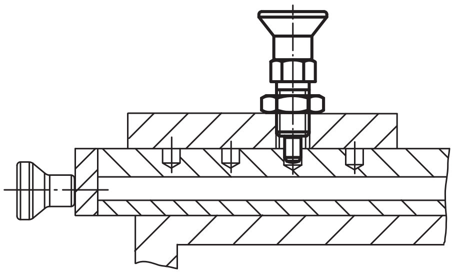
Sample order:
nlm 03089-21004

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.

On request:
Special versions.

Accessories:
Spacer rings 03089





Indexing plungers with extended indexing pins, steel, indexing pins hardened

Order No. Form A	Order No. Form B	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-21903	**03089-22903**	3	M6x0,75	14	33	12	5	10	5	8	-/10	0,8	4,5	12
03089-21004	**03089-22004**	4	M8x1	18	40,5	15	6	13	6	10	-/13	1	6	15
03089-21105	**03089-22105**	5	M10x1	21	46,5	17	7	15	8	13	-/17	1,3	5	16
03089-21206	**03089-22206**	6	M12x1,5	25	54,7	20	8	17	9	14	-/19	1,8	6	18
03089-21308	**03089-22308**	8	M16x1,5	33	72	26	10	23	12	19	-/24	2,3	15	45
03089-21410	**03089-22410**	10	M20x1,5	33	79	28	12	25	15	22	-/30	2,8	15	43
03089-21412	**03089-22412**	12	M20x1,5	33	84	28	14	25	18	22	-/30	2,8	15	51
03089-21516	**03089-22516**	16	M24x2	40	104	32	18	28	24	27	-/36	3,2	20	60

Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-23105	**03089-24105**	5	M10x1	21	49,5	17	10	15	8	13	-/17	1,3	5	16
03089-23206	**03089-24206**	6	M12x1,5	25	57,7	20	11	17	9	14	-/19	1,8	6	18
03089-23308	**03089-24308**	8	M16x1,5	33	76	26	14	23	12	19	-/24	2,3	15	45

Indexing plungers with extended indexing pins, stainless steel, indexing pins hardened

Order No. Form A	Order No. Form B	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-201903	**03089-202903**	3	M6x0,75	14	33	12	5	10	5	8	-/10	0,8	4,5	12
03089-201004	**03089-202004**	4	M8x1	18	40,5	15	6	13	6	10	-/13	1	6	15
03089-201105	**03089-202105**	5	M10x1	21	46,5	17	7	15	8	13	-/17	1,3	5	16
03089-201206	**03089-202206**	6	M12x1,5	25	54,7	20	8	17	9	14	-/19	1,8	6	18
03089-201308	**03089-202308**	8	M16x1,5	33	72	26	10	23	12	19	-/24	2,3	15	45
03089-201410	**03089-202410**	10	M20x1,5	33	79	28	12	25	15	22	-/30	2,8	15	43
03089-201412	**03089-202412**	12	M20x1,5	33	84	28	14	25	18	22	-/30	2,8	15	51
03089-201516	**03089-202516**	16	M24x2	40	104	32	18	28	24	27	-/36	3,2	20	60

Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-203105	**03089-204105**	5	M10x1	21	49,5	17	10	15	8	13	-/17	1,3	5	16
03089-203206	**03089-204206**	6	M12x1,5	25	57,7	20	11	17	9	14	-/19	1,8	6	18
03089-203308	**03089-204308**	8	M16x1,5	33	76	26	14	23	12	19	-/24	2,3	15	45

Indexing plungers with extended indexing pins, stainless steel, indexing pins not hardened

Order No. Form A	Order No. Form B	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-211903	**03089-212903**	3	M6x0,75	14	33	12	5	10	5	8	-/10	0,8	4,5	12
03089-211004	**03089-212004**	4	M8x1	18	40,5	15	6	13	6	10	-/13	1	6	15
03089-211105	**03089-212105**	5	M10x1	21	46,5	17	7	15	8	13	-/17	1,3	5	16
03089-211206	**03089-212206**	6	M12x1,5	25	54,7	20	8	17	9	14	-/19	1,8	6	18
03089-211308	**03089-212308**	8	M16x1,5	33	72	26	10	23	12	19	-/24	2,3	15	45
03089-211410	**03089-212410**	10	M20x1,5	33	79	28	12	25	15	22	-/30	2,8	15	43
03089-211412	**03089-212412**	12	M20x1,5	33	84	28	14	25	18	22	-/30	2,8	15	51
03089-211516	**03089-212516**	16	M24x2	40	104	32	18	28	24	27	-/36	3,2	20	60

Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-213105	**03089-214105**	5	M10x1	21	49,5	17	10	15	8	13	-/17	1,3	5	16
03089-213206	**03089-214206**	6	M12x1,5	25	57,7	20	11	17	9	14	-/19	1,8	6	18
03089-213308	**03089-214308**	8	M16x1,5	33	76	26	14	23	12	19	-/24	2,3	15	45

03089

Indexing plungers

short version

Material:
Steel version
Indexing pin hardened:
grade 5.8

Stainless steel version
Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob black-grey thermoplastic.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

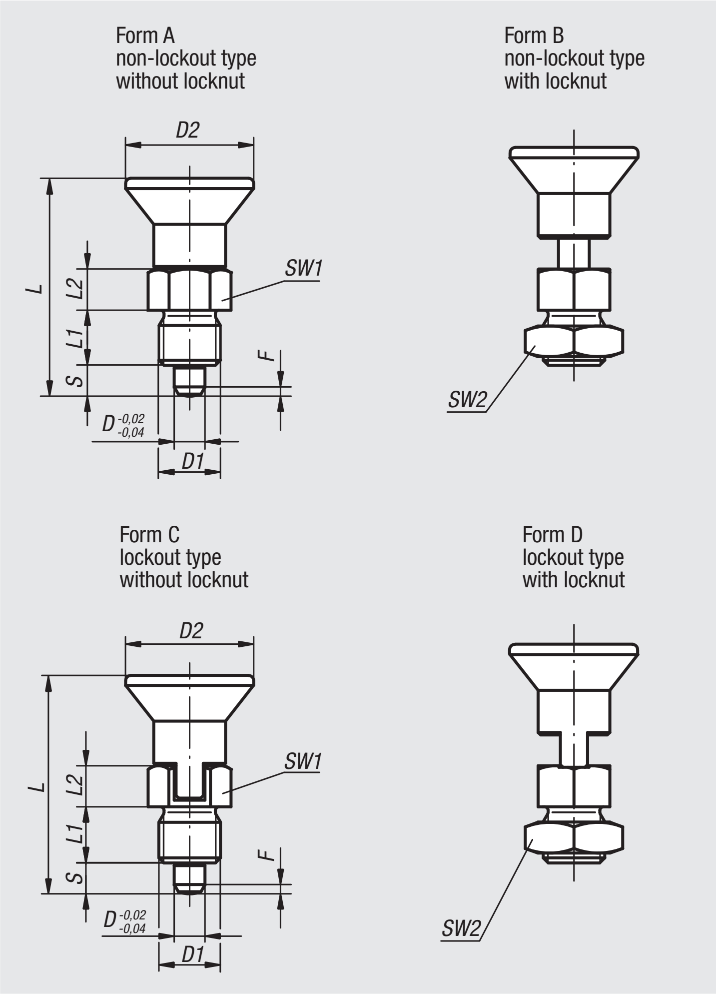
Stainless steel version:
Indexing pin not hardened, ground, bright.

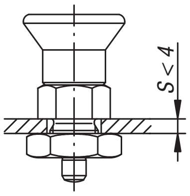
Sample order:
nlm 03089-16206

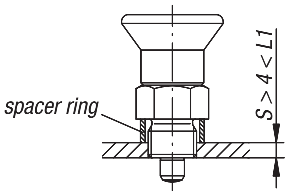
Note:
Indexing plungers are used to prevent any change in position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from springing back.

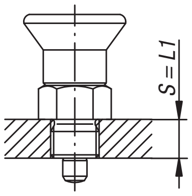
On request:
Special versions.

Accessories:
Spacer rings 03089









Indexing plungers

short version

Indexing plungers, short version, steel, indexing pin hardened

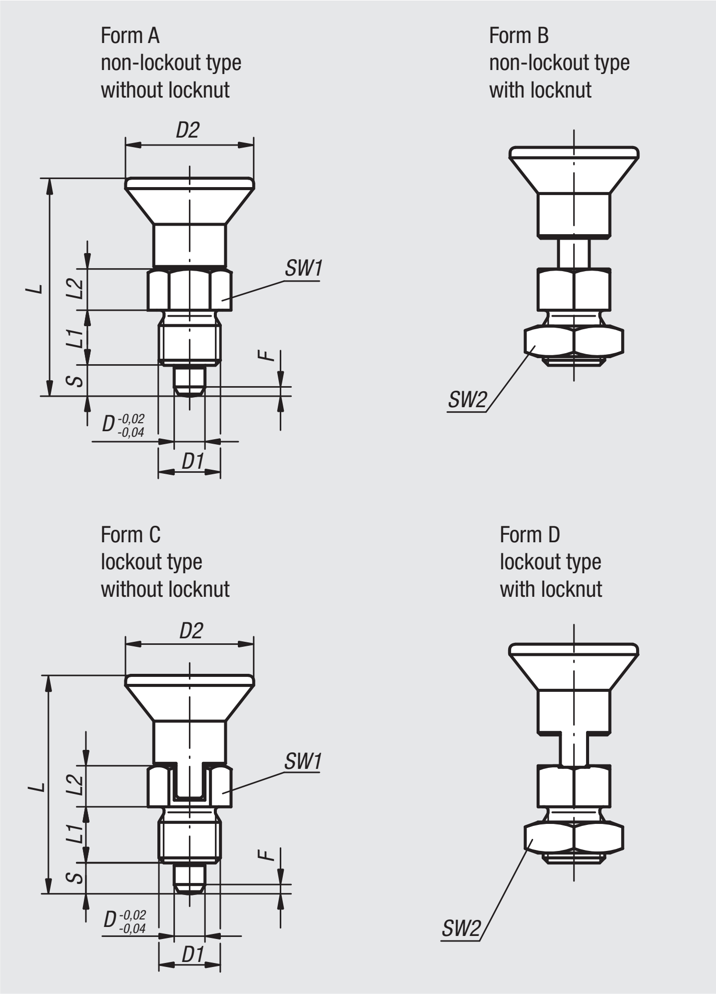
Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-5903	**03089-6903**	**03089-7903**	**03089-8903**	3	M6x0,75	14	25,5	6	5	3,5	8	-/10/-/10	0,8	4	10
03089-5004	**03089-6004**	**03089-7004**	**03089-8004**	4	M8x1	18	29,5	6	6	4	10	-/13/-/13	1	4	12
03089-5105	**03089-6105**	**03089-7105**	**03089-8105**	5	M10x1	21	34,5	8	7	5	13	-/17/-/17	1,3	5	12
03089-5206	**03089-6206**	**03089-7206**	**03089-8206**	6	M12x1,5	25	41,7	10	8	6	14	-/19/-/19	1,8	6	14
03089-5308	**03089-6308**	**03089-7308**	**03089-8308**	8	M16x1,5	33	54	12	10	8	19	-/24/-/24	2,3	14	28
03089-5410	**03089-6410**	**03089-7410**	**03089-8410**	10	M20x1,5	33	61	15	12	10	22	-/30/-/30	2,8	15	32

Indexing plungers, short version, stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-15903	**03089-16903**	**03089-17903**	**03089-18903**	3	M6x0,75	14	25,5	6	5	3,5	8	-/10/-/10	0,8	4	10
03089-15004	**03089-16004**	**03089-17004**	**03089-18004**	4	M8x1	18	29,5	6	6	4	10	-/13/-/13	1	4	12
03089-15105	**03089-16105**	**03089-17105**	**03089-18105**	5	M10x1	21	34,5	8	7	5	13	-/17/-/17	1,3	5	12
03089-15206	**03089-16206**	**03089-17206**	**03089-18206**	6	M12x1,5	25	41,7	10	8	6	14	-/19/-/19	1,8	6	14
03089-15308	**03089-16308**	**03089-17308**	**03089-18308**	8	M16x1,5	33	54	12	10	8	19	-/24/-/24	2,3	14	28
03089-15410	**03089-16410**	**03089-17410**	**03089-18410**	10	M20x1,5	33	61	15	12	10	22	-/30/-/30	2,8	15	32

Indexing plungers

short version



Material:
Steel version:
Indexing pin hardened:
steel grade 5.8.

Stainless steel version,
Indexing pin not hardened
Threaded sleeve and indexing pin 1.4305.

Mushroom knob red thermoplastic

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

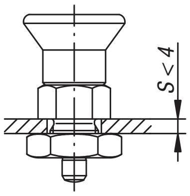
Stainless steel version:
Indexing pin not hardened, ground, bright.

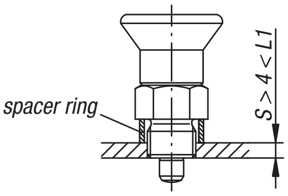
Sample order:
nlm 03089-1620684

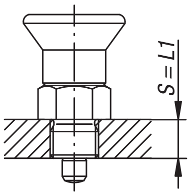
Note:
Indexing plungers are used to prevent any change in position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from springing back.

On request:
Special versions.

Accessories:
Spacer rings 03089







Indexing plungers

short version

Indexing plungers, short version, steel, indexing pin hardened

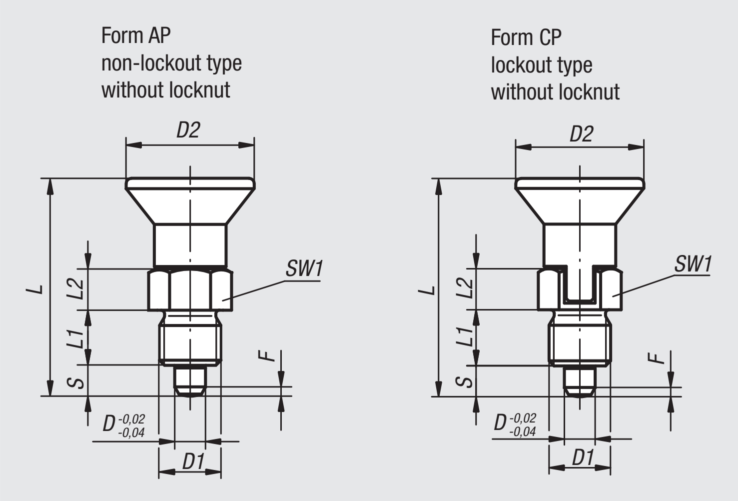
Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-590384	03089-690384	03089-790384	03089-890384	3	M6x0,75	14	25,5	6	5	3,5	8	-/10/-/10	0,8	4	10
03089-500484	03089-600484	03089-700484	03089-800484	4	M8x1	18	29,5	6	6	4	10	-/13/-/13	1	4	12
03089-510584	03089-610584	03089-710584	03089-810584	5	M10x1	21	34,5	8	7	5	13	-/17/-/17	1,3	5	12
03089-520684	03089-620684	03089-720684	03089-820684	6	M12x1,5	25	41,7	10	8	6	14	-/19/-/19	1,8	6	14
03089-530884	03089-630884	03089-730884	03089-830884	8	M16x1,5	33	54	12	10	8	19	-/24/-/24	2,3	14	28
03089-541084	03089-641084	03089-741084	03089-841084	10	M20x1,5	33	61	15	12	10	22	-/30/-/30	2,8	15	32

Indexing plungers, short version, stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-1590384	03089-1690384	03089-1790384	03089-1890384	3	M6x0,75	14	25,5	6	5	3,5	8	-/10/-/10	0,8	4	10
03089-1500484	03089-1600484	03089-1700484	03089-1800484	4	M8x1	18	29,5	6	6	4	10	-/13/-/13	1	4	12
03089-1510584	03089-1610584	03089-1710584	03089-1810584	5	M10x1	21	34,5	8	7	5	13	-/17/-/17	1,3	5	12
03089-1520684	03089-1620684	03089-1720684	03089-1820684	6	M12x1,5	25	41,7	10	8	6	14	-/19/-/19	1,8	6	14
03089-1530884	03089-1630884	03089-1730884	03089-1830884	8	M16x1,5	33	54	12	10	8	19	-/24/-/24	2,3	14	28
03089-1541084	03089-1641084	03089-1741084	03089-1841084	10	M20x1,5	33	61	15	12	10	22	-/30/-/30	2,8	15	32

Indexing plungers

short version, with thread lock



Material:
Steel version:
Indexing pin hardened:
Threaded sleeve and indexing pin steel.

Stainless steel version:
Indexing pin not hardened:
Threaded sleeve and indexing pin 1.4305.

Mushroom knob black grey thermoplastic.
Thread lock blue polyamide.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

Stainless steel version:
Indexing pin not hardened, ground, bright.

Sample order:
nlm 03089-95903

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
Form CP is recommended for applications where the plunger remains disengaged over a long period and the pin should be prevented from springing back.
The thread lock enables the plunger to be screwed in to the exact depth required, no spacer ring is required.
The thread lock is a gripping polyamide coating that is applied punctiform (spot).

On request:
Special versions.

Accessories:
Spacer rings 03089

Indexing plungers

short version, with thread lock

Indexing plungers, short version, with thread lock, steel, indexing pin hardened

Order No. Form AP	Order No. Form CP	D	D1	D2	L	L1	L2	Travel S	SW1	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-95903	**03089-97903**	3	M6x0,75	14	25,5	6	6	3,5	8	0,8	4	10
03089-95004	**03089-97004**	4	M8x1	18	29,5	6	6	4	10	1	4	12
03089-95105	**03089-97105**	5	M10x1	21	34,5	8	7	5	13	1,3	5	12
03089-95206	**03089-97206**	6	M12x1,5	25	41,7	10	8	6	14	1,8	6	14
03089-95308	**03089-97308**	8	M16x1,5	33	54	12	10	8	19	2,3	14	28
03089-95410	**03089-97410**	10	M20x1,5	33	61	15	12	10	22	2,8	15	32

Indexing plungers, short version, with thread lock, stainless steel, indexing pin not hardened

Order No. Form AP	Order No. Form CP	D	D1	D2	L	L1	L2	Travel S	SW1	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-195903	**03089-197903**	3	M6x0,75	14	25,5	6	6	3,5	8	0,8	4	10
03089-195004	**03089-197004**	4	M8x1	18	29,5	6	6	4	10	1	4	12
03089-195105	**03089-197105**	5	M10x1	21	34,5	8	7	5	13	1,3	5	12
03089-195206	**03089-197206**	6	M12x1,5	25	41,7	10	8	6	14	1,8	6	14
03089-195308	**03089-197308**	8	M16x1,5	33	54	12	10	8	19	2,3	14	28
03089-195410	**03089-197410**	10	M20x1,5	33	61	15	12	10	22	2,8	15	32

03089

Indexing plungers stainless steel

Material:
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob 1.4305, electropolished.

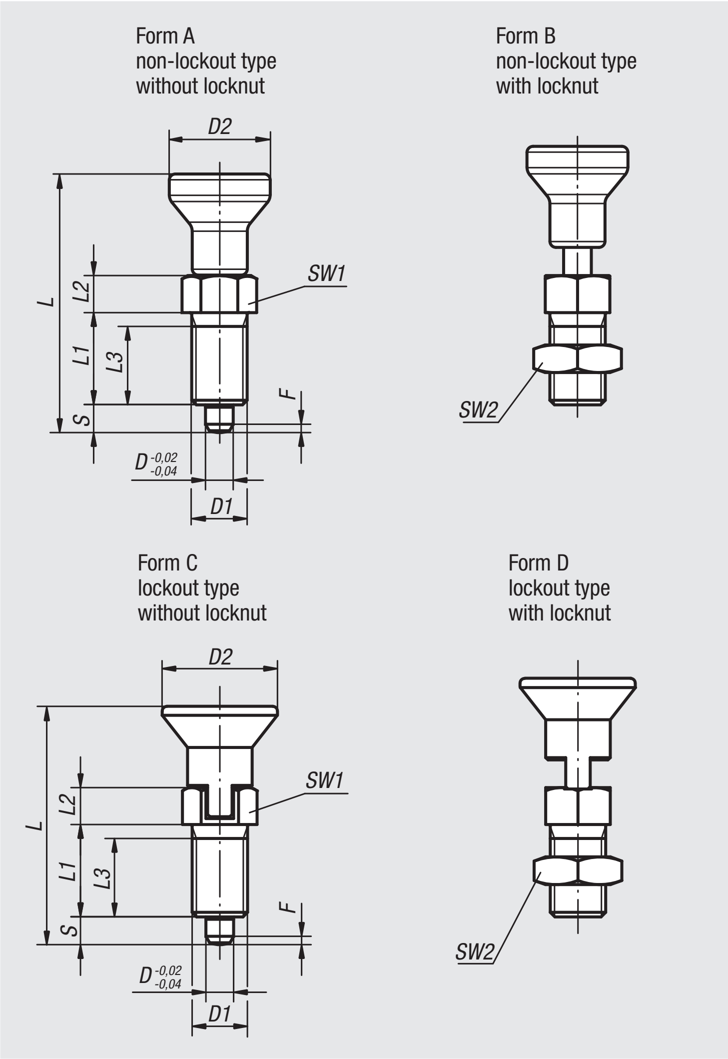
Version:
Bright.
Indexing pin ground.

Sample order:
nlm 03089-001004

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from springing back.

On request:
Special versions.

Accessories:
Spacer rings 03089



Indexing plungers stainless steel, indexing pin hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-001903	03089-002903	03089-003903	03089-004903	3	M6x0,75	14	34,5/34,5/31,5/31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-001004	03089-002004	03089-003004	03089-004004	4	M8x1	18	43/43/38,5/38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-001105	03089-002105	03089-003105	03089-004105	5	M10x1	21	50/50/43,5/43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-001206	03089-002206	03089-003206	03089-004206	6	M12x1,5	25	59/59/51,7/51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-001308	03089-002308	03089-003308	03089-004308	8	M16x1,5	33	77/77/68/68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-001410	03089-002410	03089-003410	03089-004410	10	M20x1,5	33	83/83/74/74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-001412	03089-002412	03089-003412	03089-004412	12	M20x1,5	33	87/87/78/78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-001516	03089-002516	03089-003516	03089-004516	16	M24x2	40	106/106/96/96	32	18	28	16	27	-/36/-/36	3,2	20	46

Indexing plungers stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-111903	03089-112903	03089-113903	03089-114903	3	M6x0,75	14	34,5/34,5/31,5/31,5	12	5	10	3,5	8	-/10/-/10	0,8	4,5	10
03089-111004	03089-112004	03089-113004	03089-114004	4	M8x1	18	43/43/38,5/38,5	15	6	13	4	10	-/13/-/13	1	6	12
03089-111105	03089-112105	03089-113105	03089-114105	5	M10x1	21	50/50/43,5/43,5	17	7	15	5	13	-/17/-/17	1,3	5	12
03089-111206	03089-112206	03089-113206	03089-114206	6	M12x1,5	25	59/59/51,7/51,7	20	8	17	6	14	-/19/-/19	1,8	6	14
03089-111308	03089-112308	03089-113308	03089-114308	8	M16x1,5	33	77/77/68/68	26	10	23	8	19	-/24/-/24	2,3	15	35
03089-111410	03089-112410	03089-113410	03089-114410	10	M20x1,5	33	83/83/74/74	28	12	25	10	22	-/30/-/30	2,8	15	34
03089-111412	03089-112412	03089-113412	03089-114412	12	M20x1,5	33	87/87/78/78	28	14	25	12	22	-/30/-/30	2,8	15	39
03089-111516	03089-112516	03089-113516	03089-114516	16	M24x2	40	106/106/96/96	32	18	28	16	27	-/36/-/36	3,2	20	46

Indexing plungers

for thin-walled parts

Material:
Steel version
Indexing pin hardened:
grade 5.8

Stainless steel version
Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob black-grey thermoplastic.

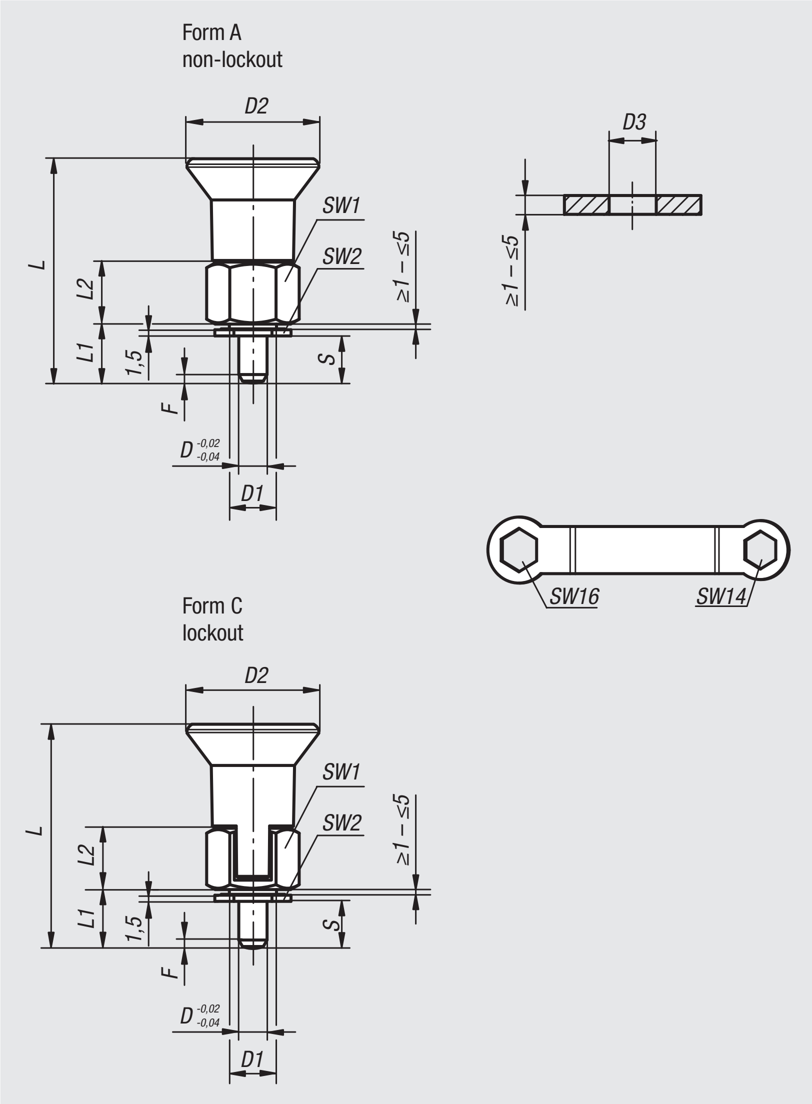
Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

Stainless steel version:
Indexing pin not hardened, ground, bright.

Sample order:
nlm 03089-31105 (indexing plunger)
nlm 03089-91416 (ring spanner)

Note:
These indexing plungers have been specially designed for assembly in thin-walled parts.
Indexing plungers are used where any change in locking position due to lateral forces should be prevented. A new locking position can be set only after the pin has been manually disengaged.
Form C is recommended for applications where the locking pin should remain disengaged for an extended period and be prevented from springing back.

Accessories:
A double-ended ring spanner can be supplied as an accessory to tighten the nut.



Indexing plungers for thin-walled parts, steel, indexing pin hardened

Order No.	Form	D	D1	D2	D3	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Article number double-ended ring spanner
03089-31105	A	5	M10x1	28	10	46,5	11,5	13	5-9	17	14	1,3	6	15	03089-91416
03089-31206	A	6	M10x1	28	10	47,5	12,5	13	6-10	17	14	1,8	7	19	03089-91416
03089-33105	C	5	M10x1	28	10	46,5	11,5	13	5-9	17	14	1,3	6	15	03089-91416
03089-33206	C	6	M10x1	28	10	47,5	12,5	13	6-10	17	14	1,8	7	19	03089-91416

Indexing plungers for thin-walled parts, stainless steel, indexing pin not hardened

Order No.	Form	D	D1	D2	D3	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Article number double-ended ring spanner
03089-311105	A	5	M10x1	28	10	46,5	11,5	13	5-9	17	14	1,3	6	15	03089-91416
03089-311206	A	6	M10x1	28	10	47,5	12,5	13	6-10	17	14	1,8	7	19	03089-91416
03089-313105	C	5	M10x1	28	10	46,5	11,5	13	5-9	17	14	1,3	6	15	03089-91416
03089-313206	C	6	M10x1	28	10	47,5	12,5	13	6-10	17	14	1,8	7	19	03089-91416

Indexing plungers - Premium

with cylindrical pin

Material:
Steel version:
indexing pin hardened: grade 5.8

Stainless steel version:
indexing pin hardened: threaded sleeve 1.4305, indexing pin 1.4305.

Mushroom knob black grey thermoplastic.

Version:
Steel version:
indexing pin hardened, ground and black oxidised.

Stainless steel version:
indexing pin hardened, ground and bright.

Sample order:
nlm 03089-41105

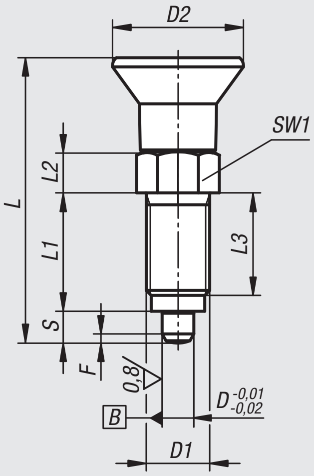
Note:
Premium indexing plungers are characterized by more stringent manufacturing requirements for the indexing plungers and threaded sleeve. In addition, a centring locator that can be used to increase the positioning accuracy is provided on the threaded sleeve. These indexing plungers are used when it is necessary to prevent shifting of the locked position by transverse forces and greater positioning accuracy is required. A new locking position can only be set after the pin has been manually disengaged. When high lateral forces are to be expected, the centring locator should be used.

Assembly:
When using the threaded sleeve centring, it is recommended the receiving reamed hole be machined before tapping.

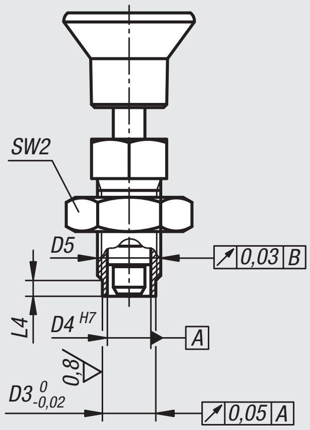
On request:
Special versions and spacer rings.

Accessories:
Matching cylindrical bush 03089.
Locknut 07212-….

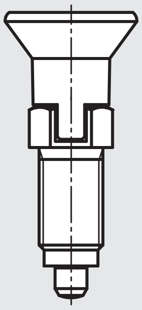
Form A
non-lockout type
without locknut



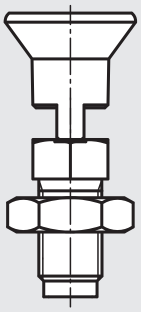
Form B
non-lockout type
with locknut



Form C
lockout type
without locknut



Form D
lockout type
with locknut



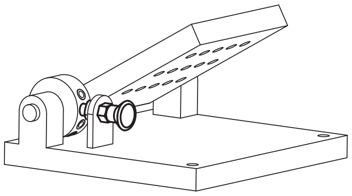
Premium indexing plungers with cylindrical pin, steel, indexing pin hardened

Order No. Form A	Order No. Form B	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-41105	**03089-42105**	5	M10x1	21	8	6	6 -0,01/-0,02	43,5	17	7	15	3	5	13	-/17	1,3	5	12
03089-41206	**03089-42206**	6	M12x1,5	25	10	8,5	8,5 -0,01/-0,03	51,7	20	8	17	3	6	14	-/19	1,8	6	14
03089-41308	**03089-42308**	8	M16x1,5	33	13,5	11	11 -0,01/-0,03	68	26	10	23	4	8	19	-/24	2,3	15	35
03089-41410	**03089-42410**	10	M20x1,5	33	17	11	11 -0,01/-0,03	74	28	12	25	4	10	22	-/30	2,8	15	34

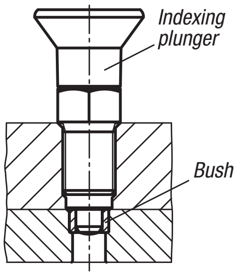
Order No. Form C	Order No. Form D	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-43105	**03089-44105**	5	M10x1	21	8	6	6 -0,01/-0,02	43,5	17	7	15	3	5	13	-/17	1,3	5	12
03089-43206	**03089-44206**	6	M12x1,5	25	10	8,5	8,5 -0,01/-0,03	51,7	20	8	17	3	6	14	-/19	1,8	6	14
03089-43308	**03089-44308**	8	M16x1,5	33	13,5	11	11 -0,01/-0,03	68	26	10	23	4	8	19	-/24	2,3	15	35
03089-43410	**03089-44410**	10	M20x1,5	33	17	11	11 -0,01/-0,03	74	28	12	25	4	10	22	-/30	2,8	15	34

Indexing plungers - Premium

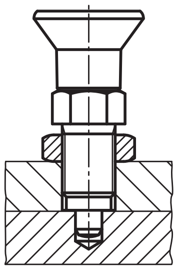
with cylindrical pin



Fixation
with bush:



Fixation
without bush:



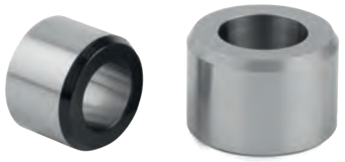
Premium indexing plungers with cylindrical pin, stainless steel, indexing pin hardened

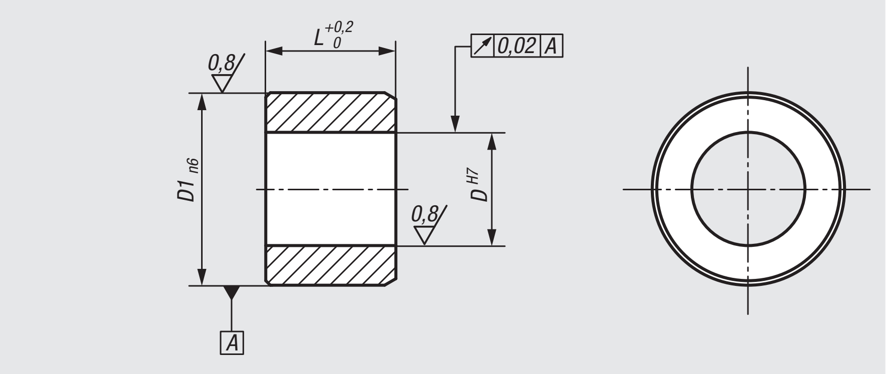
Order No. Form A	Order No. Form B	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-401105	**03089-402105**	5	M10x1	21	8	6	6 -0,01/-0,02	43,5	17	7	15	3	5	13	-/17	1,3	5	12
03089-401206	**03089-402206**	6	M12x1,5	25	10	8,5	8,5 -0,01/-0,03	51,7	20	8	17	3	6	14	-/19	1,8	6	14
03089-401308	**03089-402308**	8	M16x1,5	33	13,5	11	11 -0,01/-0,03	68	26	10	23	4	8	19	-/24	2,3	15	35
03089-401410	**03089-402410**	10	M20x1,5	33	17	11	11 -0,01/-0,03	74	28	12	25	4	10	22	-/30	2,8	15	34

Order No. Form C	Order No. Form D	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-403105	**03089-404105**	5	M10x1	21	8	6	6 -0,01/-0,02	43,5	17	7	15	3	5	13	-/17	1,3	5	12
03089-403206	**03089-404206**	6	M12x1,5	25	10	8,5	8,5 -0,01/-0,03	51,7	20	8	17	3	6	14	-/19	1,8	6	14
03089-403308	**03089-404308**	8	M16x1,5	33	13,5	11	11 -0,01/-0,03	68	26	10	23	4	8	19	-/24	2,3	15	35
03089-403410	**03089-404410**	10	M20x1,5	33	17	11	11 -0,01/-0,03	74	28	12	25	4	10	22	-/30	2,8	15	34

03089

Bushes cylindrical





Material:
Steel or 1.4034 stainless steel.

Version:
Steel version:
black oxidised, hardened and ground.
Stainless steel version:
bright, hardened and ground.

Sample order:
nlm 03089-9005

Note:
Bush for premium indexing plungers with cylindrical indexing pin 03089.

Assembly:
To increase the coaxial alignment accuracy, the hole for the bush and the premium indexing plunger can be machined simultaniously.

Order No.	Main material	D	D1	L
03089-9005	steel	5	8	6
03089-9006	steel	6	10	7
03089-9008	steel	8	13,5	9,5
03089-9010	steel	10	17	11,5
03089-90005	stainless steel	5	8	6
03089-90006	stainless steel	6	10	7
03089-90008	stainless steel	8	13,5	9,5
03089-90010	stainless steel	10	17	11,5

Indexing plungers - Premium

with tapered pin

Material:
Steel version:
indexing pin hardened: grade 5.8

Stainless steel version:
indexing pin hardened: threaded sleeve 1.4305, indexing pin 1.4305.

Mushroom knob black grey thermoplastic.

Version:
Steel version:
indexing pin hardened, ground and black oxidised.

Stainless steel version:
indexing pin hardened, ground and bright.

Sample order:
nlm 03089-52206

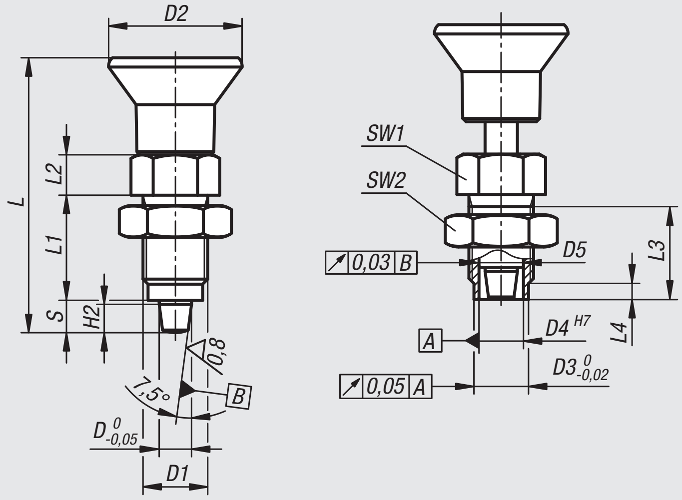
Note:
Premium indexing plungers are characterized by more stringent manufacturing requirements for the indexing plungers and the threaded sleeve. In addition, a centring locator that can be used to increase the positioning accuracy is provided on the threaded sleeve. These indexing plungers are used when it is necessary to prevent shifting of the locked position by transverse forces and greater positioning accuracy is required. A new locking position can only be set after the pin has been manually disengaged. When high lateral forces are to be expected, the centring locator should be used.

Assembly:
When using the threaded sleeve centring, it is recommended the receiving reamed hole be machined before tapping.
The conical contact surface is aligned by the threaded sleeve and locking nut.

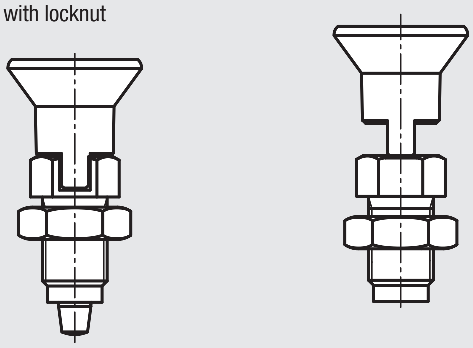
On request:
Special versions and spacer rings.

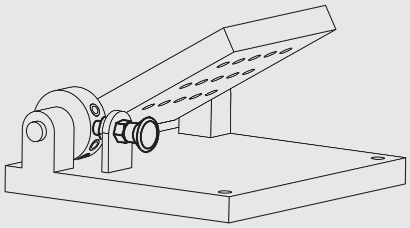
Accessories:
Matching tapered bush 03089.

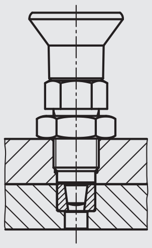
Form B
non-lockout type
with locknut



Form D
lockout type
with locknut







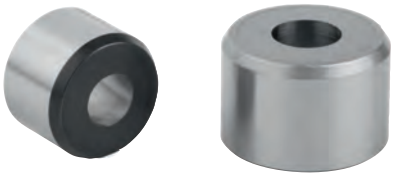
Premium indexing plungers with tapered pin, steel, indexing pin hardened

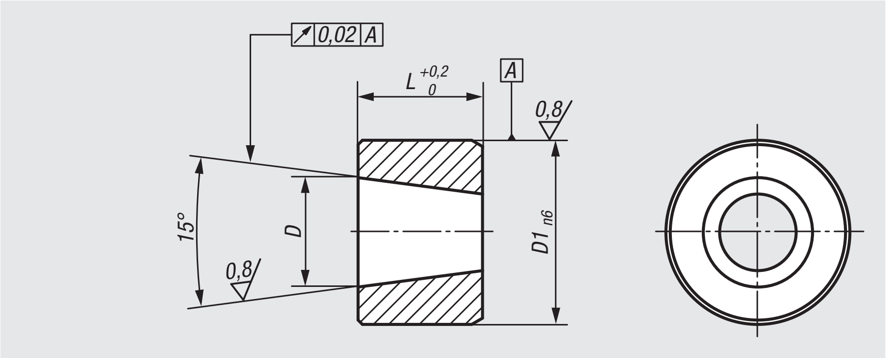
Order No. Form B	Order No. Form D	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	H2	Travel S	SW1	SW2	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-52105	03089-54105	5	M10x1	21	8	6	6 -0,01/-0,02	43,5	17	7	15	3	4	5	13	17	5	12
03089-52206	03089-54206	6	M12x1,5	25	10	8,5	8,5 -0,01/-0,03	51,7	20	8	17	3	5	6	14	19	6	14
03089-52308	03089-54308	8	M16x1,5	33	13,5	11	11 -0,01/-0,03	68	26	10	23	4	7	8	19	24	15	35
03089-52410	03089-54410	10	M20x1,5	33	17	11	11 -0,01/-0,03	74	28	12	25	4	9	10	22	30	15	34

Premium indexing plungers with tapered pin, stainless steel, indexing pin hardened

Order No. Form B	Order No. Form D	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	H2	Travel S	SW1	SW2	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-502105	03089-504105	5	M10x1	21	8	6	6 -0,01/-0,02	43,5	17	7	15	3	4	5	13	17	5	12
03089-502206	03089-504206	6	M12x1,5	25	10	8,5	8,5 -0,01/-0,03	51,7	20	8	17	3	5	6	14	19	6	14
03089-502308	03089-504308	8	M16x1,5	33	13,5	11	11 -0,01/-0,03	68	26	10	23	4	7	8	19	24	15	35
03089-502410	03089-504410	10	M20x1,5	33	17	11	11 -0,01/-0,03	74	28	12	25	4	9	10	22	30	15	34

Bushes tapered





Material:
Steel or 1.4034 stainless steel.

Version:
Steel version:
black oxidised, hardened and ground.
Stainless steel version:
bright, hardened and ground.

Sample order:
nlm 03089-9106

Note:
Matching bush for premium indexing plungers with tapered pin 03089.

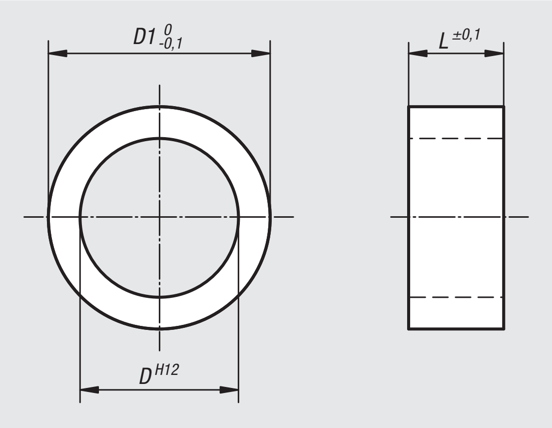
Assembly:
To increase the coaxial alignment accuracy, the holes for the bush and the premium indexing plunger can be machined simultaniously.

Order No.	Main material	D	D1	L
03089-9105	steel	5	8	6
03089-9106	steel	6	10	7
03089-9108	steel	8	13,5	9,5
03089-9110	steel	10	17	11,5
03089-91005	stainless steel	5	8	6
03089-91006	stainless steel	6	10	7
03089-91008	stainless steel	8	13,5	9,5
03089-91010	stainless steel	10	17	11,5

Notes

03089

Spacer rings



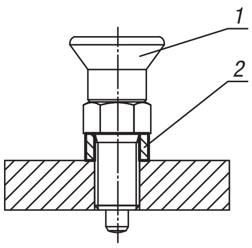
Material:
Stainless steel 1.4305.

Version:
Bright.

Sample order:
nlm 03089-90811021

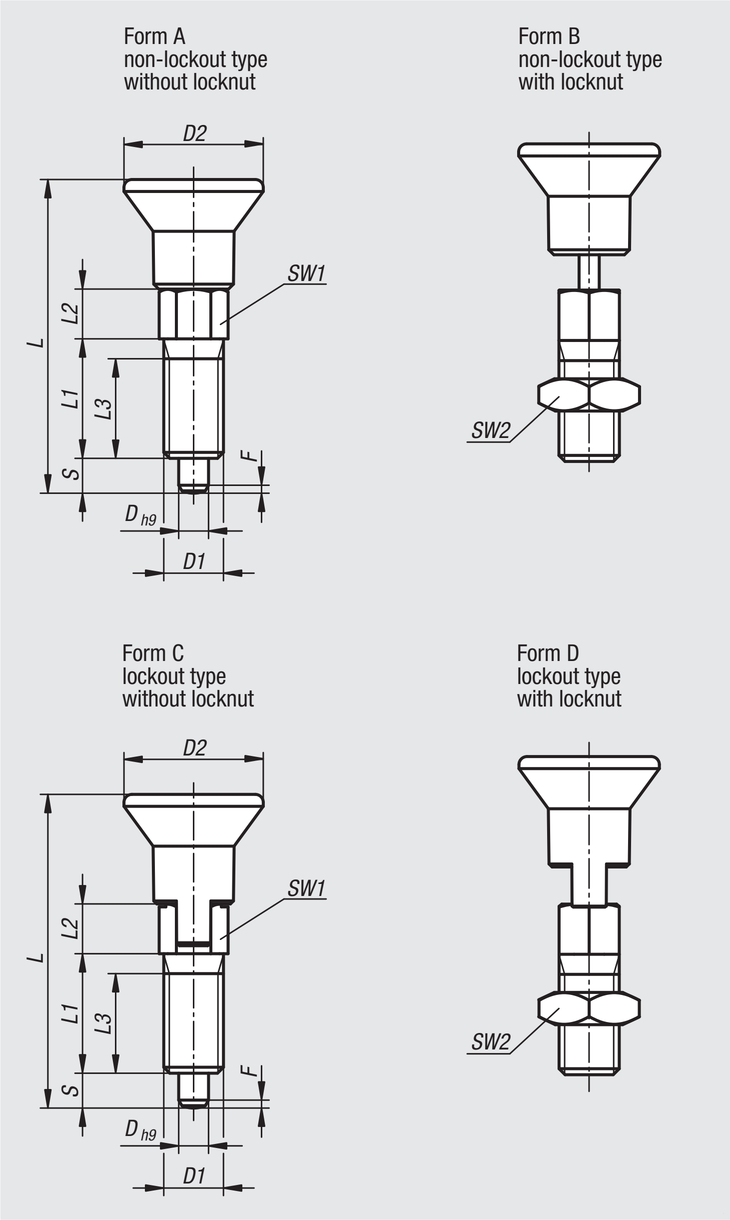
Note:
Spacer rings are used to adjust the indexing plunger thread length to suit the application wall thickness.

Drawing reference:
1) Indexing plunger
2) Spacer ring



Order No.	D	D1	L
03089-90811021	8	11	2
03089-90811031	8	11	3
03089-90811041	8	11	4
03089-90811061	8	11	6
03089-90811081	8	11	8
03089-91014021	10	14	2
03089-91014031	10	14	3
03089-91014041	10	14	4
03089-91014061	10	14	6
03089-91014081	10	14	8
03089-91215021	12	15	2
03089-91215041	12	15	4
03089-91215051	12	15	5
03089-91215061	12	15	6
03089-91215081	12	15	8
03089-91217021	12	17	2
03089-91217041	12	17	4
03089-91217051	12	17	5
03089-91217061	12	17	6
03089-91217081	12	17	8
03089-91621041	16	21	4
03089-91621051	16	21	5
03089-91621061	16	21	6
03089-91621081	16	21	8
03089-91621101	16	21	10

Indexing plungers ECO



Material:
Steel version:
Indexing pin not hardened.
Threaded sleeve 1.0718.
Indexing pin 1.4305.

Stainless steel version:
Indexing pin not hardened.
Threaded sleeve and indexing pin 1.4305.

Mushroom knob black grey thermoplastic.

Version:
Steel version:
Indexing pin hardened.
Threaded sleeve trivalent blue passivated.
Indexing pin bright.

Stainless steel version:
Indexing pin not hardened.
Steel parts bright.

Sample order:
nlm 03089-01903060

Note:
This article is a cost-efficient alternative to the existing indexing plungers. It is suitable for applications which require less precision.
The max. tightening torque should be observed when assembling.

On request:
Special versions and fine thread.

Indexing plunger ECO, steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque max. Nm
03089-01903060	03089-02903060	03089-03903060	03089-04903060	3	M6	14	31,5	12	5	10	3,5	6	-/10/-/10	0,8	4	10	2
03089-01004060	03089-02004060	03089-03004060	03089-04004060	4	M6	14	36	15	6	13	4	6	-/10/-/10	1	6	12	2
03089-01105080	03089-02105080	03089-03105080	03089-04105080	5	M8	14	40	17	7	15	5	8	-/13/-/13	1,3	6	12	7
03089-01206100	03089-02206100	03089-03206100	03089-04206100	6	M10	18	47,5	20	8	17	6	10	-/17/-/17	1,8	8	15	15
03089-01308120	03089-02308120	03089-03308120	03089-04308120	8	M12	25	61,7	26	10	23	8	12	-/19/-/19	2,3	8	19	20

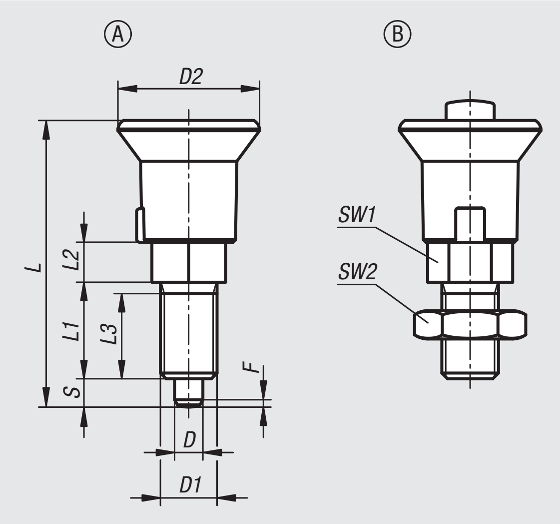
Indexing plunger ECO, stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque max. Nm
03089-11903060	03089-12903060	03089-13903060	03089-14903060	3	M6	14	31,5	12	5	10	3,5	6	-/10/-/10	0,8	4	10	2
03089-11004060	03089-12004060	03089-13004060	03089-14004060	4	M6	14	36	15	6	13	4	6	-/10/-/10	1	6	12	2
03089-11105080	03089-12105080	03089-13105080	03089-14105080	5	M8	14	40	17	7	15	5	8	-/13/-/13	1,3	6	12	7
03089-11206100	03089-12206100	03089-13206100	03089-14206100	6	M10	18	47,5	20	8	17	6	10	-/17/-/17	1,8	8	15	15
03089-11308120	03089-12308120	03089-13308120	03089-14308120	8	M12	25	61,7	26	10	23	8	12	-/19/-/19	2,3	8	19	20

03089

Indexing plunger

with lock



Material:
Steel version:
threaded sleeve and indexing pin, steel.

Stainless steel version:
indexing pin not hardened.
Threaded sleeve and indexing pin 1.4305.

Mushroom grip, black grey thermoplastic.
Release button, red thermoplastic.

Version:
Steel version:
threaded sleeve, black oxidised.
Indexing pin hardened, ground and black oxidised.

Stainless steel version:
threaded sleeve, bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03089-11051

Note:
Indexing plungers are used where any change in locking position due to lateral forces should be prevented.
The locking mechanism is activated by pressing the push button.
The red release button enables the indexed position to be changed.

Drawing reference:
Form A: without locknut
Form B: with locknut

Order No. Form A	Order No. Form B	Main material	Surface finish body	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	return force N
03089-11051	**03089-21051**	steel	hardened	5	M10x1	25	50,5	17	7	15	5	13	-/17	1,3	8-12
03089-12061	**03089-22061**	steel	hardened	6	M12x1,5	25	55,5	20	8	17	6	14	-/19	1,8	4-12
03089-13081	**03089-23081**	steel	hardened	8	M16x1,5	33	76	26	10	23	8	19	-/24	2,3	10-20
03089-14101	**03089-24101**	steel	hardened	10	M20x1,5	33	82	28	12	25	10	22	-/30	2,8	3-23
03089-111051	**03089-121051**	stainless steel	not hardened	5	M10x1	25	50,5	17	7	15	5	13	-/17	1,3	8-12
03089-112061	**03089-122061**	stainless steel	not hardened	6	M12x1,5	25	55,5	20	8	17	6	14	-/19	1,8	4-12
03089-113081	**03089-123081**	stainless steel	not hardened	8	M16x1,5	33	76	26	10	23	8	19	-/24	2,3	10-20
03089-114101	**03089-124101**	stainless steel	not hardened	10	M20x1,5	33	82	28	12	25	10	22	-/30	2,8	3-23

Indexing plungers

with rotation lock and lead-in chamfer

Material:
Steel version:
indexing pin hardened: grade 5.8
Stainless steel version:
indexing pin hardened: threaded sleeve 1.4305, indexing pin 1.4305.

Mushroom knob black grey thermoplastic.

Version:
Steel version:
indexing pin hardened, ground and black oxidised.
Stainless steel version:
indexing pin hardened, ground and bright.

Sample order:
nlm 03089-10-12060

Note:
Indexing plungers are used where any change in locking position due to lateral forces should be prevented. The rotation lock ensures that the position of the pin in relation to the sleeve cannot be changed. The point angle enables the pin to retract automatically through a lateral force from one side. Loosening the screw as far as the marking on the plunger enables the point angle to be rotated in 60° increments.

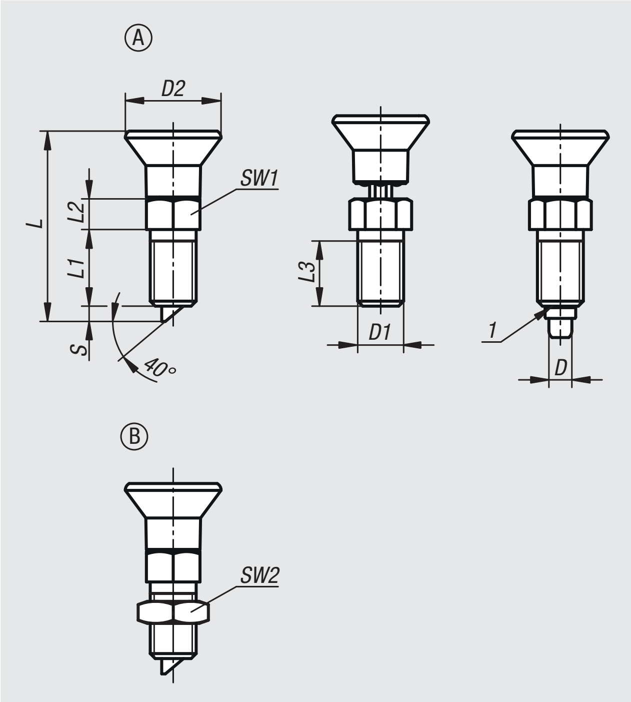
Assembly:
The screw can be loosened using a hex. key.

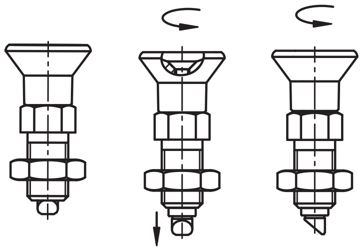
On request:
Special versions.

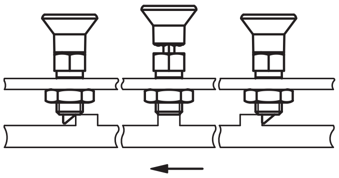
Accessories:
Spacer rings 03089

Drawing reference:
Form A: without locknut
Form B: with locknut

1) marking ring







Indexing plunger with rotation lock and lead-in chamfer, steel, indexing pin hardened

Order No. Form A	Order No. Form B	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-10-12061	**03089-10-22061**	6	M12x1,5	25	49,7	20	8	17	4	14	-/19	8	14
03089-10-12060	**03089-10-22060**	6	M12	25	49,7	20	8	17	4	14	-/19	8	14
03089-10-13081	**03089-10-23081**	8	M16x1,5	33	66	26	10	23	6	19	-/24	20	35
03089-10-13080	**03089-10-23080**	8	M16	33	66	26	10	23	6	19	-/24	20	35

Indexing plunger with rotation lock and lead-in chamfer, stainless steel, indexing pin hardened

Order No. Form A	Order No. Form B	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-10-012061	**03089-10-022061**	6	M12x1,5	25	49,7	20	8	17	4	14	-/19	8	14
03089-10-012060	**03089-10-022060**	6	M12	25	49,7	20	8	17	4	14	-/19	8	14
03089-10-013081	**03089-10-023081**	8	M16x1,5	33	66	26	10	23	6	19	-/24	20	35
03089-10-013080	**03089-10-023080**	8	M16	33	66	26	10	23	6	19	-/24	20	35

Indexing plungers

Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob black-grey thermoplastic.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

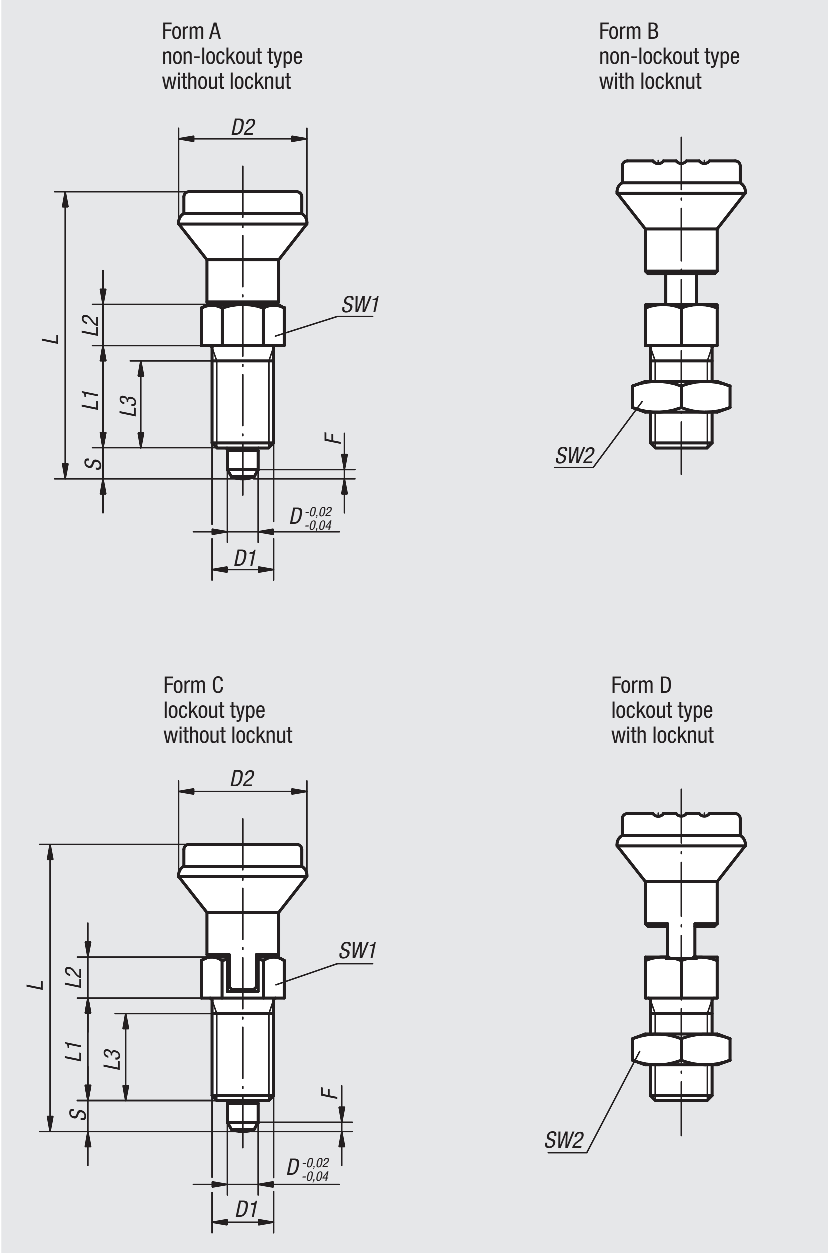
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

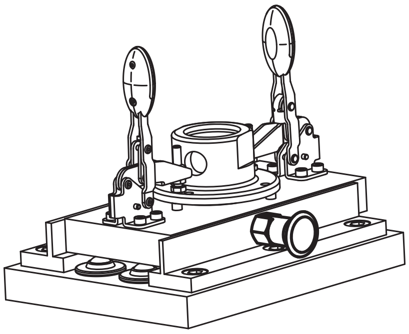
Sample order:
nlm 03090-04206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from springing back.

On request:
Special versions.

Accessories:
Spacer rings 03089





Indexing plungers

Indexing plungers, steel, indexing pin hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03090-1105	**03090-2105**	**03090-3105**	**03090-4105**	5	M10x1	21	47	17	7	15	5	13	-/17/-/17	1,3	5	12
03090-1206	**03090-2206**	**03090-3206**	**03090-4206**	6	M12x1,5	25	56	20	8	17	6	14	-/19/-/19	1,8	6	14
03090-1308	**03090-2308**	**03090-3308**	**03090-4308**	8	M16x1,5	33	74	26	10	23	8	19	-/24/-/24	2,3	15	35
03090-1410	**03090-2410**	**03090-3410**	**03090-4410**	10	M20x1,5	33	80	28	12	25	10	22	-/30/-/30	2,8	15	34

Indexing plungers, stainless steel, indexing pin hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03090-01105	**03090-02105**	**03090-03105**	**03090-04105**	5	M10x1	21	47	17	7	15	5	13	-/17/-/17	1,3	5	12
03090-01206	**03090-02206**	**03090-03206**	**03090-04206**	6	M12x1,5	25	56	20	8	17	6	14	-/19/-/19	1,8	6	14
03090-01308	**03090-02308**	**03090-03308**	**03090-04308**	8	M16x1,5	33	74	26	10	23	8	19	-/24/-/24	2,3	15	35
03090-01410	**03090-02410**	**03090-03410**	**03090-04410**	10	M20x1,5	33	80	28	12	25	10	22	-/30/-/30	2,8	15	34

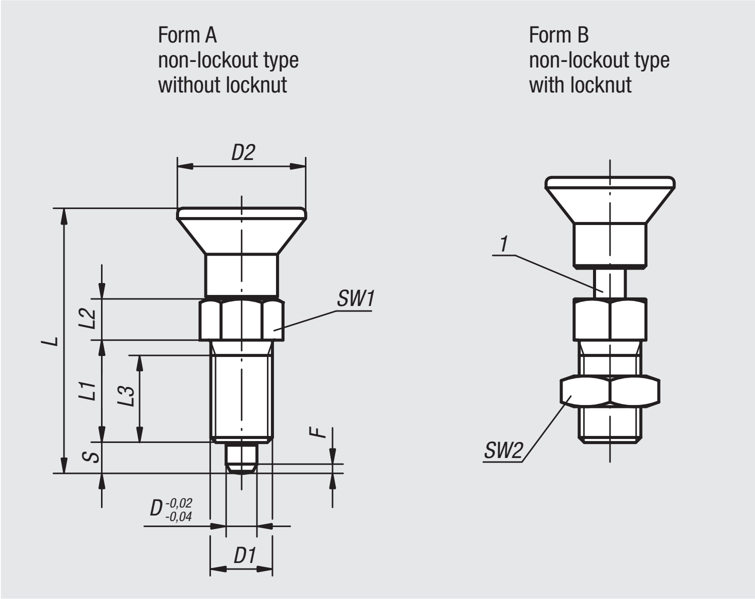
Indexing plungers, stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03090-11105	**03090-12105**	**03090-13105**	**03090-14105**	5	M10x1	21	47	17	7	15	5	13	-/17/-/17	1,3	5	12
03090-11206	**03090-12206**	**03090-13206**	**03090-14206**	6	M12x1,5	25	56	20	8	17	6	14	-/19/-/19	1,8	6	14
03090-11308	**03090-12308**	**03090-13308**	**03090-14308**	8	M16x1,5	33	74	26	10	23	8	19	-/24/-/24	2,3	15	35
03090-11410	**03090-12410**	**03090-13410**	**03090-14410**	10	M20x1,5	33	80	28	12	25	10	22	-/30/-/30	2,8	15	34

03090

Indexing plungers

with locked mark



Material:
Indexing pin steel.
Threaded sleeve 1.0718.
Mushroom knob black grey thermoplastic.
Lock mark aluminium.

Version:
Indexing pin steel, hardened, ground and black oxidised.
Threaded sleeve black oxidised.
Lock mark red anodised.

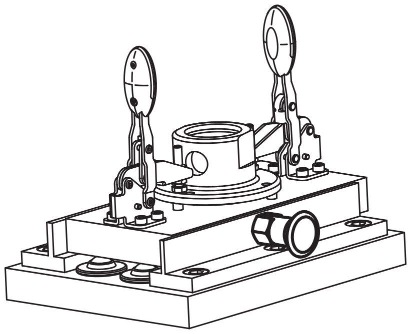
Sample order:
nlm 03090-71105

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the plunger has been manually disengaged.
When the lock mark is visible the plunger is either completely disengaged or only partly in the index position.

On request:
Special versions.

Accessories:
Spacer rings 03089

Drawing reference:
1) marking ring



Order No. Form A	Order No. Form B	D	D1	D2	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03090-71105	**03090-72105**	5	M10x1	21	43,5	17	7	15	5	13	-/17	1,3	5	12
03090-71206	**03090-72206**	6	M12x1,5	25	51,7	20	8	17	6	14	-/19	1,8	6	14
03090-71308	**03090-72308**	8	M16x1,5	33	68	26	10	23	8	19	-/24	2,3	15	35

Notes

Indexing plungers

with T-grip

Material:
Steel version:
Indexing pin hardened:
pin 1.0718
threaded sleeve 1.0718.

Stainless steel version:
Indexing pin hardened:
pin 1.4305
threaded sleeve 1.4305.

T-grip thermoplastic, black grey or traffic red RAL 3020.

Version:
Steel version:
indexing pin hardened, ground and black oxidised.
Threaded sleeve black oxidised

Stainless steel version:
indexing pin hardened, ground and bright.
Threaded sleeve bright.

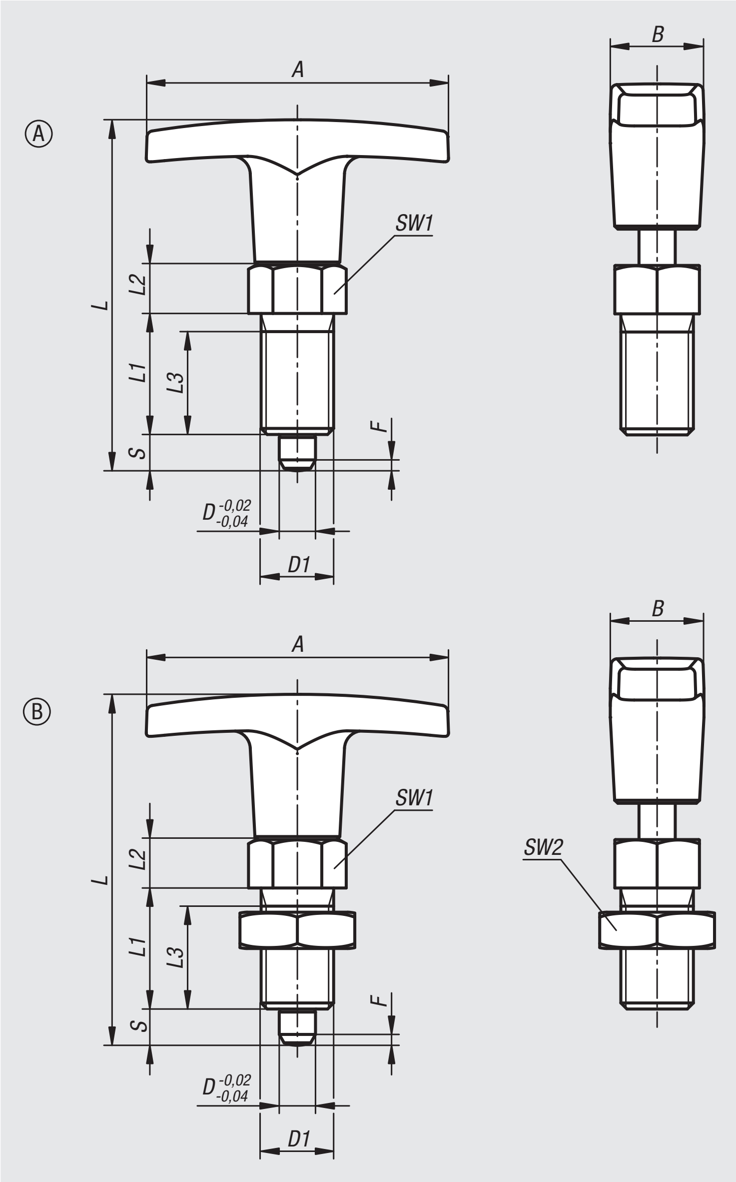
Sample order:
nlm 03090-5308

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. The ergonomic T-grip enables easy handling and low effort.

On request:
Special versions.

Accessories:
Spacer rings 03089

Drawing reference:
Form A: without locknut
Form B: with locknut



Indexing plungers

with T-grip

Indexing plungers, steel, indexing pin hardened

Order No. Form A	Order No. Form B	Component colour	A	B	D	D1	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03090-5206	**03090-6206**	black grey RAL 7021	50	15,5	6	M12x1,5	58	20	8	17	6	14	-/19	1,8	6	14
03090-5308	**03090-6308**	black grey RAL 7021	60	18	8	M16x1,5	77	26	10	23	8	19	-/24	2,3	15	35
03090-5410	**03090-6410**	black grey RAL 7021	72	19	10	M20x1,5	84	28	12	25	10	22	-/30	2,8	15	34
03090-520684	**03090-620684**	red	50	15,5	6	M12x1,5	58	20	8	17	6	14	-/19	1,8	6	14
03090-530884	**03090-630884**	red	60	18	8	M16x1,5	77	26	10	23	8	19	-/24	2,3	15	35
03090-541084	**03090-641084**	red	72	19	10	M20x1,5	84	28	12	25	10	22	-/30	2,8	15	34

Indexing plungers, stainless steel, indexing pin hardened

Order No. Form A	Order No. Form B	Component colour	A	B	D	D1	L	L1	L2	L3	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03090-05206	**03090-06206**	black grey RAL 7021	50	15,5	6	M12x1,5	58	20	8	17	6	14	-/19	1,8	6	14
03090-05308	**03090-06308**	black grey RAL 7021	60	18	8	M16x1,5	77	26	10	23	8	19	-/24	2,3	15	35
03090-05410	**03090-06410**	black grey RAL 7021	72	19	10	M20x1,5	84	28	12	25	10	22	-/30	2,8	15	34
03090-0520684	**03090-0620684**	red	50	15,5	6	M12x1,5	58	20	8	17	6	14	-/19	1,8	6	14
03090-0530884	**03090-0630884**	red	60	18	8	M16x1,5	77	26	10	23	8	19	-/24	2,3	15	35
03090-0541084	**03090-0641084**	red	72	19	10	M20x1,5	84	28	12	25	10	22	-/30	2,8	15	34

03090

Indexing plungers ECO

short version

Material:
Steel version:
Indexing pin not hardened.
Threaded sleeve 1.0718.
Indexing pin 1.4305.

Stainless steel version:
Indexing pin not hardened.
Threaded sleeve and indexing pin 1.4305.

Mushroom knob black grey thermoplastic.

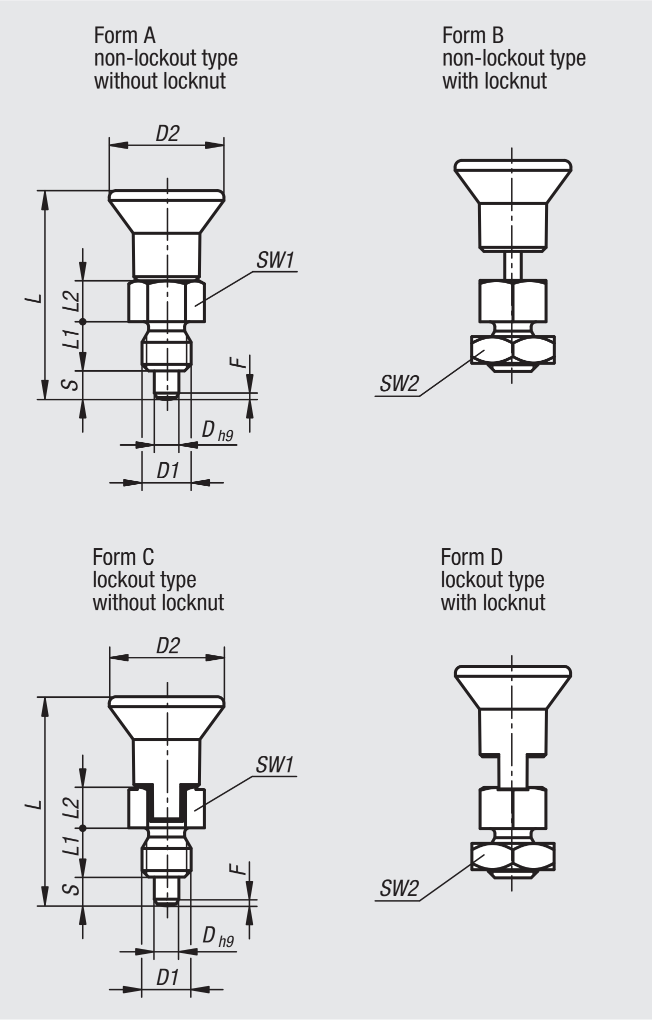
Version:
Steel version:
Indexing pin hardened.
Threaded sleeve trivalent blue passivated.
Indexing pin bright.

Stainless steel version:
Indexing pin not hardened.
Steel parts bright.

Sample order:
nlm 03090-01903060

Note:
This article is a cost-efficient alternative to the existing indexing plungers. It is suitable for applications which require less precision.
The max. tightening torque should be observed when assembling.

On request:
Special versions.



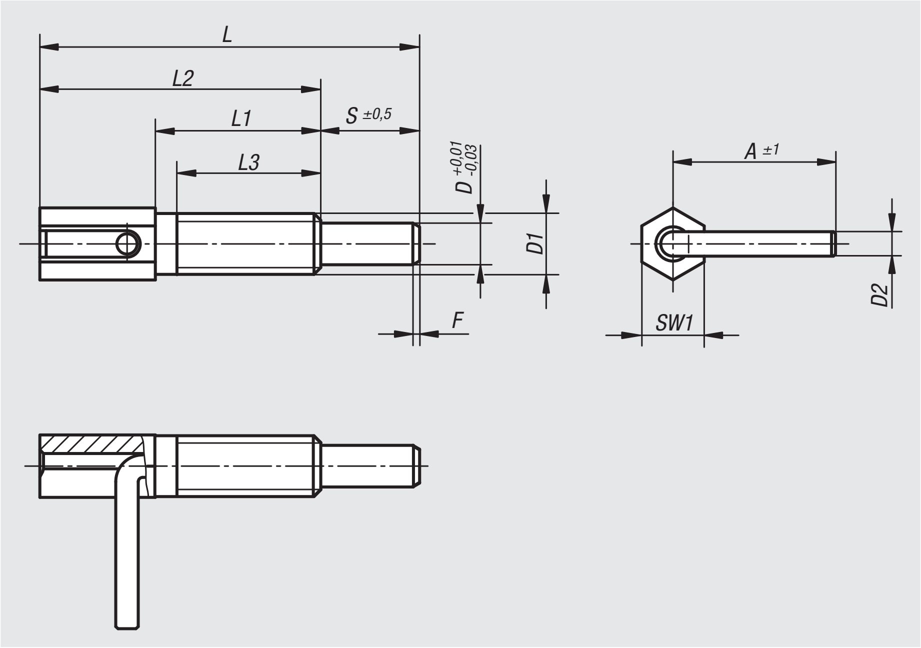
Indexing plungers ECO, short version, steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque max. Nm
03090-01903060	03090-02903060	03090-03903060	03090-04903060	3	M6	14	25,5	6	5	3,5	8	-/10/-/10	0,8	3,5	8	2
03090-01004080	03090-02004080	03090-03004080	03090-04004080	4	M8	18	29,5	6	6	4	10	-/13/-/13	1	3,5	9	2
03090-01105100	03090-02105100	03090-03105100	03090-04105100	5	M10	21	34,5	8	7	5	13	-/17/-/17	1,3	6	12	7
03090-01206120	03090-02206120	03090-03206120	03090-04206120	6	M12	25	41,7	10	8	6	14	-/19/-/19	1,8	6	12	15
03090-01308160	03090-02308160	03090-03308160	03090-04308160	8	M16	33	54	12	10	8	19	-/24/-/24	2,3	6	13	20

Indexing plungers ECO, short version, stainless steel, indexing pin not hardened

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	D	D1	D2	L	L1	L2	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque max. Nm
03090-11903060	03090-12903060	03090-13903060	03090-14903060	3	M6	14	25,5	6	5	3,5	8	-/10/-/10	0,8	3,5	8	2
03090-11004080	03090-12004080	03090-13004080	03090-14004080	4	M8	18	29,5	6	6	4	10	-/13/-/13	1	3,5	9	2
03090-11105100	03090-12105100	03090-13105100	03090-14105100	5	M10	21	34,5	8	7	5	13	-/17/-/17	1,3	6	12	7
03090-11206120	03090-12206120	03090-13206120	03090-14206120	6	M12	25	41,7	10	8	6	14	-/19/-/19	1,8	6	12	15
03090-11308160	03090-12308160	03090-13308160	03090-14308160	8	M16	33	54	12	10	8	19	-/24/-/24	2,3	6	13	20

Indexing plungers



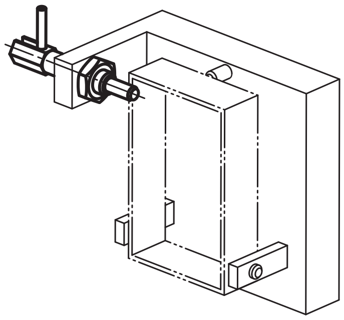
Material:
Steel grade 5.8.

Version:
Trivalent blue passivated.

Sample order:
nlm 03091-1206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.

On request:
Special versions.



Order No.	A	D	D1	D2	L	L1	L2	L3	Travel S	SW1	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque max. Nm
03091-1104	16	4	M6	2,3	41,5	20	32	17	9,5	6	0,7	3	10	1,6
03091-1905	19	5	M8	3	54	27	42	24	12	8	0,9	3,5	13,5	4,5
03091-1206	23,5	6	M10	3,5	65	33,5	51	30	14	10	1,1	4	16	10
03091-1308	31	8	M12	4,7	73	31,8	54	28	19	12	1,3	4	22	13
03091-1410	33	10	M16	4,7	102,5	50,5	77,5	44,5	25	16	1,6	4	23	42

Indexing plungers

Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

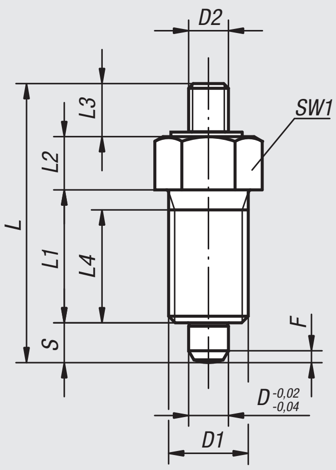
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03092-02308

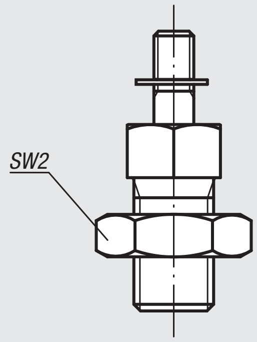
Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been disengaged. Special grips can be fitted on the projecting threaded pin. This pin is also suitable for automatic actuation e.g. programme controlled pneumatic cylinder or by remote control using bowden cables.

On request:
Special versions.

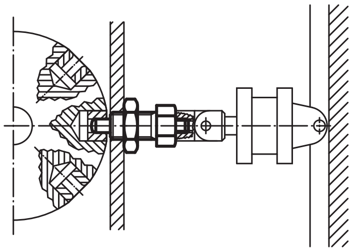
Accessories:
Spacer rings 03089



Form E
with threaded pin
without locknut



Form F
with threaded pin
with locknut



Indexing plungers

Indexing plungers, steel, indexing pin hardened

Order No. Form E	Order No. Form F	D	D1	D2	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03092-1903	**03092-2903**	3	M6x0,75	M2	24	12	5	3,5	10	3,5	8	- / 10	0,8	4,5	10
03092-1004	**03092-2004**	4	M8x1	M3	32	15	6	7	13	4	10	- / 13	1	6	12
03092-1105	**03092-2105**	5	M10x1	M4	37	17	7	8	15	5	13	- / 17	1,3	5	12
03092-1206	**03092-2206**	6	M12x1,5	M6	42	20	8	8	17	6	14	- / 19	1,8	6	14
03092-1308	**03092-2308**	8	M16x1,5	M8	56	26	10	12	23	8	19	- / 24	2,3	15	35
03092-1410	**03092-2410**	10	M20x1,5	M8	62	28	12	12	25	10	22	- / 30	2,8	15	34
03092-1412	**03092-2412**	12	M20x1,5	M8	66	28	14	12	25	12	22	- / 30	2,8	15	39
03092-1516	**03092-2516**	16	M24x2	M10	80	32	18	14	28	16	27	- / 36	3,2	20	46

Indexing plungers, stainless steel, indexing pin hardened

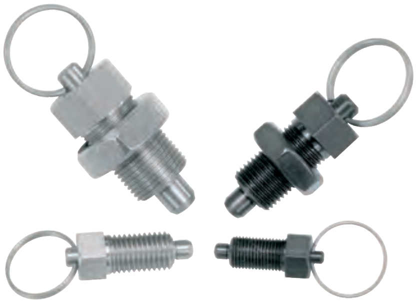
Order No. Form E	Order No. Form F	D	D1	D2	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03092-01903	**03092-02903**	3	M6x0,75	M2	24	12	5	3,5	10	3,5	8	- / 10	0,8	4,5	10
03092-01004	**03092-02004**	4	M8x1	M3	32	15	6	7	13	4	10	- / 13	1	6	12
03092-01105	**03092-02105**	5	M10x1	M4	37	17	7	8	15	5	13	- / 17	1,3	5	12
03092-01206	**03092-02206**	6	M12x1,5	M6	42	20	8	8	17	6	14	- / 19	1,8	6	14
03092-01308	**03092-02308**	8	M16x1,5	M8	56	26	10	12	23	8	19	- / 24	2,3	15	35
03092-01410	**03092-02410**	10	M20x1,5	M8	62	28	12	12	25	10	22	- / 30	2,8	15	34
03092-01412	**03092-02412**	12	M20x1,5	M8	66	28	14	12	25	12	22	- / 30	2,8	15	39
03092-01516	**03092-02516**	16	M24x2	M10	80	32	18	14	28	16	27	- / 36	3,2	20	46

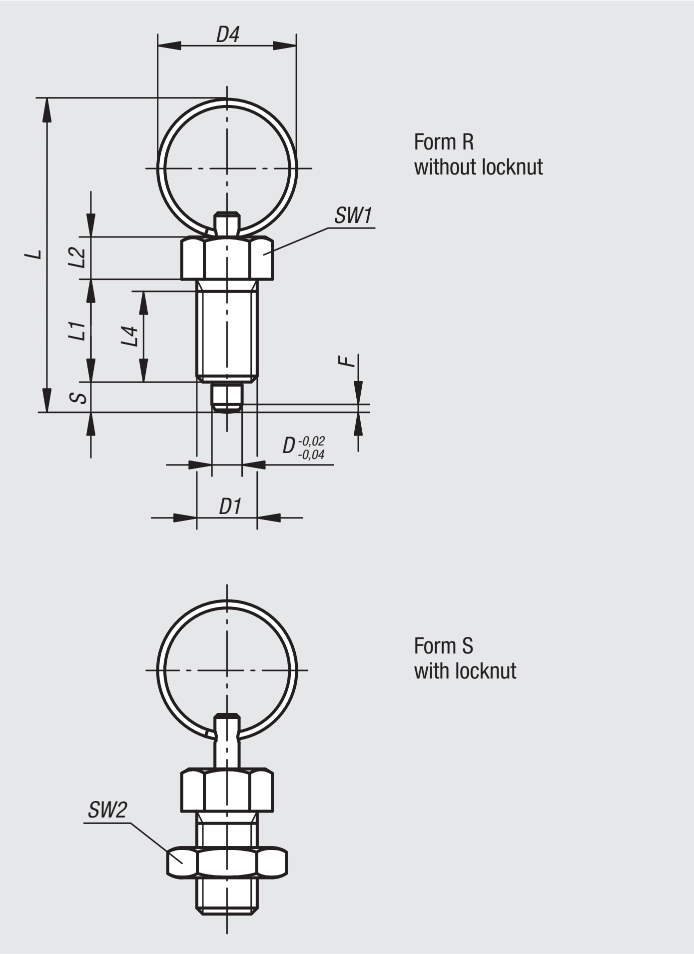
Indexing plungers, stainless steel, indexing pin not hardened

Order No. Form E	Order No. Form F	D	D1	D2	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03092-11903	**03092-12903**	3	M6x0,75	M2	24	12	5	3,5	10	3,5	8	- / 10	0,8	4,5	10
03092-11004	**03092-12004**	4	M8x1	M3	32	15	6	7	13	4	10	- / 13	1	6	12
03092-11105	**03092-12105**	5	M10x1	M4	37	17	7	8	15	5	13	- / 17	1,3	5	12
03092-11206	**03092-12206**	6	M12x1,5	M6	42	20	8	8	17	6	14	- / 19	1,8	6	14
03092-11308	**03092-12308**	8	M16x1,5	M8	56	26	10	12	23	8	19	- / 24	2,3	15	35
03092-11410	**03092-12410**	10	M20x1,5	M8	62	28	12	12	25	10	22	- / 30	2,8	15	34
03092-11412	**03092-12412**	12	M20x1,5	M8	66	28	14	12	25	12	22	- / 30	2,8	15	39
03092-11516	**03092-12516**	16	M24x2	M10	80	32	18	14	28	16	27	- / 36	3,2	20	46

03092

Indexing plungers





Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Key ring 1.4310, bright.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

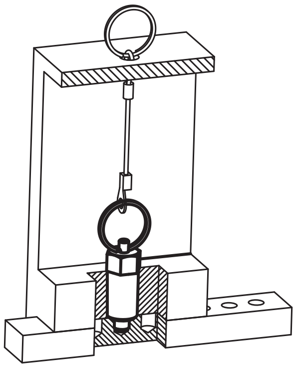
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03092-03308

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been disengaged. The key ring is also suitable for automatic actuation of the indexing plunger by e.g. program-controlled pneumatic cylinder or by remote control using bowden cables.

On request:
Special versions.

Accessories:
Spacer rings 03089



Indexing plungers

Indexing plungers, steel, indexing pin hardened

Order No. Form R	Order No. Form S	D	D1	D4	L	L1	L2	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03092-3004	**03092-4004**	4	M8x1	15	40	15	6	13	4	10	- / 13	1	6	12
03092-3105	**03092-4105**	5	M10x1	23	52	17	7	15	5	13	- / 17	1,3	5	12
03092-3206	**03092-4206**	6	M12x1,5	23	57	20	8	17	6	14	- / 19	1,8	6	14
03092-3308	**03092-4308**	8	M16x1,5	28	72	26	10	23	8	19	- / 24	2,3	15	35
03092-3410	**03092-4410**	10	M20x1,5	28	78	28	12	25	10	22	- / 30	2,8	15	34

Indexing plungers, stainless steel, indexing pin hardened

Order No. Form R	Order No. Form S	D	D1	D4	L	L1	L2	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03092-03004	**03092-04004**	4	M8x1	15	40	15	6	13	4	10	- / 13	1	6	12
03092-03105	**03092-04105**	5	M10x1	23	52	17	7	15	5	13	- / 17	1,3	5	12
03092-03206	**03092-04206**	6	M12x1,5	23	57	20	8	17	6	14	- / 19	1,8	6	14
03092-03308	**03092-04308**	8	M16x1,5	28	72	26	10	23	8	19	- / 24	2,3	15	35
03092-03410	**03092-04410**	10	M20x1,5	28	78	28	12	25	10	22	- / 30	2,8	15	34

Indexing plungers, stainless steel, indexing pin not hardened

Order No. Form R	Order No. Form S	D	D1	D4	L	L1	L2	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03092-13004	**03092-14004**	4	M8x1	15	40	15	6	13	4	10	- / 13	1	6	12
03092-13105	**03092-14105**	5	M10x1	23	52	17	7	15	5	13	- / 17	1,3	5	12
03092-13206	**03092-14206**	6	M12x1,5	23	57	20	8	17	6	14	- / 19	1,8	6	14
03092-13308	**03092-14308**	8	M16x1,5	28	72	26	10	23	8	19	- / 24	2,3	15	35
03092-13410	**03092-14410**	10	M20x1,5	28	78	28	12	25	10	22	- / 30	2,8	15	34

Indexing plungers

without collar

Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob black-grey thermoplastic.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

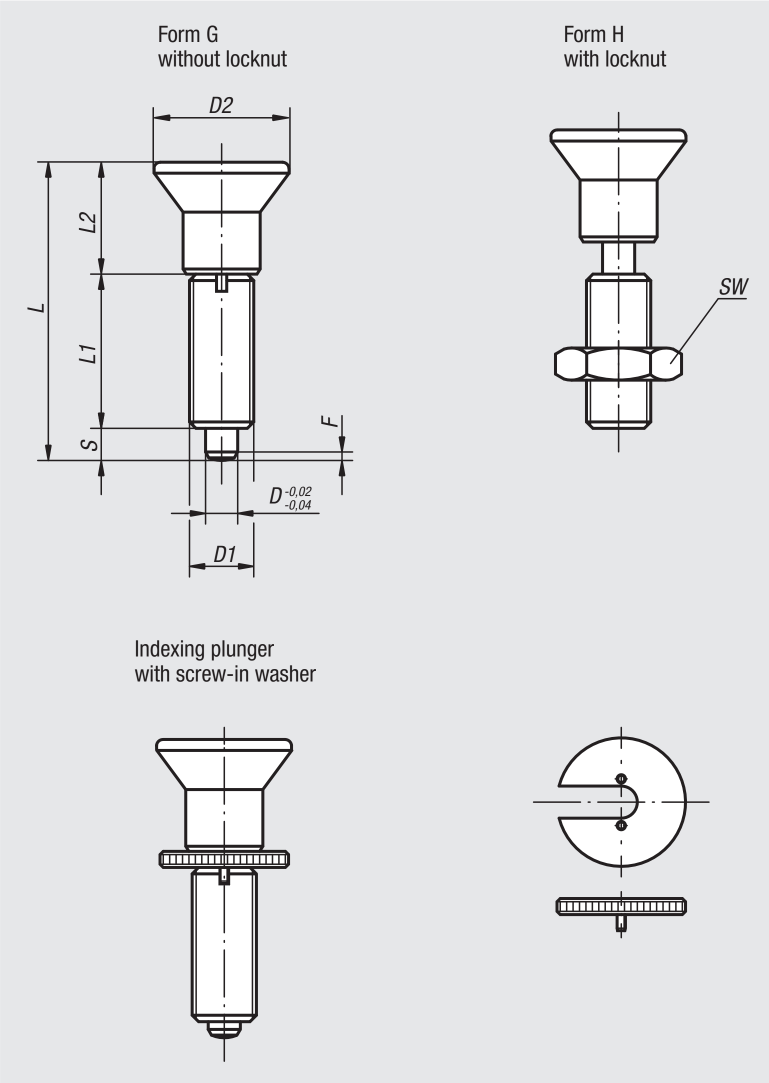
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

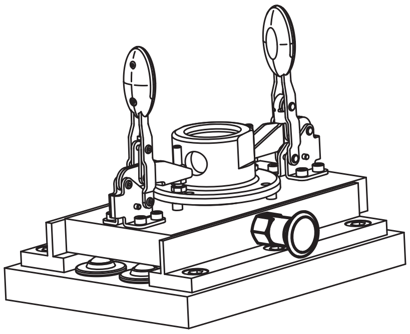
Sample order:
nlm 03093-02206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
A washer is available to aid by screwing in the indexing plungers. The washer slides beneath the mushroom knob so that the carrier pins engage in the slot.

On request:
Special versions.

Accessories:
Spacer rings 03089





Indexing plungers

without collar

Indexing plungers without collar, steel, indexing pin hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-1903	**03093-2903**	3	M6x0,75	14	31,5	17	11	3,5	- / 10	0,8	4,5	10	03094-99
03093-1004	**03093-2004**	4	M8x1	18	38,5	21	13,5	4	- / 13	1,3	6	12	03094-90
03093-1105	**03093-2105**	5	M10x1	21	43,5	24	14,5	5	- / 17	1,3	5	12	03094-91
03093-1206	**03093-2206**	6	M12x1,5	25	51,7	28	17,7	6	- / 19	1,8	6	14	03094-92
03093-1308	**03093-2308**	8	M16x1,5	33	68	36	24	8	- / 24	2,3	15	35	03094-93
03093-1410	**03093-2410**	10	M20x1,5	33	74	40	24	10	- / 30	2,8	15	34	03094-94
03093-1412	**03093-2412**	12	M20x1,5	33	78	42	24	12	- / 30	2,8	15	39	03094-94
03093-1516	**03093-2516**	16	M24x2	40	96	50	30	16	- / 36	3,2	20	46	03094-95

Indexing plungers without collar, stainless steel, indexing pin hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-01903	**03093-02903**	3	M6x0,75	14	31,5	17	11	3,5	- / 10	0,8	4,5	10	03094-99
03093-01004	**03093-02004**	4	M8x1	18	38,5	21	13,5	4	- / 13	1,3	6	12	03094-90
03093-01105	**03093-02105**	5	M10x1	21	43,5	24	14,5	5	- / 17	1,3	5	12	03094-91
03093-01206	**03093-02206**	6	M12x1,5	25	51,7	28	17,7	6	- / 19	1,8	6	14	03094-92
03093-01308	**03093-02308**	8	M16x1,5	33	68	36	24	8	- / 24	2,3	15	35	03094-93
03093-01410	**03093-02410**	10	M20x1,5	33	74	40	24	10	- / 30	2,8	15	34	03094-94
03093-01412	**03093-02412**	12	M20x1,5	33	78	42	24	12	- / 30	2,8	15	39	03094-94
03093-01516	**03093-02516**	16	M24x2	40	96	50	30	16	- / 36	3,2	20	46	03094-95

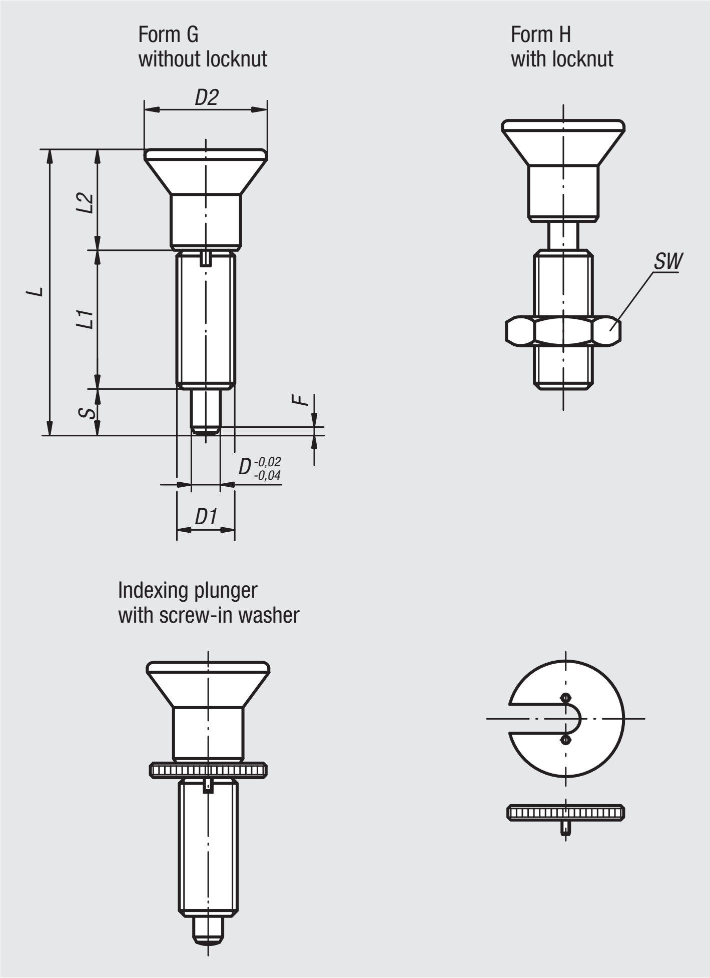
Indexing plungers without collar, stainless steel, indexing pin not hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-11903	**03093-12903**	3	M6x0,75	14	31,5	17	11	3,5	- / 10	0,8	4,5	10	03094-99
03093-11004	**03093-12004**	4	M8x1	18	38,5	21	13,5	4	- / 13	1,3	6	12	03094-90
03093-11105	**03093-12105**	5	M10x1	21	43,5	24	14,5	5	- / 17	1,3	5	12	03094-91
03093-11206	**03093-12206**	6	M12x1,5	25	51,7	28	17,7	6	- / 19	1,8	6	14	03094-92
03093-11308	**03093-12308**	8	M16x1,5	33	68	36	24	8	- / 24	2,3	15	35	03094-93
03093-11410	**03093-12410**	10	M20x1,5	33	74	40	24	10	- / 30	2,8	15	34	03094-94
03093-11412	**03093-12412**	12	M20x1,5	33	78	42	24	12	- / 30	2,8	15	39	03094-94
03093-11516	**03093-12516**	16	M24x2	40	96	50	30	16	- / 36	3,2	20	46	03094-95

03093

Indexing plungers

without collar, extended indexing pin



Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob black-grey thermoplastic.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

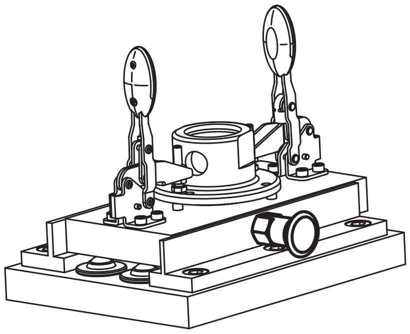
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03093-21004

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
A washer is available to aid by screwing in the indexing plungers. The washer slides beneath the mushroom knob so that the carrier pins engage in the slot.

On request:
Special versions.

Accessories:
Spacer rings 03089



Indexing plungers

without collar, extended indexing pin

Indexing plungers without collar with extended indexing pin, steel, indexing pin hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-21903	**03093-22903**	3	M6x0,75	14	33	17	11	5	- / 10	0,8	4,5	12	03094-99
03093-21004	**03093-22004**	4	M8x1	18	40,5	21	13,5	6	- / 13	1	6	15	03094-90
03093-21105	**03093-22105**	5	M10x1	21	46,5	24	14,5	8	- / 17	1,3	5	16	03094-91
03093-21206	**03093-22206**	6	M12x1,5	25	54,7	28	17,7	9	- / 19	1,8	6	18	03094-92
03093-21308	**03093-22308**	8	M16x1,5	33	72	36	24	12	- / 24	2,3	15	45	03094-93
03093-21410	**03093-22410**	10	M20x1,5	33	79	40	24	15	- / 30	2,8	15	43	03094-94
03093-21412	**03093-22412**	12	M20x1,5	33	84	42	24	18	- / 30	2,8	15	51	03094-94
03093-21516	**03093-22516**	16	M24x2	40	104	50	30	24	- / 36	3,2	20	60	03094-95

Indexing plungers without collar with extended indexing pin, stainless steel, indexing pin hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-201903	**03093-202903**	3	M6x0,75	14	33	17	11	5	- / 10	0,8	4,5	12	03094-99
03093-201004	**03093-202004**	4	M8x1	18	40,5	21	13,5	6	- / 13	1	6	15	03094-90
03093-201105	**03093-202105**	5	M10x1	21	46,5	24	14,5	8	- / 17	1,3	5	16	03094-91
03093-201206	**03093-202206**	6	M12x1,5	25	54,7	28	17,7	9	- / 19	1,8	6	18	03094-92
03093-201308	**03093-202308**	8	M16x1,5	33	72	36	24	12	- / 24	2,3	15	45	03094-93
03093-201410	**03093-202410**	10	M20x1,5	33	79	40	24	15	- / 30	2,8	15	43	03094-94
03093-201412	**03093-202412**	12	M20x1,5	33	84	42	24	18	- / 30	2,8	15	51	03094-94
03093-201516	**03093-202516**	16	M24x2	40	104	50	30	24	- / 36	3,2	20	60	03094-95

Indexing plungers without collar with extended indexing pin, stainless steel, indexing pin not hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-211903	**03093-212903**	3	M6x0,75	14	33	17	11	5	- / 10	0,8	4,5	12	03094-99
03093-211004	**03093-212004**	4	M8x1	18	40,5	21	13,5	6	- / 13	1	6	15	03094-90
03093-211105	**03093-212105**	5	M10x1	21	46,5	24	14,5	8	- / 17	1,3	5	16	03094-91
03093-211206	**03093-212206**	6	M12x1,5	25	54,7	28	17,7	9	- / 19	1,8	6	18	03094-92
03093-211308	**03093-212308**	8	M16x1,5	33	72	36	24	12	- / 24	2,3	15	45	03094-93
03093-211410	**03093-212410**	10	M20x1,5	33	79	40	24	15	- / 30	2,8	15	43	03094-94
03093-211412	**03093-212412**	12	M20x1,5	33	84	42	24	18	- / 30	2,8	15	51	03094-94
03093-211516	**03093-212516**	16	M24x2	40	104	50	30	24	- / 36	3,2	20	60	03094-95

03093

Indexing plungers stainless steel

without collar

Material:
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob 1.4305, electropolished.

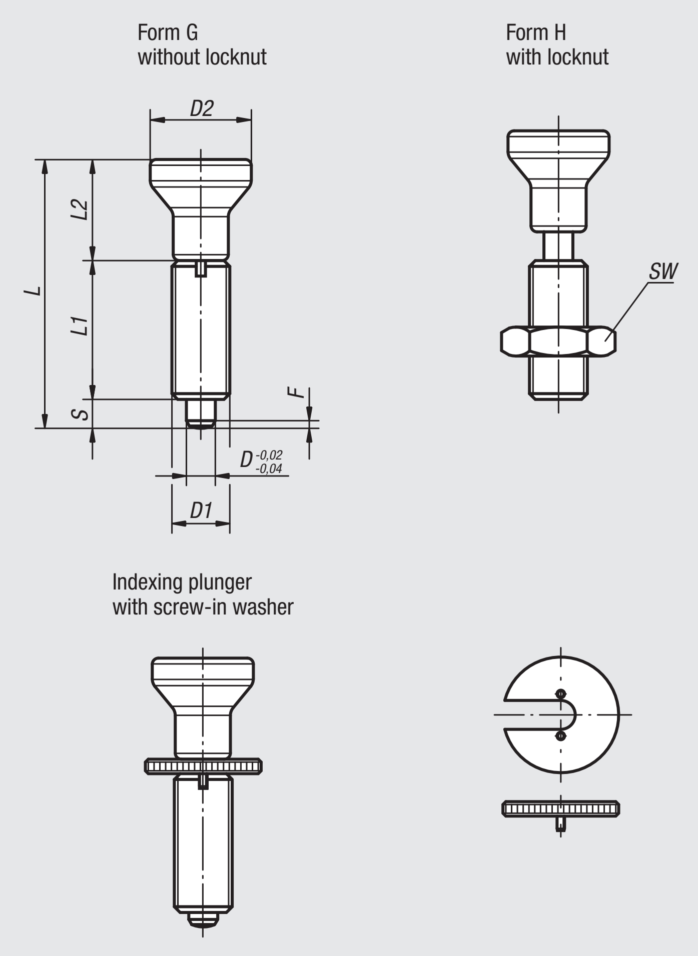
Version:
Bright.
Indexing pin ground.

Sample order:
nlm 03093-001004

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
A screw-in washer can be supplied to help screw the indexing plungers in. The washer slides beneath the disengaged mushroom knob so that the follower pins engage in the slot.

On request:
Special versions.

Accessories:
Spacer rings 03089



Indexing plungers stainless steel

without collar

Indexing plungers stainless steel without collar, indexing pin hardened

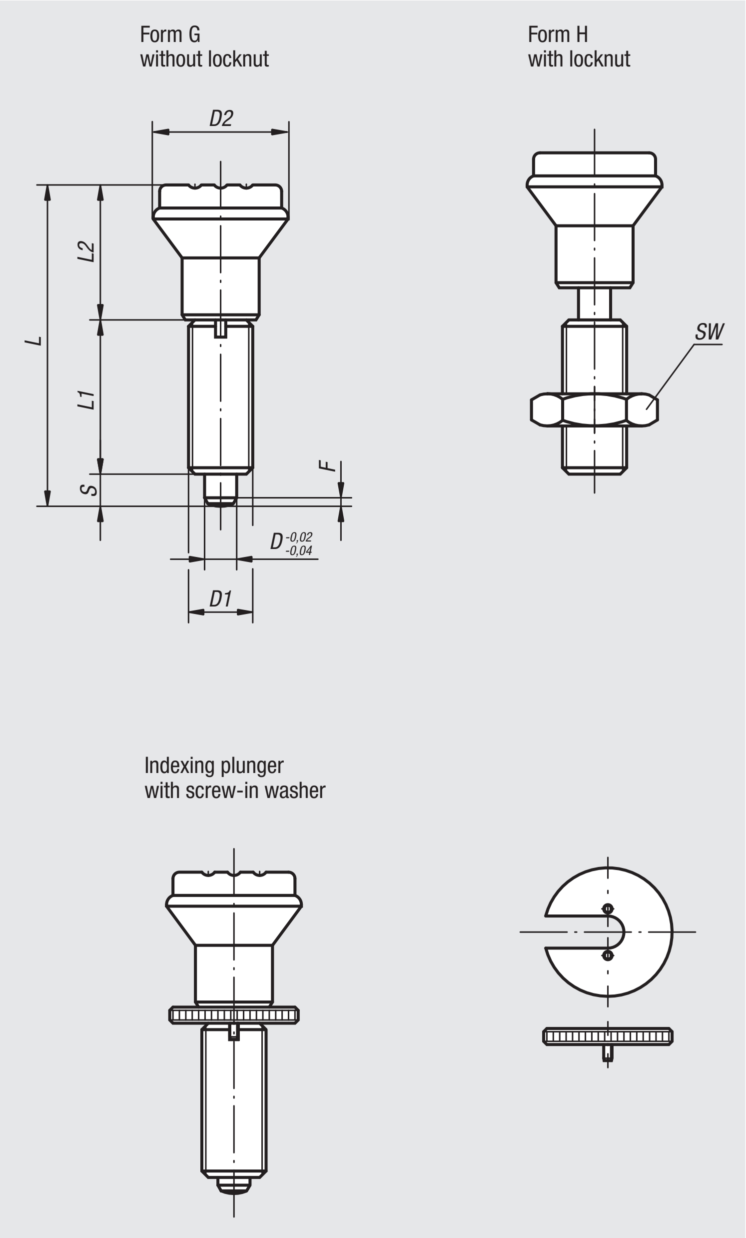
Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-001903	**03093-002903**	3	M6x0,75	14	34,5	17	14	3,5	-/10	0,8	4,5	10	03094-99
03093-001004	**03093-002004**	4	M8x1	18	43	21	18	4	-/13	1	6	12	03094-90
03093-001105	**03093-002105**	5	M10x1	21	50	24	21	5	-/17	1,3	5	12	03094-91
03093-001206	**03093-002206**	6	M12x1,5	25	59	28	25	6	-/19	1,8	6	14	03094-92
03093-001308	**03093-002308**	8	M16x1,5	33	77	36	33	8	-/24	2,3	15	35	03094-93
03093-001410	**03093-002410**	10	M20x1,5	33	83	40	33	10	-/30	2,8	15	34	03094-94
03093-001412	**03093-002412**	12	M20x1,5	33	87	42	33	12	-/30	2,8	15	39	03094-94
03093-001516	**03093-002516**	16	M24x2	40	106	50	40	16	-/36	3,2	20	46	03094-95

Indexing plungers stainless steel without collar, indexing pin not hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03093-111903	**03093-112903**	3	M6x0,75	14	34,5	17	14	3,5	-/10	0,8	4,5	10	03094-99
03093-111004	**03093-112004**	4	M8x1	18	43	21	18	4	-/13	1	6	12	03094-90
03093-111105	**03093-112105**	5	M10x1	21	50	24	21	5	-/17	1,3	5	12	03094-91
03093-111206	**03093-112206**	6	M12x1,5	25	59	28	25	6	-/19	1,8	6	14	03094-92
03093-111308	**03093-112308**	8	M16x1,5	33	77	36	33	8	-/24	2,3	15	35	03094-93
03093-111410	**03093-112410**	10	M20x1,5	33	83	40	33	10	-/30	2,8	15	34	03094-94
03093-111412	**03093-112412**	12	M20x1,5	33	87	42	33	12	-/30	2,8	15	39	03094-94
03093-111516	**03093-112516**	16	M24x2	40	106	50	40	16	-/36	3,2	20	46	03094-95

Indexing plungers

without collar



Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Mushroom knob black-grey thermoplastic.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

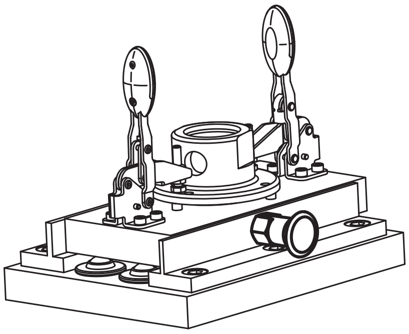
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03094-02206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
A screw-in washer can be supplied to help screw in the indexing plungers. The washer is slid beneath the disengaged mushroom knob so that the carrier pins engage in the slot.

On request:
Special versions.

Accessories:
Spacer rings 03089



Indexing plungers

without collar

Indexing plungers without collar, steel, indexing pin hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03094-1105	**03094-2105**	5	M10x1	21	47	24	18	5	-/17	1,3	5	12	03094-91
03094-1206	**03094-2206**	6	M12x1,5	25	56	28	22	6	-/19	1,8	6	14	03094-92
03094-1308	**03094-2308**	8	M16x1,5	33	74	36	30	8	-/24	2,3	15	35	03094-93
03094-1410	**03094-2410**	10	M20x1,5	33	80	40	30	10	-/30	2,8	15	34	03094-94

Indexing plungers without collar, stainless steel, indexing pin hardened

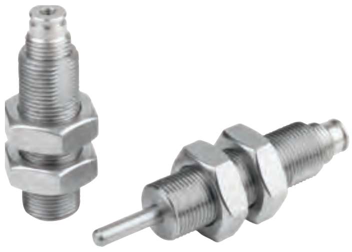
Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03094-01105	**03094-02105**	5	M10x1	21	47	24	18	5	-/17	1,3	5	12	03094-91
03094-01206	**03094-02206**	6	M12x1,5	25	56	28	22	6	-/19	1,8	6	14	03094-92
03094-01308	**03094-02308**	8	M16x1,5	33	74	36	30	8	-/24	2,3	15	35	03094-93
03094-01410	**03094-02410**	10	M20x1,5	33	80	40	30	10	-/30	2,8	15	34	03094-94

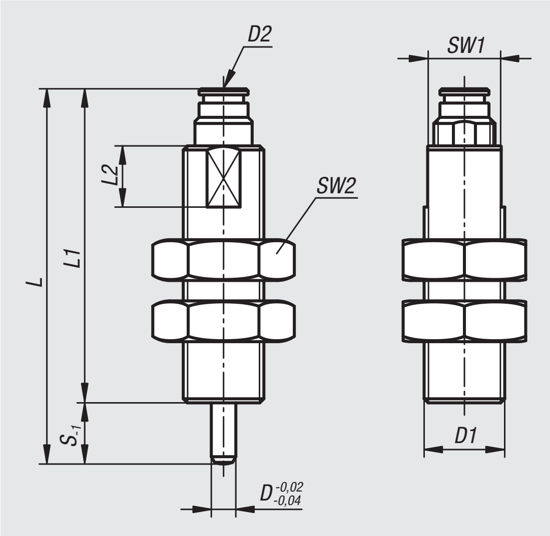
Indexing plungers without collar, stainless steel, indexing pin not hardened

Order No. Form G	Order No. Form H	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03094-11105	**03094-12105**	5	M10x1	21	47	24	18	5	-/17	1,3	5	12	03094-91
03094-11206	**03094-12206**	6	M12x1,5	25	56	28	22	6	-/19	1,8	6	14	03094-92
03094-11308	**03094-12308**	8	M16x1,5	33	74	36	30	8	-/24	2,3	15	35	03094-93
03094-11410	**03094-12410**	10	M20x1,5	33	80	40	30	10	-/30	2,8	15	34	03094-94

03095

Indexing plungers, pneumatic





Material:
Steel version:
threaded sleeve and thrust pin, free-cutting steel.
hexagon nuts, steel, grade 04.

Stainless steel version:
threaded sleeve 1.4305
thrust pin 1.4034
hexagon nuts, A2 stainless steel.

Version:
Steel version:
threaded sleeve, black oxidised
thrust pin hardened, black oxidised and ground
hexagon nuts, black oxidised

Stainless steel version:
threaded sleeve, bright
thrust pin, hardened, ground and bright
hexagon nuts, bright

Sample order:
nlm 03095-1206010

Note:
The indexing plungers are operated by applying compressed air.
The spring-loaded reset occurs by disconnecting the air supply.

Pneumatic cylinder:
Single-acting piston rod cylinder.
Materials:
cylinder tube, nickel-plated brass,
piston rod, stainless steel
seals, NBR, PU.
Operating medium:
filtered and dried air, oiled or not oiled.
Application temperature: -20 °C to +80 °C.

Order No. steel	Order No. stainless steel	D	D1	D2	L	L1	L2	Travel S	SW1	SW2	Operating pressure bar	Piston force at 6 bar (N)	Spring retraction force ca. N
03095-1206010	**03095-01206010**	6	M20x1,5	M5	80	70	15	10	18	30	2 - 6	38,7-35,1	9,9-6
03095-1206015	**03095-01206015**	6	M20x1,5	M5	92	77	15	15	18	30	2 - 6	38,7-32,9	11,8-6
03095-1308010	**03095-01308010**	8	M20x1,5	M5	77	67	15	10	18	30	2 - 6	39,6-35,3	11,6-5,1
03095-1308015	**03095-01308015**	8	M20x1,5	M5	89	74	15	15	18	30	2 - 6	39,6-33,1	11,6-5,1

Notes

03096

Indexing plungers

without collar

Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

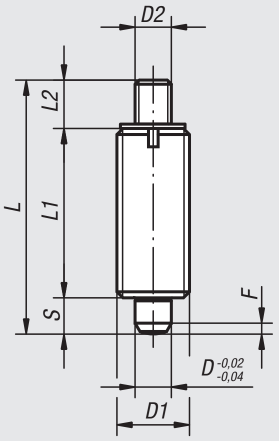
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03096-01206

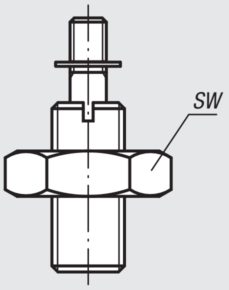
Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been disengaged.
Special grips can be fitted on the projecting threaded pin. This pin is also suitable for automatic actuation by e.g. program controlled pneumatic cylinder or by remote control using bowden cables.
A washer is available to aid screwing in the indexing plungers. The washer is placed on the threaded sleeve so that the carrier pins engage in the slot.

On request:
Special versions.

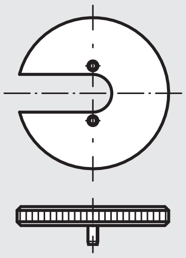
Accessories:
Spacer rings 03089



Form J
with threaded pin
without locknut



Form K
with threaded pin
with locknut



Indexing plungers

without collar

Indexing plungers without collar, steel, indexing pin hardened

Order No. Form J	Order No. Form K	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03096-1903	**03096-2903**	3	M6x0,75	M2	24	17	3,5	3,5	-/10	0,8	4,5	10	03094-99
03096-1004	**03096-2004**	4	M8x1	M3	32	21	7	4	-/13	1	6	12	03094-90
03096-1105	**03096-2105**	5	M10x1	M4	37	24	8	5	-/17	1,3	5	12	03094-91
03096-1206	**03096-2206**	6	M12x1,5	M6	42	28	8	6	-/19	1,8	6	14	03094-92
03096-1308	**03096-2308**	8	M16x1,5	M8	56	36	12	8	-/24	2,3	15	35	03094-93
03096-1410	**03096-2410**	10	M20x1,5	M8	62	40	12	10	-/30	2,8	15	34	03094-94
03096-1412	**03096-2412**	12	M20x1,5	M8	66	42	12	12	-/30	2,8	15	39	03094-94
03096-1516	**03096-2516**	16	M24x2	M10	80	50	14	16	-/36	3,2	20	46	03094-95

Indexing plungers without collar, stainless steel, indexing pin hardened

Order No. Form J	Order No. Form K	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03096-01903	**03096-02903**	3	M6x0,75	M2	24	17	3,5	3,5	-/10	0,8	4,5	10	03094-99
03096-01004	**03096-02004**	4	M8x1	M3	32	21	7	4	-/13	1	6	12	03094-90
03096-01105	**03096-02105**	5	M10x1	M4	37	24	8	5	-/17	1,3	5	12	03094-91
03096-01206	**03096-02206**	6	M12x1,5	M6	42	28	8	6	-/19	1,8	6	14	03094-92
03096-01308	**03096-02308**	8	M16x1,5	M8	56	36	12	8	-/24	2,3	15	35	03094-93
03096-01410	**03096-02410**	10	M20x1,5	M8	62	40	12	10	-/30	2,8	15	34	03094-94
03096-01412	**03096-02412**	12	M20x1,5	M8	66	42	12	12	-/30	2,8	15	39	03094-94
03096-01516	**03096-02516**	16	M24x2	M10	80	50	14	16	-/36	3,2	20	46	03094-95

Indexing plungers without collar, stainless steel, indexing pin not hardened

Order No. Form J	Order No. Form K	D	D1	D2	L	L1	L2	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03096-11903	**03096-12903**	3	M6x0,75	M2	24	17	3,5	3,5	-/10	0,8	4,5	10	03094-99
03096-11004	**03096-12004**	4	M8x1	M3	32	21	7	4	-/13	1	6	12	03094-90
03096-11105	**03096-12105**	5	M10x1	M4	37	24	8	5	-/17	1,3	5	12	03094-91
03096-11206	**03096-12206**	6	M12x1,5	M6	42	28	8	6	-/19	1,8	6	14	03094-92
03096-11308	**03096-12308**	8	M16x1,5	M8	56	36	12	8	-/24	2,3	15	35	03094-93
03096-11410	**03096-12410**	10	M20x1,5	M8	62	40	12	10	-/30	2,8	15	34	03094-94
03096-11412	**03096-12412**	12	M20x1,5	M8	66	42	12	12	-/30	2,8	15	39	03094-94
03096-11516	**03096-12516**	16	M24x2	M10	80	50	14	16	-/36	3,2	20	46	03094-95

Indexing plungers

without collar

Material:
Steel version
Indexing pin hardened:
grade 5.8.

Stainless steel version
Indexing pin hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4034.

Indexing pin not hardened:
Threaded sleeve 1.4305.
Indexing pin 1.4305.

Key ring 1.4310, bright.

Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

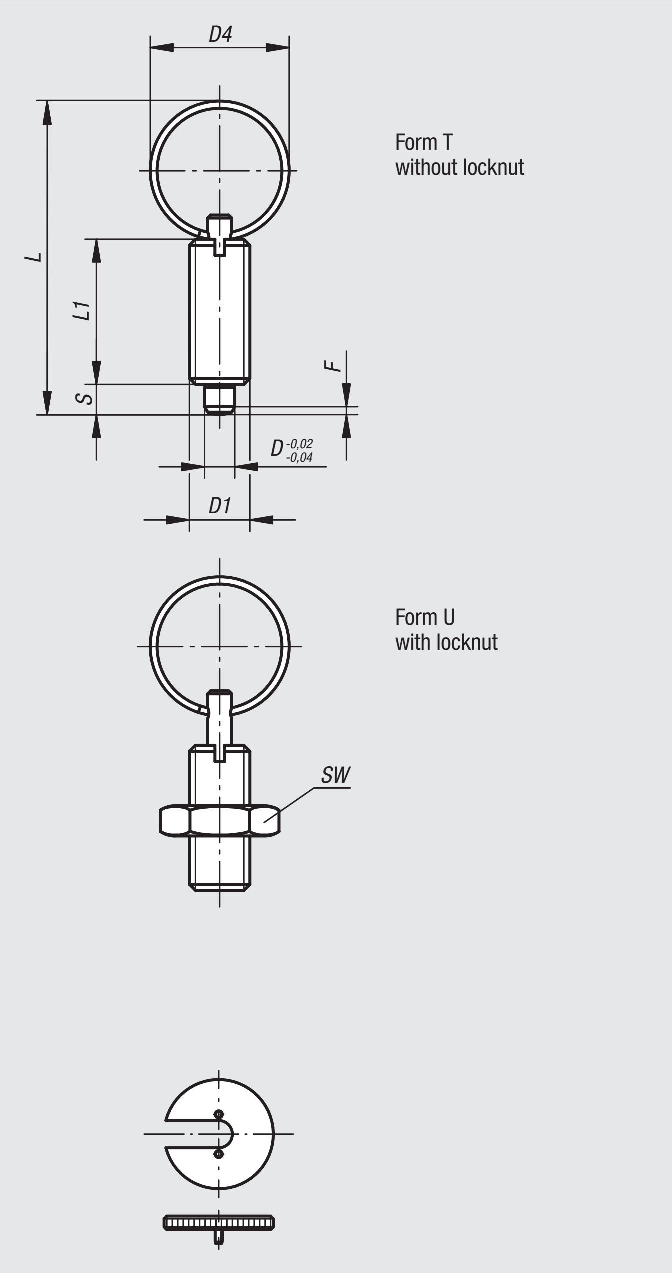
Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03096-03206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been disengaged.
The key ring is also suitable for actuation of the indexing plungers e.g. automatically (program-controlled) with the aid of a pneumatic cylinder or remote control with bowden cables.
A screw-in washer can be supplied to help screw in the indexing plungers. The washer is fitted onto the threaded sleeve so that the carrier pins engage in the slot.

On request:
Special versions.

Accessories:
Spacer rings 03089



Indexing plungers

without collar

Indexing plungers without collar, steel, indexing pin hardened

Order No. Form T	Order No. Form U	D	D1	D4	L	L1	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03096-3004	**03096-4004**	4	M8x1	15	40	21	4	-/13	1	6	12	03094-90
03096-3105	**03096-4105**	5	M10x1	23	52	24	5	-/17	1,3	5	12	03094-91
03096-3206	**03096-4206**	6	M12x1,5	23	57	28	6	-/19	1,8	6	14	03094-92
03096-3308	**03096-4308**	8	M16x1,5	28	72	36	8	-/24	2,3	15	35	03094-93
03096-3410	**03096-4410**	10	M20x1,5	28	78	40	10	-/30	2,8	15	34	03094-94

Indexing plungers without collar, stainless steel, indexing pin hardened

Order No. Form T	Order No. Form U	D	D1	D4	L	L1	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03096-03004	**03096-04004**	4	M8x1	15	40	21	4	-/13	1	6	12	03094-90
03096-03105	**03096-04105**	5	M10x1	23	52	24	5	-/17	1,3	5	12	03094-91
03096-03206	**03096-04206**	6	M12x1,5	23	57	28	6	-/19	1,8	6	14	03094-92
03096-03308	**03096-04308**	8	M16x1,5	28	72	36	8	-/24	2,3	15	35	03094-93
03096-03410	**03096-04410**	10	M20x1,5	28	78	40	10	-/30	2,8	15	34	03094-94

Indexing plungers without collar, stainless steel, indexing pin not hardened

Order No. Form T	Order No. Form U	D	D1	D4	L	L1	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. screw-in washer
03096-13004	**03096-14004**	4	M8x1	15	40	21	4	-/13	1	6	12	03094-90
03096-13105	**03096-14105**	5	M10x1	23	52	24	5	-/17	1,3	5	12	03094-91
03096-13206	**03096-14206**	6	M12x1,5	23	57	28	6	-/19	1,8	6	14	03094-92
03096-13308	**03096-14308**	8	M16x1,5	28	72	36	8	-/24	2,3	15	35	03094-93
03096-13410	**03096-14410**	10	M20x1,5	28	78	40	10	-/30	2,8	15	34	03094-94

03096-10

Indexing plunger, stainless steel

with remote actuation

Indexing plungers are used where it is necessary to prevent changes of position due to lateral forces.
Some examples of this are for length, height and position locking in machine, furniture and special vehicle construction.

Indexing plungers with remote actuation are used where inaccessible assembly spaces are making it difficult to operate, or where remote actuation is required for ergonomic or safety reasons.

The indexing plunger is connected to the operator side by a Bowden cable. The combination of indexing plunger and actuating element forms a complete system which can be used for many types of application.
As an alternative to the actuating element, the supplied screw nipple (Ø5 x 7 mm) can be used to integrate an individual actuating element into the system.

The Bowden cable is available in various lengths.
To ensure an exact fit in the application concerned, the Bowden cable can be shortened as required when installing.

Corrosion protection is provided by selecting a suitable material for coating application. The wire cable or cable casing can be replaced easily if required.

Material:
Indexing plunger:
Threaded sleeve stainless steel 1.4305.
Indexing pin stainless steel 1.4034.

Actuating element stainless steel 1.4305.
Mushroom grip thermoplastic.
Wire cable stainless steel 1.4401.
Steel wire casing with plastic casing inside and out.
Brass end sleeves, adjusting screws and screw nipples.

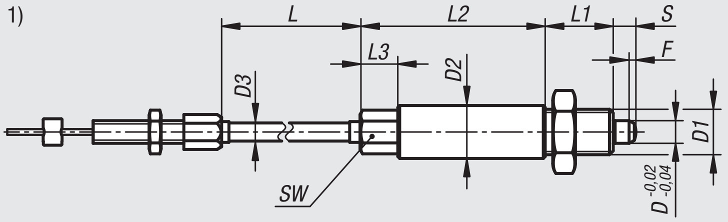
Version:
Indexing pin, hardened, ground and bright.
Bowden cable casing, black.
Mushroom grip, thermoplastic dark grey.
Plastic cover, thermoplastic in black, grey, red or yellow.

Sample order:
nlm 03096-10-02206X1000 (include length L)

Note for ordering:
Indexing plungers with remote actuation and actuating element must be ordered separately.

Note:
When installing the Bowden cables, the following points should be noted:
The length of the free end of the cable can change due to the layout angle, bending radius and load factors. So, after laying the Bowden cable, the length of the counter-bearing (casing) must be adjusted using the adjusting screw supplied. The adjusting screw is also used to set the pretension in the Bowden cable system.

1)



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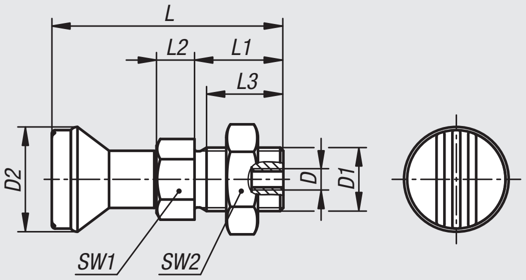


Indexing plunger, stainless steel

with remote actuation

When laying the cable, particular care must be taken to ensure that the bending radius is not below the minimum value, which in this case is R = 65 mm. A radius which is too narrow can lead to increased wear and higher friction.
Also avoid letting the bending radius briefly go below the minimum value when installing, as this can cause damage to the casing. Also, the casing is designed only to support pressure forces. If pulled too sharply, the inner coil will be stretched and permanently damaged.

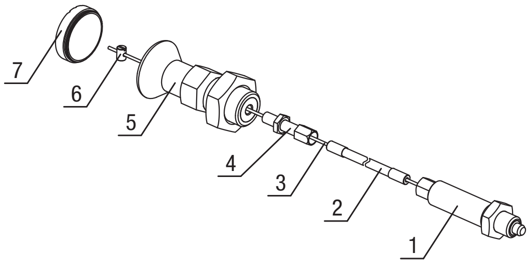
On request:
Special versions.

Supplied with:
Indexing plunger with remote actuation:
Indexing plunger with preassembled cable, casing, end sleeve, adjusting screw M6 x 34 mm and screw nipple Ø5 x 7 mm.

Actuating element:
Actuating element with plastic cover.

Accessories:
Hexagon nuts 07212.
Mounting brackets 03099.
Spacer rings 03089.
Positioning bushes 03099-50.
Actuating element 03096-10-12420.

Drawing reference:
1) Indexing plunger
2) Bowden cable casing
3) Bowden cable
4) Adjusting screw
5) Actuating element
6) Screw nipple
7) Cover



Indexing plunger, stainless steel with remote actuation

Order No.	D	D1	D2	D3	L	L1	L2	L3	Travel S	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03096-10-02206X	6	M12x1,5	14	5	1000/3000/5000	18	49	10	6	10	1,8	6	14
03096-10-02308X	8	M16x1,5	19	5	1000/3000/5000	23	59	10	8	13	2,3	15	35
03096-10-02410X	10	M20x1,5	23	5	1000/3000/5000	24	65	10	10	16	2,8	15	34
03096-10-02412X	12	M20x1,5	23	5	1000/3000/5000	26	65	10	12	16	2,8	15	39

Actuating elements

Order No.	Colour Cap	D Internal thread	D1	D2	L	L1	L2	L3	SW1	SW2
03096-10-12420	black grey RAL 7021	M6	M20x1,5	33	73	28	12	25	22	30
03096-10-124205	light grey RAL 7035	M6	M20x1,5	33	73	28	12	25	22	30
03096-10-124206	traffic red RAL 3020	M6	M20x1,5	33	73	28	12	25	22	30
03096-10-124207	rape yellow RAL 1021	M6	M20x1,5	33	73	28	12	25	22	30

Indexing plungers

without collar

Material:
Steel version:
Indexing pin hardened:
Sleeve 1.0403 weldable.
Indexing pin grade 5.8.

Stainless steel version:
Indexing pin hardened:
Sleeve 1.4301 weldable.
Indexing pin 1.4034.

Indexing pin not hardened:
Sleeve 1.4301 weldable.
Indexing pin 1.4305.

Mushroom knob black grey thermoplastic.

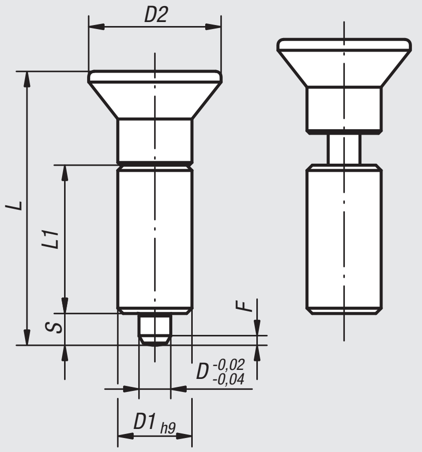
Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

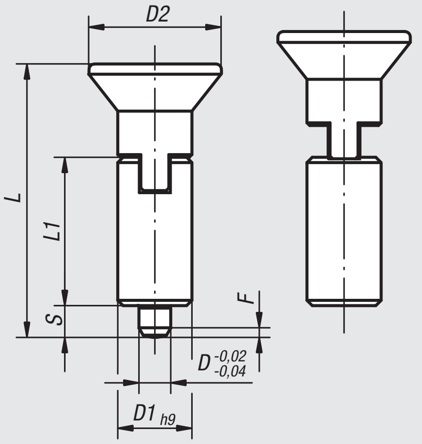
Sample order:
nlm 03097-01206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
Form M is recommended for applications in where the indexing plungers should remain disengaged over extended periods and the pin prevented from springing back.
To weld the indexing plungers we recommend inert gas-shielded welding with TIG welding equipment.

On request:
Special versions.



Form L
without locking slot



Form M
with locking slot

Indexing plungers

without collar

Indexing plungers without collar, steel, indexing pin hardened

Order No. Form L	Order No. Form M	D	D1	D2	L	L1	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03097-1004	**03097-2004**	4	10	18	38,5	21	4	1	6	12
03097-1105	**03097-2105**	5	12	21	43,5	24	5	1,3	5	12
03097-1206	**03097-2206**	6	14	25	51,7	28	6	1,8	6	14
03097-1308	**03097-2308**	8	18	33	68	36	8	2,3	15	35
03097-1410	**03097-2410**	10	22	33	74	40	10	2,8	15	34

Indexing plungers without collar, stainless steel, indexing pin hardened

Order No. Form L	Order No. Form M	D	D1	D2	L	L1	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03097-01004	**03097-02004**	4	10	18	38,5	21	4	1	6	12
03097-01105	**03097-02105**	5	12	21	43,5	24	5	1,3	5	12
03097-01206	**03097-02206**	6	14	25	51,7	28	6	1,8	6	14
03097-01308	**03097-02308**	8	18	33	68	36	8	2,3	15	35
03097-01410	**03097-02410**	10	22	33	74	40	10	2,8	15	34

Indexing plungers without collar, stainless steel, indexing pin not hardened

Order No. Form L	Order No. Form M	D	D1	D2	L	L1	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03097-11004	**03097-12004**	4	10	18	38,5	21	4	1	6	12
03097-11105	**03097-12105**	5	12	21	43,5	24	5	1,3	5	12
03097-11206	**03097-12206**	6	14	25	51,7	28	6	1,8	6	14
03097-11308	**03097-12308**	8	18	33	68	36	8	2,3	15	35
03097-11410	**03097-12410**	10	22	33	74	40	10	2,8	15	34

03098

Indexing plungers

without collar

Material:
Steel version:
Indexing pin hardened:
Sleeve 1.0403 weldable.
Indexing pin grade 5.8.

Stainless steel version:
Indexing pin hardened:
Sleeve 1.4301 weldable.
Indexing pin 1.4034.

Indexing pin not hardened:
Sleeve 1.4301 weldable.
Indexing pin 1.4305.

Mushroom knob black grey thermoplastic.

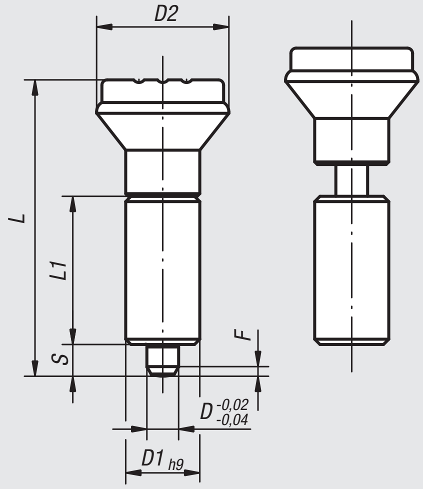
Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

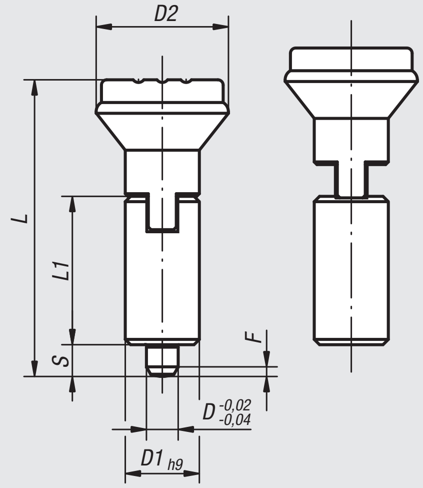
Sample order:
nlm 03098-02206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
Form M is recommended for applications where the indexing plungers should remain disengaged over an extended period and the pin prevented from springing back.
Special grips can be fitted on the projecting threaded pin of Form N. This pin is also suitable for actuating the indexing plunger e.g. automatically (program-controlled) with the aid of a pneumatic cylinder or remote controlled with bowden cables.
To weld the indexing plungers we recommend inert gas shielded welding with TIG welding equipment.

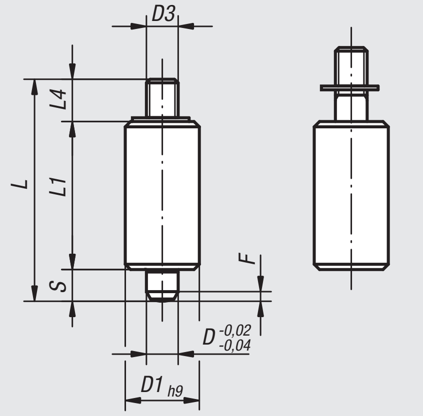
On request:
Special versions.



Form L
without locking slot



Form M
with locking slot



Form N
with threaded pin

Indexing plungers

without collar

Indexing plungers without collar, steel, indexing pin hardened

Order No. Form L	Order No. Form M	Order No. Form N	D	D1	D2	D3	L	L1	L4	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03098-1105	**03098-2105**	**03098-3105**	5	12	21/21/-	-/-/M4	47/47/37	24	-/-/8	5	1,3	5	12
03098-1206	**03098-2206**	**03098-3206**	6	14	25/25/-	-/-/M6	56/56/43	28	-/-/9	6	1,8	6	14
03098-1308	**03098-2308**	**03098-3308**	8	18	33/33/-	-/-/M8	74/74/56	36	-/-/12	8	2,3	15	35
03098-1410	**03098-2410**	**03098-3410**	10	22	33/33/-	-/-/M8	80/80/62	40	-/-/12	10	2,8	15	34

Indexing plungers without collar, stainless steel, indexing pin hardened

Order No. Form L	Order No. Form M	Order No. Form N	D	D1	D2	D3	L	L1	L4	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03098-01105	**03098-02105**	**03098-03105**	5	12	21/21/-	-/-/M4	47/47/37	24	-/-/8	5	1,3	5	12
03098-01206	**03098-02206**	**03098-03206**	6	14	25/25/-	-/-/M6	56/56/43	28	-/-/9	6	1,8	6	14
03098-01308	**03098-02308**	**03098-03308**	8	18	33/33/-	-/-/M8	74/74/56	36	-/-/12	8	2,3	15	35
03098-01410	**03098-02410**	**03098-03410**	10	22	33/33/-	-/-/M8	80/80/62	40	-/-/12	10	2,8	15	34

Indexing plungers without collar, stainless steel, indexing pin not hardened

Order No. Form L	Order No. Form M	Order No. Form N	D	D1	D2	D3	L	L1	L4	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03098-11105	**03098-12105**	**03098-13105**	5	12	21/21/-	-/-/M4	47/47/37	24	-/-/8	5	1,3	5	12
03098-11206	**03098-12206**	**03098-13206**	6	14	25/25/-	-/-/M6	56/56/43	28	-/-/9	6	1,8	6	14
03098-11308	**03098-12308**	**03098-13308**	8	18	33/33/-	-/-/M8	74/74/56	36	-/-/12	8	2,3	15	35
03098-11410	**03098-12410**	**03098-13410**	10	22	33/33/-	-/-/M8	80/80/62	40	-/-/12	10	2,8	15	34

03098

Indexing plungers

without collar

Material:
Steel version:
Indexing pin hardened.
Sleeve1.0403 weldable.
Indexing pin grade 5.8.

Stainless steel version:
Indexing pin hardened:
Sleeve 1.4301 weldable.
Indexing pin 1.4034.

Indexing pin not hardened:
Sleeve 1.4301 weldable.
Indexing pin 1.4305.

Key ring 1.4310, bright.

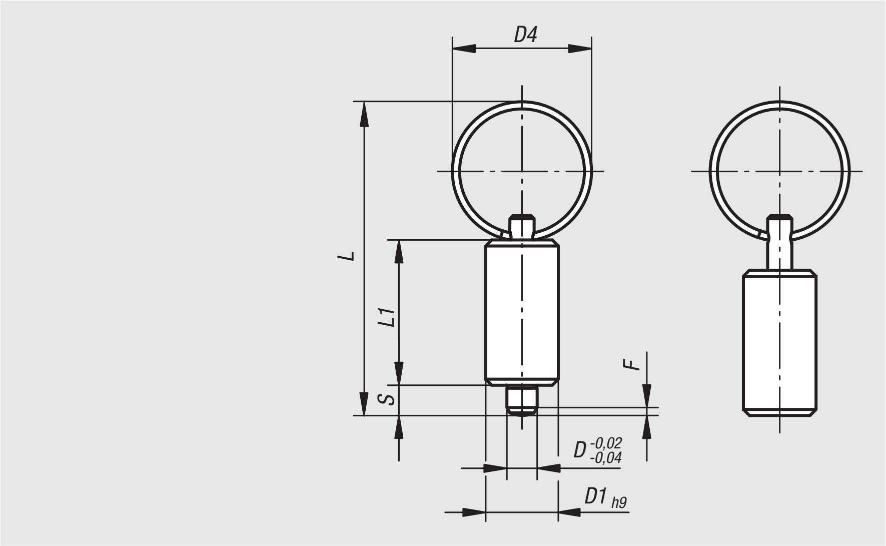
Version:
Steel version:
Indexing pin hardened, ground, black oxidised.

Stainless steel version:
Indexing pin hardened, ground and bright.
Indexing pin not hardened, ground and bright.

Sample order:
nlm 03098-4206

Note:
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been disengaged. The key ring is also suitable for actuating the indexing plungers e.g. automatically (program-controlled) with the aid of a pneumatic cylinder or remote controlled with bowden cables.
To weld the indexing plungers we recommend inert gas shielded welding with TIG welding equipment.

On request:
Special versions.



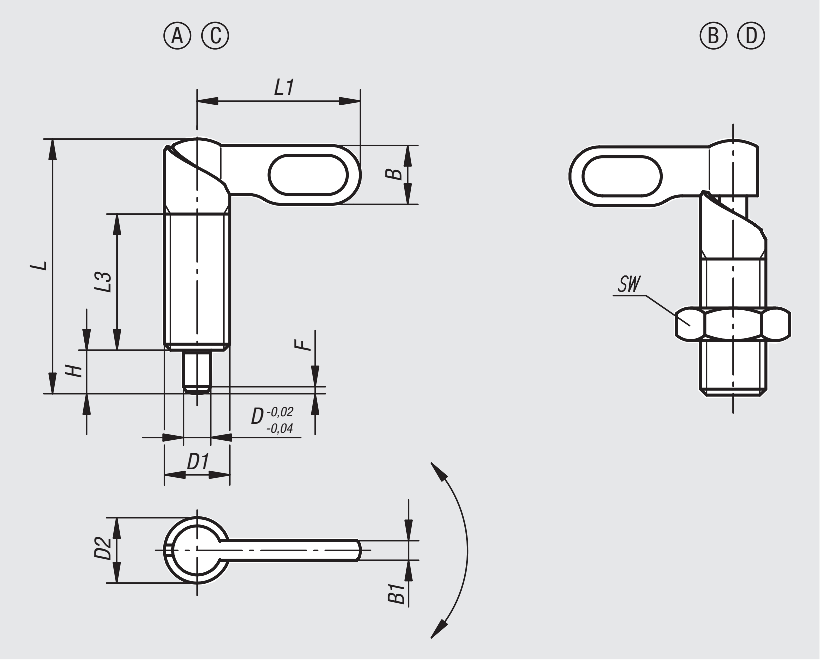
Order No.	Main material	Surface finish body	D	D1	D4	L	L1	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03098-4004	steel	hardened	4	10	15	40	21	4	1	6	12
03098-4105	steel	hardened	5	12	23	52	24	5	1,3	5	12
03098-4206	steel	hardened	6	14	23	57	28	6	1,8	6	14
03098-4308	steel	hardened	8	18	28	72	36	8	2,3	15	35
03098-4410	steel	hardened	10	22	28	78	40	10	2,8	15	34

Order No.	Main material	Surface finish body	D	D1	D4	L	L1	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03098-04004	stainless steel	hardened	4	10	15	40	21	4	1	6	12
03098-04105	stainless steel	hardened	5	12	23	52	24	5	1,3	5	12
03098-04206	stainless steel	hardened	6	14	23	57	28	6	1,8	6	14
03098-04308	stainless steel	hardened	8	18	28	72	36	8	2,3	15	35
03098-04410	stainless steel	hardened	10	22	28	78	40	10	2,8	15	34

Order No.	Main material	Surface finish body	D	D1	D4	L	L1	Travel S	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03098-14004	stainless steel	not hardened	4	10	15	40	21	4	1	6	12
03098-14105	stainless steel	not hardened	5	12	23	52	24	5	1,3	5	12
03098-14206	stainless steel	not hardened	6	14	23	57	28	6	1,8	6	14
03098-14308	stainless steel	not hardened	8	18	28	72	36	8	2,3	15	35
03098-14410	stainless steel	not hardened	10	22	28	78	40	10	2,8	15	34

03099

Cam-action indexing plungers



Material:
Steel grade 5.8.

Version:
Black oxidised.
Pin hardened and ground.

Sample order:
nlm 03099-040616

Note:
Cam-action indexing plungers are used when the indexing pin should not project all the time. Turning the handle through 180° retracts the pin and a notch ensures that the handle remains in this position.

Drawing reference:
Form A: grip uncoated without nut
Form C: grip powder-coated without nut
Form B: grip uncoated with nut
Form D: grip powder-coated with nut

Order No. Form A	Order No. Form C	Order No. Form B	Order No. Form D	D	D1	D2	L	L1	L3	B	B1	H	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03099-040410	03099-060410	03099-050410	03099-070410	4	M10	10	38	25	20	9	3	6	-/-/17/17	1	8	14
03099-040510	03099-060510	03099-050510	03099-070510	5	M10	10	38	25	20	9	3	6	-/-/17/17	1,3	8	14
03099-040610	03099-060610	03099-050610	03099-070610	6	M10	10	38	25	20	9	3	6	-/-/17/17	1,8	8	14
03099-0404101	03099-0604101	03099-0504101	03099-0704101	4	M10x1	10	38	25	20	9	3	6	-/-/17/17	1	8	14
03099-0405101	03099-0605101	03099-0505101	03099-0705101	5	M10x1	10	38	25	20	9	3	6	-/-/17/17	1,3	8	14
03099-0406101	03099-0606101	03099-0506101	03099-0706101	6	M10x1	10	38	25	20	9	3	6	-/-/17/17	1,8	8	14
03099-040512	03099-060512	03099-050512	03099-070512	5	M12	12	46,8	30	25	10,8	3,6	8	-/-/19/19	1,3	8	15
03099-040612	03099-060612	03099-050612	03099-070612	6	M12	12	46,8	30	25	10,8	3,6	8	-/-/19/19	1,8	8	15
03099-040812	03099-060812	03099-050812	03099-070812	8	M12	12	46,8	30	25	10,8	3,6	8	-/-/19/19	2,3	8	15
03099-0405121	03099-0605121	03099-0505121	03099-0705121	5	M12x1,5	12	46,8	30	25	10,8	3,6	8	-/-/19/19	1,3	8	15
03099-0406121	03099-0606121	03099-0506121	03099-0706121	6	M12x1,5	12	46,8	30	25	10,8	3,6	8	-/-/19/19	1,8	8	15
03099-0408121	03099-0608121	03099-0508121	03099-0708121	8	M12x1,5	12	46,8	30	25	10,8	3,6	8	-/-/19/19	2,3	8	15
03099-040616	03099-060616	03099-050616	03099-070616	6	M16	16	60,4	40	32	14,4	4,8	10	-/-/24/24	1,8	15	35
03099-040816	03099-060816	03099-050816	03099-070816	8	M16	16	60,4	40	32	14,4	4,8	10	-/-/24/24	2,3	15	35
03099-041016	03099-061016	03099-051016	03099-071016	10	M16	16	60,4	40	32	14,4	4,8	10	-/-/24/24	2,8	15	35
03099-0406161	03099-0606161	03099-0506161	03099-0706161	6	M16x1,5	16	60,4	40	32	14,4	4,8	10	-/-/24/24	1,8	15	35
03099-0408161	03099-0608161	03099-0508161	03099-0708161	8	M16x1,5	16	60,4	40	32	14,4	4,8	10	-/-/24/24	2,3	15	35
03099-0410161	03099-0610161	03099-0510161	03099-0710161	10	M16x1,5	16	60,4	40	32	14,4	4,8	10	-/-/24/24	2,8	15	35
03099-040820	03099-060820	03099-050820	03099-070820	8	M20	20	70	50	35	18	6	12	-/-/30/30	2,3	20	60
03099-041020	03099-061020	03099-051020	03099-071020	10	M20	20	70	50	35	18	6	12	-/-/30/30	2,8	20	60
03099-041220	03099-061220	03099-051220	03099-071220	12	M20	20	70	50	35	18	6	12	-/-/30/30	3	20	60
03099-0408201	03099-0608201	03099-0508201	03099-0708201	8	M20x1,5	20	70	50	35	18	6	12	-/-/30/30	2,3	20	60
03099-0410201	03099-0610201	03099-0510201	03099-0710201	10	M20x1,5	20	70	50	35	18	6	12	-/-/30/30	2,8	20	60
03099-0412201	03099-0612201	03099-0512201	03099-0712201	12	M20x1,5	20	70	50	35	18	6	12	-/-/30/30	3	20	60

03099-20

Cam action indexing plunger

with stop

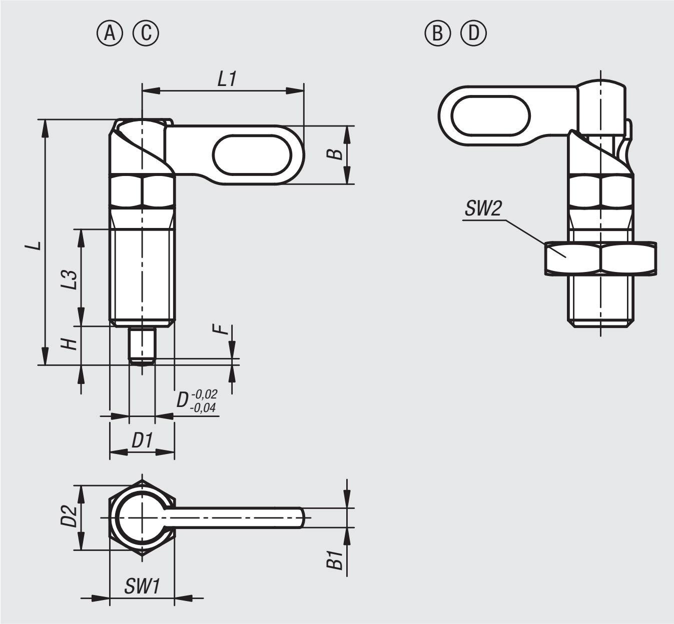
Material:
Steel grade 5.8.

Version:
Black oxidised.
Pin hardened and ground.

Sample order:
nlm 03099-20-1040616

Note:
Cam-action indexing plungers are used when the indexing pin should not project all the time. Turning the handle through 180° retracts the pin.
A notch ensures that the handle remains in this position.
A stop prevents the handle being rotated through more than 180° ensuring that the pin remains retracted.
Selecting which side the stop is on defines the rotation direction of the plunger.

Drawing reference:
Form A: grip uncoated without nut
Form C: grip powder-coated without nut
Form B: grip uncoated with nut
Form D: grip powder-coated with nut

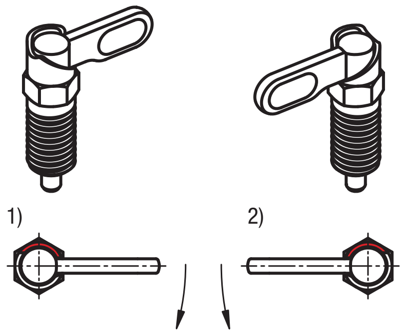


Order No. Form A	Order No. Form C	Version 2	D	D1	D2	L	L1	L3	B	B1	H	SW1	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03099-20-1040410	03099-20-1060410	left	4	M10	10	38	25	15	9	3	6	10	1	8	14
03099-20-1040510	03099-20-1060510	left	5	M10	10	38	25	15	9	3	6	10	1,3	8	14
03099-20-1040610	03099-20-1060610	left	6	M10	10	38	25	15	9	3	6	10	1,8	8	14
03099-20-1040512	03099-20-1060512	left	5	M12	12	47,8	30	19	10,8	3,6	8	12	1,3	8	15
03099-20-1040612	03099-20-1060612	left	6	M12	12	47,8	30	19	10,8	3,6	8	12	1,8	8	15
03099-20-1040812	03099-20-1060812	left	8	M12	12	47,8	30	19	10,8	3,6	8	12	2,3	8	15
03099-20-1040616	03099-20-1060616	left	6	M16	16	60,4	40	26	14,4	4,8	10	16	1,8	15	35
03099-20-1040816	03099-20-1060816	left	8	M16	16	60,4	40	26	14,4	4,8	10	16	2,3	15	35
03099-20-1041016	03099-20-1061016	left	10	M16	16	60,4	40	26	14,4	4,8	10	16	2,8	15	35
03099-20-10408201	03099-20-10608201	left	8	M20x1,5	20	70	50	30	18	6	12	20	2,3	20	60
03099-20-10410201	03099-20-10610201	left	10	M20x1,5	20	70	50	30	18	6	12	20	2,8	20	60
03099-20-10412201	03099-20-10612201	left	12	M20x1,5	20	70	50	30	18	6	12	20	3	20	60
03099-20-2040410	03099-20-2060410	right	4	M10	10	38	25	15	9	3	6	10	1	8	14
03099-20-2040510	03099-20-2060510	right	5	M10	10	38	25	15	9	3	6	10	1,3	8	14
03099-20-2040610	03099-20-2060610	right	6	M10	10	38	25	15	9	3	6	10	1,8	8	14
03099-20-2040512	03099-20-2060512	right	5	M12	12	47,8	30	19	10,8	3,6	8	12	1,3	8	15
03099-20-2040612	03099-20-2060612	right	6	M12	12	47,8	30	19	10,8	3,6	8	12	1,8	8	15
03099-20-2040812	03099-20-2060812	right	8	M12	12	47,8	30	19	10,8	3,6	8	12	2,3	8	15
03099-20-2040616	03099-20-2060616	right	6	M16	16	60,4	40	26	14,4	4,8	10	16	1,8	15	35
03099-20-2040816	03099-20-2060816	right	8	M16	16	60,4	40	26	14,4	4,8	10	16	2,3	15	35
03099-20-2041016	03099-20-2061016	right	10	M16	16	60,4	40	26	14,4	4,8	10	16	2,8	15	35
03099-20-20408201	03099-20-20608201	right	8	M20x1,5	20	70	50	30	18	6	12	20	2,3	20	60
03099-20-20410201	03099-20-20610201	right	10	M20x1,5	20	70	50	30	18	6	12	20	2,8	20	60
03099-20-20412201	03099-20-20612201	right	12	M20x1,5	20	70	50	30	18	6	12	20	3	20	60

03099-20

Cam action indexing plunger

with stop

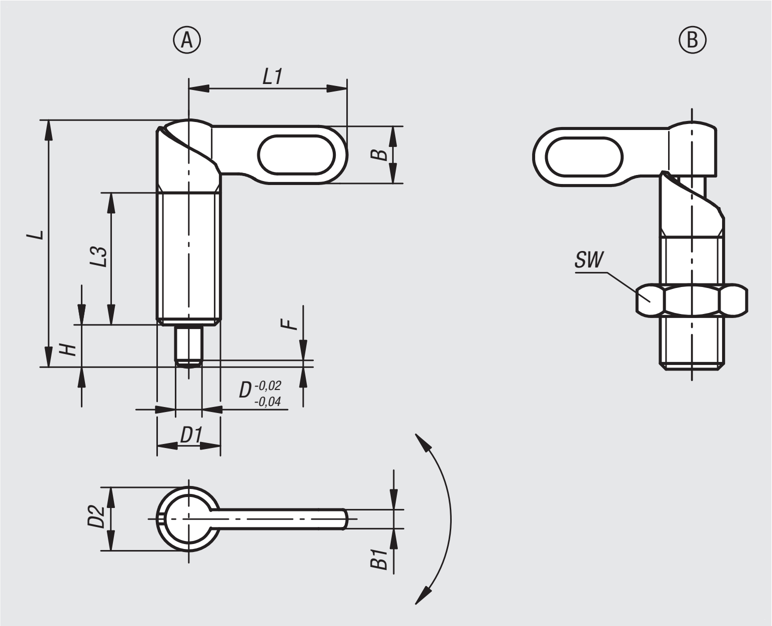


1) stop left
2) stop right

Order No. Form B	Order No. Form D	Version 2	D	D1	D2	L	L1	L3	B	B1	H	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03099-20-1050410	**03099-20-1070410**	left	4	M10	10	38	25	15	9	3	6	10	17	1	8	14
03099-20-1050510	**03099-20-1070510**	left	5	M10	10	38	25	15	9	3	6	10	17	1,3	8	14
03099-20-1050610	**03099-20-1070610**	left	6	M10	10	38	25	15	9	3	6	10	17	1,8	8	14
03099-20-1050512	**03099-20-1070512**	left	5	M12	12	47,8	30	19	10,8	3,6	8	12	19	1,3	8	15
03099-20-1050612	**03099-20-1070612**	left	6	M12	12	47,8	30	19	10,8	3,6	8	12	19	1,8	8	15
03099-20-1050812	**03099-20-1070812**	left	8	M12	12	47,8	30	19	10,8	3,6	8	12	19	2,3	8	15
03099-20-1050616	**03099-20-1070616**	left	6	M16	16	60,4	40	26	14,4	4,8	10	16	24	1,8	15	35
03099-20-1050816	**03099-20-1070816**	left	8	M16	16	60,4	40	26	14,4	4,8	10	16	24	2,3	15	35
03099-20-1051016	**03099-20-1071016**	left	10	M16	16	60,4	40	26	14,4	4,8	10	16	24	2,8	15	35
03099-20-10508201	**03099-20-10708201**	left	8	M20x1,5	20	70	50	30	18	6	12	20	30	2,3	20	60
03099-20-10510201	**03099-20-10710201**	left	10	M20x1,5	20	70	50	30	18	6	12	20	30	2,8	20	60
03099-20-10512201	**03099-20-10712201**	left	12	M20x1,5	20	70	50	30	18	6	12	20	30	3	20	60
03099-20-2050410	**03099-20-2070410**	right	4	M10	10	38	25	15	9	3	6	10	17	1	8	14
03099-20-2050510	**03099-20-2070510**	right	5	M10	10	38	25	15	9	3	6	10	17	1,3	8	14
03099-20-2050610	**03099-20-2070610**	right	6	M10	10	38	25	15	9	3	6	10	17	1,8	8	14
03099-20-2050512	**03099-20-2070512**	right	5	M12	12	47,8	30	19	10,8	3,6	8	12	19	1,3	8	15
03099-20-2050612	**03099-20-2070612**	right	6	M12	12	47,8	30	19	10,8	3,6	8	12	19	1,8	8	15
03099-20-2050812	**03099-20-2070812**	right	8	M12	12	47,8	30	19	10,8	3,6	8	12	19	2,3	8	15
03099-20-2050616	**03099-20-2070616**	right	6	M16	16	60,4	40	26	14,4	4,8	10	16	24	1,8	15	35
03099-20-2050816	**03099-20-2070816**	right	8	M16	16	60,4	40	26	14,4	4,8	10	16	24	2,3	15	35
03099-20-2051016	**03099-20-2071016**	right	10	M16	16	60,4	40	26	14,4	4,8	10	16	24	2,8	15	35
03099-20-20508201	**03099-20-20708201**	right	8	M20x1,5	20	70	50	30	18	6	12	20	30	2,3	20	60
03099-20-20510201	**03099-20-20710201**	right	10	M20x1,5	20	70	50	30	18	6	12	20	30	2,8	20	60
03099-20-20512201	**03099-20-20712201**	right	12	M20x1,5	20	70	50	30	18	6	12	20	30	3	20	60

03099

Cam-action indexing plungers stainless steel



Material:
Stainless steel 1.4305.

Version:
Bright.
Indexing pin ground, not hardened.

Sample order:
nlm 03099-1040616

Note:
Cam-action indexing plungers are used when the indexing pin should not project all the time. Turning the handle through 180° retracts the pin.
A notch ensures that the handle remains in this position.

Drawing reference:
Form A: grip uncoated without nut
Form B: grip uncoated with nut

Order No. Form A	Order No. Form B	D	D1	D2	L	L1	L3	B	B1	H	SW	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03099-1040410	**03099-1050410**	4	M10	10	38	25	20	9	3	6	-/17	1	8	14
03099-1040510	**03099-1050510**	5	M10	10	38	25	20	9	3	6	-/17	1,3	8	14
03099-1040610	**03099-1050610**	6	M10	10	38	25	20	9	3	6	-/17	1,8	8	14
03099-10404101	**03099-10504101**	4	M10x1	10	38	25	20	9	3	6	-/17	1	8	14
03099-10405101	**03099-10505101**	5	M10x1	10	38	25	20	9	3	6	-/17	1,3	8	14
03099-10406101	**03099-10506101**	6	M10x1	10	38	25	20	9	3	6	-/17	1,8	8	14
03099-1040512	**03099-1050512**	5	M12	12	46,8	30	25	10,8	3,6	8	-/19	1,3	8	15
03099-1040612	**03099-1050612**	6	M12	12	46,8	30	25	10,8	3,6	8	-/19	1,8	8	15
03099-1040812	**03099-1050812**	8	M12	12	46,8	30	25	10,8	3,6	8	-/19	2,3	8	15
03099-10405121	**03099-10505121**	5	M12x1,5	12	46,8	30	25	10,8	3,6	8	-/19	1,3	8	15
03099-10406121	**03099-10506121**	6	M12x1,5	12	46,8	30	25	10,8	3,6	8	-/19	1,8	8	15
03099-10408121	**03099-10508121**	8	M12x1,5	12	46,8	30	25	10,8	3,6	8	-/19	2,3	8	15
03099-1040616	**03099-1050616**	6	M16	16	60,4	40	32	14,4	4,8	10	-/24	1,8	15	35
03099-1040816	**03099-1050816**	8	M16	16	60,4	40	32	14,4	4,8	10	-/24	2,3	15	35
03099-1041016	**03099-1051016**	10	M16	16	60,4	40	32	14,4	4,8	10	-/24	2,8	15	35
03099-10406161	**03099-10506161**	6	M16x1,5	16	60,4	40	32	14,4	4,8	10	-/24	1,8	15	35
03099-10408161	**03099-10508161**	8	M16x1,5	16	60,4	40	32	14,4	4,8	10	-/24	2,3	15	35
03099-10410161	**03099-10510161**	10	M16x1,5	16	60,4	40	32	14,4	4,8	10	-/24	2,8	15	35
03099-1040820	**03099-1050820**	8	M20	20	70	50	35	18	6	12	-/30	2,3	20	60
03099-1041020	**03099-1051020**	10	M20	20	70	50	35	18	6	12	-/30	2,8	20	60
03099-1041220	**03099-1051220**	12	M20	20	70	50	35	18	6	12	-/30	3	20	60
03099-10408201	**03099-10508201**	8	M20x1,5	20	70	50	35	18	6	12	-/30	2,3	20	60
03099-10410201	**03099-10510201**	10	M20x1,5	20	70	50	35	18	6	12	-/30	2,8	20	60
03099-10412201	**03099-10512201**	12	M20x1,5	20	70	50	35	18	6	12	-/30	3	20	60

03099-21

Cam action indexing plunger

stainless steel, with stop

Material:
Stainless steel 1.4305.

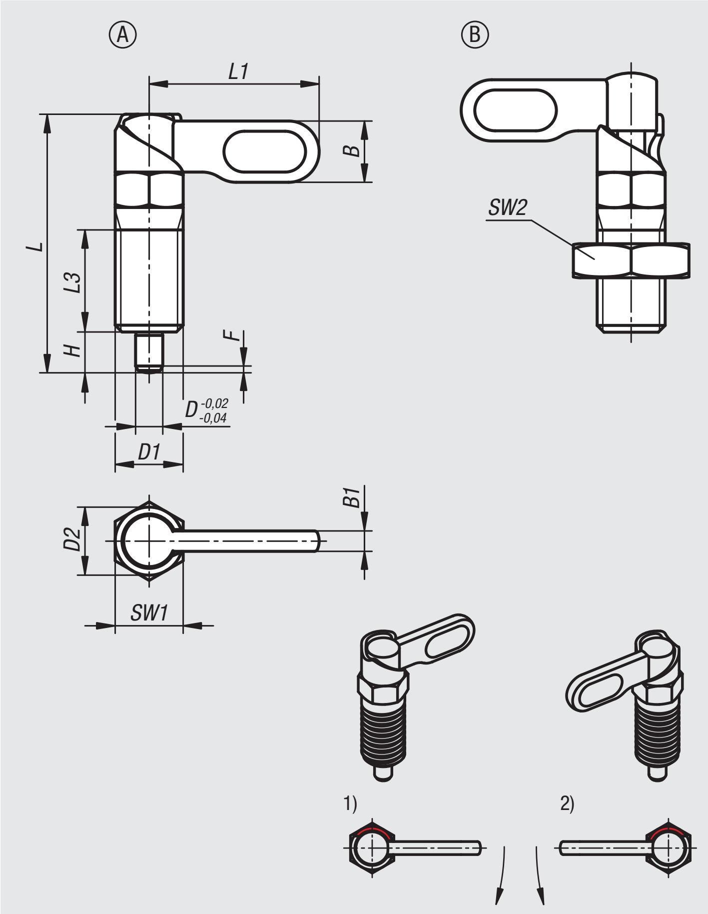
Version:
Bright.
Indexing pin ground, not hardened.

Sample order:
nlm 03099-21-1040616

Note:
Cam-action indexing plungers are used when the indexing pin should not project all the time. Turning the handle through 180° retracts the pin.
A notch ensures that the handle remains in this position.
A stop prevents the handle being rotated through more than 180° ensuring that the pin remains retracted.
Selecting which side the stop is on defines the rotation direction of the plunger.

Drawing reference:
Form A: grip uncoated without nut
Form B: grip uncoated with nut

1) stop left
2) stop right



Order No. Form A	Order No. Form B	Version 2	D	D1	D2	L	L1	L3	B	B1	H	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03099-21-1040410	**03099-21-1050410**	left	4	M10	10	38	25	15	9	3	6	10	-/17	1	8	14
03099-21-1040510	**03099-21-1050510**	left	5	M10	10	38	25	15	9	3	6	10	-/17	1,3	8	14
03099-21-1040610	**03099-21-1050610**	left	6	M10	10	38	25	15	9	3	6	10	-/17	1,8	8	14
03099-21-1040512	**03099-21-1050512**	left	5	M12	12	47,8	30	19	10,8	3,6	8	12	-/19	1,3	8	15
03099-21-1040612	**03099-21-1050612**	left	6	M12	12	47,8	30	19	10,8	3,6	8	12	-/19	1,8	8	15
03099-21-1040812	**03099-21-1050812**	left	8	M12	12	47,8	30	19	10,8	3,6	8	12	-/19	2,3	8	15
03099-21-1040616	**03099-21-1050616**	left	6	M16	16	60,4	40	26	14,4	4,8	10	16	-/24	1,8	15	35
03099-21-1040816	**03099-21-1050816**	left	8	M16	16	60,4	40	26	14,4	4,8	10	16	-/24	2,3	15	35
03099-21-1041016	**03099-21-1051016**	left	10	M16	16	60,4	40	26	14,4	4,8	10	16	-/24	2,8	15	35
03099-21-10408201	**03099-21-10508201**	left	8	M20x1,5	20	70	50	30	18	6	12	20	-/30	2,3	20	60
03099-21-10410201	**03099-21-10510201**	left	10	M20x1,5	20	70	50	30	18	6	12	20	-/30	2,8	20	60
03099-21-10412201	**03099-21-10512201**	left	12	M20x1,5	20	70	50	30	18	6	12	20	-/30	3	20	60
03099-21-2040410	**03099-21-2050410**	right	4	M10	10	38	25	15	9	3	6	10	-/17	1	8	14
03099-21-2040510	**03099-21-2050510**	right	5	M10	10	38	25	15	9	3	6	10	-/17	1,3	8	14
03099-21-2040610	**03099-21-2050610**	right	6	M10	10	38	25	15	9	3	6	10	-/17	1,8	8	14
03099-21-2040512	**03099-21-2050512**	right	5	M12	12	47,8	30	19	10,8	3,6	8	12	-/19	1,3	8	15
03099-21-2040612	**03099-21-2050612**	right	6	M12	12	47,8	30	19	10,8	3,6	8	12	-/19	1,8	8	15
03099-21-2040812	**03099-21-2050812**	right	8	M12	12	47,8	30	19	10,8	3,6	8	12	-/19	2,3	8	15
03099-21-2040616	**03099-21-2050616**	right	6	M16	16	60,4	40	26	14,4	4,8	10	16	-/24	1,8	15	35
03099-21-2040816	**03099-21-2050816**	right	8	M16	16	60,4	40	26	14,4	4,8	10	16	-/24	2,3	15	35
03099-21-2041016	**03099-21-2051016**	right	10	M16	16	60,4	40	26	14,4	4,8	10	16	-/24	2,8	15	35
03099-21-20408201	**03099-21-20508201**	right	8	M20x1,5	20	70	50	30	18	6	12	20	-/30	2,3	20	60
03099-21-20410201	**03099-21-20510201**	right	10	M20x1,5	20	70	50	30	18	6	12	20	-/30	2,8	20	60
03099-21-20412201	**03099-21-20512201**	right	12	M20x1,5	20	70	50	30	18	6	12	20	-/30	3	20	60

Mounting brackets

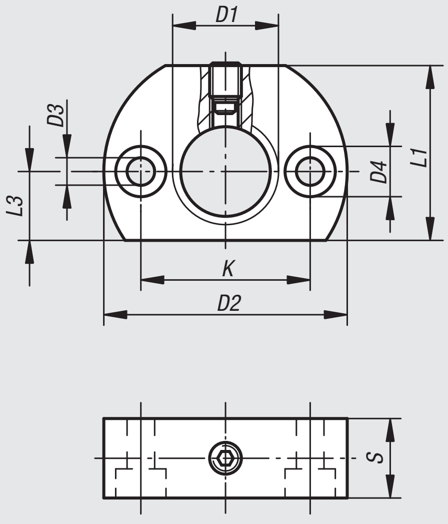
steel

Material:
Steel.

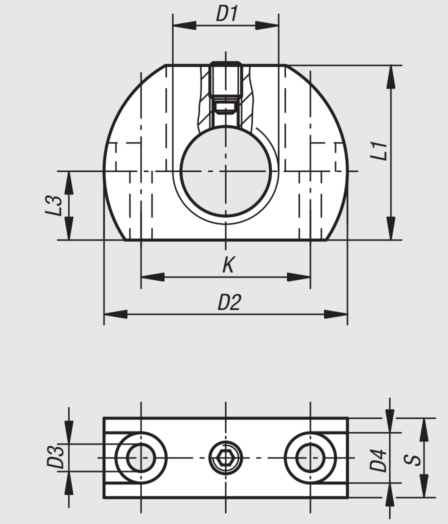
Version:
Black oxidised.

Sample order:
nlm 03099-116

Note:
These mounting brackets are assembly aids for cam-action indexing plungers and extend their application field. They can also be used with other indexing plungers or other elements that have a suitable thread. Fastened using cap screws.



Form A
fastening holes parallel
to indexing plunger



Form B
fastening holes perpendicular
to indexing plunger

Order No.	Form	D1	D2	D3	D4	K	L1	L3	S
03099-112	A	M12	36	5,5	10	24	25	10	12
03099-1121	A	M12x1,5	36	5,5	10	24	25	10	12
03099-116	A	M16	46	5,5	10	32	33	13	15
03099-1161	A	M16x1,5	46	5,5	10	32	33	13	15
03099-120	A	M20	46	5,5	10	32	33	13	15
03099-1201	A	M20x1,5	46	5,5	10	32	33	13	15
03099-212	B	M12	36	5,5	10	24	25	10	12
03099-2121	B	M12x1,5	36	5,5	10	24	25	10	12
03099-216	B	M16	46	5,5	10	32	33	13	15
03099-2161	B	M16x1,5	46	5,5	10	32	33	13	15
03099-220	B	M20	46	5,5	10	32	33	13	15
03099-2201	B	M20x1,5	46	5,5	10	32	33	13	15

Positioning bushes

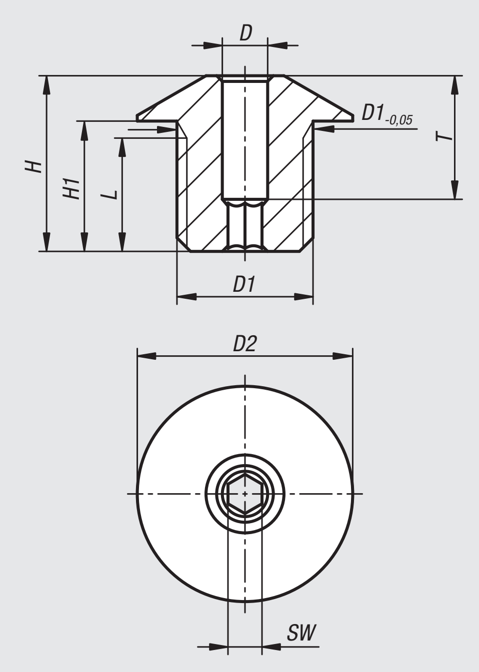
for indexing plungers

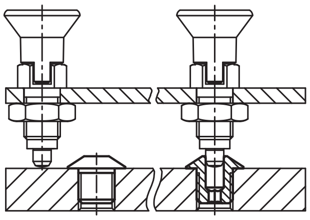
Material:
Steel or stainless steel 1.4112.

Version:
Black oxidised, hardened and ground.
Stainless steel version bright.

Sample order:
nlm 03099-50-04

Note:
Positioning bushes suitable for indexing plunger.
Matched with mounting brackets 03099.





Order No.	Main material	D	D1	D2	H	H1	L	SW	T
03099-50-04	steel	4	M12x1,5	19	15,5	11,5	10	3	11
03099-50-05	steel	5	M12x1,5	19	15,5	11,5	10	4	10
03099-50-06	steel	6	M12x1,5	19	15,5	11,5	10	4	10
03099-50-08	steel	8	M16x1,5	26	19,5	14,5	13	6	12
03099-50-10	steel	10	M16x1,5	26	19,5	14,5	13	6	12
03099-50-104	stainless steel	4	M12x1,5	19	15,5	11,5	10	3	11
03099-50-108	stainless steel	8	M16x1,5	26	19,5	14,5	13	6	12
03099-50-105	stainless steel	5	M12x1,5	19	15,5	11,5	10	4	10
03099-50-106	stainless steel	6	M12x1,5	19	15,5	11,5	10	4	10
03099-50-110	stainless steel	10	M16x1,5	26	19,5	14,5	13	6	12

03099

Mounting brackets

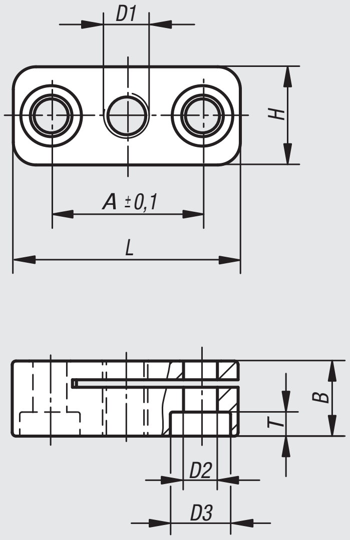
aluminium

Material:
Aluminium 3.2163.

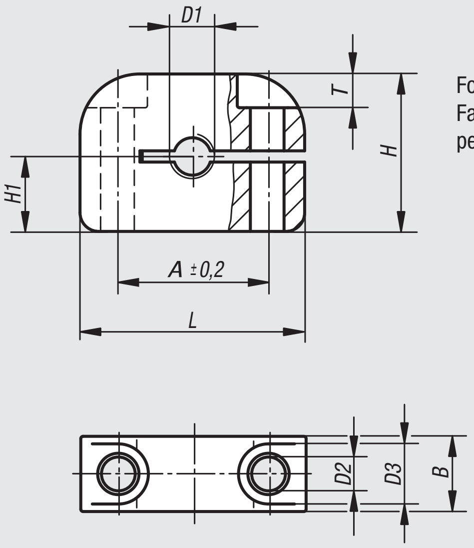
Version:
black.

Sample order:
nlm 03099-308

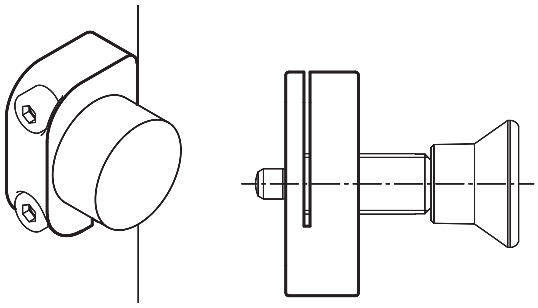
Note:
These mounting brackets are an assembly aid for cam-action and other indexing plungers and expand the application field. They can also be used with other elements that have a suitable thread. Fastened using DIN 912 / ISO 4762 cap screws.



Form A
Fastening holes
parallel to thread



Form B
Fastening holes
perpendicular to thread



Mounting brackets

aluminium

Order No.	Form	D1	D2	D3	A	B	H	H1	L	T
03099-306	A	M6	4,5	8	20	10	13	-	30	3,2
03099-3061	A	M6x0,75	4,5	8	20	10	13	-	30	3,2
03099-308	A	M8	4,5	8	20	10	13	-	30	3,2
03099-3081	A	M8x1	4,5	8	20	10	13	-	30	3,2
03099-310	A	M10	5,5	10	24	12	18	-	37	3,9
03099-3101	A	M10x1	5,5	10	24	12	18	-	37	3,9
03099-312	A	M12	5,5	10	24	12	18	-	37	3,9
03099-3121	A	M12x1,5	5,5	10	24	12	18	-	37	3,9
03099-316	A	M16	5,5	10	32	15	25	-	46	3,9
03099-3161	A	M16x1,5	5,5	10	32	15	25	-	46	3,9
03099-320	A	M20	5,5	10	32	15	25	-	46	3,9
03099-3201	A	M20x1,5	5,5	10	32	15	25	-	46	3,9
03099-406	B	M6	4,5	8	20	10	21	10	30	4,5
03099-4061	B	M6x0,75	4,5	8	20	10	21	10	30	4,5
03099-408	B	M8	4,5	8	20	10	21	10	30	4,5
03099-4081	B	M8x1	4,5	8	20	10	21	10	30	4,5
03099-410	B	M10	5,5	10	24	12	26	13	36	5,5
03099-4101	B	M10x1	5,5	10	24	12	26	13	36	5,5
03099-412	B	M12	5,5	10	24	12	26	13	36	5,5
03099-4121	B	M12x1,5	5,5	10	24	12	26	13	36	5,5
03099-416	B	M16	5,5	10	32	15	29	17	46	5,5
03099-4161	B	M16x1,5	5,5	10	32	15	29	17	46	5,5
03099-420	B	M20	5,5	10	32	15	29	17	46	5,5
03099-4201	B	M20x1,5	5,5	10	32	15	29	17	46	5,5

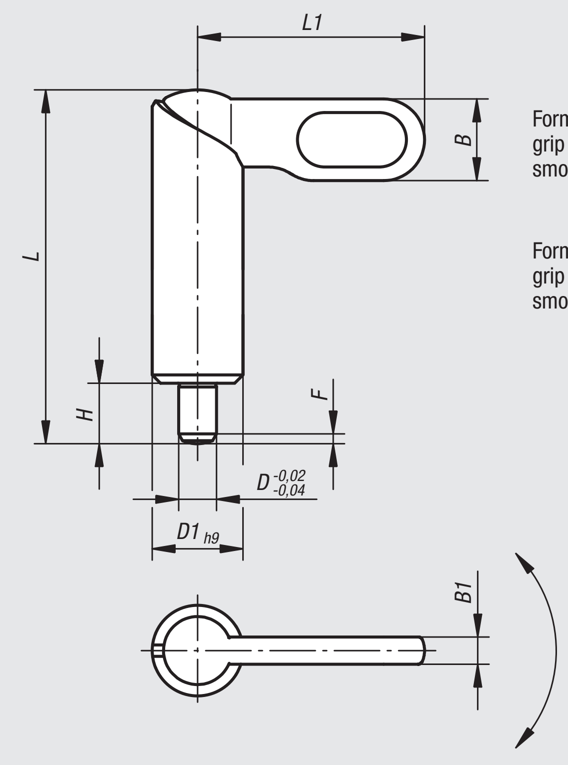
Cam-action indexing plungers

Material:
Handle 1.0503.
Pin steel grade 5.8.
Sleeve 1.0403 weldable.

Version:
Black oxidised.
Pin hardened and ground.

Sample order:
nlm 03099-091220

Note:
Cam-action indexing plungers are used when the indexing pin should not project all the time. Turning the handle through 180° retracts the pin.
A notch ensures that the handle remains in this position.
To weld the plungers we recommend inert gas shielded welding with TIG welding equipment.

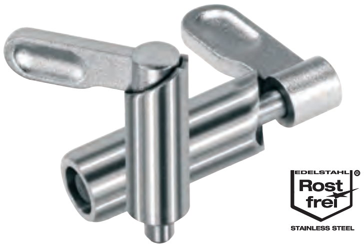


Form E
grip uncoated
smooth sleeve

Form F
grip powder-coated
smooth sleeve

Order No. Form E	Order No. Form F	D	D1	L	L1	B	B1	H	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03099-080410	**03099-090410**	4	10	38	25	9	3	6	1	8	14
03099-080510	**03099-090510**	5	10	38	25	9	3	6	1,3	8	14
03099-080610	**03099-090610**	6	10	38	25	9	3	6	1,8	8	14
03099-080512	**03099-090512**	5	12	46,8	30	10,8	3,6	8	1,3	8	15
03099-080612	**03099-090612**	6	12	46,8	30	10,8	3,6	8	1,8	8	15
03099-080812	**03099-090812**	8	12	46,8	30	10,8	3,6	8	2,3	8	15
03099-080616	**03099-090616**	6	16	60,4	40	14,4	4,8	10	1,8	15	35
03099-080816	**03099-090816**	8	16	60,4	40	14,4	4,8	10	2,3	15	35
03099-081016	**03099-091016**	10	16	60,4	40	14,4	4,8	10	2,8	15	35
03099-080820	**03099-090820**	8	20	70	50	18	6	12	2,3	20	60
03099-081020	**03099-091020**	10	20	70	50	18	6	12	2,8	20	60
03099-081220	**03099-091220**	12	20	70	50	18	6	12	3	20	60

Cam-action indexing plungers stainless steel

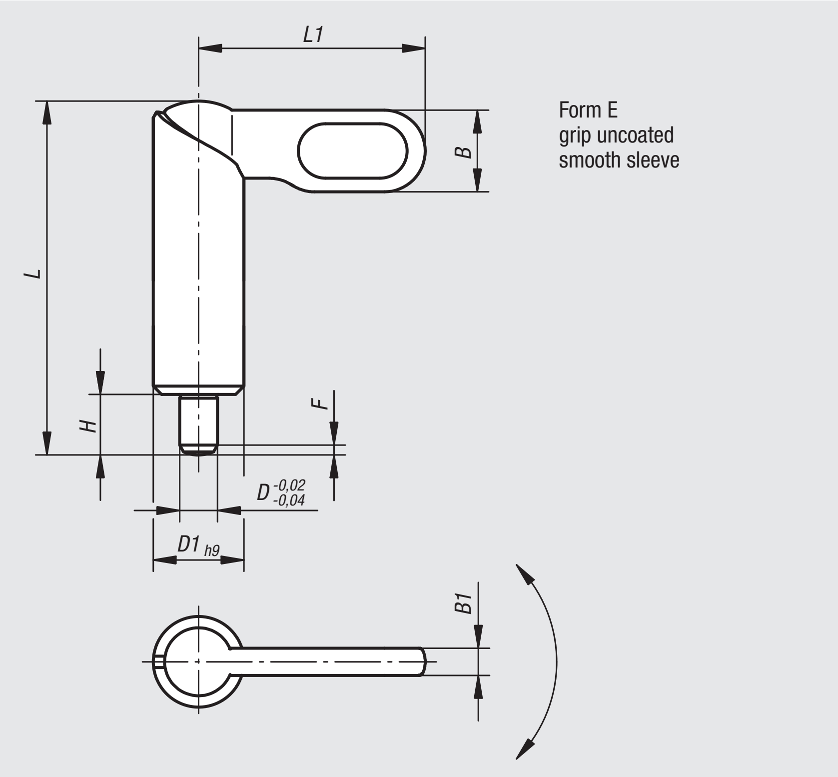


Material:
Handle stainless steel 1.4308.
Indexing pin stainless steel 1.4305.
Sleeve weldable stainless steel 1.4301.

Version:
Bright.
Indexing pin ground, not hardened.

Sample order:
nlm 03099-1081220

Note:
Cam-action indexing plungers are used when the indexing pin should not project all the time. Turning the handle through 180° retracts the pin.
A notch ensures that the handle remains in this position.
To weld the plungers we recommend inert gas shielded welding with TIG welding equipment.



Form E
grip uncoated
smooth sleeve

Order No.	Form	D	D1	L	L1	B	B1	H	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03099-1080410	E	4	10	38	25	9	3	6	1	8	14
03099-1080510	E	5	10	38	25	9	3	6	1,3	8	14
03099-1080610	E	6	10	38	25	9	3	6	1,8	8	14
03099-1080512	E	5	12	46,8	30	10,8	3,6	8	1,3	8	15
03099-1080612	E	6	12	46,8	30	10,8	3,6	8	1,8	8	15
03099-1080812	E	8	12	46,8	30	10,8	3,6	8	2,3	8	15
03099-1080616	E	6	16	60,4	40	14,4	4,8	10	1,8	15	35
03099-1080816	E	8	16	60,4	40	14,4	4,8	10	2,3	15	35
03099-1081016	E	10	16	60,4	40	14,4	4,8	10	2,8	15	35
03099-1080820	E	8	20	70	50	18	6	12	2,3	20	60
03099-1081020	E	10	20	70	50	18	6	12	2,8	20	60
03099-1081220	E	12	20	70	50	18	6	12	3	20	60

03102

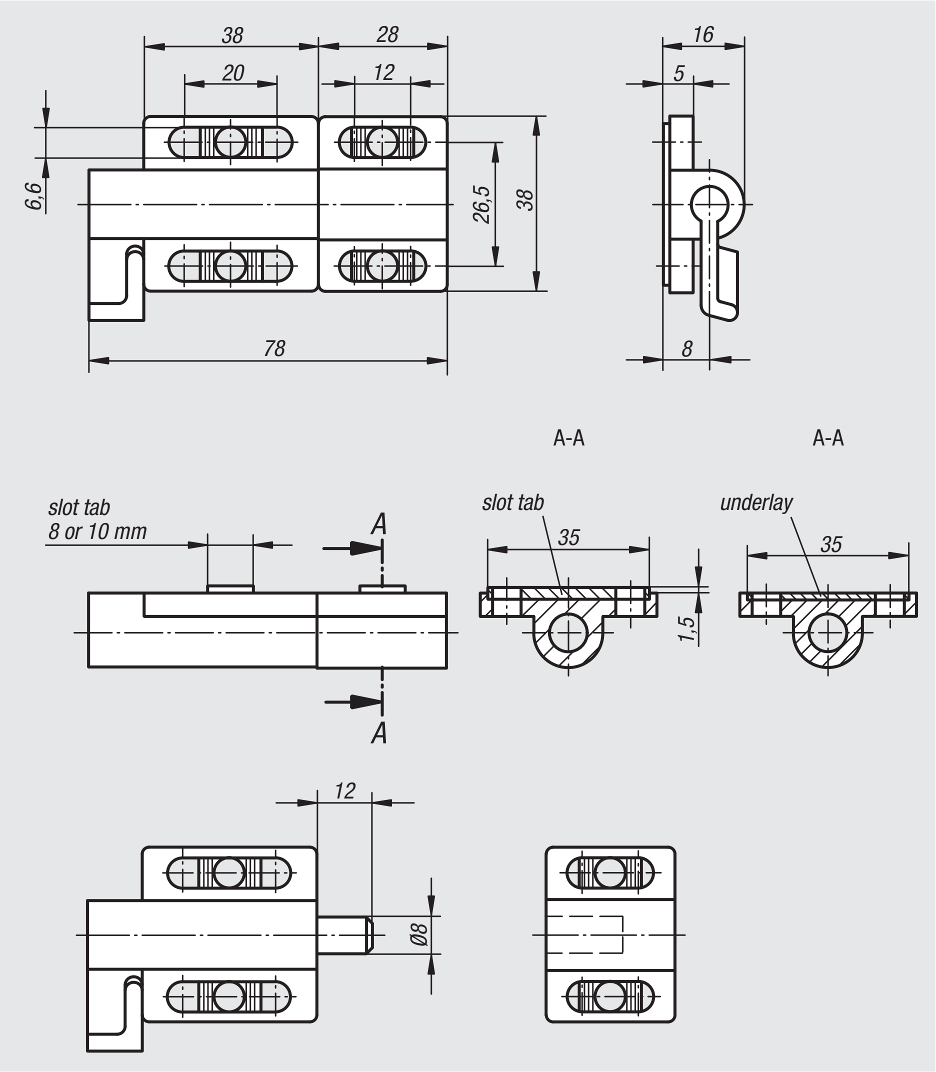
Barrel slide bolts

Material:
Housing die-cast zinc.
Grip, underlay and slot tabs thermoplastic PA.
Bolt stainless steel.

Version:
Housing painted silver.
Grip, underlay and slot tabs black.
Bolt bright.

Sample order:
nlm 03102-38038028

Note:
Spring loaded bolt.
Supplied with:
- 2 underlays for mounting on level surfaces.
- 2 of each tabs for mounting on profiles with 8 or 10 mm slots.

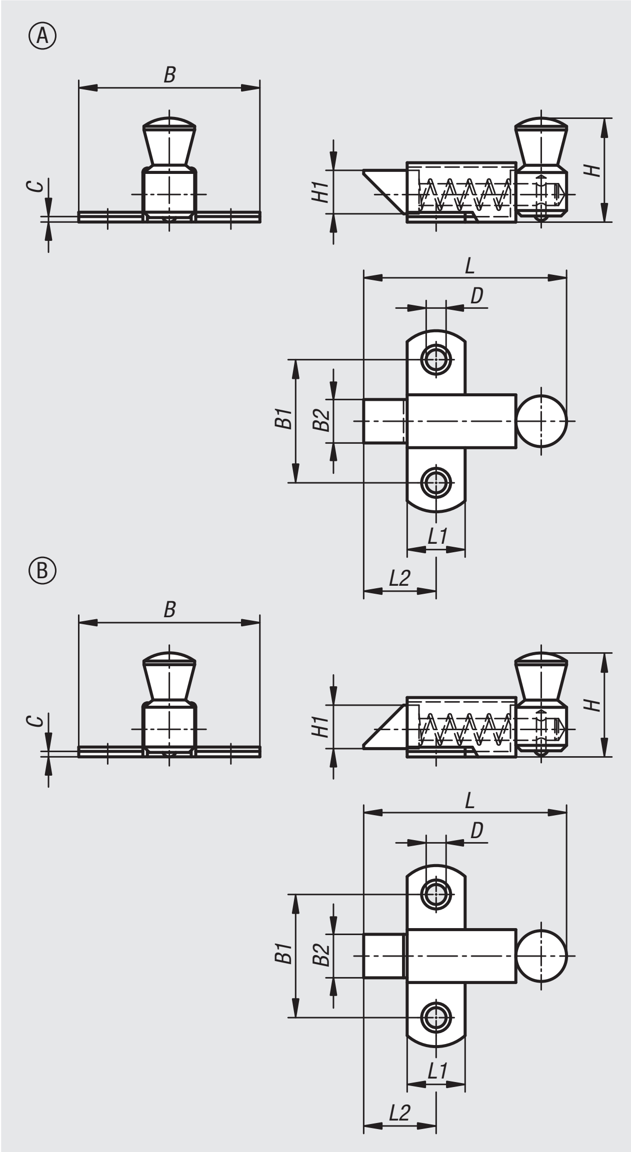


Order No.	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03102-38038028	5	15

03102-05

Barrel locks with return spring, steel or brass

bevel up or down



Material:
Steel or brass.

Version:
Steel zinc-plated.
Brass chromed.

Sample order:
nlm 03102-05-056500

Note:
Barrel locks with return spring can be easily screwed onto doors, hatches and hoods. These locks are available in two different variants: bevelled upward or bevelled downward. The bevelled surface allows the application to be closed or opened without actuating the grip. The integrated return spring always brings the grip back to its original position.

Method of operation:
When the grip is pushed, the barrel moves into the open position and the door can be opened. When the door is pushed to, it is locked automatically by the bevel.

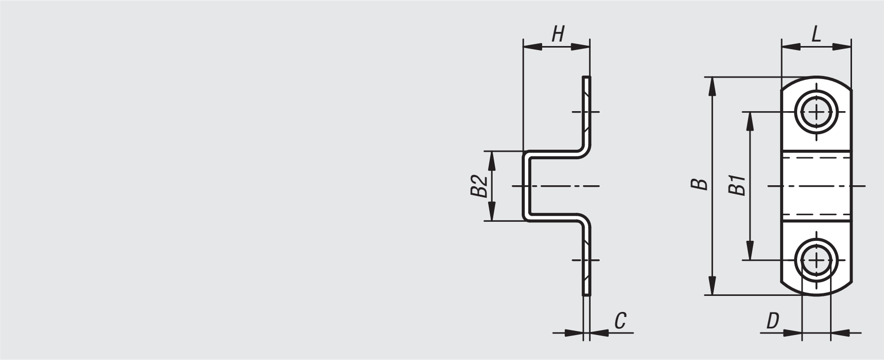
Accessories:
Catch plate steel or brass 03102-06.

Order No. steel	Order No. brass	Form	Form-Type	B	B1	B2	C	D	H	H1	L	L1	L2
03102-05-036350	**03102-05-036351**	A	bevel up	35	23	8	1,2	3,5	19	8	36,5	11	13,5
03102-05-056500	**03102-05-056501**	A	bevel up	50	34	12	1,5	4,8	29,5	12	56	16	19
03102-05-073700	**03102-05-073701**	A	bevel up	70	45	16	2	7	38	16	73	22	28
03102-05-136350	**03102-05-136351**	B	bevel down	35	23	8	1,2	3,5	19	8	36,5	11	13,5
03102-05-156500	**03102-05-156501**	B	bevel down	50	34	12	1,5	4,8	29,5	12	56	16	19
03102-05-173700	**03102-05-173701**	B	bevel down	70	45	16	2	7	38	16	73	22	28

03102-06

Catch plates, steel or brass

for barrel locks with return spring



Material:
Steel or brass.

Version:
Steel zinc-plated.
Brass chromed.

Sample order:
nlm 03102-06-16500

Note:
The catch plates can be simply screwed onto the application.

Order No. steel	Order No. brass	B	B1	B2	C	D	H	L
03102-06-11350	**03102-06-11351**	35	23	11,5	1,2	3,5	11,5	11
03102-06-16500	**03102-06-16501**	50	34	16	1,5	4,8	16	16
03102-06-22680	**03102-06-22651**	68,5	43,5	21	2	7	21	22

03102-10

Barrel locks with return spring aluminium

grip to left or right

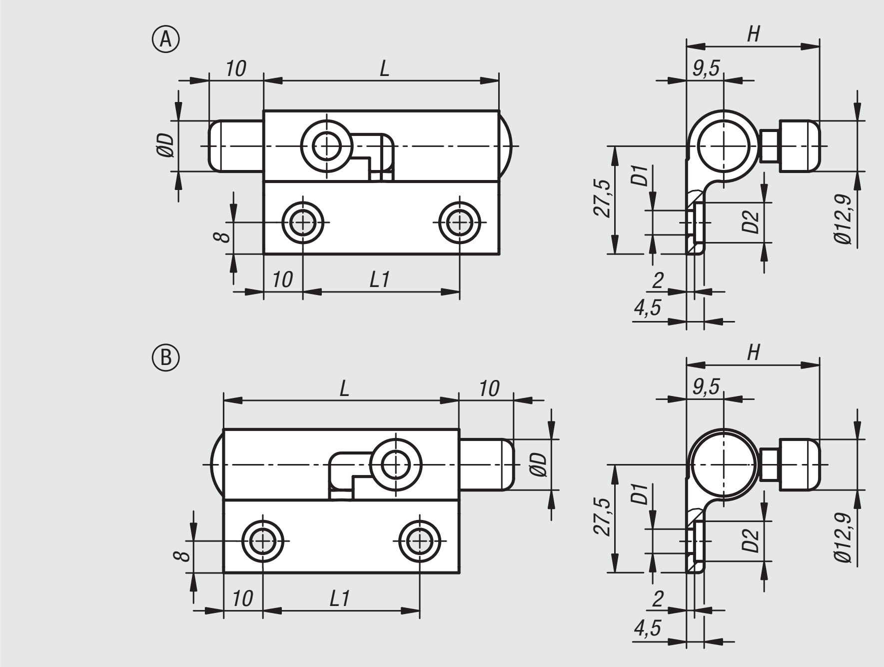
Material:
Barrel lock aluminium.
Spring stainless steel.

Sample order:
nlm 03102-10-04036

Note:
Barrel locks with return spring can be easily screwed onto doors, hatches and hoods. These locks are available in two different variants for left-opening and right-opening doors. The barrel can be latched in the open position. The integrated return spring always brings the grip back to its original position.

Method of operation:
When the grip is pushed, the barrel moves into the open position and the door can be opened. If the barrel is not latched in open position, it returns automatically to its original position. The door can be closed only if the grip is held in the open position.

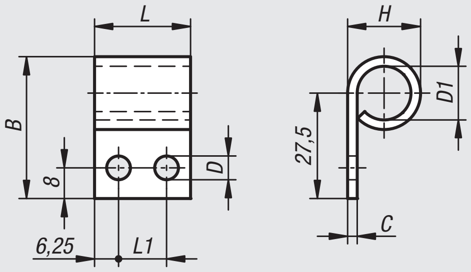
Accessories:
Catch plates aluminium 03102-11.



Order No.	Form	Form-Type	B	D	D1	D2	H	L	L1
03102-10-04036	A	left	36,5	12,9	6,2	10,2	34	60	40
03102-10-14036	B	right	36,5	12,9	6,2	10,2	34	60	40

Catch plate aluminium

for barrel locks with return spring



Material:
Aluminium.

Sample order:
nlm 03102-11-2537

Note:
The catch plates can be simply screwed onto the application.

Order No.	B	C	D	D1	H	L	L1
03102-11-2537	37	2,5	6,2	14	19	25	12,5

Notes

03102-15

Barrel locks with return spring stainless steel

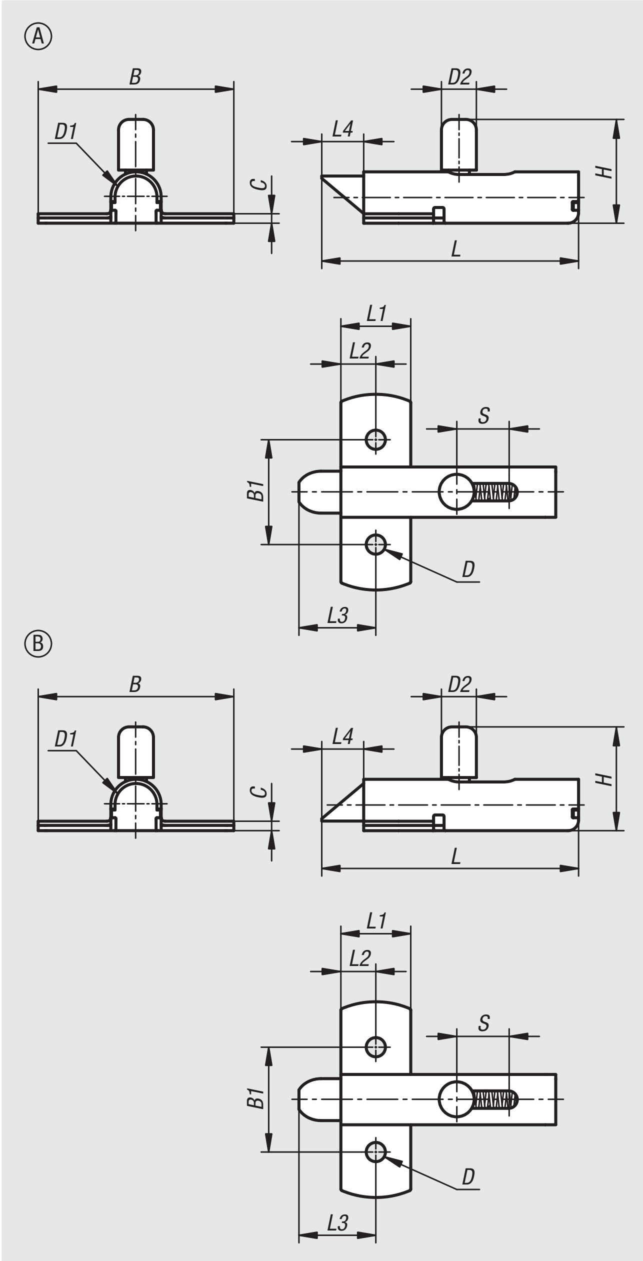
bevel up or down

Material:
Stainless steel

Sample order:
nlm 03102-15-07356

Note:
Barrel locks with return spring can be easily screwed onto doors, hatches and hoods. These locks are available in two different variants: bevelled upward or bevelled downward. The bevelled surface allows the application to be closed or opened without actuating the grip. The integrated return spring always brings the grip back to its original position.

Method of operation:
When the grip is pushed, the barrel moves into the open position and the door can be opened. When the door is pushed to, it is locked automatically by the bevel.



Order No.	Form	Form-Type	B	B1	C	D	D1	D2	H	Travel S	L	L1	L2	L3	L4
03102-15-07356	A	bevel up	56	30	2,7	5,5	12	10	29,7	13	73,5	20	10	22	12
03102-15-17356	B	bevel down	56	30	2,7	5,5	12	10	29,7	13	73,5	20	10	22	12

03105

Locating pins removable

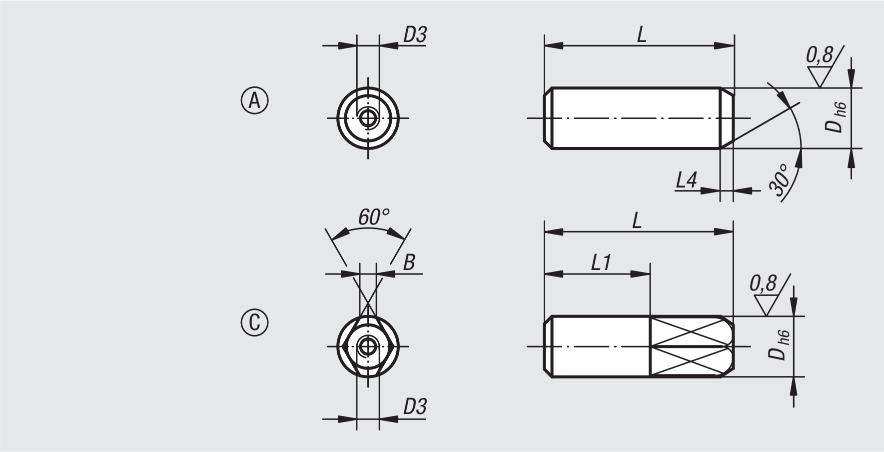
Form A and C

Material:
Tool steel.

Version:
Hardened and ground (HRC 56 +2).

Sample order:
nlm 03105-12

Note:
The locating pins can be easily removed with an extractor.



Order No. Form A	Order No. Form C	D	D3	L	L1	L4	B
03105-08	**03105-082**	8	M3	25	-/14	3/-	-/2,2
03105-10	**03105-102**	10	M3	30	-/17	3/-	-/3
03105-12	**03105-122**	12	M5	34	-/20	4/-	-/3,5
03105-16	**03105-162**	16	M5	42	-/26	4/-	-/5
03105-20	**03105-202**	20	M5	47	-/30	5/-	-/6
03105-25	**03105-252**	25	M5	49	-/30	5/-	-/8

03106

Locating pins removable

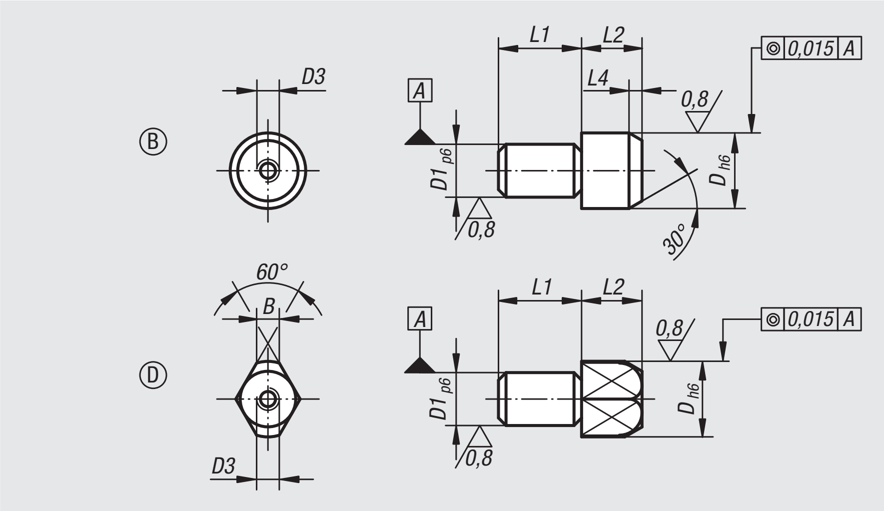
Form B and D

Material:
Tool steel.

Version:
Hardened and ground (HRC 55-60).

Sample order:
nlm 03106-20

Note:
Locating pins can be easily removed with an extractor.

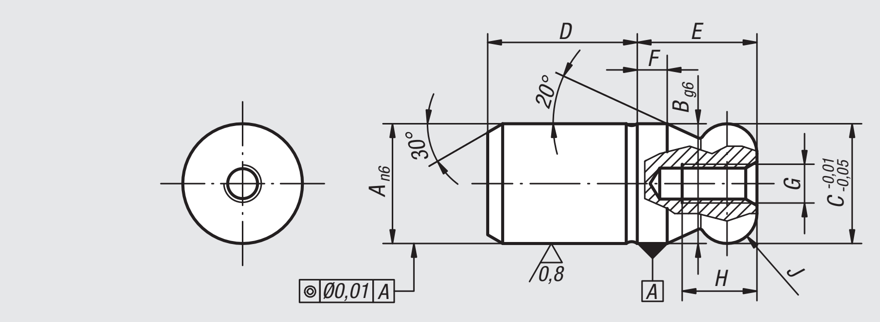


Order No. Form B	Order No. Form D	D	D1	D3	L1	L2	L4	B
03106-10	**03106-102**	10	7	M3	11	11	3	-/3
03106-12	**03106-122**	12	8	M5	13	12	4	-/3,5
03106-16	**03106-162**	16	12	M5	18	14	4,5	-/5
03106-20	**03106-202**	20	14	M5	22	15	5	-/6
03106-22	**03106-222**	22	16	M5	22	17	5	-/7
03106-25	**03106-252**	25	18	M5	25	17	5	-/8

03107

Locating pins

with ball-end Form A



Material:
Tool steel or 1.4305 stainless steel.

Version:
Steel hardened and ground.
Stainless steel ground and kolsterised.

Sample order:
nlm 03107-12

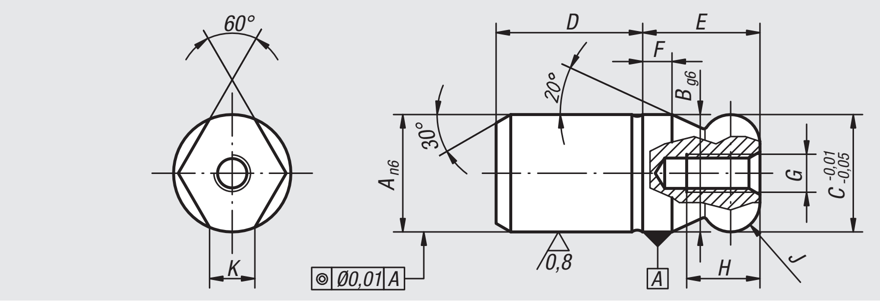
Note:
Ball end locating pins are specially designed to ease the locating process. The tendency to jam, caused by the locating hole not being at right angles to the pin or by the pushing force not being parallel to the pin axis, is minimized by the ball-end form. (See the illustration 1 by 03108 Form B)

Order No. tool steel	Order No. stainless steel	A	B	C	D	E	F	G	H	J
03107-05	**03107-505**	5	5	5	6	5	2	M2,5	4,5	R 1
03107-06	**03107-506**	6	6	6	8	6	2	M3	5	R 1
03107-08	**03107-508**	8	8	8	10	8	2	M3	6	R 2
03107-10	**03107-510**	10	10	10	13	10	2,5	M3	6	R 2,5
03107-12	**03107-512**	12	12	12	15	12	3	M4	8	R 3
03107-14	**03107-514**	14	14	14	17	14	3,5	M4	8	R 3,5
03107-16	**03107-516**	16	16	16	20	16	4	M5	10	R 4
03107-20	**03107-520**	20	20	20	25	20	5	M5	10	R 5
03107-25	-	25	25	25	25	25	6	M5	10	R 6
03107-30	-	30	30	30	30	30	8	M6	12	R 8
03107-40	-	40	40	40	40	40	10	M6	12	R 10
03107-50	-	50	50	50	50	50	12	M6	12	R 12

03107

Locating pins

with flattened ball-end Form C



Material:
Tool steel or 1.4305 stainless steel.

Version:
Steel hardened and ground.
Stainless steel ground and kolsterised.

Sample order:
nlm 03107-162

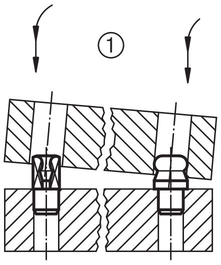
Note:
Ball end locating pins are specially designed to ease the locating process. The tendency to jam, caused by the locating hole not being at right angles to the pin or by the pushing force not being parallel to the pin axis, is minimized by the ball-end form. (See the illustration 1 by 03108 Form B)

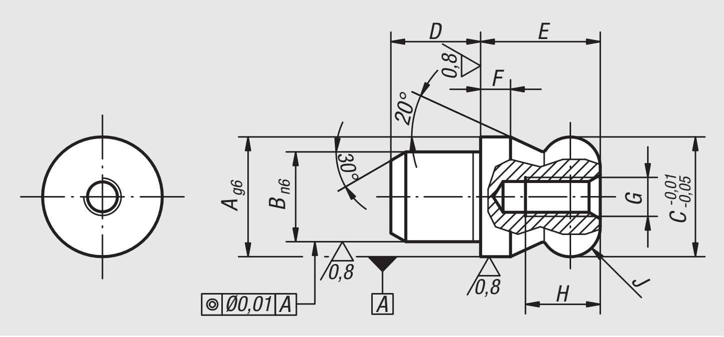
Order No. tool steel	Order No. stainless steel	A	B	C	D	E	F	G	H	J	K
03107-052	**03107-5052**	5	5	5	6	5	2	M2,5	4,5	R 1	1,5
03107-062	**03107-5062**	6	6	6	8	6	2	M3	5	R 1	1,8
03107-082	**03107-5082**	8	8	8	10	8	2	M3	6	R 2	1,9
03107-102	**03107-5102**	10	10	10	13	10	2,5	M3	6	R 2,5	2,5
03107-122	**03107-5122**	12	12	12	15	12	3	M4	8	R 3	2,5
03107-142	**03107-5142**	14	14	14	17	14	3,5	M4	8	R 3,5	3,9
03107-162	**03107-5162**	16	16	16	20	16	4	M5	10	R 4	4,3
03107-202	**03107-5202**	20	20	20	25	20	5	M5	10	R 5	5
03107-252	-	25	25	25	25	25	6	M5	10	R 6	5,6
03107-302	-	30	30	30	30	30	8	M6	12	R 8	8,8
03107-402	-	40	40	40	40	40	10	M6	12	R 10	12,8
03107-502	-	50	50	50	50	50	12	M6	12	R 12	16,7

03108

Locating pins

with ball-end Form B





Material:
Tool steel or 1.4305 stainless steel.

Version:
Steel hardened and ground.
Stainless steel ground and kolsterised.

Sample order:
nlm 03108-20

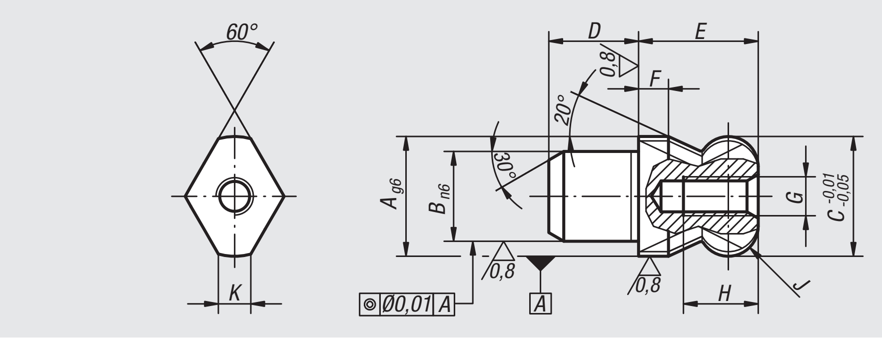
Note:
Ball end locating pins are specially designed to ease the locating process. The tendency to jam, caused by the locating hole not being at right angles to the pin or by the pushing force not being parallel to the pin axis, is minimized by the ball-end form (see illustration).

Order No. tool steel	Order No. stainless steel	A	B	C	D	E	F	G	H	J
03108-06	**03108-506**	6	4	6	4	6	2	M2,5	4,5	R 1
03108-08	**03108-508**	8	6	8	6	8	2	M3	6	R 2
03108-10	**03108-510**	10	7	10	7	10	2,5	M3	6	R 2,5
03108-12	**03108-512**	12	8	12	8	12	3	M4	8	R 3
03108-14	**03108-514**	14	10	14	10	14	3,5	M4	8	R 3,5
03108-16	**03108-516**	16	12	16	12	16	4	M5	10	R 4
03108-20	**03108-520**	20	14	20	14	20	5	M5	10	R 5
03108-22	-	22	16	22	16	22	5,5	M5	10	R 5,5
03108-25	-	25	18	25	18	25	6	M5	10	R 6

03108

Locating pins

with flattened ball-end Form D



Material:
Tool steel or 1.4305 stainless steel.

Version:
Steel hardened and ground.
Stainless steel ground and kolsterised.

Sample order:
nlm 03108-162

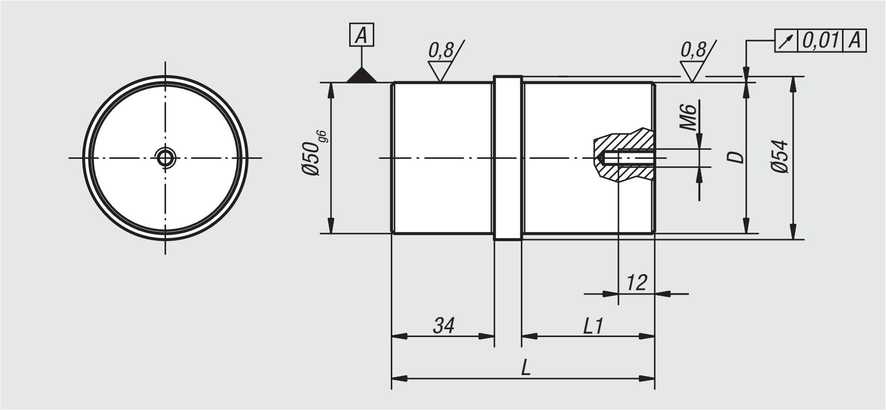
Note:
Ball end locating pins are specially designed to ease the locating process. The tendency to jam, caused by the locating hole not being at right angles to the pin or by the pushing force not being parallel to the pin axis, is minimized by the ball-end form. (See the illustration 1 by 03108 Form B)

Order No. tool steel	Order No. stainless steel	A	B	C	D	E	F	G	H	J	K
03108-062	**03108-5062**	6	4	6	4	6	2	M2,5	4,5	R 1	1,7
03108-082	**03108-5082**	8	6	8	6	8	2	M3	6	R 2	2
03108-102	**03108-5102**	10	7	10	7	10	2,5	M3	6	R 2,5	2,5
03108-122	**03108-5122**	12	8	12	8	12	3	M4	8	R 3	2,5
03108-142	**03108-5142**	14	10	14	10	14	3,5	M4	8	R 3,5	3,76
03108-162	**03108-5162**	16	12	16	12	16	4	M5	10	R 4	4,3
03108-202	**03108-5202**	20	14	20	14	20	5	M5	10	R 5	5
03108-222	-	22	16	22	16	22	5,5	M5	10	R 5,5	5
03108-252	-	25	18	25	18	25	6	M5	10	R 6	5,6

03110

Centring pins

for central hole



Material:
Steel.

Version:
Case-hardened.
Toleranced diameter ground.

Sample order:
nlm 03110-5025

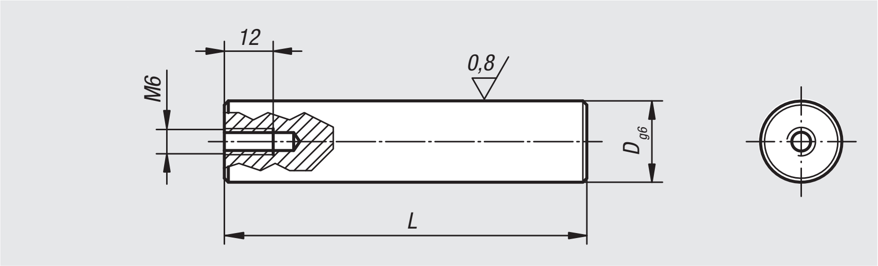
Note:
These centring pins are suitable for the central holes of our workholding elements 01148, 01263, 01265, 01267 and 01850.

Order No.	D	L	L1
03110-5025	25 g6	77	34
03110-5030	30 h6	87	44
03110-5050	50 g6	87	44

03112

Centring pins

for aligning hole



Material:
Steel.

Version:
Case-hardened.
Toleranced diameter ground.

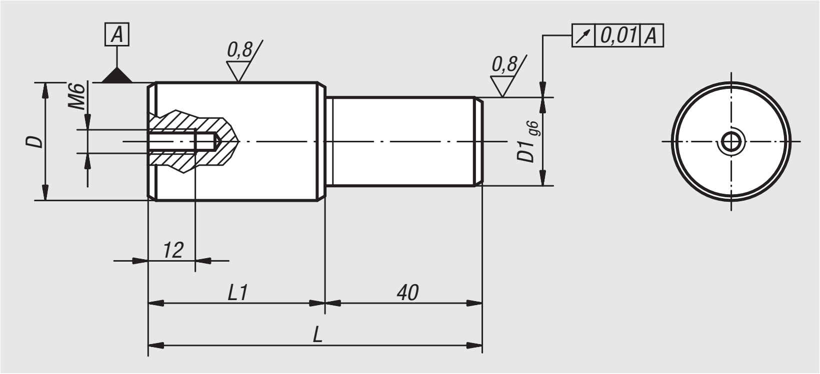
Sample order:
nlm 03112-25125

Note:
These centring pins are suitable for the aligning holes of our workholding elements 01263, 01265 and 01850.

Order No.	D	L
03112-20075	20	75
03112-20089	20	89
03112-25125	25	125

Centring pins

for aligning hole



Material:
Steel.

Version:
Case-hardened.
Toleranced diameter ground.

Sample order:
nlm 03114-2520

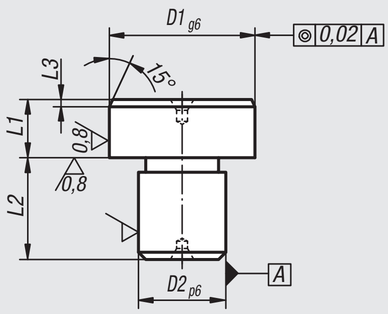
Note:
These centring pins are suitable for our subplates 01148.

Order No.	D	D1	L	L1
03114-2520	25 g6	20	75	35
03114-3020	30 h6	20	85	45
03114-3025	30 h6	25	85	45

03120

Positioning pins cylindrical

ground



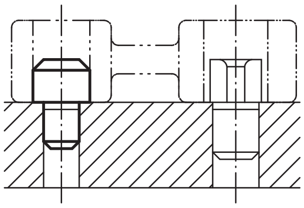
Material:
Tool steel.

Version:
Hardened and ground.

Sample order:
nlm 03120-08

Note:
Top face with centrebore.

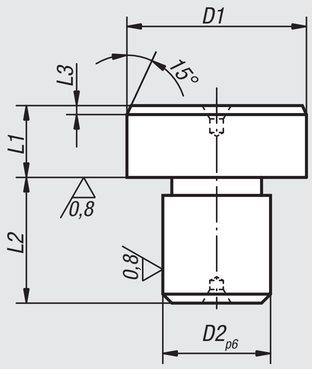
Order No.	D1	D2	L1	L2	L3
03120-05	8	5	8	8	2
03120-07	10	7	8	8	2
03120-08	12	8	8	10	2
03120-081	14	8	8	10	3
03120-09	16	9	8	12	3
03120-12	18	12	8	12	3
03120-121	20	12	8	14	3
03120-14	22	14	8	14	3
03120-16	25	16	8	16	3



03130

Positioning pins cylindrical

not ground



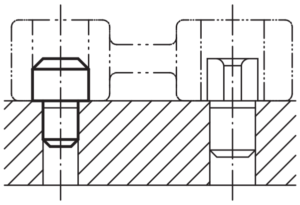
Material:
Tool steel.

Version:
Hardened.

Sample order:
nlm 03130-05

Note:
Top face with centrebore.

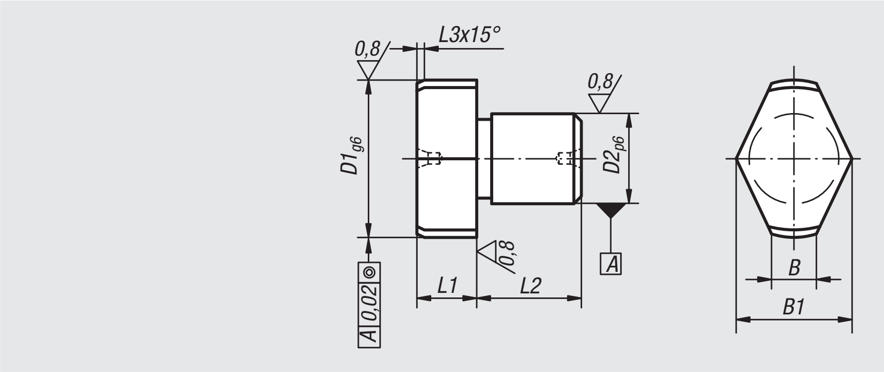
Order No.	D1	D2	L1	L2	L3
03130-05	8,5	5	8	8	2
03130-07	10,5	7	8	8	2
03130-08	12,5	8	8	10	2
03130-081	14,5	8	8	10	3
03130-09	16,5	9	8	12	3
03130-12	18,5	12	8	12	3
03130-121	20,5	12	8	14	3
03130-14	22,5	14	8	14	3
03130-16	25,5	16	8	16	3



03140

Positioning pins free-milled

ground

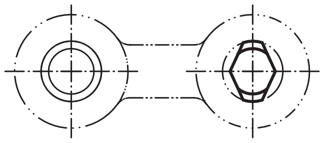


Material:
Tool steel.

Version:
Hardened and ground.

Sample order:
nlm 03140-08

Note:
Top face with centrebore.

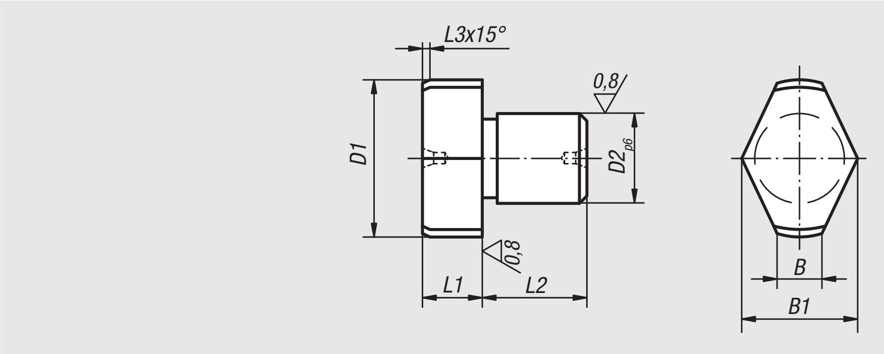


Order No.	D1	D2	L1	L2	L3	B	B1
03140-05	8	5	8	8	2	2	6,6
03140-07	10	7	8	8	2	3	8,6
03140-08	12	8	8	10	2	3	9,8
03140-081	14	8	8	10	3	3,5	11,2
03140-09	16	9	8	12	3	4	13,2
03140-12	18	12	8	12	3	4,5	14,7
03140-121	20	12	8	14	3	5	16,6
03140-14	22	14	8	14	3	5,6	18
03140-16	25	16	8	16	3	6	19,8

03150

Positioning pins free-milled

not ground

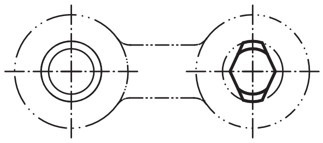


Material:
Tool steel.

Version:
Hardened.

Sample order:
nlm 03150-05

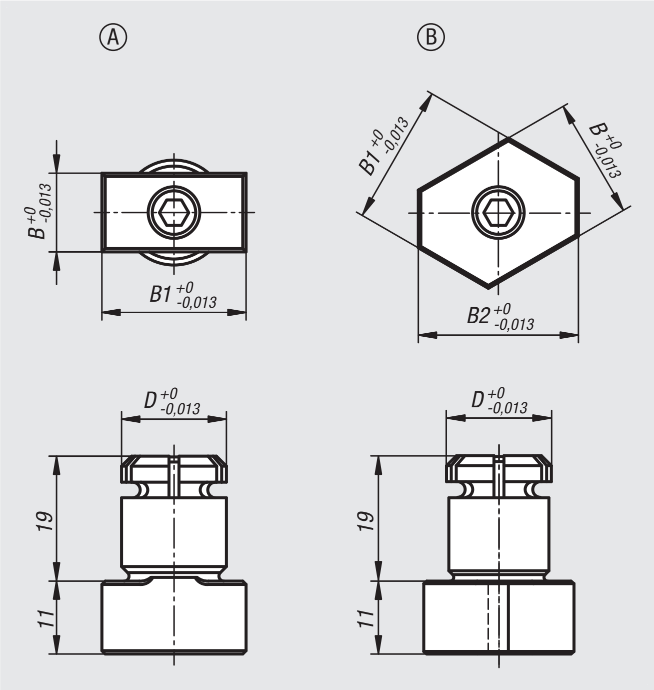
Note:
Top face with centrebore.



Order No.	D1	D2	L1	L2	L3	B	B1
03150-05	8,5	5	8	8	2	2	6,6
03150-07	10,5	7	8	8	2	3	8,6
03150-08	12,5	8	8	10	2	3	9,8
03150-081	14,5	8	8	10	3	3,5	11,2
03150-09	16,5	9	8	12	3	4	13,2
03150-12	18,5	12	8	12	3	4,5	14,7
03150-121	20,5	12	8	14	3	5	16,6
03150-14	22,5	14	8	14	3	5,6	18
03150-16	25,5	16	8	16	3	6	19,8

03151

Locating pins expanding



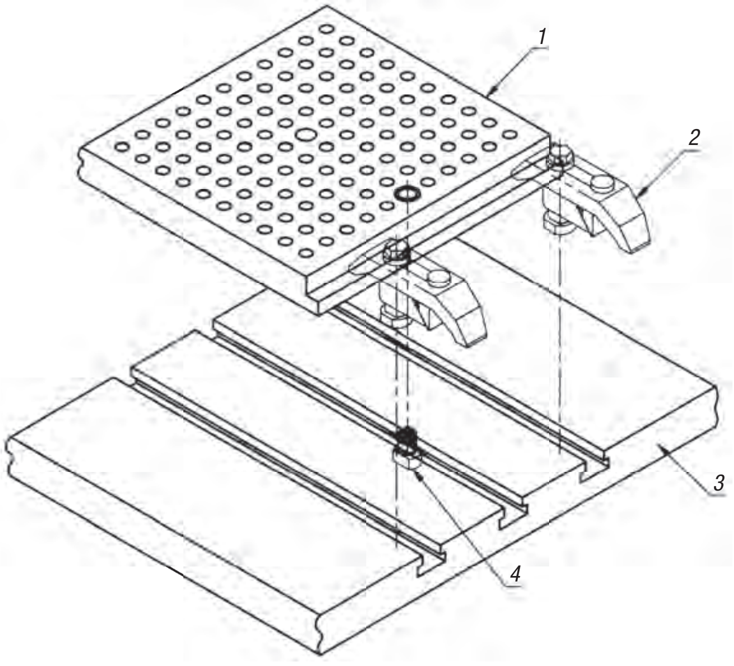
Material:
Carbon steel.

Version:
Tempered and black oxidised.
Locating diameter and guide faces ground.

Sample order:
nlm 03151-1610

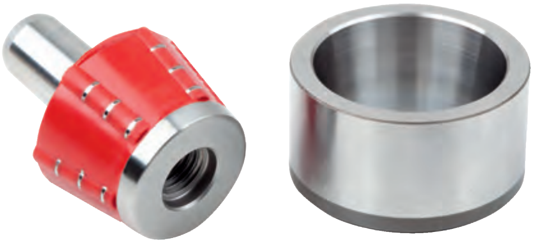
Note:
These expanding locating pins enable e.g. tooling plates to be positioned in the T-slots of machine tables (see illustration).
The plates to be positioned must have two holes matching the expanding pin diameter.
The expansion screw has a broached through hexagonal hole allowing the pin to be tightened or loosened from two sides.

Drawing reference:
1) tooling plate
2) clamp straps
3) machine table
4) expanding locating pin



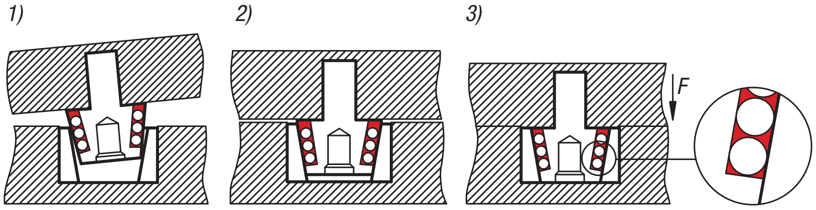
Order No.	Form	D	B	B1	B2	Recommended Ø
03151-1610	A	16	10	20	-	16,01 ±0,01
03151-1612	A	16	12	22	-	16,01 ±0,01
03151-1614	B	16	14	16	18	16,01 ±0,01
03151-2024	B	20	24	28	32	20,01 ±0,01

Technical note for centring unit



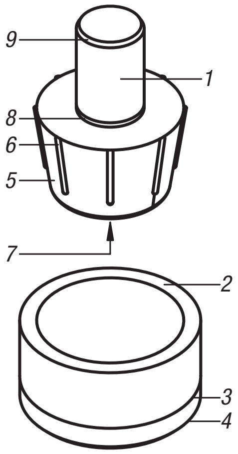
Functional description

1) To join two plates fitted with the centring unit, the cone is simply positioned into the bush.
2) The balls on the cone are now in light contact with the inner surface of the bush, but there is still a small gap between the two plates.
3) When a down force (F) is applied, the precision balls in the rubber jacket are pressed onto the surface of the cone and the surfaces of the two plates align with each other. The metal conical surfaces of the bush and cone both have the same overall hardness and can only deform within their elastic limit where the precision balls make contact. So the balls cannot damage the surfaces. Due to the prevailing balance of forces, the cone always strives to align itself with the centre of the bush. This centre alignment means that the component is always positioned precisely and with high repeat precision in the axis.



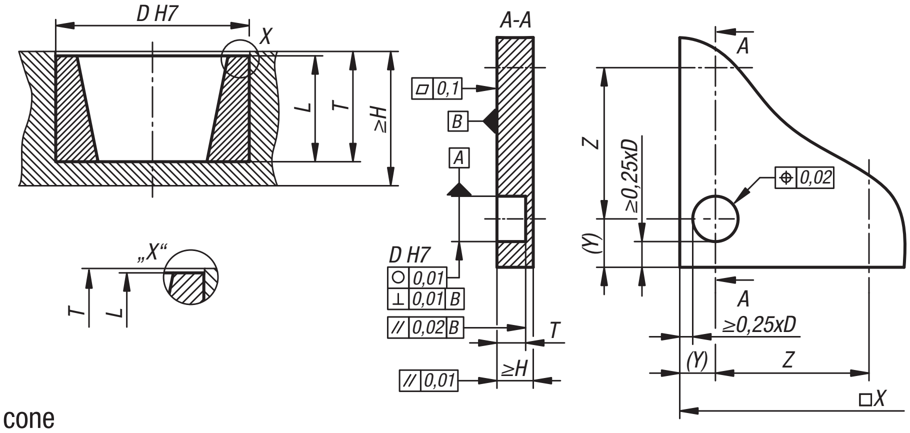
- Temperature differences of up to 30 K can be compensated for
- The rubber does not embrittle and is insensitive to dirt or swarf
- Embedded swarf splinters do not effect the system
- Ester-based or antifreeze coolants should be avoided
- Some form of undercut should be added to the receiving hole so that the bush can be pulled out and replaced

Centring unit in detail

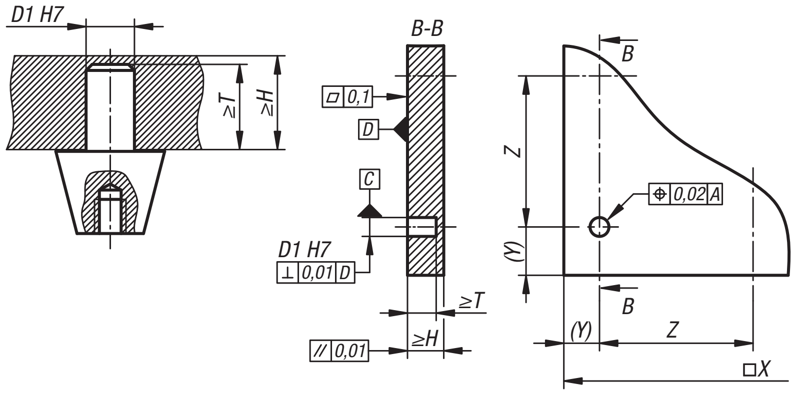
Description	
1 Cone **2 Bush** **3 Positioning diameter for easy assembly** **4 Lead-in chamfer for easy assembly** **5 Rubber for holding the precision balls** **6 Precision balls as centring element** **7 Tapped hole for removing the cone** **8 Undercut for flat-parallel installation of the cone** **9 Lead-in chamfer for easy assembly**	

Mounting dimensions

bush

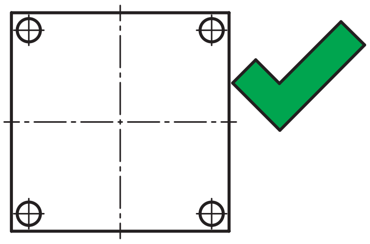


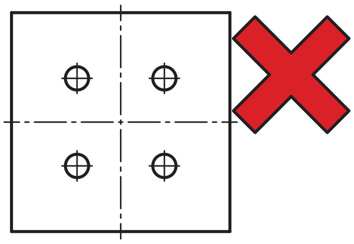
cone



component	bush		cone	
Size	1	3	1	3
D (bore diameter)	16^{H7}	32^{H7}		
L (bush length)	8,5	17,5		
T (bore depth)	9-0,1	18-0,1		
≥H (plate thickness)	12,5	25		
D1 (bore diameter)			6^{H7}	10^{H7}
≥T (bore depth)			9	18
≥H (plate thickness)			12	21

To obtain the best possible alignment of the two workpieces, the centring units should be positioned as far apart as possible.



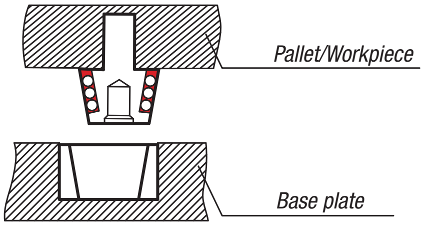


Minimum down force exerted by a retraction mechanism (e.g. bolts)

Size	1		3	
Number of centring units	1	4	1	4
Minimum down force (kN)	1,5	6	1,5	10

The down force applied by the retraction mechanism must be taken up by the components, as the centring units are only designed for centring, not taking up forces. Application of the minimum down force creates a frictional bond between the two components, leaving the centring units free from lateral forces.

- The maximum working temperature is +80 °C
- Generally, the bush is pressed into the baseplate and the cone is pressed into a pallet or the workpiece
- The maximum centre offset between bush and cone should not exceed 3 mm when mating

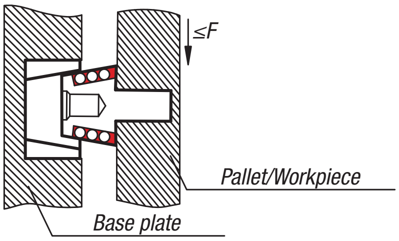


Special aspects for horizontal mounting

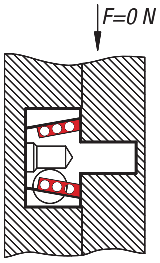
The same mounting dimensions apply as for vertical mounting. Since the workpieces take up the lateral forces when clamped by a down force, the centring units are left free of lateral forces. However, during pallet changes or when mating workpieces the centring units should only be subjected to the following maximum lateral forces:

Size	1		3	
Number of centring units	1	4	1	4
Lateral force Fmax (N)	35		250	

Mating



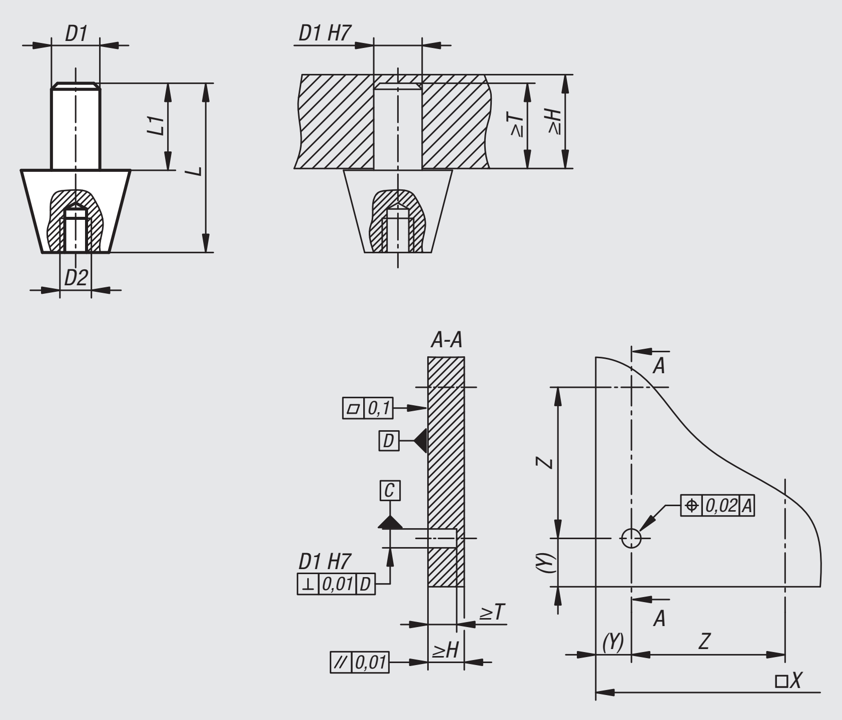
Clamped position



03152-10

Positioning cones, steel

for centring units



Material:
Cone, steel.
Balls, ball bearing steel.

Version:
Cone hardened and ground.
Balls embedded in rubber which is vucanised on the cones.

Sample order:
nlm 03152-10-3

Note:
In conjunction with the position bushings, the position cones form a centring unit for the high-precision positioning of two components. The system achieves a repeat accuracy of <0.003 mm. The bonded rubber does not become brittle and is insensitive to contamination or swarf. Small embedded swarf splinters do not effect the system.

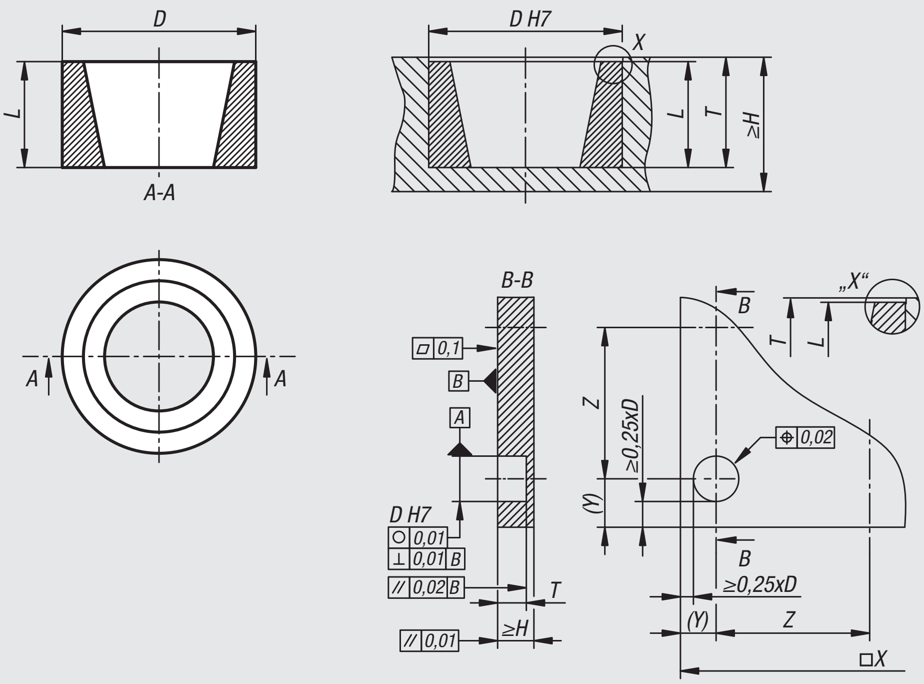
Temperature range:
+80 °C.

Functional principle:
When the positioning cone and bush are mated, the balls are pressed together within the rubbers elastic range and thus locate the two parts in which they have been fitted, with maximum accuracy. To ensure that the rubber in which the balls are embedded is deformed within the elastic range, one must merely ensure that the depth of the hole into which the positioning bush is later pressed is precisely observed. The positioning cone is supplied ready to fit into the positioning bush and must simply be fitted into the counterpart component. Henceforth, a precise zero point positioning system is in place.

Order No.	Size	D1	D2	H min.	L max.	L1	T min.	for Art. No.
03152-10-1	1	6	M4	12	17,5	9	9	03152-11-1
03152-10-3	3	10	M8	21	35	18	18	03152-11-3

Positioning bush steel

for centring units



Material:
Steel.

Version:
Hardened and ground.

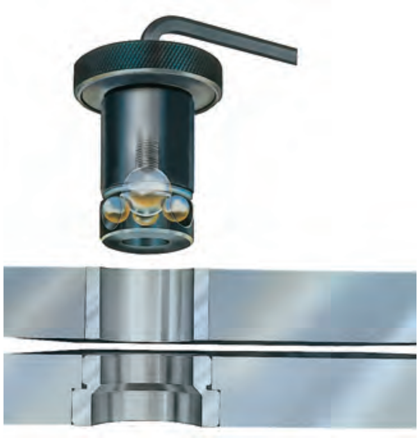
Sample order:
nlm 03152-11-3

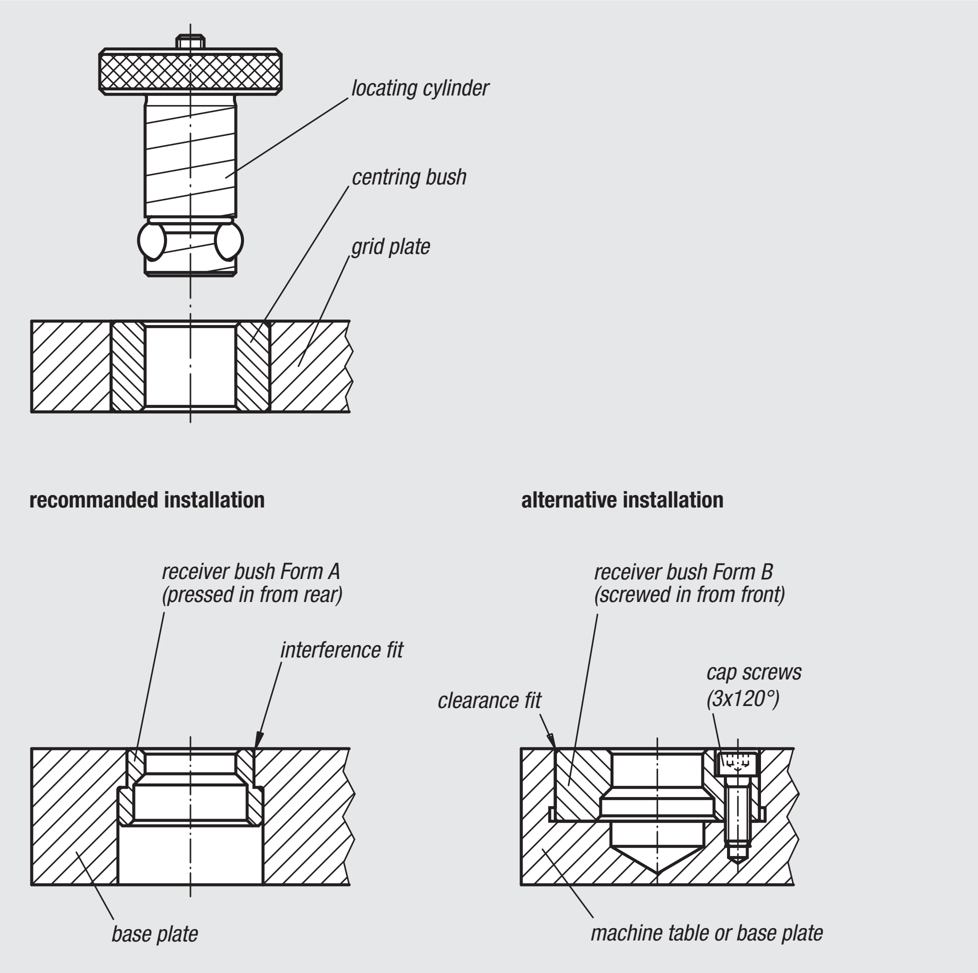
Note:
These positioning bushes match positioning cones.

Temperature range:
+80 °C.

Order No.	Size	D	H min.	L max.	T	for Art. No.
03152-11-1	1	16	12,5	8,5	9-0,1	03152-10-1
03152-11-3	3	32	25	17,5	18-0,1	03152-10-3

Locating and clamping system, mechanical





General information

1. With the mechanical locating and clamping system, base and tooling plates can be precisely positioned and fastening in a couple of seconds. The system consists of a locating cylinder, a centring bush and a receiver bush.

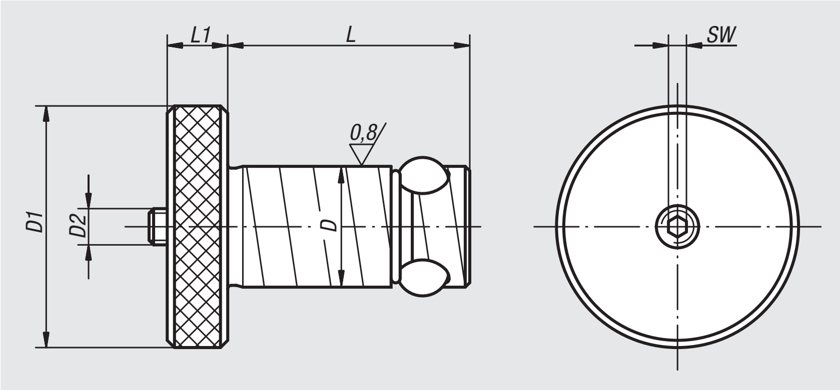
2. Three easy steps to applying the positioning and clamping system:
   Mount two receiver bushes on the machine table or on the base plate, and two centring bushes on the clamping plate.
   Insert the locating cylinder through the centring bush into the receiver bush to attain precise positioning.
   Turn the set screws in each locating cylinder roughly two rotations to clamp tight.
   Eighteen different locating cylinders, two centring bush types and two receiver bush models are available.

3. A centring bush grade I (below left) and a centring bush grade I or II (above right) should be installed in each fastening plate as far apart from one another as possible. More than two positioning points bring no further advantages. When more than two locating cylinders are used for additional holding force (dependent on application), holes in the fastening plate must be 0.4 mm to 0.8 mm bigger than the selected locating cylinder diameter.

4.If the centre distance between the two positioning holes in the e.g. machine table and the clamping plate is kept within a tolerance of ±0.005 mm and two centring bushings grade I are used, a repeat accuracy within ±0.013 mm can be achieved.
For a somewhat lower repeat accuracy within ±0.04 mm, one centring bushing grade I and one centring bushing grade II with a centre distance tolerance of ±0.03 mm are used.

5. The difference between the centring bush grade I and the centring bush grade II is that the centring bush grade II has a larger internal diameter in order to correspond to the greater centre distance tolerance in the machine table or the base plate.

Locating cylinder Ball Lock



Material:
Locating cylinder carbon steel.
Balls roller bearing steel.

Version:
Locating cylinder tempered, black oxidised.
Balls hardened, bright.

Sample order:
nlm 03153-16020

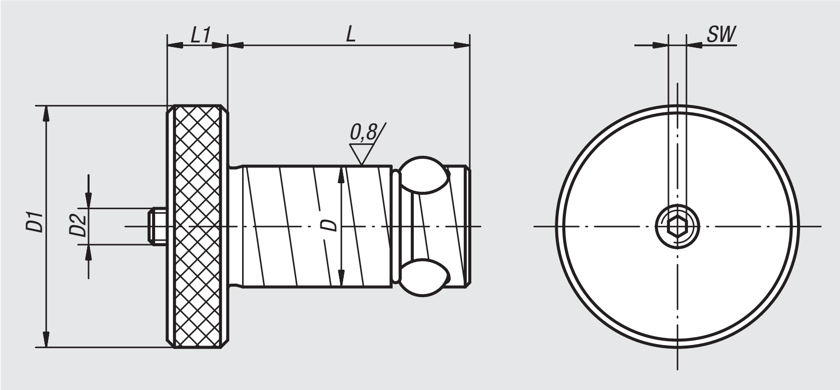
Note:
By tightening the thrust screw (D2) the centre ball is pressed downwards and in turn forces the three locking balls outwards, where they locked in the receiver bush.
With this easy to use system machine set-up times are up to twelve times shorter than when conventional methods are used.

Order No.	Grid plate thickness ±0,05	D	D1	D2	L	L1	SW	Holding force F kN	Tightening torque max. Nm	Order No. Repair Kit
03153-13013	13	13	22	M5	27,6	6	2,5	3,3	1	03153-913013
03153-13020	20	13	22	M5	34,6	6	2,5	3,3	1	03153-913020
03153-16020	20	16	32	M6	36,5	8	3	5,3	3	03153-916020
03153-16025	25	16	32	M6	41,5	8	3	5,3	3	03153-916025
03153-20020	20	20	40	M6	39,5	10	3	13,3	4	03153-920020
03153-20025	25	20	40	M6	44,5	10	3	13,3	4	03153-920025
03153-25020	20	25	45	M8	44	10	4	30	9	03153-925020
03153-25025	25	25	45	M8	49	10	4	30	9	03153-925025
03153-30020	20	30	50	M10	49	13	5	44	15	03153-930020
03153-30025	25	30	50	M10	54	13	5	44	15	03153-930025
03153-35020	20	35	60	M12	51	13	6	68	25	03153-935020
03153-35025	25	35	60	M12	56	13	6	68	25	03153-935025
03153-35040	40	35	60	M12	71	13	6	68	25	03153-935040
03153-35050	50	35	60	M12	81	13	6	68	25	03153-935050
03153-50020	20	50	75	M20	64	20	10	88	50	03153-950020
03153-50025	25	50	75	M20	69	20	10	88	50	03153-950025
03153-50040	40	50	75	M20	84	20	10	88	50	03153-950040
03153-50050	50	50	75	M20	94	20	10	88	50	03153-950050

03153-02

Locating cylinder, stainless steel

Ball Lock



Material:
Locating cylinder and ball stainless steel 1.4542.

Version:
Locating cylinder and ball hardened to min. 40 HRC, bright.

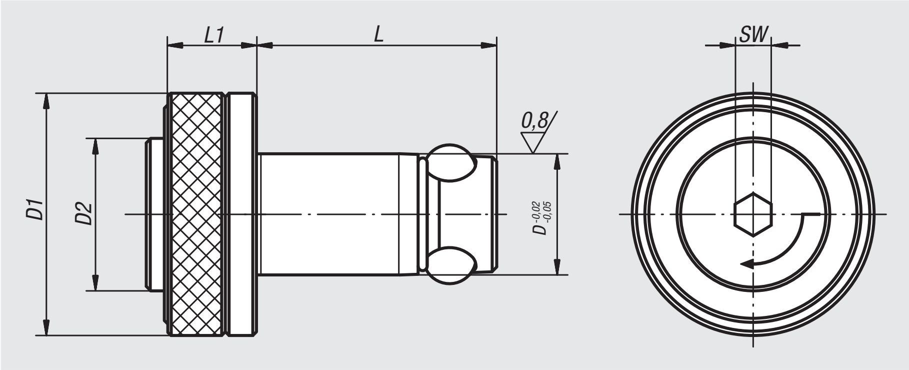
Sample order:
nlm 03153-02-16020

Note:
By tightening the thrust screw (D2) the centre ball is pressed downwards and in turn forces the three locking balls outwards, where they locked in the receiver bush.
With this easy to use system machine set-up times are up to twelve times shorter than when conventional methods are used.

Order No.	Grid plate thickness ±0.13	D	D1	D2	L	L1	SW	Holding force F kN	Tightening torque max. Nm	Order No. Repair Kit
03153-02-13013	13	13	22	M5	27,6	6	2,5	3,3	1,2	03153-02-913013
03153-02-13020	20	13	22	M5	34,6	6	2,5	3,3	1,2	03153-02-913020
03153-02-16020	20	16	32	M6	36,5	8	3	5,3	4,5	03153-02-916020
03153-02-16025	25	16	32	M6	41,5	8	3	5,3	4,5	03153-02-916025
03153-02-20020	20	20	40	M6	39,5	10	3	13,3	5,3	03153-02-920020
03153-02-20025	25	20	40	M6	44,4	10	3	13,3	5,3	03153-02-920025
03153-02-25020	20	25	45	M8	44	10	4	30	11	03153-02-925020
03153-02-25025	25	25	45	M8	49	10	4	30	11	03153-02-925025
03153-02-30020	20	30	50	M10	49	13	5	44	18	03153-02-930020
03153-02-30025	25	30	50	M10	54	13	5	44	18	03153-02-930025
03153-02-35020	20	35	60	M12	51	13	6	68	33	03153-02-935020
03153-02-35025	25	35	60	M12	56	13	6	68	33	03153-02-935025
03153-02-35040	40	35	60	M12	71	13	6	68	33	03153-02-935040
03153-02-35050	50	35	60	M12	81	13	6	68	33	03153-02-935050
03153-02-50020	20	50	75	M20	64	20	10	88	65	03153-02-950020
03153-02-50025	25	50	75	M20	69	20	10	88	65	03153-02-950025
03153-02-50040	40	50	75	M20	84	20	10	88	65	03153-02-950040
03153-02-50050	50	50	75	M20	94	20	10	88	65	03153-02-950050

Locating cylinders

with quick clamping system



Material:
Locating cylinder carbon steel.
Balls roller bearing steel.

Version:
Locating cylinder tempered, black oxidised.
Balls hardened, bright.

Sample order:
nlm 03153-113013

Note:
Locating cylinder with quick-clamp system for extra timesaving during setups.

Insert the locating cylinder into the receiving hole and press the button. The three balls are pushed out and position the components. By tightening the set screw a 1/4 turn using an hexagonal key, the components are positively and securely held.

Order No.	Grid plate thickness ±0,05	D	D1	D2	L	L1	SW	Holding force F kN	Tightening torque max. Nm
03153-113013	13	13	25	16	27,6	12	4	4	1
03153-113020	20	13	25	16	34,6	12	4	4	1
03153-116020	20	16	32	20	36,5	15	6	8	2
03153-116025	25	16	32	20	41,5	15	6	8	2
03153-120020	20	20	40	25	39,5	15	6	8	2
03153-120025	25	20	40	25	44,5	15	6	8	2

03154

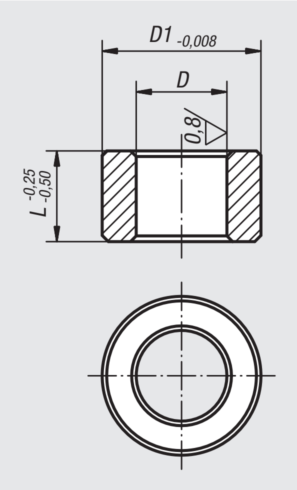
Centring bushes

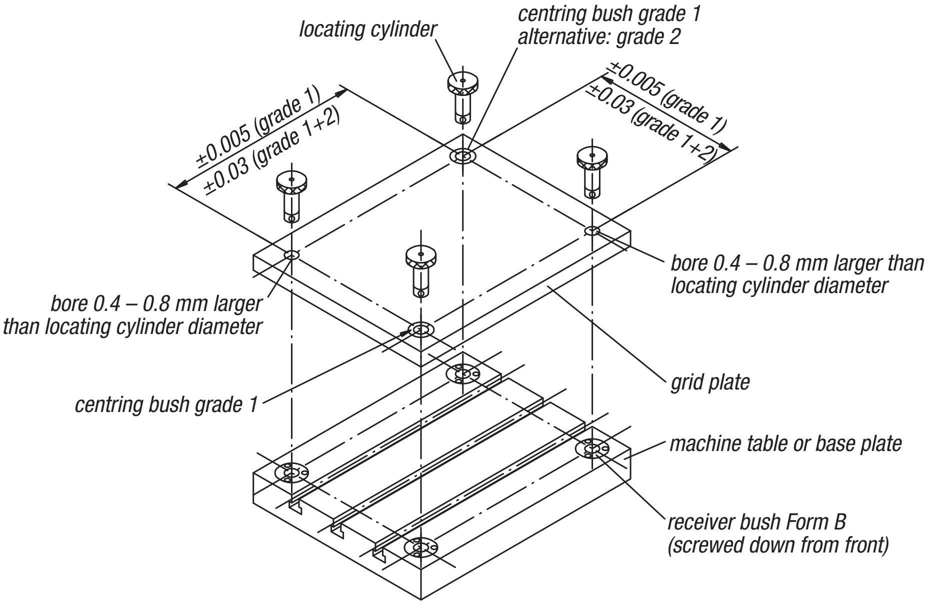
Material:
Ball bearing steel

Version:
Hardened, black oxidised.

Sample order:
nlm 03154-113020

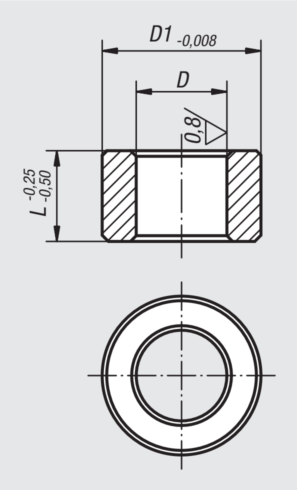
Note:
By a centre distance tolerance of ±0.005 mm and two grade I centring bushes a repeat accuracy of ±0.013 mm is possible.
By a centre distance tolerance of ±0.03 mm and one grade I and one grade II centring bush a repeat accuracy of 0.04 mm is possible.
The centring bushes are pressed into the receiver holes of the tooling plates using a light pressure.
For further details see “General information”.





Order No. grade I	T=tolerance grade I	**Order No. grade II**	T=tolerance grade II	D	D1	L	Bore size for centring bush Ø +0.01
03154-113013	+0,005 - +0,018	**03154-213013**	+0,025 - +0,050	13	19,04	13	19,016
03154-113020	+0,005 - +0,018	**03154-213020**	+0,025 - +0,050	13	19,04	20	19,016
03154-116020	+0,005 - +0,018	**03154-216020**	+0,025 - +0,050	16	25,042	20	25,016
03154-116025	+0,005 - +0,018	**03154-216025**	+0,025 - +0,050	16	25,042	25	25,016
03154-120020	+0,005 - +0,018	**03154-220020**	+0,025 - +0,050	20	35,042	20	35,018
03154-120025	+0,005 - +0,018	**03154-220025**	+0,025 - +0,050	20	35,042	25	35,018
03154-125020	+0,005 - +0,018	**03154-225020**	+0,025 - +0,050	25	35,042	20	35,018
03154-125025	+0,005 - +0,018	**03154-225025**	+0,025 - +0,050	25	35,042	25	35,018
03154-130020	+0,005 - +0,018	**03154-230020**	+0,025 - +0,050	30	45,042	20	45,018
03154-130025	+0,005 - +0,018	-	-	30	45,042	25	45,018
03154-135020	+0,005 - +0,018	-	-	35	45,042	20	45,018
03154-135025	+0,005 - +0,018	**03154-235025**	+0,025 - +0,050	35	45,042	25	45,018
03154-135040	+0,005 - +0,018	**03154-235040**	+0,025 - +0,050	35	45,042	40	45,018
03154-135050	+0,005 - +0,018	**03154-235050**	+0,025 - +0,050	35	45,042	50	45,018
03154-150020	+0,005 - +0,018	-	-	50	63,546	20	63,521
-	-	**03154-250025**	+0,025 - +0,050	50	63,546	25	63,521
03154-150040	+0,005 - +0,018	**03154-250040**	+0,025 - +0,050	50	63,546	40	63,521
03154-150050	+0,005 - +0,018	**03154-250050**	+0,025 - +0,050	50	63,546	50	63,521

Centring bushes stainless steel

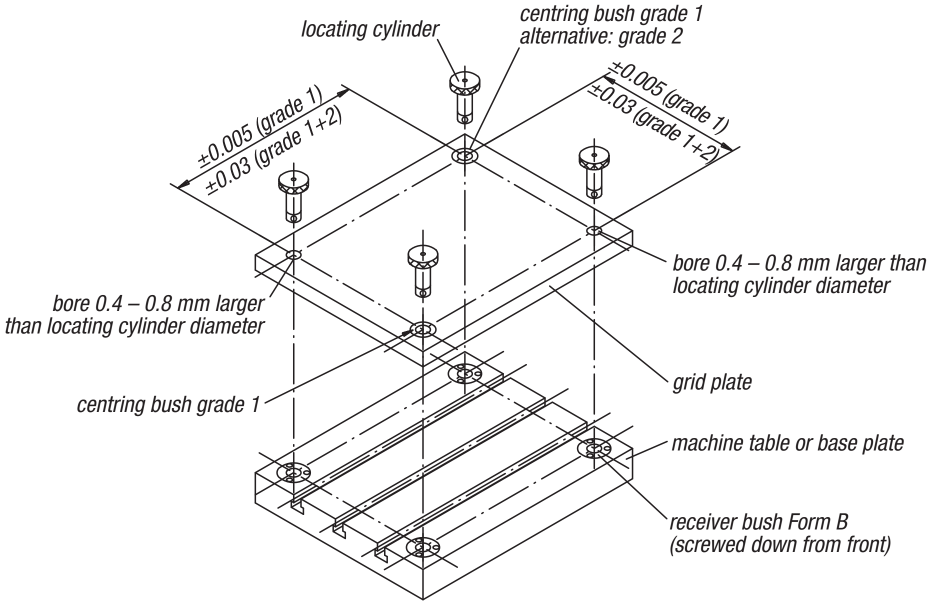


Material:
Stainless steel 1.4548.

Version:
Hardened to min. 40 HRC, bright.

Sample order:
nlm 03154-02-113020

Note:
By a centre distance tolerance of ±0.005 mm and two grade I centring bushes a repeat accuracy of ±0.013 mm is possible.
By a centre distance tolerance of ±0.03 mm and one grade I and one grade II centring bush a repeat accuracy of 0.04 mm is possible.
The centring bushes are pressed into the receiver holes of the tooling plates using a light pressure.
For further details see "General information".

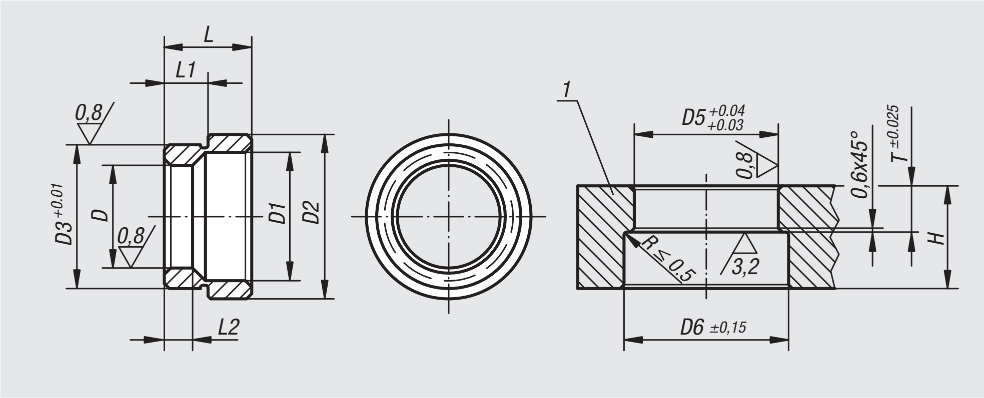


Order No. grade I	T=tolerance grade I	**Order No. grade II**	T=tolerance grade II	D	D1	L	Bore size for centring bush Ø +0.01
03154-02-113013	+0,005 - +0,018	**03154-02-213013**	+0,025 - +0,050	13	19,04	13	19,016
03154-02-113020	+0,005 - +0,018	**03154-02-213020**	+0,025 - +0,050	13	19,04	20	19,016
03154-02-116020	+0,005 - +0,018	**03154-02-216020**	+0,025 - +0,050	16	25,042	20	25,016
03154-02-116025	+0,005 - +0,018	**03154-02-216025**	+0,025 - +0,050	16	25,042	25	25,016
03154-02-120020	+0,005 - +0,018	**03154-02-220020**	+0,025 - +0,050	20	35,042	20	35,018
03154-02-120025	+0,005 - +0,018	**03154-02-220025**	+0,025 - +0,050	20	35,042	25	35,018
03154-02-125020	+0,005 - +0,018	**03154-02-225020**	+0,025 - +0,050	25	35,042	20	35,018
03154-02-125025	+0,005 - +0,018	**03154-02-225025**	+0,025 - +0,050	25	35,042	25	35,018
03154-02-130020	+0,005 - +0,018	**03154-02-230020**	+0,025 - +0,050	30	45,042	20	45,018
03154-02-130025	+0,005 - +0,018	**03154-02-230025**	+0,025 - +0,050	30	45,042	25	45,018
03154-02-135020	+0,005 - +0,018	**03154-02-235020**	+0,025 - +0,050	35	45,042	20	45,018
03154-02-135025	+0,005 - +0,018	**03154-02-235025**	+0,025 - +0,050	35	45,042	25	45,018
03154-02-135040	+0,005 - +0,018	**03154-02-235040**	+0,025 - +0,050	35	45,042	40	45,018
03154-02-135050	+0,005 - +0,018	**03154-02-235050**	+0,025 - +0,050	35	45,042	50	45,018
03154-02-150020	+0,005 - +0,018	**03154-02-250020**	+0,025 - +0,050	50	63,546	20	63,521
03154-02-150025	+0,005 - +0,018	**03154-02-250025**	+0,025 - +0,050	50	63,546	25	63,521
03154-02-150040	+0,005 - +0,018	**03154-02-250040**	+0,025 - +0,050	50	63,546	40	63,521
03154-02-150050	+0,005 - +0,018	**03154-02-250050**	+0,025 - +0,050	50	63,546	50	63,521

03155

Locating bushes

Form A (pressed in from rear)



Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 03155-20

Drawing reference:
1) grid plate

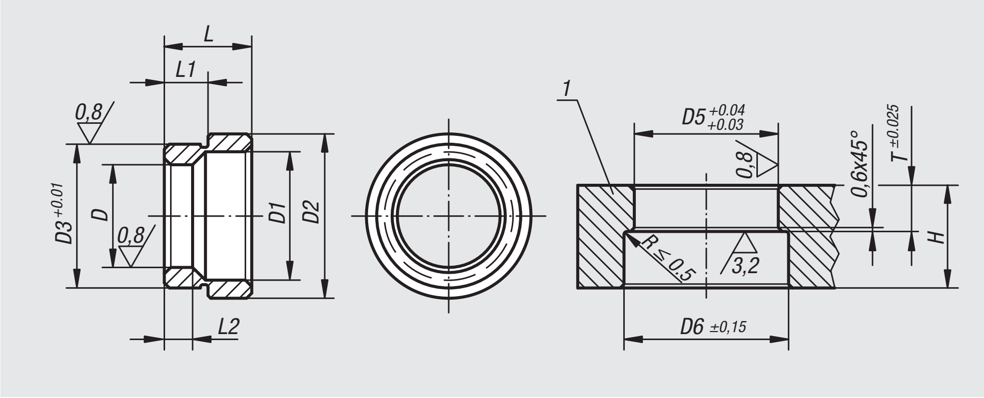
Order No.	D	D1	D2	D3	L	L1	L2	D5	D6	T	Min. grid plate thickness H
03155-13	13	17,3	25	20,03	12,1	6,6	5,58	20	26	6,92	20
03155-16	16	20,7	28,6	22,03	12,1	6,9	6,6	22	29	7,24	20
03155-20	20	24,8	32,2	28,03	17,1	8,42	8,13	28	33	8,74	25
03155-25	25	30,4	40,2	35,03	21	10,22	10,16	35	41	10,54	25
03155-30	30	36,2	48,2	42,03	21,8	10,63	11,18	42	49	10,95	30
03155-35	35	41,3	54,2	48,03	25,1	12,18	14,78	48	55	12,5	32
03155-50	50	58,4	75,2	67,03	31,1	15,43	18,67	67	76	15,75	45

03155-02

Locating bushes, stainless steel

Form A (pressed in from rear)

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Stainless steel 1.4548.

Version:
Hardened to min. 40 HRC, bright.

Sample order:
nlm 03155-02-20

Drawing reference:
1) grid plate

Order No.	D	D1	D2	D3	L	L1	L2	D5	D6	T	Min. grid plate thickness H
03155-02-13	13	17,3	25	20,03	12,1	6,6	5,58	20	26	6,92	20
03155-02-16	16	20,7	28,6	22,03	12,1	6,9	6,6	22	29	7,24	20
03155-02-20	20	24,8	32,2	28,03	17,1	8,42	8,13	28	33	8,74	25
03155-02-25	25	30,4	40,2	35,03	21	10,22	10,16	35	41	10,54	25
03155-02-30	30	36,2	48,2	42,03	21,8	10,63	11,18	42	49	10,95	30
03155-02-35	35	41,3	54,2	48,03	25,1	12,18	14,78	48	55	12,5	32
03155-02-50	50	58,4	75,2	67,03	31,1	15,43	18,67	67	76	15,75	45

03156

Locating bushes

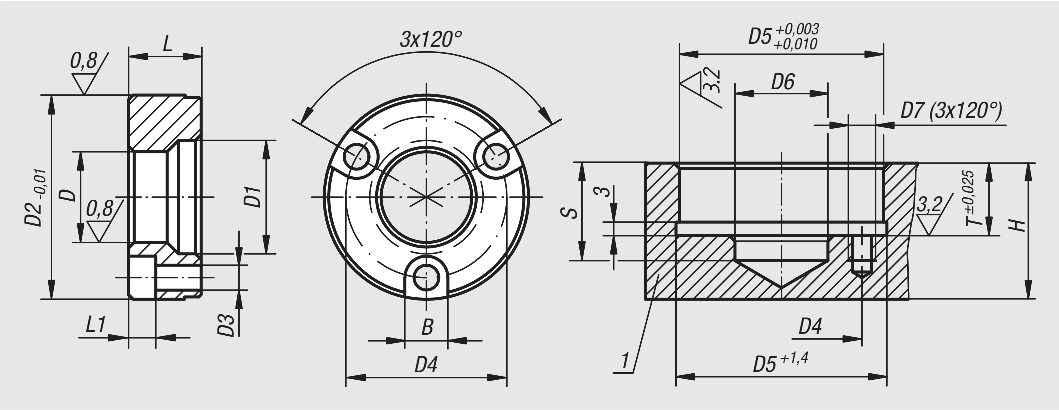
Form B (screwed down from front)

Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 03156-13

Note:
Fastening screws included.



Drawing reference:
1) grid plate

Order No.	D	D1	D2	D3	D4	L	L1	B	D5	D6	D7	S	T	Min. grid plate thickness H
03156-13	13	17,3	34,99	4,4	25	11,56	4,5	7,6	35	13,5	M4x7	20	11,91	20
03156-16	16	20,7	36,99	4,4	29	11,56	4,5	7,6	37	21	M4x7	20	11,91	20
03156-20	20	24,8	44,99	5,4	35	15,82	6	9,5	45	21	M5x9	25	16,21	25
03156-25	25	30,4	54,99	6,4	42	19,94	7	11	55	25,5	M6x10	25	20,32	25
03156-30	30	36,2	59,99	6,4	48	21,77	7	11	60	30,5	M6x11	30	22,15	30
03156-35	35	41,3	69,99	8,4	56	22,61	9	14	70	40	M8x17	32	22,99	32
03156-50	50	58,4	91,99	10,4	75	31,12	11	17	92	55	M10x18	45	31,5	45

03156-02

Locating bushes, stainless steel

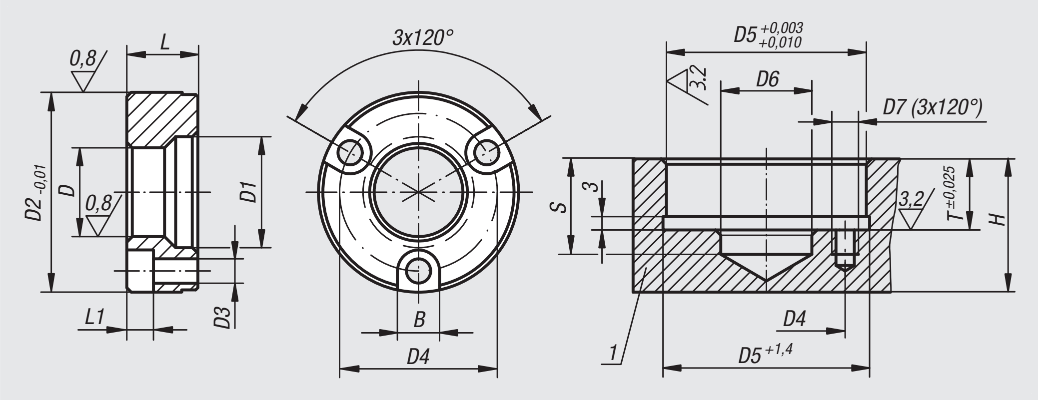
Form B (screwed down from front)

Material:
Stainless steel 1.4548.

Version:
Hardened to min. 40 HRC, bright.

Sample order:
nlm 03156-02-13

Note:
Fastening screws included.

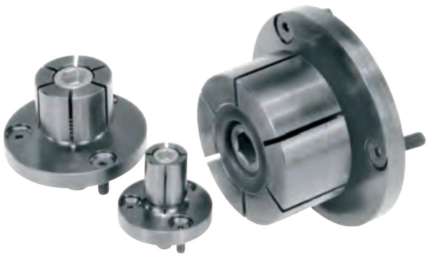


Drawing reference:
1) grid plate

Order No.	D	D1	D2	D3	D4	L	L1	B	D5	D6	D7	S	T	Min. grid plate thickness H
03156-02-13	13	17,3	34,99	4,4	25	11,56	4,5	7,6	35	13,5	M4x7	20	11,91	20
03156-02-16	16	20,7	36,99	4,4	29	11,56	4,5	7,6	37	21	M4x7	20	11,91	20
03156-02-20	20	24,8	44,99	5,4	35	15,82	6	9,5	45	21	M5x9	25	16,21	25
03156-02-25	25	30,4	54,99	6,4	42	19,94	7	11	55	25,5	M6x10	25	20,32	25
03156-02-30	30	36,2	59,99	6,4	48	21,77	7	11	60	30,5	M6x11	30	22,15	30
03156-02-35	35	41,3	69,99	8,4	56	22,61	9	14	70	40	M8x17	32	22,99	32
03156-02-50	50	58,4	91,99	10,4	75	31,12	11	17	92	55	M10x18	45	31,5	45

03157

Mandrel collets



Material:
Mandrel mild steel.
Taper-head screw low-carbon steel

Version:
Mandrel black oxidised.
Taper-head screw case-hardened.

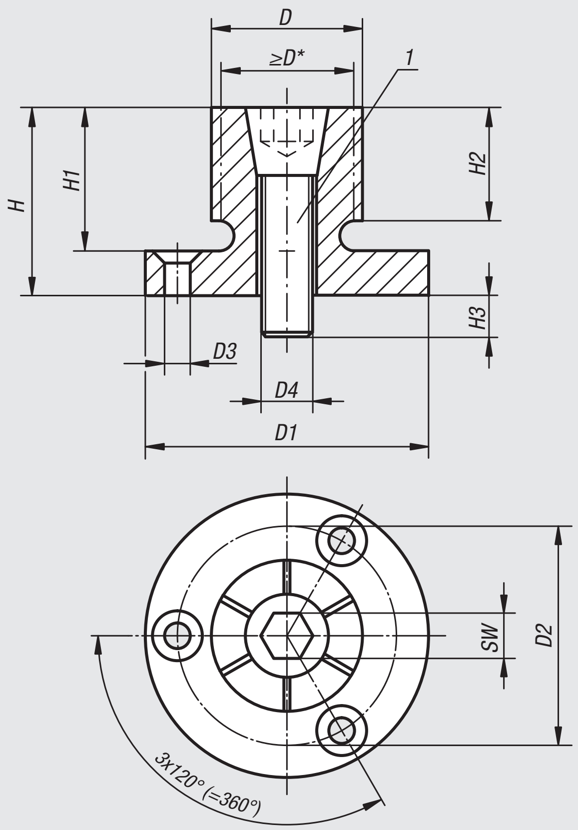
Sample order:
nlm 03157-081420

Note:
The mandrel collet is ideal for finish machining turned parts. The diameter “D” can be turned or milled to suit the workpiece ID.
Low design - no interfering clamp straps.
Tightened using a hex socket wrench or hydraulics.

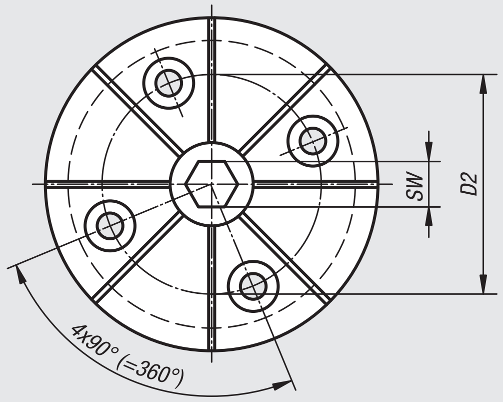
* D min. = smallest diameter to which “D” may be turned or milled.

Assembly:
Expand the mandrel approx. 0.1 mm over the relaxed diameter. Turn or mill the mandrel to suit the internal diameter of the workpiece. The base flange can be centred in a pocket or using dowel pins.

Drawing reference:
1) taper-head screw



03157-1630175



Order No.	D	D min.	D1	D2	D3 for screw ISO 10642	D4 Tapered-head bolt	H	H1	H2	H3	SW Tapered-head bolt	Tightening torque max. Nm	Clamping force max. kN
03157-020407	7,4	4,1	20 h9	13,7	M2	M2	10,7	7,6	6,1	4,1	1,5	0,7	1,1
03157-040812	12,4	8	29,72 h9	21	M3	M4	21,8	16	15	8	3	5	4,2
03157-061214	14,2	12,2	31,5 h9	23,1	M3	M6	24,9	19	15	12	5	17	8,5
03157-081420	20	13,5	37,5 h9	29	M3	M8	24,9	19	15	14	6	34	11,1
03157-062027	27	18	50 h9	39,4	M4	M10	28,6	22,2	17,5	17	8	60	20
03157-102535	35,3	23	56 h9	45,5	M4	M12	31,8	25,4	20,6	21	10	150	26,3
03157-123442	42	29,3	69,5 h8	55,9	M5	M16	39,6	31,8	27	22	14	280	44,5
03157-123452	51,5	29,3	75,5 h9	63,9	M5	M16	39,6	31,8	27	22	14	280	44,5
03157-163077	77,7	29,3	107,5 h9	92,5	M6	M16	45,5	37,6	32,3	20	14	280	44,5
03157-1630103	103	29,3	132,9 h9	118	M6	M16	45,5	37,6	32,3	20	14	280	44,5
03157-1630175	175	29,3	132,9 h9	118	M6	M16	45,5	37,6	32,3	20	14	280	44,5

Mandrel collets

with side lock

Material:
Mandrel mild steel.
Clamping screw carbon steel.

Version:
Mandrel black oxidised.
Clamping screw tempered to 10.9, hardened and PTFE coated.

Sample order:
nlm 03157-118029

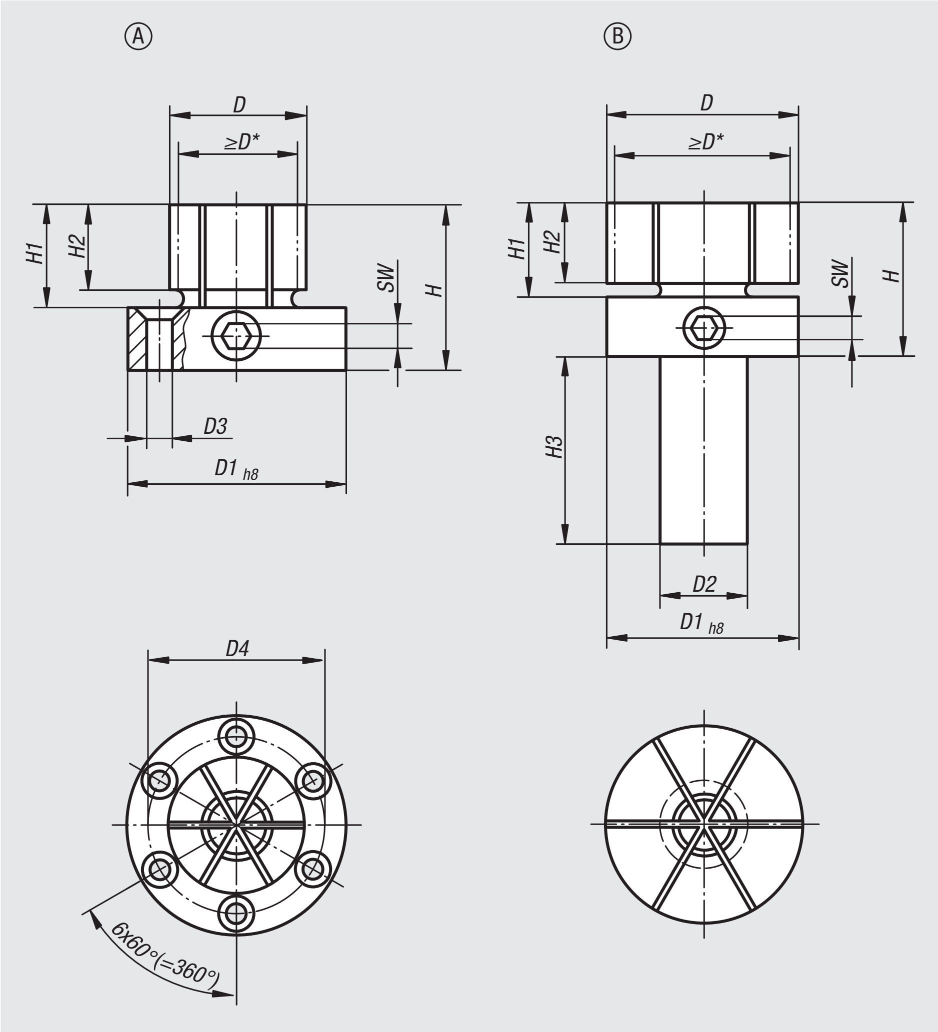
Note:
The side lock make these mandrel collets ideal for finish machining parts with blind internal diameters. The diameter "D" can be turned or milled to suit the workpiece ID.

Manual tightening with hexagon socket wrench.

* D min. = smallest diameter to which "D" may be turned or milled.

Assembly:
Expand the mandrel approx. 0.1 mm over the relaxed diameter. Turn or mill the mandrel to suit the internal diameter of the workpiece. A locking ring is included for machining.
The shank or flange is centred in a reamed hole or pocket.
Form A is supplied with 6 fastening screws.

Drawing reference:
Form A:
for machining centres, drilling and milling machines
Form B:
with shaft for holding in lathe chucks

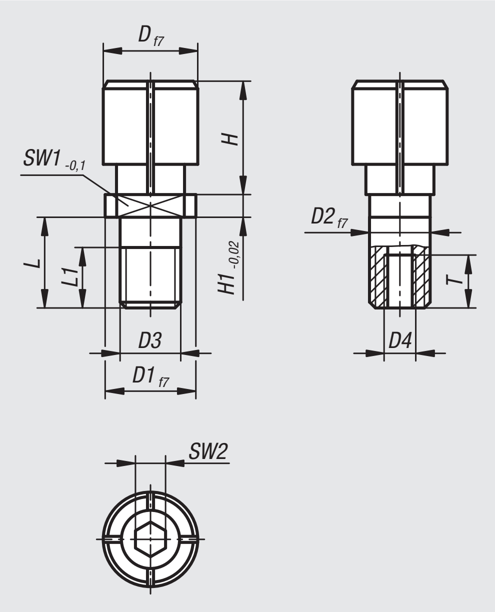


Order No.	Form	D	D min.	D1	D2	D3 for screw ISO 10642	D4	H	H1	H2	H3	SW	Tightening torque max. Nm	Clamping force max. kN
03157-118029	A	28,7	17,8	50	-	M4	39,4	41,3	22,4	17,5	-	6	66	20
03157-218053	B	53,3	18	53,3	25	-	-	44,4	25,4	21	45	6	66	20

03157-10

Mandrel collet

for small bores



Material:
Stainless steel 1.4305.

Version:
Bright.

Sample order:
nlm 03157-10-104050

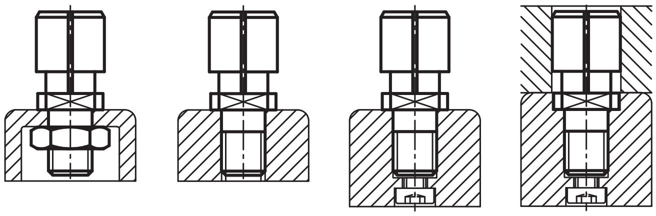
Note:
The mandrel collet is used in small through bores to position and clamp workpieces. Clamping is carried out manually from above using a hex key. The mandrel diameter can be ground to suit the application. The bore for the mandrel should have an H7 tolerance.

D min = smallest permissible diameter to which D can be ground.

- applicable for holes from Ø5 to Ø12.5 mm
- compact design, small installation space
- simple handling
- mounting in any position
- different installation types possible
- surface pressure protects the workpiece surface
- individually adaptable to the diameter

Assembly:
If required, diameter D can be adapted to suit the diameter being held. To do this, expand the mandrel collet ca. 0.2 mm over the required diameter. Grind the OD of the mandrel collet to suit the ID of the workpiece bore.

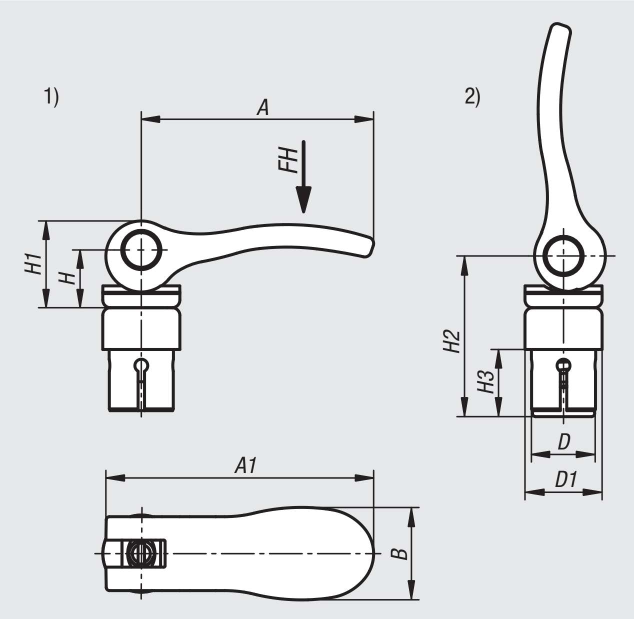
Technical data:
The tightening torque max. Nm given in the table refers to the spanner size AF2.



Order No.	D	D min.	D1	D2	D3	D4	H	H1	L	L1	SW1	SW2	T	Tightening torque max. Nm	Clamping force max. kN
03157-10-105060	6	5	10	6	M6	M3	8	2,5	10	6	6	2	6	0,9	0,19
03157-10-106080	8	6	10	6	M6	M3	10	2,5	10	6	6	2,5	6	2,4	0,34
03157-10-108100	10	8	12	8	M8	M4	12	3	12	8	8	3	7	4,4	0,62
03157-10-110125	12,5	10	12	8	M8	M4	15	3	12	8	8	4	7	8,1	0,62

Mandrel collets, steel

with cam lever



With this patented clamping system, two components can be positioned without tools via form fit and then clamped together by frictional connection. The clamping range and the holding force is adjustable.

Material:
Handles, cast aluminium, EN AC-46200.
Thrust washer, fibreglass reinforced PA 66 GF 35 X plastic.
Hinge pin stainless steel.
Tie rod, washer, collet, disc spring, steel.

Version:
Grips fine structure powder-coated, black or red RAL 3003.
Thrust washer, black.
Washer blue passivated.
Tie rod and collet black oxidised.

Sample order:
nlm 03157-15-1001

Note:
It is recommended that the cam lever is in a vertical position when the collet is positioned in the bore.
The function of the clamping system was tested in bores with tolerance H7. All values for retaining force are guide values and are given without safety factor.
The suitability for the respective application must be checked by the user.

Advantages:
Two components can be joined together without tools. The components are perfectly centred in the clamped state. The compact design means that the mandrel collet with cam lever can even be used in blind holes. There are no specific dimensional requirements for the holes. Additionally, the surfaces and design do not need to have any specific properties.

Functional principle:
The clamping system is inserted in the hole in the open state. At the beginning of the locking process, the mandrel collet expands and clamps itself in the lower component. The integrated disc spring assembly creates a positive down force that also clamps the two components to one another at the end of the locking process.

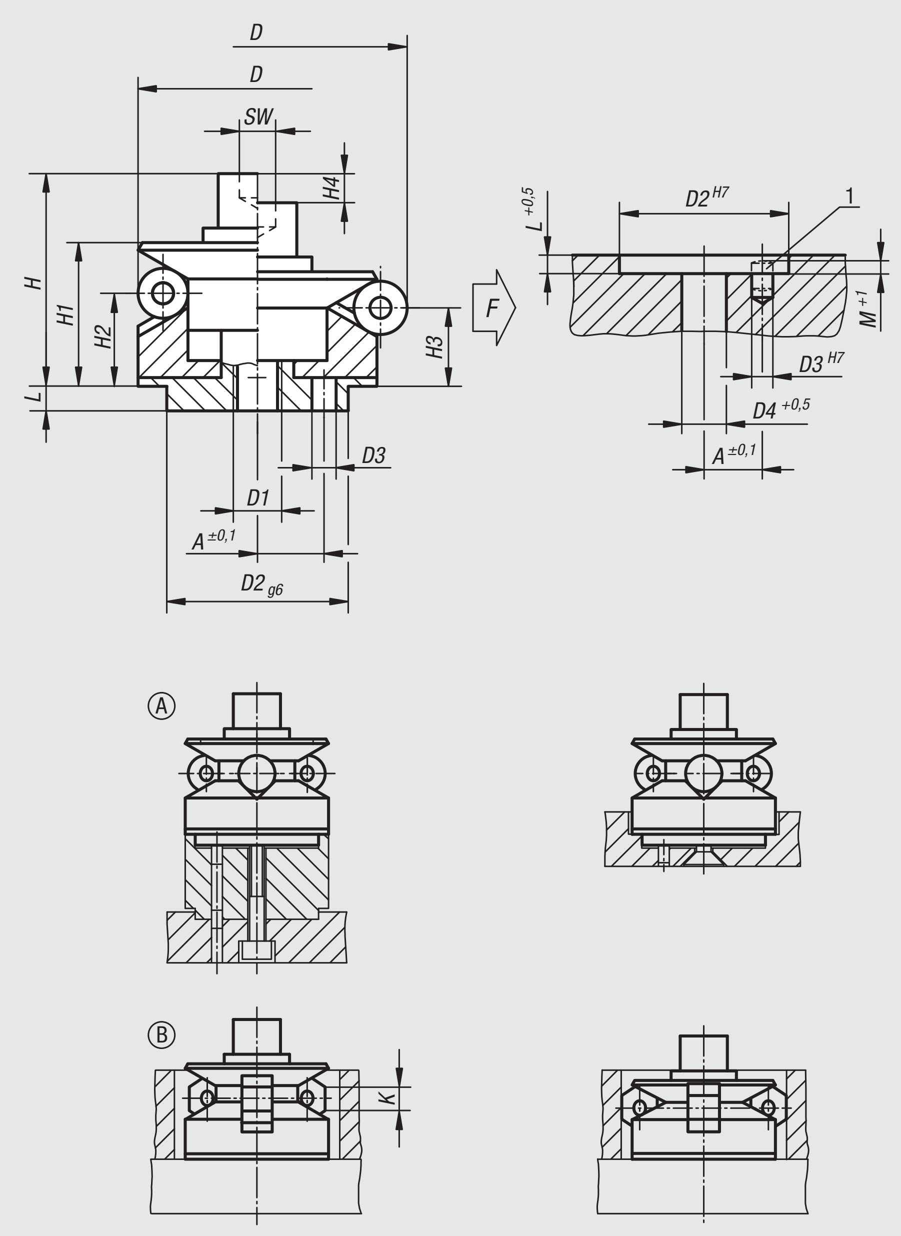
Drawing reference:
1) actuated
2) not actuated

Order No. black	Order No. red	A	A1	B	D	D1	H	H1	H2	H3	Hand force FH N	Holding force F kN
03157-15-1001	**03157-15-1004**	36,2	41,7	14,4	10	12	9	13	25	10,4	90	1,35
03157-15-1202	**03157-15-1205**	52,3	59,1	18	12	15,4	11,2	17	30	12,6	100	3
03157-15-1403	**03157-15-1406**	70,4	79,2	21,5	14	18,1	14,5	22	35	14,7	120	3,3

03158

Centring clamps

with ball or hexagon segments



Material:
Body 1.2842.
Ball and hex segments 1.4112.
Tension spring 1.4310.

Version:
Body hardened and black oxidised.
Ball and hex segments hardened and ground.

Sample order:
nlm 03158-101203

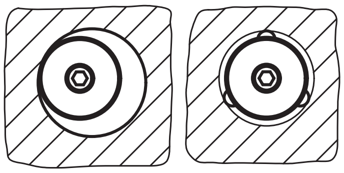
Application:
To position and centre existing bores on the machining surface.

Advantages:
- Precise self-centring.
- Distortion free clamping.
- Large spread range.
- Low overall height.

Technical data:
Repetitive accuracy ±0.025
Concentric accuracy ±0.05

Drawing reference:
Form A:
With balls for holes where light marking is acceptable.
Form B:
With hexagons for sensitive hole surfaces.

1) Mounting aid:
pin to accurately position the mandrel segments.



Centring clamps

with ball or hexagon segments

Centring clamps with ball segments

Order No.	Form	A	D min.	D max.	D1	D2	D3	D4	H	H1	H2	H3	H4	L	M	SW	Ball Ø	No. of balls	Clamping force max. kN	Tightening torque max. Nm
03158-101203	A	3,5	11,7	14,2	M4	10	1,5	4,3	15	10	4,2	3	1,5	3,5	2,5	3	2,5	3	0,5	5
03158-101504	A	4,5	14,5	18,5	M4	12	2	4,3	19,5	14,5	9,8	8,6	2,3	5,5	3	3	4	3	3,5	5
03158-101905	A	5,5	18,5	22,5	M5	15	2,5	5,3	23,5	16,5	11,6	10,4	2,3	7,5	3	4	4	3	4	10
03158-102306	A	7	22,5	26,5	M6	20	3	6,4	28,8	19,8	14,2	13	2,3	6	4	5	4	3	4,5	17
03158-102706	A	7	26,5	30,5	M6	20	3	6,4	28,8	19,8	14,2	13	2,3	6	4,5	5	4	3	4,5	17
03158-103106	A	9	30,5	38,5	M6	25	4	6,4	32,7	23,1	14,2	11,9	4,6	7	4,5	5	8	3	4,5	17
03158-103908	A	11	38,5	46,5	M8	30	4	8,4	39,2	27,2	17,8	15,5	4,6	7,5	4,5	6	8	6	6,5	43
03158-104708	A	11	46,5	54,5	M8	30	4	8,4	39,2	27,2	18	15,7	4,6	7,5	4,5	6	8	6	6,5	43
03158-105510	A	15	54,5	70,5	M10	45	5	10,5	54,6	40,6	23,7	19,1	9,3	9	5,5	8	16	6	8	79
03158-107112	A	17	70,5	86,5	M12	60	5	13	63,1	46,1	28,3	23,7	9,3	10	5,5	10	16	6	10	141
03158-108712	A	25	86,5	102,5	M16	60	5	17	73	51	30,2	25,7	9,3	10	5,5	14	16	6	12,5	354

Centring clamps with hexagon segments

Order No.	Form	A	D min.	D max.	D1	D2	D3	D4	H	H1	H2	H3	H4	L	M	K	SW	No. of hex	Clamping force max. kN	Tightening torque max. Nm
03158-201504	B	4,5	14,5	18,5	M4	12	2	4,3	19,5	14,5	9,8	8,6	2,3	5,5	3	4	3	3	3,5	5
03158-201905	B	5,5	18,5	22,5	M5	15	2,5	5,3	23,5	16,5	11,6	10,4	2,3	7,5	3	4	4	3	4	10
03158-202306	B	7	22,5	26,5	M6	20	3	6,4	28,8	19,8	14,2	13	2,3	6	4	4	5	3	4,5	17
03158-202706	B	7	26,5	30,5	M6	20	3	6,4	28,8	19,8	14,2	13	2,3	6	4,5	4	5	3	4,5	17
03158-203106	B	9	30,5	38,5	M6	25	4	6,4	32,7	23,1	14,2	11,9	4,6	7	4,5	8	5	3	4,5	17
03158-203908	B	11	38,5	46,5	M8	30	4	8,4	39,2	27,2	17,8	15,5	4,6	7,5	4,5	8	6	6	6,5	43
03158-204708	B	11	46,5	54,5	M8	30	4	8,4	39,2	27,2	18	15,7	4,6	7,5	4,5	8	6	6	6,5	43
03158-205510	B	15	54,5	70,5	M10	45	5	10,5	54,6	40,6	23,7	19,1	9,3	9	5,5	16	8	6	8	79
03158-207112	B	17	70,5	86,5	M12	60	5	13	63,1	46,1	28,3	23,7	9,3	10	5,5	16	10	6	10	141
03158-208712	B	25	86,5	102,5	M16	60	5	17	73	51	30,2	25,7	9,3	10	5,5	16	14	6	12,5	354

03158

Centring clamps

with ball or hexagon segments

Material:
Body 1.2842.
Ball and hex segments 1.4112.
Tension spring 1.4310.

Version:
Body hardened and black oxidised.
Ball and hex segments hardened and ground.

Sample order:
nlm 03158-0101203

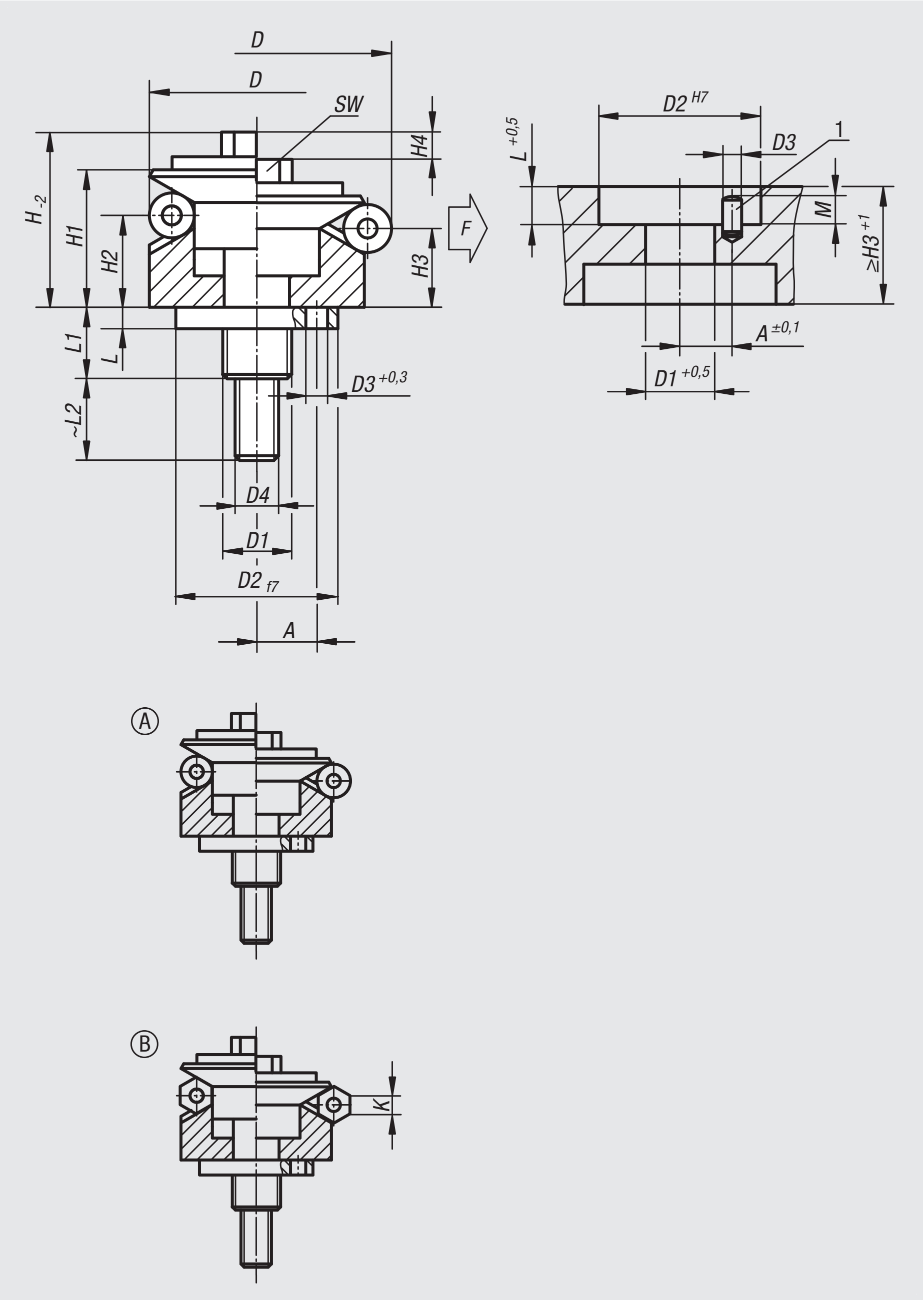
Application:
For centre positioning and clamping in blind holes. Operated from below, manual or automatic using pneumatics or hydraulics.

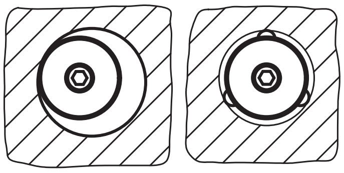
Advantages:
- Precise self-centring.
- Distortion free clamping.
- Large spread range.
- Low overall height.
- Positive down force.

Technical data:
Repetitive accuracy ±0.025
Concentric accuracy ±0.05

Drawing reference:
Form A:
With balls for holes where light marking is acceptable.
Form B:
With hexagons for sensitive hole surfaces.

1) Mounting aid:
pin to accurately position the mandrel segments.





Centring clamps

with ball or hexagon segments

Centring clamps with ball segments

Order No.	Form	A	D min.	D max.	D1	D2	D3	D4	H	H1	H2	H3	H4	L	L1	L2	M	SW	Ball Ø	No. of balls	Clamping force max. kN	Tightening torque max. Nm
03158-0101203	A	3,5	11,7	14,2	M5	10	1,5	M3	12,8	10	4,2	3	1,4	3,5	11	10	2	5,5	2,5	3	0,5	2
03158-0101503	A	4,5	14,5	18,5	M6	12	2	M3	17,3	14,5	9,8	8,6	2,3	5,5	14,1	12	2,5	5,5	4	3	3,5	2
03158-0101904	A	5,5	18,5	22,5	M8	15	2,5	M4	20,9	16,5	11,6	10,4	2,3	7,5	18,2	14	3,5	7	4	3	4	5
03158-0102305	A	7	22,5	26,5	M10	20	3	M5	25,4	19,8	14,2	13	2,3	6	17,4	15	3,5	8	4	3	4,5	10
03158-0102705	A	7	26,5	30,5	M10	20	3	M5	25,4	19,8	14,2	13	2,3	6	17,4	15	3,5	8	4	3	4,5	10
03158-0103106	A	9	30,5	38,5	M12	25	4	M6	30,3	23,1	14,2	11,9	4,6	7	21,9	20	3,5	10	8	3	4,5	17
03158-0103906	A	11	38,5	46,5	M12	30	4	M6	34,2	27,2	17,8	15,5	4,6	7,5	22,5	20	4,5	10	8	6	6,5	17
03158-0104706	A	11	46,5	54,5	M12	30	4	M6	34,2	27,2	18	15,7	4,6	7,5	22,5	20	6,5	10	8	6	6,5	17
03158-0105508	A	15	54,5	70,5	M14x1,5	45	5	M8	49,9	40,6	23,7	19,1	9,3	9	24,5	32	6,5	13	16	6	8	43
03158-0107108	A	17	70,5	86,5	M16x1,5	60	5	M8	55,4	46,1	28,3	23,7	9,3	10	29,4	20	6,5	13	16	6	10	43
03158-0108708	A	25	86,5	102,5	M16x1,5	60	5	M10	61,6	51	30,2	25,7	9,3	10	29,4	25	6,5	17	16	6	12,5	79

Centring clamps with hexagon segments

Order No.	Form	A	D min.	D max.	D1	D2	D3	D4	H	H1	H2	H3	H4	L	L1	L2	M	K	SW	No. of hex	Clamping force max. kN	Tightening torque max. Nm
03158-0201503	B	4,5	14,5	18,5	M6	12	2	M3	17,3	14,5	9,8	8,6	1,4	5,5	14,1	12	2,5	4	5,5	3	3,5	2
03158-0201904	B	5,5	18,5	22,5	M8	15	2,5	M4	20,9	16,5	11,6	10,4	2,3	7,5	18,2	14	3,5	4	7	3	4	5
03158-0202305	B	7	22,5	26,5	M10	20	3	M5	25,4	19,8	14,2	13	2,3	6	17,4	15	3,5	4	8	3	4,5	10
03158-0202705	B	7	26,5	30,5	M10	20	3	M5	25,4	19,8	14,2	13	2,3	6	17,4	15	3,5	4	8	3	4,5	10
03158-0203106	B	9	30,5	38,5	M12	25	4	M6	30,3	23,1	14,2	11,9	4,6	7	21,9	20	3,5	8	10	6	4,5	17
03158-0203906	B	11	38,5	46,5	M12	30	4	M6	34,2	27,2	17,8	15,5	4,6	7,5	22,5	20	4,5	8	10	6	6,5	17
03158-0204706	B	11	46,5	54,5	M12	30	4	M6	34,2	27,2	18	15,7	4,6	7,5	22,5	20	6,5	8	10	6	6,5	17
03158-0205508	B	15	54,5	70,5	M14	45	5	M8	49,9	40,6	23,7	19,1	9,3	9	24,5	32	6,5	16	13	6	8	43
03158-0207108	B	17	70,5	86,5	M16	60	5	M8	55,4	46,1	28,3	23,7	9,3	10	29,4	20	6,5	16	13	6	10	43
03158-0208708	B	25	86,5	102,5	M16	60	5	M10	61,6	51	30,2	25,7	9,3	10	29,4	25	6,5	16	16	6	12,5	79

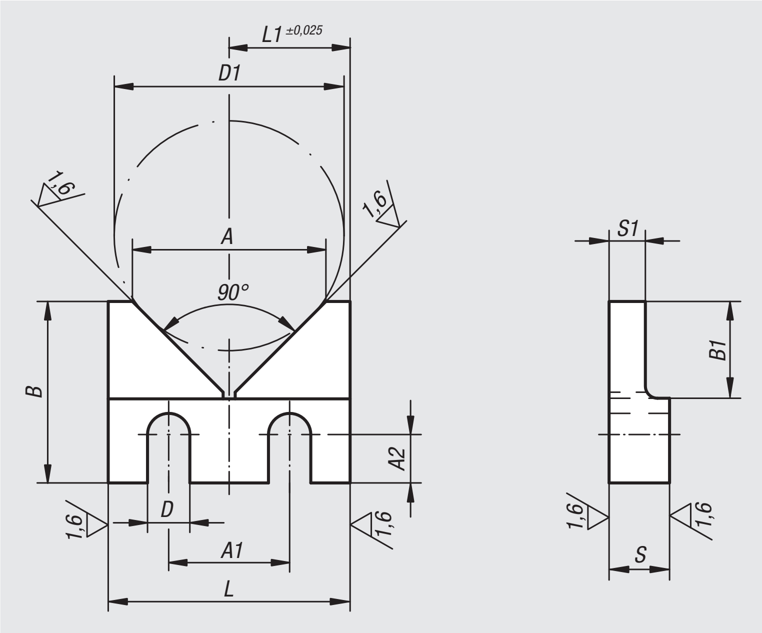
03160

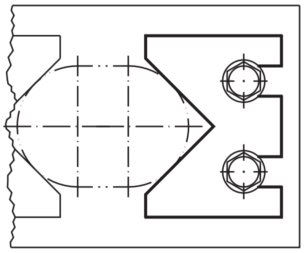
Centring V

Material:
Carbon steel 1.1181.

Version:
Black oxidised.

Sample order:
nlm 03160-02





Order No.	L	L1	B	B1	S	S1	D	D1 max.	A	A1	A2
03160-01	40	20	30	16	10	6	7	38	32	20	8
03160-02	50	25	40	20	12	8	9	46	40	25	12
03160-03	63	31,5	50	25	16	10	11	58	50	32	16

Notes

Locating cylinders

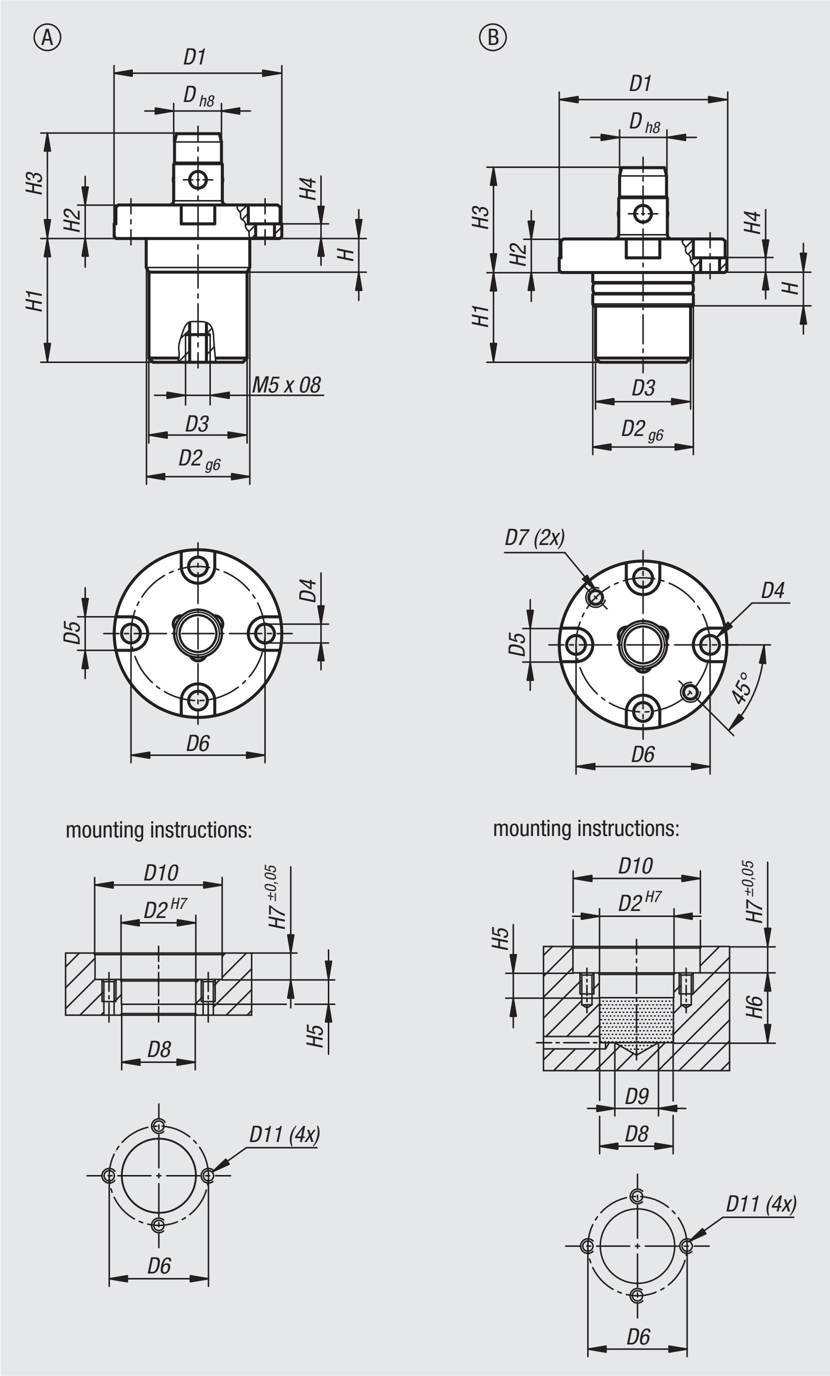
pneumatic

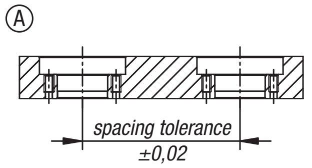
Material:
Carbon steel.

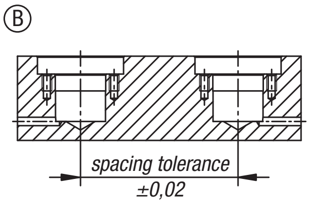
Version:
nickel-plated.

Sample order:
nlm 03161-112

Note:
The 3 clamping balls are pneumatically released. The 3 clamping balls retract and the fixture can be exchanged. If the air is stopped, the 3 clamping balls advance and the fixture is clamped.
This easy-to-operate system significantly reduces the changeover times.







Order No.	Form	D	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	H	H1	H2	H3	H4	H5	H6	H7	Retaining force F1 N
03161-112	A	12	40	24	23,4	4,5	8	32	-	23,8	-	41	M4	8	29,5	8	25	3,5	8,5	-	8,5	250
03161-116	A	16	51	32	31,4	5,5	9,5	41	-	31,8	-	52	M5	8,5	31,7	9,5	28,5	4	9	-	10	350
03161-212	B	12	40	24	23,4	4,5	8	32	M4	23,8	14	41	M4	8	24,5	8	25	3,5	8,5	25,5	8,5	250
03161-216	B	16	51	32	31,4	5,5	9,5	41	M5	31,8	20	52	M5	8,5	25,5	9,5	28,5	4	9	26,5	10	350

Locating cylinders

pneumatic

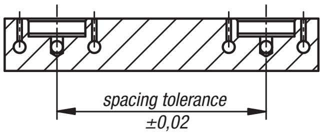
Material:
Housing and clamping cylinder, carbon steel.
Balls, stainless steel 1.0503.

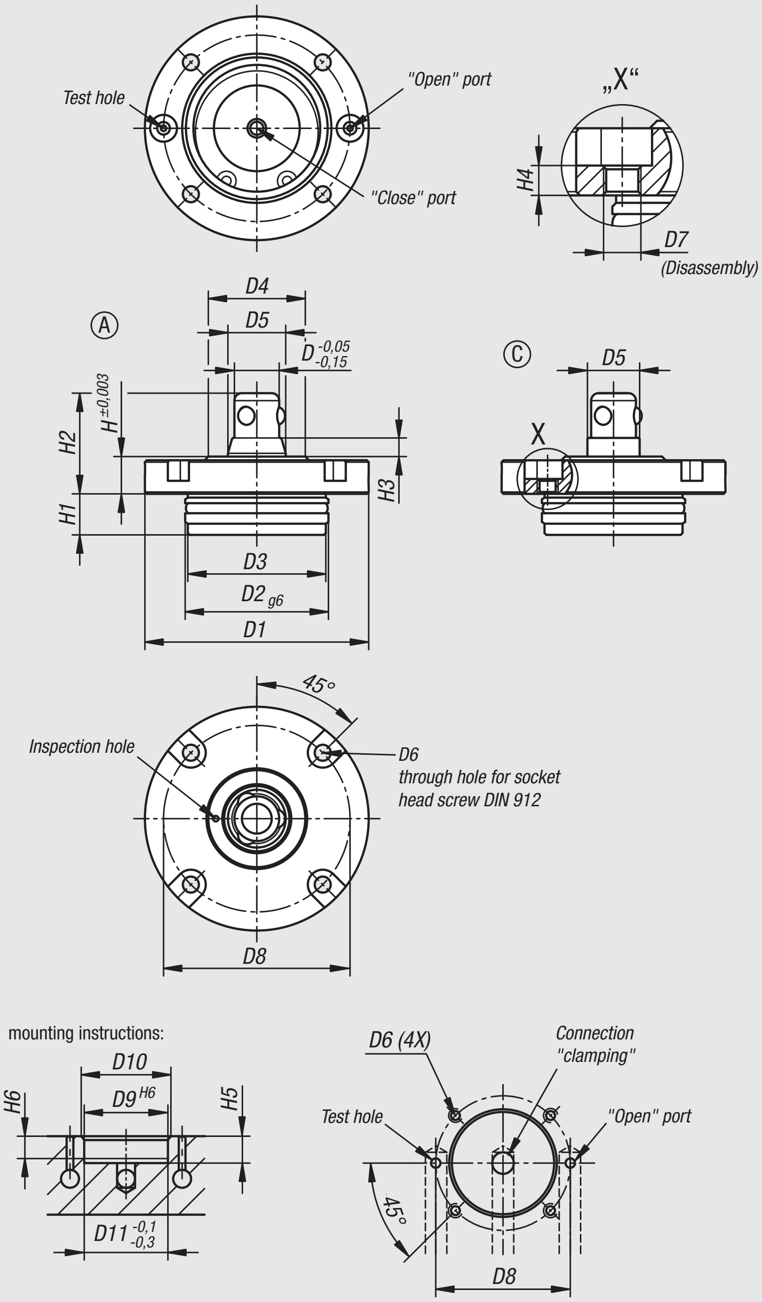
Version:
Housing hardened and black oxidised.
Contact faces ground.

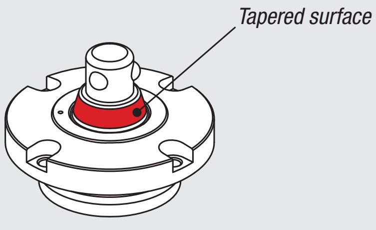
Sample order:
nlm 03161-02-11670

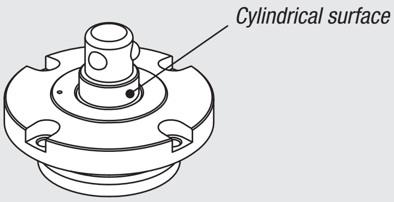
Note:
This positioning and clamping system is especially suitable for installation in fixtures (plates, clamping tower blocks, etc.) in all mounting positions. The modular design allows the number of and distance between the locating cylinders to be ideally adjusted to suit the clamping task. Due to the small diameters, the spacing between the locating cylinders can also be reduced.

The 3 clamping balls are mechanically released through control of the locating cylinder with the „opening“ connection. The 3 clamping balls move inward and the fixture can be changed quickly.
For clamping, the air is taken from the „opening“ connection and the „clamping“ connection then receives air on the locating cylinder. The 3 clamping balls are mechanically driven outward again and the new fixture is clamped.
To achieve optimal retaining force, the locating cylinder remains connected to the air.









Order No.	Version 2	Form	D	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	H	H1	H2	H3	H4	H5	H6	Retaining force F1 N
03161-02-11670	conical	A	16	70	48	47,5	38	24,5	M5	M6	60	48	50	48	12	15	35	8	5	16	12	4000
03161-02-31670	cylindrical	C	16	70	48	47,5	38	20	M5	M6	60	48	50	48	12	15	35	8	5	16	12	4000
03161-02-12085	conical	A	20	85	58	57,5	48	31,5	M6	M8	72	58	60	58	15	19	44	10	6	20	16	6300
03161-02-32085	cylindrical	C	20	85	58	57,5	48	26	M6	M8	72	58	60	58	15	19	44	10	6	20	16	6300

Locating bushes

for pneumatic locating cylinder

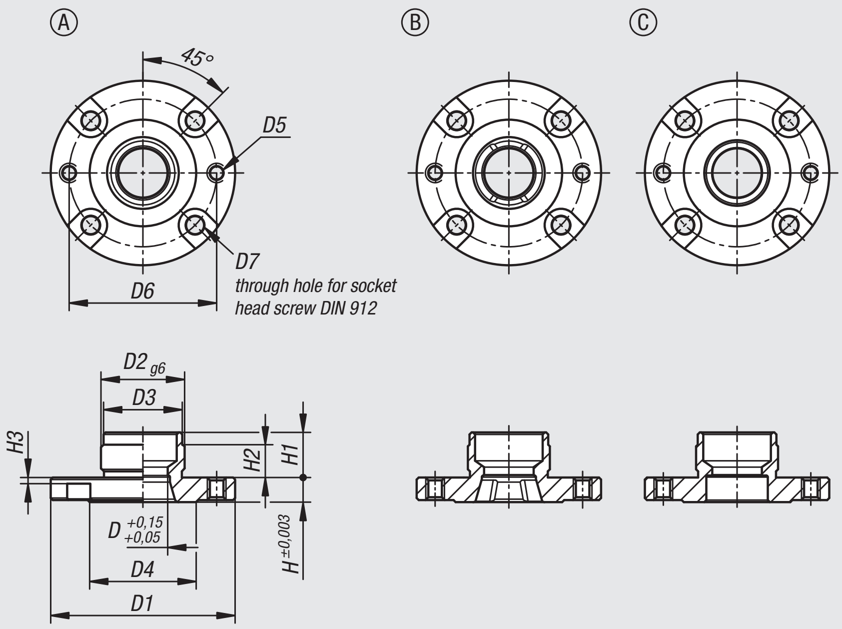
Material:
Carbon steel.

Version:
Housing hardened and black oxidised.
Contact faces ground.

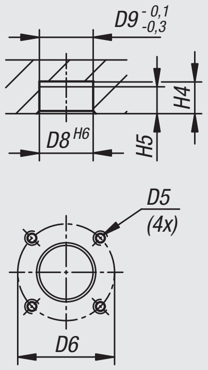
Sample order:
nlm 03161-03-11660

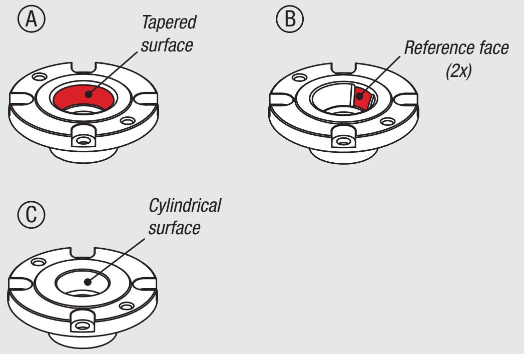
Note:
Locating bushes are placed in a fixture or interchangeable subplate and form the counterpart to the locating cylinder. The locating bushes are centred in a reamed hole and then fastened with 4 screws.
The balls of the locating cylinder engage in the groove in the locating bush, thereby forming a fast, secure and highly accurate changeover unit, and reducing setup and changeover times.

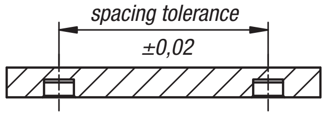
Attention:
Please observe installation notes of the locating bushes.



mounting instructions:







Order No. Form A	Order No. Form B	Order No. Form C	D	D1	D2	D3	D4	D5	D6	D7	D8	D9	H	H1	H2	H3	H4	H5
03161-03-11660	03161-03-21660	03161-03-31660	16	60	28	27,5	38	M5	50	M5	28	28	8	15	10	2,5	16	12
03161-03-12075	03161-03-22075	03161-03-32075	20	75	36	35,5	48	M6	62	M6	36	36	10	19	14	3,5	20	16

03162

Locating bushes

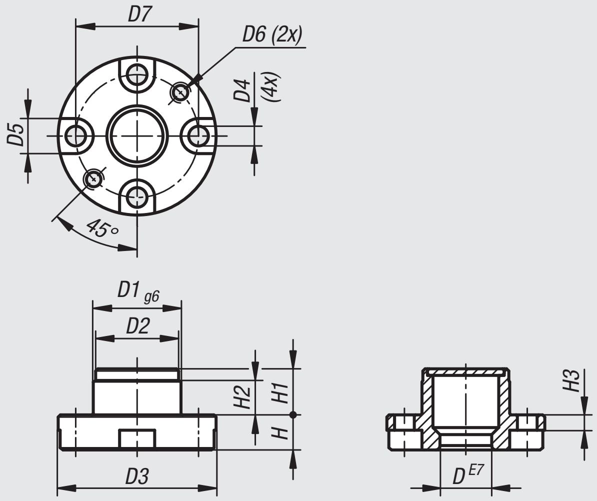
for pneumatic locating cylinder

Material:
Carbon steel.

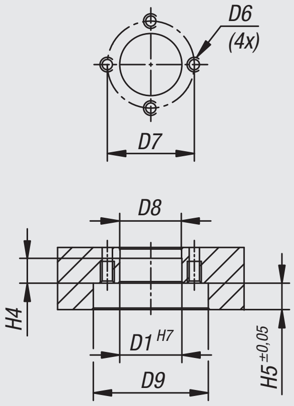
Version:
nickel-plated.

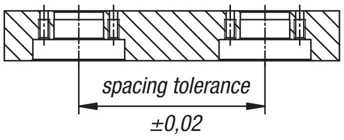
Sample order:
nlm 03162-12

Note:
Locating bushes are placed in a fixture or interchangeable subplate and form the counterpart to the locating cylinder. The locating bushes are centred in a reamed hole and then fastened with 4 screws.
The balls of the locating cylinder engage in the groove in the locating bush, thereby forming a fast, secure and highly accurate changeover unit, and reducing setup and changeover times.



mounting instructions:





Order No.	D	D1	D2	D3	D4	D5	D6	D7	D8	D9	H	H1	H2	H3	H4	H5
03162-12	12,1	20	19,6	36	4,5	8	M4	28	19,8	37	8	10,5	7,5	3,5	8	8,5
03162-16	16,1	25	24,6	44	5,5	9,5	M5	34	24,8	45	9,5	11	7	4	7,5	10

03163

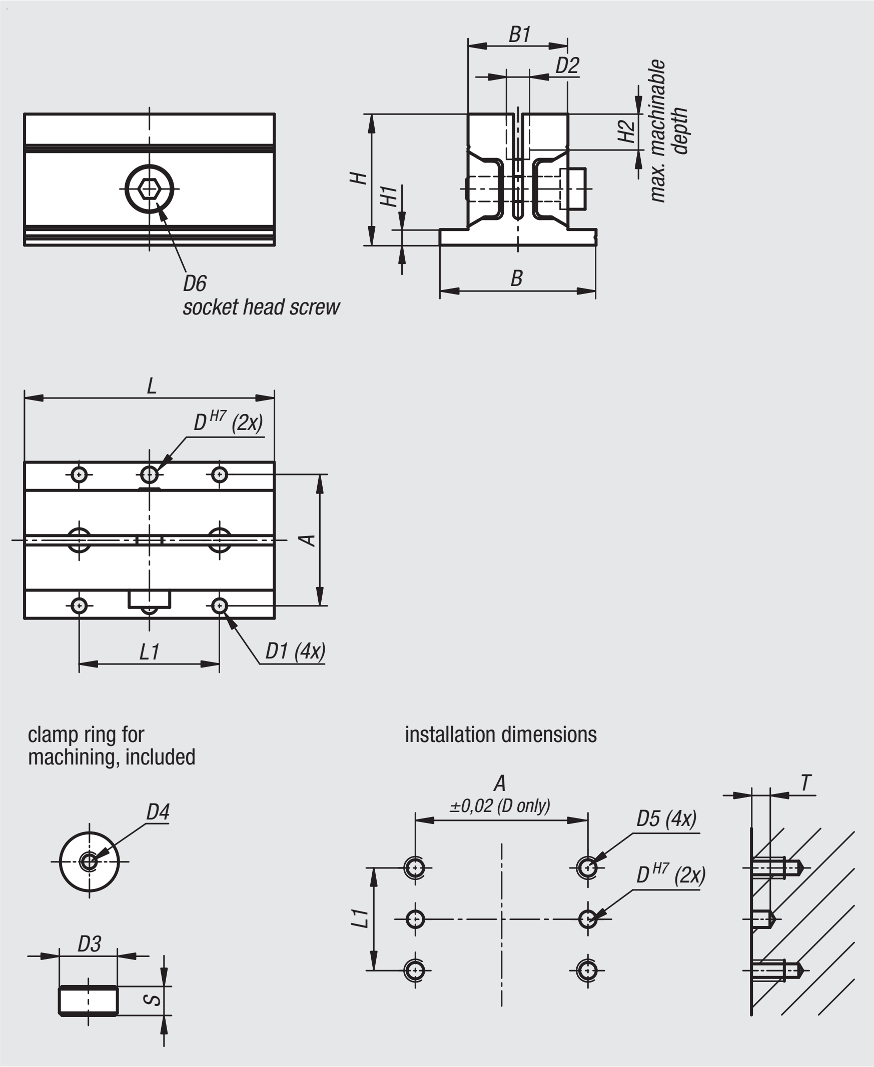
Machinable collets, square

Material:
Body EN AC-51400.
Wedges high-carbon steel.

Version:
Body natural colour anodised.
Wedges black oxidised.

Sample order:
nlm 03163-32040

Note:
The lateral clamping screw tightens the jaws and clamps the workpiece on the circumference.
The simple and compact design allows 2 workpieces to be clamped.
The clamping travel is max. 0.5 mm.
The jaws must be pre-tensioned before machining the contour, the supplied clamping ring is used for this purpose.

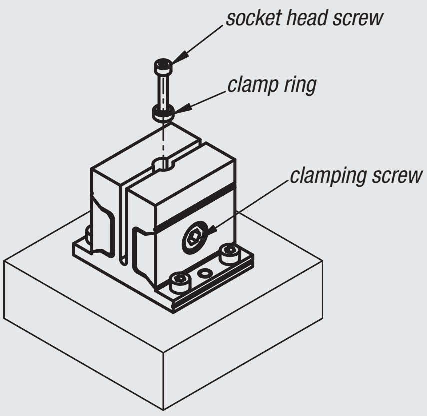


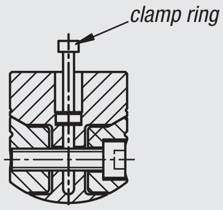
Order No.	A	B	B1	D	D1	D2	D3	D4	D5	D6	H	H1	H2	L	L1	S	T	Clamping force N	Tightening torque Nm
03163-32040	42	50	32	5	4,5	7,4	7	M3x0,5	M4x0,7	M6	42	5	10	40	25	3,5	5	2500	7,5
03163-32080	42	50	32	5	4,5	7,7	7	M3x0,5	M4x0,7	M8	42	5	10	80	45	3,5	5	2500	14
03163-50050	62	72	50	6	5,5	11,4	11	M3x0,5	M5x0,8	M10	63	7	15	50	30	5,5	8	5500	26
03163-50100	62	72	50	6	5,5	11,4	11	M3x0,5	M5x0,8	M12	63	7	15	100	58	5,5	8	5500	46

Machinable collets, square

Machining the jaws:

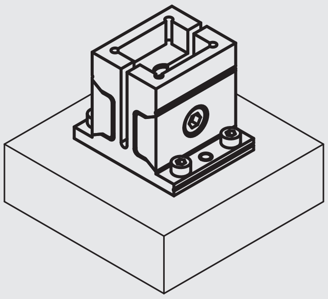
1. Inserting the clamp ring:
Insert the clamp ring into the bore in the centre of and between the jaws.
Tighten the clamp screw to hold the clamp ring in place.
(Use a cap screw to aid inserting the clamp ring)





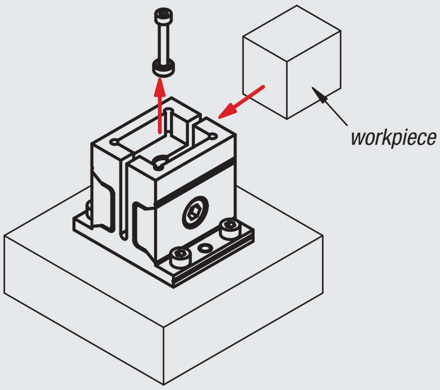
Note:
The clamp ring must be placed at the bottom of the bore.

2. Machine the jaws:
Remove the cap screw from the clamp ring.
Machine the contour of the workpiece to be held into the jaws.

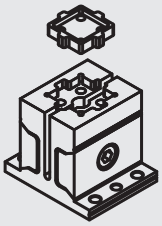


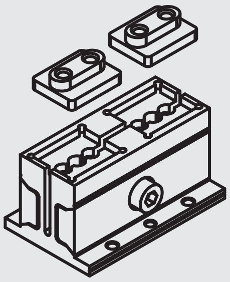
Note:
The contour should not be deeper than the max. permitted depth.

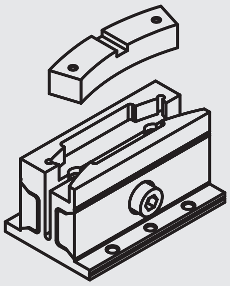
3. Mounting the workpiece:
Loosen the clamp screw and remove the clamp ring.
Place the workpiece into the contour and tighten the clamp screw.

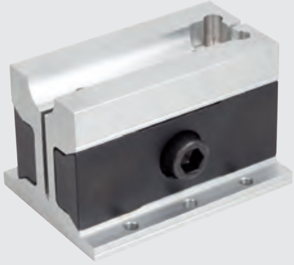


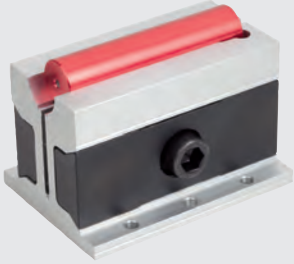
Applications

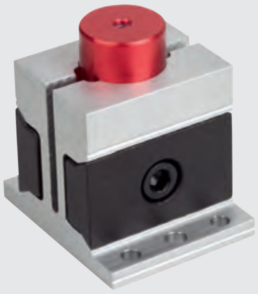












03164

Centring clamps

round

Material:
Carbon steel.

Version:
Hardened (33–39 HRC) and black oxidised.

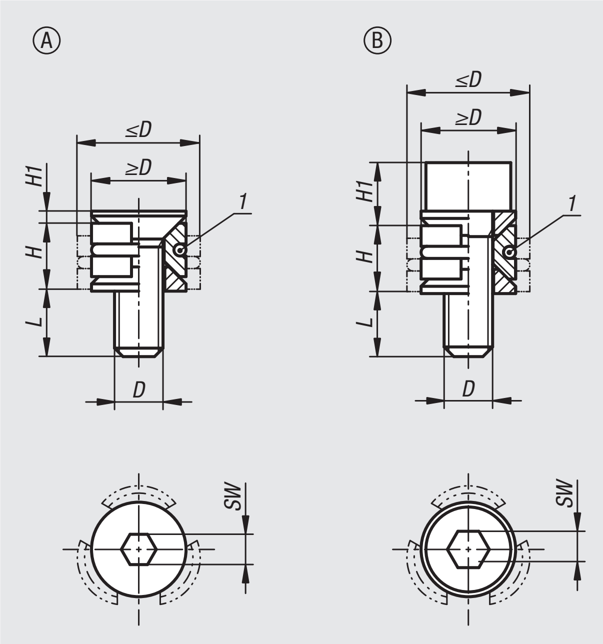
Sample order:
nlm 03164-10804

Note:
The centring clamp enables a workpiece to be centred and clamped in the bore.
The wedges generate higher clamping forces.
The centring clamp is available with a cap screw or countersunk screw.
Centring clamp with pull-down effect.

Drawing reference:
Form A: with countersunk screw
Form B: with cap screw

Dimension H refers to the height at ≥D.
Dimension L refers to the length at ≤D

1) O-ring



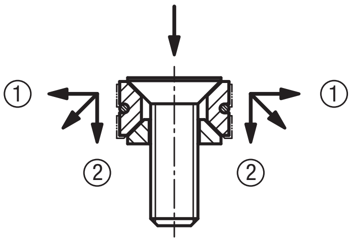
Order No.	Form	D	D min.	D max.	H	H1	L	SW	Clamping force max. kN	Tightening torque Nm
03164-10804	A	M4x12	8	10,3	5,5	0,9	7,3	2,5	0,9	2,1
03164-11005	A	M5X15	10	12,3	6,4	1,1	9,1	3	1,5	4,3
03164-11206	A	M6X18	12	16,3	8,6	1,3	11,2	4	2,1	7,3
03164-11608	A	M8X25	16	22	11,5	1,6	16,2	5	4	18
03164-20804	B	M4x12	8	10,3	5,5	5,1	7,1	3	1,5	2,7
03164-21005	B	M5X15	10	12,3	6,4	6,2	9	4	2,5	5,4
03164-21206	B	M6X18	12	16,3	8,6	7,9	10,6	5	5	9,1
03164-21608	B	M8X25	16	22	11,5	10,4	15,4	6	9	25

Centring clamps

round

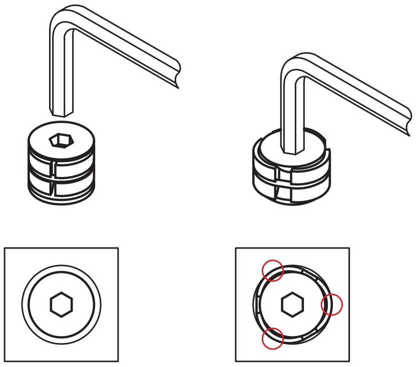
Technical information:

- These clamps grip the inside diameter of a workpiece.
- The wedge shape enables high clamping forces on the workpiece.



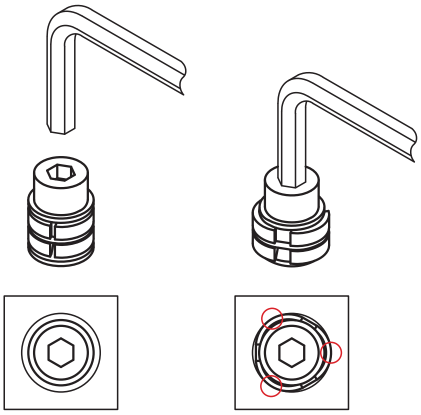
(Jaws exert positive down force)
① Horizontal thrust against workpiece
② Vertical thrust prevents the workpiece lifting

Form A:



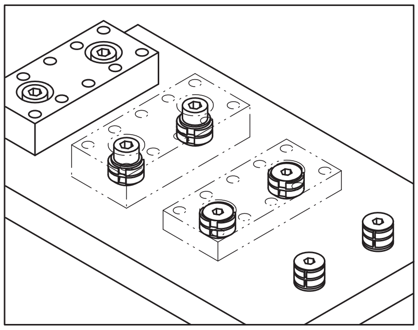
unclamped clamped

Form B:

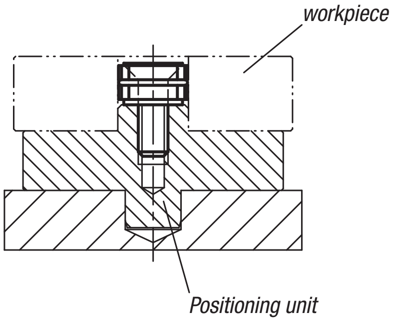


unclamped clamped

Note:
The clamp makes point contact with the bore wall when clamped.



For accurate repeat positioning use these clamps together with a positioning unit.
Clamping is carried out with the centring clamp.



03165

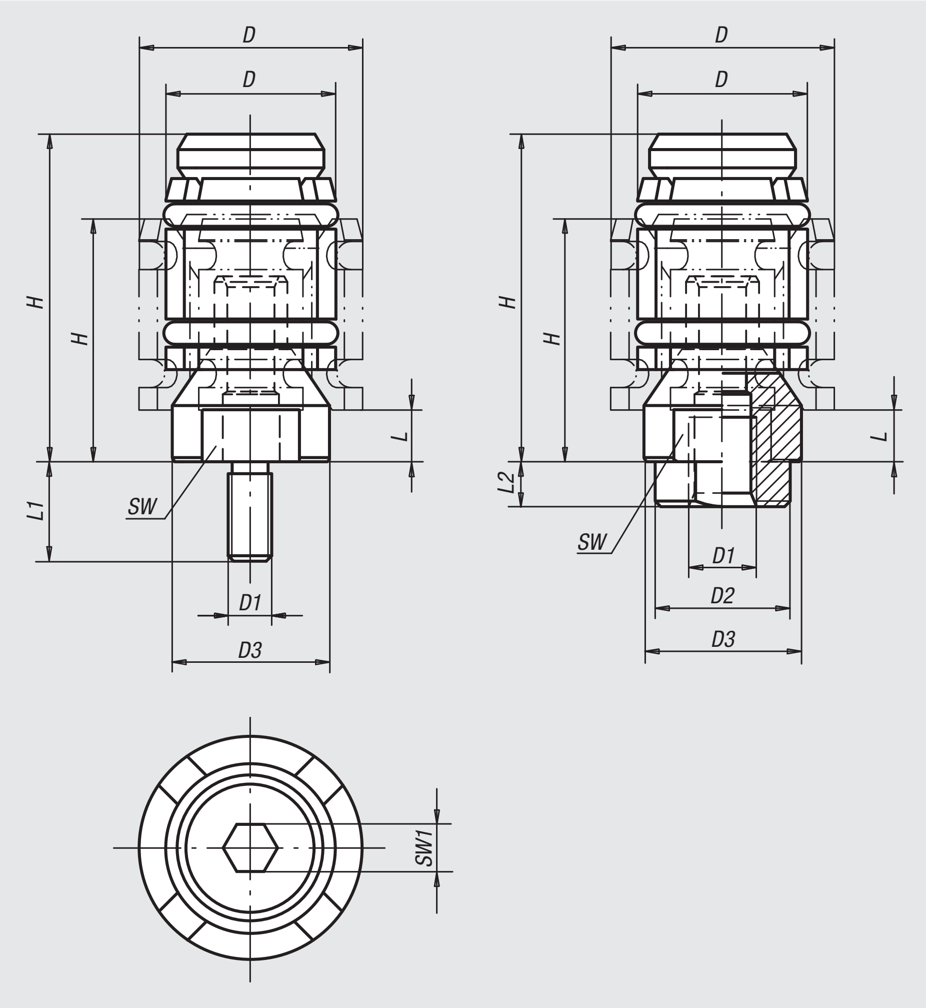
Centring clamps

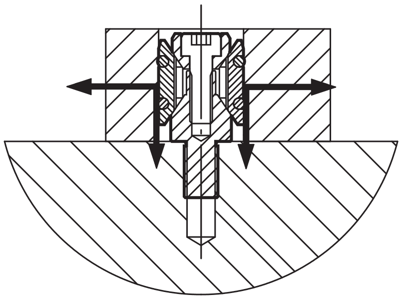
Material:
Body steel.
Bushes carbon steel.

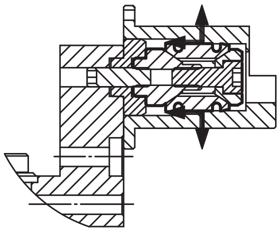
Version:
Black oxidised.

Sample order:
nlm 03165-0615

Note:
These centring clamps enable workpieces to be centred on and lightly clamped in a bore. The clamps have a wide expansion range. The series covers a bore range of Ø12 to Ø30 mm. To increase the centring accuracy the clamps with internal thread have a centring spigot (D2) for a locating hole. The centring accuracy is ±0.2 mm.
Centring clamps with female threads fit on M6 grid systems (see illustration).







Order No.	Thread type	D min.	D max.	D1	D2	D3	H min.	H max.	L min.	L1	L2	SW	SW1	Clamping force max. kN	Tightening torque max. Nm
03165-0615	internal thread	12	15	M6	12	11,4	22	27,5	4,8	-	4	9	2,5	1,5	2,2
03165-0619	internal thread	15	19	M6	12	14	24,5	32	4,8	-	4	12	4	2,5	6
03165-0624	internal thread	19	24	M6	12	17,8	26	35	4,5	-	4	15	5	4	10
03165-0630	internal thread	24	30	M6	12	23	32	44,5	7	-	4	19	5	4,5	10
03165-061215	external thread	12	15	M6	-	11,4	22	27,5	4,8	12	-	9	2,5	1,5	2,2
03165-061219	external thread	15	19	M6	-	14	24,5	32	4,8	12	-	12	4	2,5	6
03165-081624	external thread	19	24	M8	-	17,8	26	35	4,5	16	-	15	5	4	10
03165-081630	external thread	24	30	M8	-	23	32	44,5	7	16	-	19	5	4,5	10

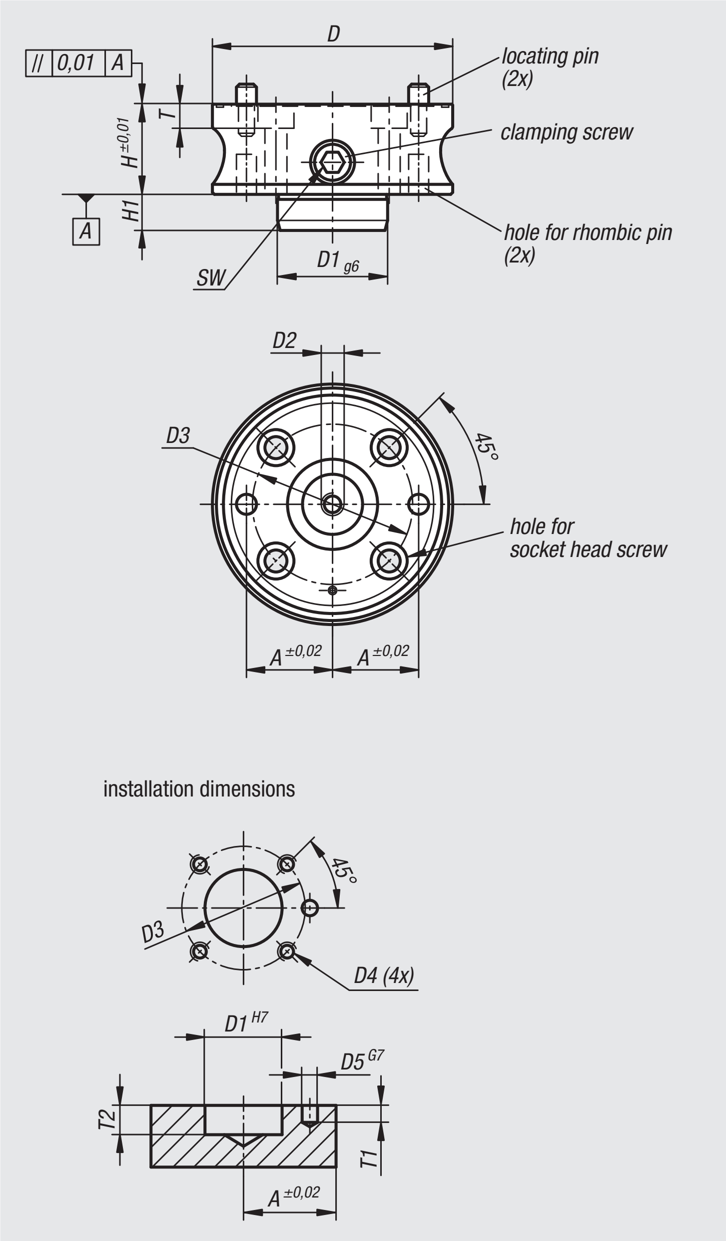
Adapter for collet

Material:
Carbon steel.

Version:
nickel-plated.

Sample order:
nlm 03167-065

Note:
With this adaptor, collets for internal and external clamping can be mounted.
The workpiece is clamped by tightening the screw on the side.
A dowel pin is used to secure the adaptor against rotation.
The collet is positioned on the adaptor with 2 dowel pins.

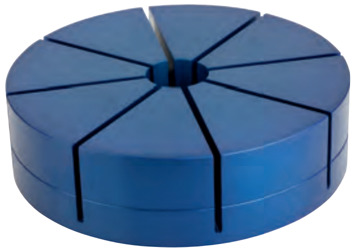


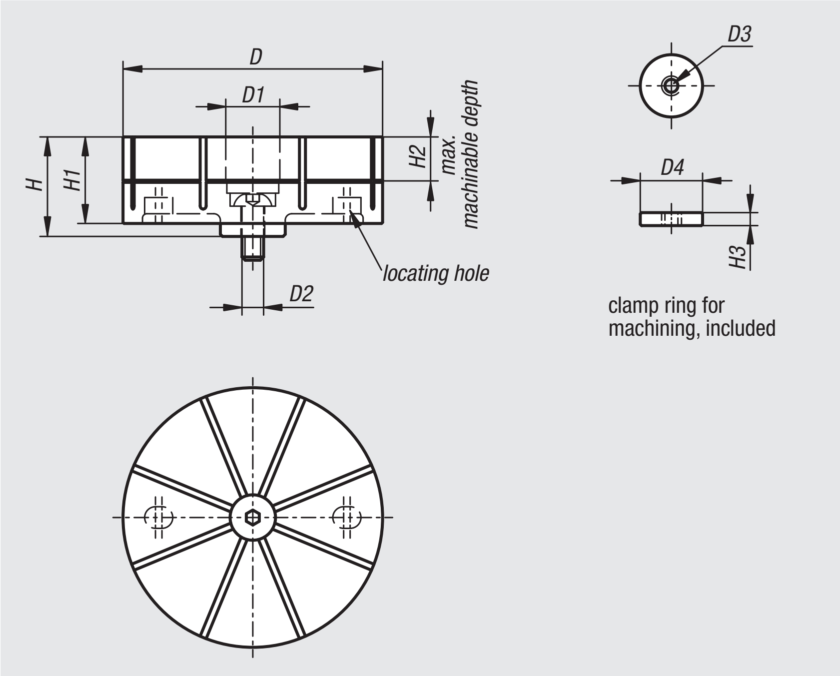
Order No.	A	D	D1	D2	D3	D4	D5	H	H1	SW	T	T1	T2	for screws	Tightening torque max. Nm	F1=Max. outer clamping (kN)	F2=Max. internal clamping (kN)
03167-065	22	65	28	M8	42	M6x1	6	35	12	8	8	6	13	M6	15	4,5	4,5
03167-090	30	90	42	M10	60	M8x1,25	8	40	14	8	10	8	15	M8	25	7	7
03167-120	43	120	55	M10	80	M10x1,5	10	45	18	10	12	11	19	M10	40	10	10
03167-160	60	160	63	M12	110	M12x1,75	12	50	24	10	14	13	25	M12	40	12	10

03168

Collet

for external clamping





clamp ring for machining, included

Material:
High-strength aluminium alloy

Version:
blue anodised.

Sample order:
nlm 03168-1065

Note:
Collets for clamping external contours.
The contour of the workpiece to be held is inserted into the collet. Free-form and asymmetrical contours can be held.
The collet mechanism enables a secure clamping of the workpiece.
Clamping travel per collet segment (8x) max. 0.15 mm.
Workpiece repeat accuracy: ±0.03.
Collet repeat accuracy: ±0.02.
Matching adaptor 03167.

Order No.	D	D1	D2	D3	D4	H	H1	H2	H3
03168-1065	65	21	M8	M5	20	29	25	10	4
03168-1090	90	25	M10	M6	24	40	35	15	5
03168-1120	120	25	M10	M6	24	46	40	20	5
03168-1160	160	29	M12	M8	28	52	45	25	6

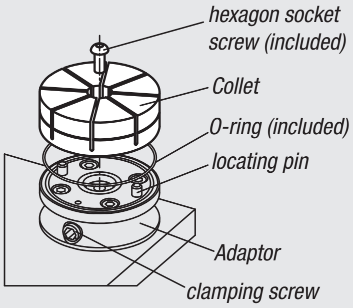
Collet

for external clamping

1. Mounting collet:

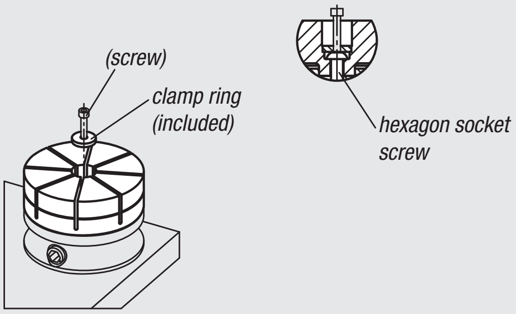
- Insert an O-ring into the groove on the top face of the clamp base.
- Set a collet on the base making sure the locating pins fit into the locating holes on the undeside of the collet. Secure the collet using a buttonhead hex socket screw.

Note:
Before mounting the collet, ensure the cam cylinder is fully loosened by turning the tightening screw clockwise until it stops.

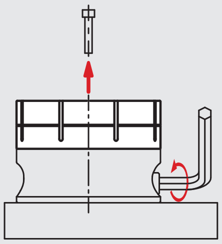


2. Machining collet:

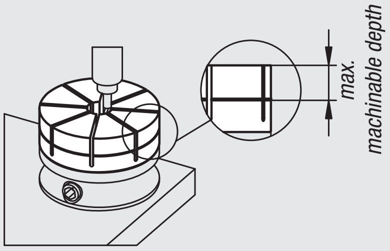
2.1
Place the clamp ring in the centre of the collet.
(Use a screw as an insertion aid)



2.2
Tighten the cam cylinder to clamp the clamp ring (recommended torque: 15Nm).
Remove the screw from the clamp ring before machining.



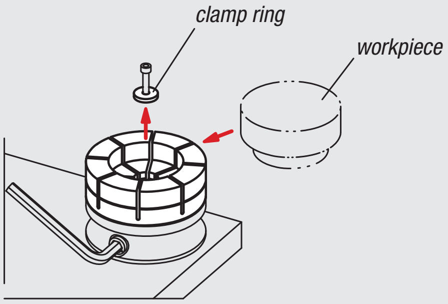
2.3
Machine the contour of the part that is to be held into the collet.



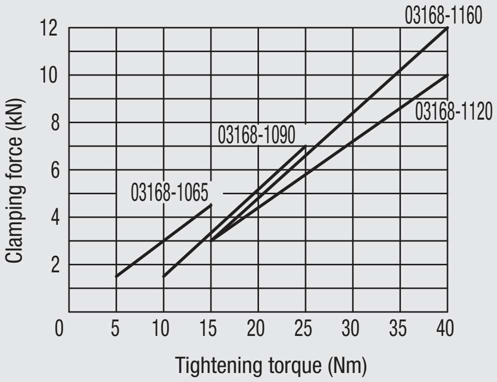
Note:
Do not machine the contour deeper than the permitted depth.

3. Mounting workpiece:

- Loosen the cam cylinder and remove the clamp ring.
- Place the workpiece in the contour and re-tighten the cam cylinder.



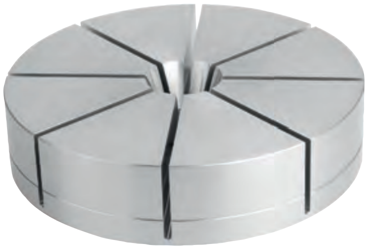
Performance curve

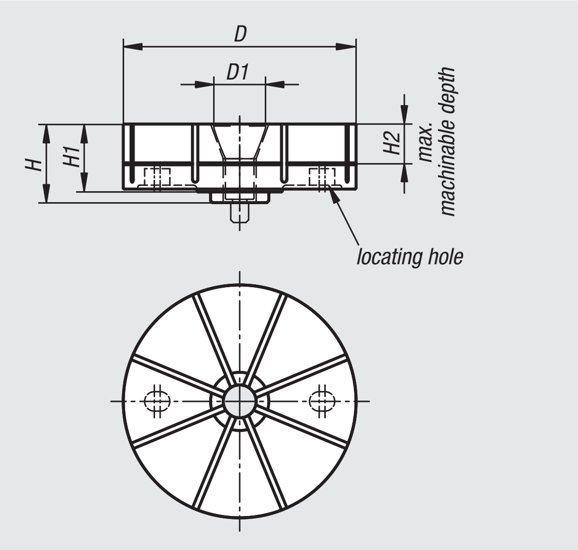


To avoid damaging the collet do not tighten the clamp without a workpiece or clamp ring.
Observe the maximum tightening torque in the table.

Collet

for internal clamping





Material:
High-strength aluminium alloy

Version:
natural tone anodised

Sample order:
nlm 03168-2065

Note:
Collets for clamping internal contours.
The contour of the workpiece to be held is inserted into the collet. Free-form and asymmetrical contours can be held.
The collet mechanism enables a secure clamping of the workpiece.
Clamping travel per collet segment (8x) max. 0.15 mm.
Workpiece repeat accuracy: ±0.03.
Collet repeat accuracy: ±0.02.
The traction cone 03169 is required when using the collet for internal clamping.
Matching adaptor 03167.

Order No.	D	D1	H	H1	H2
03168-2065	65	22,5	28,5	25	10
03168-2090	90	27	34,5	30	15
03168-2120	120	29	40,5	35	20
03168-2160	160	33	46,5	40	25

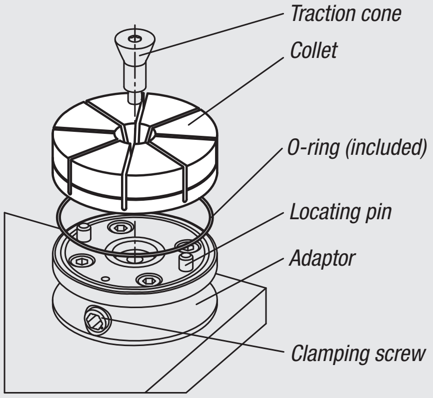
Collet

for internal clamping

1. Mounting collet:

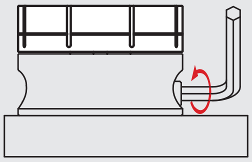
- Insert an O-ring into the groove on the top face of the clamp base.
- Set a collet on the base making sure the locating pins fit into the locating holes on the undeside of the collet.
  Secure the collet using a tapered screw.

Note:
Before mounting the collet, ensure the cam cylinder is fully loosened by turning the tightening screw clockwise until it stops.

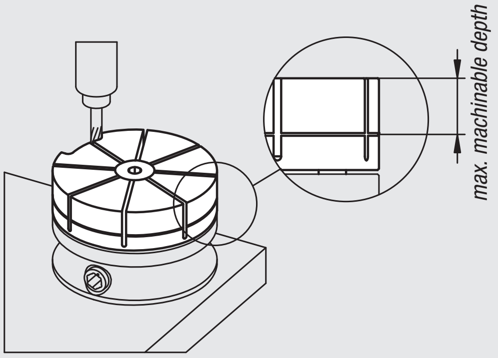


2. Machining collet:

2.1
Fully loosen the cam cylinder and measure the OD of the collet. Tighten the cam cylinder until the collet OD has expanded by 0.15 mm.

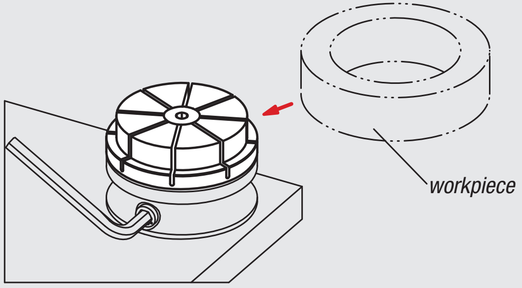


2.2
Machine the contour of the part that is to be held into the collet.

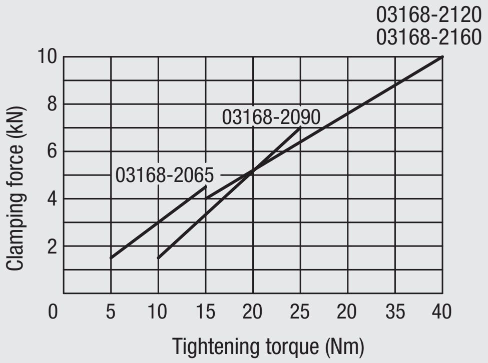


3. Mounting workpiece:

- Loosen the cam cylinder and remove the clamp ring.
- Place the workpiece in the contour and re-tighten the cam cylinder.



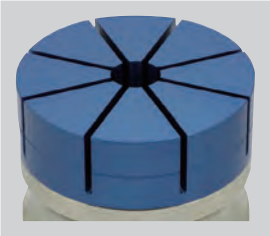
Performance curve

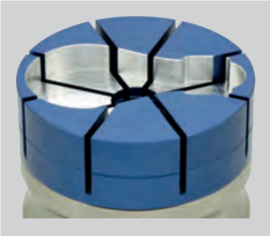


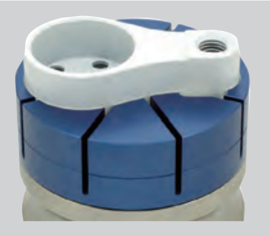
To avoid damaging the collet do not tighten the clamp without a workpiece or clamp ring.
Observe the maximum tightening torque in the table.

Technical information for collets

for external clamping


1. Prepare collet

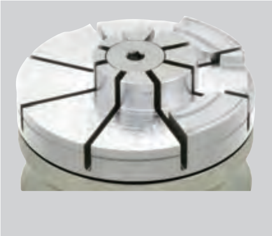

2. Machine collet


3. Position workpiece


4. Tighten cam cylinder

for internal clamping


1. Prepare collet

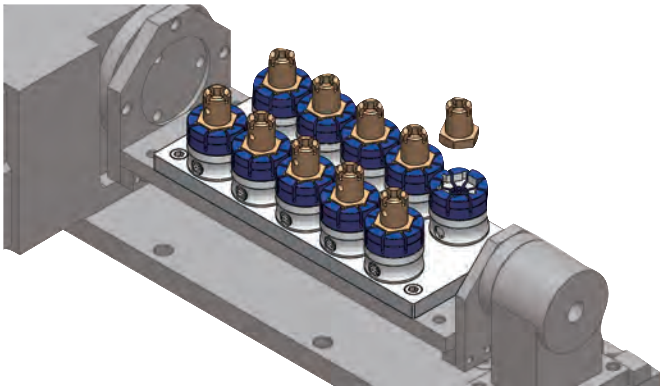

2. Machine collet


3. Position workpiece


4. Tighten cam cylinder

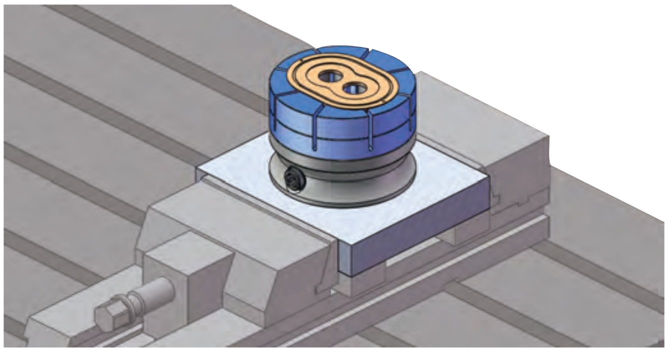
Technical information for collets

Series clamping



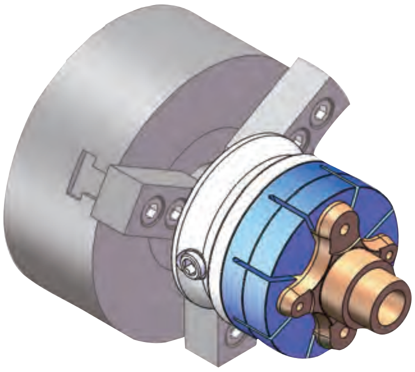
Small OD allows clamping in series with a limited space.

Fixture for individual parts



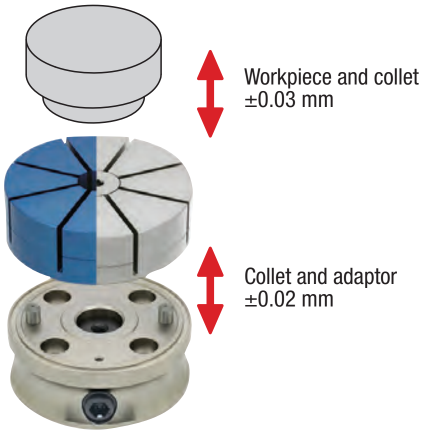
Clamp in a vice by mounting on a plate.

Fixture for lathe chuck

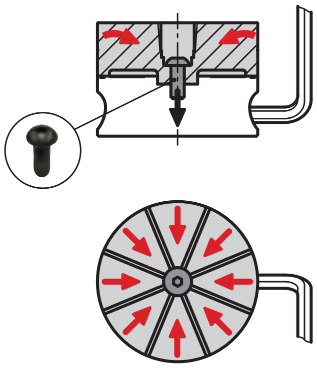


Can hold complex forms which are impossible for a 3 jaw chuck.

Technical information for collets

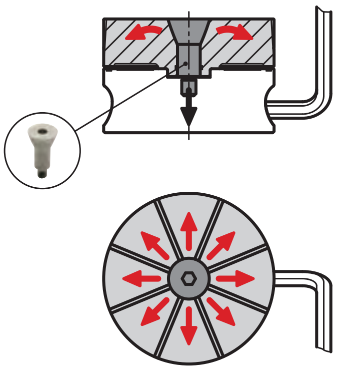


Force effect:



**Collet segment travel:
0.3mm in diameter**

When the cam cylinder is tightened, the the collet is drawn down.
At the same time the 8 collet segments tilt towards the centre and clamp the workpiece.

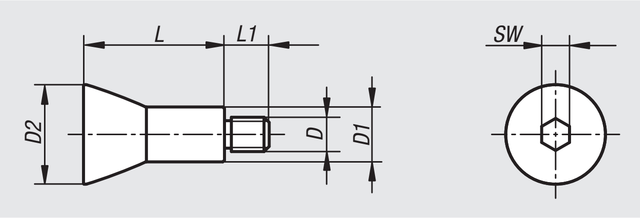


**Collet segment travel:
0.3mm in diameter**

When the clamping cylinder is tightened, the traction cone is pulled downwards (positive down force).
At the same time, the 8 collet segments tilt outwards from the centre and the workpiece is clamped.

Traction cone

for internal clamping collet



Material:
Carbon steel.

Version:
hardened and nickel-plated.

Sample order:
nlm 03169-0829

Note:
The traction cone is required for the collet for internal clamping.

Order No.	D	D1	D2	L	L1	SW
03169-0829	M8	13,2	22,5	29	10	6
03169-1035	M10	16	27	35	11	8
03169-1041	M10	16	29	41	13	8
03169-1247	M12	18	33	47	14	10

03178-10

Machinable collets

pneumatic

Material:
Chuck high-carbon steel, nickel-plated.
Collet high-strength aluminium, blue anodised.

Sample order:
nlm 03178-10-1065090

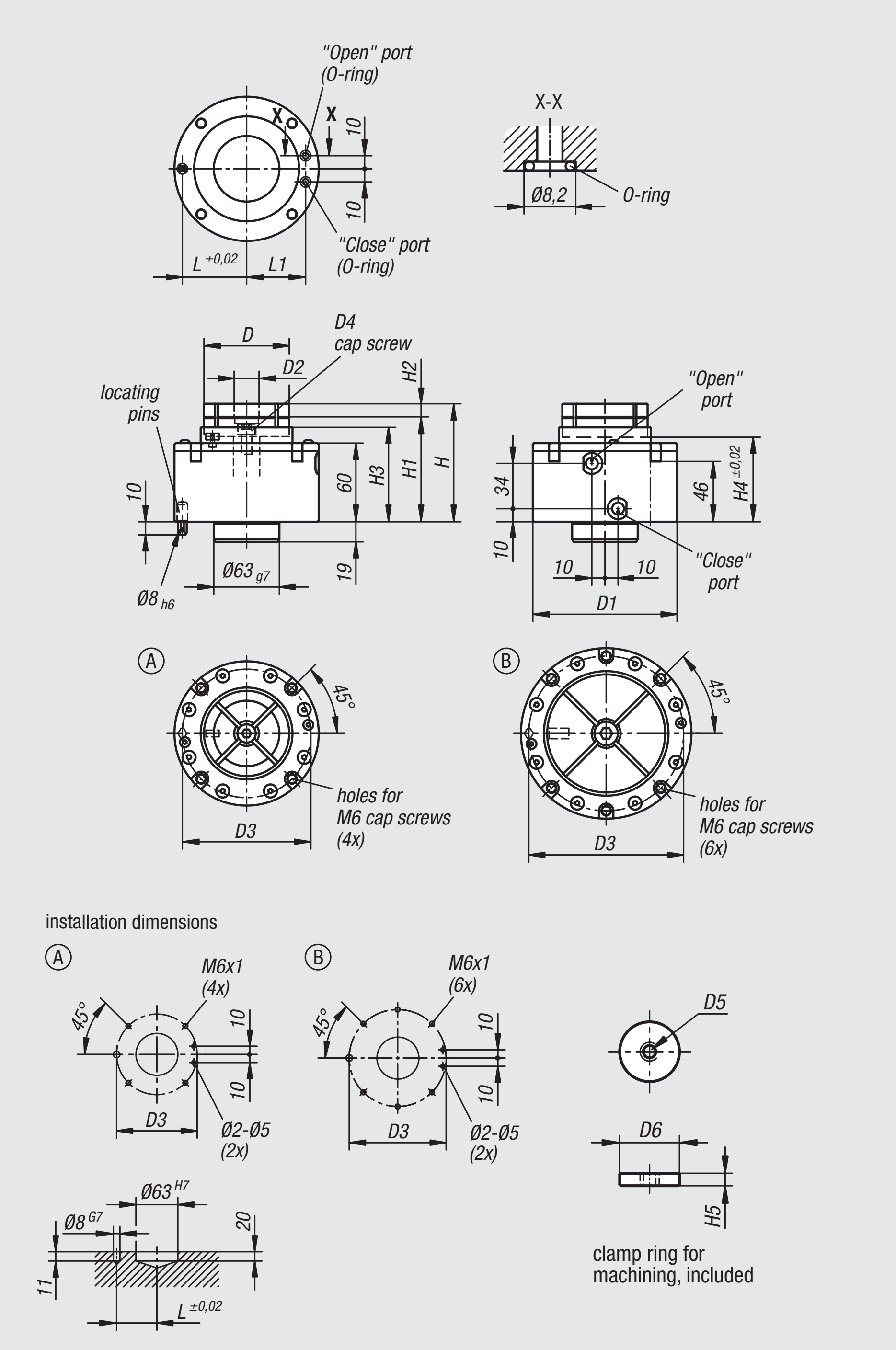
Note:
The pneumatic collet system consists of a chuck and a machinable collet.
The chuck can be screwed onto fixtures according to the mounting dimensions.

Clamping procedure:
The collet is opened by applying compressed air to the „open“ port.
The collet is closed (for clamping) by applying compressed air to the „close“ port.
The pneumatic connections can be screwed on either from below or from the side. If the air is connected from below, the side ports must be closed.

Machining the collet for external clamping:
The negative form of the workpiece to be clamped is machined into the collet. Free-form and asymmetrical contours are possible.
Different workpieces can be clamped quickly and securely by simply exchanging the collet.
The collet can be milled down to height H2. This enables multiple workpiece contours to be machined into one collet.

Repeat accuracy for workpiece: +/-0.03
Repeat accuracy after replacing the collet +/- 0.02
The collet radial clamping travel is 0.15 mm per clamping segment.
To prevent damage the collet should not be tightened without a workpiece or clamping ring in place.
The operating air pressure should lay between 0.45 - 0.55 MPa.
The clamping forces indicated are based on 0.5 MPa.

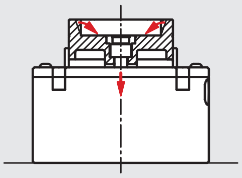
Accessories:
Clamping ring for machining the contour.
O-ring.
Locating pin.
Clamping screw for collet.



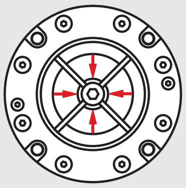
Order No.	Form	D	D1	D2	D3	D4	D5	D6	H	H1	H2	H3	H4	H5	L	L1	Operating pressure MPa	Clamping force N
03178-10-1065090	A	65	110	19	98	M8	M4	18	90	80	10	72	65	4	49	45	0,5	4000
03178-10-1090100	B	90	130	23	118	M10	M5	22	100	85	15	74	66	6	59	55	0,5	6000

Machinable collets

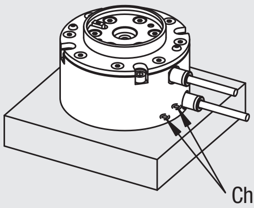
pneumatic



Applying compressed air draws the cylinder down.
The 4 clamping segments move inwards and
clamp the workpiece.

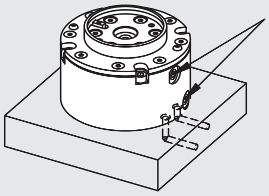


Using the side ports:
- Seal the lower ports with the O-rings provided.
- Check that no air escaping from here.



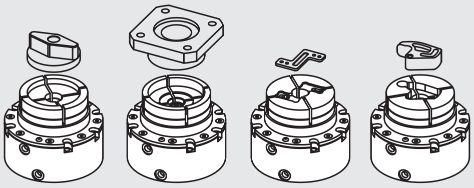
Check that the
lower ports are sealed.

Using the lower ports:
- Fit the O-rings provided into the lower ports.
- The side ports must be closed.

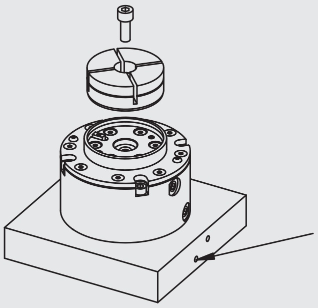


Seal the air connections
and check them for tightness.

Different workpiece shapes can be machined into the collets.

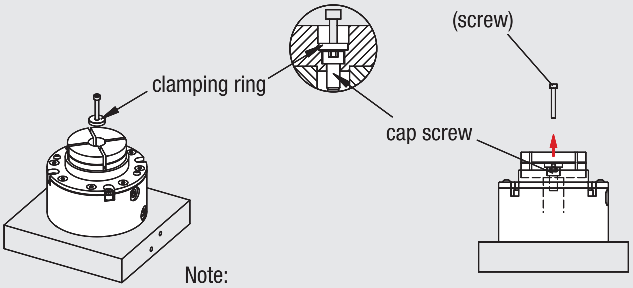


Mounting the collet:
When mounting the collet, make sure that air is connected to ,
the "open" connection.
The cylinder and fastening screw are loose.

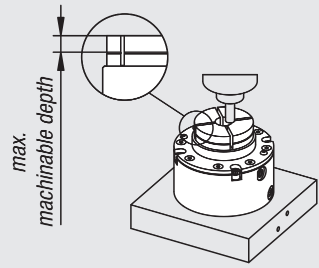


Note:
Connect air to
the "open" port

Machine the collet:
Insert the clamping ring into the collet.
(A screw can be used as an insertion aid)



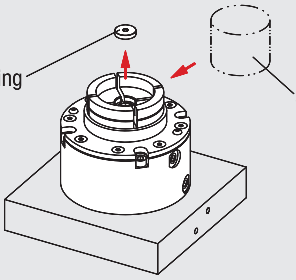
Note:
Position the clamping ring over
the fastening screw of the collet.



Clamp the collet
over the "close" port.

Machine the collet to suit to the workpiece shape.

Clamp the workpiece:
After machining the collet, remove the clamping ring.
Insert the workpiece and apply air to the “close” port to clamp it.



03180

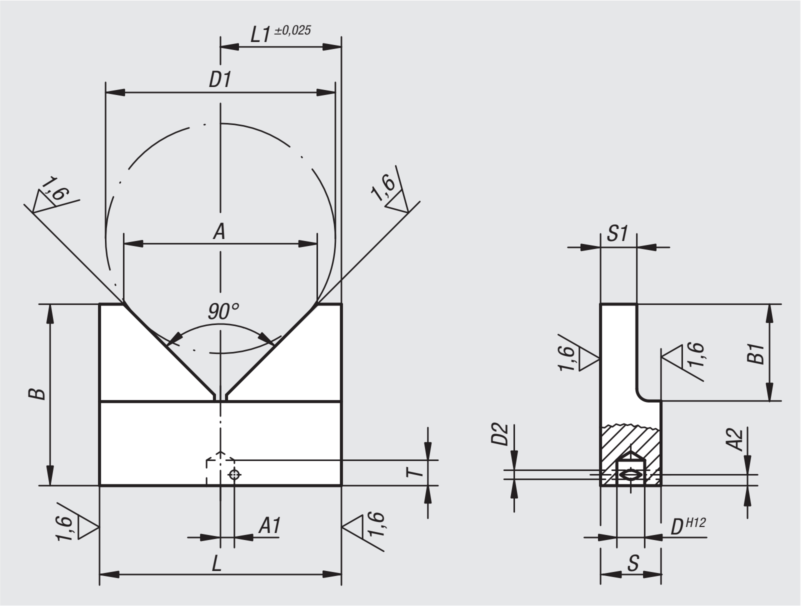
Centring V-plate

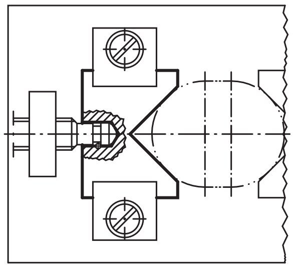
Material:
Carbon steel 1.1181.

Version:
Black oxidised.

Sample order:
nlm 03180-03

Note:
Thrust pad type screws such as 07120 or 06150 may be used for the spindle.





Order No.	A	A1	A2	B	B1	D	D1 max.	D2	L	L1	S	S1	T
03180-01	32	2,6	1,8	30	16	4,6	38	1,5	40	20	10	6	4,2
03180-02	40	3,7	2	40	20	6,1	46	1,5	50	25	12	8	5
03180-03	50	4,7	2,7	50	25	8,1	58	2	63	31,5	16	10	7

03182

Indexing plungers - Precision

with tapered pin

Material:
Steel.
Grip ball thermoplastic.

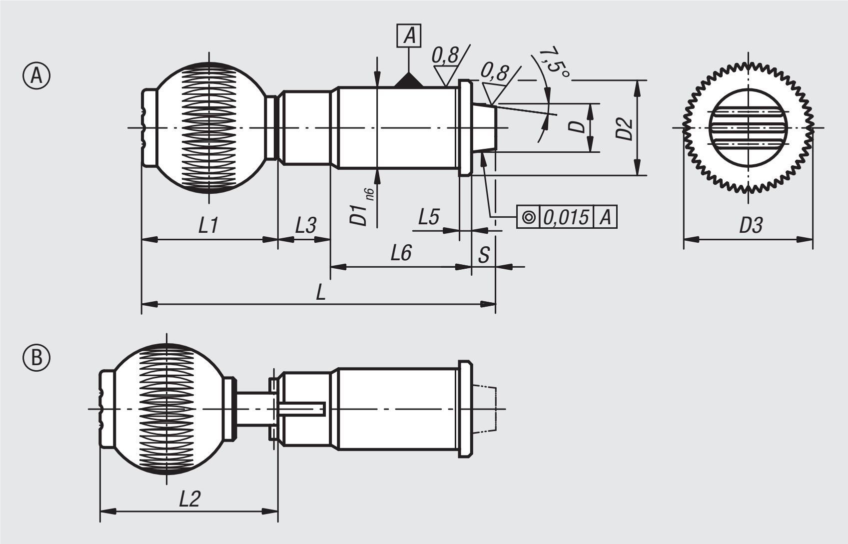
Version:
Hardened and ground.
Grip ball black grey.

Sample order:
nlm 03182-020

Note:
The indexing plungers with bushes are a perfect combination for rapid positioning and fixating. The precise design of both the indexing plunger and the bush guarantees high repeat accuracy when assembling two elements.

For technical information see assembly and installation instructions.

Drawing reference:
Form A: standard
Form B: lockable



Order No. Form A standard	Order No. Form B lockable	D	D1	D2	D3	L	L1	L2	L3	L5	L6	Travel S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Internal thread grip ball
03182-010	**03182-110**	10	16	19	25	75	25	-/30,5	13	2,5	31	6	19	29	M6
03182-012	**03182-112**	12	20	23	32	87	33	-/40,5	13	3	35	6	22	35	M8
03182-016	**03182-116**	16	25	28	40	102,5	41,5	-/49	13	3	42	6	30	50	M10
03182-020	**03182-120**	20	30	33	40	110,5	41,5	-/49	13	3	50	6	46	63	M10
03182-025	**03182-125**	25	38	42	50	130	51	-/58,5	13	3	60	6	39	73	M10

03184

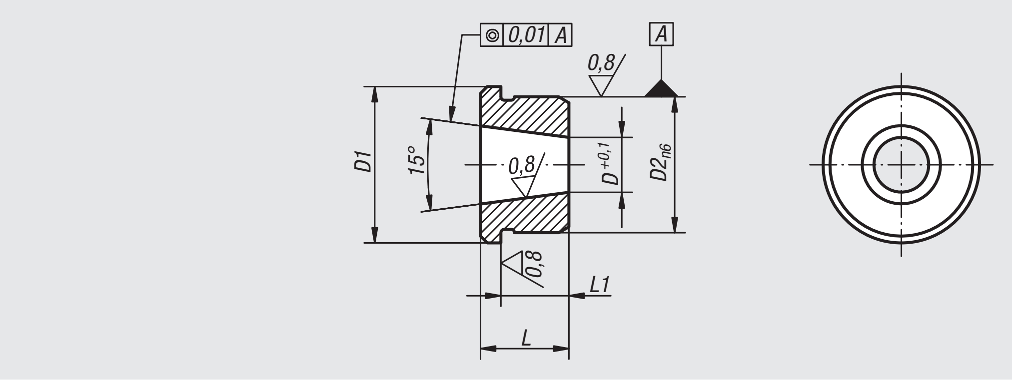
Bushes tapered

Material:
Steel.

Version:
Hardened and ground.

Sample order:
nlm 03184-20

Note:
Bushes for precision indexing plungers 03182.



Order No.	D	D1	D2	L	L1
03184-10	7,1	19	16	11	8,5
03184-12	8,28	23	20	13	10
03184-16	11,52	28	25	17	14
03184-20	15,49	33	30	16	13
03184-25	19,7	42	38	19	16

03186

Indexing plungers - Precision

with cylindrical pin

Material:
Steel.
Grip ball thermoplastic.

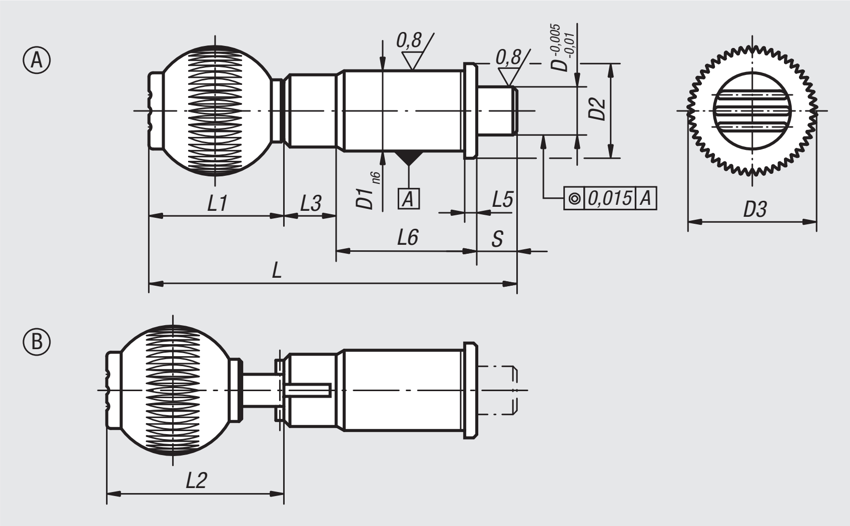
Version:
Hardened and ground.
Grip ball black grey.

Sample order:
nlm 03186-020

Note:
The indexing plungers with bushes are a perfect combination for rapid positioning and fixing. The precise design of both the indexing plungers and the bush guarantees high repeating accuracy when assembling two elements.

Technical Information see assembly and installation instructions.

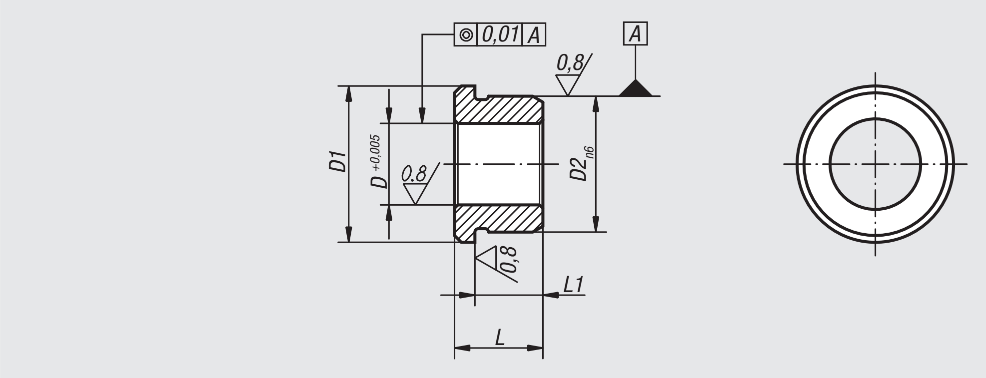
Drawing reference:
Form A: standard
Form B: lockable



Order No. Form A standard	Order No. Form B lockable	D	D1	D2	D3	L	L1	L2	L3	L5	L6	Travel S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Internal thread grip ball
03186-010	**03186-110**	10	16	19	25	79	25	-/36,5	13	2,5	31	10	15	30	M6
03186-012	**03186-112**	12	20	23	32	91	33	-/44,5	13	3	35	10	15	35	M8
03186-016	**03186-116**	16	25	28	40	106,5	41,5	-/53	13	3	42	10	20	50	M10
03186-020	**03186-120**	20	30	33	40	114,5	41,5	-/53	13	3	50	10	36	63	M10
03186-025	**03186-125**	25	38	42	50	134	51	-/62,5	13	3	60	10	20	73	M10

03188

Bushes cylindrical

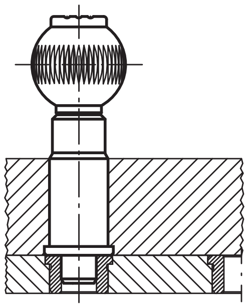


Material:
Steel.

Version:
Hardened and ground.

Sample order:
nlm 03188-20

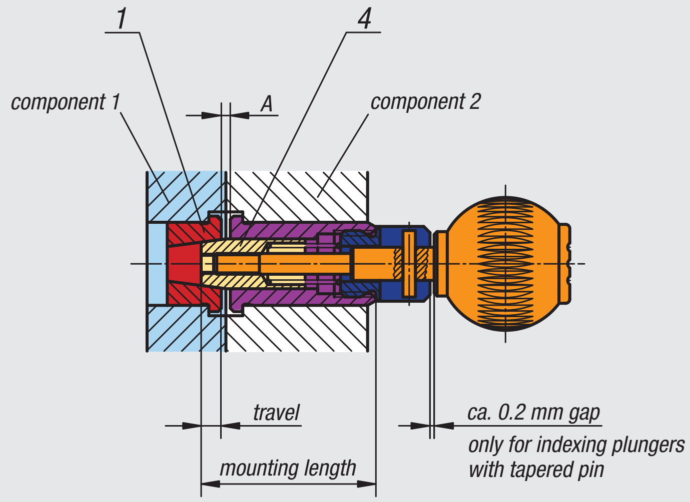
Note:
Bushes for precision indexing plungers 03186.



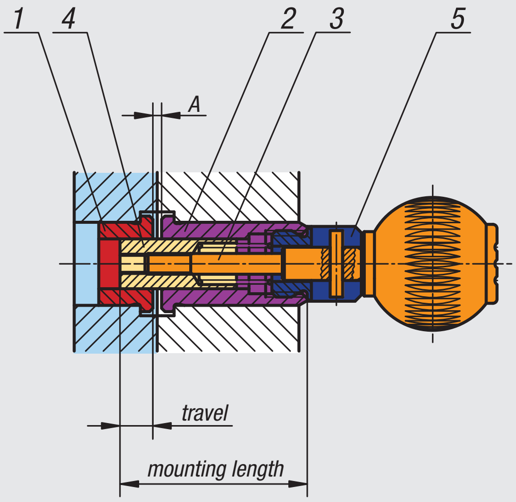
Order No.	D	D1	D2	L	L1
03188-10	10	19	16	11	8,5
03188-12	12	23	20	13	10
03188-16	16	28	25	17	14
03188-20	20	33	30	16	13
03188-25	25	42	38	19	16

Assembly and installation instructions for precision indexing plungers

Precision indexing plungers with tapered indexing pin



Precision indexing plungers with cylindrical indexing pin



Assembly instructions:

1. Fit tapered or cylindrical bush (1) into “component 1”.
2. Mount sleeve (2) into “component 2”.
3. Determine mounting length (actual dimension). Mounting length = A + travel + length of sleeve 2. Models with tapered pin should have a 0.2 mm gap.
4. Glue screw (3) and centring pin (4) together with anaerobic adhesive. We recommend Loctite 638.
5. Screw centring pin with nut (4) and handle into the mounted sleeve (2). If necessary glue together with anaerobic adhesive.
6. Check whether the product is operational. Keep to the index travel length given in the catalogue.

Note:
The precision indexing plunger is only ready for operation after the stated adhesive hardening time. When gluing the components, ensure that no adhesive comes into contact with movable parts.

03190

Indexing plunger

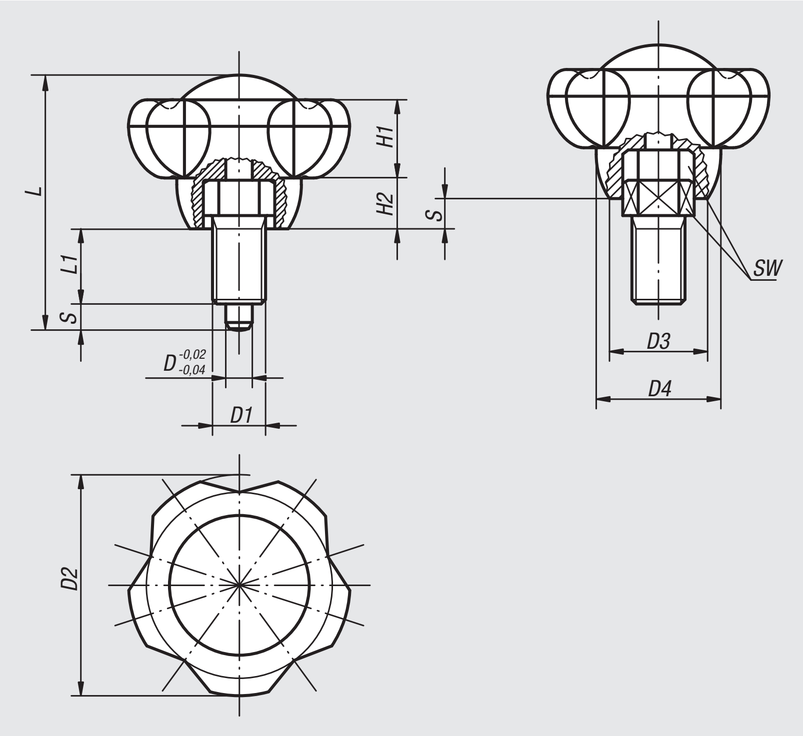
with five lobe grip

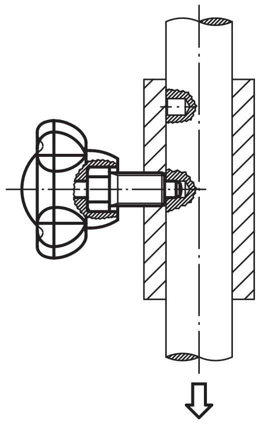
Material:
Thermoplastic.
Indexing pin and screw steel 5.8.

Version:
Lower grip black-grey.
Indexing pin and screw black oxidised.
Indexing pin hardened and ground.

Sample order:
nlm 03190-11056 (cap colour traffic red)

Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.



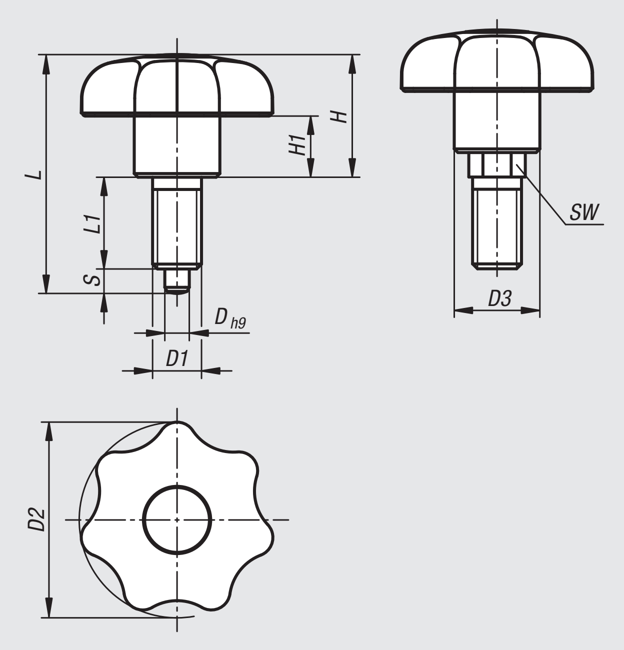


black grey	light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7
 RAL 7021	 RAL 7035	 RAL 3020	 RAL 1021

Order No.	D	D1	D2	D3	D4	H1	H2	L	L1	Travel S	SW
03190-1105Δ	5	M10x1	50	22,2	28,2	17,8	11,5	52,8	13	5	13
03190-1206Δ	6	M12x1,5	50	22,2	28,2	17,8	11,5	57,8	17	6	14
03190-13085Δ	8	M16x1,5	63	28	35,5	22,5	14,5	74	22	8	19
03190-1410Δ	10	M20x1,5	63	28	35,5	22,5	14,5	78	24	10	22

Notes

Indexing and clamping grip



The indexing and clamping grips enable the positioning, securing and clamping of diverse positioning elements with just one product. Indexing is carried out using the indexing pin and the item is clamped using the end face of the sleeve.

Material:
Star grip black grey thermoplastic.
Threaded sleeve 1.0718.
Indexing pin stainless steel 1.4305.

Version:
Steel electro zinc-plated.
Stainless steel bright.

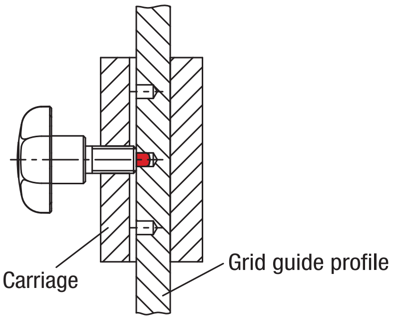
Sample order:
nlm 03190-10-108040

Advantages:
Indexing and clamping with one product.
Ergonomic operation via star grip.

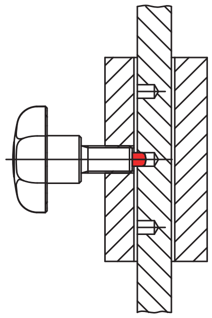
On request:
Special versions.

Accessories:
Hexagon nuts thin DIN 439

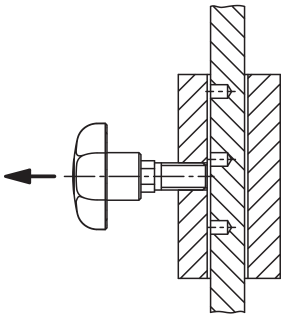
Indexing and clamping grip



- Indexing pin engaged
- Grid guide profile clamped
- Locking slide system locked and clamped play-free with threaded sleeve



- Indexing pin engaged
- Lock released
- Locking slide system locked, but not play-free

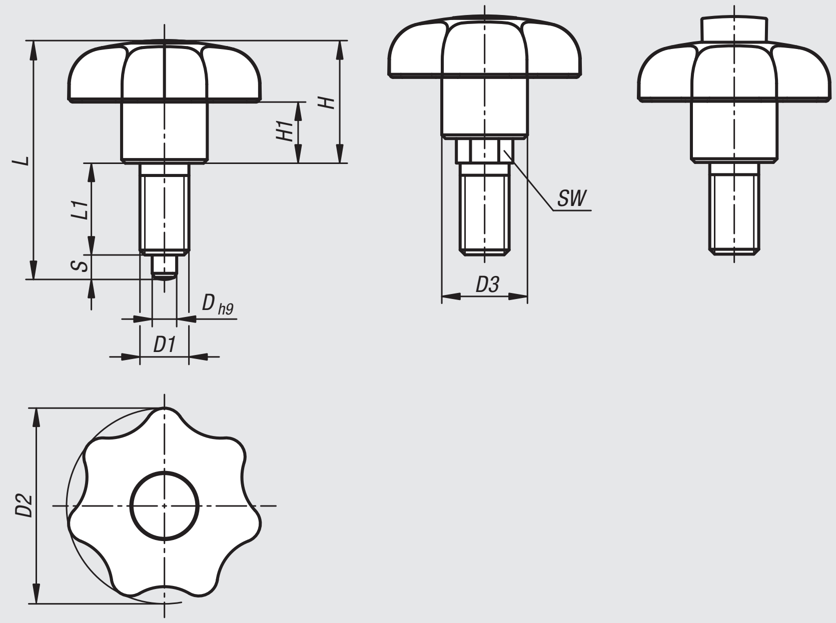


- Indexing and clamping grip retracted
- Indexing pin disengaged
- Lock released
- Locking slide system can be moved

Order No.	D	D1	D2	D3	H	H1	L	L1	Travel S	SW
03190-10-108040	4	M8	32	14	20	10	39	15	4	8
03190-10-210050	5	M10	40	18	24,9	13	46,9	17	5	10
03190-10-312060	6	M12	50	22	31,8	17	57,8	20	6	12
03190-10-416080	8	M16	63	26	40	21	74	26	8	16
03190-10-108041	4	M8x1	32	14	20	10	39	15	4	8
03190-10-210051	5	M10x1	40	18	24,9	13	46,9	17	5	10
03190-10-312061	6	M12x1,5	50	22	31,8	17	57,8	20	6	12
03190-10-416081	8	M16x1,5	63	26	40	21	74	26	8	16

Indexing and clamping grip

with optical locked indicator



The indexing and clamping grips enable the positioning, securing and clamping of diverse positioning elements with just one product. Indexing is carried out using the indexing pin and the item is clamped using the end face of the sleeve. A protruding signal button means that the indexing pin is not completely extended.

Material:
Star grip black grey thermoplastic.
Signal button red thermoplastic.
Threaded sleeve 1.0718.
Indexing pin stainless steel 1.4305.

Version:
Steel electro zinc-plated.
Stainless steel bright.

Sample order:
nlm 03191-108040

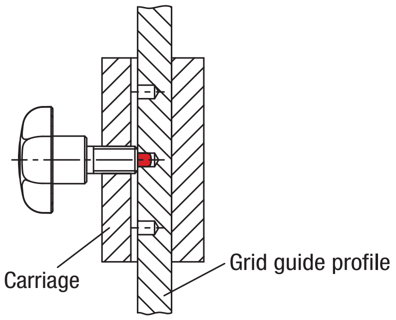
Advantages:
Optical indication of the engagement function.
Indexing and clamping with one product.
Ergonomic operation via star grip.

On request:
Special versions.

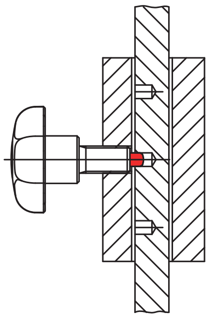
Accessories:
Hexagon nuts thin DIN 439

Indexing and clamping grip

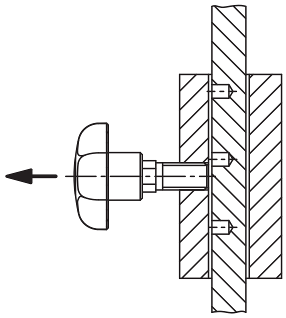
with optical locked indicator



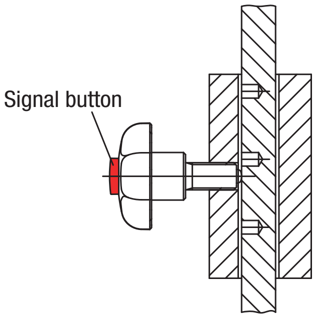
- Indexing pin engaged
- Grid guide profile clamped
- Locking slide system locked and clamped play-free with threaded sleeve



- Indexing pin engaged
- Lock released
- Locking slide system locked, but not play-free



- Indexing and clamping grip retracted
- Indexing pin disengaged
- Lock released
- Locking slide system can be moved



- Indexing and clamping grip not retracted
- Indexing pin disengaged
- Lock released
- Signal button protruding
- Locking slide system can be moved to the next notch

Order No.	D	D1	D2	D3	H	H1	L	L1	Travel S	SW
03191-108040	4	M8	32	14	20	10	39	15	4	8
03191-210050	5	M10	40	18	24,9	13	46,9	17	5	10
03191-312060	6	M12	50	22	32	17	58	20	6	12
03191-416080	8	M16	63	26	40,3	21	74,3	26	8	16
03191-108041	4	M8x1	32	14	20	10	39	15	4	8
03191-210051	5	M10x1	40	18	24,9	13	46,9	17	5	10
03191-312061	6	M12x1,5	50	22	32	17	58	20	6	12
03191-416081	8	M16x1,5	63	26	40,3	21	74,3	26	8	16

Ball lock pins

Material:
Grip and push button thermoplastic.
Metal parts stainless steel.

Version:
Grip black.
Push button traffic red.
Steel parts bright.

Sample order:
nlm 03193-3806050
(include length L e.g. 050 for L = 50 mm)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. Release the button to lock the balls and secure the connection.
Form A is suitable for applications where high demands and precision are required.

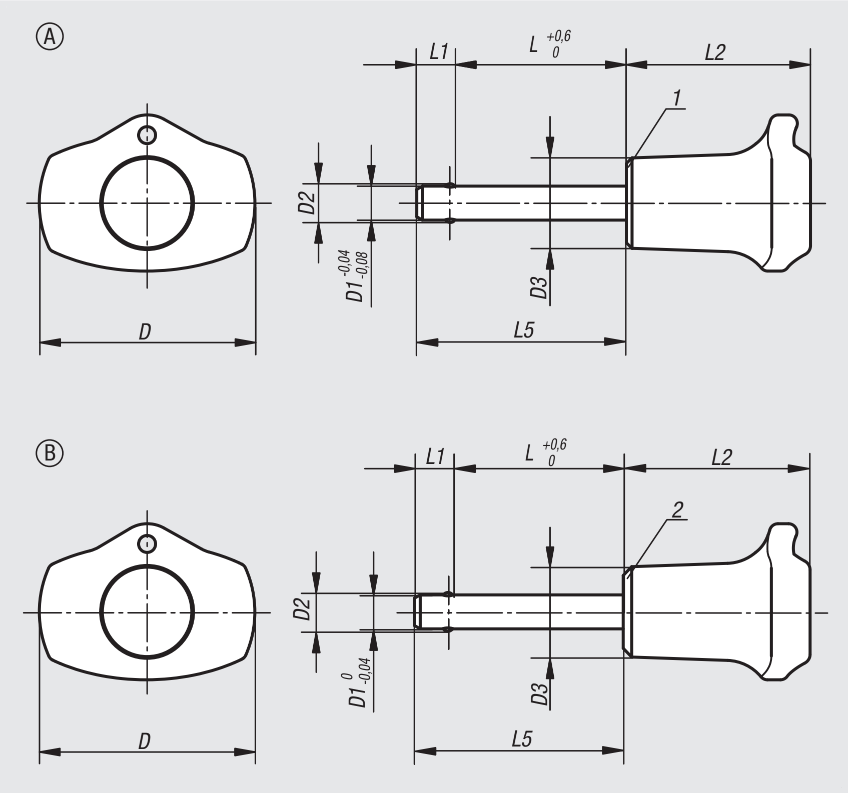
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

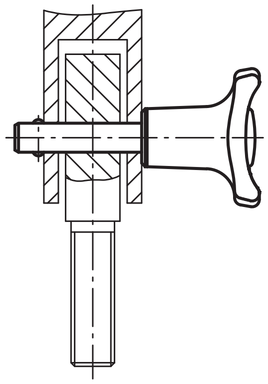
Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Features:
Form A:
Pin ground, metal collar, high axial pull-out force
Form B:
Pin h9, plastic collar, low axial pull-out force



Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

Drawing reference:
1) Metal collar
2) Plastic collar



Ball lock pins, Form A, metal collar

Order No.	D	D1	D2	D3	L	L1	L2	L5	Receiving hole H11	Shearing force double shear max.kN
03193-3805* **	38	5	5,5	16	10/15/20/25/30	6	32,5	16/21/26/31/36	5	15
03193-3806* **	38	6	6,85	16	10/15/20/25/30/35/40/45/50	7	32,5	17/22/27/32/37/42/47/52/57	6	22
03193-3808* **	38	8	9,5	16	20/25/30/35/40/45/50	8	32,5	28/33/38/43/48/53/58	8	38
03193-4710* **	47	10	12	23	20/25/30/35/40/45/50/60	9	40	29/34/39/44/49/54/59/69	10	60
03193-4712* **	47	12	14,5	23	25/30/35/40/45/50/60/70/80	10	40	35/40/45/50/55/60/70/80/90	12	86
03193-4716* **	47	16	19	23	30/35/40/45/50/60/70/80	13	40	43/48/53/58/63/73/83/93	16	153

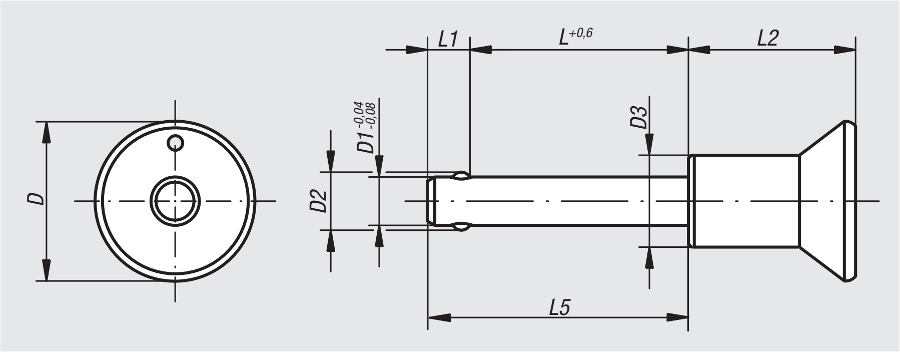
Ball lock pins, Form B, plastic collar

Order No.	D	D1	D2	D3	L	L1	L2	L5	Receiving hole H11	Shearing force double shear max.kN
03193-13805* **	38	5	5,5	16	15/20/25/30	5,9	33	20,9/25,9/30,9/35,9	5	15
03193-13806* **	38	6	6,85	16	30/40/50	6,8	33	36,8/46,8/56,8	6	22
03193-13808* **	38	8	9,5	16	30/40/50	7,8	33	37,8/47,8/57,8	8	38

03194

Ball lock pins

stainless steel



Material:
Metal parts stainless steel.

Version:
Bright.

Sample order:
nlm 03194-3110030
(include length L e.g. 030 for L = 30 mm)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. Release the button to lock the balls and secure the connection.
Corrosion resistant. Option for connecting retaining cable.

Shear force double shear $(F) = S \cdot \tau$ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

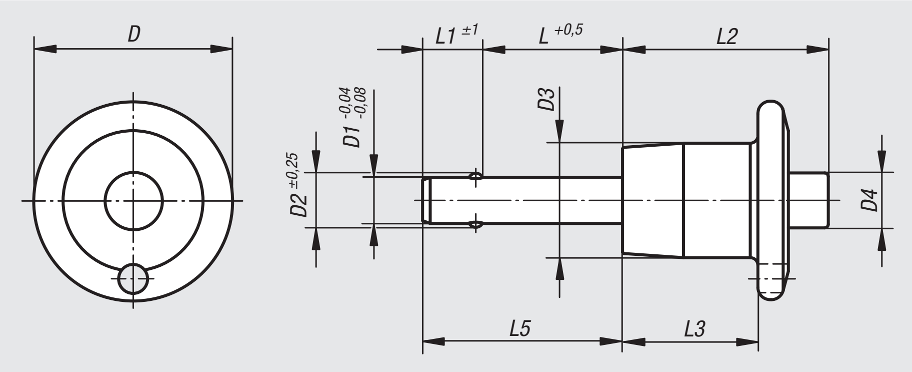
Accessories:
Safety spiral cable: 03199-10200
Retaining cable with loop: 03199-...
Key Ring 03199-15/19/23
Bushing for ball lock pins 03197....

Order No.	D	D1	D2	D3	L	L1	L2	L5	Receiving hole H11	Shearing force double shear max.kN
03194-2305* **	25	5	5,5	14	10/15/20/25/30	6	26,5	16/21/26/31/36	5	15
03194-2306* **	25	6	6,85	14	10/15/20/25/30/35/40/45/50	7	26,5	17/22/27/32/37/42/47/52/57	6	22
03194-2308* **	25	8	9,5	14	20/25/30/35/40/45/50	8	26,5	28/33/38/43/48/53/58	8	38
03194-3110* **	33	10	12	19	20/25/30/35/40/45/50/60	9	34,6	29/34/39/44/49/54/59/69	10	60
03194-3112* **	33	12	14,5	19	25/30/35/40/45/50/60/70/80	10	34,6	35/40/45/50/55/60/70/80/90	12	86
03194-3116* **	33	16	19	20	30/35/40/45/50/60/70/80	13,3	34,6	43,3/48,3/53,3/58,3/63,3/73,3/83,3/93,3	16	153

03194

Ball lock pins with mushroom grip

stainless steel



Material:
Pin stainless steel 1.4542.
Mushroom knob and push button stainless steel 1.4305.
Balls stainless steel 1.4125.
Compression spring stainless steel.

Version:
All stainless steel parts passivated.
Pin hardened to min. 40 HRC.
Balls hardened to 58 +4 HRC.

Sample order:
nlm 03194-02105030
(include length L e.g. 030 for L = 30 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely. If required, the ball lock pins can be fitted with a retaining cable.

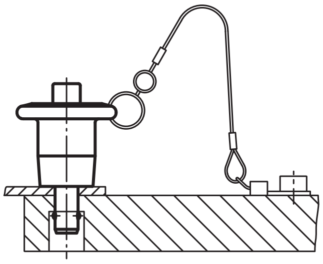
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

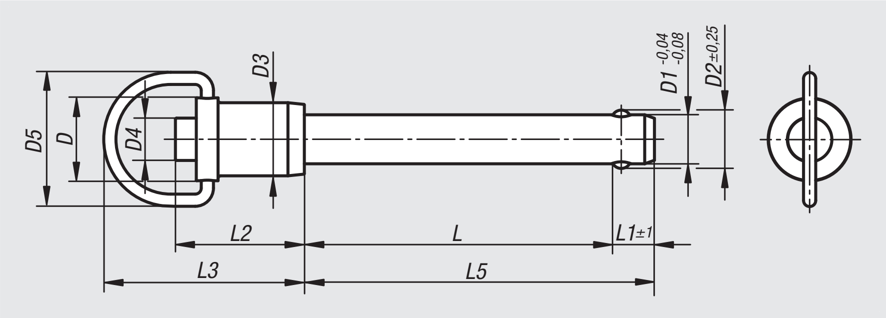
Accessories:
Bushes for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199



Order No.	D	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03194-02105***	20,6	5	5,54	11,9	5,8	10/15/20/25/30/35/40/50/60/70	6	23,4	16	16/21/26/31/36/41/46/56/66/76	5	24,4
03194-02106***	20,6	6	6,99	11,9	5,8	10/15/20/25/30/35/40/50/60/70/80	7	23,4	16	17/22/27/32/37/42/47/57/67/77/87	6	35,64
03194-02108***	20,6	8	9,42	11,9	5,8	10/15/20/25/30/35/40/50/60/70/80	8	23,4	16	18/23/28/33/38/43/48/58/68/78/88	8	63,8
03194-02510***	25,4	10	11,86	14,2	7,4	15/20/25/30/35/40/50/60/70/80/90/100	9	25,7	17,8	24/29/34/39/44/49/59/69/79/89/99/109	10	100,1
03194-03512***	34,7	12	14,45	18,3	10,7	20/25/30/35/40/50/60/70/80/90/100	10	32,3	21,6	30/35/40/45/50/60/70/80/90/100/110	12	144,06

Ball lock pins with grip ring

stainless steel



Material:
Pin stainless steel 1.4542.
Head and push button stainless steel 1.4305.
Balls stainless steel 1.4125.
Spring stainless steel.
Grip ring and key ring stainless steel.

Version:
All stainless steel parts passivated.
Pin, hardened to min. 40 HRC.
Balls hardened to 58 +4 HRC.

Sample order:
nlm 03194-01505030
(Include length L e.g. 030 for L = 30 mm)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. Release the button to lock the balls and secure the connection. If required, the ball lock pins can be fitted with a retaining cable.

The hardened, high-tensile stainless steel pin permits extreme loads with low wear. Thanks to the high corrosion and acid resistance, they are mainly used in the foodstuff industry, in the chemical and petrochemical industry and as constructional elements in the aerospace industry.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

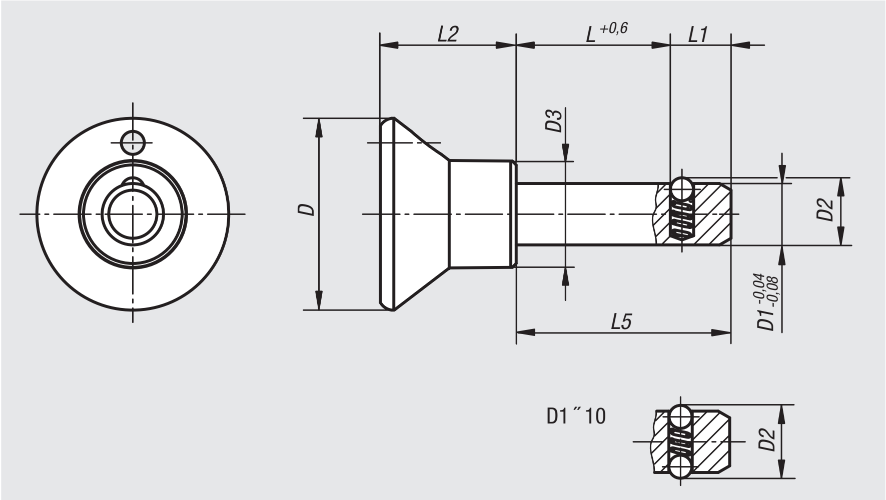
Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Accessories:
Safety spiral cable 03199-10200
Retaining cable with loop 03199- ....
Key ring 03199-15/19/23
Bushing for ball lock pins 03197-...

Order No.	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03194-01505***	15	5	5,54	11,9	5,8	29,5	10/15/20/25/30/35/40/45/50/60/70/80/90/100	6	23,4	36,8	16	5	24,4
03194-01506***	15	6	6,99	11,9	5,8	29,5	10/15/20/25/30/35/40/45/50/60/70/80/90/100	7	23,4	36,8	17	6	35,64
03194-01508***	15	8	9,42	11,9	5,8	29,5	10/15/20/25/30/35/40/45/50/60/70/80/90/100	8	23,4	36,8	18	8	63,8
03194-01710***	16,5	10	11,86	14,2	7,4	29,5	15/20/25/30/35/40/45/50/60/70/80/90/100	9	25,7	38,6	24	10	100,1
03194-02112***	20,6	12	14,45	18,3	10,7	36,3	20/25/30/35/40/45/50/60/70/80/90/100	10	32,3	47,8	30	12	144,06
03194-02716***	26,9	16	19	23,9	13,7	43,7	25/30/35/40/45/50/60/70/80/90/100	14	41,9	65,3	39	16	257,18

03195

Locking pins



Material:
Grip thermoplastic.
Steel parts stainless steel.

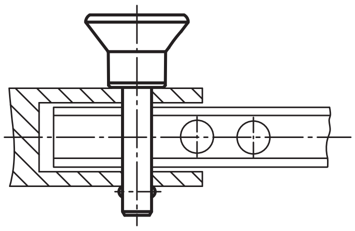
Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03195-2508020
(include length L, e.g. 020 for L = 20 mm)

Note:
Locking pins are used for quick and easy fixating and joining of parts and workpieces.

Shearing force double-shear (F) = S · τ aB max.

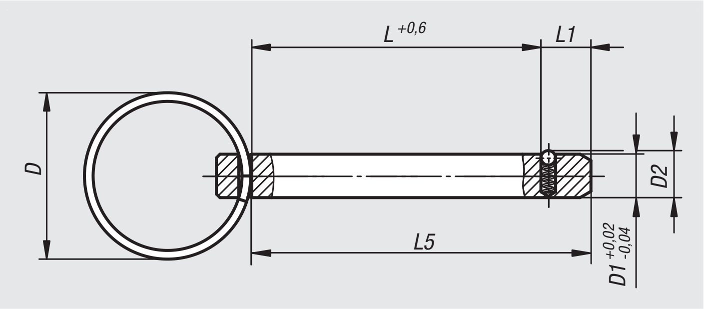
Accessories:
Safety spiral cable 03199-10200
Restraining cable with eye 03199-....
Key ring 03199-15/19/23
Bushing for ball lock pins 03197....



Order No.	D	D1	D2	D3	L	L1	L2	L5	Receiving hole H11	Shearing force double shear max.kN
03195-2506* **	25	6	6,5	14	10/15/20/25/30/40/50	7	17,7	17/22/27/32/37/47/57	6	22
03195-2508* **	25	8	8,75	14	15/20/25/30/40/50	8	17,7	23/28/33/38/48/58	8	38
03195-3310* **	33	10	12	19	15/20/25/30/40/50	9	24	24/29/34/39/49/59	10	60
03195-3312* **	33	12	14,5	19	20/30/40/50	10	24	30/40/50/60	12	86

Locking pins

with key ring



Material:
Pin steel.
Key ring stainless steel.

Version:
Pins electro zinc-plated.
Key ring bright.

Sample order:
nlm 03195-102306015

Note:
Locking pins are used for quick and easy fixating and joining of parts and workpieces.

Shearing force double shear (F) = S · τ aB max.

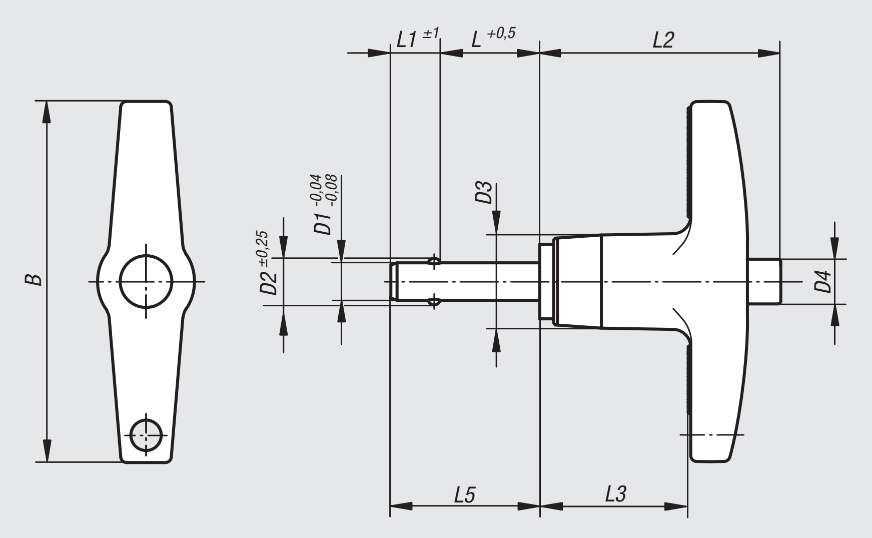
The locking pins with key ring represent a cost-effective alternative to other locking pins.

Order No.	D	D1	D2	L	L1	L5	Shearing force double shear max.kN
03195-102306015	23	6	6,5	15	7	22	22
03195-102306020	23	6	6,5	20	7	27	22
03195-102306030	23	6	6,5	30	7	37	22
03195-102306040	23	6	6,5	40	7	47	22
03195-102808030	28	8	8,8	30	8	38	38
03195-102808040	28	8	8,8	40	8	48	38
03195-102808050	28	8	8,8	50	8	58	38

03196

Ball lock pins

with T-grip



Material:
Pin 1.4542 stainless steel.
Grip die-cast aluminium EN-AC 46000.
Push button aluminium EN-AW 2024 T4.
Balls 1.4125 stainless steel.
Spring stainless steel wire.

Version:
All stainless steel parts passivated.
Pin hardened to min. 40 HRC.
Grip black anodised.
Push button blue anodised.
Balls hardened to 58 +4 HRC.

Sample order:
nlm 03196-24605030
(include length L e.g. 030 for L = 30 mm)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. Release the button to lock the balls and secure the connection. If required, the ball lock pins can be fitted with a retaining cable.

The hardened, high-tensile stainless steel pin permits extreme loads with low wear.

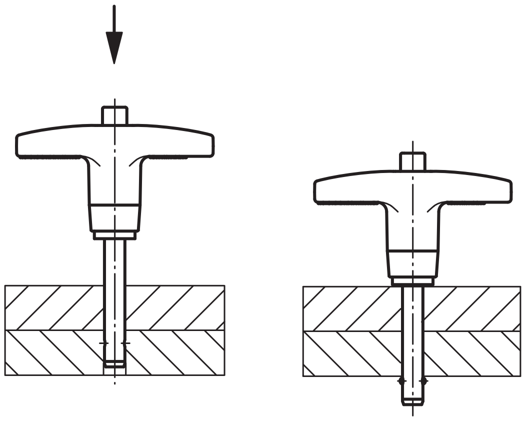
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

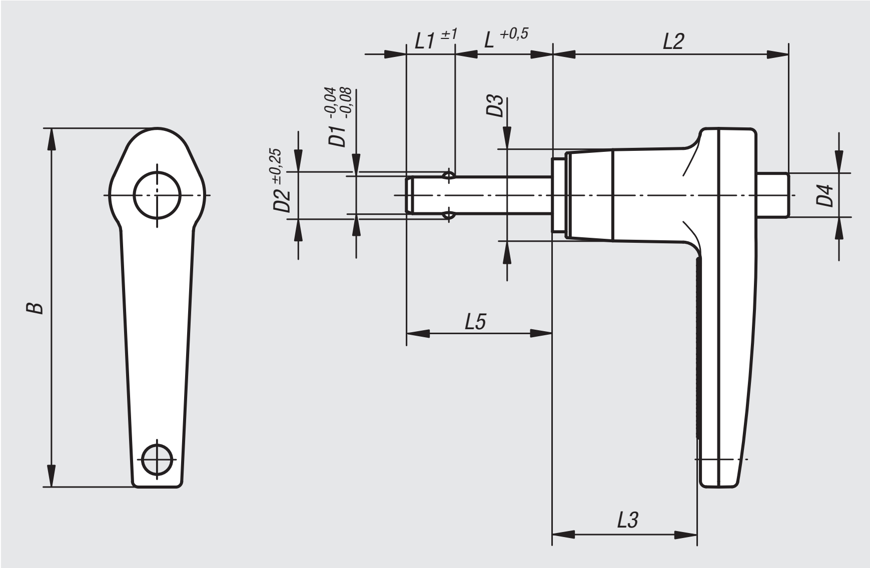
Accessories:
Safety spiral cable 03199-10200
Retaining cable with loop 03199-....
Key ring 03199-15/19/23/28
Bushing for ball lock pins 03197....



Order No.	B	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03196-24605***	46	5	5,54	11,9	5,8	10/15/20/25/30/35/40/50/60/70	6	30,7	19,3	16/21/26/31/36/41/46/56/66/76	5	24,4
03196-24606***	46	6	6,99	11,9	5,8	10/15/20/25/30/35/40/50/60/70/80	7	30,7	19,3	17/22/27/32/37/42/47/57/67/77/87	6	35,64
03196-24608***	46	8	9,42	11,9	5,8	10/15/20/25/30/35/40/50/60/70/80	8	30,7	19,3	18/23/28/33/38/43/48/58/68/78/88	8	63,8
03196-25110***	50,8	10	11,86	14,2	7,4	15/20/25/30/35/40/50/60/70/80/90/100	9	34,8	22,1	24/29/34/39/44/49/59/69/79/89/99/109	10	100,1
03196-25812***	57,2	12	14,45	18,3	10,7	20/25/30/35/40/50/60/70/80/90/100	10	40,6	25,4	30/35/40/45/50/60/70/80/90/100/110	12	144,06
03196-27816***	78	16	19	23,9	13,7	25/30/35/40/50/60/70/80/90/100	14	45	28,2	39/44/49/54/64/74/84/94/104/114	16	257,18

Ball lock pins

with L-grip



Material:
Pin 1.4542 stainless steel.
Grip die-cast aluminium EN-AC 46000.
Push button aluminium EN-AW 2024 T4.
Balls 1.4125 stainless steel.
Spring stainless steel wire.

Version:
All stainless steel parts passivated.
Pin hardened to min. 40 HRC.
Grip black anodised.
Push button blue anodised.
Balls hardened to 58 +4 HRC.

Sample order:
nlm 03196-14405030
(include length L e.g. 030 for L = 30 mm)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. Release the button to lock the balls and secure the connection. If required, the ball lock pins can be fitted with a retaining cable.

The hardened, high-tensile stainless steel pin permits extreme loads with low wear.

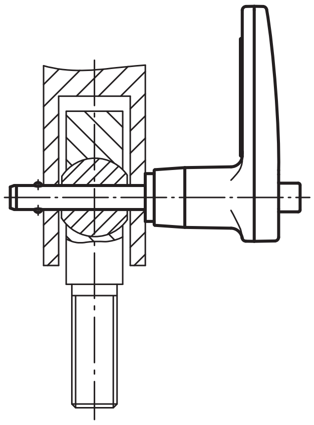
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

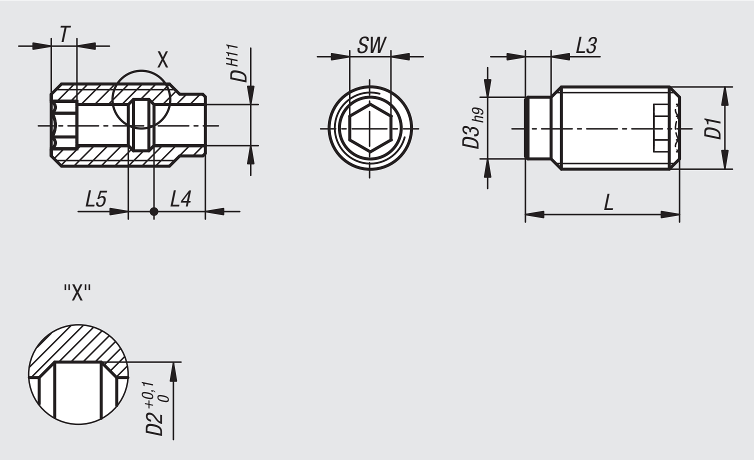
Accessories:
Safety spiral cable 03199-10200
Retaining cable with loop 03199-....
Key ring 03199-15/19/23
Bushing for ball lock pins 03197....



Order No.	B	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03196-14405* **	46,7	5	5,54	11,9	5,8	10/15/20/25/30/35/40/50/60/70	6	30,7	19,3	16/21/26/31/36/41/46/56/66/76	5	24,4
03196-14406* **	46,7	6	6,99	11,9	5,8	10/15/20/25/30/35/40/50/60/70/80	7	30,7	19,3	17/22/27/32/37/42/47/57/67/77/87	6	35,64
03196-14408* **	46,7	8	9,42	11,9	5,8	10/15/20/25/30/35/40/50/60/70/80	8	30,7	19,3	18/23/28/33/38/43/48/58/68/78/88	8	63,8
03196-15110* **	54,1	10	11,86	14,2	7,4	15/20/25/30/35/40/50/60/70/80/90/100	9	34,8	22,1	24/29/34/39/44/49/59/69/79/89/99/109	10	100,1
03196-15712* **	60,2	12	14,45	18,3	10,7	20/25/30/35/40/50/60/70/80/90/100	10	40,6	25,4	30/35/40/45/50/60/70/80/90/100/110	12	144,06
03196-16816* **	68,3	16	19	23,9	13,7	25/30/35/40/50/60/70/80/90/100	14	45	28,2	39/44/49/54/64/74/84/94/104/114	16	257,18

03197

Bushing for ball lock pins



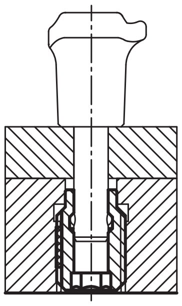
Material:
Stainless steel 1.4305.

Version:
Bright.

Sample order:
nlm 03197-11224

Note:
These bushes are ideal for easy and quick positioning of ball lock pins and locking pins.

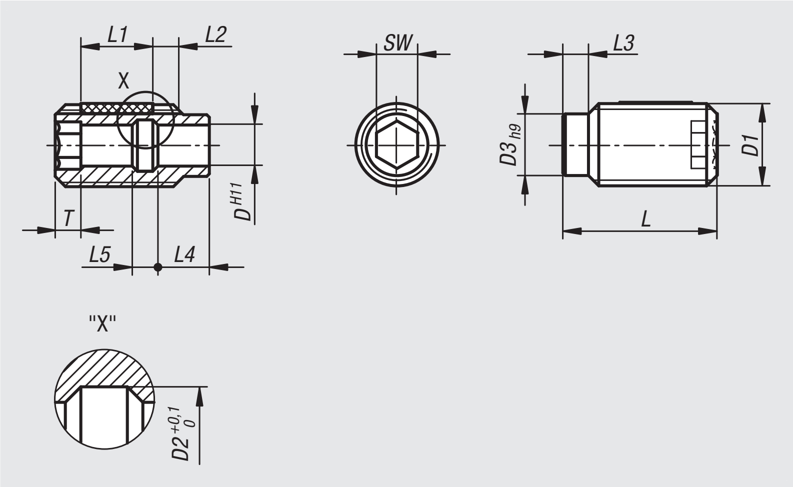
Advantages:
- centred by the centring collar.
- easy and reliable installation.
- can be screwed into various materials.
- usable both sides



Order No.	D	D1	D2	D3	L	L3	L4	L5	SW	T
03197-10512	5	M12	6	9	25	4	7	3	5	4
03197-10616	6	M16	7,5	12	30	5	10	5	6	5
03197-10816	8	M16	10	12	30	5	10	5	8	5
03197-11024	10	M24	13	18	35	6	8	7	10	6
03197-11224	12	M24	15	18	35	6	8	7	12	6
03197-11630	16	M30	20	24	40	8	11	9	16	7

Bushing for ball lock pins

with LONG-LOK thread lock



Material:
Stainless steel 1.4305.

LONG-LOK thread lock Nylon.

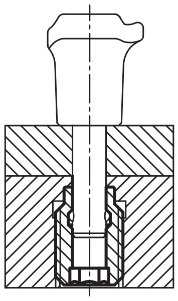
Version:
Bright.

Sample order:
nlm 03197-112241

Note:
These bushes are ideal for easy and quick positioning of ball lock pins and locking pins.

Advantages:
- centred by the centring collar.
- easy and reliable installation.
- can be screwed into various materials.
- usable both sides
- the LONG-LOK thread lock enables the depth to be exactly matched to existing components, no locknut is required.

Drawing reference:
L2 = approx. 2x thread pitch



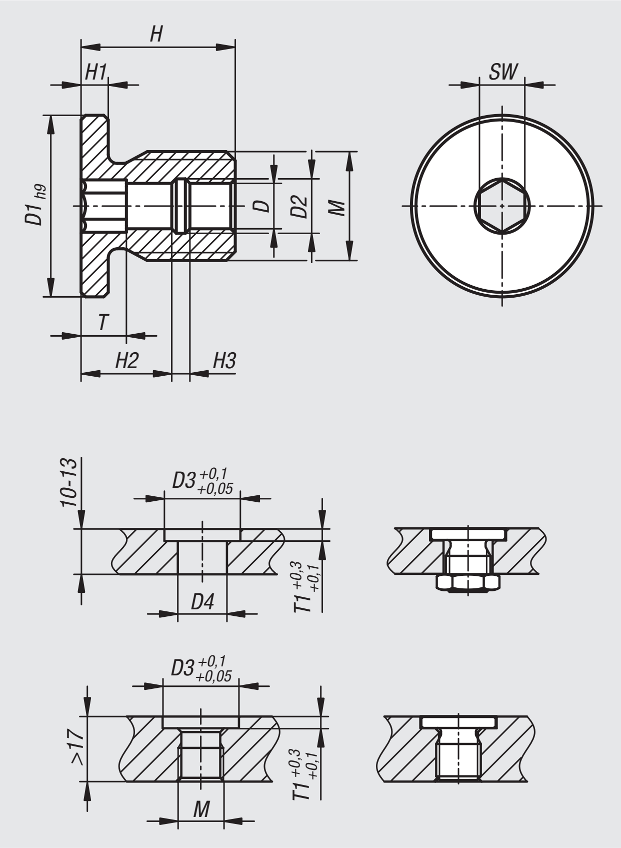
Order No.	D	D1	D2	D3	L	L1	L3	L4	L5	SW	T
03197-105121	5	M12	6	9	25	10	4	7	3	5	4
03197-106161	6	M16	7,5	12	30	14	5	10	5	6	5
03197-108161	8	M16	10	12	30	14	5	10	5	8	5
03197-110241	10	M24	13	18	35	14	6	8	7	10	6
03197-112241	12	M24	15	18	35	14	6	8	7	12	6
03197-116301	16	M30	20	24	40	14	8	11	9	16	7

03197-05

Locating bushes with collar, stainless steel

for ball lock pins

EDELSTAHL Rost frei STAINLESS STEEL



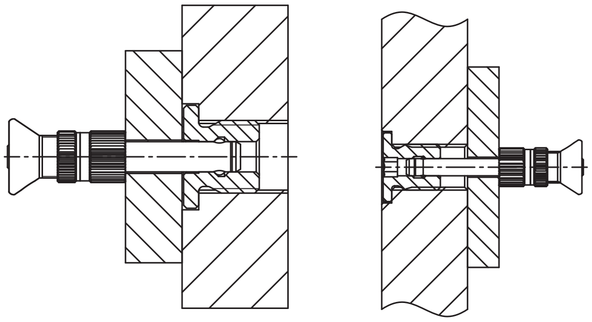
Material:
Stainless steel 1.4305.

Version:
Bright.

Sample order:
nlm 03197-05-10512

Note:
Locating bushes for ball lock pins are ideal for easy and quick positioning of ball lock pins and locking pins.
The collar serves as a stop at one end.
With hex socket to help screw in.

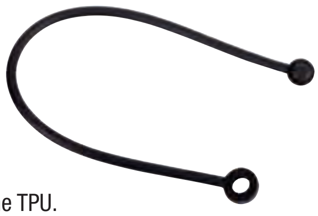
Advantages:
- The collar guarantees a defined screw-in depth.
- Easy and reliable screwing in.
- Can be screwed into various materials.
- Can be used from both sides.



Order No.	D	D1	D2	D3	D4	H	H1	H2	H3	M	SW	T	T1
03197-05-10512	5	20	6	20	13,5	17	3	10	2	M12	5	5	3
03197-05-10616	6	24	7,5	24	17,5	20	3	10	5	M16	6	5	3
03197-05-10816	8	24	10	24	17,5	20	3	10	5	M16	8	5	3
03197-05-11024	10	34	13	34	25	25	5	10	5	M24	10	5	5
03197-05-11224	12	34	15	34	25	25	5	10	5	M24	12	5	5
03197-05-11630	16	40	20	40	31	28	5	10	8	M30	16	5	5

03198

Safety cable



Material:
Thermoplastic urethane TPU.

Sample order:
nlm 03198-04190

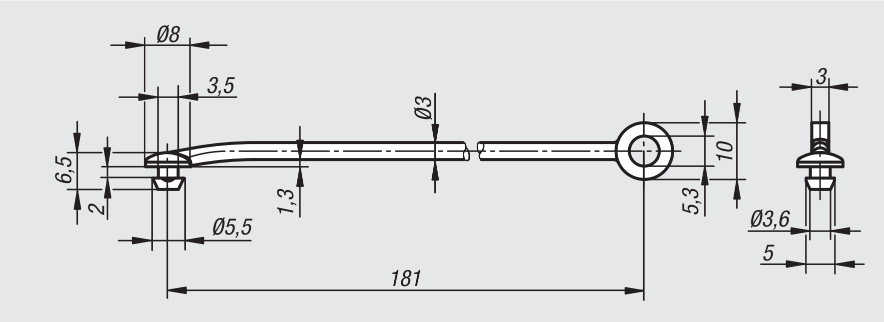
Note:
The safety cable is distinguished by its high elongation and good rebound resilience.

It was especially conceived for the star grips 06212, 06220 as an unlosable operating part.

Refitting of existing star grips 06212, 06220 as well as knurled knobs 06266/06267 and knurled knobs 06092 from our assortment is possible with this safety cable.

Assembly:
Recommended hole Ø 3.8 $_{-0.1}$ The hole edge should be deburred. A Teflon based lubrication is recommended to aid assembly.

On request:
Can be combined with other products.



Order No.	Dimensions
03198-04190	see drawing

03199

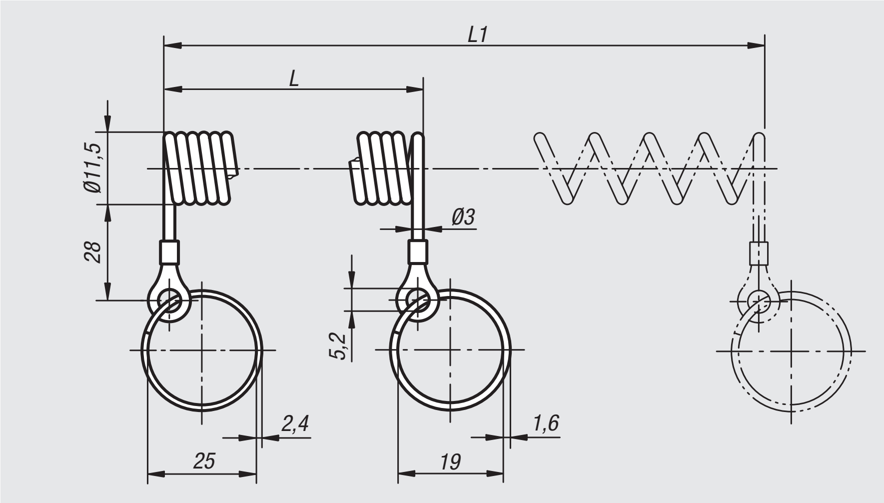
Safety spiral cable

Material:
Spiral cable PUR.
Eye copper or stainless steel.
Key ring steel or stainless steel.

Version:
Spiral cable black.
Eye, zinc-plated copper or bright stainless steel.
Key ring, chromed steel or bright stainless steel.

Sample order:
nlm 03199-10200

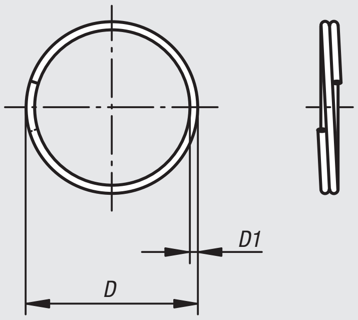
Note:
Elastic spiral cable to secure equipment parts. Very good reset force, robust and wear-resistant.



Order No.	Key Rings	L	L1
03199-10100	steel	100	500
03199-10200	steel	200	1000
03199-20100	stainless steel	100	500
03199-20200	stainless steel	200	1000

Key rings

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Stainless steel 1.4310.

Version:
Bright.

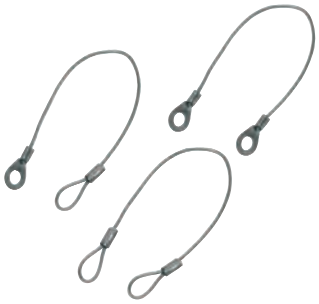
Sample order:
nlm 03199-23

Note:
Suitable for spiral cable 03199, ball lock pins 03193, 03194, 03196, locking pins 03195 and indexing plungers 03092, 03096, 03098.

Order No.	D	D1
03199-15	15	1.0
03199-19	19	1.0
03199-23	23	1.2
03199-28	28	1.7

Notes

Retaining cables

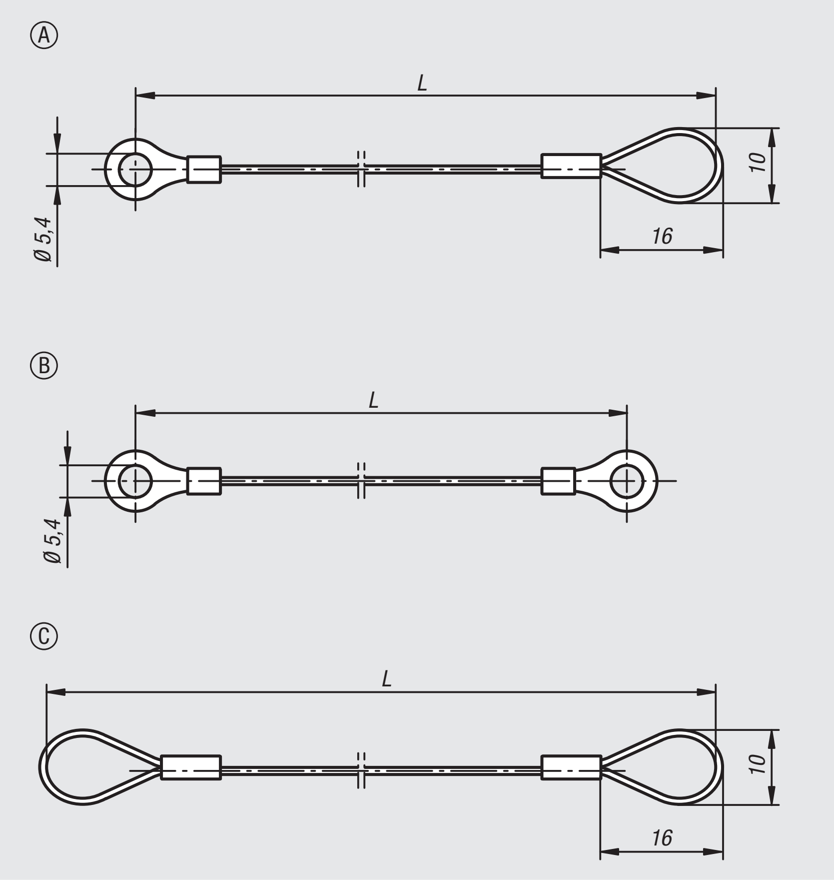


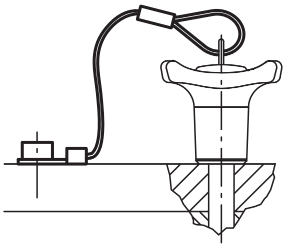
Material:
Cable stainless steel.
Crimp and end terminal aluminium.

Version:
Cable plastic coated.

Sample order:
nlm 03199-0200

Note:
With the retaining cable and pin ring (03199) the ball lock pins (03193, 03194 and 03196) can be secured so that they cannot be lost. An M5 screw is used to secure the retaining cable.
Application temperature: +80 °C.



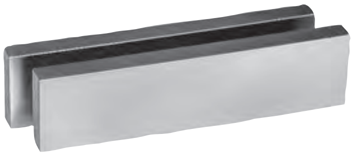


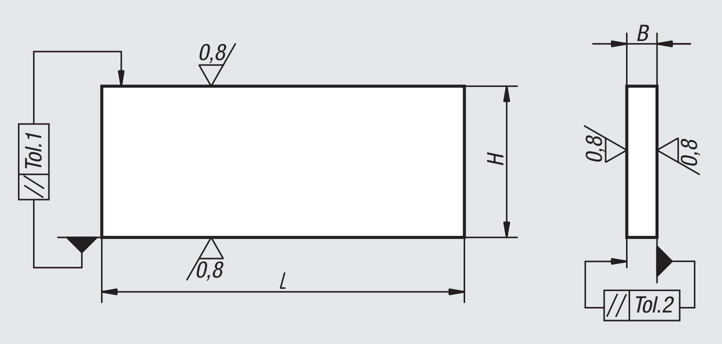
Order No.	Form	L
03199-0150	A	150
03199-0200	A	200
03199-0300	A	300
03199-0500	A	500
03199-1150	B	150
03199-1200	B	200
03199-1300	B	300
03199-1500	B	500
03199-2150	C	150
03199-2200	C	200
03199-2300	C	300
03199-2500	C	500

03200

Parallel blocks pair

DIN 6346



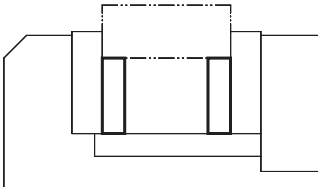


Material:
Steel.

Version:
Hardened and ground, precision grade 1, paired tolerance IT 5, nominal dimensional tolerance DIN ISO 2768-mK

Sample order:
nlm 03200-10

On request:
Several matched pairs.



Order No.	H	Tolerance 1	Tolerance DIN ISO 2768-mK	Tolerance per pair IT 5	B	Tolerance 2	Tolerance DIN ISO 2768-mk (2)	Tolerance per pair IT 5 (2)	L
03200-01	8	0,006	±0,2	±0,006	2,5	0,004	±0,1	±0,005	63
03200-02	10	0,006	±0,2	±0,006	3,2	0,005	±0,1	±0,005	63
03200-03	12	0,008	±0,2	±0,008	4	0,005	±0,1	±0,005	63
03200-04	16	0,008	±0,2	±0,008	5	0,005	±0,1	±0,005	63
03200-05	20	0,009	±0,2	±0,009	6,3	0,006	±0,2	±0,006	63
03200-06	12	0,008	±0,2	±0,008	4	0,005	±0,1	±0,005	100
03200-07	16	0,008	±0,2	±0,008	5	0,005	±0,1	±0,005	100
03200-08	20	0,009	±0,2	±0,009	6,3	0,006	±0,2	±0,006	100
03200-09	25	0,009	±0,2	±0,009	8	0,006	±0,2	±0,006	100
03200-10	32	0,011	±0,3	±0,011	10	0,006	±0,2	±0,006	100
03200-11	40	0,011	±0,3	±0,011	12	0,008	±0,2	±0,008	100
03200-12	25	0,009	±0,2	±0,009	8	0,006	±0,2	±0,006	160
03200-13	32	0,011	±0,3	±0,011	10	0,006	±0,2	±0,006	160
03200-14	40	0,011	±0,3	±0,011	12	0,008	±0,2	±0,008	160
03200-15	50	0,011	±0,3	±0,011	16	0,008	±0,2	±0,008	160
03200-16	63	0,013	±0,3	±0,013	20	0,009	±0,2	±0,009	160
03200-17	63	0,013	±0,3	±0,013	20	0,009	±0,2	±0,009	250
03200-18	80	0,013	±0,3	±0,013	25	0,009	±0,2	±0,009	250
03200-19	100	0,015	±0,3	±0,015	32	0,011	±0,3	±0,011	250

03212

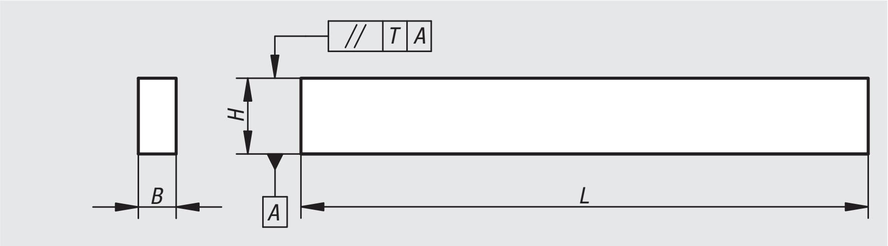
Parallel block sets

Material:
Steel.

Version:
Case-hardened and ground.
Paired height tolerance 0.004 mm, nominal dimension height tolerance of ±0.004 mm.
B and L nominal dimension tolerances acc. to DIN ISO 2768-m.

Sample order:
nlm 03212-01

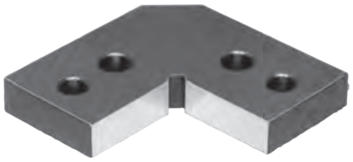
Note:
The parallel block set is supplied in a wooden box with removable lid.



Order No.	Contents 1 pair of each H x B x L	H paired tolerance T	H nom. dim. tolerance
03212-01	14x10x150, 16x10x150, 18x10x150, 20x10x150, 22x10x150, 24x10x150, 26x10x150, 28x10x150, 30x10x150, 32x10x150, 35x10x150, 40x10x150, 45x10x150, 50x10x150	0,004	±0,004

03220

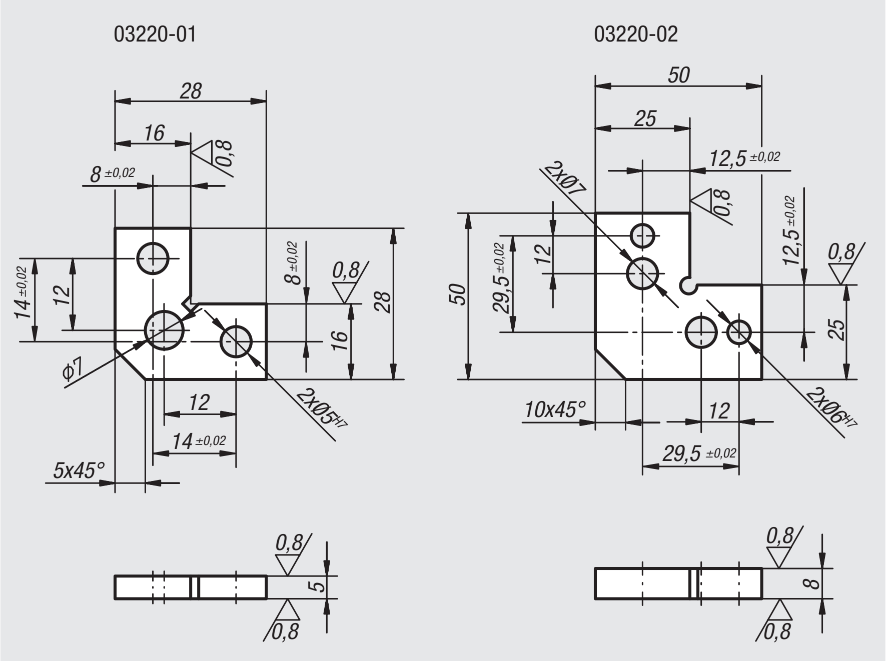
Positioning brackets

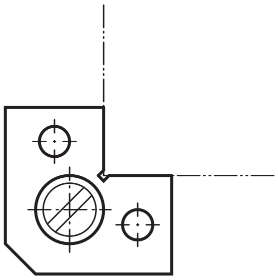


Material:
Carbon steel 1.7225

Version:
nitrided.

Sample order:
nlm 03220-02





Order No.	Dimensions
03220-01	see drawing
03220-02	see drawing

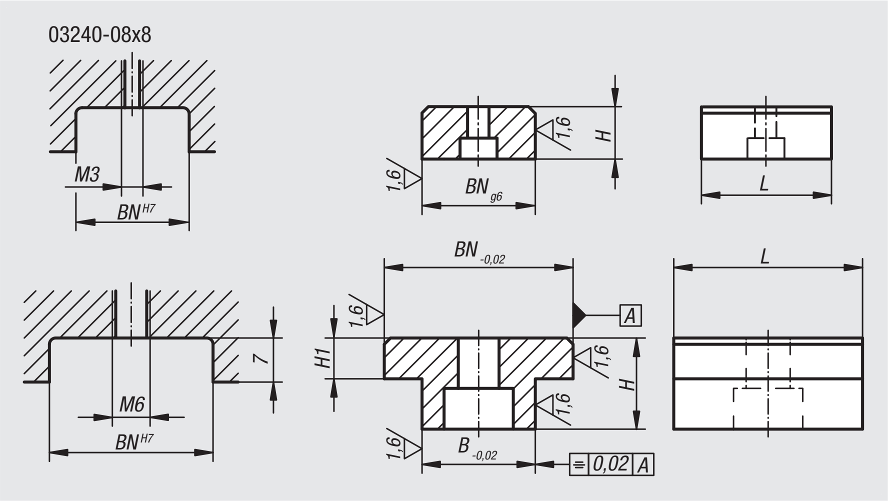
03240

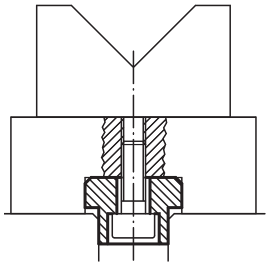
T-slot keys

Material:
Carbon steel 1.1191

Version:
Black oxidised.

Sample order:
nlm 03240-08X8 (include dimension B1)

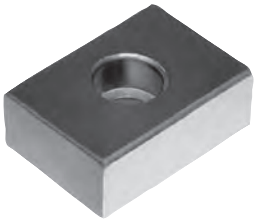




Order No.	BN=Slot width	B	H	H1	L
03240-08X	8	8	8	-	20
03240-12X	20/22/30	12	14	6	30
03240-14X	20/22/30	14	14	6	30
03240-16X	20/22/30	16	14	6	30
03240-18X	20/22/30	18	14	6	30
03240-22X	20/22/30	22	14	6	30

03250

Slot keys

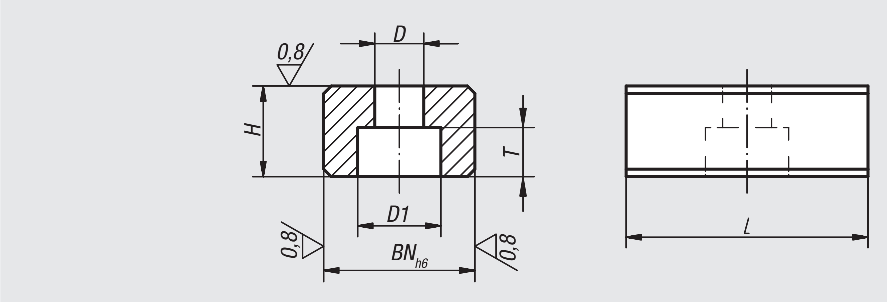


Material:
Steel.

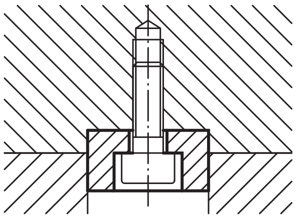
Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 03250-16

Note:
Slot keys are used to align fixtures and clamps on machine tables with DIN 650 T-slots. They are screwed into the fixture alignment slots. Slot keys are only used when the fixture and machine table have the same slot width.

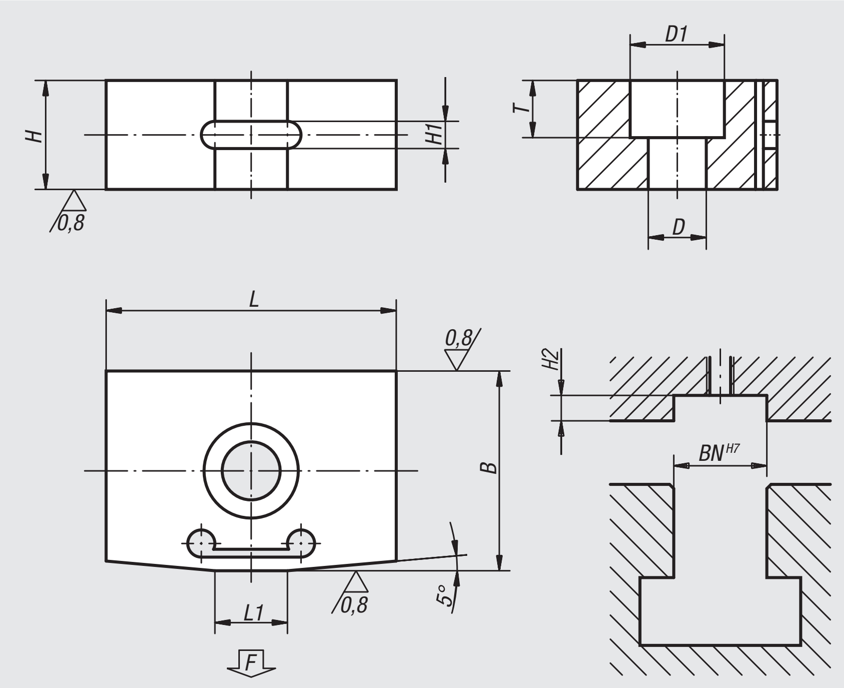


Order No.	BN=Slot width	D	D1	H	L	T	for screws DIN 84 or 912
03250-10	10	4,5	8	8	20	4,3	M4x10
03250-12	12	5,3	10	8	20	5,3	M5x12
03250-14	14	6,6	11	10	22	6,3	M6x16
03250-16	16	6,6	11	10	22	6,3	M6x16
03250-18	18	6,6	11	10	22	6,3	M6x16
03250-20	20	6,6	11	10	22	6,3	M6x16
03250-22	22	6,6	11	12	32	6,3	M6x16



Elastic slot keys

Pat. No. 4200676



Material:
Steel.

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 03252-12

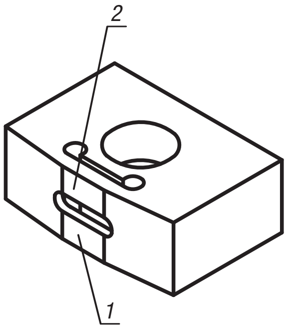
Note:
Elastic slot keys are used to align fixtures and clamps play-free on machine tables with DIN 650 T-slots.

Advantages:
- Play-free seating through elastic deformation.
- The two-part sprung face allows the tolerance play of the guide slots in the machine table and fixture/clamp to be independently equalised.
- Repeat accuracies within 0.005 mm are possible.

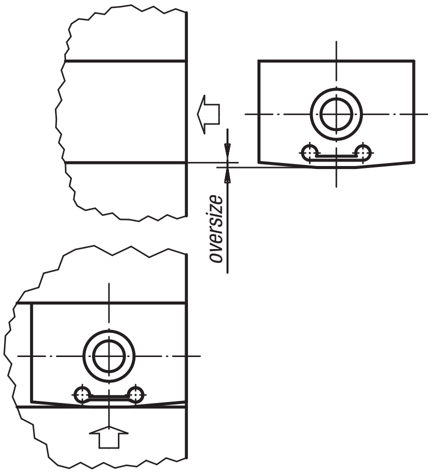
Drawing reference:
Independent compensation of two different slot dimensions

Spring surface 1:
Adjusted to the guide slot of the add-on part (fixture/chucking tool).

Spring surface 2:
Adjusted to the guide slot of the supporting table.



elastic deformation produces playfree seating

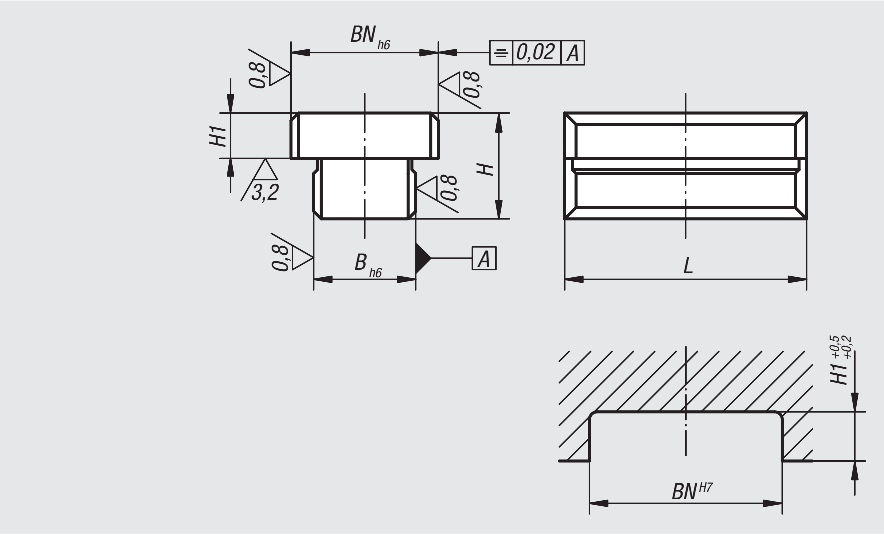


Order No.	BN=Slot width	B	D	D1	H	H1	H2	L	L1	T	Approx. spring force at 0,02 spring tension	Approx. spring force at 0,03 spring tension
03252-10	10	10 +0,035 +0,020	4,3	7,4	8	2	4	20	6	4,3	100	200
03252-12	12	12 +0,038 +0,023	5,3	9,4	8	2	4	20	6	5,3	100	200
03252-14	14	14 +0,038 +0,023	6,4	10,4	10	3	5	22	8	6,3	100	200
03252-16	16	16 +0,038 +0,023	6,4	10,4	10	3	5	22	8	6,3	100	200
03252-18	18	18 +0,038 +0,023	6,4	10,4	10	3	5	22	8	6,3	100	200
03252-20	20	20 +0,040 +0,025	6,4	10,4	10	3	5	22	8	6,3	100	200
03252-22	22	22 +0,040 +0,025	6,4	10,4	12	3	6	32	11	6,3	100	200

03260

Slot keys loose

DIN 6323

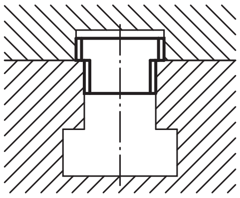


Material:
Hardened steel 1.0401

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 03260-14

Note:
Loose slot keys 03260 acc. to DIN 6323 combine the advantages of fixed slot keys with the improved handling of machine vices, dividing heads and fixtures. These keys can slide sideways after rough alignment.
No protruding key on the base to damage the machine table when moving the fixture.

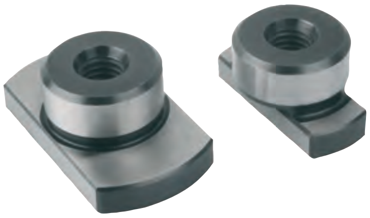


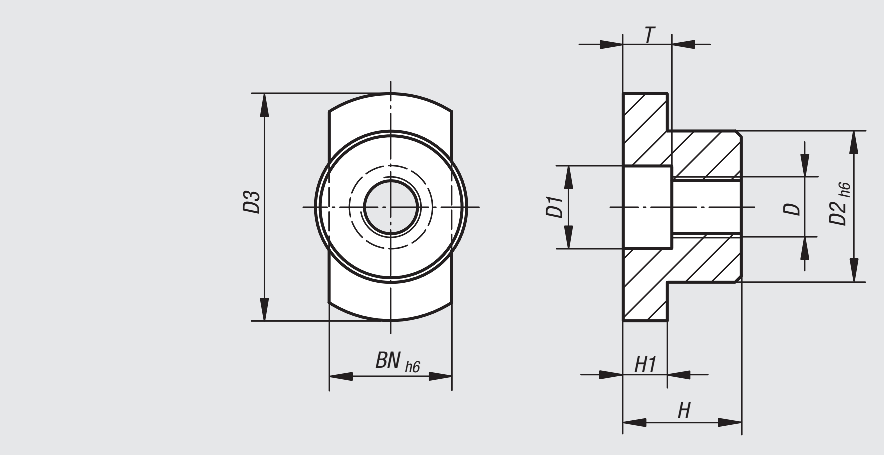
Order No.	BN=Slot width	B	H	H1	L
03260-10	12	10	12	3,6	20
03260-12	20	12	14	5,5	32
03260-14	20	14	14	5,5	32
03260-16	20	16	14	5,5	32
03260-18	20	18	14	5,5	32

03270

Slot keys

with locating pin



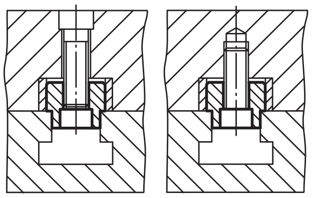


Material:
Steel.

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 03270-10

Note:
To align fixtures and clamping elements on subplates and palettes with location holes.
They can be mounted in holes or slots.



Order No.	BN=Slot width	D	D1	D2	D3	H	H1	T
03270-10	10	M8	11	20	30	15,5	5,8	6,4
03270-12	12	M8	11	20	30	15,5	5,8	6,4
03270-14	14	M8	11	20	30	15,5	5,8	6,4
03270-16	16	M8	11	20	30	15,5	5,8	6,4
03270-18	18	M8	11	20	30	15,5	5,8	6,4
03270-20	20	M8	11	20	36	15,5	5,8	6,4
03270-22	22	M8	11	20	40	15,5	5,8	6,4

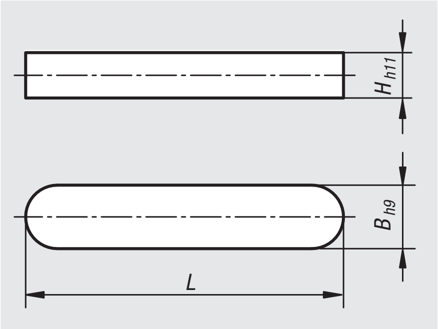
Parallel keys

DIN 6885 A

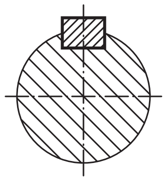
Material:
Steel 1.1192 or stainless steel 1.4571.

Version:
Bright.

Sample order:
nlm 03288-04X12 (include length L)



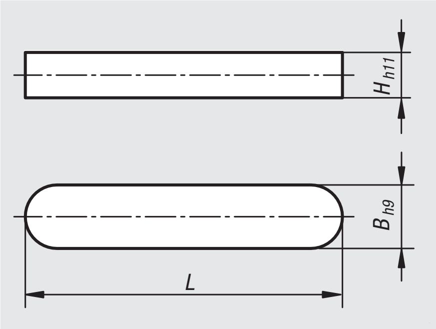
Application example:



Order No.	Main material	B	H	L = length
03288-03X	steel	3	3	8/10/12/14/16/18/20/22/25/28
03288-04X	steel	4	4	8/10/12/14/16/18/20/22/25/28
03288-05X	steel	5	5	12/14/16/18/20/22/25/28/32/36/40
03288-06X	steel	6	6	12/14/16/18/20/22/25/28/32/36/40/45
03288-08X	steel	8	7	14/16/18/20/22/25/28/32/36/40/45/50/70
03288-10X	steel	10	8	22/25/28/32/36/40/45/50/56/70/80
03288-12X	steel	12	8	25/28/32/36/40/45/50/56/70/80
03288-14X	steel	14	9	25/28/32/36/40/45/50/56/70/80
03288-16X	steel	16	10	50/56/63/70/80/90/100
03288-103X	stainless steel	3	3	10/12/16/20
03288-104X	stainless steel	4	4	10/12/14/16/18/20/22
03288-105X	stainless steel	5	5	12/14/16/18/20/22/25/28/36/40
03288-106X	stainless steel	6	6	12/14/16/18/20/22/25/28/32/36/40
03288-108X	stainless steel	8	7	16/18/20/22/25/28/32/36/40/45/50/70
03288-110X	stainless steel	10	8	22/25/28/32/36/40/45/50/56/70/80
03288-112X	stainless steel	12	8	28/32/36/40/45/50/56/70/80
03288-114X	stainless steel	14	9	32/40/45/50/56/70/80
03288-116X	stainless steel	16	10	50/63/70/80/90/100

Parallel key, ceramic

similar to DIN 6885 A



Material:
High performance ceramic Z141.

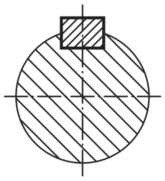
Version:
Ground

Sample order:
nlm 03288-01-03X8 (include length L)

Note:
Parallel keys are used for the implementation of shaft-hub connections. These are positive connections which are used to transmit torque.

Advantages:
- Exceptionally wear-resistant
- Dimensionally stable even at high temperatures
- Electrically insulating
- Frequency neutral

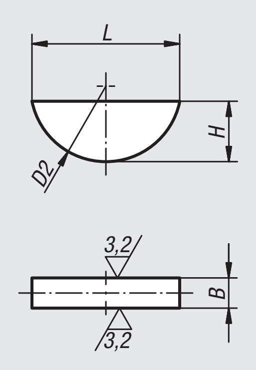
Application example:



Order No.	B	H	L = length
03288-01-03X	3	3	8/16/25
03288-01-04X	4	4	8/16/25
03288-01-05X	5	5	12/22/40
03288-01-06X	6	6	12/22/40
03288-01-08X	8	7	14/70
03288-01-10X	10	8	22/36
03288-01-12X	12	8	25/40
03288-01-14X	14	9	25/40
03288-01-16X	16	10	50/70

Woodruff keys

DIN 6888

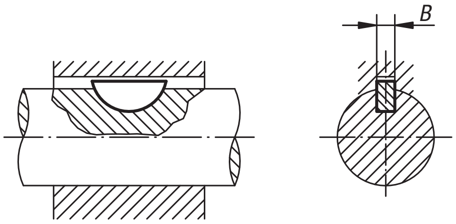


Material:
Steel 1.1192

Version:
Bright.

Sample order:
nlm 03289-04X65
(Include dimension H, e.g. 65 for H = 6.5 mm)

On request:
Stainless steel 1.4571 woodruff keys.



Order No.	B	H	L	D2
03289-02X5	2	5	12,6	13
03289-03X5	3	5	12,6	13
03289-03X65	3	6,5	15,7	16
03289-04X5	4	5	12,6	13
03289-04X65	4	6,5	15,7	16
03289-04X75	4	7,5	18,6	19
03289-05X65	5	6,5	15,7	16
03289-05X75	5	7,5	18,6	19
03289-05X9	5	9	21,6	22
03289-06X9	6	9	21,6	22
03289-06X10	6	10	24,5	25
03289-06X11	6	11	27,3	28
03289-08X11	8	11	27,3	28
03289-08X13	8	13	31,4	32
03289-10X13	10	13	31,4	32
03289-10X16	10	16	43,1	45

03290

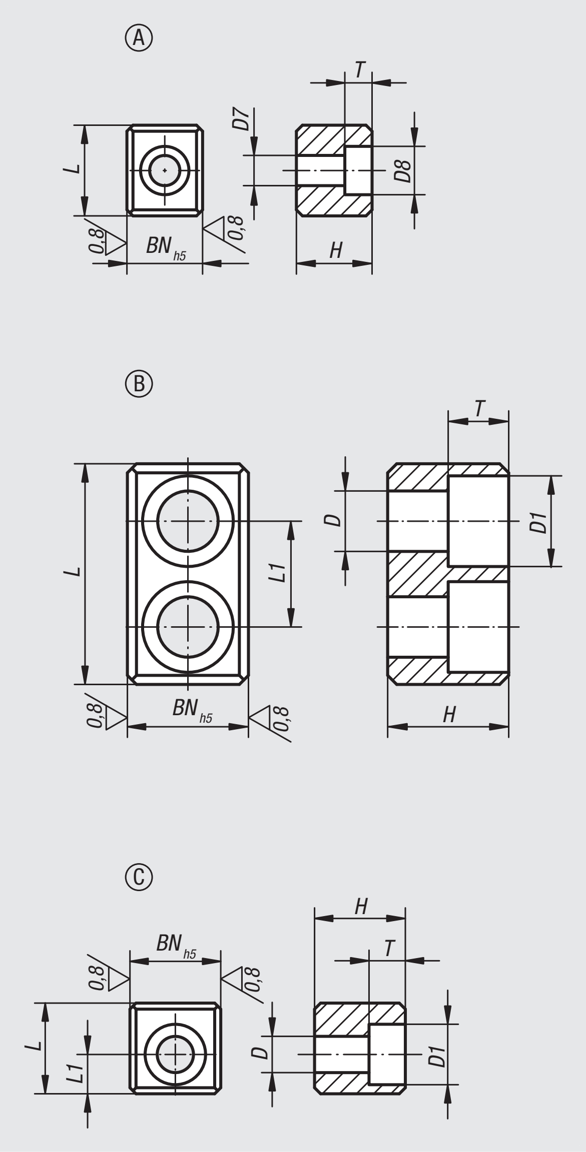
Carrier keys

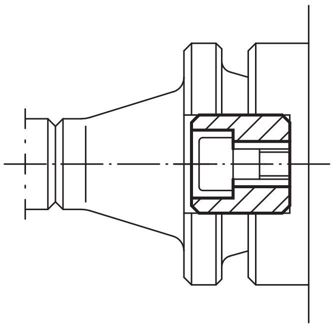
DIN 2079

Material:
Steel.

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 03290-04



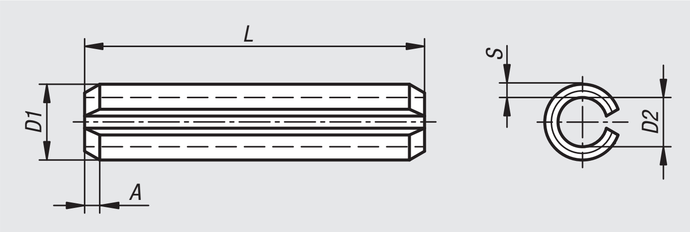


Order No. Form A	Order No. Form B	Order No. Form C	for spindle head No.	BN=Slot width	D	D1	H	L	L1	T
03290-01	-	**03290-013**	30	15,9	6,4	10,4	16/24,5	16,5/13,5	5,5/5,5	6,2
03290-02	-	**03290-023**	40	15,9	6,4	10,4	16/24,5	19,5/16,5	7/7	6,2
03290-03	-	**03290-033**	45	19	8,4	13,5	19/26	19,5/17,5	7,5/7,5	8,3
03290-04	-	**03290-043**	50-55	25,4	13	19	25/29	26,5/24	11/11	12,3
03290-05	**03290-06**	-	60	25,4	13	19	25/25	45,5/45,5	-/22	12,3

03315

Roll dowel

heavy duty ISO 8752



Material:
Spring steel or stainless steel 1.4310.

Version:
Bright.

Sample order:
nlm 03315-010X4 (include length L)

Note:
The nominal diameter of the pin is the same as the receiving hole diameter. The recommended hole tolerance is ISO H12.

Due to the chamfered end, the pins can be inserted easily into the hole with a hammer or using automatic placement. After insertion, the plus tolerance of the pins results in a vibration-proof seating.

The pins can be easily removed using a mandrel and reused several times.

The pins can transmit high shear forces and are resistant to shocks and impacts due to their spring properties.

The values specified for the shear force only apply to spring steel.

Order No.	Main material	A	D1	D1 max.	D2	L	S	Shearing force double shear max.kN
03315-010X	steel	0,15	1	1,3	0,8	4/5/6/8/10/12	0,2	0,7
03315-015X	steel	0,25	1,5	1,8	1,1	5/6/8/10/12/14/16/18/20	0,3	1,58
03315-020X	steel	0,35	2	2,4	1,5	5/6/8/10/12/14/16/18/20/22/24/26/28/30	0,4	2,82
03315-025X	steel	0,4	2,5	2,9	1,8	5/6/8/10/12/14/16/18/20/22/24/26/28/30	0,5	4,38
03315-030X	steel	0,5	3	3,5	2,1	5/6/8/10/12/14/16/18/20/22/24/26/28/30/32/36/40	0,6	6,32
03315-035X	steel	0,6	3,5	4	2,3	6/8/10/12/14/16/18/20/22/24/26/28/30/32/36/40	0,75	9,06
03315-040X	steel	0,65	4	4,6	2,8	6/8/10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50	0,8	11,24
03315-050X	steel	0,9	5	5,6	3,4	6/8/10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50/60/70	1	17,54
03315-060X	steel	1,2	6	6,7	4	10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50/60/70/80	1,2	26,04
03315-080X	steel	2	8	8,8	5,5	10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50/60/70/80	1,5	42,76
03315-100X	steel	2	10	10,8	6,5	10/14/16/18/20/22/24/26/28/30/32/36/40/45/50/60/70/80/90/100	2	70,16
03315-120X	steel	2	12	12,8	7,5	20/22/24/26/28/30/32/36/40/45/50/60/70/80/90/100	2,5	104,1

Order No.	Main material	A	D1	D1 max.	D2	L	S
03315-1010X	stainless steel	0,15	1	1,3	0,8	4/5/6/8/10/12	0,2
03315-1015X	stainless steel	0,25	1,5	1,8	1,1	5/6/8/10/12/14/16/18/20	0,3
03315-1020X	stainless steel	0,35	2	2,4	1,5	5/6/8/10/12/14/16/18/20/22/24/26/28/30	0,4
03315-1025X	stainless steel	0,4	2,5	2,9	1,8	5/6/8/10/12/14/16/18/20/22/24/26/28/30	0,5
03315-1030X	stainless steel	0,5	3	3,5	2,1	5/6/8/10/12/14/16/18/20/22/24/26/28/30/32/36/40	0,6
03315-1035X	stainless steel	0,6	3,5	4	2,3	6/10/12/14/16/18/22/24/26/28/30/32/36/40	0,75
03315-1040X	stainless steel	0,65	4	4,6	2,8	6/8/10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50	0,8
03315-1050X	stainless steel	0,9	5	5,6	3,4	6/8/10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50/60/70	1
03315-1060X	stainless steel	1,2	6	6,7	4	10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50/60/70/80	1,2
03315-1080X	stainless steel	2	8	8,8	5,5	10/12/14/16/18/20/22/24/26/28/30/32/36/40/45/50/60/70/80	1,5
03315-1100X	stainless steel	2	10	10,8	6,5	10/12/14/16/18/20/22/24/28/30/32/36/40/45/50/60/70/80/90/100	2

03320

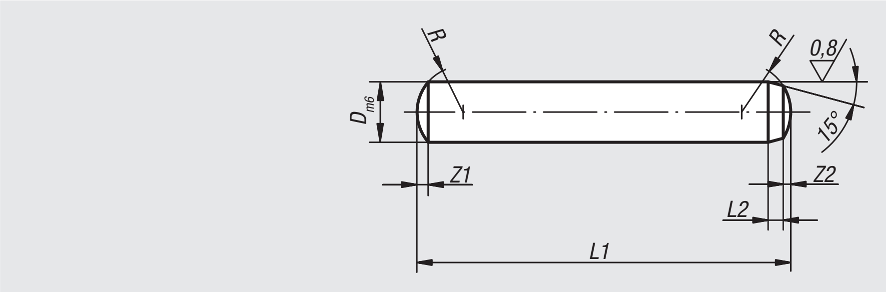
Cylindrical pins

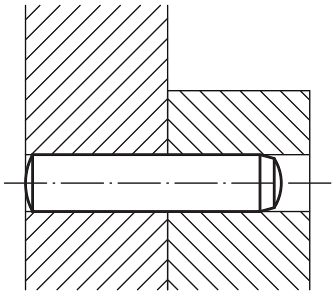
DIN 6325

Material:
Tool steel 1.2067

Version:
Hardened. Hardness 60 ±2 HRC.

Sample order:
nlm 03320-06X28 (include length L1)





Order No.	D	L1 = length	L2	R	Z1	Z2
03320-02X	2	6/8/10/12/14/16/18/20	0,6	2	0,3	0,18
03320-25X	2,5	6/8/10/12/14/16/18/20/22/24	0,7	2,5	0,4	0,25
03320-03X	3	8/10/12/14/16/18/20/22/24/28/30/32	0,8	3	0,45	0,3
03320-04X	4	8/10/12/14/16/18/20/22/24/28/30/32/36/40	1	4	0,6	0,4
03320-05X	5	10/12/14/16/18/20/22/24/28/30/32/36/40/45/50	1,2	5	0,75	0,5
03320-06X	6	10/12/14/16/18/20/22/24/28/30/32/36/40/45/50/55/60	1,5	6	0,9	0,6
03320-08X	8	12/14/16/18/20/22/24/28/30/32/36/40/45/50/55/60/70/80	1,8	8	1,2	0,8
03320-10X	10	16/18/20/24/28/30/32/36/40/45/50/55/60/70/80/90/100	2	10	1,5	1
03320-12X	12	18/20/24/28/30/32/36/40/45/50/55/60/70/80/90/100/120	2,5	12	1,8	1,3
03320-14X	14	24/28/32/36/40/45/50/55/60/70/80/90/100/120	2,5	16	2	1,3
03320-16X	16	24/28/32/36/40/45/50/55/60/70/80/90/100/110/120	3	16	2,5	1,7

03320-01

Ceramic dowel pins

similar to DIN 6325

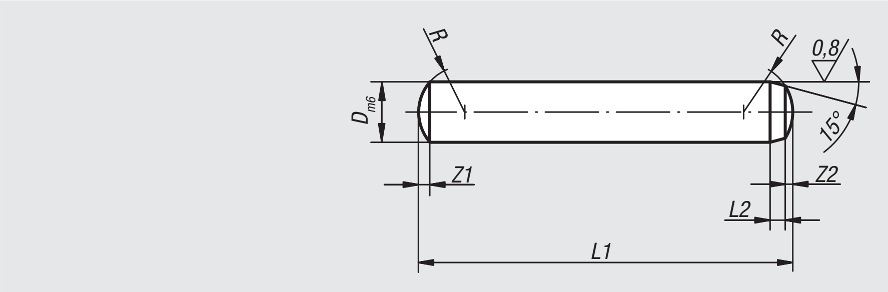
Material:
High performance ceramic Z101.

Version:
Ground

Sample order:
nlm 03320-01-06X28 (include length L1)

Note:
The dimensions of the dowel pin comply with DIN 6325.

Advantages:
Ideal for fixture construction
Dimensionally stable even at high temperatures
Electrically insulating

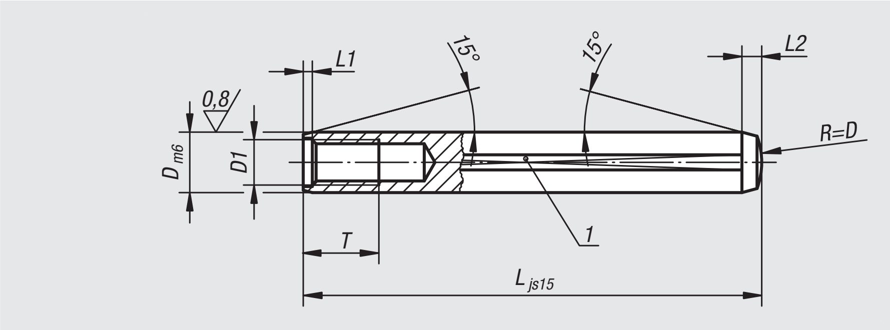


Order No.	D	L1 = length	L2	R	Z1	Z2
03320-01-02X	2	6/8/10/12/14	0,6	2	0,3	0,18
03320-01-03X	3	10/12/14/18/20/28/32	0,8	3	0,45	0,3
03320-01-04X	4	10/12/16/18/20/28/32	1	4	0,6	0,4
03320-01-05X	5	16/18/20/24/28/32/36	1,2	5	0,75	0,5
03320-01-06X	6	14/18/20/24/28/32/36/40/50/60	1,5	6	0,9	0,6
03320-01-08X	8	18/20/24/32/40/50/60/70	1,8	8	1,2	0,8
03320-01-10X	10	24/32/40/50/60/70/90	2	10	1,5	1
03320-01-12X	12	28/40/60	2,5	12	1,8	1,3
03320-01-14X	14	40	2,5	16	2	1,3

03325

Cylindrical pins with internal thread

DIN EN ISO 8735



Material:
Tool steel 1.2067

Version:
Case hardened, hardness 60 ±2 HRC.
Annealed, ground and lapped.

Sample order:
nlm 03325-06X28 (include length L)

Note:
Tapped cylindrical pins are chiefly used in blind holes. The milled flat prevents air compression in blind holes. The tapping makes it possible to use the extractor 03328.

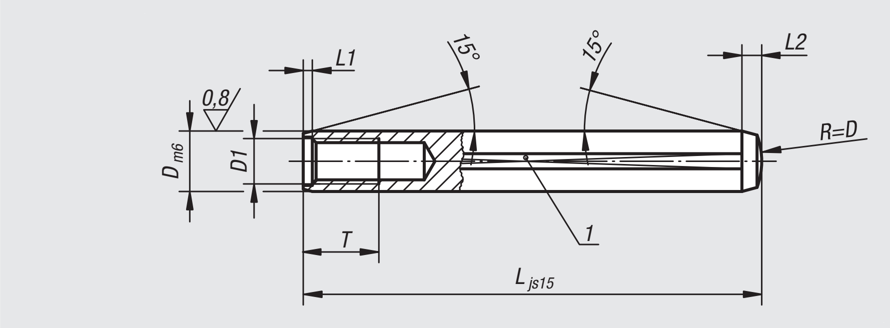
Drawing reference:
1) ground flat

Order No.	D	L	D1	T	L1 ca.	L2 ca.
03325-05X	5	16/20/24/28/32/36/40/45	M3	6	0,6	1,7
03325-06X	6	16/18/20/24/28/32/36/40/45/50/55/60	M4	6	0,8	2,1
03325-08X	8	20/24/28/32/36/40/45/50/55/60/70/80/90/100	M5	8	1	2,6
03325-10X	10	20/24/28/32/36/40/45/50/55/60/70/80/90/100	M6	10	1,2	3
03325-12X	12	32/36/40/45/50/55/60/70/80/90/100/120	M6	10	1,6	3,8
03325-14X	14	32/36/40/45/50/55/60/70/80/90/100/120	M8	12	1,8	4
03325-16X	16	40/45/50/55/60/70/80/90/100/120	M8	12	2	4,7
03325-20X	20	45/50/55/60/70/80/90/100/120	M10	16	2,5	6

03325-01

Ceramic dowel pins with female thread

similar to DIN 7979



Material:
High performance ceramic Z101.

Version:
Ground

Sample order:
nlm 03325-01-06X28 (include length L)

Note:
Tapped dowel pins are chiefly used in blind holes. The milled flat prevents air compression in blind holes. The thread is for connecting the extractor 03328.

The dimensions of the dowel pin comply with DIN 7979.

Advantages:
Ideal for fixture construction
Dimensionally stable even at high temperatures
Electrically insulating

Drawing reference:
1) ground flat

Order No.	D	L	D1	T	L1 ca.	L2 ca.
03325-01-06X	6	14/20/24/28/32/40	M4	6	0,8	2,1
03325-01-08X	8	24/32/40/50	M5	8	1	2,6
03325-01-10X	10	32/40	M6	10	1,2	3
03325-01-12X	12	40	M6	10	1,6	3,8

Extractor

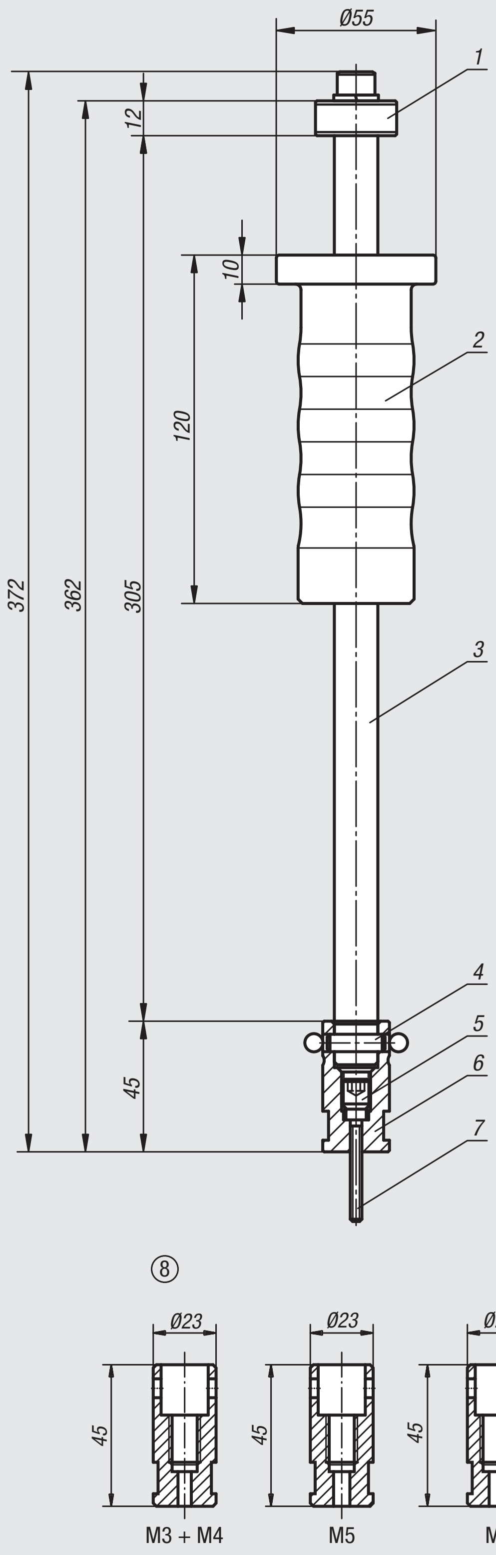
Material:
Hammer head carbon steel.
Shaft, stop and guide sleeves tool steel.

Version:
Slide hammer tempered and chromed.
Shaft, stop and guide sleeve hardened and chromed.

Sample order:
nlm 03328-40

Note:
These extractors are used to remove locating pins and centring pins (03105, 03106, 03107, 03108, 03325) with M3 - M8 tapped holes.

Drawing reference:
1) stop
2) slide hammer
3) shaft
4) cross pin
5) lock screw
6) guide sleeve
7) cap screw
8) 1 set guide sleeves

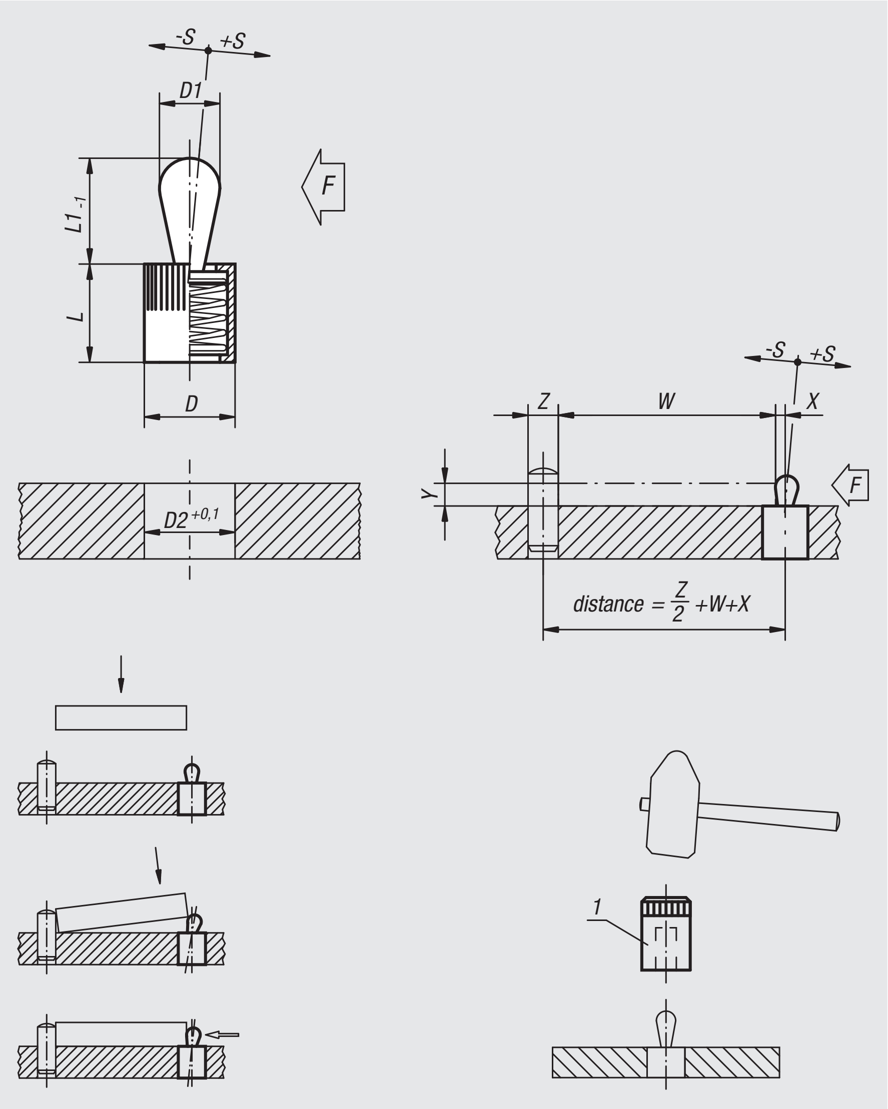


Order No.	Dimensions
03328-40	see drawing

Notes

03330

Lateral spring plungers



Material:
Sleeve aluminium.
Spring steel.
Thrust pin steel or POM.

Version:
Steel thrust pin hardened and electro zinc-plated.
Sleeve blue electro zinc-plated.

Sample order:
nlm 03330-72064

Note:
Lateral spring plungers are for positioning, clamping, holding and fastening of workpieces during engraving, labelling, drilling, reaming, tapping, honing, grinding, welding, soldering, tooling, assembling, etc.
Eccentric adjustment bushes are also avaialable.

Dimensions W and Z are customer specific.

Drawing reference:
1) assembly tool

Lateral spring plungers without seal, thrust pin and spring steel

Order No.	D	D1	L	L1	D2	±S	F ca.N	X if Y = 1	X if Y = 2	X if Y = 3	X if Y = 4.5	X if Y = 6	X if Y = 8	Order No. assembly tool
03330-21034	6	3	7	4	6	0,5	10	0,8	1	1	1	1	1	03330-03
03330-21036	6	3	7	4	6	0,5	20	0,8	1	1	1	1	1	03330-03
03330-21038	6	3	7	4	6	0,5	40	0,8	1	1	1	1	1	03330-03
03330-21054	10	5	11	6,7	10	0,8	20	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-21056	10	5	11	6,7	10	0,8	50	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-21058	10	5	11	6,7	10	0,8	100	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-21064	10	6	11	10,7	10	1	40	-	-	-	1,7	1,9	1,9	03330-05
03330-21066	10	6	11	10,7	10	1	75	-	-	-	1,7	1,9	1,9	03330-05
03330-21068	10	6	11	10,7	10	1	100	-	-	-	1,7	1,9	1,9	03330-05
03330-21084	12	8	13	13,9	12	1,3	50	-	-	-	-	2,5	2,7	03330-08
03330-21086	12	8	13	13,9	12	1,3	100	-	-	-	-	2,5	2,7	03330-08
03330-21088	12	8	13	13,9	12	1,3	150	-	-	-	-	2,5	2,7	03330-08
03330-21104	16	10	17	16,7	16	1,6	100	-	-	-	-	-	3,1	03330-10
03330-21106	16	10	17	16,7	16	1,6	150	-	-	-	-	-	3,1	03330-10
03330-21108	16	10	17	16,7	16	1,6	200	-	-	-	-	-	3,1	03330-10

Lateral spring plungers

Lateral spring plungers with seal, thrust pin and spring steel

Order No.	D	D1	L	L1	D2	±S	F ca.N	X if Y = 1	X if Y = 2	X if Y = 3	X if Y = 4.5	X if Y = 6	X if Y = 8	Order No. assembly tool
03330-22034	6	3	7	4	6	0,5	10	0,8	1	1	1	1	1	03330-03
03330-22036	6	3	7	4	6	0,5	20	0,8	1	1	1	1	1	03330-03
03330-22038	6	3	7	4	6	0,5	40	0,8	1	1	1	1	1	03330-03
03330-22054	10	5	12	6	10	0,8	20	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-22056	10	5	12	6	10	0,8	50	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-22058	10	5	12	6	10	0,8	100	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-22064	10	6	12	10	10	1	40	-	-	-	1,7	1,9	1,9	03330-05
03330-22066	10	6	12	10	10	1	75	-	-	-	1,7	1,9	1,9	03330-05
03330-22068	10	6	12	10	10	1	100	-	-	-	1,7	1,9	1,9	03330-05
03330-22084	12	8	14	13	12	1,3	50	-	-	-	-	2,5	2,7	03330-08
03330-22086	12	8	14	13	12	1,3	100	-	-	-	-	2,5	2,7	03330-08
03330-22088	12	8	14	13	12	1,3	150	-	-	-	-	2,5	2,7	03330-08
03330-22104	16	10	18	16	16	1,6	100	-	-	-	-	-	3,1	03330-10
03330-22106	16	10	18	16	16	1,6	150	-	-	-	-	-	3,1	03330-10
03330-22108	16	10	18	16	16	1,6	200	-	-	-	-	-	3,1	03330-10

Lateral spring plungers without seal, thrust pin POM, spring steel

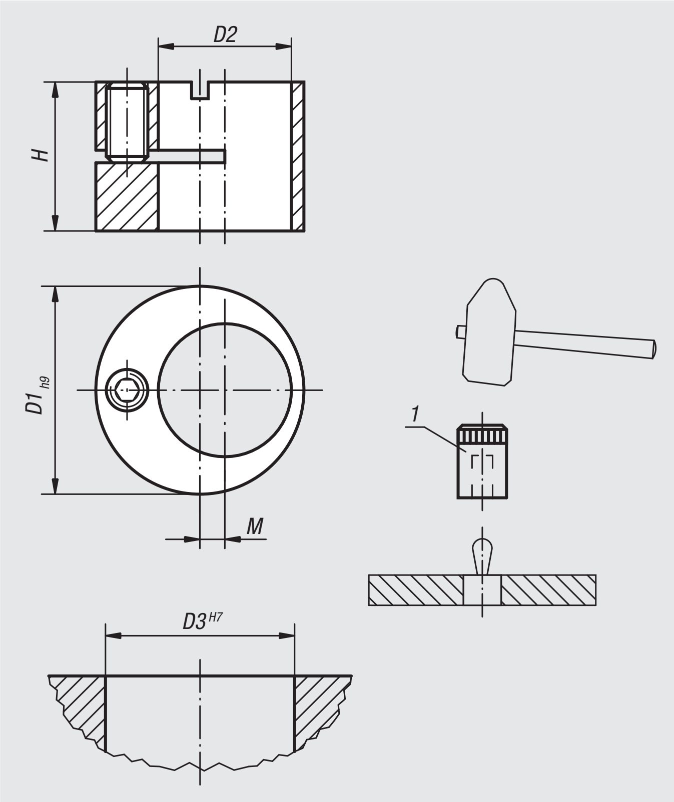
Order No.	D	D1	L	L1	D2	±S	F ca.N	X if Y = 1	X if Y = 2	X if Y = 3	X if Y = 4.5	X if Y = 6	X if Y = 8	Order No. assembly tool
03330-71034	6	3	7	4	6	0,5	10	0,8	1	1	1	1	1	03330-03
03330-71054	10	5	11	6,7	10	0,8	20	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-71064	10	6	11	10,7	10	1	40	-	-	-	1,7	1,9	1,9	03330-05
03330-71084	12	8	13	13,9	12	1,3	50	-	-	-	-	2,5	2,7	03330-08
03330-71104	16	10	17	16,7	16	1,6	100	-	-	-	-	-	3,1	03330-10

Lateral spring plungers with seal, thrust pin POM, spring steel

Order No.	D	D1	L	L1	D2	±S	F ca.N	X if Y = 1	X if Y = 2	X if Y = 3	X if Y = 4.5	X if Y = 6	X if Y = 8	Order No. assembly tool
03330-72034	6	3	7	4	6	0,5	10	0,8	1	1	1	1	1	03330-03
03330-72054	10	5	12	6	10	0,8	20	-	1,5	1,7	1,7	1,7	1,7	03330-05
03330-72064	10	6	12	10	10	1	40	-	-	-	1,7	1,9	1,9	03330-05
03330-72084	12	8	14	13	12	1,3	50	-	-	-	-	2,5	2,7	03330-08
03330-72104	16	10	18	16	16	1,6	100	-	-	-	-	-	3,1	03330-10

Eccentric bushes and assembly tools

for lateral spring plungers



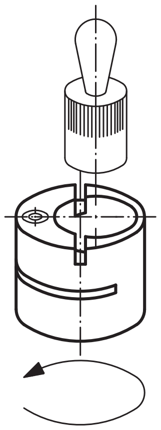
Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 03330-180

Note:
Eccentric bushes enable lateral spring plungers to be precisely positioned with regard to the workpiece.

Drawing reference:
1) assembly tool



Assembly tools

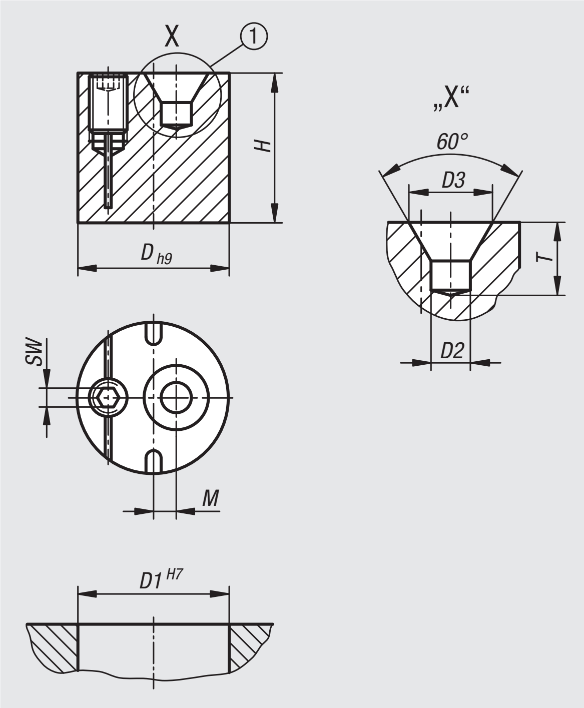
Order No.	Suitable for lateral spring plungers with D =
03330-03	6
03330-05	10
03330-08	12
03330-10	16

Eccentric bushes for lateral spring plungers

Order No.	D1	D2	D3	H	M	Suitable for lateral spring plungers with D =
03330-120	12	6	12	9,9	2	6
03330-150	15	8	15	9,9	2	8
03330-160	16	10	16	11,9	2	10
03330-180	18	12	18	13,9	2	12
03330-250	25	16	25	17,9	3	16

Eccentric bushes

with centre bore



Material:
Stainless steel 1.4305.

Version:
Bright.

Sample order:
nlm 03331-121

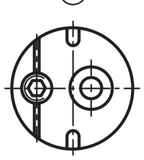
Note:
For H7 holes. Turning the grub screw creates a surface pressure. Use a face pin spanner to turn the bush to the desired position and lock it in place with the grub screw.

Application:
These eccentric bushes can be used as e.g. stops or tolerance compensators.

1) DIN 332-1 centre bore, Form A
2) Basic form with centring
3) With scale groove for visual stop
4) Through hole
5) Tapped hole

Advantages:
- Easy handling
- Grub screw clamping
- Minimal installation space
- Arbitrary mounting position
- Customised application
- Versatile use

②



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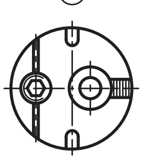

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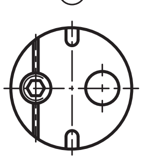

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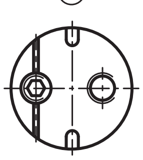
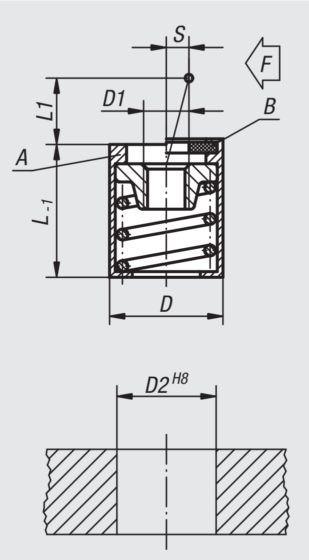


Order No.	D	D1	D2	D3	H	M	SW	T	Tightening torque Nm
03331-101	10	10	1	2,12	9,8	2,25	2	1,9	1,5
03331-121	12	12	1,6	3,35	11,8	2	2	2,9	1,5
03331-141	15	15	2,5	5,3	14,8	2,25	2,5	4,6	2
03331-161	18	18	4	8,5	15,8	2,25	2,5	7,4	2
03331-201	20	20	4	8,5	19,8	3	3	7,4	5

03332

Lateral spring plungers

without thrust pin



Material:
Sleeve aluminium.
Receiving washer steel.
Spring steel.

Version:
Sleeve blue electro zinc-plated.
Washer, hardened and burnished.

Sample order:
nlm 03332-31058

Note:
The thrust pin can be made to suit the required circumstances and screwed into the tapped hole in the locating washer.
The required lateral thrust (F) can be achieved through the stroke (S) and length (L1).
Form B has a seal to keep swarf and dirt out.

Drawing reference:
Form A: without seal
Form B: with seal

Lateral spring plungers without thrust pin, Form A, without seal

Order No.	Form	D	D1	D2	L	L1	S	F ca.N
03332-31054	A	10	M4	10	12	4	1,6	20
03332-31056	A	10	M4	10	12	4	1,6	50
03332-31058	A	10	M4	10	12	4	1,6	100
03332-31064	A	10	M4	10	12	7,5	2	40
03332-31066	A	10	M4	10	12	7,5	2	75
03332-31068	A	10	M4	10	12	7,5	2	100
03332-31104	A	16	M6	16	18	11,5	3,2	100
03332-31106	A	16	M6	16	18	11,5	3,2	150
03332-31108	A	16	M6	16	18	11,5	3,2	200

Lateral spring plungers without thrust pins, Form B, with seal

Order No.	Form	D	D1	D2	L	L1	S	F ca.N
03332-32054	B	10	M4	10	12	4	1,6	20
03332-32056	B	10	M4	10	12	4	1,6	50
03332-32058	B	10	M4	10	12	4	1,6	100
03332-32064	B	10	M4	10	12	7,5	2	40
03332-32066	B	10	M4	10	12	7,5	2	75
03332-32068	B	10	M4	10	12	7,5	2	100
03332-32104	B	16	M6	16	18	11,5	3,2	100
03332-32106	B	16	M6	16	18	11,5	3,2	150
03332-32108	B	16	M6	16	18	11,5	3,2	200

Notes

Lateral spring plungers

with threaded sleeve

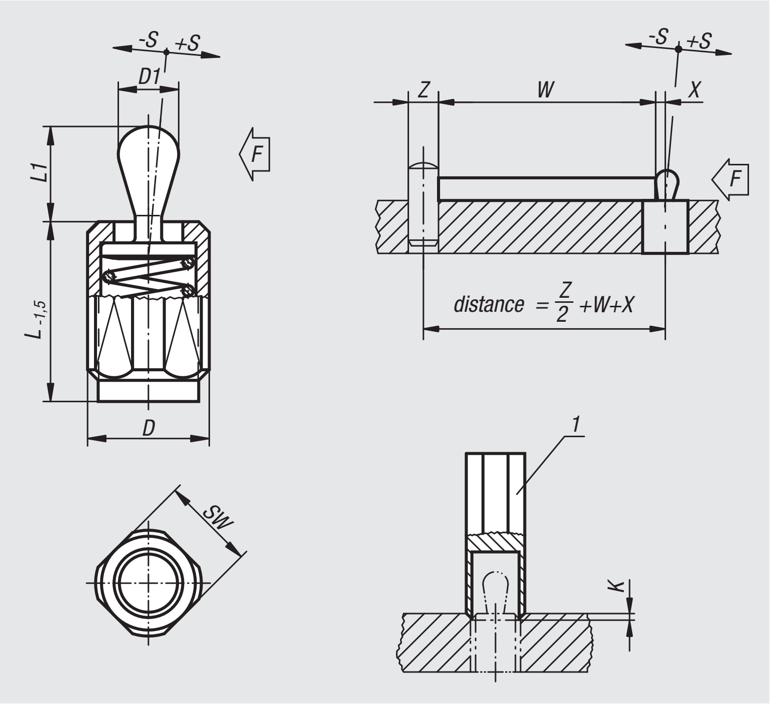
Material:
Steel.

Version:
Thrust pin steel, hardened and electro zinc-plated.
Sleeve blue electro zinc-plated.

Sample order:
nlm 03334-1020X12

Note:
Lateral spring plungers with threaded sleeve can be individually adjusted to suit the the part being held. The threaded sleeve is also suitable for screwing into thin sheet metal as it can be fastened with one or two nuts.
W and Z are customer specified.

Drawing reference:
1) assembly tool

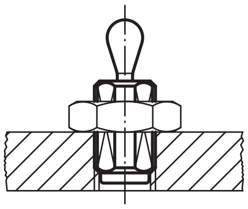


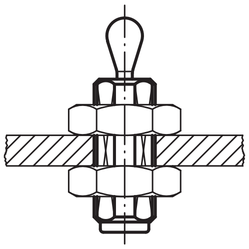
Lateral spring plungers without seal

Order No.	D	D1	K	L	L1	±S	SW	X	F ca.N	Order No. assembly tool
03334-1020X12	M12	5	2x60°	11,5	6,7	0,8	10	1,6	20	03334-06
03334-1020X20	M12	5	2x60°	19	6,7	0,8	10	1,6	20	03334-06
03334-1020X27	M12	5	2x60°	26,5	6,7	0,8	10	1,6	20	03334-06
03334-1050X12	M12	5	2x60°	11,5	6,7	0,8	10	1,6	50	03334-06
03334-1050X20	M12	5	2x60°	19	6,7	0,8	10	1,6	50	03334-06
03334-1050X27	M12	5	2x60°	26,5	6,7	0,8	10	1,6	50	03334-06
03334-1100X12	M12	5	2x60°	11,5	6,7	0,8	10	1,6	100	03334-06
03334-1100X20	M12	5	2x60°	19	6,7	0,8	10	1,6	100	03334-06
03334-1100X27	M12	5	2x60°	26,5	6,7	0,8	10	1,6	100	03334-06
03334-1040X12	M12	6	2x60°	11,5	10,7	1	10	1,8	40	03334-06
03334-1040X20	M12	6	2x60°	19	10,7	1	10	1,8	40	03334-06
03334-1040X27	M12	6	2x60°	26,5	10,7	1	10	1,8	40	03334-06
03334-1075X12	M12	6	2x60°	11,5	10,7	1	10	1,8	75	03334-06
03334-1075X20	M12	6	2x60°	19	10,7	1	10	1,8	75	03334-06
03334-1075X27	M12	6	2x60°	26,5	10,7	1	10	1,8	75	03334-06
03334-1150X12	M12	6	2x60°	11,5	10,7	1	10	1,8	100	03334-06
03334-1150X20	M12	6	2x60°	19	10,7	1	10	1,8	100	03334-06
03334-1150X27	M12	6	2x60°	26,5	10,7	1	10	1,8	100	03334-06
03334-1100X16	M18X1,5	10	2,5x60°	18	16,7	1,6	16	3,2	100	03334-10
03334-1100X29	M18X1,5	10	2,5x60°	31,5	16,7	1,6	16	3,2	100	03334-10
03334-1100X43	M18X1,5	10	2,5x60°	45	16,7	1,6	16	3,2	100	03334-10
03334-1200X16	M18X1,5	10	2,5x60°	18	16,7	1,6	16	3,2	150	03334-10
03334-1200X29	M18X1,5	10	2,5x60°	31,5	16,7	1,6	16	3,2	150	03334-10
03334-1200X43	M18X1,5	10	2,5x60°	45	16,7	1,6	16	3,2	150	03334-10
03334-1300X16	M18X1,5	10	2,5x60°	18	16,7	1,6	16	3,2	200	03334-10
03334-1300X29	M18X1,5	10	2,5x60°	31,5	16,7	1,6	16	3,2	200	03334-10
03334-1300X43	M18X1,5	10	2,5x60°	45	16,7	1,6	16	3,2	200	03334-10

Lateral spring plungers

with threaded sleeve



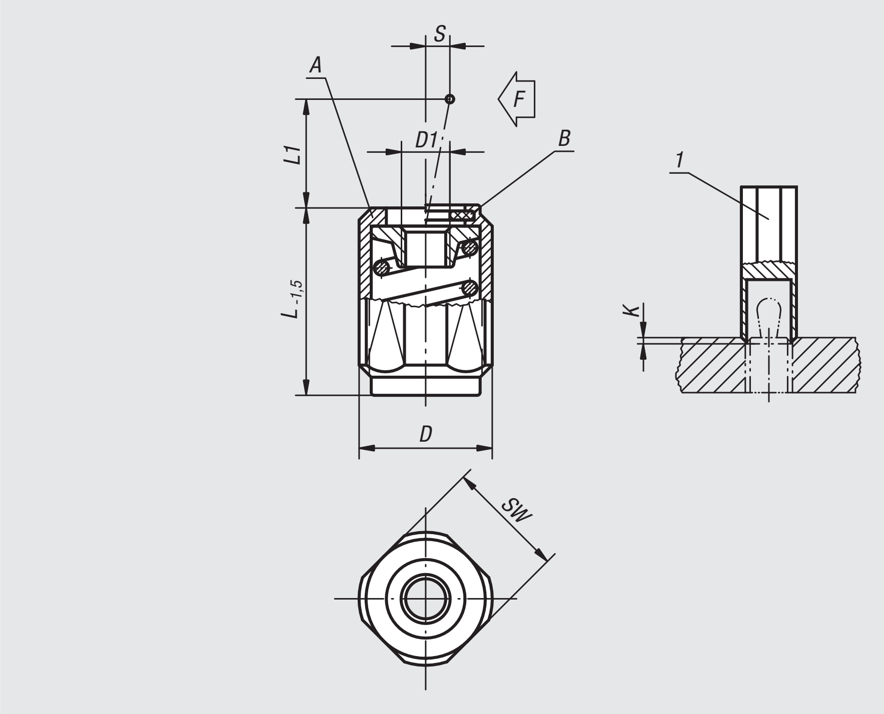


Lateral spring plungers with seal

Order No.	D	D1	K	L	L1	±S	SW	X	F ca.N	Order No. assembly tool
03334-3020X12	M12	5	2x60°	11,5	6	0,8	10	1,6	20	03334-06
03334-3020X20	M12	5	2x60°	19	6	0,8	10	1,6	20	03334-06
03334-3020X27	M12	5	2x60°	26,5	6	0,8	10	1,6	20	03334-06
03334-3050X12	M12	5	2x60°	11,5	6	0,8	10	1,6	50	03334-06
03334-3050X20	M12	5	2x60°	19	6	0,8	10	1,6	50	03334-06
03334-3050X27	M12	5	2x60°	26,5	6	0,8	10	1,6	50	03334-06
03334-3100X12	M12	5	2x60°	11,5	6	0,8	10	1,6	100	03334-06
03334-3100X20	M12	5	2x60°	19	6	0,8	10	1,6	100	03334-06
03334-3100X27	M12	5	2x60°	26,5	6	0,8	10	1,6	100	03334-06
03334-3040X12	M12	6	2x60°	11,5	10	1	10	1,8	40	03334-06
03334-3040X20	M12	6	2x60°	19	10	1	10	1,8	40	03334-06
03334-3040X27	M12	6	2x60°	26,5	10	1	10	1,8	40	03334-06
03334-3075X12	M12	6	2x60°	11,5	10	1	10	1,8	75	03334-06
03334-3075X20	M12	6	2x60°	19	10	1	10	1,8	75	03334-06
03334-3075X27	M12	6	2x60°	26,5	10	1	10	1,8	75	03334-06
03334-3150X12	M12	6	2x60°	11,5	10	1	10	1,8	100	03334-06
03334-3150X20	M12	6	2x60°	19	10	1	10	1,8	100	03334-06
03334-3150X27	M12	6	2x60°	26,5	10	1	10	1,8	100	03334-06
03334-3100X16	M18X1,5	10	2,5x60°	18	16	1,6	16	3,2	100	03334-10
03334-3100X29	M18X1,5	10	2,5x60°	31,5	16	1,6	16	3,2	100	03334-10
03334-3100X43	M18X1,5	10	2,5x60°	45	16	1,6	16	3,2	100	03334-10
03334-3200X16	M18X1,5	10	2,5x60°	18	16	1,6	16	3,2	150	03334-10
03334-3200X29	M18X1,5	10	2,5x60°	31,5	16	1,6	16	3,2	150	03334-10
03334-3200X43	M18X1,5	10	2,5x60°	45	16	1,6	16	3,2	150	03334-10
03334-3300X16	M18X1,5	10	2,5x60°	18	16	1,6	16	3,2	200	03334-10
03334-3300X29	M18X1,5	10	2,5x60°	31,5	16	1,6	16	3,2	200	03334-10
03334-3300X43	M18X1,5	10	2,5x60°	45	16	1,6	16	3,2	200	03334-10

Lateral spring plungers

with threaded sleeve, without thrust pin



Material:
Steel.

Version:
Sleeve blue electro zinc-plated.
Washer, hardened and burnished.

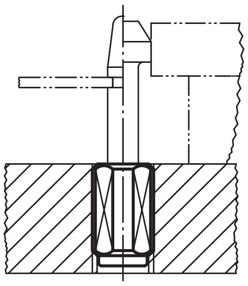
Sample order:
nlm 03336-1100X20

Note:
The thrust pin can be made to suit the required circumstances and screwed into the tapped hole in the locating washer.
The required lateral thrust (F) can be achieved through the stroke (S) and length (L1).
Form B has a seal to keep swarf and dirt out.

Drawing reference:
Form A: without seal
Form B: with seal

1) assembly tool

Order No. Form A	Order No. Form B	D	D1	K	L	L1	±S	SW	F ca.N	Order No. assembly tool
03336-1020X	**03336-2020X**	M12	M4	2x60°	11,5	4	1,6	10	20	03334-06
03336-1020X	**03336-2020X**	M12	M4	2x60°	19	4	1,6	10	20	03334-06
03336-1020X	**03336-2020X**	M12	M4	2x60°	26,5	4	1,6	10	20	03334-06
03336-1050X	**03336-2050X**	M12	M4	2x60°	11,5	4	1,6	10	50	03334-06
03336-1050X	**03336-2050X**	M12	M4	2x60°	19	4	1,6	10	50	03334-06
03336-1050X	**03336-2050X**	M12	M4	2x60°	26,5	4	1,6	10	50	03334-06
03336-1100X	**03336-2100X**	M12	M4	2x60°	11,5	4	1,6	10	100	03334-06
03336-1100X	**03336-2100X**	M12	M4	2x60°	19	4	1,6	10	100	03334-06
03336-1100X	**03336-2100X**	M12	M4	2x60°	26,5	4	1,6	10	100	03334-06
03336-1040X	**03336-2040X**	M12	M4	2x60°	11,5	7,5	2	10	40	03334-06
03336-1040X	**03336-2040X**	M12	M4	2x60°	19	7,5	2	10	40	03334-06
03336-1040X	**03336-2040X**	M12	M4	2x60°	26,5	7,5	2	10	40	03334-06
03336-1075X	**03336-2075X**	M12	M4	2x60°	11,5	7,5	2	10	75	03334-06
03336-1075X	**03336-2075X**	M12	M4	2x60°	19	7,5	2	10	75	03334-06
03336-1075X	**03336-2075X**	M12	M4	2x60°	26,5	7,5	2	10	75	03334-06
03336-1150X	**03336-2150X**	M12	M4	2x60°	11,5	7,5	2	10	100	03334-06
03336-1150X	**03336-2150X**	M12	M4	2x60°	19	7,5	2	10	100	03334-06
03336-1150X	**03336-2150X**	M12	M4	2x60°	26,5	7,5	2	10	100	03334-06
03336-1100X	**03336-2100X**	M18X1,5	M6	2,5x60°	18	11,5	3,2	16	100	03334-10
03336-1100X	**03336-2100X**	M18X1,5	M6	2,5x60°	31,5	11,5	3,2	16	100	03334-10
03336-1100X	**03336-2100X**	M18X1,5	M6	2,5x60°	45	11,5	3,2	16	100	03334-10
03336-1200X	**03336-2200X**	M18X1,5	M6	2,5x60°	18	11,5	3,2	16	150	03334-10
03336-1200X	**03336-2200X**	M18X1,5	M6	2,5x60°	31,5	11,5	3,2	16	150	03334-10
03336-1200X	**03336-2200X**	M18X1,5	M6	2,5x60°	45	11,5	3,2	16	150	03334-10
03336-1300X	**03336-2300X**	M18X1,5	M6	2,5x60°	18	11,5	3,2	16	200	03334-10
03336-1300X	**03336-2300X**	M18X1,5	M6	2,5x60°	31,5	11,5	3,2	16	200	03334-10
03336-1300X	**03336-2300X**	M18X1,5	M6	2,5x60°	45	11,5	3,2	16	200	03334-10



Push-Pull spring plungers

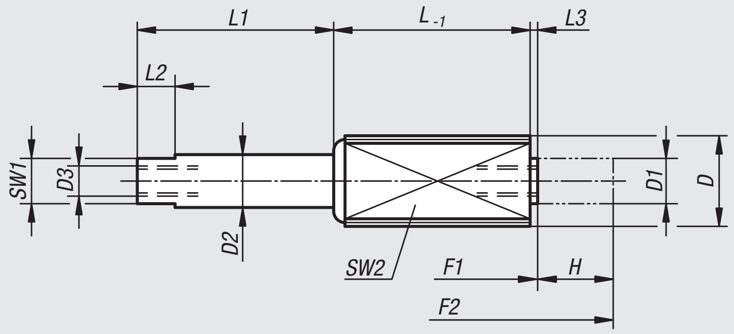
Material:
Steel.

Version:
Sleeve blue electro zinc-plated.
Spring pins black oxidised.

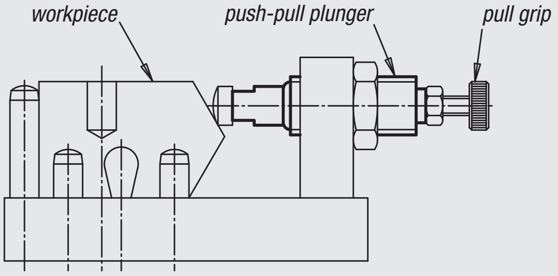
Sample order:
nlm 03338-1202004

Note:
The tapped hole in both ends of the spring pin allow various inserts to be attached e.g. prisms, thrust pins, self-aligning pads, knobs, grips etc.

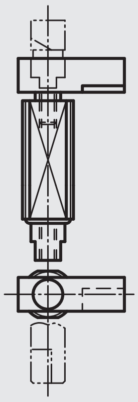
Assembly:
LOCTITE threadlocker 97990-243.... is recommended for gluing the threaded sleeve in position.



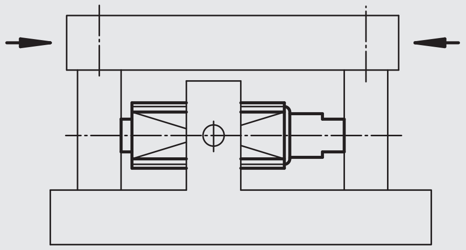
push-pull plunger



pull plunger
as lock

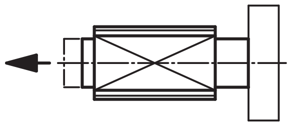


push-pull plunger as carrier

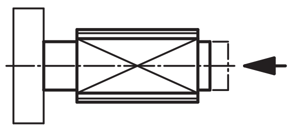


Application:

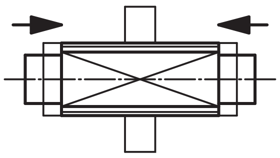
As **push plunger:**
The spring force pushes the object.



As **pull plunger:**
The spring force pulls the object.



As **push-pull plunger**:
In this case the internal pin has a fixed position.
The threaded sleeve acts as carrier.
The spring force pushes or pulls the object in both directions.



Order No.	D	D1	D2	D3	H	L	L1	L2	L3	SW1	SW2 square	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03338-1202004	M12	6	7	M4x8	3,5	11	4,5	5	1	6	10	5	20
03338-1202006	M12	6	7	M4x8	6	18,5	7	5	1	6	10	5	20
03338-1202010	M12	6	7	M4x8	10	26	11	5	1	6	10	5	20
03338-1206003	M12	6	7	M4x8	3	11	4,5	5	1	6	10	12	40
03338-1206005	M12	6	7	M4x8	5	18,5	7	5	1	6	10	12	40
03338-1206008	M12	6	7	M4x8	8	26	11	5	1	6	10	12	40
03338-1212503	M12	6	7	M4x8	3	11	4,5	5	1	6	10	20	100
03338-1212505	M12	6	7	M4x8	5	18,5	7	5	1	6	10	20	100
03338-1212508	M12	6	7	M4x8	8	26	11	5	1	6	10	20	100
03338-1815004	M18x1,5	10	11	M6x12	4	17	6	6	2,5	9	16	50	150
03338-1815007	M18x1,5	10	11	M6x12	7	29,5	11,5	6	2,5	9	16	50	150
03338-1815013	M18x1,5	10	11	M6x12	12,5	45,5	16	6	2,5	9	16	50	150

03339

Push-Pull spring plungers

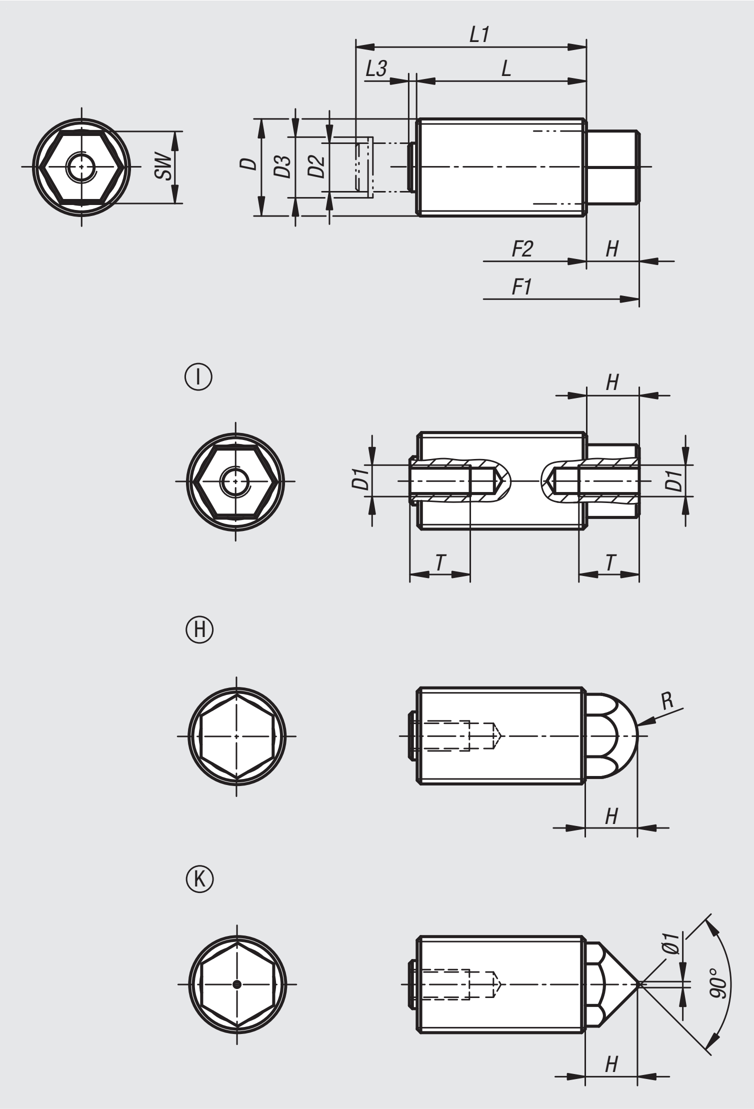
with rotation lock

Material:
Steel.

Version:
Threaded sleeve trivalent blue passivated.
Screw case hardened and black oxidised.
Spring strength - standard or intensified.

Sample order:
nlm 03339-1112

Note:
The push-pull spring plungers, also called two-way spring plungers are used to engage, position or clamp various components. The hexagonal tapped pin which cannot rotate can be used for traction or thrust.



Order No.	Form	Spring strength	D	D1	D2	D3	F1 N	F2 N	H	L	L1	L3	R	SW	T min.
03339-1112	I	standard	M12x1,5	M4	5,5	6,78	16	38	6,12	20	27,5	1,38	-	8	8
03339-1116	I	standard	M16x1,5	M5	8	10	25	71	8,7	28	38	1,3	-	11	10
03339-1120	I	standard	M20x1,5	M6	10	12,2	40	140	10,3	34	47	2,7	-	14	12
03339-1212	I	intensified	M12x1,5	M4	5,5	6,78	20	60	6,12	20	27,5	1,38	-	8	8
03339-1216	I	intensified	M16x1,5	M5	8	10	35	103	8,7	28	38	1,3	-	11	10
03339-1220	I	intensified	M20x1,5	M6	10	12,2	60	175	10,3	34	47	2,7	-	14	12
03339-2112	H	standard	M12x1,5	M4	5,5	6,78	16	38	6,12	20	27,5	1,38	5,5	8	8
03339-2116	H	standard	M16x1,5	M5	8	10	25	71	8,7	28	38	1,3	7	11	10
03339-2120	H	standard	M20x1,5	M6	10	12,2	40	140	10,3	34	47	2,7	9	14	12
03339-2212	H	intensified	M12x1,5	M4	5,5	6,78	20	60	6,12	20	27,5	1,38	5,5	8	8
03339-2216	H	intensified	M16x1,5	M5	8	10	35	103	8,7	28	38	1,3	7	11	10
03339-2220	H	intensified	M20x1,5	M6	10	12,2	60	175	10,3	34	47	2,7	9	14	12
03339-3112	K	standard	M12x1,5	M4	5,5	6,78	16	38	6,12	20	27,5	1,38	-	8	8
03339-3116	K	standard	M16x1,5	M5	8	10	25	71	8,7	28	38	1,3	-	11	10
03339-3120	K	standard	M20x1,5	M6	10	12,2	40	140	10,3	34	47	2,7	-	14	12
03339-3212	K	intensified	M12x1,5	M4	5,5	6,78	20	60	6,12	20	27,5	1,38	-	8	8
03339-3216	K	intensified	M16x1,5	M5	8	10	35	103	8,7	28	38	1,3	-	11	10
03339-3220	K	intensified	M20x1,5	M6	10	12,2	60	175	10,3	34	47	2,7	-	14	12

Lateral spring plungers

Material:
Body mild steel.
Ball steel or stainless steel hardened or POM.
Spring stainless steel or plastic.

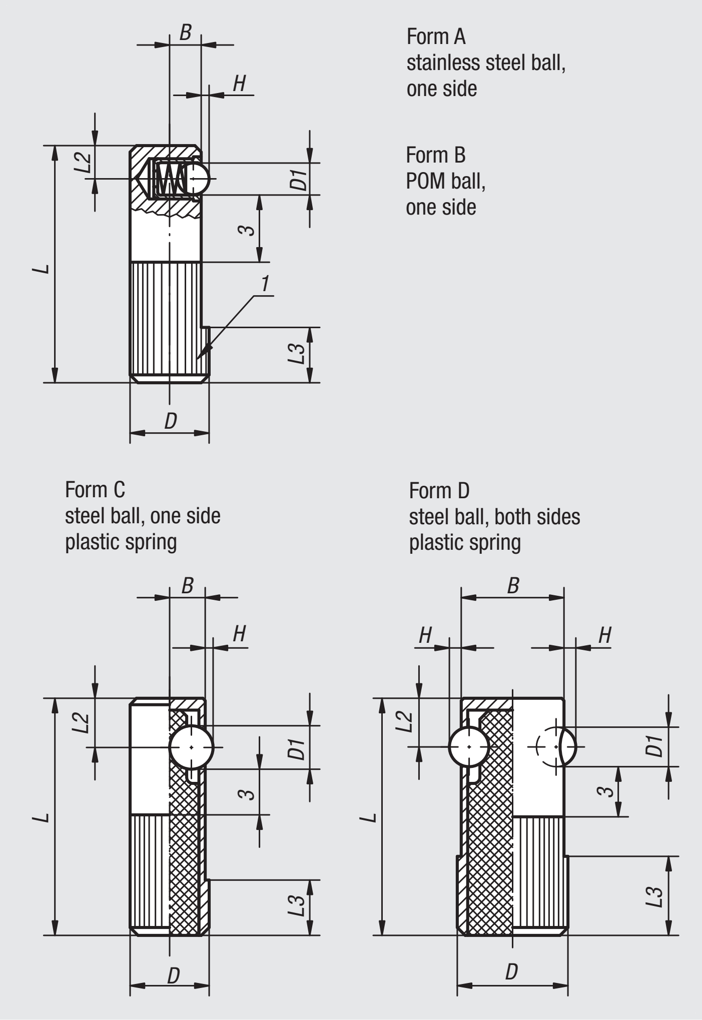
Version:
Body black oxidised.
Ball bright.

Sample order:
nlm 03340-410

Note:
The lateral spring plunger must be pressed into the hole to at least depth L3. These plungers are for positioning and holding small parts in fixtures. If mechanical machining of the workpiece is to be carried out, other clamps may be necessary. When the fixture is not in use it should be ensured that plastic springs are not under stress.

Spring force refers to a mean value.

Drawing reference:
1) knurl
2) light holding

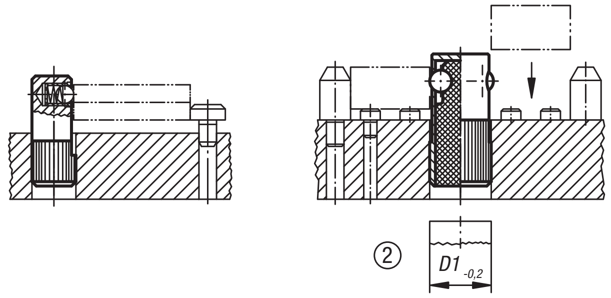


Form A
stainless steel ball,
one side

Form B
POM ball,
one side

Form C
steel ball, one side
plastic spring

Form D
steel ball, both sides
plastic spring



Order No.	Form	B	D	D1	H	L	L2	L3	Receiving hole H8	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03340-008	A	3,2	8	3	0,7	25	3,6	6	8	2,5	6,5
03340-010	A	4	10	4	1,0	30	4,2	7	10	4,5	9
03340-012	A	5	12	5	1,5	35	4,8	9	12	6,5	13
03340-014	A	5,4	14	6,5	1,8	40	5,8	10	14	8	18
03340-108	B	3,2	8	3	0,7	25	3,6	6	8	2,5	6,5
03340-110	B	4	10	4	1,0	30	4,2	7	10	4,5	9
03340-112	B	5	12	5	1,5	35	4,8	9	12	6,5	13
03340-114	B	5,4	14	6,5	1,8	40	5,8	10	14	8	18
03340-410	C	4,5	10	5,5	1	30	7	8	10	60	170
03340-412	C	5,5	12	6,5	1,5	35	8	9	12	80	260
03340-414	C	6,5	14	8	2	40	9	10	14	120	480
03340-616	D	15	16	5,5	1,5	35	7	11	16	110	220
03340-618	D	17	18	6,5	1,8	40	8	12	18	120	330
03340-622	D	21	22	8	2,5	45	9	15	22	130	540

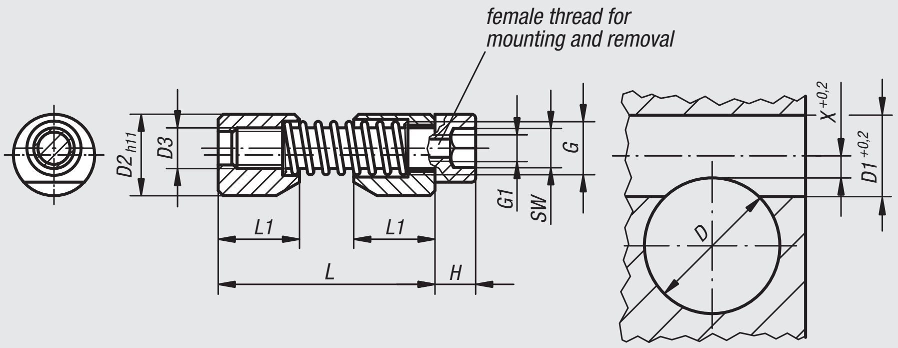
Shaft clamping units

Material:
Jaws steel.
Spring 1.4310.
Screw grade 8.8.

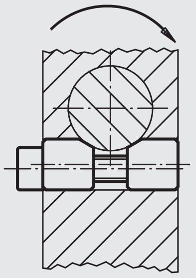
Version:
Jaws black oxidised.
Screw blue electro zinc-plated.

Sample order:
nlm 03350-04

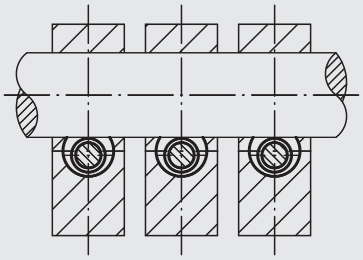
Note:
These shaft clamping units are the simple alternative to conventional shaft clamping (slot and grub screw).
The units are suitable for various materials (metal, plastic, wood etc).
To loosen a jammed clamp simply hit it axially or extract it using a screw in the jaw end or screw head.

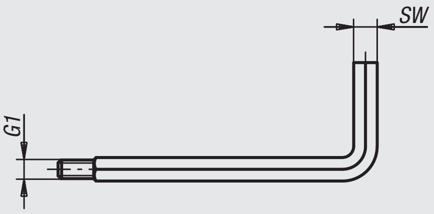


axial and radial clamping



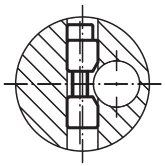
adjusting and clamping



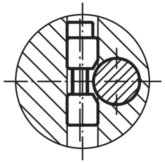


Special hex key with a threaded pin.
The pin is screwed into the hole G1 in the head of the cap screw to aid in positioning or removing the clamping unit.

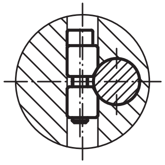
Insert clamping unit



Insert shaft or tube

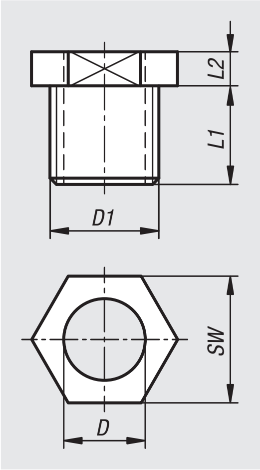


Clamp



Order No.	D min.	D max.	D1	D2	D3	G	G1	H	L max.	L1	SW	X	Clamping torque Mx Nm	Tightening torque max. Nm	Order No. assembly tool
03350-04	6	10	8	8	M4	M5	M2,5	4	27	8	3	2,8	max. 20	2,9	03350-904
03350-05	10	15	10	10	M5	M6	M3	5	33	10	4	3,3	max. 45	6	03350-905
03350-06	15	20	12	12	M6	M7	M4	6	39	12	5	3,5	max. 100	10	03350-906
03350-08	20	30	16	16	M8	M10	M5	8	46	16	6	4	max. 170	25	03350-908
03350-10	30	40	20	20	M10	M12	M6	10	53	20	8	4,8	max. 290	46	03350-910
03350-12	40	60	25	25	M12	M14	M8	12	70	25	10	5,6	max. 450	82	03350-912
03350-16	60	125	30	30	M16	M18	M10	16	81	30	14	7,9	max. 650	206	03350-916

Threaded clamping bushes



Material:
Stainless steel 1.4301 or aluminium.

Version:
Bright.

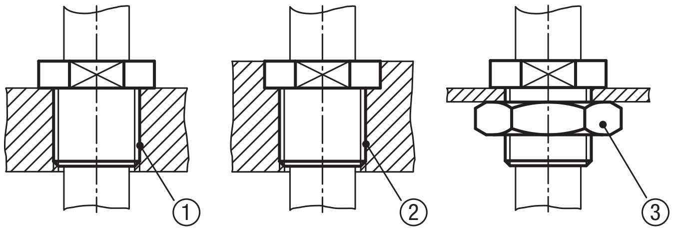
Sample order:
nlm 03351-041

Note:
Various installation versions are possible. Shafts, rods and tubes should have an h9 OD tolerance. An even surface pressure develops across the entire thread pitch.

Application:
The threaded clamping bushes are used to clamp shafts, rods, tubes, etc. without damaging the surface.

Advantages:
- Compact design
- Versatile use
- Arbitrary mounting position
- Easy handling
- Quick clamping and precise positioning
- Clamping without surface damage
- Clamping in thin plates
- Reusable

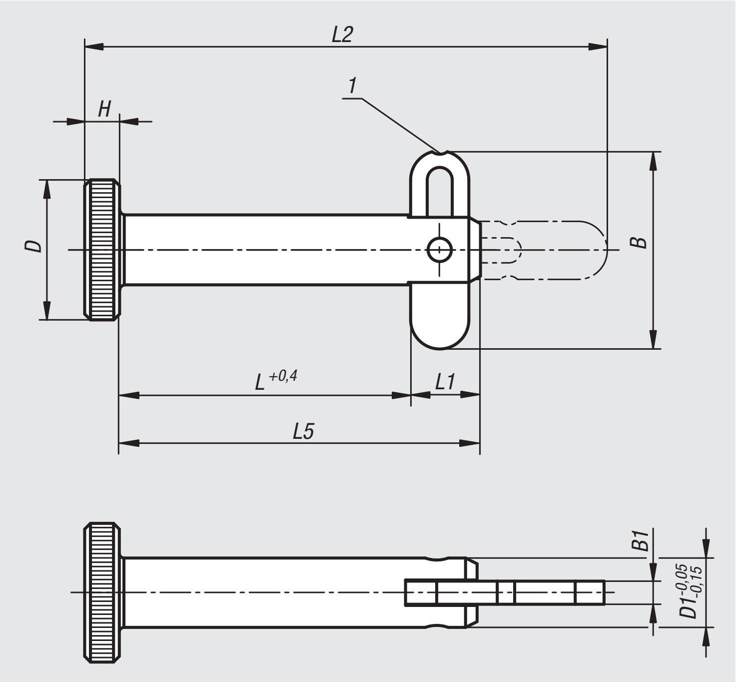
Drawing reference:
1) Mounting via thread with collar contact
2) Mounting via thread with sunken collar
3) Mounting in thin-walled plate with hex. nut



Order No. stainless steel	Order No. aluminium	D	D1	L1	L2	SW
03351-041	**03351-042**	4	M6	7	5	10
03351-051	**03351-052**	5	M8	10	5	12
03351-061	**03351-062**	6	M10	10	5	13
03351-081	**03351-082**	8	M12x1,5	10	5	15
03351-101	**03351-102**	10	M14x1,5	12	5	17
03351-121	**03351-122**	12	M16x1,5	12	6	19
03351-161	**03351-162**	16	M20x1,5	12	7	24

Locking pins

with folding latch

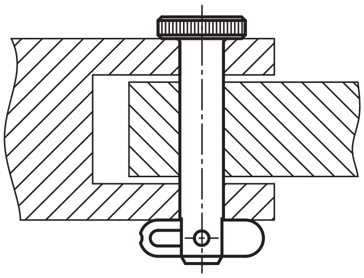


Material:
Steel electro zinc-plated.

Sample order:
nlm 03400-06025

Note:
Locking pins with folding latch are not only used for fast and easy fixing but also for permanent joining of movable parts and workpieces.
The wide folding latch lets you secure the parts to be joined over a large cross section. It can also work under pressure in the axial direction.
Indexing slots in the folding latch allow definite “Closed” and “Open” positions.

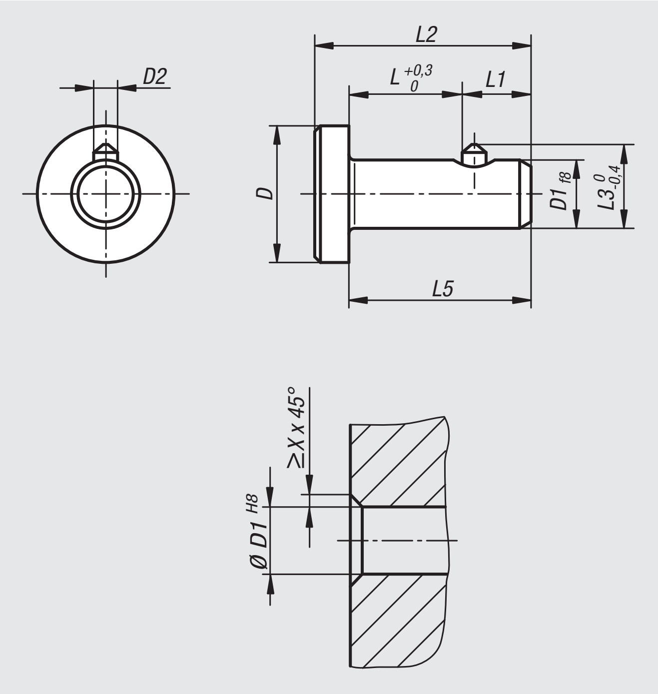
Drawing reference:
1) locking slot



Order No.	B	B1	D	D1	H	L	L1	L2	L5	Receiving hole H11	Shearing force double shear max.kN	Extraction force F N
03400-06025	16,9	2	12	6	3	25	6	45	31	6	12	190
03400-06040	16,9	2	12	6	3	40	6	60	46	6	12	190
03400-06050	16,9	2	12	6	3	50	6	70	56	6	12	190
03400-08025	16,9	2	16	8	4	25	6	46	31	8	21	270
03400-08040	16,9	2	16	8	4	40	6	61	46	8	21	270
03400-08050	16,9	2	16	8	4	50	6	71	56	8	21	270

Locking pins

with axial locking



Material:
Steel.

Version:
Electro zinc-plated.

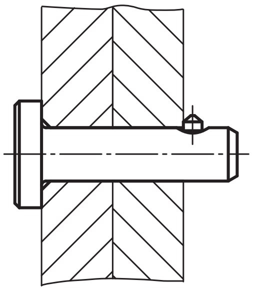
Sample order:
nlm 03410-1206016

Note:
Locking pins are used for quick and easy fixating and joining of parts and workpieces.

Shearing force double-shear (F) = S · τ aB max.

Assembly:
Observe the assembly aid dimension X in the workpiece.

Drawing reference:
Chamfer for counterpart Xmin. x 45°

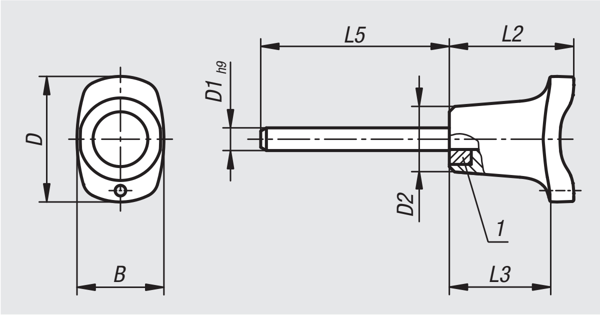


Order No.	D	D1	D2	L	L1	L2	L3	L5	X	Shearing force double shear max.kN
03410-1206010	12	6	2,1	10	6	19	7,4	16	1,1	12
03410-1206012	12	6	2,1	12	6	21	7,4	18	1,1	12
03410-1206016	12	6	2,1	16	6	25	7,4	22	1,1	12
03410-1206020	12	6	2,1	20	6	29	7,4	26	1,1	12
03410-1608012	16	8	2,1	12	6	22	9,4	18	1,1	22
03410-1608016	16	8	2,1	16	6	26	9,4	22	1,1	22
03410-1608020	16	8	2,1	20	6	30	9,4	26	1,1	22
03410-1608025	16	8	2,1	25	6	35	9,4	31	1,1	22
03410-2010012	20	10	2,8	12	8	24	11,8	20	1,2	35
03410-2010016	20	10	2,8	16	8	28	11,8	24	1,2	35
03410-2010020	20	10	2,8	20	8	32	11,8	28	1,2	35
03410-2010025	20	10	2,8	25	8	37	11,8	33	1,2	35
03410-2412016	24	12	2,8	16	8	29	13,8	24	1,2	51
03410-2412020	24	12	2,8	20	8	33	13,8	28	1,2	51
03410-2412025	24	12	2,8	25	8	38	13,8	33	1,2	51
03410-2412030	24	12	2,8	30	8	43	13,8	38	1,2	51

03412

Locking pins

with magnetic axial lock



Material:
Grip thermoplastic.
Steel parts 1.4305 stainless steel.
Magnet NdFeB.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03412-3306030
(include length L e.g. 030 for L = 30 mm.)

Note:
The locking pins with magnetic axial lock are used for fast and easy fixating and joining of parts and workpieces. Magnets integrated into the grip ensure axial positioning and hold the locking pin in the inserted position.

Smooth surfaces and a perpendicular insertion bore have a positive effect on the retaining forces.

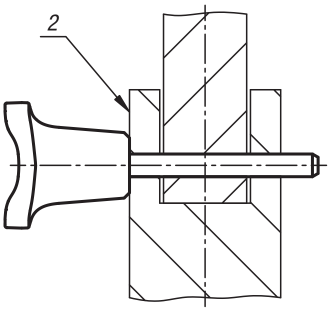
Optional retainer systems can be used to make the locking pins captive.

Shear force double-shear (F) = S · τ aB max.

On request:
Other pin lengths.

Accessories:
Safety spiral cable 03199....
Retaining cable with loop 03199....
Key ring 03199....
Ball chains 96390....

Drawing reference:
1) Magnet
2) Steel part/workpiece



Order No.	B	D	D1	D2	L2	L3	L5	Receiving hole	Shearing force double shear max.kN	Clamping force ca. N
03412-3306* **	23	33,2	6	17,3	33	26,1	15/30/40/50/60/70/80	6	22	43
03412-3308* **	23	33,2	8	17,3	33	26,1	15/30/40/50/60/70/80	8	38	43
03412-4610* **	33	45,9	10	26,3	39,5	31,3	15/30/40/50/60/70/80	10	60	74
03412-4612* **	33	45,9	12	26,3	39,5	31,3	30/40/50/60/70/80	12	86	74

Ball lock pins

stainless steel

Material:
Grip and push button 1.4305 stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring and hanger 1.4310 stainless steel wire.

Version:
Bright.

Sample order:
nlm 03415-001508050
(include length L e.g. 050 for L = 50 mm)

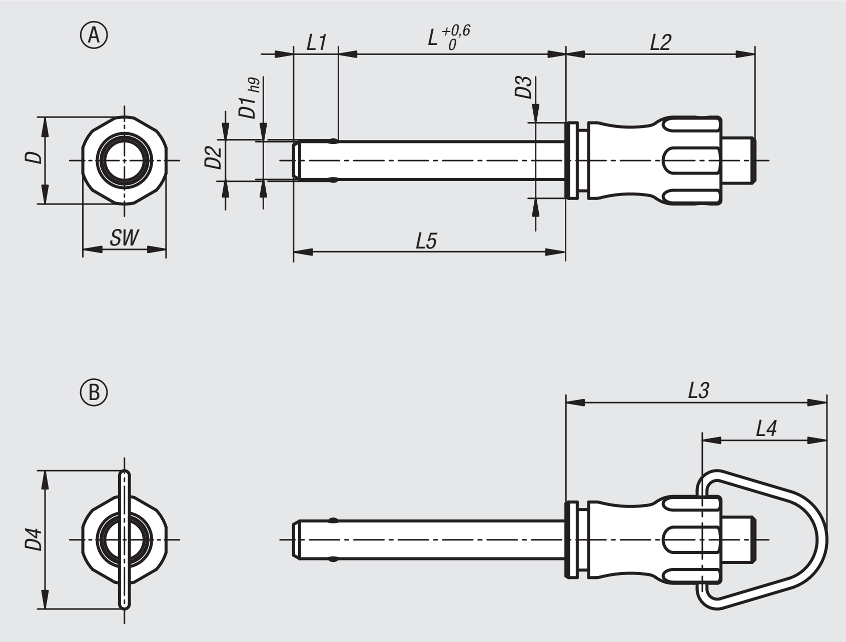
Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

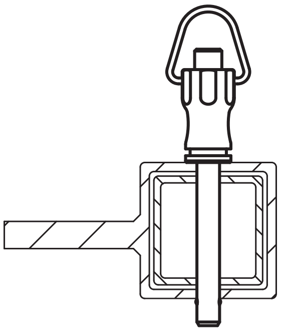
The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.



Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199



Ball lock pins, in stainless steel, Form A

Order No. Form A	D	D1	D2	D3	L	L1	L2	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-001205* **	11,5	5	5,5	10	10/15/20/25/30	5,9	25	15,9/20,9/25,9/30,9/35,9	11	5	15
03415-001206* **	11,5	6	6,85	10	10/15/20/25/30/35/40/45/50	6,8	25	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	11	6	22
03415-001508* **	15,5	8	9,5	13,5	20/25/30/35/40/45/50	7,8	33	27,8/32,8/37,8/42,8/47,8/52,8/57,8	15	8	38
03415-001510* **	15,5	10	12	13,5	20/25/30/35/40/45/50/60	8,9	33	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	15	10	60
03415-002112* **	22	12	14,5	20	25/30/35/40/45/50/60/70/80	9,9	39,5	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	21	12	86
03415-002116* **	22	16	19	20	30/35/40/45/50/60/70/80	13,1	39,5	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	21	16	153

Ball lock pins, stainless steel, Form B

Order No. Form B	D	D1	D2	D3	D4	L	L1	L2	L3	L4	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-101205* **	11,5	5	5,5	10	18,3	10/15/20/25/30	5,9	25	34,6	16,6	15,9/20,9/25,9/30,9/35,9	11	5	15
03415-101206* **	11,5	6	6,85	10	18,3	10/15/20/25/30/35/40/45/50	6,8	25	34,6	16,6	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	11	6	22
03415-101508* **	15,5	8	9,5	13,5	24	20/25/30/35/40/45/50	7,8	33	46,7	22,7	27,8/32,8/37,8/42,8/47,8/52,8/57,8	15	8	38
03415-101510* **	15,5	10	12	13,5	24	20/25/30/35/40/45/50/60	8,9	33	46,7	22,7	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	15	10	60
03415-102112* **	22	12	14,5	20	33	25/30/35/40/45/50/60/70/80	9,9	39,5	59,3	30,3	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	21	12	86
03415-102116* **	22	16	19	20	33	30/35/40/45/50/60/70/80	13,1	39,5	59,3	30,3	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	21	16	153

Ball lock pins, stainless steel

with high shear strength

Material:
Grip and push button
1.4305 stainless steel.
Pin 1.4542 stainless steel.
Balls 1.4125 stainless steel.
Spring and hanger 1.4310 stainless steel wire.

Version:
Bright.

Sample order:
nlm 03415-011508050
(include length L e.g. 050 for L = 50 mm)

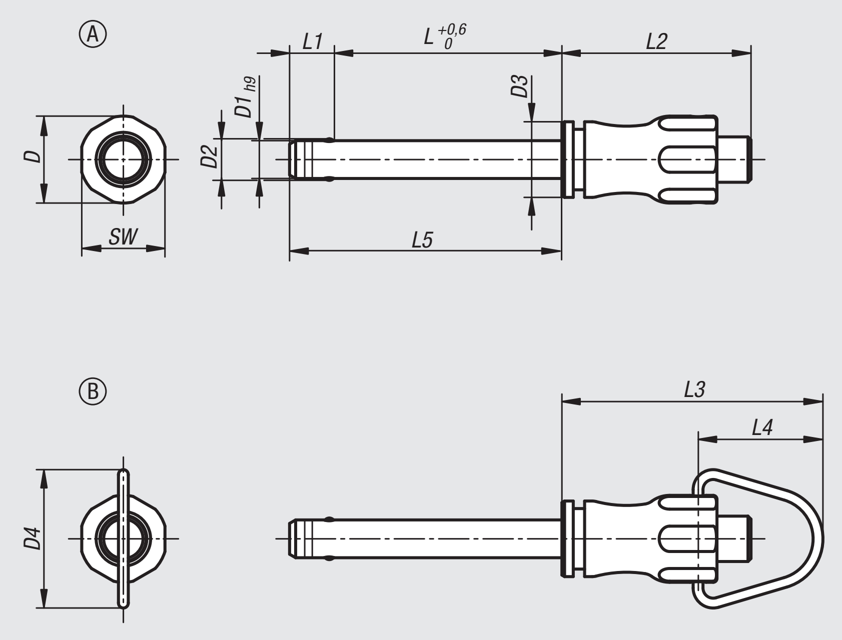
Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear $(F) = S \cdot \tau_{aB}$ max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.



Ball lock pins with high shear strength are identified by a groove marking on the pin.

Advantages:
Higher loading in comparison to standard ball lock pins.
The pins made from 1.4542 stainless steel is hardened, has a higher shear resistance and is extremely durable.

Accessories:
Adapter bushes for ball lock pins 03197.
For Form B:
Safety spiral cable 03199
Retaining cable with eyelet 03199
Key ring 03199

Ball lock pins, stainless steel, with high shear strength, Form A

Order No. Form A	D	D1	D2	D3	L	L1	L2	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-011205***	11,5	5	5,5	10	10/15/20/25/30	5,9	25	15,9/20,9/25,9/30,9/35,9	11	5	24
03415-011206***	11,5	6	6,85	10	10/15/20/25/30/35/40/45/50	6,8	25	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	11	6	35
03415-011508***	15,5	8	9,5	13,5	20/25/30/35/40/45/50	7,8	33	27,8/32,8/37,8/42,8/47,8/52,8/57,8	15	8	63
03415-011510***	15,5	10	12	13,5	20/25/30/35/40/45/50/60	8,9	33	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	15	10	100
03415-012112***	22	12	14,5	20	25/30/35/40/45/50/60/70/80	9,9	39,5	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	21	12	144
03415-012116***	22	16	19	20	30/35/40/45/50/60/70/80	13,1	39,5	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	21	16	257

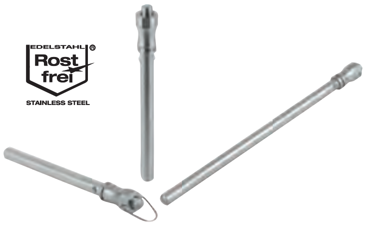
Ball lock pins, stainless steel, with high shear strength, Form B

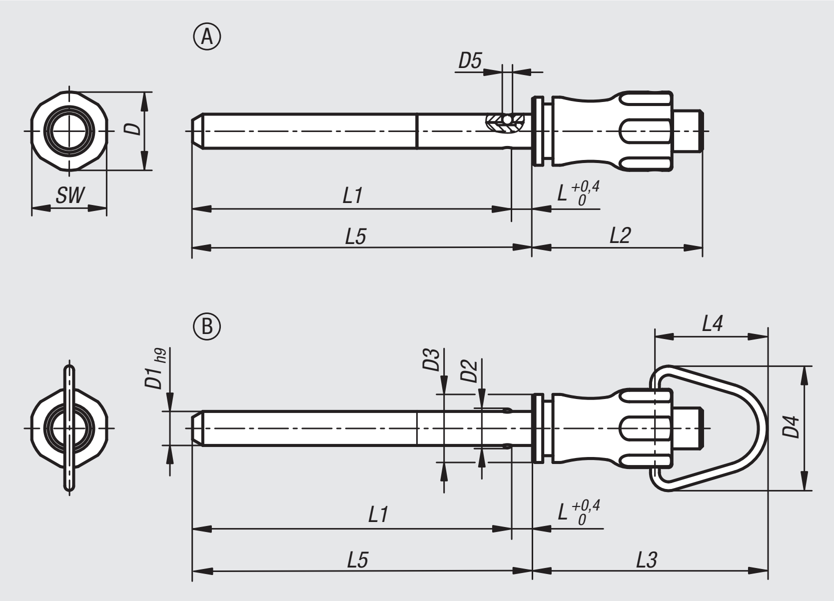
Order No. Form B	D	D1	D2	D3	D4	L	L1	L2	L3	L4	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-111205***	11,5	5	5,5	10	18,3	10/15/20/25/30	5,9	25	34,6	16,6	15,9/20,9/25,9/30,9/35,9	11	5	24
03415-111206***	11,5	6	6,85	10	18,3	10/15/20/25/30/35/40/45/50	6,8	25	34,6	16,6	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	11	6	35
03415-111508***	15,5	8	9,5	13,5	24	20/25/30/35/40/45/50	7,8	33	46,7	22,7	27,8/32,8/37,8/42,8/47,8/52,8/57,8	15	8	63
03415-111510***	15,5	10	12	13,5	24	20/25/30/35/40/45/50/60	8,9	33	46,7	22,7	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	15	10	100
03415-112112***	22	12	14,5	20	33	25/30/35/40/45/50/60/70/80	9,9	39,5	59,3	30,3	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	21	12	144
03415-112116***	22	16	19	20	33	30/35/40/45/50/60/70/80	13,1	39,5	59,3	30,3	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	21	16	257

03415-10

Ball lock pins

stainless steel, with headend lock





Material:
Grip and push button
1.4305 stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring and hanger 1.4310 stainless steel wire.

Version:
Bright.

Sample order:
nlm 03415-10-001205050
(include length L5 e.g. 050 for L5 = 50 mm)

Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = $S \cdot \tau$ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Advantages:
Wide connections possible.
The pin length does not need to be coordinated with the component width.

On request:
Other pin lengths.

Accessories:
Locating bushes for ball lock pins with head-end lock 03425.

Ball lock pins stainless steel, with head-end lock, Form A

Order No.	Form	D	D1	D2	D3	D5	L	L1	L2	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-10-001205***	A	11,5	5	5,5	10	1,5	3	47/97/147	25	50/100/150	11	5	10
03415-10-001206***	A	11,5	6	6,85	10	2	3	47/97/147	25	50/100/150	11	6	14
03415-10-001508***	A	15,5	8	9,5	13,5	3	3,5	96,5/146,5/196,5	33	100/150/200	15	8	26
03415-10-001510***	A	15,5	10	12	13,5	4	3,5	96,5/146,5/196,5	33	100/150/200	15	10	40
03415-10-002112***	A	22	12	14,5	20	4,5	3,5	146,5/196,5/246,5	39,5	150/200/250	21	12	57
03415-10-002116***	A	22	16	19	20	6,5	4	146/196/246	39,5	150/200/250	21	16	100

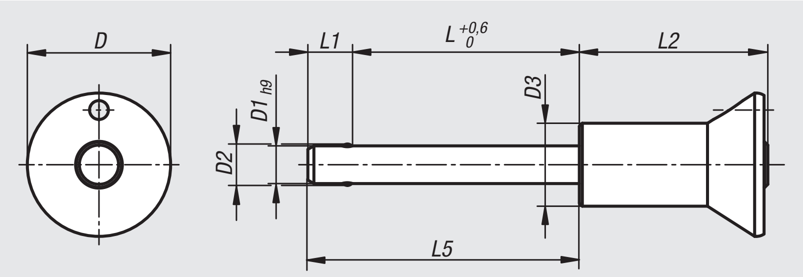
Ball lock pins, stainless steel, with head-end lock, Form B

Order No.	Form	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-10-101205***	B	11,5	5	5,5	10	18,3	1,5	3	47/97/147	25	34,6	16,6	50/100/150	11	5	10
03415-10-101206***	B	11,5	6	6,85	10	18,3	2	3	47/97/147	25	34,6	16,6	50/100/150	11	6	14
03415-10-101508***	B	15,5	8	9,5	13,5	24	3	3,5	96,5/146,5/196,5	33	46,7	22,7	100/150/200	15	8	26
03415-10-101510***	B	15,5	10	12	13,5	24	4	3,5	96,5/146,5/196,5	33	46,7	22,7	100/150/200	15	10	40
03415-10-102112***	B	22	12	14,5	20	33	4,5	3,5	146,5/196,5/246,5	39,5	59,3	30,3	150/200/250	21	12	57
03415-10-102116***	B	22	16	19	20	33	6,5	4	146/196/246	39,5	59,3	30,3	150/200/250	21	16	100

03418

Ball lock pins with mushroom grip

stainless steel



Material:
Mushroom knob and push button stainless steel 1.4305.
Pin stainless steel 1.4305.
Balls stainless teel 1.4125.
Compression spring stainless steel 1.4310.

Version:
Bright.

Sample order:
nlm 03418-02510050
(include length L e.g. 050 for L = 50 mm)

Note:
Ball lock pins are used for easy fastening or joining of components. The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

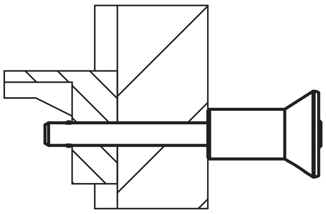
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

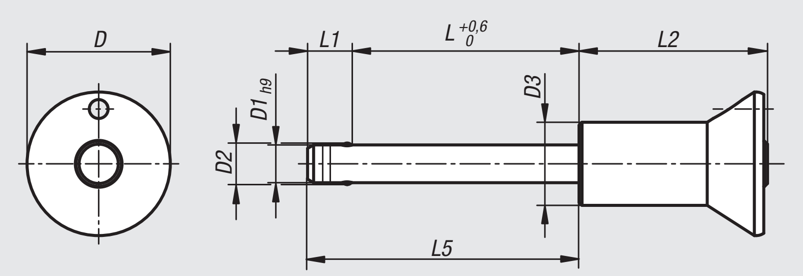


Order No.	D	D1	D2	D3	L	L1	L2	L5	Receiving hole H11	Shearing force double shear max.kN
03418-01905***	19	5	5,5	11	10/15/20/25/30	5,9	25	15,9/20,9/25,9/30,9/35,9	5	15
03418-01906***	19	6	6,85	11	10/15/20/25/30/35/40/45/50	6,8	25	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03418-02508***	25	8	9,5	14	20/25/30/35/40/45/50	7,8	33	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03418-02510***	25	10	12	14	20/25/30/35/40/45/50/60	8,9	33	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03418-03512***	35	12	14,5	22	25/30/35/40/45/50/60/70/80	9,9	39,5	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03418-03516***	35	16	19	22	30/35/40/45/50/60/70/80	13,1	39,5	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

03418

Ball lock pins with mushroom grip

stainless steel, with high shear strength



Material:
Mushroom knob and push button stainless steel 1.4305.
Pin stainless steel 1.4542.
Balls stainless teel 1.4125.
Compression spring stainless steel 1.4310.

Version:
Bright.

Sample order:
nlm 03418-12510050
(include length L e.g. 050 for L = 50 mm)

Note:
Ball lock pins are used for easy fastening or joining of components. The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load. These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

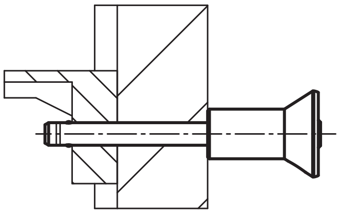
The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Ball lock pins with high shear strength are identified by a groove marking on the pin.

Advantages:
Higher loading in comparison to standard ball lock pins.
The pins made from 1.4542 stainless steel is hardened, has a higher shear resistance and is extremely durable.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

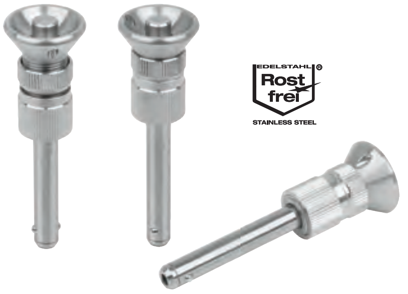


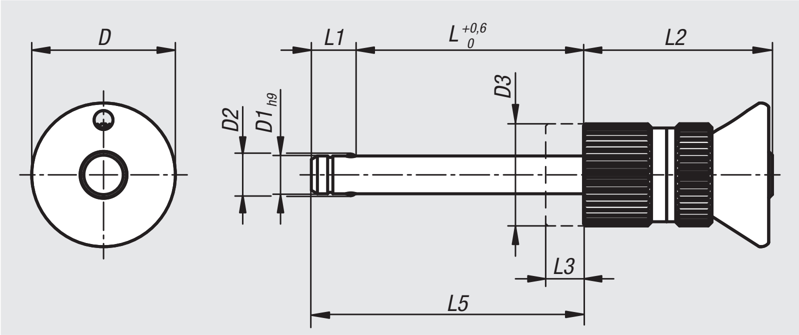
Order No.	D	D1	D2	D3	L	L1	L2	L5	Receiving hole H11	Shearing force double shear max.kN
03418-11905***	19	5	5,5	11	10/15/20/25/30	5,9	25	15,9/20,9/25,9/30,9/35,9	5	24
03418-11906***	19	6	6,85	11	10/15/20/25/30/35/40/45/50	6,8	25	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03418-12508***	25	8	9,5	14	20/25/30/35/40/45/50	7,8	33	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03418-12510***	25	10	12	14	20/25/30/35/40/45/50/60	8,9	33	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03418-13512***	35	12	14,5	22	25/30/35/40/45/50/60/70/80	9,9	39,5	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03418-13516***	35	16	19	22	30/35/40/45/50/60/70/80	13,1	39,5	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

03418-10

Ball lock pins with mushroom grip

stainless steel, adjustable





Material:
Mushroom grip, locknut, adjusting nut and push button, 1.4305 stainless steel.
Pin, 1.4305 stainless steel.
Balls, 1.4125 stainless steel.
Compression spring, 1.4310 stainless steel.

Version:
Bright.

Sample order:
nlm 03418-10-02510050

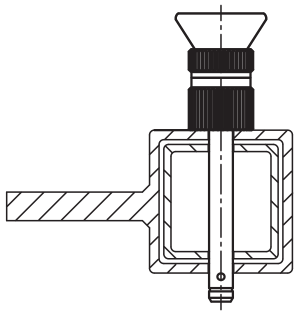
Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.
The length range is infinitely adjustable using the locknut and adjusting nut. This enables play-free positioning on the workpiece.

Shear force double shear (F) = $S \cdot \tau$ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.



Ball lock pins with mushroom grip

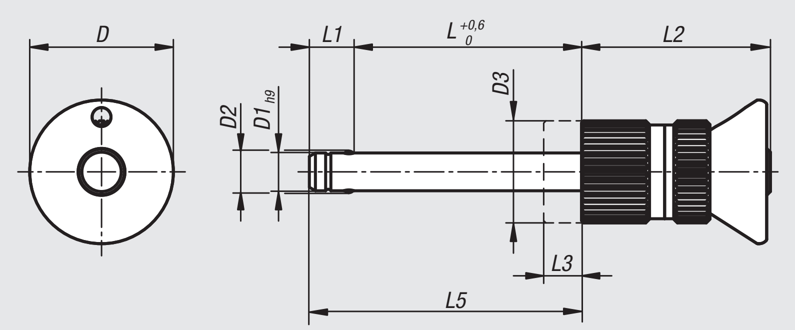
stainless steel, adjustable

Order No.	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03418-10-01905010	19	5	5,5	13,5	2-10	5,9	25	8	7,9-15,9	5	15
03418-10-01905015	19	5	5,5	13,5	7-15	5,9	25	8	12,9-20,9	5	15
03418-10-01905020	19	5	5,5	13,5	12-20	5,9	25	8	17,9-25,9	5	15
03418-10-01905025	19	5	5,5	13,5	17-25	5,9	25	8	22,9-30,9	5	15
03418-10-01905030	19	5	5,5	13,5	22-30	5,9	25	8	27,9-35,9	5	15
03418-10-01906010	19	6	6,85	13,5	2-10	6,8	25	8	8,8-16,8	6	22
03418-10-01906015	19	6	6,85	13,5	7-15	6,8	25	8	13,8-21,8	6	22
03418-10-01906020	19	6	6,85	13,5	12-20	6,8	25	8	18,8-26,8	6	22
03418-10-01906025	19	6	6,85	13,5	17-25	6,8	25	8	23,8-31,8	6	22
03418-10-01906030	19	6	6,85	13,5	22-30	6,8	25	8	28,8-36,8	6	22
03418-10-01906035	19	6	6,85	13,5	27-35	6,8	25	8	33,8-41,8	6	22
03418-10-01906040	19	6	6,85	13,5	32-40	6,8	25	8	38,8-46,8	6	22
03418-10-01906045	19	6	6,85	13,5	37-45	6,8	25	8	43,8-51,8	6	22
03418-10-01906050	19	6	6,85	13,5	42-50	6,8	25	8	48,8-56,8	6	22
03418-10-02508020	25	8	9,5	17	10-20	7,8	33	10	17,8-27,8	8	38
03418-10-02508025	25	8	9,5	17	15-25	7,8	33	10	22,8-32,8	8	38
03418-10-02508030	25	8	9,5	17	20-30	7,8	33	10	27,8-37,8	8	38
03418-10-02508035	25	8	9,5	17	25-35	7,8	33	10	32,8-42,8	8	38
03418-10-02508040	25	8	9,5	17	30-40	7,8	33	10	37,8-47,8	8	38
03418-10-02508045	25	8	9,5	17	35-45	7,8	33	10	42,8-52,8	8	38
03418-10-02508050	25	8	9,5	17	40-50	7,8	33	10	47,8-57,8	8	38
03418-10-02510020	25	10	12	17	10-20	8,9	33	10	18,9-28,9	10	60
03418-10-02510025	25	10	12	17	15-25	8,9	33	10	23,9-33,9	10	60
03418-10-02510030	25	10	12	17	20-30	8,9	33	10	28,9-38,9	10	60
03418-10-02510035	25	10	12	17	25-35	8,9	33	10	33,9-43,9	10	60
03418-10-02510040	25	10	12	17	30-40	8,9	33	10	38,9-48,9	10	60
03418-10-02510045	25	10	12	17	35-45	8,9	33	10	43,9-53,9	10	60
03418-10-02510050	25	10	12	17	40-50	8,9	33	10	48,9-58,9	10	60
03418-10-02510060	25	10	12	17	50-60	8,9	33	10	58,9-68,9	10	60
03418-10-03512025	35	12	14,5	26	13-25	9,9	39,5	12	22,9-34,9	12	86
03418-10-03512030	35	12	14,5	26	18-30	9,9	39,5	12	27,9-39,9	12	86
03418-10-03512035	35	12	14,5	26	23-35	9,9	39,5	12	32,9-44,9	12	86
03418-10-03512040	35	12	14,5	26	28-40	9,9	39,5	12	37,9-49,9	12	86
03418-10-03512045	35	12	14,5	26	33-45	9,9	39,5	12	42,9-54,9	12	86
03418-10-03512050	35	12	14,5	26	38-50	9,9	39,5	12	47,9-59,9	12	86
03418-10-03512060	35	12	14,5	26	48-60	9,9	39,5	12	57,9-69,9	12	86
03418-10-03512070	35	12	14,5	26	58-70	9,9	39,5	12	67,9-79,9	12	86
03418-10-03512080	35	12	14,5	26	68-80	9,9	39,5	12	77,9-89,9	12	86
03418-10-03516030	35	16	19	26	18-30	13,1	39,5	12	31,1-43,1	16	153
03418-10-03516035	35	16	19	26	23-35	13,1	39,5	12	36,1-48,1	16	153
03418-10-03516040	35	16	19	26	28-40	13,1	39,5	12	41,1-53,1	16	153
03418-10-03516045	35	16	19	26	33-45	13,1	39,5	12	46,1-58,1	16	153
03418-10-03516050	35	16	19	26	38-50	13,1	39,5	12	51,1-63,1	16	153
03418-10-03516060	35	16	19	26	48-60	13,1	39,5	12	61,1-73,1	16	153
03418-10-03516070	35	16	19	26	58-70	13,1	39,5	12	71,1-83,1	16	153
03418-10-03516080	35	16	19	26	68-80	13,1	39,5	12	81,1-93,1	16	153

03418-10

Ball lock pins with mushroom grip

stainless steel, with high shear strength, adjustable



Material:
Mushroom grip, locknut, adjusting nut and push button, 1.4305 stainless steel.
Pin, 1.4542 stainless steel.
Balls, 1.4125 stainless steel.
Compression spring, 1.4310 stainless steel.

Version:
Bright.

Sample order:
nlm 03418-10-12510050

Note:
Ball lock pins are used for easy fastening or joining of components. The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

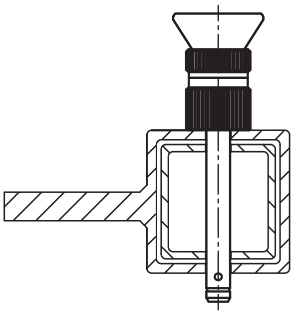
The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Ball lock pins with high shear strength are identified by a groove marking on the pin.

Advantages:
- Higher loading in comparison to standard ball lock pins.
- The length range is infinitely adjustable using the locknut and adjustment nut. This enables play-free positioning on the workpiece.
- The pins made from 1.4542 stainless steel are hardened, have a higher shear resistance and are extremely durable.



03418-10

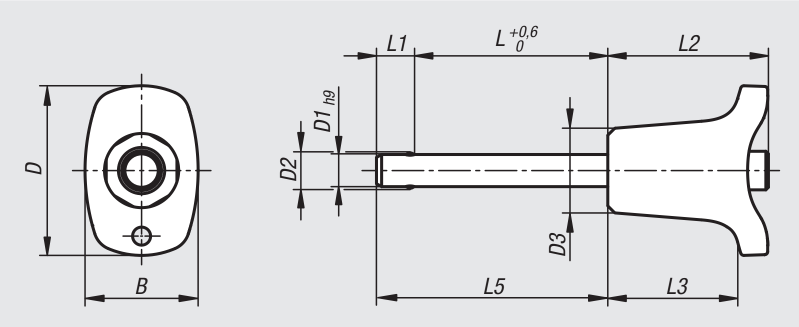
Ball lock pins with mushroom grip

stainless steel, with high shear strength, adjustable

Order No.	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03418-10-11905010	19	5	5,5	13,5	2-10	5,9	25	8	7,9-15,9	5	24
03418-10-11905015	19	5	5,5	13,5	7-15	5,9	25	8	12,9-20,9	5	24
03418-10-11905020	19	5	5,5	13,5	12-20	5,9	25	8	17,9-25,9	5	24
03418-10-11905025	19	5	5,5	13,5	17-25	5,9	25	8	22,9-30,9	5	24
03418-10-11905030	19	5	5,5	13,5	22-30	5,9	25	8	27,9-35,9	5	24
03418-10-11906010	19	6	6,85	13,5	2-10	6,8	25	8	8,8-16,8	6	35
03418-10-11906015	19	6	6,85	13,5	7-15	6,8	25	8	13,8-21,8	6	35
03418-10-11906020	19	6	6,85	13,5	12-20	6,8	25	8	18,8-26,8	6	35
03418-10-11906025	19	6	6,85	13,5	17-25	6,8	25	8	23,8-31,8	6	35
03418-10-11906030	19	6	6,85	13,5	22-30	6,8	25	8	28,8-36,8	6	35
03418-10-11906035	19	6	6,85	13,5	27-35	6,8	25	8	33,8-41,8	6	35
03418-10-11906040	19	6	6,85	13,5	32-40	6,8	25	8	38,8-46,8	6	35
03418-10-11906045	19	6	6,85	13,5	37-45	6,8	25	8	43,8-51,8	6	35
03418-10-11906050	19	6	6,85	13,5	42-50	6,8	25	8	48,8-56,8	6	35
03418-10-12508020	25	8	9,5	17	10-20	7,8	33	10	17,8-27,8	8	63
03418-10-12508025	25	8	9,5	17	15-25	7,8	33	10	22,8-32,8	8	63
03418-10-12508030	25	8	9,5	17	20-30	7,8	33	10	27,8-37,8	8	63
03418-10-12508035	25	8	9,5	17	25-35	7,8	33	10	32,8-42,8	8	63
03418-10-12508040	25	8	9,5	17	30-40	7,8	33	10	37,8-47,8	8	63
03418-10-12508045	25	8	9,5	17	35-45	7,8	33	10	42,8-52,8	8	63
03418-10-12508050	25	8	9,5	17	40-50	7,8	33	10	47,8-57,8	8	63
03418-10-12510020	25	10	12	17	10-20	8,9	33	10	18,9-28,9	10	100
03418-10-12510025	25	10	12	17	15-25	8,9	33	10	23,9-33,9	10	100
03418-10-12510030	25	10	12	17	20-30	8,9	33	10	28,9-38,9	10	100
03418-10-12510035	25	10	12	17	25-35	8,9	33	10	33,9-43,9	10	100
03418-10-12510040	25	10	12	17	30-40	8,9	33	10	38,9-48,9	10	100
03418-10-12510045	25	10	12	17	35-45	8,9	33	10	43,9-53,9	10	100
03418-10-12510050	25	10	12	17	40-50	8,9	33	10	48,9-58,9	10	100
03418-10-12510060	25	10	12	17	50-60	8,9	33	10	58,9-68,9	10	100
03418-10-13512025	35	12	14,5	26	13-25	9,9	39,5	12	22,9-34,9	12	144
03418-10-13512030	35	12	14,5	26	18-30	9,9	39,5	12	27,9-39,9	12	144
03418-10-13512035	35	12	14,5	26	13-35	9,9	39,5	12	22,9-44,9	12	144
03418-10-13512040	35	12	14,5	26	28-30	9,9	39,5	12	37,9-39,9	12	144
03418-10-13512045	35	12	14,5	26	33-45	9,9	39,5	12	42,9-54,9	12	144
03418-10-13512050	35	12	14,5	26	38-50	9,9	39,5	12	47,9-59,9	12	144
03418-10-13512060	35	12	14,5	26	48-60	9,9	39,5	12	57,9-69,9	12	144
03418-10-13512070	35	12	14,5	26	58-70	9,9	39,5	12	67,9-79,9	12	144
03418-10-13512080	35	12	14,5	26	68-80	9,9	39,5	12	77,9-89,9	12	144
03418-10-13516030	35	16	19	26	18-30	13,1	39,5	12	31,1-43,1	16	257
03418-10-13516035	35	16	19	26	23-35	13,1	39,5	12	36,1-48,1	16	257
03418-10-13516040	35	16	19	26	28-40	13,1	39,5	12	41,1-53,1	16	257
03418-10-13516045	35	16	19	26	33-45	13,1	39,5	12	46,1-58,1	16	257
03418-10-13516050	35	16	19	26	38-50	13,1	39,5	12	51,1-63,1	16	257
03418-10-13516060	35	16	19	26	48-60	13,1	39,5	12	61,1-73,1	16	257
03418-10-13516070	35	16	19	26	58-70	13,1	39,5	12	71,1-83,1	16	257
03418-10-13516080	35	16	19	26	68-80	13,1	39,5	12	81,1-93,1	16	257

03420

Ball lock pins



Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black or traffic red RAL 3020.
Stainless steel bright.

Sample order:
nlm 03420-002606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.
If required, the ball lock pins can be fitted with a retaining cable.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

Order No. black	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-002605***	17,6	26,4	5	5,5	13,2	10/15/20/25/30	5,9	25	20,2	15,9/20,9/25,9/30,9/35,9	5	15
03420-002606***	17,6	26,4	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	20,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03420-003308***	23	33,2	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	26,1	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03420-003310***	23	33,2	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	26,1	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03420-004612***	33	45,9	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	31,3	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03420-004616***	33	45,9	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	31,3	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

Order No. red	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-00842605***	17,6	26,4	5	5,5	13,2	10/15/20/25/30	5,9	25	20,2	15,9/20,9/25,9/30,9/35,9	5	15
03420-00842606***	17,6	26,4	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	20,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03420-00843308***	23	33,2	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	26,1	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03420-00843310***	23	33,2	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	26,1	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03420-00844612***	33	45,9	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	31,3	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03420-00844616***	33	45,9	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	31,3	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

Ball lock pins

with high shear strength

Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4542 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black or traffic red RAL 3020.
Stainless steel bright.

Sample order:
nlm 03420-012606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components. The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

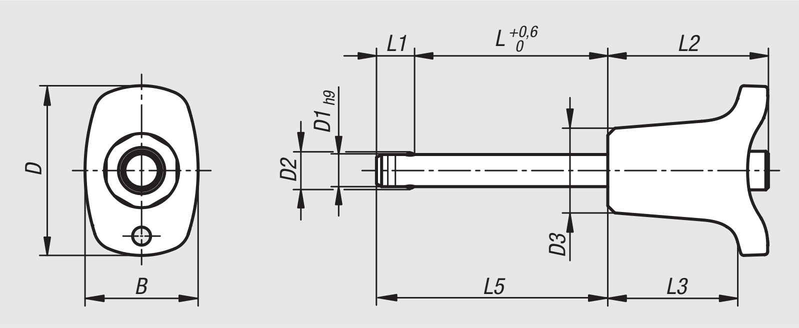
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

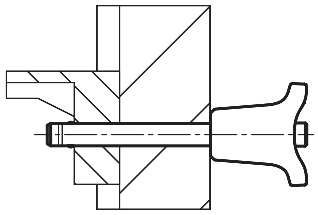
Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Ball lock pins with high shear strength are identified by a groove marking on the pin.



Advantages:
Higher loading in comparison to standard ball lock pins.
The pins made from 1.4542 stainless steel is hardened, has a higher shear resistance and is extremely durable.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199



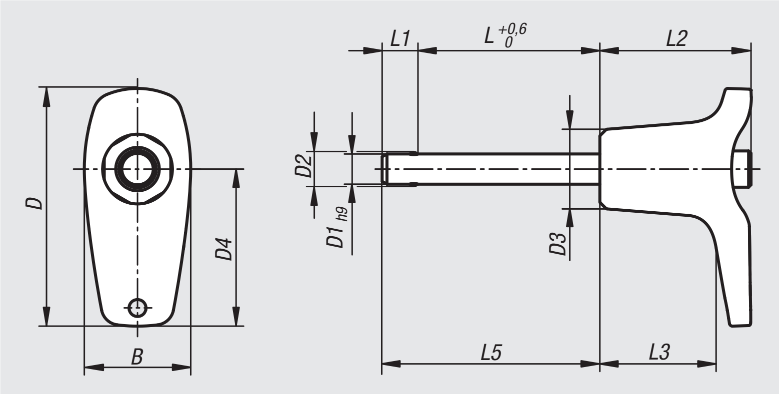
Order No. black	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-012605***	17,6	26,4	5	5,5	13,2	10/15/20/25/30	5,9	25	20,2	15,9/20,9/25,9/30,9/35,9	5	24
03420-012606***	17,6	26,4	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	20,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03420-013308***	23	33,2	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	26,1	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03420-013310***	23	33,2	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	26,1	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03420-014612***	33	45,9	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	31,3	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03420-014616***	33	45,9	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	31,3	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

Order No. red	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-01842605***	17,6	26,4	5	5,5	13,2	10/15/20/25/30	5,9	25	20,2	15,9/20,9/25,9/30,9/35,9	5	24
03420-01842606***	17,6	26,4	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	20,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03420-01843308***	23	33,2	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	26,1	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03420-01843310***	23	33,2	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	26,1	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03420-01844612***	33	45,9	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	31,3	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03420-01844616***	33	45,9	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	31,3	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

03420

Ball lock pins

with L-grip



Material:
Grip thermoplastic.
Push button 1.4305
stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black or traffic red RAL 3020.
Stainless steel bright.

Sample order:
nlm 03420-102606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely. If required, the ball lock pins can be fitted with a retaining cable.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load. These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

Order No. black	B	D	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-102605***	17,6	39,3	5	5,5	13,2	26	10/15/20/25/30	5,9	25	19,2	15,9/20,9/25,9/30,9/35,9	5	15
03420-102606***	17,6	39,3	6	6,85	13,2	26	10/15/20/25/30/35/40/45/50	6,8	25	19,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03420-103508***	23	52,2	8	9,5	17,3	35,4	20/25/30/35/40/45/50	7,8	33	24,2	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03420-103510***	23	52,2	10	12	17,3	35,4	20/25/30/35/40/45/50/60	8,9	33	24,2	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03420-104712***	33	70,2	12	14,5	26,3	47	25/30/35/40/45/50/60/70/80	9,9	39,5	28,4	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03420-104716***	33	70,2	16	19	26,3	47	30/35/40/45/50/60/70/80	13,1	39,5	28,4	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

Order No. red	B	D	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-10842605***	17,6	39,3	5	5,5	13,2	26	10/15/20/25/30	5,9	25	19,2	15,9/20,9/25,9/30,9/35,9	5	15
03420-10842606***	17,6	39,3	6	6,85	13,2	26	10/15/20/25/30/35/40/45/50	6,8	25	19,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03420-10843508***	23	52,2	8	9,5	17,3	35,4	20/25/30/35/40/45/50	7,8	33	24,2	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03420-10843510***	23	52,2	10	12	17,3	35,4	20/25/30/35/40/45/50/60	8,9	33	24,2	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03420-10844712***	33	70,2	12	14,5	26,3	47	25/30/35/40/45/50/60/70/80	9,9	39,5	28,4	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03420-10844716***	33	70,2	16	19	26,3	47	30/35/40/45/50/60/70/80	13,1	39,5	28,4	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

03420

Ball lock pins with L-grip

with high shear strength

Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4542 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black or traffic red RAL 3020.
Stainless steel bright.

Sample order:
nlm 03420-112606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

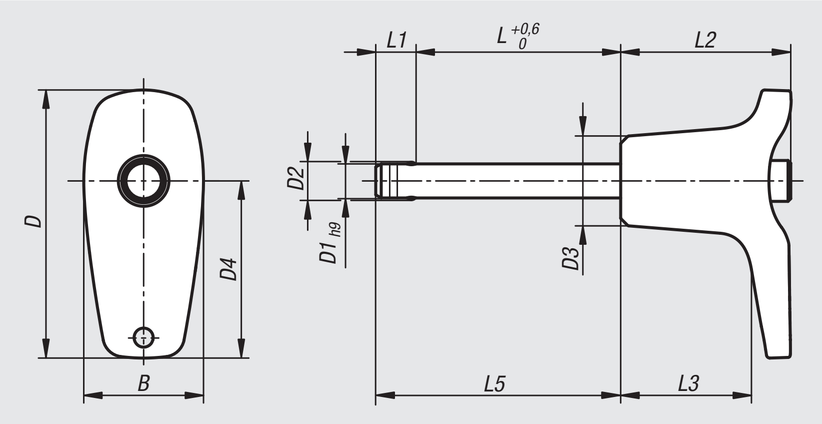
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

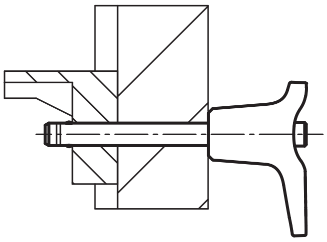
Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Ball lock pins with high shear strength are identified by a groove marking on the pin.



Advantages:
Higher loading in comparison to standard ball lock pins.
The pins made from 1.4542 stainless steel is hardened, has a higher shear resistance and is extremely durable.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199



Order No. black	B	D	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-112605***	17,6	39,3	5	5,5	13,2	26	10/15/20/25/30	5,9	25	19,2	15,9/20,9/25,9/30,9/35,9	5	24
03420-112606***	17,6	39,3	6	6,85	13,2	26	10/15/20/25/30/35/40/45/50	6,8	25	19,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03420-113508***	23	52,2	8	9,5	17,3	35,4	20/25/30/35/40/45/50	7,8	33	24,2	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03420-113510***	23	52,2	10	12	17,3	35,4	20/25/30/35/40/45/50/60	8,9	33	24,2	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03420-114712***	33	70,2	12	14,5	26,3	47	25/30/35/40/45/50/60/70/80	9,9	39,5	28,4	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03420-114716***	33	70,2	16	19	26,3	47	30/35/40/45/50/60/70/80	13,1	39,5	28,4	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

Order No. red	B	D	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-11842605***	17,6	39,3	5	5,5	13,2	26	10/15/20/25/30	5,9	25	19,2	15,9/20,9/25,9/30,9/35,9	5	24
03420-11842606***	17,6	39,3	6	6,85	13,2	26	10/15/20/25/30/35/40/45/50	6,8	25	19,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03420-11843508***	23	52,2	8	9,5	17,3	35,4	20/25/30/35/40/45/50	7,8	33	24,2	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03420-11843510***	23	52,2	10	12	17,3	35,4	20/25/30/35/40/45/50/60	8,9	33	24,2	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03420-11844712***	33	70,2	12	14,5	26,3	47	25/30/35/40/45/50/60/70/80	9,9	39,5	28,4	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03420-11844716***	33	70,2	16	19	26,3	47	30/35/40/45/50/60/70/80	13,1	39,5	28,4	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

03420

Ball lock pins

with T-grip

Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black or traffic red RAL 3020.
Stainless steel bright.

Sample order:
nlm 03420-204606050
(include length L e.g. 050 for L = 50 mm.)

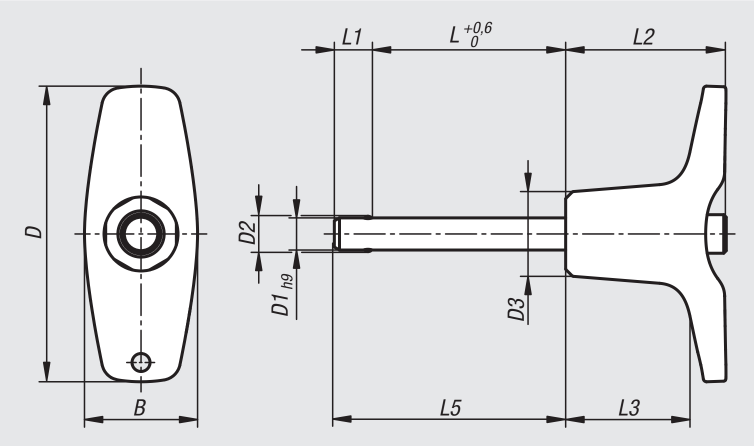
Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely. If required, the ball lock pins can be fitted with a retaining cable.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load. These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.



Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

Order No. black	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-204605* **	17,6	46	5	5,5	13,2	10/15/20/25/30	5,9	25	19,4	15,9/20,9/25,9/30,9/35,9	5	15
03420-204606* **	17,6	46	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	19,4	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03420-206308* **	23	62,9	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	24,4	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03420-206310* **	23	62,9	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	24,4	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03420-208212* **	33	81,8	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	28,8	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03420-208216* **	33	81,8	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	28,8	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

Order No. red	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-20844605* **	17,6	46	5	5,5	13,2	10/15/20/25/30	5,9	25	19,4	15,9/20,9/25,9/30,9/35,9	5	15
03420-20844606* **	17,6	46	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	19,4	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03420-20846308* **	23	62,9	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	24,4	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03420-20846310* **	23	62,9	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	24,4	28,9/33,9/38,9/44,9/48,9/54,9/58,9/68,9	10	60
03420-20848212* **	33	81,8	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	28,8	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03420-20848216* **	33	81,8	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	28,8	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

03420

Ball lock pins with T-grip

with high shear strength

Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4542 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black or traffic red RAL 3020.
Stainless steel bright.

Sample order:
nlm 03420-214606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components. The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

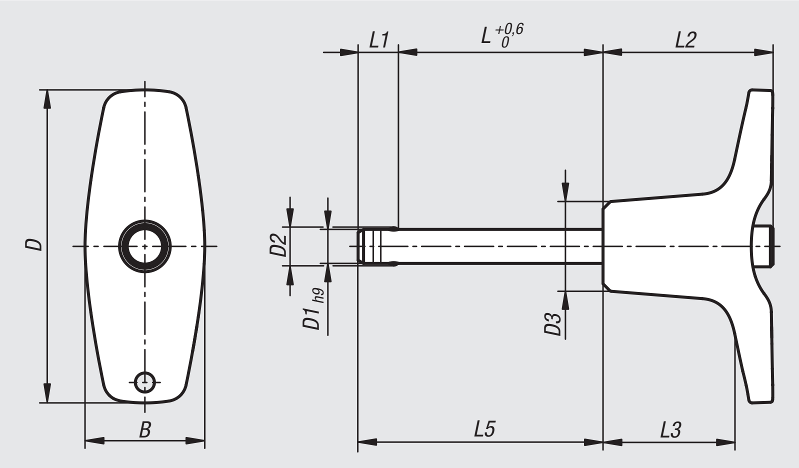
Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

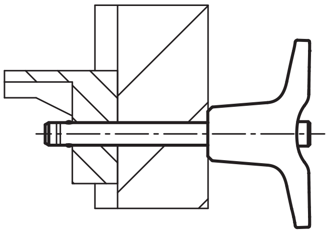
Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Ball lock pins with high shear strength are identified by a groove marking on the pin.



Advantages:
Higher loading in comparison to standard ball lock pins.
The pins made from 1.4542 stainless steel is hardened, has a higher shear resistance and is extremely durable.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199



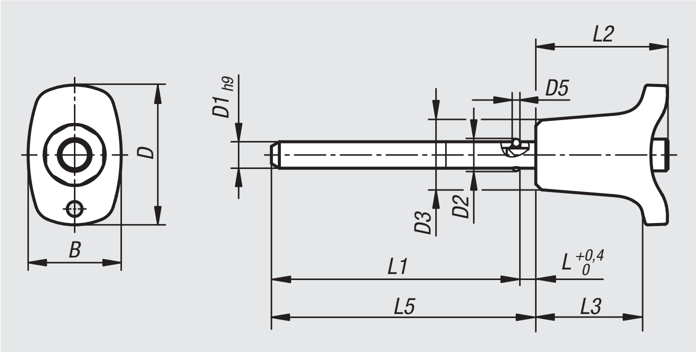
Order No. black	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-214605***	17,6	46	5	5,5	13,2	10/15/20/25/30	5,9	25	19,4	15,9/20,9/25,9/30,9/35,9	5	24
03420-214606***	17,6	46	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	19,4	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03420-216308***	23	62,9	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	24,4	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03420-216310***	23	62,9	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	24,4	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03420-218212***	33	81,8	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	28,8	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03420-218216***	33	81,8	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	28,8	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

Order No. red	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-21844605***	17,6	46	5	5,5	13,2	10/15/20/25/30	5,9	25	19,4	15,9/20,9/25,9/30,9/35,9	5	24
03420-21844606***	17,6	46	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	19,4	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03420-21846308***	23	62,9	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	24,4	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03420-21846310***	23	62,9	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	24,4	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03420-21848212***	33	81,8	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	28,8	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03420-21848216***	33	81,8	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	28,8	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

03420-10

Ball lock pins

stainless steel, with headend lock



Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03420-10-002605050
(include length L5 e.g. 050 for L5 = 50 mm)

Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Advantages:
Wide connections possible.
The pin length does not need to be coordinated with the component width.

On request:
Other pin lengths.

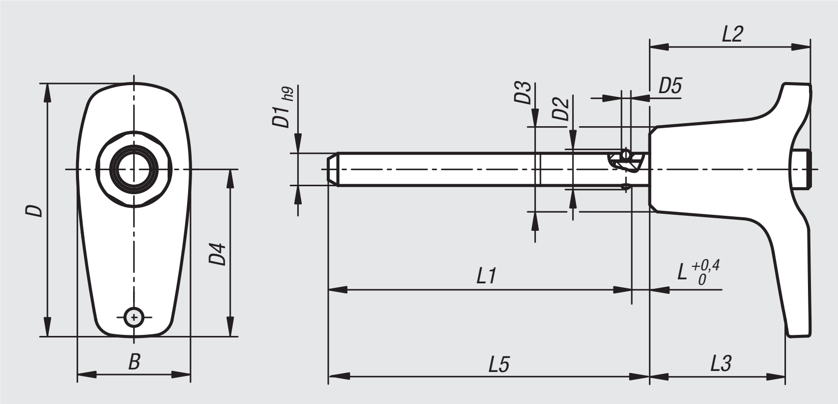
Accessories:
Adapter bushes for ball lock pins with head lock 03425
Safety spiral cable 03199
Retaining cable with eyelet 03199
Key ring 03199

Order No.	B	D	D1	D2	D3	D5	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-10-002605***	17,6	26,4	5	5,5	13,2	1,5	3	47/97/147	25	20,2	50/100/150	5	10
03420-10-002606***	17,6	26,4	6	6,85	13,2	2	3	47/97/147	25	20,2	50/100/150	6	14
03420-10-003308***	23	33,2	8	9,5	17,3	3	3,5	96,5/146,5/196,5	33	26,1	100/150/200	8	26
03420-10-003310***	23	33,2	10	12	17,3	4	3,5	96,5/146,5/196,5	33	26,1	100/150/200	10	40
03420-10-004612***	33	45,9	12	14,5	26,3	4,5	3,5	146,5/196,5/246,5	39,5	31,3	150/200/250	12	57
03420-10-004616***	33	45,9	16	19	26,3	6,5	4	146/196/246	39,5	31,3	150/200/250	16	100

03420-10

Ball lock pins with L-grip

stainless steel, with head-end lock



Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03420-10-102605050
(include length L5 e.g. 050 for L5 = 50 mm)

Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load. These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Advantages:
Wide connections possible.
The pin length does not need to be coordinated with the component width.

On request:
Other pin lengths.

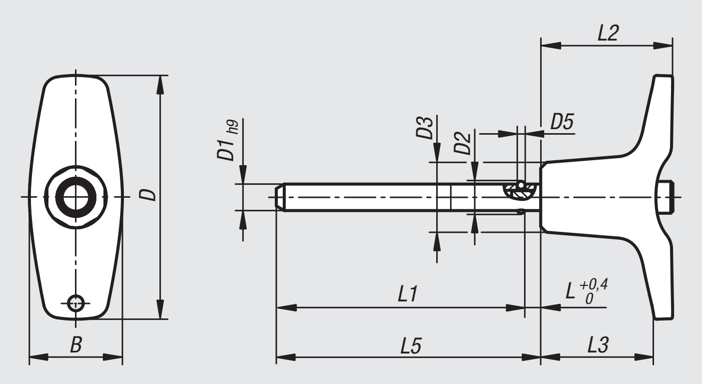
Accessories:
Adapter bushes for ball lock pins with head lock 03425
Safety spiral cable 03199
Retaining cable with eyelet 03199
Key ring 03199

Order No.	B	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03420-10-102605* **	17,6	39,3	5	5,5	13,2	26	1,5	3	47/97/147	25	19,2	50/100/150	5	10
03420-10-102606* **	17,6	39,3	6	6,85	13,2	26	2	3	47/97/147	25	19,2	50/100/150	6	14
03420-10-103508* **	23	52,2	8	9,5	17,3	35,4	3	3,5	96,5/146,5/196,5	33	24,2	100/150/200	8	26
03420-10-103510* **	23	52,2	10	12	17,3	35,4	4	3,5	96,5/146,5/196,5	33	24,2	100/150/200	10	40
03420-10-104712* **	33	70,2	12	14,5	26,3	47	4,5	3,5	146,5/196,5/246,5	39,5	28,4	150/200/250	12	57
03420-10-104716* **	33	70,2	16	19	26,3	47	6,5	4	146/196/246	39,5	28,4	150/200/250	16	100

03420-10

Ball lock pins with T-grip

stainless steel, with head-end lock



Material:
Grip thermoplastic.
Push button 1.4305 stainless steel.
Pin 1.4305 stainless steel.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel wire.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03420-10-204605050
(include length L5 e.g. 050 for L5 = 50 mm)

Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load. These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Advantages:
Wide connections possible.
The pin length does not need to be coordinated with the component width.

On request:
Other pin lengths.

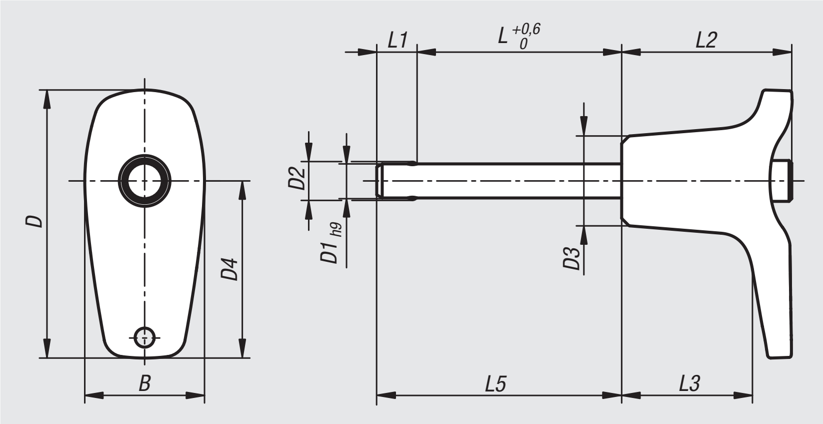
Accessories:
Adapter bushes for ball lock pins with head lock 03425
Safety spiral cable 03199
Retaining cable with eyelet 03199
Key ring 03199

Order No.	B	D	D1	D2	D3	D5	L	L1	L2	L3	L5	Receiver hole H11	Shearing force double shear max.kN
03420-10-204605* **	17,6	46	5	5,5	13,2	1,5	3	47/97/147	25	19,4	50/100/150	5	10
03420-10-204606* **	17,6	46	6	6,85	13,2	2	3	47/97/147	25	19,4	50/100/150	6	14
03420-10-206308* **	23	62,9	8	9,5	17,3	3	3,5	96,5/146,5/196,5	33	24,4	100/150/200	8	26
03420-10-206310* **	23	62,9	10	12	17,3	4	3,5	96,5/146,5/196,5	33	24,4	100/150/200	10	40
03420-10-208212* **	33	81,8	12	14,5	26,3	4,5	3,5	146,5/196,5/246,5	39,5	28,8	150/200/250	12	57
03420-10-208216* **	33	81,8	16	19	26,3	6,5	4	146/196/246	39,5	28,8	150/200/250	16	100

Notes

Ball lock pins

with zinc L-grip



Material:
Grip die-cast zinc.
Steel parts 1.4305 stainless steel.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03422-102606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely. If required, the ball lock pins can be fitted with a retaining cable.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

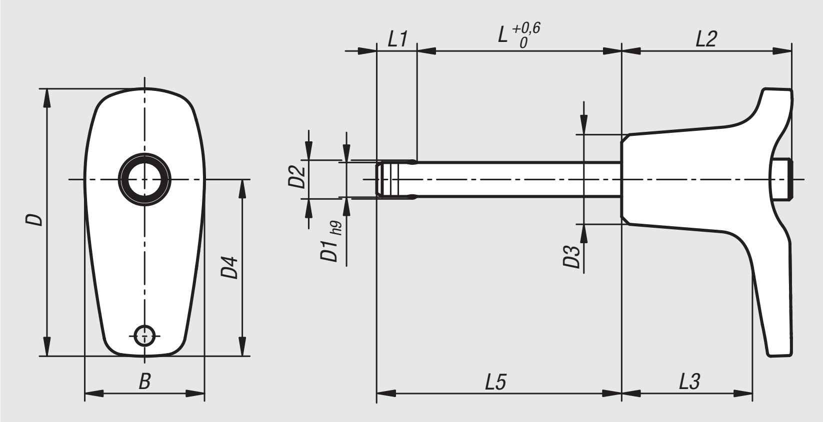
Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

Order No.	B	D	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03422-102605* **	17,6	39,3	5	5,5	13,2	26	10/15/20/25/30	5,9	25	19,2	15,9/20,9/25,9/30,9/35,9	5	15
03422-102606* **	17,6	39,3	6	6,85	13,2	26	10/15/20/25/30/35/40/45/50	6,8	25	19,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03422-103508* **	23	52,2	8	9,5	17,3	35,4	20/25/30/35/40/45/50	7,8	33	24,2	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03422-103510* **	23	52,2	10	12	17,3	35,4	20/25/30/35/40/45/50/60	8,9	33	24,2	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03422-104712* **	33	70,2	12	14,5	26,3	47	25/30/35/40/45/50/60/70/80	9,9	39,5	28,4	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03422-104716* **	33	70,2	16	19	26,3	47	30/35/40/45/50/60/70/80	13,1	39,5	28,4	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

Ball lock pins with L-grip

with high shear strength



Material:
Grip die-cast zinc.
Push button 1.4305 stainless steel.
Pin stainless steel 1.4542.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03422-112606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

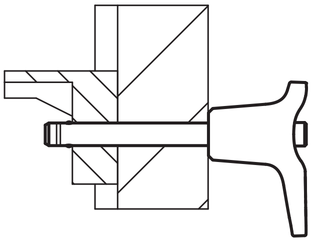
The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Ball lock pins with high shear strength are identified by a groove marking on the pin.

Advantages:
Higher loading in comparison to standard ball lock pins.
The pins made from 1.4542 stainless steel is hardened, has a higher shear resistance and is extremely durable.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

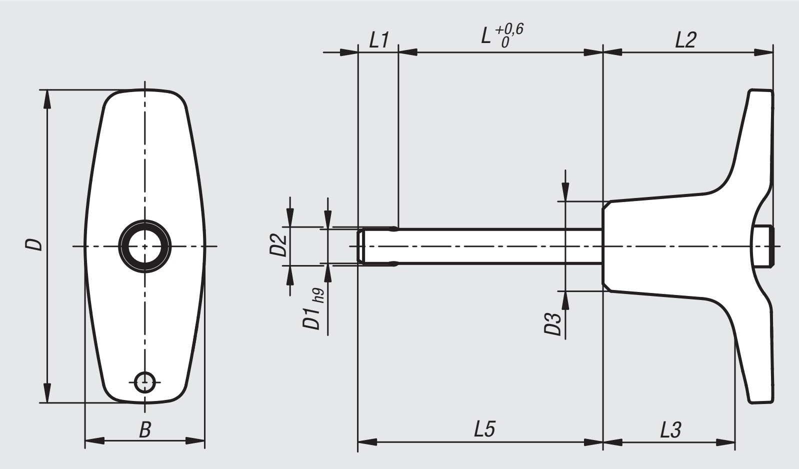


Order No.	B	D	D1	D2	D3	D4	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03422-112605***	17,6	39,3	5	5,5	13,2	26	10/15/20/25/30	5,9	25	19,2	15,9/20,9/25,9/30,9/35,9	5	24
03422-112606***	17,6	39,3	6	6,85	13,2	26	10/15/20/25/30/35/40/45/50	6,8	25	19,2	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03422-113508***	23	52,2	8	9,5	17,3	35,4	20/25/30/35/40/45/50	7,8	33	24,2	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03422-113510***	23	52,2	10	12	17,3	35,4	20/25/30/35/40/45/50/60	8,9	33	24,2	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03422-114712***	33	70,2	12	14,5	26,3	47	25/30/35/40/45/50/60/70/80	9,9	39,5	28,4	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03422-114716***	33	70,2	16	19	26,3	47	30/35/40/45/50/60/70/80	13,1	39,5	28,4	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

03422

Ball lock pins

with zinc T-grip



Material:
Grip die-cast zinc.
Steel parts 1.4305 stainless steel.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03422-204606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely. If required, the ball lock pins can be fitted with a retaining cable.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load.
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

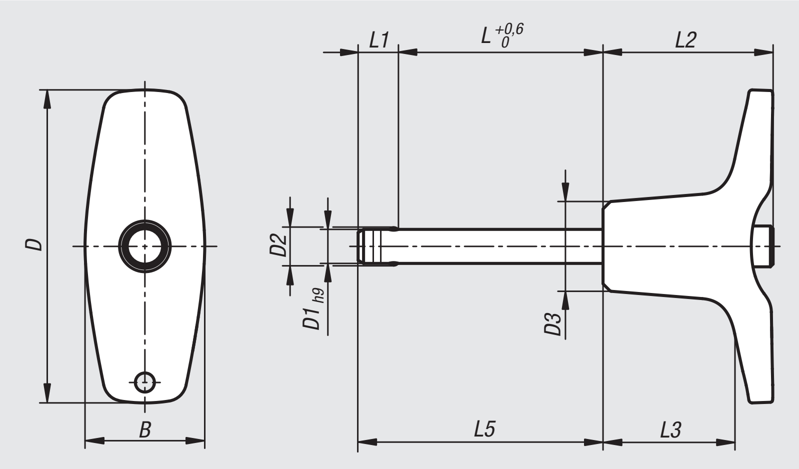
Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

Order No.	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03422-204605***	17,6	46	5	5,5	13,2	10/15/20/25/30	5,9	25	19,4	15,9/20,9/25,9/30,9/35,9	5	15
03422-204606***	17,6	46	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	19,4	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	22
03422-206308***	23	62,9	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	24,4	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	38
03422-206310***	23	62,9	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	24,4	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	60
03422-208212***	33	81,8	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	28,8	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	86
03422-208216***	33	81,8	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	28,8	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	153

Ball lock pins with T-grip

with high shear strength



Material:
Grip die-cast zinc.
Push button 1.4305 stainless steel.
Pin stainless steel 1.4542.
Balls 1.4125 stainless steel.
Spring 1.4310 stainless steel.

Version:
Grip black.
Stainless steel bright.

Sample order:
nlm 03422-214606050
(include length L e.g. 050 for L = 50 mm.)

Note:
Ball lock pins are used for easy fastening or joining of components. The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely.

Shear force double shear (F) = S · τ aB max.

The values given for the shear force are the theoretical breaking load. These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

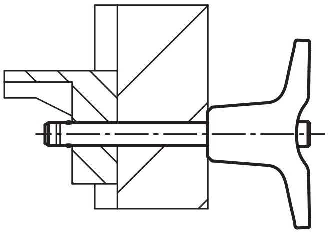
The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

Different materials in which the ball lock pins are used, weather conditions and wear can influence the determined values.

Ball lock pins with high shear strength are identified by a groove marking on the pin.

Advantages:
Higher loading in comparison to standard ball lock pins.
The pins made from 1.4542 stainless steel is hardened, has a higher shear resistance and is extremely durable.

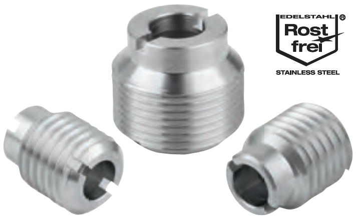
Accessories:
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

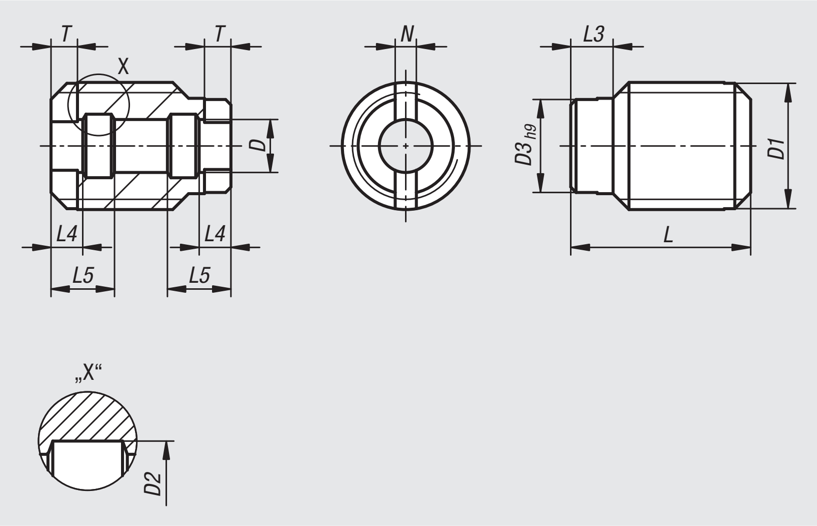


Order No.	B	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03422-214605* **	17,6	46	5	5,5	13,2	10/15/20/25/30	5,9	25	19,4	15,9/20,9/25,9/30,9/35,9	5	24
03422-214606* **	17,6	46	6	6,85	13,2	10/15/20/25/30/35/40/45/50	6,8	25	19,4	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	6	35
03422-216308* **	23	62,9	8	9,5	17,3	20/25/30/35/40/45/50	7,8	33	24,4	27,8/32,8/37,8/42,8/47,8/52,8/57,8	8	63
03422-216310* **	23	62,9	10	12	17,3	20/25/30/35/40/45/50/60	8,9	33	24,4	28,9/33,9/38,9/43,9/48,9/53,9/58,9/68,9	10	100
03422-218212* **	33	81,8	12	14,5	26,3	25/30/35/40/45/50/60/70/80	9,9	39,5	28,8	34,9/39,9/44,9/49,9/54,9/59,9/69,9/79,9/89,9	12	144
03422-218216* **	33	81,8	16	19	26,3	30/35/40/45/50/60/70/80	13,1	39,5	28,8	43,1/48,1/53,1/58,1/63,1/73,1/83,1/93,1	16	257

Locating bushes stainless steel

for ball lock pins





Material:
Stainless steel 1.4305.

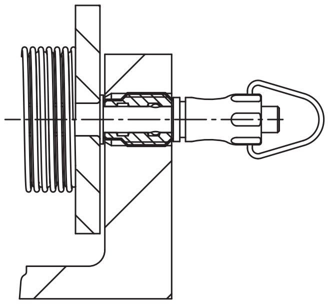
Version:
Bright.

Sample order:
nlm 03425-10512

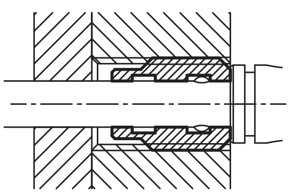
Note:
The locating bushes are ideal for easy and quick positioning of ball lock pins with head-end lock.

Advantages:
The adapter bushes can be used from both sides. Additional centring of the adapter bush is provided by the centring collar (D3).

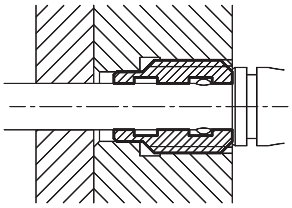
Drawing reference:
1) without centring
2) with centring



1)



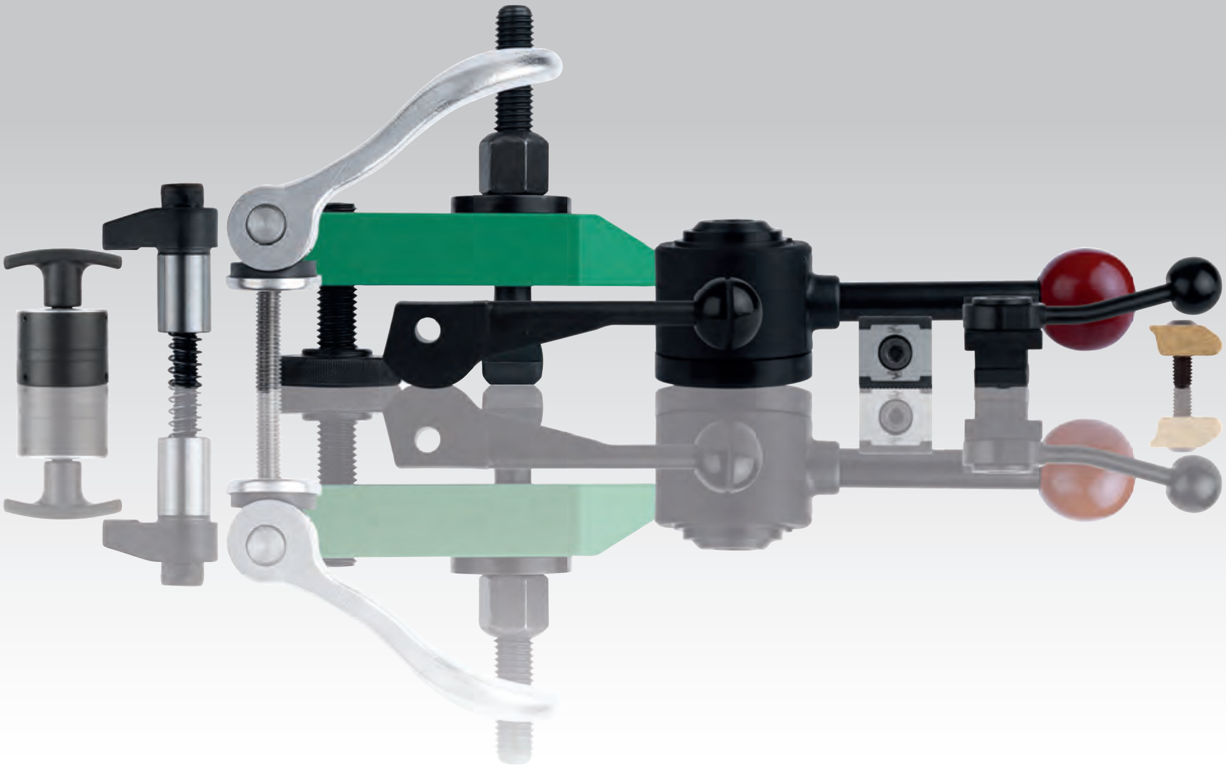
2)



Order No.	D	D1	D2	D3	L	L3	L4	L5	N	T
03425-10512	5	M12	6	9	17	4	3	6	2	2,5
03425-10616	6	M16	7,5	12	18	5	3	7	2	2,5
03425-10816	8	M16	10	12	20,5	5	3,5	8,5	2	2,5
03425-11024	10	M24x1,5	13	18	21,5	5	3,5	9	2,5	2,5
03425-11224	12	M30x1,5	15	24	22,5	5	3,5	9,5	2,5	2,5
03425-11630	16	M30x1,5	20	24	27	5	4,1	11,1	2,5	3

04000

Clamp straps
Clamping devices



04010

Clamp straps

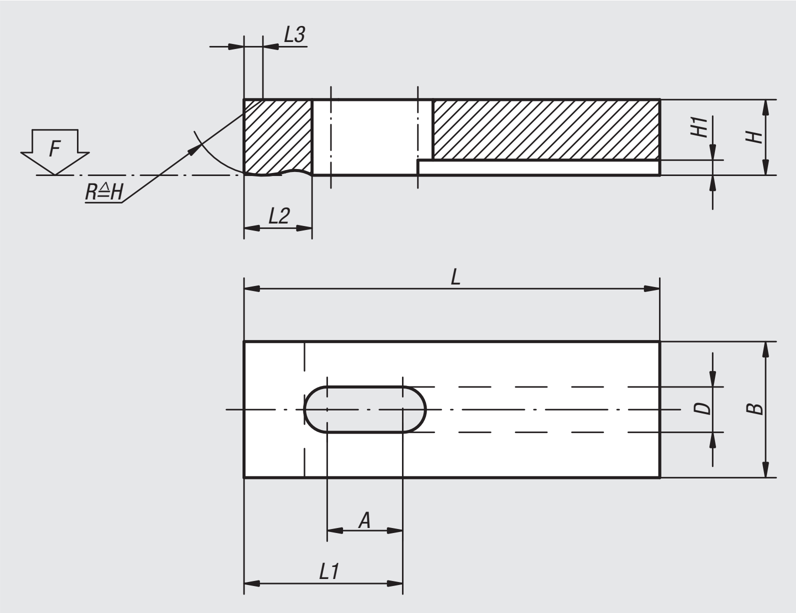
slotted heel

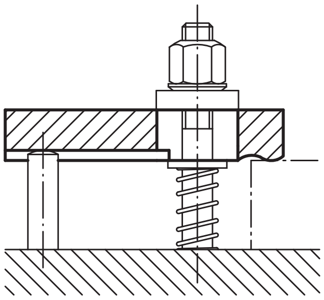
Material:
Carbon steel 1.1191

Version:
Black oxidised.

Sample order:
nlm 04010-101

Note:
For suitable supports and adjustable rest pads, see 02130 and 02150.



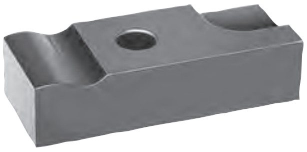


Order No.	A	B	D	H	H1	L	L1	L2	L3	F kN
04010-05	8	12	5,5	8	3	32	14	8	1,2	3,42
04010-051	13	12	5,5	8	3	50	23	8	1,2	3,42
04010-06	10	16	7	10	3	40	17	10	1,6	4,82
04010-061	17	16	7	10	3	63	29	10	1,6	4,82
04010-08	12	20	9	12	4	50	22	12	2	8,77
04010-081	21	20	9	12	4	80	37	12	2	8,77
04010-10	16	25	11	16	4,5	63	28	16	2,5	13,9
04010-101	26	25	11	16	4,5	100	46	16	2,5	13,9
04010-12	20	32	14	20	5	80	35	20	3	20,2
04010-121	33	32	14	20	5	125	58	20	3	20,2
04010-14	25	40	16	25	6	100	44	25	4	27,6
04010-141	42	40	16	30	6	160	74	25	4	27,6
04010-16	42	50	18	30	6	160	73	32	5	37,8
04010-20	52	60	22	30	8	200	92	40	6	58,8

04030

Clamp straps

swivel-heel

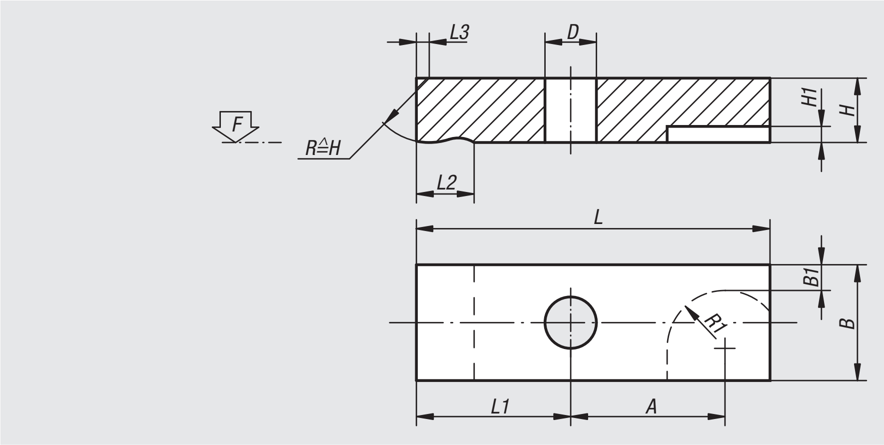


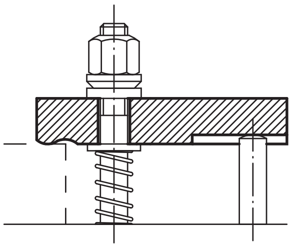
Material:
Carbon steel 1.1191

Version:
Black oxidised.

Sample order:
nlm 04030-10

Note:
Recommended clamp supports: 02130 and 02150.





Order No.	L	L1	L2	L3	B	B1	H	H1	D	A	R1	F kN
04030-05	32	14	8	1,2	12	2,5	8	3	5,5	14	7	3,42
04030-06	40	17	10	1,6	16	4	10	3	7	18	8	4,82
04030-08	50	22	12	2	20	5	12	4	9	22	10	8,77
04030-10	63	28	16	2,5	25	6,5	16	4	11	27	12	13,9
04030-12	80	35	20	3	32	9	20	5	14	35	14	20,2
04030-14	100	44	25	4	40	12	25	6	16	44	16	27,6
04030-16	125	55	32	5	50	16	30	6	18	54	18	37,8
04030-20	160	75	40	6	60	20,5	30	8	22	65	22	58,8

04050

Clamp straps

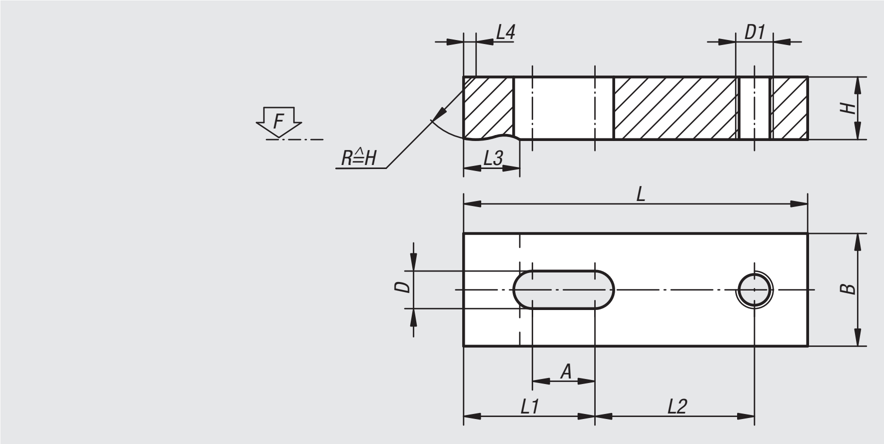
tapped-heel

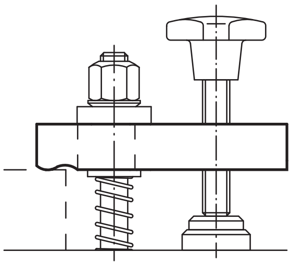
Material:
Carbon steel 1.1191

Version:
Black oxidised.

Sample order:
nlm 04050-08

Note:
When using spherical washers use the wide series 07420 Form G.



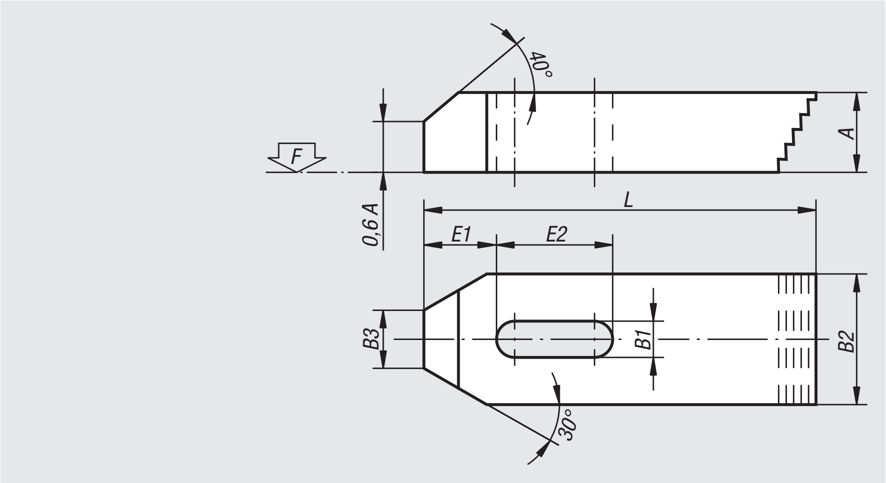


Order No.	L	L1	L2	L3	L4	B	H	D	D1	A	F kN
04050-05	40	18	18	8	1,2	12	8	5,5	M6	10	3,42
04050-06	50	22	23	10	1,6	16	10	7	M6	12	4,82
04050-08	63	28	29	12	2	20	12	9	M8	16	8,77
04050-10	80	36	36	16	2,5	25	16	11	M10	20	13,9
04050-12	100	45	45	20	3	32	20	14	M12	25	20,2
04050-14	125	57	56	25	4	40	25	16	M14	32	27,6
04050-16	160	72	72	32	5	50	30	18	M16	40	37,8
04050-20	200	90	90	40	6	60	30	22	M20	50	58,8

04070

Clamp straps

stepped-heel, steel or aluminium



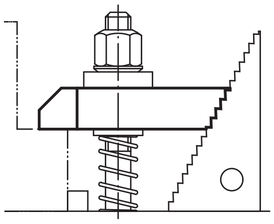
Material:
Carbon steel or EN AW-7022.

Version:
Steel painted.
Aluminium bright.

Sample order:
nlm 04070-12

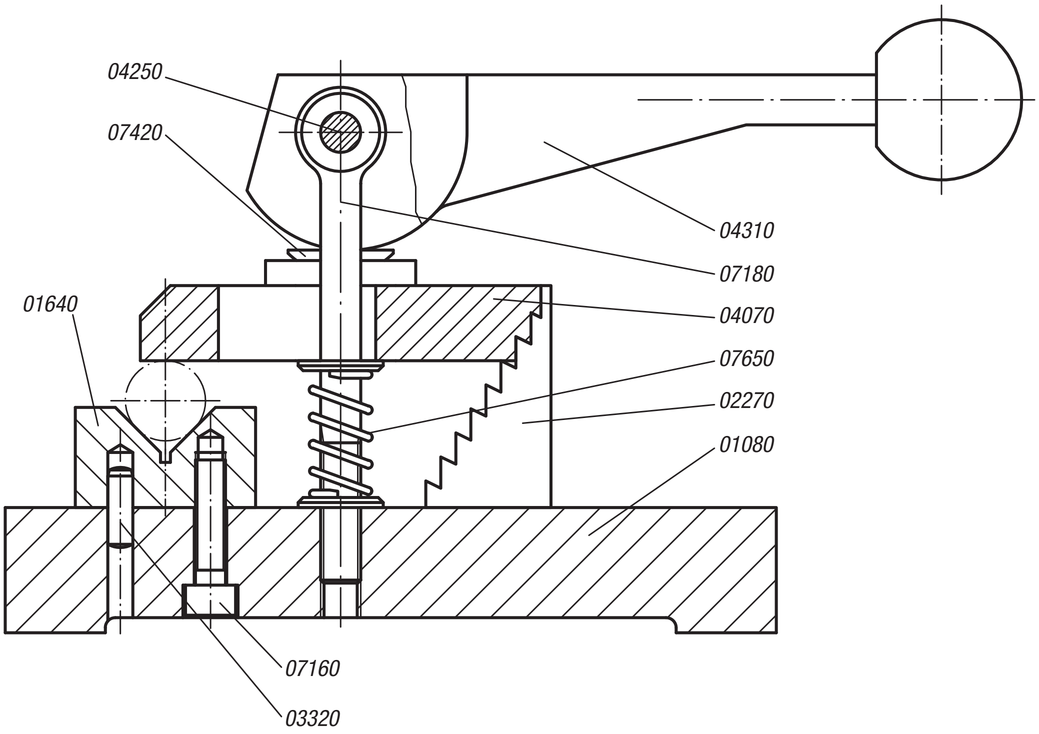
Note:
Use only with step blocks 02270.

When using spherical washers 07420 use Form G.



Order No. high carbon steel	Order No. aluminium	L	A	B1	B2	B3	E1	E2	F kN	for screw
04070-06	**04070-206**	50	10	7	20	8	10	20	4,82	M6
04070-08	**04070-208**	60	12	9	25	10	13	22	8,77	M8
04070-10	**04070-210**	80	15	11	30	12	15	30	13,9	M10
04070-12	**04070-212**	100	20	14	40	14	21	40	20,2	M12/M14
04070-16	**04070-216**	125	25	18	50	18	26	45	37,8	M16/M18
04070-20	**04070-220**	160	30	22	60	22	30	60	58,8	M20/M22
04070-24	**04070-224**	200	30	26	70	26	35	80	84,7	M24

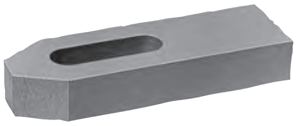
Example of a fixture using almost exclusively norelem parts:

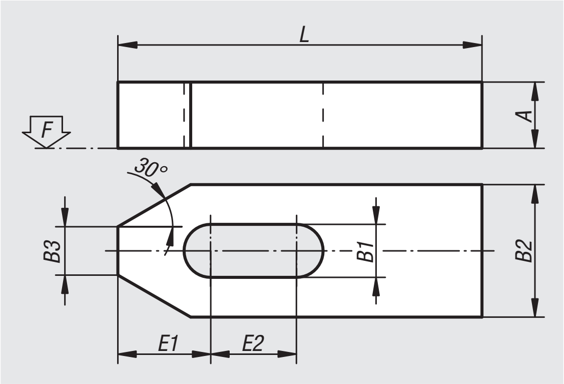


04080

Clamp straps

DIN 6314 straight, steel or aluminium



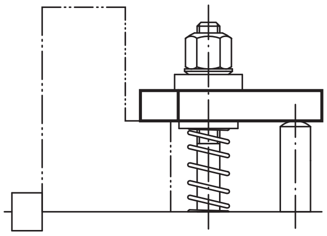


Material:
Carbon steel or EN AW-7022.

Version:
Steel painted.
Aluminium bright.

Sample order:
nlm 04080-16

Note:
When using spherical washers use the wide series 07420 Form G.



Order No. high carbon steel	Order No. aluminium	L	A	B1	B2	B3	E1	E2	F kN	for screw
04080-06	**04080-206**	50	10	7	20	8	13,5	13	4,82	M6
04080-08	**04080-208**	60	12	9	25	10	14,5	13	8,77	M8
04080-10	**04080-210**	80	15	11	30	12	20,5	19	13,9	M10
04080-12	**04080-212**	100	20	14	40	14	28	26	20,2	M12/M14
04080-14	**04080-214**	125	20	14	40	14	28	36	20,2	M12/M14
04080-16	**04080-216**	125	25	18	50	18	35	27	37,8	M16/M18
04080-18	**04080-218**	160	25	18	50	18	35	47	37,8	M16/M18
04080-20	**04080-220**	160	30	22	60	22	41	38	58,8	M20/M22
04080-201	**04080-2201**	200	30	22	60	22	41	58	58,8	M20/M22
04080-24	**04080-224**	200	30	26	70	26	48	54	84,7	M24
04080-241	**04080-2241**	250	35	26	70	26	48	79	84,7	M24
04080-30	**04080-230**	250	40	34	80	34	62	66	135	M30/M32
04080-301	**04080-2301**	315	50	34	80	34	62	96	135	M30/M32

Clamp straps

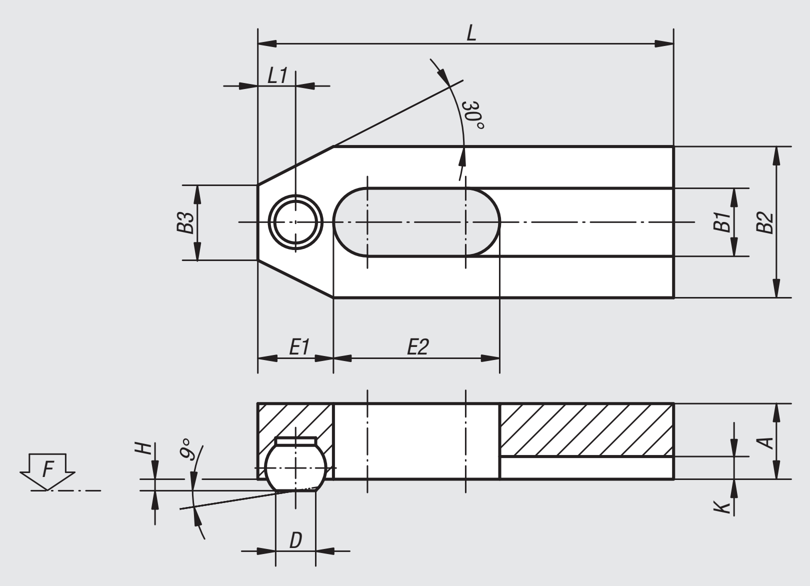
with flattened ball

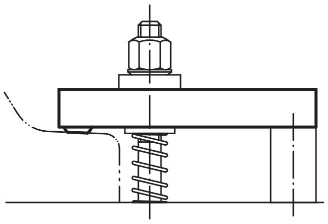
Material:
Straps carbon steel.
Balls roller bearing steel.

Version:
Strap black oxidised.
Ball hardened, bright.

Sample order:
nlm 04081-08

Note:
When using spherical washers 07420 use Form G.
Ball secured against rotation.



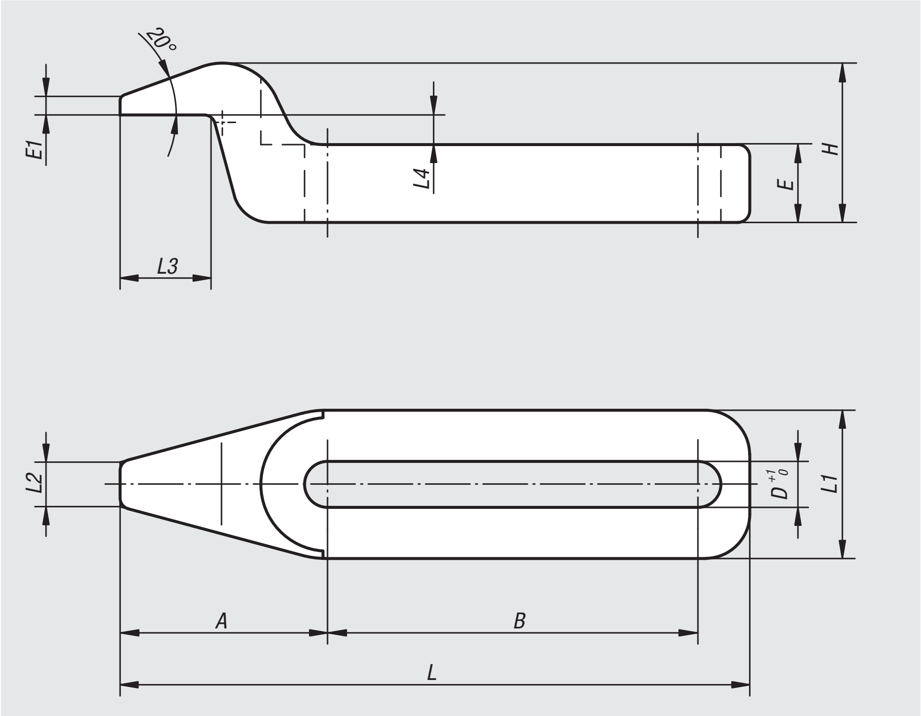


Order No.	L	L1	A	B1	B2	B3	D	H	K	Ball Ø	E1	E2	F kN	for screw
04081-06	50	5	10	7	20	8	5,5	1,6	2,5	8,5	10	20	4,82	M6
04081-08	60	6,5	12	9	25	10	7,2	2	3	10	13	22	8,77	M8
04081-10	80	7,5	15	11	30	12	8,6	2,7	3,5	12	15	30	13,9	M10
04081-12	125	10,5	20	13	40	14	10,5	3,5	4	16	21	50	20,2	M12

04088

Clamp straps gooseneck

narrow, steel

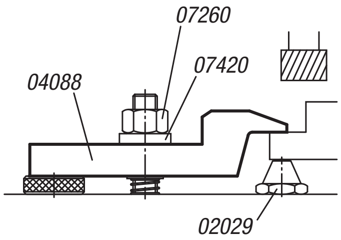


Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 04088-06010

Note:
The flat gooseneck allows lower steps on the workpiece to be machined or clamped. When using spherical washers 07420 use Form G.

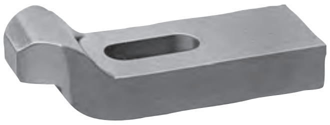


Order No.	A	B	D	E	E1	H	L	L1	L2	L3	L4	Clamping force kN
04088-06005	28	32	6,2	7,5	2,5	18,5	67	20	6	12,5	4	4,82
04088-06010	28	50	6,2	10,5	2,5	21,5	85	20	6	12,5	4	4,82
04088-08005	28	32	8,2	7,5	2,5	18,5	67	20	6	12,5	4	8,77
04088-08010	28	50	8,2	10,5	2,5	21,5	85	20	6	12,5	4	8,77
04088-10005	45	50	10,2	12	4	30	105	30	10	20	6	13,9
04088-10010	45	80	10,2	17	4	35	135	30	10	20	6	13,9
04088-12005	45	50	12,2	12	4	30	105	30	10	20	6	20,2
04088-12010	45	80	12,2	17	4	35	135	30	10	20	6	20,2
04088-16005	72	80	16,2	19	7	48	168	48	16	32	9,5	37,8
04088-16010	72	128	16,2	27	7	56	216	48	16	32	9,5	37,8
04088-20005	72	80	20,2	19	7	48	168	48	16	32	9,5	58,8
04088-20010	72	128	20,2	27	7	56	216	48	16	32	9,5	58,8

04090

Clamp straps gooseneck

DIN 6316 wide, steel or aluminium

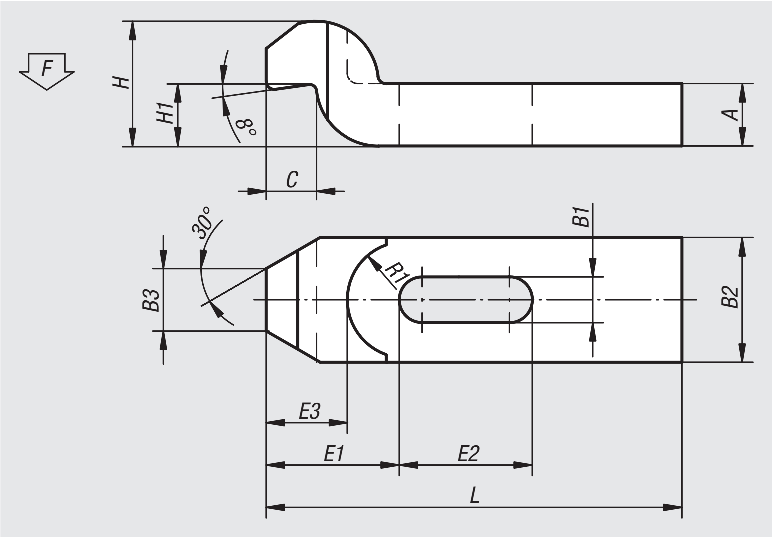


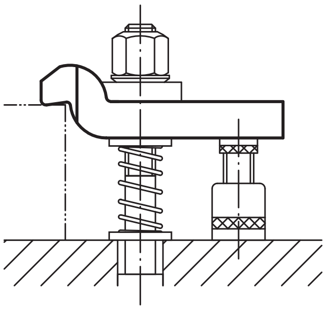
Material:
Carbon steel or EN AW-7022.

Version:
Steel painted.
Aluminium bright.

Sample order:
nlm 04090-10

Note:
When using spherical washers use the wide series 07420 Form G.





Order No. high carbon steel	Order No. aluminium	L	B1	B2	B3	H max.	H1	A	C	E1	E2	E3	R1	F kN	for screw
04090-06	**04090-206**	60	7	20	10	20	9	10	8	20	20	14	11	4,82	M6
04090-08	**04090-208**	80	9	25	12	24	11	12	9	25	25	17	14	8,77	M8
04090-10	**04090-210**	100	11	30	15	30	14	15	12	32	32	22	18	13,9	M10
04090-12	**04090-212**	125	14	40	20	40	18	20	16	40	40	28	20	20,2	M12/M14
04090-16	**04090-216**	125	18	50	25	46	23	25	20	49	40	38	25	37,8	M16/M18
04090-161	**04090-2161**	160	18	50	25	46	23	25	20	49	50	38	25	37,8	M16/M18
04090-20	**04090-220**	160	22	60	30	60	28	30	24	55	55	40	28	58,8	M20/M22
04090-201	**04090-2201**	200	22	60	30	60	28	30	24	55	70	40	28	58,8	M20/M22
04090-24	**04090-224**	200	26	70	35	70	32	35	28	72	60	54	34	84,7	M24
04090-241	**04090-2241**	250	26	70	35	70	32	35	28	72	80	54	34	84,7	M24
04090-30	**04090-230**	250	34	80	40	80	37	40	40	91	80	72	40	135	M30/M32
04090-301	**04090-2301**	315	34	80	40	100	56	50	40	91	100	72	40	135	M30/M32

Clamp straps

assorted, long slot

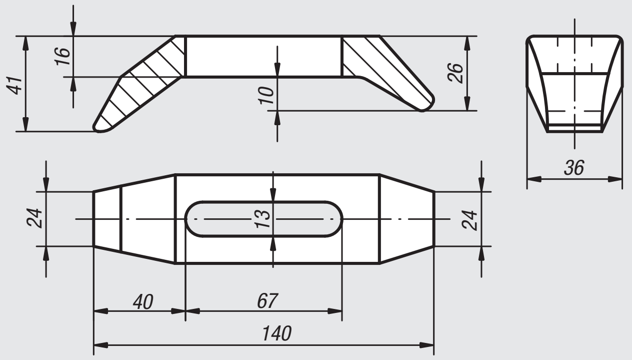
Material:
Carbon steel 1.7225

Version:
Tempered to 1000 N/mm², black oxidised.

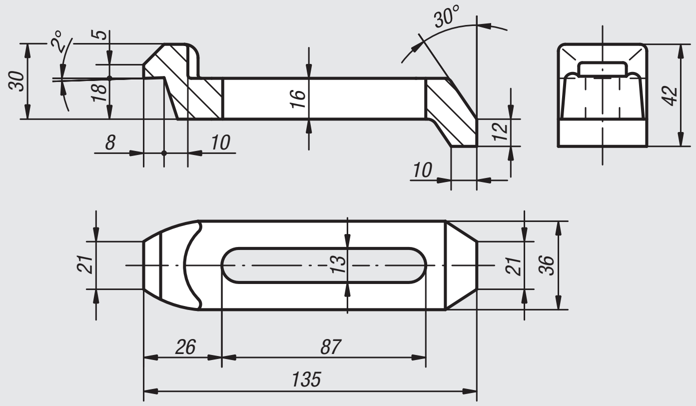
Sample order:
nlm 04100-10

Note:
These clamp straps with long slot are also used with the compact clamp strap module 04200.

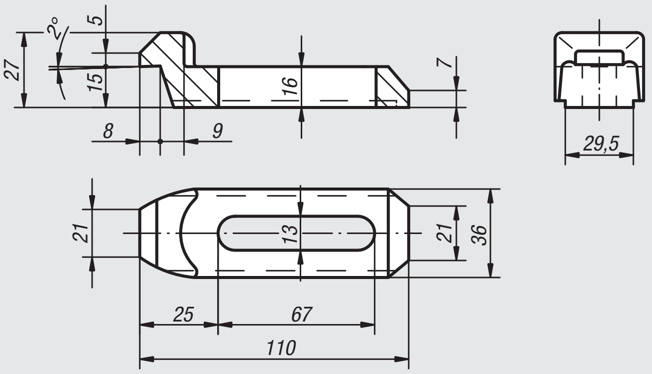
04100-01 (0,5 kg)

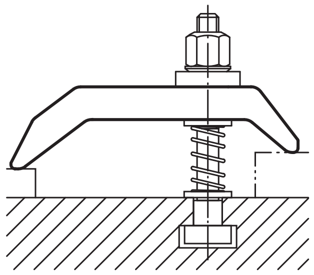


04100-05 (0,48 kg)



04100-10 (0,35 kg)

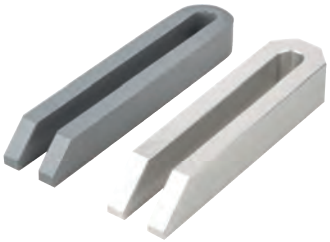




Order No.	Item
04100-01	Clamp Strap
04100-05	Clamp Strap
04100-10	Clamp Strap

Clamp straps open U

DIN 6315, steel or aluminium

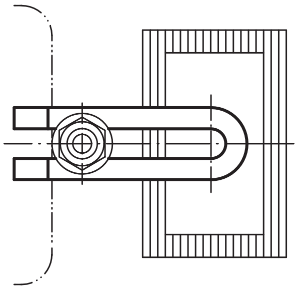


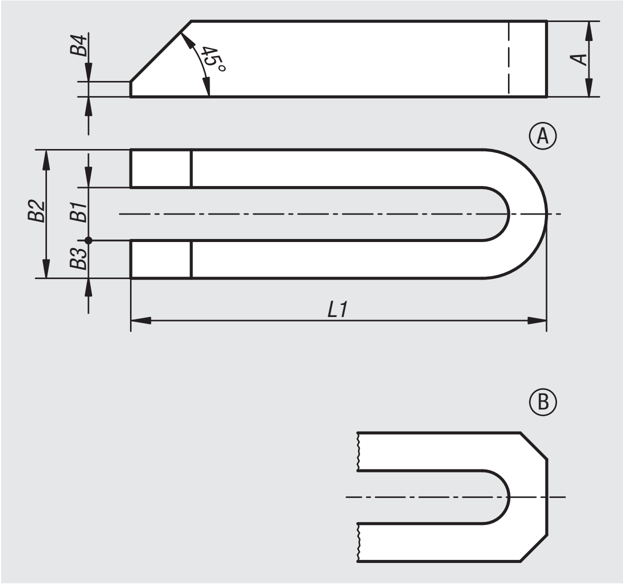
Material:
Carbon steel or EN AW-7022.

Version:
Steel painted.
Aluminium bright.

Sample order:
nlm 04110-06

Note:
When using spherical washers use the wide series 07420 Form G.



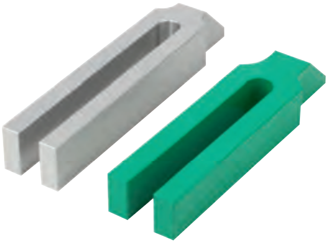


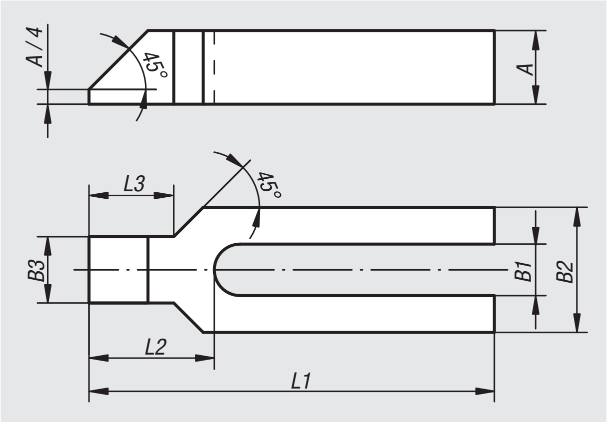
Order No.	Main material	Form	L1	A	B1	B2	B3	B4	for screw
04110-06	high carbon steel	A	60	12	6,6	18	6	3	M6
04110-08	high carbon steel	A	80	15	9	25	8	4	M8
04110-10	high carbon steel	A	100	20	11	31	10	5	M10
04110-12	high carbon steel	A	125	25	14	38	12	6	M12/M14
04110-121	high carbon steel	A	160	25	14	38	12	6	M12/M14
04110-122	high carbon steel	A	200	25	14	38	12	6	M12/M14
04110-16	high carbon steel	A	160	30	18	48	15	8	M16/M18
04110-161	high carbon steel	A	200	30	18	48	15	8	M16/M18
04110-162	high carbon steel	A	250	40	18	48	15	10	M16/M18
04110-20	high carbon steel	A	200	40	22	52	15	10	M20/M22
04110-201	high carbon steel	A	250	40	22	62	20	10	M20/M22
04110-202	high carbon steel	A	315	40	22	62	20	10	M20/M22
04110-24	high carbon steel	A	200	40	26	66	20	10	M24
04110-241	high carbon steel	A	250	40	26	66	20	10	M24
04110-242	high carbon steel	A	315	40	26	66	20	10	M24
04110-301	high carbon steel	A	250	50	33	73	20	12	M30/M32
04110-30	high carbon steel	A	315	50	33	73	20	12	M30/M32
04110-302	high carbon steel	A	400	50	33	73	20	12	M30/M32
04110-40	high carbon steel	A	400	60	40	100	30	12	M36
04110-401	high carbon steel	A	600	60	40	100	30	12	M36
04110-206	aluminium	B	60	12	7	19	6	3	M6
04110-208	aluminium	B	80	15	9	25	8	4	M8
04110-210	aluminium	B	100	20	11	31	10	5	M10
04110-212	aluminium	B	125	25	14	38	12	6	M12/M14
04110-2121	aluminium	B	160	28	14	38	12	6	M12/M14
04110-216	aluminium	B	160	30	18	48	15	8	M16/M18
04110-2161	aluminium	B	200	36	18	48	15	8	M16/M18
04110-220	aluminium	B	200	40	22	52	15	10	M20/M22
04110-2201	aluminium	B	250	40	22	62	20	10	M20/M22
04110-224	aluminium	B	200	40	26	66	20	10	M24
04110-2241	aluminium	B	250	40	26	66	20	10	M24
04110-230	aluminium	B	315	50	34	74	20	12	M30/M32

04130

Clamp straps open U

flat pin, steel or aluminium



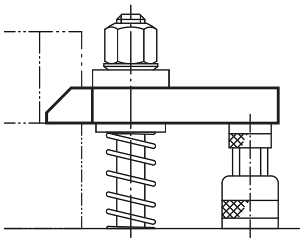


Material:
Carbon steel or EN AW-7022.

Version:
Steel painted.
Aluminium bright.

Sample order:
nlm 04130-12

Note:
When using spherical washers use the wide series 07420 Form G.

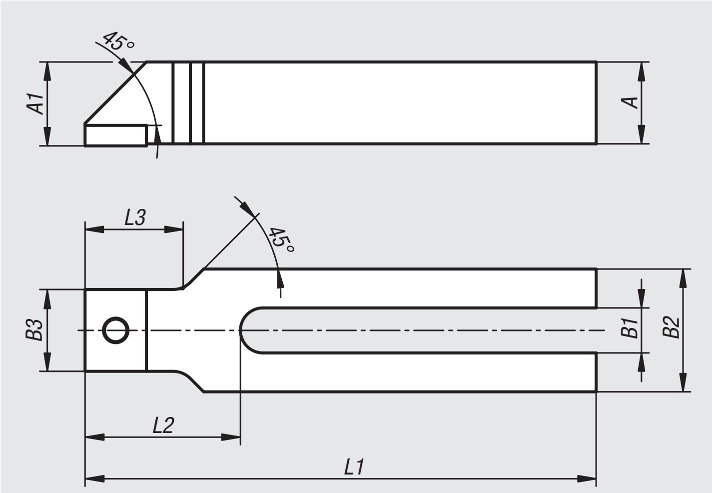


Order No.	Main material	L1	A	B1	B2	B3	L2	L3	for screw
04130-08	high carbon steel	100	15	9	30	16	32	18	M8
04130-10	high carbon steel	125	20	11	30	20	38	24	M10
04130-12	high carbon steel	160	25	14	40	24	47	30	M12/M14
04130-121	high carbon steel	200	25	14	40	24	47	30	M12/M14
04130-16	high carbon steel	200	30	18	50	28	57	36	M16/M18
04130-161	high carbon steel	250	30	18	50	28	57	36	M16/M18
04130-20	high carbon steel	250	40	22	60	35	68	45	M20/M22
04130-201	high carbon steel	315	40	22	60	35	68	45	M20/M22
04130-24	high carbon steel	250	40	26	70	43	83	56	M24
04130-241	high carbon steel	315	40	26	70	43	83	56	M24
04130-30	high carbon steel	315	60	34	80	50	88	56	M30/M32
04130-301	high carbon steel	400	60	34	80	50	88	56	M30/M32
04130-208	aluminium	100	15	9	30	16	32	18	M8
04130-210	aluminium	125	20	11	30	20	38	24	M10
04130-212	aluminium	160	28	14	40	24	47	30	M12/M14
04130-2121	aluminium	200	36	14	40	24	47	30	M12/M14
04130-216	aluminium	200	36	18	50	28	57	36	M16/M18
04130-2161	aluminium	250	40	18	50	28	57	36	M16/M18
04130-220	aluminium	250	40	22	60	35	68	45	M20/M22
04130-2201	aluminium	315	48	22	60	35	68	45	M20/M22
04130-224	aluminium	250	40	26	70	43	83	56	M24
04130-2241	aluminium	315	48	26	70	43	83	56	M24
04130-230	aluminium	315	60	34	80	50	88	56	M30/M32
04130-2301	aluminium	400	60	34	80	50	88	56	M30/M32

04131

Clamp straps open-U

with pin and protective insert



Material:
Carbon steel.
Soft pad POM or polyurethane 99 Shore A.

Version:
Black oxidised.

Sample order:
nlm 04131-110008

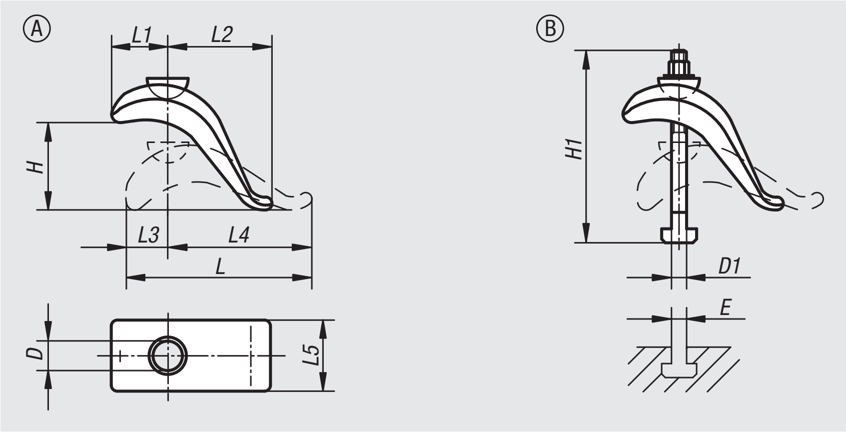
Note:
The pressed in plastic inserts offer optimal damage protection for sensitive workpiece faces.

Order No.	Component material	L1	A	A1	B1	B2	B3	L2	L3	for screws
04131-110008	polyacetal	100	15	15,5	9	30	16	32	18	M8
04131-112510	polyacetal	125	20	20,5	11	30	20	38	24	M10
04131-116012	polyacetal	160	25	25,5	14	40	24	47	30	M12
04131-210008	polyurethane	100	15	15,5	9	30	16	32	18	M8
04131-212510	polyurethane	125	20	20,5	11	30	20	38	24	M10
04131-216012	polyurethane	160	25	25,5	14	40	24	47	30	M12

04140

Clamp straps pivot

strap only or assembly



Material:
Steel.

Version:
Forged, tempered and painted.
Bolts, nuts, washers grade 8.8

Sample order:
nlm 04140-010

Note:
The strap provides instant height adjustment without blocks or shims and requires little space on the machine table. Designed for rugged use and highly suitable for clamping blanking and punching dies.

Form A strap only

Order No.	Form	D	H	L	L1	L2	L3	L4	L5	Clamping force kN
04140-010	A	17	75	140	55	60	30	110	50	20,2
04140-020	A	21	85	175	70	80	40	135	60	37,8

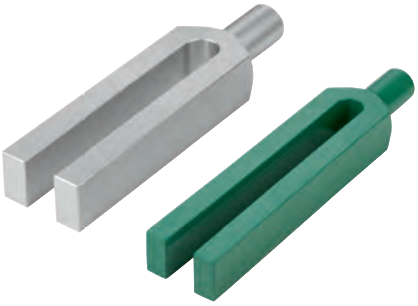
Form B with T-slot bolt, nut and washer

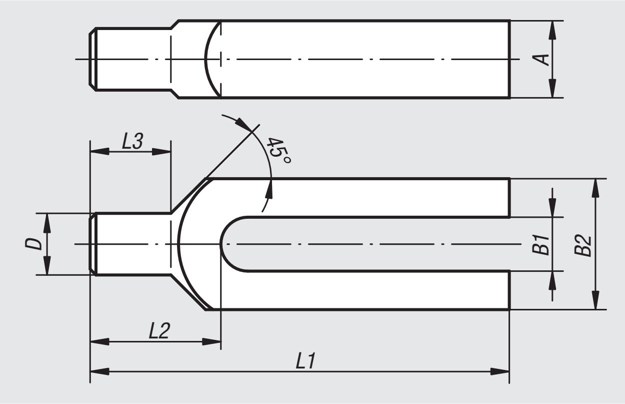
Order No.	Form	D	D1	E	H	H1	L	L1	L2	L3	L4	L5	Clamping force kN
04140-030	B	17	M12	12	50	125	140	55	60	30	110	50	20,2
04140-040	B	17	M12	14	50	125	140	55	60	30	110	50	20,2
04140-050	B	17	M16	16	75	160	140	55	60	30	110	50	37,8
04140-060	B	17	M16	18	75	160	140	55	60	30	110	50	37,8
04140-080	B	21	M16	16	65	160	175	70	80	40	135	60	37,8
04140-100	B	21	M16	18	65	160	175	70	80	40	135	60	37,8
04140-120	B	21	M20	22	85	200	175	70	80	40	135	60	58,8

04150

Clamp straps open U

DIN 6315 C, round pin, steel or aluminium





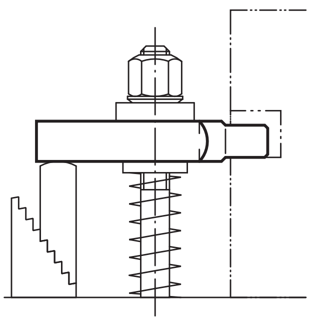
Material:
Carbon steel or EN AW-7022.

Version:
Steel painted.
Aluminium bright.

Sample order:
nlm 04150-161

Note:
When using spherical washers 07420 use Form G.

The stated clamping forces are only valid for steel straps.

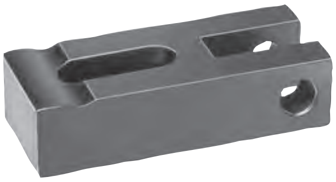


Order No.	Main material	L1	A	B1	B2	D	L2	L3	for screw	Clamping force kN
04150-08	high carbon steel	100	15	9	30	12	30	18	M8	8,77
04150-10	high carbon steel	125	20	11	30	16	36	24	M10	13,9
04150-12	high carbon steel	160	25	14	40	20	45	30	M12/M14	20,2
04150-121	high carbon steel	200	25	14	40	20	45	30	M12/M14	20,2
04150-16	high carbon steel	200	30	18	50	24	55	36	M16/M18	37,8
04150-161	high carbon steel	250	30	18	50	24	55	36	M16/M18	37,8
04150-20	high carbon steel	250	40	22	60	30	65	45	M20/M22	58,8
04150-201	high carbon steel	315	40	22	60	30	65	45	M20/M22	58,8
04150-208	aluminium	100	15	9	30	12	30	18	M8	-
04150-210	aluminium	125	20	11	30	16	36	24	M10	-
04150-212	aluminium	160	28	14	40	20	45	30	M12/M14	-
04150-216	aluminium	200	30	18	50	24	55	36	M16/M18	-
04150-2161	aluminium	250	30	18	50	24	55	36	M16/M18	-
04150-220	aluminium	250	40	22	60	30	65	45	M20/M22	-

04170

Clamp straps

hinge heel

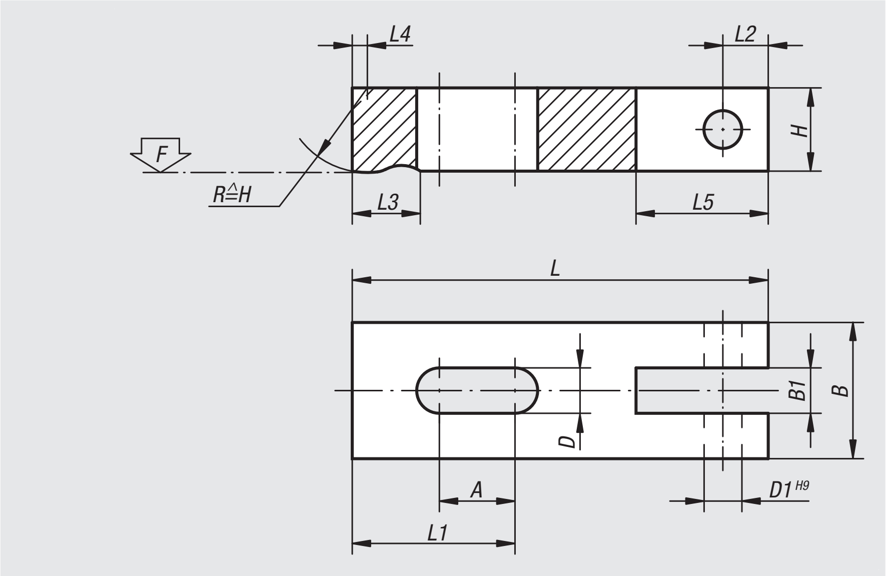


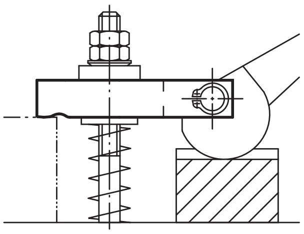
Material:
Carbon steel 1.1191

Version:
Tempered and black oxidised.

Sample order:
nlm 04170-12

Note:
Suitable hinge pins 04250.
Cam levers 04290.
When using spherical washers 07420 use Form G.





Order No.	L	L1	L2	L3	L4	L5	B	B1	H	D	D1	A	F max. kN
04170-08	63	28	8	12	2	24	25	9,5	16	9	8	16	8,77
04170-10	80	36	10	16	2,5	29	32	12,5	20	11	10	20	13,9
04170-12	100	45	12	22	3	36	40	14,5	25	14	12	25	20,2

04185

Clamp straps mini

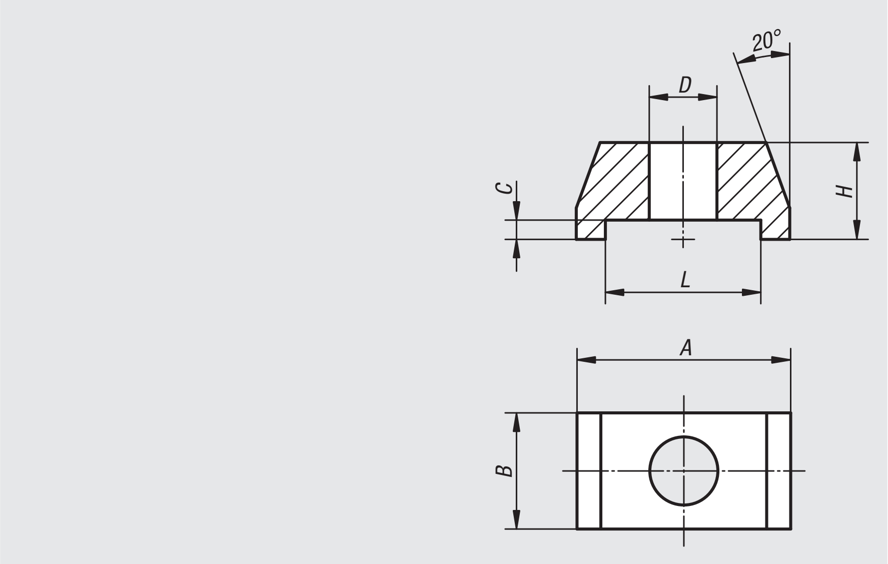
double sided

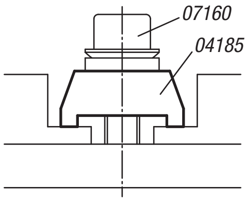
Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 04185-012

Note:
Two workpieces can be clamped simultaneously from one clamping point using the mini clamp strap.



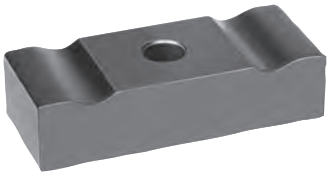


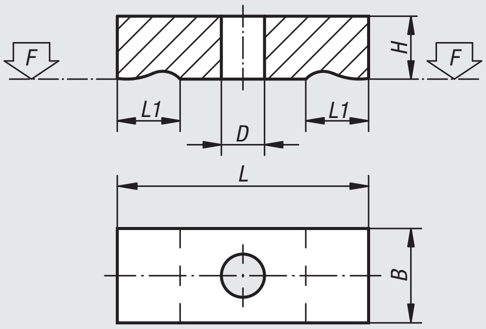
Order No.	A	B	C	D	H	L	Clamping force kN
04185-006	22	12	2	7	10	16	4,82
04185-008	22	12	2	9	10	16	8,77
04185-010	35	19	3	11	15	24	13,9
04185-012	35	19	3	13	15	24	20,2
04185-016	50	29	5	17	25	36	37,8

04190

Clamp straps

double sided

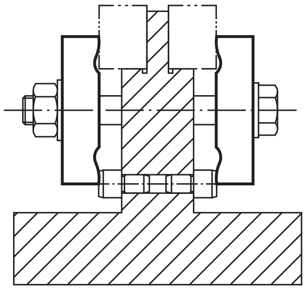




Material:
Carbon steel 1.1191

Version:
Black oxidised.

Sample order:
nlm 04190-12



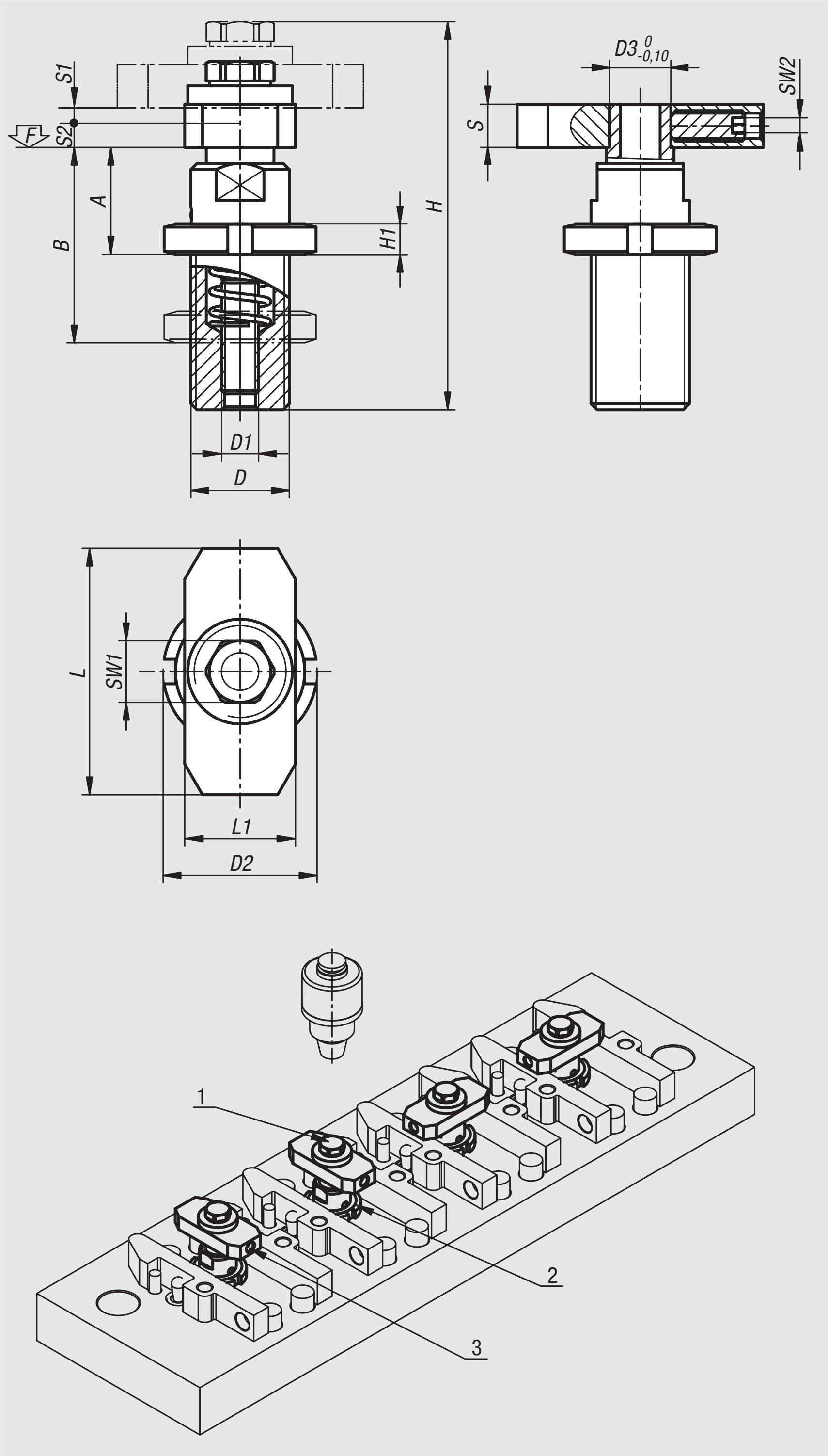
Order No.	L	L1	B	H	D	F kN
04190-05	32	8	12	8	5,5	3,42
04190-06	40	10	16	10	7	4,82
04190-08	50	12	20	12	9	8,77
04190-10	63	16	25	16	11	13,9
04190-12	80	20	32	20	14	20,2
04190-14	100	25	40	25	16	27,6
04190-16	125	32	50	30	18	37,8
04190-20	160	40	60	30	22	58,8

Notes

04191

Clamp straps

double-sided, 90° swivelling



Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 04191-1640

Note:
The double-sided clamp straps are ideal for series clamping.
For special applications, the clamping flange can be replaced with another clamping flange by loosening the clamping screw. The clamping flange must always have a contact point on both sides.

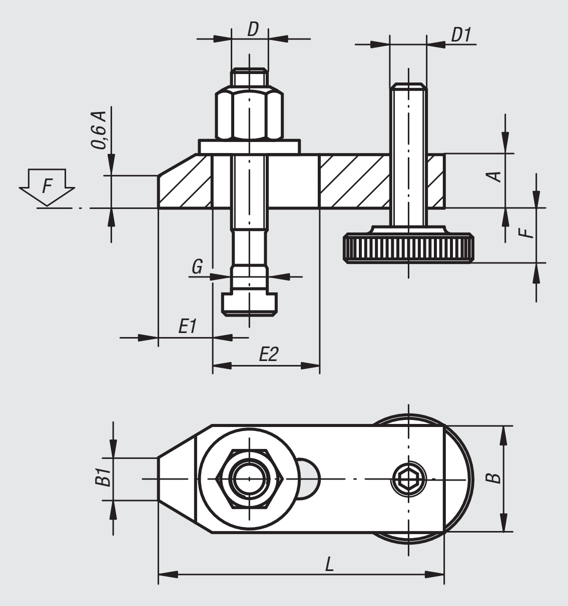
Functional principle:
1. Use a hand-held or electric tool to tighten the hexagon head bolt (make sure that the maximum tightening torque is not exceeded). When clamping, the clamping flange automatically turns by quarter of a rotation and starts the clamping stroke.

2. Use reverse procedure to loosen the hexagon head bolt. The clamping flange automatically returns to its starting position (the set screw can be used to change the position of the clamping flange).

Drawing reference:
1) Hexagon head bolt
2) Slotted round nut
3) Set screw

Order No.	D	D1	D2	D3	A	B	H	H1	L	L1	S	S1	S2	SW1	SW2	Tightening torque max. Nm	F max. kN
04191-1640	M16x1	M6	25	10	15	25	61	5	40	18	7	4,5	2,5	10	2,5	10,4	8,97
04191-2460	M24x2	M8	36	14	22	35	87	7	60	28	9	6	4	13	3	25,3	16,5

Clamp strap assemblies



Material:
Carbon steel.
Screws tempered to 8.8.

Version:
Clamp painted. Screws black oxidised.

Sample order:
nlm 04192-1616

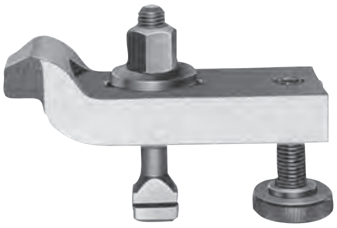
Note:
“F” is dependent on the depth of the DIN 650 slot.

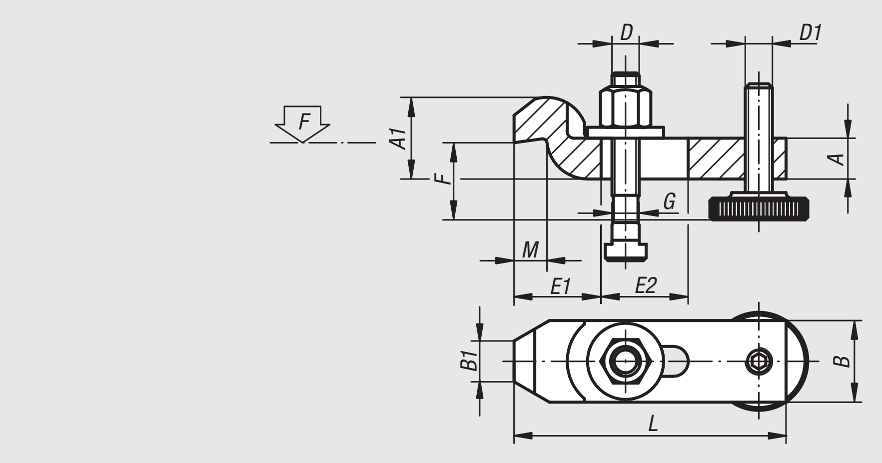
Order No.	L	A	B	B1	E1	E2	F	G for T-slot	D	D1	F kN
04192-1010	80	15	30	12	15	30	8-32	10	M10x80	M10	13,9
04192-1212	100	20	40	14	21	40	10-40	12	M12x100	M12	20,2
04192-1214	100	20	40	14	21	40	10-38	14	M12x100	M12	20,2
04192-1616	125	25	50	18	26	45	13-49	16	M16x125	M16	37,8
04192-1618	125	25	50	18	26	45	13-46	18	M16x125	M16	37,8
04192-2020	160	30	60	22	30	60	16-65	20	M20x160	M20	58,8
04192-2022	160	30	60	22	30	60	16-65	22	M20x160	M20	58,8

04193

Clamp strap assemblies

goose-neck





Material:
Carbon steel.
Screws tempered to 8.8.

Version:
Straps painted.
Screws black oxidised.

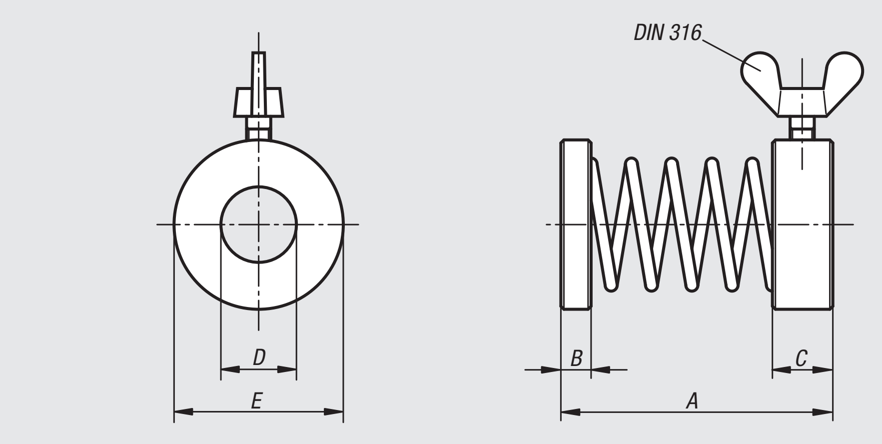
Sample order:
nlm 04193-1616

Note:
“F” is dependent on the depth of the DIN 650 slot.

Order No.	L	A	A1	B	B1	E1	E2	F	G for T-slot	D	D1	M	F kN
04193-1010	100	15	30	30	15	32	32	22-46	10	M10x80	M10	12	13,9
04193-1212	125	20	40	40	20	40	40	28-58	12	M12x100	M12	16	20,2
04193-1214	125	20	40	40	20	40	40	28-56	14	M12x100	M12	16	20,2
04193-1616	160	25	50	50	25	49	50	36-72	16	M16x125	M16	20	37,8
04193-1618	160	25	50	50	25	49	50	36-69	18	M16x125	M16	20	37,8
04193-2020	200	30	60	60	30	55	70	43-92	20	M20x160	M20	24	58,8
04193-2022	200	30	60	60	30	55	70	43-92	22	M20x160	M20	24	58,8

04195

Clamp springs



Material:
Thrust and retaining ring carbon steel.
Spring, spring steel.

Version:
Thrust and retaining ring black oxidised.
Spring bright.

Sample order:
nlm 04195-12046

Order No.	A	B	C	D	E	Wing nuts to DIN 316
04195-08029	29	2	6	8,5	16	M4x6
04195-12046	46	3	8	13	25	M4x10
04195-16050	50	4	8	16,5	28	M5x10

04200

Clamp strap modules

compact

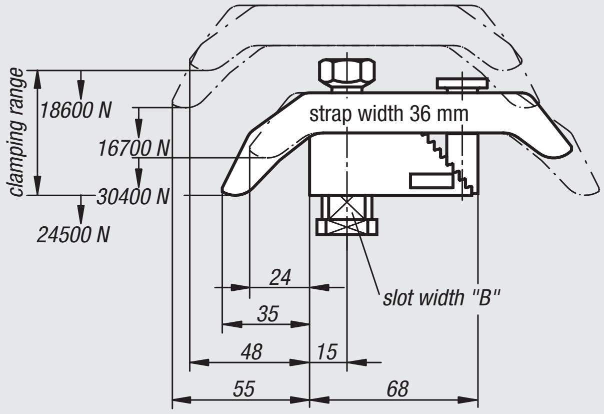
Material:
Base, ductile iron.
Clamp strap and clamping screw carbon steel.

Version:
Black oxidised.

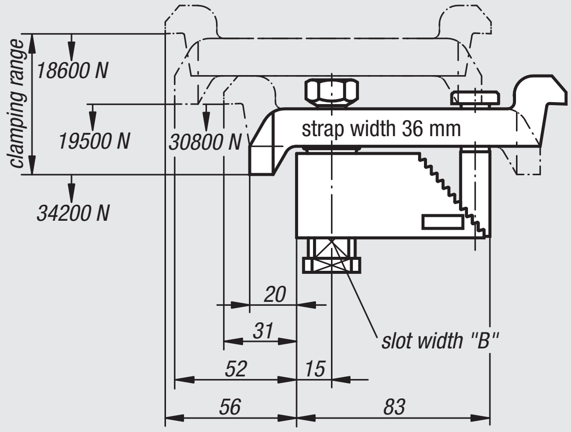
Sample order:
nlm 04200-40X16 (include dimension B)

Note:
These clamp strap modules are universal, flexible clamps constructed from individual components building a compact unit. There are no loose parts which first have to be altered for a clamping operation. The compact design allows these clamps to be placed close to the workpiece enabling the full area of the machine table to be used.

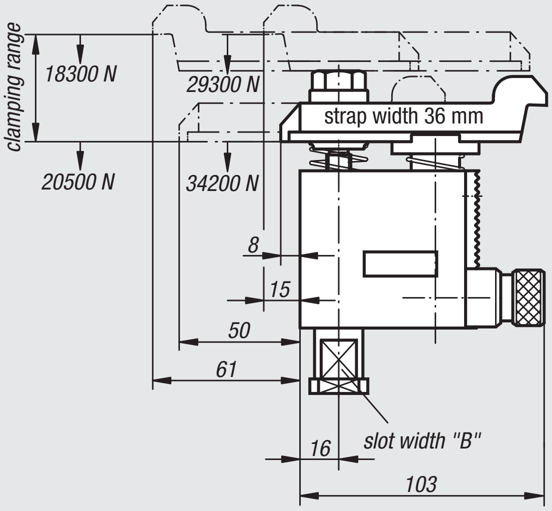
Size 1

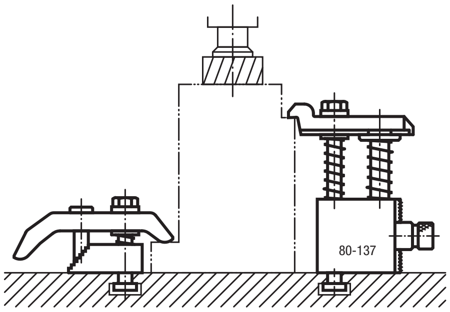


Size 2



Size 3-5





Order No.	Size	Clamp range	Slot width B DIN 650
04200-10X	1	0-35	12/14/16/18
04200-20X	2	25-85	12/14/16/18
04200-30X	3	80-137	12/14/16/18
04200-40X	4	125-224	12/14/16/18
04200-50X	5	160-300	12/14/16/18

Notes

04203

Clamp strap assemblies

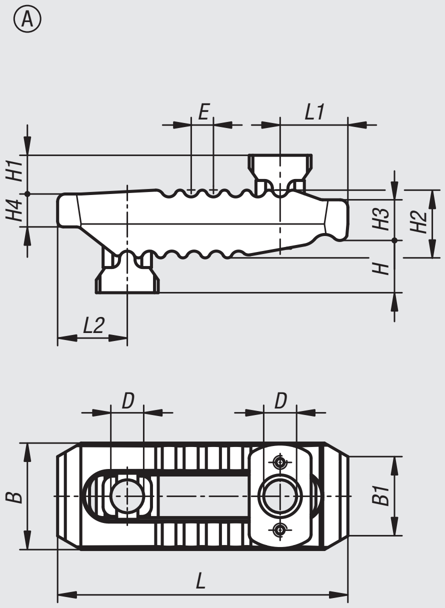
Material:
Steel.

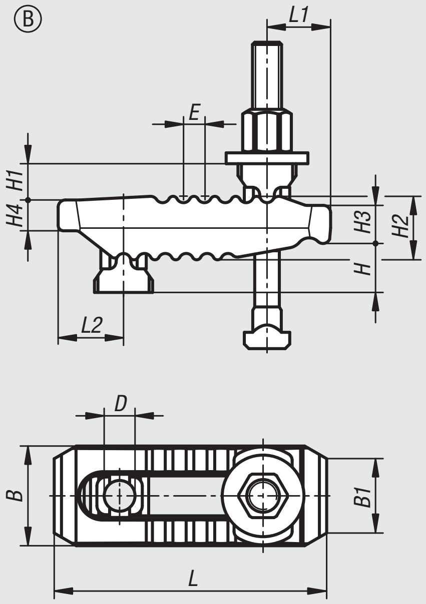
Version:
Form A: Tempered and electro zinc-plated.
Form B: Tempered and electro zinc-plated.
Complete with DIN 787 screw for T-slots, DIN 6340 washer and DIN 6330B nut.
Form C: Tempered and electro zinc-plated.
Complete with DIN 6379 stud, DIN 6340 washer and DIN 6330B nut.

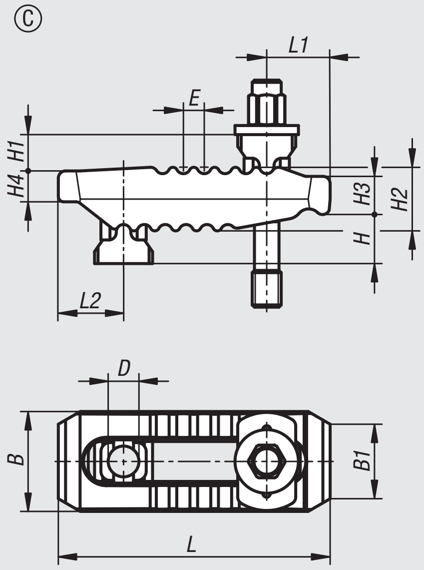
Sample order:
nlm 04203-113115

Note:
These clamp strap assemblies can be quickly and infinitely adapted to the clamping situation. The clamp straps have different heel types both sides enabling the best end to be selected depending on the specific application. These extremely versatile clamp straps are suitable for use by metal cutting or non-cutting machining and also for press and injection-moulding applications.

Accessories:
04204 adjustable heel supports







Clamp strap assemblies

Order No.	Form	B	B1	D	E	H clamping range	H1	H2	H3	H4	L	L1	L2	Slot width	Clamping force kN
04203-113115	A	44	30	13	11	0-55	18	27	17	12	115	25	30	10-12-14	30
04203-117150	A	55	41	17	12	0-70	20	36	21	17	150	35	36	12-14-16-18	40
04203-121187	A	62	30	21	14	0-80	30	42	27	20	187	44	44	16-18-20-22	60
04203-125235	A	70	30	25	17	0-100	31	51	34	24	235	60	47	20-22-24-28	75
04203-125285	A	73	30	25	17	0-100	35	56	35	24	285	62	51	20-22-24-28	75

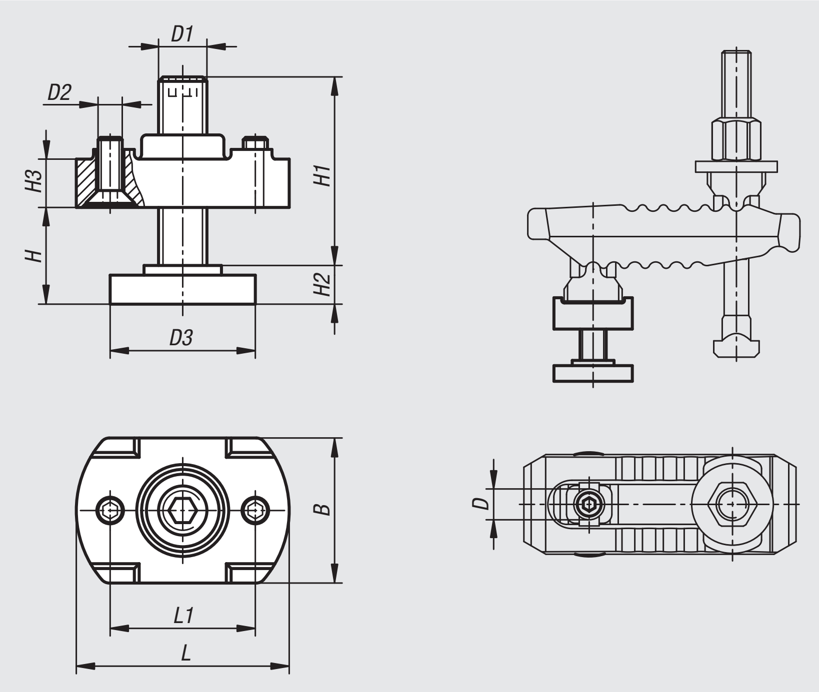
Order No. with t-slot nut	Form	B	B1	D	E	H clamping range	H1	H2	H3	H4	L	L1	L2	Slot width	Fastening screw(s)	Clamping force kN
04203-210115100	B	44	30	13	11	0-40	18	27	17	12	115	25	30	10	M10X100	25
04203-212115125	B	44	30	13	11	0-55	18	27	17	12	115	25	30	12	M12X125	30
04203-214115125	B	44	30	13	11	0-55	18	27	17	12	115	25	30	14	M12X125	30
04203-212150160	B	55	41	17	12	0-70	20	36	21	17	150	35	36	12	M12X160	35
04203-214150160	B	55	41	17	12	0-70	20	36	21	17	150	35	36	14	M12X160	35
04203-216150160	B	55	41	17	12	0-70	20	36	21	17	150	35	36	16	M16X160	40
04203-218150160	B	55	41	17	12	0-70	20	36	21	17	150	35	36	18	M16X160	40
04203-216187200	B	62	30	21	14	0-80	30	42	27	20	187	44	44	16	M16X200	55
04203-218187200	B	62	30	21	14	0-80	30	42	27	20	187	44	44	18	M16X200	55
04203-220187200	B	62	30	21	14	0-80	30	42	27	20	187	44	44	20	M20X200	60
04203-222187200	B	62	30	21	14	0-80	30	42	27	20	187	44	44	22	M20X200	60
04203-220235250	B	70	30	25	17	0-100	31	51	34	24	235	60	47	20	M20X250	70
04203-222235250	B	70	30	25	17	0-100	31	51	34	24	235	60	47	22	M20X250	70
04203-224235250	B	70	30	25	17	0-100	31	51	34	24	235	60	47	24	M24X250	75
04203-228235250	B	70	30	25	17	0-100	31	51	34	24	235	60	47	28	M24X250	75

Order No. with stud	Form	B	B1	D	E	H clamping range	H1	H2	H3	H4	L	L1	L2	Fastening screw(s)	Clamping force kN
04203-312115100	C	44	30	13	11	0-30	18	27	17	12	115	25	30	M12X100	30
04203-312115125	C	44	30	13	11	0-55	18	27	17	12	115	25	30	M12X125	30
04203-312150125	C	55	41	17	12	0-50	20	36	21	17	150	35	36	M12X125	40
04203-312150160	C	55	41	17	12	0-70	20	36	21	17	150	35	36	M12X160	40
04203-316150125	C	55	41	17	12	0-40	20	36	21	17	150	35	36	M16X125	40
04203-316150160	C	55	41	17	12	0-70	20	36	21	17	150	35	36	M16X160	40
04203-320187160	C	62	30	21	14	0-40	30	42	27	20	187	44	44	M20X160	60
04203-320187200	C	62	30	21	14	0-80	30	42	27	20	187	44	44	M20X200	60
04203-320235200	C	70	30	25	17	0-70	31	51	34	24	235	60	47	M20X200	75
04203-320235250	C	70	30	25	17	0-100	31	51	34	24	235	60	47	M20X250	75
04203-324235200	C	70	30	25	17	0-50	31	51	34	24	235	60	47	M24X200	75
04203-324235250	C	70	30	25	17	0-100	31	51	34	24	235	60	47	M24X250	75

04204

Adjustable heel supports

for clamp strap assembly



Material:
Carbon steel.

Version:
Body tempered and electro zinc-plated.
Support bolt tempered, grade 8.8.

Sample order:
nlm 04204-1039

Note:
These adjustable heel supports consist of support plate, support bolt and fastening screws for the strap heel support.
Adjustable heel supports are used to increase the clamping height of the clamp strap assemblies.

Order No.	B	D	D1	D2	D3	H clamping range	H1	H2	H3	L	L1
04204-1039	30	13	M10	M5	30	8-30	39	8	10	44	30
04204-1249	42	17	M12	M5	36	10-37	49	10	16	54	35
04204-1294	42	17	M12	M5	36	10-80	94	10	16	54	35
04204-1655	50	21	M16	M5	42	13-41	55	13	20	60	40
04204-1690	50	21	M16	M5	42	13-73	90	13	20	60	40
04204-2069	50	25	M20	M6	50	16-52	69	16	25	70	50
04204-20109	50	25	M20	M6	50	16-91	109	16	25	70	50

04205

Clamp straps pivot

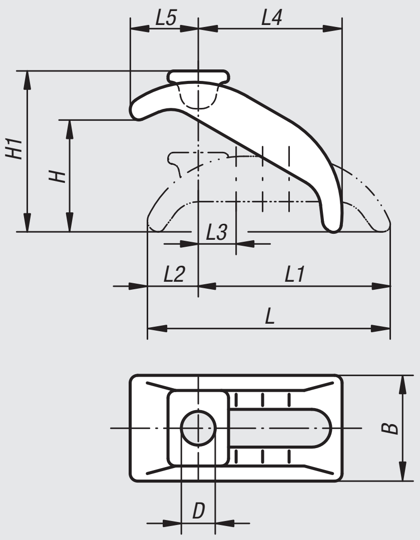
steel

Material:
Carbon steel.

Version:
Blue electro zinc-plated.

Sample order:
nlm 04205-20

Note:
The strap provides instant height adjustment without blocks or shims and requires little space on the machine table. Designed for rugged use and highly suitable for clamping blanking and punching dies. Suitable mounting bolts for these clamps see 07040.



Order No.	suitable for slot width	suitable fastening screw	D	L	L1	L2	L3	L4	L5	B	H	H1
04205-12	12, 14	M12	13	88	68	23	14	48	28	38	0-40	57
04205-16	16, 18	M16	18	130	101	29	18	74	38	56	0-65	90
04205-20	20, 22	M20	22	144	112	32	20	80	46	66	0-70	103
04205-24	24, 28	M24	25	174	135	39	24	100	52	76	0-85	120

04210

Clamp straps hinge heel

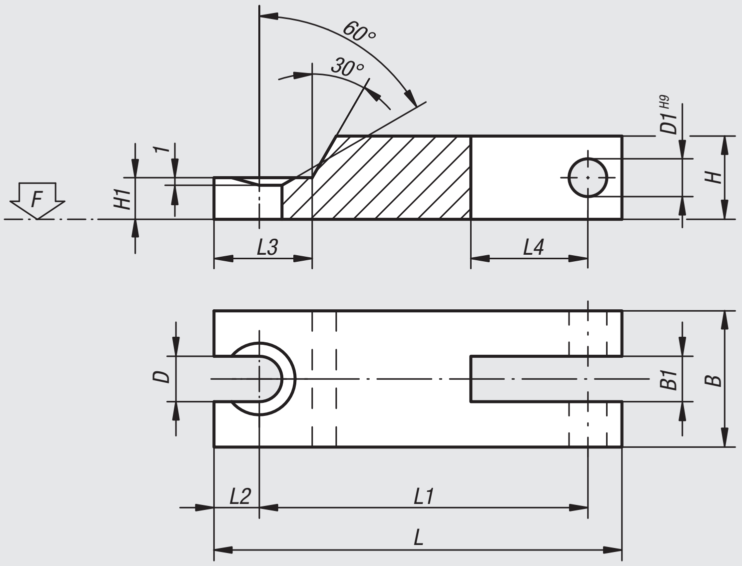
with bolt slot

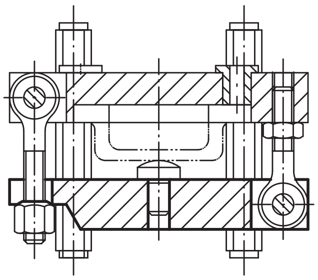
Material:
Carbon steel 1.1191

Version:
Black oxidised.

Sample order:
nlm 04210-10

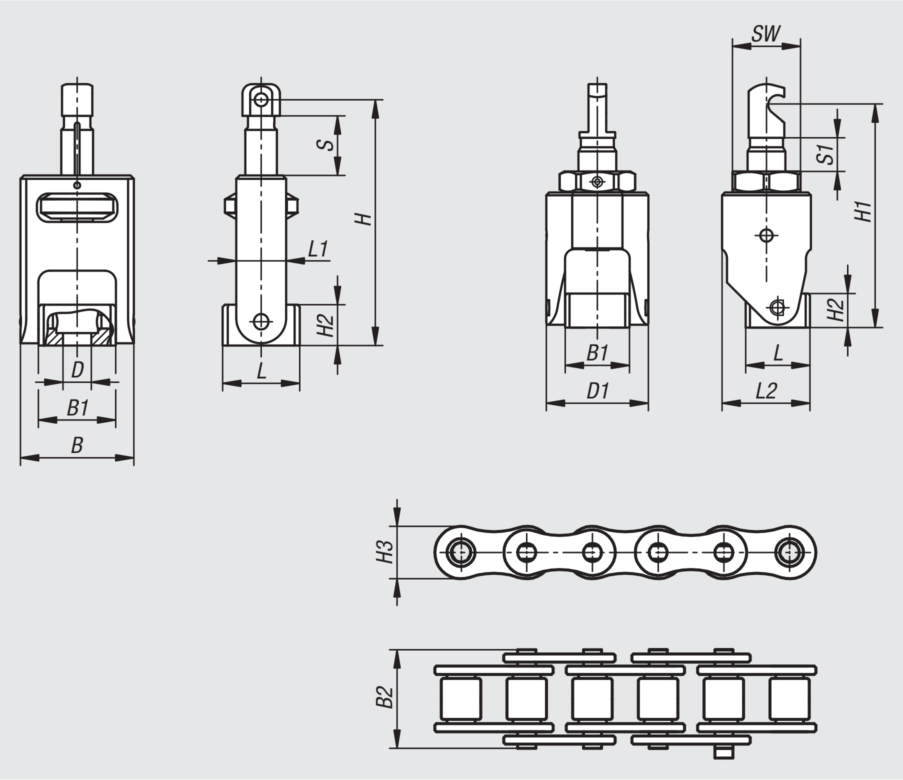
Note:
Suitable hinge pins see 04520.
Use hexagon nut 07260 to clamp.





Order No.	L	L1	L2	L3	L4	B	B1	H	H1	D	D1	F kN
04210-08	100	85	7	17	11	25	9,5	16	8	9	8	17,54
04210-10	125	105	10	24	12	32	12,5	20	10	11	10	27,8
04210-12	160	138	10	25	15	40	14,5	25	12,5	14	12	40,4

Chain clamp sets, steel



Material:
Clamping hook, steel.
Clamping bracket, steel.
Roller chain, steel.

Version:
Steel parts, tempered.

Sample order:
nlm 04211-15

Note:
Chain clamps are used mainly in machine and plant construction.
Chain clamps enable cylindrical, complicated and large to very large workpieces to be clamped securely and effectively in the quickest and easiest way.

Suitable for cylindrical workpieces, valve bodies, pistons etc.

The workpiece surface can be protected by attaching the plastic elements.

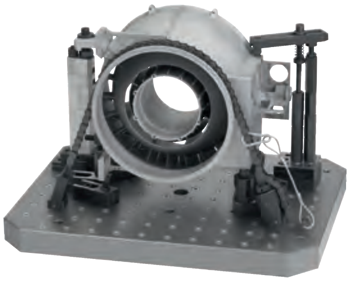
Application:
The knurled nut on the clamping bracket can be used to preset the chain length and the clamping force. The required torque is set on the clamping hook.

Supplied with:
Chain clamp set 04211-15:
- Clamping hook.
- Clamping bracket.
- 4x roller chains (2x 492 mm, 1x 238 mm, 1x 15.9 mm).
- 4x connecting links with cotter pins to connect.
- 6x snap-on plastic elements.
- Securing set for clamping chains.

Chain clamp set 04211-40:
- Clamping hook.
- Clamping bracket.
- 4x roller chains (1x 991 mm, 1x 483 mm, 1x 229 mm, 1x 25.4 mm).
- 4x connecting links with cotter pins to connect.
- 6x snap-on plastic elements.
- Securing set for clamping chains.

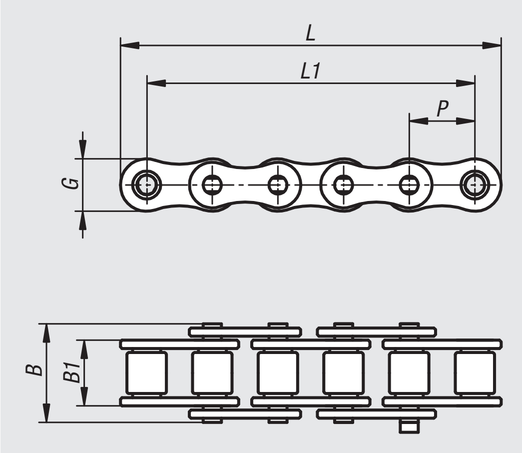
Accessories:
Steel roller chains for chain clamp sets 04211-03.
Steel turnbuckles for chain clamp sets 04211-06.
Steel prisms for chain clamp sets 04211-09.
Nuts for T-slots DIN 508 enhanced, 07060.
Cap screws DIN EN ISO 4762, 07160.

Attention:
- The opening angle of the chain should not exceed 30°.
- Do not exceed max. permitted tightening torques.



Order No.	B	B1	B2	D	D1	H max.	H min.	H1 max.	H1 min.	H2	H3	Travel S	L	L1	L2	S1	SW	Max. torque Nm	Clamping force max. kN
04211-15	50	34	20	M12	54	108	83	118	100	18	15	25	34	21	46,5	18	36	45	15
04211-40	64	44	33	M16	70	146	110	153	122	25	21	36	37	29	61,5	31	46	90	40

Roller chains, steel, for chain clamp sets



Material:
Steel.

Sample order:
nlm 04211-03-150125

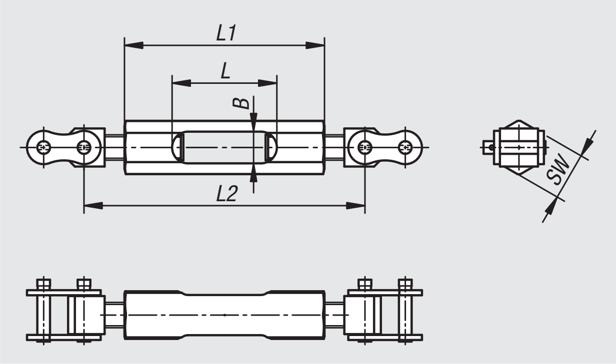
Note:
Roller chains for chain clamp sets can be used with chain clamp sets (04211) for clamping round, irregular, and large to very large workpieces. Roller chains can be shortened and joined together with other roller chains as desired.

Supplied with:
1x roller chain

Accessories:
Steel turnbuckles for chain clamp sets 04211-06.

Order No.	B	B1	G	L	L1	P	Clamping force max. kN
04211-03-150125	20	13	15	126	111	15,875	15
04211-03-150250	20	13	15	253	238	15,875	15
04211-03-150500	20	13	15	507	492	15,875	15
04211-03-151000	20	13	15	1015	1000	15,875	15
04211-03-400125	33	25	21	148	127	25,4	40
04211-03-400250	33	25	21	250	229	25,4	40
04211-03-400500	33	25	21	504	483	25,4	40
04211-03-401000	33	25	21	1012	991	25,4	40

Turnbuckles, steel, for chain clamp sets



Material:
Steel.

Sample order:
nlm 04211-06-15052

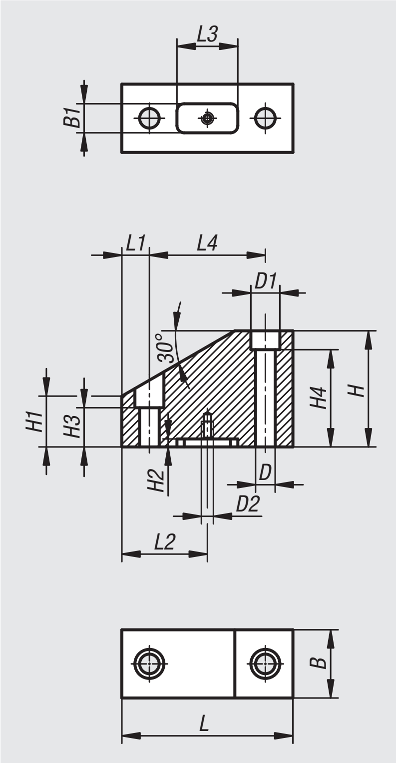
Note:
Steel turnbuckles for chain clamp sets are mounted between the chains. The turnbuckles are used to pre-tension the chain and remove any play, which is always greater with longer chains.

Accessories:
Steel roller chains for chain clamp sets 04211-03.

Order No.	B	L	L1	L2	SW	Clamping force max. kN
04211-06-15052	14	52	97	111-147	24	15
04211-06-40066	20	66	126	151-203	30	40

04211-09

Prisms, steel, for chain clamp sets



Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 04211-09-11847080

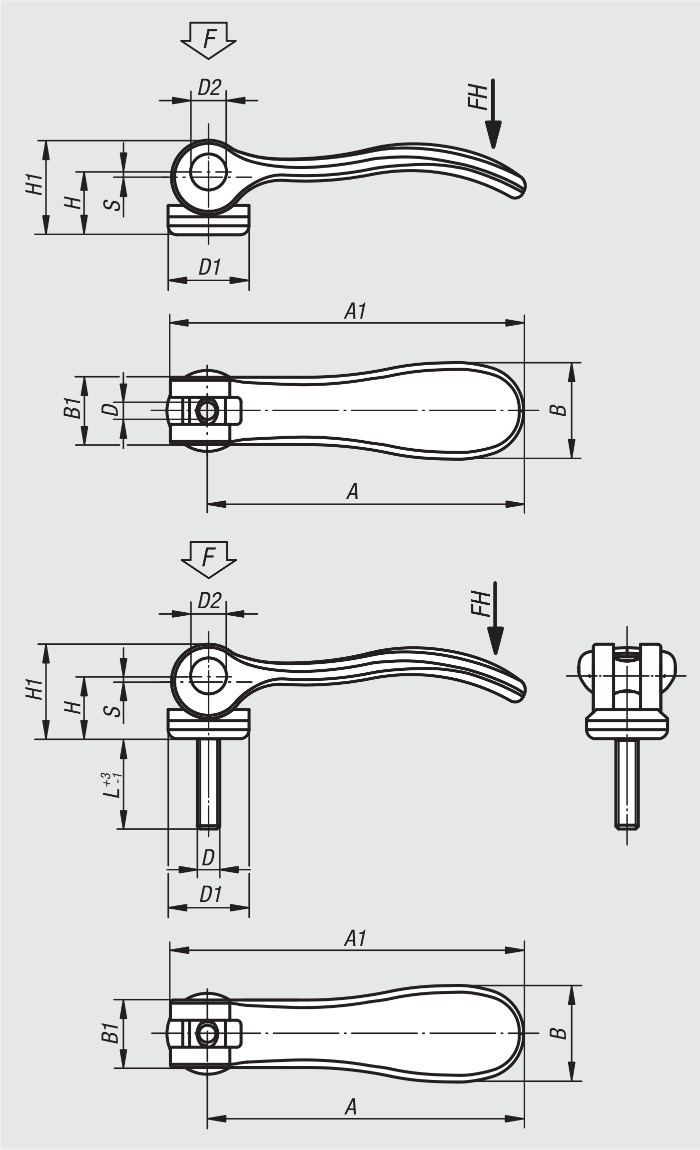
Note:
Prisms for chain clamp sets enable flexible positioning of the workpiece. The prisms can be fastened to the machine table using T-slot nuts.

Accessories:
Nuts for T-slots DIN 508 enhanced, 07060.

Order No.	B	B1	D	D1	D2	H	H1	H2	H3	H4	L	L1	L2	L3	L4
04211-09-11847080	47	20	13,5	20	M6	80	35	5,5	27	67	118	19	59	42	80
04211-09-14847100	47	20	17,5	26	M6	100	44	5,5	33	33	148	24	74	44	100

Cam levers

internal and external thread, steel or stainless steel



Material:
Handles cast aluminum EN AC-46200.
Thrust washer plastic PA 66 GF 35-X fibreglass reinforced.
Hinge pin stainless steel 1.4305.
Studs and washer steel grade 5.8 or stainless steel 1.4305.

Version:
Handles fine structured powder-coated, black or red RAL 3003.
Thrust washer black.
Hinge pin bright.
Studs and washer blue passivated steel or bright stainless steel.

Sample order:
nlm 04232-1501105X20 (include length L)

Note:
Plastics are subject to creeping under load (retardation).

Cam levers

internal and external thread, steel or stainless steel

Cam levers with internal thread, grip black

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	Travel S	Clamping force F (kN)	Hand force FH N
04232-9501103	**04232-9511103**	M3	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-9501104	**04232-9511104**	M4	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-0501104	**04232-0511104**	M4	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-0501105	**04232-0511105**	M5	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-1501105	**04232-1511105**	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-1501106	**04232-1511106**	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-2501108	**04232-2511108**	M8	27,1	11	33,3	24	18	28,5	96	108	1,5	8	350

Cam levers with internal thread, grip red

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	Travel S	Clamping force F (kN)	Hand force FH N
04232-9501403	**04232-9511403**	M3	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-9501404	**04232-9511404**	M4	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-0501404	**04232-0511404**	M4	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-0501405	**04232-0511405**	M5	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-1501405	**04232-1511405**	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-1501406	**04232-1511406**	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-2501408	**04232-2511408**	M8	27,1	11	33,3	24	18	28,5	96	108	1,5	8	350

Cam levers with external thread, grip black

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04232-9501103X	**04232-9511103X**	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-9501104X	**04232-9511104X**	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-0501104X	**04232-0511104X**	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04232-0501105X	**04232-0511105X**	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04232-1501105X	**04232-1511105X**	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-1501106X	**04232-1511106X**	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-2501108X	**04232-2511108X**	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04232-2501110X	**04232-2511110X**	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350

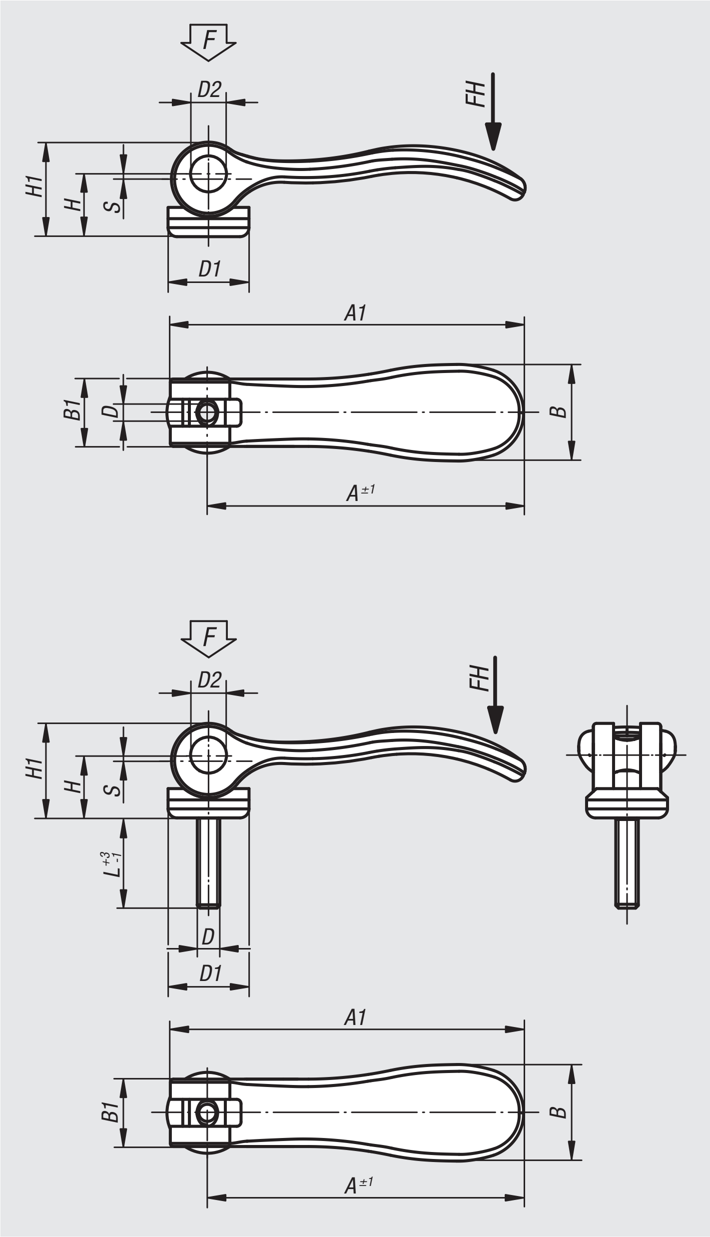
Cam levers with external thread, grip red

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04232-9501403X	**04232-9511403X**	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-9501404X	**04232-9511404X**	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-0501404X	**04232-0511404X**	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04232-0501405X	**04232-0511405X**	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04232-1501405X	**04232-1511405X**	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-1501406X	**04232-1511406X**	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-2501408X	**04232-2511408X**	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04232-2501410X	**04232-2511410X**	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350

04232

Cam levers steel

with internal and external thread



Material:
Handle steel 1.0401.
Thrust washer plastic PA 66 GF 35-X fibreglass reinforced.
Hinge pin stainless steel 1.4305.
Stud and washer steel, grade 5.8.

Version:
Handle, stud and washer trivalent blue passivated.
Thrust washer black.
Hinge pin bright.

Sample order:
nlm 04232-1502205

Note:
Plastics are subject to creeping under load (retardation).

Cam levers with internal thread, steel

Order No.	D	D1	D2	B	B1	H	H1	A	A1	Travel S	Clamping force F (kN)	Hand force FH N
04232-1502205	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-1502206	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-2502208	M8	27,1	11	33,2	24	18	28,5	96	108	1,5	8	350

Cam levers with external thread, steel

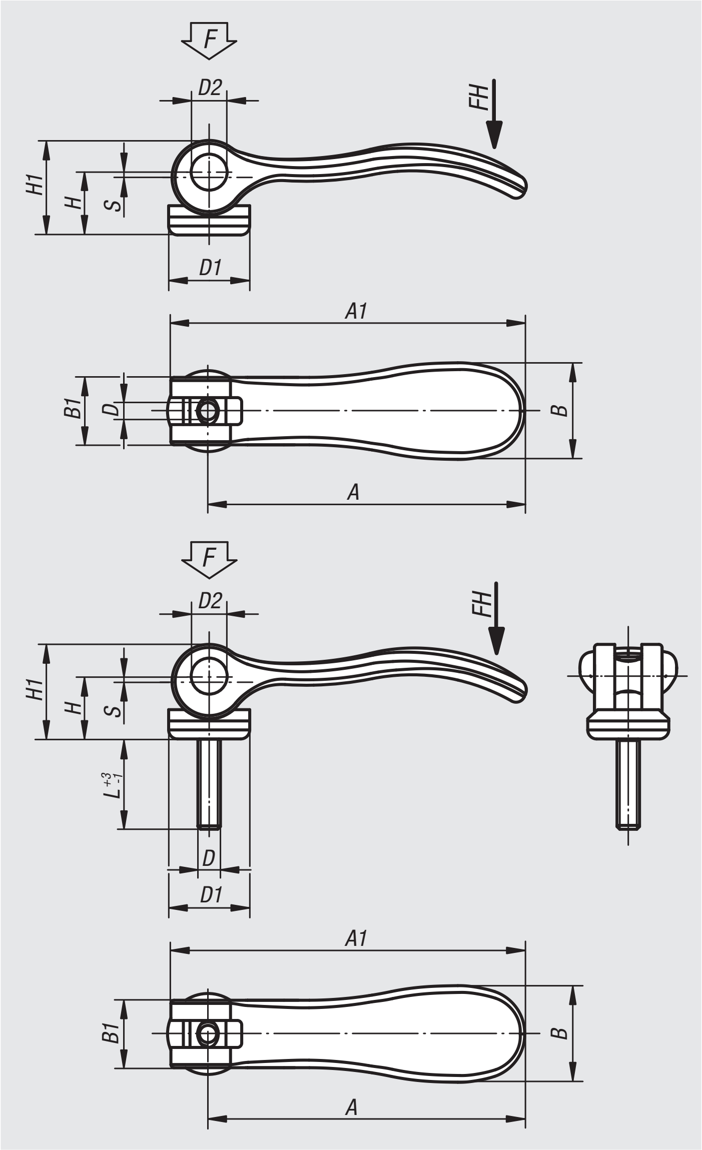
Order No.	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04232-1502205X	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-1502206X	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-2502208X	M8	27,1	11	33,2	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04232-2502210X	M10	27,1	11	33,2	24	18	28,5	96	108	25/30/40/50	1,5	8	350

Notes

04232

Cam levers

internal and external thread, stainless steel



Material:
Handles 1.4308 stainless steel.
Thrust washer plastic PA 66 GF 35-X, fibreglass reinforced.
Hinge pin, washer and screw 1.4305 stainless steel.

Version:
Handle electropolished or blasted.
Thrust washer black.
Hinge pin, washer and screw bright.

Sample order:
nlm 04232.1512005X20 (include length L)

Note:
Plastics are subject to creeping under load (retardation).

Cam levers

internal and external thread, stainless steel

Cam levers with internal thread, stainless steel

Order No.	Surface finish body	D	D1	D2	B	B1	H	H1	A	A1	Travel S	Clamping force F (kN)	Hand force FH N
04232-9512003	electropolished	M3	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-9512004	electropolished	M4	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-0512004	electropolished	M4	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-0512005	electropolished	M5	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-1512005	electropolished	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-1512006	electropolished	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-2512008	electropolished	M8	27,1	11	33,3	24	18	28,5	96	108	1,5	8	350
04232-9512303	blasted	M3	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-9512304	blasted	M4	12	6	14,4	11,5	9	13	36,2	41,7	1	1,5	90
04232-0512304	blasted	M4	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-0512305	blasted	M5	15,4	8	18	13	11,2	17	52,3	59,1	1	2,5	100
04232-1512305	blasted	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-1512306	blasted	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	1,2	4	120
04232-2512308	blasted	M8	27,1	11	33,3	24	18	28,5	96	108	1,5	8	350

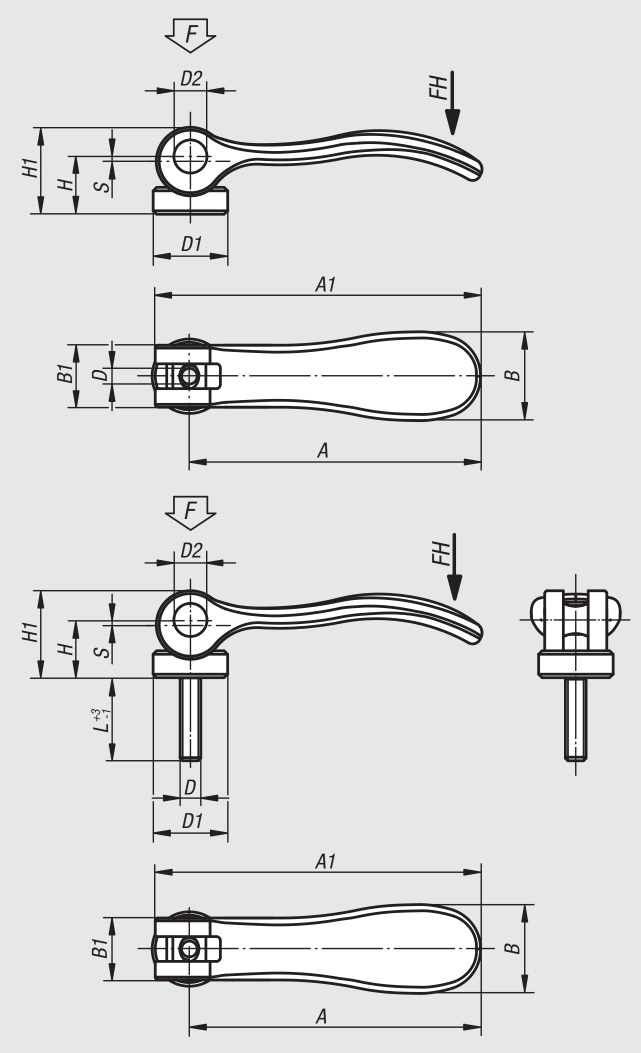
Cam levers with external thread, stainless steel

Order No.	Surface finish body	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04232-9512003X	electropolished	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-9512004X	electropolished	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-0512004X	electropolished	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04232-0512005X	electropolished	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04232-1512005X	electropolished	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-1512006X	electropolished	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-2512008X	electropolished	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04232-2512010X	electropolished	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04232-9512303X	blasted	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-9512304X	blasted	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04232-0512304X	blasted	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04232-0512305X	blasted	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04232-1512305X	blasted	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-1512306X	blasted	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-2512308X	blasted	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04232-2512310X	blasted	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350

04232

Cam levers

internal or external thread, stainless steel, thrust washer stainless steel



Material:
Handle 1.4308 stainless steel.
Thrust washer 1.4034 stainless steel, hardened.
Hinge pin and stud 1.4305 stainless steel.

Version:
Handle electropolished or blasted.
Thrust washer, hinge pin and screw bright.

Sample order:
nlm 04232-0541005X20 (include length L)

Note:
The thrust washer face is lightly greased before delivery. The grease is FDA conform and is suitable for use in the foodstuff and pharmaceutical industries.

Cam levers, stainless steel, with internal thread, thrust washer stainless steel

Order No. electropolished	Order No. blasted	D	D1	D2	B	B1	H	H1	A	A1	Travel S	Clamping force F (kN)	Hand force FH N
04232-9541003	**04232-9541303**	M3	12	6	14,4	11,5	9	13,5	36,2	41,7	1	1,5	90
04232-9541004	**04232-9541304**	M4	12	6	14,4	11,5	9	13,5	36,2	41,7	1	1,5	90
04232-0541004	**04232-0541304**	M4	15,4	8	18	13	11,4	17,2	52,3	59,1	1	2,5	100
04232-0541005	**04232-0541305**	M5	15,4	8	18	13	11,4	17,2	52,3	59,1	1	2,5	100
04232-1541005	**04232-1541305**	M5	18	9	21,5	15	14,7	22	70,4	79,2	1,2	4	120
04232-1541006	**04232-1541306**	M6	18	9	21,5	15	14,7	22	70,4	79,2	1,2	4	120
04232-2541008	**04232-2541308**	M8	27	11	33,3	24	18,3	28,8	96	108	1,5	8	350

Cam levers, stainless steel, with external thread, thrust washer stainless steel

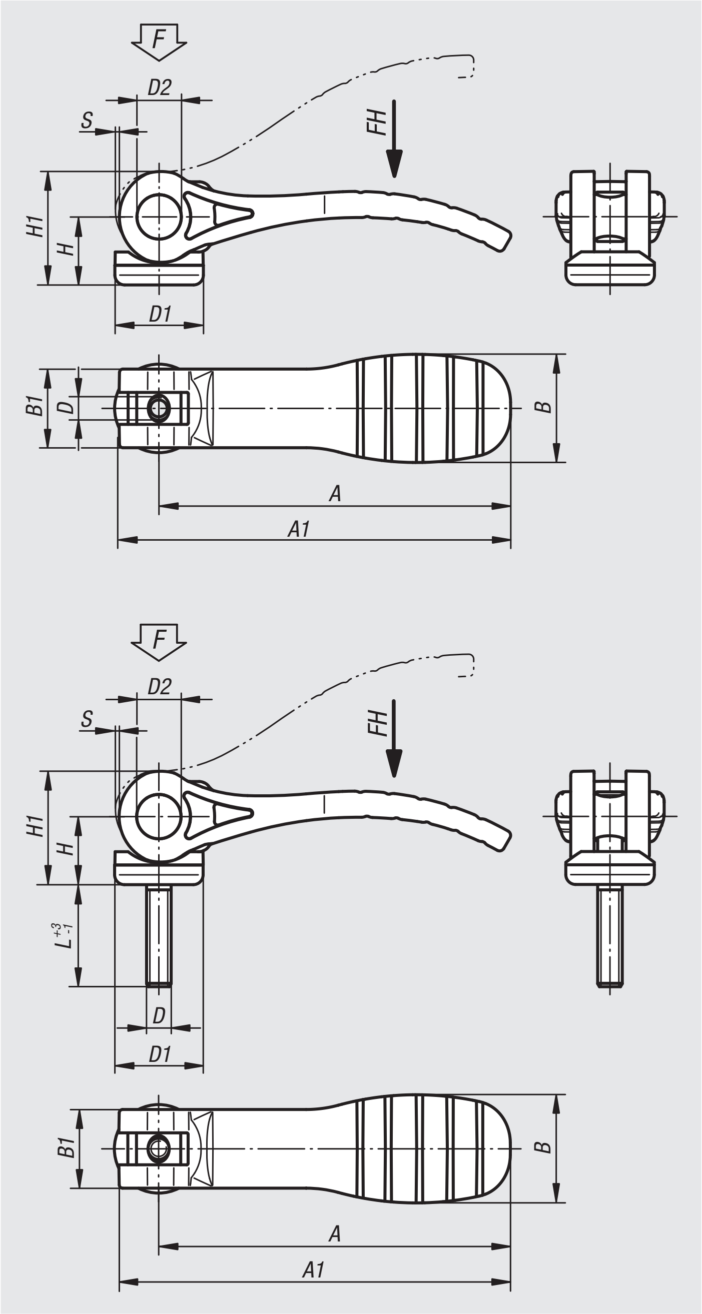
Order No. electropolished	Order No. blasted	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04232-9541003X	**04232-9541303X**	M3	12	6	14,4	11,5	9	13,5	36,2	41,7	10/15/30	1	1,5	90
04232-9541004X	**04232-9541304X**	M4	12	6	14,4	11,5	9	13,5	36,2	41,7	10/15/30	1	1,5	90
04232-0541004X	**04232-0541304X**	M4	15,4	8	18	13	11,4	17,2	52,3	59,1	15/20/30	1	2,5	100
04232-0541005X	**04232-0541305X**	M5	15,4	8	18	13	11,4	17,2	52,3	59,1	20/30/40/50	1	2,5	100
04232-1541005X	**04232-1541305X**	M5	18	9	21,5	15	14,7	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-1541006X	**04232-1541306X**	M6	18	9	21,5	15	14,7	22	70,4	79,2	20/30/40/50	1,2	4	120
04232-2541008X	**04232-2541308X**	M8	27	11	33,3	24	18,3	28,8	96	108	25/30/40/50	1,5	8	350
04232-2541010X	**04232-2541310X**	M10	27	11	33,3	24	18,3	28,8	96	108	25/30/40/50	1,5	8	350

Notes

04232

Cam levers with plastic handle

internal and external thread, steel or stainless steel



Material:
Grip and thrust washer plastic PA 66 fibreglass reinforced.
Hinge pins stainless steel 1.4305.
Studs and washer steel grade 5.8 or stainless steel 1.4305.

Version:
Grip black or traffic red RAL3020.
Thrust washer black.
Hinge pin bright.
Stud and washer trivalent blue passivated or bright stainless steel.

Sample order:
nlm 04232-1521105X20 (include length L)

Note:
Plastics are subject to creeping under load (retardation), this can cause reduced clamping force.

Cam levers with black plastic grip and internal thread

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	Travel S	Clamping force F (kN)	Hand force FH N
04232-1521105	**04232-1531105**	M5	18,1	9	22	16	14	23,4	71,5	79,6	1,15	2,5	125
04232-1521106	**04232-1531106**	M6	18,1	9	22	16	14	23,4	71,5	79,6	1,15	2,5	125
04232-2521108	**04232-2531108**	M8	27,1	11	33	24,2	16,2	27,7	100	110	1,5	5	170

Cam levers with red plastic grip and internal thread

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	Travel S	Clamping force F (kN)	Hand force FH N
04232-152118405	**04232-153118405**	M5	18,1	9	22	16	14	23,4	71,5	79,6	1,15	2,5	125
04232-152118406	**04232-153118406**	M6	18,1	9	22	16	14	23,4	71,5	79,6	1,15	2,5	125
04232-252118408	**04232-253118408**	M8	27,1	11	33	24,2	16,2	27,7	100	110	1,5	5	170

Cam levers with plastic handle

internal and external thread, steel or stainless steel

Cam levers with black plastic grip and external thread

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04232-1521105X	**04232-1531105X**	M5	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04232-1521106X	**04232-1531106X**	M6	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04232-2521108X	**04232-2531108X**	M8	27,1	11	33	24,2	16,2	27,7	100	110	25/30/40/50	1,5	5	170
04232-2521110X	**04232-2531110X**	M10	27,1	11	33	24,2	16,2	27,7	100	110	25/30/40/50	1,5	5	170

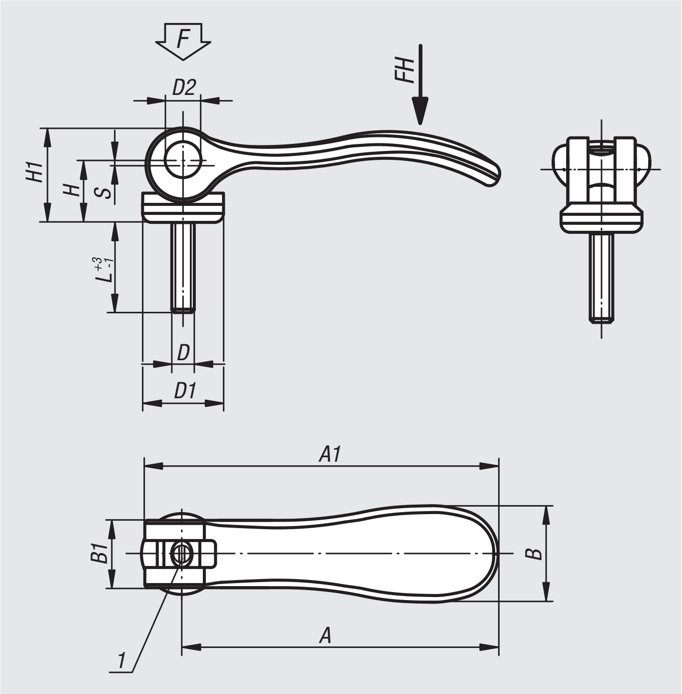
Cam levers with red plastic grip and external thread

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04232-152118405X	**04232-153118405X**	M5	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04232-152118406X	**04232-153118406X**	M6	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04232-252118408X	**04232-253118408X**	M8	27,1	11	33	24,2	16,2	27,7	100	110	25/30/40/50	1,5	5	170
04232-252118410X	**04232-253118410X**	M10	27,1	11	33	24,2	16,2	27,7	100	110	25/30/40/50	1,5	5	170

04233

Cam levers adjustable

external thread, steel or stainless steel



Material:
Handles cast aluminium EN AC-46200.
Thrust washer fibreglass reinforced plastic PA 66 GF 35-X.
Hinge pins 1.4305 stainless steel.
Screw and washer steel grade 5.8 or 1.4305 stainless steel.

Version:
Handles fine structured powder-coated, black or red RAL 3003.
Thrust washer black.
Hinge pin bright.
Studs and washer blue passivated steel or bright stainless steel.

Sample order:
nlm 04233-1501105X20 (include length L)

Note:
Adjustable cam levers are used if the position of the lever relative to the axis of tension only permits one specific position (interference circle). The exact position of the lever is adjusted using a screwdriver on the fine thread setscrew.
Plastics are subject to creeping under load (retardation).

Drawing reference:
1) setscrew for fine adjustment of lever

Adjustable cam levers with external thread, grip black

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04233-9501103X	**04233-9511103X**	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-9501104X	**04233-9511104X**	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-0501104X	**04233-0511104X**	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04233-0501105X	**04233-0511105X**	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04233-1501105X	**04233-1511105X**	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-1501106X	**04233-1511106X**	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-2501108X	**04233-2511108X**	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04233-2501110X	**04233-2511110X**	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350

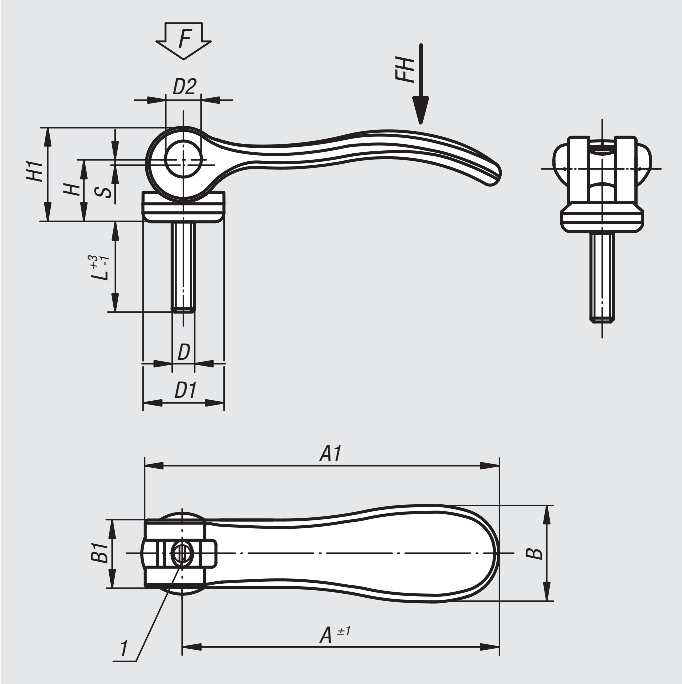
Adjustable cam levers with external thread, grip red

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04233-9501403X	**04233-9511403X**	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-9501404X	**04233-9511404X**	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-0501404X	**04233-0511404X**	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04233-0501405X	**04233-0511405X**	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04233-1501405X	**04233-1511405X**	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-1501406X	**04233-1511406X**	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-2501408X	**04233-2511408X**	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04233-2501410X	**04233-2511410X**	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350

04233

Cam levers adjustable

steel, with external thread



Material:
Handle steel 1.0401.
Thrust washer plastic PA 66 GF 35-X fibreglass reinforced.
Hinge pin stainless steel 1.4305.
Stud and washer steel, grade 5.8.

Version:
Handle, stud and washer trivalent blue passivated.
Thrust washer black.
Hinge pin bright.

Sample order:
nlm 04233-1502205X20

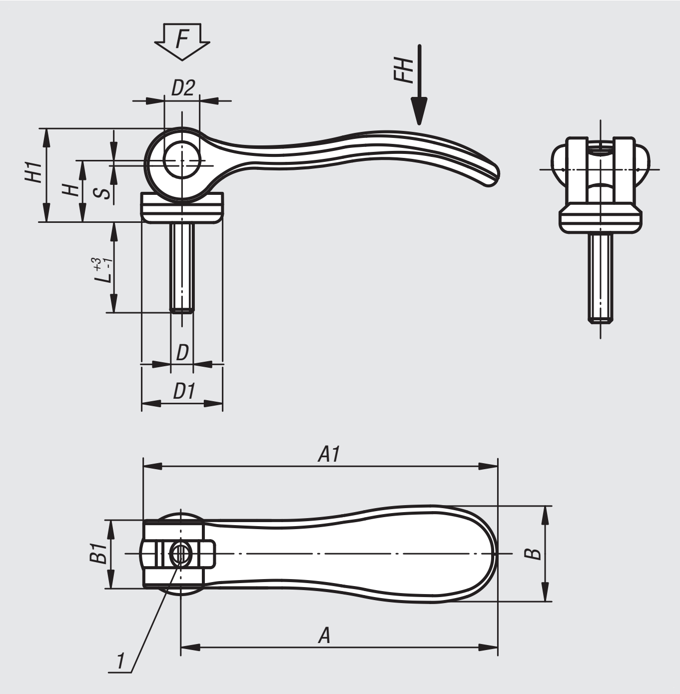
Note:
Adjustable cam levers are used if the position of the lever relative to the axis of tension only permits one specific position (interference circle). The exact position of the lever is adjusted using a screwdriver on the fine thread setscrew.
Plastics are subject to creeping under load (retardation).

Drawing reference:
1) setscrew for fine adjustment of lever

Order No.	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04233-1502205X	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-1502206X	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-2502208X	M8	27,1	11	33,2	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04233-2502210X	M10	27,1	11	33,2	24	18	28,5	96	108	25/30/40/50	1,5	8	350

Cam levers adjustable

external thread, stainless steel



Material:
Handles 1.4308 stainless steel.
Thrust washer plastic PA 66 GF 35-X, fibreglass reinforced.
Hinge pin, washer and screw 1.4305 stainless steel.

Version:
Handle electropolished or blasted.
Thrust washer black.
Hinge pin, washer and screw bright.

Sample order:
nlm 04233-1512005X20 (include length L)

Note:
Adjustable cam levers are used if the position of the lever relative to the axis of tension only permits one specific position (interference circle). The exact position of the lever is adjusted using a screwdriver on the fine thread setscrew.
Plastics are subject to creeping under load (retardation).

Drawing reference:
1) setscrew for fine adjustment of lever

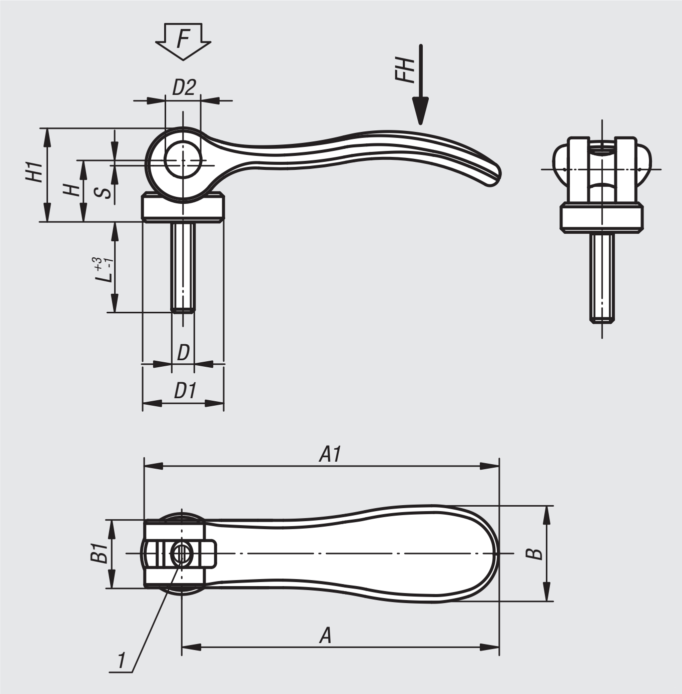
Order No.	Main colour	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04233-9512003X	electropolished	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-9512004X	electropolished	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-0512004X	electropolished	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04233-0512005X	electropolished	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04233-1512005X	electropolished	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-1512006X	electropolished	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-2512008X	electropolished	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04233-2512010X	electropolished	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04233-9512303X	blasted	M3	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-9512304X	blasted	M4	12	6	14,4	11,5	9	13	36,2	41,7	10/15/30	1	1,5	90
04233-0512304X	blasted	M4	15,4	8	18	13	11,2	17	52,3	59,1	15/20/30	1	2,5	100
04233-0512305X	blasted	M5	15,4	8	18	13	11,2	17	52,3	59,1	20/30/40/50	1	2,5	100
04233-1512305X	blasted	M5	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-1512306X	blasted	M6	18,1	9	21,5	15	14,5	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-2512308X	blasted	M8	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350
04233-2512310X	blasted	M10	27,1	11	33,3	24	18	28,5	96	108	25/30/40/50	1,5	8	350

04233

Cam levers adjustable

external thread, stainless steel, thrust washer stainless steel

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Handle 1.4308 stainless steel.
Thrust washer 1.4034 stainless steel, hardened.
Hinge pin and stud 1.4305 stainless steel.

Version:
Handle electropolished or blasted.
Thrust washer, hinge pin and screw bright.

Sample order:
nlm 04233-0541305X20 (include length L)

Note:
Adjustable cam levers are used when the position of the clamping lever relative to the clamping axis permits only one specific position (swing circle interference). The exact position of the clamping lever is adjusted with a screwdriver via the fine thread on the stud.

The thrust washer face is lightly greased before delivery. The grease is FDA conform and is suitable for use in the foodstuff and pharmaceutical industries.

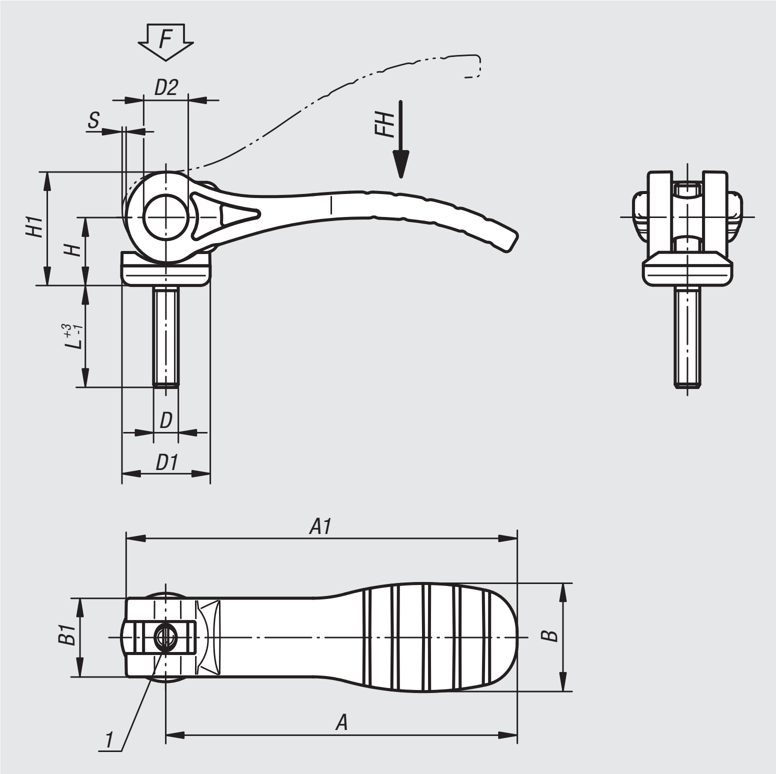
Drawing reference:
1) setscrew for fine adjustment of lever

Order No. electropolished	Order No. blasted	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04233-9541003X	**04233-9541303X**	M3	12	6	14,4	11,5	9	13,5	36,2	41,7	10/15/30	1	1,5	90
04233-9541004X	**04233-9541304X**	M4	12	6	14,4	11,5	9	13,5	36,2	41,7	10/15/30	1	1,5	90
04233-0541004X	**04233-0541304X**	M4	15,4	8	18	13	11,4	17,2	52,3	59,1	15/20/30	1	2,5	100
04233-0541005X	**04233-0541305X**	M5	15,4	8	18	13	11,4	17,2	52,3	59,1	20/30/40/50	1	2,5	100
04233-1541005X	**04233-1541305X**	M5	18	9	21,5	15	14,7	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-1541006X	**04233-1541306X**	M6	18	9	21,5	15	14,7	22	70,4	79,2	20/30/40/50	1,2	4	120
04233-2541008X	**04233-2541308X**	M8	27	11	33,3	24	18,3	28,8	96	108	25/30/40/50	1,5	8	350
04233-2541010X	**04233-2541310X**	M10	27	11	33,3	24	18,3	28,8	96	108	25/30/40/50	1,5	8	350

04233

Cam levers adjustable with plastic handle

external thread, steel or stainless steel



Material:
Handles and thrust washer fiberglass reinforced plastic PA 66.
Hinge pins 1.4305 stainless steel.
Screw and washer steel quality class 5.8 or 1.4305 stainless steel.

Version:
Grip black or traffic red RAL3020.
Thrust washer black.
Hinge pin bright.
Stud and washer trivalent blue passivated or bright stainless steel.

Sample order:
nlm 04233-1521105X20 (include length L)

Note:
Adjustable cam levers are used if the position of the lever relative to the axis of tension only permits one specific position (interference circle). The exact position of the lever is adjusted using a screwdriver on the fine thread setscrew.

Plastics are subject to creeping under load (retardation), this can cause reduced clamping force.

Drawing reference:
1) setscrew for fine adjustment of lever

Cam levers, adjustable with black plastic grip and external thread

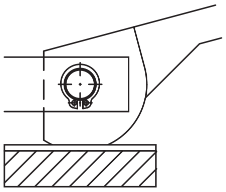
Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04233-1521105X	**04233-1531105X**	M5	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04233-1521106X	**04233-1531106X**	M6	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04233-2521108X	**04233-2531108X**	M8	27,1	11	33	24	16,2	27,7	100	110	25/30/40/50	1,5	5	170
04233-2521110X	**04233-2531110X**	M10	27,1	11	33	24	16,2	27,7	100	110	25/30/40/50	1,5	5	170

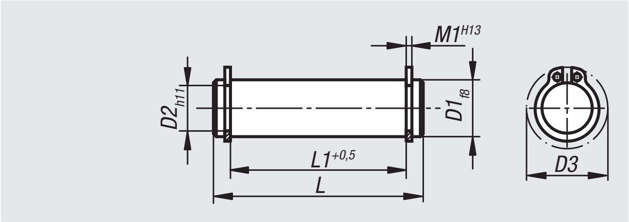
Cam levers, adjustable with red plastic grip and external thread

Order No. steel	Order No. stainless steel	D	D1	D2	B	B1	H	H1	A	A1	L	Travel S	Clamping force F (kN)	Hand force FH N
04233-152118405X	**04233-153118405X**	M5	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04233-152118406X	**04233-153118406X**	M6	18,1	9	22	16	14	23,4	71,5	79,6	20/30/40/50	1,15	2,5	125
04233-252118408X	**04233-253118408X**	M8	27,1	11	33	24	16,2	27,7	100	110	25/30/40/50	1,5	5	170
04233-252118410X	**04233-253118410X**	M10	27,1	11	33	24	16,2	27,7	100	110	25/30/40/50	1,5	5	170

04250

Hinge pins





Material:
Carbon steel 1.0503.07

Version:
Tempered and ground, bright.

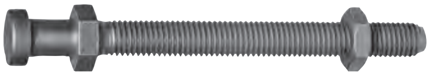
Sample order:
nlm 04250-08

Note:
For use with:
Single cam levers 04290 and 04310.
Eye bolts 07180.
Clevis 07620.
Circlips supplied.

Order No.	D1	L	L1	M1	D2	D3
04250-05	5	18	13	0,7	4,8	10,7
04250-06	6	22	17	0,8	5,7	12,2
04250-08	8	30	25	0,9	7,6	15,2
04250-081	8	20	16	0,9	7,6	15,2
04250-082	8	27	21	0,9	7,6	15,2
04250-10	10	37	32	1,1	9,6	17,6
04250-101	10	25	20	1,1	9,6	17,6
04250-102	10	35	29	1,1	9,6	17,6
04250-12	12	46	40	1,1	11,5	19,6
04250-121	12	31	25	1,1	11,5	19,6
04250-122	12	37	31	1,1	11,5	19,6
04250-14	14	44	37	1,1	13,4	22
04250-16	16	48	41	1,1	15,2	24,4
04250-18	18	58	51	1,3	17	26,8

04270

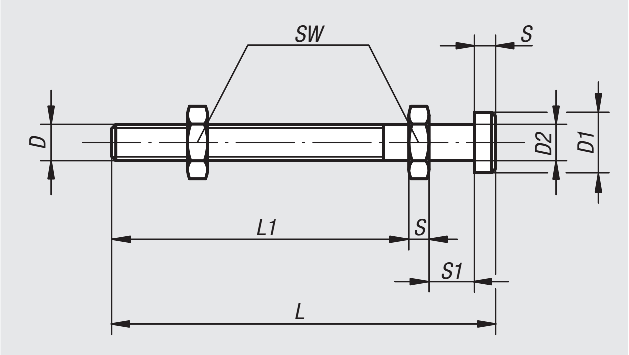
Spacer bolts

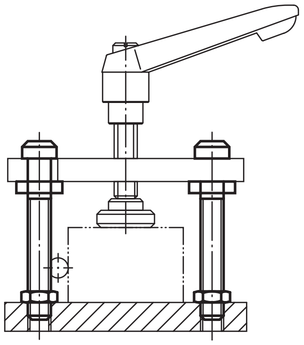


Material:
Carbon steel 1.1181.

Version:
Tempered and black oxidised.

Sample order:
nlm 04270-08





Order No.	D	D1	D2	L	L1	S	S1	SW
04270-08	M8	13	8	80	60	4	11	13
04270-10	M10	17	10	100	77	5	13	17
04270-12	M12	19	12	125	97	6	15	19
04270-14	M14	22	14	160	129	7	17	22

04290

Cam levers single

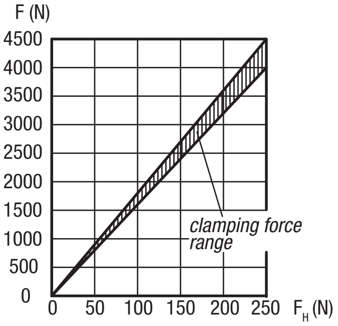
Material:
Carbon steel 1.7220.
Ball grip plastic.

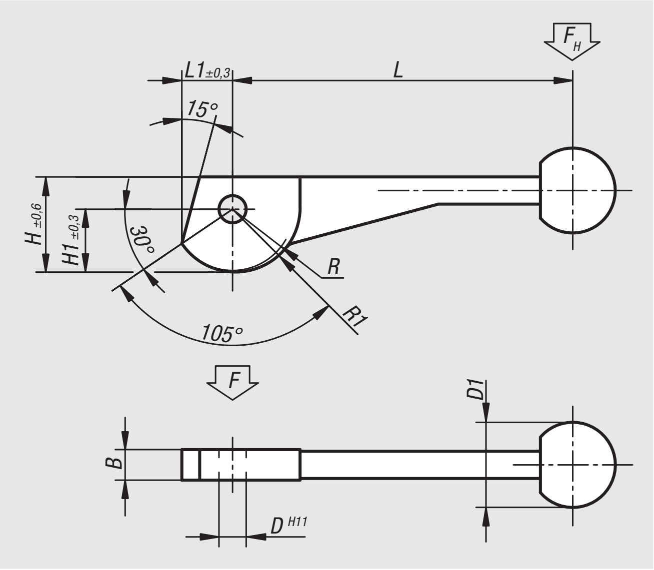
Version:
Tempered and black oxidised.

Sample order:
nlm 04290-10

Note:
Suitable hinge pin see 04250.
The cam lever is an eccentric lever that moves along a logarithmic spiral. Its clamping properties are even over the entire contact surface of the cam.

Force diagram





Order No.	L	L1	B	H	H1	D	D1	R	R1
04290-08	104±2	14,9	9	28,2	18,7	8	25	17,2	19,2
04290-10	123±2	18,6	12	34,8	23,3	10	30	21,5	24
04290-12	146±3	24,3	14	43,8	30,3	12	30	28	31,2

04310

Cam levers double

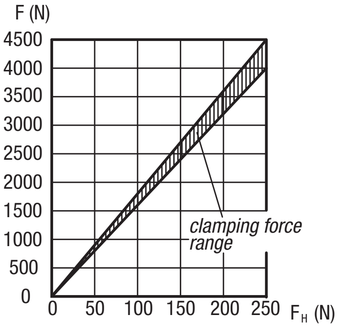
Material:
Carbon steel 1.7220.
Ball grip plastic.

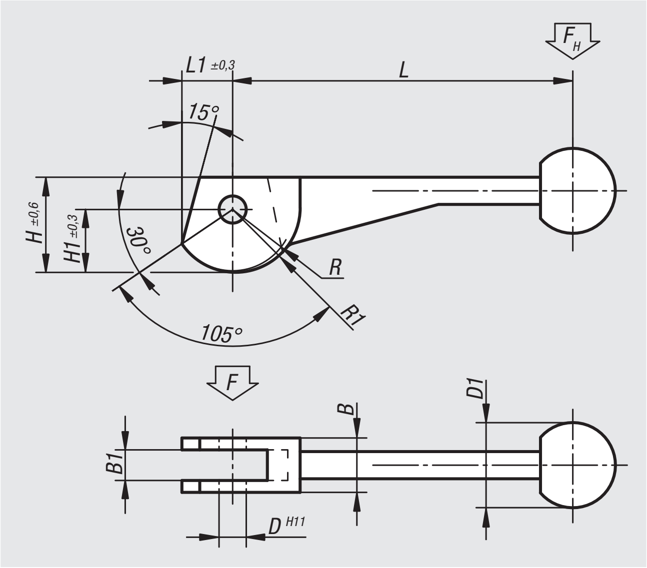
Version:
Tempered and black oxidised.

Sample order:
nlm 04310-12

Note:
Suitable hinge pin see 04250.
The cam lever is an eccentric lever that moves along a logarithmic spiral. Its clamping properties are even over the entire contact surface of the cam.

Force diagram



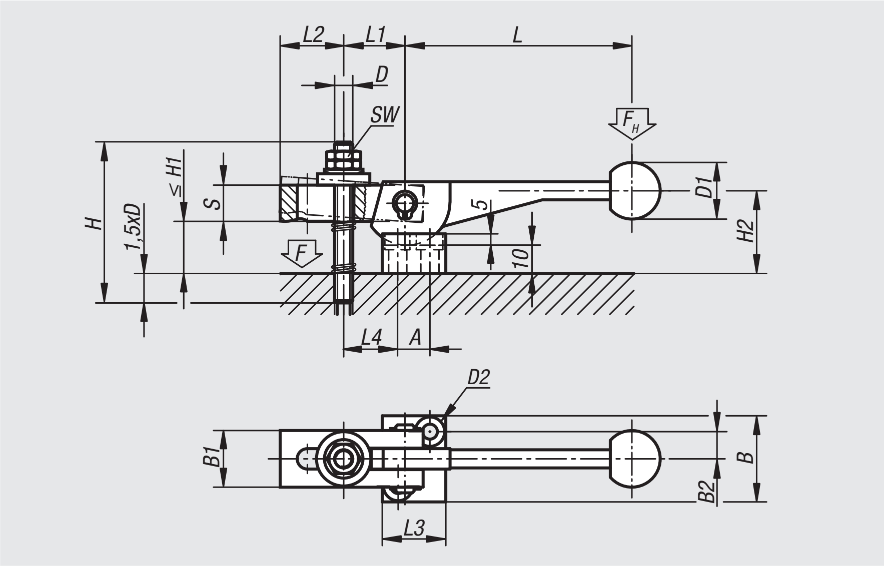


Order No.	L	L1	B	B1	H	H1	D	D1	R	R1
04310-08	104±2	14,9	16	9	28,2	18,7	8	25	17,2	19,2
04310-10	123±2	18,6	20	12	34,8	23,3	10	30	21,5	24
04310-12	146±3	24,3	25	14	43,8	30,3	12	30	28	31,2

04330

Cam clamps

with end lock

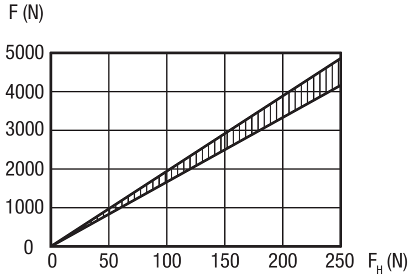


Material:
Cam lever carbon steel 1.7220.
Strap carbon steel 1.1191.

Version:
Black oxidised.

Sample order:
nlm 04330-10

Force diagram

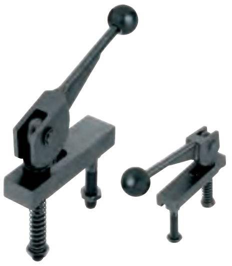


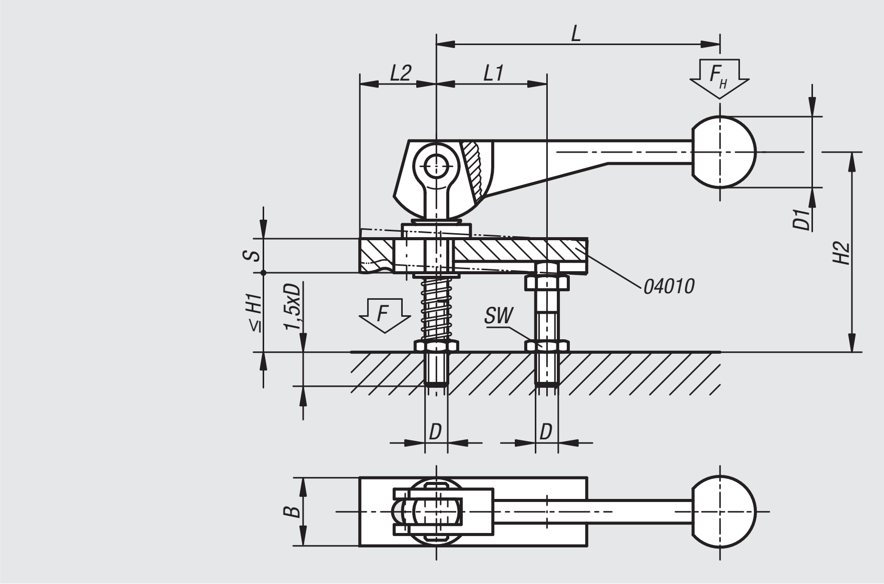
Order No.	L	L1	L2	L3	L4	B	B1	B2	S	H	H1 max.	H2	D	D1	D2	A	SW
04330-08	104±2	27	28	28	27	38	25	12	16	70	25	34	M8	25	7	14	13
04330-10	123±2	34	36	32	35	41	32	13,5	20	80	24	40	M10	30	7	16	17
04330-12	146±3	43	45	37	45	43	40	14,5	25	100	31	48	M12	30	7	19	19

04350

Cam clamps

with middle lock



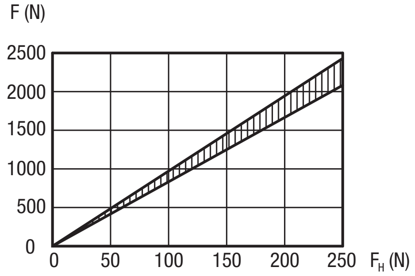


Material:
Cam lever carbon steel 1.7220.
Strap carbon steel 1.1191

Version:
Black oxidised.

Sample order:
nlm 04350-12

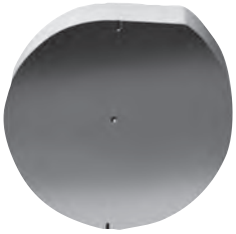
Force diagram

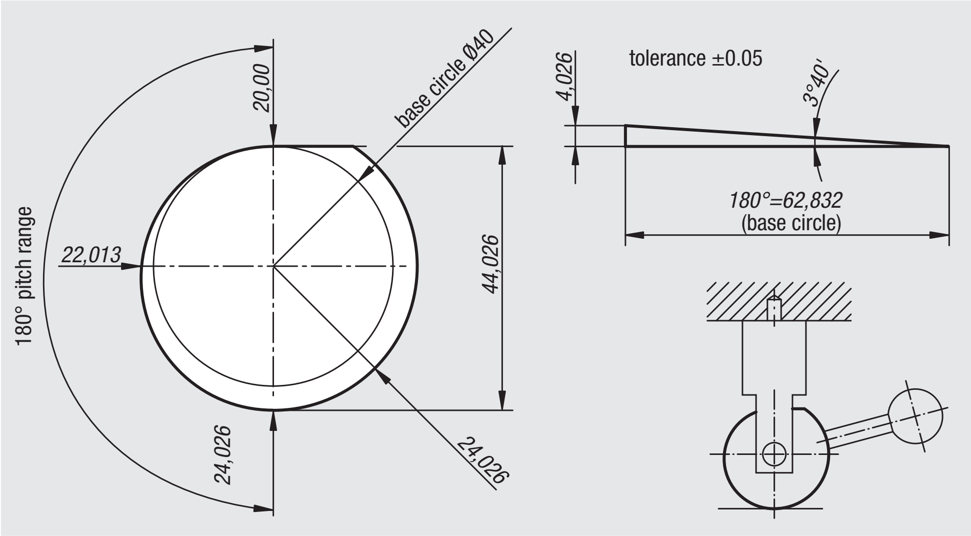


Order No.	L	L1	L2	B	S	H1 max.	H2	D	D1	SW
04350-08	104±2	39	37	20	12	28	74	M8	25	13
04350-10	123±2	49	46	25	16	39	92	M10	30	17
04350-12	146±3	61	58	32	20	49	120	M12	30	19

04360

Spiral cams





Material:
Profile steel 1.7131.

Version:
Saw cut and deburred.
Centre is centre-punched.
Start and end of spiral is marked.

Sample order:
nlm 04360-14

Note:
Spiral cams are used where something must be self-locking clamped or secured.
The cam is operated mechanically, pneumatically or hydraulically using a shaft through the centre or a lever fastened to the side. By pressure failure the self-locking effect is still operative leading to much higher operating safety by pneumatic and hydraulic clamping.

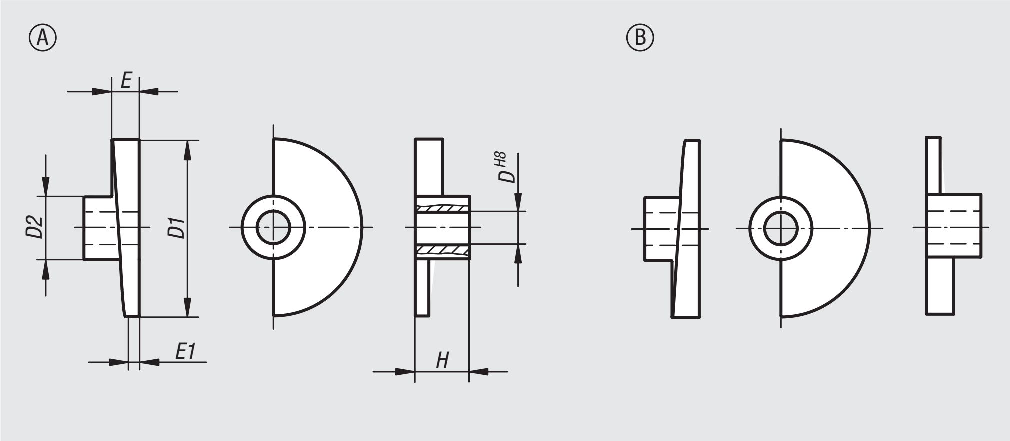
Order No.	base circle Ø	disc thickness
04360-14	40	14
04360-20	40	20

04362

Door latch

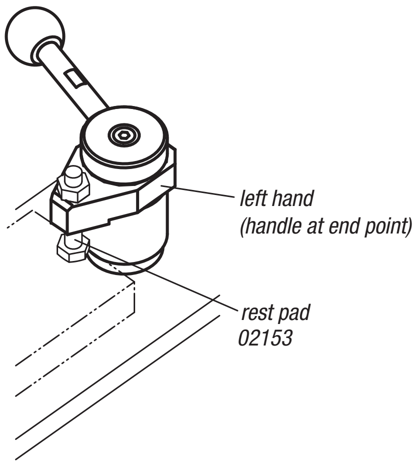
Material:
Sintered steel

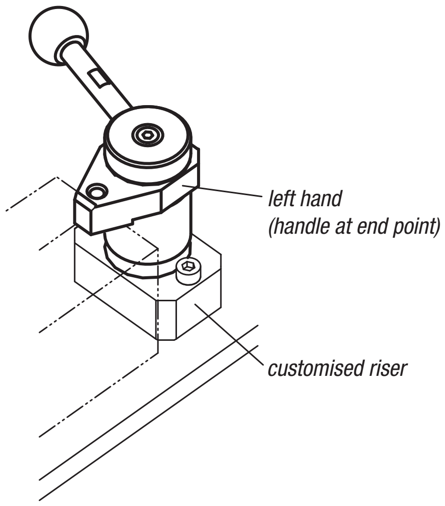
Sample order:
nlm 04362-108



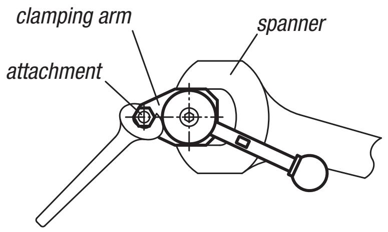
Order No. Form A right	**Order No. Form B left**	D	D1	D2	E	E1	H
04362-108	**04362-208**	8	35	18	7	3	15
04362-110	**04362-210**	10	35	18	7	3	15
04362-112	**04362-212**	12	65	23	7	5	20
04362-116	**04362-216**	16	80	27	9	6	24

Technical information for swing clamps





Mounting an attachment



When mounting an attachment on the clamping arm, use a spanner to lock the arm and prevent it from turning.

Notes

Swing clamps mini,

with cam lever

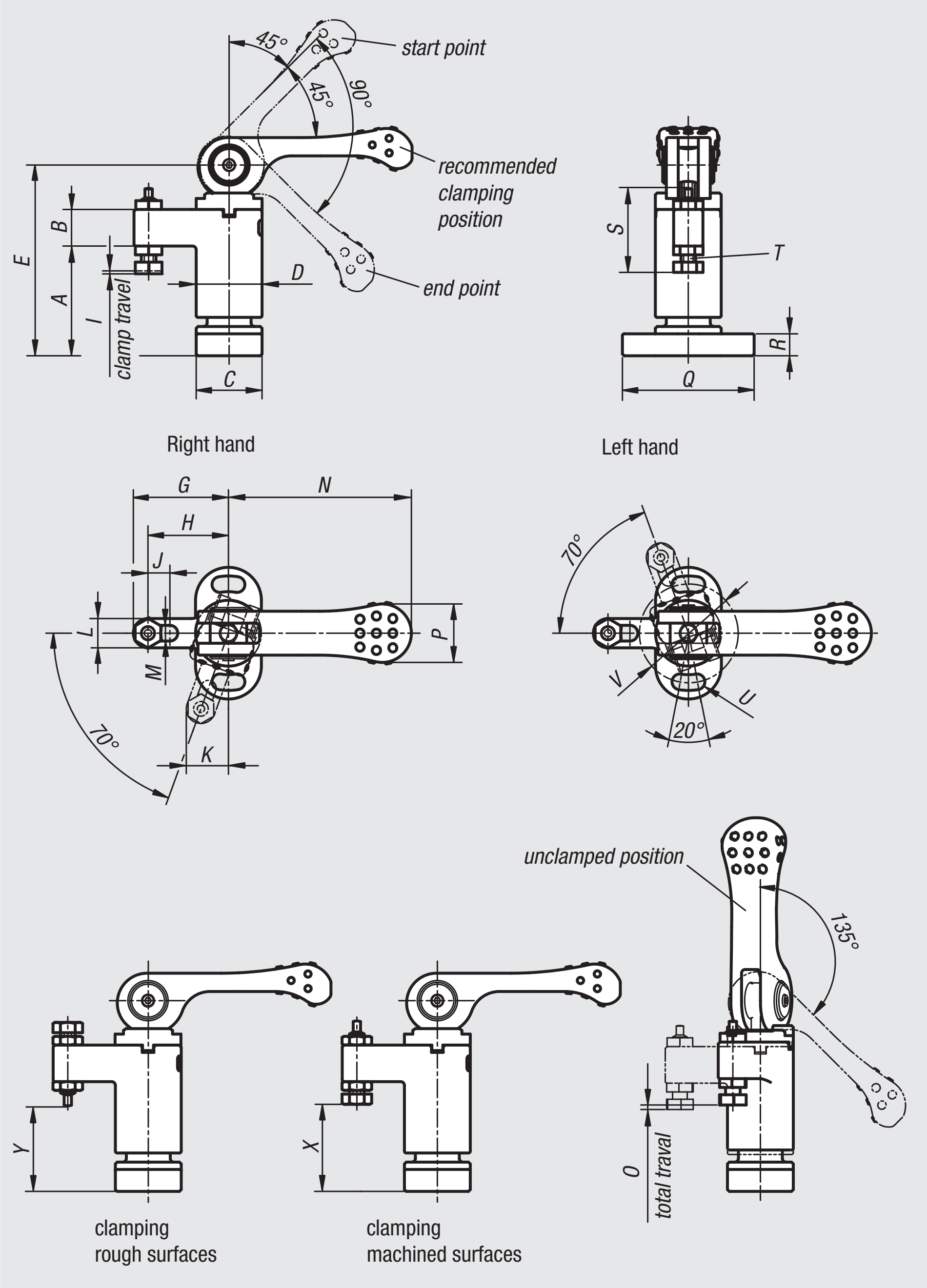
Material:
Carbon steel.

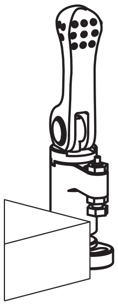
Version:
Tempered and black oxidised.

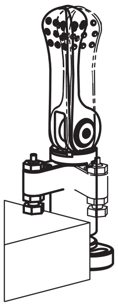
Sample order:
nlm 04363-0100

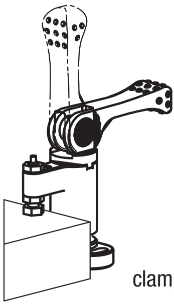
Note:
Swing clamps are used where the clamping points must be free when the workpiece is loaded or removed.

* Admissible hand force for the handle.




unclamped


swivel


clamp

Order No. left	Order No. right	A	B	C	D	E	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	X min.	X max.	Y min.	Y max.	F=retaining force N	Hand force FH N
04363-0100	**04363-1100**	30	10	18	18	52	26	22	0,8	6	11,5	8	4,3	50	1,2	16	36	6	22,8	M4	4,3	27	22,4	25,2	22	24,8	800	100*
04363-0150	**04363-1150**	40	14	23	23	68	35	30	1	8	15,3	10	5,3	63	1,5	19	45	8	28,5	M5	5,3	34	30,8	33,8	31,7	34,7	1500	150*
04363-0200	**04363-1200**	50	18	30	30	87	45	37	1,2	8	20,7	16	8,4	80	1,8	24	65	12	45,5	M8	8,4	48	31,9	39,6	32,9	40,6	2100	200*
04363-0300	**04363-1300**	60	22	40	40	107	55	45	1,5	8	25,4	20	10,4	100	2,3	30	85	15	57	M10	10,5	64	35,7	46,7	38,2	49,2	2800	300*

Swing clamps mini

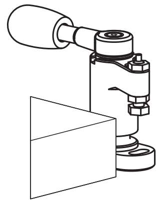
Material:
Carbon steel.
Grip plastic.

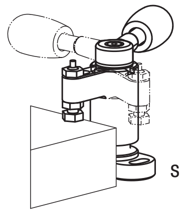
Version:
Tempered, black oxidised.
Grip black.

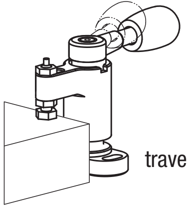
Sample order:
nlm 04364-0100

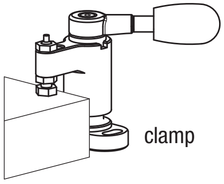
Note:
Swing clamps are used where the clamping points must be free when the workpiece is loaded or removed.

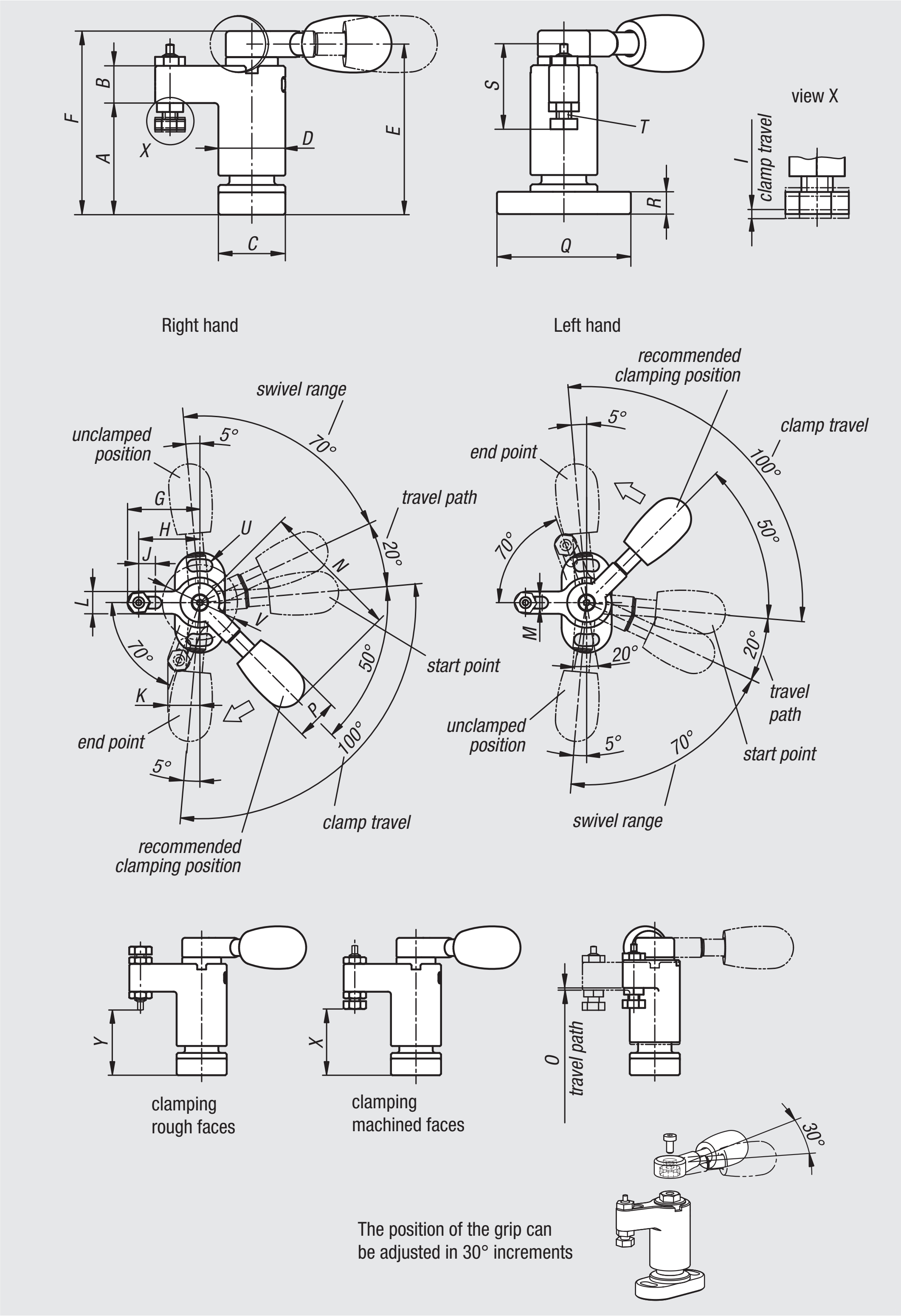
* Admissible hand force for the handle.


unclamped


swivel


travel path


clamp



The position of the grip can be adjusted in 30° increments

Order No. left	Order No. right	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	X min.	X max.	Y min.	Y max.	F=retaining force N	Hand force FH N
04364-0100	**04364-1100**	30	10	18	18	45,8	49	26	22	1	6	11,5	8	4,3	50	0,8	15	36	6	22,8	M4	4,3	27	22,3	25,3	21,9	24,9	1100	100*
04364-0150	**04364-1150**	40	14	23	23	61,3	66	35	30	1,4	8	15,3	10	5,3	63	1,1	20	45	8	28,5	M5	5,3	34	30,6	34	31,5	34,9	1800	150*
04364-0200	**04364-1200**	50	18	30	30	76,5	82	45	37	1,5	8	20,7	16	8,4	80	1,4	26	65	12	45,5	M8	8,4	48	31,7	39,7	32,7	40,7	2200	200*
04364-0300	**04364-1300**	60	22	40	40	93	100	55	45	1,9	8	25,4	20	10,4	100	1,7	33	85	15	57	M10	10,5	64	35,5	46,9	38	49,4	3500	300*

04365

Swing clamp

pneumatic

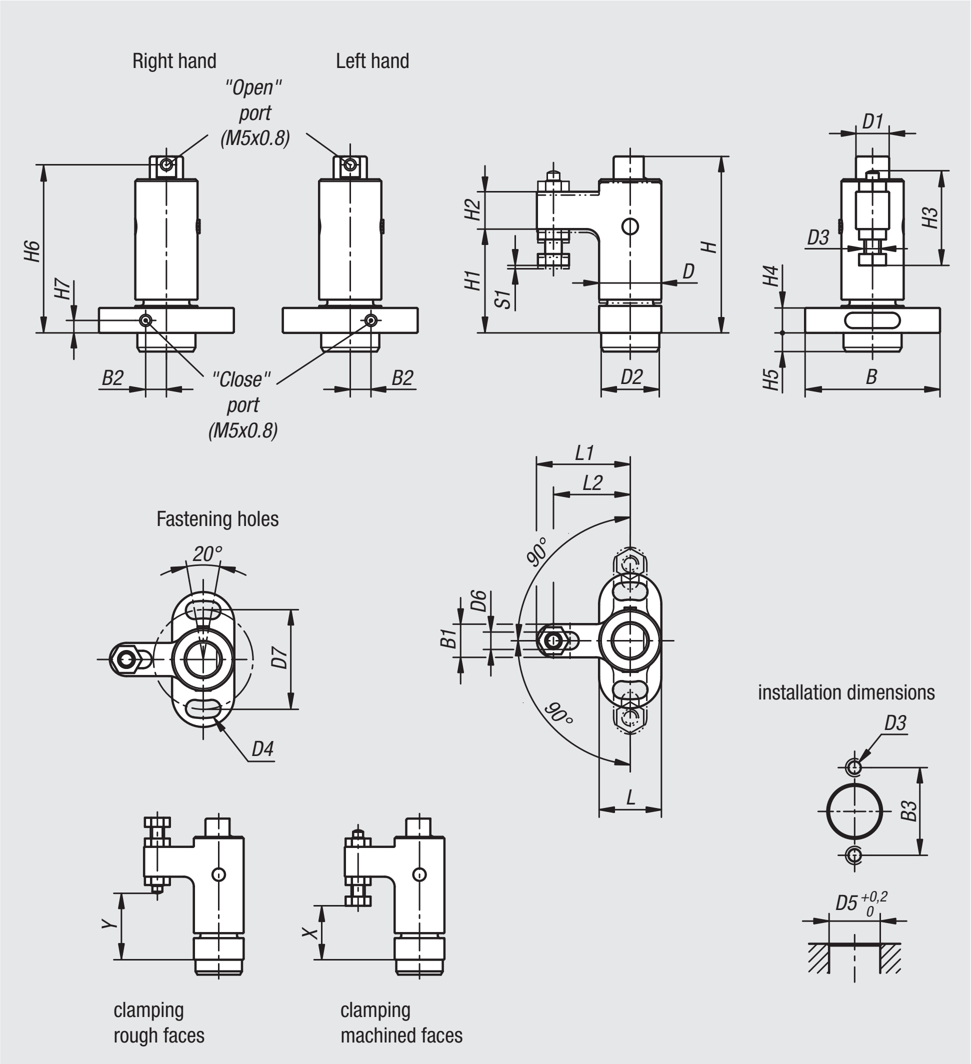
Material:
Carbon steel.

Version:
Clamping element nickel-plated.
Clamping bolt tempered and nickel-plated.

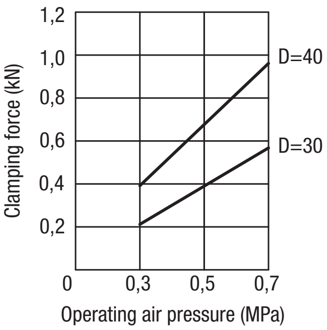
Sample order:
nlm 04365-13945

Note:
The pneumatic swing clamp is suitable for clamping workpieces from above. The swivel and clamping function occurs pneumatically. The swivel function enables unobstructed insertion and removal of the workpiece. Optimum accessibility to the workpiece is guaranteed. The foot of the housing offers universal fastening possibilities, enabling the swing clamp to be optimally aligned with the workpiece being clamped. The swing clamps are available in left or right swivelling versions. Pneumatic swing clamps can also be placed in multiple positions on the workpiece and operated in a particular order. They can be controlled manually or automatically.

The clamping force and retaining force indicated are based on 0.5 MPa.



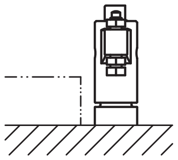
Performance curve



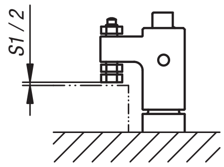
Swing clamp

pneumatic

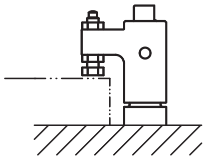
Setting the distance between the workpiece and thrust screw:
The distance between thrust screw and workpiece should be ca. half of the clamping travel (S1).
The clamping arm swivels in horizontally.
Carry out the following steps to set the thrust screw correctly.



1. Open the clamp by applying compressed air to the "open" port.



2. Manually swivel the arm to the clamping position. Set the distance between the thrust screw and the workpiece top face to half the clamping travel (S1).



3. Secure the thrust screw in place using locknuts.

Order No.	Version 1	B	B1	B2	B3	D	D1	D2	D3	D4	D5	D6	D7	H	H1	H2
04365-13945	right	65	16	10	48	30	16	28	M8	8,4	28	8,4	48	85	50	18
04365-03945	left	65	16	10	48	30	16	28	M8	8,4	28	8,4	48	85	50	18
04365-15155	right	85	20	13	64	40	22	35	M10	10,5	35	10,4	64	106	65	22
04365-05155	left	85	20	13	64	40	22	35	M10	10,5	35	10,4	64	106	65	22

Order No.	H3	H4	H5	H6	H7	L	L1	L2	S1 (travel)	F=retaining force N	Holding force F kN	Operating pressure MPa	X min.	X max.	Y min.	Y max.
04365-13945	45,5	12	9	81	6	30	45	37	1,2	400	0,8	0,3 - 0,7	32,5	39	33,5	40
04365-03945	45,5	12	9	81	6	30	45	37	1,2	400	0,8	0,3 - 0,7	32,5	39	33,5	40
04365-15155	57	15	11	101	8	40	55	45	1,6	650	1,3	0,3 - 0,7	41,5	51	44	53,5
04365-05155	57	15	11	101	8	40	55	45	1,6	650	1,3	0,3 - 0,7	41,5	51	44	53,5

04366

Swing clamps

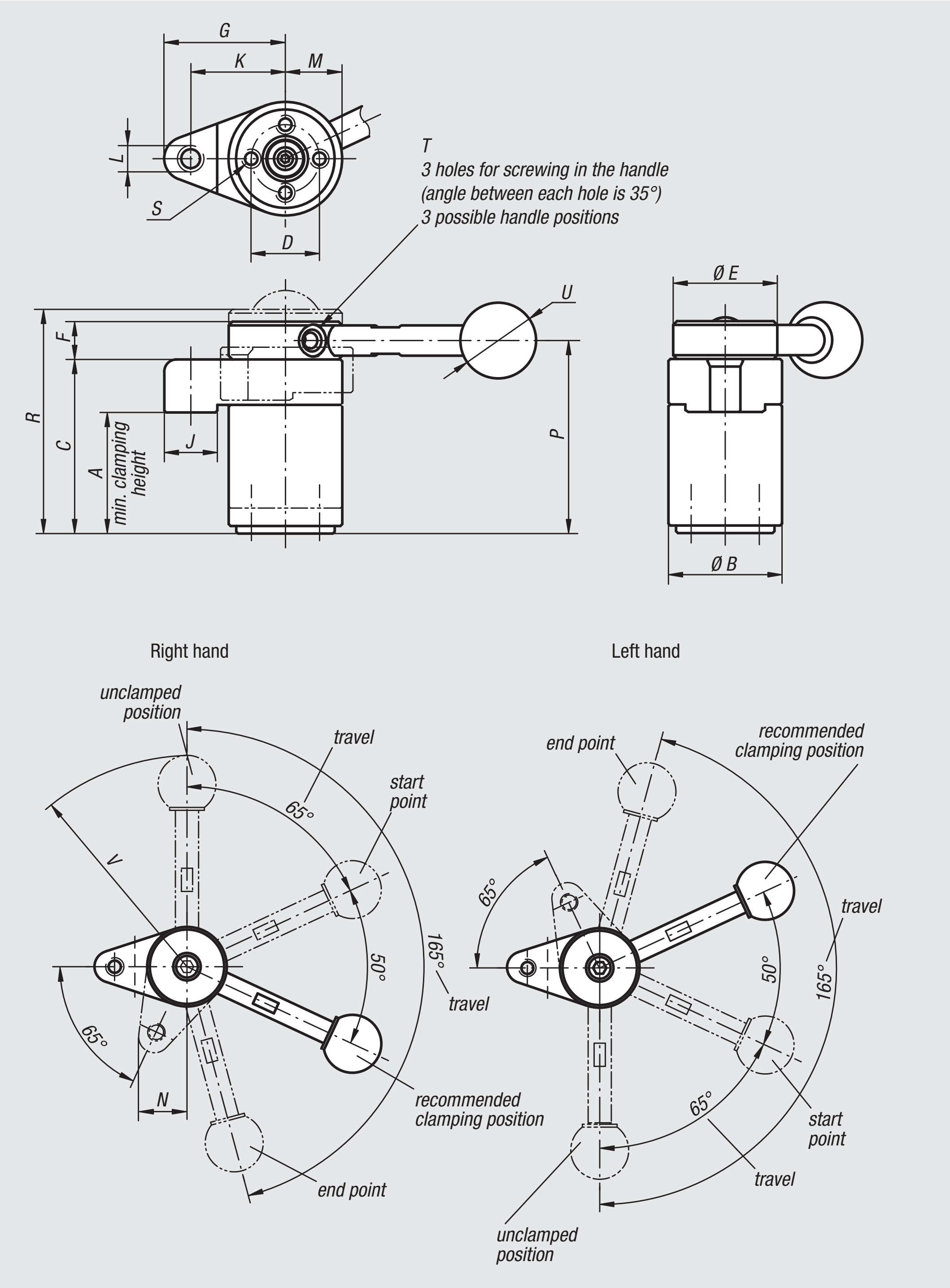
Material:
Carbon steel.
Ball knob plastic.

Version:
Tempered and black oxidised.
Ball knob thermoset PF 31, black.

Sample order:
nlm 04366-013232

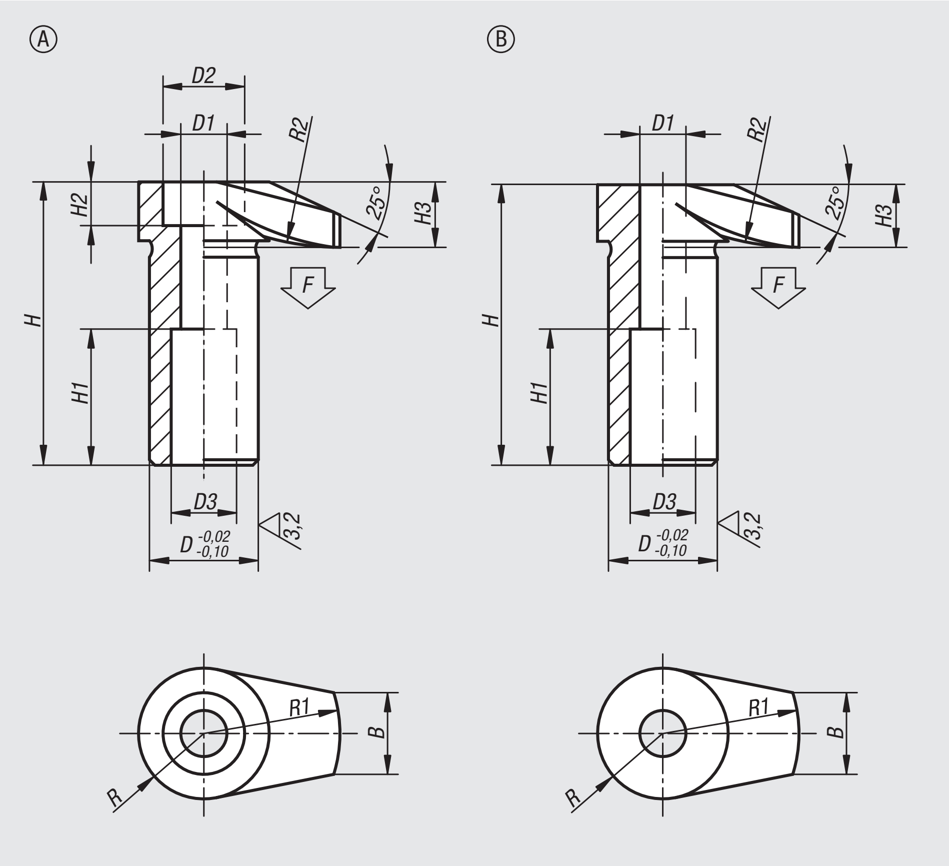
Note:
* Admissible hand force to operate the handle.

Accessories:
Standard handles 06355.
Screw-in handles with adjustable torque 06357.



Order No. left	Order No. right	Grip	A min.	A max.	B	C	D	E	F	G	J	K	L	M	N	P	R	S	T	U	V	F=retaining force N	Hand force FH N
04366-003232	**04366-103232**	without	31,4	32,6	30	46	18	30	10	32	14	25	M6	15	17	51	57,5	M4x8	M5	-	-	800	150*
04366-004540	**04366-104540**	without	44,1	45,9	40	63	25	38	13	40	16	32	M8	20	22,5	69,5	78,1	M6x12	M6	-	-	1200	200*
04366-013232	**04366-113232**	with handle	31,4	32,6	30	46	18	30	10	32	14	25	M6	15	17	51	57,5	M4x8	M5	20	73	800	150*
04366-014540	**04366-114540**	with handle	44,1	45,9	40	63	25	38	13	40	16	32	M8	20	22,5	69,5	78,1	M6x12	M6	25	107	1200	200*

Hook clamps

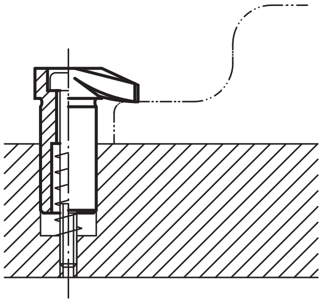


Material:
Carbon steel, tempered.

Version:
Black oxidised.

Sample order:
nlm 04370-10

Accessories:
Springs 07650 and socket head screws 07160.



Order No.	Form	D	D1	D2	D3	H	H1	H2	H3	B	R	R1	R2	F max. kN
04370-06	A	16	6,5	11	10	42	20	6	10	11	9	20	30	4,8
04370-08	A	20	8,5	15	12	52	25	8	12	15	12	25	50	8,8
04370-10	A	25	10,5	18	14	66	32	10	16	17	14	32	60	13,9
04370-12	A	32	12,5	20	17	83	40	12	20	20	18	40	80	20,2

Order No.	Form	D	D1	D3	H	H1	H3	B	R	R1	R2	F max. kN
04370-106	B	16	6,5	10	41,5	20	9,5	11	9	20	30	4,8
04370-108	B	20	8,5	12	51,5	25	11,5	15	12	25	50	8,8
04370-110	B	25	10,5	14	65,5	32	15,5	17	14	32	60	13,9
04370-112	B	32	12,5	17	82,5	40	19,5	20	18	40	80	20,2

04370

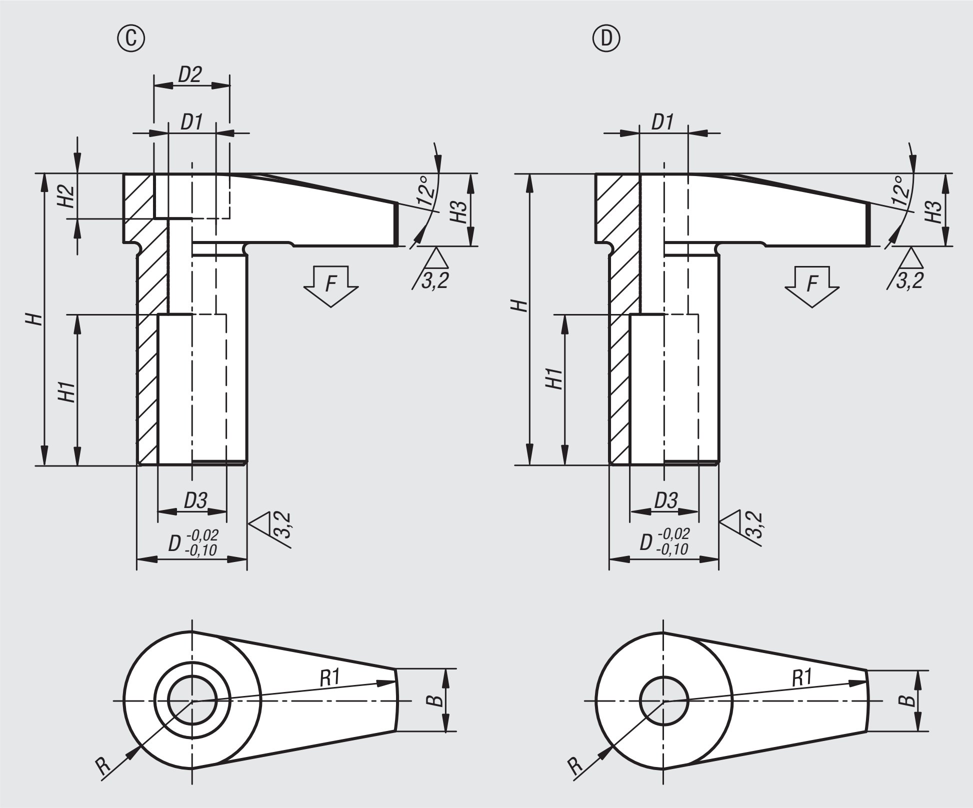
Hook clamp

with long clamp strap

Material:
Carbon steel, tempered.

Version:
Black oxidised.

Sample order:
nlm 04370-406



Order No.	Form	B	D	D1	D2	D3	H	H1	H2	H3	R	R1	F max. kN
04370-406	C	9	16	7	11	10	42,5	22	6	10,5	10	30	4,5
04370-408	C	12	20	8,6	15	12	52,5	25	8	12,5	12,5	40	6,5
04370-410	C	18	25	10,6	18	14	66,5	32	10	16,5	16	50	11,8

Order No.	Form	B	D	D1	D3	H	H1	H3	R	R1	F max. kN
04370-506	D	9	16	7	10	42,5	22	10,5	10	30	4,5
04370-508	D	12	20	8,6	12	52,5	25	12,5	12,5	40	6,5
04370-510	D	18	25	10,6	14	66,5	32	16,5	16	50	11,8

04370

Hook clamps

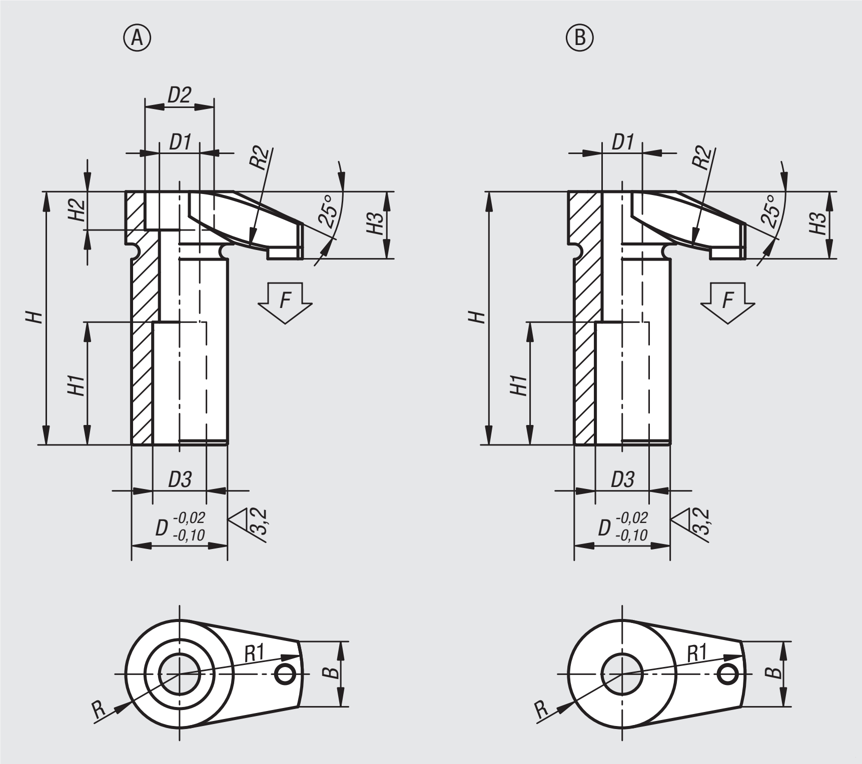
with protective insert

Material:
Carbon steel.
Soft pad POM or polyurethane 99 Shore A.

Version:
Tempered and black oxidised.

Sample order:
nlm 04370-206

Note:
The pressed in plastic inserts offer optimal damage protection for sensitive workpiece faces.



Order No.	Form	Component material	D	D1	D2	D3	H	H1	H2	H3	B	R	R1	R2	F max. kN
04370-206	A	polyacetal	16	6,5	11	10	42	20	6	10,5	11	9	20	30	4,8
04370-208	A	polyacetal	20	8,5	15	12	52	25	8	13,5	15	12	25	50	8,8
04370-210	A	polyacetal	25	10,5	18	14	66	32	10	17,5	17	14	32	60	11,6
04370-212	A	polyacetal	32	12,5	20	17	83	40	12	21	20	18	40	80	18,8
04370-2106	B	polyacetal	16	6,5	-	10	41,5	20	-	10	11	9	20	30	4,8
04370-2108	B	polyacetal	20	8,5	-	12	51,5	25	-	13	15	12	25	50	8,8
04370-2110	B	polyacetal	25	10,5	-	14	65,5	32	-	17	17	14	32	60	11,6
04370-2112	B	polyacetal	32	12,5	-	17	82,5	40	-	21	20	18	40	80	18,8
04370-306	A	polyurethane	16	6,5	11	10	42	20	6	10,5	11	9	20	30	4,8
04370-308	A	polyurethane	20	8,5	15	12	52	25	8	13,5	15	12	25	50	8,8
04370-310	A	polyurethane	25	10,5	18	14	66	32	10	17,5	17	14	32	60	11,6
04370-312	A	polyurethane	32	12,5	20	17	83	40	12	21	20	18	40	80	18,8
04370-3106	B	polyurethane	16	6,5	-	10	41,5	20	-	10	11	9	20	30	4,8
04370-3108	B	polyurethane	20	8,5	-	12	51,5	25	-	13	15	12	25	50	8,8
04370-3110	B	polyurethane	25	10,5	-	14	65,5	32	-	17	17	14	32	60	11,6
04370-3112	B	polyurethane	32	12,5	-	17	82,5	40	-	21	20	18	40	80	18,8

04371

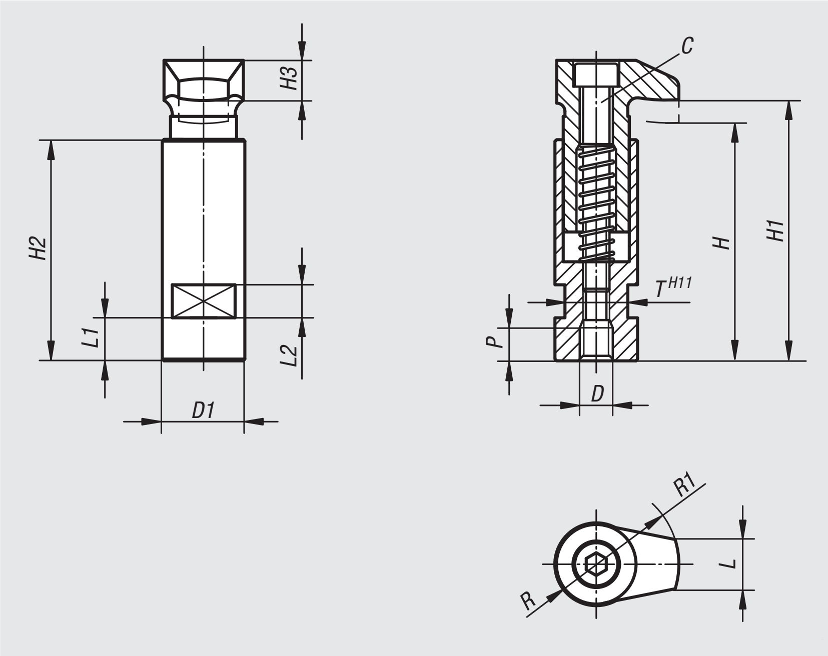
Hook clamps

with collar

Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 04371-06

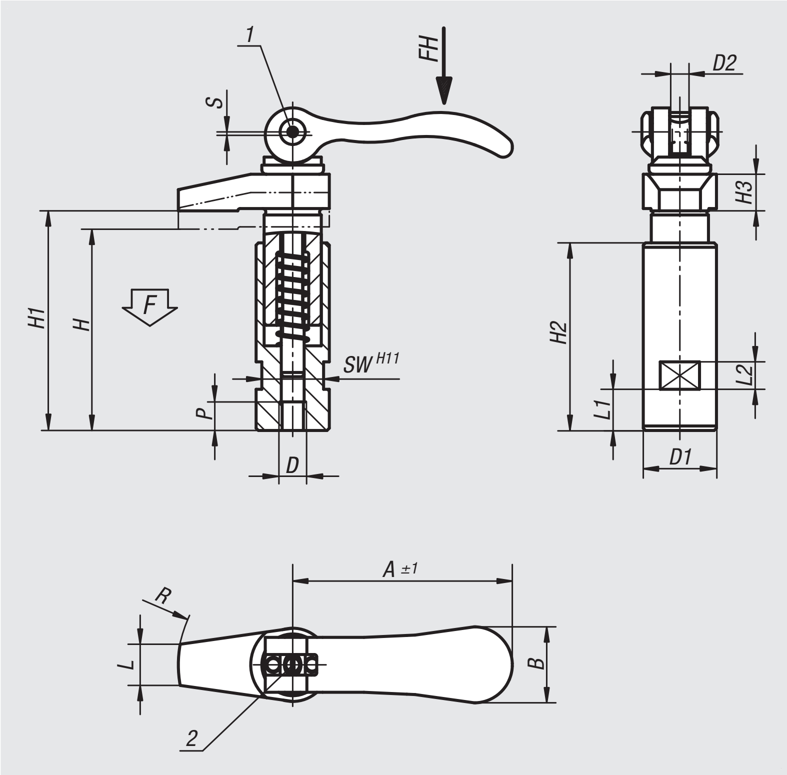


Order No.	C	D	D1	H	H1	H2	H3	L	L1	L2	P	R	R1	T	Clamping force kN
04371-06	M6	M6	20	56	60	53	10	11	9	8	8	9	20	17	4,82
04371-08	M6	M8	20	56	60	53	10	11	9	8	8	9	20	17	8,77
04371-10	M8	M10	25	72	79	67	12	15	13	10	10	12	25	19	13,9
04371-12	M10	M12	32	88	96	82	16	17	18	12	12	14	32	27	20,2
04371-16	M12	M16	40	109	118	102	20	20	22	12	16	18	40	32	37,8

04371

Hook clamps

with collar and cam lever



Material:
Body and hook, high-carbon steel.
Handles, cast aluminium EN AC-46200.
Thrust washer, fibreglass reinforced plastic PA 66 GF 35-X.
Hinge pin, stud and washer stainless steel 1.4305.

Version:
Body and hook tempered and black oxidised.
Handles, black powder-coated.
Thrust washer black.
Hinge pin, stud and washer bright.

Sample order:
nlm 04371-106

Note:
Ideal for clamping where the parts are to be inserted from above as the hook can be swivelled out of the way.

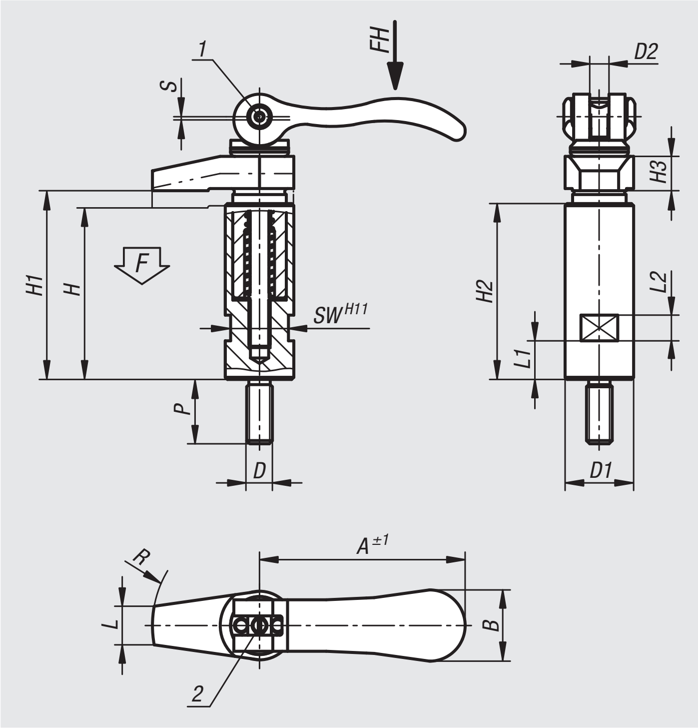
The exact clamping height is set by the fine thread on the stud using a screwdriver. This setting can be secured with the locking screw. The length S corresponds to the cam travel.

Drawing reference:
1) Locking screw for pin
2) Screw for fine adjustment of lever

Order No.	D	D1	D2	H	H1	H2	H3	L	L1	L2	A	B	P	R	SW	Travel S	F kN	Hand force FH N
04371-106	M6	20	M6x0,5	56	60	53	10	9	9	8	70,4	21,5	8	30	17	1,2	4	120
04371-108	M8	20	M6x0,5	56	60	53	10	9	9	8	70,4	21,5	8	30	17	1,2	4	120
04371-110	M10	25	M8x0,75	72	79	67	12	12	13	10	96	33,3	10	40	19	1,5	8	350
04371-112	M12	32	M8x0,75	88	96	82	15	18	18	12	96	33,3	12	50	27	1,5	8	350

Hook clamps

with collar and cam lever



Material:
Body and hook, high-carbon steel.
Handles, cast aluminium EN AC-46200.
Thrust washer, fibreglass reinforced plastic PA 66 GF 35-X.
Hinge pin, stud and washer stainless steel 1.4305.

Version:
Body and hook tempered and black oxidised.
Handles, black powder-coated.
Thrust washer black.
Hinge pin, stud and washer bright.

Sample order:
nlm 04371-208

Note:
Ideal for clamping where the parts are to be inserted from above as the hook can be swivelled out of the way.

The exact clamping height is set by the fine thread on the stud using a screwdriver. This setting can be secured with the locking screw. The length S corresponds to the cam travel.

Drawing reference:
1) Locking screw for pin
2) Screw for fine adjustment of lever

Order No.	D	D1	D2	H	H1	H2	H3	L	L1	L2	A	B	P	R	SW	Travel S	F kN	Hand force FH N
04371-206	M6	20	M6x0,5	56	60	53	10	9	9	8	70,4	21,5	20	30	17	1,2	4	120
04371-208	M8	20	M6x0,5	56	60	53	10	9	9	8	70,4	21,5	20	30	17	1,2	4	120
04371-210	M10	25	M8x0,75	72	79	67	12	12	13	10	96	33,3	25	40	19	1,5	8	350
04371-212	M12	32	M8x0,75	88	96	82	18	18	18	12	96	33,3	30	50	27	1,5	8	350

Notes

04372

Hook clamps

Material:
Carbon steel, tempered.

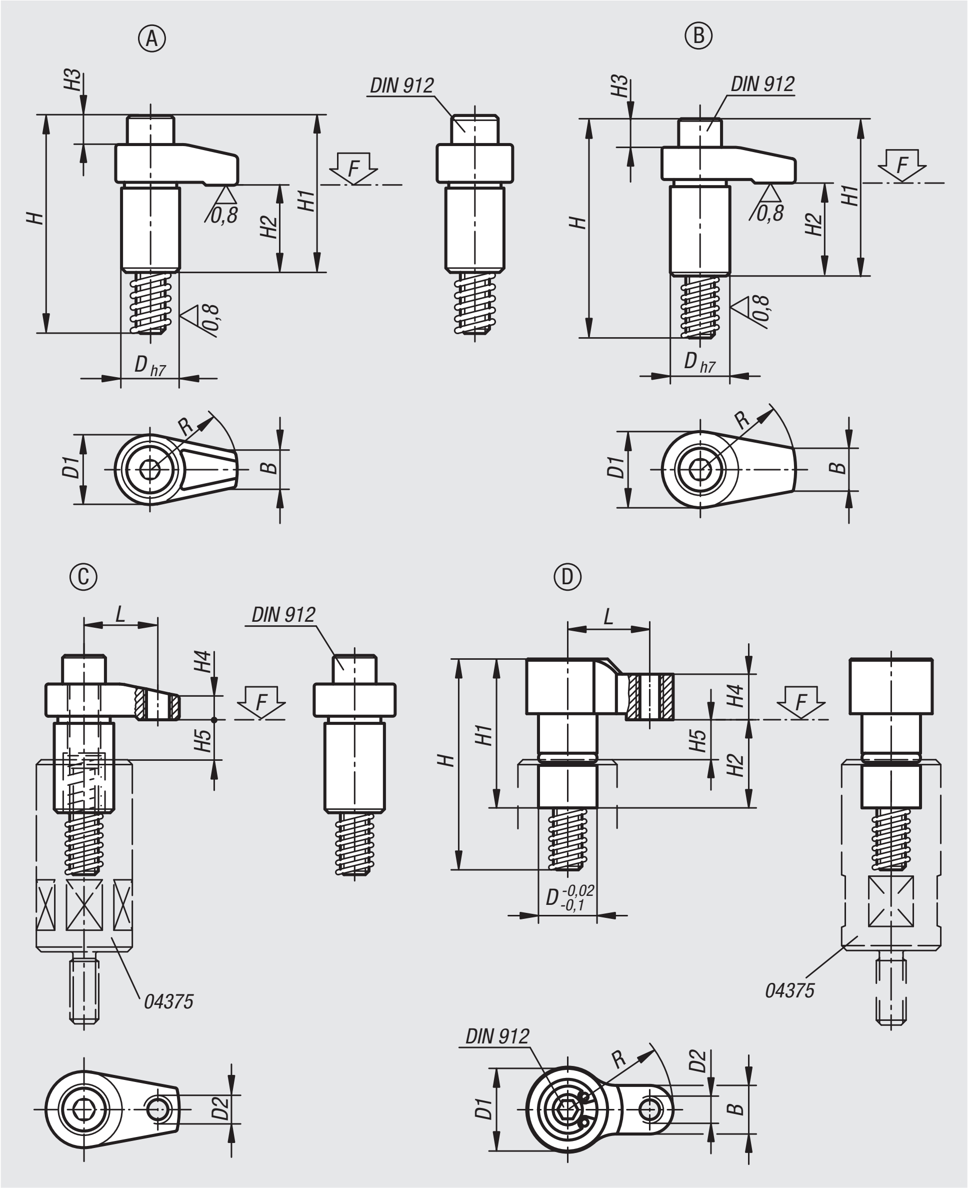
Version:
Form A-C: black oxidised. Shaft diameter ground.
Form D: black oxidised.

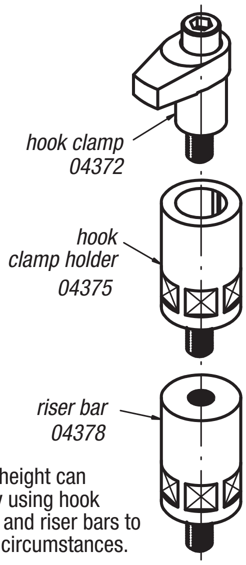
Sample order:
nlm 04372-216040

Note:
The stated clamping forces (F max.) and tightening torques are valid within the stated clamping ranges (H5).

Advantages:
Compact design for use in the tightest of spaces
Diverse versions and sizes

Accessories:
Hook clamp holders 04375.
Hook clamp holders 04379.
Extensions for jack screws 04378.





The clamping height can be adjusted by using hook clamp holders and riser bars to suit individual circumstances.

Hook clamps

Order No.	Form	D	D1	D2	H	H1	H2	H3	H4	H5 max. clamping range	B	L	R	Socket head screw DIN 912	Tightening torque max. Nm	F max. kN
04372-110030	A	20	25	-	75	54	30	9	10	12	12	-	30	M10x65	37,2	13
04372-110040	A	20	25	-	75	54	30	9	10	12	12	-	40	M10x65	31,4	9,8
04372-208020	B	18	22	-	58	37	23	2	7	10	10	-	20	M8x50	37,2	13,6
04372-208025	B	18	22	-	58	37	23	2	7	10	10	-	25	M8x50	32,3	10,9
04372-208030	B	18	22	-	58	37	23	2	7	10	10	-	30	M8x50	29,4	9
04372-212040	B	25	32	-	92	66	39	11	12	15	18	-	40	M12x80	58,8	17,5
04372-212050	B	25	32	-	92	68	39	11	12	15	18	-	50	M12x80	49	14
04372-212060	B	25	32	-	92	68	39	11	12	15	18	-	60	M12x80	45,1	11,6
04372-216040	B	32	36	-	101	75	39	15	15	15	22	-	40	M16x85	166,6	37,9
04372-216050	B	32	36	-	101	75	39	15	15	15	22	-	50	M16x85	147	30,4
04372-216060	B	32	36	-	101	75	39	15	15	15	22	-	60	M16x85	127,4	25,2
04372-312140	C	25	32	M12	92	66	39	11	10	15	18	31	40	M12x80	58,8	22,6
04372-312150	C	25	32	M12	92	68	39	11	13	15	18	38	50	M12x80	49	18,5
04372-312160	C	25	32	M12	92	68	39	11	13	15	18	46	60	M12x80	45,1	15,2
04372-316150	C	32	36	M12	101	75	39	15	16	15	22	38	50	M16x85	147	38
04372-316160	C	32	36	M12	101	75	39	15	16	15	22	46	60	M16x85	127,4	33
04372-404118	D	10	14	M4	37	24,5	14,5	-	7,5	3	8	14	18	M4x30	2,7	2
04372-406122	D	12	16	M5	44	30,5	17,5	-	9,5	4	10	17	22	M6x35	7	3,5

04373

Hook clamps

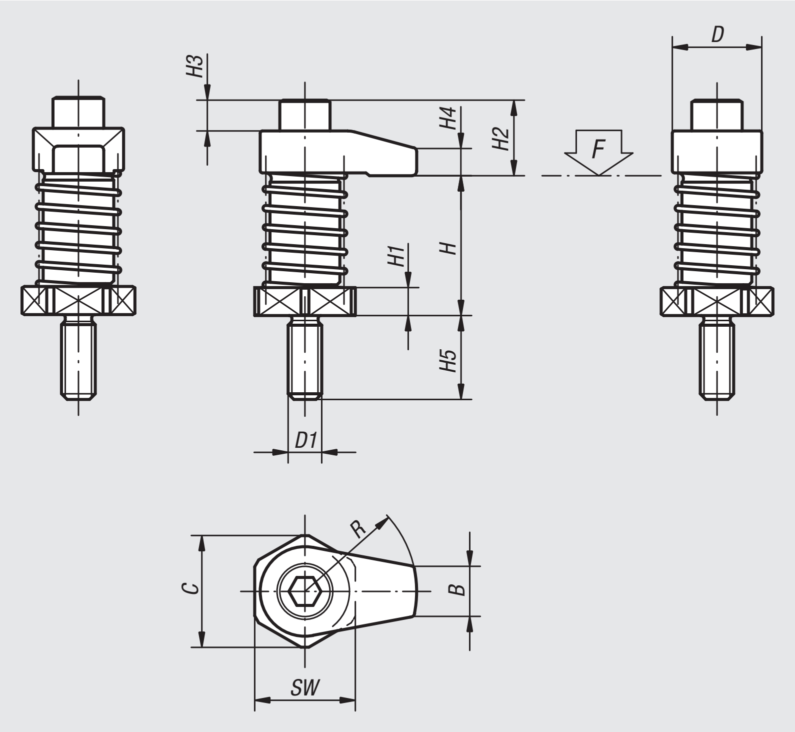
with collar

Material:
Hook clamps and hook clamp holders carbon steel, tempered.

Version:
Black oxidised.

Sample order:
nlm 04373-12060

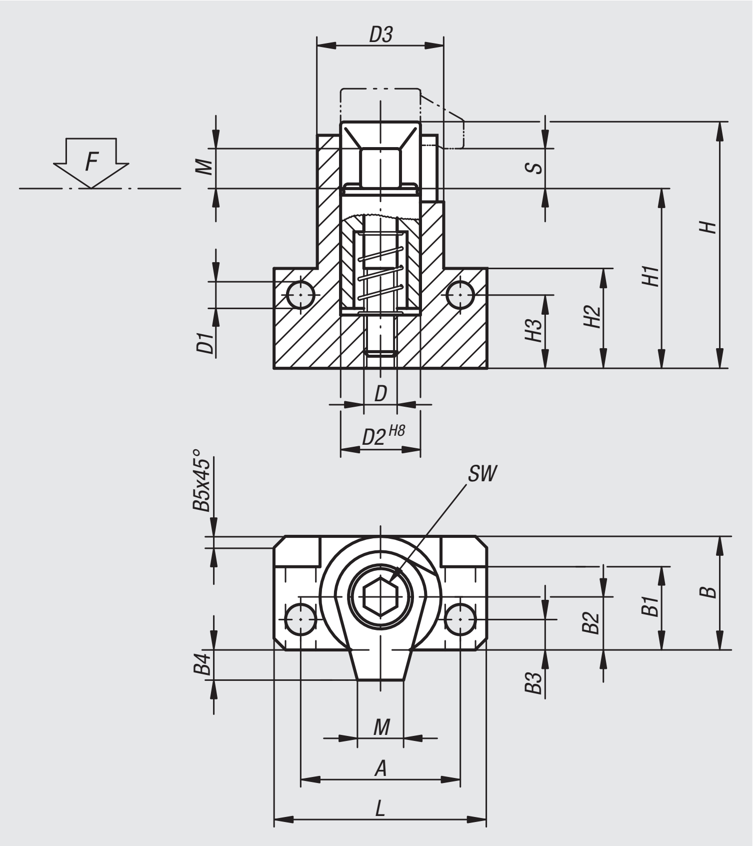
Note:
Hook clamps with collars can be screwed directly into grid holes etc. with or without counterbore.
For suitable height adjustment elements see risers 04378.



Order No.	D	D1	H clamping range	H1	H2	H3	H4	H5	B	C	R	SW	Tightening torque max. Nm	F max. kN
04373-08020	22	M8	35 - 45	6	14	2	7	19	10	25	20	22	20	7,9
04373-08025	22	M8	35 - 45	6	14	2	7	19	10	25	25	22	20	7,3
04373-08030	22	M8	35 - 45	6	14	2	7	19	10	25	30	22	20	6,7
04373-08120	22	M8	45 - 55	16	14	2	7	19	10	25	20	22	20	7,9
04373-08125	22	M8	45 - 55	16	14	2	7	19	10	25	25	22	20	7,3
04373-08130	22	M8	45 - 55	16	14	2	7	19	10	25	30	22	20	6,7
04373-12040	32	M12	50 - 65	10	27	11	10	30	18	40	40	36	45	13,5
04373-12050	32	M12	50 - 65	10	29	11	12	30	18	40	50	36	45	12,6
04373-12060	32	M12	50 - 65	10	29	11	12	30	18	40	60	36	45	11,7
04373-12140	32	M12	65 - 80	25	27	11	10	30	18	40	40	36	45	13,5
04373-12150	32	M12	65 - 80	25	29	11	12	30	18	40	50	36	45	12,6
04373-12160	32	M12	65 - 80	25	29	11	12	30	18	40	60	36	45	11,7
04373-16040	36	M16	50 - 65	10	36	15	15	30	22	40	40	36	60	13,4
04373-16050	36	M16	50 - 65	10	36	15	15	30	22	40	50	36	60	12,4
04373-16060	36	M16	50 - 65	10	36	15	15	30	22	40	60	36	60	12
04373-16140	36	M16	65 - 80	25	36	15	15	30	22	40	40	36	60	13,4
04373-16150	36	M16	65 - 80	25	36	15	15	30	22	40	50	36	60	12,4
04373-16160	36	M16	65 - 80	25	36	15	15	30	22	40	60	36	60	12

Hook clamps

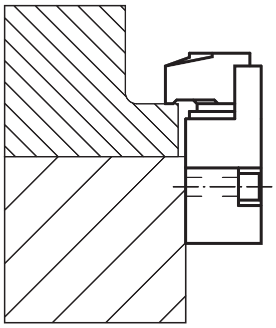
with mounting bracket



Material:
Hook clamps and clamping screw carbon steel, tempered.

Version:
Black oxidised.

Sample order:
nlm 04374-12



Order No.	D	D1	D2	D3	A	B	B1	B2	B3	B4	B5	H	H1	H2	H3	L	M	S	SW	Tightening torque max. Nm	F max. kN
04374-08	M8	6,4	20	28	38	26	19,5	12	6	6	2,5	62	47,5	25	18	50	10	4	6	30	17
04374-10	M10	8,4	24	34	48	31	22,5	14	7,5	9	3	74	57,5	30	21	64	12	5	8	50	18
04374-12	M12	10,5	28	40	55	36,5	26	16,5	9	10,5	3,5	87	67	35	24	75	15	5	10	60	20
04374-16	M16	12,8	34	48	65	43,5	31	19,5	10	16,5	4	112	87	45	32	88	20	5	14	120	24

04375

Hook clamp holders

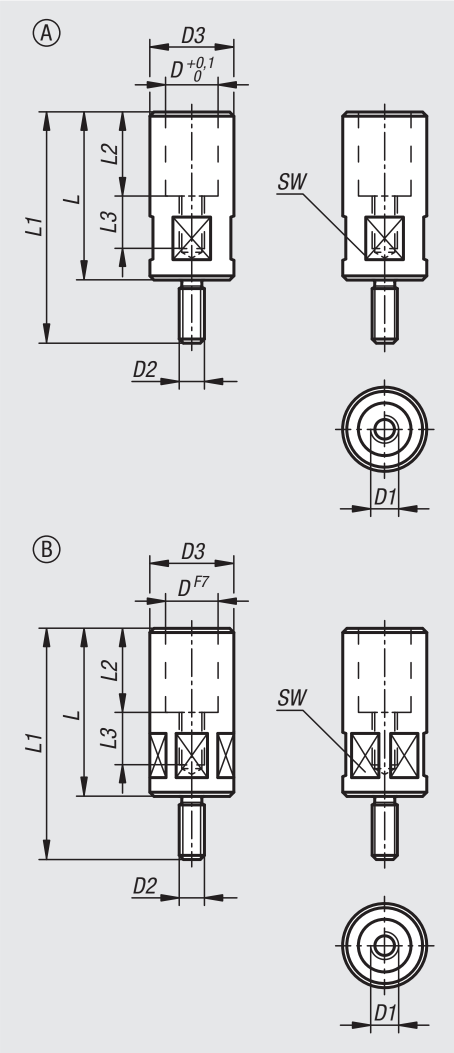
Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 04375-12080

Note:
Hook clamp holders are for holding and raising hook clamps.

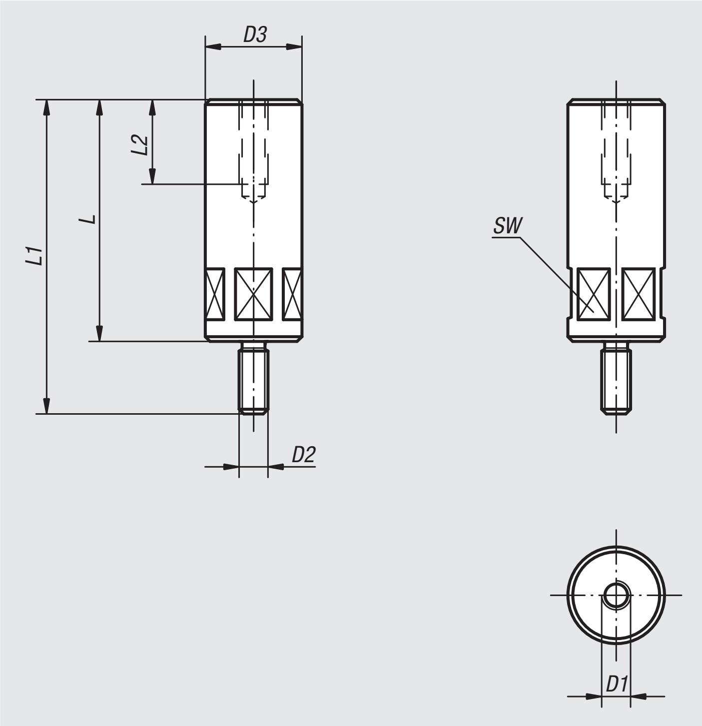
Accessories:
Hook clamps 04372.
Extensions for jack screws 04378.



Order No.	Form	Form-Type	D	D1	D2	D3	L	L1	L2	L3	SW	Tightening torque max. Nm
04375-04035	A	with square	10	M4	M6	14	35	46	16	13	12	2,7
04375-06040	A	with square	12	M6	M8	16	40	54	19	14	13	7
04375-08055	B	with hexagon	18	M8	M8	24	55	74	25	20	22	29,4
04375-10063	B	with hexagon	20	M10	M12	32	63	93	30	21	30	39,2
04375-10080	B	with hexagon	20	M10	M12	32	80	110	30	23	30	39,2
04375-12080	B	with hexagon	25	M12	M12	40	80	110	40	25	36	49
04375-12100	B	with hexagon	25	M12	M12	40	100	130	40	28	36	49
04375-16080	B	with hexagon	32	M16	M16	50	80	110	40	25	46	78,4
04375-16100	B	with hexagon	32	M16	M16	50	100	130	40	28	46	78,4

04378

Riser bars



Material:
Carbon steel.

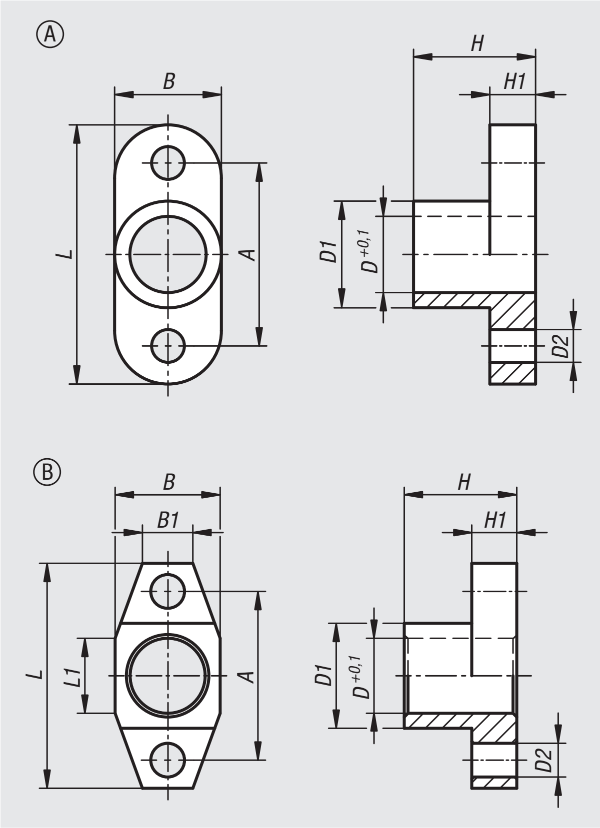
Version:
Black oxidised.

Sample order:
nlm 04378-16050

Note:
The height of the hook clamps and hook clamp holders can be raised using these riser bars.

Order No.	D1	D2	D3	L	L1	L2	SW	Tightening torque max. Nm
04378-08032	M8	M8	24	32	51	20	22	29,4
04378-08040	M8	M8	24	40	59	20	22	29,4
04378-08050	M8	M8	24	50	69	20	22	29,4
04378-08065	M8	M8	24	65	84	20	22	29,4
04378-12050	M12	M12	40	50	80	35	36	49
04378-12065	M12	M12	40	65	95	35	36	49
04378-12080	M12	M12	40	80	110	35	36	49
04378-12100	M12	M12	40	100	130	35	36	49
04378-12125	M12	M12	40	125	155	35	36	49
04378-12160	M12	M12	40	160	190	35	36	49
04378-12200	M12	M12	40	200	230	35	36	49
04378-16050	M16	M16	50	50	80	35	46	78,4
04378-16065	M16	M16	50	65	95	35	46	78,4
04378-16080	M16	M16	50	80	110	35	46	78,4
04378-16100	M16	M16	50	100	130	35	46	78,4
04378-16125	M16	M16	50	125	155	35	46	78,4
04378-16160	M16	M16	60	160	190	35	55	78,4
04378-16200	M16	M16	60	200	230	35	55	78,4

Hook clamp holders

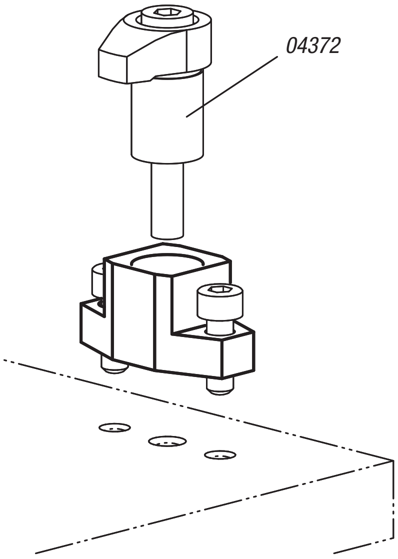


Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 04379-08025

Accessories:
Hook clamps 04372.



Order No.	Form	Form-Type	A	B	B1	D	D1	D2	H	H1	L	L1
04379-04016	A	rounded	24	14	-	10	14	4,3	16	6	34	-
04379-06019	A	rounded	28	16	-	12	16	5,3	19	8	40	-
04379-08025	B	square	38	24	11,3	18	24	6,6	25	10	50	15
04379-10030	B	square	45	28	13,4	20	28	9	30	12	60	20
04379-12040	B	square	55	35	15	25	35	11	40	14	75	20
04379-16040	B	square	65	42	20,2	32	42	13,5	40	16	85	25

04380

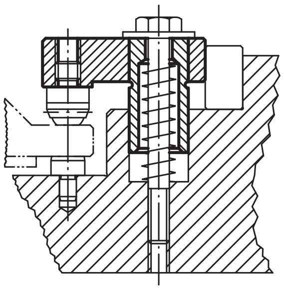
Hook clamps precision

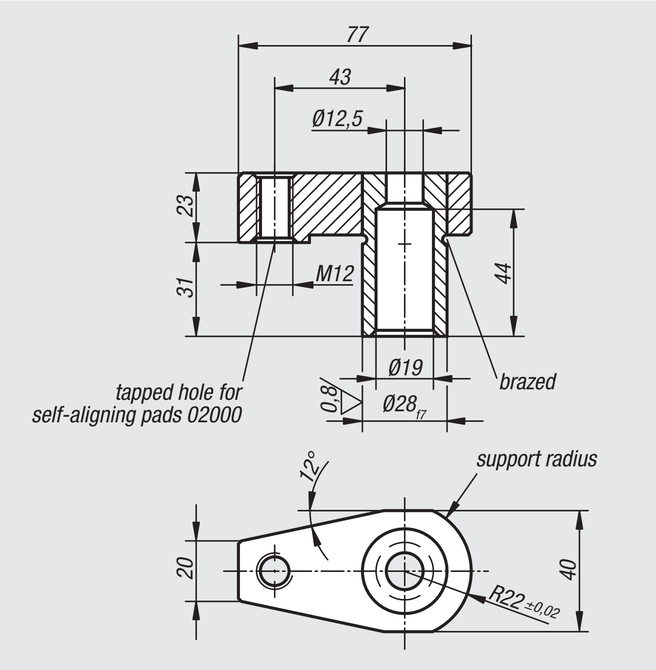
Material:
Steel.

Version:
Case-hardened, black oxidised and ground.

Sample order:
nlm 04380-00

Note:
Precision hook clamps are used as conventional clamping elements in fixtures.
A reamed hole is drilled into the fixture base. The hole depth depends on the required clamping height. A support is placed under the rear rounded hook part (radius 22) to take the counterforce, this can be flat, semicircular or prismatic. A DIN 933 hex. head screw tightens the clamp.





Order No.	Dimensions
04380-00	see drawing

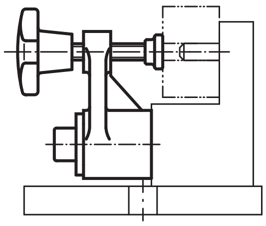
04390

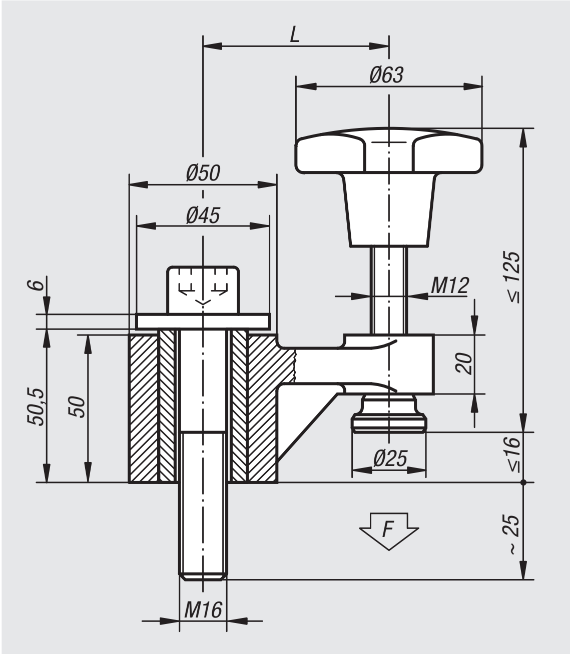
Swing clamps

Material:
Body malleable iron.
Sleeve carbon steel 1.1191.
Screw carbon steel 1.1181.
Thrust pad mild steel 1.0301.

Version:
Painted.
Thrust pads case-hardened.

Sample order:
nlm 04390-01

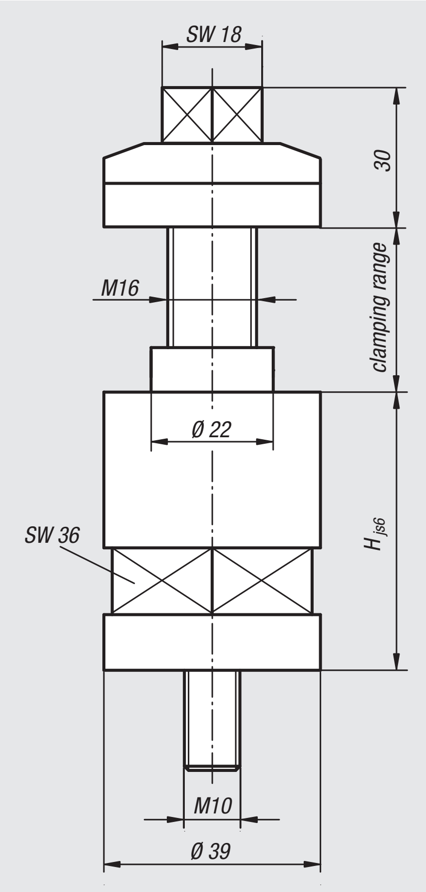




Order No.	L	Clamping force N
04390-01	63	5000
04390-02	100	3000

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Clamping bolts



Material:
Clamping bolt, steel.
Clamping screw, carbon steel.
Clamping ring brass.

Version:
Clamping bolt hardened and black oxidised.
Clamping screw black oxidised.
Clamping ring bright.

Sample order:
nlm 04395-050

Note:
The clamping bolts can be fixed to the machine table directly with T-slot nuts. Clamping parallel to the table is guaranteed by low tolerance classes (js6) for the height.
The clamping range is 8 – 40 mm. Clamping screws for the ranges 40 – 67 and 65 – 87 mm are also available.
The intermediate plate prevents damage to the machine table, as well as shifting during tightening.
The brass clamping ring prevents impressions on the workpiece.

Clamping bolts

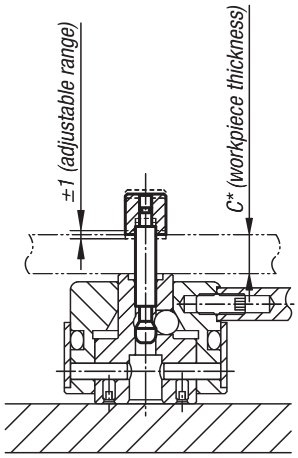
Order No.	H	Clamp range
04395-050	50	8-40
04395-100	100	8-40

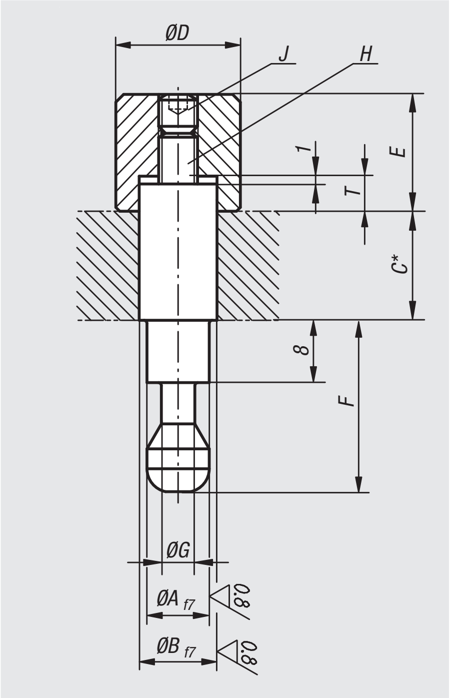
Clamping screws

Order No.	Clamp range
04395-4067	40-67
04395-6587	65-87

04400

Clamping pins





Material:
Carbon steel.

Version:
Pins tempered and ground.
Knurled knob tempered, black oxidised.

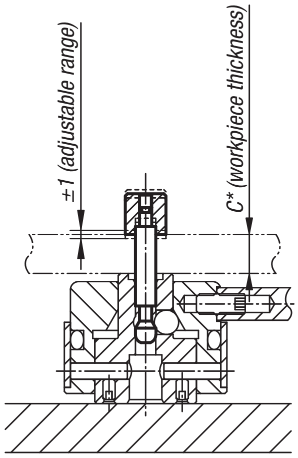
Sample order:
nlm 04400-005050

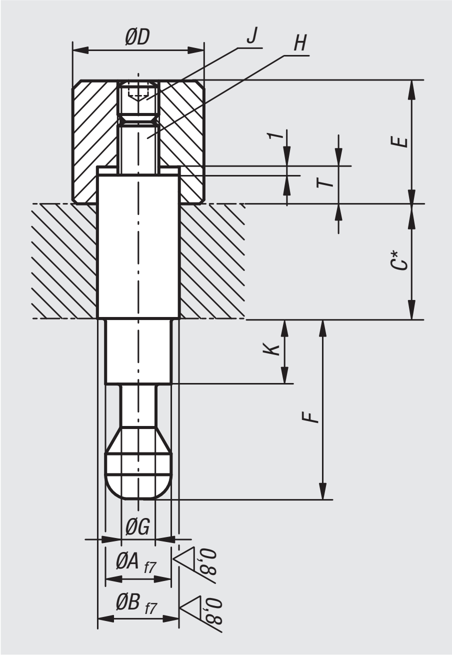
Note:
* The clamping pin can be altered to suit the workpiece thickness.

Order No.	A	B	C	D	E	F	G	H	J	T
04400-005050	5	5	50	10	10	17	3	M3	M3x4	3
04400-006050	5	6	50	10	10	17	3	M3	M3x4	3
04400-008080	8	8	80	16	15	22	4,3	M5	M5x5	4,5
04400-010080	8	10	80	16	15	22	4,3	M5	M5x5	4,5

04400

Clamping pins (high force)





Material:
Carbon steel.

Version:
Pins tempered and ground.
Knurled knob tempered, black oxidised.

Sample order:
nlm 04400-412100

Note:
* The clamping pin can be altered to suit the workpiece thickness.

Order No.	A	B	C	D	E	F	G	H	J	K	T	Suitable for
04400-412100	12	12	100	18	23	38	6,5	M8	M8x8	21,5	7	04400-506501
04400-416100	12	16	100	24	23	38	6,5	M8	M8x8	21,5	7	04400-506501
04400-516120	16	16	120	24	29	48	9,5	M10	M10x10	28	9	04400-638001
04400-520120	16	20	120	30	29	48	9,5	M10	M10x10	28	9	04400-638001

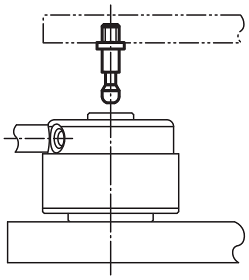
04400

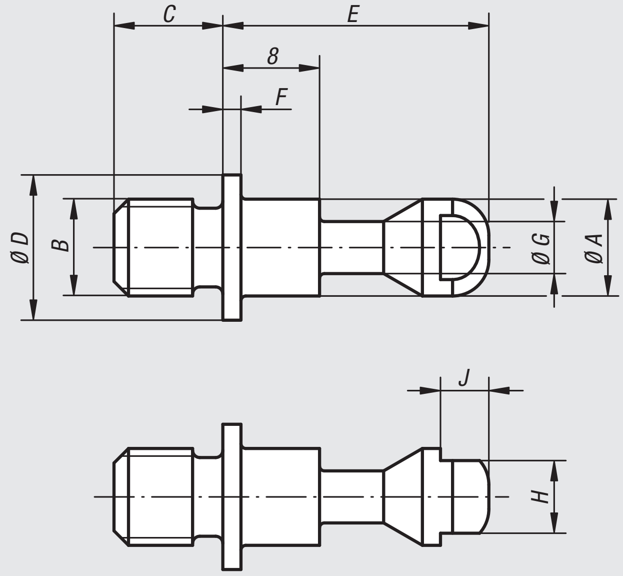
Clamping screws

Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 04400-105060





Order No.	A	B	C	D	E	F	G	H	J
04400-105060	5	M5	6	8	17	1,2	3	4	2,5
04400-106070	5	M6	7	8	17	1,2	3	4	2,5
04400-108090	8	M8	9	12	22	1,5	4,3	6	4
04400-110110	8	M10	11	12	22	1,5	4,3	6	4

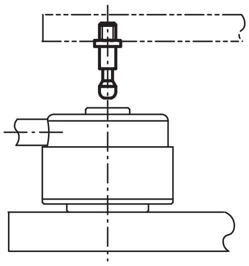
04400

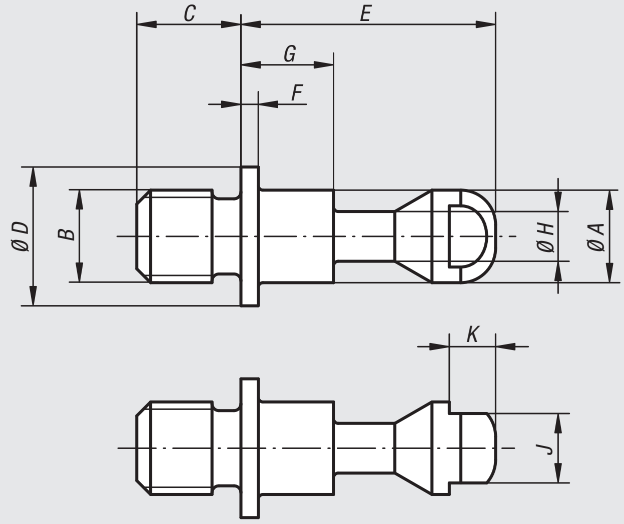
Clamping screws (high force)

Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 04400-1412013



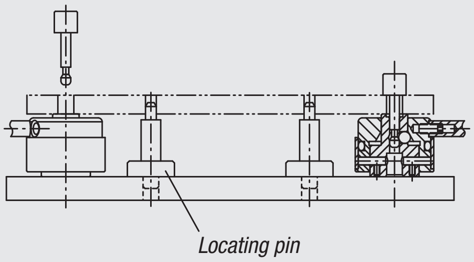


Order No.	A	B	C	D	E	F	G	H	J	K	Suitable for
04400-1412013	12	M12	13	20	38	2	21,5	6,5	10	4	04400-506501
04400-1416017	12	M16	17	20	38	2	21,5	6,5	10	4	04400-506501
04400-1516017	16	M16	17	25	48	2,5	28	9,5	13	5	04400-638001
04400-1520021	16	M20	21	25	48	2,5	28	9,5	13	5	04400-638001

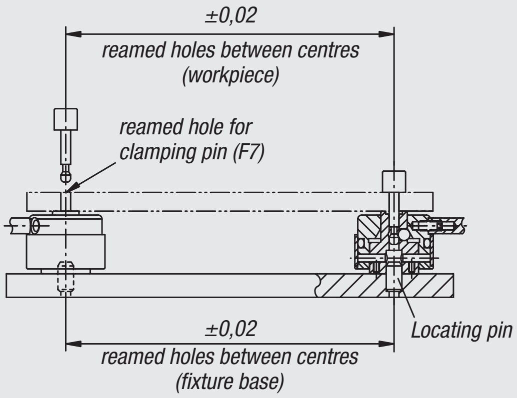
Technical information for pull clamps

Workpiece positioning

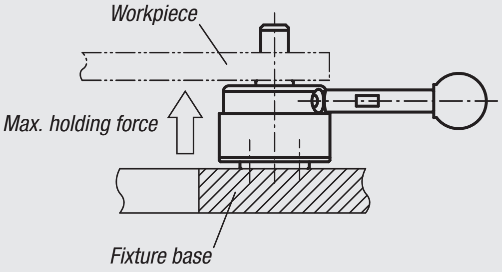
Clamping using a pull clamp and clamping pin



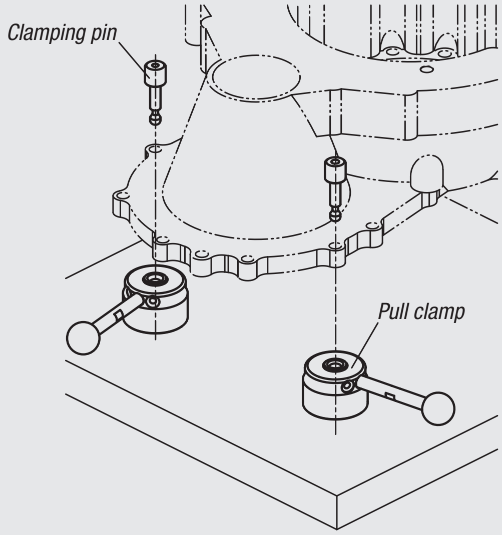
Simultaneous clamping and positioning of a workpiece



Holding forces for workpiece processing

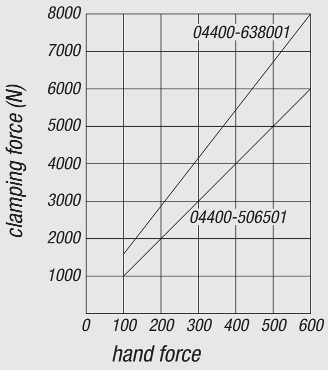


Make sure that no force on the underside of the workpiece exceeds the values given in the table.



Example using pull clamps

Performance curve



04400

Pull clamps

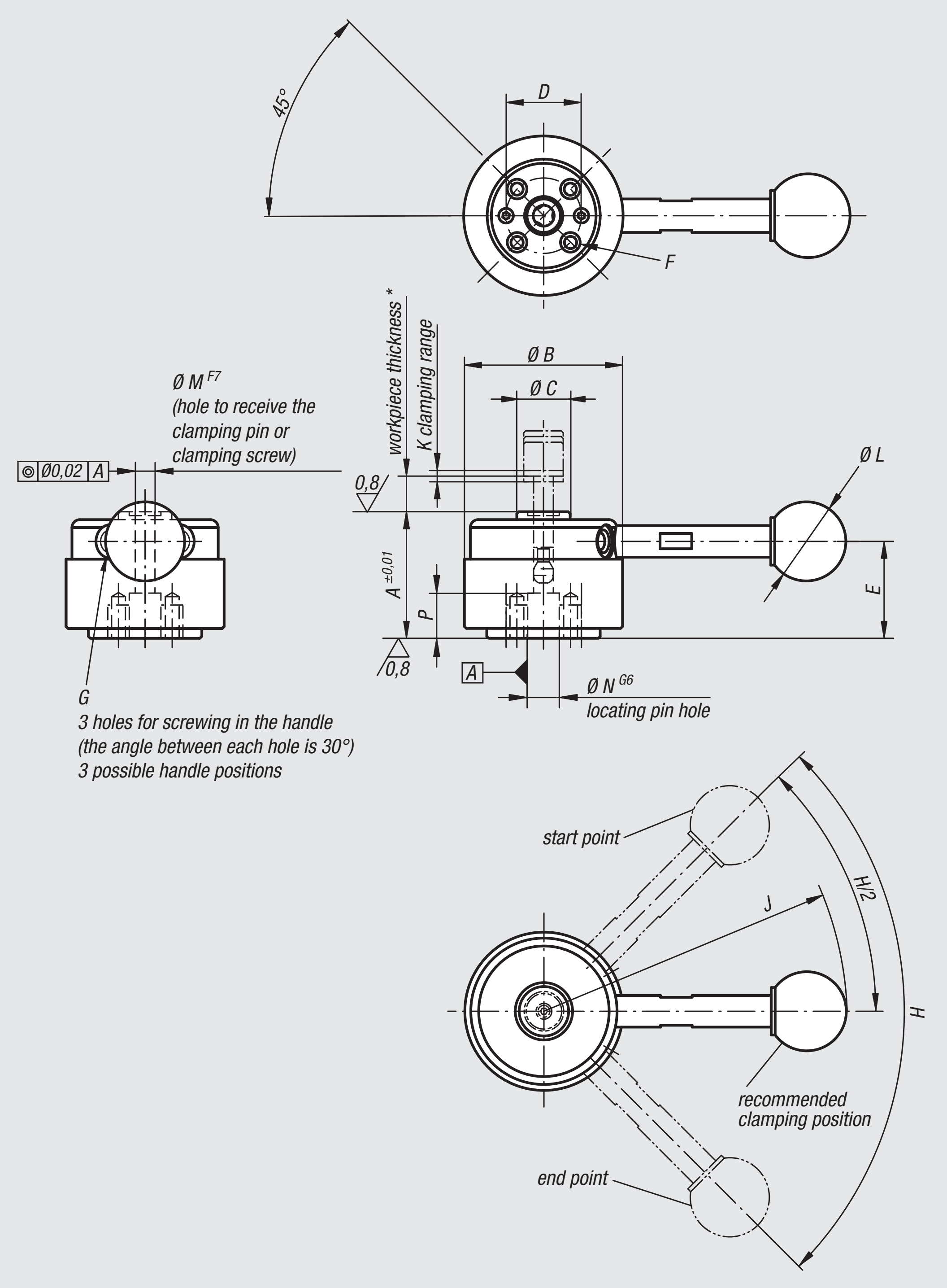
Material:
Housing and cam tool steel.
Grip carbon steel.
Ball knob thermoset PF 31.

Version:
Housing and cam hardened and black oxidised.
Grip black oxidised.
Ball knob black.

Sample order:
nlm 04400-324001

Note:
* Max. workpiece thickness see clamping pin 04400 (dimension C).
** Admissible hand force for the handle.

Accessories:
Standard handles 06355.
Screw-in handles with adjustable torque 06357.



Order No.	Version 1	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Clamping force N	Recommended workpiece thickness tolerance	Hand force FH N	Holding force N
04400-324000	without grip	32	40	13,5	18	24,5	M4x8	M5	90°	-	1,5	-	5	8	10	900	±0,3*	150**	2000
04400-324001	with grip	32	40	13,5	18	24,5	M4x8	M5	90°	76,5	1,5	20	5	8	10	900	±0,3*	150**	2000
04400-405000	without grip	40	50	18	25	30,7	M6x9	M6	110°	-	2	-	8	12	13	2500	±0,5*	200**	5500
04400-405001	with grip	40	50	18	25	30,7	M6x9	M6	110°	111,5	2	25	8	12	13	2500	±0,5*	200**	5500

Pull clamps (high force)

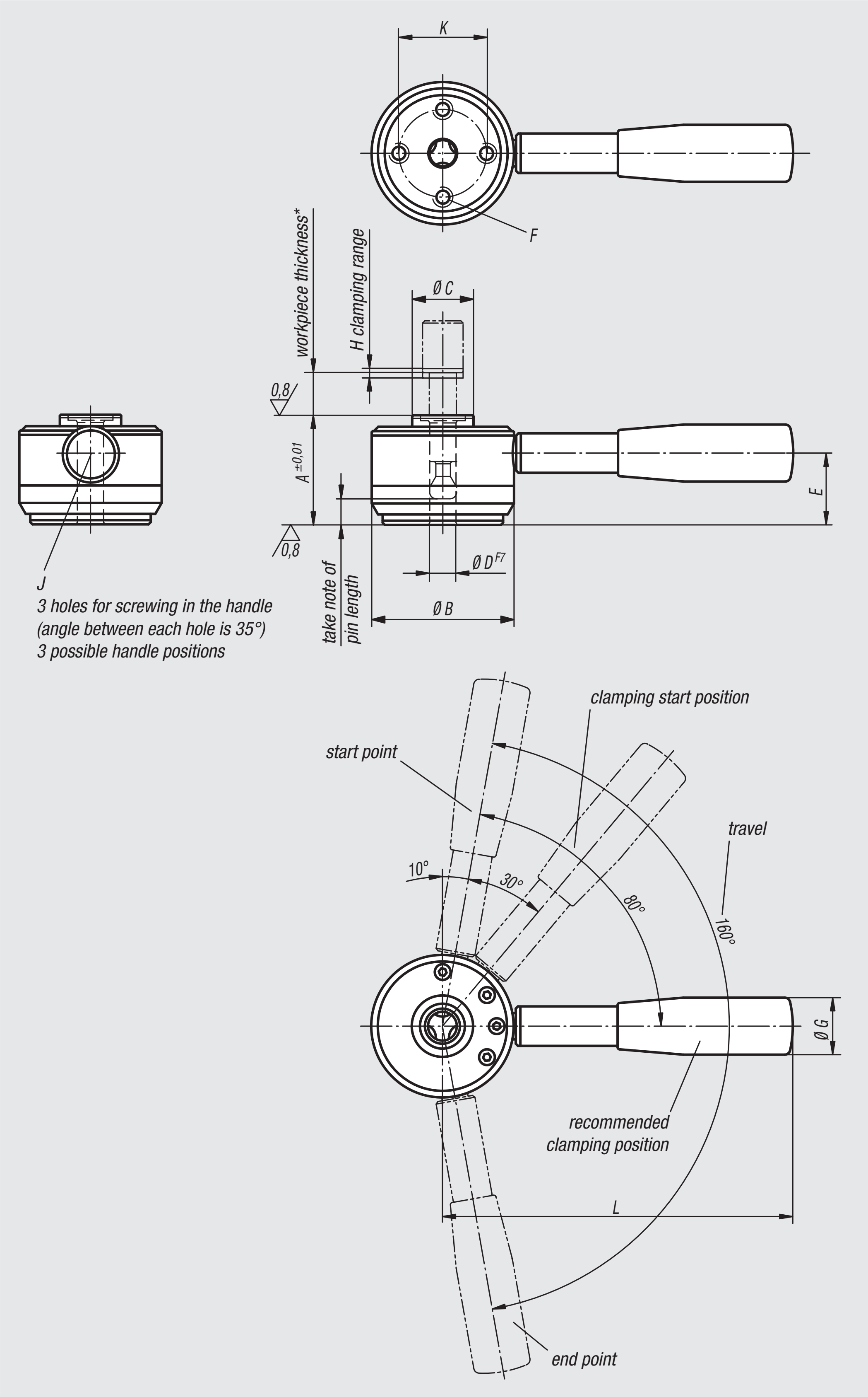
Material:
Housing, clamping ring and handles, carbon steel.
Grip thermoset PF 31.

Version:
Housing and clamping ring hardened and black oxidised.
Handles black oxidised.
Grip black.

Sample order:
nlm 04400-506501

Note:
When clamping with a high force clamping pin the recommended workpiece tolerances must be maintained. The grip lever must be lay between the recommended clamping position and end point for safe clamping.

* Max. workpiece thickness see clamping pin 04400 (dimension C).
** Permitted manual force for handle.



Order No.	A	B	C	D	E	F	G	H	J	K	L	Clamping force N	Recommended workpiece thickness tolerance	Hand force FH N	Holding force N
04400-506501	50	65	28	12	36	M8x14	26	2	10	40	160	6000	±0,5*	600**	8000
04400-638001	63	80	34	16	45	M10x18	28	2,5	12	50	180	8000	±0,8*	600**	14000

04403

Pull clamps

pneumatic

Material:
Carbon steel.

Version:
Clamping element hardened, ground and black oxidised.

Sample order:
nlm 04403-40075

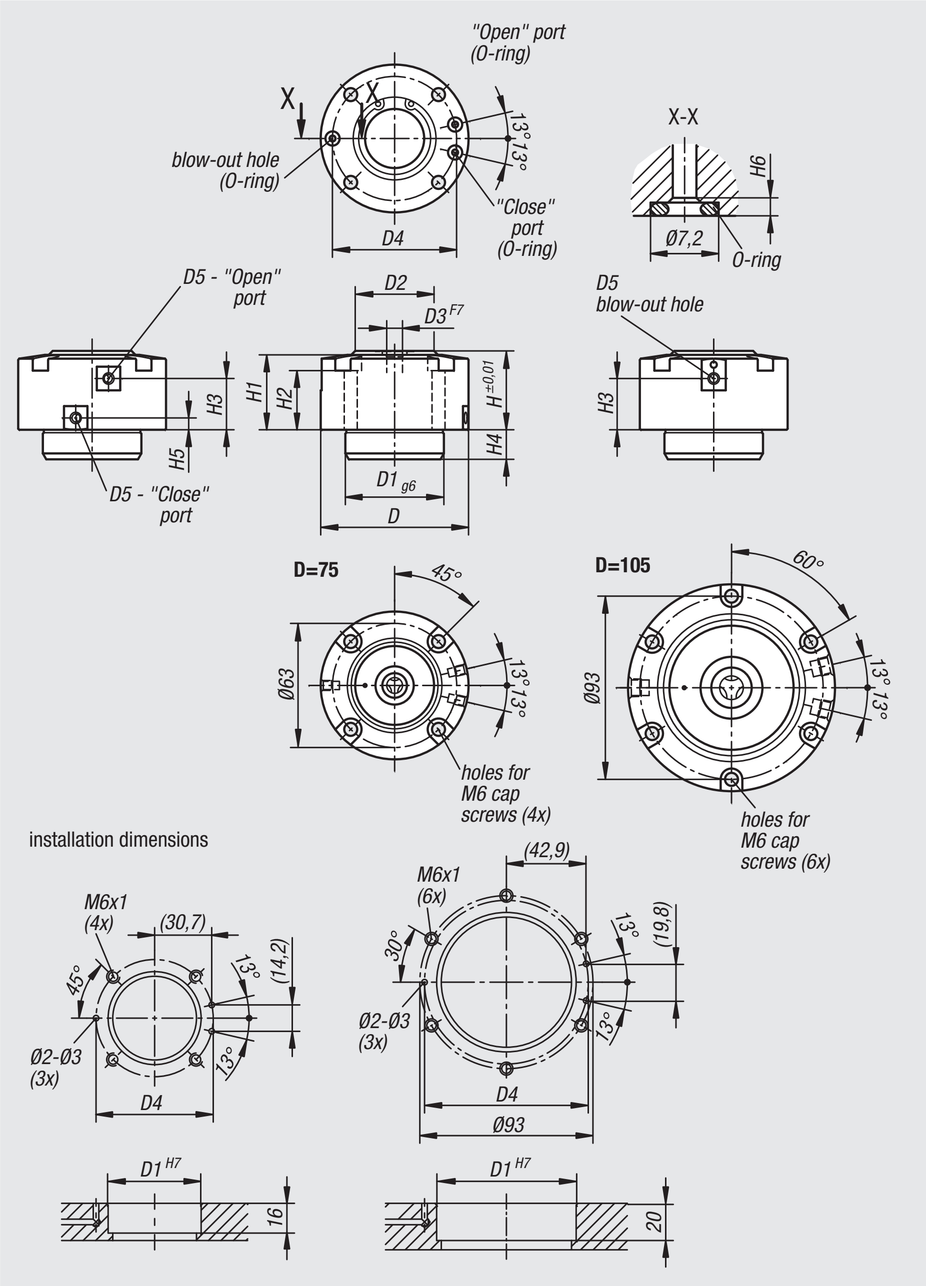
Note:
Pneumatic pull clamps are used to clamp workpieces and fixtures.
The draw bolts are screwed onto the workpiece or fixture.

Clamping procedure:
Open the clamping element by applying compressed air to the „open“ connection.
Close clamping element (for clamping) by applying compressed air to the „close“ connection.

The third connection (D5) is used to blow out and clean the seating face. It can also be used to ensure the workpiece is correctly seated, or to ease lifting the workpiece off after the opening procedure.

The system can also be used as a zero-point clamping system.

The clamping forces indicated are based on 0.5 MPa.



Order No.	D	D1	D2	D3	D4	D5	H	H1	H2	H3	H4	H5	H6	Clamping force kN	Operating pressure MPa
04403-40075	75	50	40	8	63	M5	40	38	30	26	15	6	1,9	1	0,3 - 1,0
04403-50105	105	75	63	12	88	G 1/8	50	47	35	31	19	10	1,9	2,5	0,3 - 1,0

Pull clamps

pneumatic

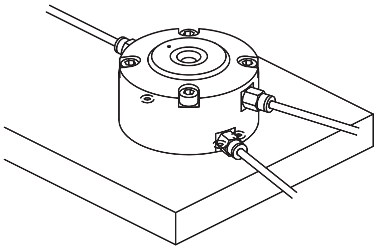
Mounting instructions:

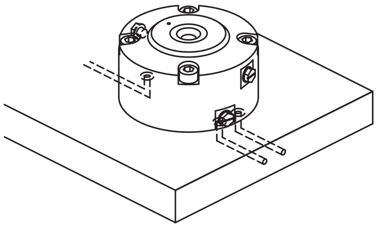
Using the side ports:

- Seal the lower ports with the O-rings provided.
- Check that no air coming is escaping from here.

Using the lower ports:

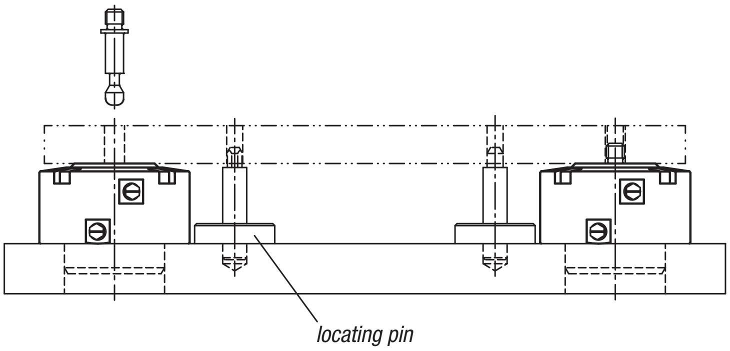
- Fit the O-rings provided into the lower port.
- The side ports must be closed.



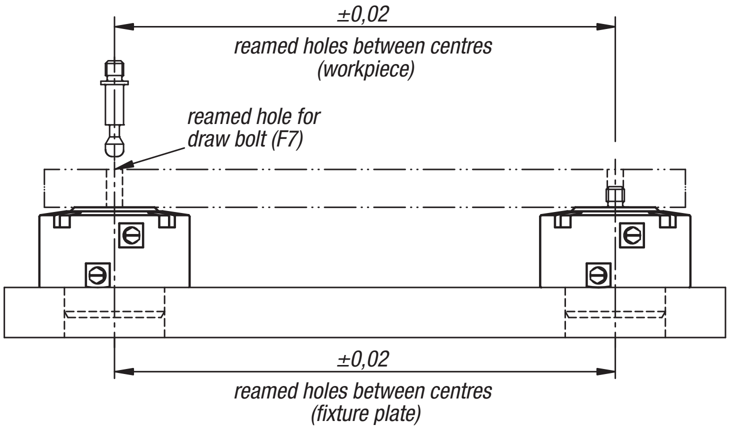


Positioning the workpiece

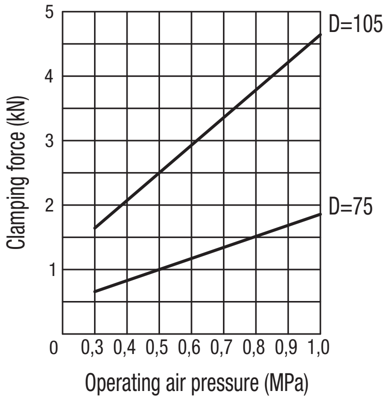
Clamping with pull clamp and draw bolt



Simultaneous clamping and positioning of a workpiece



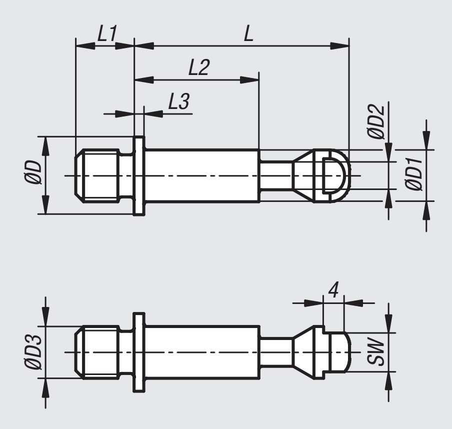
Performance curve



04403-01

Draw bolts

for pneumatic pull clamps



Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 04403-01-108090

Note:
These draw bolts for the pneumatic pull clamp are screwed directly into the workpiece. This enables the workpiece to be quickly connected to and released from the pull clamp over a pneumatic valve.
The system can also be used as a zero-point clamping system.

Order No.	D	D1	D2	D3	L	L1	L2	L3	SW
04403-01-108090	12	8	4,3	M8	38	9	24	1,5	6
04403-01-110011	12	8	4,3	M10	38	11	24	1,5	6
04403-01-112013	20	12	6,5	M12	48	13	31,5	2	10
04403-01-116017	20	12	6,5	M16	48	17	31,5	2	10

Notes

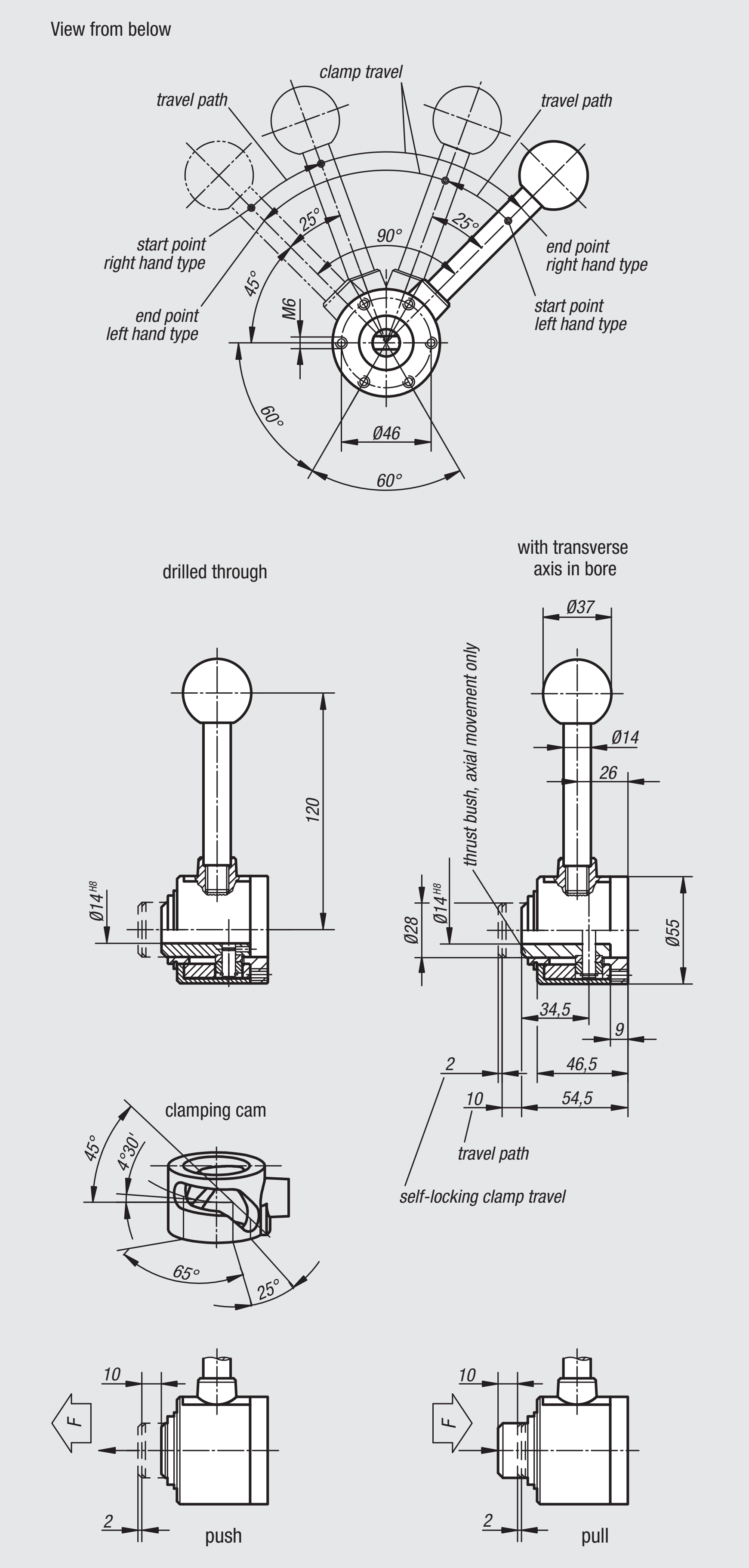
Clamping element “actima”

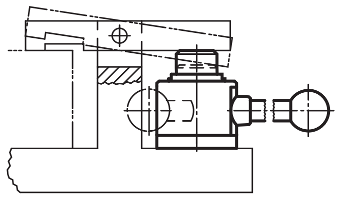
Material:
Steel.
Housing thermoplastic.
Ball knob thermoset PF 31.
Accessories steel.

Version:
Black oxidised.
Housing black.
Ball knob, red.
Accessories black oxidised.

Sample order:
nlm 04410-10

Note:
The travel path is 10 mm. Self-locking occurs in any position within only 2 mm of clamp travel, so workpieces with tolerances of up to 1.5 mm can be safely clamped. The Actima clamping device can be mounted in any horizontal or vertical position.
Standard parts enable further applications and are available as optional accessories.
All parts of the cam system subject to heavy loads are case-hardened (thrust sleeve and accessories only if specified).
The maximum permissible clamping force is approximately 4905 N.





Clamping element “actima”

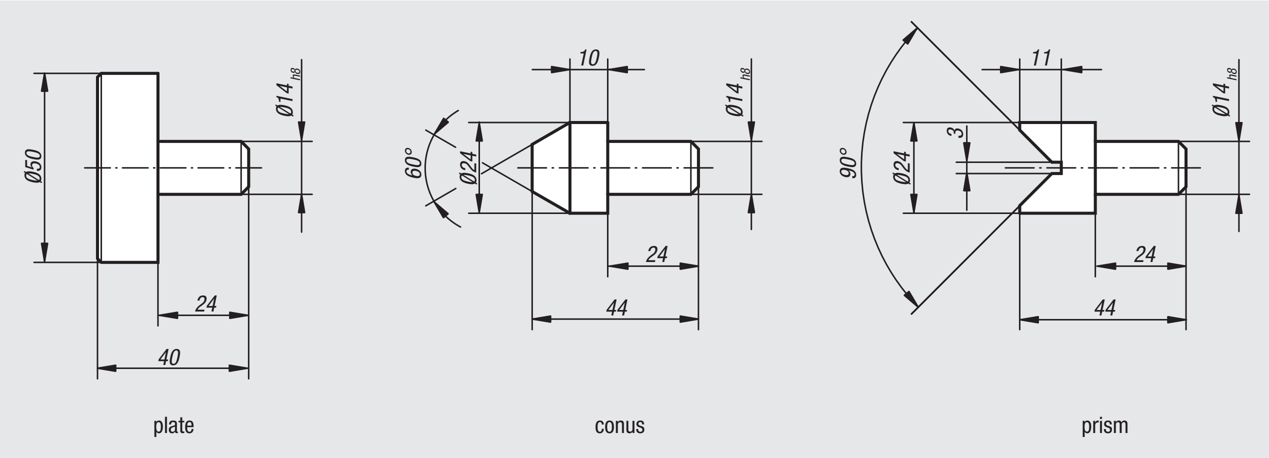


plate conus prism

“actima” clamping element with transverse axis in bore

Order No.	Version
04410-10	right-hand / thrust
04410-15	right-hand / pull
04410-20	left-hand / thrust
04410-25	left-hand / pull

“actima” clamping element with drilled through bore

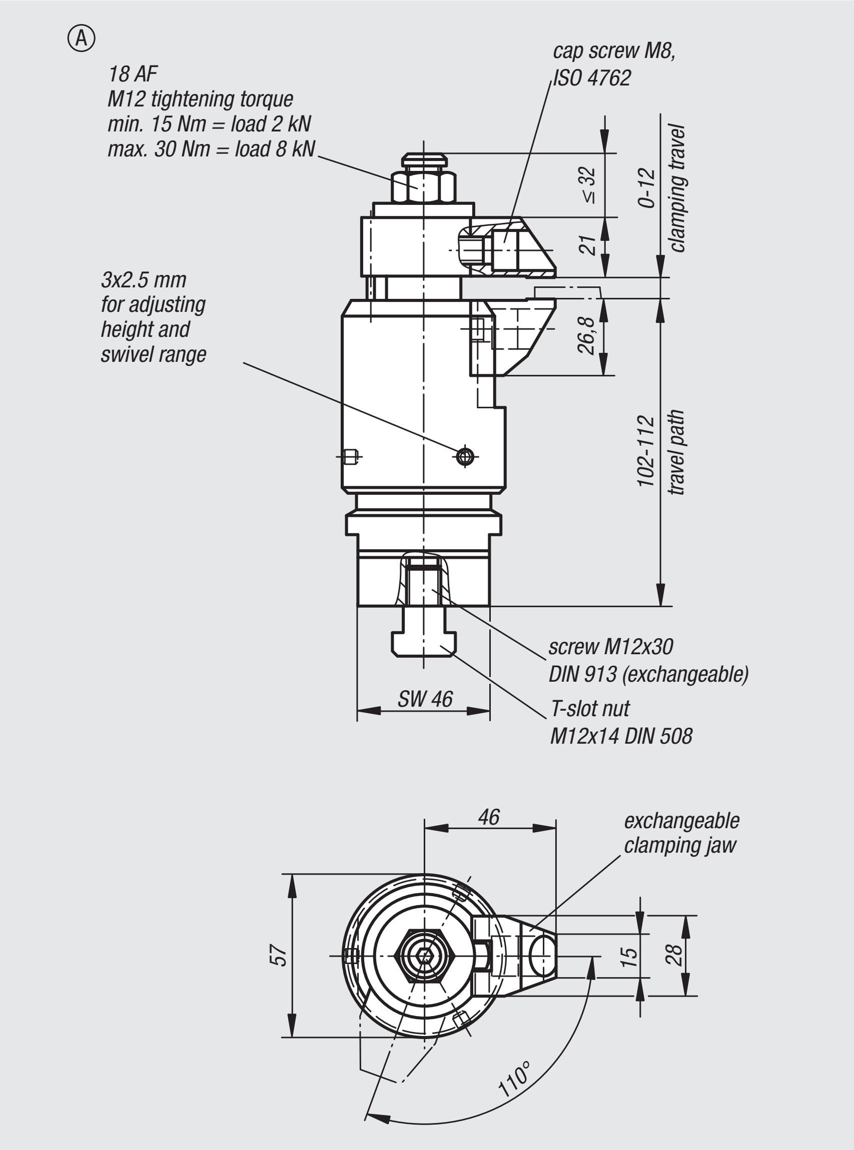
Order No.	Version
04410-30	right-hand / thrust
04410-35	right-hand / pull
04410-40	left-hand / thrust
04410-45	left-hand / pull

“actima” accessories

Order No.	Item
04410-02	Plate
04410-03	Conus
04410-04	Prism

04420

Floating clamp



Material:
Base body and jaws steel.
Housing aluminium.

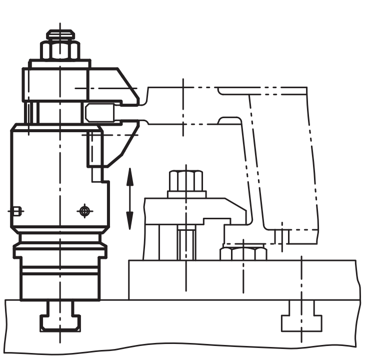
Version:
Body nitrided, black oxidised and ground.
Jaws nitrided and black oxidised.
Housing red anodised.

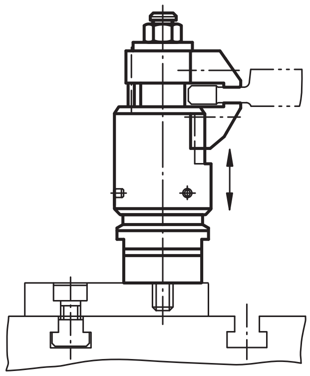
Sample order:
nlm 04420-100812

Note:
The floating clamp is used to clamp and support overhanging clamping points on components.
It prevents vibrations and deflection during machining.

Method of operation:
1. Push the floating clamp down.
2. Pivot the jaws to the stop. The floating clamp contacts the bottom of the workpiece with a light spring force.
3. Tighten the floating clamp with the SW 18 hexagon nut (note the min. and max. torque). During clamping the workpiece is clamped and simultaneously supported.
4. Reverse the process to release.

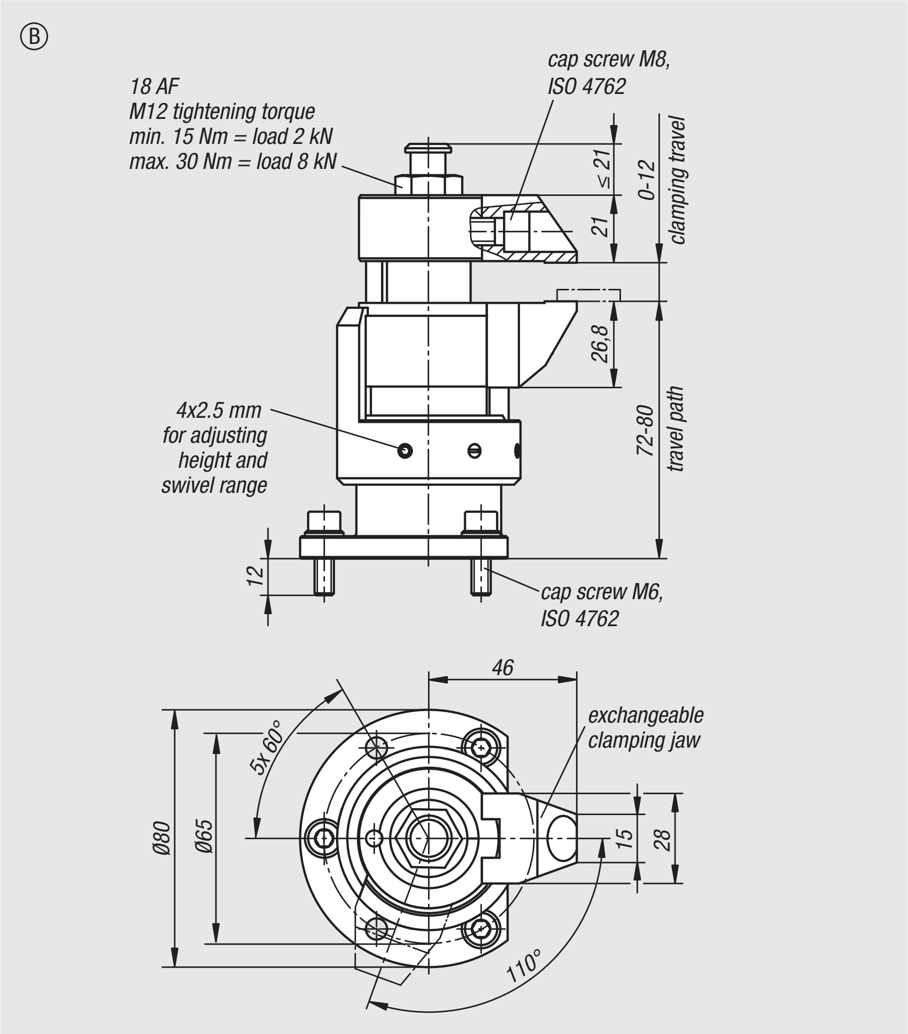
Assembly:
Form A:
Fasten the floating clamp to the fixture with the M12 screw.
Adjust the height stop and swivel range using the red sleeve and lock with the 3x2.5 mm grub screws. When setting the height leave generous clearance above.
For safe operation the M12 tapped hole must always be closed.
For specific clamping applications the standard jaws can be altered or replaced.
Form B:
Fasten floating clamp with M6 fastening hole to a fixture.
Adjust the height stop and pivot range with the red adjusting sleeve and clamp with grub screws (4x AF 2.5). When setting the height limit, allow ample play at the top.
For specific clamping situations, the standard jaw plates can be modified or replaced.

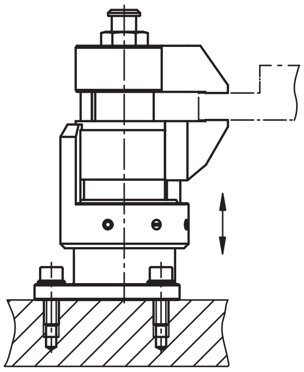




Order No.	Travel path	max. clamping travel	Load capacity N	Clamping force N
04420-100812	10	12	8000	8000

Floating clamp





Order No.	Travel path	max. clamping travel	Load capacity N	Clamping force N
04420-080812	8	12	8000	8000

04421

Floating clamp

with separate workpiece clamp and interlock

Material:
Base body and jaws steel.
Housing aluminium.

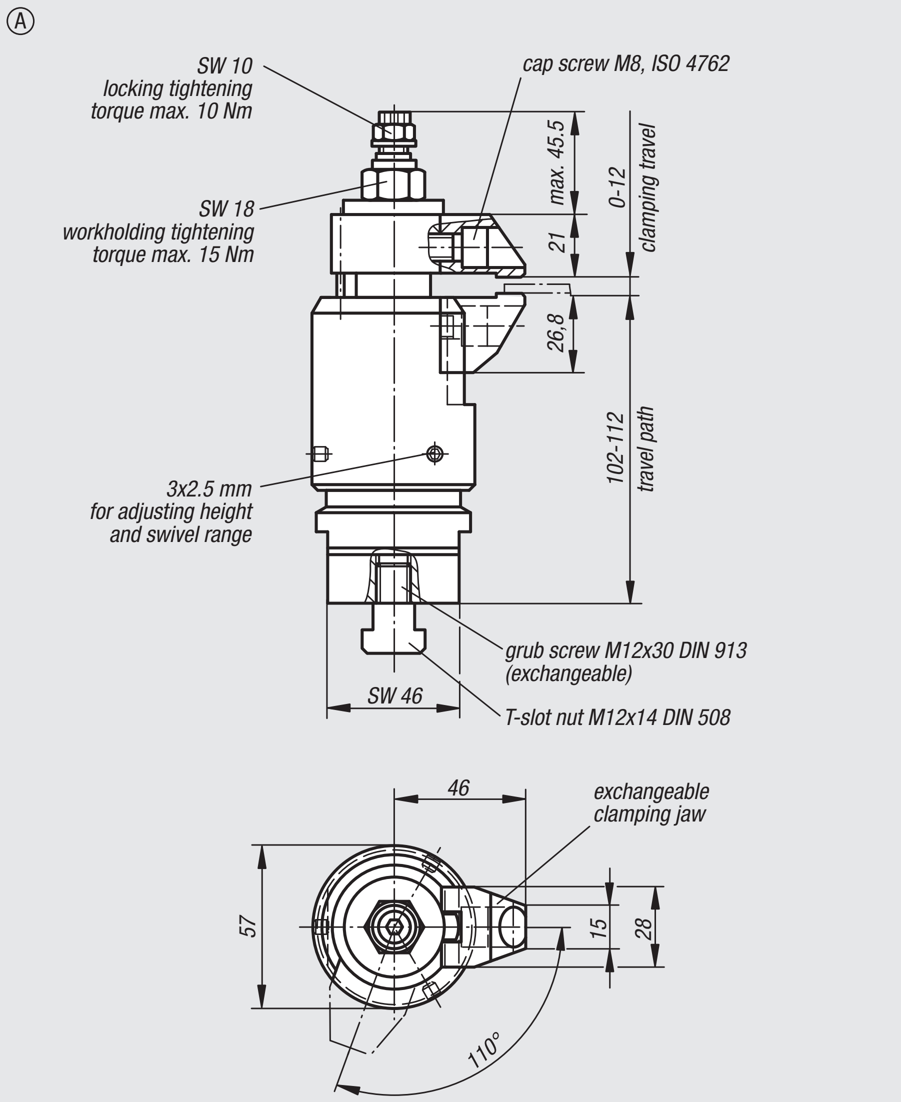
Version:
Body nitrided, black oxidised and ground.
Jaws nitrided and black oxidised.
Housing blue anodised.

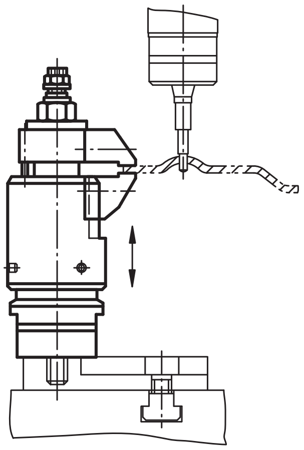
Sample order:
nlm 04421-100812

Note:
The floating clamp is used to clamp and support overhanging points on thin walled, sensitive and pliable components. It prevents vibrations and bending during machining.

Method of operation:
1. Push the floating clamp down.
2. Pivot the jaws in. The lower jaw contacts the workpiece with a light spring force.
3. Tighten the AF 18 hexagon nut with max. 15 Nm torque. The jaws clamp the workpiece, the clamp is still floating.
4. Tighten the AF 10 hexagon nut with max. 10 Nm torque. The clamping process is completed.
5. Reverse the process to release.

Assembly:
Form A:
Fasten the floating clamp to the fixture with the M12 screw.
Adjust the height stop and the swivel range using the blue sleeve and lock with the 3x2.5 mm grub screws. When setting the height leave generous clearance above.
For safe operation the M12 tapped hole must always be closed.
For specific clamping applications the standard jaws can be altered or replaced.
Form B:
Fasten the floating clamp with M6 fastening holes to a fixture.
Adjust the height stop and pivot range using the blue adjusting sleeve and clamp with grub screws (4x AF 2.5). When setting the height limit, allow ample play at the top.
For specific clamping situations, the standard jaw plates can be modified or replaced.

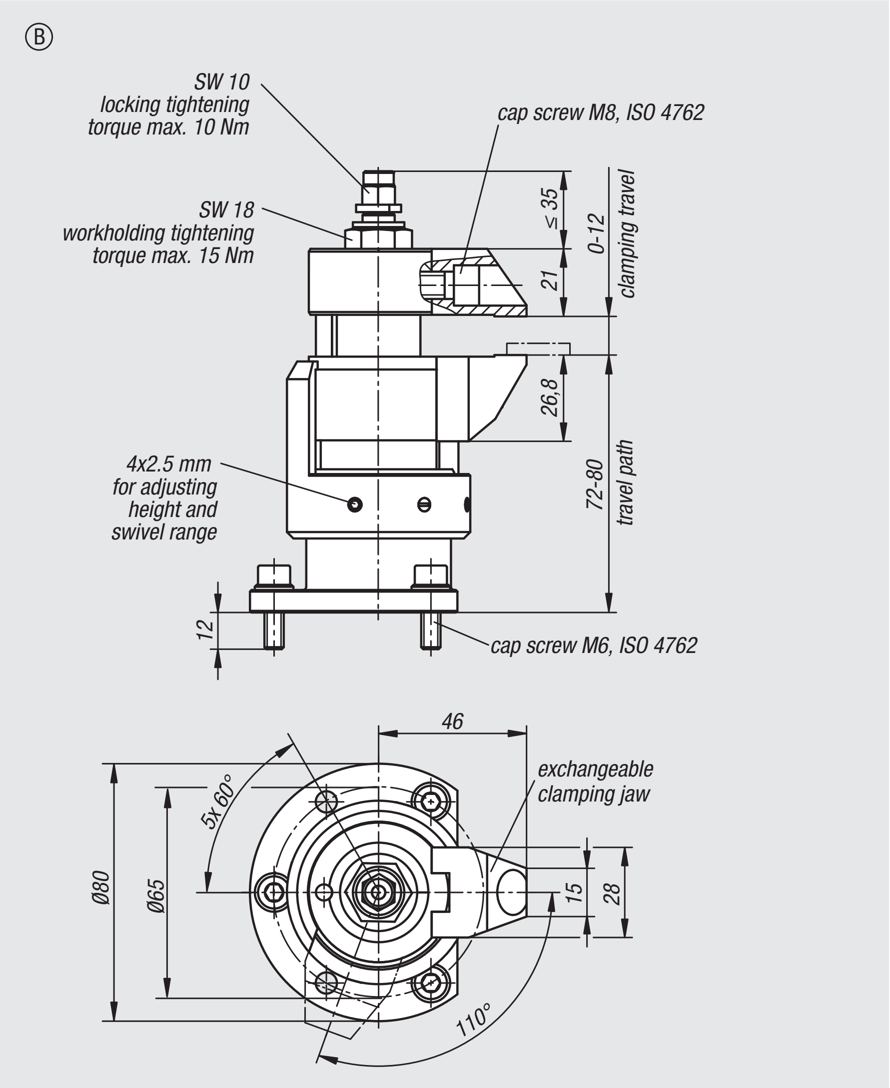


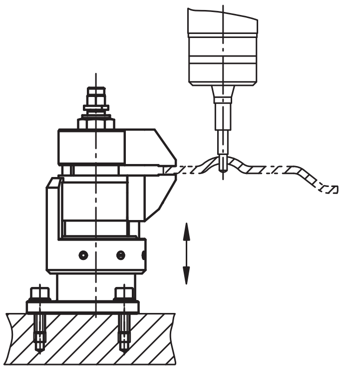


Order No.	Form	Travel path	max. clamping travel	Load capacity N	Clamping force N
04421-100812	A	10	12	8000	8000

Floating clamp

with separate workpiece clamp and interlock



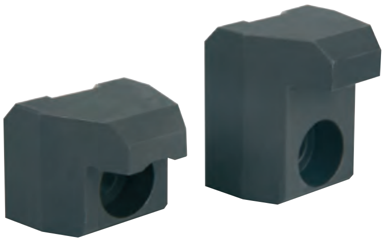


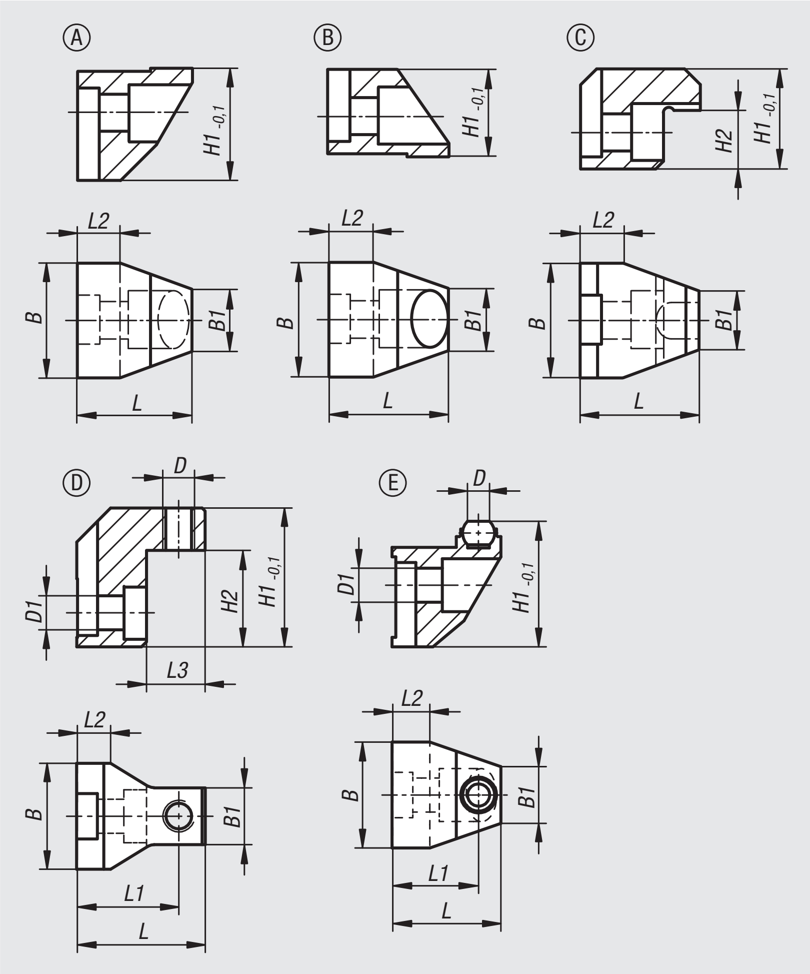
Order No.	Form	Travel path	max. clamping travel	Load capacity N	Clamping force N
04421-080812	B	8	12	8000	8000

04422

Clamping jaws

for floating clamps



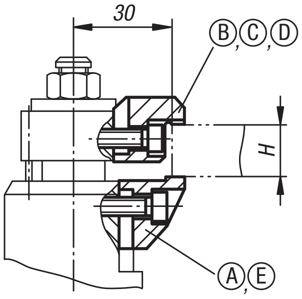


Material:
Steel.

Version:
Nitrided and black oxidised.

Sample order:
nlm 04422-90000

Note:
The clamping jaws can be used for floating clamps to increase the clamping range.



Order No.	H = clamping range max. in comination with 04422-90000 [mm]	H = clamping range max. in comination with 04422-910000 [mm]
04422-90416	4-16	-
04422-91527	15-27	-
04422-92638	26-38	-
04422-90029	29	23
04422-90040	40	34

Order No.	Form	Version 1	B	B1	D	D1	H clamping range	H1	H2	L	L1	L2	L3
04422-90000	A	standard lower jaw	28	15	-	-	-	26,8	-	28	-	10	-
04422-90012	B	standard upper jaw	28	15	-	-	0-12	21	-	29,5	-	11,5	-
04422-90416	C	exchange upper jaw	28	15	-	-	4-16	24,5	3,5	29,5	-	11,5	-
04422-91527	C	exchange upper jaw	28	15	-	-	15-27	24,5	14,5	29,5	-	11,5	-
04422-92638	C	exchange upper jaw	28	15	-	-	26-38	35,5	25,5	29,5	-	11,5	-
04422-90029	D	upper jaw	28	15	M8	4,5	-	29,5	16,5	31,5	24,5	8	16
04422-90040	D	upper jaw	28	15	M8	4,5	-	40,5	27,5	31,5	24,5	8	16
04422-910000	E	lower jaw	28	15	5,8	4,5	-	32,8	-	30	23	10	-

Notes

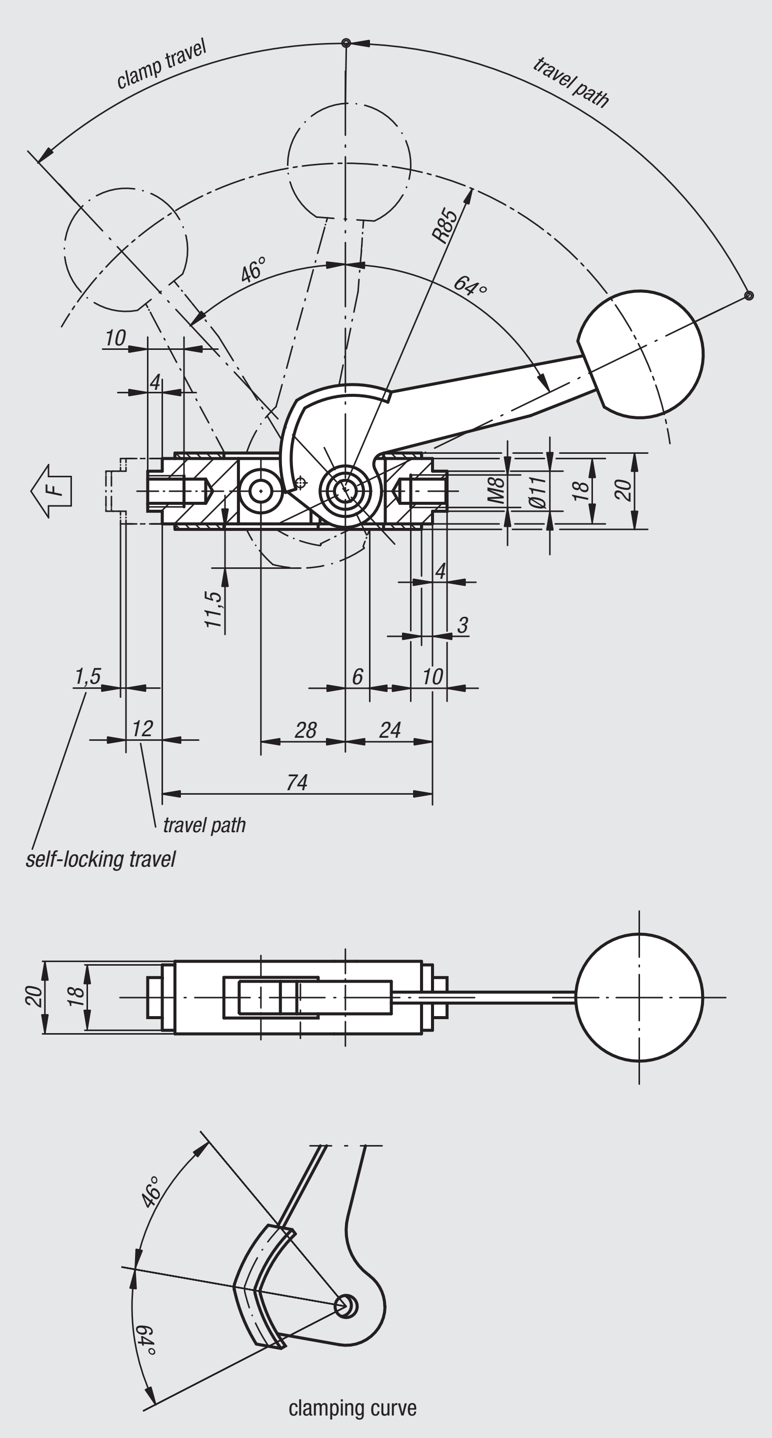
Clamping element “arness”

Material:
Steel.
Ball knob thermoset PF 31

Version:
Housing painted silver-grey hammertone.
All other parts and accessories black oxidised.
Ball knob red.

Sample order:
nlm 04430-01

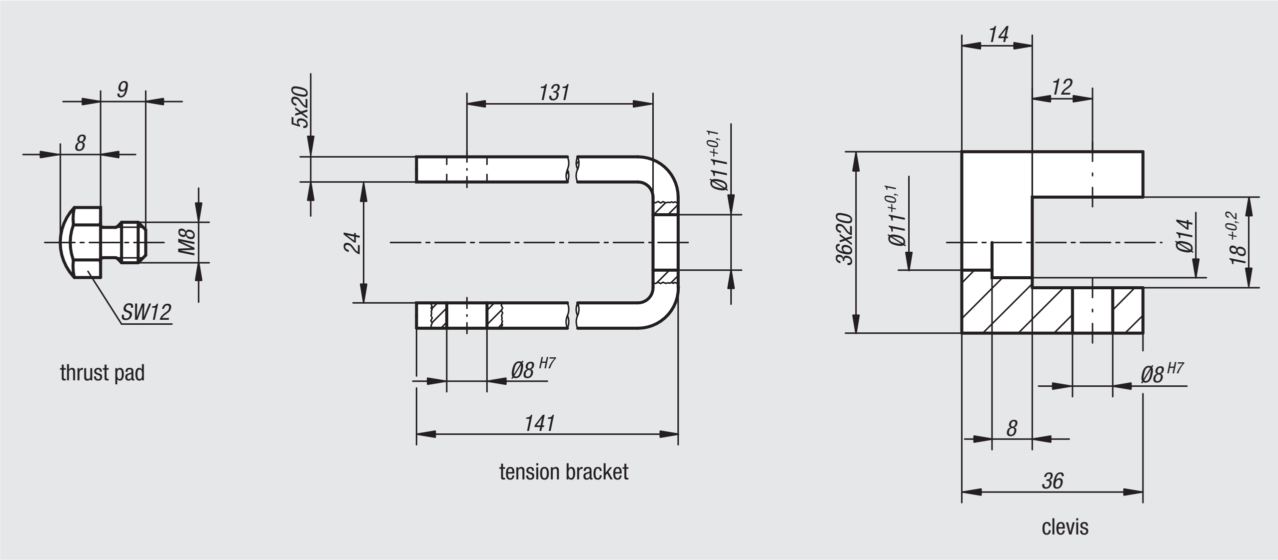
Note:
The travel path is 12 mm. Self-locking occurs in any position within only 1.5 mm of clamp travel, allowing workpieces with tolerances of up to 1 mm to be securely clamped. The arness clamping element can be fitted in any horizontal or vertical position.
Several standard parts have been developed to achieve individual adaptation for various circumstances and are available as optional accessories.
The thrust pad and all parts of the cam system subject to heavy loads are case-hardened.
The maximum permissible clamping force is approximately 4905 N.



Clamping element “arness”

Order No.	Dimensions
04430-01	see drawing

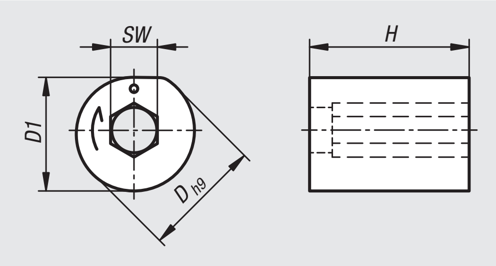
Clamping element “arness”



“arness” accessories

Order No.	Item
04430-02	Clevis
04430-03	Tension Bracket
04430-04	Thrust Pad

Clamp cam brass



Material:
Brass.

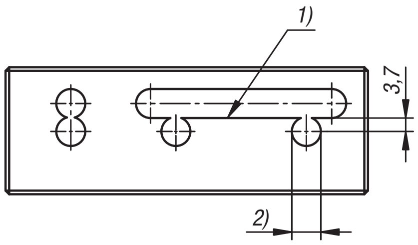
Sample order:
nlm 04430-10-0808

Application:
These clamping cams are used to fixate components in workpieces.
The clamped components can be easily and quckly released again.
Workpieces and components can be acurately positioned in an assembly.

Advantages:
Using the cam clamps often saves the need for complex cross holes for clamping screws.
The bore for the clamping cam can be produced cost-effectively in the same machine set-up as the bore or slot for the component to be clamped.

Functional principle:
Insert the component to be clamped and the clamping cam into the workpiece. The indent mark on the clamp cam top face should be adjacent the part to be clamped.
The clamp cam is rotated with an hex key in the direction of the arrow.
The part can be released again by turning the cam in the opposite direction.

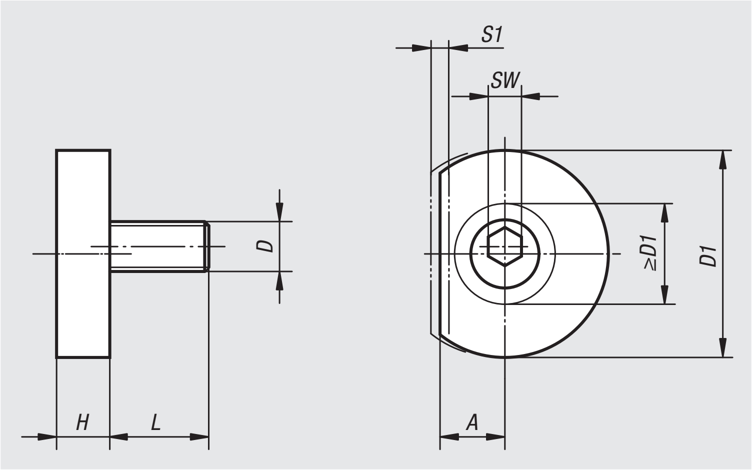
Drawing reference:
1) Clamping edge
2) 8 H9 min. depth 8



Order No.	D	D1	H	SW
04430-10-0808	8	7,5	8	3

04431

Fixture clamps machinable



Material:
Cam screw alloyed steel.
Clamping disc steel.

Version:
Cam screw and clamping disc black oxidised.

Sample order:
nlm 04431-06

Note:
These fixture clamps have a round washer that can be machined to suit the contour of the workpiece being clamped. This allows positive clamping for round, contoured or fragile workpieces. The flat edge is the same distance from the screw centre as our hexagonal fixture clamps 04435 allowing an interchange between the two. “A” = distance from workpiece to screw centre (cam screw).

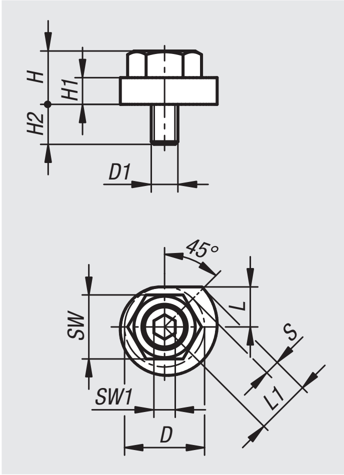
“D1 min.” = maximum depth of contour.

On request:
Replacement cam screws.

Order No.	A	D	D1	D1 min.	H	L	SW	S1 (travel)	Clamping force kN
04431-06	7,8	M6	24,9	12,1	6,4	11,9	4	1,01	3,3
04431-10	10,2	M10	31,2	17,2	8,9	18	7	1,52	8,9
04431-12	12,7	M12	37,6	22,4	11,4	22,9	8	2,03	17,8
04431-16	15	M16	43,9	26,1	14	28,6	12	2,54	26,7

04431-05

Clamping cams



Material:
Carbon steel.

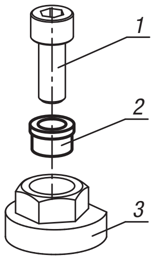
Version:
Black oxidised.

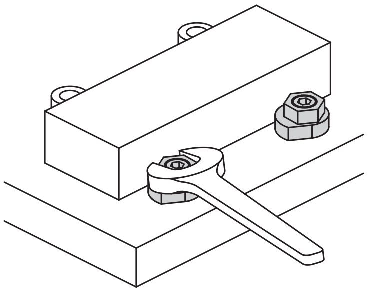
Sample order:
nlm 04431-05-10

Assembly:
1. Screw the locking screw into the collar bush and fixture clamp and screw onto the baseplate.
2. The workpiece is clamped by tightening the fixture clamp with a spanner.

Advantages:
- Compact design
- Quick and easy clamping of components

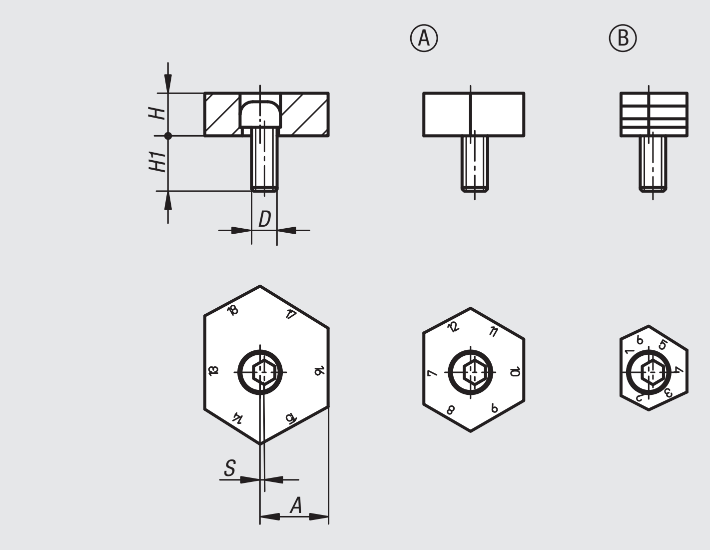
Drawing reference:
1) Locking screw
2) Collar bush
3) Fixture clamp





Order No.	D	D1	H	H1	H2	L	L1	SW	SW1	Clamping force kN	Travel S	Tightening torque max. Nm
04431-05-08	24	M8	16	8	12	12	16,4	19	6	5,2	4,4	50
04431-05-10	30	M10	20	10	15	15	20,5	24	8	8	5,5	75
04431-05-12	34	M12	24	12	18	17	23,2	27	10	9,3	6,2	90

Fixture clamps unequal hexagon



Material:
Cam screw steel tempered to 10.9.
Hexagon washer mild steel.

Version:
Cam screw black oxidised.
Hexagon washer hardened and black oxidised.

Sample order:
nlm 04432-13

Note:
Theses unequal hexagon fixture clamps can minimise the cost of clamping in fixtures. The clamping range can be altered up to 17 mm from the same tapped hole. Simply rotate the hexagon washer.

On request:
Replacement cam screws.

Order No. Form A smooth	Order No. Form B serrated	Distance A by face No.	D	H	H1	S (cam travel)	Clamping force kN
04432-09	**04432-13**	1/12, 2/13, 3/14, 4/15, 5/16, 6/17	M12	10	22	1	18
04432-10	**04432-14**	7/18, 8/19, 9/20, 10/21, 11/22, 12/23	M12	10	22	1	18
04432-11	**04432-15**	13/24, 14/25, 15/26, 16/27, 17/28, 18/29	M12	10	22	1	18

04433

Spiral cam screws

Material:
Steel.

Version:
Case-hardened (56 ±1 HRC) and blue electro zinc-plated.
Grade 8.8

Sample order:
nlm 04433-0408

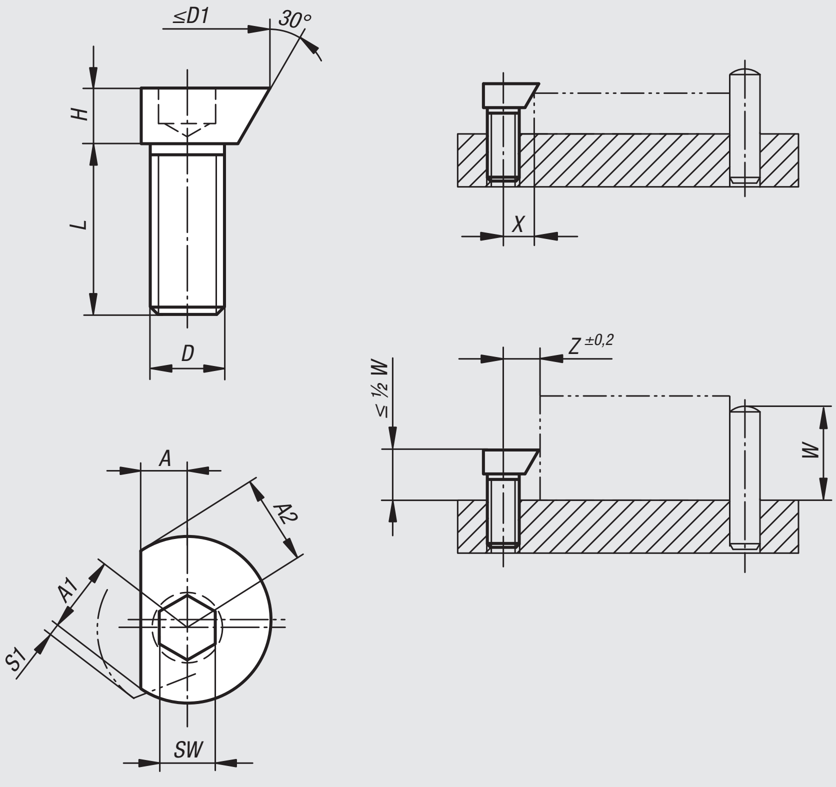
Note:
Robust, compact spiral cam clamping screws that exert a positive down force on diverse workpiece forms.

Assembly:
Drill and tap several holes at a distance X or Z (see diagram). Screw the cam screw into the required height and position with the flat side to the workpiece. Position the workpiece and tighten the cam screw with a hexagon key. Full clamping is achieved with approximately a 1/3 rotation. Lubricate the tapped hole regularly.

Place stops on the face towards which the screw turns to prevent the workpiece rotating away.

On request:
Spiral cam screws with LH thread.

Drawing reference:
1) clamping sheet metal
2) clamping round parts



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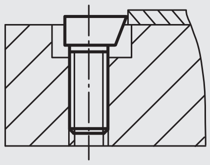

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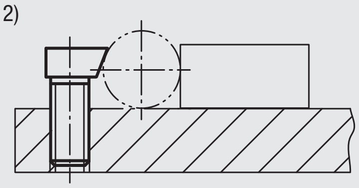
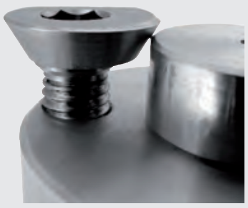
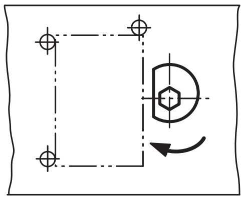
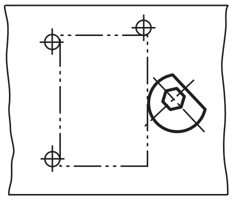








Order No.	A	A1	A2	D	D1 max.	H	L	SW	S1 (travel)	X	Z	Clamping force kN	Tightening torque max. Nm
04433-0408	3	4,6	4	M4	9,2	3	8	2,5	0,6	3,5	4,2	0,09	1,5
04433-0510	3,5	5,7	5	M5	11,4	4	10	3	0,7	4,2	5,2	0,1	2
04433-0612	4,5	7,1	6,1	M6	14,2	5	12	4	1	5,4	6,4	0,3	4,5
04433-0816	5,5	8,9	7,7	M8	18	6	16	5	1,2	6,6	8	2,7	20
04433-1020	6,5	11,1	9,4	M10	22,2	7	20	6	1,7	8,3	9,8	4	30
04433-1224	8	13,5	11,6	M12	27	9	24	8	1,9	10,1	12	5,4	44

04434

Cam screws

with knife edge washer

Material:
Knife edge washer.
Cam screw carbon steel.

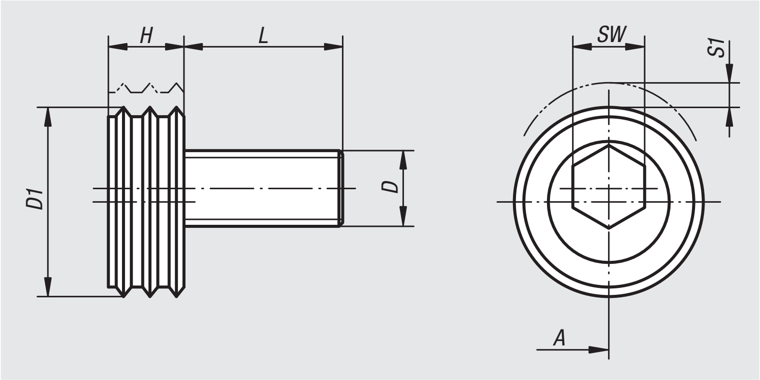
Version:
Cam screw tempered to 10.9 and black oxidised.
Knife edge washer hardened and anodised.

Sample order:
nlm 04434-16

Note:
Also called knife edge clamps.
The hardened knife edge washer is suitable for clamping rough cut stock, castings, forgings etc.

“A” = distance from workpiece to screw centre (cam screw).

On request:
Replacement cam screws.



Order No.	A	D	D1	L	H	SW	S1 (travel)	Clamping force kN	Tightening torque max. Nm
04434-12	12,7	M12	25,4	22,5	9,6	8	2	18	88
04434-16	15	M16	30,1	26,8	12,7	12	2,5	27	135

04435

Cam screws

with hexagon washer

Material:
Cam screw carbon steel.
Hex washer brass.

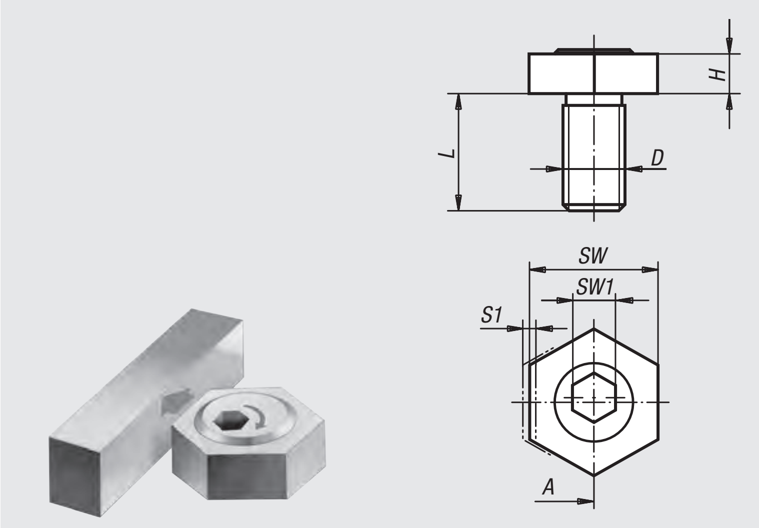
Version:
Cam screw tempered to 10.9 and black oxidised.

Sample order:
nlm 04435-12

Note:
Also called fixture clamps.
The minimal height of this fixture clamp allows numerous clamping problems in fixture and equipment construction to be solved. The brass hex washer offers a gentle yet extremely stable and safe clamping of workpieces. By using several fixture clamps entire pallets can be set-up.

“A” = distance from workpiece to screw centre (cam screw).

On request:
Replacement cam screws.



Order No.	A	D	H	L	SW	SW1	S1 (travel)	Clamping force kN	Tightening torque max. Nm
04435-04	3,8	M4	2,8	10	8	3	0,8	0,9	2,2
04435-06	7,8	M6	4,8	12	16	4	1	3,4	8,5
04435-08	10,2	M8	4,8	15	20,6	5	1	3,6	11,3
04435-10	10,2	M10	6,4	20	20,6	7	1,6	9,0	28,06
04435-12	12,7	M12	9,5	25	25,4	8	2	18,0	88
04435-16	15	M16	12,7	30	30,2	12	2,5	27,0	135

04436

Cam screws

with hexagon washer, for T-slots

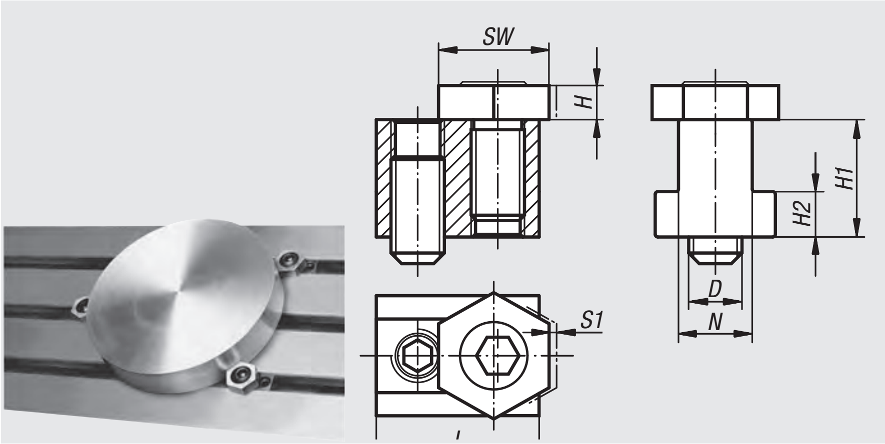
Material:
Carbon steel.
Hex washer brass.

Version:
Tempered to 10.9 and black oxidised.

Sample order:
nlm 04436-12

Note:
Also called fixture clamps for T-slots.
These fixture clamps can be used directly on machine tables or other tables with T-slots. The grub screw at the rear locks the T-nut in the slot. Thin shims are recommended to prevent marking the bottom of the T-slot.

On request:
Replacement cam screws.



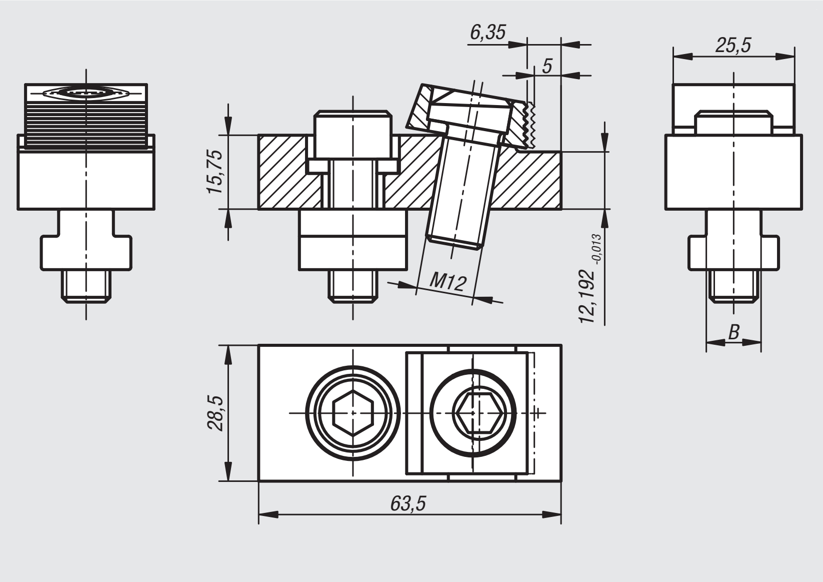
Order No.	D	N	H	H1	H2	L	SW	S1 (travel)	Clamping force kN
04436-08	M6	8	4,8	9,6	4,5	23	16	1	3,4
04436-10	M6	10	4,8	14	4,5	23	16	1	3,4
04436-12	M8	12	4,8	15,5	6,5	28	21	1	3,6
04436-14	M10	14	6,4	22	8,5	30,5	21	1,6	9
04436-16	M12	16	9,5	22,5	9	30,5	25	2	18
04436-18	M12	18	9,5	28,5	10	34,5	25	2	18
04436-20	M16	20	12,7	32	12	39	30	2,5	27
04436-22	M16	22	12,7	38,2	14	44	30	2,5	27

Typical setup using fixture clamps

04437

Cam clamps

with riser



Material:
Steel.

Version:
Body tempered and black oxidised.
Square washer case hardened and brass-plated.

Sample order:
nlm 04437-16

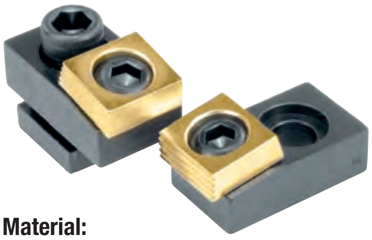
Note:
Also called riser clamps.
These cam clamps with riser can be used directly on machine tables. A positive down force is exerted during clamping.

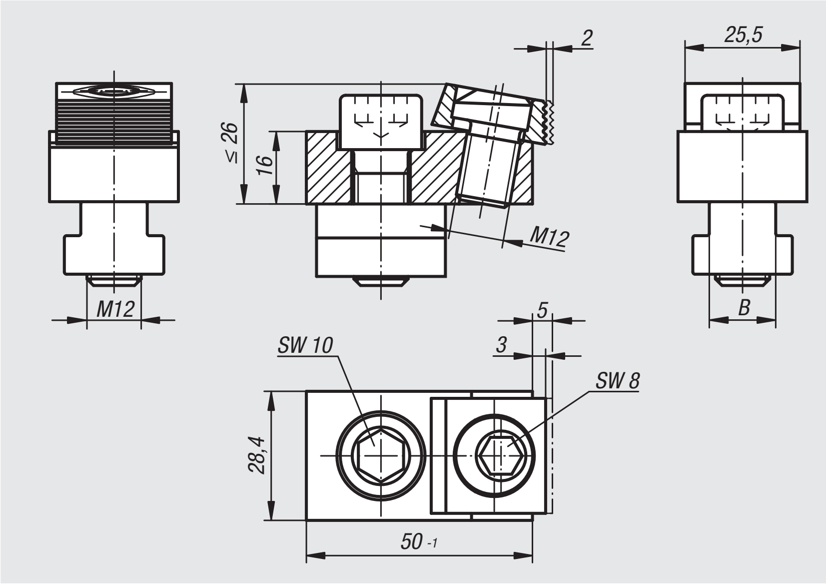
On request:
Replacement cam screws.

Order No.	B Slot width	Clamping force kN
04437-12	12	12
04437-14	14	12
04437-16	16	12
04437-18	18	12

04439

Toe clamps for T-slots





Material:
Steel.

Version:
Body tempered and black oxidised.
Square washer case hardened and brass-plated.

Sample order:
nlm 04439-14

Note:
These toe clamps can be used on machine tables or adapter plates. The positive down force holds the workpiece down on the supporting surface. The square washer can adapt slightly to an angular position i.e. the workpiece does not have to be exactly parallel. The clamping washer has a smooth side for machined surfaces and a serrated side for rough faces.

On request:
Replacement cam screws.

Order No.	B Slot width	Clamping force kN
04439-00	without slot key	18
04439-14	14	18
04439-16	16	18
04439-18	18	18

04440

Talon grips

Material:
Steel.

Version:
Hardened (52+2 HRC) and black oxidised.

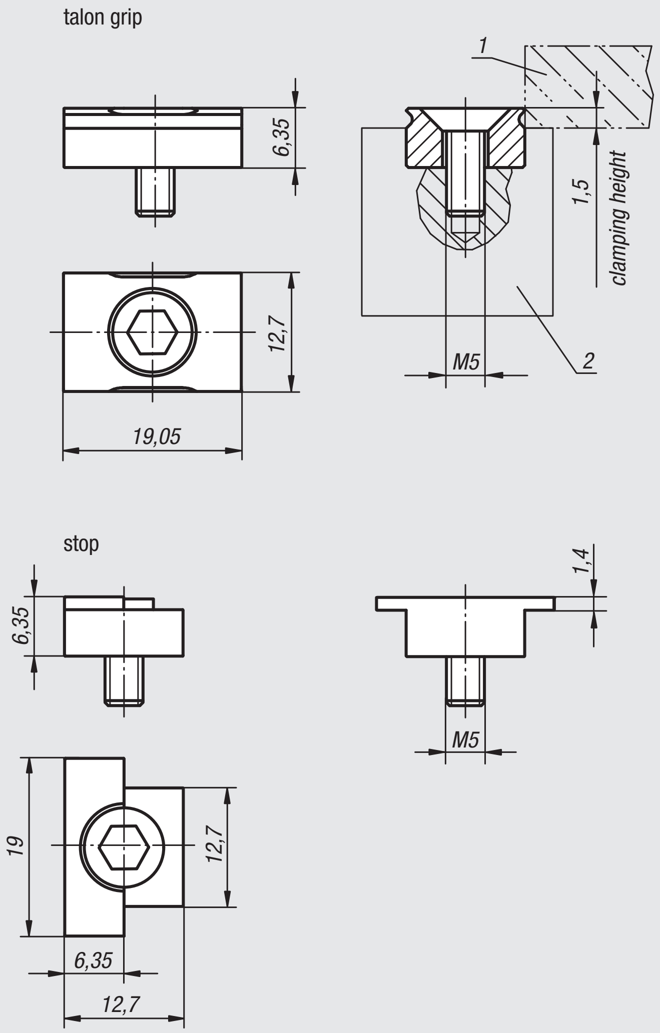
Sample order:
nlm 04440-1219

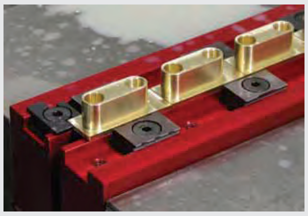
Note:
Talon grips are meant for installing into vice jaw plates. A slot with tapped hole is sufficient for mounting. The sharp edges on the talons bite into the workpiece and prevent lateral and horizontal movement.

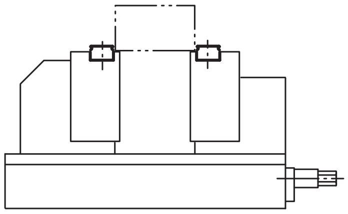
- Positive clamping for high cutting speeds.
- Low clamping height of 1.5 mm (saves material costs).
- The contour of the talons produces a slight pull-down effect.

A matching stop is available as an accessory.

Drawing reference:
1) workpiece
2) clamping jaw







Order No.	Version
04440-1219	talon grip
04440-12	stop

Talon grips round

Material:
Steel.

Version:
Hardened (52+2 HRC) and black oxidised.

Sample order:
nlm 04440-0919

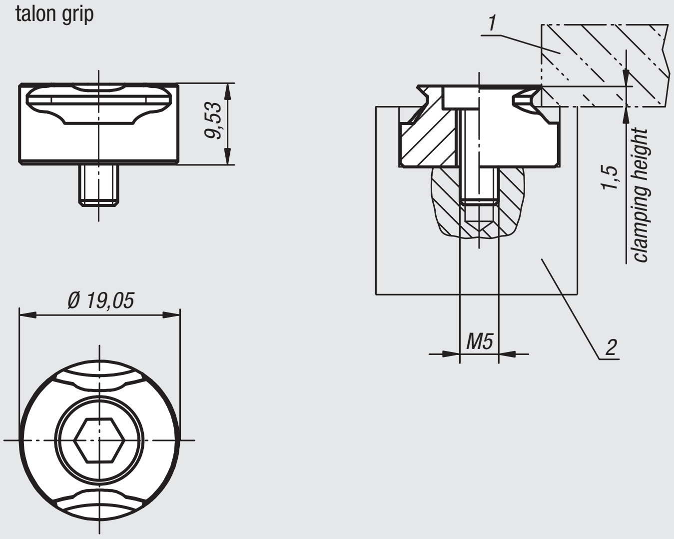
Note:
Talon grips are meant for installing into vice jaw plates. A tapped hole with counterbore is sufficient for the mounting. The sharp edges on the talons bite into the workpiece and prevent lateral and horizontal movement.

- Positive clamping for high cutting speeds.
- Low clamping height of 1.5 mm (saves material costs).
- The contour of the talons produces a slight pull-down effect.

Talon grips expand the application possibilities of your machine vice. Round, contoured and oversized workpieces can be quickly and securely clamped by using talon grips.

Drawing reference:
1) workpiece
2) clamping jaw

talon grip



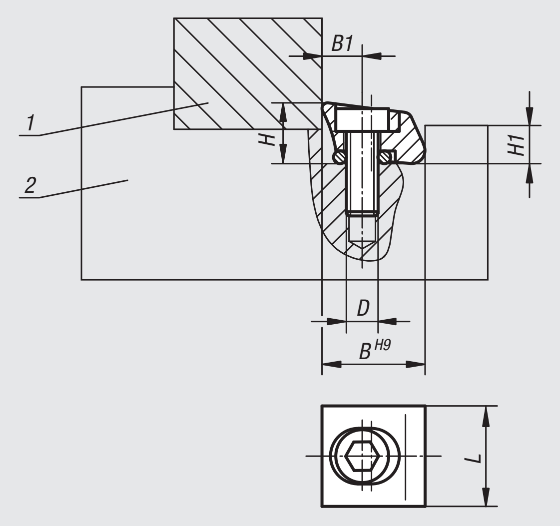
special components

round components

Order No.	Version
04440-0919	talon grip

04441

Chock clamps



Material:
Clamping element steel or brass.

Version:
Steel hardened.

Sample order:
nlm 04441-113

Note:
Also known as pitbull clamps.
Extremely space-saving design.
No protruding edges due to lateral clamping.
Positive down force.

Drawing reference:
1) workpiece
2) Fixture

Order No.	Version	Main material	D	B	B1	H	H1	L	Clamping travel	Clamping force kN	Tightening torque max. Nm
04441-110	with knife edge	steel	M2,5 x 8	9,5	3,8	6	3,6	9,5	0,15	2,8	1,8
04441-113	with knife edge	steel	M4 x 12	12,7	5,1	8	4,8	13	0,4	6,6	5,6
04441-119	with knife edge	steel	M6X16	19,05	7,6	11,5	7,2	19	0,6	16	22,5
04441-210	with blunt edge	steel	M2,5 x 8	9,5	3,8	6	3,6	9,5	0,15	2,8	1,8
04441-213	with blunt edge	steel	M4 x 12	12,7	5,1	8	4,8	13	0,4	6,6	5,6
04441-219	with blunt edge	steel	M6X16	19,05	7,6	11,5	7,2	19	0,6	16	22,5
04441-310	with blunt edge	brass	M2,5 x 8	9,5	3,8	6	3,6	9,5	0,15	0,9	0,56
04441-313	with blunt edge	brass	M4 x 12	12,7	5,1	8	4,8	13	0,4	1,8	2,8
04441-319	with blunt edge	brass	M6X16	19,05	7,6	11,5	7,2	19	0,6	4,2	5,6

Cam clamps adjustable

with riser

Material:
Steel.

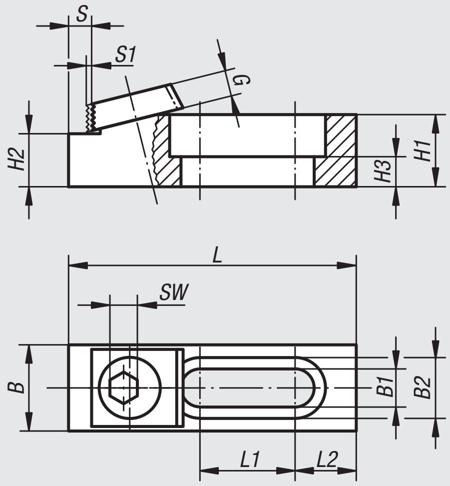
Version:
Body tempered, black oxidised, riser faces ground.
Square washer case hardened and brass-plated.

Sample order:
nlm 04444-12

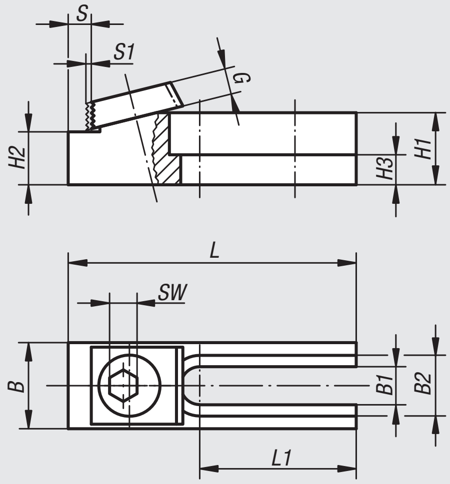
Note:
Also called multi-fixture clamps and stops.
Cost-effective custom made clamping fixtures can be produced using the adjustable riser cam clamps together with the matching riser stops.

On request:
Replacement cam screws.

04444-08, 04444-12



04444-16



Order No.	suitable fastening screw	L	L1	L2	B	B1	B2	H1	H2	H3	S	S1	G	SW	Long hole	Clamping force kN	Tightening torque max. Nm
04444-08	M8	63,5	21	13,5	19	8,4	13,4	15,9	11,684 -0,013	6,6	6,3	1,2	5,3	7	closed	8,9	28
04444-12	M12	95,1	42,7	12,7	28,5	13	19,8	15,9	12,192 -0,013	6,9	7,1	2	9,5	8	closed	17,8	88
04444-16	M16	107	46,3	-	38	17	24,8	41	35,001 -0,013	21	8,3	2,5	12,7	12	open	26,7	135

04445

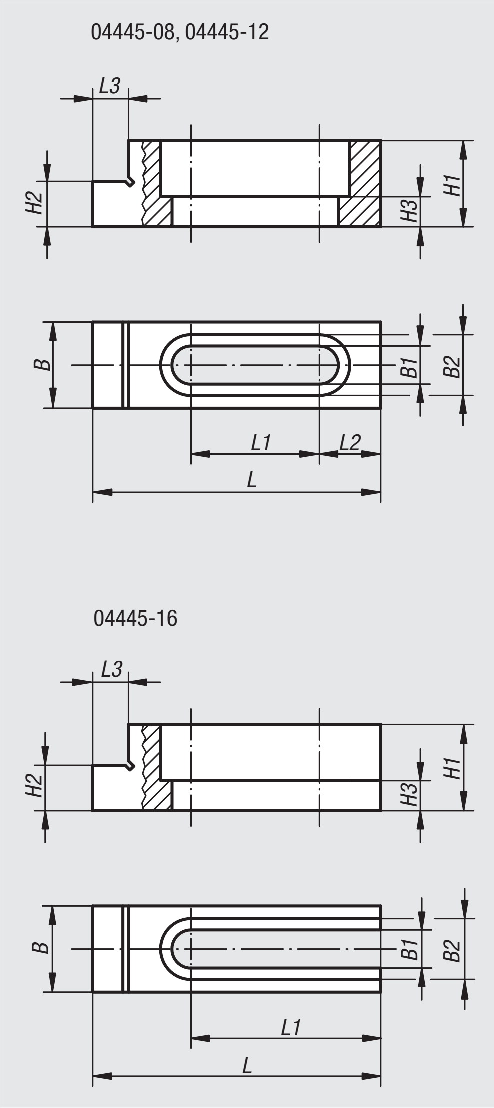
Riser stops

Material:
Steel.

Version:
Tempered, black oxidised.
Riser faces ground.

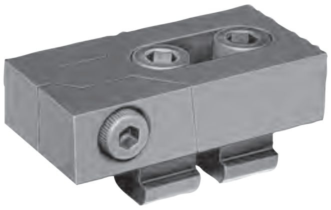
Sample order:
nlm 04445-12

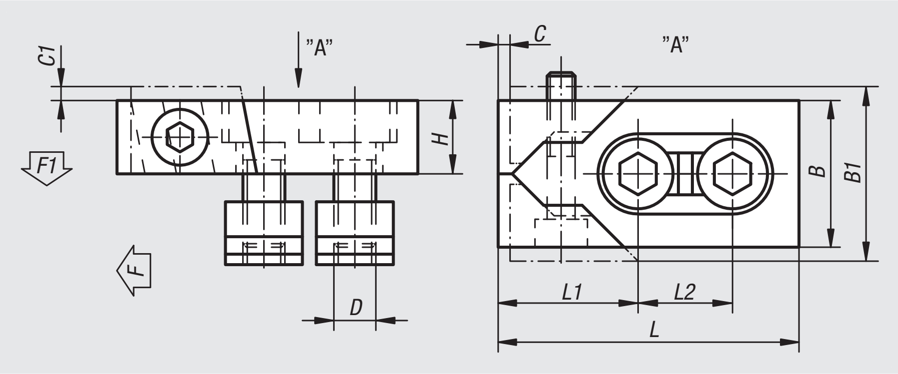
Note:
Also called multi-fixture clamps and stops. Cost-effective custom made clamping fixtures can be produced using the adjustable riser cam clamps together with the matching riser stops.



Order No.	suitable fastening screw	L	L1	L2	L3	B	B1	B2	H1	H2	H3	Long hole
04445-08	M8	63,5	28,3	13,5	7,9	19	8,4	13,4	19	11,684 -0,013	6,6	closed
04445-12	M12	95,2	42,7	12,7	7,9	28,5	13,4	19,8	22	12,192 -0,013	6,9	closed
04445-16	M16	107	46,2	-	9,5	38	17	24,8	50,7	35,001 -0,013	21,3	open

Low-profile clamps





Material:
Steel.

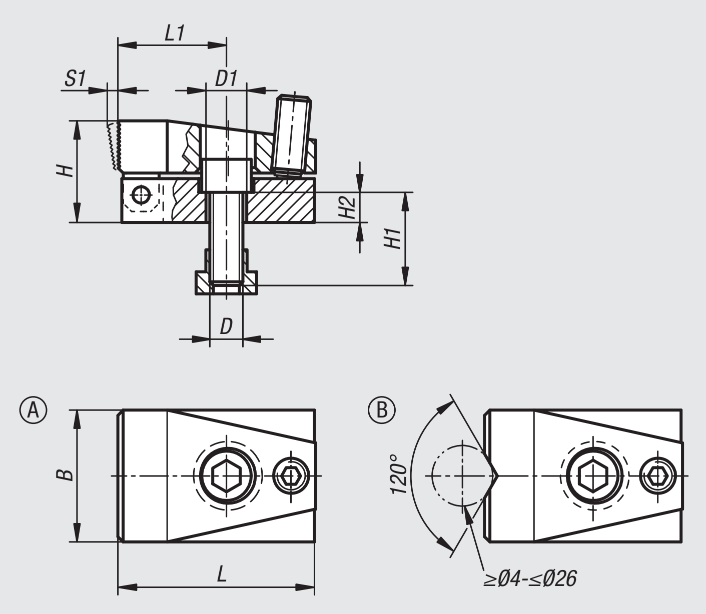
Version:
Hardened, black oxidised.

Sample order:
nlm 04450-16

Note:
These handy low-profile clamp jaws are ideal for machining most workpiece sizes. The hardened wedge operated jaws also provide positive down force.

Order No.	Slot width	L	L1	L2	B	B1	H	C	C1	D	F kN	F1 kN	Tightening torque max. Nm
04450-12	12	80	39	26	40	47	20	3	2,5	M10	16	0,6	15
04450-14	14	80	39	26	40	47	20	3	2,5	M12	22	0,9	18
04450-16	16	80	39	26	40	47	20	3	3	M12	22	0,9	18
04450-161	16	100	46	34	50	59	25	4	2,5	M14	32	1,2	25
04450-18	18	100	46	34	50	60	25	4	3	M16	36	1,4	35
04450-20	20	100	46	34	50	60	25	4	3	M16	36	1,4	35
04450-22	22	140	65	50	78	95	30	5	4	M20	36	1,4	45

Side clamps



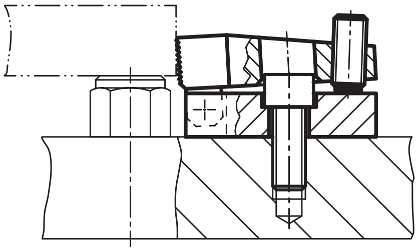
Material:
Steel.

Version:
Case-hardened and black oxidised.

Sample order:
nlm 04460-110

Note:
Tightening the ball-end thrust screw moves the jaw plates forwards. The workpiece is pushed against the fixed stop and simultaneously forced down onto the seating face. The seating face for the workpiece can be mounted directly on the machine table.

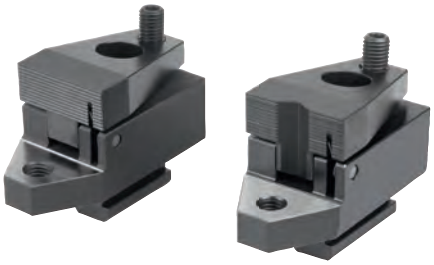
Drawing reference:
Form A: with flat jaw
Form B: with prism jaw



Order No. Form A	Order No. Form B	Slot width	B	D	D1	H	H1	H2	L	L1	S1 (travel)	Clamping force N	Tightening torque max. Nm
04460-110	**04460-210**	10	32	M8	8,4	24	20	8	52	28	3	7000	3
04460-114	**04460-214**	14	48	M12	12,5	37	30	11	72	40	4	15000	9
04460-118	**04460-218**	18	68	M16	16,5	47	35	13	86	41	7	21500	20

Side clamps

with support



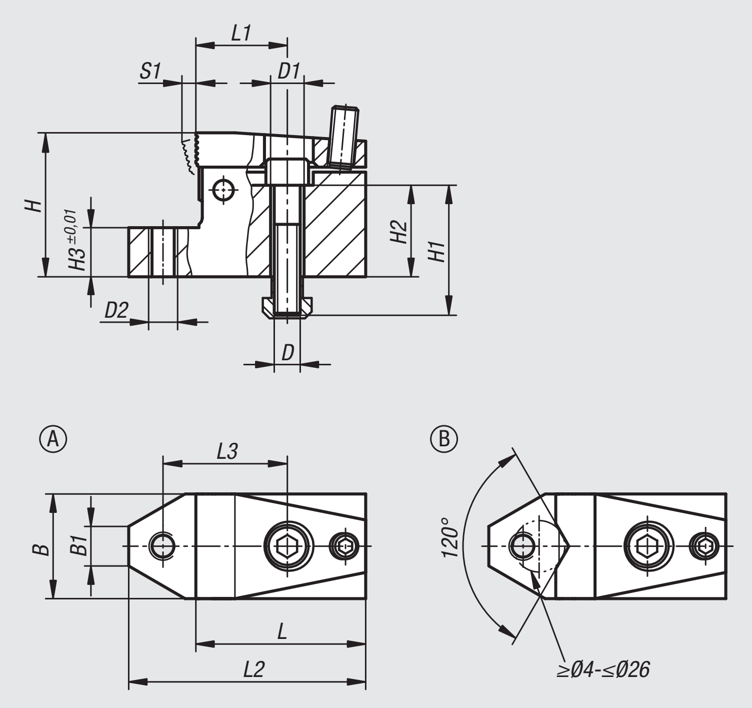
Material:
Steel.

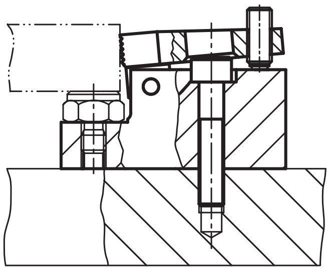
Version:
Case-hardened and black oxidised.

Sample order:
nlm 04461-110

Note:
Tightening the ball-end thrust screw moves the jaw plates forwards. The workpiece is pushed against the fixed stop and simultaneously forced down onto the seating face. This side clamp has a ground seating face and tapped hole for adjustable support elements.

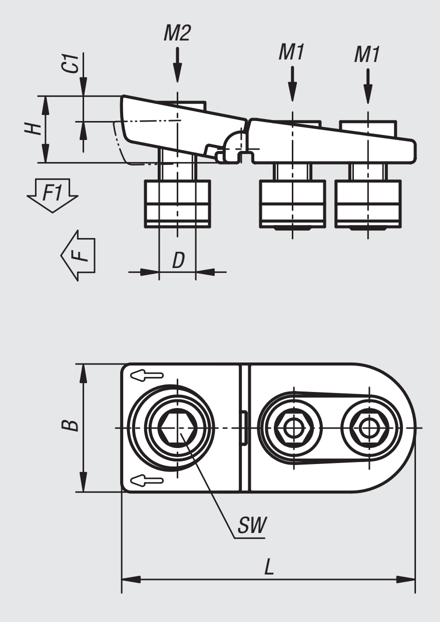
Drawing reference:
Form A: with flat jaw
Form B: with prism jaw





Order No. Form A	Order No. Form B	Slot width	B	B1	D	D1	D2	H	H1	H2	H3	L	L1	L2	L3	S1 (travel)	Clamping force N	Tightening torque max. Nm
04461-110	**04461-210**	10	32	12,1	M8	8,4	M8	44	40	28	15	52	28	72,5	38	3	7000	3
04461-114	**04461-214**	14	48	16	M12	13	M12	53	45	27	15	72	40	100	55	4	15000	9
04461-118	**04461-218**	18	68	18,8	M16	17	M16	72	60	38	20	86	41	126	63	7	21500	20

T-slot clamps



Material:
Clamping element (front) steel 1.7225.
Retaining element (rear) steel 1.0503.
Cap screws and slot keys grade 8.8 steel.

Version:
Body parts hardened and nickel-plated.
Fasteners black oxidised.

Sample order:
nlm 04462-1214

Note:
Particularly low workpieces can be clamped using the T-slot clamps. The positive down force helps to hold the workpiece down on the machine table.

Application:
1. Slide the clamp in the machine table T-slot up to the workpiece.
2. Tighten the fastening screws with the appropriate torque.
3. Tighten the clamping screw to clamp the workpiece in place.

Order No.	Slot width	B	C1	D	H	L	SW	F kN	F1 kN	Tightening torque M1 Nm	Tightening torque M2 Nm
04462-1214	14	44	8	M12	25	112	10	15	7,5	65	52
04462-1618	18	56	10	M16	30	132	14	25	12,5	150	120
04462-2022	22	62	11	M20	35	155	17	36	18	300	240

04469

T-slot clamp

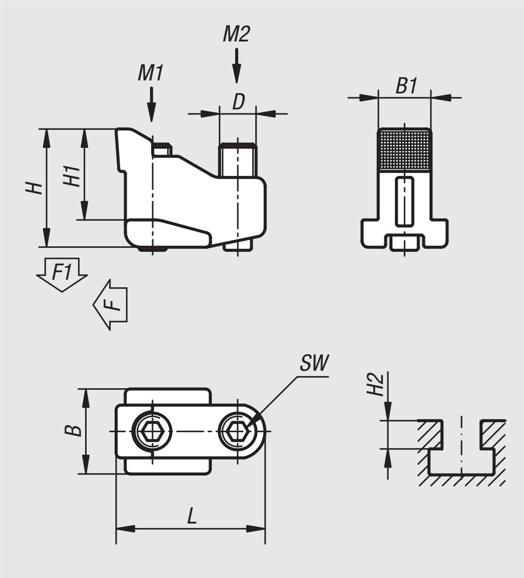
Material:
Body steel 1.7225.
Screws steel grade 8.8.

Version:
Body hardened and nickel-plated.
Screws black oxidised.

Sample order:
nlm 04469-1014

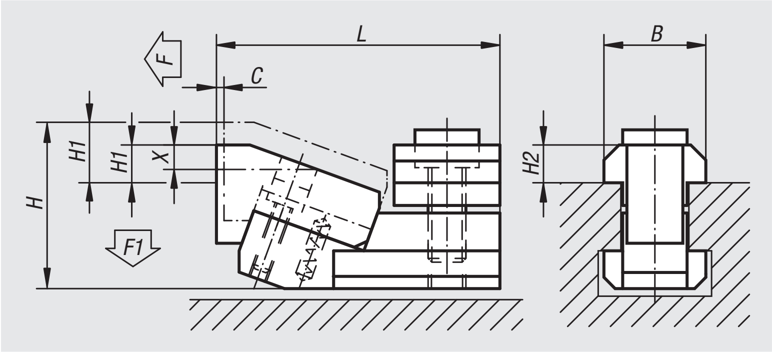
Note:
Particularly low workpieces can be clamped using the T-slot clamps. The positive down force pushes the workpiece down on the machine table.

Application:
1. Slide the clamp in the machine table T-slot up to the workpiece.
2. Tighten the fastening screws with the appropriate torque.
3. Tighten the clamping screw to clamp the workpiece in place.



Order No.	Slot width	B	D	H	H1	H2	L	B1	SW	F kN	F1 kN	Tightening torque M1 Nm	Tightening torque M2 Nm
04469-1214	14	22	M10	31	24	14-19	40	13,6	5	7	3,5	18	9
04469-1618	18	28	M12	39	30	18-24	49	17,4	6	10	5	32	15
04469-2022	22	35	M16	50	37	22-30	63	21,5	8	-	8	75	35

T-slot clamps

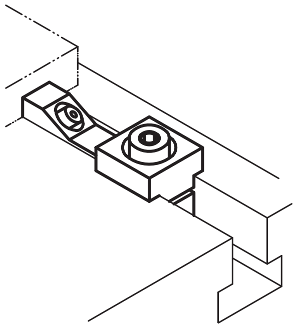


Material:
Steel.

Version:
Hardened, black oxidised.

Sample order:
nlm 04470-12

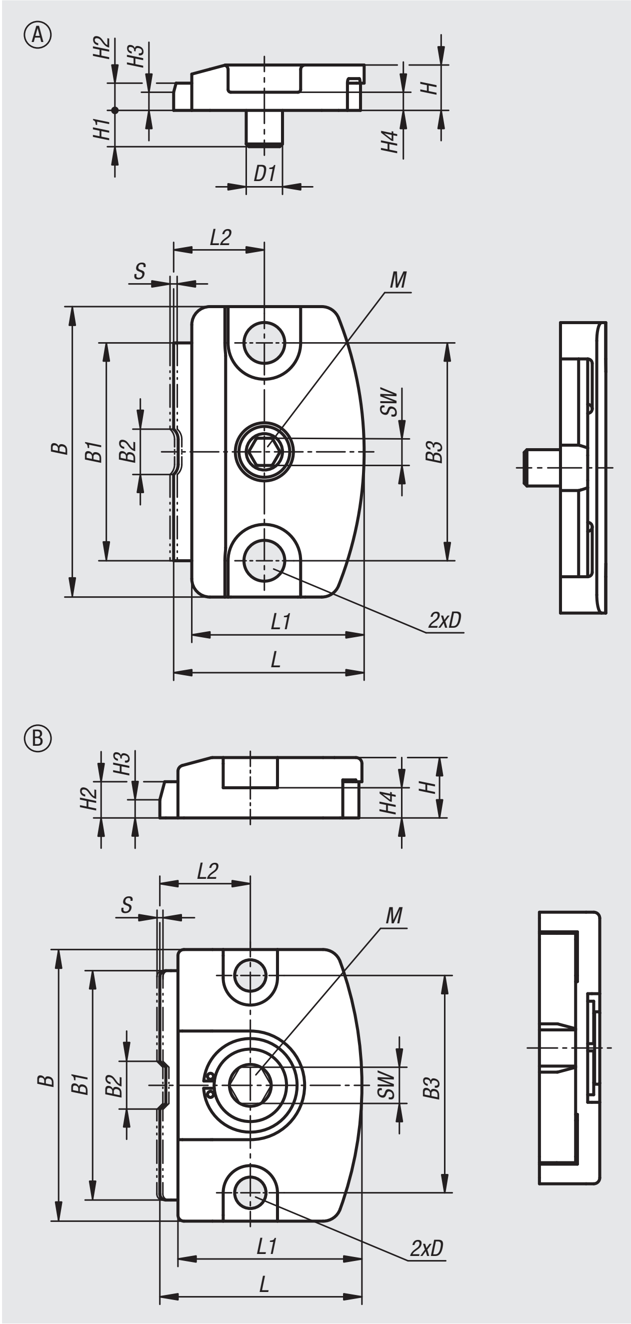
Note:
These T-slot clamps are especially useful for clamping low profile workpieces. The wedge operated jaws also provide positive down force.
Dimensions “H1” and “X” depend on the max. T-slot depth acc. to DIN 650.
To achieve the minimal clamping height by the minimal slot depth, the jaw can be ground down by the dimension “X”.



Order No.	Slot width	C	L	B	H	H1 min.	H1 max.	X	H2	F kN	F1 kN
04470-12	12	1,8	52	18	31	3,5	8,5	5	7	5	0,6
04470-14	14	1,8	55	22	34	2,5	7,5	5	8	5,5	0,7
04470-16	16	2,5	68	25	41	4	11	6	9	8	0,9
04470-18	18	2,5	71	28	43	2	9	6	10	9	1
04470-22	22	3	89	35	53	5	14	9	14	16	1,9

T-slot clamp

with cam



Material:
Carbon steel.

Version:
Black oxidised.

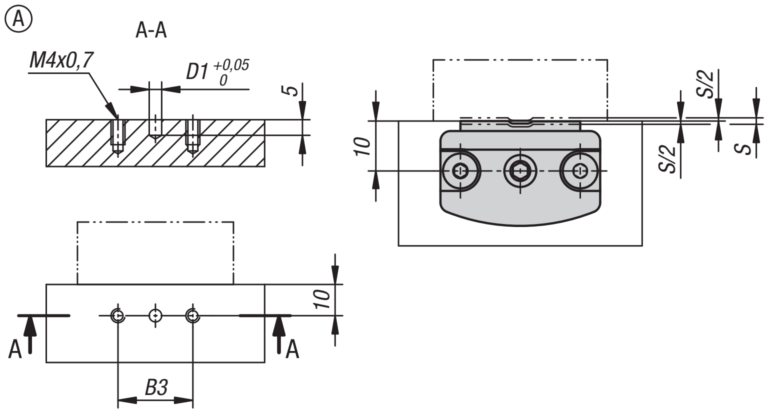
Sample order:
nlm 04472-10400

Note:
Form A with locating pin.
Form B without locating pin.

Assembly:
See drawing (Form A).

Advantages:
- Compact and flat design
- Quick and easy clamping of components

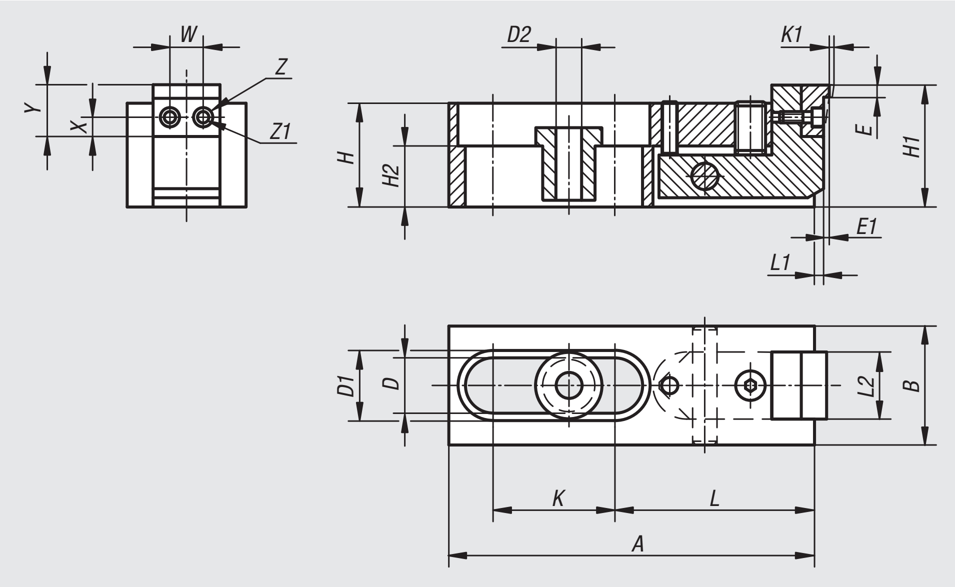
mounting instructions:



Order No.	Form	B	B1	B2	B3	D	D1	H	H1	H2	H3	H4	L	L1	L2	SW	Travel S	Clamping force kN	Tightening torque max. Nm
04472-00130	A	32	24	5	24	4,5	4	5	4	3	2	2	21	19	10	3	0,8	1,3	2,1
04472-10400	B	45	38	8	36	5,2	-	10	-	6	3	5	33,5	30,5	15	6	1	4	10
04472-10600	B	70	60	12	55	8,2	-	15	-	9	5	7	50	46	22	10	2	6	27

04480

Side clamps



Material:
Body steel.
Jaw mild steel.
Centring bush with collar carbon steel.

Version:
Black oxidised.
Jaw plates case-hardened.

Sample order:
nlm 04480-006

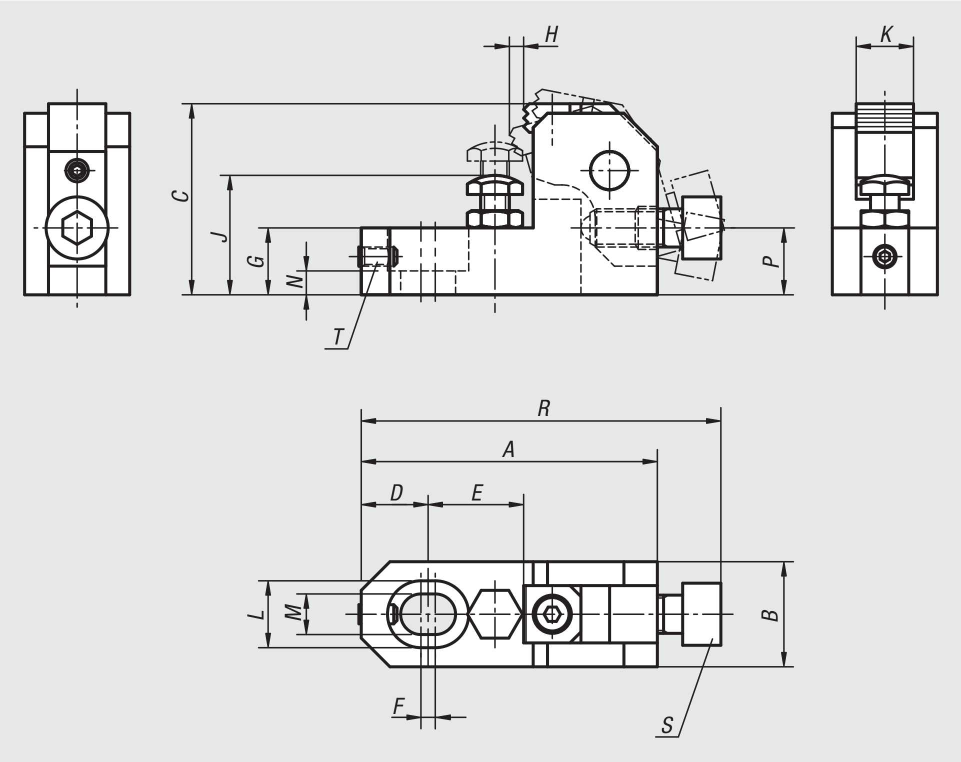
Note:
These flat design side clamps are ideal for machining low profile workpieces. The hardened jaws also provide positive down force.

Order No.	A	B	D	D1	D2	E	E1	H	H1	H2	K	K1	L	L1	L2	W	X	Y	Z	Z1	F=retaining force N
04480-006	80	24	12,2	16	6,5	2,5	0,6	21	25,5	9	25,5	2	44,5	2,5	13,5	7	4,5	11	5	3	3000
04480-010	120	39	18,2	24	10,5	4	1	34	40	20	40,5	2,5	65,5	4	21,5	10	6	15	8	4,5	16000
04480-016	186	60	26,2	35	17	7	1,5	51	59	22	60,5	4	105	6,5	35,5	16	9	24	14	9	31000

04485

Side clamps

with rest pad

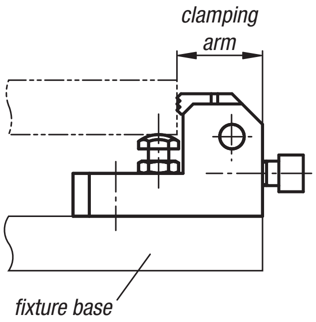


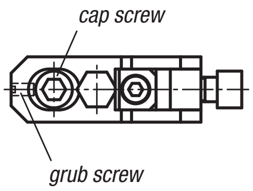
Material:
Housing and arm carbon steel.
Jaw tool steel.

Version:
Housing tempered and black oxidised.
Arm black oxidised.
Jaw tempered and black oxidised.

Sample order:
nlm 04485-02508

Drawing reference:
T) grub screw
S) ball pressure screw

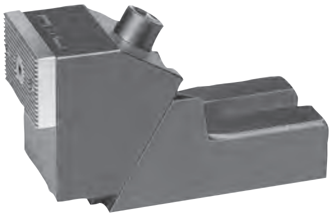


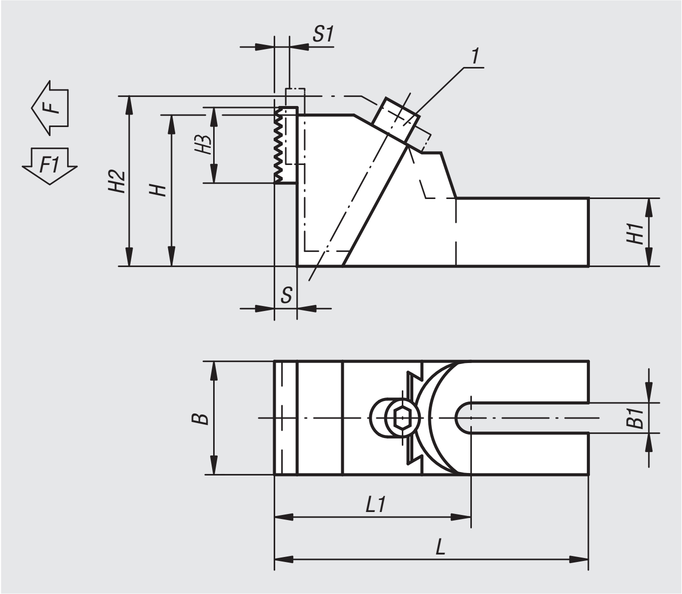


Order No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	F=retaining force N	Tightening torque Nm
04485-02508	62	22	40	14	20	3	14	3	25-32	12	14	8,5	5	14	75,5	M8x20	M4x8	6000	15
04485-03210	78	25	50	18	25	4	18	3,7	32-40	16	17,5	11	7	17,5	95	M10x25	M5x10	10000	30
04485-04012	93	32	60	21	30	5	21	4,5	40-48	20	20	13	8	21	113	M12x30	M6x12	17000	65
04485-04816	124	38	80	28	40	6	27	6	48-63	25	26	17	10	28	151	M16x40	M8x16	25000	130

04500

Side clamps robust





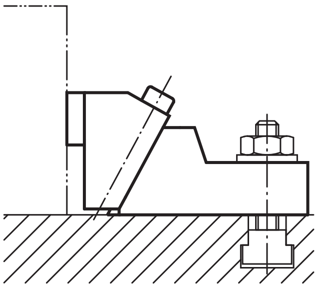
Material:
Body malleable iron.
Jaws mild steel.

Version:
Black oxidised.
Jaws case-hardened.

Sample order:
nlm 04500-26

Note:
The jaws are reversible, smooth side for machined parts, serrated side for rough surfaces. We recommend using two bolts to mount the clamp to the machine table!
The T-slot bolts 07040 can be used for mounting (order separately).

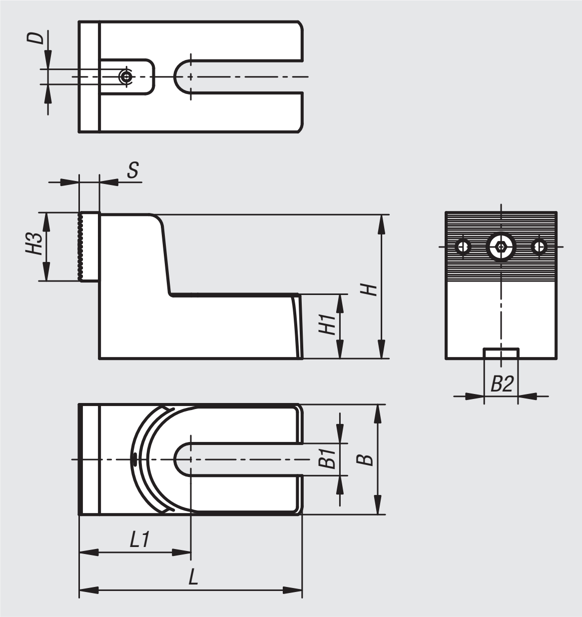
Drawing reference:
1) tightening torque max. 50 Nm



Order No.	suitable for slot width	L	L1	B	B1	H	H1	H2	H3	S	S1	F N	F1 N
04500-19	12,14,16,18	177,5	112,5	65	19	85	37	99	40	12	8	18800	2260
04500-26	20,22,24,28,30	226,5	136,5	75	26	100	45	118	40	12	11	23050	2770
04500-38	32,36,42	262,5	157,5	90	38	120	55	145	40	12	15	29400	3330

04500-01

Fixed jaws for robust side clamps



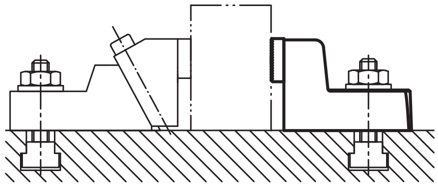
Material:
Cast steel body
Low-carbon steel jaw plates.

Version:
Black oxidised.
Jaw plates case-hardened.

Sample order:
nlm 04500-01-19

Note:
Fixed jaws for workpieces or fixtures which are clamped or fastened on the machine table using a robust side clamp. The jaw plates are reversible, smooth side for machined faces, serrated side for rough faces.

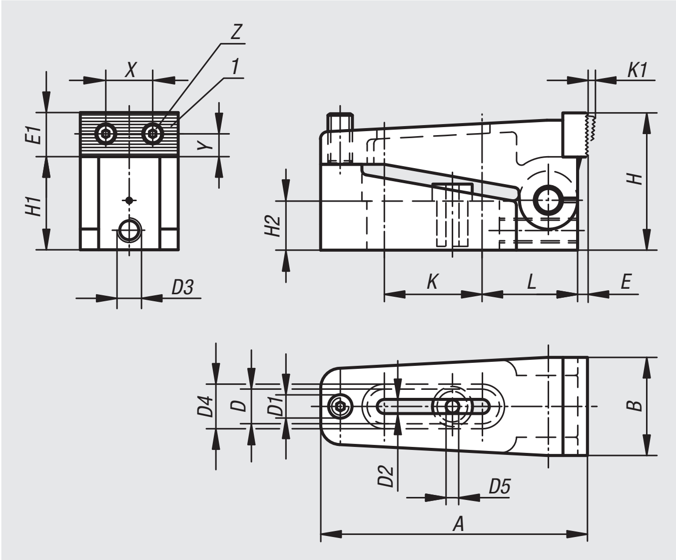
A flat slot key can be used to position the jaw precisely in the machine table slot.



Order No.	suitable for slot width	B	B1	B2	D	H	H1	H3	L	L1	S
04500-01-19	12,14,16,18	65	19	20	M6	85	38	40	132	66	12
04500-01-26	20,22,24,28,30	75	26	20	M6	100	45	40	177	85,5	12
04500-01-38	32,36,42	90	38	20	M6	120	56	40	211	95	12

04509

Side clamps



Material:
Body steel.
Jaw mild steel.
Centring bush carbon steel

Version:
Black oxidised.
Jaw plates case-hardened.

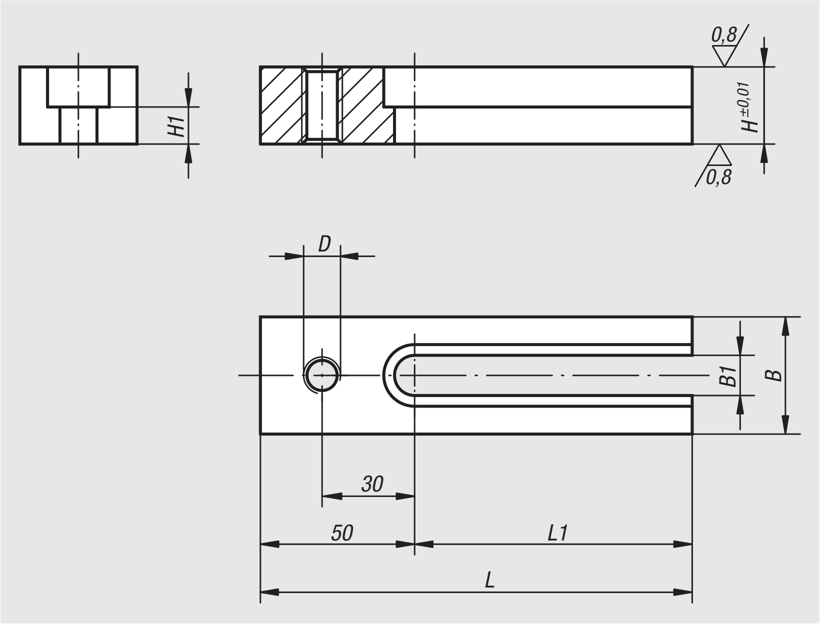
Sample order:
nlm 04509-006

Note:
The jaws are reversible - smooth side for machined surfaces, serrated side for rough surfaces.
A positive down force is also exerted during clamping.

Drawing reference:
1) reversible jaw

Order No.	A	B	D	D1	D2	D3	D4	D5	E	E1	H	H1	H2	K	K1	L	X	Y	Z	F=retaining force N
04509-006	73	25	12,2	M6	7	M6	16	6,5	2,5	11	35	24	12,4	25,5	2,5	27	12	4,5	M3	10000
04509-010	110	39	18,2	M10	11	M10	24	10,5	4	18	56	38	20	40,5	4	39	20,5	8	M5	40000
04509-016	170	58	26,2	M16	17	M10	35	17	7	27	85	60	30	60,5	7	61	32	13	M8	100000

Seating blocks adjustable

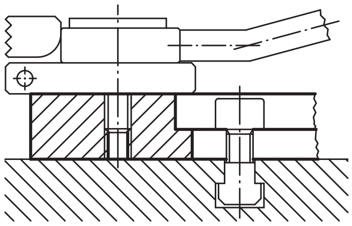


Material:
Carbon steel.

Version:
Tempered, black oxidised.
Contact faces ground.

Sample order:
nlm 04512-12125

Note:
The tapped hole is for mounting fixture components.
The slot allows the riser to be set in any desired position.



Order No.	D	L	L1	B	B1	H	H1
04512-12025	M12	90	40	38	13	25	12
04512-12032	M12	90	40	38	13	32	19
04512-12040	M12	90	40	38	13	40	27
04512-12050	M12	90	40	38	13	50	37
04512-12125	M12	140	90	38	13	25	12
04512-12132	M12	140	90	38	13	32	19
04512-12140	M12	140	90	38	13	40	27
04512-12150	M12	140	90	38	13	50	37
04512-16032	M16	90	40	50	17	32	15
04512-16040	M16	90	40	50	17	40	23
04512-16050	M16	90	40	50	17	50	33
04512-16132	M16	140	90	50	17	32	15
04512-16140	M16	140	90	50	17	40	23
04512-16150	M16	140	90	50	17	50	33

04515

Side clamp

with cam

Material:
Carbon steel.

Version:
Black oxidised.

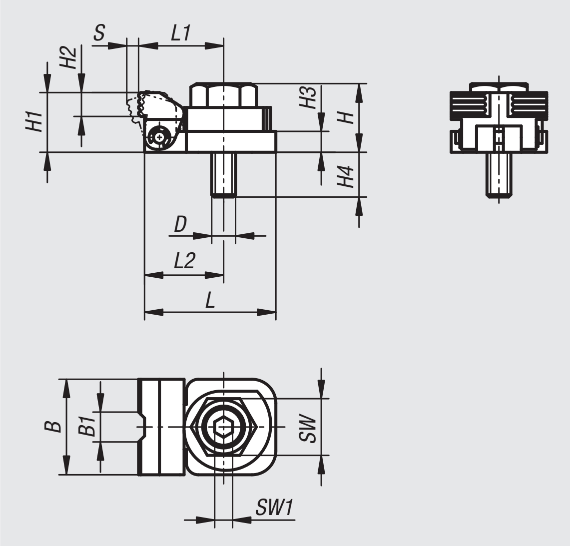
Sample order:
nlm 04515-101

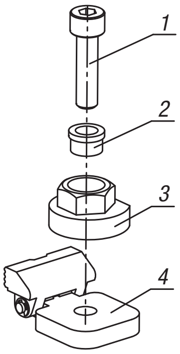
Assembly:

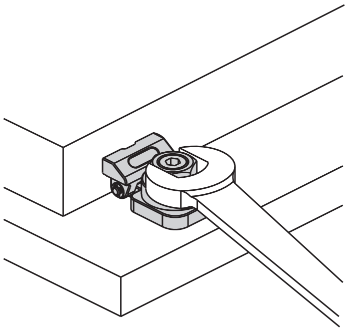
1. Screw the locking screw into the collar bush, fixture clamp and clamping unit and screw onto the baseplate.
2. The workpiece is clamped by tightening the fixture clamp with a spanner.

Advantages:
- Compact design
- Quick and easy clamping of components
- Pull-down effect

Drawing reference:
1) Locking screw
2) Collar bush
3) Fixture clamp
4) Clamping unit







Order No.	B	B1	D	H	H1	H2	H3	H4	L	L1	L2	SW	SW1	Travel S	Clamping force kN	Tightening torque max. Nm
04515-081	32	10	M8	23	20	8	7	15	44	28,5	26,5	19	6	4	3,5	45
04515-101	40	12	M10	29	25	10	9	16	54	35	33	24	8	5	5,5	55
04515-121	46	14	M12	35	30	12	11	17	62	39,5	37,5	27	10	5,5	7	70

Side clamps

Material:
Steel.

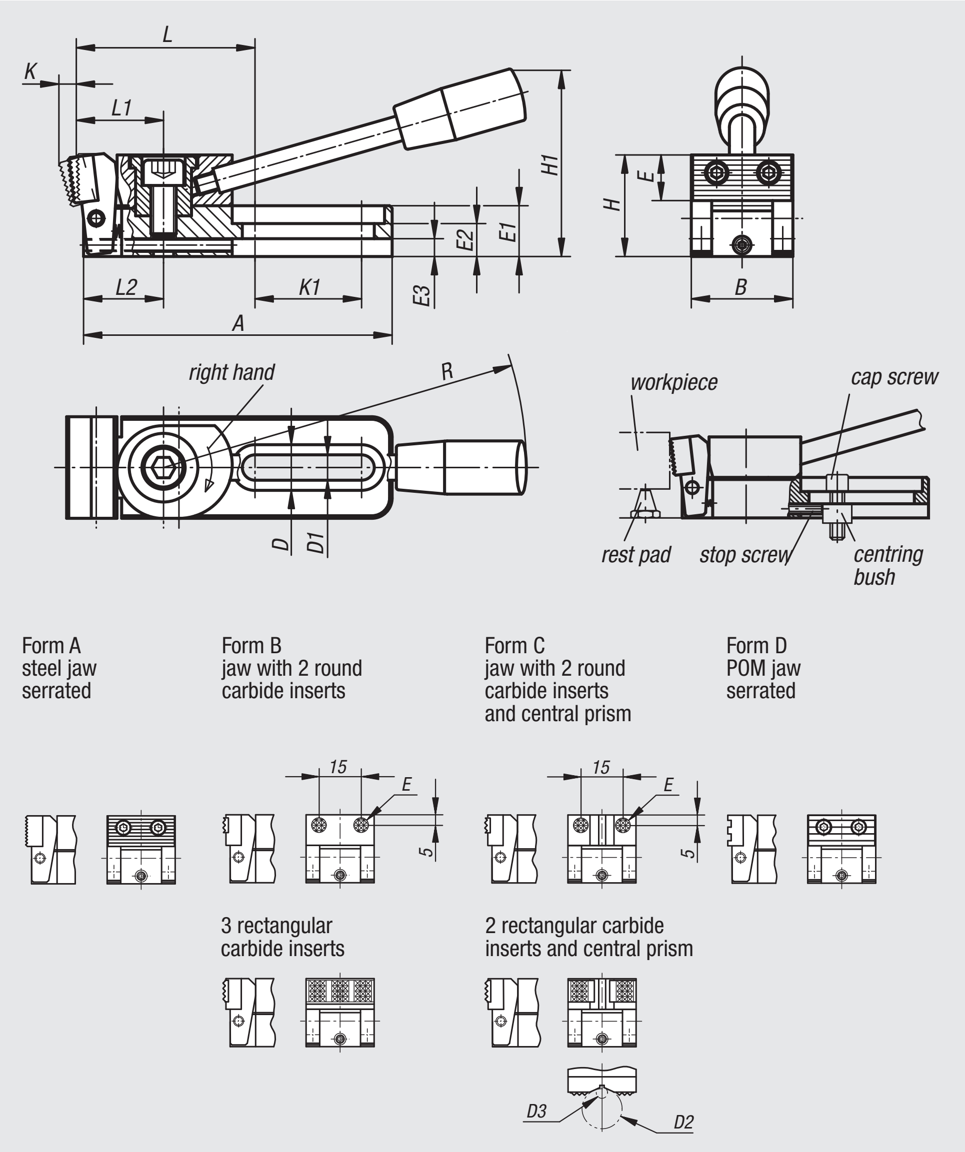
Version:
Case-hardened and black oxidised.

Sample order:
nlm 04516-006010

Note:
This is a quick-action side clamp where workpieces are clamped by rotating a cam wheel which exerts pressure on the swivel jaw, simultaneously producing a positive down force. Using the stop screw and centring bush (see diagram), the side clamp can be mounted and positioned on a modular grid system.

The versions 04516-006010, 04516-006015, 04516-006030 and 04516-006035 have 2 round carbide inserts.

Clamping force:
04516-006... = 3800 N
04516-010... = 7200 N



Form A
steel jaw
serrated

Form B
jaw with 2 round
carbide inserts

Form C
jaw with 2 round
carbide inserts
and central prism

Form D
POM jaw
serrated

3 rectangular
carbide inserts

2 rectangular carbide
inserts and central prism

Order No.	Form	Version 1	A	B	D	D1	D2 max.	D3 min.	E	E1	E2	E3	H	H1	K	K1	L	L1	L2	R	F=retaining force N
04516-006005	A	right	78	25	12	6,2	-	-	11	12	8	4	25	45	4	26	46,5	22	20	110	3800
04516-010005	A	right	121,5	40	18	10,2	-	-	18	20	13	7	40	74	6	42	71	35	31,5	143	7200
04516-006025	A	left	78	25	12	6,2	-	-	11	12	8	4	25	45	4	26	46,5	22	20	110	3800
04516-010025	A	left	121,5	40	18	10,2	-	-	18	20	13	7	40	74	6	42	71	35	31,5	143	7200
04516-006010	B	right	78	25	12	6,2	-	-	ø8	12	8	4	24	45	3,5	26	46,5	22	20	110	3800
04516-010010	B	right	121,5	40	18	10,2	-	-	12,7	20	13	7	39	74	5,5	42	73	35	31,5	143	7200
04516-006030	B	left	78	25	12	6,2	-	-	ø8	12	8	4	24	45	3,5	26	46,5	22	20	110	3800
04516-010030	B	left	121,5	40	18	10,2	-	-	12,7	20	13	7	39	74	5,5	42	73	35	31,5	143	7200
04516-006015	C	right	78	25	12	6,2	9,5	2,5	ø8	12	8	4	24	45	3,5	26	46,5	22	20	110	3800
04516-010015	C	right	121,5	40	18	10,2	27	4,5	12,7	20	13	7	39	74	5,5	42	73	35	31,5	143	7200
04516-006035	C	left	78	25	12	6,2	9,5	2,5	ø8	12	8	4	24	45	3,5	26	46,5	22	20	110	3800
04516-010035	C	left	121,5	40	18	10,2	27	4,5	12,7	20	13	7	39	74	5,5	42	73	35	31,5	143	7200
04516-006020	D	right	78	25	12	6,2	-	-	11	12	8	4	25	45	4	26	46,5	22	20	110	3800
04516-010020	D	right	121,5	40	18	10,2	-	-	18	20	13	7	40	74	6	42	70,5	35	31,5	143	7200
04516-006040	D	left	78	25	12	6,2	-	-	11	12	8	4	25	45	4	26	46,5	22	20	110	3800
04516-010040	D	left	121,5	40	18	10,2	-	-	18	20	13	7	40	74	6	42	70,5	35	31,5	143	7200

Side clamps

Material:
Steel.

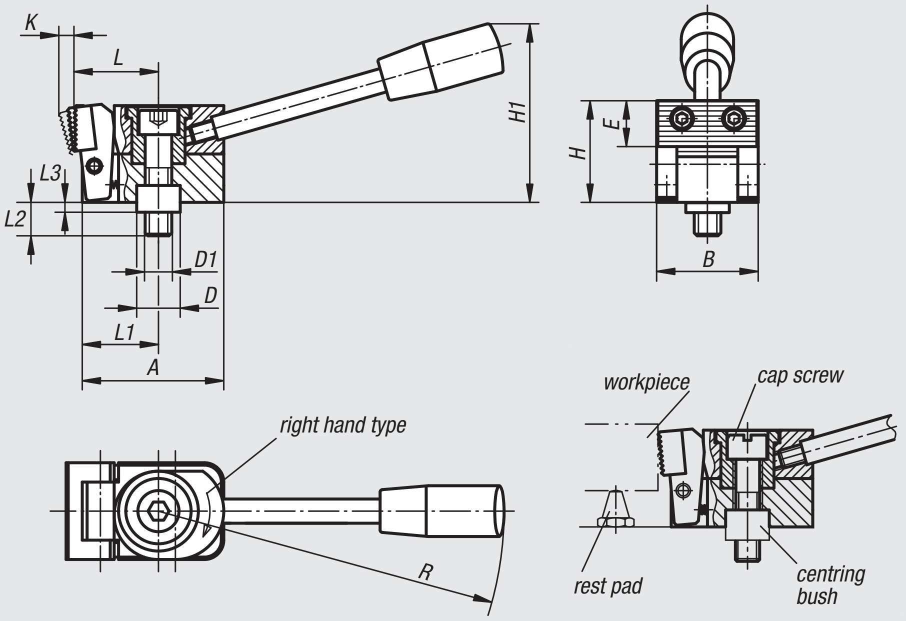
Version:
Case-hardened and black oxidised.

Sample order:
nlm 04518-006005

Note:
This is a quick-action side clamp where workpieces are clamped by rotating a cam wheel which exerts pressure on the swivel jaw, simultaneously producing a positive down force.
Using the centring bush (see diagram), the side clamp can be mounted and positioned on a modular grid system.

The versions 04518-006010, 04518-006015, 04518-006030 and 04518-006035 have 2 round carbide inserts.

Clamping force:
04518-006... = 3800 N
04518-010... = 7200 N

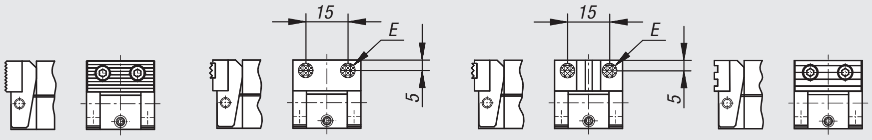


Form A
steel jaw
serrated

Form B
jaw with 2 round
carbide inserts

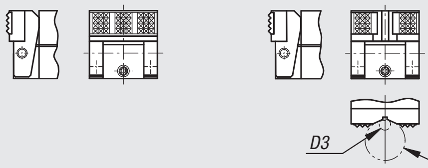
Form C
jaw with 2 round
carbide inserts
and central prism

Form D
POM jaw
serrated



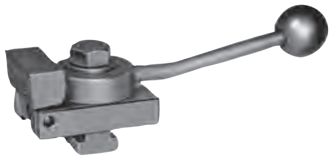
3 rectangular
carbide inserts

2 rectangular carbide
inserts and central prism



Order No.	Form	Version 1	A	B	D	D1	D2 max.	D3 min.	E	H	H1	K	L	L1	L2	L3	R	F=retaining force N
04518-006005	A	right	38,5	25	12	M6	-	-	11	25	45	4	22	20	17	4	110	3800
04518-010005	A	right	58,5	40	18	M10	-	-	18	40	74	6	35	31,5	27	6	143	7200
04518-006025	A	left	38,5	25	12	M6	-	-	11	25	45	4	22	20	17	4	110	3800
04518-010025	A	left	58,5	40	18	M10	-	-	18	40	74	6	35	31,5	27	6	143	7200
04518-006010	B	right	38,5	25	12	M6	-	-	ø8	24	45	3,5	22	20	17	4	110	3800
04518-010010	B	right	58,5	40	18	M10	-	-	12,7	39	74	5,5	37	31,5	27	6	143	7200
04518-006030	B	left	38,5	25	12	M6	-	-	ø8	24	45	3,5	22	20	17	4	110	3800
04518-010030	B	left	58,5	40	18	M10	-	-	12,7	39	74	5,5	37	31,5	27	6	143	7200
04518-006015	C	right	38,5	25	12	M6	9,5	2,5	ø8	24	45	3,5	22	20	17	4	110	3800
04518-010015	C	right	58,5	40	18	M10	27	4,5	12,7	39	74	5,5	37	31,5	27	6	143	7200
04518-006035	C	left	38,5	25	12	M6	9,5	2,5	ø8	24	45	3,5	22	20	17	4	110	3800
04518-010035	C	left	58,5	40	18	M10	27	4,5	12,7	39	74	5,5	37	31,5	27	6	143	7200
04518-006020	D	right	38,5	25	12	M6	-	-	11	25	45	4,5	22	20	17	4	110	3800
04518-010020	D	right	58,5	40	18	M10	-	-	18	40	74	7	34,5	31,5	27	6	143	7200
04518-006040	D	left	38,5	25	12	M6	-	-	11	25	45	4,5	22	20	17	4	110	3800
04518-010040	D	left	58,5	40	18	M10	-	-	18	40	74	7	34,5	31,5	27	6	143	7200

Side clamps

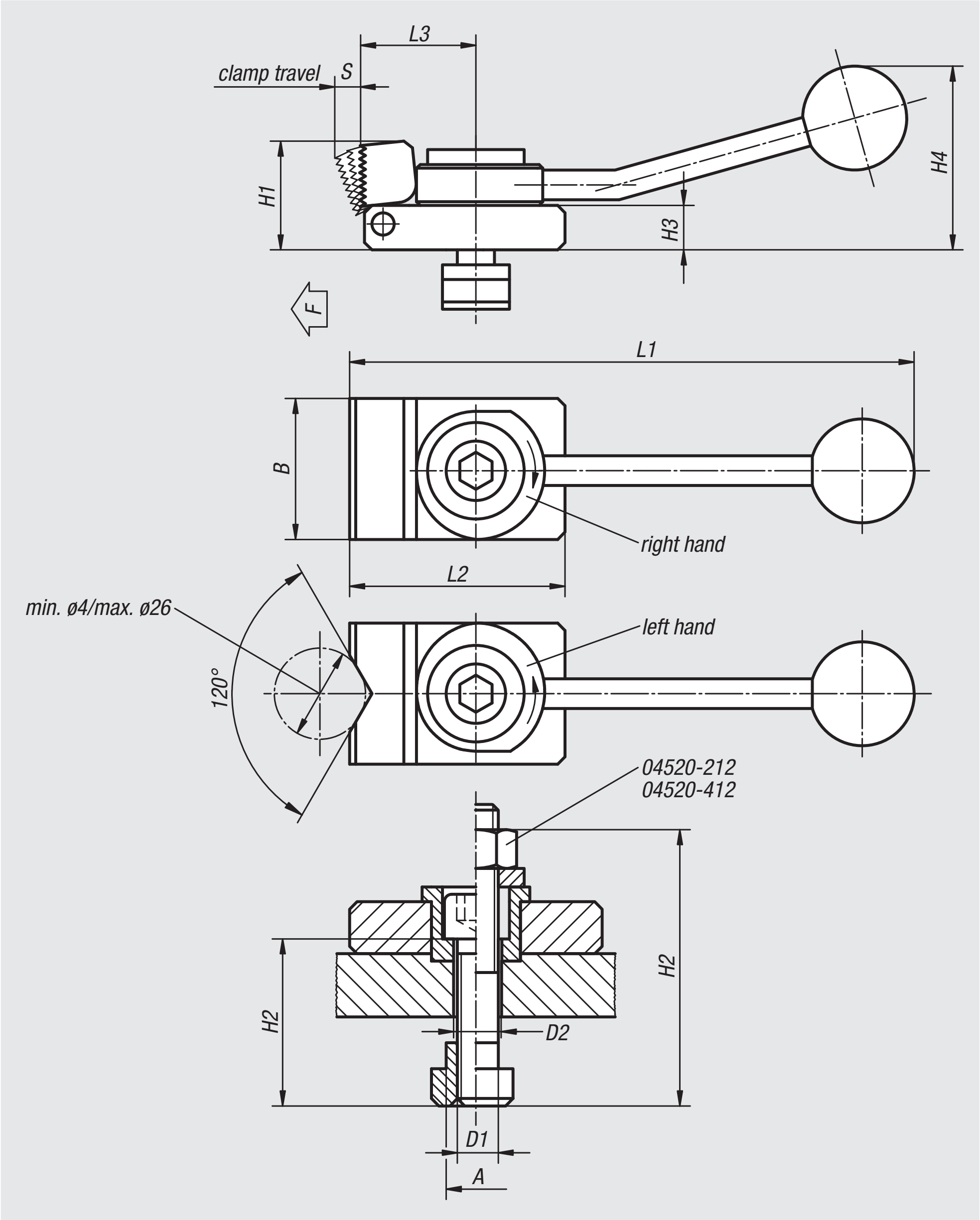


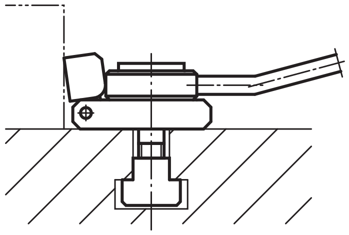
Material:
Steel.

Version:
Case-hardened and black oxidised.

Sample order:
nlm 04520-114X2

Note:
This is a quick-action side clamp where workpieces are clamped by rotating a cam wheel which exerts pressure on the swivel jaw, simultaneously producing a positive down force. The low-profile design allows workpieces to be machined over the entire top surface without the need to move the the clamp. A spring withdraws the jaw when opened.
The clamp can be positioned parallel to the T-slot by mounting on the seating block 04512.

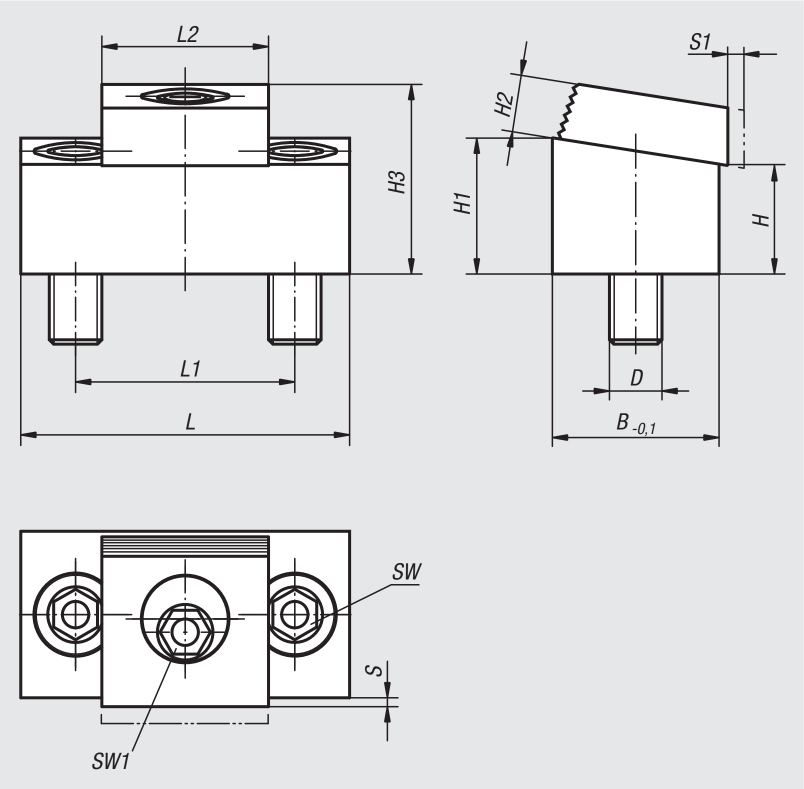




Order No. right	Order No. left	Version 2	slot dimension A	D1	D2	L1	L2	L3	B	H1	H2	H3	H4	S	F max. kN
04520-310X2	**04520-110X2**	jaw plate prism	10	M8	8,4	132	50	32	32	20	30	8	40	3	3,5
04520-310X1	**04520-110X1**	jaw plate level	10	M8	8,4	132	50	32	32	20	30	8	40	3	3,5
04520-312X2	**04520-112X2**	jaw plate prism	12	M8	8,4	132	50	32	32	20	30	8	40	3	3,5
04520-312X1	**04520-112X1**	jaw plate level	12	M8	8,4	132	50	32	32	20	30	8	40	3	3,5
04520-412X2	**04520-212X2**	jaw plate prism	12	M12	12,5	190	72	40	48	38	60	16	62	4	7
04520-412X1	**04520-212X1**	jaw plate level	12	M12	12,5	190	72	40	48	38	60	16	62	4	7
04520-314X2	**04520-114X2**	jaw plate prism	14	M8	8,4	132	50	32	32	20	30	8	40	3	3,5
04520-314X1	**04520-114X1**	jaw plate level	14	M8	8,4	132	50	32	32	20	30	8	40	3	3,5
04520-414X2	**04520-214X2**	jaw plate prism	14	M12	12,5	190	72	40	48	38	40	16	62	4	7
04520-414X1	**04520-214X1**	jaw plate level	14	M12	12,5	190	72	40	48	38	40	16	62	4	7
04520-416X2	**04520-216X2**	jaw plate prism	16	M12	12,5	190	72	40	48	38	40	16	62	4	7
04520-416X1	**04520-216X1**	jaw plate level	16	M12	12,5	190	72	40	48	38	40	16	62	4	7
04520-418X2	**04520-218X2**	jaw plate prism	18	M12	12,5	190	72	40	48	38	40	16	62	4	7
04520-418X1	**04520-218X1**	jaw plate level	18	M12	12,5	190	72	40	48	38	40	16	62	4	7

04521

Toe clamps compact



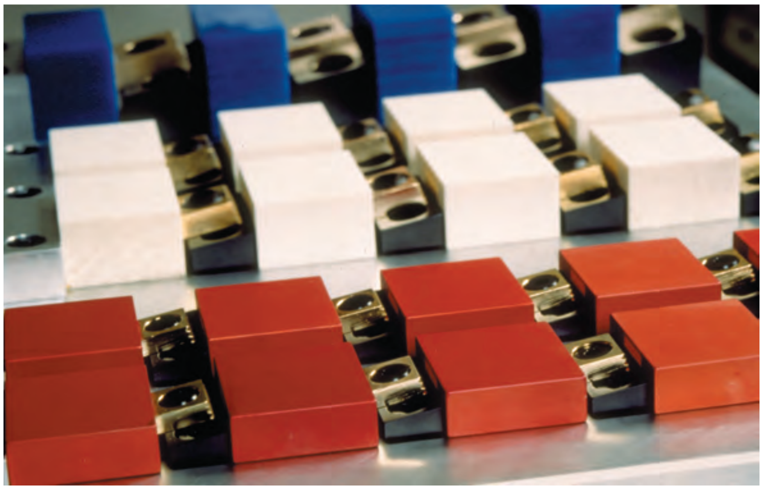
Material:
Steel.

Version:
Body tempered and black oxidised.
Square washer case-hardened and brass-plated.

Sample order:
nlm 04521-10

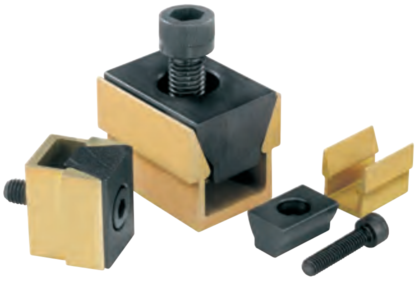
Note:
This cam action compact toe clamp requires very little space to produce multi-fixture clamping.
Workpieces can be clamped in series by using the back side of a clamp as a stop for the next row.
Mount preferably in slots with B +0.05 mm. The height of the clamp can be adjusted by altering the slot depth.

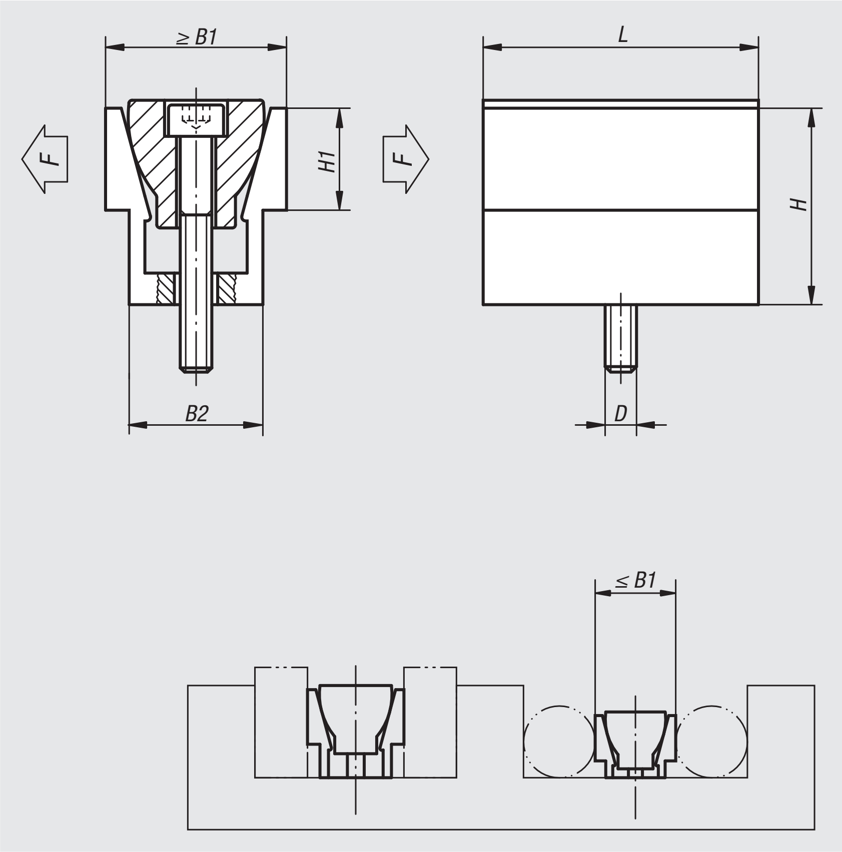
Example of series clamping using compact toe clamps



Order No.	L	L1	L2	B	H	H1	H2	H3 max.	S	D	S1 (travel)	SW	SW1	Clamping force kN	Tightening torque max. Nm
04521-08	43,2	25,4	19	19	12,7	15,7	6,4	21,4	1,5	M8	1,6	5	7	8,9	28
04521-10	54	33,5	25,4	25,4	11,4	15,4	9,7	24,5	1,8	M10	2	7	8	17,8	88
04521-12	75	50,8	38	38,1	25,5	31,5	13	43	2,05	M12	2,5	10	12	26,7	135

Wedge clamps





Material:
Channel aluminium profile.
Wedge hardened steel.

Version:
Channel anodised.
Wedge black oxidised.

Sample order:
nlm 04522-08

Note:
Two workpieces can be held simultaneously with the wedge clamp. They are ideal for clamping round or rectangular pieces. The compact design allows space-saving series clamping.

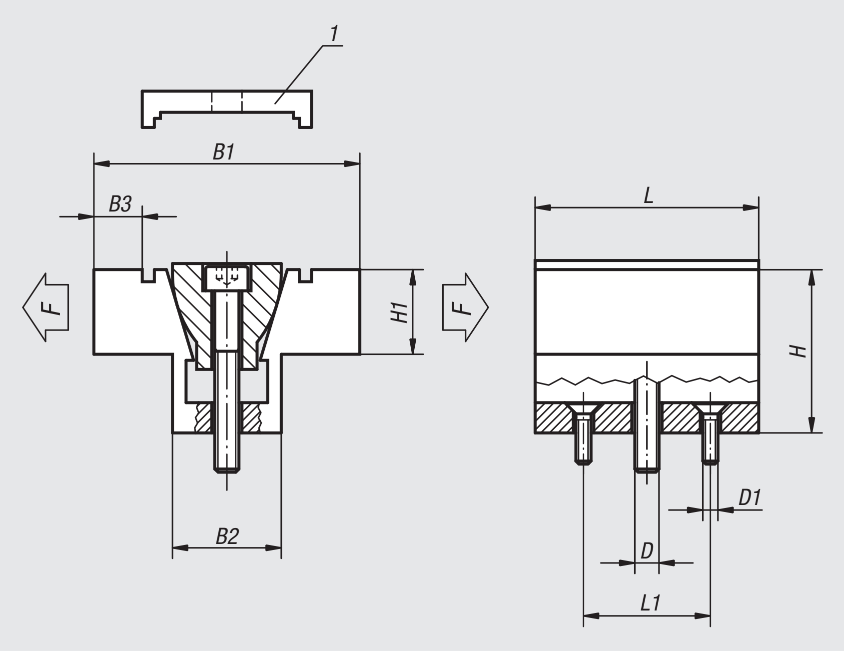
Drawing reference:
In clamped position dimension B1 max. given in the table should be achieved.

Order No.	D	L	B1 min. - max.	B2	H	H1	Clamping force max. kN	Tightening torque max. Nm
04522-04	M4	15,9	12,3 - 13,1	10,4	12,7	5,6	2,2	3,4
04522-06	M6	23,8	18,6 - 19,9	16,1	19	9,5	6,7	14,3
04522-08	M8	31,7	24,8 - 26,6	20,8	25,4	12,7	8,9	14,5
04522-12	M12	47,6	37,3 - 39,7	30,8	38,1	19	15,6	38,4
04522-16	M16	63,5	49,7 - 52,8	41,2	50,8	25,4	26,7	74,6

04523

Wedge clamps

machinable



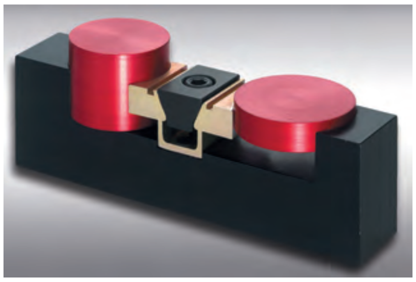
Material:
Channel aluminium profile.
Wedge hardened steel.

Version:
Channel anodised.
Wedge black oxidised.

Sample order:
nlm 04523-08

Note:
Two workpieces can be held simultaneously with the wedge clamp. The jaws have extra material allowing them to be machined to conform to the shape of the workpiece. The compact design allows space-saving series clamping.

Drawing reference:
1) The locking plate is only used for machining the form, not for clamping the workpiece.

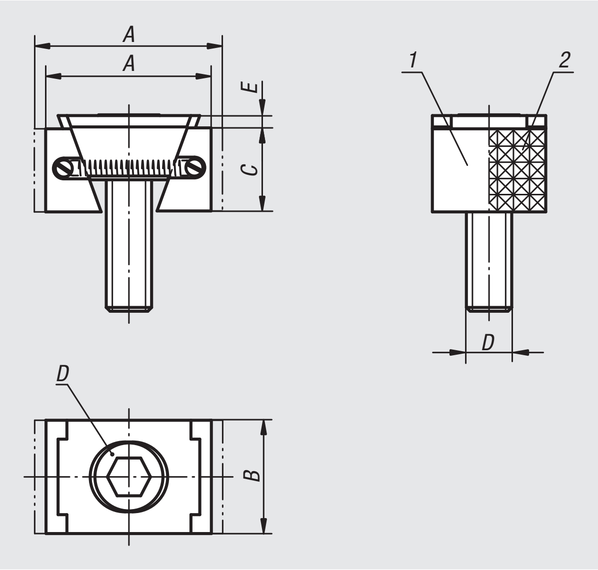


Order No.	D	D1	L	L1	B1 min. - max.	B2	B3	H	H1	Clamping force max. kN	Tightening torque max. Nm
04523-04	M4	M2	15,7	10,16	28,6 - 29,1	10,6	4,6	12,7	6,3	2,2	3,4
04523-06	M6	M4	23,9	15,9	38,1 - 39	16,1	6,6	19,1	9,4	6,7	14,3
04523-08	M8	M4	31,8	20,6	50,8 - 52	20,8	9,9	25,4	12,7	8,9	14,5
04523-12	M12	M5	47,5	30,5	76,2 - 78	30,9	15,7	38,1	19	15,6	38,4
04523-16	M16	M6	63,5	41,28	101,6 - 103,9	41,3	20,3	50,8	25,4	26,7	74,6

04524

Wedge clamps

jaw face smooth or serrated



Material:
Wedge and jaw segments carbon steel.

Version:
Wedge and jaw segments hardened, black.

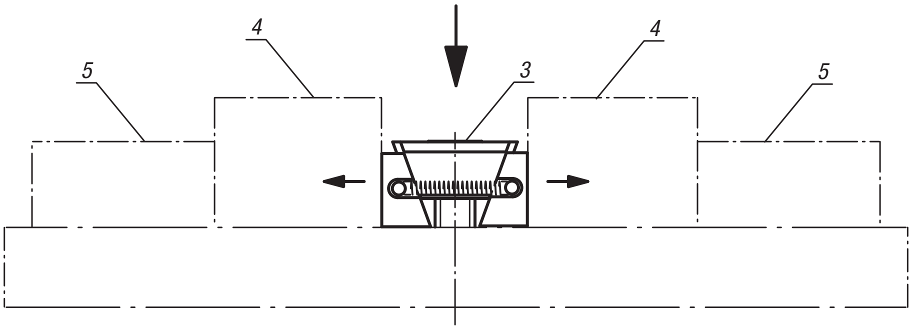
Sample order:
nlm 04524-2208

Note:
The functioning principle make the wedge clamps ideal for series clamping. The wedge form can exert high clamping forces.
These wedge clamps can be mounted in grid holes or T-slots.
Tightening the socket screw moves the wedge down and the jaws out pressing the workpieces against the fixtures fixed stops.
The wedge has a slightly elongated hole allowing for movement to compensate for tolerances.

Spread width:
M8 = ±0.5 mm
M10 = ±1.0 mm
M12 = ±1.0 mm
M16 = ±1.5 mm

Drawing reference:
D) DIN 6912 cap screw

1) Jaw face smooth
2) Jaw face serrated
3) Wedge clamps
4) Workpiece
5) Fixed stop



Wedge clamps, narrow version

Order No. smooth	Order No. serrated	A min.	A max.	B	C	D	E	Clamping force max. kN	Tightening torque max. Nm
04524-1108	**04524-2108**	30,5	33,5	24	15	M8X25	2	15	25
04524-1110	**04524-2110**	32	37	28	19	M10X25	3,5	20	49
04524-1112	**04524-2112**	44	49,5	30	22	M12X40	3,5	30	85
04524-1116	**04524-2116**	55	62	40	29	M16X60	4	50	210

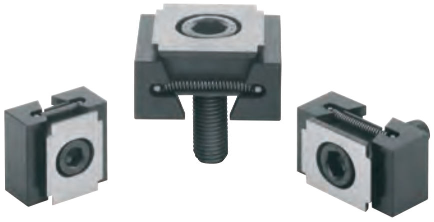
Wedge clamps, wide version

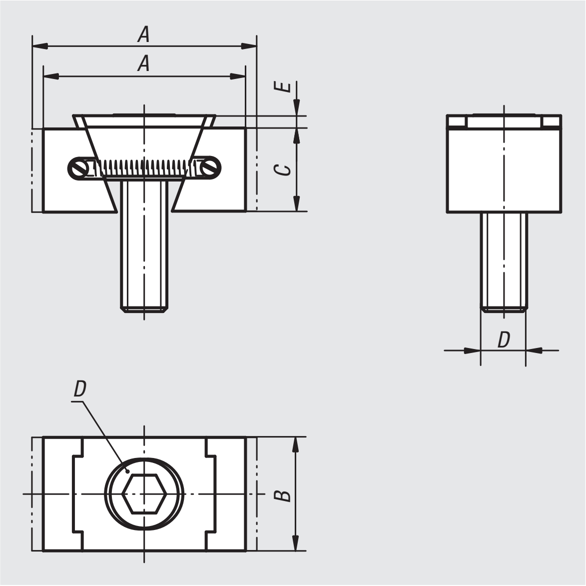
Order No. smooth	Order No. serrated	A min.	A max.	B	C	D	E	Clamping force max. kN	Tightening torque max. Nm
04524-1208	**04524-2208**	30,5	33,5	30	15	M8X25	2	15	25
04524-1210	**04524-2210**	32	37	38	19	M10X25	3,5	20	49
04524-1212	**04524-2212**	44	49,5	48	22	M12X40	3,5	30	85
04524-1216	**04524-2216**	55	62	48	29	M16X60	4	50	210

04524

Wedge clamps

machinable





Material:
Wedge and jaw segments carbon steel.

Version:
Wedge and jaw segments tempered, black.

Sample order:
nlm 04524-3110

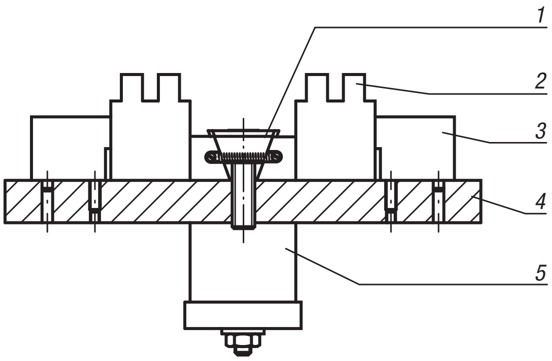
Note:
These wedge clamps have extra long jaws. This extra material allows the jaws to machined to suit the form of the workpiece.
The functioning principle make the wedge clamps ideal for series clamping. The wedge form can exert high clamping forces.
These wedge clamps can be mounted in grid holes or T-slots.
Tightening the socket screw moves the wedge down and the jaws out pressing the workpieces against the fixtures fixed stops.
The wedge has a slightly elongated hole allowing for movement to compensate for tolerances.

Spread width:
M8 = ±0.5 mm
M10 = ±1.0 mm
M12 = ±1.0 mm
M16 = ±1.5 mm

Attention:
These wedge clamps have a machining allowance per jaw of 3 mm for version M8 and 5 mm for versions M10, M12 and M16.

Drawing reference:
D) DIN 6912 cap screw

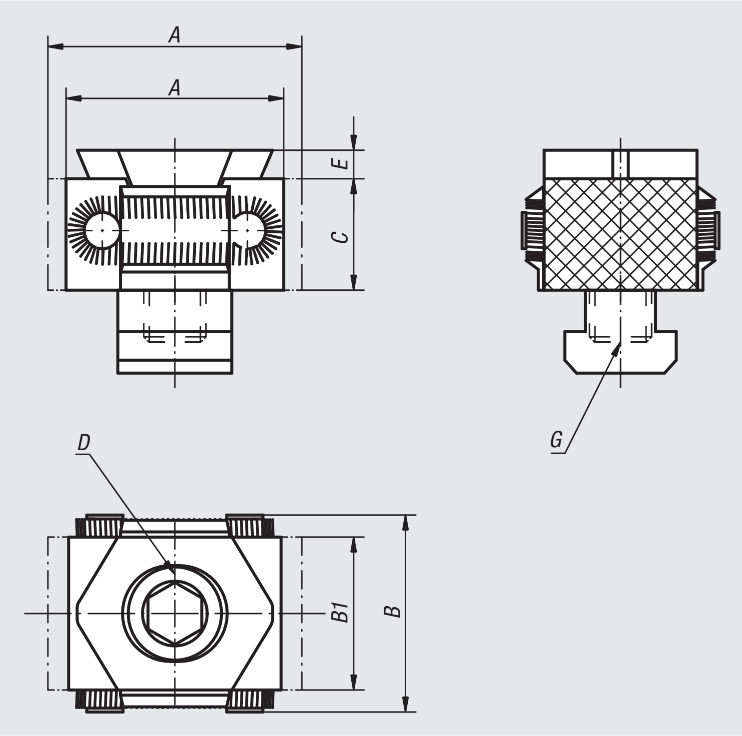
1) wedge clamps
2) workpiece
3) fixed stop
4) base plate
5) hydraulic/pneumatic cylinder



Order No.	Version	A min.	A max.	B	C	D	E	Clamping force max. kN	Tightening torque max. Nm
04524-3108	narrow	36,5	39,5	24	15	M8X25	2	11	19
04524-3110	narrow	42	47	28	19	M10X25	3,5	15	37
04524-3112	narrow	54	59,5	30	22	M12X40	3,5	23	65
04524-3116	narrow	65	72	40	29	M16X60	4	38	160
04524-3208	wide	36,5	39,5	30	15	M8X25	2	11	19
04524-3210	wide	42	47	38	19	M10X25	3,5	15	37
04524-3212	wide	54	59,5	48	22	M12X40	3,5	23	65
04524-3216	wide	65	72	48	29	M16X60	4	38	160

Wedge clamps

jaw faces serrated



Material:
Body and clamping segments tool steel.

Version:
Body hardened.
Jaw segments hardened (49-51 HRC) black oxidised.
Wedge faces ground.

Sample order:
nlm 04525-1618

Note:
The compact design makes these wedge clamps ideal for horizontal and vertical series clamping. The hardened and ground wedge faces can exert high clamping forces. These wedge clamps can be mounted in grid holes or T-slots. Tightening the DIN 912 socket screw moves the wedge down and the jaws out pressing the workpieces against the fixtures fixed stops.

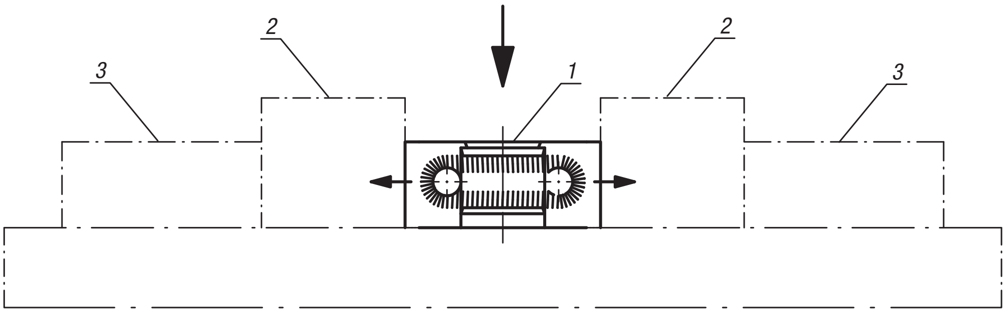
The jaws of version 04525-08 and 04525-0810 are not serrated.

The wedge has a slightly elongated hole allowing for movement.

Spread width:
04525-08 = ±0.5 mm
04525-12 = ±1.0 mm
04525-16 = ±1.5 mm

Drawing reference:
D) DIN 912 cap screw

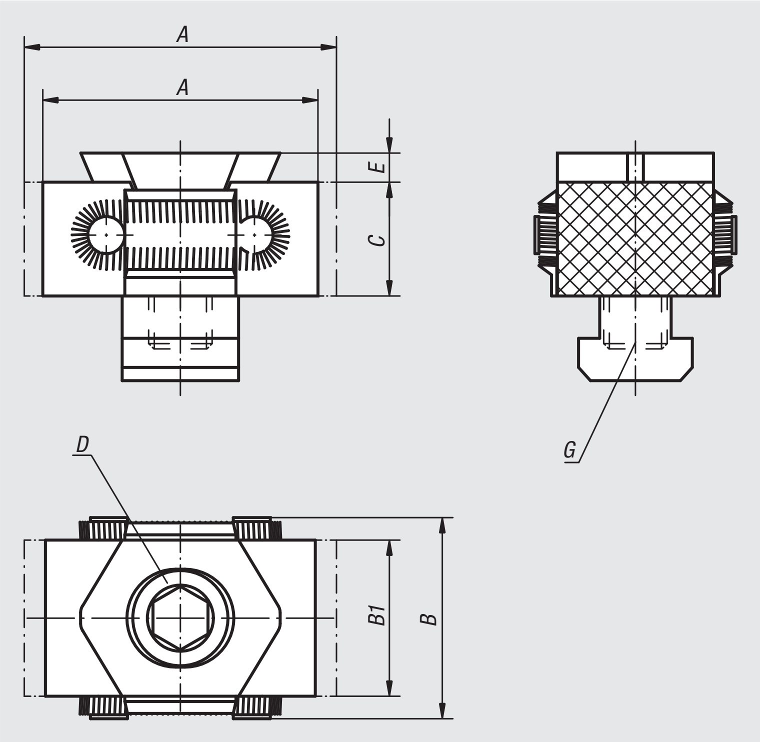
1) Wedge clamps
2) Workpiece
3) Fixed stop



Order No.	Version 1	A min.	A max.	B	B1	C	D	E	Version 2	G	Clamping force max. kN	Tightening torque max. Nm
04525-08	smooth	27	31	29	21	15	M8X25	2,5	for tapped hole	M8	15	25
04525-0810	smooth	27	31	29	21	15	M8X25	2,5	for t-slot	10	15	25
04525-12	serrated	42	49	41	30	22	M12X40	4	for tapped hole	M12	30	85
04525-1214	serrated	42	49	41	30	22	M12X30	4	for t-slot	14	30	85
04525-16	serrated	57	66	56	42	29	M16X60	5	for tapped hole	M16	50	210
04525-1618	serrated	57	66	56	42	29	M16X50	5	for t-slot	18	50	210

Wedge clamps

machinable



Material:
Body tool steel.
Jaw segments tool steel (30 HRC).

Version:
Body hardened.
Jaw segments black oxidised.
Wedge faces ground.

Sample order:
nlm 04526-12

Note:
The special feature of the wedge clamp lies in the machining allowance per vice jaw of 3 mm for version 04526-08 and 5 mm for versions 04526-12 and 04526-16.
This extra length allows for forms adjusted to the workpiece geometry to be incorporated (see illustration).

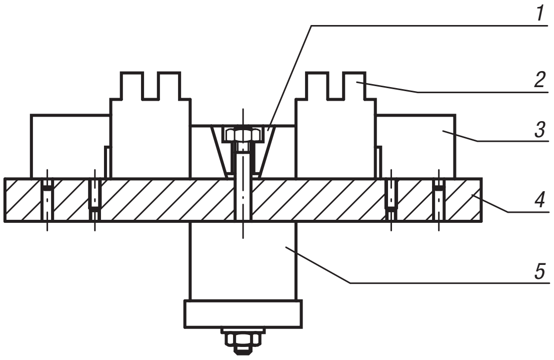
Vice jaws version 04526-08 and 04526-0810 are not serrated.

Travel acc. to order No.:
04526-08 = ±0.5 mm
04526-12 = ±1.0 mm
04526-16 = ±1.5 mm

On request:
Pre-formed jaw segments or other hardness grades.

Drawing reference:
D) DIN 912 cap screw

1) wedge clamps
2) workpiece
3) fixed stop
4) base plate
5) hydraulic/pneumatic cylinder

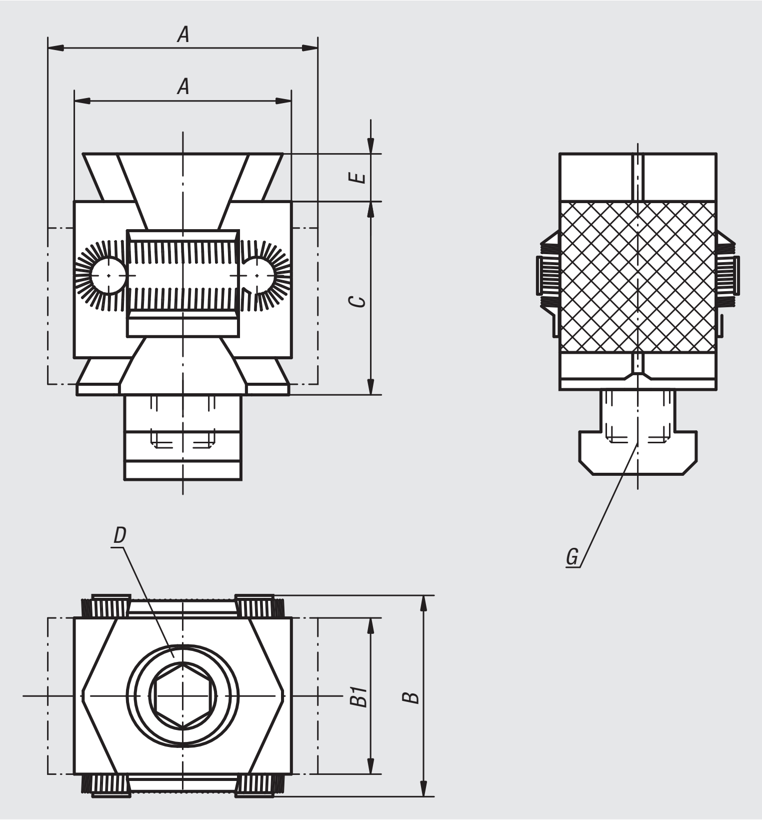


Order No.	A min.	A max.	B	B1	C	D	E	Version 2	G	Clamping force max. kN	Tightening torque max. Nm
04526-08	33	37	29	21	15	M8X25	2,5	for tapped hole	M8	15	25
04526-0810	33	37	29	21	15	M8X25	2,5	for t-slot	10	15	25
04526-12	52	59	41	30	22	M12X40	4	for tapped hole	M12	30	85
04526-1214	52	59	41	30	22	M12X30	4	for t-slot	14	30	85
04526-16	67	76	56	42	29	M16X60	5	for tapped hole	M16	50	210
04526-1618	67	76	56	42	29	M16X50	5	for t-slot	18	50	210

04527

Wedge clamps double

jaw faces serrated



Material:
Body and jaw segments tool steel.

Version:
Body hardened.
Jaw segments hardened (49-51 HRC) and black oxidised.
Wedge faces ground.

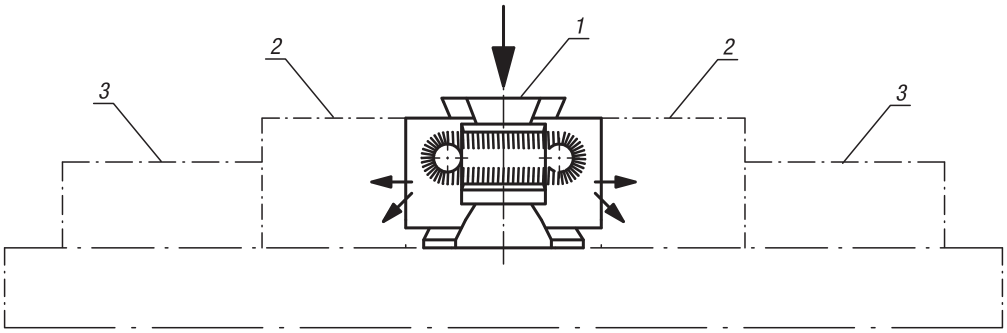
Sample order:
nlm 04527-1214

Note:
Because of their compact design, the double wedge clamps are especially suitable for horizontal and vertical multiple clamping. The hardened and ground wedge surfaces make high clamping forces possible.
Optionally, the appropriate wedge clamp can be mounted either in a grid hole or T-slot. Inserting a socket head screw DIN 912 moves the two clamping segments outwards and presses the workpieces against a fixed stop.
The so-called “draw-down effect” is caused by the double wedge of this version.

Travel acc. to order No.:
04527-12 = ±1.0 mm
04527-16 = ±1.5 mm

Drawing reference:
D) DIN 912 cap screw

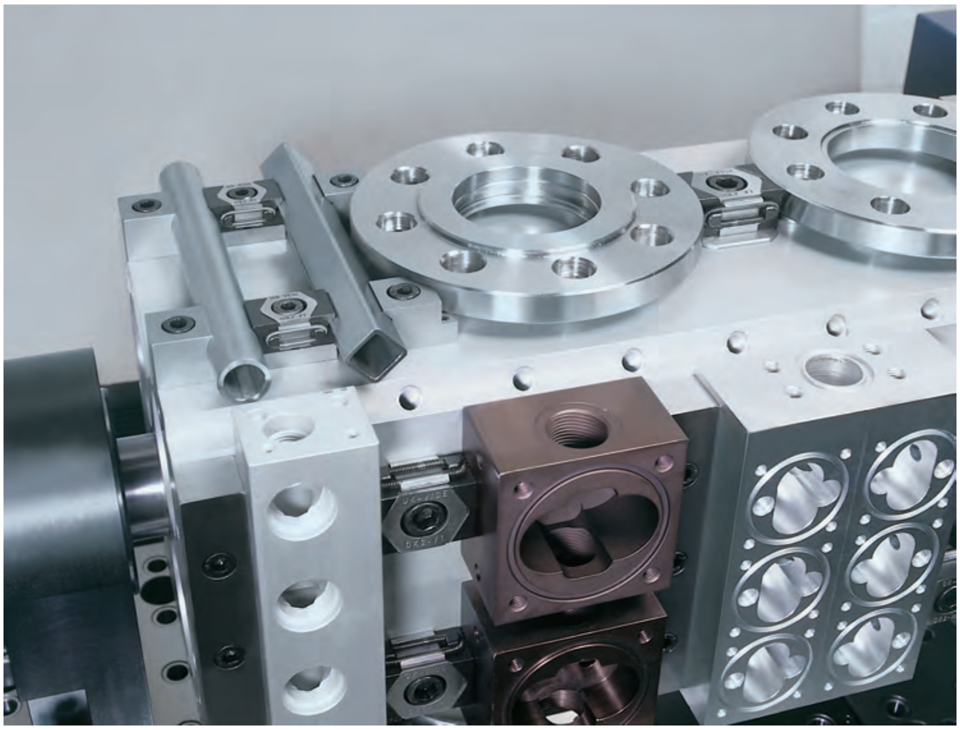
1) Wedge clamps
2) Workpiece
3) Fixed stop



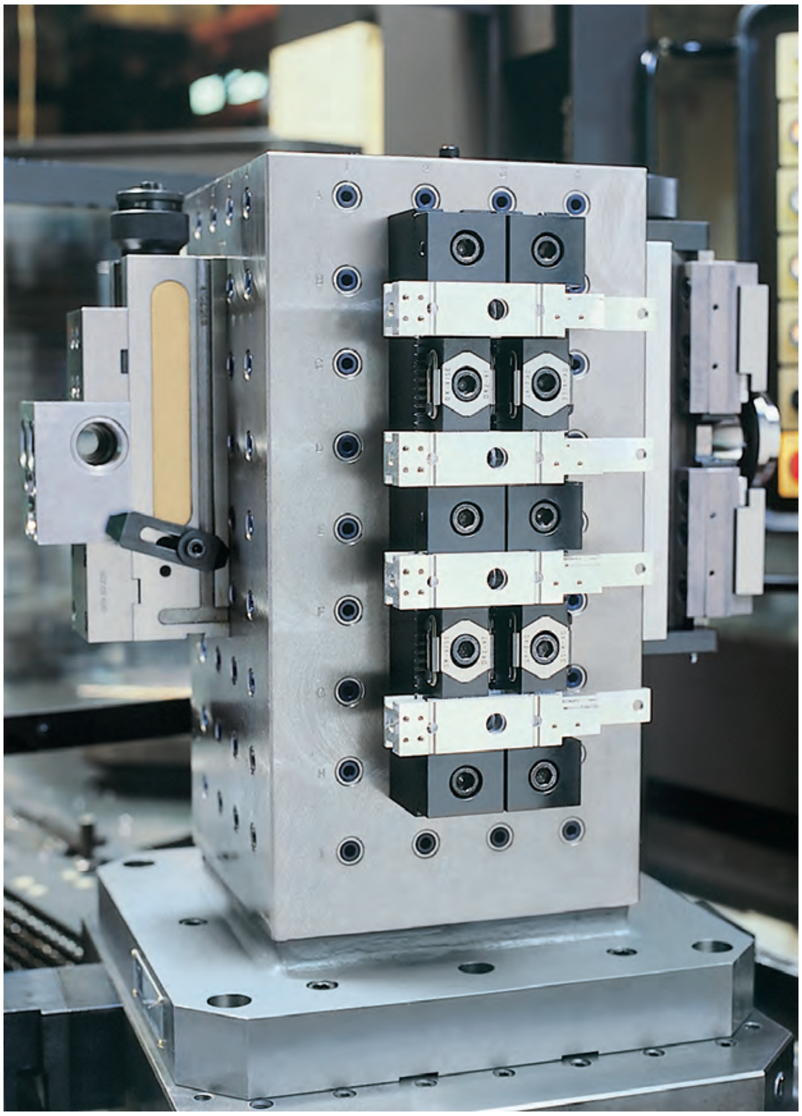
Order No.	A min.	A max.	B	B1	C	D	E	Version 2	G	Clamping force max. kN	Tightening torque max. Nm
04527-12	42	49	41	30	36	M12X60	5	for tapped hole	M12	40	85
04527-1214	42	49	41	30	36	M12X50	5	for t-slot	14	40	85
04527-16	57	67	56	42	50	M16X80	5	for tapped hole	M16	60	210
04527-1618	57	67	56	42	50	M16X70	5	for t-slot	18	60	210

Example of wedge clamps in use

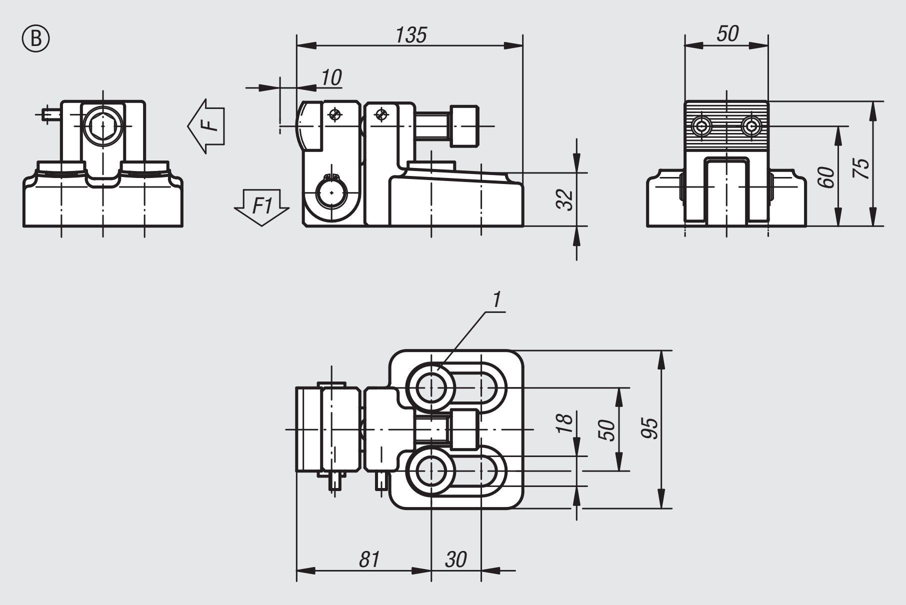
Wedge clamps
04525



Double wedge clamps
04527



Side clamps



Material:
Body ductile iron (SG iron).
Jaw hardened carbon steel.

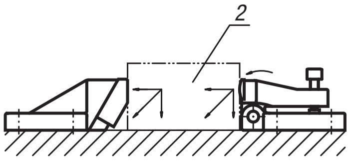
Version:
Painted black.
Jaw bright.

Sample order:
nlm 04530-03

Note:
The workpiece is clamped between side clamps and the side stops, simultaneously producing a positive down force.
Side clamps and stops are secured with DIN 912 cylinder screws. A secure clamping is ensured when side clamps and side stops are used together.

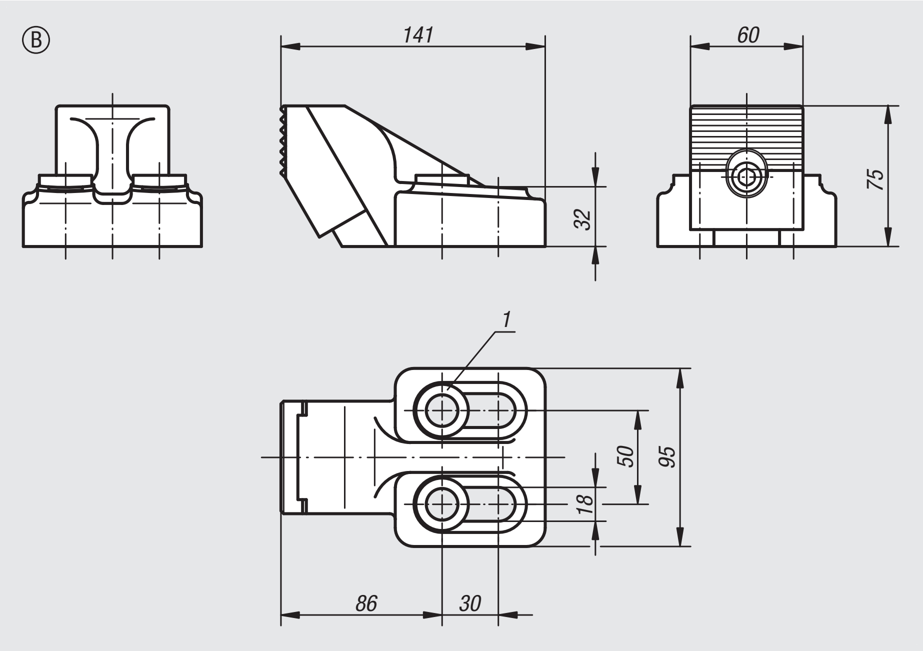
Form B:
2 conical seats and 2 spherical washers for M12 and M16 are supplied.

Drawing reference:
1) spherical washer set for M12 and M16
2) workpiece



Order No.	Form	F kN	F1 kN	Tightening torque Nm
04530-03	B	58	2,4	150

Side stops



Material:
Body ductile iron (SG iron).
Jaw hardened carbon steel.

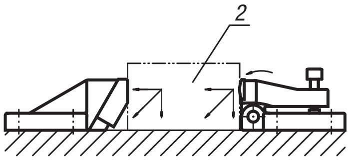
Version:
Painted black.
Jaw bright.

Sample order:
nlm 04540-01

Note:
The workpiece is clamped between side clamps and the side stops, simultaneously producing a positive down force.
Side clamps and stops are secured with DIN 912 cylinder screws. A secure clamping is ensured when side clamps and side stops are used together.

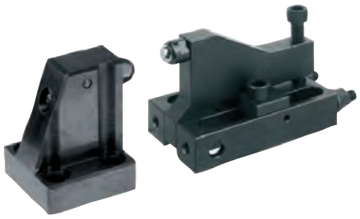
Form B:
2 conical seats and 2 spherical washers for M12 and M16 are supplied.

Drawing reference:
1) spherical washer set for M12 and M16
2) workpiece



Order No.	Form
04540-02	B

Side clamps

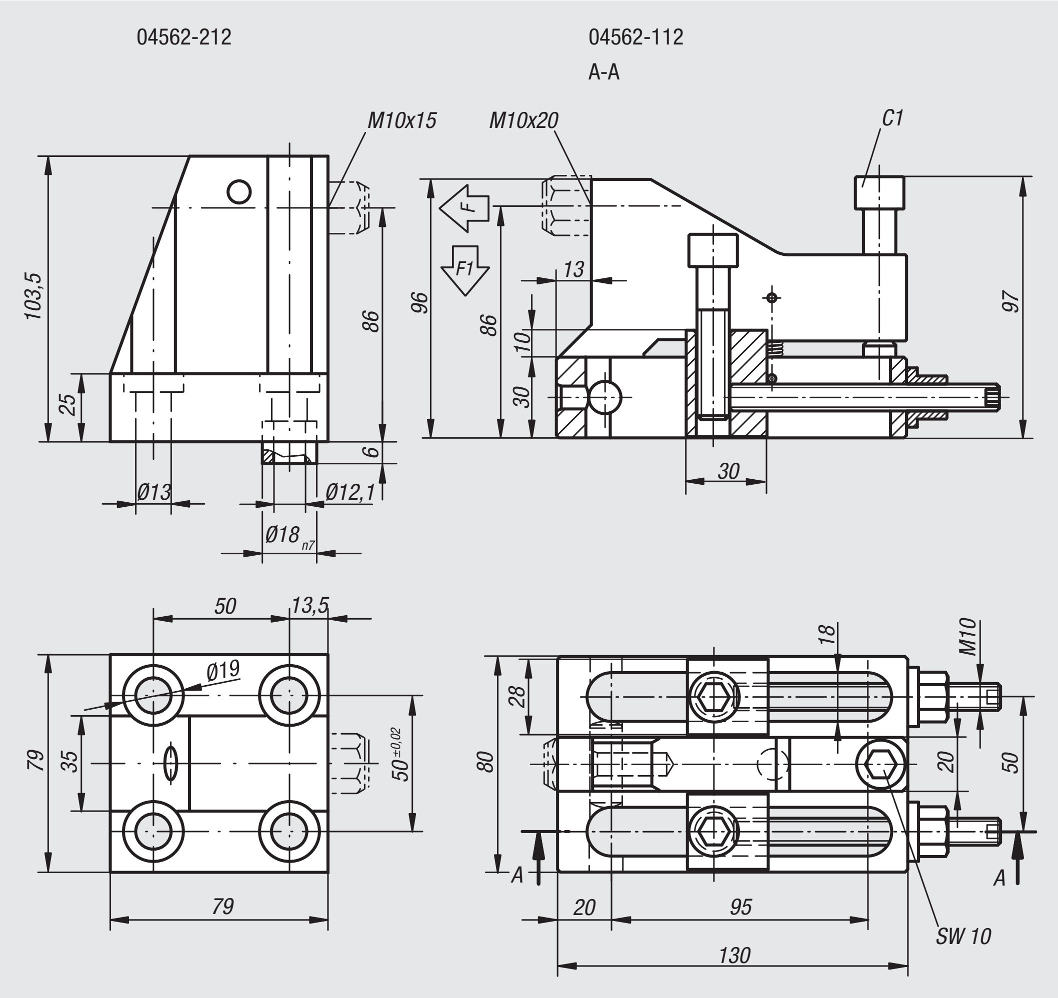


Material:
Body steel 1.1191.

Version:
Black oxidised.
Centring bush hardened.

Sample order:
nlm 04562-112
(self-aligning pads not supplied)

Note:
The unit comprises of an adjustable side clamp and a side stop and are used to clamp workpieces with a simultaneous positive down force. The side clamp has two DIN 913 grub screws which can be set to prevent backward slippage during clamping.



Order No.	F N	F1 N	Tightening torque of screw C1 Nm
04562-112	25000	5000	30
04562-212	22500	4500	30

Notes

04567

Wedge clamps

Material:
Carbon steel.

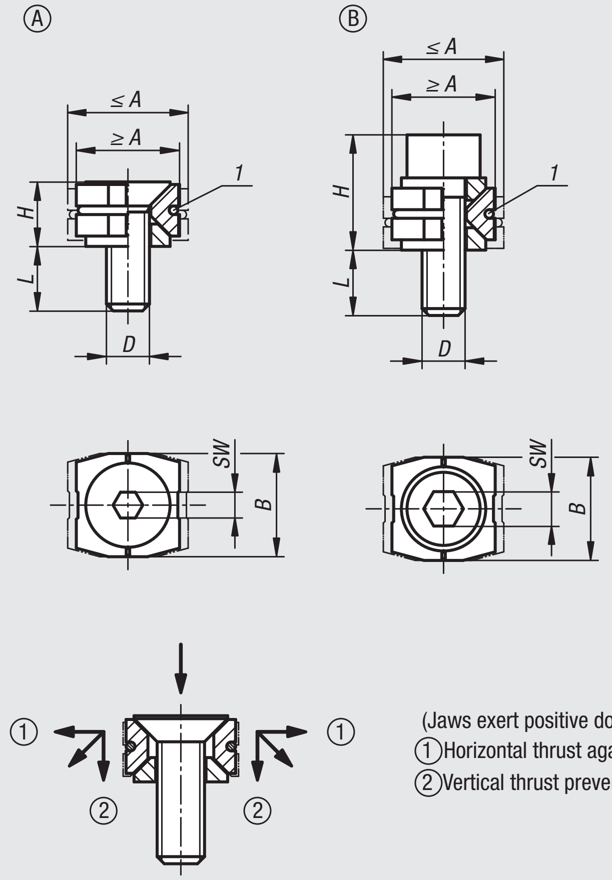
Version:
Jaw plate hardened (33–39 HRC) and black oxidised.

Sample order:
nlm 04567-11205

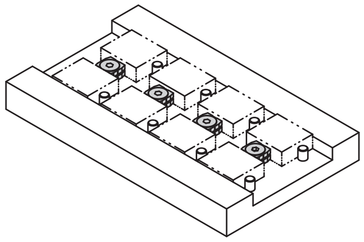
Note:
Due to the functioning principle, wedge clamps are suitable for clamping in series.
The wedges generate higher clamping forces.
The wedge clamps are available with cap screws or countersunk screws.
Wedge clamps with pull-down effect.

Drawing reference:
Dimension L refers to ≤ A.
Dimension H refers to ≥ A.

1) O-ring

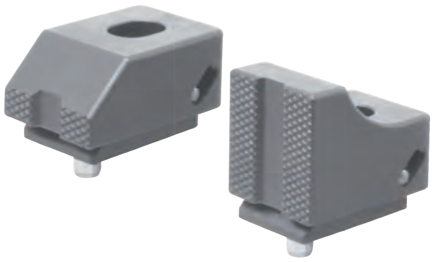


(Jaws exert positive down force)
①Horizontal thrust against workpiece
②Vertical thrust prevents the workpiece lifting



Order No.	Form	Version 2	A min.	A max.	B	D	H	L	SW	Clamping force max. kN	Tightening torque max. Nm
04567-11205	A	with csk. screw	12	14	12	M5X15	7,5	9,5	3	2	4,3
04567-11506	A	with csk. screw	15	17	14,8	M6X16	8,7	9,3	4	3,5	7,3
04567-11808	A	with csk. screw	18,5	21,5	18,4	M8X20	11,8	11,3	5	5	18
04567-21205	B	with socket head screw	12	14	12	M5X16	13,4	9,6	4	3	5,4
04567-21506	B	with socket head screw	15	17	14,8	M6X18	15,8	10,2	5	4,5	9,1
04567-21808	B	with socket head screw	18,5	21,5	18,4	M8X25	21,2	14,9	6	9	22

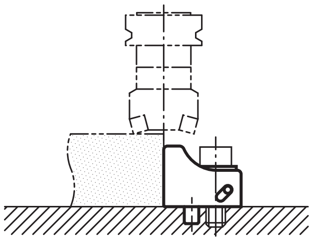
Toe clamps

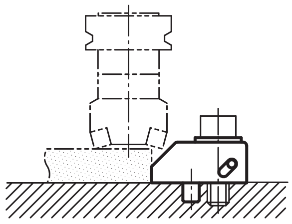


Material:
Carbon steel.

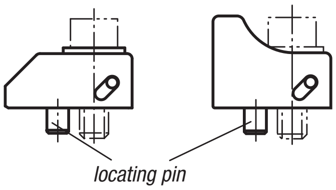
Version:
Tempered and black oxidised.

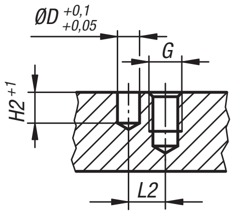
Sample order:
nlm 04570-0806

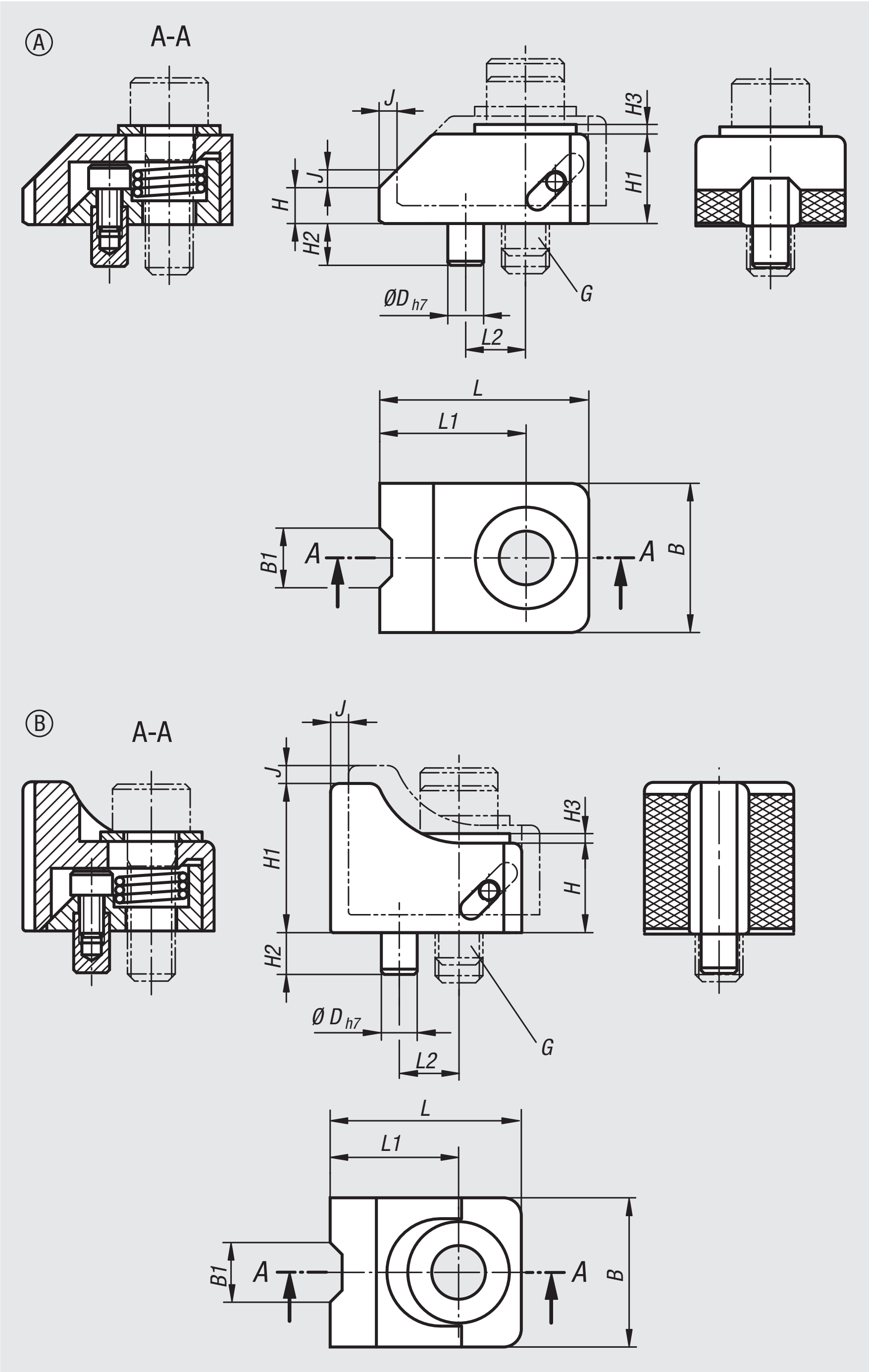




mounting instructions:







Order No.	Form	B	B1	D	G	H	H1	H2	H3	J	L	L1	L2	Clamping force N	Tightening torque Nm
04570-0806	A	25	10	6	M8	6	15	7	1,6	3	35	24,5	10	7000	25
04570-1008	A	30	11	6	M10	8	19	7	2	4	43	29	12	8500	50
04570-1209	A	35	12	8	M12	9	23	10	2,3	5	54	37	16	20000	90
04570-1610	A	40	14	10	M16	10	25	10	3,2	6	65	45	20	40000	200
04570-0825	B	25	10	6	M8	15	25	7	1,6	3	32	21,5	10	7000	25
04570-1032	B	30	11	6	M10	19	32	7	2	4	40	26	12	8500	50
04570-1238	B	35	12	8	M12	23	38	10	2,3	5	50	33	16	20000	90
04570-1645	B	40	14	10	M16	25	45	10	3,2	6	60	40	20	40000	200

Flat clamps

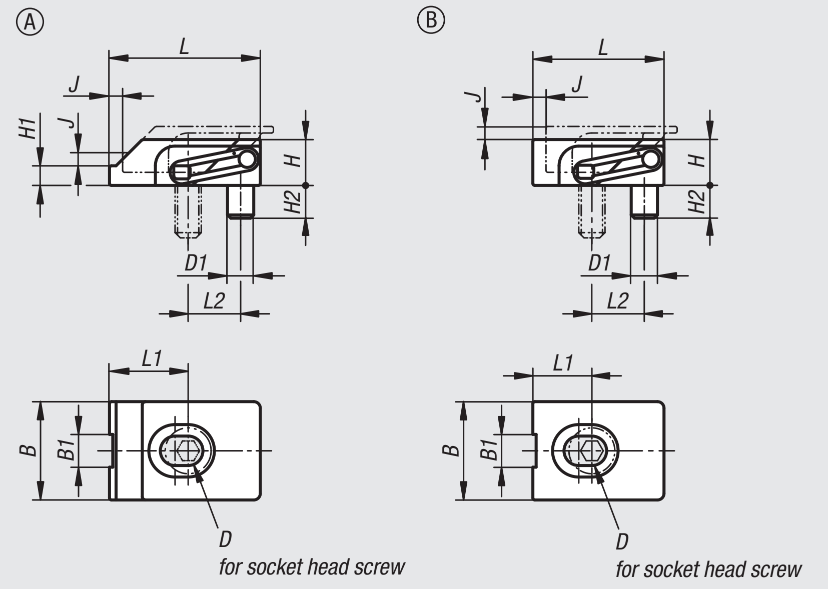
Material:
Carbon steel.

Version:
Hardened (33–39 HRC) and black oxidised.

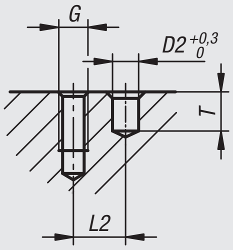
Sample order:
nlm 04571-204

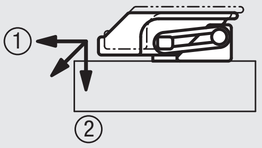
Note:
Particularly low workpieces can be clamped using these flat clamps.
Clamping element with pull-down effect.
Clamping element and fixed block in one compact unit.

Drawing reference:
Dimension L1 refers to clamped state.

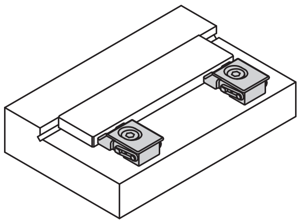


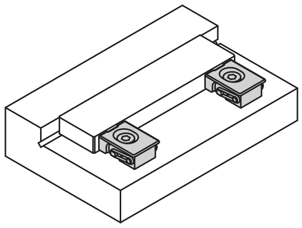
installation instructions





(Jaws exert positive down force)
① Horizontal thrust against workpiece
② Vertical thrust prevents the workpiece lifting



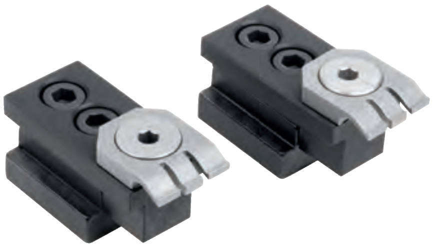


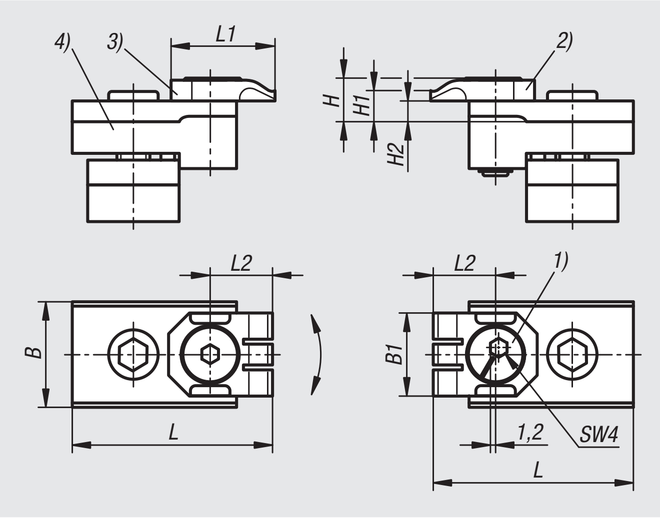
Order No.	Form	B	B1	D1	D2	G	H	H1	H2	J	L	L1	L2	T	Clamping force max. kN	Tightening torque max. Nm
04571-104	A	15	5	4	4	M4	7	3	5	2	23	12	8	6	2	2,7
04571-105	A	19	7	5	5	M5	9	4	6	2,5	28	14	10	7	3	5,4
04571-204	B	15	5	4	4	M4	7	-	5	2	20	9	8	6	2,5	2,7
04571-205	B	19	7	5	5	M5	9	-	6	2,5	25	11	10	7	3,5	5,4

04571-10

Flat clamp, steel

for T-slot





Material:
Steel body.
Clamping element and stop made from spring steel.

Version:
Base element tempered.

Sample order:
nlm 04571-10-10

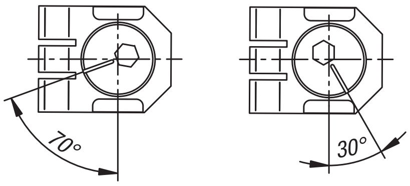
Note for ordering:
The order number includes one pair, made up of a clamping element and a stop.

Note:
By turning the cam screw on the clamping element the workpiece is forced downwards (positive down force). The clamping element also forces the workpiece against the stop, thereby providing a flat parallel seating.
The stop side provides a reference that makes precise replications possible.
Cam hub: 1.2 mm.

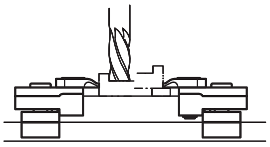
Application:
Suitable for clamping multiple and individual parts on fixtures and T-slot tables.

Drawing reference:
1) Cam screw
2) Clamping element
3) Stop
4) Body

Using the cam



Quick clamp 1/4 rotation



Workpiece clamped directly on the table top or supported on rests from below (e.g for drilling though).

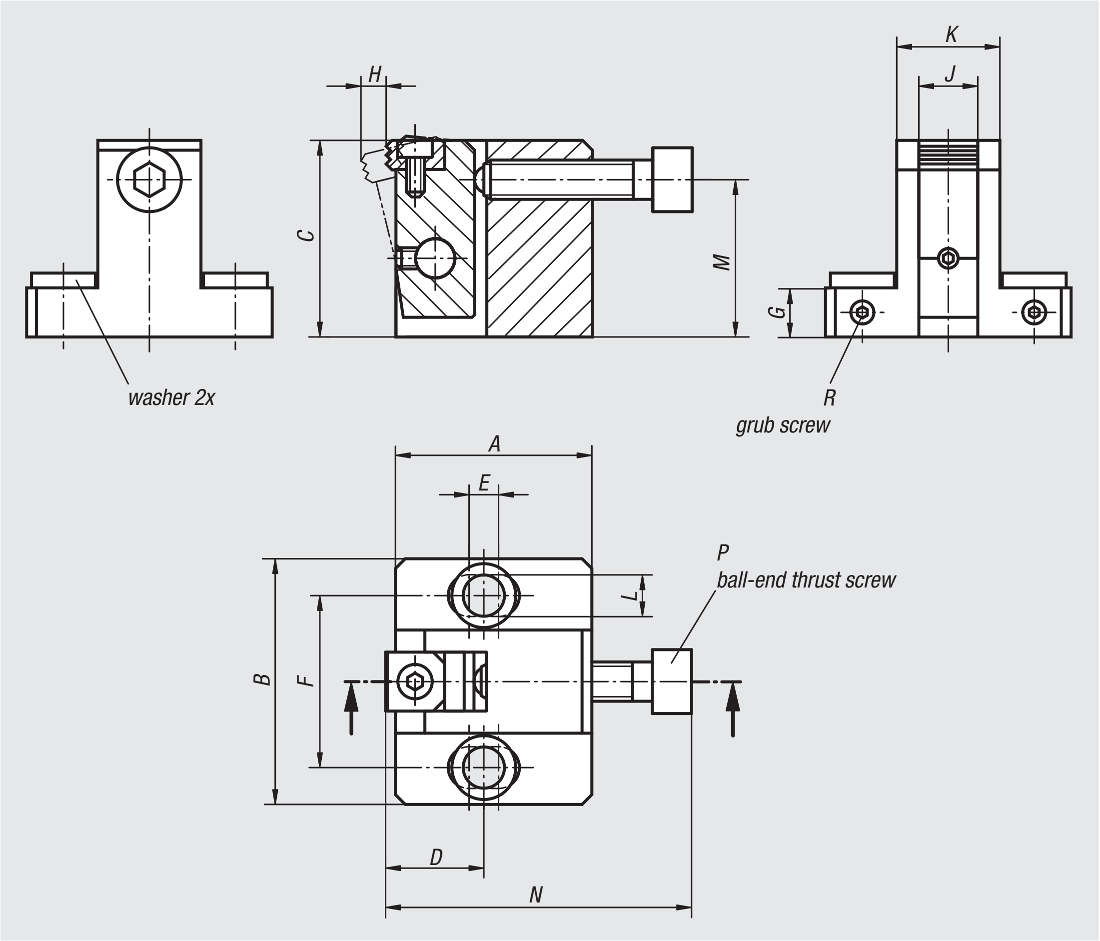
Order No.	B	B1	H	H1	H2	L	L1	L2	SW	Slot width	F kN	Tightening torque Nm
04571-10-10	18	20	10,5	7,5	5	46	25	15	4	10	4	9
04571-10-12	18	20	10,5	7,5	5	48	25	15	4	12	4	9
04571-10-14	22	20	10,5	7,5	5	52	25	15	4	14	4	9
04571-10-16	25	20	10,5	7,5	5	48	25	15	4	16	4	9
04571-10-18	25	20	10,5	7,5	5	48	25	15	4	18	4	9

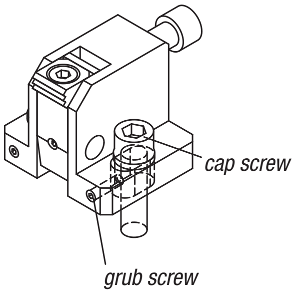
Side clamps

Material:
Housing and arm carbon steel.
Jaw tool steel.

Version:
Housing, black oxidised.
Arm and jaw tempered and black oxidised.

Sample order:
nlm 04575-080400





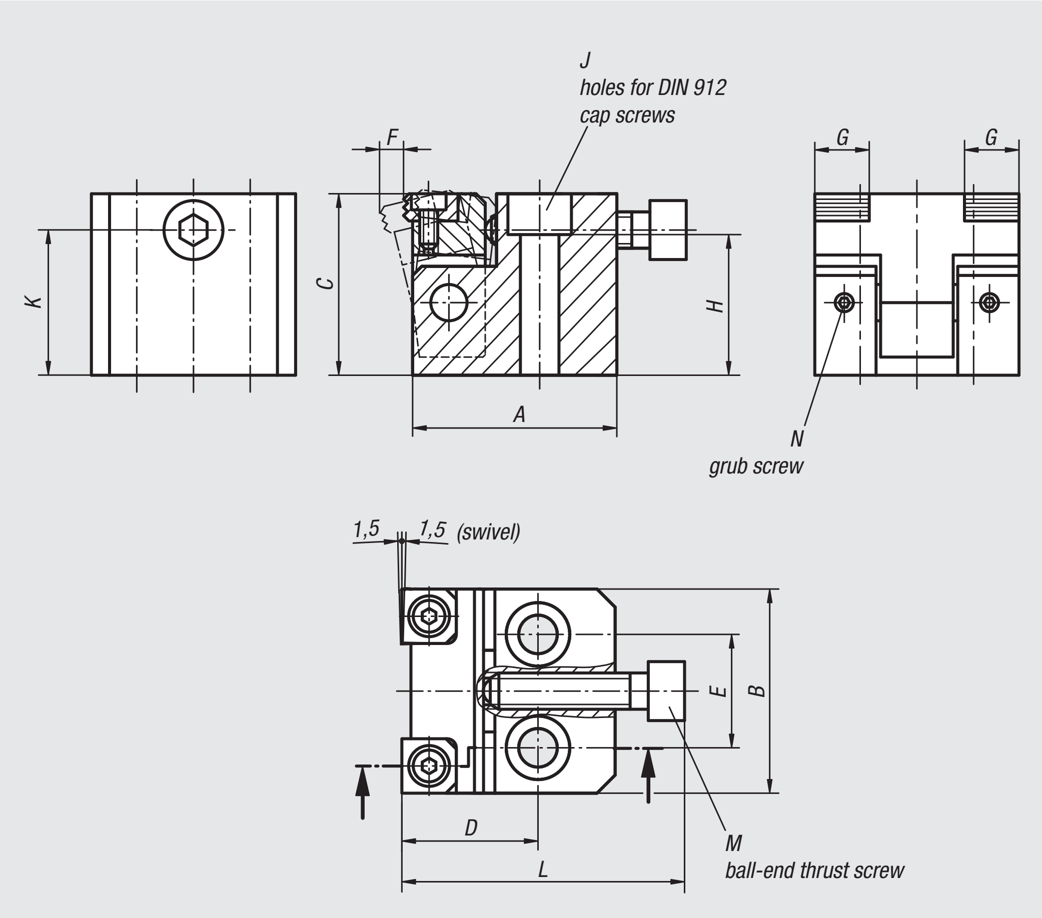
Order No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	F=Retaining force N	Tightening torque Nm
04575-080400	40	50	40	20	6	35	10	5,3	12	21	8,5	32	62,5	M8 x 35	M4x10	15000	25
04575-100500	50	65	50	25	8	45	12	7,1	16	27	11	40	74	M10 x 40	M4x12	27000	50
04575-120600	60	70	60	30	10	50	15	8	20	31	13	48	91	M12 x 50	M5x15	38000	90
04575-160800	80	90	80	40	15	65	20	10,2	25	39	17	64	115	M16 x 60	M6x20	46000	130

Side clamps

Material:
Body and arm carbon steel.
Jaw tool steel.

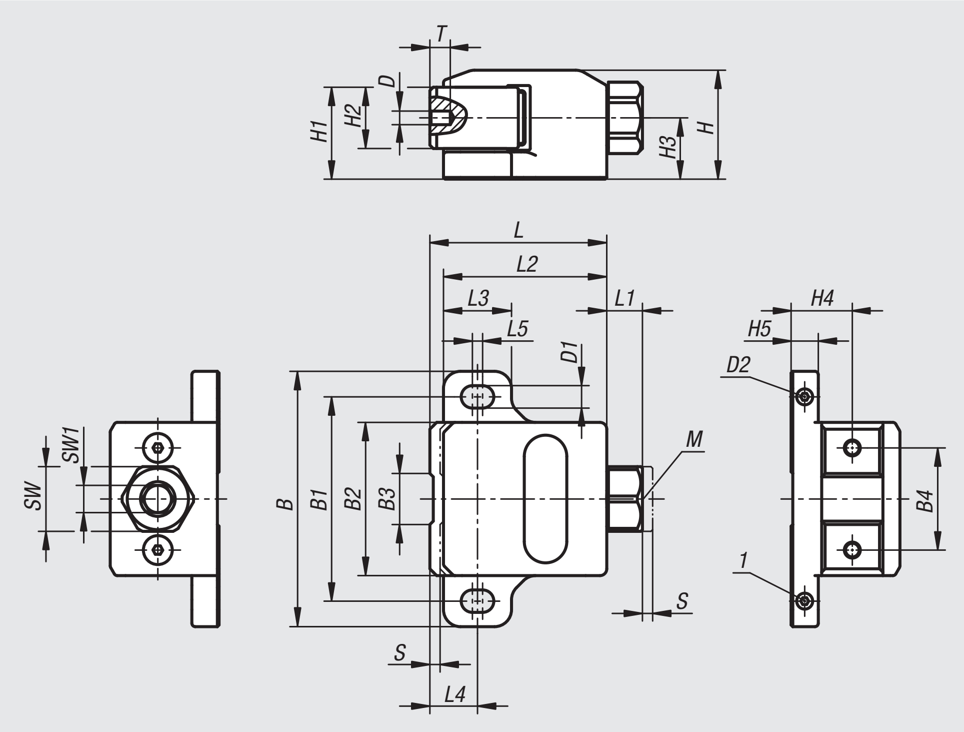
Version:
Body black oxidised.
Arm and jaw tempered and black oxidised.

Sample order:
nlm 04578-080400



Order No.	A	B	C	D	E	F	G	H	J	K	L	M	N	F=retaining force N	Tightening torque Nm
04578-080400	45	45	40	30	25	5,3	12	31	M8	32	62,5	M8x35	M4x4	15000	25
04578-100500	55	55	50	40	30	7,1	16	39	M10	40	74	M10x40	M4x4	27000	50
04578-120600	65	65	60	45	35	8	20	47	M12	48	91	M12x50	M5x5	38000	90

Side Clamp



Material:
Carbon steel.

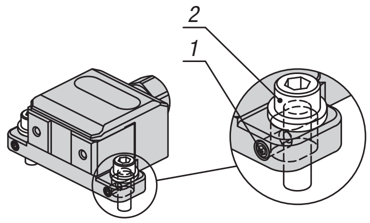
Version:
Body black oxidised.
Clamping face ground.

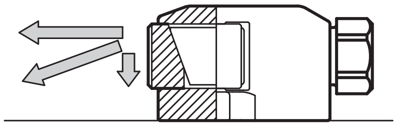
Sample order:
nlm 04579-0900

Note:
Tighten the setscrew to prevent the side clamp sliding back during the clamping process.

Advantages:
- High clamping force
- Ground clamping face
- Pull-down force prevents the workpiece lifting

Drawing reference:
1) Setscrew
2) Cap screw





Order No.	B	B1	B2	B3	B4	D	D1	D2	H	H1	H2	H3	H4	H5	L	L1	L2	L3	L4	L5	SW	SW1	T	Travel S	Clamping force kN	Tightening torque max. Nm
04579-0900	75	60	45	15	30	M4	6,6	M4x6	32	27	18	18	18	8	52	10	48	20	14	3	19	8	6	3	9	25
04579-1400	100	80	60	20	40	M5	8,6	M5x8	40	33	22	22	22	10	69	13	63	26	19	4	24	10	8	4	14	50

04610

Swivel hold-down clamps

mini, with cam lever

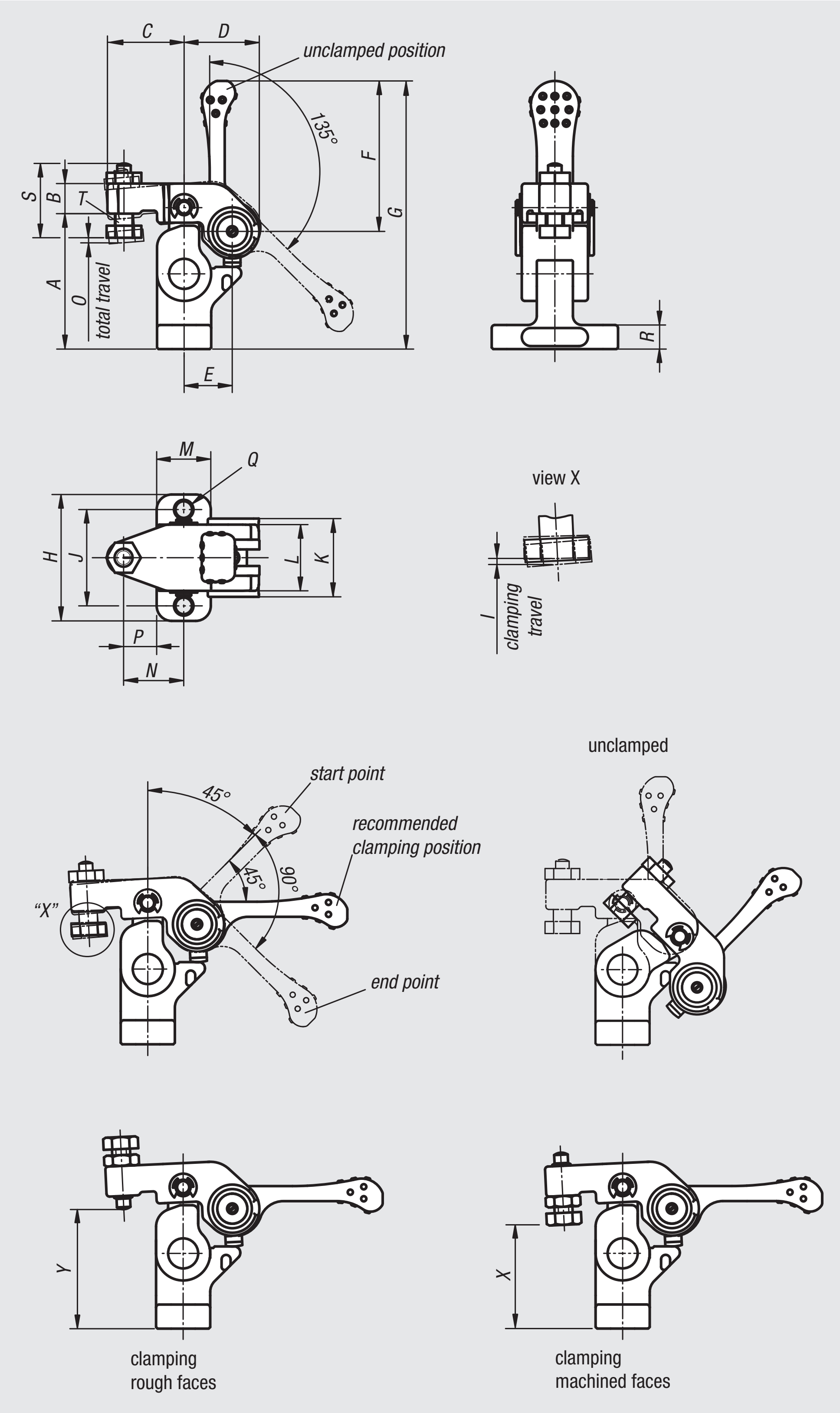
Material:
Carbon steel.

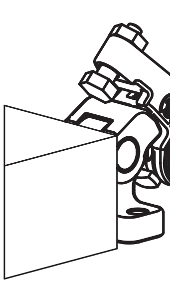
Version:
Tempered and black oxidised.

Sample order:
nlm 04610-100

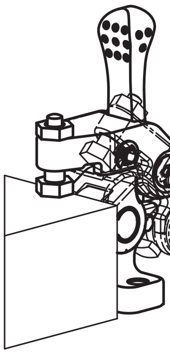
Note:
Swing clamps are used where the clamping points must be free when the workpiece is loaded or removed.

* Admissible hand force for the handle.

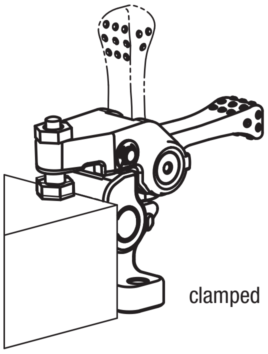




unclamped



swivel



clamped

Order No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	X min.	X max.	Y min.	Y max.	F=retaining force N	Hand force FH N
04610-100	45	10	25,5	25	16	50	89	42	1	32	26	22	18	20	1,5	11	5,5	8	24	M6	31,5	40,5	34,5	43,5	700	100*
04610-150	55	12	32	31	20	63	109	52	1,2	40	32	28	22	25	1,8	14	6,6	10	30,5	M8	36,4	48,6	41,4	53,6	1100	150*

Down-thrust clamps

Material:
Steel.

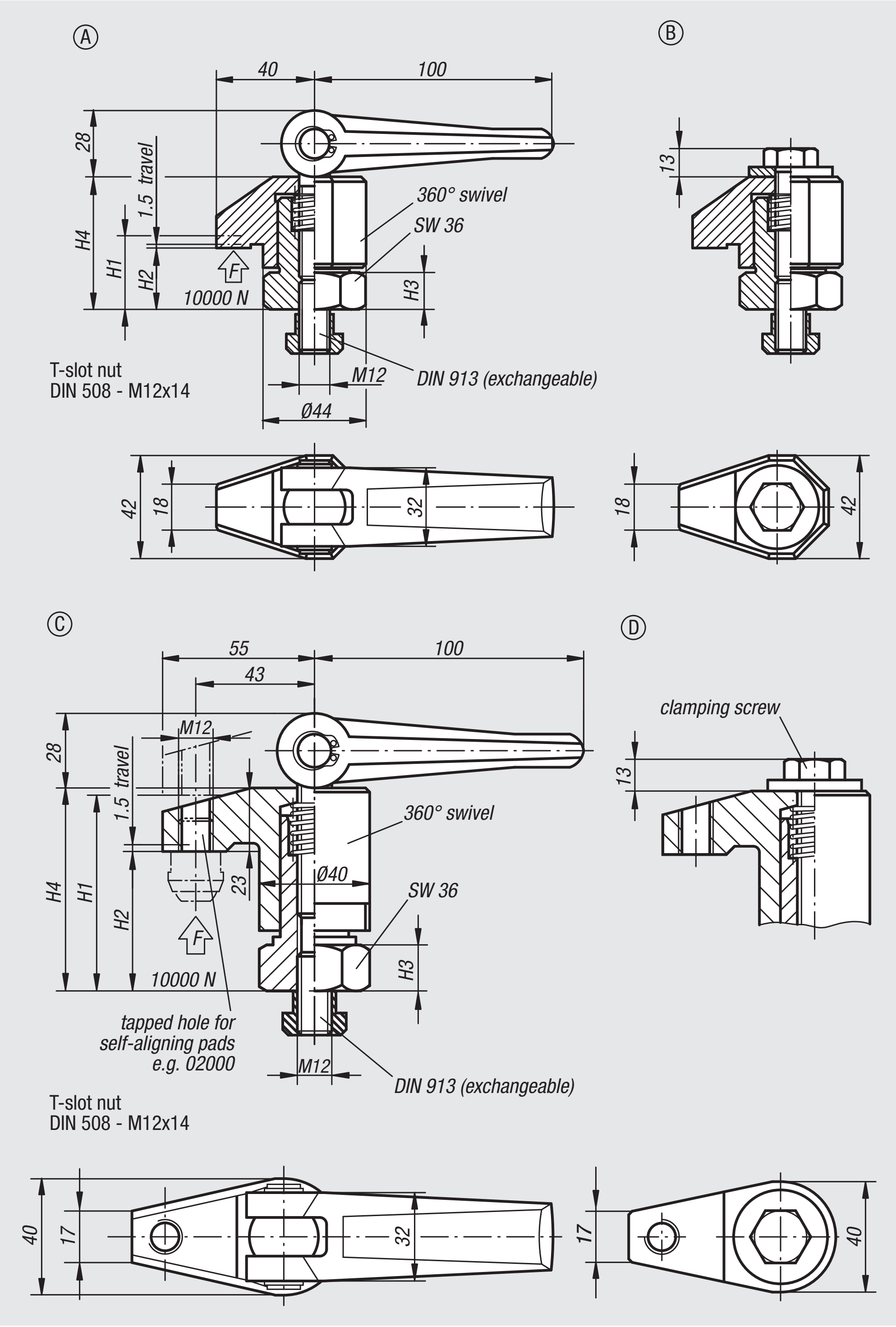
Version:
Case-hardened, black oxidised and ground.

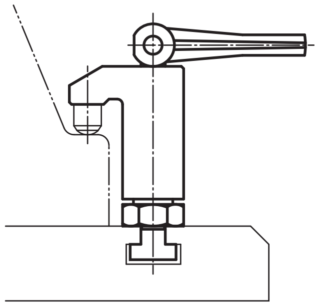
Sample order:
nlm 04620-23

Note:
The clamping heights can be increased with riser bars 04378 and for 04620-12 to 04620-14 and 04620-22 to 04620-24 reduced by self-aligning pads 02000.

Advantages:
- Rapid clamping by hand via threaded spindle and spiral cam.
- Quick and easy workpiece exchange by pivoting the clamp arm.
- Compact design, small clamping space required.
- Simple adaptation to tall clamping heights using the riser cylinders.

The clamps can be mounted in two ways:
1) in a T-slot.
2) by the M12 screw directly in a fixture base.



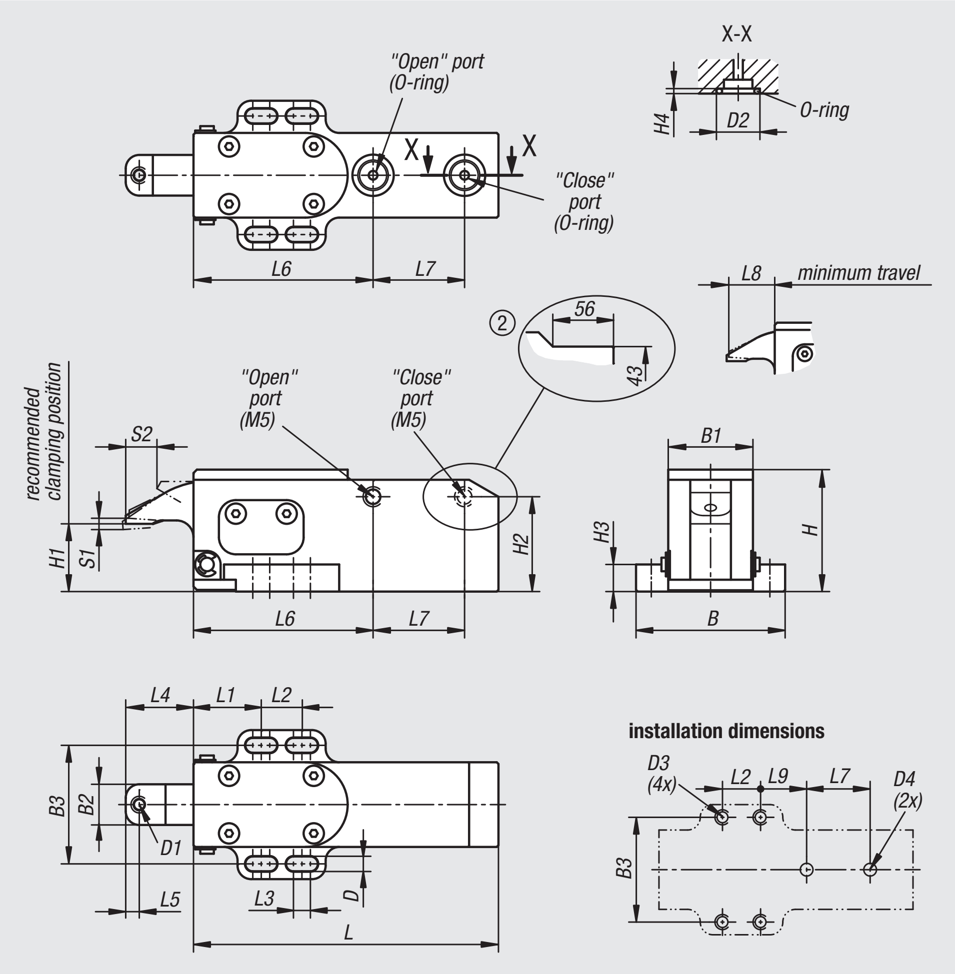


Order No.	Form	Form-Type	Clamping height max. H1	Clamping height min. H2	H3	H4
04620-11	A	with cam lever	30	25	15	54-59
04620-12	C	with cam lever and thread	70	50	15	73-93
04620-13	C	with cam lever and thread	98	68	15	91-121
04620-14	C	with cam lever and thread	135	95	22	118-158
04620-21	B	with clamping screw	30	25	15	54-59
04620-22	D	with clamping screw and thread	70	50	15	73-93
04620-23	D	with clamping screw and thread	98	68	15	91-121
04620-24	D	with clamping screw and thread	135	95	22	118-158

04624

Hold-down clamps

pneumatic



Material:
Housing aluminium.
Clamping arm steel.

Version:
Housing anodised.
Clamping arm black oxidised.

Sample order:
nlm 04624-090

Note:
The pneumatic hold-down clamp is suitable for clamping workpieces from above. This clamp is operated with standard pressure compressed air. The large swivel angle of the clamping arm makes it easy to insert and remove the workpieces without any obstructions, guaranteeing optimum accessibility to the workpiece. The block design of the housing offers universal fastening possibilities, which means that the clamp can be optimally adapted to the workpiece being clamped. Self-aligning pads with a smooth or serrated faces can be fitted in the clamping arm, enabling rough or machined workpieces to be clamped. These pneumatic clamps can be placed in multiple positions on the workpiece and operated in any particular order. They can be controlled manually or automatically. As these clamps are pneumatically actuated, they relieve the operator, particularly where frequent clamping processes are carried out.

The clamping forces indicated are based on 0.5 MPa.

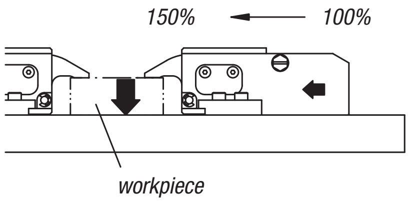
Order No.	Size	B	B1	B2	B3	D	D1	D2	D3	D4	H	H1	H2	H3	H4
04624-090	1	44	25	12	35	4,5	M4	12,2	M4	2-4	36	20	28	8	1,9
04624-135	2	65	40	18	53	6,5	M6	18	M6	2-6	54	30	33	12	2,4

Order No.	L	L1	L2	L3	L4	L5	L6	L7	L8	L9	S1 (travel)	S2	F=retaining force N	Operating pressure MPa
04624-090	90	20	12	5	20	4	53	27	19	21	2	9	140	0,3 - 1,0
04624-135	135	30	20	8	32	6	84	38	30,5	34	3	15	320	0,3 - 1,0

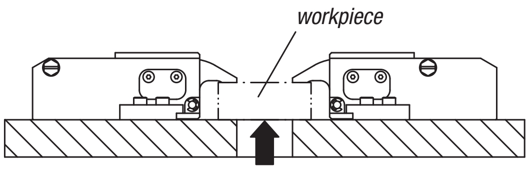
Hold-down clamps

pneumatic

The clamping mechanism increases the clamping force by 150% compared to a pneumatic cylinder of the same size.



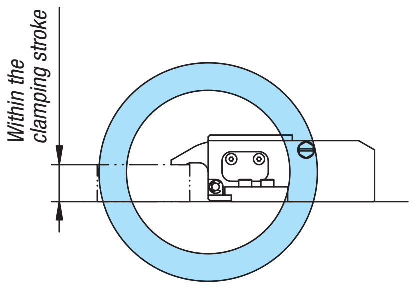
The clamping arm is operated via a wedge mechanism.
If the air pressure drops due to an air leak, the wedge mechanism prevents the clamping force from dropping rapidly.



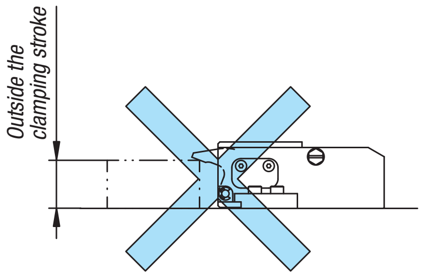
Permissible counterforce (per clamping element)

Size	Permissible clamping force (kN)
1	1
2	2,2

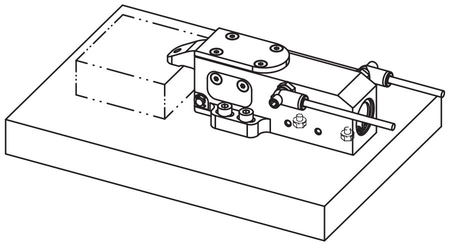
Use side clamp within the clamping travel.



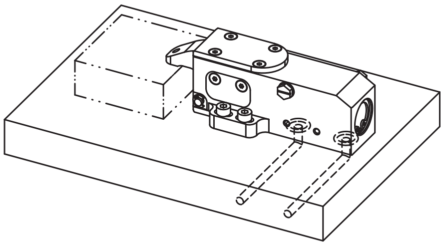
The wedge mechanism is used to clamp the workpiece securely in place.



The wedge mechanism will not function.

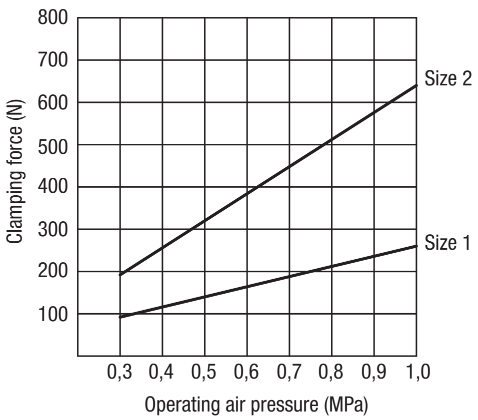


Side port as shown.
Lower ports must be sealed.



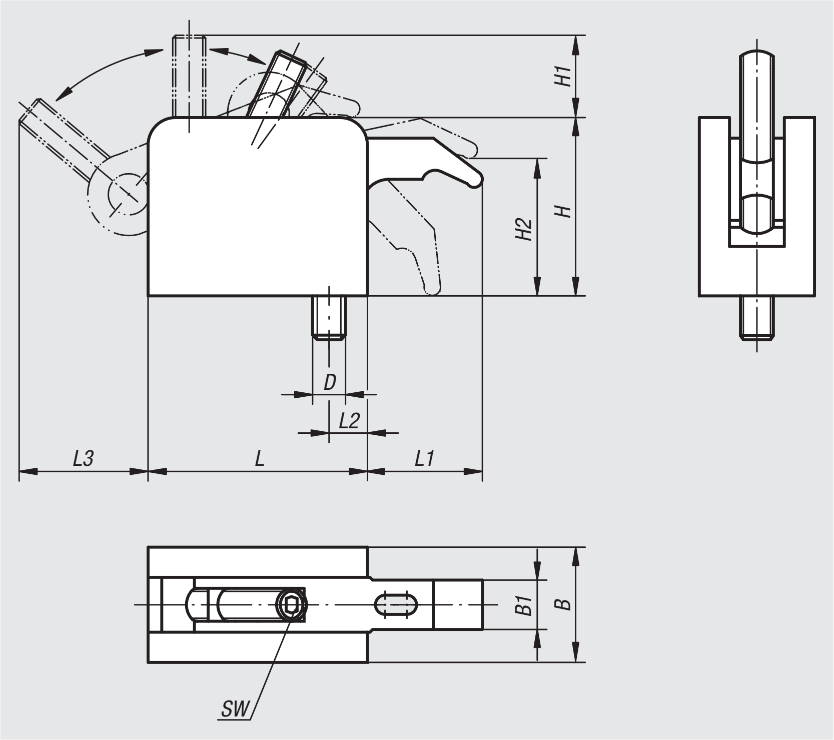
Connection from below.
The side ports must be sealed.

Performance curve



04625

Compact clamps



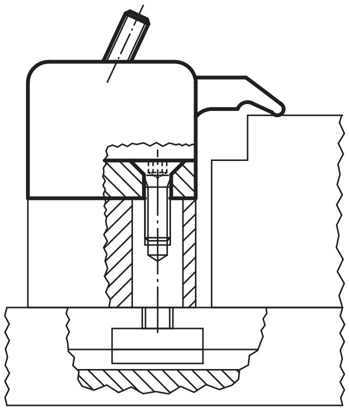
Material:
Housing aluminium.
Clamping lever hardened steel.
Clamping screw grade 10.9.

Version:
Housing bright, clamping lever ground and black oxidised.

Sample order:
nlm 04625-108

Note:
The clamping arm of this compact clamp is fully retractable.
Technical benefits:
- unhindered workpiece changes.
- infinitely variable adjustment.
- high self-locking clamping force.
- variable height assembly (riser blocks see 04626).
- high clamping force without great effort.
- clamp also suitable as stop.

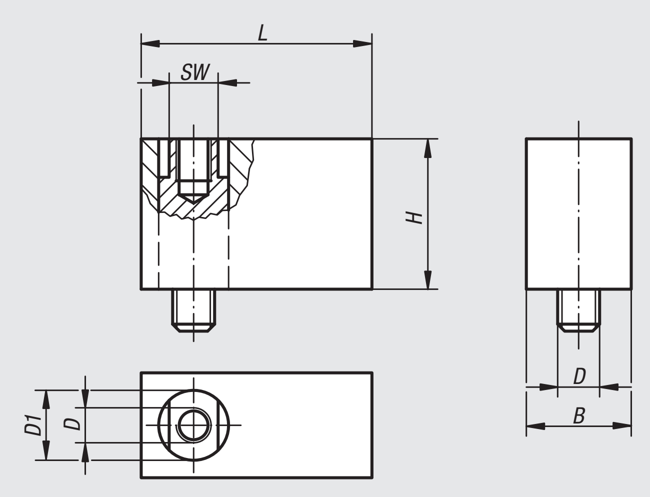
On request:
Longer tightening arm (L1).



Order No.	Size	L	L1	L2	L3	B	B1	H	H1	H2	D	SW	Clamping force kN
04625-106	1	53	27	11	29	32	11	43	17	30	M6	4	5
04625-108	1	53	27	11	29	32	11	43	17	30	M8	4	5
04625-210	2	80	40	17	45	42	18	65	30	50	M10	6	10
04625-212	2	80	40	17	45	42	18	65	30	50	M12	6	10
04625-312	3	107	53	22	57	53	25	87	32	67	M12	8	15

Riser blocks

with draw bolt



Material:
Riser block aluminium.
Draw bolt steel.

Version:
Riser block bright.
Draw bolt black oxidised.

Sample order:
nlm 04626-108

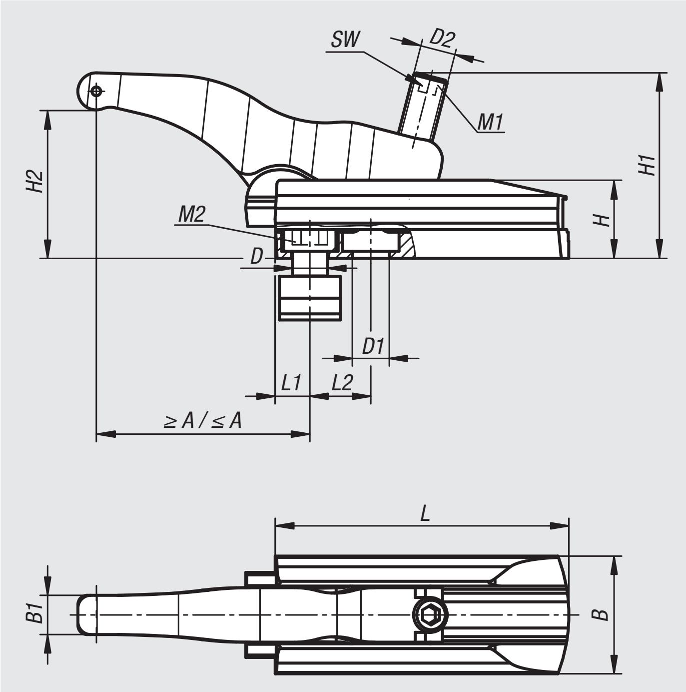
Note:
The riser blocks are the height adjustment elements for the compact clamps (04625).

Order No.	Size	L	B	H	D	D1	SW
04626-106	1	53	32	30	M6	15	13
04626-108	1	53	32	30	M8	15	13
04626-210	2	80	42	50	M10	25	19
04626-212	2	80	42	50	M12	25	19
04626-312	3	107	53	70	M12	30	24

Notes

04629

Power clamp



Material:
Carbon steel.

Version:
Forged, black electro zinc-plated.

Sample order:
nlm 04629-012135

Note:
We recommend using a lubricating paste to reduce wear to the adjustment screw.
Risers are available to increase the height of the power clamp.

Supplied with clamping element, support element, DIN 508 slot key and grade 12.9 bolt.

Application:
The height of the clamping arm can be infinitely adjusted using the adjustment screw and the workpiece can then be clamped.

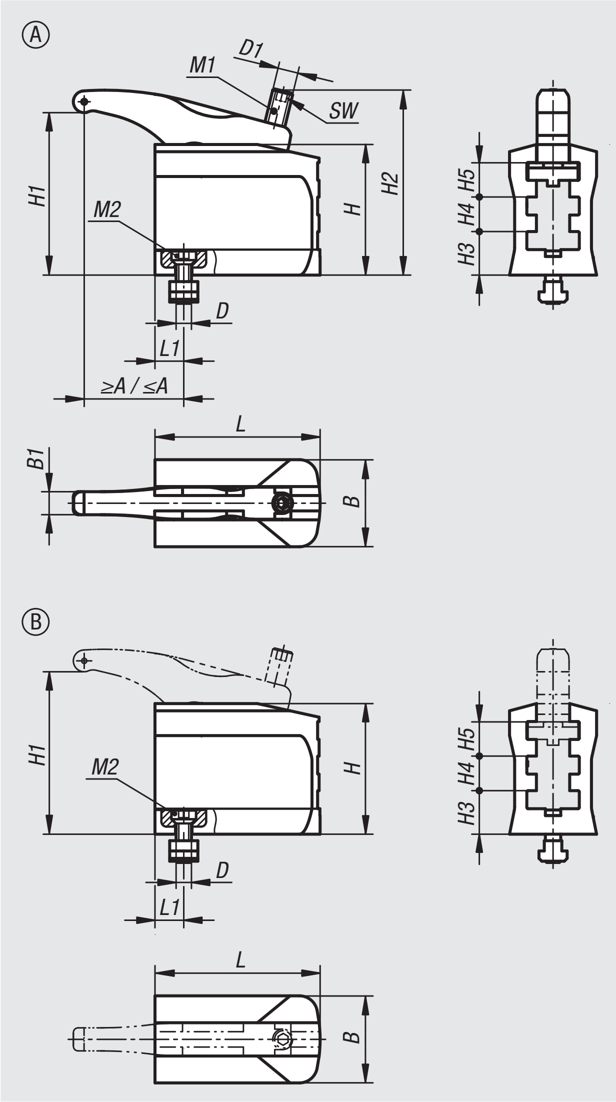
Advantages:
- Very high retaining forces of 22–49 kN.
- Low height.
- Simple element assembly.
- Enables very fast, simple clamping.
- Infinitely adjustable height and length.
- Use in 12-28 mm T-slots or M10, M12, M16, M20 grid systems.
- Thrust pad available in smooth and serrated versions.

Accessories:
Riser 04630
Thrust pads 04631

Order No.	Version 1	H2	A min.	A max.	B	B1	Slot width	D	D1	D2	H	H1	L	L1	L2	SW	Clamping force kN	Tightening torque M1 Nm	Tightening torque M2 Nm
04629-112135	long	6-68	13	110	54	18	14	M12	13	M16	36	85	135	13	25	8	30	100	70
04629-116135	long	6-68	16	114	54	18	18	M16	17	M16	36	85	135	16	28	8	30	100	150
04629-116155	long	5-80	16	134	60	20	18	M16	17	M20	42	105	155	16	32	10	43	220	150
04629-120175	long	7-88	19	165	75	25	22	M20	21	M24	52	125	175	19	36	12	49	220	200
04629-210065	short	5-38	15	50	45	13	12	M10	-	M12	30	58	65	11	-	6	22	50	35
04629-212065	short	5-38	15	50	45	13	14	M12	-	M12	30	58	65	11	-	6	22	50	40
04629-212095	short	6-50	12	82	54	18	14	M12	13	M16	36	78	95	12	20	8	32	120	70
04629-216110	short	6-50	15	95	60	20	18	M16	17	M20	42	92	110	15	26	10	40	150	150

04629-10

Power clamp 3 stage



Material:
Carbon steel.

Version:
Forged, black electro zinc-plated.

Sample order:
nlm 04629-10-1121301

Application:
The height of the clamping arm can be infinitely adjusted using the adjustment screw and the workpiece can then be clamped.

Assembly:
1. Position the support element on the machine table and fasten using the recommended torque.
2. Bring the clamping arm into the required position.
3. Clamp the workpiece by tightening the set screw.

Advantages:
- Very high retaining forces of 22–49 kN.
- Simple element assembly.
- Enables very fast, simple clamping.
- Infinitely adjustable height and length.
- Use in 14-28 mm T-slots or M12, M16, M20 grid systems.
- Thrust pad available in smooth and serrated versions.

Supplied with:
Form A:
- Clamping unit
- 3 stage support element
- Fastening set

Form B:
- 3 stage support element
- Fastening set

Accessories:
Raiser 04630
Thrust pads 04631

04629-10

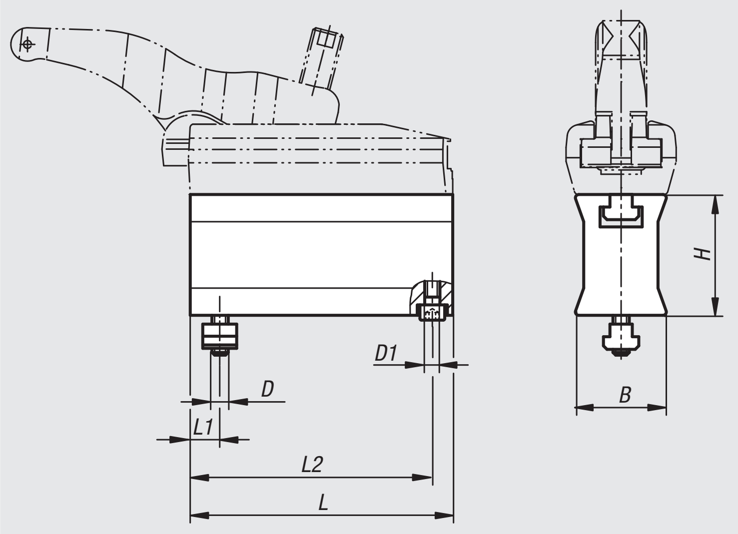
Power clamp 3 stage

Order No.	Version 1	Form	Form-Type	H1	A min.	A max.	B	B1	Slot width	D	D1
04629-10-2120651	short	A	with clamping arm	9-74	30	58	52	13	14	M12	M12
04629-10-1121301	long	A	with clamping arm	13-129	37	106	68	18	14	M12	M16
04629-10-1161501	long	A	with clamping arm	16-147	48	144	75	20	18	M16	M20
04629-10-1201701	long	A	with clamping arm	16-169	68	172	85	25	22	M20	M24
04629-10-2120650	short	B	without clamping arm	9-74	-	-	52	-	14	M12	-
04629-10-1121300	long	B	without clamping arm	13-129	-	-	68	-	14	M12	-
04629-10-1161500	long	B	without clamping arm	16-147	-	-	75	-	18	M16	-
04629-10-1201700	long	B	without clamping arm	16-169	-	-	85	-	22	M20	-

Order No.	Form	H	H2	H3	H4	H5	L	L1	SW	Clamping force kN	Tightening torque M1 Nm	Tightening torque M2 Nm
04629-10-2120651	A	67	98	25	16	16	65	14,5	6	22	55	40
04629-10-1121301	A	101	146	34	27	27	130	22,5	8	30	100	70
04629-10-1161501	A	116	175	43	29	29	150	25	10	43	200	150
04629-10-1201701	A	140	207	52	34	34	170	29	12	49	220	200
04629-10-2120650	B	67	-	25	16	16	65	14,5	-	22	-	40
04629-10-1121300	B	101	-	34	27	27	130	22,5	-	30	-	70
04629-10-1161500	B	116	-	43	29	29	150	25	-	43	-	150
04629-10-1201700	B	140	-	52	34	34	170	29	-	49	-	200

Risers

for power clamp



Material:
Carbon steel.

Version:
Forged, black electro zinc-plated.

Sample order:
nlm 04630-012060

Application:
The raiser is positioned and fastened to the machine table, the power clamp is then screwed onto the raiser. By turning the adjustment screw on the power clamp, the height of the clamping arm can be infinitely adjusted and the workpiece clamped.

Advantages:
- Other clamping heights can be achieved by mounting multiple risers one on the other.
- Infinite transition between clamping heights.
- Simple element assembly.
- For use in 12-28 mm T-slots or M10, M12, M16, M20 grid systems.

Order No.	Version 2	Slot width	B	D	D1	H	L	L1	L2	Clamping force kN
04630-012060	long	14	45	M12	M8	60	135	12	127	30
04630-016070	long	18	48	M16	M8	70	155	16	145	43
04630-020080	long	22	58	M20	M10	80	175	19	165	49
04630-110035	short	12	36	M10	M6	35	65	12	58,5	22
04630-112035	short	14	36	M12	M6	35	65	12	58,5	22
04630-112060	short	14	44,5	M12	M8	60	95	12	88	32
04630-116070	short	18	47,5	M16	M8	70	110	16	100	40

Thrust pads

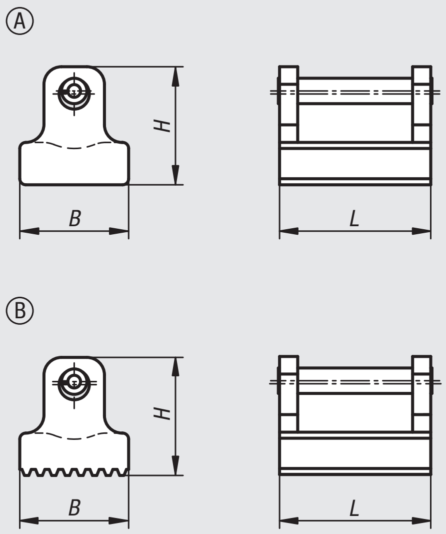
for power clamp

Material:
Stainless steel

Sample order:
nlm 04631-025

Note:
Power clamps can be fitted with serrated or smooth thrust pads.

Accessories:
Power clamp 04629
3-stage power clamp 04629-10



Order No. Form A smooth	Order No. Form B serrated	B	H	L
04631-019	**04631-119**	12	14	19
04631-025	**04631-125**	18	19,5	25
04631-030	**04631-130**	20	24	30
04631-036	**04631-136**	25	28	36

04750

Clamp nuts

Material:
Housing carbon steel, cover aluminium.

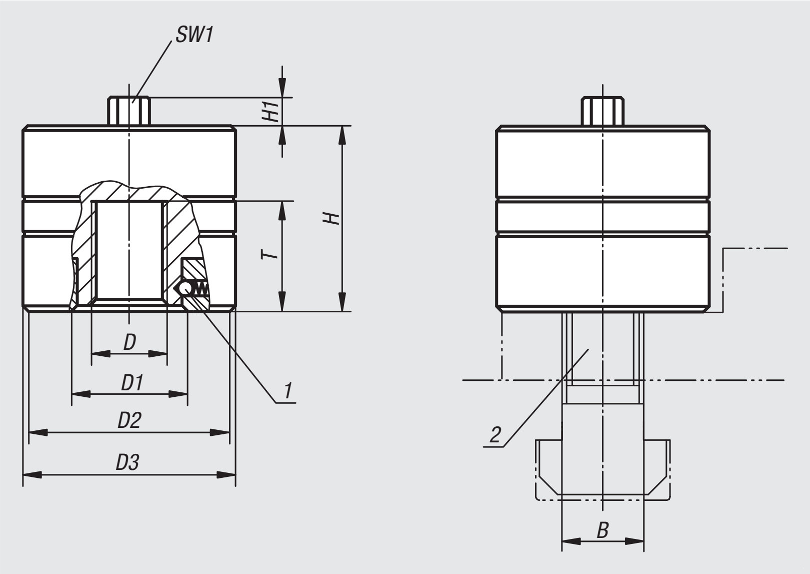
Version:
Carbonitrided

Sample order:
nlm 04750-6012

Note:
The main feature of the mechanical clamp nut is an integrated planetary gear to simplify the manual clamping torque. After manually adjusting the clamp nut up to the workpiece the drive pinion of the planetary gear is engaged by turning the hexagonal spigot “SW1” to the right. The clamp nut is self-locking in every position. The clamp nut can be used for many clamping tasks throughout the machining field, especially for clamping parts in presses and punches.
Suitable bolts for t-slots see 07040.

The clamp nuts are supplied without t-slot bolts.

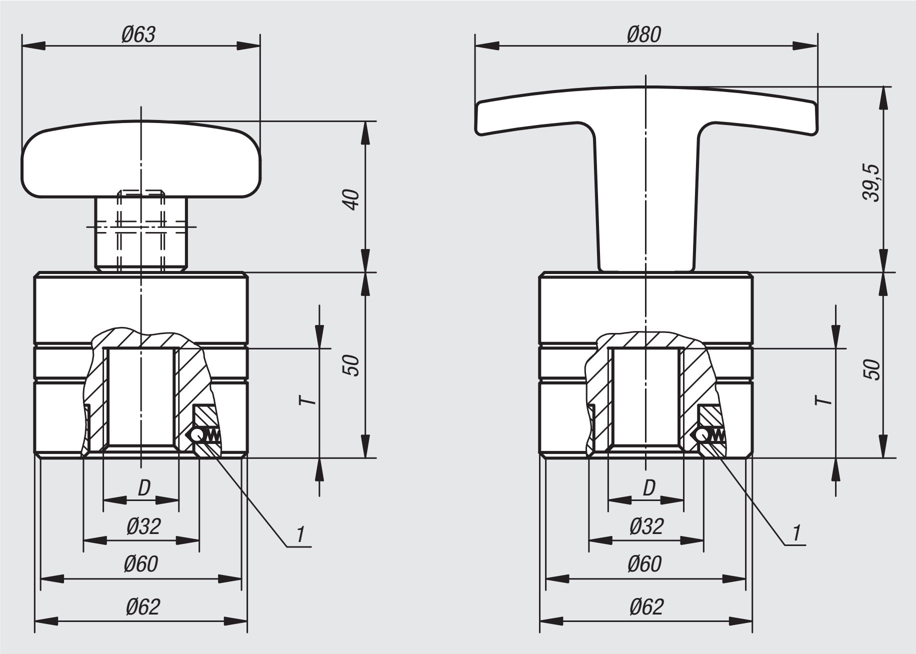
Drawing reference:
1) ratchet
2) screws for T-slots up to M24, min. grade 10.9



Clamp nut clamping sprockets during milling

Order No.	D	D1	D2	D3	H	H1	T min.	T max.	B	SW1	Clamping force max. kN	max. static load kN	Tightening torque max. Nm
04750-6012	M12	32	60	62	50	10	16	24	14	13	60	70	20
04750-6016	M16	32	60	62	50	10	16	24	18	13	60	120	25
04750-6020	M20	32	60	62	50	10	16	24	22	13	60	120	30
04750-10016	M16	42	71	73	70	10	25	35	18	15	100	130	35
04750-10020	M20	42	71	73	70	10	25	35	22	15	100	200	40
04750-10024	M24	42	71	73	70	10	25	35	28	15	100	200	45

Clamp nuts with star or T-grip



Material:
Housing high-carbon steel.
Cap aluminium.
Star grip and T-grip thermoplastic.

Version:
Carbonitrided; star and T-shaped grips: black

Sample order:
nlm 04751-4010

Note:
The clamp nut with star or T-grip are an improvement based on the tried and tested clamp nut 04750. A star or T-grip replaces the operating hexagon and an added indexing mechanism complements it. An integrated planetary gear serves as the force multiplier, the indexing mechanism triggers the automatic switch from the placing movement to the actual application of force. As a result, considerable clamping forces can be achieved with the simplest manual operation, with no additional ring or socket spanner. The robust construction and self-limiting function guarantee a high level of operating safety. Clamp nuts are used far beyond mechanical engineering for purposes in which high tension and clamping forces are required with the least possible expense. Clamp nuts are maintenance-free under normal operating conditions (max. 120 °C).

The threaded bolt must have a minimum grade 10.9. With thread diameters less than M16, bolts grade 12.9 should be used or the maximum admissible static load must be reduced.

Advantages:
- simple, manual operation.
- high tension forces due to force reinforcement.
- rapid adjustment due to automatic conversion.
- high-level operating safety due to self-limitation.

Drawing reference:
1) ratchet

Order No.	Version 1	D	T min.	T max.	Clamping force max. kN	max. static load kN	Tightening torque max. Nm
04751-4010	with star grip	M10	16	24	40	50	15
04751-4012	with star grip	M12	16	24	40	70	15
04751-4016	with star grip	M16	16	24	40	120	15
04751-4020	with star grip	M20	16	24	40	120	15
04751-40102	with t-grip	M10	16	24	40	50	25
04751-40122	with t-grip	M12	16	24	40	70	25
04751-40162	with t-grip	M16	16	24	40	120	25
04751-40202	with t-grip	M20	16	24	40	120	25

04752

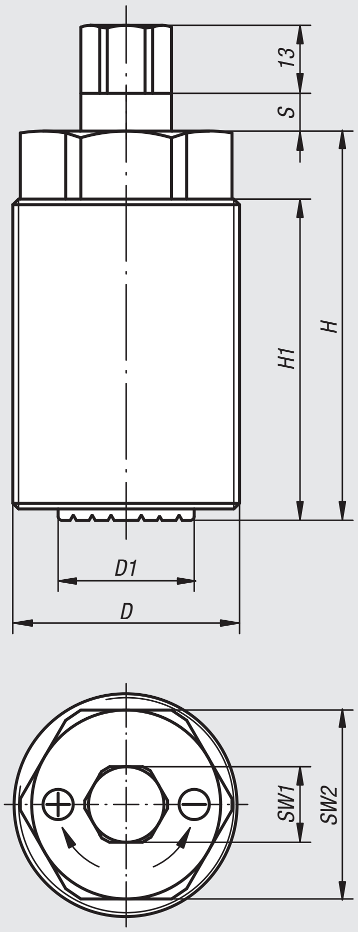
Tightening screws

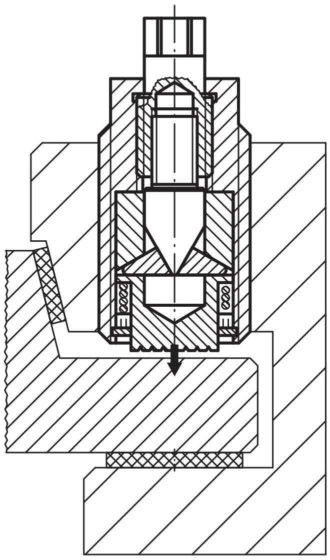
Material:
Carbon steel.

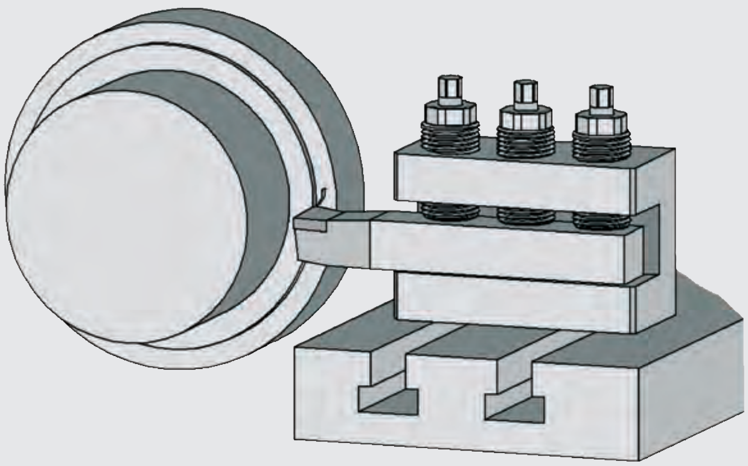
Version:
Black oxidised.

Sample order:
nlm 04752-48

Note:
These power clamping screws are fitted with a patented wedge mechanism. This system allows the greatest clamping forces to be achieved at low torques with a simple manual operation. The wedge mechanism is self-limiting in every clamping position. A longer path can be quickly traversed via the external thread of the screw before the wedge mechanism (travel up to 2.2 mm) is used for clamping. Tightening screws are used for many purposes, primarily in presses, punches, production machines, fixtures and equipment production.





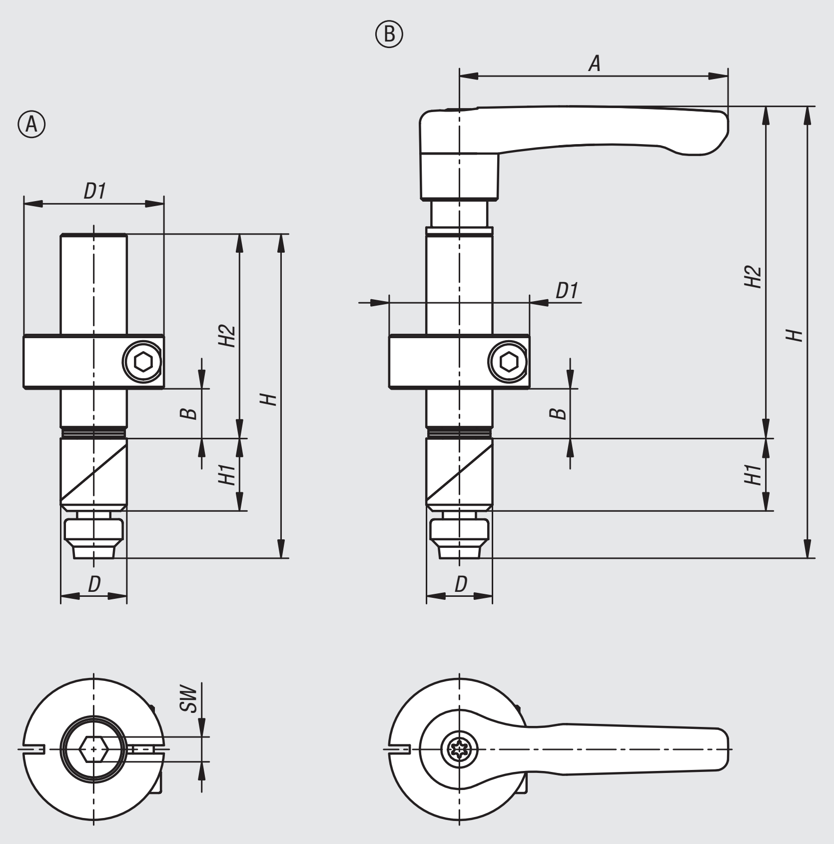


Clamping a turning tool on a large lathe

Order No.	D	D1	H	H1	S	SW1	SW2	max. clamping travel	Nominal clamping force kN	max. static load kN	Max. tightening torque on SW1 Nm
04752-36	M36x3	19	73	62	5	13	30	1,5	40	80	45
04752-48	M48x3	28	90	75	7,5	17	41	2,2	80	160	90

04753

Clamping pin, steel



Material:
Handle die-cast zinc acc. to DIN EN 12844.
Locating pin and wedges steel 1.0715.
Shaft collar steel 1.0718.

Version:
Handle black, plastic coated.
Centring pin and shaft collar phosphated.
Wedges black oxidised.
Lasered division marks.

Sample order:
nlm 04753-0016

Note:
The screw is tightened or the clamping lever is turned to expand the two wedges in the hole. The infinitely adjustable shaft collar enables one or more stop elements with various thicknesses to be securely fixated.

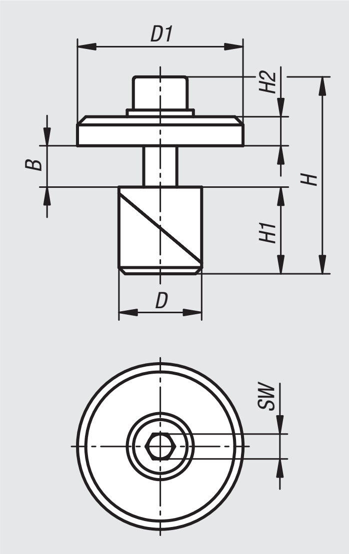
Application:
These clamping pins are perfect for fixing standard stop elements with various thicknesses to hole grid boards / welding tables with hole Ø 16 mm or 28 mm.

Advantages:
Infinitely adjustable clamping range of 0-36 mm and 0-75 mm.
Not affected by the diameter or surface quality of the bore (up to H12).
Clamping range can be easily preset using the scale.
Gentle clamping in the bore.
Pull-down effect even with thin table material (≥8 mm or ≥4 mm).
Compatible with conventional stop elements.

Order No.	Form	A	D	D1	H	H1	H2	SW	B Clamp range
04753-0016	A	-	16	34	78	17,5	49	6	0-36
04753-0028	A	-	28	48	129	28	90	6	0-75
04753-0116	B	65	16	34	109	17,5	80	-	0-36
04753-0128	B	80	28	48	168	28	129	-	0-75

Clamping pin, steel or stainless steel

with washer



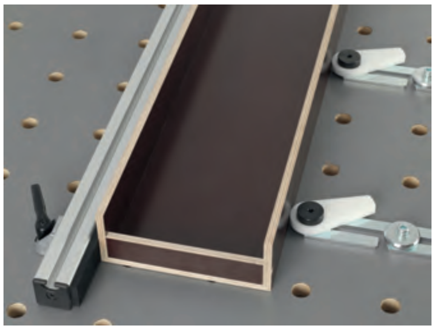
Material:
Washer steel 1.0715.
Wedges steel 1.0715 or stainless steel 1.4305.

Version:
Washer electro zinc-plated.
Wedges black oxidised or blank.

Sample order:
nlm 04754-016

Note:
For fixating adapter plates, angles and plates open on grid hole tables or plates with Ø16 mm, Ø20 mm or Ø28 mm holes. Can also be used as a point end stop for positioning and fixating exchange clamping plates. By turning the cap screw, the lock wedges expand in the bore.

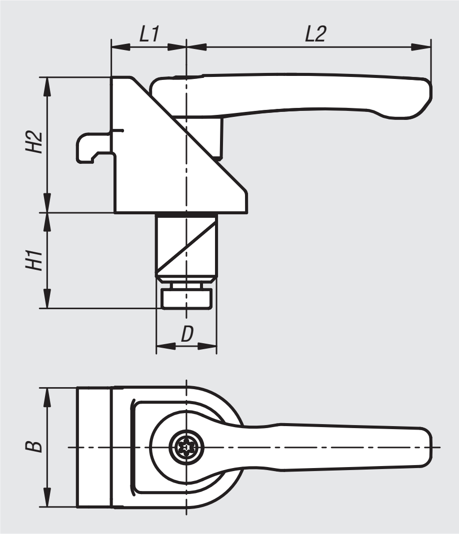
Advantages:
Functions also in thin table material (metal: ≥8 mm or ≥4 mm ; wood ≥18 mm).
Gentle clamping in the bore.
Low height.



Order No.	Main material	D	D1	H	H1	H2	SW	B Clamp range
04754-016	steel	16	40	48	17,5	7	6	0-14
04754-120	stainless steel	20	40	48	21	7	6	0-10
04754-028	steel	28	40	68	28	7	6	0-23

Clamping pin, steel or stainless steel

with clamping angle



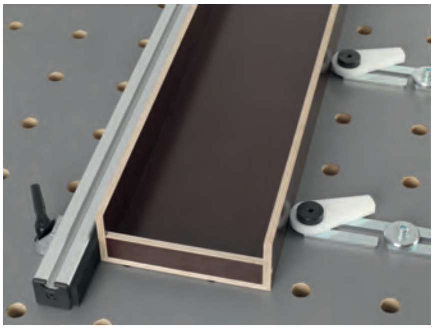
Material:
Handle die-cast zinc acc. to DIN EN 12844.
Clamping angle die-cast zinc.
Wedges steel 1.0715 or stainless steel 1.4305.

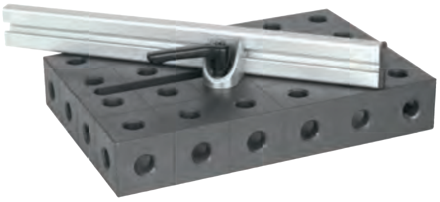
Version:
Handle black, plastic coated.
Wedges black oxidised or blank.

Sample order:
nlm 04755-016

Note:
The clamping angles are suitable for fixating aluminium profiles on to grid hole tables or plates with Ø16 mm, Ø20 mm or Ø28 mm holes, e.g. an end stops. Loosen the clamping lever to detract the wedges and enable free rotation and movement. Clamping pins with clamping angles are mostly used in pairs.

Advantages:
Functions also in thin table material (metal: ≥8 mm or ≥4 mm ; wood ≥18 mm).
Gentle clamping in the bore.
Tool-less operation.



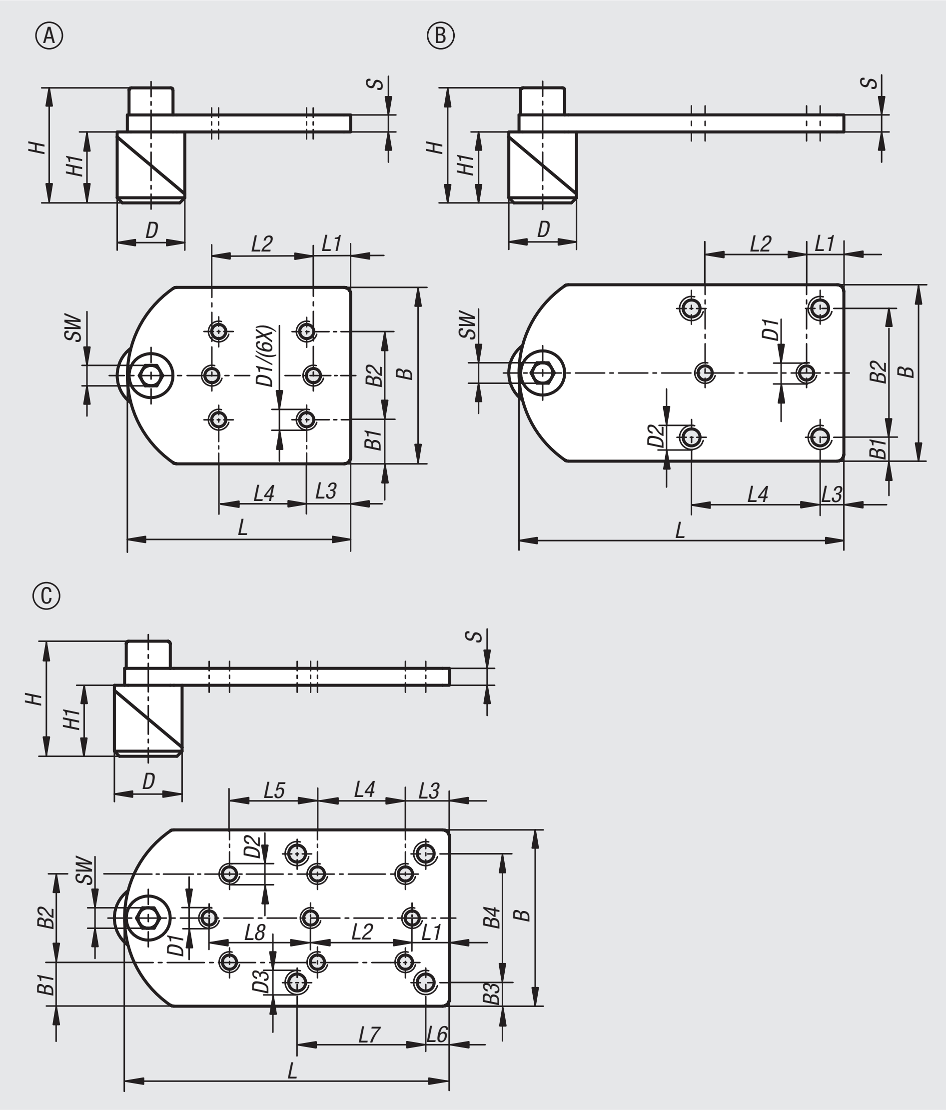


Order No.	Main material	B	D	H1	H2	L1	L2
04755-016	steel	32	16	25	36	20	65
04755-120	stainless steel	32	20	21	36	20	65
04755-028	steel	32	28	36	36	20	65

04756

Clamping pin, steel or stainless steel

with adapter plate



Material:
Adapter plate steel.
Wedges steel 1.0715 or stainless steel 1.4305.

Version:
Adapter plate electro zinc-plated.
Wedges black oxidised or blank.

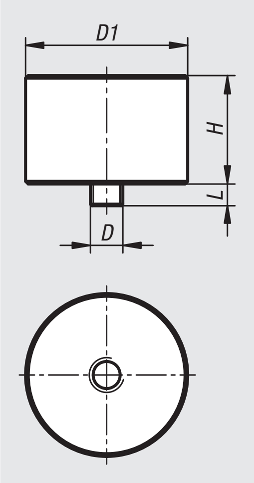
Sample order:
nlm 04756-0016

Note:
The adapter plates enable the toggle clamp to be compatible with hole pattern 3 or 4, for hole grid plates or plates with Ø16 mm, Ø20 mm or Ø28 mm holes.
The clamping pin parts lock in the hole when the cap screw is turned.

Order No.	Form	Main material	B	B1	B2	B3	B4	D	D1	D2	D3	H	H1	L	L1	L2	L3	L4	L5	L6	L7	L8	S	SW
04756-0016	A	steel	52	13	26	-	-	16	M5	-	-	30,5	17,5	66	11	30	13	26	-	-	-	-	5	6
04756-1020	A	stainless steel	52	13	26	-	-	20	M5	-	-	34	21	66	11	30	13	26	-	-	-	-	5	6
04756-0028	A	steel	52	13	26	-	-	28	M5	-	-	41	28	66	11	30	13	26	-	-	-	-	5	6
04756-0116	B	steel	52	7	38	-	-	16	M5	M6	-	30,5	17,5	96	11	30	7	38	-	-	-	-	5	6
04756-1120	B	stainless steel	52	7	38	-	-	20	M5	M6	-	34	21	96	11	30	7	38	-	-	-	-	5	6
04756-0128	B	steel	52	7	38	-	-	28	M5	M6	-	41	28	96	11	30	7	38	-	-	-	-	5	6
04756-0216	C	steel	52	13	26	7	38	16	M5	M5	M6	30,5	17,5	96	11	30	13	26	26	7	38	30	5	6
04756-1220	C	stainless steel	52	13	26	7	38	20	M5	M5	M6	34	21	96	11	30	13	26	26	7	38	30	5	6
04756-0228	C	steel	52	13	26	7	38	28	M5	M5	M6	41	28	96	11	30	13	26	26	7	38	30	5	6

Pivot bearing, steel

with external thread



Material:
Pivot bearing steel 1.0715.
Threaded pin steel.

Version:
Pivot bearing black oxidised.Screw electro zinc-plated.

Sample order:
nlm 04757-3006X04

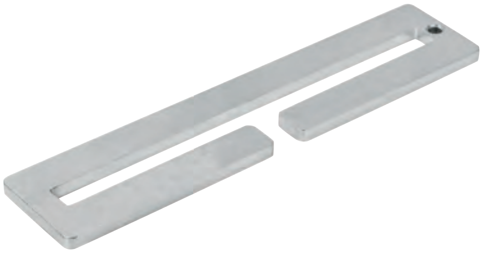
Note:
Pivot bearings are used in combination with plates and a cam clamp for indirect clamping.

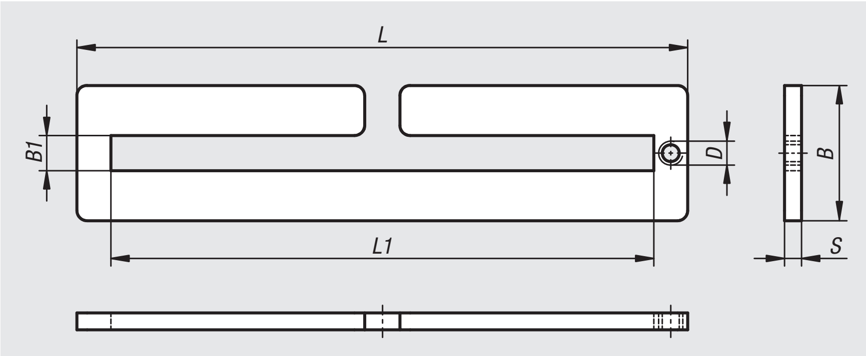
Order No.	D	D1	H	L
04757-3006X04	M6	30	20	4

04758

Plate, steel

open





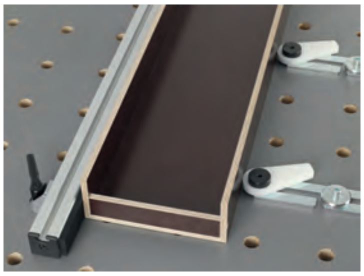
Material:
Steel.

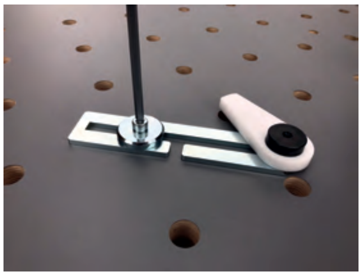
Version:
Electro zinc-plated and trivalent blue passivated.

Sample order:
nlm 04758-0180X40

Note:
Plates can be used in combination with a pivot bearing and cam clamp for indirect clamping. The plates are fastened to grid hole tables using clamping pins and washers. They can also be clamped to machine slot tables by combining with eccentric clamp modules.

Advantages:
Flexible movement and positioning.
infinitely adjustable

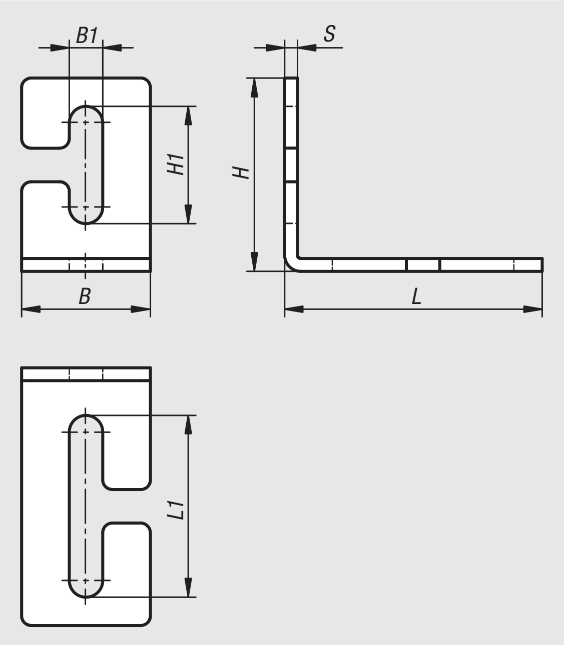




Order No.	B	B1	D	L	L1	S
04758-0180X40	40	10,4	M6	180	160	5

Angle, steel

open



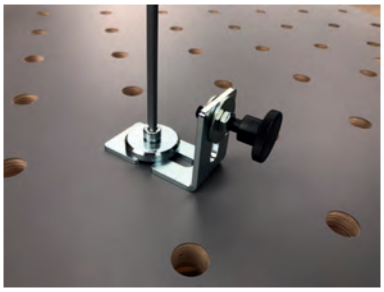
Material:
Steel.

Version:
Electro zinc-plated and trivalent blue passivated.

Sample order:
nlm 04759-0804060

Note:
The angle can also be used as an end stop on grid hole and slot tables. Fine adjustment is possible when used in combination with knurled screws. The angles are fastened to grid hole tables using clamping pins and washers. They can also be clamped to machine slot tables by combining with eccentric clamp modules.

Advantages:
Flexible movement and positioning.
The opening enables easy assembly.
Infinitely adjustable

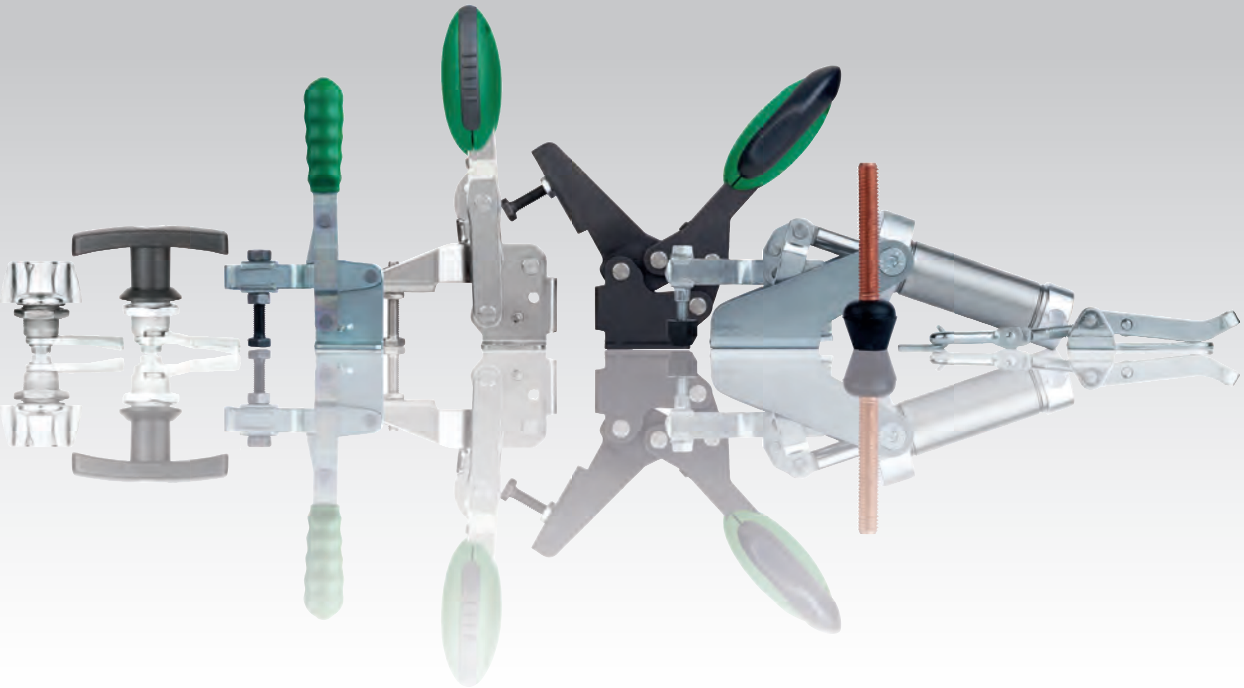


Order No.	B	B1	H	H1	L	L1	S
04759-0804060	40	10,4	60	36	80	56	4

Notes

05000

Toggle clamps
Pneumatic clamps
Accessories for clamps
Latches
Quarter-turn locks



Toggle clamps

Toggle clamps offer effective solutions where quick and economical clamping or positioning is required.

Toggle clamps work according to the knee-lever principle and can be operated with very little expenditure of force.

Self-locking is guaranteed when the dead centre position (alignment of the three joints) is exceeded.

Toggle clamps are an optimal clamping solution in drilling, welding, grinding and inspection fixtures etc. In the timber industry extreme deformations are avoided by using toggle clamps when bonding or assembling fragile sheets as the clamping force is controllable.

Principle of the knee lever

It is generally known that a person can support himself against a wall to shift a heavy piece of furniture. If the person has bent his knees and tries to move the furniture with the force of his legs, this is associated with the expenditure of considerable force.

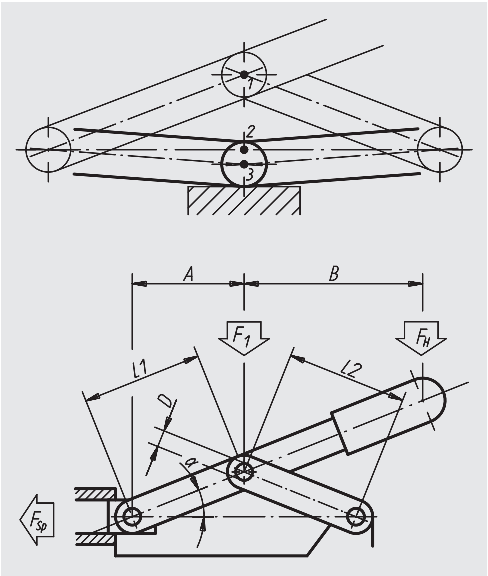
However, if the person has his legs in the position as shown in the picture above, and presses on the knee joint from above with a force, the move is much easier to achieve.

As soon as the 3 points of the joint A, B and C are in a line (knees straightened), it is no longer possible for the piece of furniture to be pressed back by a counterforce.

This principle is used with the toggle clamps.

Operating method:

1. Position before clamping.
2. Dead centre position (points of the joint in line).
3. By exceeding the dead centre secure clamping is guaranteed (self-locking).



Calculating the clamping force

Calculation variables

A:	Distance between the centres (mm)
B:	Distance to the point of force application (mm)
D:	Diameter of the axle bolt (mm)
FH:	Hand force (N)
F1:	Force on the point of the joint (N)
Fsp:	Clamping force (N)
L1, L2:	Length of the lever arm (mm)
α:	Inclination angle of the lever (degrees)
β:	Friction angle in the joints (degrees)
δ:	Angle of repose at the connecting rod (degrees)
μ:	Coefficient of friction = 0,1 => δ 5,73°

$$F_{sp} = \frac{F_1}{2}\left[\frac{1}{\tan(\alpha + \tilde{\ })} - \tan\delta\right];\quad F_1 = \frac{F_H \cdot (A + B)}{A}\quad;\quad \tilde{\ } = \arcsin\left(\frac{2D}{L_1 + L_2} \cdot \mu\right)$$

Very high clamping forces can be achieved with toggle clamps. The full potential force cannot be used however. Adhering to the retaining forces F recommended in the catalogue guarantees a long life.

The the clamping force must be attuned to the retaining force, which can be done by setting the thrust screw.

Toggle clamps vertical

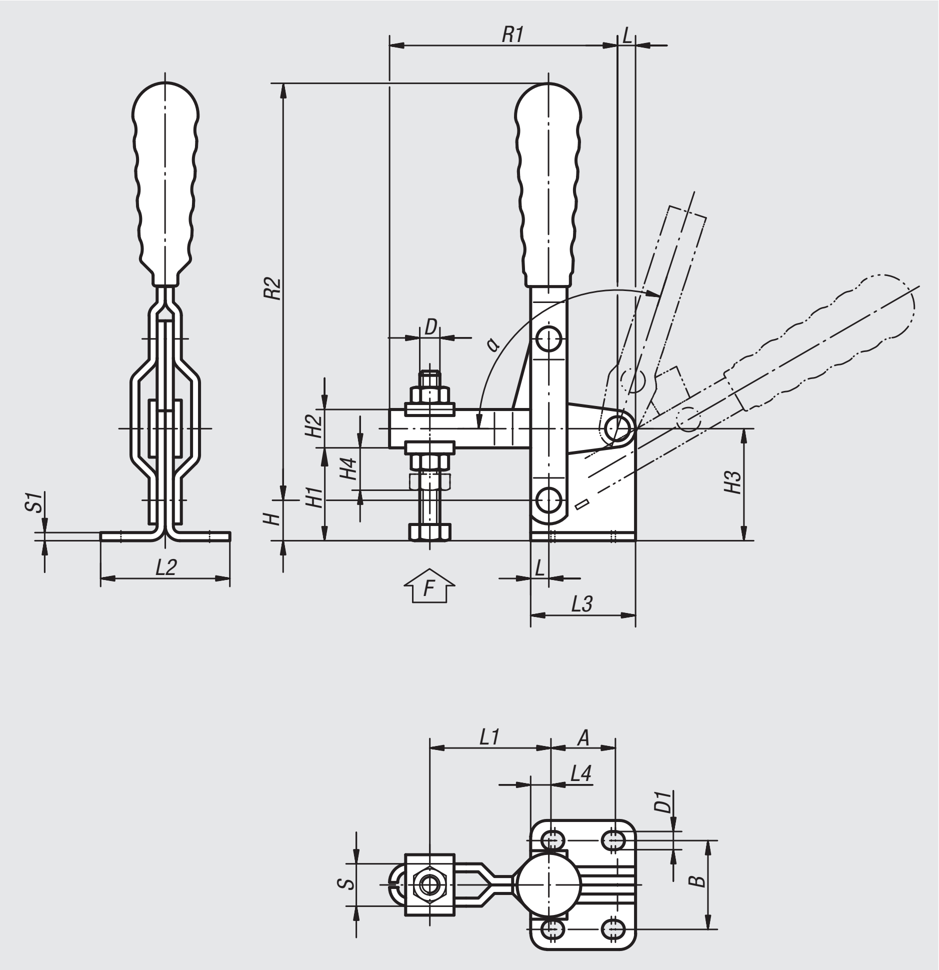
with horizontal foot

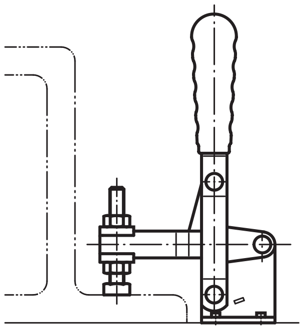
Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05020-08

Note:
See 05200 – 05280 for accessories.





Order No.	L	L1 min.	L1 max.	L2	L3	L4	B	H	H1	H2	H3	H4	A min.	A max.	D	D1	R1	R2	S	S1	F kN	α	Plastic grips
05020-05	4,5	16	35	32	26	5	22	10	23	9,5	28	10	14	16	M5x35	4,5	56,5	96	10,5	2	0,8	108°	05200-100
05020-06	5,5	23	46	38	32	9	27	13	29	11,5	35	11	12	14	M6x50	5,5	70,5	121	13,5	3	1	108°	05200-105
05020-08	7	27	55	45	39	9	32	16	35	14	42	14	19	21	M8x50	6,5	86	143	16	3	2,3	108°	05200-115
05020-10	8	33	74	56	43	7,5	38	20	39	18	48	18	26	28	M10x70	8,5	110	177	18	3,5	3,5	108°	05200-120
05020-12	10	45	100	68	50	9	45	25	45	22	56	21	32	32	M12x80	8,5	140	215	23	4	4	90°	05200-135

Toggle clamps vertical

with horizontal foot and full clamping lever

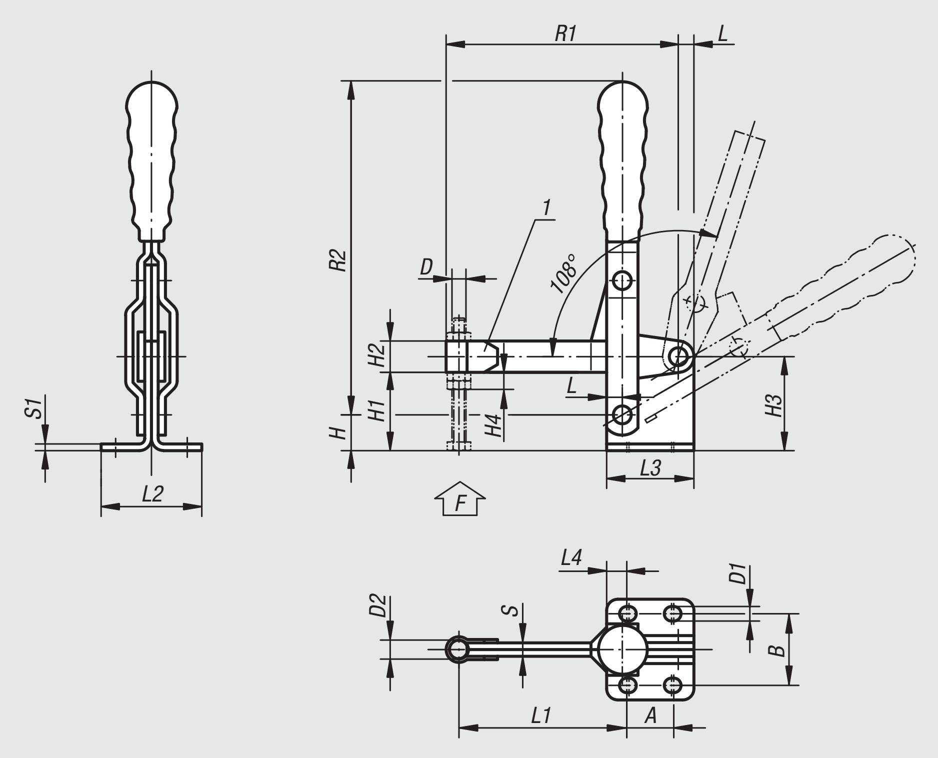
Material:
Steel plate DD11 1.0332.

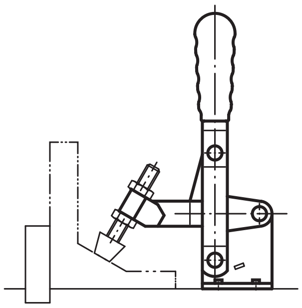
Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05020-101

Note:
Screws not supplied.
See 05200 – 05280 for accessories.

Drawing reference:
1) Weldable





Order No.	L	L1	L2	L3	L4	B	H	H1	H2	H3	H4	A min.	A max.	D	D1	D2	R1	R2	S	S1	F kN	Plastic grips
05020-081	7	75	45	39	9	32	16	35	14	42	12	19	21	M8	6,5	8,5	103	143	6	3	2,2	05200-115
05020-101	8	92	56	43	7,5	38	20	39	18	48	16	26	28	M10	8,5	10,5	125	177	7	3,5	3,4	05200-120
05020-121	10	122	68	50	9	45	25	45	22	56	19	32	32	M12	8,5	12,5	159	215	8	4	4,5	05200-135

Toggle clamps vertical

with horizontal foot, large version

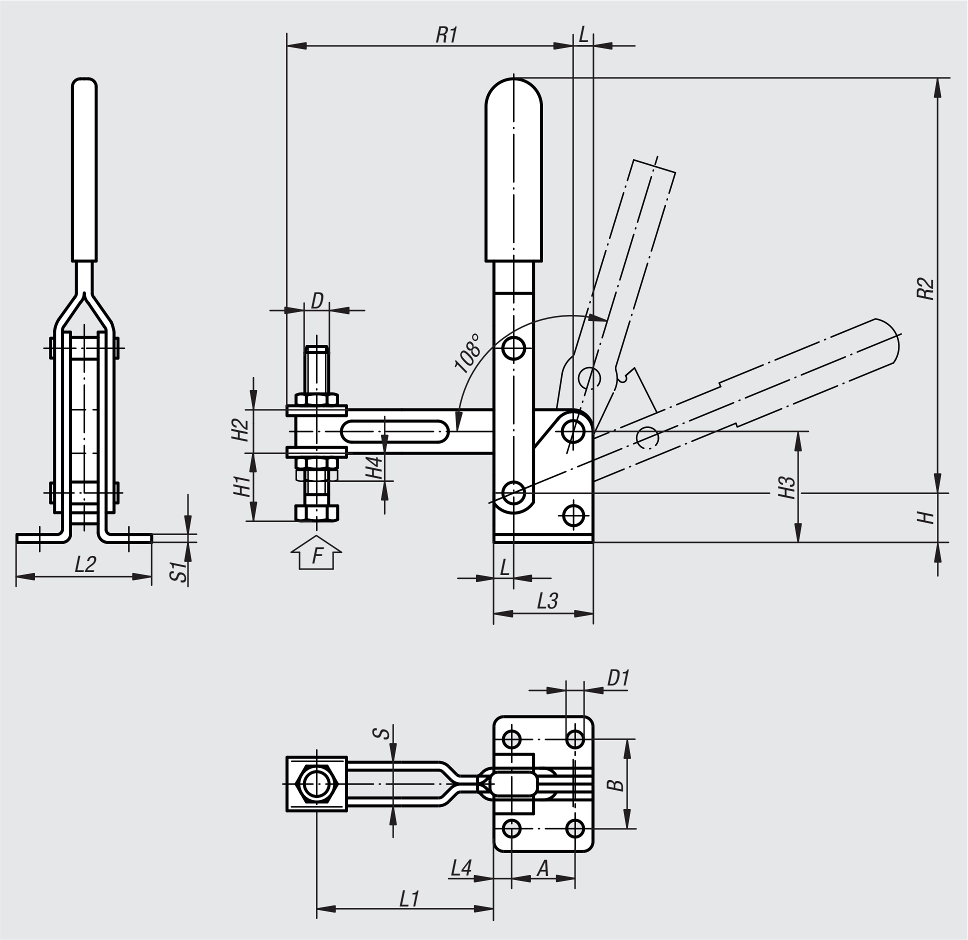
Material:
Steel plate DD11 1.0332.

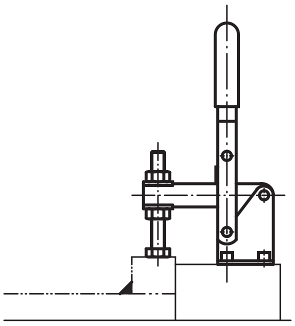
Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05020-14

Note:
See 05200 – 05280 for accessories.

Drawing reference:
1) plastic grip 05200





Order No.	L	L1 min.	L1 max.	L2	L3	L4	B	H	H1	H2	H3	H4	A	D	D1	R1	R2	S	S1	S3	F kN	Plastic grips
05020-14	10	50	165	73	60	10	52	35	62,5	25	75	21	40	M14x90	8,5	225	230	25	4	34	4,6	05200-135
05020-16	15	55	215	100	90	20	70	58	101	30	116	27	50	M16x140	12,5	300	305	30	5	44	6	05200-140

05040

Toggle clamps vertical

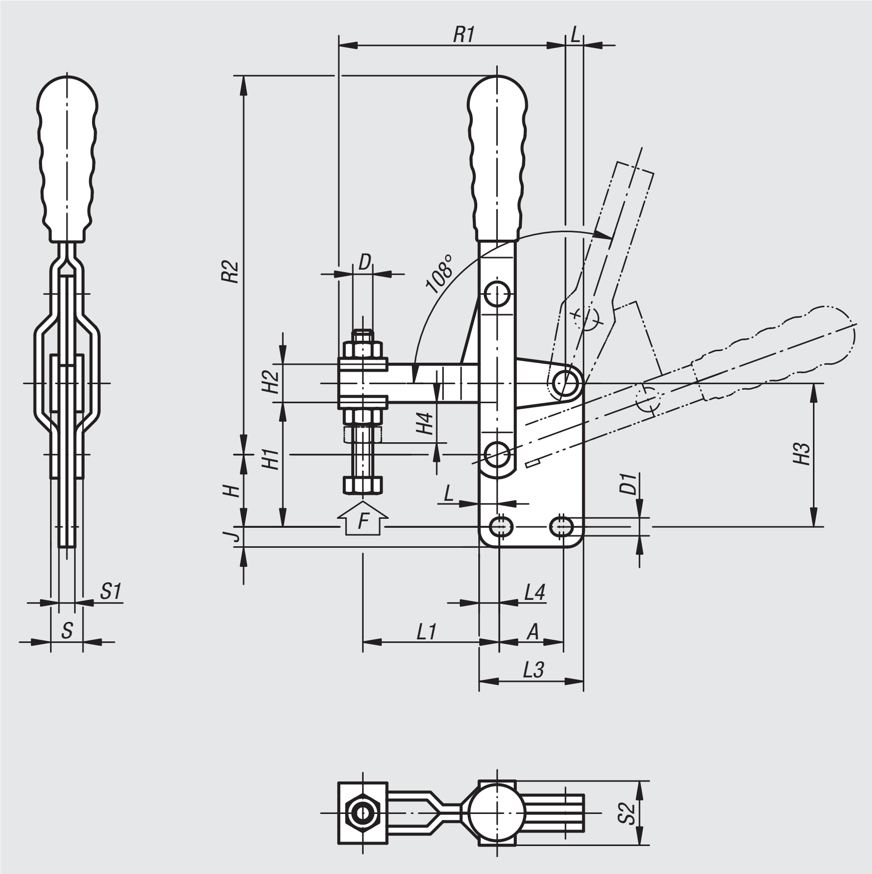
with straight foot

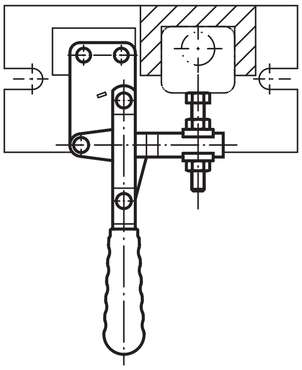
Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05040-12

Note:
See 05200 – 05280 for accessories.

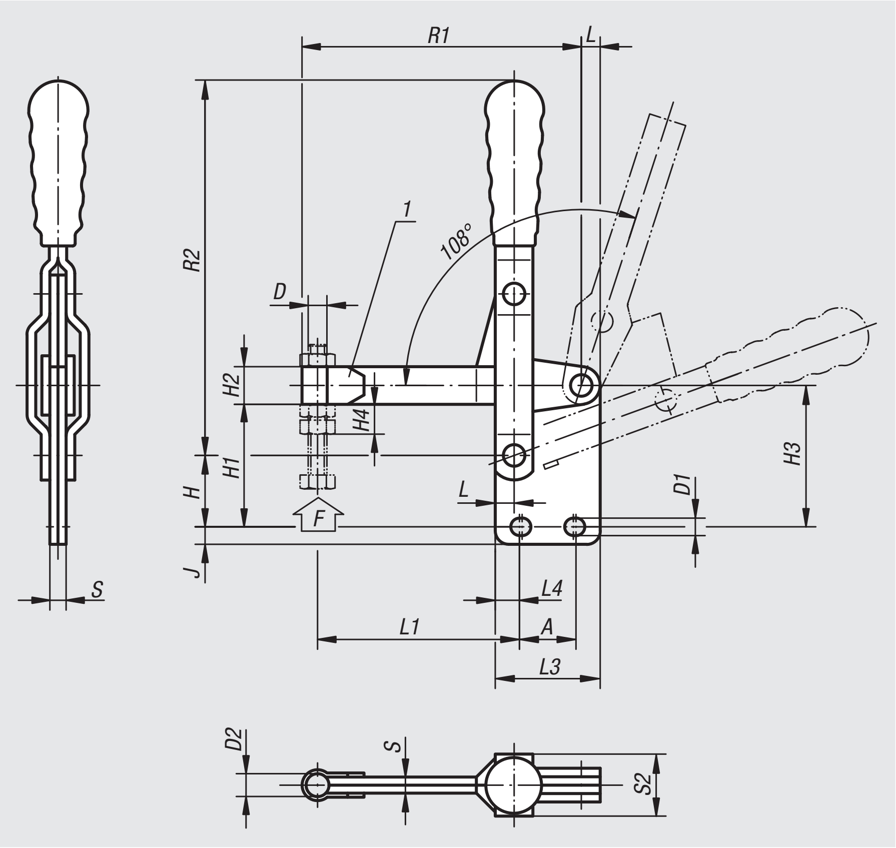




Order No.	L	L1 min.	L1 max.	L3	L4	H	H1	H2	H3	H4	A min.	A max.	D	D1	J	R1	R2	S	S1	S2	F kN	Plastic grips
05040-05	4,5	16	35	26	5	18	31	9,5	36	10	14	16	M5x35	4,5	5	56,5	96	10,5	4	16	0,8	05200-100
05040-06	5,5	23	46	32	9	21	37	11,5	43	11	12	14	M6x50	5,5	5,5	70,5	121	13,5	6	23	1	05200-105
05040-08	7	27	55	39	9	26,5	45,5	14	52,5	14	19	21	M8x50	6,5	6,5	86	143	16	6	23	2,3	05200-115
05040-10	8	33	74	43	7,5	33	52	18	61	18	26	28	M10x70	8,5	9	110	177	18	7	26	3,5	05200-120
05040-12	10	45	100	50	9	41	61	22	72	21	32	32	M12x80	8,5	11,5	140	215	23	8	30	4,6	05200-135

Toggle clamps vertical

with straight foot and full clamping lever



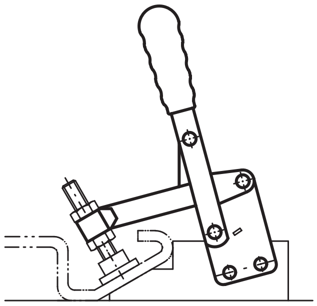
Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05040-121

Note:
Screws not supplied.
See 05200 – 05280 for accessories.

Drawing reference:
1) Weldable



Order No.	L	L1	L3	L4	H	H1	H2	H3	H4	A min.	A max.	D	D1	D2	J	R1	R2	S	S2	F kN	Plastic grips
05040-081	7	75	39	9	26,5	45,5	14	52,5	12	19	21	M8	7	8,5	6,5	103	143	6	23	2,2	05200-115
05040-101	8	92	43	7,5	33	52	18	61	16	26	28	M10	8,5	10,5	9	125	177	7	26	3,4	05200-120
05040-121	10	122	50	9	41	61	22	72	19	32	32	M12	8,5	12,5	11,5	159	215	8	30	4,5	05200-135

Toggle clamps vertical

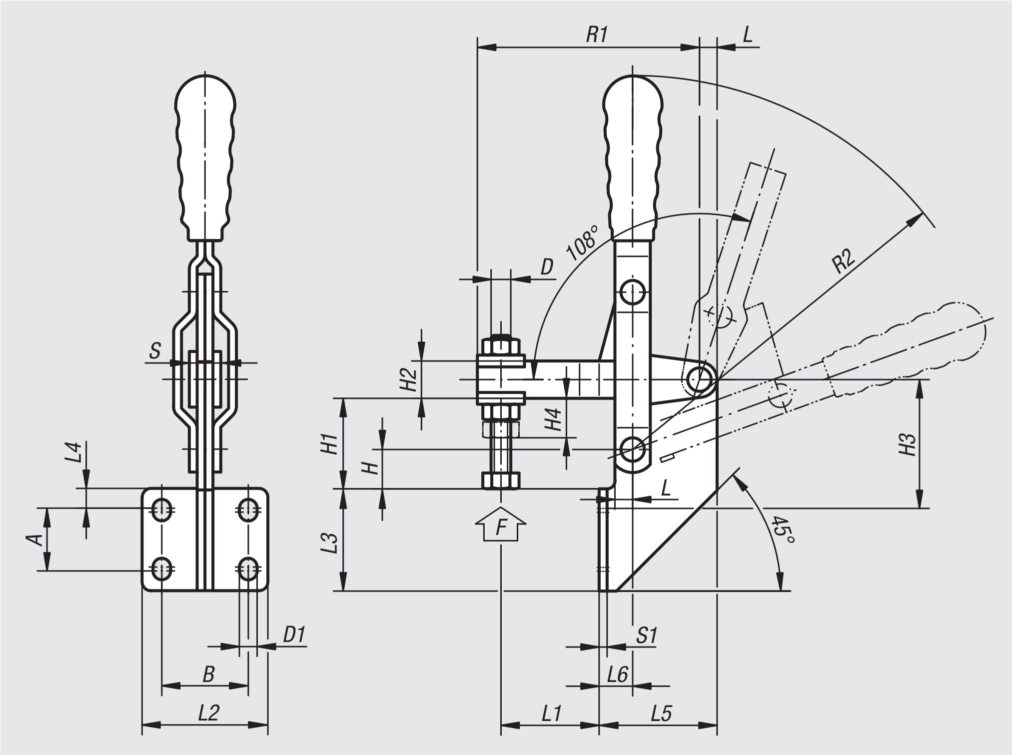
with angled foot

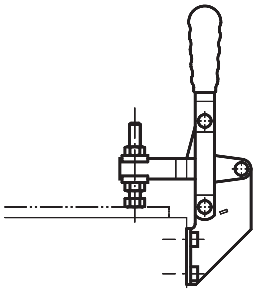
Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05060-06

Note:
See 05200 – 05280 for accessories.





Order No.	L	L1 min.	L1 max.	L2	L3	L4	L5	L6	B	H	H1	H2	H3	H4	A min.	A max.	D	D1	R1	R2	S	S1	F kN	Plastic grips
05060-05	4,5	7	26	32	26	5	30	8,5	22	10	23	9,5	33	10	14	16	M5x35	4,5	56,5	96	10,5	2	0,8	05200-100
05060-06	5,5	8	31	38	32	9	38	11,5	27	13	29	11,5	44	11	12	14	M6x50	5,5	70,5	121	13,5	3	1	05200-105
05060-08	7	12	40	45	39	9	45	13	32	16	35	14	51	14	19	21	M8x50	6,5	86	151	16	3	2,3	05200-115
05060-10	8	18,5	59,5	56	43	7,5	50	15	38	20	39	18	55,5	18	26	28	M10x70	8,5	110	177	18	3,5	3,5	05200-120

05080

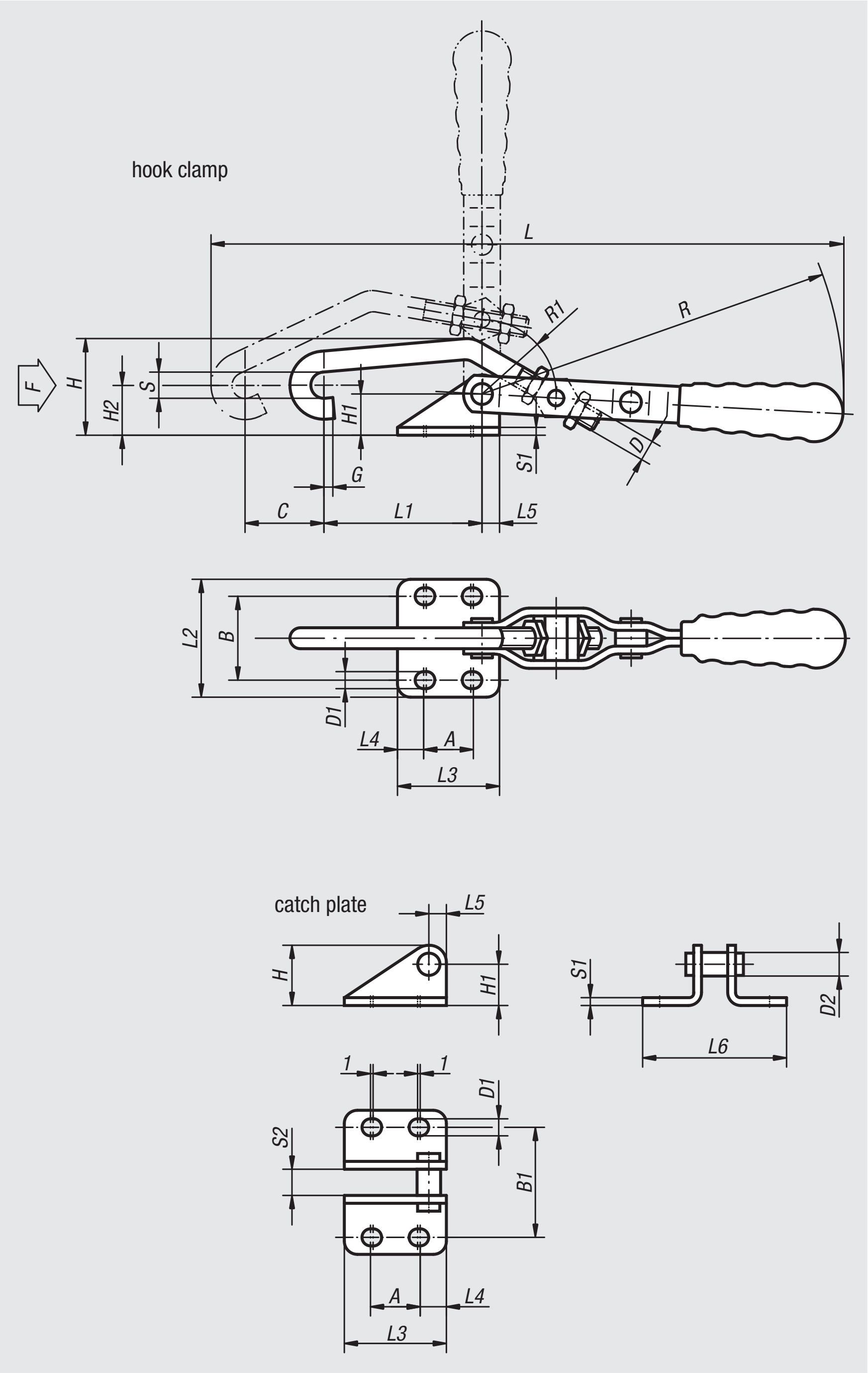
Toggle hook clamps

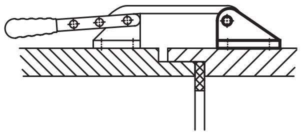
and catch plate

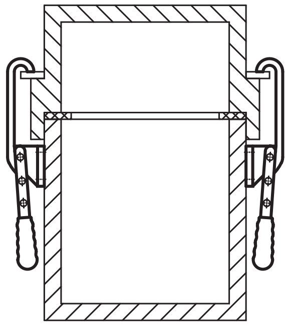
Material:
Lever, foot and catch plate steel plate DD11 1.0332.
Hinge pins and hook carbon steel 1.0501.

Version:
Steel parts electro zinc-plated.
Hinge pins and hook tempered.
Grip plastic, oil-resistant.

Sample order:
nlm 05080-01 (hook clamp)
nlm 05080-011 (catch plate)







Toggle hook clamps

Order No.	L	L1	L2	L3	L4	L5	B	H	H1	H2	A min.	A max.	C	D	D1	G	R	R1	S	S1	F kN	Plastic grips
05080-01	231	60	45	39	10	7	32	36	16	17	17	19	25	M8	6,5	3	151	29	10	3	1	05200-115
05080-03	349	90	68	50	9	10	45	64	30	31	30	32	30	M12	8,5	5	215	36,5	14	4	3	05200-135

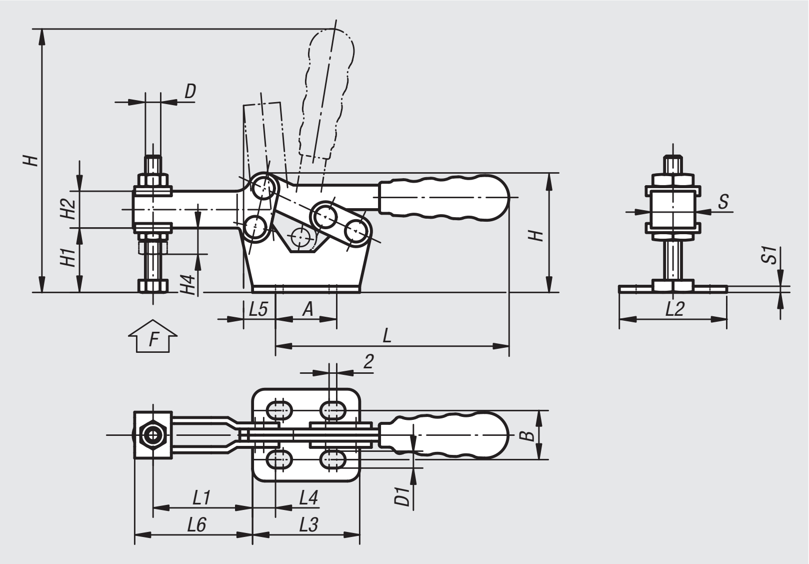
Catch plate

Order No.	L3	L4	L5	L6	B1	H	H1	A min.	A max.	D1	D2	S1	S2
05080-011	39	10	7	55	42	23	16	17	19	6,5	9	3	10
05080-031	50	9	10	82	59	40	30	30	32	8,5	13	4	14

05120

Toggle clamps horizontal

with horizontal foot

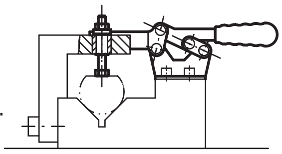


Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05120-10

Note:
See 05200 – 05280 for accessories.

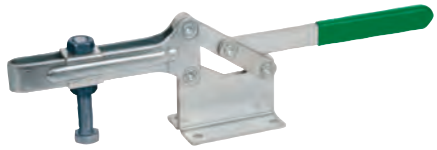


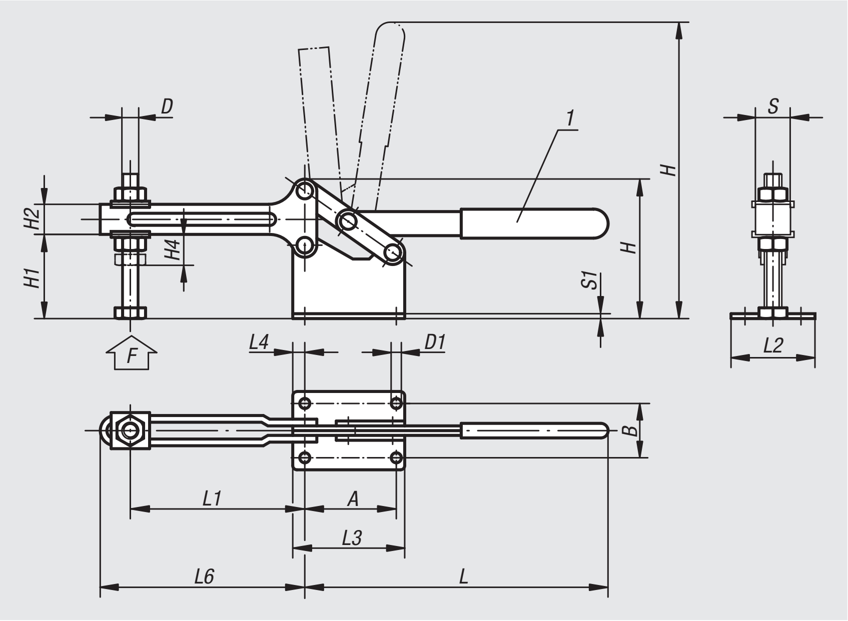
Order No.	L	L1 min.	L1 max.	L2	L3	L4	L5	L6	B	H min.	H max.	H1	H2	H4	A min.	A max.	D	D1	S	S1	F kN	Plastic grips
05120-05	76	12	32,5	30	35	7,5	9,5	39	16	39	91	20	12	10	16	20	M5x35	5,5	11	2	0,8	05200-200
05120-06	106	15,5	46	35,5	45	8,5	11,5	53,5	22	53	130	30	14	11	24	28	M6x48	5,5	14	3	1	05200-205
05120-08	140	19,5	61	40,5	55,5	14	19	71	24	67	165	40	16	14	24	28	M8x60	7	16	3	2,3	05200-210
05120-10	172	33	84	61	65,5	10,5	20	92	42	85	200	50	20	18	40	44	M10x70	9	19	3,5	3,5	05200-215
05120-12	215	31	104	64,5	80	18,5	25,5	119	42	99	250	60	24	21	40	44	M12x80	9	22	4	4,6	05200-220

05120

Toggle clamps horizontal

large version





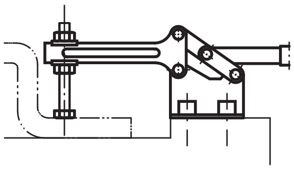
Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05120-14

Note:
See 05200 – 05280 for accessories.

Drawing reference:
1) plastic grip 05200



Order No.	L	L1 max.	L1 min.	L2	L3	L4	L6	B	H min.	H max.	H1	H2	H4	A	D	D1	S	S1	F kN	Plastic grips
05120-14	252	145	45	65	96	10	160	45	116	310	70	25	21	76	M14x90	9	24	4	4,5	05200-145
05120-16	325	205	55	85	132	15	225	55	173	425	110,5	35	27	102	M16x140	12,5	30	5	6	05200-140

05130

Toggle clamps horizontal

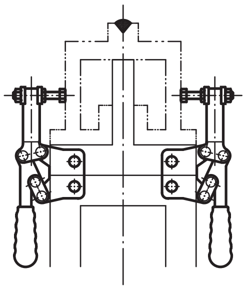
with straight foot

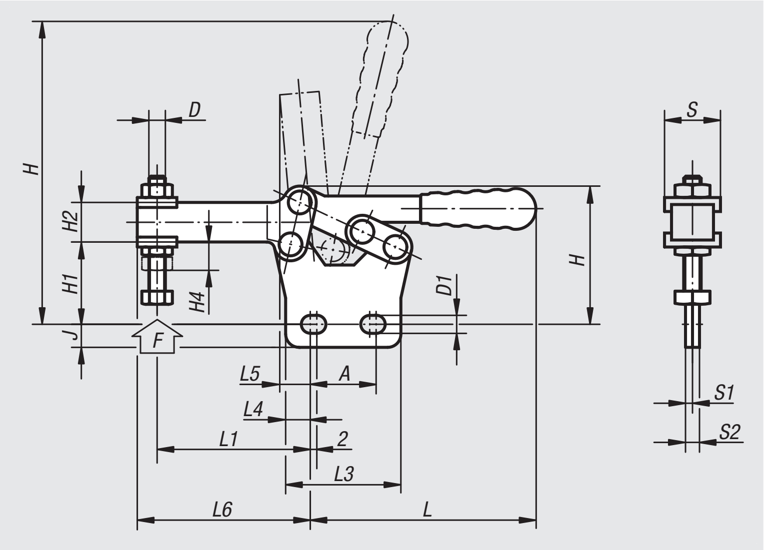
Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05130-08

Note:
See 05200 – 05280 for accessories.





Order No.	L	L1 min.	L1 max.	L3	L4	L5	L6	H min.	H max.	H1	H2	H4	A min.	A max.	D	D1	J	S	S1	S2	F kN	Plastic grips
05130-05	76	18	39	35	7,5	9,5	44	42	87	24	12	9	16	20	M5x35	6	7	14	2	4	0,8	05200-200
05130-06	106	26	51	45	8,5	11,5	60	58	124	36	14	10,5	24	28	M6x48	6	6,5	17	3	6	1	05200-205
05130-08	140	34	74	55	13,5	19	82	74	154	46,5	16	14	24	28	M8x60	7	8	20	3	6	2,3	05200-210
05130-10	172,5	40	90	65	10,5	20	100	96	205	65	20	16,5	40	44	M10x70	9	9	23	3,5	7	3,5	05200-215
05130-12	215	54	113	80	18	25,5	130	112	260	73	24	19	40	44	M12x80	9	12	26	4	8	4,6	05200-220

05140

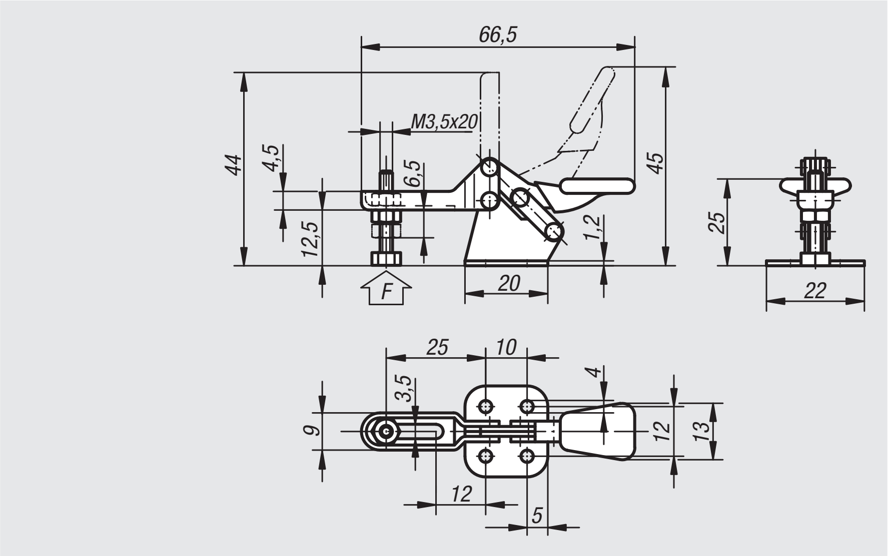
Toggle mini clamps

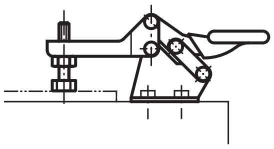
Material:
Stainless steel

Version:
Bright.
Grip with oil-resistant plastic sleeve.

Sample order:
nlm 05140-01

Note:
The handle lies horizontal when clamped.





Order No.	F N
05140-01	250

Application: welding fixture with norelem toggle clamps

05160

Toggle clamps horizontal

with push rod

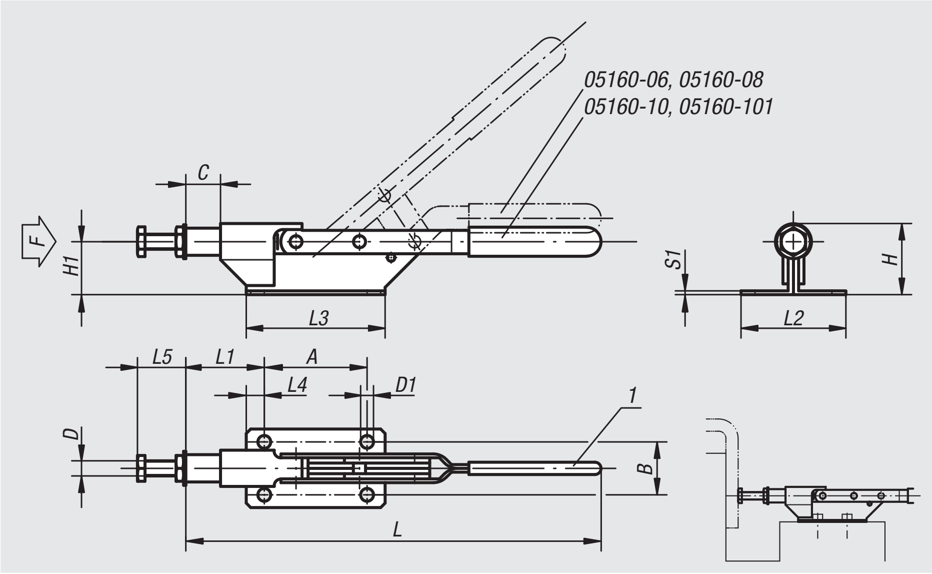
Material:
Steel plate DD11 1.0332.

Version:
Steel parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05160-10

Note:
The 05160-06 and 05160-08 versions have a swan-necked clamping lever.
See 05200 – 05280 for accessories.

Drawing reference:
1) plastic grip 05200



Order No.	L	L1	L2	L3	L4	L5 min.	L5 max.	B	H	H1	A	C (travel)	D	D1	S1	F kN	Plastic grips
05160-06	178	40	40	75	10	13	23	28	33	26,2	55	15	M6	6	2	1	05200-110
05160-08	255	49	45	85	12,5	14	26	30	42	31,5	60	22	M8	6,5	2,5	2	05200-125
05160-10	275	52	52	92	12	25	35	35	47	35,5	68	22	M10	8,5	2,5	3	05200-125
05160-101	300	62	58	100	12,5	25	36	40	59	50	75	26	M10	9	3	4	05200-135

Toggle clamps with push rod

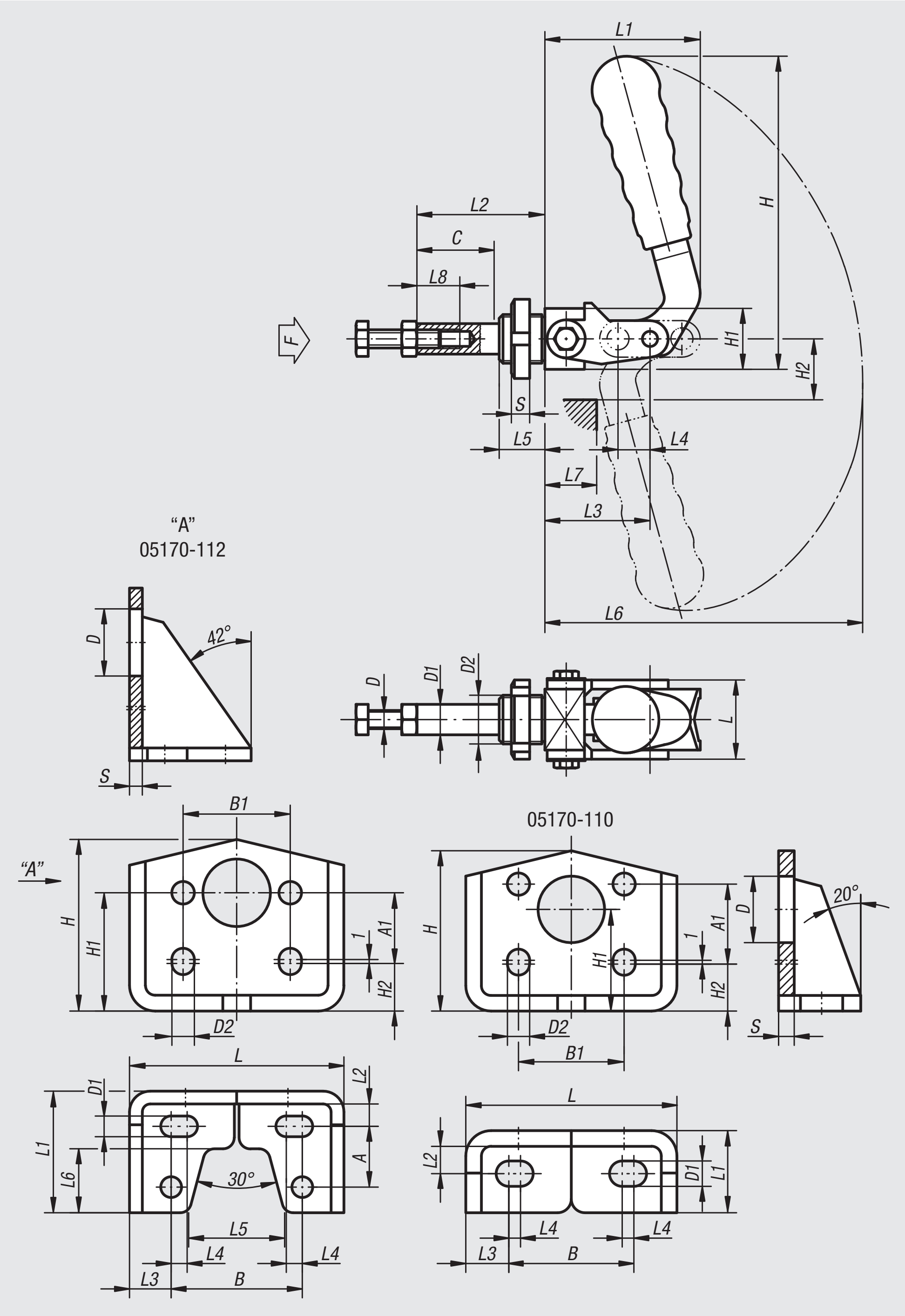
push-pull operation, for bracket mounting

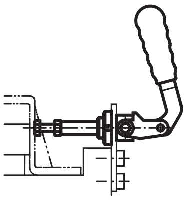
Material:
Body and push-rod 1.0501 carbon steel.
Lever parts steel plate DD11 1.0332.

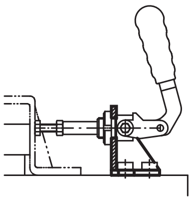
Version:
Body and lever parts electro zinc-plated.
Hinge pins tempered.
Plastic handle oil-resistant.

Sample order:
nlm 05170-012 (toggle clamp)
nlm 05170-110 (bracket)

Note:
The clamp can be mounted with a bracket or into fixtures using the front screw.







Toggle clamps

Order No.	L	L1	L2	L3	L4	L5	L6	L7	L8	H	H1	H2	D	D1	D2	C (travel)	S	F kN	Plastic grips
05170-010	26	52	42	34	13	15	130	18	20	101	20	20	M6x30	10	M16x1,5	26	6	1	05200-205
05170-012	32	75	60	50	20	18	170	30	30	139	25	28	M8x40	12	M20x1,5	40	8	1,5	05200-120
05170-016	40	105	92	78	35	20	213	60	35	155	32	44	M10x50	16	M27x1,5	70	8	3,5	05200-135

Bracket

Order No.	L	L1	L2	L3	L4	L5	L6	B	B1	H	H1	H2	A	A1	D	D1	D2	S	matching toggle clamp
05170-110	54	21	7	11	3	-	-	32	27	42,5	26	14	-	14	17	6,5	5,5	4	05170-010
05170-112	67	38	7	13	5	30	20	41	32	55	37	16	19	21	21	6,5	6,5	4	05170-012

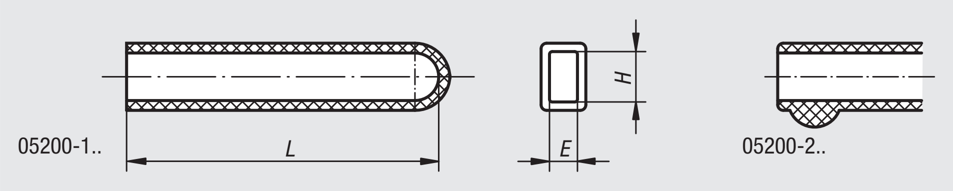
05200

Plastic grips

Material:
Plastic

Version:
Oil-resistant

Sample order:
nlm 05200-130 (with boss)
05200-210 (without boss)



Order No.	L	H	E
05200-100	33	9	4
05200-105	43	11	6
05200-110	55	12	5
05200-115	55	14	6
05200-120	75	16	7
05200-125	90	16	4
05200-130	85	19	6
05200-135	90	20	8
05200-140	115	30	9
05200-145	120	20	8
05200-200	33	8	4
05200-205	48	12	6
05200-210	65	14	6
05200-215	90	16	7
05200-220	120	20	8

05220

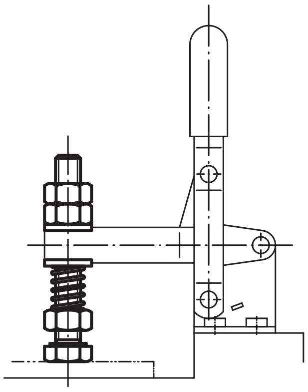
Thrust spindles spring mounted

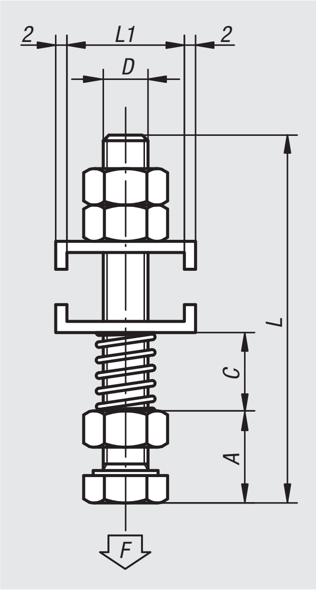
Material:
Screw and clamping plates steel.
Nut steel.
Spring class C spring wire.

Version:
Screw and clamping plates electro zinc-plated.
Nut black oxidised.

Sample order:
nlm 05220-10

Note:
For use with 05020, 05040, 05060, 05120 and 05130.



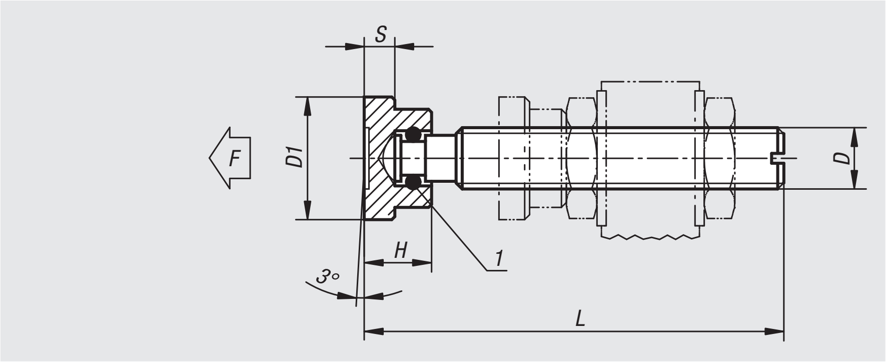


Order No.	L	L1	D	A	C min.	C max.	F max. N
05220-08	65,5	16	M8x60	12	9	30	25
05220-10	87,5	20,5	M10x80	15	14	35	35

05240

Thrust screws

with thrust pad



Material:
Screw and thrust pad steel.

Version:
Screw black.
Thrust pad black oxidised.
Screw pin and thrust pad case-hardened.

Sample order:
nlm 05240-10X63

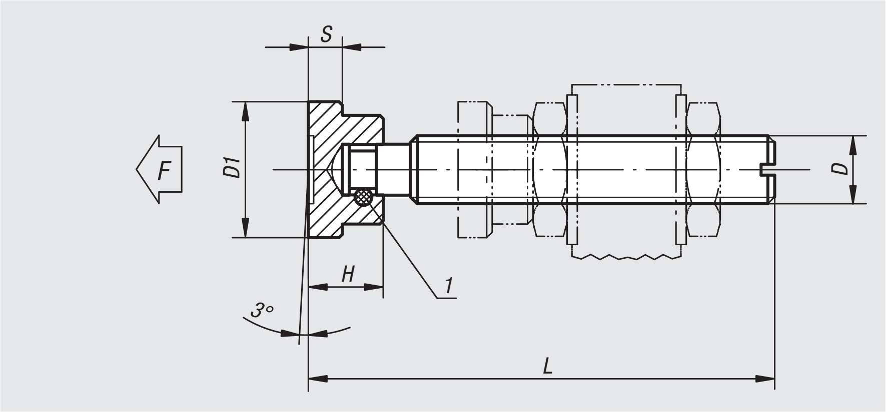
Drawing reference:
1) snap ring

Order No.	L	H	D	D1	S	F max. kN
05240-06X	32/37/42/52	7	M6	12	2,5	1
05240-08X	38/43/48/53/63	9	M8	16	4	2,3
05240-10X	53,5/58,5/63,5/68,5/83,5	11	M10	20	5	3,5
05240-12X	64,5/69,5/74,5/84,5/104,5	13	M12	25	6	4,6
05240-16X	70,3/75,3/85,3/105,3/130,3	15	M16	32	7	6

05241

Thrust screws

with thrust pad



Material:
Screw and thrust pad steel.

Version:
Screw black.
Thrust pad black oxidised.
Screw pin and thrust pad case-hardened.

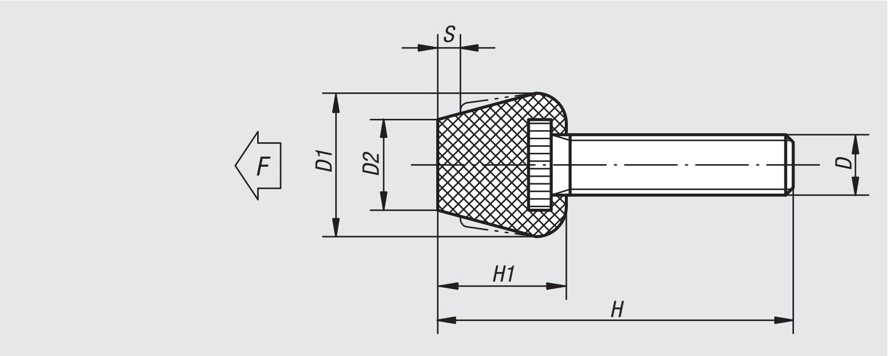
Sample order:
nlm 05241-10X84

Drawing reference:
1) retaining pin

Order No.	L	H	D	D1	S	F max. kN
05241-06X52	52	7	M6	12	2,5	1
05241-08X63	63	9	M8	16	4	2,3
05241-10X84	84	11	M10	20	5	3,5
05241-12X104	104	13	M12	25	6	4,6
05241-14X105	105	14	M14	28	6	5
05241-16X130	130	15	M16	32	7	6

05260

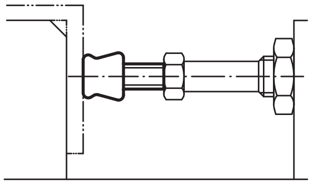
Thrust screws neoprene



Material:
Screw steel.
Thrust pad neoprene.

Version:
Neoprene pad moulded onto screw end.
Screw copper-plated.

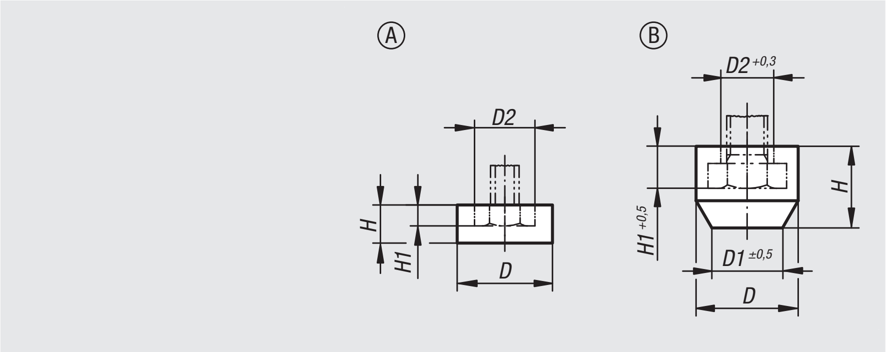
Sample order:
nlm 05260-08



Order No.	H	H1	D	D1	D2	S max.	F max. N
05260-08	63	17	M8 x 46	19	12	3	750
05260-081	43	17	M8 x 26	19	12	3	750
05260-10	80	19	M10 x 61	19	14	3,5	1000
05260-101	55	19	M10 x 36	19	14	3,5	1000

05280

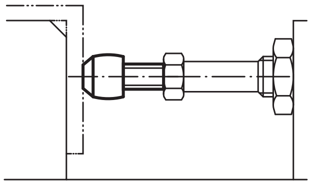
Protective caps



Material:
Neoprene or Polyamide.

Version:
Neoprene black, oil resistant, Shore hardness 75A.
Polyamide white.

Sample order:
nlm 05280-03



Order No.	Form	Main material	D	D1	D2	H	H1	for screws
05280-06	A	polyamide	9	-	6,6	4	2,3	M3
05280-01	B	neoprene	11	6,6	5,5	8,5	4	M4
05280-02	B	neoprene	12,5	7,3	6,5	10	4,7	M5
05280-03	B	neoprene	15	9,9	8,5	12	5,8	M6
05280-04	B	neoprene	19	12,7	11	15	7,1	M8
05280-07	B	neoprene	23	15	14,5	18	9	M10
05280-05	B	neoprene	26	19	16,5	20	10	M12

Toggle clamps variable horizontal

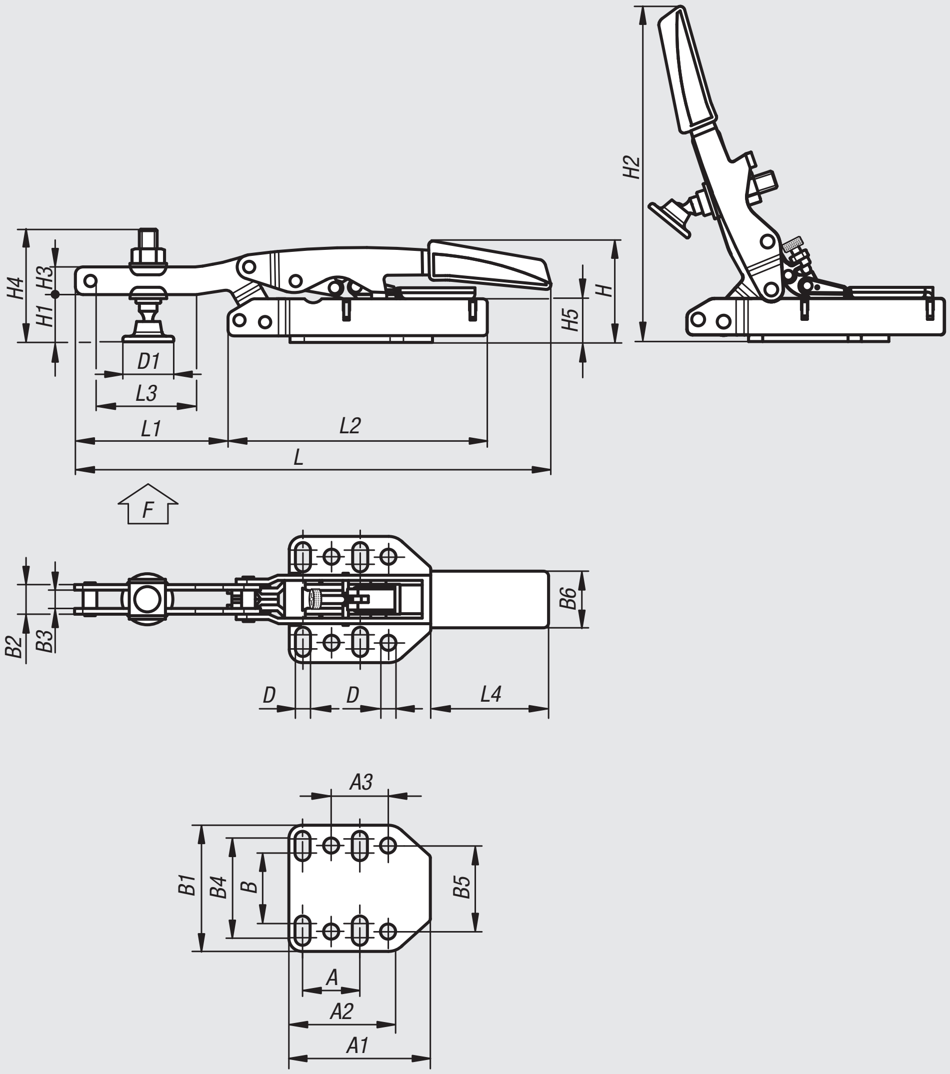
with horizontal foot

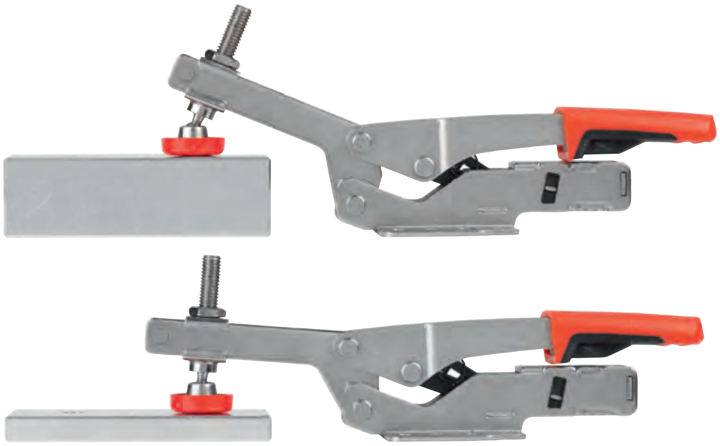
Material:
Steel.
Grip made of 2-component plastic.

Version:
Tempered and electro zinc-plated.
Grip element oil-resistant.

Sample order:
nlm 05300-040

Note:
The toggle clamp adjusts automatically to the height of the workpiece. Infinitely adjustable clamping height within 35 mm with approximately constant clamping force without manual adjustment of thrust screw position.
The clamping force can be adjusted up to 2.500 N according to requirements using a set screw under the lever in the hinge.
The hole pattern in the baseplate is suitable for millimetres and inches.



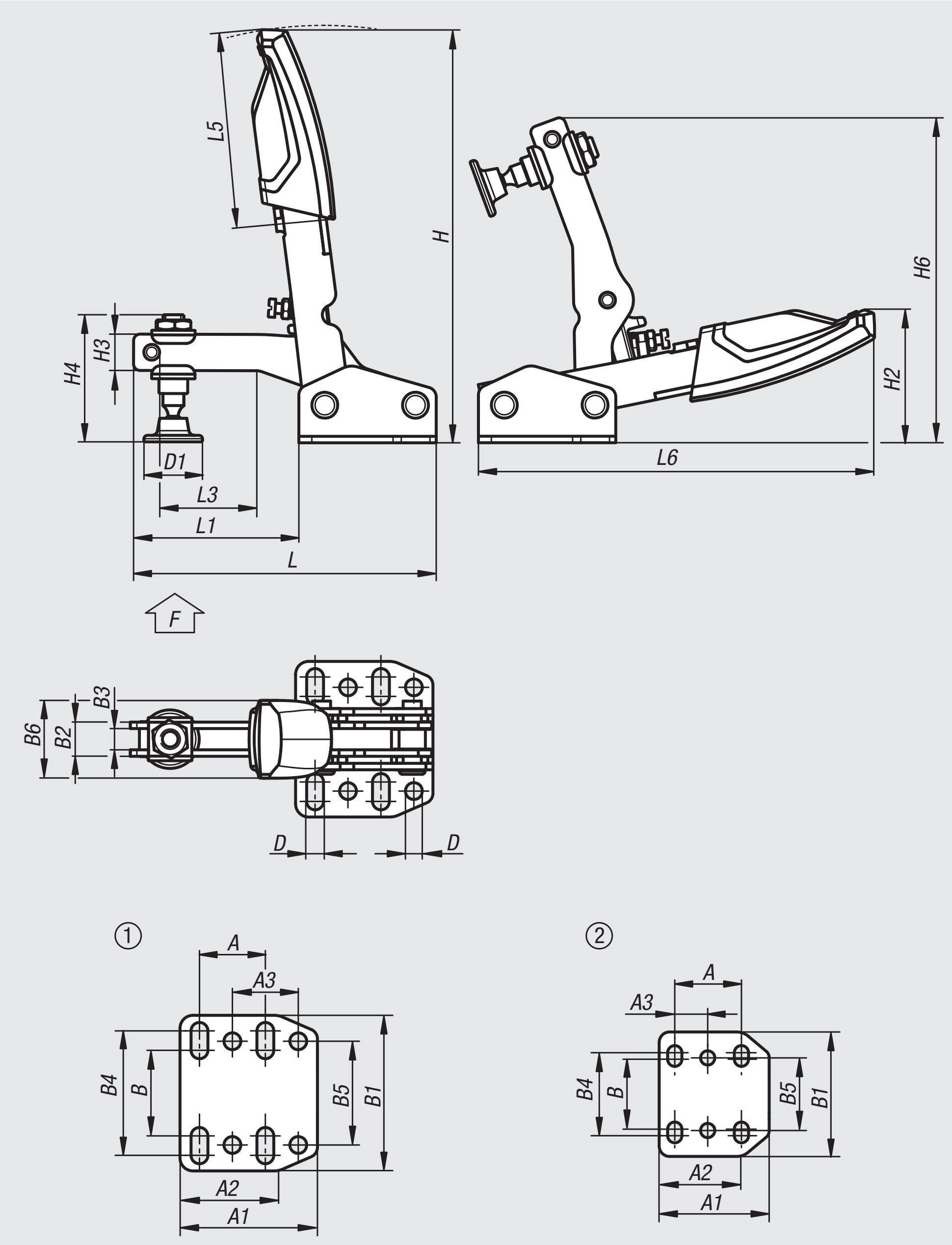


Order No.	A	A1	A2	A3	B	B1	B2	B3	B4	B5	B6	D	D1	H	H1	H2	H3	H4	H5	L	L1	L2	L3	L4	max. clamping height	F kN
05300-040	25,4	53	38	25,4	33	60	13	8	48	38	32	6,5	24,5	47	20	158	14	60	27	217	77	113	58	72	40	2,5
05300-060	25,4	53	38	25,4	33	60	13	8	48	38	32	6,5	24,5	64	36	175	14	68	44	217	77	113	58	72	60	2,5

05302

Toggle clamps variable vertical

with horizontal foot



Material:
Steel.
Grip made of 2-component plastic.

Version:
Tempered and electro zinc-plated.
Grip element oil-resistant.

Sample order:
nlm 05302-035

Note:
The toggle clamp adjusts automatically to the height of the workpiece. Infinitely adjustable clamping height within 35 mm with approximately constant clamping force without manual adjustment of thrust screw position.
The clamping force can be adjusted up to 2.500 N according to requirements using a set screw under the lever in the hinge.
The hole pattern in the baseplate is suitable for millimetres and inches.

Order No.	hole arrangement	A	A1	A2	A3	B	B1	B2	B3	B4	B5	B6	D	D1	H	H2	H3	H4	H6	L	L1	L3	L5	L6	max. clamping height	F kN
05302-035	2	25,7	42,4	32,4	12,7	27	48	10	6	32	28	24	5,5	19	129	41	10	42	100	93,7	51,3	30	60	123	35	1,1
05302-040	1	25,4	53	38	25,4	33	60	13	8	48	40	30	6,5	25	160	62	14	60	126	116	63	40	76	154	40	2,5

Toggle clamps variable

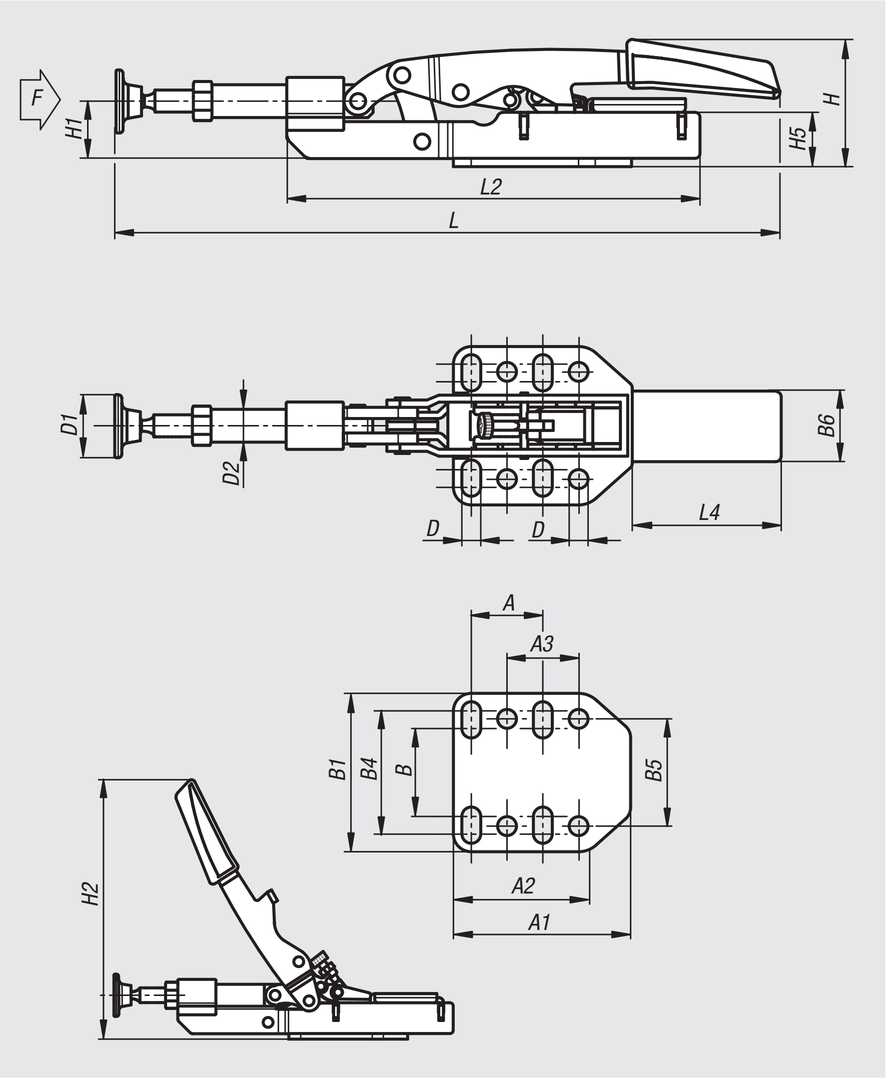
with thrust rod

Material:
Steel.
Grip made of 2-component plastic.

Version:
Tempered and electro zinc-plated.
Grip element oil-resistant.

Sample order:
nlm 05305-035

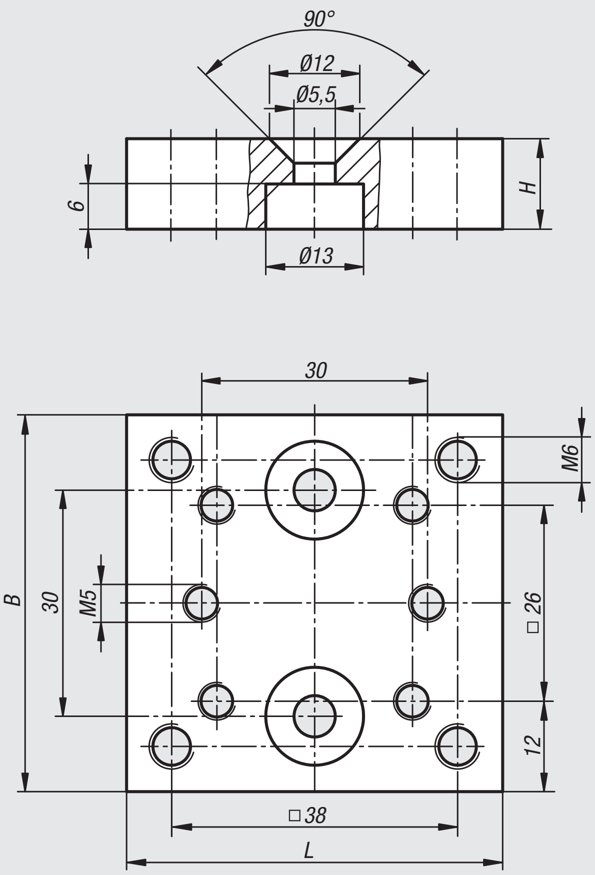
Note:
The toggle clamp adjusts automatically to the height of the workpiece. Infinitely adjustable clamping height within 13 mm with approximately constant clamping force without manual adjustment of thrust screw position.
The clamping force can be adjusted up to 2500 N according to requirements using a set screw under the lever in the hinge.
The hole pattern in the baseplate is suitable for millimetres and inches.



Order No.	A	A1	A2	A3	B	B1	B4	B5	B6	D	D1	D2	H	H1	H2	H5	L	L2	L4	max. clamping height	F kN
05305-035	25,4	53	38	25,4	33	60	48	38	32	6,5	23	12	46	27	155	25	233	154	73	35	2,5

Adapter block

aluminium



Material:
Aluminium.

Version:
natural tone anodised

Sample order:
nlm 05310-5050

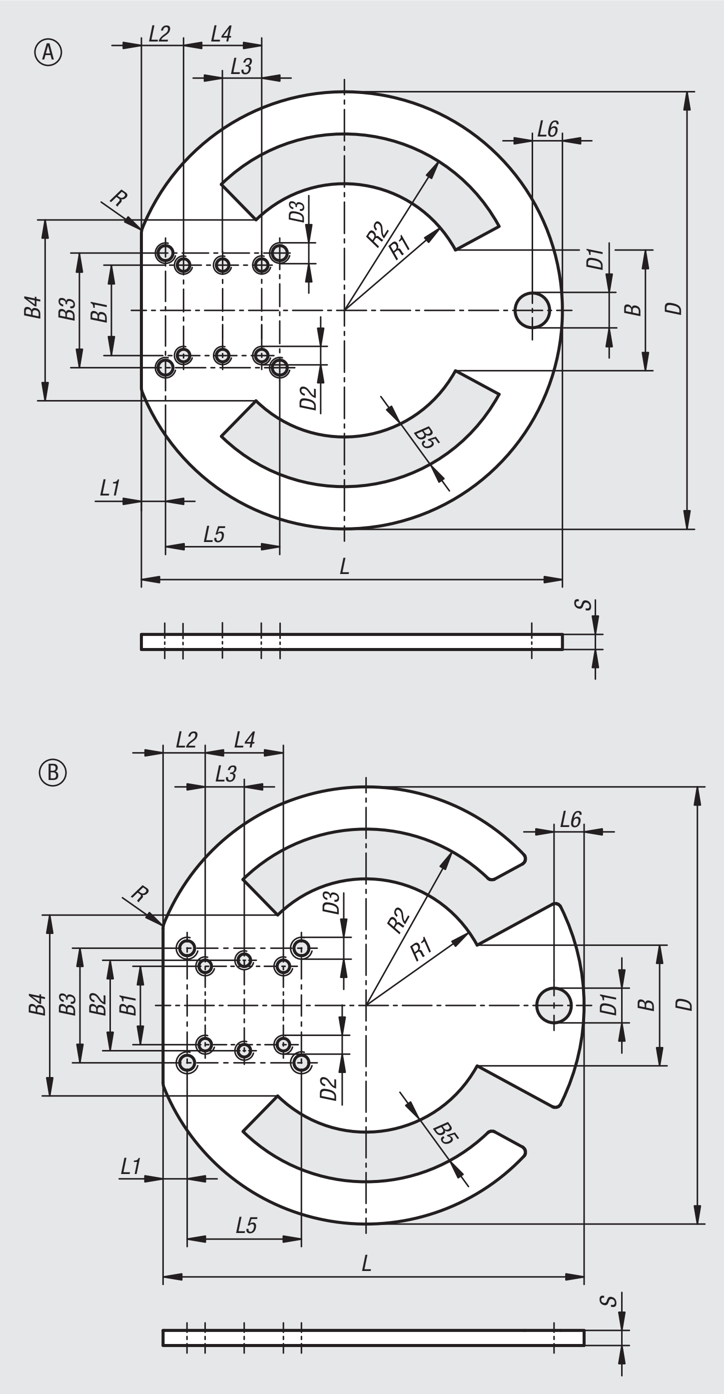
Note:
Adapter blocks are used as risers in combination with the round adapter plates 05312.
Fastening screws and nuts for assembling the block are supplied.

Order No.	B	H	L
05310-5050	50	12	50

05312

Adapter plates

round



Material:
Steel.

Version:
Electro zinc-plated and trivalent blue passivated.

Sample order:
nlm 05312-145

Note:
Adapter plates can be used in combination with toggle clamps. They enable toggle clamps to be positioned flexibly.
The adapter plates are clamped to the machine table using eccentric clamp modules.

Advantages:
Flexible movement and positioning.
Flexible height construction using the adapter block.
Easy assembly through the opening in Form B.

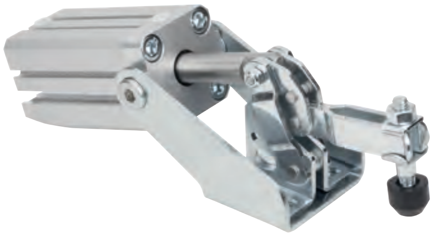
Accessories:
Eccentric clamp modules 10500
Toggle clamp 05….

Drawing reference:
Form A: closed
Form B: open

Order No.	Form	Version 2	B	B1	B2	B3	B4	B5	D	D1	D2	D3	L	L1	L2	L3	L4	L5	L6	R	R1	R2	S
05312-145	A	closed	40	30	-	38	60	16,5	145	11,5	M5	M6	140	8	14	13	26	38	10	5	42	58,5	5
05312-1145	B	open	40	30	30	38	60	16,5	145	11,5	M5	M6	140	8	14	13	26	38	10	5	42	58,5	5

05331

Pneumatic clamp



Material:
Levers steel plate.
Hinge pins stainless steel.

Version:
Lever parts electro zinc-plated.
Pneumatic cylinder, double-acting.
With magnetic piston for end position feedback.
Clamp trivalent passivated.
Complete with tempered, trivalent passivated thrust screw with protective cap.

Sample order:
nlm 05331-01

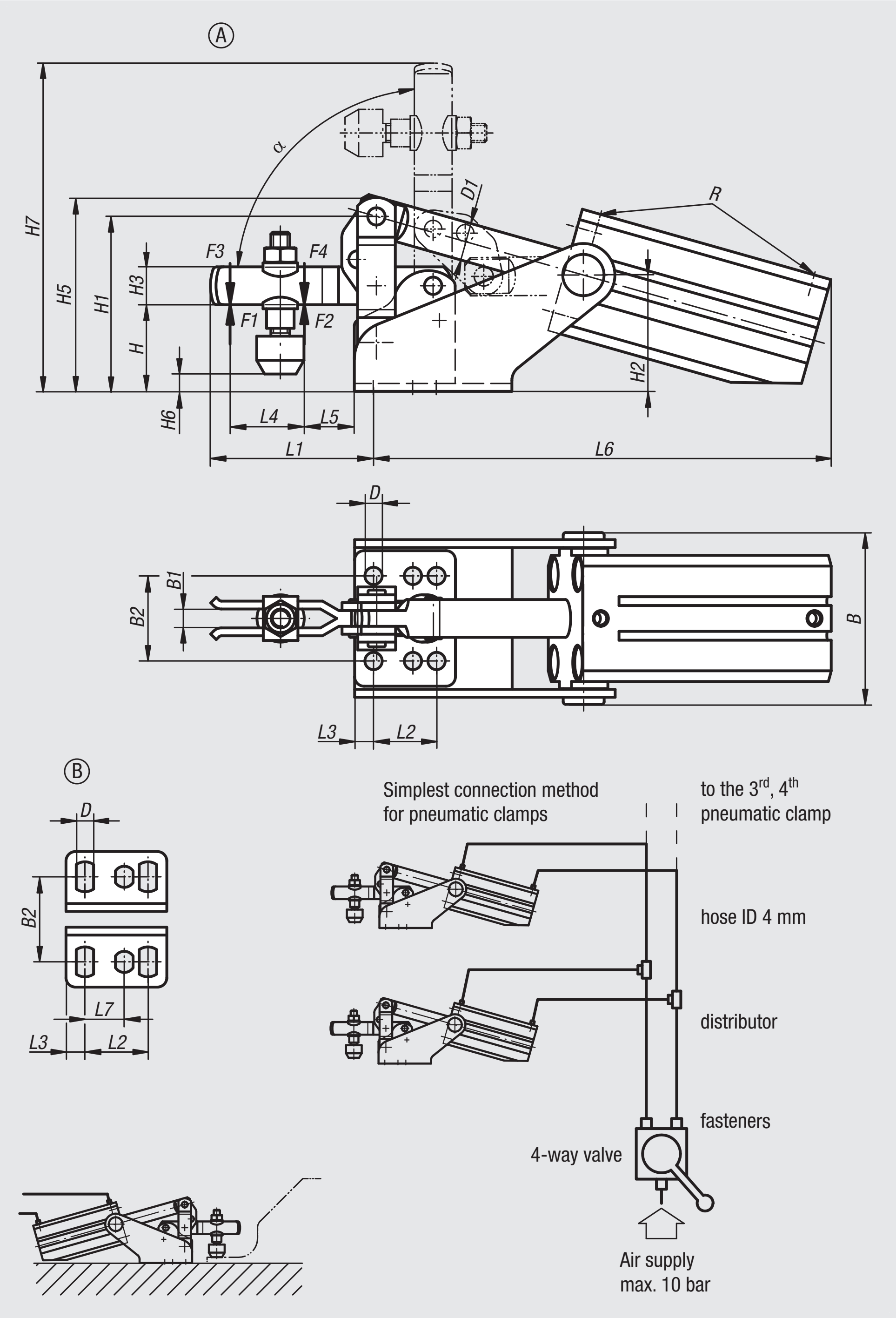
Note:
Pneumatic clamps have the following advantages compared to hand clamps:
The operator is relieved of frequent clamping.
Several clamps can be activated at the same time and can be closed in a specific sequence.
Single or multiple clamps can be activated from varying positions by machine control or hand control.
Because of the toggle system:
– the clamp remains closed if the air supply fails.
– the air consumption is low due to the large end ratio.
– pivoting the clamping arm achieves a large opening travel.
– optimum force and movement ratios are achieved.

VL = air consumption per complete cycle in dm^3 at 6 bar.

Selection criteria:
To select the correct size of pneumatic clamps, the possible clamping force at 6 bar (any compressed media are permissible, maximum pressure 10 bar) is specified besides the retaining force. F3 is the possible clamping force that the clamp exerts on the end of the clamping arm, F4 the force it exerts on the fulcrum side.

Control:
The schematic diagram for the simplest control of one or several pneumatic clamps is shown here. When constructing complete switching systems consult a well known manufacturer of pneumatic valves who can also supply all the required connectors and fittings.

Attention:
The forces F1 and F2 specified in the table are holding forces.
F3 and F4 are clamping forces.



05331

Pneumatic clamp

Order No.	Form	B	B1	B2	D	D1	H	H1	H2	H3	H5	H6	H7
05331-01	A	50	5	24	4,5	8	21	45,5	32	10	49,5	-2 to 4.5	84
05331-02	B	54,5	6	27	5,5	12	26	55	40,5	12	61	-1 to 7	104
05331-03	A	62,5	8	32	7,5	16	36,5	74,5	56	18	82,5	5.4 to 14	151
05331-04	A	77,5	10	45	8,6	16	45	90	64	20	98	-3 to 25.5	191

Order No.	L1	L2	L3	L4	L5	L6	L7	R	α	F1 kN	F2 kN	F3 kN	F4 kN	VL	suitable thrust screws
05331-01	39	16	6	18	6	126	-	M5	92°	0,8	1,1	0,2	0,3	0,08	M5x30
05331-02	51,5	20	6	25	11	145	12,5	M5	91,5°	1	1,2	0,7	1	0,26	M6x35
05331-03	78	20	7,5	36	19	165,5	-	G1/8	90°	1	2,5	0,65	1,1	0,35	M8x45
05331-04	101	32	13	45	25	196	-	G1/8	90,5°	2	3	1,5	2,2	0,8	M8x65

Pneumatic clamps vertical

with vertical cylinder bracket

Material:
Levers steel plate.
Hinge pins stainless steel.

Version:
Lever parts electro zinc-plated.
Pneumatic cylinder, double-acting.
With magnetic piston for end position feedback.
Clamp trivalent passivated.
Complete with tempered, trivalent passivated thrust screw with protective cap.

Sample order:
nlm 05332-02

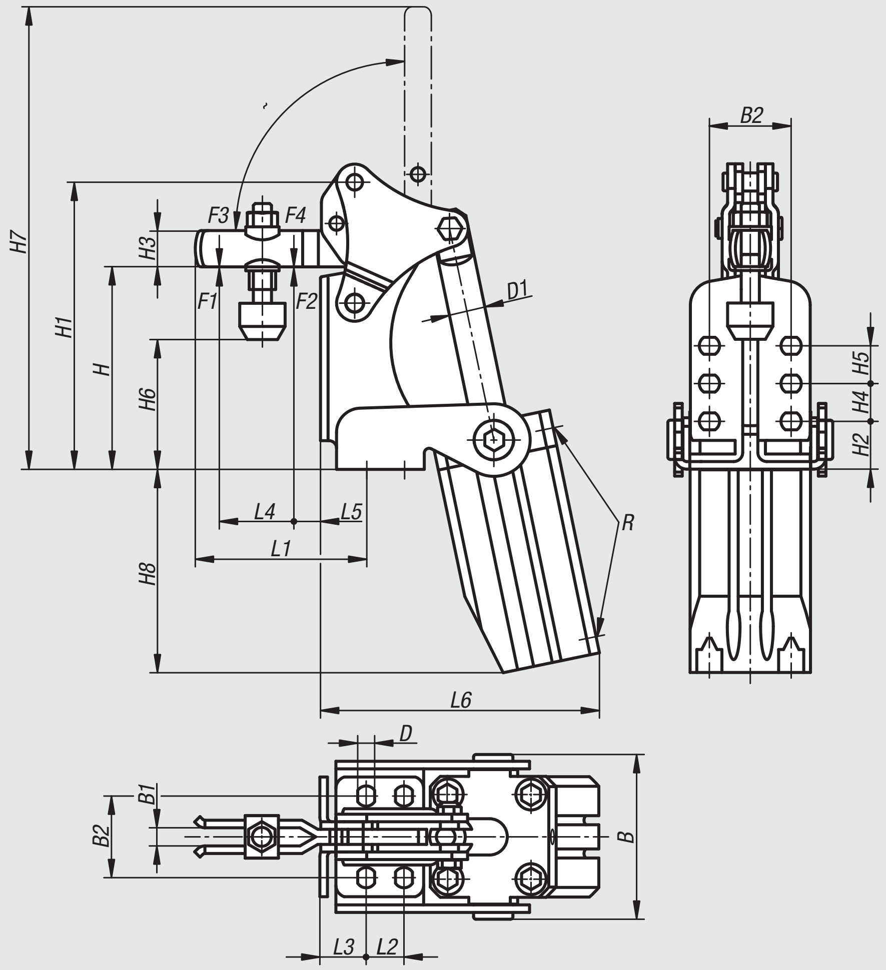
Note:
Pneumatic clamps have the following advantages compared to hand clamps:
The operator is relieved of frequent clamping.
Several clamps can be activated at the same time and can be closed in a specific sequence.
Single or multiple clamps can be activated from varying positions by machine control or hand control.
Because of the toggle system:
- the clamp remains closed if the air supply fails.
- the air consumption is low due to the large end ratio.
- pivoting the clamping arm achieves a large opening travel.
- optimum force and movement ratios are achieved.

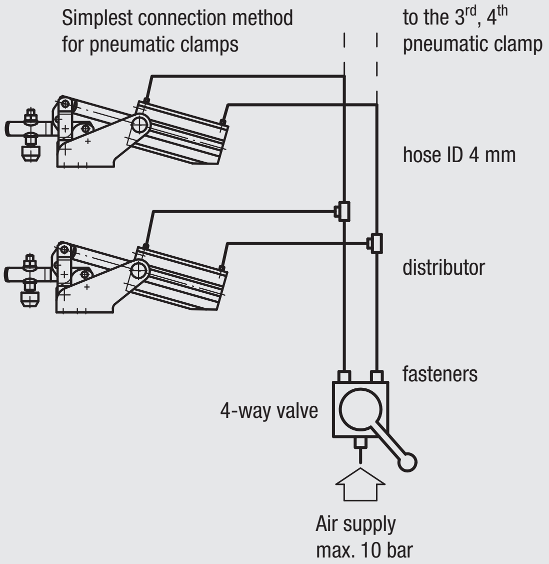
VL = air consumption per complete cycle in dm^3 at 6 bar.

Selection criteria:
To select the correct size of pneumatic clamps, the possible clamping force at 6 bar (any compressed media are permissible, maximum pressure 10 bar) is specified besides the retaining force. F3 is the possible clamping force that the clamp exerts on the end of the clamping arm, F4 the force it exerts on the fulcrum side.

Control:
The schematic diagram for the simplest control of one or several pneumatic clamps is shown here. When constructing complete switching systems consult a well known manufacturer of pneumatic valves who can also supply all the required connectors and fittings.

Attention:
The forces F1 and F2 specified in the table are holding forces.
F3 and F4 are clamping forces.





05332

Vertical pneumatic clamps

with vertical cylinder bracket

Order No.	B	B1	B2	D	D1	H	H1	H2	H3	H4	H5	H6	H7	H8
05332-02	54,5	6	27	5,6	12	65	94	15,8	12	12,5	12,5	38,4 - 45,0	143,5	67,5
05332-03	62,5	8	25	6,5	16	68,7	107	17,5	18	16	-	38,0 - 46,5	184	78
05332-04	77,5	10	45	8,5	16	100	144	20,5	20	32	32	51,0 - 80,0	245	80

Order No.	L1	L2	L3	L4	L5	L6	R	α	F1 kN	F2 kN	F3 kN	F4 kN	VL	suitable thrust screws
05332-02	56,5	12,5	15,3	25	6,5	93	M5	90°	1	1,2	0,7	1	0,26	M6x35
05332-03	80,5	16	16,5	36	12,5	112,5	G1/8	90°	1	2,5	0,65	1,1	0,35	M8x45
05332-04	102	32	17,5	49	19	139	G1/4	90°	2	3	1,5	2,2	0,8	M8x65

05340

Pneumatic clamps push-rod

Material:
Base malleable iron.
Levers and push-rod carbon steel.

Version:
Body painted.
Bracket, levers and push-rod trivalent passivated.

Sample order:
nlm 05340-07

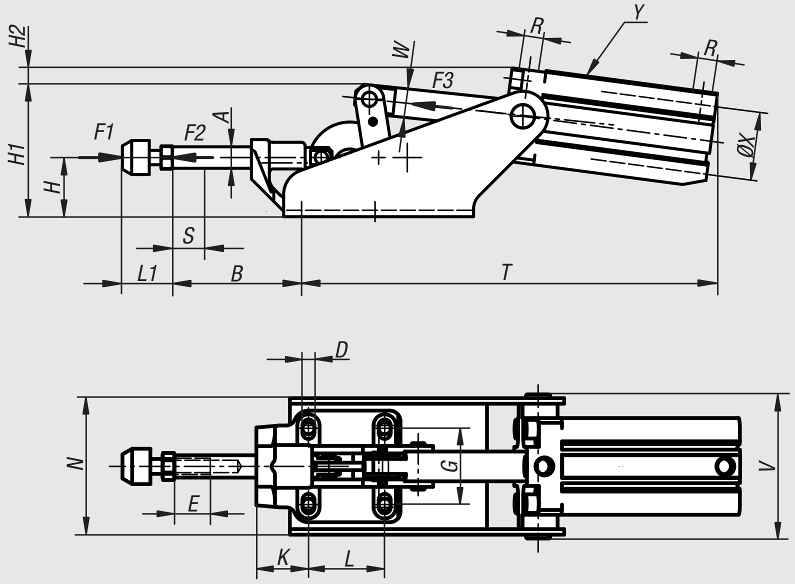
Note:
The pneumatic clamp can be used as a push and pull clamp. The heavy-duty design and the dual-acting FESTO pneumatic cylinder guarantee a long life.
A tempered and trivalent passivated thrust screw with protective cap is also supplied.

VL = compressed air consumption per complete cycle in dm^3 at 6 bar.

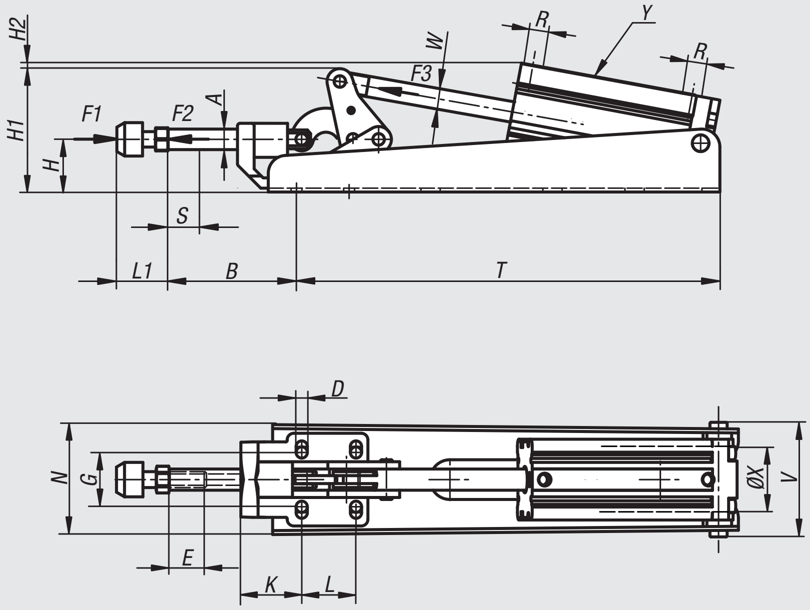
Attention:
The forces F1 specified in the table are holding forces
F2 are clamping forces.

Drawing reference:
Y = cylinder travel

05340-03



05340-05
05340-07



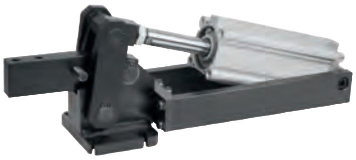
Order No.	A	B	D	E	G	H	H1	H2	K	N	T	V	W	Travel S
05340-03	12	72	6,5	30	41	33	72	22	28	73,5	232	83	16	20
05340-05	16	98	8,5	50	41	41	96	22	45	84	316	86	20	29
05340-07	22	105	11	50	57	59	128	29	45	114	422	93	20	38

Order No.	L	L1 min.	L1 max.	R	F1 kN	F2 kN	F3 kN	VL	X	suitable thrust screws
05340-03	41	21,5	35	G1/8	4	2,5	0,75	0,8	40	M8x35
05340-05	41	30	50	G1/4	10	5	1	2,2	50	M12x50
05340-07	70	30	50	G1/4	25	10	1,8	4,5	63	M12x50

05350

Pneumatic clamps vertical

heavy-duty version



Material:
Carbon steel.

Version:
Black oxidised.

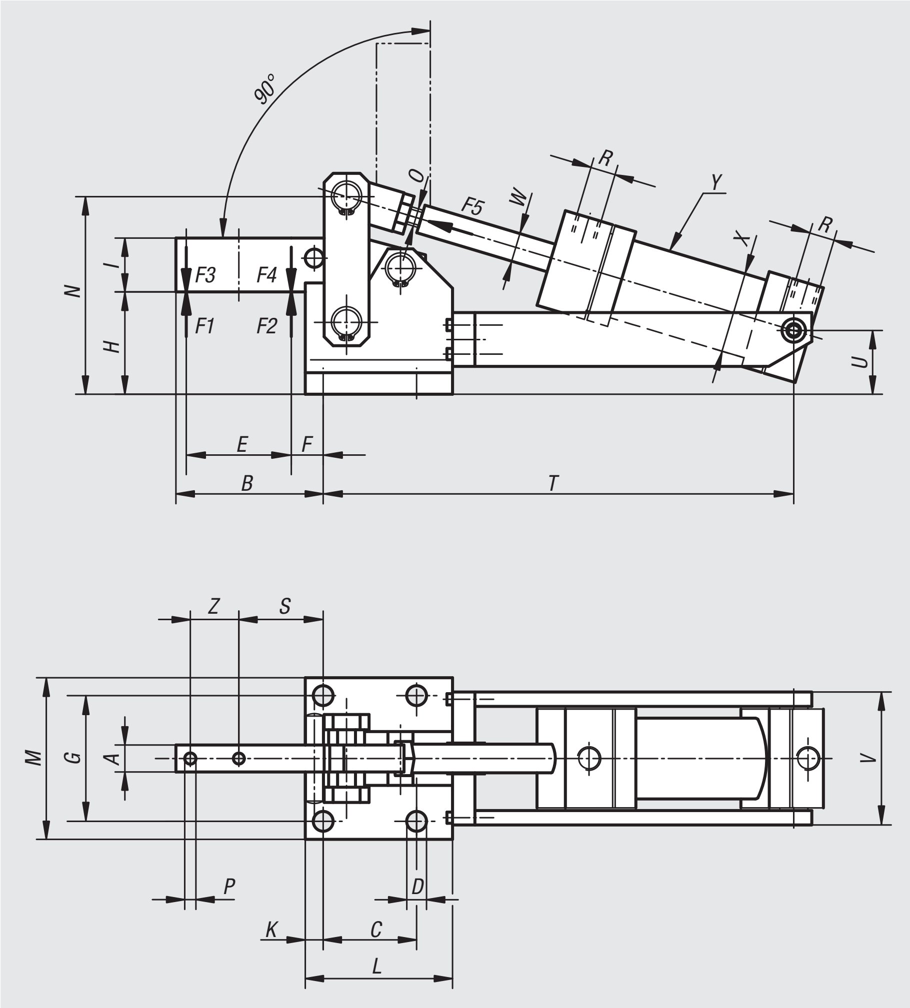
Sample order:
nlm 05350-06

Note:
The double-acting pneumatic cylinder guarantees a long life.
The fastening screws for the hinges are secured with LOCTITE.
The magnetic shaft is fitted for electrical end position feedback.

VL = air consumption per cycle in dm^3 by 6 bar.

Attention:
The forces F1 and F2 specified in the table are holding forces.
F3 and F4 are clamping forces.

Drawing reference:
Y = cylinder travel



Order No.	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T
05350-04	15	82	52	11	54	20	70	57	30	10	77	90	109	M12x1,25	6,2	G1/8	47	277
05350-06	20	90	55	11	60	21	83	61	40	11	85	105	129	M16x1,5	8,2	G1/4	53	315
05350-08	30	128	80	13	95	22	111	86	60	12,5	112,5	135	176	M16x1,5	13,2	G1/4	69,5	383

Order No.	U	V	W	X	Y	Z	total height	total length	F1 kN	F2 kN	F3 kN	F4 kN	F5 kN	VL
05350-04	35,5	82	16	40	80	27	122	380	6	9	1,5	2,2	0,75	1
05350-06	40	101	16	50	100	26	147	435	12	18	2,5	3,5	1	1,8
05350-08	54	123	20	63	120	40	196	540	20	30	4	6	1,8	4,3

05360

Pneumatic clamps vertical

with vertical mounted cylinder

Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 05360-08

Note:
The clamps 05350 and 05360 are suitable for fitting in special machines and transfer machines. The tempered and ground bearing pins that run in Teflon bearings make them maintenance-free. The heavy-duty design and the double-acting pneumatic cylinder guarantee a long life.
The fastening screws for the hinges are secured with LOCTITE.
The magnetic piston is prepared for electric end position feedback.

VL = compressed air consumption per complete cycle in dm^3 at 6 bar.

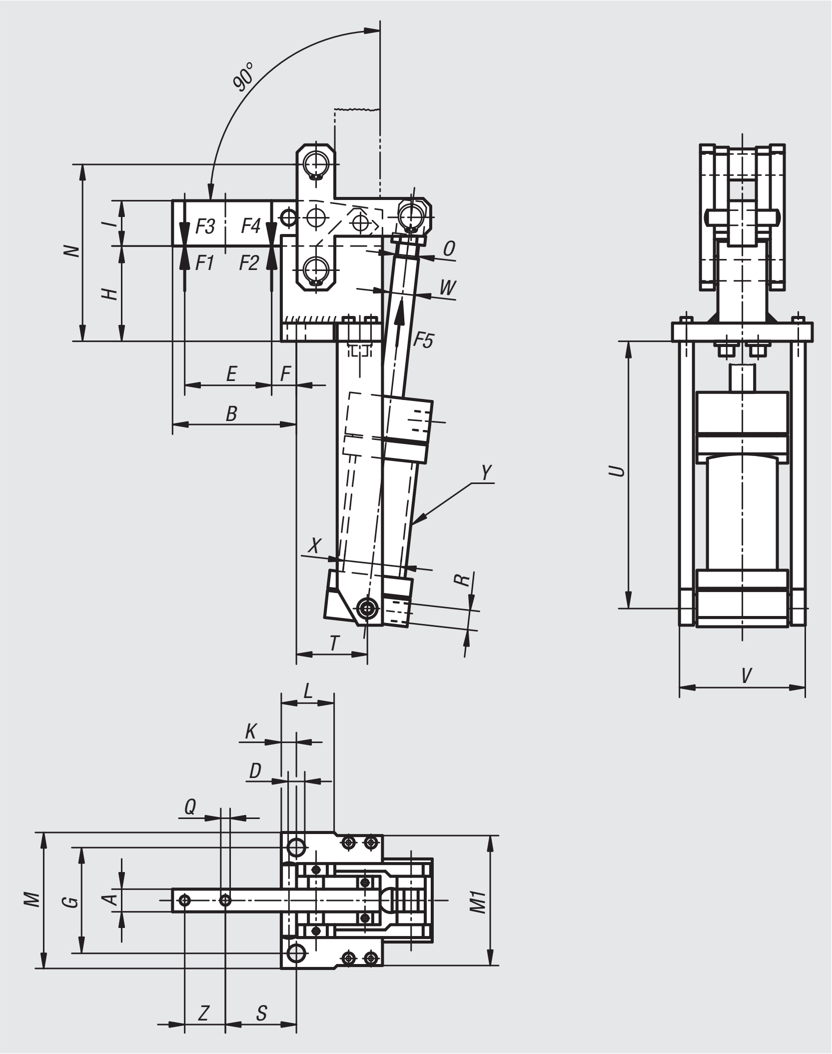
Clamping and retaining forces
The selection of the correct clamp size is dependant on the force (see table). It is distinguish between retaining force F1 or F2 and clamping force F3 or F4.

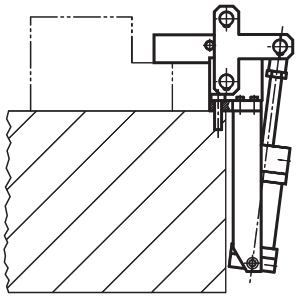
The clamping force F3 and F4 is the force exerted by the clamping arm on the part to be machined when the clamp is closed.

The retaining force F1 and F2 is the force with which the closed clamping arm opposes the machining forces occurring on the part to be machined and which it resists with no permanent deformation. It is greater than the clamping force because the dead point of the lever has to be overcome with the clamp closed when being pushed back.

On request:
Clamps without cylinder.

Drawing reference:
Y = cylinder travel





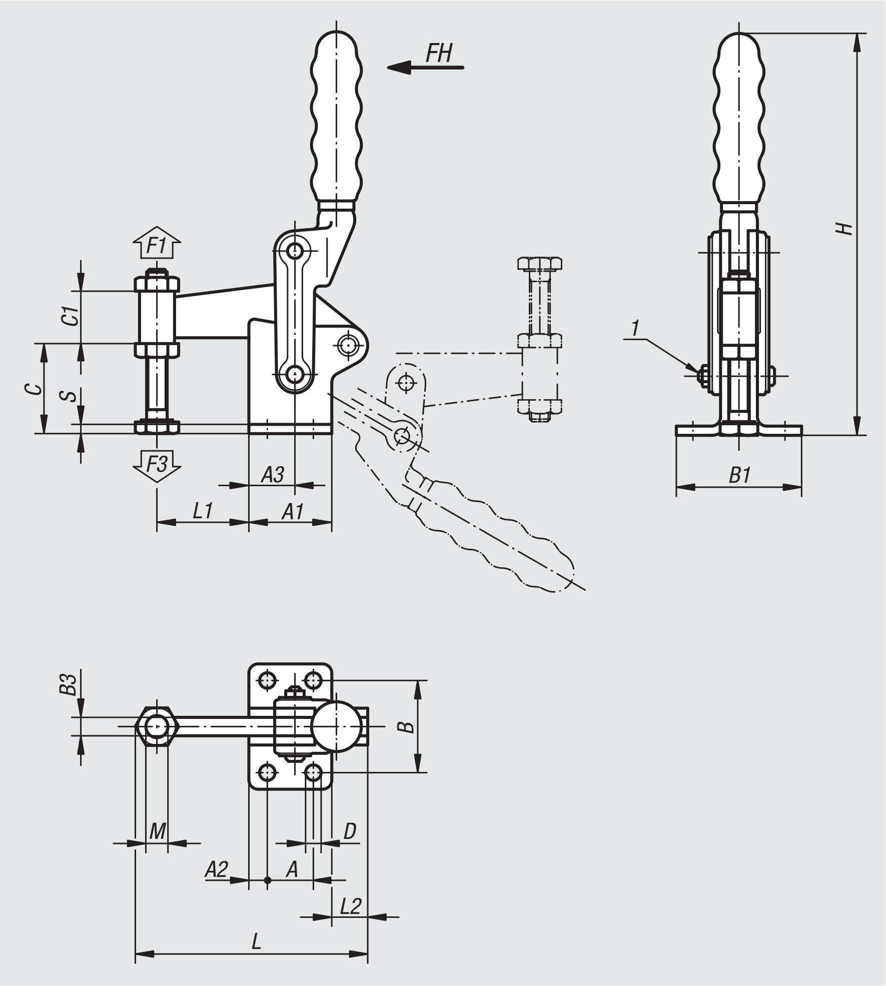
Order No.	A	B	D	E	F	G	H	I	K	L	M	M1	N	O	Q	S	T
05360-04	15	82	11	54	20	70	65	30	10	35	90	90	117	M12x1,25	6,2	47	46
05360-06	20	91	13	60	22	83	69	40	12	32	107	100	137	M16x1,5	8,2	54	48
05360-08	30	125	17	95	24,5	115	94	60	15	49	145	123	184	M16x1,5	13,2	67	77

Order No.	U	V	W	X	Y	R	Z	total height	total length	F1 kN	F2 kN	F3 kN	F4 kN	F5 kN	VL
05360-04	193	82	16	40	74	G1/8	27	172	340	6	9	1,5	2,2	0,75	1
05360-06	221	101	16	50	87	G1/4	26	195	386	12	18	2,5	3,5	1	1,8
05360-08	255	123	16	63	120	G1/4	40	272	470	20	30	4	6	1,8	4,3

05400

Toggle clamps heavy duty

vertical



Material:
Steel.

Version:
Black oxidised.
Thrust spindle and nuts phosphated.
Hinge pins and hinge bushes case-hardened.
Plastic grip oil-resistant.

Sample order:
nlm 05400-04

Note:
Oil all joints regularly.

Drawing reference:
1) adjustable clamp arm guide

Order No.	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Clamping force F3 N	Matching plastic grip
05400-02	180°	120°	340	6000	1400	05520-02
05400-04	180°	125°	500	8000	1400	05520-04
05400-06	195°	130°	500	15000	1850	05520-06

Order No.	A	A1	A2	A3	B	B1	B3	C	C1	D	H	L	L1	L2	M	S
05400-02	25	45	10	25	50	68	10	45	30	8,3	215	124	50	20	M12x100	5
05400-04	30	51	10	25	60	86,5	12	58	30	8,3	250	144	60	23	M12x100	6
05400-06	40	64	12	40	75	104	16	70	38	10,3	295	188	75	37	M16x150	8

05420

Toggle clamps heavy duty version

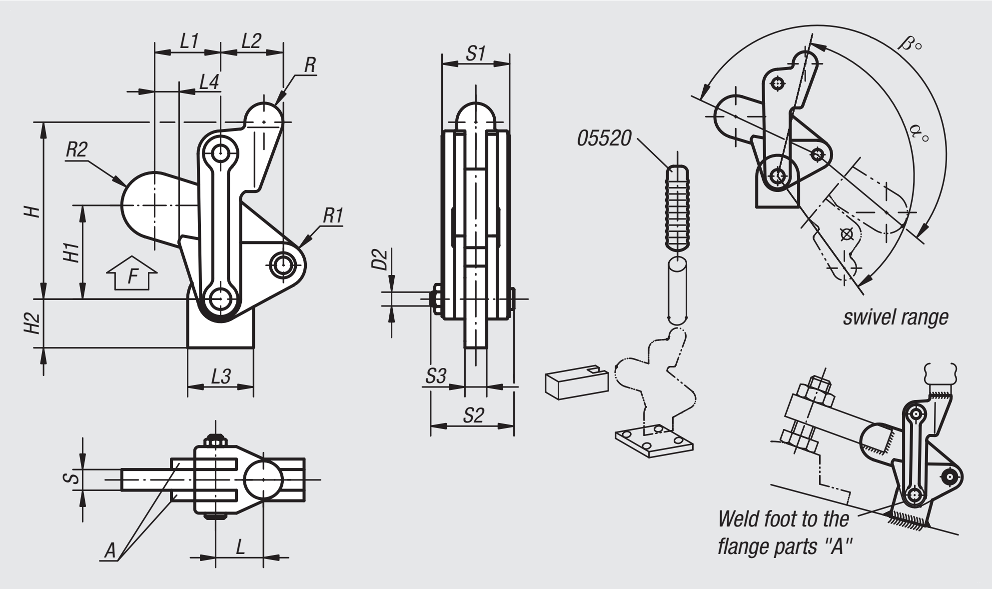
straight foot

Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 05420-02

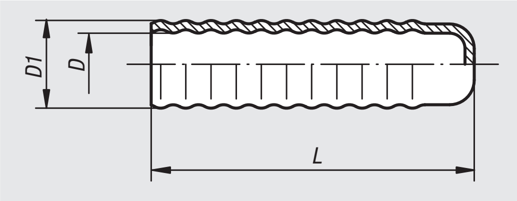
Note:
The hinge pins should be frequently lubricated. When welding the parts it should be ensured that the function of the hinges is not effected.
The toggle clamp can also be welded directly onto a solid base or a base plate. Remove the hinge pin D2 before welding and weld the base of the centre piece onto the base or base plate.
After assembly the bracket “A” should be welded to the centre piece.



Order No.	L	L1	L2	L3	L4	H	H1	H2	D2	S	S1	S2	S3	R	R1	R2	α	β	F kN
05420-02	23	26,5	29	29	1,5	84	38,5	20	8,2	10	32	41	10	10	10	13,5	134°	205°	7
05420-04	25	38	36	38	13	100	54	28	9,5	12	38	48	12	11	13	19	134°	203°	12
05420-06	35	51	44	51	10	129	69	33	12,6	16	50	62	16	15	17	22	132°	200°	24

05520

Plastic grips



Material:
Plastic

Version:
Green

Sample order:
nlm 05520-04

Order No.	L	D	D1
05520-09	80	10	14,6
05520-00	80	12	16,5
05520-01	90	16	21
05520-02	90	19	25
05520-04	100	22	27
05520-06	100	25	29

Latches

with spring clip

Material:
Steel or stainless steel 1.4301.

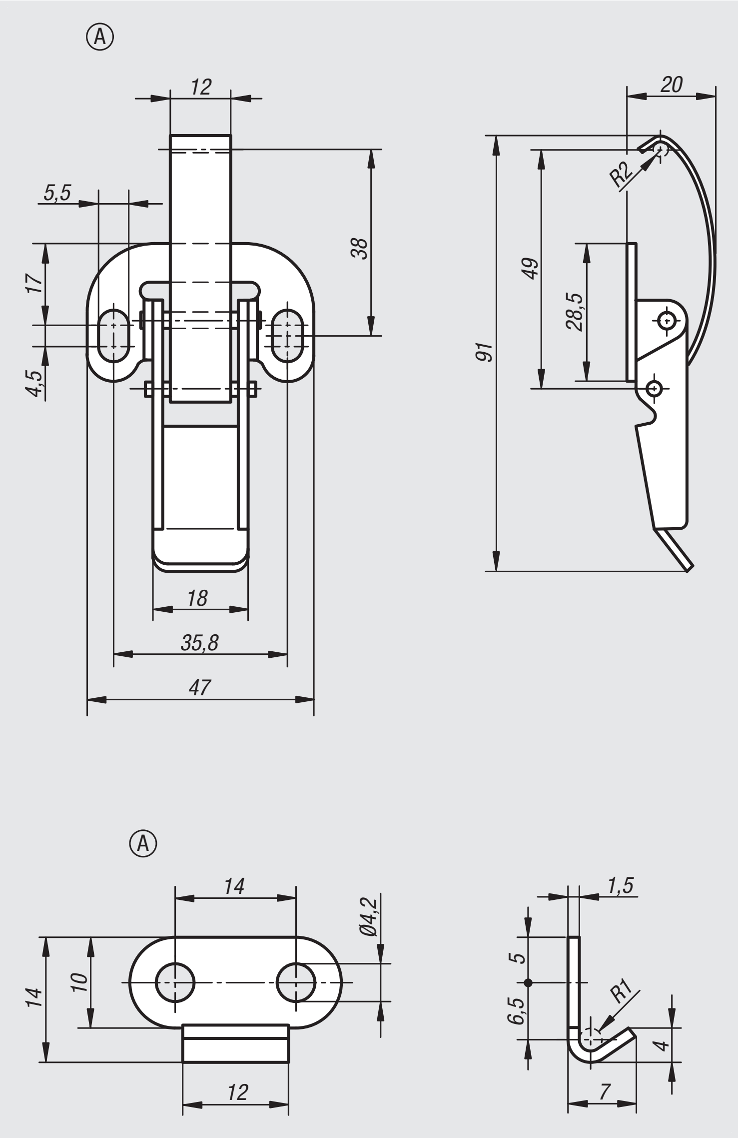
Version:
Electro zinc-plated, thick-film passivated and top coat sealed.
Stainless steel, bright.

Sample order:
nlm 05526-1550911 Latch
nlm 05526-91420141 Catch plate

Note:
Latches with spring clips for securing and locking hatches, container lids, machine cladding etc. By exceeding the dead centre they resist vibration.
The locking force is applied by tensioning a spring clip.

The latches can be screwed down or riveted. We recommend using countersunk screws for fastening the components.

Order catch plates separately.



Latches with spring clip

Order No. steel	Order No. stainless steel	Form
05526-1550911	05526-1550912	A

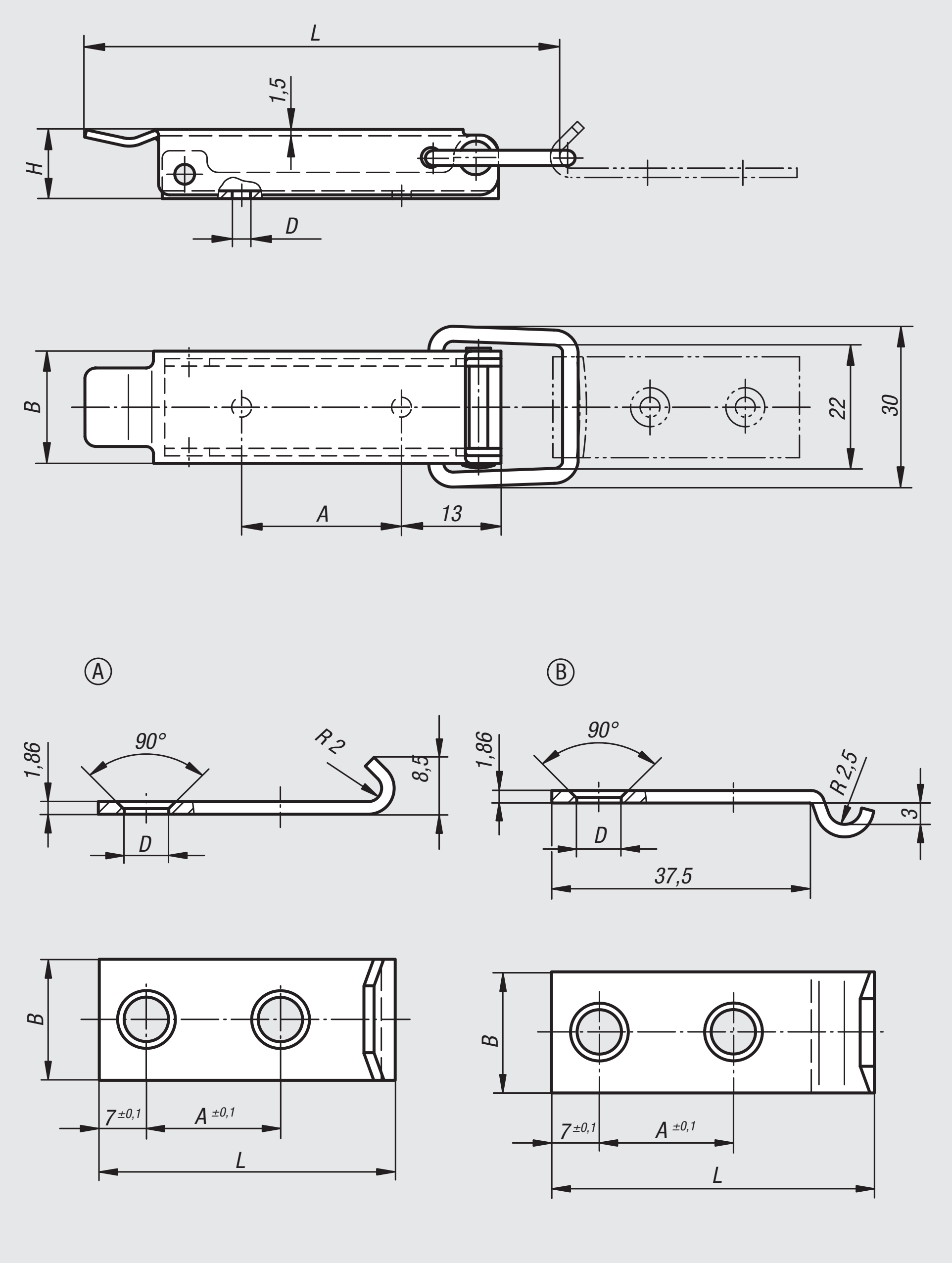
Catch plate

Order No. steel	Order No. stainless steel	Form
05526-91420141	05526-91420142	A

05530-05

Latch stainless steel

DIN 3133



Material:
Stainless steel 1.4301.

Version:
Vibratory ground.

Sample order:
nlm Latch 05530-05-350742
nlm Catch plate 05530-05-91460442

Note:
For quickly locking vertical or horizontal lids and hatches.
With security seal possibility.

Latch stainless steel DIN 3133

Order No.	L	B	H	A	D
05530-05-350742	70	18	12	22	3,5

Catch plates

Order No.	Form	L	B	A	D
05530-05-91460442	A	44	18	20	4,8
05530-05-92460482	B	48	18	20	4,8

Latches

with draw bail

Material:
Steel or stainless steel 1.4301.

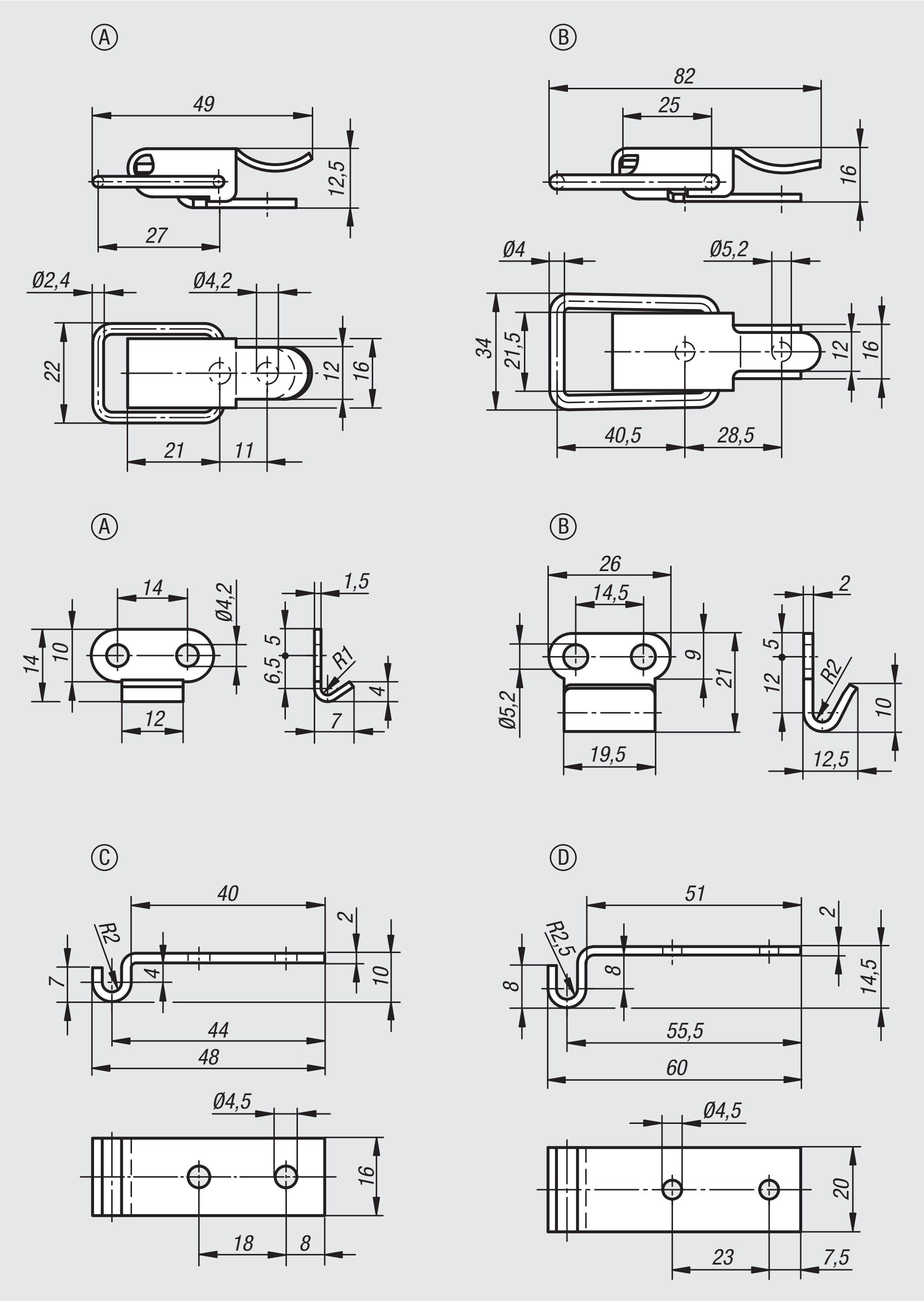
Version:
Electro zinc-plated, thick-film passivated and top coat sealed.
Stainless steel, bright.

Sample order:
nlm 05531-1420491 Latch
nlm 05531-92520211 Catch plate

Note:
Latches with draw bail for securing and locking hatches, container lids, machine cladding etc. By exceeding the dead centre they resist vibration. The locking force is applied by drawing on the bail.

The latches can be screwed down or riveted. We recommend using countersunk screws for fastening the components.

Order catch plates separately.



Latches with draw bail

Order No. steel	Order No. stainless steel	Form	Retaining force F1 N
05531-1420491	05531-1420492	A	250
05531-2520821	05531-2520822	B	300

Catch plate

Order No. steel	Order No. stainless steel	Form
05526-91420141	05526-91420142	A
05531-92520211	05531-92520212	B
05531-93450481	05531-93450482	C
05531-94450601	05531-94450602	D

05536

Latches

with draw bail

Material:
Steel or stainless steel 1.4301.

Version:
Electro zinc-plated, thick-film passivated and top coat sealed.
Stainless steel, bright.

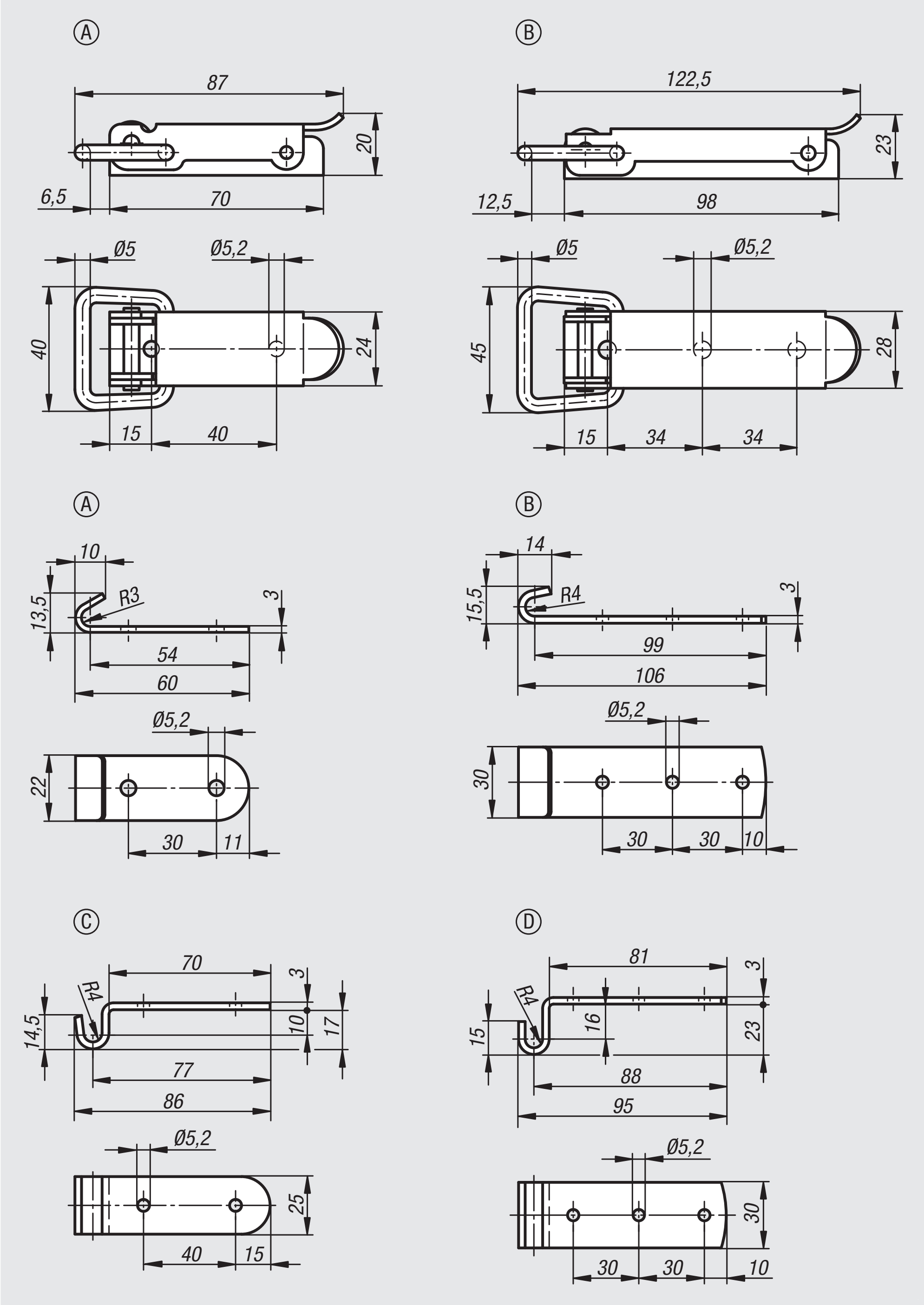
Sample order:
nlm 05536-1520871 Latch
nlm 05536-91520601 Catch plate

Note:
Latches with draw bail for securing and locking hatches, container lids, machine cladding etc. By exceeding the dead centre they resist vibration.
The locking force is applied by drawing on the bail.

The latches can be screwed down or riveted. We recommend using countersunk screws for fastening the components.

Order catch plates separately.

On request:
Lockable version with padlock bracket.



Latches with draw bail

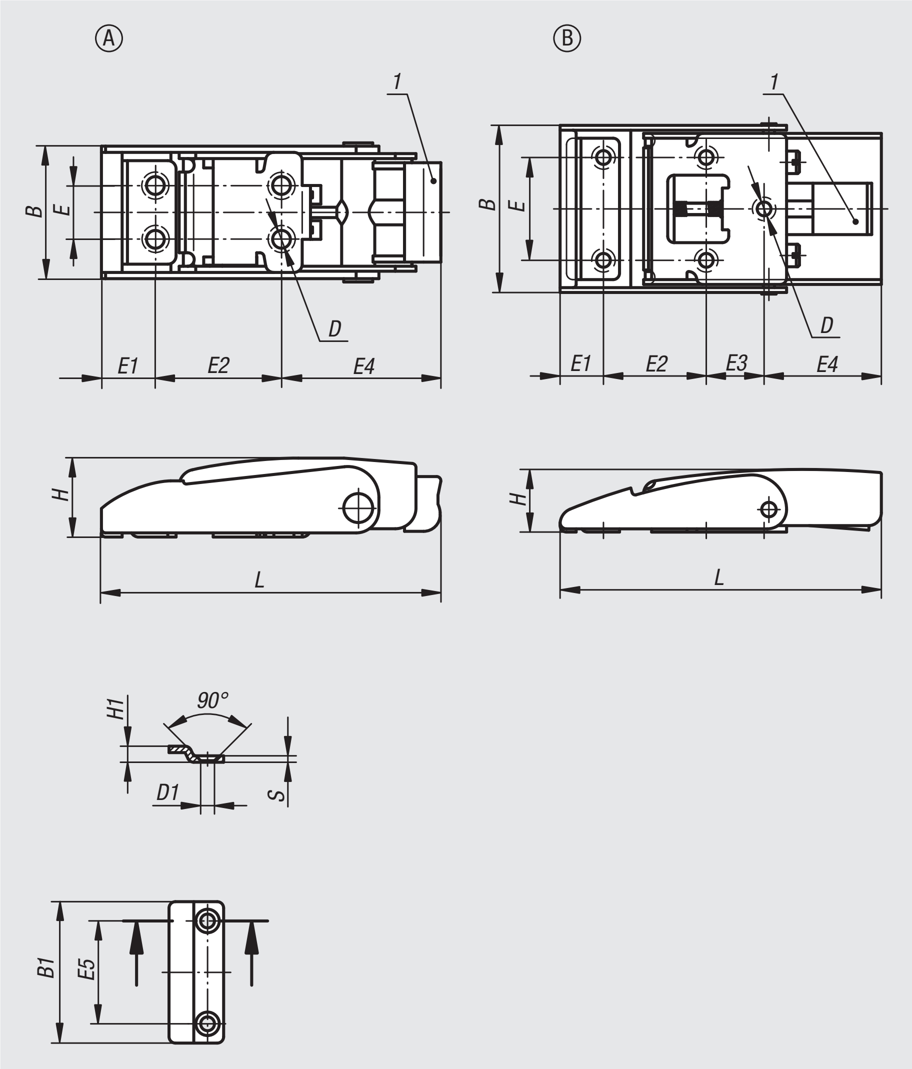
Order No. steel	Order No. stainless steel	Form
05536-1520871	05536-1520872	A
05536-2521221	05536-2521222	B

Catch plate

Order No. steel	Order No. stainless steel	Form
05536-91520601	05536-91520602	A
05536-92521061	05536-92521062	B
05536-93520861	05536-93520862	C
05536-94520951	05536-94520952	D

Latches with release

stainless steel



Material:
Stainless steel 1.4301.

Version:
Bright.
The latch surface is satin finished.

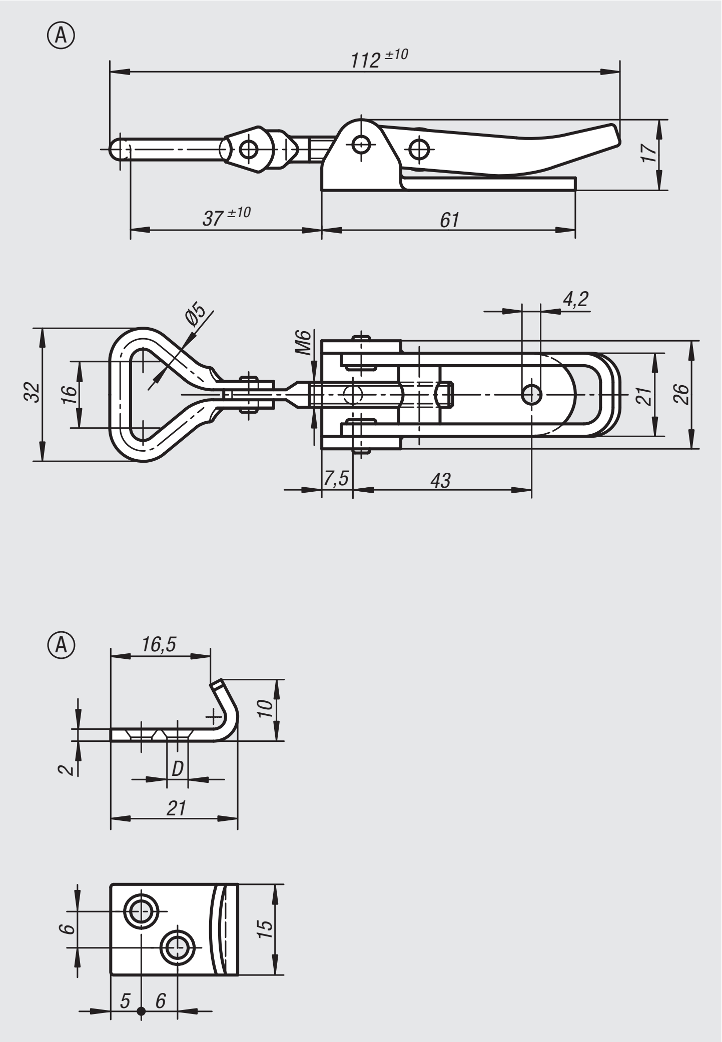
Sample order:
nlm 05547-05-43082

Drawing reference:
1) Release

Order No.	Form	L	E	E1	E2	E3	E4	B	H	D	B1	E5	H1	D1	S
05547-05-43082	A	82	13	13,5	30	-	38,5	33,6	19,5	4,3	25	13	5	4,3	2
05547-05-43100	B	100	32	13,5	32	18	36,5	53	19,5	4,3	44	32	5	4,3	2

Latches adjustable

with swing bail



Material:
Steel or stainless steel 1.4301.

Version:
Steel trivalent blue passivated.
Stainless steel bright.

Sample order:
nlm 05550-1421121 Latch
nlm 05550-9135211 Catch plate

Note:
Adjustable latches are secure locking systems for industrial applications. By exceeding the dead center they resist vibration. To compensate for tolerances the latch has a swing mounted bail.

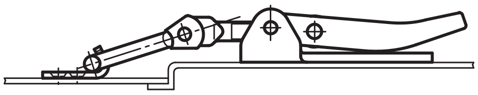
After the bail is engaged with the catch plate, the parts to be locked can be drawn together by up to 15 mm by pushing the lever down. To compensate for tolerances or to create enough tension the bail length can be adjusted by the M6 threaded spindle.

The latches can be screwed down or riveted. We recommend using countersunk screws for fastening the components.

Order catch plates separately.

The retaining force F1 applies to the latch, not the catch plate.

On request:
Available with safety catch to prevent springing open.



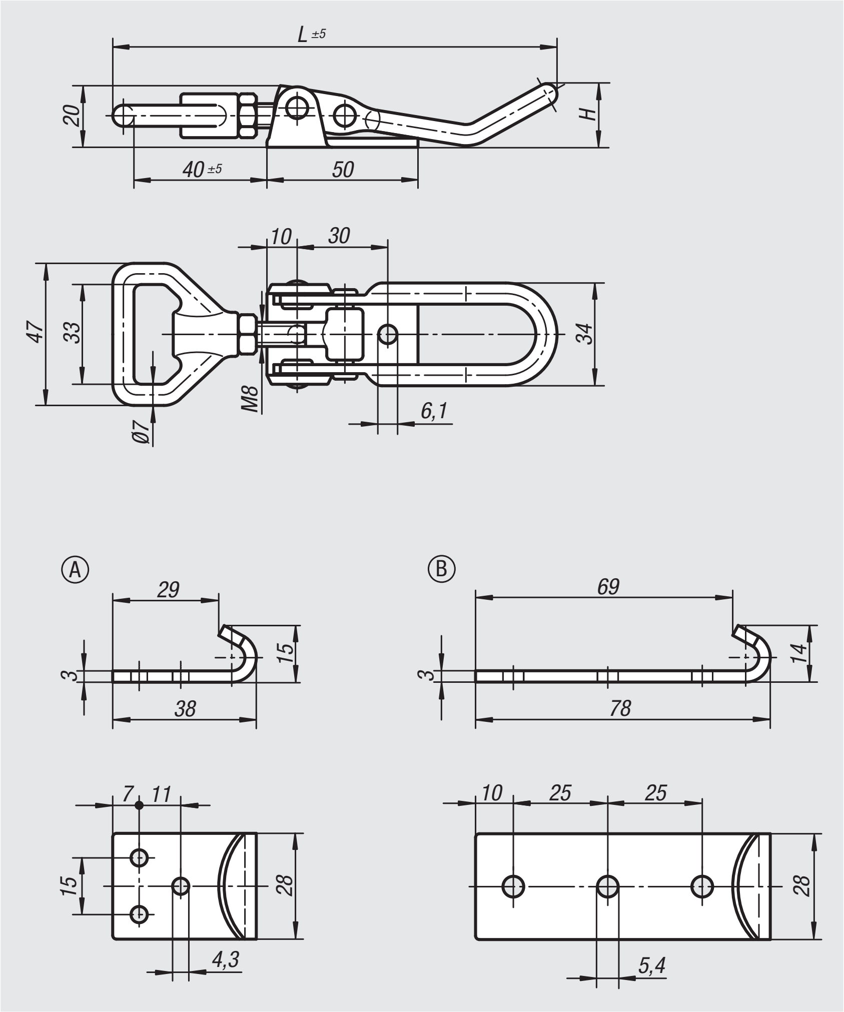
Latches adjustable, with swing bail

Order No. steel	Order No. stainless steel	Form	Retaining force F1 N
05550-1421121	05550-1421122	A	1000

Catch plates

Order No. steel	Order No. stainless steel	Form	D
05550-9135211	05550-9135212	A	3,7

Latches adjustable



Material:
Steel or stainless steel 1.4301.

Version:
Steel trivalent blue passivated.
Stainless steel bright.

Sample order:
nlm 05552-1611451 Latch
nlm 05552-9143381 Catch plate

Note:
Adjustable latches are secure locking systems for industrial applications. By exceeding the dead center they resist vibration.

After the bail engages with the catch plate, the parts to be locked can be drawn together by up to 15 mm by pushing the lever down. To compensate for tolerances or to create enough tension the bail length can be adjusted using the M8 spindle.

The latches can be screwed down or riveted. We recommend using countersunk screws for fastening the components.

Order the required catch plate version separately.

The retaining force F1 applies to the latch, not the catch plate.

On request:
Lockable version with padlock bracket.

Latches adjustable

Order No. steel	Order No. stainless steel	H	L	Retaining force F1 N
05552-1611451	**05552-1611452**	21	145	6500
05552-1611681	**05552-1611682**	36	168	6500

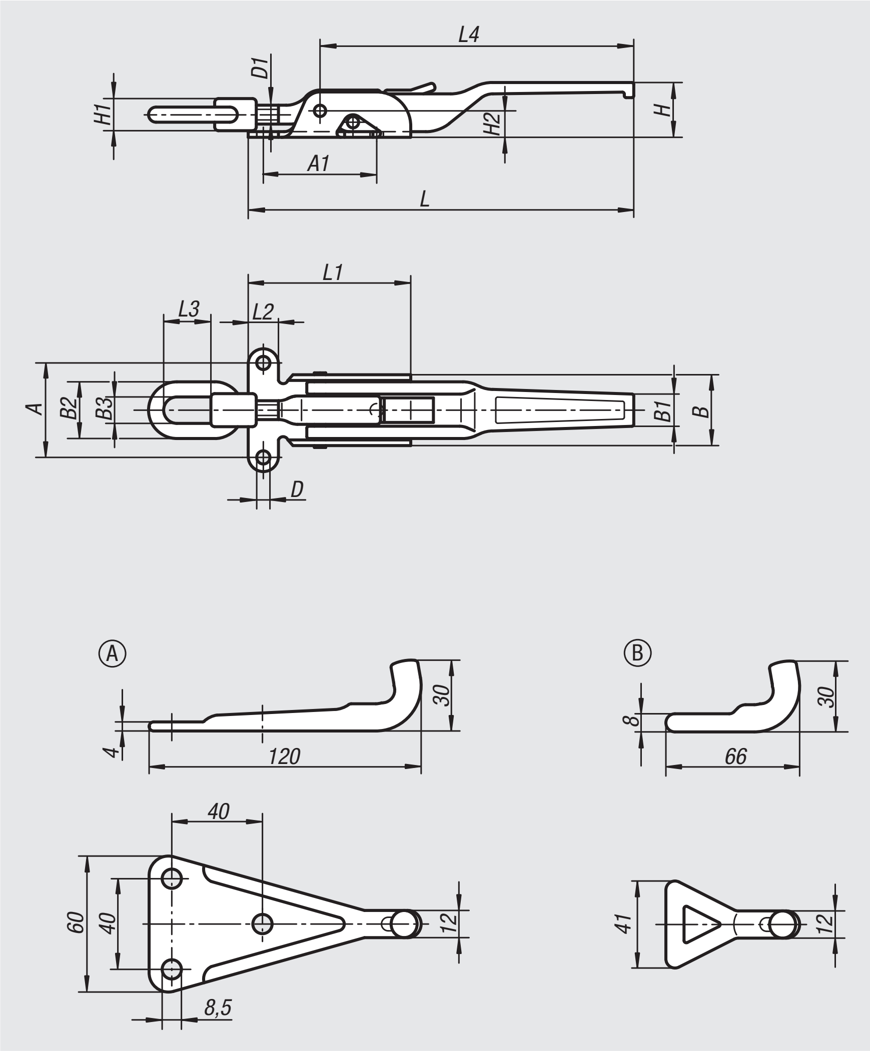
Catch plates

Order No. steel	Order No. stainless steel	Form
05552-9143381	**05552-9143382**	A
05552-9254781	**05552-9254782**	B

05560

Adjustable latches

heavy-duty version



Material:
Steel.

Version:
Trivalent blue passivated.
Catch plate Form B (weldable), bright.

Sample order:
nlm 05560-1702041 Latch
nlm 05560-91851201 Catch plate

Note:
Heavy-duty forged latches for high tensile loads. Primarily used on utility vehicles, agricultural and construction machinery. A ratchet prevents unintentional opening when closed.

To compensate for tolerances or to create enough tension the bail can be adjusted using the spindle D1.

Order required catch plate version separately.

The retaining force F1 applies to the latch, not the catch plate.

Latches adjustable, heavy-duty version

Order No.	A	A1	B	B1	B2	B3	D	D1	H	H1	H2	L	L1	L2	L3	L4	Retaining force F1 N
05560-1702041	49	62	37	18	30	14	7	M10	30	17	14	204	86	16	25	165	20000
05560-1852371	65	82	50	20	36	15	8,5	M14x1,5	32	20	18	237	104	21	40	190	30500

Catch plates

Order No.	Form
05560-91851201	A
05560-92000601	B

Quarter-turn locks compact

Material:
Housing and actuator die-cast zinc.
Nut brass.
O-ring NBR, flat seal CR.
Tongue steel.

Version:
Housing and actuator, trivalent passivated or black powder-coated.
Nut and tongue, electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05561-16131
nlm Tongue 05563-0124X075 (include tongue gap „A“)

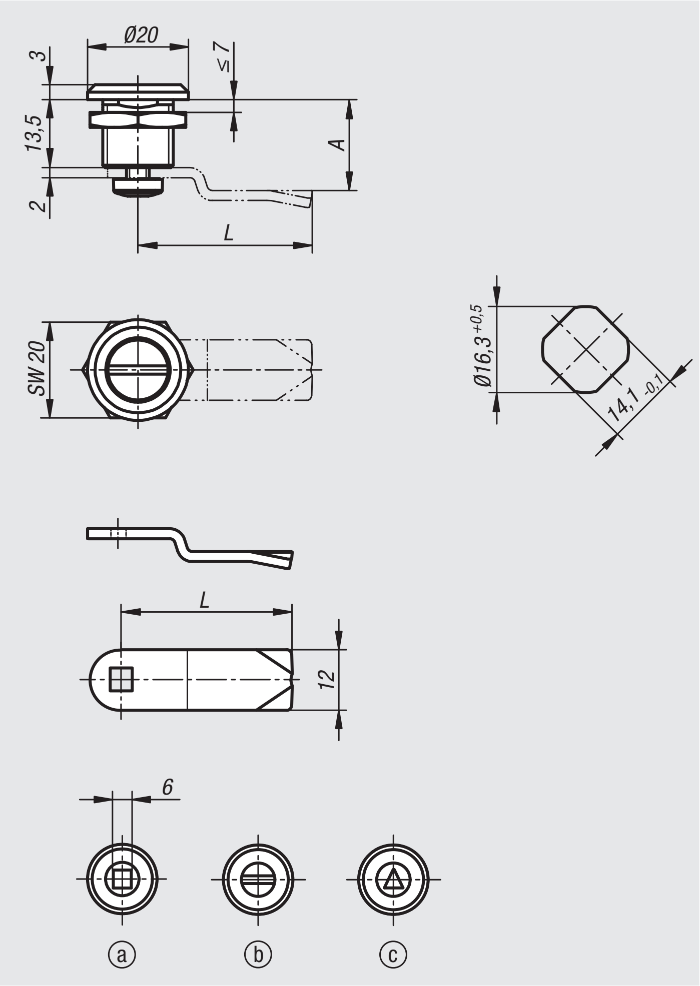
Note:
This quarter-turn lock is vibration-resistant through a detent mechanism in the end position. Right or left mounting with 90° closing and internal rotation limit. The quarter-turn lock can be installed pre-assembled (limitations by small A-dimensions and thick doors). Tested according to DIN EN 60068-2-64 (vibration) and DIN EN 60068-2-27 (shock), test standard 61373. Vibration-proof as per rail applications category 1, class B requirements (highest requirement).

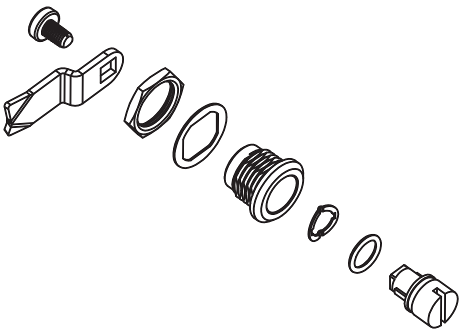
Water and dust proof as per IP65 through O-ring and flat seal.

Order the required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 6 mm
b) slot
c) triangle 6,5 mm





Quarter-turn locks compact

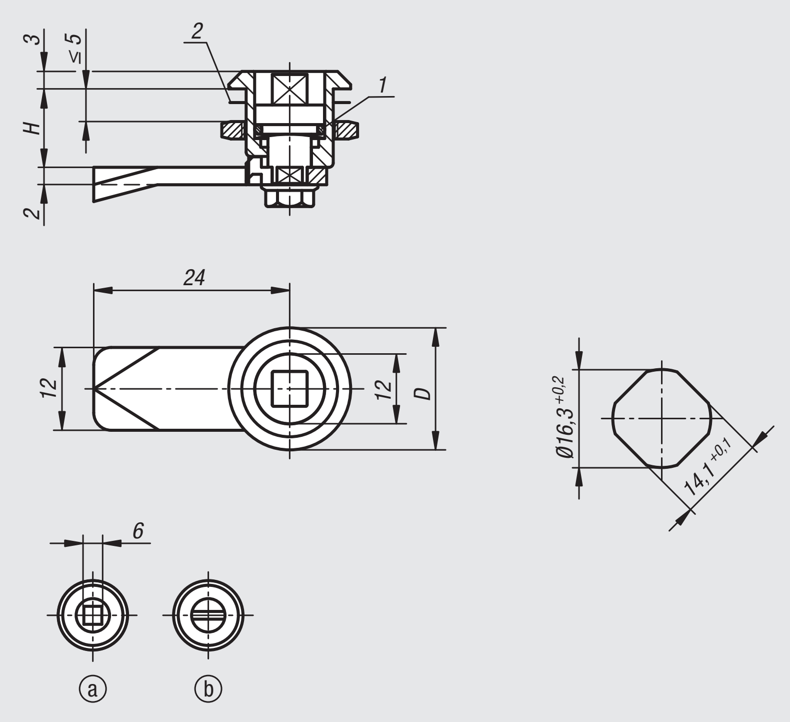
Order No. silver	Order No. black	Actuation
05561-16131	05561-16132	square 6 mm
05561-20131	05561-20132	slot
05561-86131	05561-86132	triangle 6.5 mm

Tongue for quarter-turn lock

Order No.	A	L
05563-0124X	7,5/13,5/19,5	24

05561-02

Quarter-turn lock, stainless steel



Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm 05561-02-1613

Note:
The lock can be installed pre-assembled and has a 90° closing angle.
It is protected against water and dust according to IP65 of EN 60529.

Accessories:
Lock key 05586

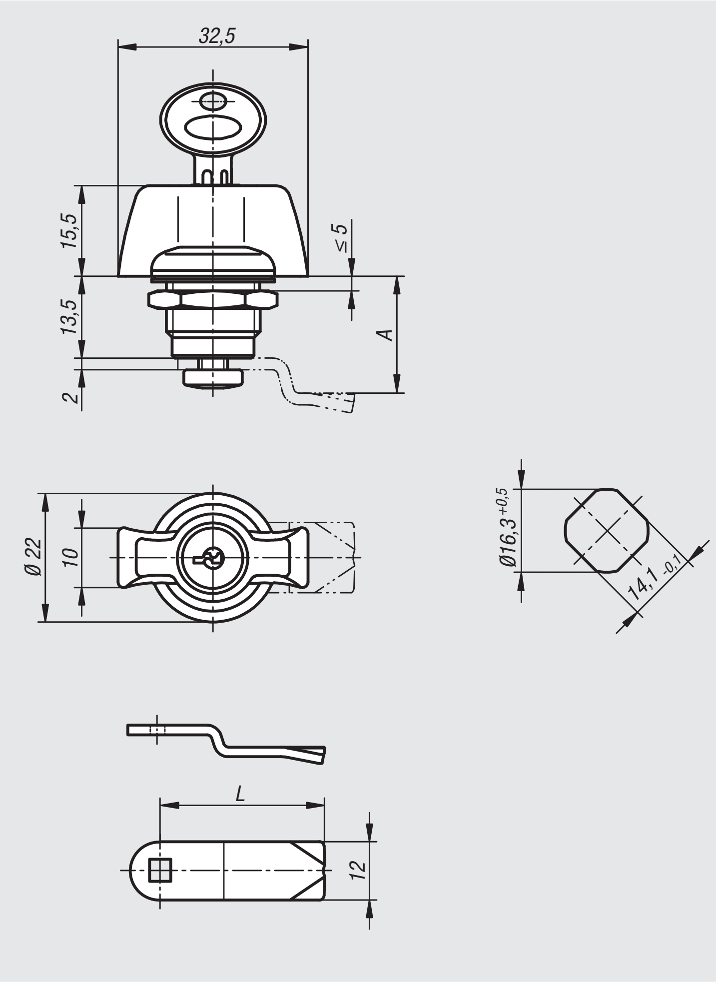
Drawing reference:
Actuation:
a) square 6 mm
b) slot

1) O-ring
2) flat seal

Order No.	Actuation	D	H
05561-02-1613	square 6 mm	20	13,5
05561-02-2013	slot	20	13,5

Quarter-turn locks compact

with wing grip



Material:
Housing and actuator die-cast zinc.
Nut brass.
O-ring NBR, flat seal CR.
Tongue steel.

Version:
Housing trivalent passivated.
Actuator black powder-coated.
Nut and tongue electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05562-30132
nlm Tongue 05563-0124X075 (include tongue gap “A”)

Note:
This quarter-turn lock is vibration-resistant through a detent mechanism in the end position. Right or left mounting with 90° closing and internal rotation limit. The quarter-turn lock can be installed pre-assembled (limitations by small A-dimensions and thick doors).

Water and dust proof as per IP65 through O-ring and flat seal.

The lockable quarter-turn locks are supplied with 2 keys. The key can be removed in both positions (opened and closed). The cylinder locks have a single key system i.e. the same key works in all locks (cylinder lock 2233).

Order the required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Quarter-turn locks compact with wing grip

Order No.	Actuation
05562-30132	grip
05562-31132	lockable grip

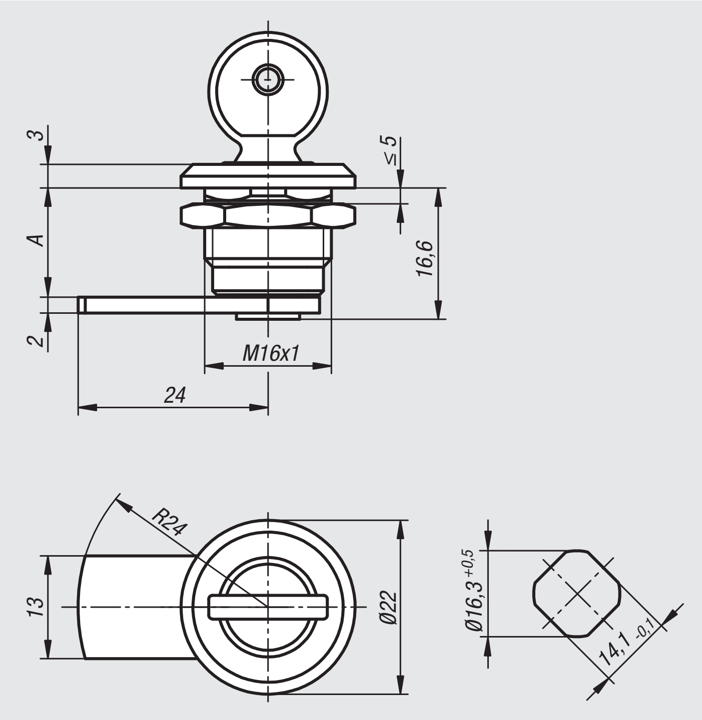
Tongue for quarter-turn lock

Order No.	A	L
05563-0124X	7,5/13,5/19,5	24

05564

Quarter-turn locks compact

lockable



Material:
Housing and actuator die-cast zinc.
Nut brass.
Tongue steel.
Key nickel silver.

Version:
Housing and actuator trivalent passivated.
Nut and tongue electro zinc-plated.

Sample order:
nlm 05564-1135

Note:
Lockable quarter-turn lock, right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled.

These lockable quarter-turn locks are supplied with 2 keys. The key can be removed in both positions (open and closed). The cylinder locks have a single-key system i.e. the same key works in all locks (lock type 2233).

Order No.	Actuation	A
05564-1075	key	7,5
05564-1135	key	13,5
05564-1195	key	19,5

Notes

05566

Quarter-turn locks

Material:
Housing, actuator and nut die-cast zinc.
O-ring NBR, flat seal PUR.
Tongue steel.

Version:
Housing and actuator, trivalent passivated or black powder-coated.
Nut and tongue, electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05566-17181
nlm Tongue 05570-145X040 (include tongue gap "A")

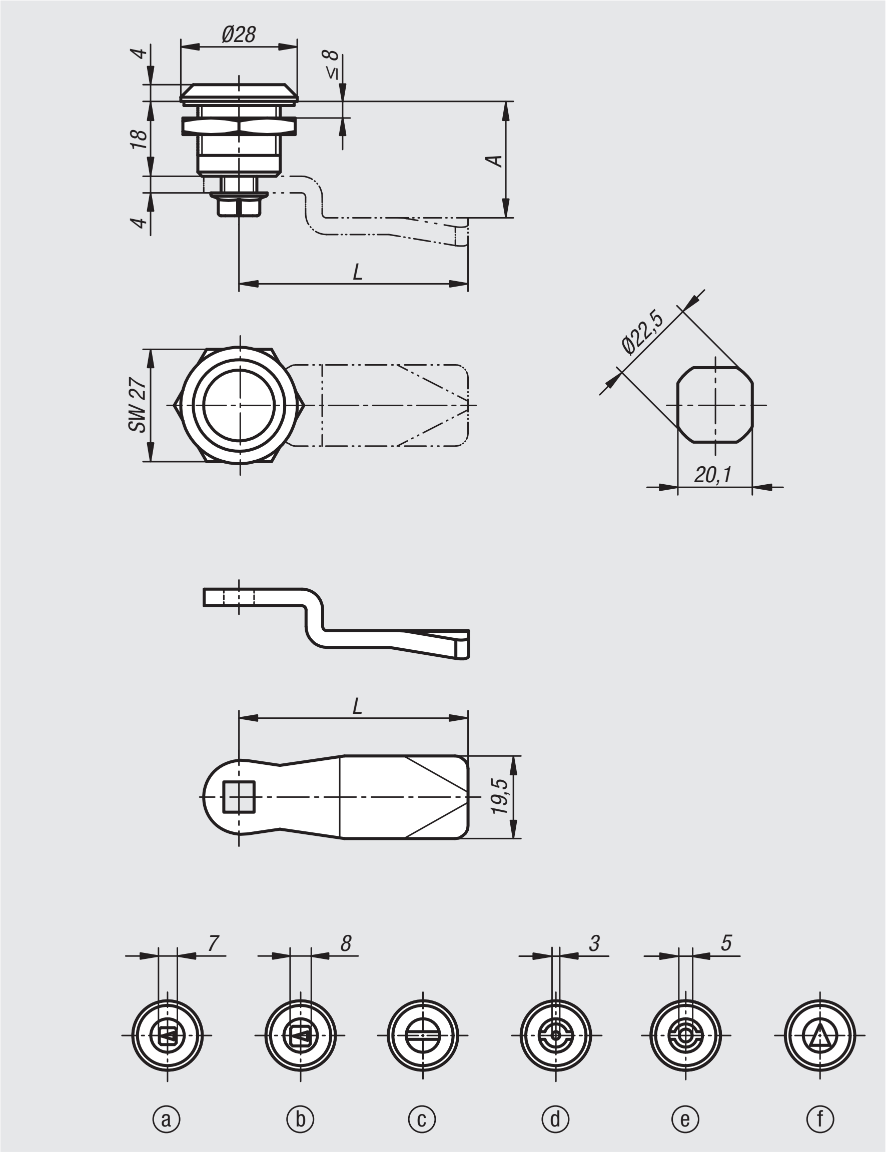
Note:
Quarter-turn lock is vibration-resistant through a detent mechanism in the end position. Right or left mounting with 90° closing and internal rotation limit. The quarter-turn lock can be installed pre-assembled (limitations by small A-dimensions and thick doors). Tested according to DIN EN 60068-2-64 (vibration) and DIN EN 60068-2-27 (shock), test standard 61373. Vibration-proof as per rail applications category 1, class B (highest requirement). The fastening nut has claws allowing it to be used as an earthing nut.

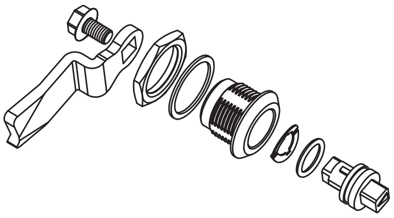
Water and dust proof as per IP65 through O-ring and foamed-on PUR seal.

Order the required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 7 mm
b) square 8 mm
c) slot
d) double lug 3 mm
e) double lug 5 mm
f) triangle 8 mm





Quarter-turn lock

Order No.	Order No. black	Actuation
05566-17181	**05566-17182**	square 7 mm
05566-18181	**05566-18182**	square 8 mm
05566-20181	**05566-20182**	slot
05566-43181	**05566-43182**	double lug 3 mm
05566-45181	**05566-45182**	double lug 5 mm
05566-88181	**05566-88182**	triangle 8 mm

Tongue for quarter-turn lock

Order No.	A	L
05570-145X	4/6/8/10/12/14/16/18/20/22/24/26/28/30/32/34/36/38/40/42	45
05570-135X	16/18/20/22/24	35

05566-03

Quarter-turn locks

stainless steel, small version

Material:
Housing 1.4404 stainless steel.
Actuation and fastening nut 1.4404 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05566-03-1718
nlm Tongue 05566-07-450660

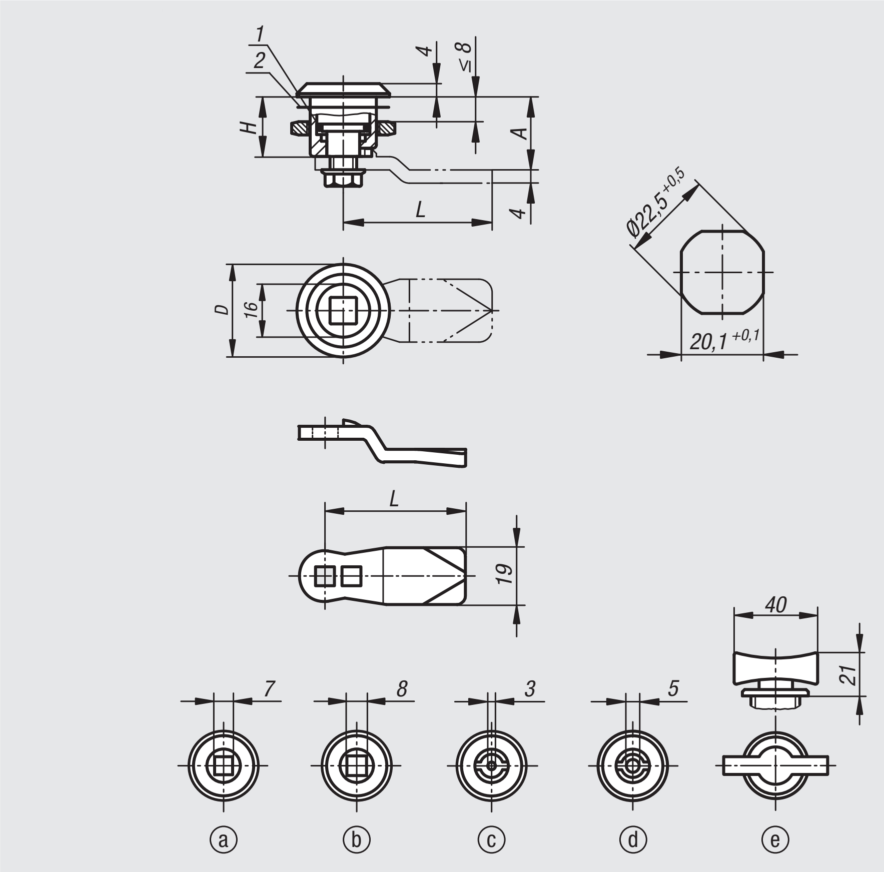
Note:
The quarter turn lock can be installed pre-assembled. For right or left use. Water and dust protected acc. to IP65 from DIN EN 60529.

Please order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 7 mm
b) square 8 mm
c) double lug 3 mm
d) double lug 5 mm
e) wing grip

1) O-ring
2) flat seal



Quarter-turn locks, stainless steel, small version

Order No.	Actuation	D	H
05566-03-1718	square 7 mm	28	18
05566-03-1818	square 8 mm	28	18
05566-03-4318	double lug 3 mm	28	18
05566-03-4518	double lug 5 mm	28	18
05566-03-0018	grip	28	18

Tongue for quarter-turn locks

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

05566-04

Quarter-turn locks, stainless steel

long version

Material:
Housing 1.4305 stainless steel.
Actuation and fastening nut 1.4404 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05566-04-1730
Tongue 05566-07-450660

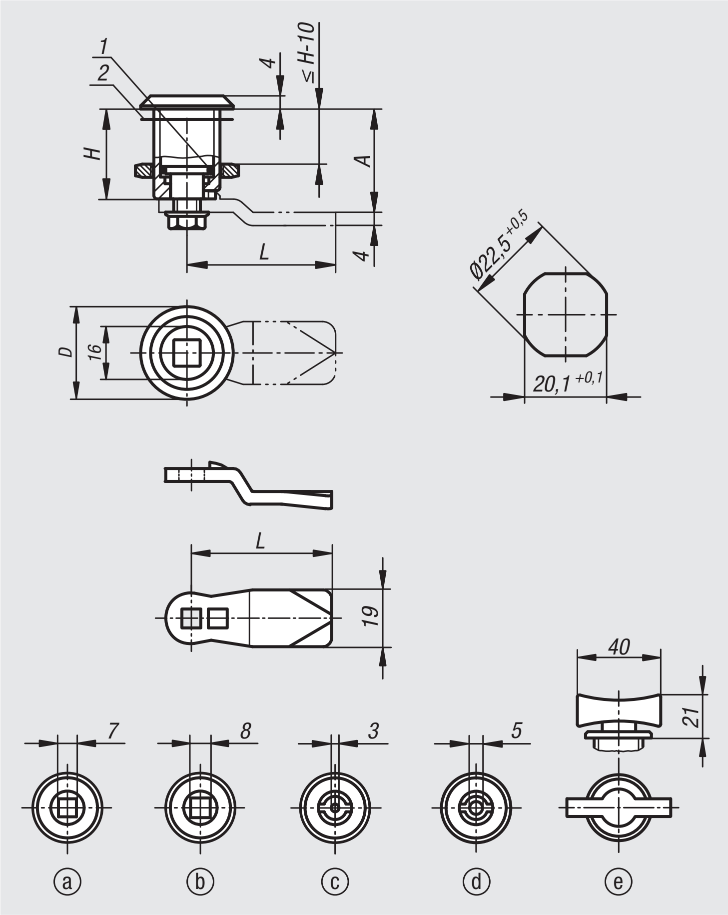
Note:
The quarter turn lock can be installed pre-assembled. For right or left use. Water and dust protected acc. to IP65 from DIN EN 60529.

Please order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 7 mm
b) square 8 mm
c) double lug 3 mm
d) double lug 5 mm
e) wing grip

1) O-ring
2) flat seal



Quarter-turn locks, stainless steel

long version

Quarter-turn locks, stainless steel, long version

Order No.	Actuation	D	H
05566-04-1730	square 7 mm	28	30
05566-04-1736	square 7 mm	28	36
05566-04-1740	square 7 mm	28	40
05566-04-1750	square 7 mm	28	50
05566-04-1760	square 7 mm	28	60
05566-04-1830	square 8 mm	28	30
05566-04-1836	square 8 mm	28	36
05566-04-1840	square 8 mm	28	40
05566-04-1850	square 8 mm	28	50
05566-04-1860	square 8 mm	28	60
05566-04-4330	double lug 3 mm	28	30
05566-04-4336	double lug 3 mm	28	36
05566-04-4340	double lug 3 mm	28	40
05566-04-4350	double lug 3 mm	28	50
05566-04-4360	double lug 3 mm	28	60
05566-04-4530	double lug 5 mm	28	30
05566-04-4536	double lug 5 mm	28	36
05566-04-4540	double lug 5 mm	28	40
05566-04-4550	double lug 5 mm	28	50
05566-04-4560	double lug 5 mm	28	60
05566-04-0030	grip	28	30
05566-04-0036	grip	28	36
05566-04-0040	grip	28	40
05566-04-0050	grip	28	50
05566-04-0060	grip	28	60

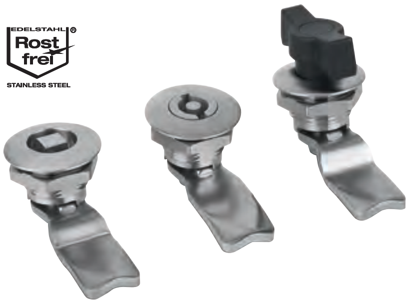
Tongue for quarter-turn locks

Order No.	A for housing length H=30	A for housing length H=36	A for housing length H=40	A for housing length H=50	A for housing length H=60	L
05566-07-45060	18	24	28	38	48	45
05566-07-45080	20	26	30	40	50	45
05566-07-45100	22	28	32	42	52	45
05566-07-45140	26	32	36	46	56	45
05566-07-45160	28	34	38	48	58	45
05566-07-45180	30	36	40	50	60	45
05566-07-45200	32	38	42	52	62	45
05566-07-45220	34	40	44	54	64	45
05566-07-45240	36	42	46	56	66	45
05566-07-45260	38	44	48	58	68	45
05566-07-45280	40	46	50	60	70	45
05566-07-45320	44	50	54	64	74	45
05566-07-45500	62	68	72	82	92	45

05566-05

Quarter-turn locks

stainless steel, small version



Material:
Housing and fastening nut 1.4404 stainless steel.
Actuator 1.4401.
O-ring NBR.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05566-05-1718
nlm Tongue 05566-07-450660

Note:
The quarter turn lock can be installed pre-assembled.
For right or left use.

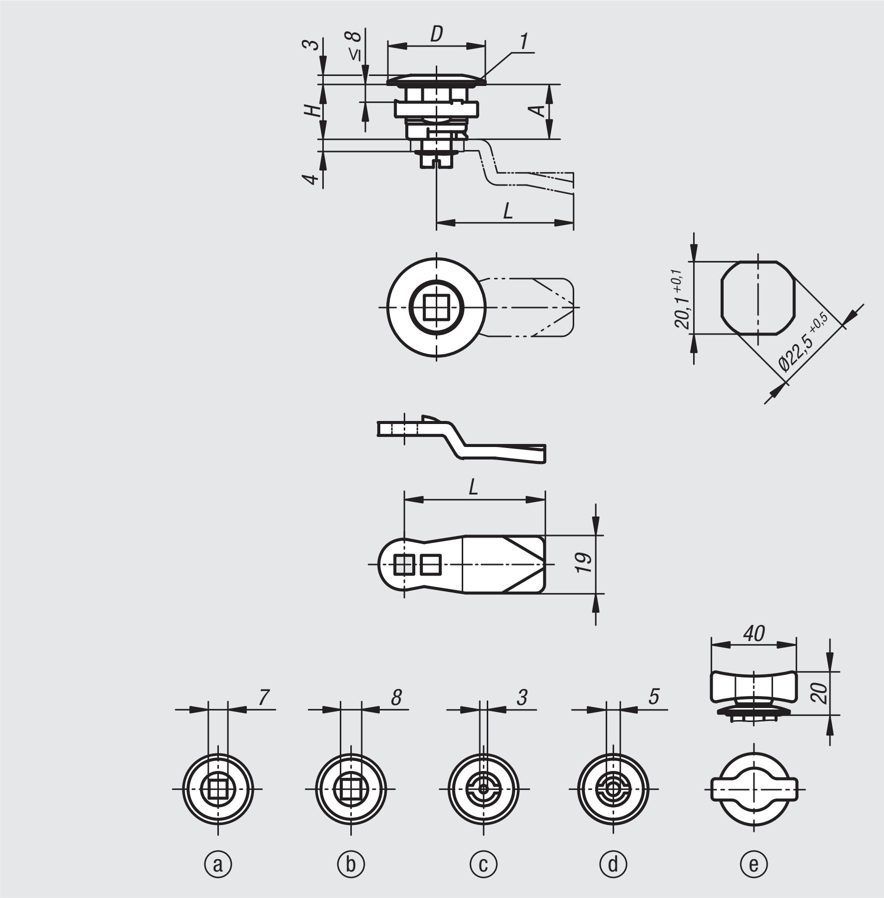
Water and dust protected acc. to IP65 to DIN EN 60529.

Please order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 7 mm
b) square 8 mm
c) double lug 3 mm
d) double lug 5 mm
e) wing grip

1) O-ring



Quarter-turn locks, stainless steel, small version

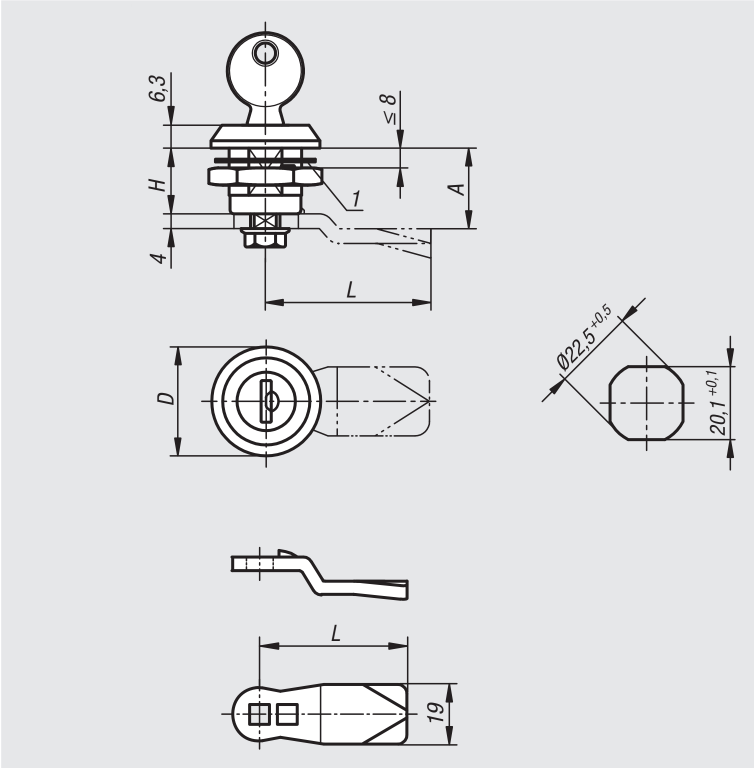
Order No.	Actuation	D	H
05566-05-1718	square 7 mm	32	18
05566-05-1818	square 8 mm	32	18
05566-05-4318	double lug 3 mm	32	18
05566-05-4518	double lug 5 mm	32	18
05566-05-0018	grip	32	18

Tongue for quarter-turn locks

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

Quarter-turn locks

lockable, stainless steel



Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05566-06-18
nlm Tongue 05566-07-450660

Note:
The quarter turn lock can be installed pre-assembled. Housing with fastening nut and plate cylinder, same key locking, incl. 2 keys.

Please order required tongue version separately. Every tongue can be combined with every housing.

Drawing reference:
1) flat seal

Quarter-turn lock, lockable, stainless steel

Order No.	Actuation	D	H
05566-06-18	key single-key system	30	18

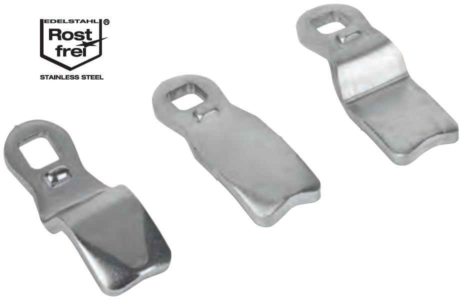
Tongue for quarter-turn lock

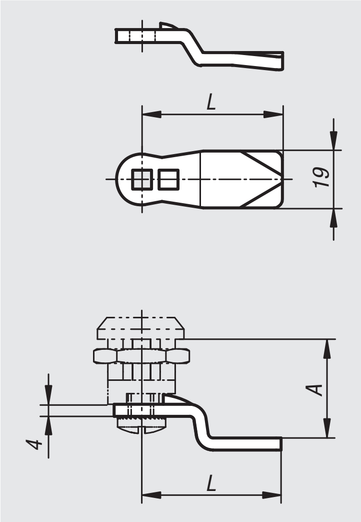
Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

05566-07

Tongue for quarter-turn lock

EDELSTAHL Rost frei STAINLESS STEEL





Material:
Stainless steel 1.4301.

Version:
Bright.

Sample order:
nlm 05566-07-45060

Order No.	A=tongue spacing	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

Quarter-turn locks

polyamide

Material:
Housing and actuator PA6 fibreglass reinforced plastic.
Nut die-cast zinc.
O-ring NBR, flat seal CR.
Tongue steel.

Version:
Housing and actuator black.
Nut and tongue electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05567-17185
nlm Tongue 05569-145X040 (include tongue gap “A”)

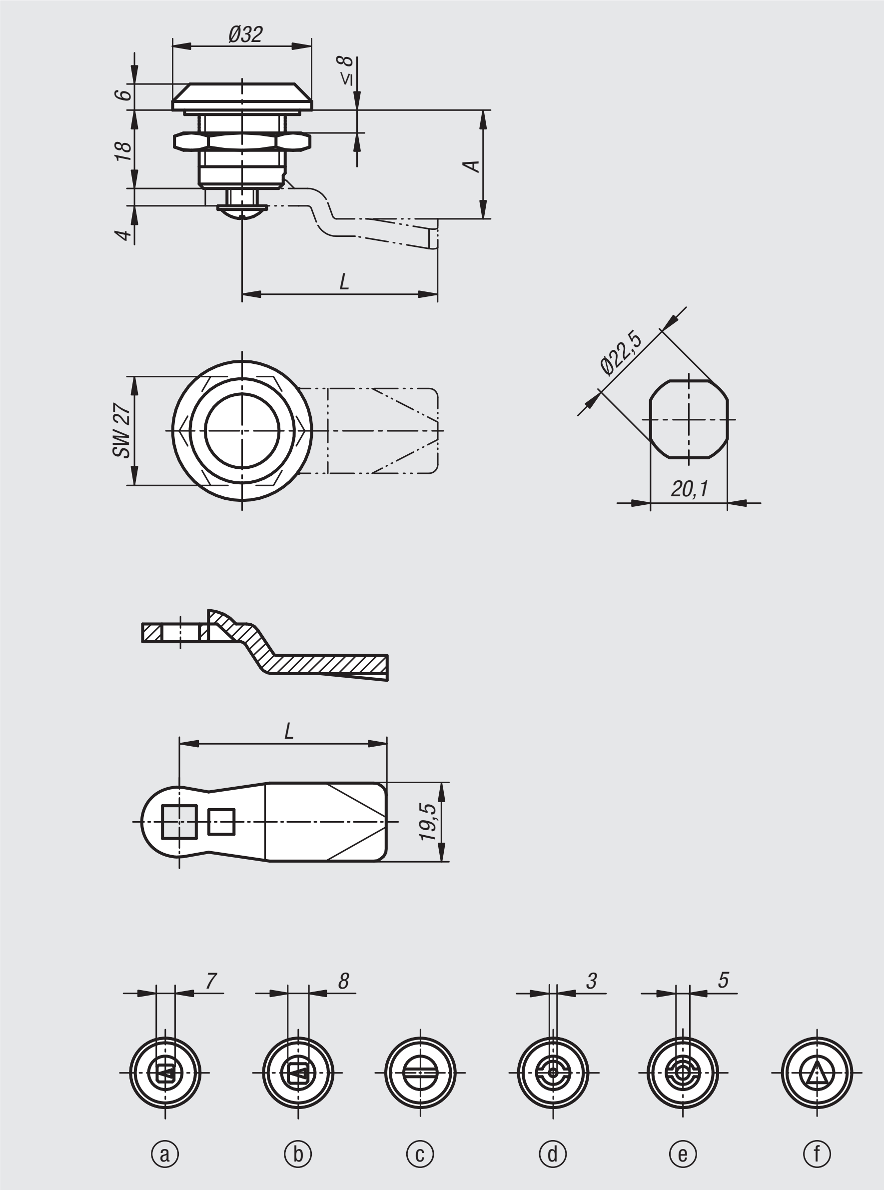
Note:
Quarter-turn lock with spring-loaded tongue. Right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled (limitations by a small A-dimension and thick doors).

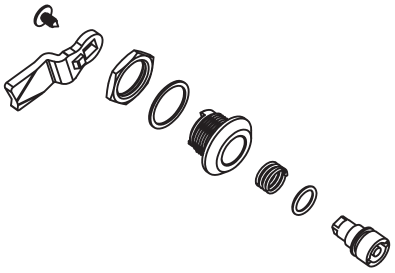
Water and dust proof as per IP65 through the O-ring and flat seal.

Order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 7 mm
b) square 8 mm
c) slot
d) double lug 3 mm
e) double lug 5 mm
f) triangle 8 mm





Quarter-turn locks polyamide

Order No.	Actuation
05567-17185	square 7 mm
05567-18185	square 8 mm
05567-20185	slot
05567-43185	double lug 3 mm
05567-45185	double lug 5 mm
05567-88185	triangle 8 mm

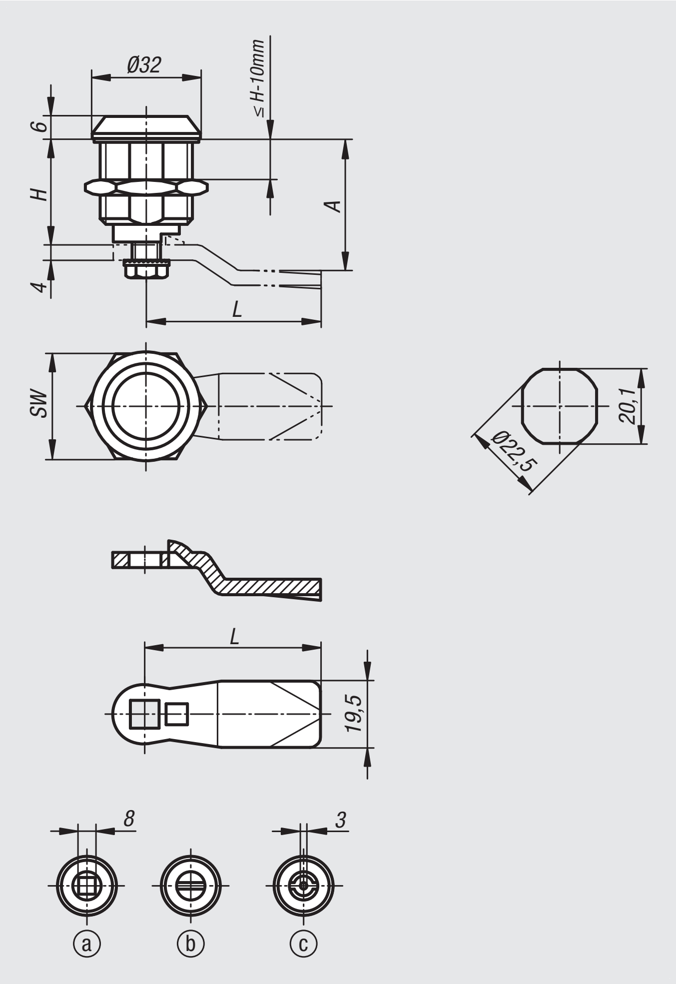
Tongue for quarter-turn lock

Order No.	A for housing length H=18	L
05569-145X	4/6/8/10/12/14/16/18/20/22/24/26/28/30/32/34/36/38/40/42	45
05569-135X	16/18/20/22/24	35

05568

Quarter-turn locks

long version



Material:
Housing and actuator die-cast zinc.
Tongue steel.

Version:
Housing and actuator trivalent passivated.
Tongue electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05568-18301
nlm Tongue 05569-145X040

Note:
Rating IP65. This is achieved using an additional O-ring underneath the actuator and a flat seal attached to the housing. The quarter-turn lock can be installed pre-assembled. Please order the required tongue separately. Every tongue can be combined with this housing.

Drawing reference:
Actuation:
a) square 8 mm
b) slot
c) double lug 3 mm

Quarter-turn locks

long version

Quarter-turn lock, long version

Order No.	H	Actuation	SW
05568-18301	30	square 8 mm	27
05568-40301	30	double lug 3 mm	27
05568-20301	30	slot	27
05568-18401	40	square 8 mm	27
05568-40401	40	double lug 3 mm	27
05568-20401	40	slot	27
05568-18501	50	square 8 mm	27
05568-40501	50	double lug 3 mm	27
05568-20501	50	slot	27

Tongue for quarter-turn locks

Order No.	A for housing length H=30	A for housing length H=40	A for housing length H=50	L
05569-145X040	16	26	36	45
05569-145X060	18	28	38	45
05569-145X080	20	30	40	45
05569-145X100	22	32	42	45
05569-145X120	24	34	44	45
05569-145X140	26	36	46	45
05569-145X160	28	38	48	45
05569-145X180	30	40	50	45
05569-145X200	32	42	52	45
05569-145X220	34	44	54	45
05569-145X240	36	46	56	45
05569-145X260	38	48	58	45
05569-145X280	40	50	60	45
05569-145X300	42	52	62	45
05569-145X320	44	54	64	45
05569-145X340	46	56	66	45
05569-145X360	48	58	68	45
05569-145X380	50	60	70	45
05569-145X400	52	62	72	45
05569-145X420	54	64	74	45

05571

Quarter-turn locks

with wing grip

Material:
Housing, actuator and nut die-cast zinc.
O-ring NBR, flat seal CR.
Tongue steel.

Version:
Housing trivalent passivated.
Actuator trivalent passivated or black powder-coated.
Nut and tongue electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05571-1181
nlm Tongue 05570-145X040 (include tongue gap “A”)

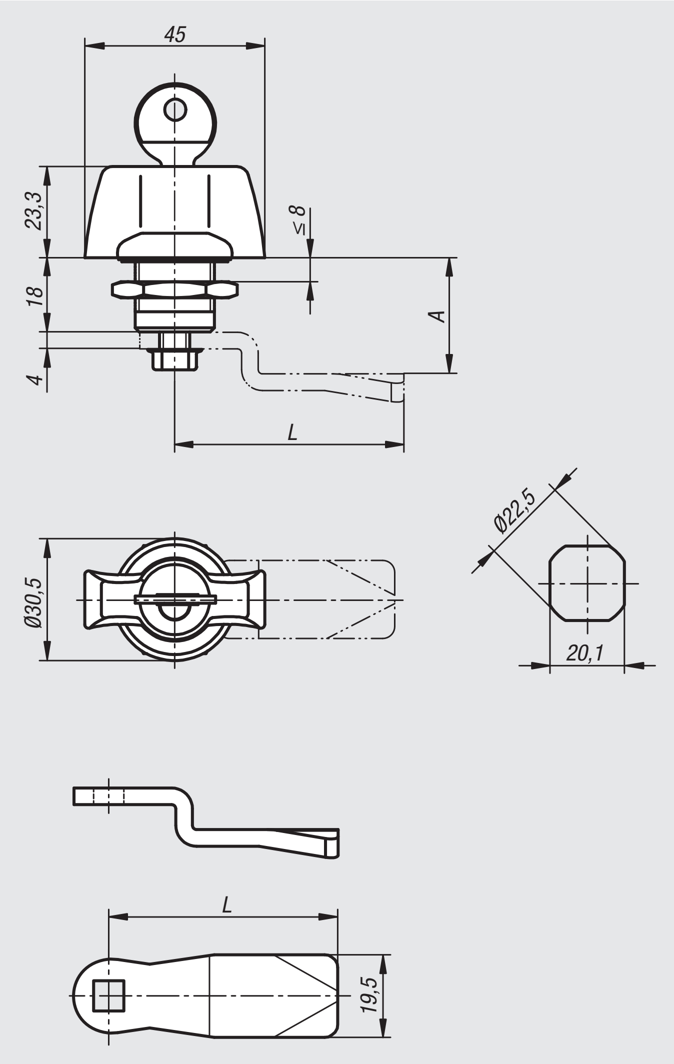
Note:
For right or left mounting with 90° closing and internal rotation limit. The quarter-turn lock can be installed pre-assembled (limitations by a small A-dimension and thick doors). The fastening nut is an earthing nut with teeth one side.

Dust and waterproof as per IP65 through an O-ring and flat seal.

The lockable quarter-turn locks are each supplied with 2 keys. The key can be removed in both positions (open and closed). The locks are keyed alike, i.e. they can all be opened using the same key (lock type 101 or 1333).

Please order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586



Quarter-turn locks with wing grip

Order No.	Finish	Actuation	Version
05571-1181	chromed	grip	-
05571-2181	chromed	lockable grip	lock 101
05571-3181	chromed	lockable grip	lock 1333
05571-1182	black powder-coated	grip	-
05571-2182	black powder-coated	lockable grip	lock 101
05571-3182	black powder-coated	lockable grip	lock 1333

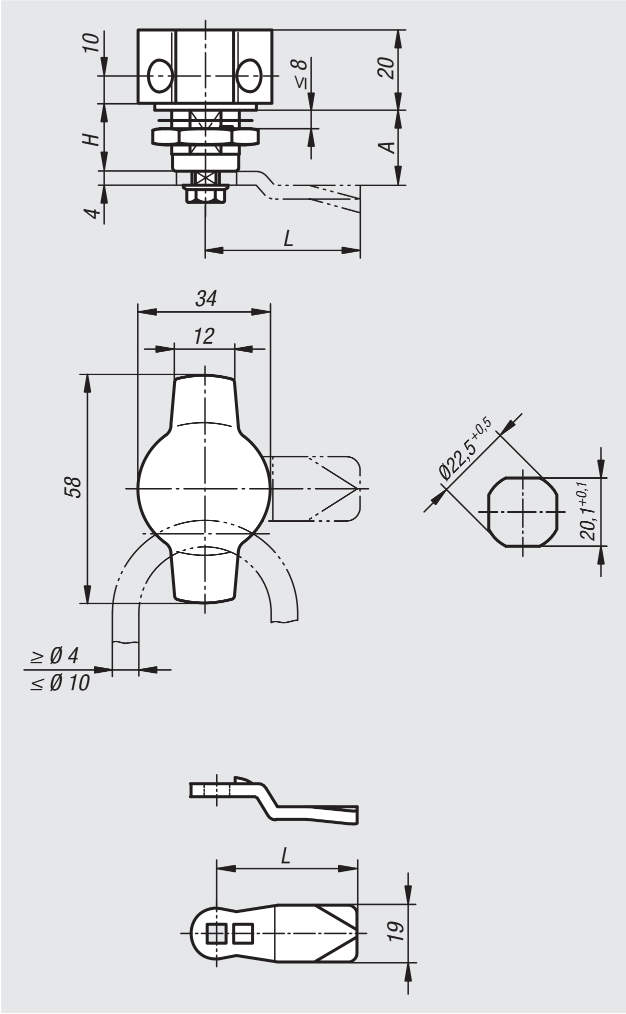
Tongue for quarter-turn locks

Order No.	A	L
05570-145X	4/6/8/10/12/14/16/18/20/22/24/26/28/30/32/34/36/38/40/42	45
05570-135X	16/18/20/22/24	35

05571-02

Quarter-turn lock stainless steel

with wing grip



Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.
Grip polished.

Sample order:
nlm Quarter turn lock 05571-02-18
nlm Tongue 05566-07-450660

Note:
Quarter-turn lock with wing grip. Right or left deployment.
The lock can be installed pre-assembled.

Water and dust tight according to IP65.

Please order the desired tongue type separately. Every tongue can be combined with every housing.

Quarter-turn lock, stainless steel with wing grip

Order No.	Actuation	H
05571-02-18	lockable grip	18

Tongue for quarter-turn lock

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

05572

Quarter-turn locks

with T-grip

Material:
Housing, actuator and nut die-cast zinc.
O-ring NBR, flat seal CR.
Tongue steel.

Version:
Housing trivalent passivated.
Actuator black powder-coated.
Nut and tongue electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05572-1182
nlm Tongue 05569-145X040 (include tongue gap “A”)

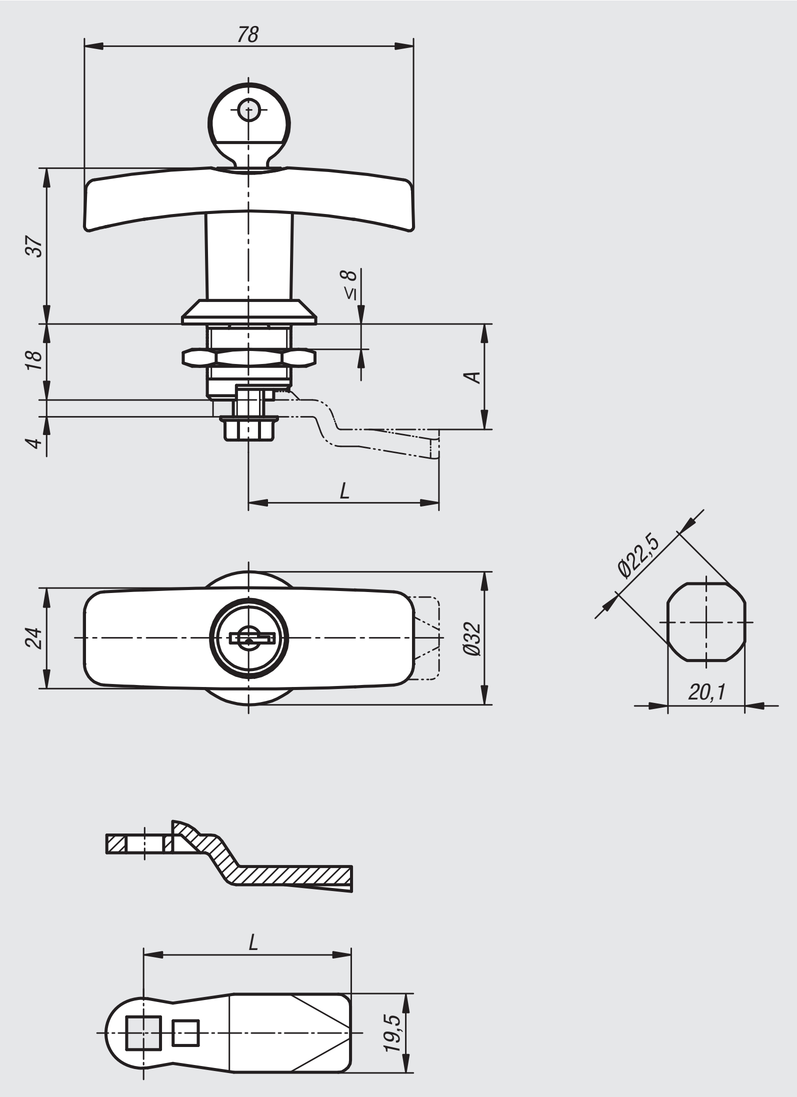
Note:
Right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled (limitations by a small A-dimension and thick doors). The fastening nut has claws allowing it to be used as an earthing nut.

Water and dust proof as per IP65 through the O-ring and flat seal.

The lockable quarter-turn locks are supplied with 2 keys. The key can be removed in both positions (open and closed). The cylinder locks have a single-key system, i.e. the same key works in all locks (lock type 101 or 1333).

Order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586



Quarter-turn locks with T-grip

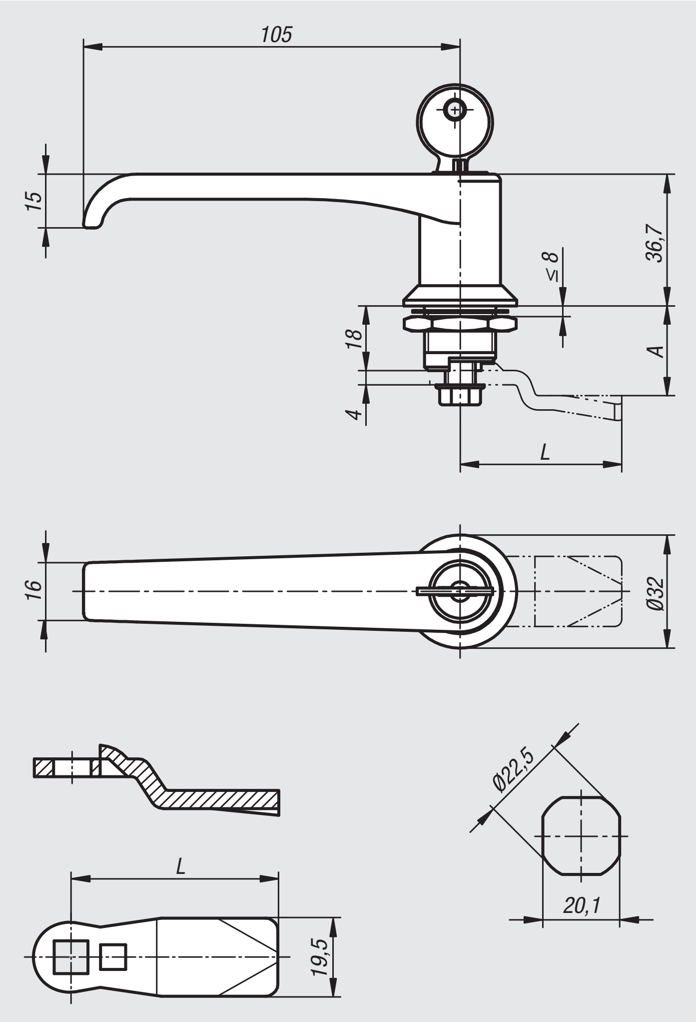
Order No.	Actuation	Version
05572-1182	T-Grip	-
05572-2182	lockable T-grip	lock 101
05572-3182	lockable T-grip	lock 1333

Tongue for quarter-turn lock

Order No.	A for housing length H=18	L
05569-145X	4/6/8/10/12/14/16/18/20/22/24/26/28/30/32/34/36/38/40/42	45
05569-135X	16/18/20/22/24	35

Quarter-turn locks

with L-grip



Material:
Housing, actuator and nut die-cast zinc.
O-ring NBR, flat seal CR.
Tongue steel.

Version:
Housing and actuator, black, powder-coated.
Nut and tongue, electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05573-1182
nlm Tongue 05569-145X040 (include tongue gap “A”)

Note:
Right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled (limitations by a small A-dimension and thick doors). The fastening nut has claws allowing it to be used as an earthing nut.

Water and dust proof as per IP65 through the O-ring and flat seal.

The lockable quarter-turn locks are supplied with 2 keys. The key can be removed in both positions (open and closed). The cylinder locks have a single-key system, i.e. the same key works in all locks (lock type 101 or 1333).

Order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

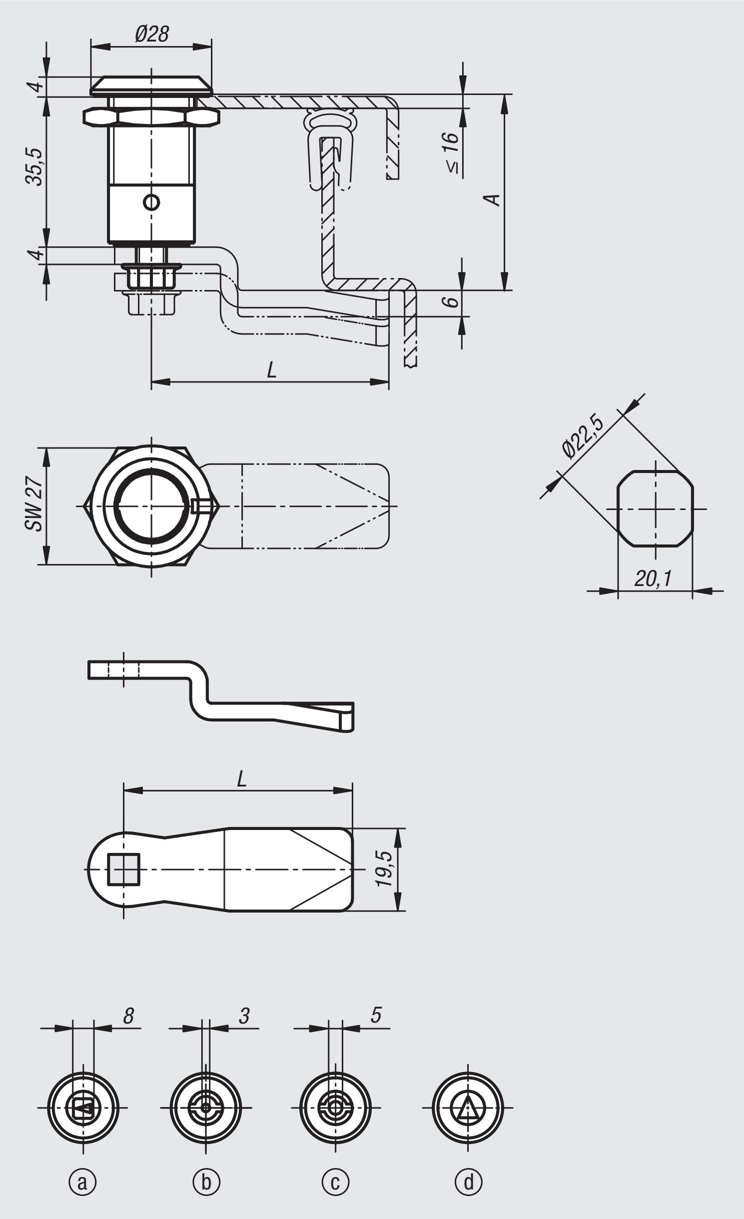
Quarter-turn locks with L-grip

Order No.	Actuation	Version
05573-1182	L-grip	-
05573-2182	lockable L-grip	lock 101
05573-3182	lockable L-grip	lock 1333

Tongue for quarter-turn lock

Order No.	A for housing length H=18	L
05569-145X	4/6/8/10/12/14/16/18/20/22/24/26/28/30/32/34/36/38/40/42	45
05569-135X	16/18/20/22/24	35

Compression latches



Material:
Housing, actuator and nut die-cast zinc.
Flat seal CR.
Tongue steel.

Version:
Housing and actuator trivalent passivated.
Nut and tongue electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05574-18351
nlm Tongue 05570-145X040 (include tongue gap "A")

Note:
Compression quarter-turn locks are primarily used for doors and housings that require a higher pressure force on the seal. For right or left use. The locking process is always clockwise. The quarter-turn lock can be installed pre-assembled. Vibration-resistant thanks to spring-loaded detent mechanism in the „locked" end position. Tested according to DIN EN 60068-2-64 (vibration) and DIN EN 60068-2-27 (shock), test standard 61373. Vibration-proof as per the requirements for rail applications category 1, class B (=highest requirement).

Water and dustproof as per IP65.

Please order required tongue version separately. Every tongue can be combined with every housing.

Function:
Turning the actuator clockwise rotates the tongue 90° and brings it into the closed position. A further 90° rotation pulls the tongue in, increasing the pressure on the frame. The axial travel is 6 mm. With marking on housing for „locked" position.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 8 mm
b) double lug 3 mm
c) double lug 5 mm
d) triangle 8 mm

Compression latches

Order No.	Actuation
05574-18351	square 8 mm
05574-43351	double lug 3 mm
05574-45351	double lug 5 mm
05574-88351	triangle 8 mm

Tongue for quarter-turn lock

Order No.	A for housing length H=35.5	L
05570-145X	21,5/23,5/25,5/27,5/29,5/31,5/33,5/35,5/37,5/39,5/41,5/43,5/45,5/47,5/49,5/51,5/53,5/55,5/57,5/59,5/61,5/63,5/65,5/67,5	45
05570-135X	33,5/35,5/37,5/39,5/41,5	35

Compression latches

with adjustable tongue height

Material:
Housing, actuator and nut die-cast zinc.
Flat seal CR.
Tongue steel.

Version:
Housing and actuator trivalent passivated.
Nut and tongue electro zinc-plated.

Sample order:
nlm Quarter-turn lock 05575-18351
nlm Tongue 05570-145X040 (include tongue gap “A”)

Note:
Compression quarter-turn locks are primarily used for doors and housings that require a higher pressure force on the seal. For right or left use. The locking process is always clockwise. The quarter-turn lock can be installed pre-assembled. Vibration-resistant thanks to spring-loaded detent mechanism in the „locked“ end position. Tested according to DIN EN 60068-2-64 (vibration) and DIN EN 60068-2-27 (shock), test standard 61373. Vibration-proof as per the requirements for rail applications category 1, class B (=highest requirement).

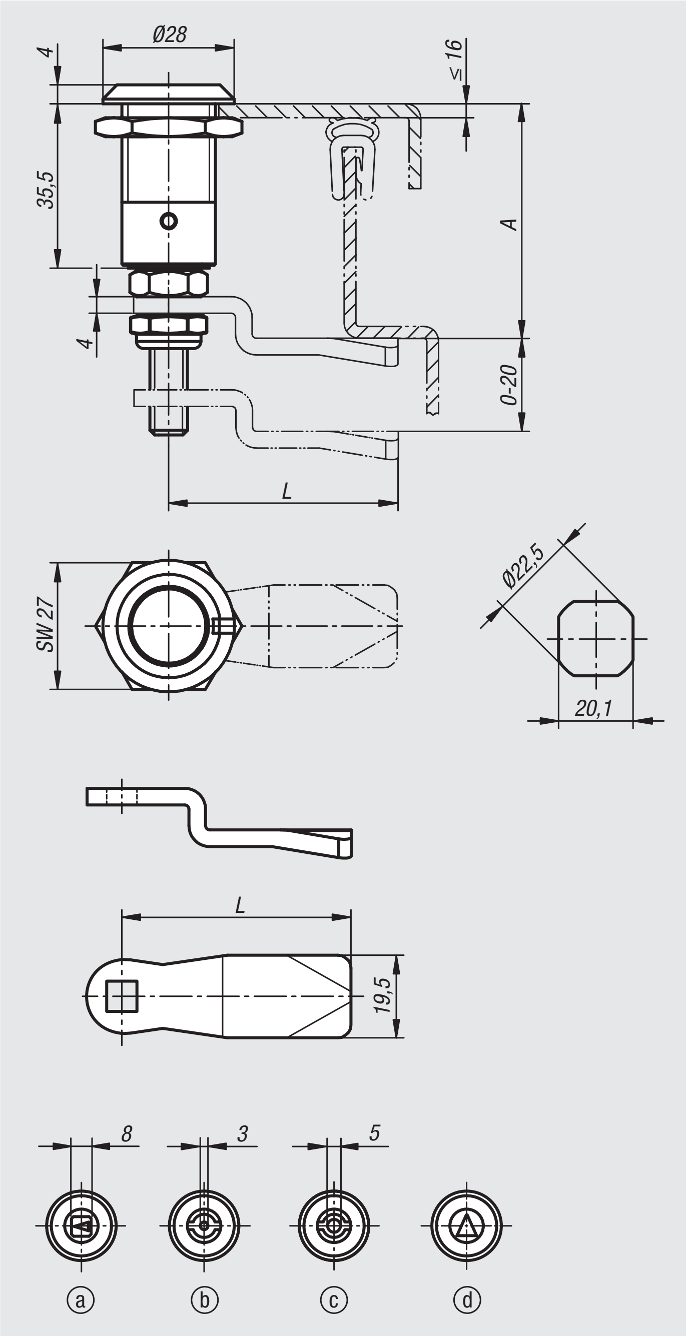
Water and dustproof as per IP65.

Please order required tongue version separately. Every tongue can be combined with every housing.

Function:
Turning the actuator clockwise rotates the tongue 90° and brings it into the closed position. A further 90° rotation pulls the tongue in, increasing the pressure on the frame. The axial travel is 6 mm. With marking on housing for „locked“ position.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 8 mm
b) double lug 3 mm
c) double lug 5 mm
d) triangle 8 mm



Compression latches with adjustable tongue gap

Order No.	Actuation
05575-18351	square 8 mm
05575-43351	double lug 3 mm
05575-45351	double lug 5 mm
05575-88351	triangle 8 mm

Tongue for quarter-turn lock

Order No.	A for housing length H=35.5	L
05570-145X	21,5/23,5/25,5/27,5/29,5/31,5/33,5/35,5/37,5/39,5/41,5/43,5/45,5/47,5/49,5/51,5/53,5/55,5/57,5/59,5/61,5/63,5/65,5/67,5	45
05570-135X	33,5/35,5/37,5/39,5/41,5	35

05576

Quarter-turn locks

with cam tongue

Material:
Housing, actuator and tongue die-cast zinc.
Nut steel.
Flat seal rubber.

Version:
Housing and actuator trivalent passivated.
Tongue blank.
Nut electro zinc-plated.

Sample order:
nlm 05576-17301

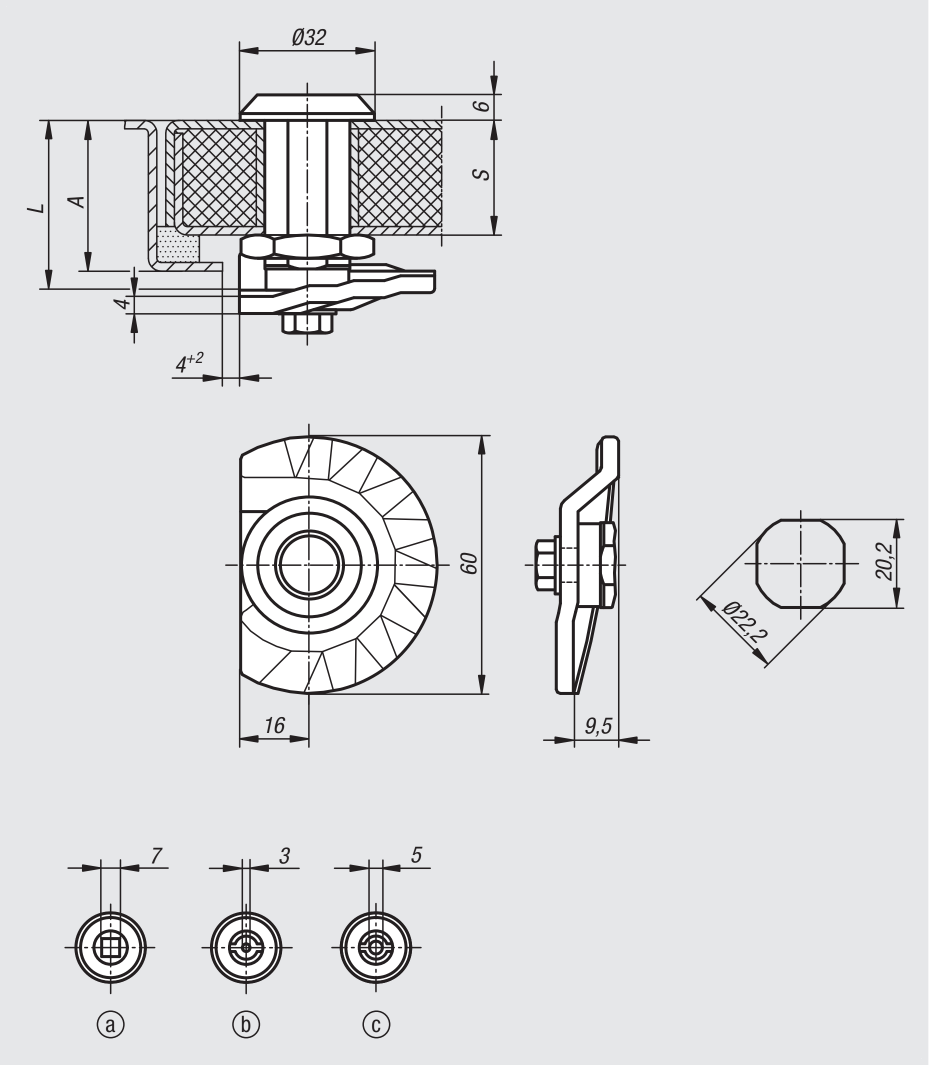
Note:
Quarter-turn locks with stepped cam are primarily used for doors and housings that require a higher pressure force on the seal. For right or left use. The locking process is always clockwise. The compression gap can be increased incrementally up to 9.5 mm at a maximum turning angle of 270° by turning the actuator clockwise.

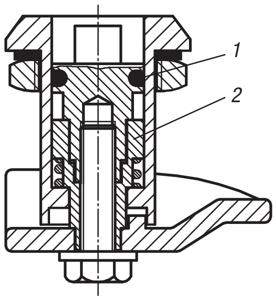
Protected from water and dust to IP65.

Accessories:
Lock key 05586

Drawing reference:
Actuation:
a) square 7 mm
b) double lug 3 mm
c) double lug 5 mm

1) O-ring
2) Adapter



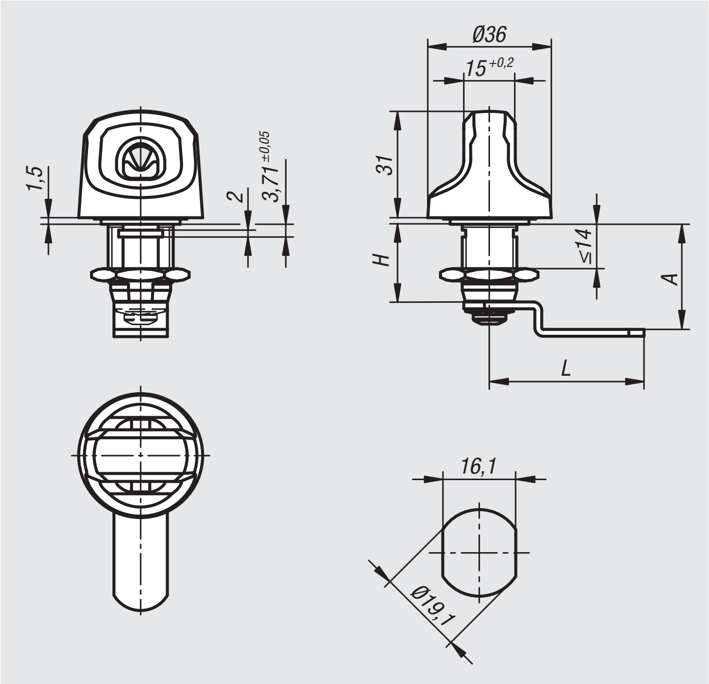


Order No.	Actuation	A	L	S max.
05576-17301	square 7 mm	30 -9,5	30	20
05576-17401	square 7 mm	40 -9,5	40	30
05576-17501	square 7 mm	50 -9,5	50	40
05576-17601	square 7 mm	60 -9,5	60	50
05576-43301	double lug 3 mm	30 -9,5	30	20
05576-43401	double lug 3 mm	40 -9,5	40	30
05576-43501	double lug 3 mm	50 -9,5	50	40
05576-43601	double lug 3 mm	60 -9,5	60	50
05576-45301	double lug 5 mm	30 -9,5	30	20
05576-45401	double lug 5 mm	40 -9,5	40	30
05576-45501	double lug 5 mm	50 -9,5	50	40
05576-45601	double lug 5 mm	60 -9,5	60	50

05577

Quarter-turn locks

free-turning



Material:
Housing and actuator die-cast zinc.
Nut brass.
Tongue steel.

Version:
Housing trivalent blue passivated.
Lever black KTL coated.
Tongue electro zinc-plated.

Sample order:
nlm 05577-22224

Note:
Particularly suitable for steel cabinets, lockers in changing rooms, schools, leisure facilities and industrial companies.

Method of operation:
The integrated free-turning function provides higher security against violent actuation compared to conventional locks.

Assembly:
The quarter-turn lock can be installed pre-assembled.

Attention:
Optimum functionality is guaranteed with padlocks with a shackle diameter of Ø6 – Ø8 mm.

Order No.	A	L	H
05577-22224	22,4	44	22,4
05577-22248	24,8	42	22,4
05577-22304	30,4	45	22,4
05577-22359	35,9	49	22,4
05577-22424	42,4	45	22,4

05578-02

Quarter-turn security locks, stainless steel

Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

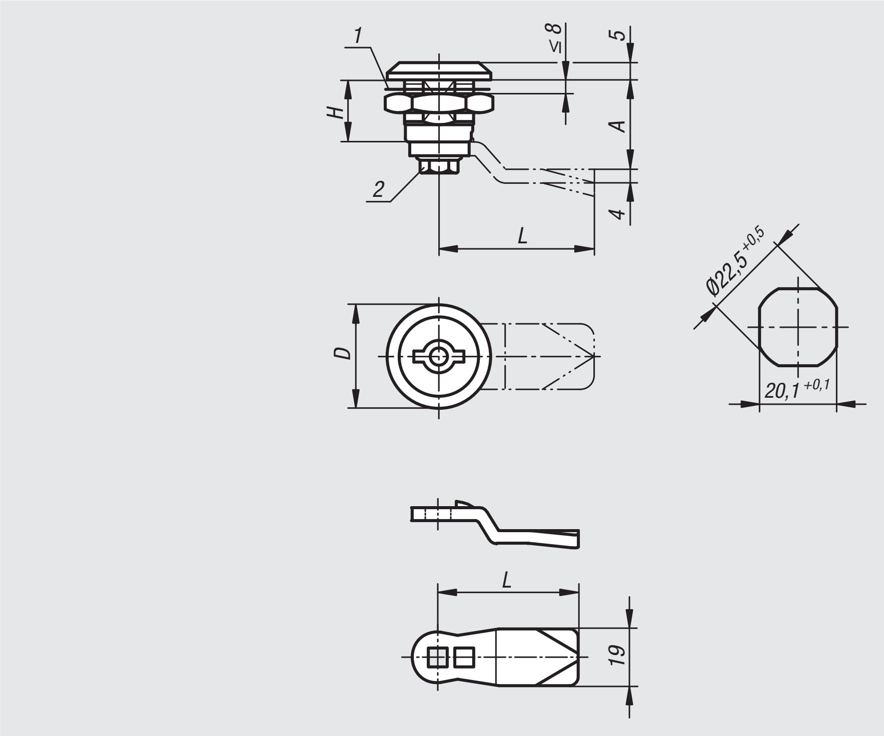
Sample order:
nlm Quarter turn lock 05578-02-14518
nlm Tongue 05566-07-450660

Note:
The secure quarter turn lock is shock and vibration-resistant acc. to DIN 43668 even under high pressing force due to a built-in restrictor element. Actuation without a suitable key is not possible. The key can be removed only in the locked position. quarter turn lock, pre-assembled. Right version = closes anti-clockwise. Left version = closes clockwise. Water and dust protected acc. to IP65 from DIN EN 60529.

Please order required tongue version separately. Every tongue can be combined with every housing.

Accessories:
Lock key 05586

Drawing reference:
1) flat seal
2) self-locking screw



Quarter-turn security locks, stainless steel

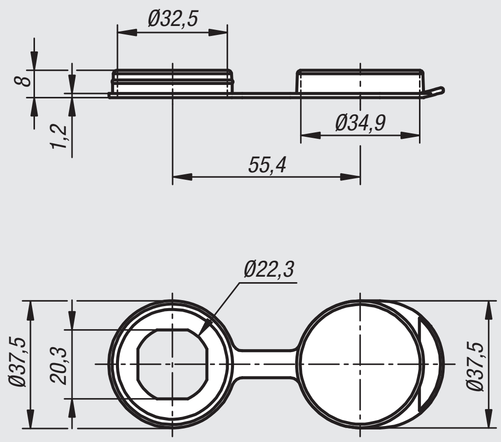
Order No.	Version 1	Actuation	D	H
05578-02-14518	right	double lug 5 mm	30	18
05578-02-24518	left	double lug 5 mm	30	18

Tongue for quarter-turn locks

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

05584

Dust caps



Material:
Plastic PP.

Version:
black.

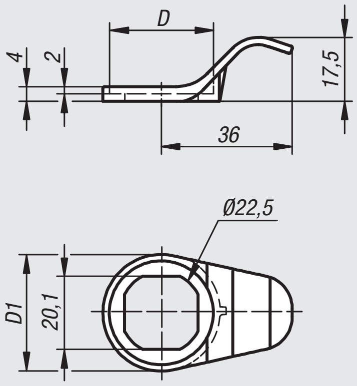
Sample order:
nlm 05584-202232

Note:
Dust caps for compression latches with a head diameter up to max. 32 mm. It offers increased protection from dust and moisture. If the dust cap is used, dimension “A” of the compression latch is reduced by 1 mm.

Order No.	Item
05584-202232	Cap

05585

Opening grips



Material:
Plastic PA6, fibreglass reinforced.

Version:
black.

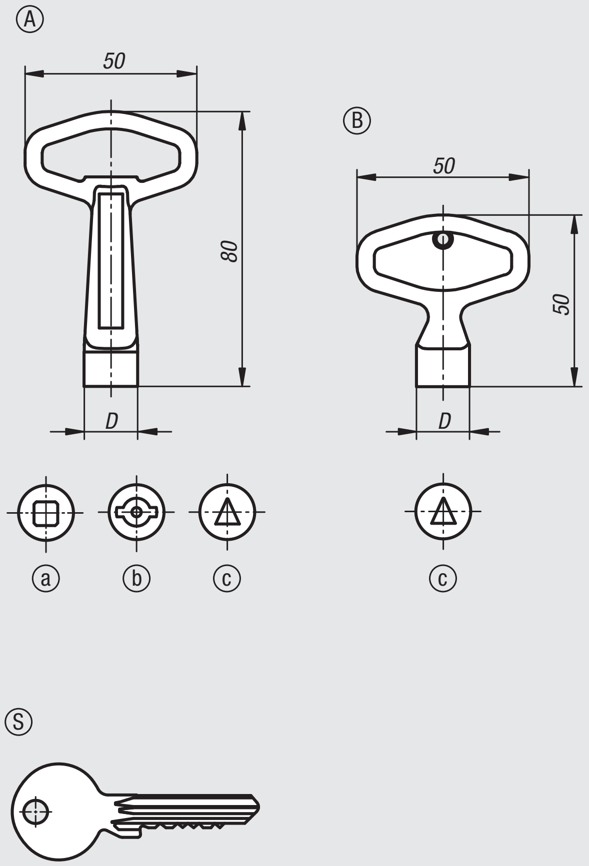
Sample order:
nlm 05585-202228

Note:
Practical opening handle for quarter-turn locks with a head diameter of max. 32 mm. Where the opening handle is used, dimension “A” of the quarter-turn lock is reduced by 2 mm.

Order No.	D max.	D1
05585-202228	28,5	32
05585-202232	32,5	36

Keys

for quarter-turn locks



Material:
Form A and Form B die-cast zinc.
Form S steel.

Version:
Form A and Form B electro zinc-plated.
Form S nickel-plated.

Sample order:
nlm 05586-16

Note:
Keys for actuating quarter-turn locks.
Form S are supplied in pairs.

Drawing reference:
a) square
b) double lug
c) triangle

Order No.	Form	Version 1	D
05586-16	A	square 6 mm	11,6
05586-17	A	square 7 mm	15,5
05586-18	A	square 8 mm	15,5
05586-88	A	triangle 8 mm	15,5
05586-43	A	double lug 3 mm	15,5
05586-45	A	double lug 5 mm	15,5
05586-865	B	triangle 6.5 mm	11,6
05586-2233	S	lock 2233	-
05586-1333	S	lock 1333	-
05586-101	S	lock 101	-

Quarter-turn locks

stainless steel

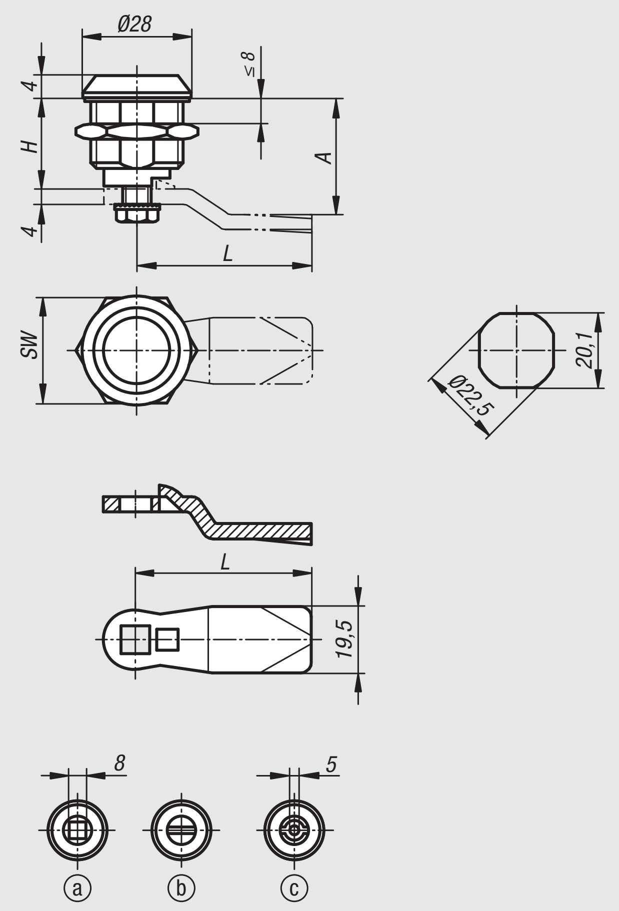
Material:
Quarter-turn lock 1.4305 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05587-40186
nlm Tongue 05569-245X180

Note:
Rating IP65. This is achieved using an additional O-ring underneath the actuator and a PUR seal foamed onto the housing. The quarter-turn lock can be installed pre-assembled. Please order the required tongue separately. Every tongue can be combined with this housing.

Drawing reference:
Actuation:
a) square 8 mm
b) slot
c) double lug 5 mm



Quarter-turn locks, stainless steel

Order No.	Actuation	H	SW
05587-18186	square 8 mm	18	27
05587-20186	slot	18	27
05587-40186	double lug 5 mm	18	27

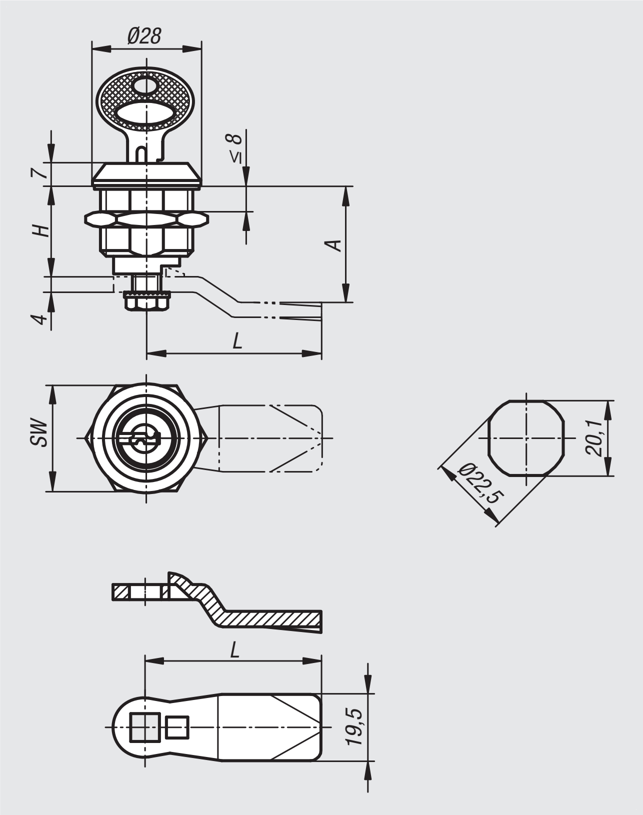
Tongue for quarter-turn locks

Order No.	A for housing length H=18	L
05569-245X180	18	45
05569-245X200	20	45
05569-245X240	24	45
05569-245X280	28	45
05569-245X320	32	45
05569-245X340	34	45
05569-245X360	36	45
05569-245X380	38	45
05569-245X400	40	45
05569-245X420	42	45

05588

Quarter-turn locks

stainless steel, lockable



Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05588-186
nlm Tongue 05569-245X180

Note:
Lockable quarter-turn lock for right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled. Please order required tongue separately. Every tongue can be combined with this housing.

These lockable quarter-turn locks are each supplied with 2 keys. The key can be removed in both the closed and open position. The cylinder locks have a single-key system i.e. the same key works in all locks.

Quarter-turn lock, stainless steel, lockable

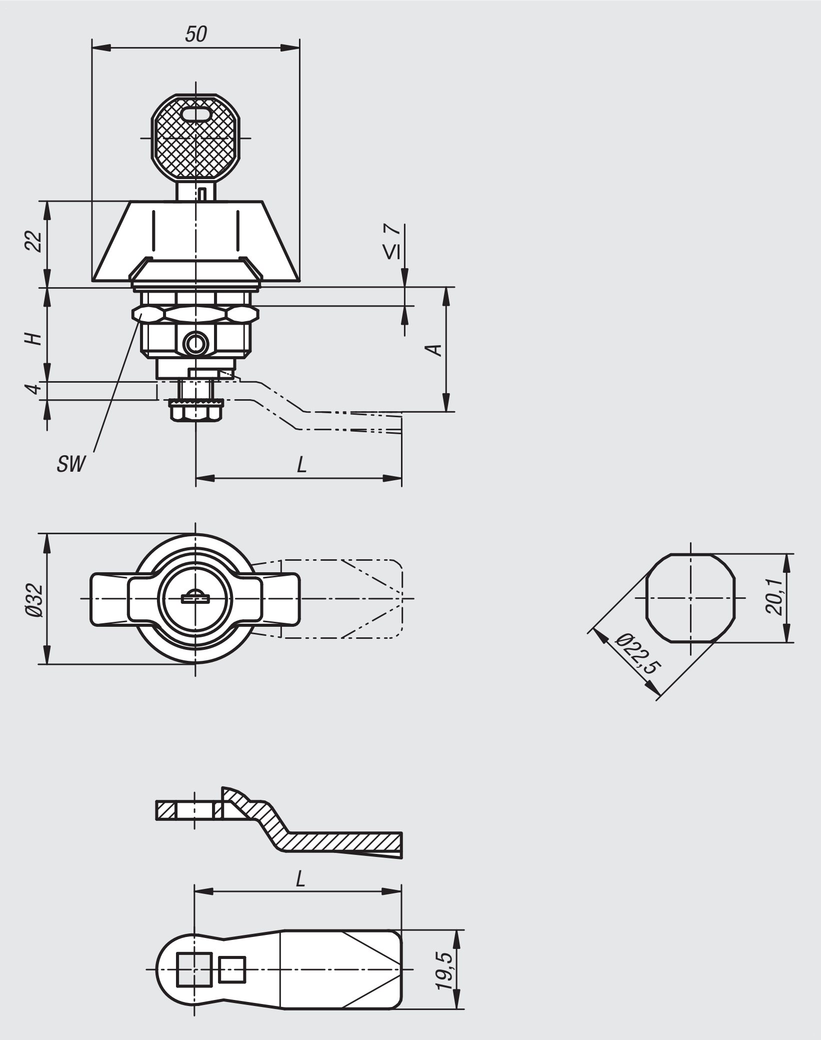
Order No.	Actuation	H	SW
05588-186	key single-key system	18	27

Tongue for quarter-turn lock

Order No.	A for housing length H=18	L
05569-245X180	18	45
05569-245X200	20	45
05569-245X240	24	45
05569-245X280	28	45
05569-245X320	32	45
05569-245X340	34	45
05569-245X360	36	45
05569-245X380	38	45
05569-245X400	40	45
05569-245X420	42	45

Quarter-turn locks

stainless steel with wing grip



Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05589-1186
nlm Tongue 05569-245X180

Note:
Quarter-turn lock with wing grip. For right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled. Supplied with standard stainless-steel nut. The lockable quarter-turn locks are each supplied with 2 keys. The key can be removed in both the closed and open position. The cylinder locks have a single-key system i.e. the same key works in all locks. Order the desired tongue separately. Every tongue can be combined with this housing.

Quarter-turn locks, stainless steel with wing grip

Order No.	Actuation	H	SW
05589-1186	grip	18	27
05589-2186	lockable grip	18	27

Tongue for quarter-turn locks

Order No.	A for housing length H=18	L
05569-245X180	18	45
05569-245X200	20	45
05569-245X240	24	45
05569-245X280	28	45
05569-245X320	32	45
05569-245X340	34	45
05569-245X360	36	45
05569-245X380	38	45
05569-245X400	40	45
05569-245X420	42	45

05593

Quarter-turn locks

stainless steel with T-grip

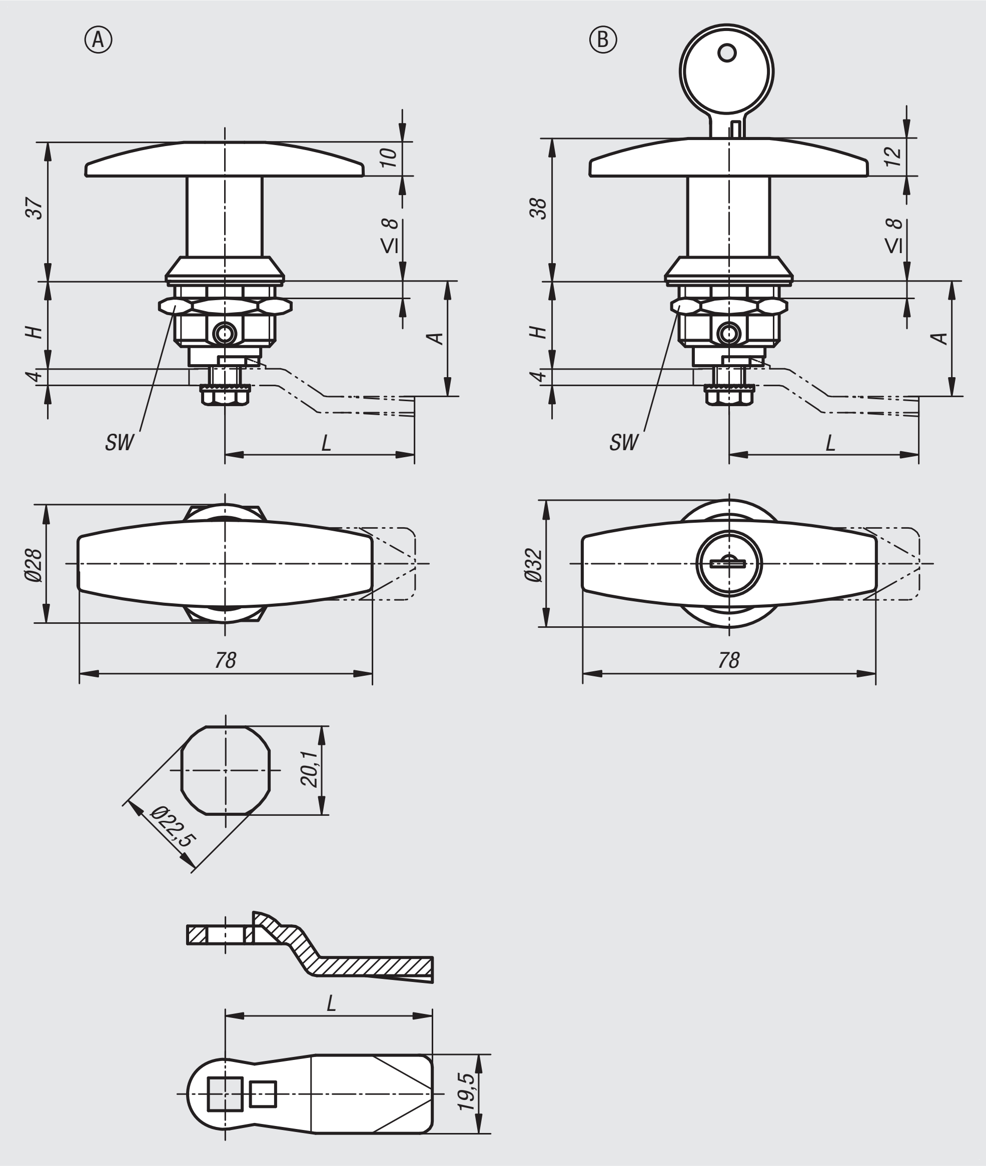
Material:
Grip and tongue 1.4301 stainless steel.
Housing and nut 1.4305 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05593-1186
nlm Tongue 05569-245X180

Note:
Quarter-turn lock with T-grip. For right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled. Supplied with standard stainless-steel nut. The lockable quarter-turn locks are each supplied with 2 keys. Rating IP65. Please order required tongue version separately. Every tongue can be combined with this housing.

The key can be removed in both the closed and open position. The cylinder locks have a single-key system i.e. the same key works in all locks.



Quarter-turn locks, stainless steel with T-grip

Order No.	Form	Actuation	H	SW
05593-1186	A	T-Grip	18	27
05593-2186	B	lockable T-grip	18	27

Tongue for quarter-turn lock

Order No.	A for housing length H=18	L
05569-245X180	18	45
05569-245X200	20	45
05569-245X240	24	45
05569-245X280	28	45
05569-245X320	32	45
05569-245X340	34	45
05569-245X360	36	45
05569-245X380	38	45
05569-245X400	40	45
05569-245X420	42	45

Quarter-turn locks

stainless steel with T-grip

Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

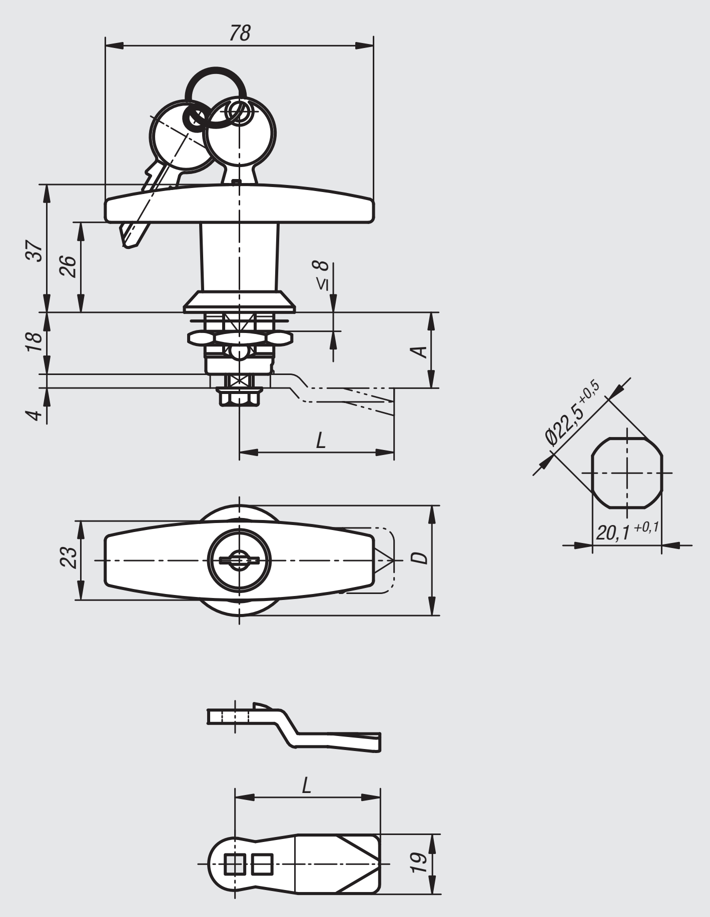
Version:
Bright.
Grip polished.

Sample order:
nlm Quarter turn lock 05593-01-1186
nlm Tongue 05566-07-450660

Note:
Quarter-turn lock with T-grip. For right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled. Supplied with standard stainless-steel nut. The lockable quarter-turn locks are each supplied with 2 keys. Rating IP65. Please order required tongue version separately. Every tongue can be combined with this housing.

The cylinder locks have a single-key system i.e. the same key works in all locks.

On request:
Available for door thickness 20 and 40 mm.



Quarter-turn locks, stainless steel with T-grip

Order No.	Actuation	D
05593-01-1186	T-Grip	32
05593-01-2186	lockable T-grip	32

Tongue for quarter-turn locks

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

05593-04

Quarter-turn locks in Hygienic DESIGN

with T-grip

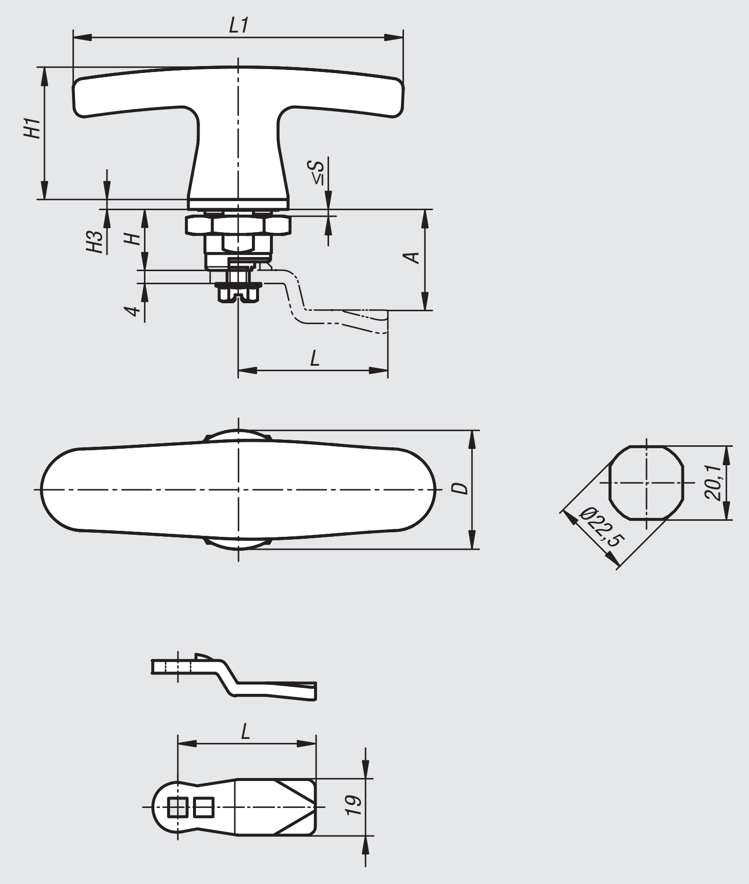
Material:
Housing and actuation: 1.4404.
Earthing nut and ratchet screw: 1.4301.
Seal: blue silicon, FDA conform.

Version:
Bright.
Grip polished.

Sample order:
nlm 05593-04-1188

Note:
The hygienic stainless steel quarter turn lock prevents bacterial attack and fulfils the strict regulations of testing principles for foodstuff machinery and hygien.
The well concieved geometric form, the mirror polished stainless steel surface and the central circumferential seal reliably prevent dirt accumulation. Water, cleaning agents etc. can drain off fully and so prevent contamination.

Especially in processes where the resistance of the seal to cleaning and disinfection agents is very important, optimised control cabinets, terminal boxes and command panels are a must. Specifically designed after the principles of Hygienic DESIGN, the hygienic quarter turn lock HD fulfils the strict regulations of the foodstuff processing industry and passes therefore optimally in their professional hygienic applications.



The special seal is suitable for high pressure washing up to max. 100 bar and fulfils IP65/67. Furthermore, the seal is temperature stable up to 80°C and the blue colour satisfies FDA regulations (reliably prevents a confusion with foodstuffs).

Please order required tongue version separately. Every tongue can be combined with every housing.

Quarter-turn locks in Hygienic DESIGN with T-grip

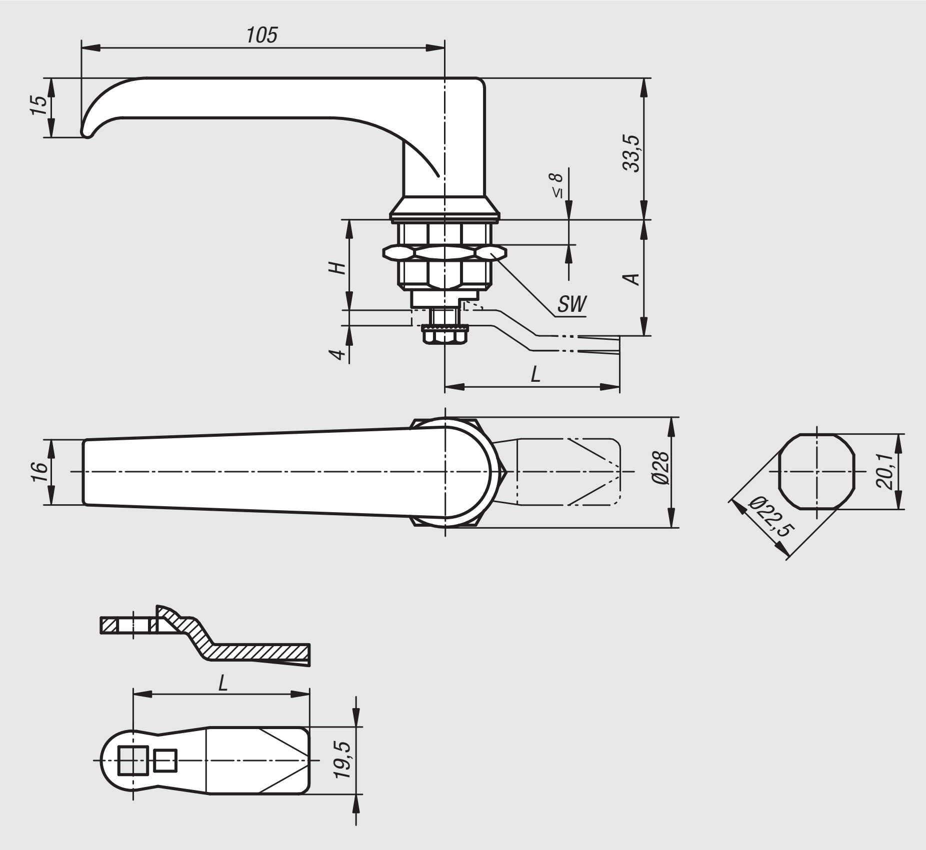
Order No.	D	H	H1	H3	L1	S max.
05593-04-1188	30	18	40	3	100	8

Tongue for quarter-turn locks

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

Quarter-turn locks

stainless steel with L-grip



Material:
Grip and tongue 1.4301 stainless steel.
Housing and nut 1.4305 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05594-1186
nlm Tongue 05569-245X180

Note:
Quarter-turn lock with L-grip. For right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled. Supplied with standard stainless-steel nut. Rating IP65. Please order required tongue version separately. Every tongue can be combined with this housing.

Quarter-turn lock, stainless steel with L-grip

Order No.	Actuation	H	SW
05594-1186	L-grip	18	27

Tongue for quarter-turn lock

Order No.	A for housing length H=18	L
05569-245X180	18	45
05569-245X200	20	45
05569-245X240	24	45
05569-245X280	28	45
05569-245X320	32	45
05569-245X340	34	45
05569-245X360	36	45
05569-245X380	38	45
05569-245X400	40	45
05569-245X420	42	45

Quarter-turn locks

stainless steel with L-grip

Material:
Quarter-turn lock 1.4401 stainless steel.
Tongue 1.4301 stainless steel.

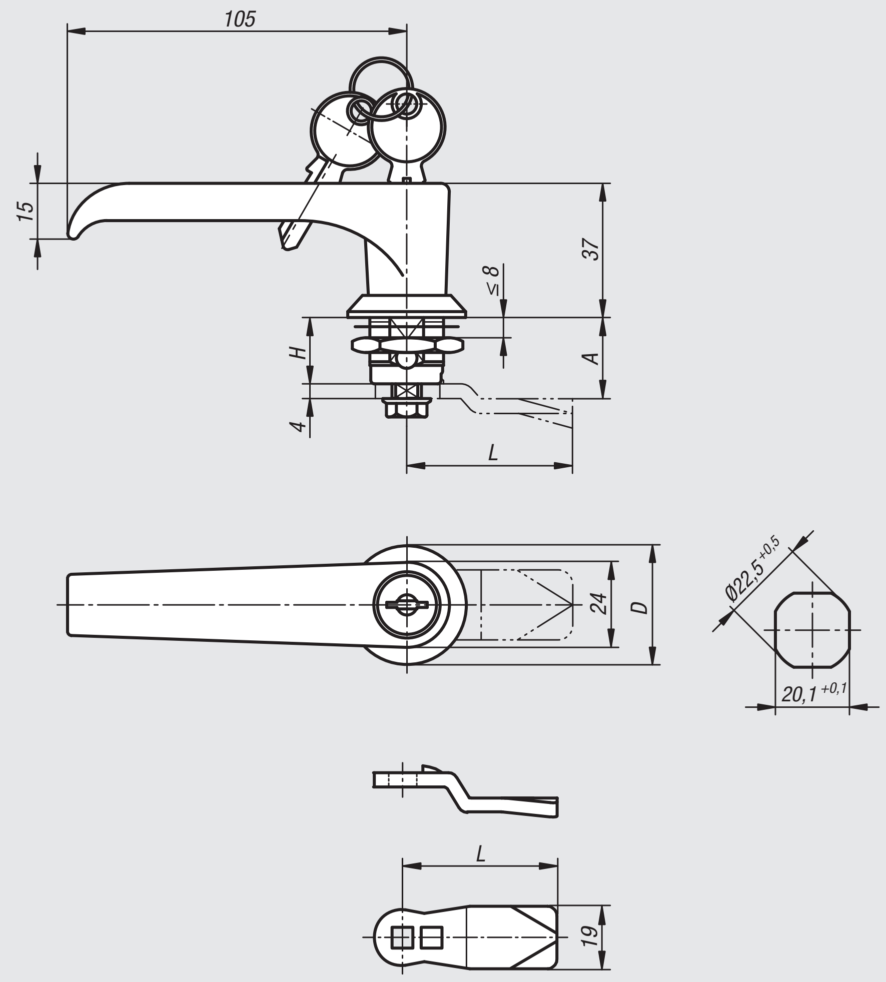
Version:
Bright.
Grip polished.

Sample order:
nlm Quarter turn lock 05594-02-118
nlm Tongue 05566-07-450660

Note:
Quarter-turn lock with L-grip. For right or left mounting with 90° closing. The quarter-turn lock can be installed pre-assembled. Rating IP65. Please order required tongue version separately. Every tongue can be combined with this housing.

The lockable quarter-turn locks are each supplied with 2 keys. The cylinder locks have a single-key system i.e. the same key works in all locks.

On request:
Available for door thickness 20 and 40 mm.



Quarter-turn locks, stainless steel with L-grip

Order No.	Actuation	D	H
05594-02-218	lockable L-grip	32	18
05594-02-118	L-grip	32	18

Tongue for quarter-turn locks

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

05595

Quarter-turn locks

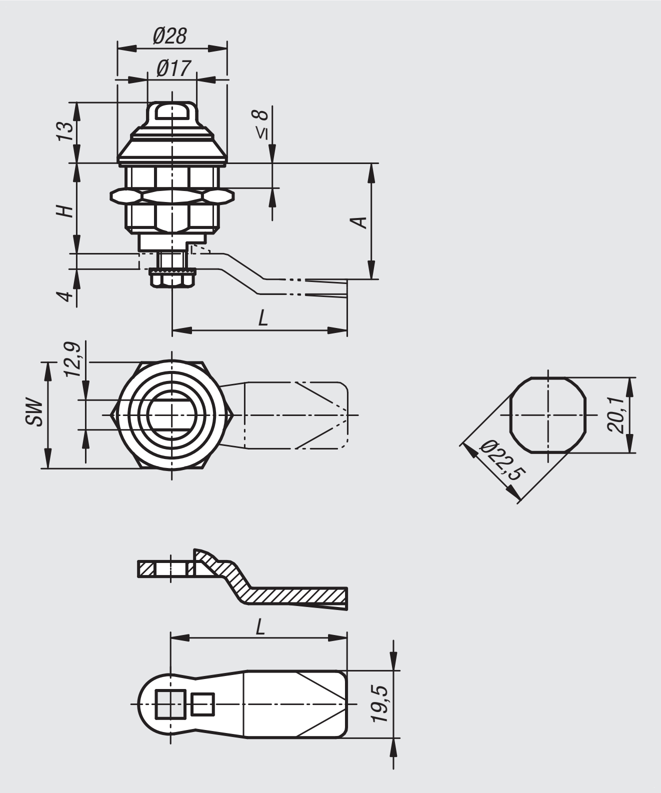
for sterile areas

Material:
Quarter-turn lock 1.4305 stainless steel.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05595-60186
nlm Tongue 05569-245X180

Note:
Stainless steel quarter-turn lock with 13 mm AF actuator for applications with hygienic requirements as per EN ISO 14159, EN 1672-2:2009*. Dust and waterproof as per IP69K. The rounded form and polished surfaces together with the material used make these locks insensitive to cleaning materials and resistant to dirt. The seal between the quarter-turn lock and the door is made using the captive PUR foam seal on the underside of the quarter-turn lock housing.



Quarter-turn lock for sterile areas

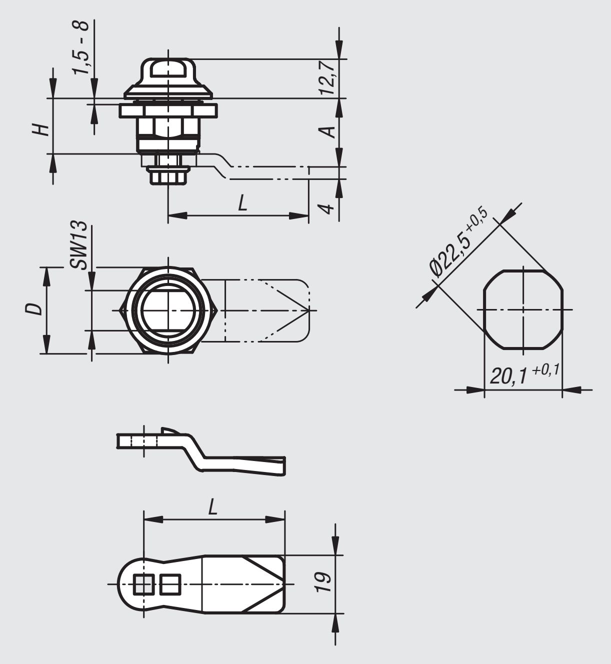
Order No.	Actuation	H	SW
05595-60186	double flat	18	27

Tongue for quarter-turn lock

Order No.	A for housing length H=18	L
05569-245X180	18	45
05569-245X200	20	45
05569-245X240	24	45
05569-245X280	28	45
05569-245X320	32	45
05569-245X340	34	45
05569-245X360	36	45
05569-245X380	38	45
05569-245X400	40	45
05569-245X420	42	45

05595-01

Quarter-turn locks in Hygienic DESIGN



Material:
Housing, actuation and fastening nut 1.4404 stainless steel.
O-rings red silicone, conforming to FDA.
Tongue 1.4301 stainless steel.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05595-01-18
Tongue 05566-07-45060

Note:
The quarter turn lock fulfills the hygienic requirements acc. to DIN EN 1672-2 and DIN EN 14159.
Especially suitable for the food and beverage industry.

Please order required tongue version separately. Every tongue can be combined with every housing.

Quarter-turn locks in Hygienic DESIGN

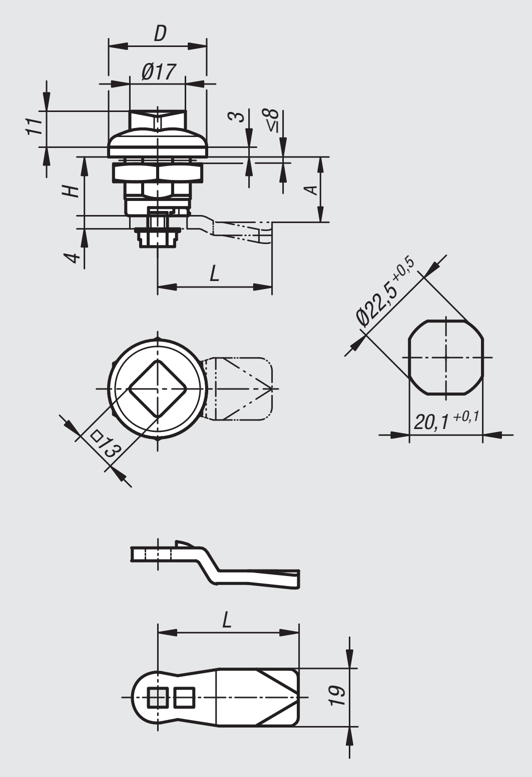
Order No.	Actuation	D	H
05595-01-18	double flat	28	18

Tongue for quarter-turn lock

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

Quarter-turn locks in Hygienic DESIGN

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Housing and actuation: 1.4404.
Earthing nut and ratchet screw: 1.4301.
Seal: blue silicon, FDA conform.
Tongue 1.4301.

Version:
Bright.

Sample order:
nlm Quarter turn lock 05595-02-18
Tongue 05566-07-45060

Note:
The hygienic stainless steel quarter turn lock prevents bacterial attack and fulfils the strict regulations of testing principles for foodstuff machinery and hygien.
The well concieved geometric form, the mirror polished stainless steel surface and the central circumferential seal reliably prevent dirt accumulation. Water, cleaning agents etc. can drain off fully and so prevent contamination.

Especially in processes where the resistance of the seal to cleaning and disinfection agents is very important, optimised control cabinets, terminal boxes and command panels are a must. Specifically designed after the principles of Hygienic DESIGN, the hygienic quarter turn lock HD fulfils the strict regulations of the foodstuff processing industry and passes therefore optimally in their professional hygienic applications.
The special seal is suitable for high pressure washing up to max. 100 bar and fulfils IP65/67.
Furthermore, the seal is temperature stable up to 80°C and the blue colour satisfies FDA regulations (reliably prevents a confusion with foodstuffs).

Please order required tongue version separately. Every tongue can be combined with every housing.

Quarter-turn locks in Hygienic DESIGN

Order No.	Actuation	D	H
05595-02-18	square	30	18

Tongue for quarter-turn lock

Order No.	A	L
05566-07-45060	6	45
05566-07-45080	8	45
05566-07-45100	10	45
05566-07-45140	14	45
05566-07-45160	16	45
05566-07-45180	18	45
05566-07-45200	20	45
05566-07-45220	22	45
05566-07-45240	24	45
05566-07-45260	26	45
05566-07-45280	28	45
05566-07-45320	32	45
05566-07-45500	50	45

05598

Slam latches

Material:
Die cast aluminium.
End caps plastic.

Version:
Black powder-coated.
End caps black.

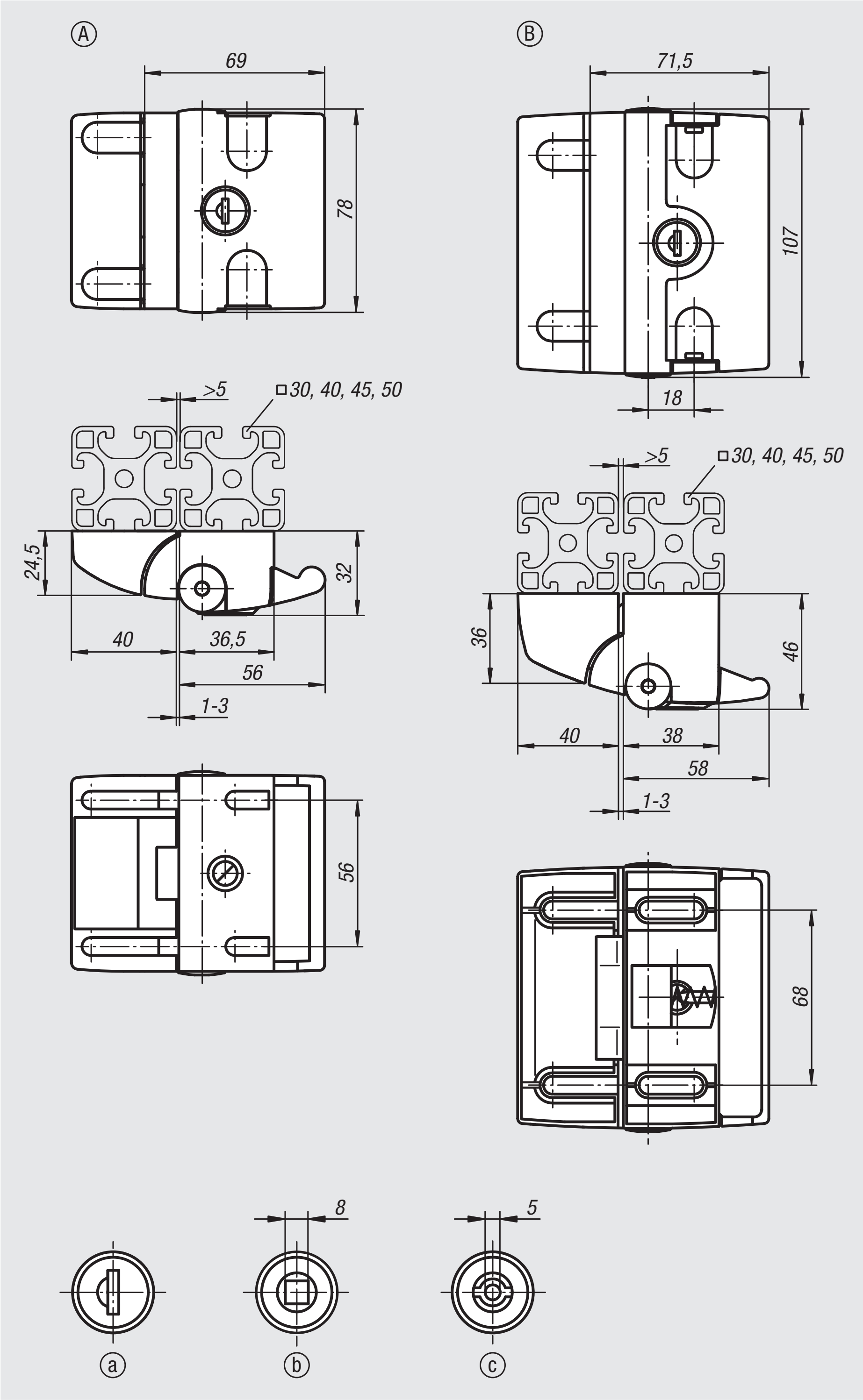
Sample order:
nlm 05598-100561

Note:
For the simple and safe locking of doors and hatches. Installed from the front without mechanical processing using M6 cylinder-head or cheese-head screws. Secured to prevent removal when locked.

The key-operated version is supplied with 2 keys. The key can be removed in both positions (open and closed). The locks are keyed alike, i.e. they can all be opened using the same key (euro key 5333).

The double-lug version is supplied with a double lug key.

Drawing reference:
Actuation:
a) single-key system
b) square 8 mm
c) double lug 5 mm



Order No.	Form	Slot width	Actuation
05598-100561	A	8/10	not lockable
05598-170561	A	8/10	key
05598-118561	A	8/10	square 8 mm
05598-145561	A	8/10	double lug 5 mm
05598-200681	B	8/10	not lockable
05598-270681	B	8/10	key

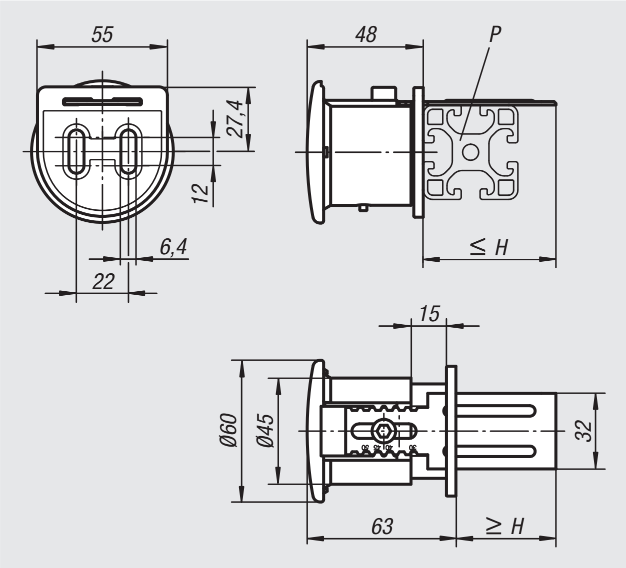
Emergency openers

Material:
Body plastic PA 6, fibreglass reinforced.
Push button plastic PA 6, fibreglass reinforced.
Release catch steel.

Version:
Body black.
Push button red.
Release catch electro zinc-plated.

Sample order:
nlm 05599-93050

Note:
Rear-side emergency release for slam latches. Installation with two socket head screws (preferably DIN 912 M6x12), no machining required. Suitable for all slam latches.

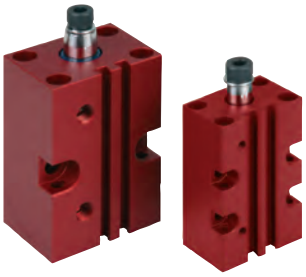


Order No.	Slot width	H min.	H max.	P
05599-93050	8/10	30	50	30-50
05599-96080	8/10	60	80	60-80

05610

Swing clamps

pneumatic



Material:
Body aluminium.
Double-acting piston rod stainless steel.

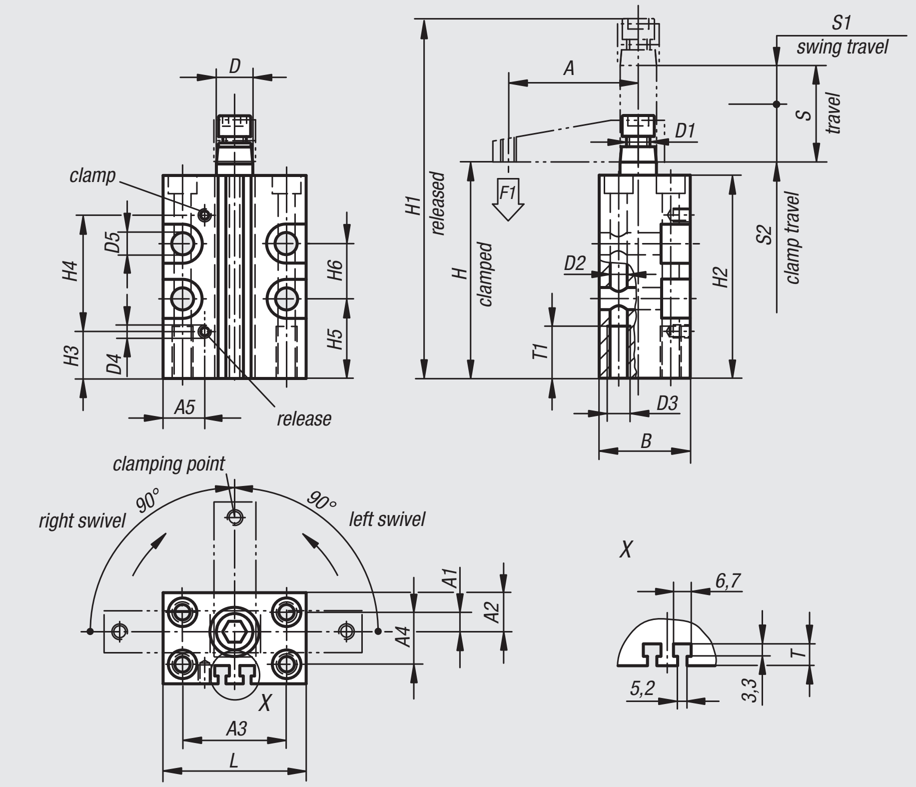
Version:
Body, red anodised.
Double acting piston rod, polished.

Sample order:
nlm 05610-112

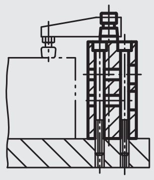
Note:
Swing clamps are used where low clamping forces suffice or where the clamping point must be free when mounting and removing the workpiece. The block form of the housing offers universal fastening possibilities. The magnetic piston is primed for electrical end position feedback. Including screw and lock washer for fastening the clamping arms (accessories). The swing action of the clamp should not be blocked.
F1 = at 6 bar (max. operating pressure).

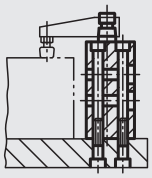
On request:
Proximitiy switch.

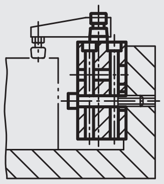
Accessories:
- Clamping arm 05620
- Adapter 05625

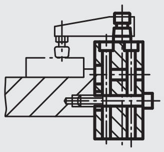


Examples:


with screws from above


with screws from below


lateral to the rear


lateral to the front

Order No. swivel to the right	Order No. swivel to the left	Size	A	A1	A2	A3	A4	A5	B	D	D1	D2	D3	Travel S	S1	S2
05610-112	**05610-212**	12	35	0	10	31	-	20	24	8	M5	4,3	M5	16	7	9
05610-116	**05610-216**	16	41	-2	11	31	-	21	28	8	M5	4,3	M5	16	7	9
05610-120	**05610-220**	20	48	8	13	36	20	11,5	30	12	M8	5,5	M6	27	12	15
05610-125	**05610-225**	25	50	7,5	15	40	20	17	35	14	M8	6,5	M8	27	15	12
05610-132	**05610-232**	32	60	12,5	20	45	30	18	45	16	M8	6,5	M8	30	16	14
05610-140	**05610-240**	40	70	15,5	24,5	52	37	22	55	16	M8	8,5	M10	31	16	15
05610-150	**05610-250**	50	80	21,5	31	66	46	25	65	20	M10	8,5	M10	30	15	15
05610-163	**05610-263**	63	90	27,5	37,5	80	60	30	80	20	M10	10,5	M12	30	15	15

Order No. swivel to the right	Order No. swivel to the left	Size	D4	D5	H	H1	H2	H3	H4	H5	H6	L	T	T1	F1 kN
05610-112	**05610-212**	12	M5	4,3	75	104	70	11	51	26	21	40	5	15	0,03
05610-116	**05610-216**	16	M5	4,3	75	104	70	11	51	26	21	42	4,5	15	0,06
05610-120	**05610-220**	20	M5	5,5	79	124	74	17	44,5	24	22	46	4,5	20	0,08
05610-125	**05610-225**	25	M5	8,5	82	125	78	17	44,5	32	-	55	5	20	0,17
05610-132	**05610-232**	32	G1/8	8,5	96	145	90	22	50	43	-	60	6,5	20	0,27
05610-140	**05610-240**	40	G1/8	8,5	95	145	90	20	52	40	-	70	8	25	0,45
05610-150	**05610-250**	50	G1/8	10,5	106	162	100	25	53,5	45	-	85	6,5	30	0,7
05610-163	**05610-263**	63	G1/8	10,5	106	162	100	28	53,5	36	-	100	8,5	30	1,1

05620

Clamping arm

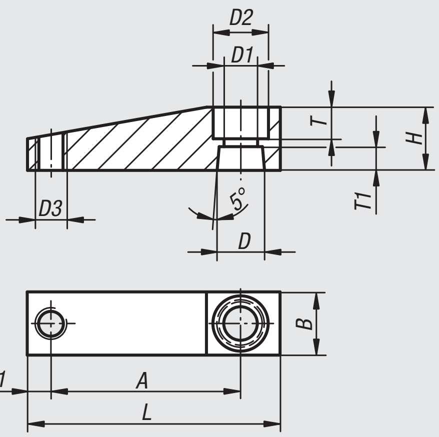
for swing clamp

Material:
High-strength aluminium alloy

Version:
Coated with hart-coat®

Sample order:
nlm 05620-12

Note:
Hard wearing surface, repels welding particles. Suitable for pneumatic swing clamp 05610, in respective sizes.



Order No.	Size	A	A1	B	D	D1	D2	D3	H	L	T	T1
05620-12	12	35	4	12	8	5,5	9	M4	12	45	5	5
05620-16	16	41	4	12	8	5,5	9	M4	12	51	4	5
05620-20	20	48	6	16	12	8,5	14	M6	16	64	8	6
05620-25	25	50	6	16	14	9	14	M6	16	66	6	6
05620-32	32	60	9	20	16	9	14	M8	20	80	7	9
05620-40	40	70	9	20	16	9	14	M8	20	90	7	9
05620-50	50	80	10	25	20	11	17	M12	25	105	9	10
05620-63	63	90	10	25	20	11	17	M12	25	115	9	10

05625

Adapters

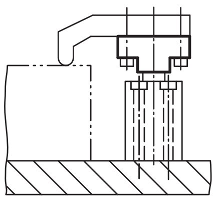
for swing clamp

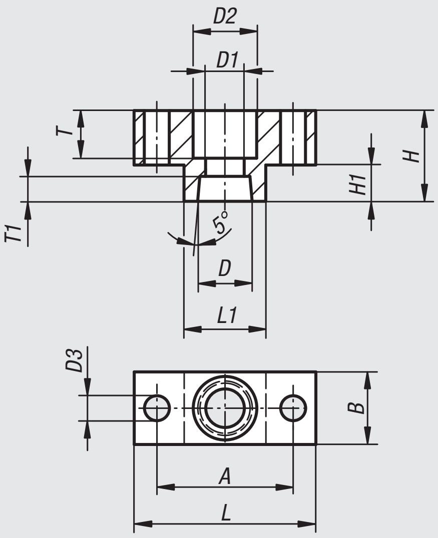
Material:
High-strength aluminium alloy

Version:
Coated with hart-coat®

Sample order:
nlm 05625-1216

Note:
Hard wearing surface, repels welding particles. Holds matching clamping arms. Suitable for pneumatic swing clamp 05610 in respective sizes.





Order No.	Size	A	B	D	D1	D2	D3	H	H1	L	L1	T	T1
05625-1216	12/16	22	12	8	5,5	10	4,5	14	6	30	13	7	5
05625-2000	20	30	16	12	8,5	14	5,5	20	8	40	18	10,5	5,5
05625-2500	25	38	16	14	8,5	14	5,5	20	8	50	25	8	6,5
05625-3240	32/40	45	19	16	8,5	14	7	25	10	60	30	11	9
05625-5063	50/63	48	25	20	10,5	17	9	30	12	65	30	14	10

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Notes

Pneumatic toggle lever clamps

Tünkers system

Pneumatic toggle lever clamps are used for economic manufacturing in transfer lines, machine tools, fixtures and specialist machines.

Functional principle:
High clamping forces are achieved at low air pressure and air consumption because of the knee-operated lever clamp. The clamping arm is laterally stable and solidly bearing-mounted against rotation, torsion and angular shift. The clamping forces engendered by the knee-operated lever are taken up by thrust bearings.

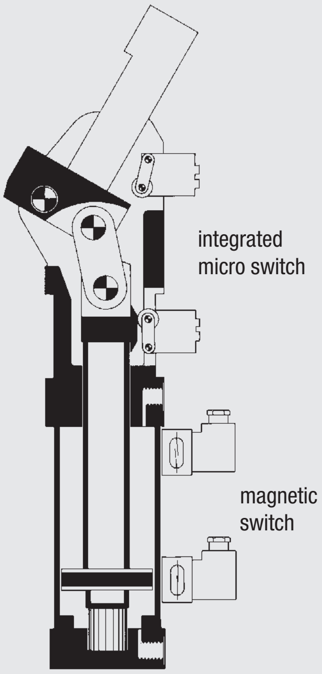
Particular design features:

Clamp design:
Hardened bushes and guide rails, roller-mounted thrust bearings. Maintenance-free due to permanent lubrication and specialist bearing bushes.

Retaining clamps:
Are completely self-inhibiting. The clamping force is safely guaranteed, even if the pressure is removed. Clip position in the top dead centre position:

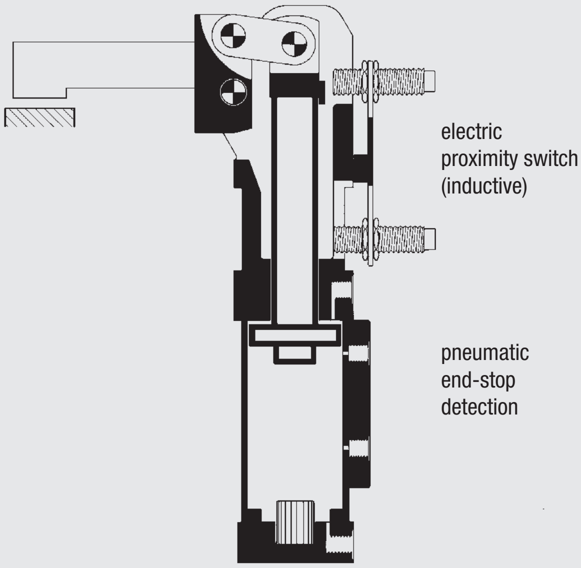
Note:
The clamping arm can always be moved from the top dead centre position if the acting retention force does not exceed the clamping force created (e.g. by slippage of the clamped machined part).

Determining the end position:

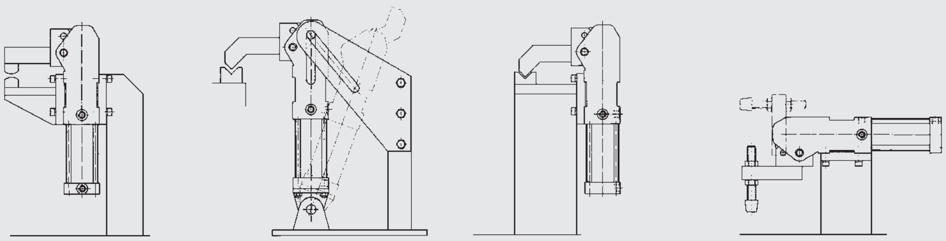


Control:
When constructing complete switches consult the known manufacturers of pneumatic valves, who also supply all the connecting components and fittings.

Selection criteria:
With pneumatic clamps, in order to be able to select the correct clamp size, in addition to the retention force, the possible clamping force at 5 bar air pressure (max. possible air pressure 8 bar) is also specified.



mounting example



Mini clamps

Material:
Casing high-tensile aluminium.
Clamping arm steel.

Version:
Clamping arm black oxidised.

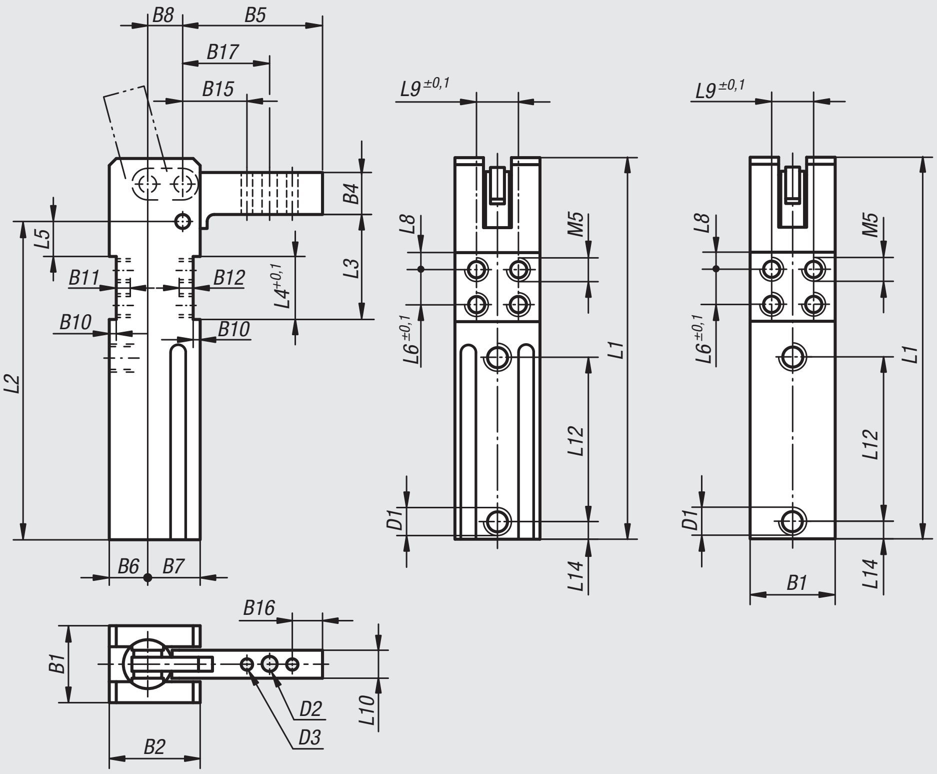
Sample order:
nlm 05650-0500111

Note:
The mini clamp is characterised by its small dimensions, positioning accuracy of the clamping arm and light construction. Mini clamps are fully self-limiting. The clamping force is guaranteed even when the pressure is removed through the over dead-centre position of the toggle lever on the clamping arm. The permanent lubrication and special bearing bushings make the mini clamps maintenance-free. They can be operated using dry, oil-free air.

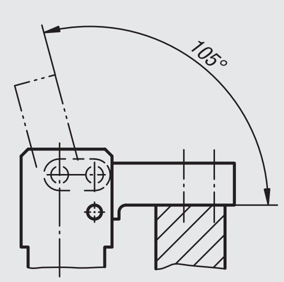
On request:
Clamping arm without holes.

electronic end position feedback

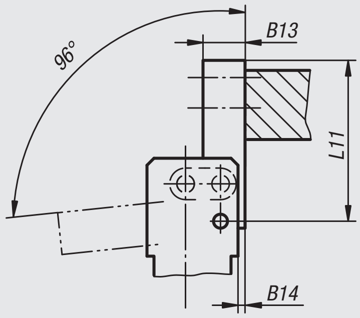
no end position feedback



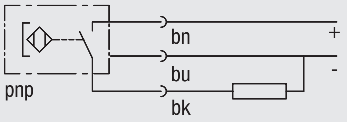
Form A
vertical clamping force
max. opening angle 105°



Form B
horizontal clamping force
max. opening angle 96°



Electrical
connection diagram



Connection type	PICO
Operating voltage (V)	10...30 VDC
Residual ripple (%)	≦ 10
Intrinsic current consumption (mA)	≦ 2,0
Constant current (mA)	≦ 120
Switching hysteresis (mm)	≦ 1
Condition display	LED
Permissible environmental temperature (°C)	-25...+70
Protection class (DIN 40 050)	IP 67

05650

Mini clamps

Mini clamp with electronic end position feedback

Order No. Form A	Order No. Form B	Size	Tightening torque Nm at 5 bar	Retaining torque Nm	Operating pressure bar with oil-free air	Max pressure bar with oil-free air	B1	B2	B4	B5	B6	B7	B8	B10	B11	B12	B13	B14
05650-0500111	**05650-0500121**	2	8	25	5	6	26	32	15	50	14	18	12	2,5	5	7	12	2
05650-0900111	**05650-0900121**	3	15	54	5	6	30	39	18	60	17	22	15	3	6	8	16	3
05650-1000111	**05650-1000121**	4	25	75	5	6	35	45	22	75	20	25	18	4	6	8	18	4

Order No. Form A	Order No. Form B	Size	B15	B16	B17	D1	D2	D3	L1	L2	L3	L4	L5	L6	L8	L9	L10	L11	L12	L14
05650-0500111	**05650-0500121**	2	28	6	36	M5	5,5	4	123	96	27,5	20	7,5	10	5	16	10	50	57	12
05650-0900111	**05650-0900121**	3	32	8	42	G 1/8	6,5	5	158	120	40	25	14	15	5	20	12	60	69	15
05650-1000111	**05650-1000121**	4	40	10	52,5	G 1/8	8,5	6	182	136	47	28	17	18	5	25	16	75	80	17,5

Mini clamp without end position feedback

Order No. Form A	Order No. Form B	Size	Tightening torque Nm at 5 bar	Retaining torque Nm	Operating pressure bar with oil-free air	Max pressure bar with oil-free air	B1	B2	B4	B5	B6	B7	B8	B10	B11	B12	B13	B14
05650-0500411	**05650-0500421**	2	8	25	5	6	26	32	15	50	14	18	12	2,5	5	7	12	2
05650-0900411	**05650-0900421**	3	15	54	5	6	30	39	18	60	17	22	15	3	6	8	16	3
05650-1000411	**05650-1000421**	4	25	75	5	6	35	45	22	75	20	25	18	4	6	8	18	4

Order No. Form A	Order No. Form B	Size	B15	B16	B17	D1	D2	D3	L1	L2	L3	L4	L5	L6	L8	L9	L10	L11	L12	L14
05650-0500411	**05650-0500421**	2	28	6	36	M5	5,5	4	123	96	27,5	20	7,5	10	5	16	10	50	57	12
05650-0900411	**05650-0900421**	3	32	8	42	G 1/8	6,5	5	158	120	40	25	14	15	5	20	12	60	69	15
05650-1000411	**05650-1000421**	4	40	10	52,5	G 1/8	8,5	6	182	136	47	28	17	18	5	25	16	75	80	17,5

Mini clamp

manual operated

Material:
Casing high-tensile aluminium.
Clamping arm steel.

Version:
Clamping arm black oxidised.

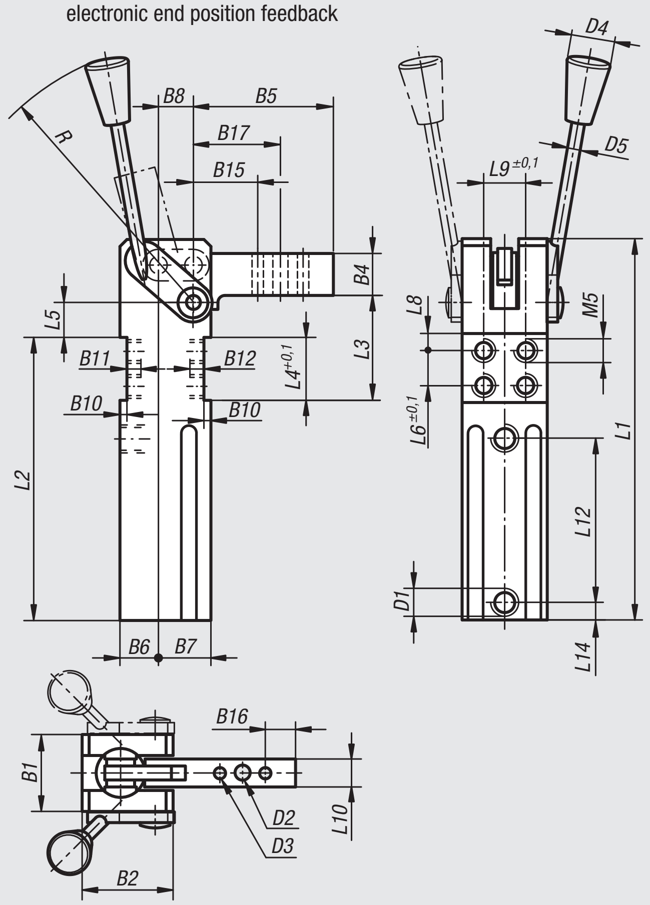
Sample order:
nlm 05652-081111

Note:
The mini clamp is characterised by its small size, positioning accuracy of the clamping arm, and lightweight construction. Mini clamps are fully self-locking. The clamping force is guaranteed even when the pressure is removed through the over dead-centre position of the toggle lever on the clamping arm. The permanent lubrication and special bearing bushings make the mini clamps maintenance-free. They can be operated using dry, oil-free air.
The manual closing and locking using the hand lever.
Pneumatic opening and closing.

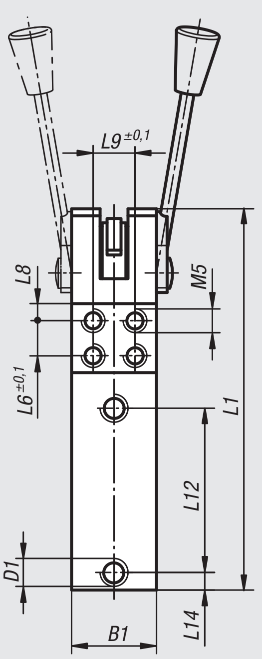
Attention: A 5/3-way valve is required, middle position vented.

On request:
Clamping arm without holes.

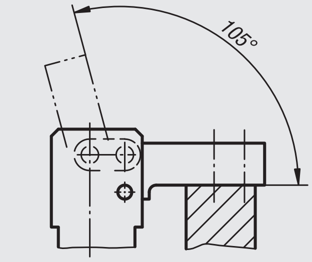
electronic end position feedback



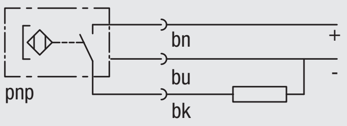
no end position feedback



Form A
vertical clamping force
max. opening angle 105°



Electrical
connection diagram



Connection type	PICO
Operating voltage (V)	10...30 VDC
Residual ripple (%)	≦ 10
Intrinsic current consumption (mA)	≦ 2,0
Constant current (mA)	≦ 120
Switching hysteresis (mm)	≦ 1
Condition display	LED
Permissible environmental temperature (°C)	-25...+70
Protection class (DIN 40 050)	IP 67

Mini clamp

manual operated

Mini clamp with electronic end position feedback

Order No.	Size	Tightening torque Nm at 5 bar	Retaining torque Nm	Operating pressure bar with oil-free air	Max pressure bar with oil-free air	B1	B2	B4	B5	B6	B7	B8	B10	B11	B12	B15	B16	B17
05652-081111	2	8	25	5	6	26	32	15	50	14	18	12	2,5	5	7	28	6	36
05652-081112	2	8	25	5	6	26	32	15	50	14	18	12	2,5	5	7	28	6	36
05652-151111	3	15	54	5	6	30	39	18	60	17	22	15	3	6	8	32	8	42
05652-151112	3	15	54	5	6	30	39	18	60	17	22	15	3	6	8	32	8	42
05652-251111	4	25	75	5	6	35	45	22	75	20	25	18	4	6	8	40	10	52,5
05652-251112	4	25	75	5	6	35	45	22	75	20	25	18	4	6	8	40	10	52,5

Order No.	Size	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5	L6	L8	L9	L10	L12	L14	R	manual operated
05652-081111	2	M5	5,5	4	20	9	123	96	27,5	20	7,5	10	5	16	10	57	12	135	left
05652-081112	2	M5	5,5	4	20	9	123	96	27,5	20	7,5	10	5	16	10	57	12	135	right
05652-151111	3	G 1/8	6,5	5	20	9	158	120	40	25	14	15	5	20	12	69	15	135	left
05652-151112	3	G 1/8	6,5	5	20	9	158	120	40	25	14	15	5	20	12	69	15	135	right
05652-251111	4	G 1/8	8,5	6	20	9	182	136	47	28	17	18	5	25	16	80	17,5	135	left
05652-251112	4	G 1/8	8,5	6	20	9	182	136	47	28	17	18	5	25	16	80	17,5	135	right

Mini clamp without end position feedback

Order No.	Size	Tightening torque Nm at 5 bar	Retaining torque Nm	Operating pressure bar with oil-free air	Max pressure bar with oil-free air	B1	B2	B4	B5	B6	B7	B8	B10	B11	B12	B15	B16	B17
05652-084111	2	8	25	5	6	26	32	15	50	14	18	12	2,5	5	7	28	6	36
05652-084112	2	8	25	5	6	26	32	15	50	14	18	12	2,5	5	7	28	6	36
05652-154111	3	15	54	5	6	30	39	18	60	17	22	15	3	6	8	32	8	42
05652-154112	3	15	54	5	6	30	39	18	60	17	22	15	3	6	8	32	8	42
05652-254111	4	25	75	5	6	35	45	22	75	20	25	18	4	6	8	40	10	52,5
05652-254112	4	25	75	5	6	35	45	22	75	20	25	18	4	6	8	40	10	52,5

Order No.	Size	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5	L6	L8	L9	L10	L12	L14	R	manual operated
05652-084111	2	M5	5,5	4	20	9	123	96	27,5	20	7,5	10	5	16	10	57	12	135	left
05652-084112	2	M5	5,5	4	20	9	123	96	27,5	20	7,5	10	5	16	10	57	12	135	right
05652-154111	3	G 1/8	6,5	5	20	9	158	120	40	25	14	15	5	20	12	69	15	135	left
05652-154112	3	G 1/8	6,5	5	20	9	158	120	40	25	14	15	5	20	12	69	15	135	right
05652-254111	4	G 1/8	8,5	6	20	9	182	136	47	28	17	18	5	25	16	80	17,5	135	left
05652-254112	4	G 1/8	8,5	6	20	9	182	136	47	28	17	18	5	25	16	80	17,5	135	right

05660

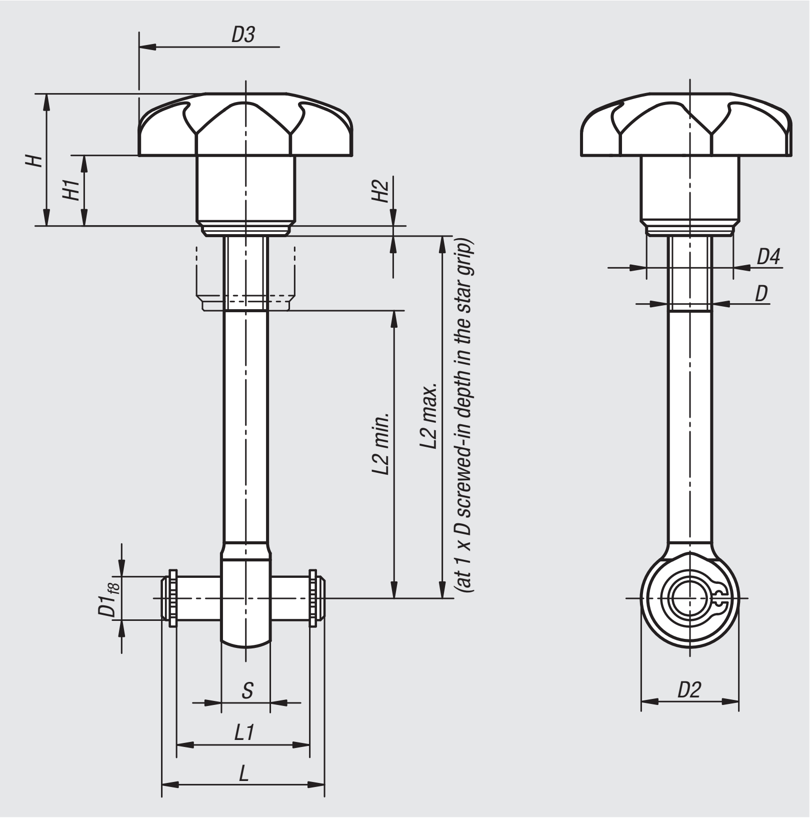
Swing screws

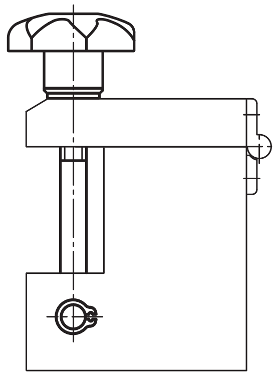
Material:
Star grip thermoplastic.
Bush steel.
Washer steel 140 HV.
Eye bolt steel grade 8.8.
Hinge pin steel 1.1181.

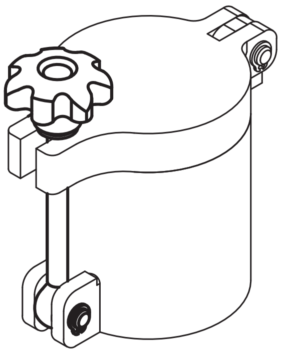
Version:
Star grip black.
Bush trivalent blue passivated
Washer bright.
Eye bolt black oxidised.
Hinge pins tempered, ground and bright.

Sample order:
nlm 05660-06050

Note:
The swing screws are supplied unassembled.
Suitable circlips are enclosed.







Order No.	D	D1	D2	D3	D4	H	H1	H2	L	L1	L2 min.	L2 max.	S
05660-06050	M6	6	14	32	12	20	10	1,6	22	17	32	44	7
05660-06075	M6	6	14	32	12	20	10	1,6	22	17	57	69	7
05660-08050	M8	8	18	40	16	24	13	1,6	30	25	28	42	9
05660-08075	M8	8	18	40	16	24	13	1,6	30	25	53	67	9
05660-10075	M10	10	20	50	20	31	17	2	37	32	49	65	12
05660-10100	M10	10	20	50	20	31	17	2	37	32	74	90	12

Notes

05665

Mini clamp

for horizontal installation

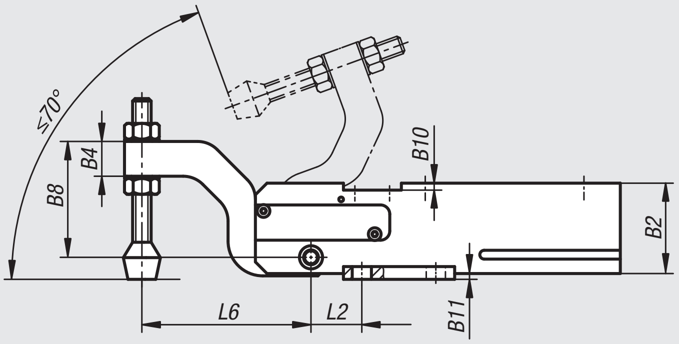
Material:
Casing high-tensile aluminium.
Clamping arm steel.

Version:
Clamping arm black oxidised.

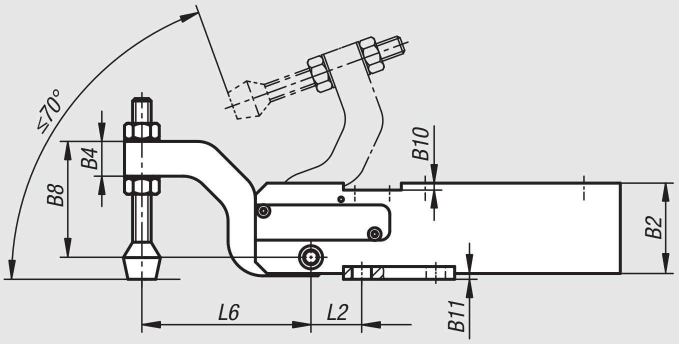
Sample order:
nlm 05665-081

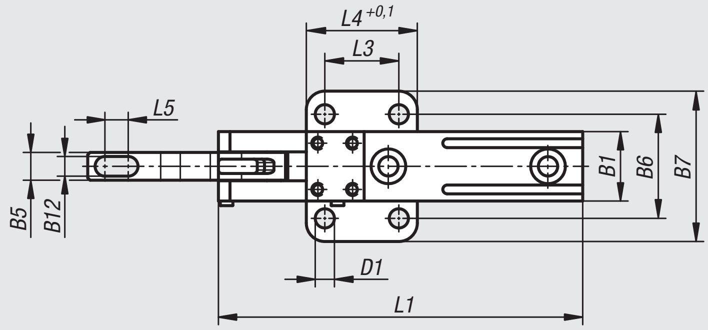
Note:
The mini clamp is characterised by its small dimensions, positioning accuracy of the clamping arm and light construction. Mini clamps are fully self-limiting. The clamping force is guaranteed even when the pressure is removed through the over dead-centre position of the toggle lever on the clamping arm. The permanent lubrication and special bearing bushings make the mini clamps maintenance-free. They can be operated using dry, oil-free air.

electronic end position feedback

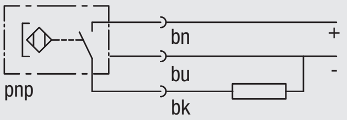


no end position feedback





Electrical
connection diagram



Connection type	PICO
Operating voltage (V)	10...30 VDC
Residual ripple (%)	≦ 10
Intrinsic current consumption (mA)	≦ 2,0
Constant current (mA)	≦ 120
Switching hysteresis (mm)	≦ 1
Condition display	LED
Permissible environmental temperature (°C)	-25...+70
Protection class (DIN 40 050)	IP 67

05665

Mini clamp

for horizontal installation

Mini clamp with electronic end position feedback

Order No.	Size	Tightening torque Nm at 5 bar	Retaining torque Nm	Operating pressure bar with oil-free air	Max pressure bar with oil-free air	B1	B2	B4	B5	B6	B7	B8
05665-081	2	8	25	5	6	26	32	12	10	45	65	33
05665-151	3	15	54	5	6	30	39	15	12	45	65	50
05665-251	4	25	75	5	6	35	45	12	16	50	70	52

Order No.	Size	B10	B11	B12	D1	L1	L2	L3	L4	L5	L6	Connecting thread
05665-081	2	2,5	3	6,5	5	123	16	32	48	4	50	M05
05665-151	3	3	3	8,5	8,3	158	22	32	48	10,5	73	G1/8
05665-251	4	4	4	8,5	8,3	182	26,5	45	64	19,5	80	G1/8

Mini clamp without end position feedback

Order No.	Size	Tightening torque Nm at 5 bar	Retaining torque Nm	Operating pressure bar with oil-free air	Max pressure bar with oil-free air	B1	B2	B4	B5	B6	B7	B8
05665-084	2	8	25	5	6	26	32	12	10	45	65	33
05665-154	3	15	54	5	6	30	39	15	12	45	65	50
05665-254	4	25	75	5	6	35	45	12	16	50	70	52

Order No.	Size	B10	B11	B12	D1	L1	L2	L3	L4	L5	L6	Connecting thread
05665-084	2	2,5	3	6,5	5	123	16	32	48	4	50	M05
05665-154	3	3	3	8,5	8,3	158	22	32	48	10,5	73	G1/8
05665-254	4	4	4	8,5	8,3	182	26,5	45	64	19,5	80	G1/8

05666

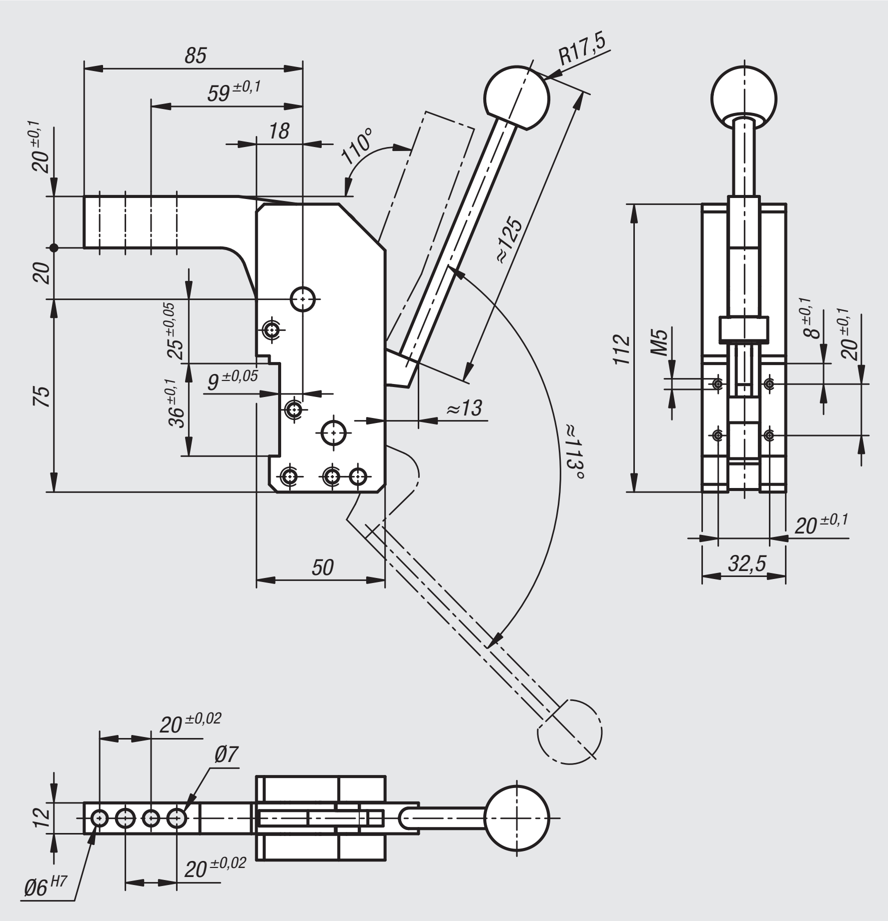
Manual clamp

vertical with hole pattern on the front

Material:
Housing and clamping arm steel.

Sample order:
nlm 05666-55

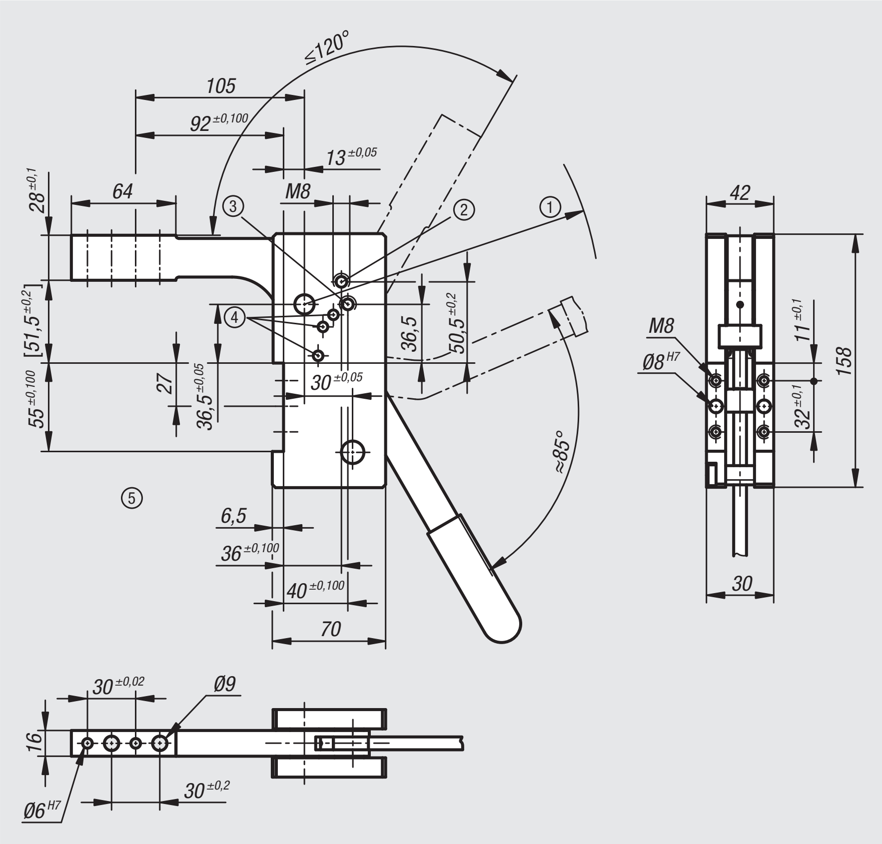
Note:
Manual clamp with integrated toggle lever mechanism for over dead centre locking.
The clamping arm is has a fixed stop for reproducible end positions.
The housing features a hole pattern at the front.
All hinge pins for the mechanics are in bushes.
The hand lever has an ergonomic ball grip.
The clamping arm has a hole pattern for mounting thrust pads.



Order No.	Clamping torque Mx Nm	Retaining torque Nm
05666-55	55	110

Manual clamp

vertical with hole pattern on the front



Material:
Housing and clamping arm steel.

Sample order:
nlm 05667-160

Note:
Manual clamp with integrated toggle lever for over dead centre locking.
The clamping arm is has a fixed stop for reproducible end positions.
The housing features a hole pattern at the front.
All hinge pins for the mechanics are in bushes.
The hand lever has an ergonomic grip.
The clamping arm has a hole pattern for mounting thrust pads.

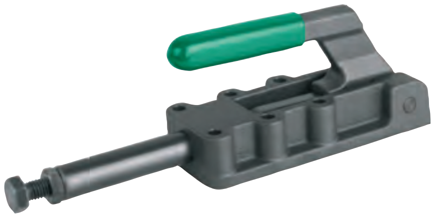
1) Cantilever: max. R 300 mm
2) Ratchet stops for opening angles 45°–65°
3) Ratchet stops for opening angles 90°–120°
4) End stop for opening angle
5) For values [...] tolerances spaced at 80 mm from the fulcrum apply

Order No.	Clamping torque Mx Nm	Retaining torque Nm
05667-160	160	320

05840

Push-pull clamps

heavy-duty version with handle

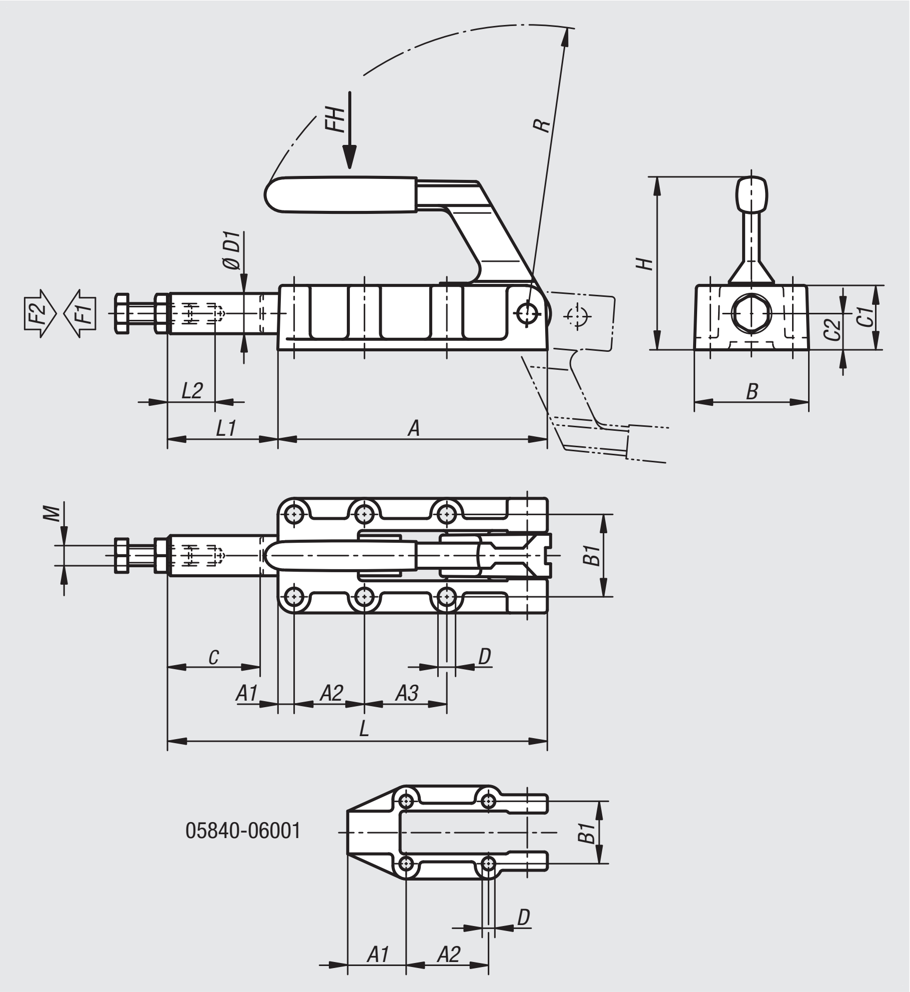


Material:
Steel.
Body and handle ductile iron (SG iron)

Version:
Phosphated, plastic handle oil-resistant

Sample order:
nlm 05840-25001

Note:
The clamps lock in the open and closed handle positions. They can be used for thrust or tension clamping.
These clamps also have travel limitation for advance and retraction.

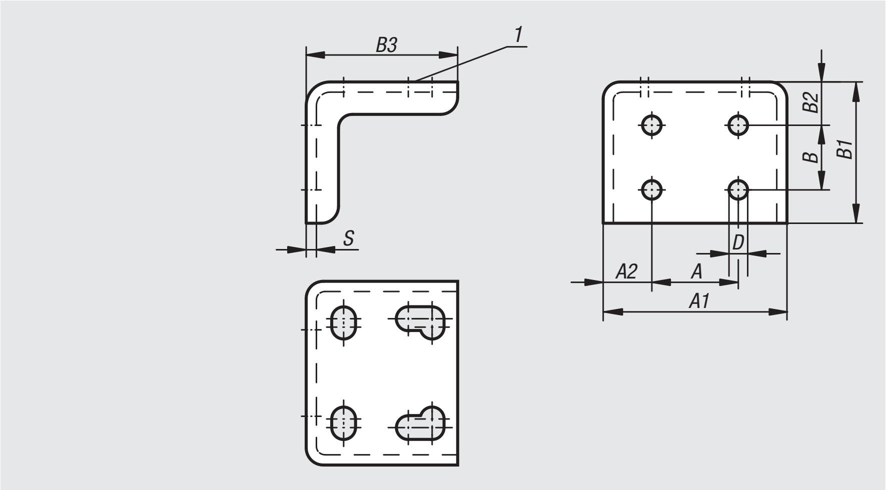


Order No.	Opening angle of handle	Hand force FH N	Retaining force F2 N	Clamping force F1 N
05840-06001	185°	140	6000	3000
05840-12001	185°	150	12000	5000
05840-25001	185°	170	25000	5000
05840-50001	185°	200	50000	7000

Order No.	A	A1	A2	A3	B	B1	C1	C2	D	D1	H	L	L1	L2	M	R	C (travel)
05840-06001	89	25	36,5	-	46	33,4	23	12	5,5	14	63	127	38	30	M8	95	32
05840-12001	133	8	35	41	61	41	32	18	8,5	20	88	188	55	40	M10	143	50
05840-25001	197	11	45	45	82	54	41	22	10,3	25	108	300	103	60	M12	200	75
05840-50001	254	10	70	70	85	57	50	28	10,3	30	127	390	136	60	M16	245	100

05880

Angle bracket



Material:
Steel.

Version:
Trivalent passivated.

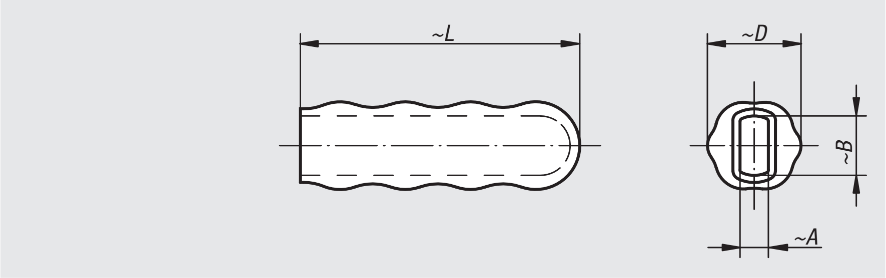
Sample order:
nlm 05880-02

Drawing reference:
1) mount clamp on this face

Order No.	A	A1	A2	B	B1	B2	B3	D	S
05880-02	18	43	12,5	15	36,5	13,5	29,5	5	2
05880-04	25,4	54	14,2	19	41,5	12,7	44,5	5,5	3
05880-06	44	76	16	32	62	21	66	8,6	4

05882

Plastic grips



Material:
Plastic

Version:
Orange, oil-resistant

Sample order:
nlm 05882-30

Order No.	A	B	D	L
05882-16	4	8	15	45
05882-19	6	10	19	53
05882-20	5	10	20	60
05882-22	4	13	22	58
05882-23	5	13	22	60
05882-28	6	15	26	85
05882-30	8	17	31	105
05882-32	8	19	31	105
05882-33	8	22	32	115
05882-34	10	22	32	95
05882-35	10	25	35	120

Notes

Technical information

Quick clamping - reliable fastening

Durable and reliable
Now even more durable, more user-friendly and safer. This is the design aim that has been achieved in the new generation. You, the user, will notice the difference immediately: On first contact, the new toggle clamp has a good grip and is robust. It delivers fast, reliable and safe operation. High quality material ensures the necessary holding power.

Advantages:

Impressively stable:
All models can easily withstand 300,000 clamping cycles

Durable:
High-quality bushings - without scoring

Extremely robust:
Corrosion-resistant NITROX COATING or stainless steel

Simple design
The fixed top nut eases spindle adjustment

Reliable:
Uniform force during opening and closing

Ideal where space is restricted:
Slim design supports safe operation

Optimum stability:
Conical clamping arm with U-profile

Safe application:
Nothing catches on the smooth edges

Fast and flexible:
Easy retrofitting thanks to a wide range of accessories

Ergonomic and slip-resistant:
Easy to operate when wearing work gloves

Non-reflecting
The NITROX-SURFACE is ideal for use with laser devices

Safe when opening:
More space between clamping arm and grip prevents pinching

Extremely compatible:
Oblong holes allows assembly on existing holes

Secure fixation and locking with safety lock:
The inner locking system is a completely revolutionary development. Nothing gets caught or stuck. Operation is easy even when wearing work gloves.

Operating principle of the safety locking mechanism:

Fig. 1:
Engaged.
No risk of injury thanks to revolutionary grip - no pinching or interfering contours.

Fig. 2:
Disengaged.
Pulling the grip releases the internal locking pin.

05900

Toggle clamps horizontal

with flat foot and adjustable clamping spindle

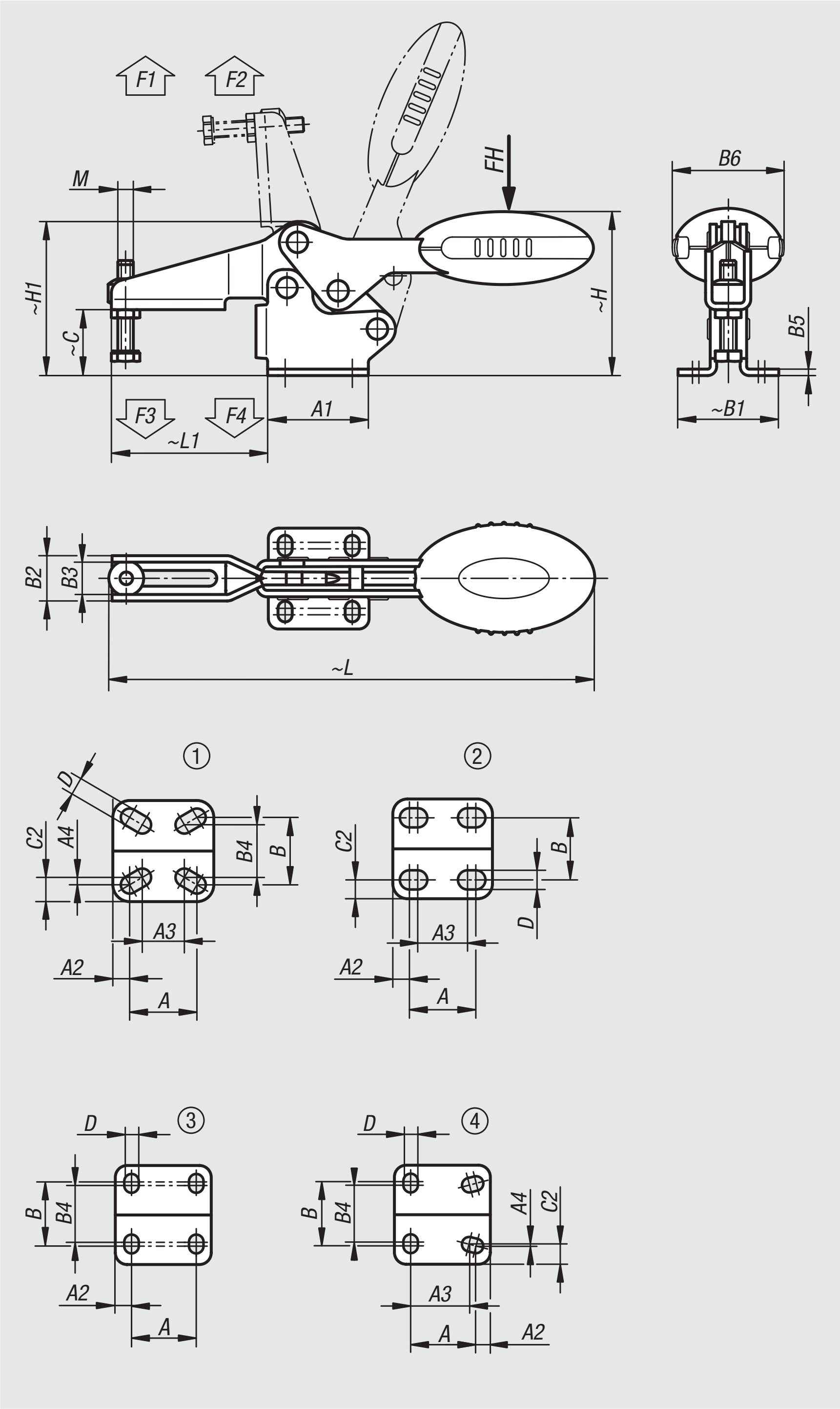
Material:
Steel.
Grip polyamide.

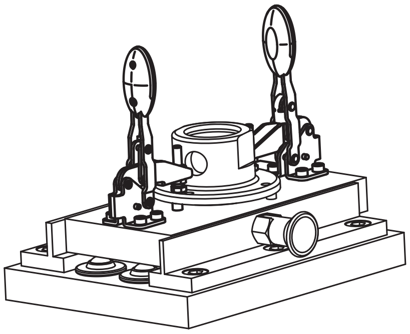
Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05900-004002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
- 05280 Protective caps
- 05880 Angle brackets
- 07110 Ball-end thrust screws
- 07117 Grippers, adjustable
- 07120 Grub screws with thrust point DIN 6332
- 07121 Grub screws with ball thrust point
- 07140 Thrust pads DIN 6311
- 07142 Thrust pads





Toggle clamps horizontal

with flat foot and adjustable clamping spindle

Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N	Order No. Angle bracket
05900-004002	1	87°	69°	80	400	500	250	300	05880-02
05900-005002	2	86°	67°	100	650	900	550	620	05880-02
05900-006002	3	86°	67°	160	1350	1900	720	1200	05880-04
05900-008002	3	86°	67°	200	2000	2800	830	1400	05880-04
05900-010002	3	90°	71°	250	2200	4500	1200	2800	05880-06
05900-012002	4	88°	68°	280	2400	5500	1000	2800	05880-06

Order No.	M	A	A1	A2	A3	A4	B	B1	B2	B3	B4	B5	B6	C	C2	D	H	H1	L	L1
05900-004002	M4x16	16	24	4	12,8	0,95	16	24	10,2	7,2	12,5	1,5	20	11,7	4,95	4,2	28,7	26,3	91,8	23,7
05900-005002	M5x25	18	27	4,5	13,5	-	16,8	27,3	13,2	9,2	-	2	22,5	17,2	5,25	5,5	43,4	38,9	125,7	41,8
05900-006002	M6x35	26	39	6,5	-	-	28	39	17,5	12,5	23	2,5	43,5	25,4	-	5,5	63,7	59,6	186,6	60,5
05900-008002	M8x45	26	44	9	-	-	31	45	21	16	24	2,5	41,5	32,2	-	6,2	73,9	70,1	223,1	74,9
05900-010002	M10x55	41,5	59	9	-	-	43	59	26	19	39	3,5	47	40	-	8,8	94,8	88	279,4	103,9
05900-012002	M12x70	44	65	10	40	1	42	67	28	21	40	3,5	47	52,3	13,5	8,5	104,8	101,6	314,7	122

05900

Toggle clamps horizontal

with flat foot and adjustable clamping spindle, stainless steel

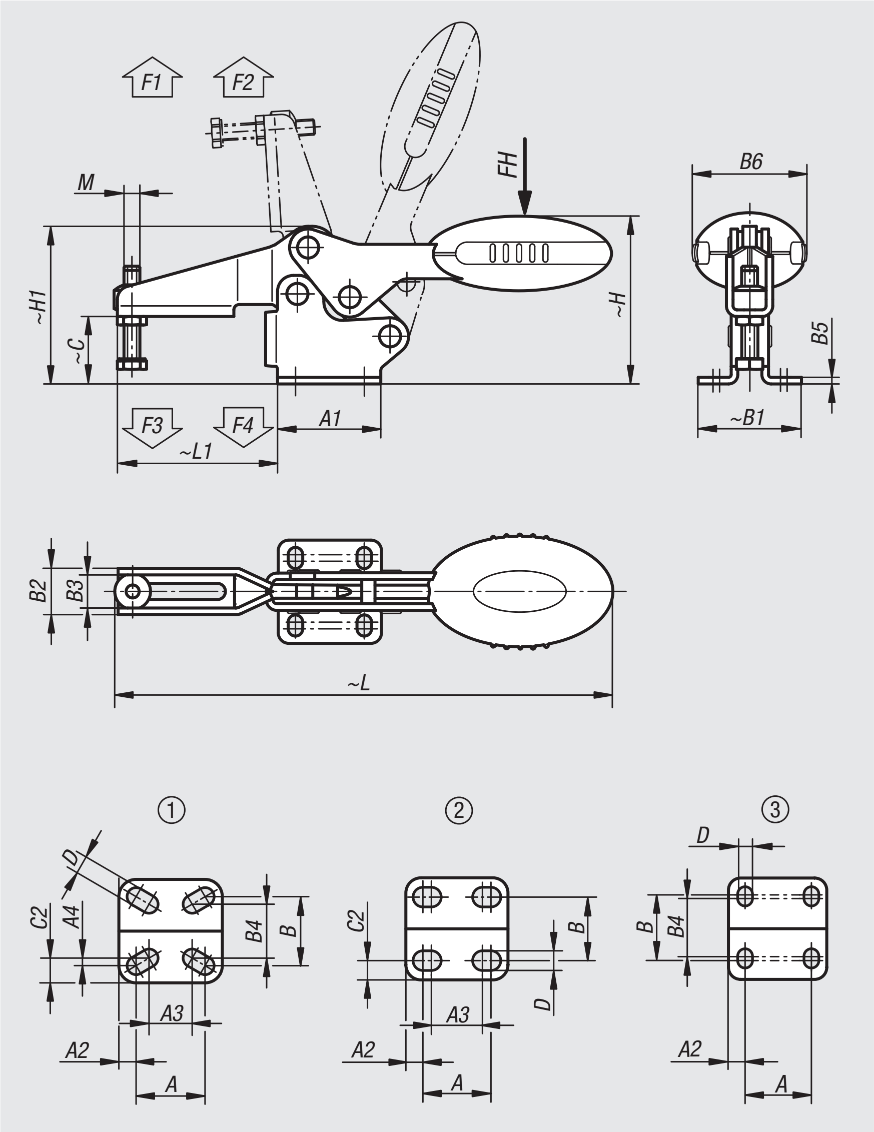
Material:
Stainless steel.
Grip polyamide.

Version:
Bright.

Sample order:
nlm 05900-104002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311



Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05900-104002	1	87°	69°	80	400	500	250	300
05900-105002	2	86°	67°	100	650	900	550	620
05900-106002	3	86°	67°	160	1350	1900	720	1200
05900-108002	3	86°	67°	200	2000	2800	830	1400

Order No.	M	A	A1	A2	A3	A4	B	B1	B2	B3	B4	B5	B6	C	C2	D	H	H1	L	L1
05900-104002	M4x16	16	24	4	12,8	0,95	16	24	10,2	7,2	12,5	1,5	20	11,7	4,95	4,2	28,7	26,3	91,8	23,7
05900-105002	M5x25	18	27	4,5	13,5	-	16,8	27,3	13,2	9,2	-	2	22,5	17,2	5,25	5,5	43,4	38,9	125,7	41,8
05900-106002	M6x35	26	39	6,5	-	-	28	39	17,5	12,5	23	2,5	43,5	25,4	-	5,5	63,7	59,6	186,6	60,5
05900-108002	M8x45	26	44	9	-	-	31	45	21	16	24	2,5	41,5	32,2	-	6,2	73,9	70,1	223,1	74,9

Toggle clamps horizontal with safety interlock

with flat foot and adjustable clamping spindle

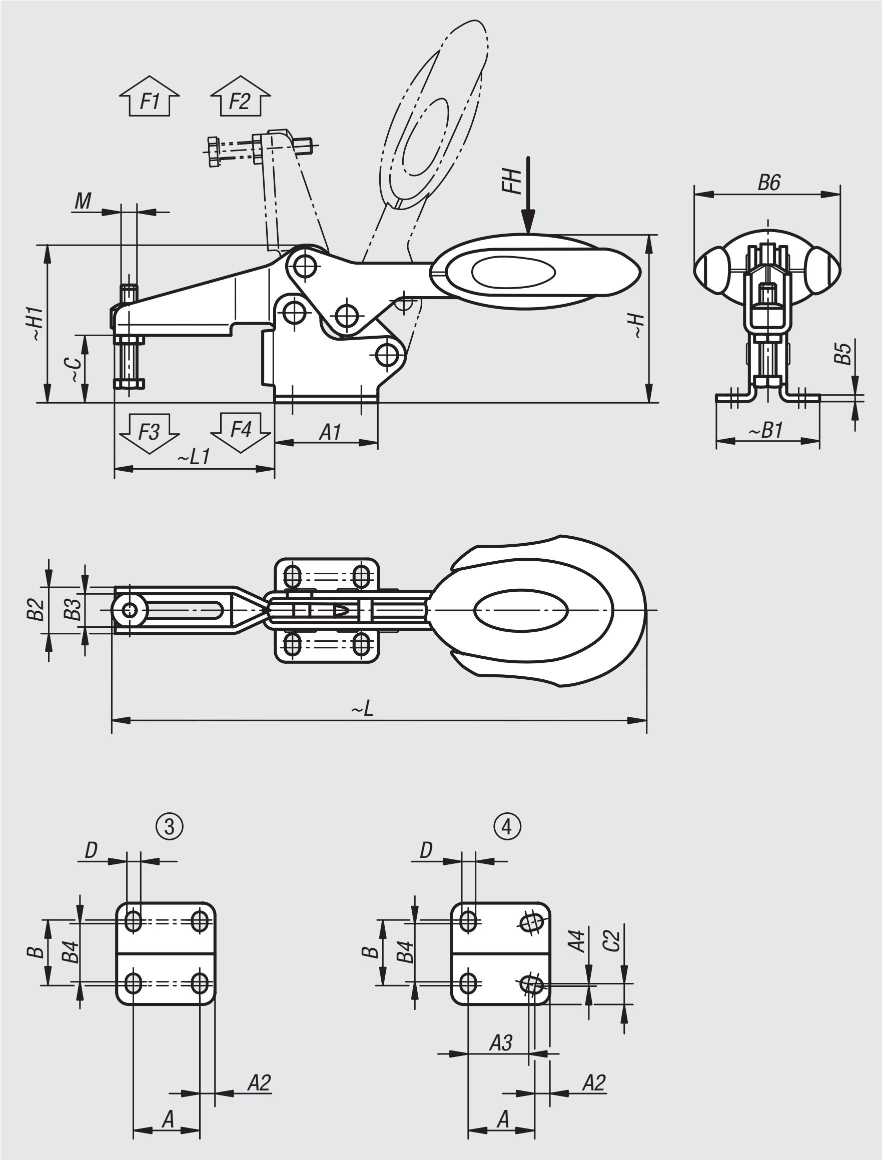
Material:
Steel.
Grip polyamide.
Unlocking bracket TPE.

Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05900-006102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
05880 Angle brackets
07110 Ball-end thrust screws
07117 Grippers, adjustable
07120 Grub screws with thrust point DIN 6332
07121 Grub screws with ball thrust point
07140 Thrust pads DIN 6311
07142 Thrust pads



Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N	Order No. Angle bracket
05900-006102	3	86°	67°	160	1350	1900	720	1200	05880-04
05900-008102	3	86°	67°	200	2000	2800	830	1400	05880-04
05900-010102	3	90°	71°	250	2200	4500	1200	2800	05880-06
05900-012102	4	88°	68°	280	2400	5500	1000	2800	05880-06

Order No.	M	A	A1	A2	A3	A4	B	B1	B2	B3	B4	B5	B6	C	C2	D	H	H1	L	L1
05900-006102	M6x35	26	39	6,5	-	-	28	39	17,5	12,5	23	2,5	53,4	25,4	-	5,5	63,7	59,6	193,3	60,5
05900-008102	M8x45	26	44	9	-	-	31	45	21	16	24	2,5	51,1	32,2	-	6,2	73,9	70,1	230,4	74,9
05900-010102	M10x55	41,5	59	8,5	-	-	43	59	26	19	39	3,5	56,5	40	-	8,8	94,8	88	286	103,9
05900-012102	M12x70	44	65	10	40	1	42	67	28	21	40	3,5	56,5	52,3	13,5	8,5	104,8	101,6	321,3	122

05900

Toggle clamps horizontal with safety interlock

with flat foot and adjustable clamping spindle, stainless steel

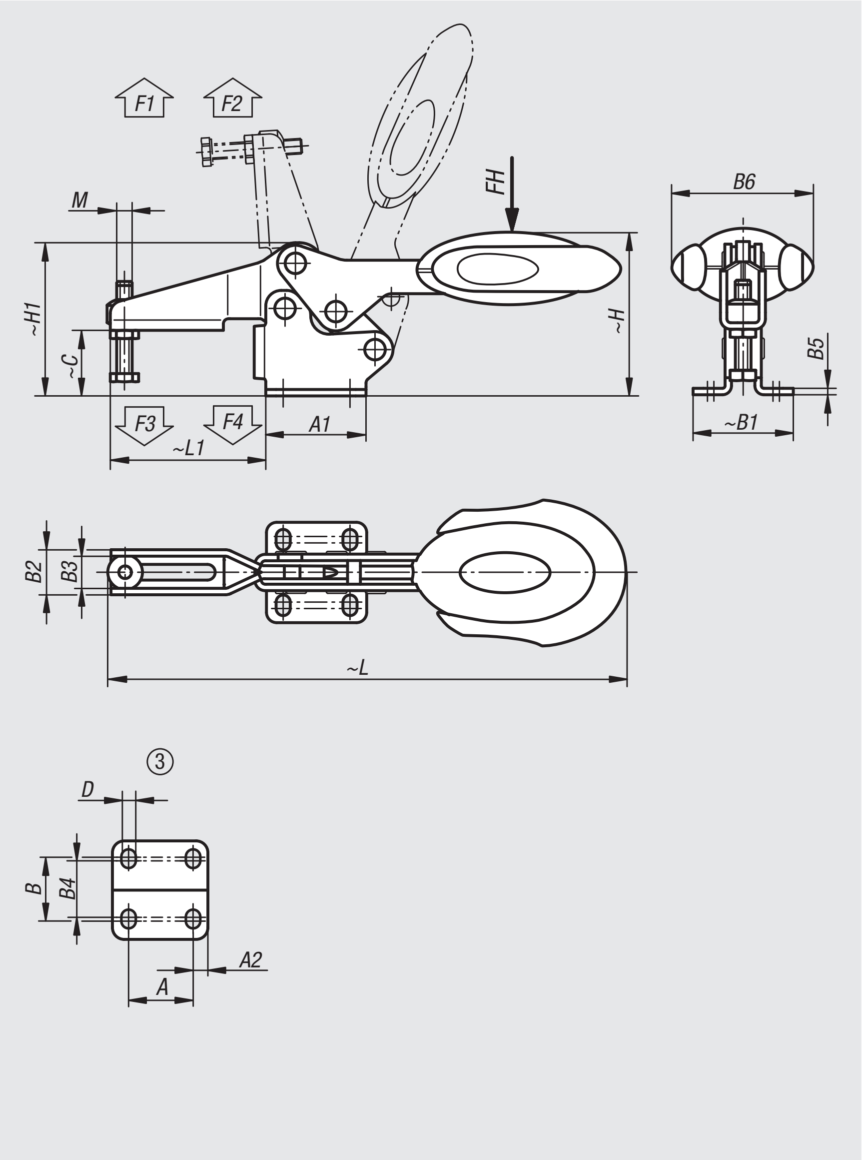
Material:
Stainless steel.
Grip polyamide.
Unlocking bracket TPE.

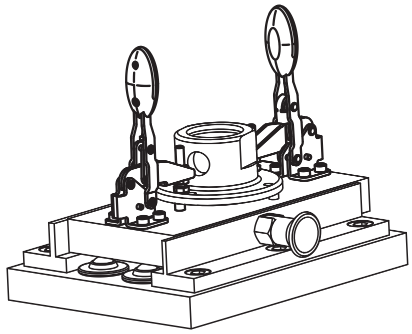
Version:
Bright.

Sample order:
nlm 05900-106102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311



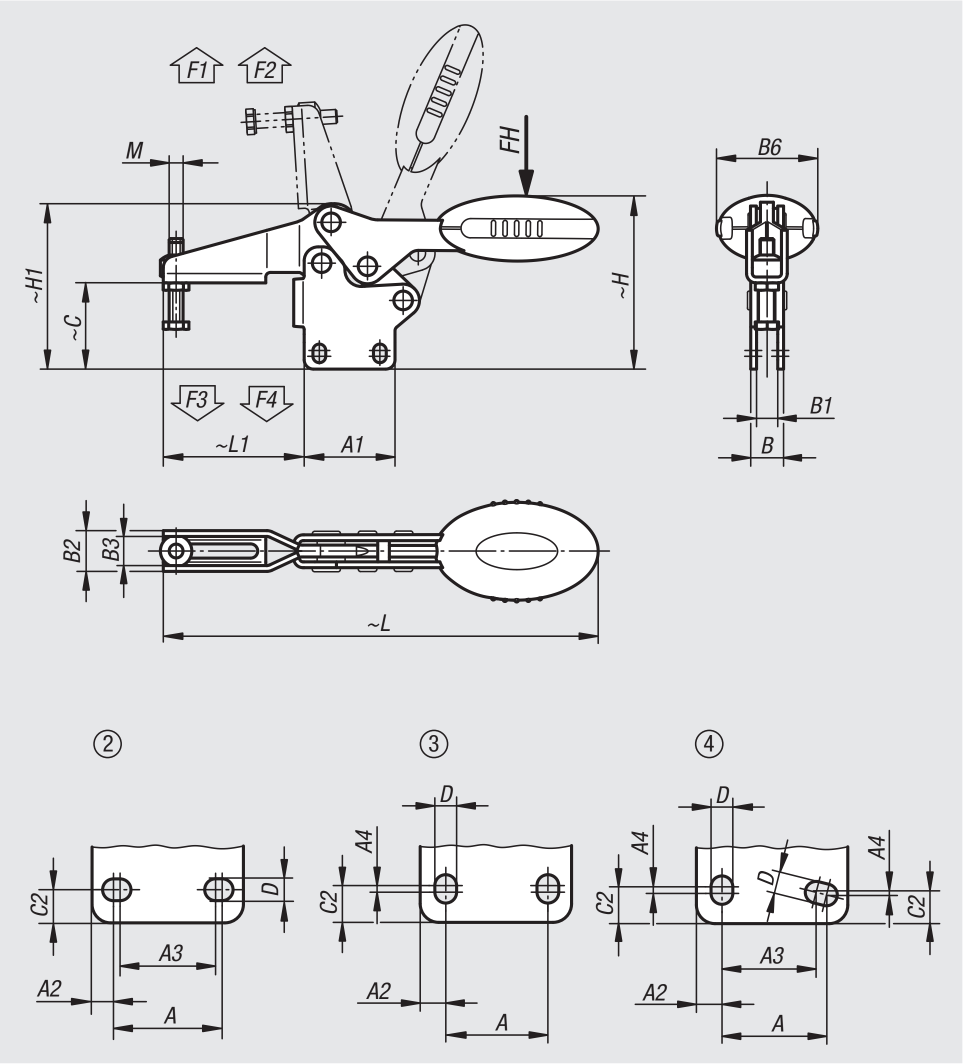


Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05900-106102	3	86°	67°	160	1350	1900	720	1200
05900-108102	3	86°	67°	200	2000	2800	830	1400

Order No.	M	A	A1	A2	B	B1	B2	B3	B4	B5	B6	C	D	H	H1	L	L1
05900-106102	M6x35	26	39	6,5	28	39	17,5	12,5	23	2,5	53,4	25,4	5,5	63,7	59,6	193,3	60,5
05900-108102	M8x45	26	44	9	31	45	21	16	24	2,5	51,1	32,2	6,2	73,9	70,1	230,4	74,9

Toggle clamps horizontal

with straight foot and adjustable clamping spindle



Material:
Steel.
Grip polyamide.

Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05904-005002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
05280 Protective caps
07110 Ball-end thrust screws
07117 Grippers, adjustable
07120 Grub screws with thrust point DIN 6332
07121 Grub screws with ball thrust point
07140 Thrust pads DIN 6311
07142 Thrust pads

Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05904-005002	2	86°	67°	100	650	900	550	620
05904-006002	3	86°	67°	160	1350	1900	720	1200
05904-008002	3	86°	67°	200	2000	2800	830	1400
05904-010002	3	90°	71°	250	2200	4500	1200	2800
05904-012002	4	88°	68°	280	2400	5500	1000	2800

Order No.	M	A	A1	A2	A3	A4	B	B1	B2	B3	B6	C	C2	D	H	H1	L	L1
05904-005002	M5x25	18	27	4,5	13,5	-	8,1	4,1	13,2	9,2	22,5	26,2	5,2	5,5	52,2	47,9	125,7	41,8
05904-006002	M6x35	26	39	6,5	-	2,5	14,1	9,1	17,5	12,5	43,5	36,9	8	5,5	75,2	71	186,6	60,5
05904-008002	M8x45	26	44	9	-	3,5	14,1	9,1	21	16	41,5	46,5	10,5	6,2	88,2	84,3	223,1	74,9
05904-010002	M10x55	41,5	59	9	-	2	16,2	9,2	26	19	47	59,6	10	8,8	114,3	107,5	279,4	103,9
05904-012002	M12x70	44	65	11	40	1	16,2	9,2	28	21	47	75,9	13,5	8,5	128,4	125,2	314,7	122

05904

Toggle clamps horizontal

with straight foot and adjustable clamping spindle, stainless steel

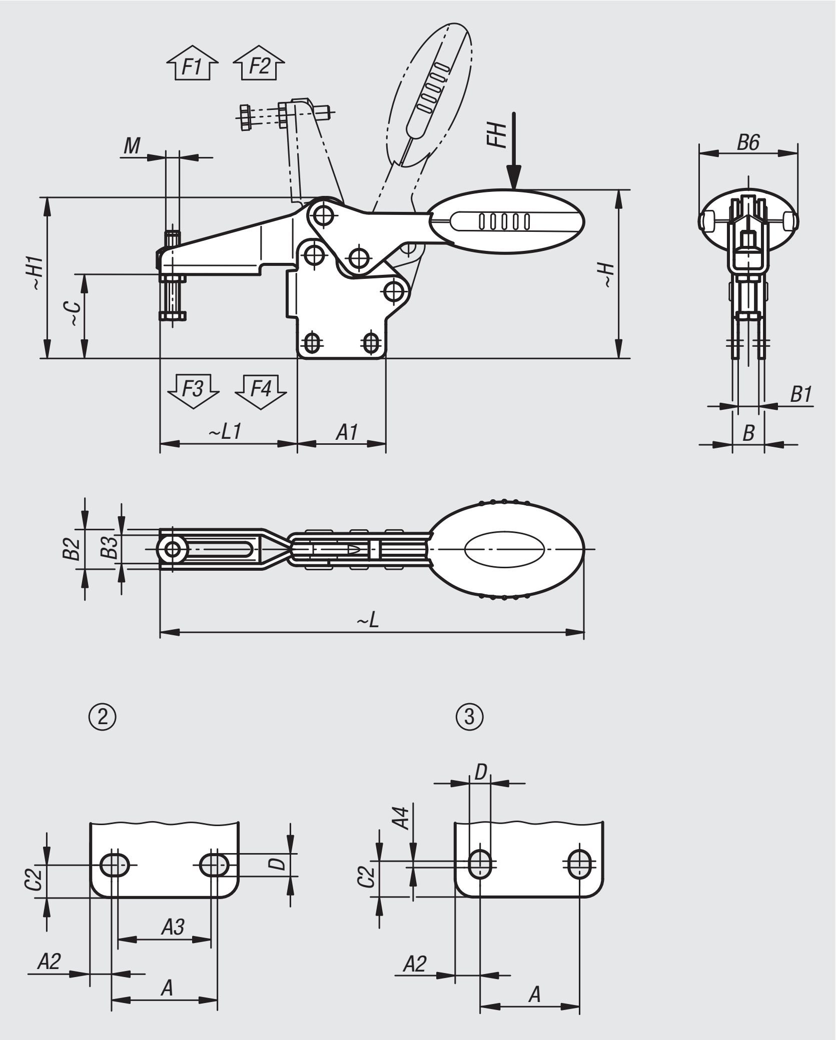
Material:
Stainless steel.
Grip polyamide.

Version:
Bright.

Sample order:
nlm 05904-105002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311



Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05904-105002	2	86°	67°	100	650	900	550	620
05904-106002	3	86°	67°	160	1350	1900	720	1200
05904-108002	3	86°	67°	200	2000	2800	830	1400

Order No.	M	A	A1	A2	A3	A4	B	B1	B2	B3	B6	C	C2	D	H	H1	L	L1
05904-105002	M5x25	18	27	4,5	13,5	-	8,1	4,1	13,2	9,2	22,5	26,2	5,2	5,5	52,2	47,9	125,7	41,8
05904-106002	M6x35	26	39	6,5	-	2,5	14,1	9,1	17,5	12,5	43,5	36,9	8	5,5	75,2	71	186,6	60,5
05904-108002	M8x45	26	44	9	-	3,5	14,1	9,1	21	16	41,5	46,5	10,5	6,2	88,2	84,3	223,1	74,9

Toggle clamps horizontal with safety interlock

with straight foot and adjustable clamping spindle

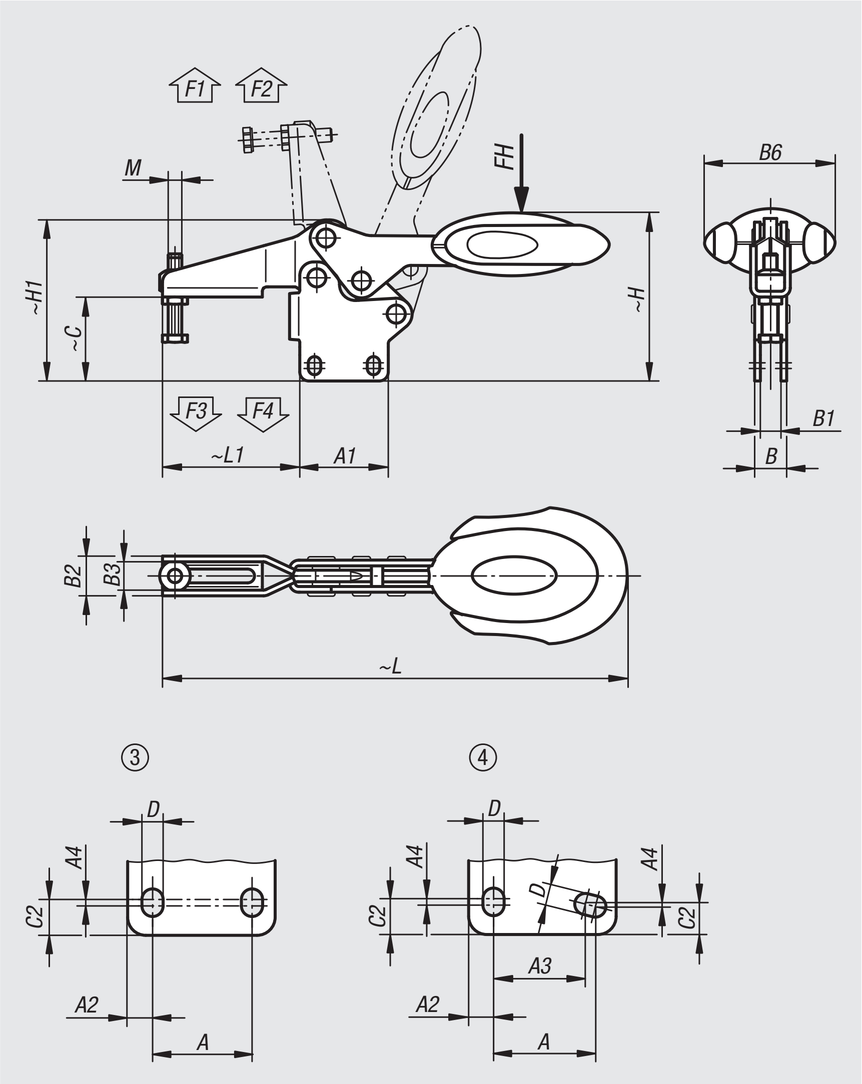
Material:
Steel.
Grip polyamide.
Unlocking bracket TPE.

Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05904-006102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
07110 Ball-end thrust screws
07117 Grippers, adjustable
07120 Grub screws with thrust point DIN 6332
07121 Grub screws with ball thrust point
07140 Thrust pads DIN 6311
07142 Thrust pads



Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05904-006102	3	86°	67°	160	1350	1900	720	1200
05904-008102	3	86°	67°	200	2000	2800	830	1400
05904-010102	3	90°	71°	250	2200	4500	1200	2800
05904-012102	4	88°	68°	280	2400	5500	1000	2800

Order No.	M	A	A1	A2	A3	A4	B	B1	B2	B3	B6	C	C2	D	H	H1	L	L1
05904-006102	M6x35	26	39	6,5	-	2,5	14,1	9,1	17,5	12,5	53,4	36,9	8	5,5	75,2	71	193,3	60,5
05904-008102	M8x45	26	44	9	-	3,5	14,1	9,1	21	16	51,1	46,5	10,5	6,2	88,2	84,3	230,4	74,9
05904-010102	M10x55	41,5	59	9	-	2	16,2	9,2	26	19	56,5	59,6	10	8,8	114,3	107,5	286	103,9
05904-012102	M12x70	44	65	11	40	1	16,2	9,2	28	21	56,5	75,9	13,5	8,5	128,4	125,2	321,3	122

05904

Toggle clamps horizontal with safety interlock

with straight foot and adjustable clamping spindle, stainless steel

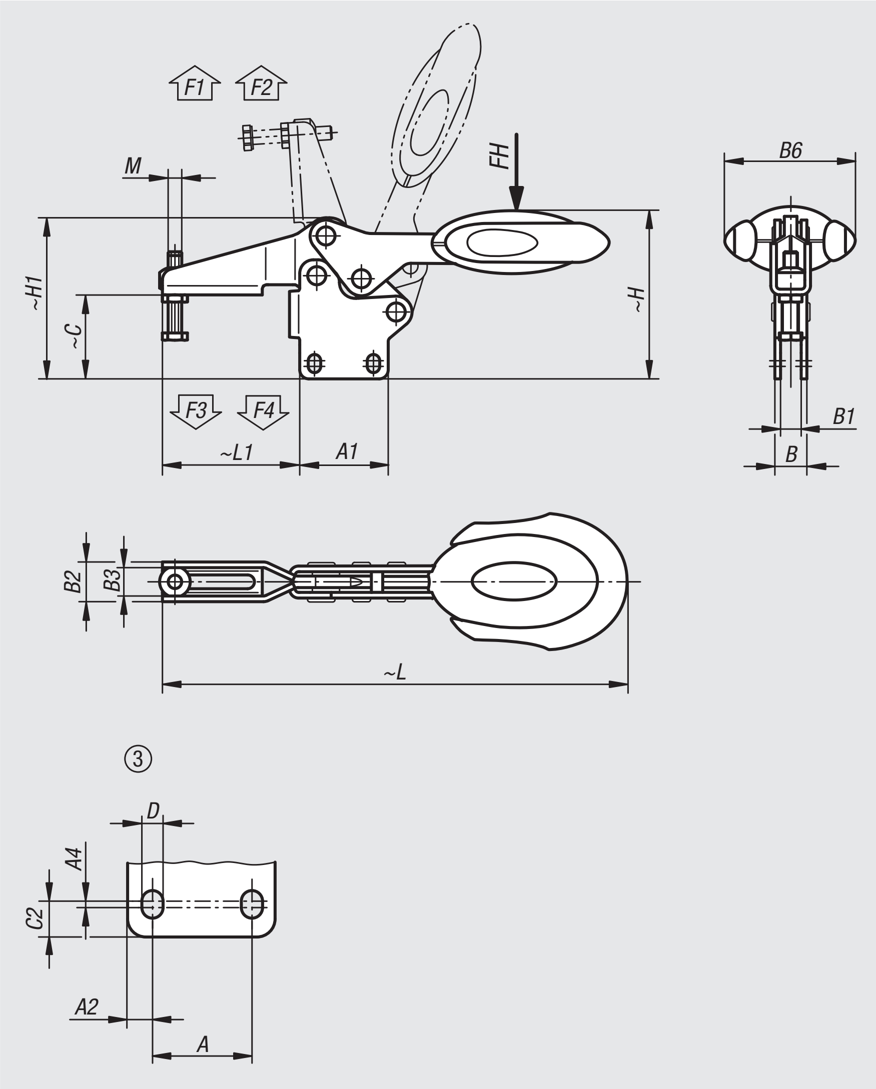
Material:
Stainless steel.
Grip polyamide.
Unlocking bracket TPE.

Version:
Bright.

Sample order:
nlm 05904-106102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311



Order No.	hole arrangement	Opening angle of holding arm	Opening angle of handle	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05904-106102	3	86°	67°	160	1350	1900	720	1200
05904-108102	3	86°	67°	200	2000	2800	830	1400

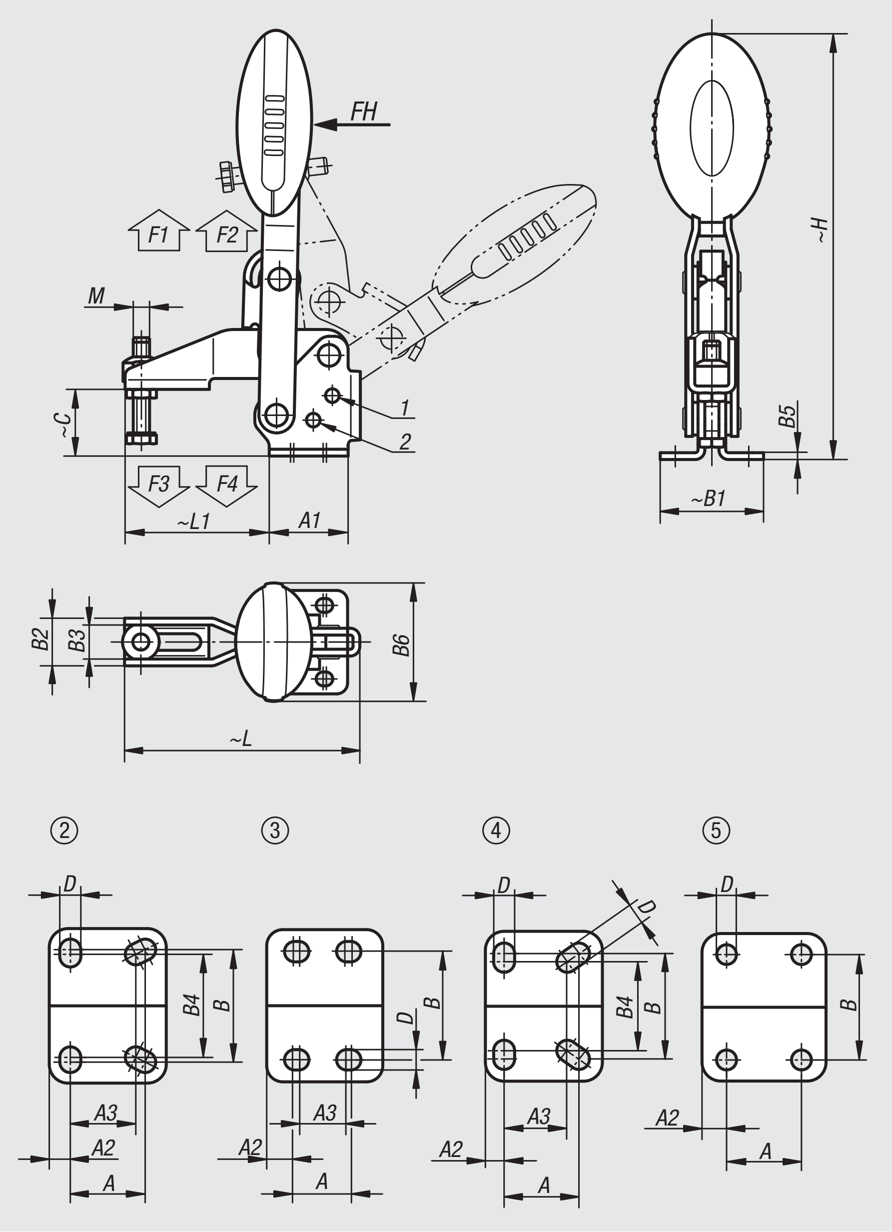
Order No.	M	A	A1	A2	A4	B	B1	B2	B3	B6	C	C2	D	H	H1	L	L1
05904-106102	M6x35	26	39	6,5	2,5	14,1	9,1	17,5	12,5	53,4	36,9	8	5,5	75,2	71	193,3	60,5
05904-108102	M8x45	26	44	9	3,5	14,1	9,1	21	16	51,1	46,5	10,5	6,2	88,2	84,3	230,4	74,9

Notes

05908

Toggle clamps vertical

with flat foot and adjustable clamping spindle



Material:
Steel.
Grip polyamide.

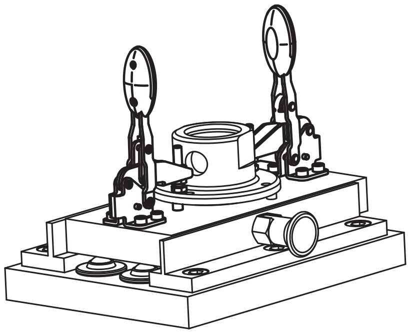
Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05908-005002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
05280 Protective caps
05880 Angle brackets
07110 Ball-end thrust screws
07117 Grippers, adjustable
07120 Grub screws with thrust point DIN 6332
07121 Grub screws with ball thrust point
07140 Thrust pads DIN 6311
07142 Thrust pads

Drawing reference:
1) stop pin position 1
2) stop pin position 2



Toggle clamps vertical

with flat foot and adjustable clamping spindle

Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Opening angle handle stop pin removed
05908-005002	100°	-	147°	64°	-	83°
05908-006002	56°	83°	152°	46°	56°	83°
05908-008002	13°	93°	158°	26°	61°	86°
05908-010002	6°	97°	176°	19°	59°	91°
05908-012002	11°	88°	164°	24°	60°	91°

Order No.	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N	Order No. Angle bracket
05908-005002	100	750	1050	620	750	05880-02
05908-006002	160	1350	1650	920	1050	05880-02
05908-008002	190	2000	2800	940	1350	05880-04
05908-010002	250	2500	4500	1500	2800	05880-06
05908-012002	280	3000	5500	1400	2800	05880-06

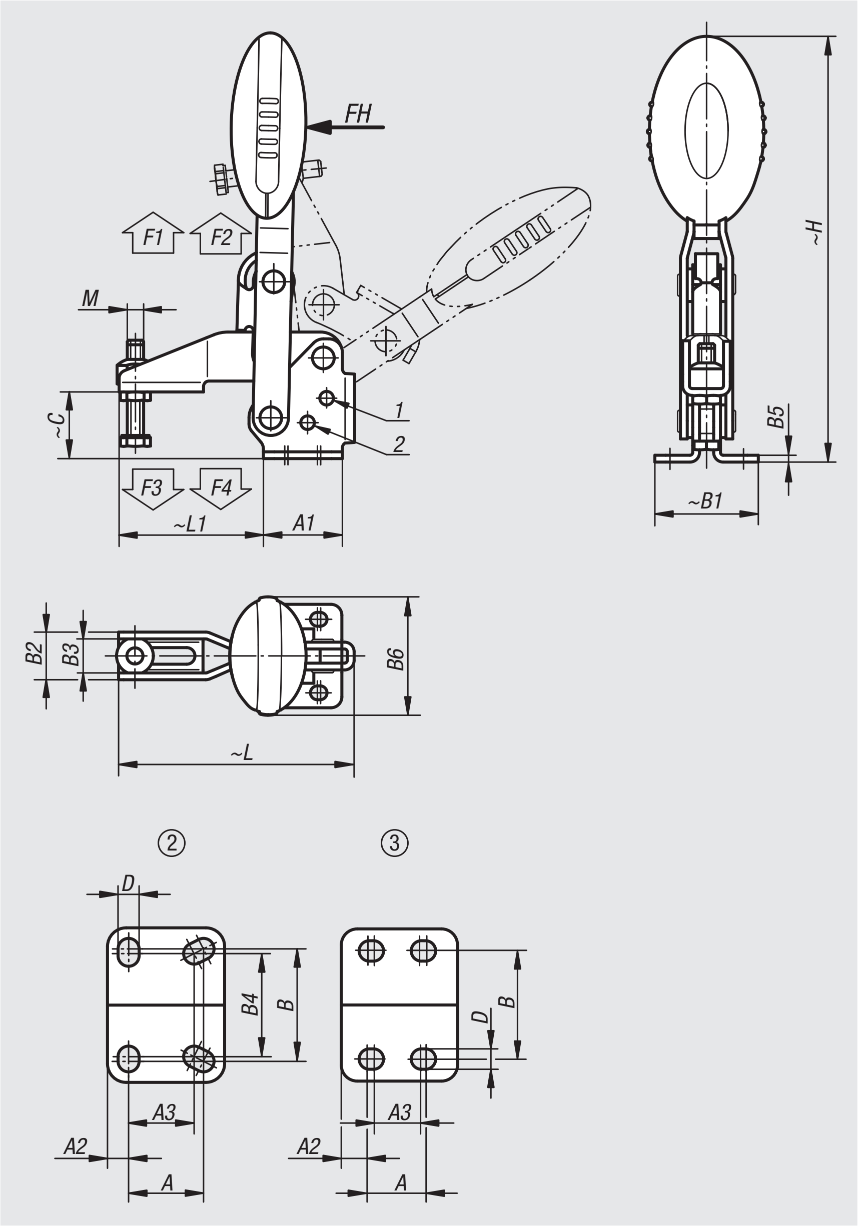
Order No.	hole arrangement	M	A	A1	A2	A3	B	B1	B2	B3	B4	B5	B6	C	D	H	L	L1
05908-005002	2	M5x25	16	25	4,5	14	24	33	13,2	9,2	22	2	22,5	18	4,5	107,4	65,6	35
05908-006002	3	M6x35	14	29	7	12	27	38	17,5	12,5	-	2,5	43,5	24,9	5,5	156,3	86,5	53
05908-008002	3	M8x45	21	39	9	19	32	45	20,6	15,6	-	2,5	41,5	32,7	6,8	184,2	107	62
05908-010002	4	M10x55	32	50	8	27	45	64	25,5	18,5	38	3,5	47	38,7	9	223,9	153	95
05908-012002	5	M12x70	32	53	10,5	-	45	63	28	21	-	3,5	47	46,7	8,8	242,4	173,5	113,5

05908

Toggle clamps vertical

with flat foot and adjustable clamping spindle, stainless steel

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Stainless steel.
Grip polyamide.

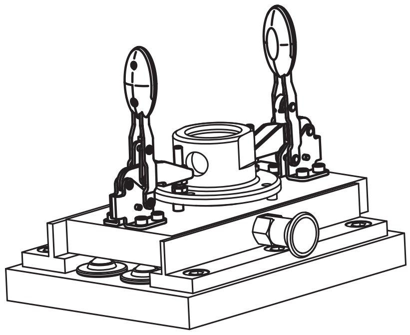
Version:
Bright.

Sample order:
nlm 05908-105002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311

Drawing reference:
1) stop pin position 1
2) stop pin position 2



Toggle clamps vertical

with flat foot and adjustable clamping spindle, stainless steel

Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Opening angle handle stop pin removed
05908-105002	100°	-	147°	64°	-	83°
05908-106002	56°	83°	152°	46°	56°	83°
05908-108002	13°	93°	158°	26°	61°	86°

Order No.	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05908-105002	100	750	1050	620	750
05908-106002	160	1350	1650	920	1050
05908-108002	190	2000	2800	940	1350

Order No.	hole arrangement	M	A	A1	A2	A3	B	B1	B2	B3	B4	B5	B6	C	D	H	L	L1
05908-105002	2	M5x25	16	25	4,5	14	24	33	13,2	9,2	22	2	22,5	18	4,5	107,4	65,6	35
05908-106002	3	M6x35	14	29	7	12	27	38	17,5	12,5	-	2,5	43,5	24,9	5,5	156,3	86,5	53
05908-108002	3	M8x45	21	39	9	19	32	45	20,6	15,6	-	2,5	41,5	32,7	6,8	184,2	107	62

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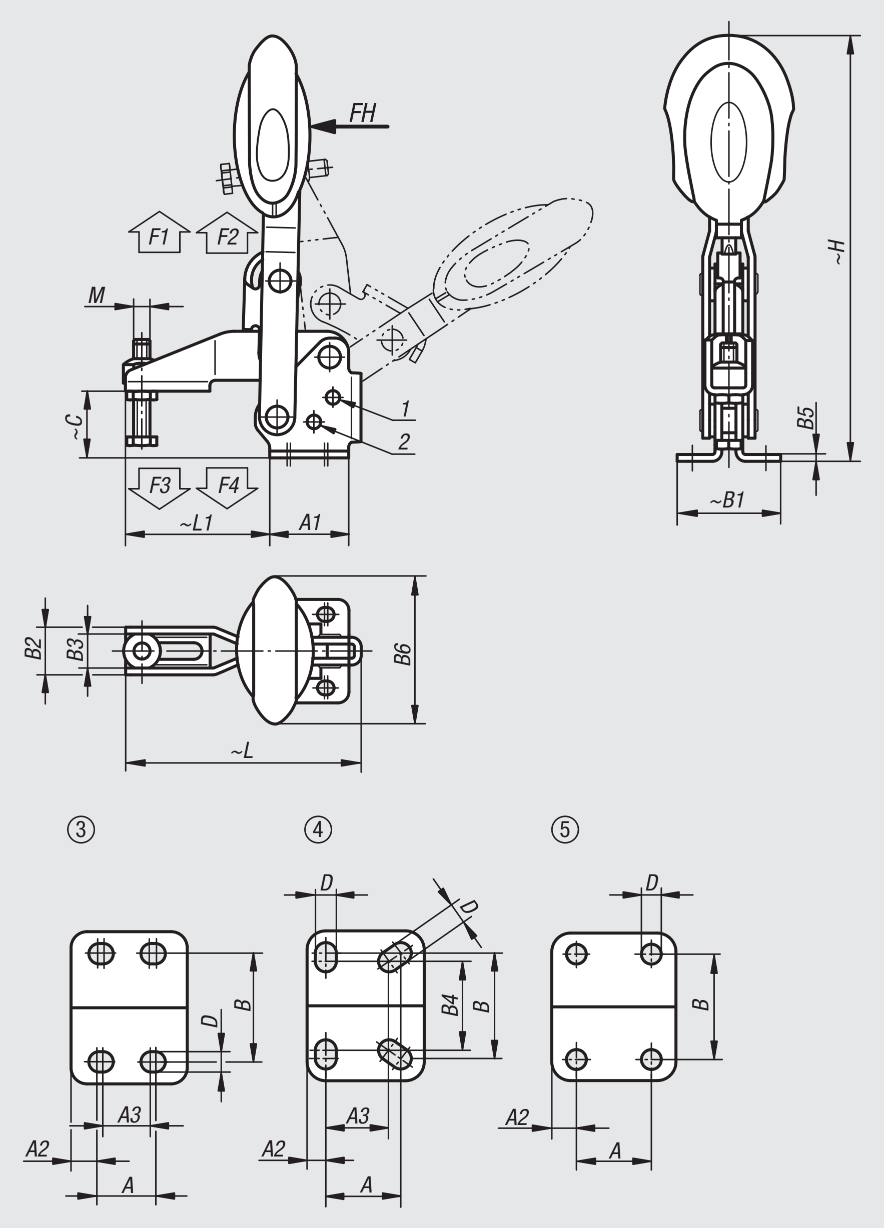
Toggle clamps vertical with safety interlock

with flat foot and adjustable clamping spindle



Material:
Steel.
Grip polyamide.
Unlocking bracket TPE.

Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05908-006102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
05880 Angle brackets
07110 Ball-end thrust screws
07117 Grippers, adjustable
07120 Grub screws with thrust point DIN 6332
07121 Grub screws with ball thrust point
07140 Thrust pads DIN 6311
07142 Thrust pads

Drawing reference:
1) stop pin position 1
2) stop pin position 2

Toggle clamps vertical with safety interlock

with flat foot and adjustable clamping spindle

Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Opening angle handle stop pin removed
05908-006102	56°	83°	152°	46°	56°	83°
05908-008102	13°	93°	158°	26°	61°	86°
05908-010102	6°	97°	176°	19°	59°	91°
05908-012102	11°	88°	164°	24°	60°	91°

Order No.	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N	Order No. Angle bracket
05908-006102	160	1350	1650	920	1050	05880-02
05908-008102	190	2000	2800	940	1350	05880-04
05908-010102	250	2500	4500	1500	2800	05880-06
05908-012102	280	3000	5500	1400	2800	05880-06

Order No.	hole arrangement	M	A	A1	A2	A3	B	B1	B2	B3	B4	B5	B6	C	D	H	L	L1
05908-006102	3	M6x35	14	29	7	12	27	38	17,5	12,5	-	2,5	53,4	24,9	5,5	163	86,5	53
05908-008102	3	M8x45	21	39	9	19	32	45	20,6	15,6	-	2,5	51,1	32,7	6,8	191,4	107	62
05908-010102	4	M10x55	32	50	8	27	45	64	25,5	18,5	38	3,5	56,5	38,7	9	230,5	153	95
05908-012102	5	M12x70	32	53	10,5	-	45	63	28	21	-	3,5	56,5	46,7	8,8	249,1	173,5	113,5

05908

Toggle clamps vertical with safety interlock

with flat foot and adjustable clamping spindle, stainless steel

Material:
Stainless steel.
Grip polyamide.
Unlocking bracket TPE.

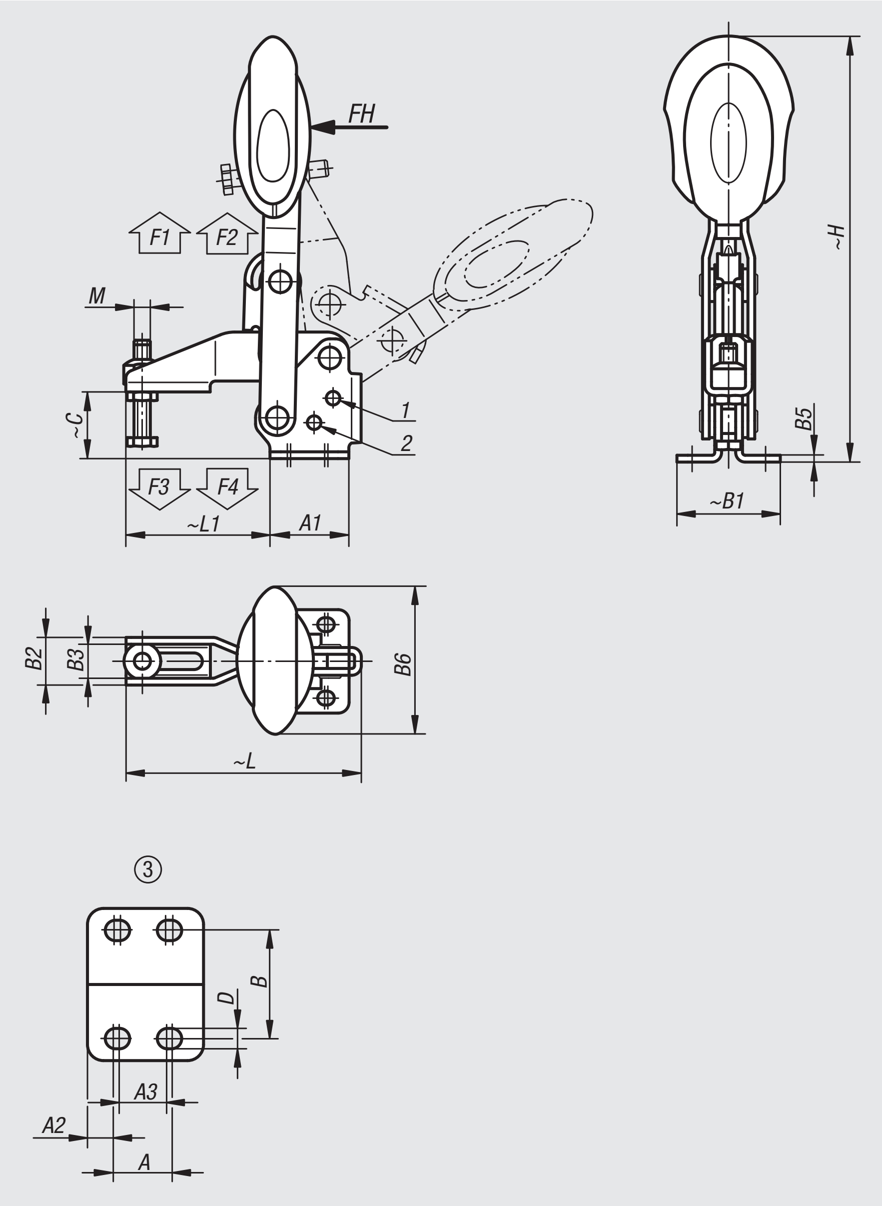
Version:
Bright.

Sample order:
nlm 05908-106102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311

Drawing reference:
1) stop pin position 1
2) stop pin position 2



Toggle clamps vertical with safety interlock

with flat foot and adjustable clamping spindle, stainless steel

Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Opening angle handle stop pin removed
05908-106102	56°	83°	152°	46°	56°	83°
05908-108102	13°	93°	158°	26°	61°	86°

Order No.	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05908-106102	160	1350	1650	920	1050
05908-108102	190	2000	2800	940	1350

Order No.	hole arrangement	M	A	A1	A2	A3	B	B1	B2	B3	B5	B6	C	D	H	L	L1
05908-106102	3	M6x35	14	29	7	12	27	38	17,5	12,5	2,5	53,4	24,9	5,5	163	86,5	53
05908-108102	3	M8x45	21	39	9	19	32	45	20,6	15,6	2,5	51,1	32,7	6,8	191,4	107	62

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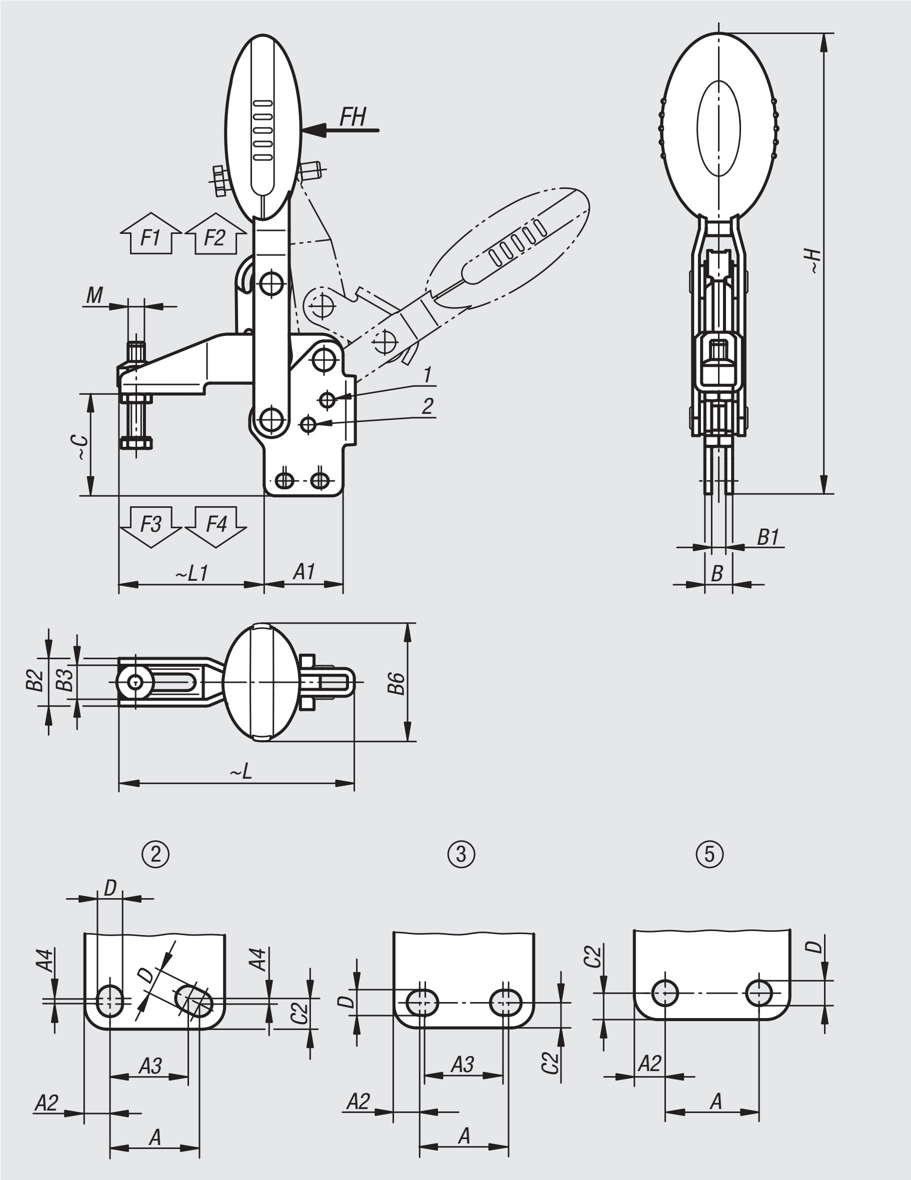
05912

Toggle clamps vertical

with straight foot and adjustable clamping spindle



Material:
Steel.
Grip polyamide.

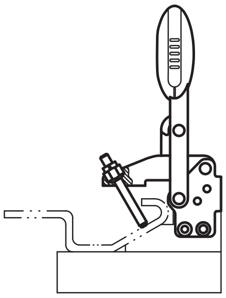
Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05912-005002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
05280 Protective caps
07110 Ball-end thrust screws
07117 Grippers, adjustable
07120 Grub screws with thrust point DIN 6332
07121 Grub screws with ball thrust point
07140 Thrust pads DIN 6311
07142 Thrust pads

Drawing reference:
1) stop pin position 1
2) stop pin position 2



Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05912-005002	100°	-	129°	64°	-	100	750	1050	620	750
05912-006002	56°	83°	141°	46°	56°	160	1350	1650	920	1050
05912-008002	13°	93°	158°	26°	61°	190	2000	2800	940	1350
05912-010002	6°	97°	176°	19°	59°	250	2500	4500	1500	2800
05912-012002	11°	88°	164°	24°	60°	280	3000	5500	1400	2800

Order No.	hole arrangement	M	A	A1	A2	A3	A4	B	B1	B2	B3	B6	C	C2	D	H	L	L1
05912-005002	2	M5x25	16	25	4,5	14	1	8,1	4,1	13,2	9,2	22,5	29,8	5,5	4,5	119,2	65,6	35
05912-006002	3	M6x35	14	29	7	12	-	10,2	5,2	17,5	12,5	43,5	37,6	5,5	5,5	169	86,5	53
05912-008002	3	M8x45	21	39	9	19	-	10,2	5,2	20,6	15,6	41,5	49	6,5	6,8	200,4	107	62
05912-010002	2	M10x55	32	50	8	27	3,5	14,1	7,1	25,5	18,5	47	62,3	13	9	247,4	153	95
05912-012002	5	M12x70	32	53	10,5	-	-	14,1	7,1	28	21	47	69,8	9	8,8	265,5	173,5	113,5

Toggle clamps vertical

with straight foot and adjustable clamping spindle, stainless steel

Material:
Stainless steel.
Grip polyamide.

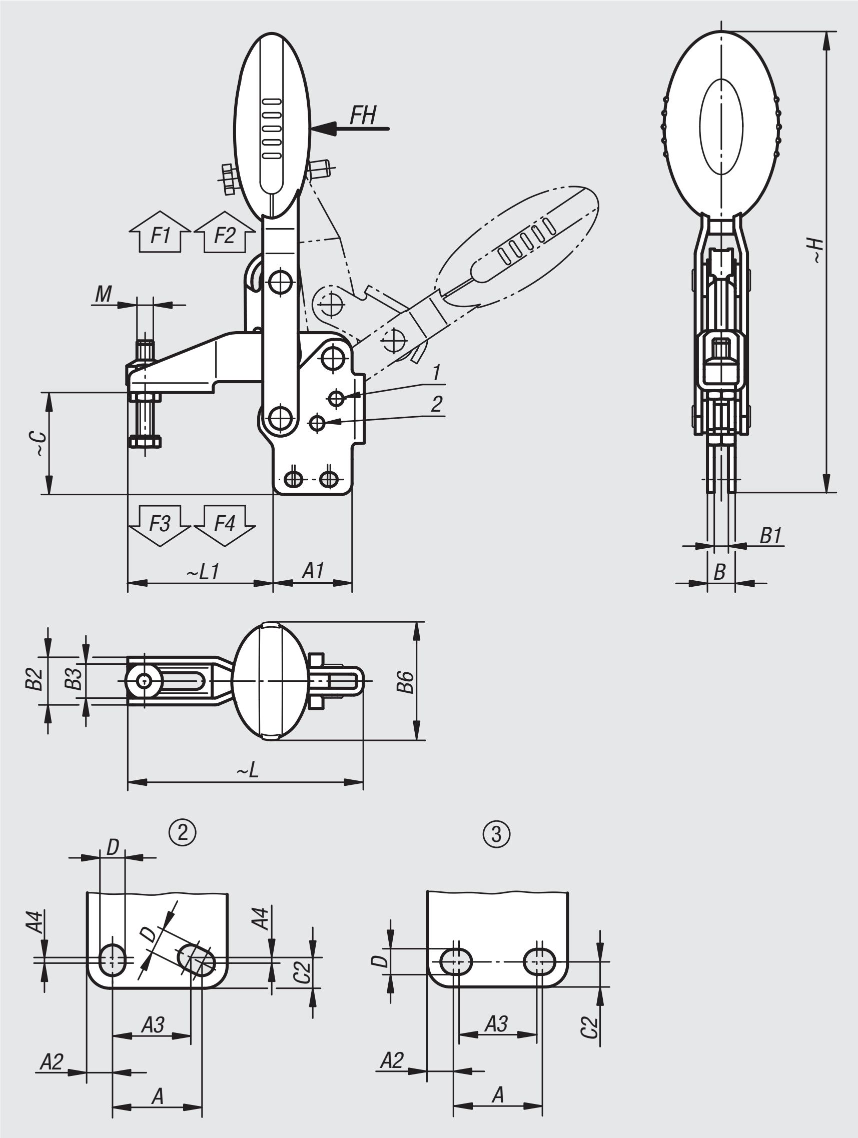
Version:
Bright.

Sample order:
nlm 05912-105002

Note:
Maintenance-free high quality link bushings. Sustainable constant use of force during opening and closing. Optimum stability through the conical, U-profile clamping arm.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311

Drawing reference:
1) stop pin position 1
2) stop pin position 2



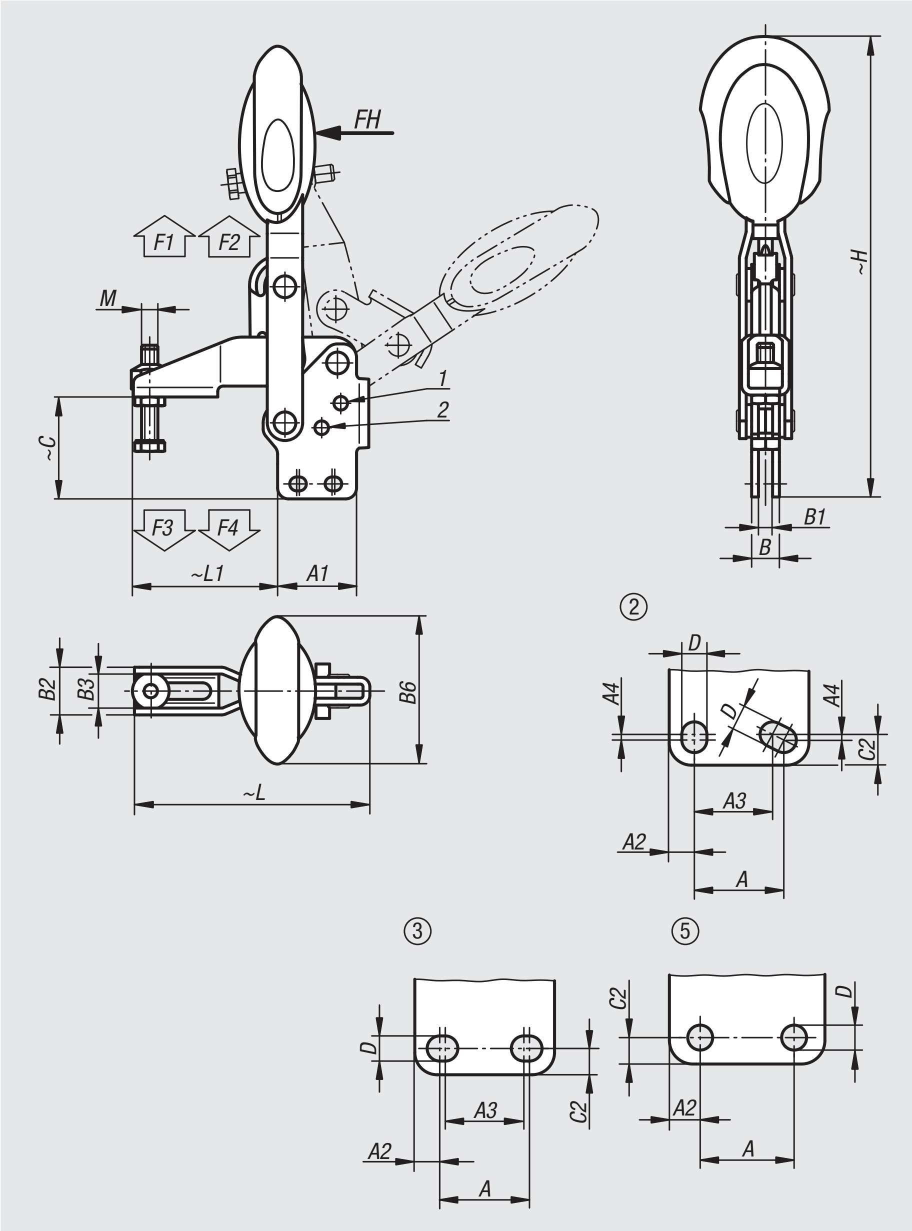
Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05912-105002	100°	-	129°	64°	-	100	750	1050	620	750
05912-106002	56°	83°	141°	46°	56°	160	1350	1650	920	1050
05912-108002	13°	93°	158°	26°	61°	190	2000	2800	940	1350

Order No.	hole arrangement	M	A	A1	A2	A3	A4	B	B1	B2	B3	B6	C	C2	D	H	L	L1
05912-105002	2	M5x25	16	25	4,5	14	1	8,1	4,1	13,2	9,2	22,5	29,8	5,5	4,5	119,2	65,6	35
05912-106002	3	M6x35	14	29	7	12	-	10,2	5,2	17,5	12,5	43,5	37,6	5,5	5,5	169	86,5	53
05912-108002	3	M8x45	21	39	9	19	-	10,2	5,2	20,6	15,6	41,5	49	6,5	6,8	200,4	107	62

05912

Toggle clamps vertical with safety interlock

with straight foot and adjustable clamping spindle



Material:
Steel.
Grip polyamide.
Unlocking bracket TPE.

Version:
Carbonitrided and black oxidised.

Sample order:
nlm 05912-006102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
07110 Ball-end thrust screws
07117 Grippers, adjustable
07120 Grub screws with thrust point DIN 6332
07121 Grub screws with ball thrust point
07140 Thrust pads DIN 6311
07142 Thrust pads

Drawing reference:
1) stop pin position 1
2) stop pin position 2

Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05912-006102	56°	83°	141°	46°	56°	160	1350	1650	920	1050
05912-008102	13°	93°	158°	26°	61°	190	2000	2800	940	1350
05912-010102	6°	97°	176°	19°	59°	250	2500	4500	1500	2800
05912-012102	11°	88°	164°	24°	60°	280	3000	5500	1400	2800

Order No.	hole arrangement	M	A	A1	A2	A3	A4	B	B1	B2	B3	B6	C	C2	D	H	L	L1
05912-006102	3	M6x35	14	29	7	12	-	10,2	5,2	17,5	12,5	53,4	37,6	5,5	5,5	175,7	86,5	53
05912-008102	3	M8x45	21	39	9	19	-	10,2	5,2	20,6	15,6	51,1	49	6,5	6,8	207,6	107	62
05912-010102	2	M10x55	32	50	8	27	3,5	14,1	7,1	25,5	18,5	56,5	62,3	13	9	254	153	95
05912-012102	5	M12x70	32	53	10,5	-	-	14,1	7,1	28	21	56,5	69,8	9	8,8	272,1	173,5	113,5

Toggle clamps vertical with safety interlock

with straight foot and adjustable clamping spindle, stainless steel

Material:
Stainless steel.
Grip polyamide.
Unlocking bracket TPE.

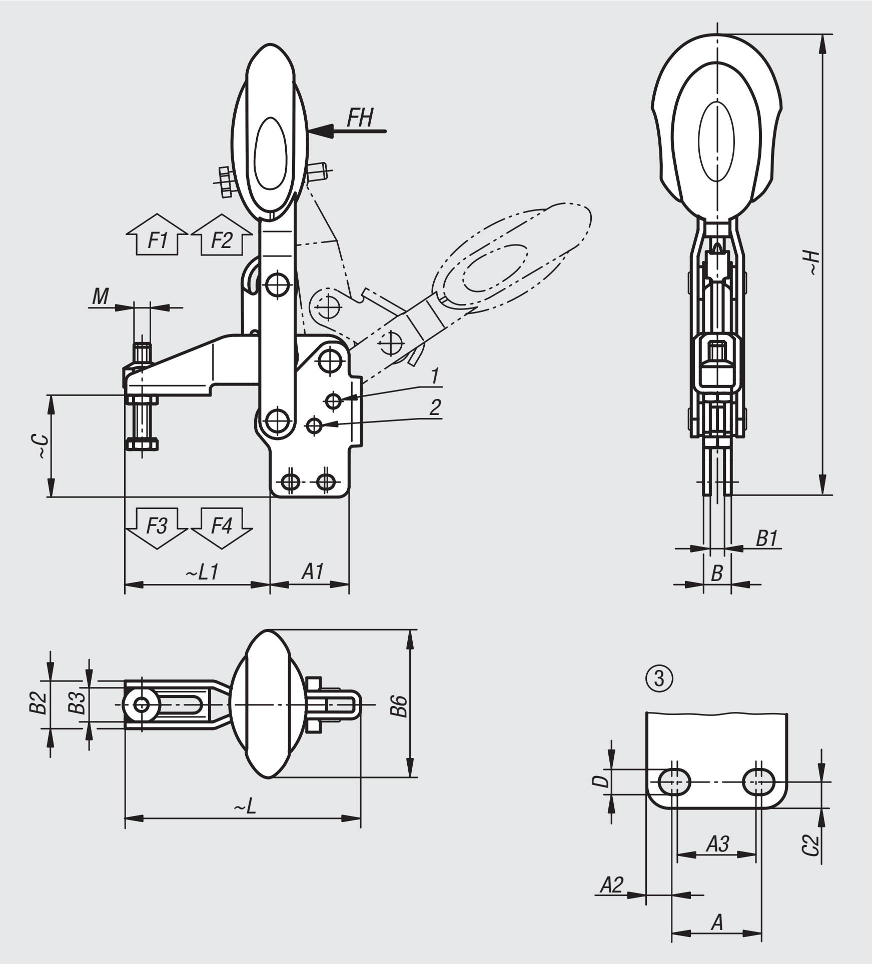
Version:
Bright.

Sample order:
nlm 05912-106102

Note:
Maintenance-free high quality link bushings. Sustainable constant force during opening and closing. Optimum stability through the conical, U-profile clamping arm. Including internal bar lock with automatic safety catch.

Accessories:
05280 Protective caps
07111 Ball-end thrust screws, stainless steel
07119 Thrust screws, stainless steel
07120 Grub screws with thrust point DIN 6332
07140 Thrust pads DIN 6311

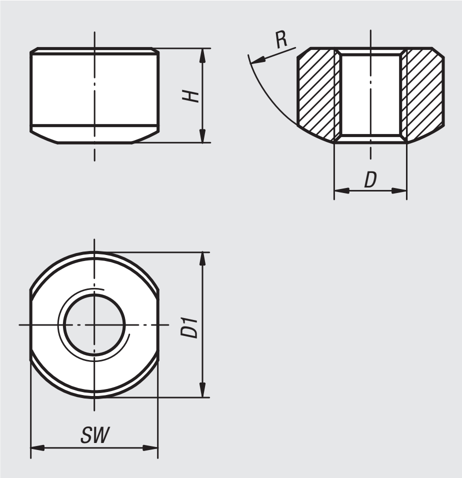
Drawing reference:
1) stop pin position 1
2) stop pin position 2



Order No.	Opening angle holding arm position 1	Opening angle holding arm position 2	Opening angle holding arm stop pin removed	Opening angle handle position 1	Opening angle handle position 2	Hand force FH N	Retaining force F1 N	Retaining force F2 N	Clamping force F3 N	Clamping force F4 N
05912-106102	56°	83°	141°	46°	56°	160	1350	1650	920	1050
05912-108102	13°	93°	158°	26°	61°	190	2000	2800	940	1350

Order No.	hole arrangement	M	A	A1	A2	A3	B	B1	B2	B3	B6	C	C2	D	H	L	L1
05912-106102	3	M6x35	14	29	7	12	10,2	5,2	17,5	12,5	53,4	37,6	5,5	5,5	175,7	86,5	53
05912-108102	3	M8x45	21	39	9	19	10,2	5,2	20,6	15,6	51,1	49	6,5	6,8	207,6	107	62

Spherical seating nuts

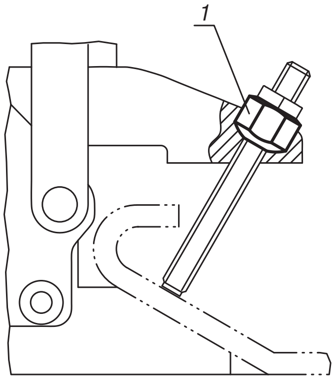


Material:
Steel or stainless steel.

Version:
Steel black oxidised.
Stainless steel bright.

Sample order:
nlm 05990-04

Drawing reference:
1) Weldable

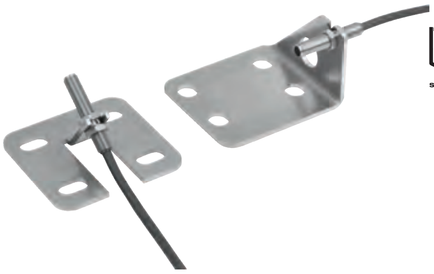


Order No. steel	Order No. stainless steel	D	H	D1	SW	R
05990-04	**05990-104**	M4	5,2	8	7	7
05990-05	**05990-105**	M5	6,7	10	9	9
05990-06	**05990-106**	M6	9,5	13,5	12,2	10
05990-08	**05990-108**	M8	12,8	18	15,3	12
05990-10	-	M10	12,1	20	18,2	14
05990-12	-	M12	14,8	23	20	16

05990-20

Status sensors, stainless steel with bracket

for toggle clamps



EDELSTAHL Rost frei STAINLESS STEEL

Status sensors with brackets are used to monitor the actuated status of toggle clamps.
The sensor detects whether the toggle clamp is open or closed and enables this status information to be processed electronically.
The sensor is attached to the toggle clamp via the bracket.

Material:
Stainless steel

Version:
Bright.

Sample order:
nlm 05990-20-06111

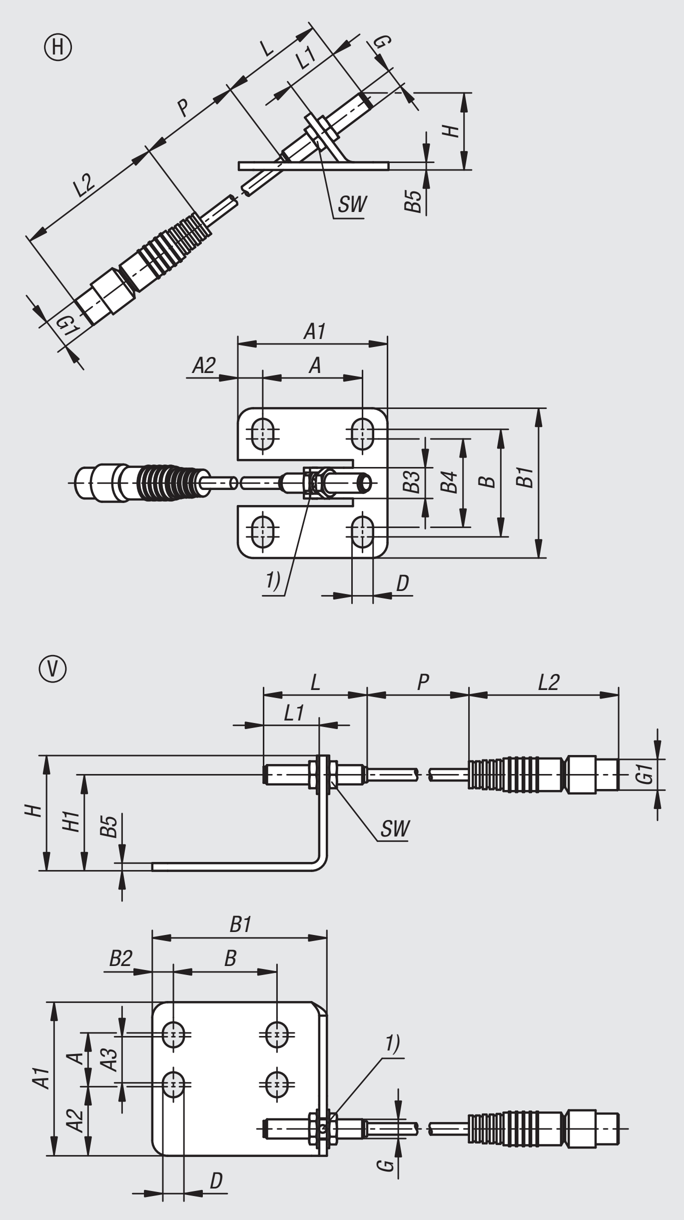
Note:
The status sensor and brackets are supplied unassembled.

Assembly:
The status sensor is fastened to the bracket with the nuts and set to dimension L1.
The bracket is attached with the toggle clamp screws through holes between the foot and the mounting surface.
The switch point fine-tuning is carried out once the toggle clamp is mounted.
The detailed procedure is described in the assembly instructions.

Accessories:
05900
05908
10451
80140

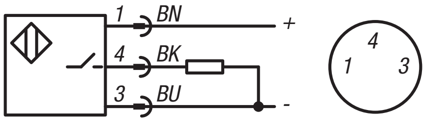
Technical data:
Inductive sensor:
Output circuit: PNP NO
Operating voltage: 10 - 30 V DC
Operating current: 100 mA
Contact gap: 0.8 mm
Switch frequency: 5000 Hz
Short-circuit proof: yes
Reverse polarity protection: yes
Rating: IP 67
Connection type: 0.3 m cable, PUR with plug
Temperature range: -25 °C - +70 °C
Approvals: CE, c UL us, EAC

Safety:
Status sensors are not suitable for protecting people.



Drawing reference:
1) LED-indicator

BN = brown
BK = black
BU = blue



Order No.	Form	A	A1	A2	A3	B	B1	B2	B3	B4	B5	D	G	G1	H	H1	L	L1	L2	P	SW	matching toggle clamp	M
05990-20-06111	H	26	39	6,5	-	28	39	-	8	23	2	5,5	M5X0,5	M8x1	20,1	-	27	13,8	39	300	7	05900	M6x35
05990-20-08111	H	26	44	9	-	31	45	-	8	24	2	6,2	M5X0,5	M8x1	27,3	-	27	20,6	39	300	7	05900	M8x45
05990-20-06121	V	14	40	18	12	27	45,5	5,5	-	-	2	5,5	M5X0,5	M8x1	30	25	27	14,5	39	300	7	05908	M6x35
05990-20-08121	V	21	45	15	19	32	49	6,5	-	-	2	6,8	M5X0,5	M8x1	30	25	27	14,5	39	300	7	05908	M8x45

Notes

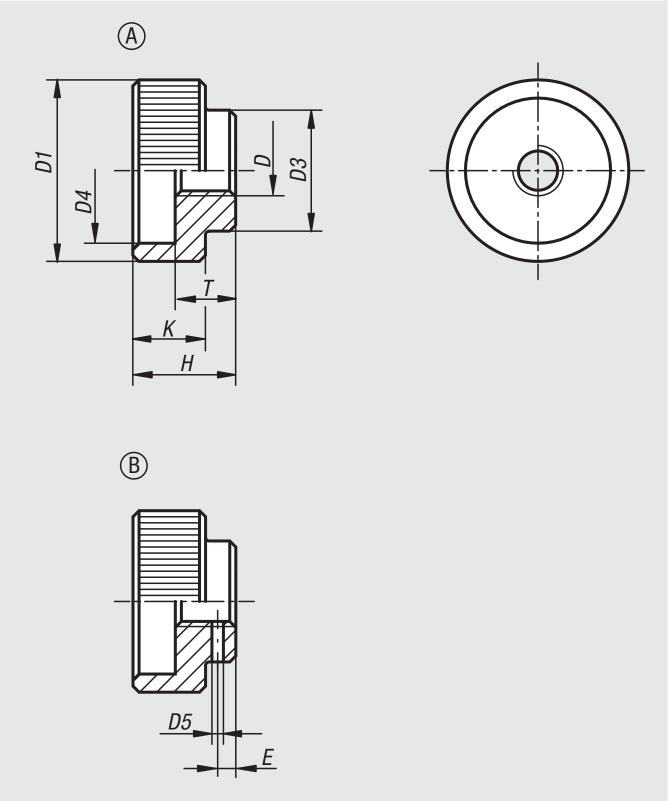
06000

Operating parts

06010

Knurled nuts

steel and stainless steel, DIN 6303



Material:
Steel 1.0718.
Stainless steel 1.4305.

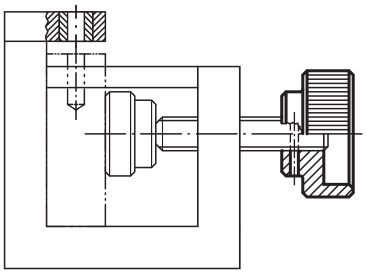
Version:
Steel, black oxidised.
Stainless steel, bright.

Sample order:
nlm 06010-108

Note:
Due to the better haptics, a larger pitch was chosen contrary to DIN.

Drawing reference:
Form A: without pin hole
Form B: with pin hole

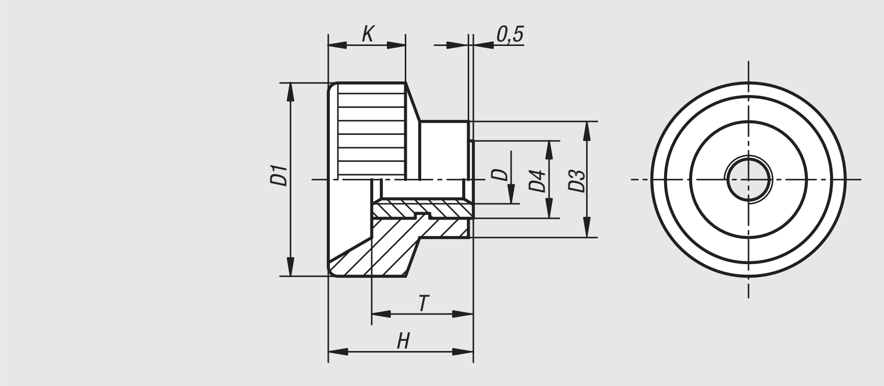
- Drill through and ream pin hole during assembly.



Order No.	Form	Main material	D	D1	D3	D4	D5 predrilled	E	H	K	T	suitable dowel pin ISO 2338
06010-105	A	steel	M5	20	14	15	-	-	12	8	7	-
06010-106	A	steel	M6	24	16	18	-	-	14	10	8	-
06010-108	A	steel	M8	30	20	24	-	-	17	12	10	-
06010-110	A	steel	M10	36	28	30	-	-	20	14	12	-
06010-112	A	steel	M12	40	32	34	-	-	24	16	14	-
06010-1052	A	stainless steel	M5	20	14	15	-	-	12	8	7	-
06010-1062	A	stainless steel	M6	24	16	18	-	-	14	10	8	-
06010-1082	A	stainless steel	M8	30	20	24	-	-	17	12	10	-
06010-1102	A	stainless steel	M10	36	28	30	-	-	20	14	12	-
06010-1122	A	stainless steel	M12	40	32	34	-	-	24	16	14	-
06010-205	B	steel	M5	20	14	15	1,4	2,5	12	8	7	1,5
06010-206	B	steel	M6	24	16	18	1,4	2,5	14	10	8	1,5
06010-208	B	steel	M8	30	20	24	1,9	3	17	12	10	2
06010-210	B	steel	M10	36	28	30	2,9	4	20	14	12	3
06010-212	B	steel	M12	40	32	34	3,9	4	24	16	14	4

Knurled nuts

plastic



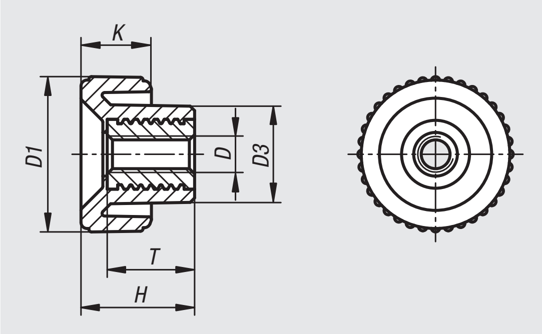
Material:
Black thermoset PF 31.
Tapped bush brass.

Version:
Tapped bush nickel-plated.

Sample order:
nlm 06013-08

Order No.	D	D1	D3	D4	H	K	T
06013-04	M4	18	10	7	13	8	9
06013-05	M5	20	12	8	14	8	10
06013-06	M6	24	13	9	16	9	10
06013-08	M8	30	15	11	18	11	11
06013-10	M10	35	18	14	19	12	11

Knurled nuts plastic



Material:
Body reinforced polyamide thermoplastic, black grey.
Tapped bush 5.8 steel or stainless steel 1.4305.

Version:
Tapped bush blue passivated steel or bright stainless steel.

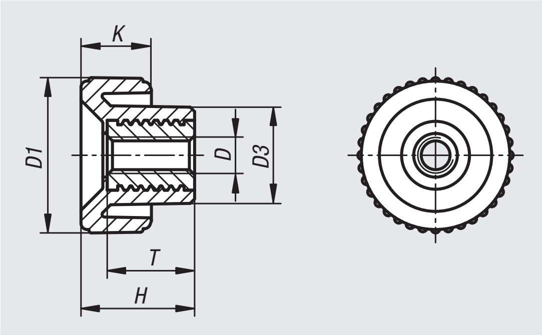
Sample order:
nlm 06014-1804

Advantages:
The knurled nuts can be tightened or loosened without tools.
Suitable for manual fixating and clamping.
Various thread sizes.

Order No. steel	Order No. stainless steel	D	D1	D3	H	K	T
06014-1804	**06014-18042**	M4	18	11	13	8	10
06014-2005	**06014-20052**	M5	20	13,6	15	9	10
06014-2006	**06014-20062**	M6	20	13,6	15	9	10
06014-2505	**06014-25052**	M5	25	14	17	10	10
06014-2506	**06014-25062**	M6	25	14	17	10	10
06014-3208	**06014-32082**	M8	32	18	22	13	14
06014-3210	**06014-32102**	M10	32	18	22	13	14
06014-4008	**06014-40082**	M8	40	19	25	14	14
06014-4010	**06014-40102**	M10	40	19	25	14	14

06014

Knurled nuts plastic, antistatic



Material:
Reinforced polyamide thermoplastic, graphite grey.
Screw steel 5.8.

Version:
Tapped bush trivalent blue passivated.

Sample order:
nlm 06014-11180424

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

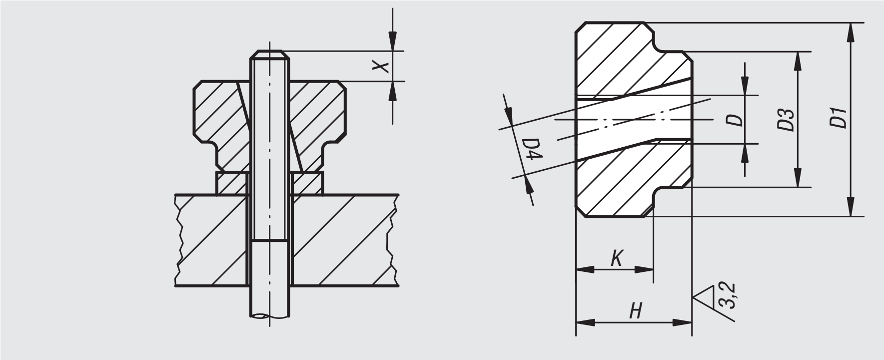
Advantages:
To protect sensitive electrical or electronic parts, components and devices.
Areas of application: electrical assembly, equipment construction according to ATEX directives.
Made from a special electrically conductive plastic.
ESD operating parts have been specially designed for use in ESD protected areas.
The knurled nuts can be tightened or loosened without tools.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Order No.	D	D1	D3	H	K	T
06014-11180424	M4	18	11	13	8	10
06014-11200524	M5	20	13,6	15	9	10
06014-11250624	M6	25	14	17	10	10
06014-11320824	M8	32	18	22	13	14
06014-11401024	M10	40	19	25	14	14

Knurled nuts quick-acting



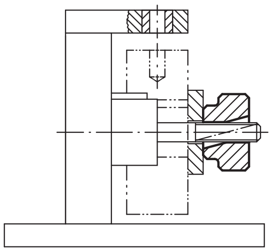
Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 06030-08

Note:
Quick-acting knurled nuts are mainly used in applications where no high clamping pressures are required.
Tilt the nut to slide on, then straighten it to engage the threads.

Drawing reference:
X: The stud should be several mm longer than height “H”



Order No.	D	D1	D3	D4	H	K
06030-05	M5	20	14	5,2	12	8
06030-06	M6	24	16	6,2	14	10
06030-08	M8	30	20	8,2	17	12
06030-10	M10	36	28	10,3	20	14
06030-12	M12	40	32	12,3	24	16

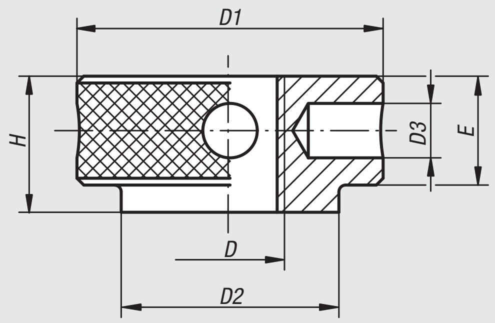
06070

Knurled nuts

Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 06070-100

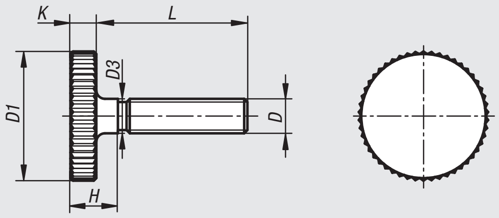


Order No.	D	D1	D2	D3	E	H
06070-100	M10	32	22	4	10	12
06070-120	M12	36	25	5	13,5	16
06070-140	M14	40	28	6	15	18
06070-160	M16	45	32	8	16	20

06089

Knurled screws low head

steel and stainless steel, DIN 653



Material:
Steel or stainless steel (A 1).

Version:
Steel grade 5.8, bright;
Stainless steel, bright.

Sample order:
nlm 06089-062X20 (include length L)

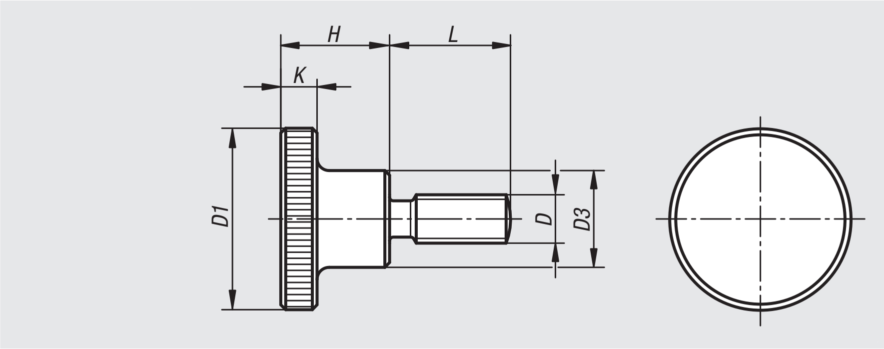
Note:
Delivery is according to DIN 653 or DIN 653-A.

Order No.	Main material	D	D1	D3	H	K	L
06089-03X	steel	M3	12	3	4,5	2,5	10/12/16
06089-04X	steel	M4	16	4	6,5	3,5	8/10/12/16/20
06089-05X	steel	M5	20	5	7	4	10/12/16/20/25/30
06089-06X	steel	M6	24	6	9	5	12/16/20/25/30/35/40
06089-08X	steel	M8	30	8	11	6	16/20/25/30/35/40
06089-10X	steel	M10	36	10	14	8	20/25/30/35/40
06089-032X	stainless steel	M3	12	3	4,5	2,5	10/12/16
06089-042X	stainless steel	M4	16	4	6,5	3,5	8/10/12/16/20
06089-052X	stainless steel	M5	20	5	7	4	10/12/16/20/25/30
06089-062X	stainless steel	M6	24	6	9	5	12/16/20/25/30/35/40
06089-082X	stainless steel	M8	30	8	11	6	16/20/25/30
06089-102X	stainless steel	M10	36	10	14	8	20/25/30/40

06090

Knurled screws high form

steel and stainless steel, DIN 464

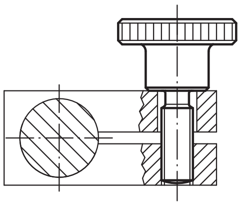


Material:
Steel 1.0718.
Stainless steel 1.4305.

Version:
Steel, black oxidised.
Stainless steel, bright.

Sample order:
nlm 06090-06X20 (include length L)

Note:
* Threads with these lengths have no undercut at the shoulder.

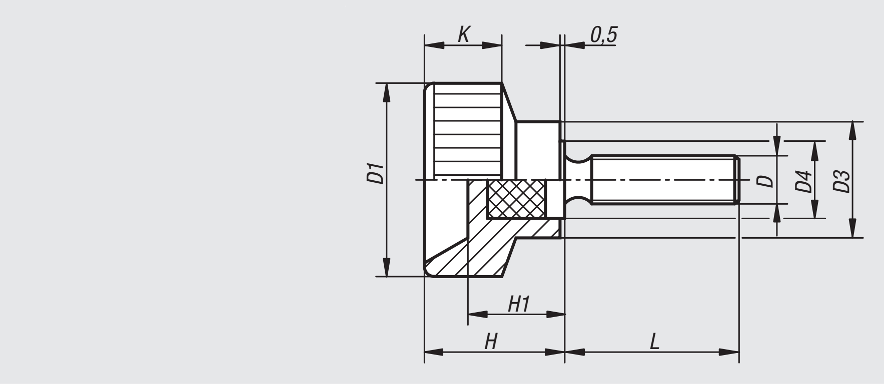


Order No. stainless steel	Order No. steel	D	D1	D3	H	K	L
06090-042X	**06090-04X**	M4	16	8	9,5	3,5	10/16/20*
06090-052X	**06090-05X**	M5	20	10	11,5	4	10/16/20
06090-062X	**06090-06X**	M6	24	12	15	5	10/16/20/25*
06090-082X	**06090-08X**	M8	30	16	18	6	16/20/25/30*
06090-102X	**06090-10X**	M10	36	20	23	8	20/25/30/40*

06091

Knurled thumb screws

plastic



Material:
Black thermoset PF 31.
Screw steel.

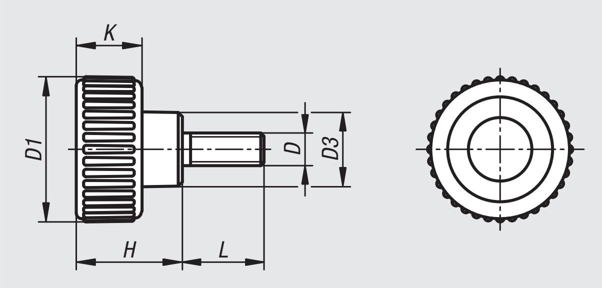
Version:
Screw electro zinc-plated.

Sample order:
nlm 06091-05X25 (include length L)

Order No.	D	D1	D3	D4	H	H1	K	L
06091-04X	M4	18	10	7	13,5	9	8	15/20
06091-05X	M5	20	12	8	14,5	10	8	10/18/25
06091-06X	M6	24	13	10	15	9,5	9	20/28
06091-08X	M8	30	15	12	18	11	11	25/32
06091-10X	M10	35	18	14	18,5	11	12	30

06091-01

Knurled screws plastic



Material:
Reinforced polyamide thermoplastic, black grey.
Threaded pin 5.8 steel or stainless steel 1.4305.

Version:
Threaded pin trivalent blue passivated steel, bright stainless steel.

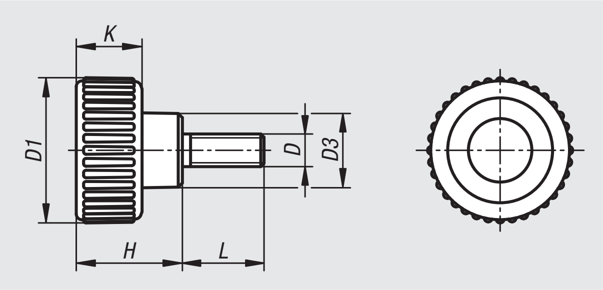
Sample order:
nlm 06091-01-2005X20 (include length L)

Advantages:
The knurled screws can be tightened or loosened without tools.
Suitable for manual fixing and clamping.
Various thread sizes and lengths.

Order No. steel	Order No. stainless steel	D	D1	D3	H	K	L
06091-01-1804X	**06091-01-18042X**	M4	18	9	13	8	10/15
06091-01-2005X	**06091-01-20052X**	M5	20	10,6	15	9	10/15/20
06091-01-2506X	**06091-01-25062X**	M6	25	12	17	10	10/15/20/30/40
06091-01-3208X	**06091-01-32082X**	M8	32	14	22	13	15/20/30/40
06091-01-4010X	**06091-01-40102X**	M10	40	18	25	14	20/30/40

06091-01

Knurled screws plastic, antistatic



Material:
Reinforced polyamide thermoplastic, graphite grey.
Screw steel 5.8.

Version:
Screw blue passivated.

Sample order:
nlm 06091-01-11200524X20 (include length L)

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Advantages:
To protect sensitive electrical or electronic parts, components and devices.
Areas of application: electrical assembly, equipment construction according to ATEX directives.
Made from a special electrically conductive plastic.
ESD operating parts have been specially designed for use in ESD protected areas.
The knurled screws can be tightened or loosened without tools.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Order No.	D	D1	D3	H	K	L
06091-01-11180424X	M4	18	9	13	8	10/15
06091-01-11200524X	M5	20	10,6	15	9	10/15/20
06091-01-11250624X	M6	25	12	17	10	10/15/20
06091-01-11320824X	M8	32	14	22	13	15/20/30
06091-01-11401024X	M10	40	18	25	14	20/30

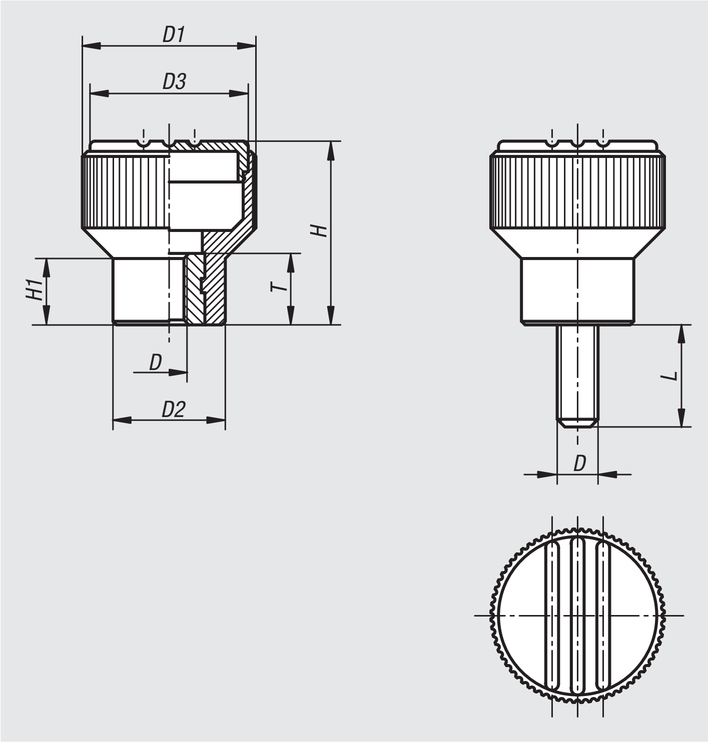
Knurled knobs

Material:
Black thermoplastic.
Bush and screw 5.8 steel or 1.4305 stainless steel.

Version:
Steel trivalent blue passivated.
Stainless steel, bright.

Sample order:
nlm 06092-01056X20
(Cap colour traffic red. Include length L)

Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.



black grey RAL 7021	pure orange Δ = 1 RAL 2004	signal green Δ = 2 RAL 6032	traffic blue Δ = 3 RAL 5017
light grey Δ = 5 RAL 7035	traffic red Δ = 6 RAL 3020	colza yellow Δ = 7 RAL 1021	

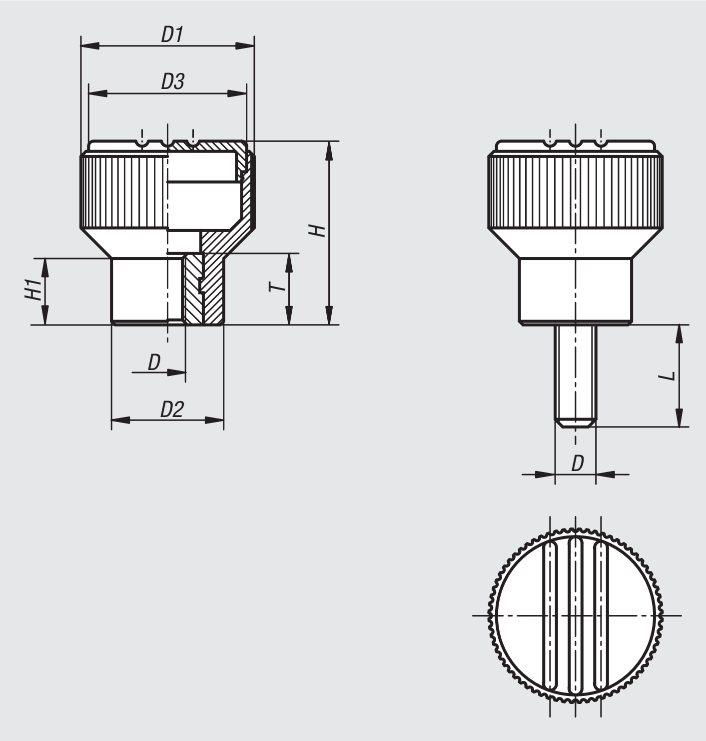
Knurled knobs with internal thread

Order No. stainless steel	Order No. steel	D	D1	D2	D3	H	H1	T
06092-0104Δ	**06092-104Δ**	M4	21	14	19	22	8	10
06092-0105Δ	**06092-105Δ**	M5	21	14	19	22	8	10
06092-0106Δ	**06092-106Δ**	M6	21	14	19	22	8	10
06092-0208Δ	**06092-208Δ**	M8	26	18	23	26	9,5	14
06092-0308Δ	**06092-308Δ**	M8	34	22	31	36	13	14
06092-0310Δ	**06092-310Δ**	M10	34	22	31	36	13	14

Knurled knobs with external thread

Order No. steel	Order No. stainless steel	D	D1	D2	D3	H	H1	L
06092-105ΔX	**06092-0105ΔX**	M5	21	14	19	22	8	10/12/15/20/25
06092-106ΔX	**06092-0106ΔX**	M6	21	14	19	22	8	15/20/25/30
06092-208ΔX	**06092-0208ΔX**	M8	26	18	23	26	9,5	20/25/30/40
06092-310ΔX	**06092-0310ΔX**	M10	34	22	31	36	13	20/30/40

Knurled knobs antistatic



Material:
Thermoplastic, graphite black.
Bush or screw steel 5.8.

Version:
Screw blue passivated.

Sample order:
nlm 06092-1110624

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Knurled knobs antistatic with internal thread

Order No.	D	D1	D2	D3	H	H1	T
06092-1110624	M6	21	14	19	22	8	10

Knurled knobs antistatic with external thread

Order No.	D	D1	D2	D3	H	H1	L
06092-1110624X15	M6	21	14	19	22	8	15

06094

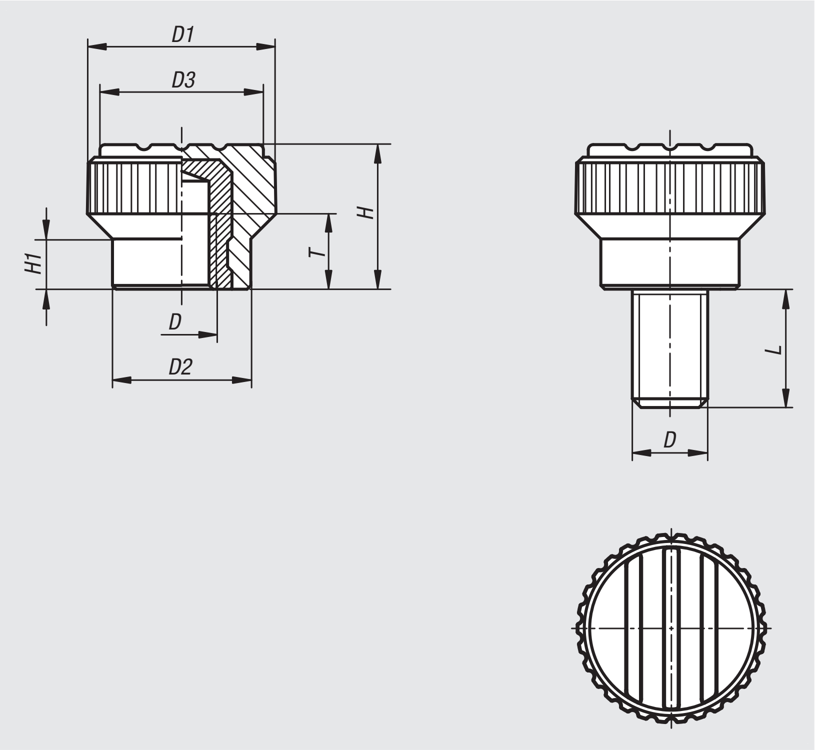
Knurled knobs

Material:
Grip black grey thermoplastic.
Bush brass or stainless steel 1.4305.
Screw steel 5.8 or stainless steel 1.4305.

Version:
Steel trivalent blue passivated.
Stainless steel, bright.

Sample order:
nlm 06094-005X12

On request:
Other colours.



Knurled knobs with internal thread

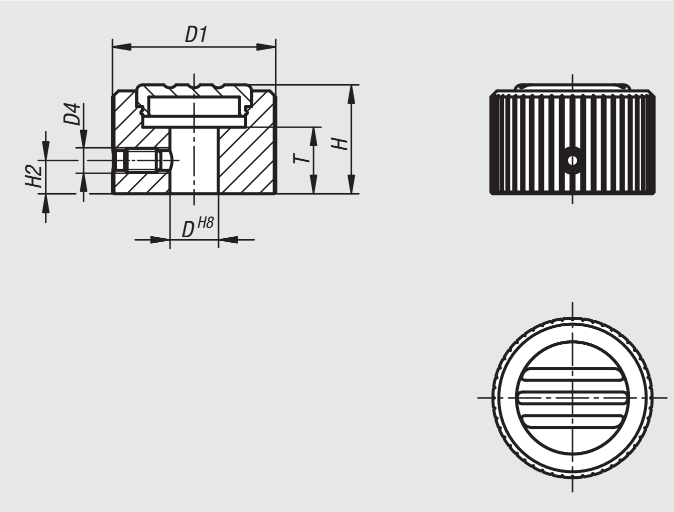
Order No.	Component material	D	D1	D2	D3	H	H1	T
06094-003	brass	M3	15	11	13	11,5	4,3	4,5
06094-004	brass	M4	15	11	13	11,5	4,3	6
06094-005	brass	M5	15	11	13	11,5	4,3	6
06094-0003	stainless steel	M3	15	11	13	11,5	4,3	4,5
06094-0004	stainless steel	M4	15	11	13	11,5	4,3	6
06094-0005	stainless steel	M5	15	11	13	11,5	4,3	6

Knurled knobs with external thread

Order No.	Component material	D	D1	D2	D3	H	H1	L
06094-003X	steel	M3	15	11	13	11,5	4,3	8/10/12/15
06094-004X	steel	M4	15	11	13	11,5	4,3	8/10/12/15
06094-005X	steel	M5	15	11	13	11,5	4,3	10/12/15/20
06094-006X	steel	M6	15	11	13	11,5	4,3	10/15/20/25
06094-0003X	stainless steel	M3	15	11	13	11,5	4,3	8/10/12/15
06094-0004X	stainless steel	M4	15	11	13	11,5	4,3	8/10/12/15
06094-0005X	stainless steel	M5	15	11	13	11,5	4,3	10/12/15/20
06094-0006X	stainless steel	M6	15	11	13	11,5	4,3	10/15/20/25

Knurled knobs

aluminium



Material:
Body aluminium.
Cap thermoplastic PA6.
Grub screw stainless steel.

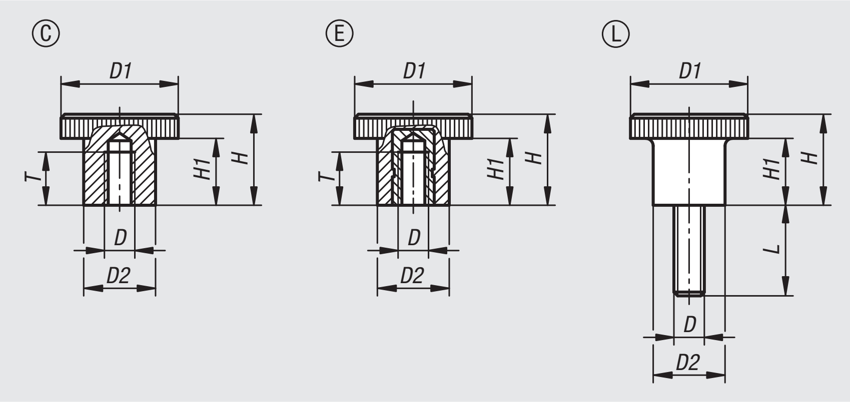
Version:
Body black anodised.
Cap light grey RAL 7035.
Grub screw bright.

Sample order:
nlm 06096-27085

On request:
Other female threads, colours and special versions.

Order No.	D	D1	D4	H	H2	T
06096-27085	8	27	M4	18	5,5	11
06096-27105	10	27	M4	18	5,5	11
06096-34105	10	34	M5	21	7	11
06096-34125	12	34	M5	21	7	11
06096-42125	12	42	M5	24,5	8,5	15
06096-42145	14	42	M5	24,5	8,5	15

Knurled knobs



Material:
Thermoset PF 31, black.
Screw, steel.
Tapped bush, steel or brass.

Version:
Screw, electro zinc-plated.
Tapped bush, electro zinc-plated or bright brass.

Sample order:
nlm 06097-302205X10

Drawing reference:
Form C: tapped blind hole
Form E: tapped bush
Form L: external thread

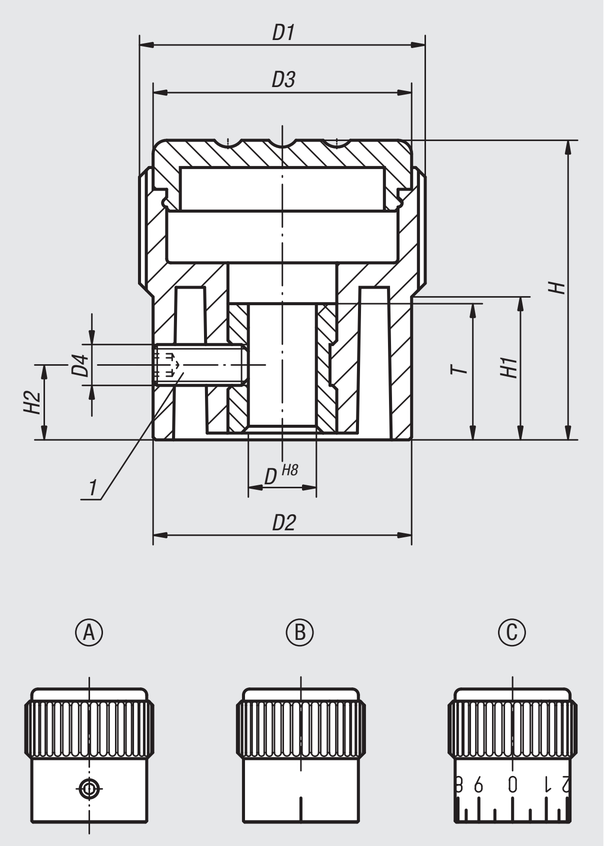
Knurled knobs with internal thread

Order No.	Form	Component material	D	D1	D2	H	H1	T
06097-102206	C	plastic	M6	22	12	13	6	7,5
06097-102606	C	plastic	M6	26	17	20	14	9
06097-212205	E	brass	M5	22	12	13	6	6
06097-202606	E	steel	M6	26	17	20	14	10
06097-202608	E	steel	M8	26	17	20	14	12

Knurled knobs with external thread

Order No.	Form	Component material	D	D1	D2	H	H1	L
06097-302206X	L	steel	M6	22	12	13	6	30/10/15/20
06097-302606X	L	steel	M6	26	15	13	6	15/30/10/20
06097-302205X	L	steel	M5	22	12	13	6	15/10/20
06097-302608X	L	steel	M8	26	15	13	6	20/15/30

Knurled knobs



Material:
Thermoplastic, black grey.
Bush steel.

Version:
Steel trivalent blue passivated.

Sample order:
nlm 06100-11055 (cap colour light grey)

Note:
Available without graduations, with one scale line or with 20 graduations and 10 digits.

Δ Add the desired cap colour here. No colour code is required for black grey caps.

On request:
Special graduations.

Drawing reference:
Form A: without graduations
Form B: with one scale line
Form C: with standard graduations

1) Set screw for locking (by Form C between numbers 5 and 6)

black grey ⚫ RAL 7021	pure orange Δ = 1 🟠 RAL 2004	signal green Δ = 2 🟢 RAL 6032	traffic blue Δ = 3 🔵 RAL 5017
light grey Δ = 5 ⚪ RAL 7035	traffic red Δ = 6 🔴 RAL 3020	colza yellow Δ = 7 🟡 RAL 1021	

Order No.	Form	D	D1	D2	D3	D4	H	H1	H2	T
06100-1105Δ	A	5	21	19	19	M3	22	10,5	5	10
06100-1206Δ	A	6	26	23	23	M3	26	12	6	10
06100-1308Δ	A	8	34	31	31	M4	36	17,5	7	14
06100-2105Δ	B	5	21	19	19	M3	22	10,5	5	10
06100-2206Δ	B	6	26	23	23	M3	26	12	6	10
06100-2308Δ	B	8	34	31	31	M4	36	17,5	7	14
06100-3105Δ	C	5	21	19	19	M3	22	10,5	5	10
06100-3206Δ	C	6	26	23	23	M3	26	12	6	10
06100-3308Δ	C	8	34	31	31	M4	36	17,5	7	14

Knurled knobs

with arrow

Material:
Knurled knob thermoplastic.
Washer aluminium.

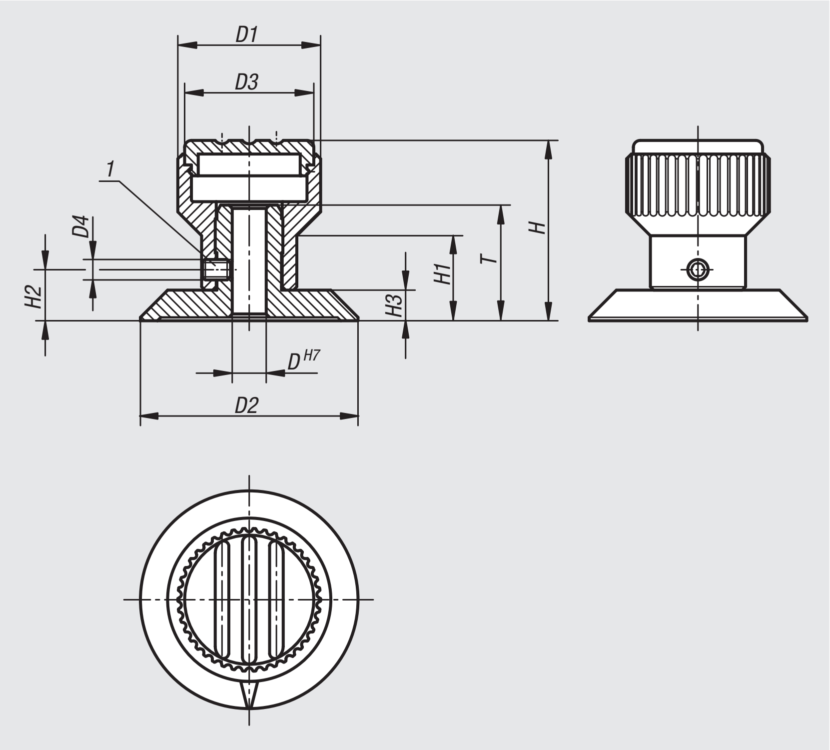
Version:
Aluminium black anodised.

Sample order:
nlm 06105-1055 (cap colour light grey)

Note:
The arrow is engraved after anodizing. The set screw secures both the hub and the pressed-in washer. The H7 hole in the hub ensures a good tight fit on the shaft.

Δ Add the desired cap colour here. No colour code is required for black grey caps.

Drawing reference:
1) set screw



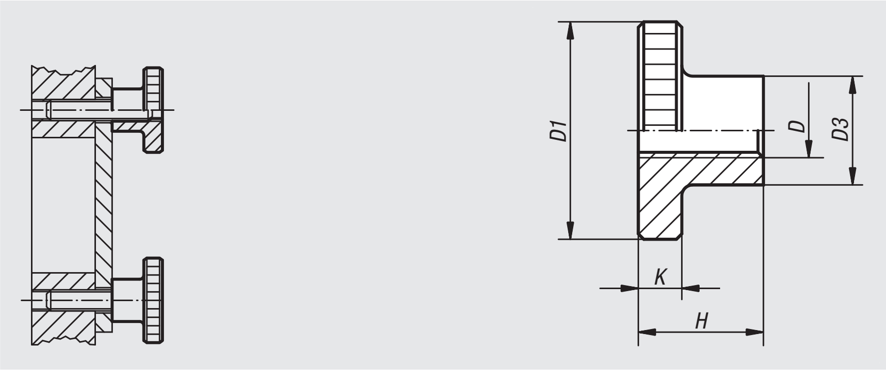
black grey	pure orange Δ = 1	signal green Δ = 2	traffic blue Δ = 3
⚫ RAL 7021	🟠 RAL 2004	🟢 RAL 6032	🔵 RAL 5017
light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7	
⚪ RAL 7035	🔴 RAL 3020	🟡 RAL 1021	

Order No.	D	D1	D2	D3	D4	H	H1	H2	H3	T
06105-105Δ	5	21	32	19	M3	26,5	12,5	7,5	4,5	17
06105-206Δ	6	26	40	23	M4	31,5	15	9,5	5,5	20,5
06105-308Δ	8	34	52	31	M4	43	20	12	7	22

06110

Knurled nuts high

steel and stainless steel, DIN 466



Material:
Steel 1.0718.
Stainless steel 1.4305.

Version:
Steel black oxidised.
Stainless steel bright.

Sample order:
nlm 06110-04

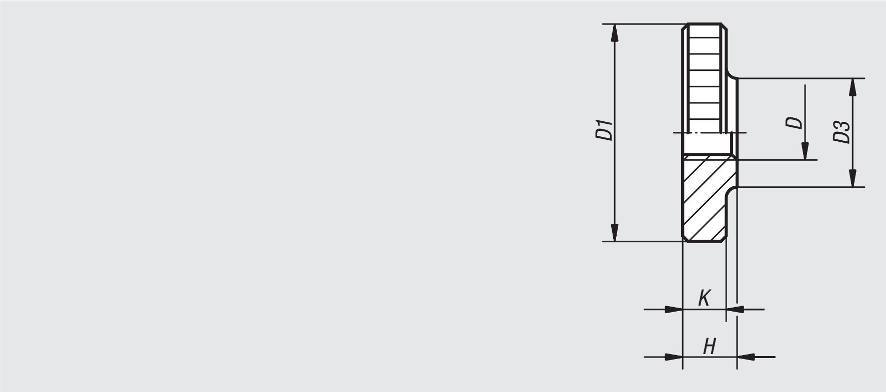
Note:
M12 high knurled nuts are not included in the official standards sheet.

Order No. stainless steel	Order No. steel	D	D1	D3	H	K
06110-042	**06110-04**	M4	16	8	9,5	3,5
06110-052	**06110-05**	M5	20	10	11,5	4
06110-062	**06110-06**	M6	24	12	15	5
06110-082	**06110-08**	M8	30	16	18	6
06110-122	**06110-12**	M12	36	20	23	8
06110-102	**06110-10**	M10	36	20	23	8

06120

Knurled nuts flat

steel and stainless steel, DIN 467



Material:
Steel 1.0718.
Stainless steel 1.4305.

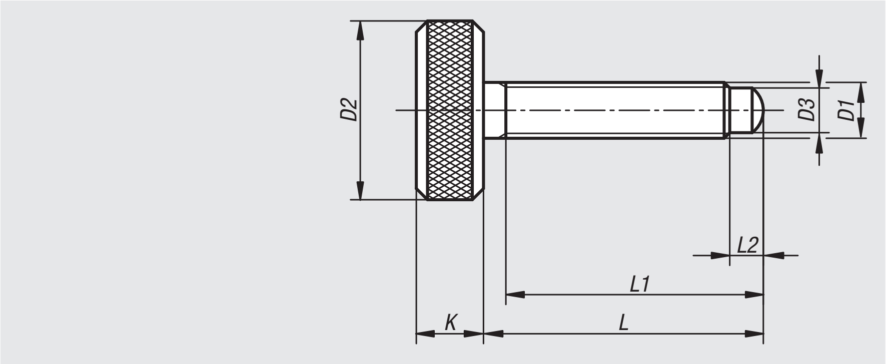
Version:
Steel black oxidised.
Stainless steel bright.

Sample order:
nlm 06120-042

Note:
M12 flat knurled nuts are not included in the official standards sheet.

Order No. stainless steel	Order No. steel	D	D1	D3	H	K
06120-042	**06120-04**	M4	16	8	4	3,5
06120-052	**06120-05**	M5	20	10	5	4
06120-062	**06120-06**	M6	24	12	6	5
06120-082	**06120-08**	M8	30	16	8	6
06120-122	**06120-12**	M12	36	20	10	8
06120-102	**06120-10**	M10	36	20	10	8

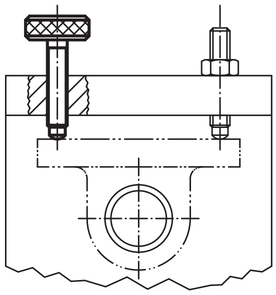
Knurled screws



Material:
Carbon steel.

Version:
Tempered and black oxidised.

Sample order:
nlm 06130-061X50

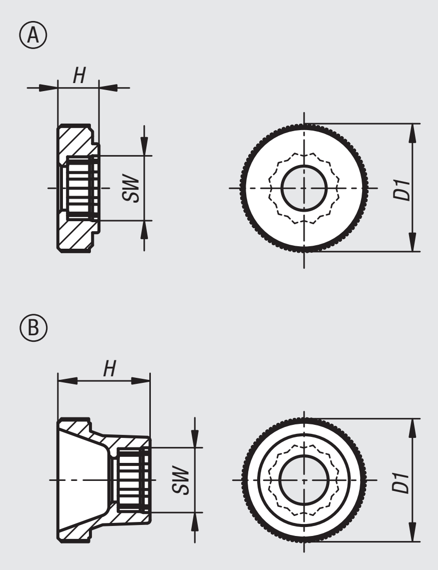


Order No.	D1	D2	D3	K	L	L1	L2
06130-05X25	M5	16	4	6	25	23	3
06130-051X40	M5	16	4	6	40	38	3
06130-06X35	M6	18	4,5	7	35	33	3,5
06130-061X50	M6	18	4,5	7	50	48	3,5
06130-062X70	M6	18	4,5	7	70	68	3,5
06130-08X45	M8	20	6	8	45	42	5
06130-081X60	M8	20	6	8	60	57	5
06130-10X45	M10	25	7,5	10	45	42	5,5
06130-101X60	M10	25	7,5	10	60	57	5,5

Notes

Knurled knobs

for screws with hex head



Material:
Thermoplastic.

Version:
Black or orange.

Sample order:
nlm 06131-00040 (knurled knob colour black)
Colour code:
0=black
1=orange

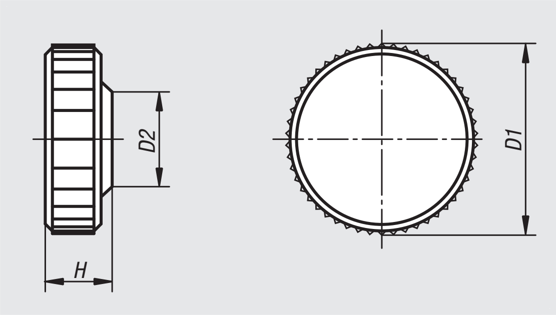
Note:
Suitable screws ISO 4014.

Δ add the desired colour code here

Order No.	Form	for screws	D1	H	SW
06131-0Δ040	A	M4	17	5,5	7
06131-0Δ050	A	M5	20	6,5	8
06131-0Δ060	A	M6	25	8	10
06131-0Δ080	A	M8	36	10	13
06131-0Δ100	A	M10	36	10	17
06131-1Δ040	B	M4	17	11,5	7
06131-1Δ050	B	M5	20	15	8
06131-1Δ060	B	M6	25	18	10
06131-1Δ080	B	M8	36	23	13
06131-1Δ100	B	M10	36	23	17

Knurled heads

for hexagon socket screws



Material:
Thermoplastic.

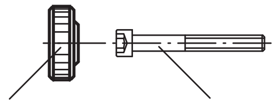
Version:
Black, grey or red.

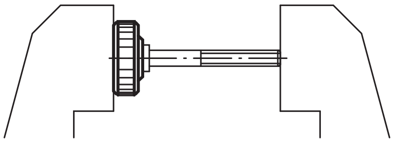
Sample order:
nlm 06132-0506 (knurled head colour red)
Colour Code:
5 = grey
6 = red

Note:
Suitable screws ISO 4762.

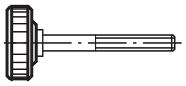
Δ Add the desired colour code here.
No colour code is required for black.

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000





press the screw into the head



knurled head with male thread

Order No.	D1	D2	H	for cap screws
06132-030Δ	9,5	8,3	4,5	M3
06132-040Δ	13	9,6	5	M4
06132-050Δ	16	11,5	6,5	M5
06132-060Δ	19	14	7,5	M6
06132-061Δ	26	13	8	M6
06132-080Δ	26	16	10	M8

06133

Wing grips

for hexagon socket screws

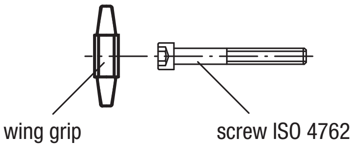
Material:
Thermoplastic.

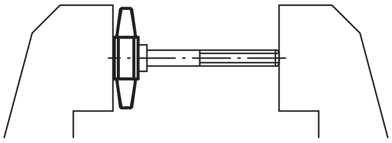
Version:
Black, grey or red.

Sample order:
nlm 06133-0506 (wing grip colour red)
Colour code:
5 = grey
6 = red

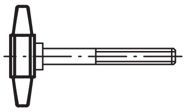
Note:
Suitable screws ISO 4762.

Δ Add the desired grip colour here. No colour code is required for black grips.

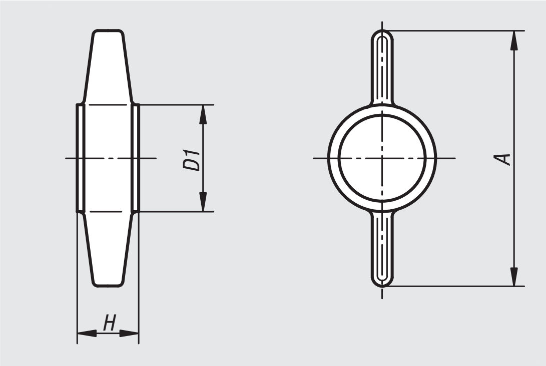




press screwhead into wing grip



wing grip with male thread



Order No.	A	D1	H	for cap screws
06133-050Δ	26	12	7	M5
06133-060Δ	30	13,5	8	M6
06133-080Δ	38	17	10	M8
06133-100Δ	45	20	12,5	M10

06134

Disc grips

for hexagon socket screws

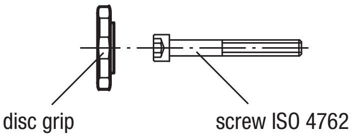
Material:
Thermoplastic.

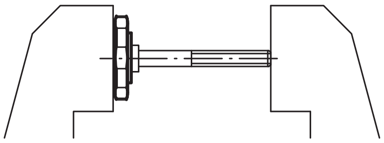
Version:
Black or grey

Sample order:
nlm 06134-0805 (disc grip colour grey)
Colour Code:
5 = grey

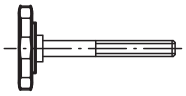
Note:
Suitable screws see ISO 4762.

Δ Add the desired grip colour here. No colour code is required for black grips

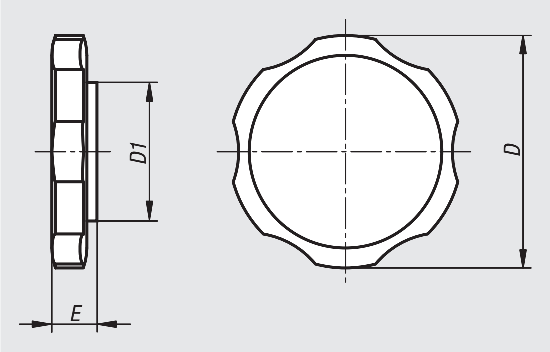




press the screwhead into the grip



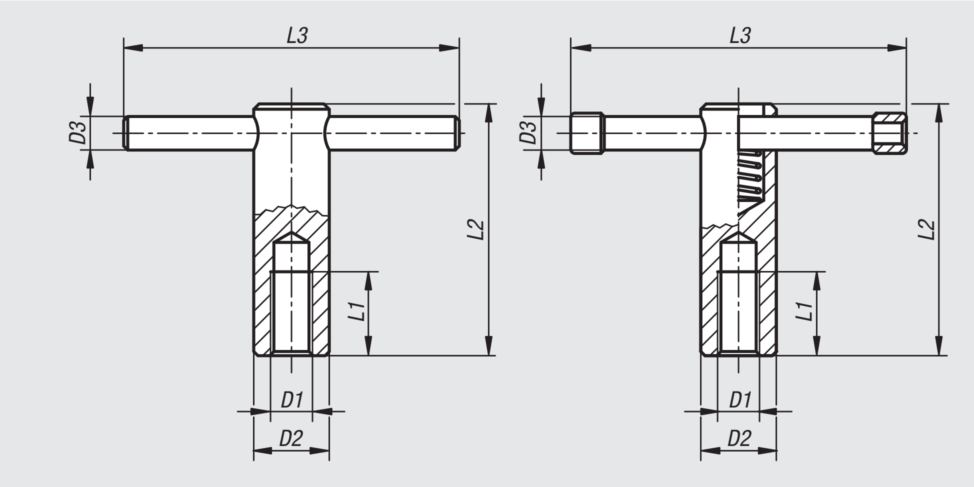
grip with male thread



Order No.	D	D1	E	for cap screws
06134-060Δ	38	14	13	M6
06134-080Δ	38	17	11,5	M8
06134-100Δ	38	20	13	M10

Tommy bars

with fixed or sliding T-bar, DIN 6305 or DIN 6307

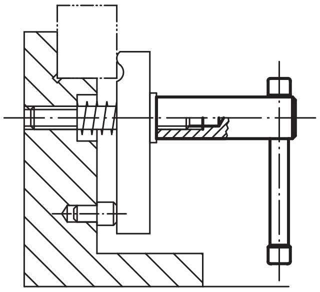


Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 06140-210

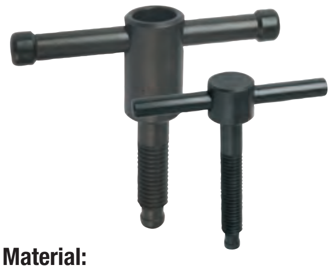
Note:
By the version with sliding T-bar the bar is held in any desired position by a spring in the body. End stops prevent the bar falling out.
By the version with fixed T-bar the bar is pressed in.



Order No.	Version 1	D1	D2	D3	L1	L2	L3
06140-110	fixed t-bar	M10	18	8	20	60	80
06140-112	fixed t-bar	M12	20	10	25	70	100
06140-116	fixed t-bar	M16	24	12	35	85	120
06140-120	fixed t-bar	M20	30	16	40	95	140
06140-210	sliding t-bar	M10	18	8	20	60	80
06140-212	sliding t-bar	M12	20	10	25	70	100
06140-216	sliding t-bar	M16	24	13	35	85	120
06140-220	sliding t-bar	M20	30	16	40	95	140

T-thrust screws

with fixed or sliding T-bar, DIN 6304 or DIN 6306

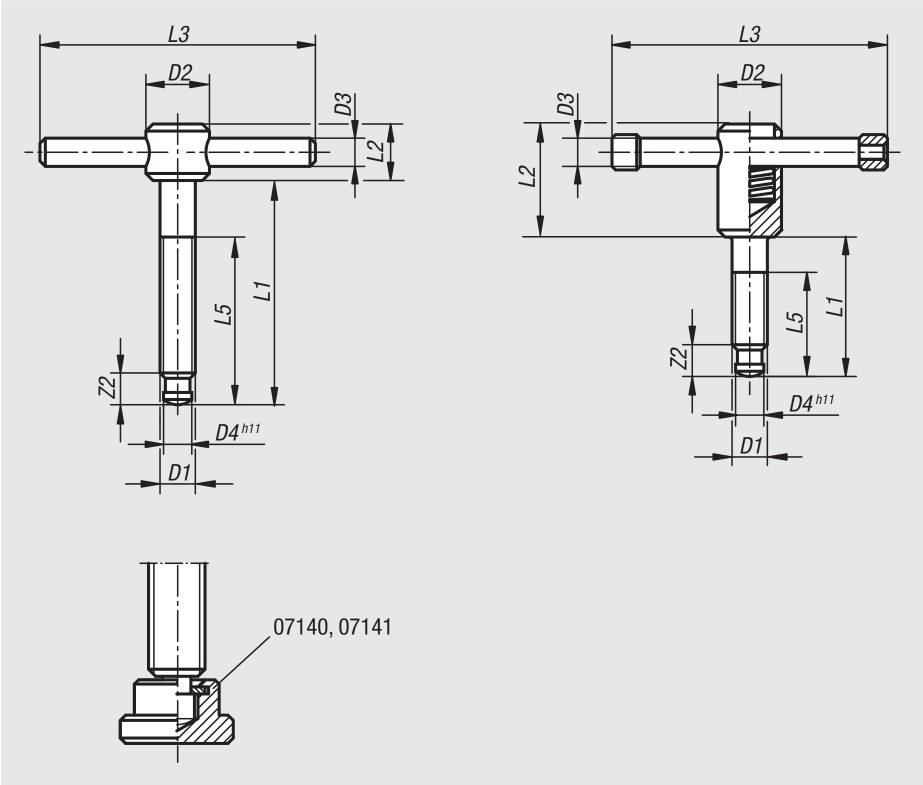


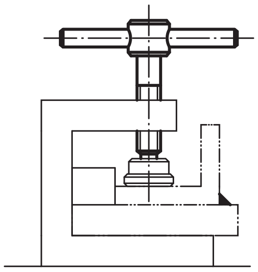
Material:
Steel.

Version:
Black oxidised. Thrust pin hardened.

Sample order:
nlm 06150-116X90

Note:
By the thrust screws with sliding T-bar the bar is held in any desired position by a spring in the body. End stops prevent the bar falling out. By the fixed handles the T-bar is pressed in.





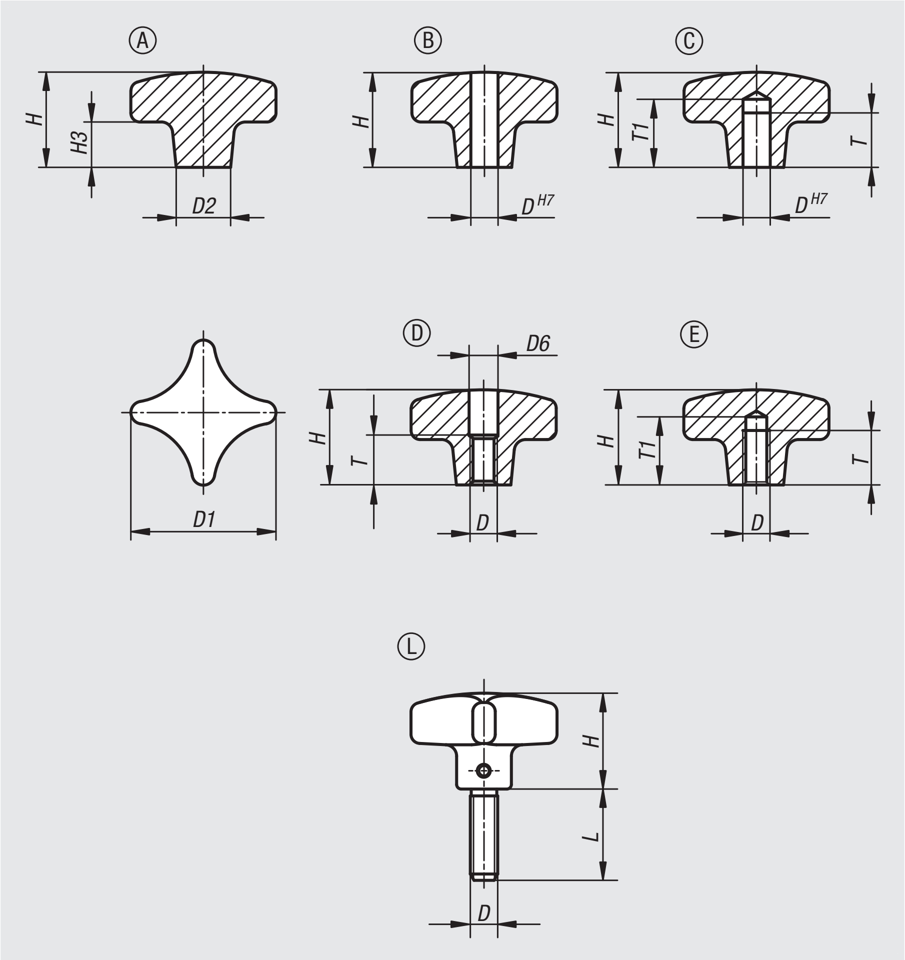
Order No.	Version 1	D1	D2	D3	D4	L1	L2	L3	L5	Z2
06150-106X40	fixed t-bar	M6	12	5	4,5	40	10	50	30	6
06150-106X50	fixed t-bar	M6	12	5	4,5	50	10	50	40	6
06150-108X50	fixed t-bar	M8	14	6	6	50	12	60	35	7,5
06150-108X60	fixed t-bar	M8	14	6	6	60	12	60	45	7,5
06150-110X60	fixed t-bar	M10	18	8	8	60	14	80	40	9
06150-110X70	fixed t-bar	M10	18	8	8	70	14	80	50	9
06150-112X70	fixed t-bar	M12	20	10	8	70	18	100	50	10
06150-112X80	fixed t-bar	M12	20	10	8	80	18	100	60	10
06150-116X75	fixed t-bar	M16	24	12	12	75	20	120	55	12
06150-116X90	fixed t-bar	M16	24	12	12	90	20	120	70	12
06150-116X110	fixed t-bar	M16	24	12	12	110	20	120	90	12
06150-120X75	fixed t-bar	M20	30	16	15,5	75	28	140	55	14
06150-120X90	fixed t-bar	M20	30	16	15,5	90	28	140	70	14
06150-120X110	fixed t-bar	M20	30	16	15,5	110	28	140	90	14
06150-210X40	sliding t-bar	M10	18	8	8	40	32	80	30	9
06150-210X50	sliding t-bar	M10	18	8	8	50	32	80	40	9
06150-212X50	sliding t-bar	M12	20	10	8	50	35	100	40	10
06150-212X60	sliding t-bar	M12	20	10	8	60	35	100	50	10
06150-216X55	sliding t-bar	M16	24	13	12	55	40	120	45	12
06150-216X70	sliding t-bar	M16	24	13	12	70	40	120	60	12
06150-216X90	sliding t-bar	M16	24	13	12	90	40	120	80	12
06150-220X55	sliding t-bar	M20	30	16	15,5	55	45	140	45	14
06150-220X70	sliding t-bar	M20	30	16	15,5	70	45	140	60	14
06150-220X90	sliding t-bar	M20	30	16	15,5	90	45	140	80	14

Notes

06156

Palm grips

aluminium, similar to DIN 6335



Material:
Aluminium.
Grub screw stainless steel 1.4305.
Pin stainless steel 1.4310.

Version:
Vibratory ground or ground and polished.
Grub screw and pin bright.

Sample order:
nlm 06156-604008X20 (include length L.)

On request:
Blank palm grips (not tumbled).

Drawing reference:
Form A: blank
Form B: drilled through
Form C: blind hole
Form D: tapped and counterbored
Form E: tapped blind hole
Form L: external thread

Order No.	Surface finish body	Form	D1	D2	H	H3
06156-104008	tumbled	A	40	14	26	14
06156-105010	tumbled	A	50	18	34	20
06156-106312	tumbled	A	63	25	42	25
06156-108016	tumbled	A	80	25	52	30

Palm grips

aluminium, similar to DIN 6335

Order No. tumbled	Order No. polished	Form	D	D1	D2	H
06156-204008	**06156-2040082**	B	8	40	14	25
06156-205010	**06156-2050102**	B	10	50	18	32
06156-206312	**06156-2063122**	B	12	63	25	40
06156-208016	**06156-2080162**	B	16	80	25	50

Order No. tumbled	Order No. polished	Form	D	D1	D2	H	T	T1
06156-304008	**06156-3040082**	C	8	40	14	25	15	18
06156-305010	**06156-3050102**	C	10	50	18	32	18	21
06156-306312	**06156-3063122**	C	12	63	25	40	22	25
06156-308016	**06156-3080162**	C	16	80	25	50	28	32

Order No. tumbled	Order No. polished	Form	D	D1	D2	D6	H	T
06156-404008	**06156-4040082**	D	M8	40	14	8,4	25	15
06156-405010	**06156-4050102**	D	M10	50	18	10,5	32	18
06156-406312	**06156-4063122**	D	M12	63	25	13	40	22
06156-408016	**06156-4080162**	D	M16	80	25	17	50	28

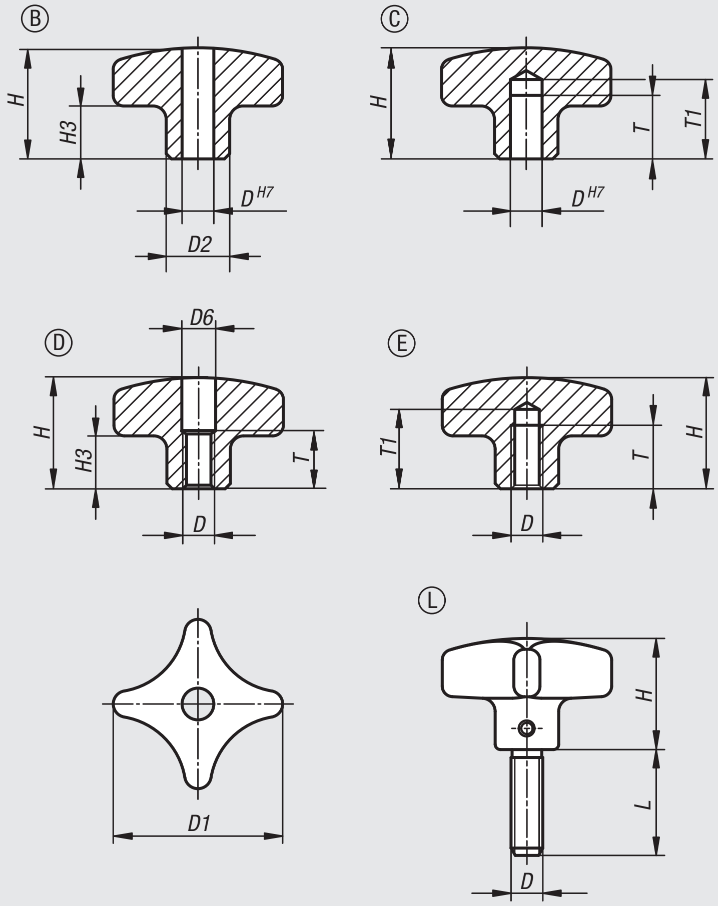
Order No. tumbled	Order No. polished	Form	D	D1	D2	H	T	T1
06156-504008	**06156-5040082**	E	M8	40	14	25	15	18
06156-505010	**06156-5050102**	E	M10	50	18	32	18	21
06156-506312	**06156-5063122**	E	M12	63	25	40	22	25
06156-508016	**06156-5080162**	E	M16	80	25	50	28	32

Order No.	Form	Surface finish body	D	D1	D2	H	L
06156-604008X	L	vibratory ground	M8	40	14	25	20/25/30/40/50
06156-605010X	L	vibratory ground	M10	50	18	32	20/25/30/40/50
06156-606312X	L	vibratory ground	M12	63	25	40	20/30/40/50

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Palm grips

stainless steel, similar to DIN 6335



Material:
Stainless steel 1.4308.
Grub screw stainless steel 1.4305.
Pin stainless steel 1.4310.

Version:
Ground and polished or blasted.
Grub screw and pin bright.

Sample order:
nlm 06158-6032063X20 (include length L.)

Drawing reference:
Form B: drilled through
Form C: blind hole
Form D: tapped and counterbored
Form E: tapped blind hole
Form L: external thread

Palm grips

stainless steel, similar to DIN 6335

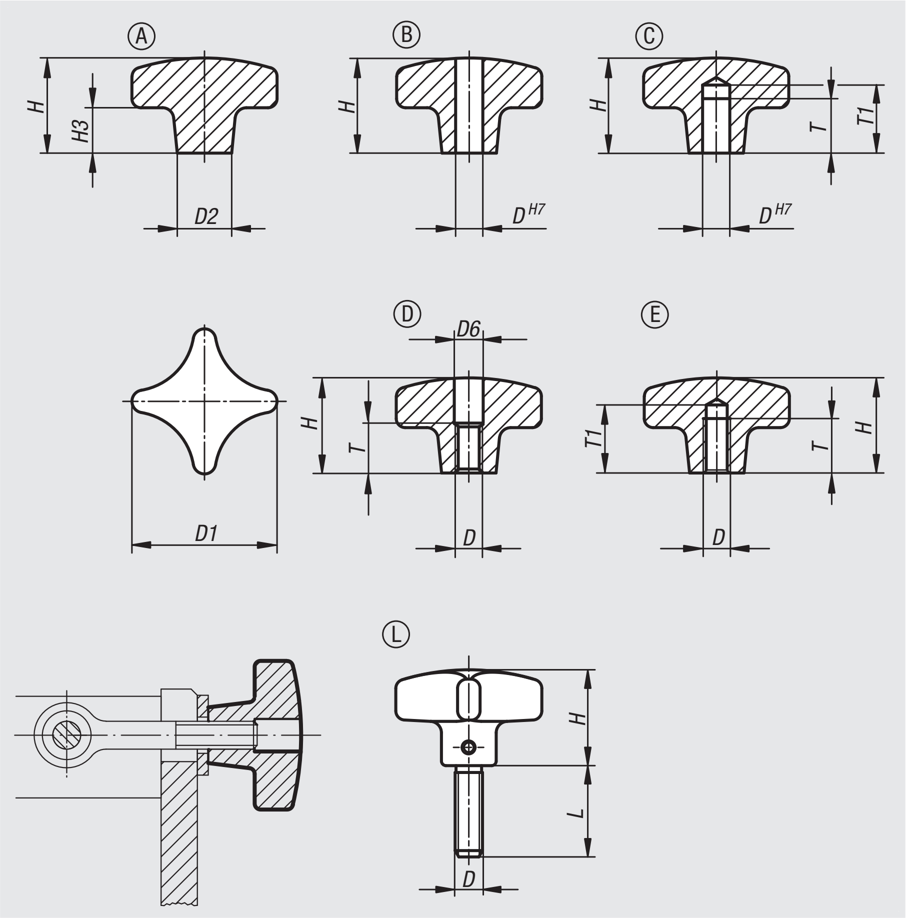
Order No. Form B	Order No. Form C	Main colour	D	D1	D2	H	H3	T	T1
06158-2032062	**06158-3032062**	polished	6	32	12	21	10	-/12	-/15
06158-2040082	**06158-3040082**	polished	8	40	14	26	14	-/15	-/18
06158-2050102	**06158-3050102**	polished	10	50	18	34	20	-/18	-/21
06158-2063122	**06158-3063122**	polished	12	63	20	42	25	-/22	-/25
06158-2032063	**06158-3032063**	blasted	6	32	12	21	10	-/12	-/15
06158-2040083	**06158-3040083**	blasted	8	40	14	26	14	-/15	-/18
06158-2050103	**06158-3050103**	blasted	10	50	18	34	20	-/18	-/21
06158-2063123	**06158-3063123**	blasted	12	63	20	42	25	-/22	-/25

Order No. Form D	Order No. Form E	Main colour	D	D1	D2	D6	H	H3	T	T1
06158-4032062	**06158-5032062**	polished	M6	32	12	6,4/-	21	10	11/12	-/15
06158-4040082	**06158-5040082**	polished	M8	40	14	8,4/-	26	14	14/15	-/18
06158-4050102	**06158-5050102**	polished	M10	50	18	10,5/-	34	20	18	-/21
06158-4063122	**06158-5063122**	polished	M12	63	20	13/-	42	25	22	-/25
06158-4032063	**06158-5032063**	blasted	M6	32	12	6,4/-	21	10	11/12	-/15
06158-4040083	**06158-5040083**	blasted	M8	40	14	8,4/-	26	14	14/15	-/18
06158-4050103	**06158-5050103**	blasted	M10	50	18	10,5/-	34	20	18	-/21
06158-4063123	**06158-5063123**	blasted	M12	63	20	13/-	42	25	22	-/25

Order No.	Form	Main colour	D	D1	D2	H	H3	L
06158-6032063X	L	blasted	M6	32	12	21	10	15/20/25/30/40/50
06158-6040083X	L	blasted	M8	40	14	26	14	20/25/30/40/50
06158-6050103X	L	blasted	M10	50	18	34	20	20/25/30/40/50
06158-6063123X	L	blasted	M12	63	20	42	25	20/30/40/50

Palm grips

grey cast iron DIN 6335



Material:
Grey cast iron GJL 200.
Grub screw stainless steel 1.4305.
Pin stainless steel 1.4310.

Version:
Vibratory ground, bright.
Grub screw and pin bright.

Sample order:
nlm 06160-606X20 (include length L.)

Drawing reference:
Form A: blank
Form B: drilled through
Form C: blind hole
Form D: tapped and counterbored
Form E: tapped blind hole
Form L: external thread

Order No. Form A	Order No. Form B	Version 1	D	D1	D2	H	H3
06160-106	**06160-206**	tumbled	-/6	32	12	21/20	10
06160-108	**06160-208**	tumbled	-/8	40	14	26/25	14
06160-110	**06160-210**	tumbled	-/10	50	18	34/32	20
06160-112	**06160-212**	tumbled	-/12	63	20	42/40	25
06160-116	**06160-216**	tumbled	-/16	80	25	52/50	30
06160-120	**06160-220**	tumbled	-/20	100	32	65/63	38

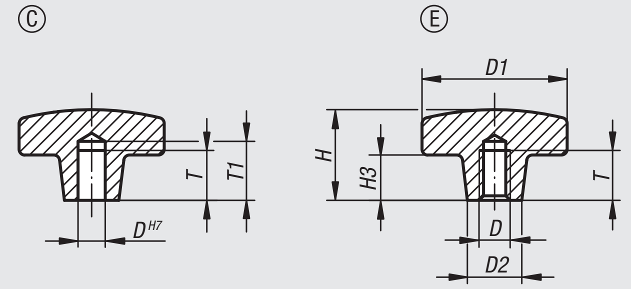
Order No. Form C	Order No. Form D	Order No. Form E	Version 1	D	D1	D2	H	H3	T	T1
06160-306	**06160-406**	**06160-506**	tumbled	6 / M6 / M6	32	12	20	10	12/10/12	15/-/15
06160-308	**06160-408**	**06160-508**	tumbled	8 / M8 / M8	40	14	25	14	15/13/15	18/-/18
06160-310	**06160-410**	**06160-510**	tumbled	10 / M10 / M10	50	18	32	20	18/16/18	21/-/21
06160-312	**06160-412**	**06160-512**	tumbled	12 / M12 / M12	63	20	40	25	22/20/22	25/-/25
06160-316	**06160-416**	**06160-516**	tumbled	16 / M16 / M16	80	25	50	30	28/20/28	32/-/32
06160-320	**06160-420**	**06160-520**	tumbled	20 / M20 / M20	100	32	63	38	36/25/36	40/-/40

Order No.	Form	Version 1	D	D1	H	L
06160-606X	L	tumbled	M6	32	20	15/20/25/30/40/50
06160-608X	L	tumbled	M8	40	25	20/25/30/40/50
06160-610X	L	tumbled	M10	50	32	20/25/30/40/50
06160-612X	L	tumbled	M12	63	40	20/30/40/50

06161

Palm grips

plastic coated grey cast iron, DIN 6335



Material:
Grey cast iron GJL 200.

Version:
Plastic coated.

Sample order:
nlm 06161-212

Note:
Available colours:
Pure orange RAL 2004.
Jet black RAL 9005.

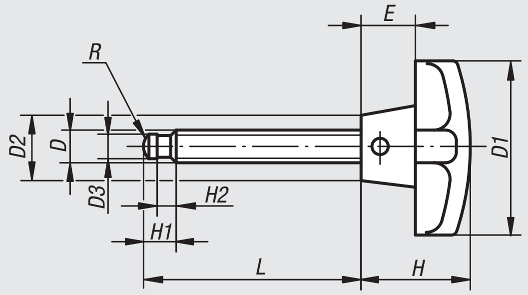
Drawing reference:
Form C: blind hole
Form E: tapped blind hole

Order No. orange	Order No. black	Form	D	D1	D2	H	H3	T	T1
06161-108	**06161-208**	C	8	40	14	26	14	15	18
06161-110	**06161-210**	C	10	50	18	34	20	18	21
06161-112	**06161-212**	C	12	63	20	42	25	22	25
06161-116	**06161-216**	C	16	80	25	52	30	28	32
06161-308	**06161-408**	E	M8	40	14	26	14	15	-
06161-310	**06161-410**	E	M10	50	18	34	20	18	-
06161-312	**06161-412**	E	M12	63	20	42	25	22	-
06161-316	**06161-416**	E	M16	80	25	52	30	28	-

06170

Palm grips

with threaded spindle



Material:
Palm grip grey cast iron.
Grup screw steel.

Version:
Palm grip painted.
Grub screw black oxidised.

Sample order:
nlm 06170-100064

Note:
The grub screw is screwed and pinned into the palm grip.

Order No.	D	D1	D2	D3	E	H	H1	H2	L	R
06170-060020	M6	32	12	4,5	10	20	6	2,5	20	3
06170-060040	M6	32	12	4,5	10	20	6	2,5	40	3
06170-080027	M8	40	14	6	14	25	7,5	3	27	5
06170-080047	M8	40	14	6	14	25	7,5	3	47	5
06170-100044	M10	50	18	8	20	32	9	4,5	44	6
06170-100064	M10	50	18	8	20	32	9	4,5	64	6
06170-120040	M12	63	20	8	25	40	10	4,5	40	6
06170-120060	M12	63	20	8	25	40	10	4,5	60	6
06170-120080	M12	63	20	8	25	40	10	4,5	80	6
06170-160052	M16	80	25	12	30	50	12	5	52	9
06170-160072	M16	80	25	12	30	50	12	5	72	9
06170-160097	M16	80	25	12	30	50	12	5	97	9

06180

Palm grips

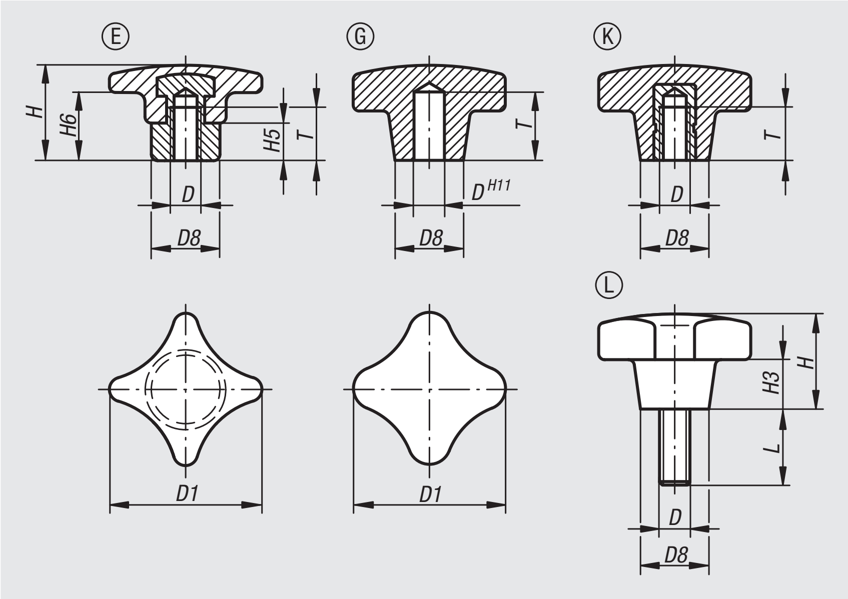
similar to DIN 6335

Material:
Black thermoset PF 31.
Bush and screw electro zinc-plated steel.

Version:
High-gloss polished.

Sample order:
nlm 06180-505X30
(include length L)

Drawing reference:
Form E: projecting steel bush
Form G: blind hole
Form K: tapped bush
Form L: external thread



Order No.	Form	D	D1	D8	H	H5	H6	T
06180-306	E	M6	32	12	23	9	12	12
06180-308	E	M8	40	14	26	10	13	15
06180-310	E	M10	50	18	32	12	18	18
06180-312	E	M12	63	20	40	14	23	22
06180-316	E	M16	80	25	50	17	28	28

Order No.	Form	D	D1	D8	H	H3	T
06180-405	G	5	25	12	16	8	12
06180-406	G	6	32	14	20	10	15
06180-408	G	8	40	18	25	13	18
06180-410	G	10	50	22	32	20	21
06180-412	G	12	63	26	40	25	25

Order No.	Form	D	D1	D8	H	H3	T
06180-205	K	M5	25	12	16	8	9,5
06180-206	K	M6	32	14	20	10	12
06180-208	K	M8	40	18	25	13	14
06180-210	K	M10	50	22	32	20	18
06180-212	K	M12	63	26	40	25	22
06180-216	K	M16	80	35	50	30	30

Order No.	Form	D	D1	D8	H	H3	L
06180-505X	L	M5	25	12	16	8	15/20/25/30/40/50
06180-506X	L	M6	32	14	20	10	15/20/25/30/40/50
06180-508X	L	M8	40	18	25	13	20/25/30/35/40/45/50
06180-510X	L	M10	50	22	32	20	20/25/30/35/40/45/50
06180-512X	L	M12	63	26	40	25	20/30/40/50/60

06181

Palm grips

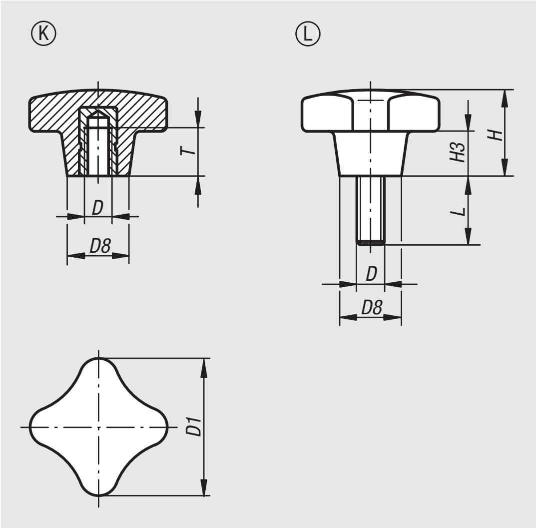
similar to DIN 6335 metal parts stainless-steel

Material:
Thermoset PF 31, black.
Metal parts stainless steel 1.4301.

Version:
High-gloss polished, black.

Sample order:
nlm 06181-22505 (Form K)
06181-52505x15 (Form L)

Drawing reference:
Form K: tapped bush
Form L: external thread

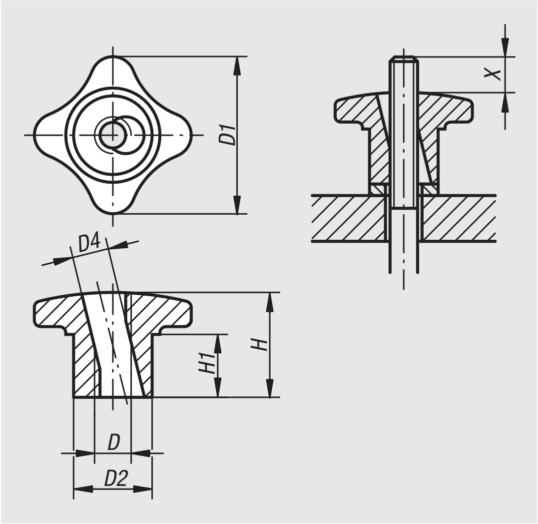


Order No.	Form	Component material	D	D1	D8	H	H3	T
06181-22505	K	stainless steel	M5	25	12	16	8	9,5
06181-23206	K	stainless steel	M6	32	14	20	10	12
06181-24008	K	stainless steel	M8	40	18	25	13	14
06181-25010	K	stainless steel	M10	50	22	32	20	18
06181-26312	K	stainless steel	M12	63	26	40	25	22

Order No.	Form	Component material	D	D1	D8	H	H3	L
06181-52505X15	L	stainless steel	M5	25	12	16	8	15
06181-52505X20	L	stainless steel	M5	25	12	16	8	20
06181-53206X15	L	stainless steel	M6	32	14	20	10	15
06181-53206X20	L	stainless steel	M6	32	14	20	10	20
06181-53206X25	L	stainless steel	M6	32	14	20	10	25
06181-53206X30	L	stainless steel	M6	32	14	20	10	30
06181-53206X40	L	stainless steel	M6	32	14	20	10	40
06181-53206X50	L	stainless steel	M6	32	14	20	10	50
06181-54008X20	L	stainless steel	M8	40	18	25	13	20
06181-54008X25	L	stainless steel	M8	40	18	25	13	25
06181-54008X30	L	stainless steel	M8	40	18	25	13	30
06181-54008X40	L	stainless steel	M8	40	18	25	13	40
06181-54008X50	L	stainless steel	M8	40	18	25	13	50

Palm grips quick-acting

grey cast iron



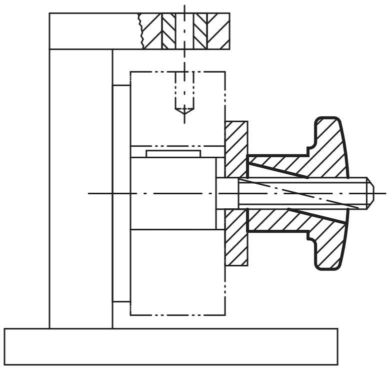
Material:
Grey cast iron GJL 300

Version:
Vibratory ground.

Sample order:
nlm 06190-08

Note:
Quick-acting palm grips can be used on all fixtures that do not require a high clamping force.
Tilt the grip to slide on, then straighten it to engage the threads.

Drawing reference:
X: The stud should be several mm longer than height “H”



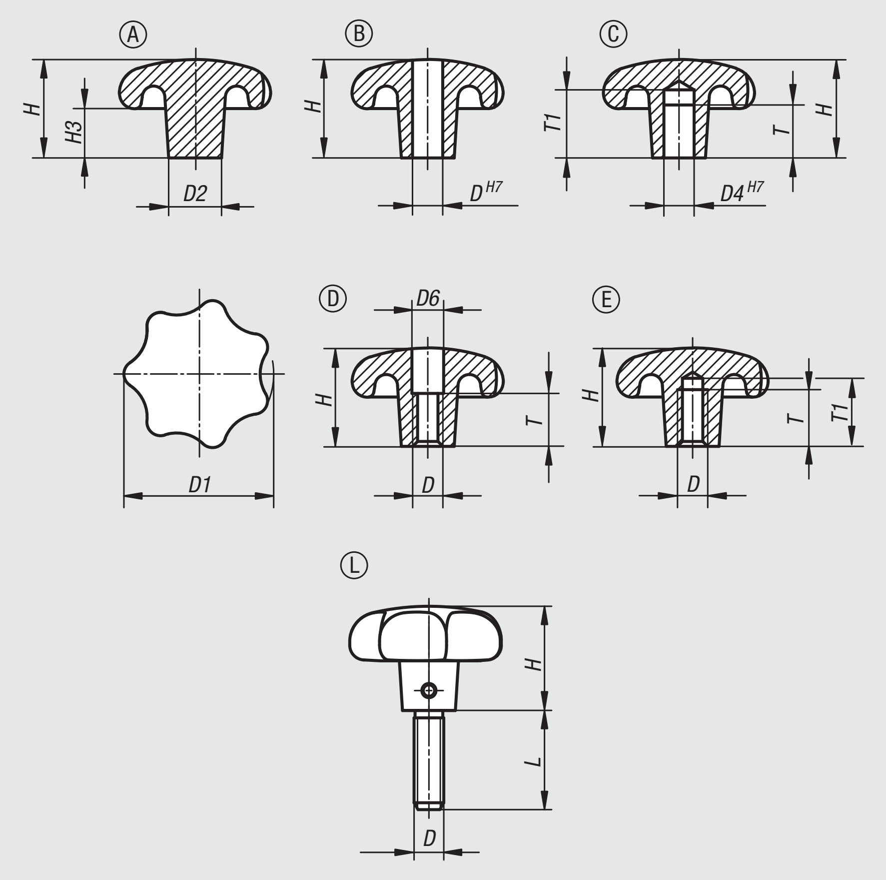
Order No.	D	D1	D2	D4	H	H1
06190-06	M6	30	15	7	20	10
06190-08	M8	40	18	9,4	25	14
06190-10	M10	50	21	11,3	30	16
06190-12	M12	60	26	13,1	35	19
06190-14	M14	70	30	15,6	40	22
06190-16	M16	80	34	17,6	45	25

Notes

06192

Star grips

aluminium, similar to DIN 6336



Material:
Aluminium.
Grub screw stainless steel 1.4305.
Pin stainless steel 1.4310.

Version:
Vibratory ground or ground and polished.
Grub screw and pin bright.

Sample order:
nlm 06192-64008X20 (include length L.)

On request:
Blank star grips (not tumbled).

Drawing reference:
Form A: blank
Form B: drilled through
Form C: blind hole
Form D: tapped and counterbored
Form E: tapped blind hole
Form L: external thread

Order No.	Form	Surface finish body	D1	D2	H	H3
06192-14008	A	tumbled	40	14	26	13
06192-15010	A	tumbled	50	18	34	17
06192-16312	A	tumbled	63	20	42	21
06192-18016	A	tumbled	80	25	52	25

Order No. tumbled	**Order No. polished**	Form	D	D1	D2	H
06192-24008	**06192-240082**	B	8	40	14	25
06192-25010	**06192-250102**	B	10	50	18	32
06192-26312	**06192-263122**	B	12	63	20	40
06192-28016	**06192-280162**	B	16	80	25	50

06192

Star grips

aluminium, similar to DIN 6336

Order No. tumbled	Order No. polished	Form	D	D1	D2	H	T	T1
06192-34008	**06192-340082**	C	8	40	14	25	15	18
06192-35010	**06192-350102**	C	10	50	18	32	18	21
06192-36312	**06192-363122**	C	12	63	20	40	22	25
06192-38016	**06192-380162**	C	16	80	25	50	28	32

Order No. tumbled	Order No. polished	Form	D	D1	D2	D6	H	T
06192-44008	**06192-440082**	D	M8	40	14	8,4	25	12
06192-45010	**06192-450102**	D	M10	50	18	10,5	32	16
06192-46312	**06192-463122**	D	M12	63	20	13	40	20
06192-48016	**06192-480162**	D	M16	80	25	17	50	30

Order No. tumbled	Order No. polished	Form	D	D1	D2	H	T	T1
06192-54008	**06192-540082**	E	M8	40	14	25	15	18
06192-55010	**06192-550102**	E	M10	50	18	32	18	21
06192-56312	**06192-563122**	E	M12	63	20	40	22	25
06192-58016	**06192-580162**	E	M16	80	25	50	28	32

Order No.	Form	Surface finish body	D	D1	D2	H	L
06192-64008X	L	tumbled	M8	40	14	25	20/25/30/40
06192-65010X	L	tumbled	M10	50	18	32	25/30/40/50
06192-66312X	L	tumbled	M12	63	20	40	30/40/50/60

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Star grips

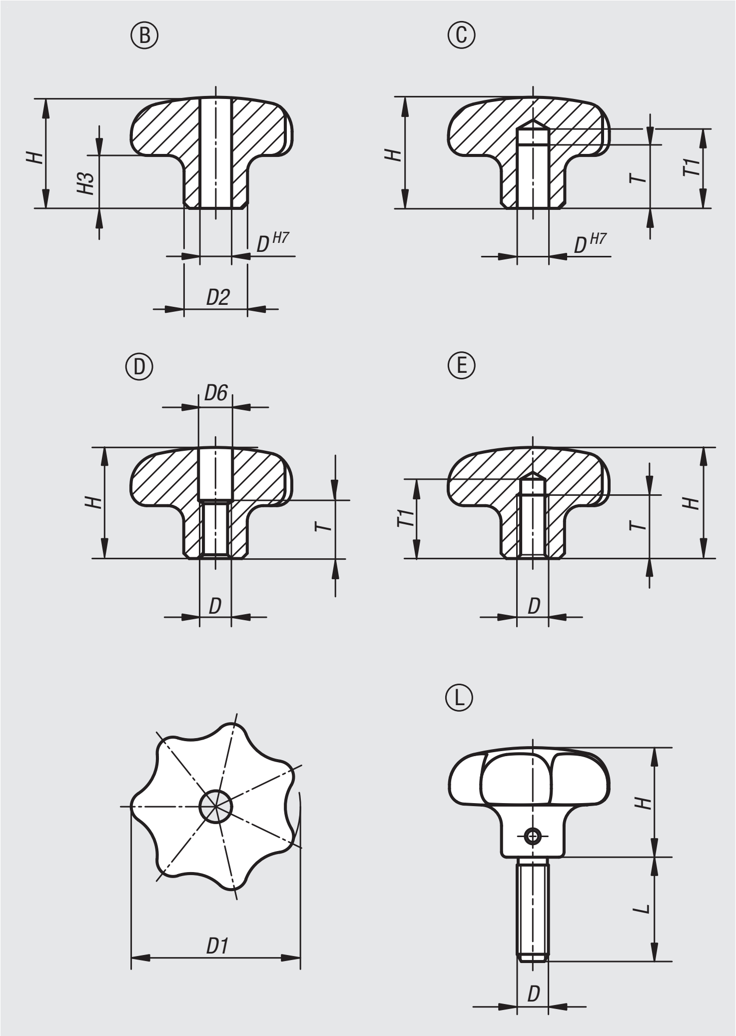
stainless steel, similar to DIN 6336

Material:
Stainless steel 1.4308.
Grub screw stainless steel 1.4305.
Pin stainless steel 1.4310.

Version:
Ground and polished or blasted.
Grub screw and pin bright.

Sample order:
nlm 06194-632063X20 (include length L.)

Drawing reference:
Form B: drilled through
Form C: blind hole
Form D: tapped and counterbored
Form E: tapped blind hole
Form L: external thread



06194

Star grips

stainless steel, similar to DIN 6336

Order No. Form B	**Order No. Form C**	Surface finish body	D	D1	D2	H	H3	T	T1
06194-232062	**06194-332062**	polished	6	32	12	21	10	-/12	-/15
06194-240082	**06194-340082**	polished	8	40	14	26	13	-/15	-/18
06194-250102	**06194-350102**	polished	10	50	18	34	17	-/18	-/21
06194-263122	**06194-363122**	polished	12	63	20	42	21	-/22	-/25
06194-232063	**06194-332063**	blasted	6	32	12	21	10	-/12	-/15
06194-240083	**06194-340083**	blasted	8	40	14	26	13	-/15	-/18
06194-250103	**06194-350103**	blasted	10	50	18	34	17	-/18	-/21
06194-263123	**06194-363123**	blasted	12	63	20	42	21	-/22	-/25

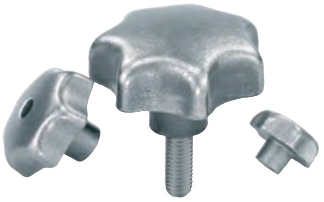
Order No. Form D	**Order No. Form E**	Surface finish body	D	D1	D2	D6	H	H3	T	T1
06194-432062	**06194-532062**	polished	M6	32	12	6,4/-	21	10	11/12	-/15
06194-440082	**06194-540082**	polished	M8	40	14	8,4/-	26	13	14/15	-/18
06194-450102	**06194-550102**	polished	M10	50	18	10,5/-	34	17	18	-/21
06194-463122	**06194-563122**	polished	M12	63	20	13/-	42	21	22	-/25
06194-432063	**06194-532063**	blasted	M6	32	12	6,4/-	21	10	11/12	-/15
06194-440083	**06194-540083**	blasted	M8	40	14	8,4/-	26	13	14/15	-/18
06194-450103	**06194-550103**	blasted	M10	50	18	10,5/-	34	17	18	-/21
06194-463123	**06194-563123**	blasted	M12	63	20	13/-	42	21	22	-/25

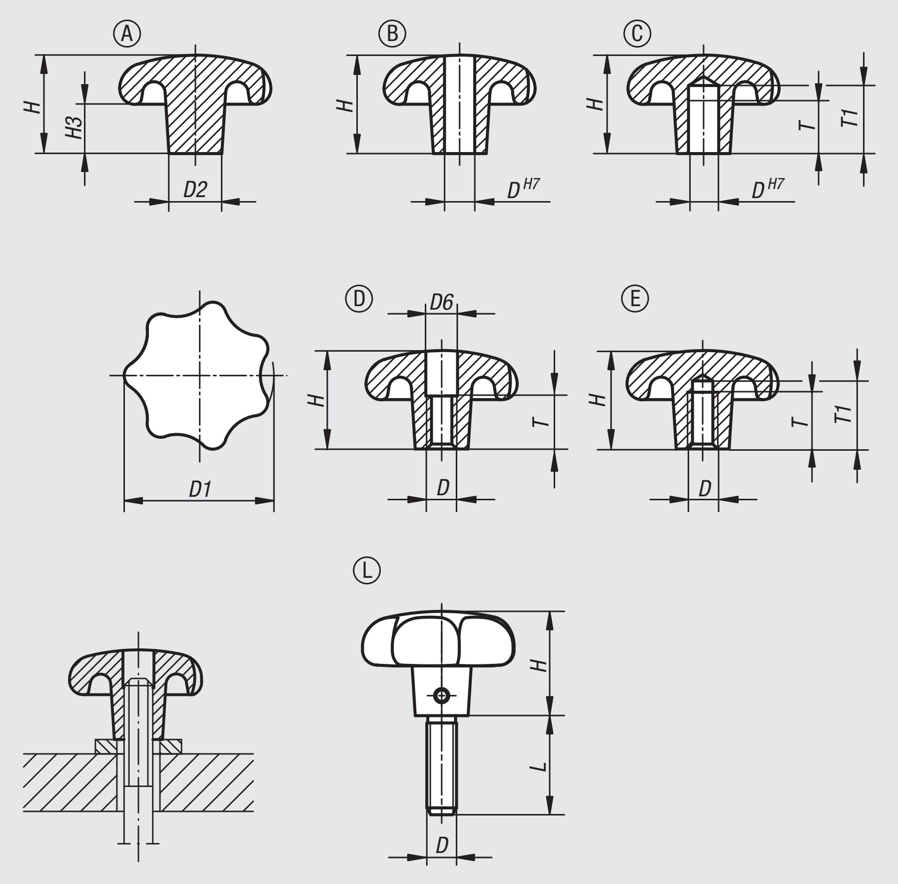
Order No.	Form	Surface finish body	D	D1	D2	H	H3	L
06194-632063X	L	blasted	M6	32	12	21	10	15/20/25/30
06194-640083X	L	blasted	M8	40	14	26	13	20/25/30/40
06194-650103X	L	blasted	M10	50	18	34	17	25/30/40/50
06194-663123X	L	blasted	M12	63	20	42	21	30/40/50/60

06200

Star grips

grey cast iron, DIN 6336





Material:
Grey cast iron GJL 200.
Grub screw stainless steel 1.4305.
Pin stainless steel 1.4310.

Version:
Vibratory ground, bright.
Grub screw and pin bright.

Sample order:
nlm 06200-606X20 (include length L.)

On request:
Grips with a plastic coating.

Drawing reference:
Form A: blank
Form B: drilled through
Form C: blind hole
Form D: tapped and counterbored
Form E: tapped blind hole
Form L: external thread

Order No. Form A	Order No. Form B	Surface finish body	D	D1	D2	H	H3
06200-106	**06200-206**	tumbled	-/6	32	12	21/20	10
06200-108	**06200-208**	tumbled	-/8	40	14	26/25	13
06200-110	**06200-210**	tumbled	-/10	50	18	34/32	17
06200-112	**06200-212**	tumbled	-/12	63	20	42/40	21
06200-116	**06200-216**	tumbled	-/16	80	25	52/50	25

Order No. Form C	Order No. Form D	Order No. Form E	Surface finish body	D	D1	D2	H	H3	T	T1
06200-306	**06200-406**	**06200-506**	tumbled	6 / M6 / M6	32	12	20	10	12/10/12	15/-/15
06200-308	**06200-408**	**06200-508**	tumbled	8 / M8 / M8	40	14	25	13	15/13/15	18/-/18
06200-310	**06200-410**	**06200-510**	tumbled	10 / M10 / M10	50	18	32	17	18/16/18	21/-/21
06200-312	**06200-412**	**06200-512**	tumbled	12 / M12 / M12	63	20	40	21	22/20/22	25/-/25
06200-316	**06200-416**	**06200-516**	tumbled	16 / M16 / M16	80	25	50	25	28/20/28	32/-/32

Order No.	Form	Surface finish body	D	D1	D2	H	L
06200-606X	L	tumbled	M6	32	12	20	15/20/25/30
06200-608X	L	tumbled	M8	40	14	25	20/25/30/40
06200-610X	L	tumbled	M10	50	18	32	25/30/40/50
06200-612X	L	tumbled	M12	63	20	40	30/40/50/60

Star grips

similar to DIN 6336

Material:
Thermoset PF 31, black.
Bush and screw steel, trivalent blue passivated.

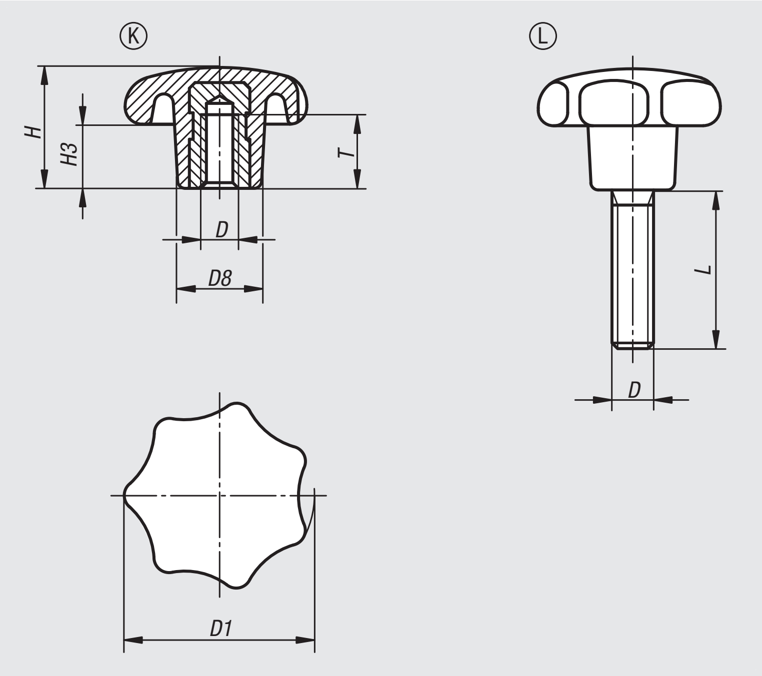
Version:
High-gloss polished.

Sample order:
nlm 06208-42505X15 (include length L)

Note:
The version 06208-22004 has a brass bush.

On request:
Other colours.

Drawing reference:
Form K: tapped bush
Form L: external thread

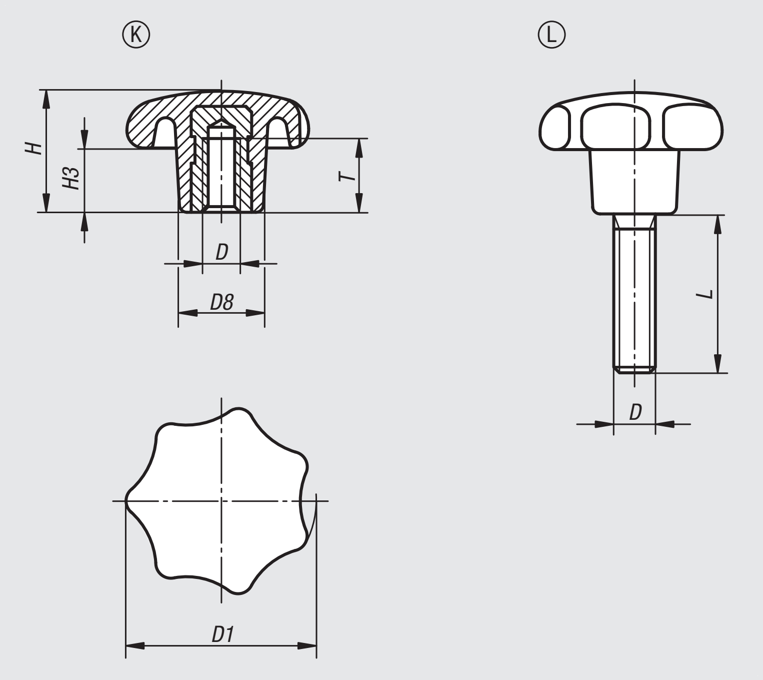


Order No.	Form	D	D1	D8	H	H3	T
06208-22004	K	M4	20	10	13	7	6,5
06208-22505	K	M5	25	12	16	8	9,5
06208-23206	K	M6	32	14	20	10	12
06208-24008	K	M8	40	18	25	13	14
06208-25010	K	M10	50	22	32	17	18
06208-26312	K	M12	63	26	40	21	22
06208-28016	K	M16	80	35	50	25	30

Order No.	Form	D	D1	D8	H	H3	L
06208-42505X	L	M5	25	12	16	8	15/20/25
06208-43206X	L	M6	32	14	20	10	15/20/25/30
06208-44008X	L	M8	40	18	25	13	20/25/30/35/40
06208-45010X	L	M10	50	22	32	17	25/30/35/40/50
06208-46312X	L	M12	63	26	40	21	30/35/40/50/60
06208-48016X	L	M16	80	35	50	25	30/40/50/60

Star grips

similar to DIN 6336, metal parts stainless steel



Material:
Thermoset PF 31, black.
Bushing or threaded pin stainless steel 1.4301.

Version:
High-gloss polished.

Sample order:
nlm 06209-43206X20 (include length L)

On request:
Other colours.

Drawing reference:
Form K: tapped bush
Form L: external thread

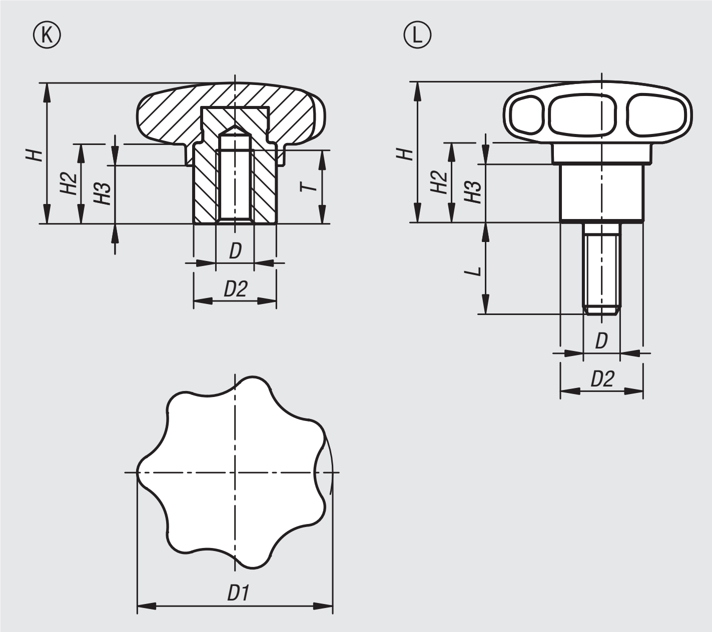
Order No.	Form	D	D1	D8	H	H3	T
06209-22505	K	M5	25	12	16	8	7,5
06209-23206	K	M6	32	14	20	10	12
06209-24008	K	M8	40	18	25	13	14
06209-25010	K	M10	50	22	32	17	18
06209-26312	K	M12	63	26	40	21	22
06209-28016	K	M16	80	35	50	25	24

Order No.	Form	D	D1	D8	H	H3	L
06209-42505X	L	M5	25	12	16	8	15/20/25
06209-43206X	L	M6	32	14	20	10	15/20/25/30/40
06209-44008X	L	M8	40	18	25	13	20/25/30/40/50
06209-45010X	L	M10	50	22	32	17	25/30/40/50
06209-46312X	L	M12	63	26	40	21	30/40/50/60
06209-48016X	L	M16	80	35	50	25	30/40/50/60

06209-01

Star grips, plastic

with protruding steel bush



The thermoset star grip is distinguished by its closed grip contour. The contact surface of the protruding steel bush is vertical to the thread axis and ensures a firm screw connection.

Material:
Thermoset PF 31.
Steel grade 5.8 or stainless steel 1.4305.

Version:
Thermoset black, high-gloss polished.
Metal parts trivalent blue passivated steel or bright stainless steel.

Sample order:
nlm 06209-01-43206X10 (include length L)

Advantages:
Wear resistant contact surface
Closed grip contour

On request:
Form H: bush with blind hole

Drawing reference:
Form K: tapped bush
Form L: external thread

Star grips plastic with protruding steel bush, internal thread, Form K

Order No. steel	Order No. stainless steel	Form	D	D1	D2	H	H2	H3	T
06209-01-23206	**06209-01-33206**	K	M6	32	13,5	23	13	9,5	12
06209-01-24006	**06209-01-34006**	K	M6	40	13,5	25	13	10	12
06209-01-24008	**06209-01-34008**	K	M8	40	13,5	25	13	10	12
06209-01-25008	**06209-01-35008**	K	M8	50	19	32	17	12	17
06209-01-25010	**06209-01-35010**	K	M10	50	19	32	17	12	17
06209-01-26310	**06209-01-36310**	K	M10	63	19	40	20	15	17
06209-01-26312	**06209-01-36312**	K	M12	63	19	40	20	15	17

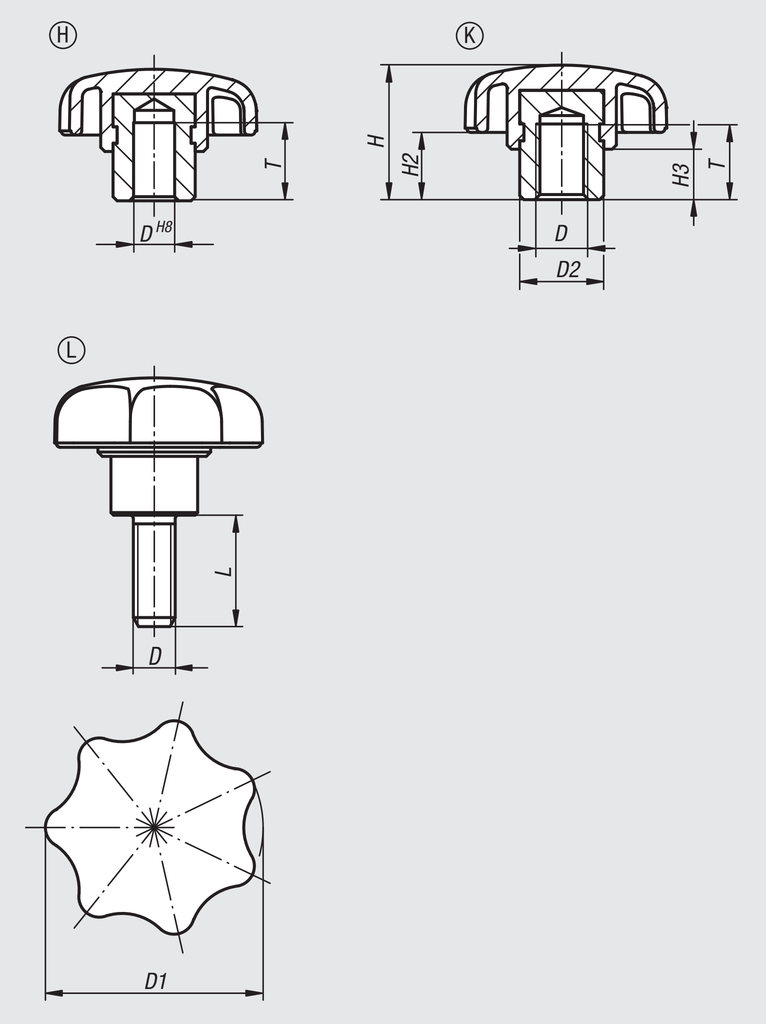
Star grips plastic with protruding steel bush, external thread, Form L

Order No. steel	Order No. stainless steel	Form	D	D1	D2	H	H2	H3	L
06209-01-43206X	**06209-01-53206X**	L	M6	32	13,5	23	13	9,5	10/15/20/25/30
06209-01-44008X	**06209-01-54008X**	L	M8	40	13,5	25	13	10	15/20/25/30/40/50
06209-01-45010X	**06209-01-55010X**	L	M10	50	19	32	17	12	20/25/30/40/50/60
06209-01-46312X	**06209-01-56312X**	L	M12	63	19	40	20	15	20/25/30/40/50/60

06210

Star grips

with projecting steel bush



Material:
Black thermoplastic.
Steel grade 5.8 or stainless steel 1.4305.

Version:
Metal parts trivalent blue passivated steel or bright stainless steel.

Sample order:
nlm 06210-405X20 (include length L.)

Note:
Star grips with projecting steel bush and blind hole or female thread are especially suited for cross pinning.

Drawing reference:
Form H: bush with blind hole
Form K: tapped bush
Form L: external thread

06210

Star grips

with projecting steel bush

Order No.	Form	Component material	D	D1	D2	H	H2	H3	T
06210-105	H	steel	5	25	10	17	9	7	9,5
06210-106	H	steel	6	32	13,5	21	11	9,5	12,5
06210-1061	H	steel	6	40	13,5	25	13	10	12,5
06210-108	H	steel	8	40	13,5	25	13	10	12,5
06210-1081	H	steel	8	50	19	32	17	12	19,5
06210-110	H	steel	10	50	19	32	17	12	19,5
06210-1101	H	steel	10	63	19	37	18	12	19,5
06210-112	H	steel	12	63	19	37	18	12	19,5
06210-116	H	steel	16	63	23	40	21	15	24,5

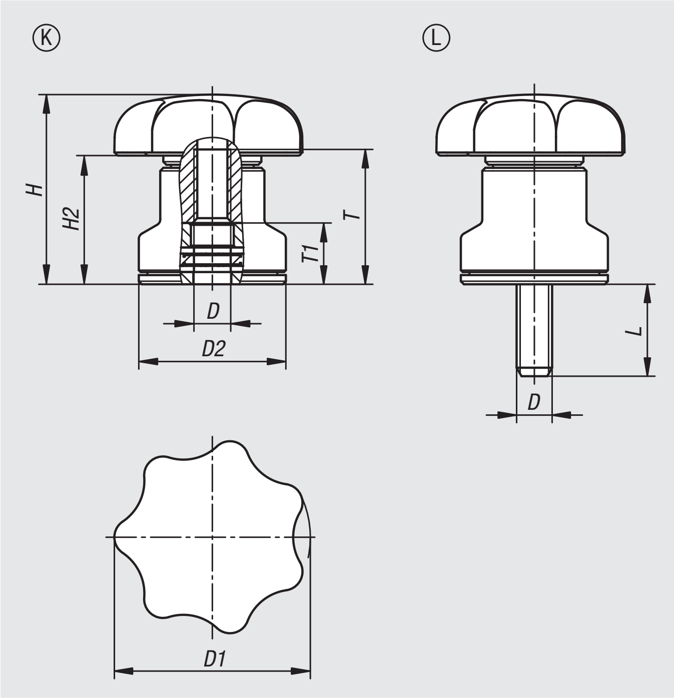
Order No. steel	Order No. stainless steel	Form	D	D1	D2	H	H2	H3	T
06210-205	**06210-305**	K	M5	25	10	17	9	7	9
06210-206	**06210-306**	K	M6	32	13,5	21	11	9,5	12
06210-2061	**06210-3061**	K	M6	40	13,5	25	13	10	12
06210-208	**06210-308**	K	M8	40	13,5	25	13	10	12
06210-2081	**06210-3081**	K	M8	50	19	32	17	12	17
06210-210	**06210-310**	K	M10	50	19	32	17	12	17
06210-2101	**06210-3101**	K	M10	63	19	37	18	12	17
06210-212	**06210-312**	K	M12	63	19	37	18	12	17
06210-216	**06210-316**	K	M16	63	23	40	21	15	23

Order No. steel	Order No. stainless steel	Form	D	D1	D2	H	H2	H3	L
06210-405X	**06210-505X**	L	M5	25	10	17	9	7	10/15/20
06210-406X	**06210-506X**	L	M6	32	13,5	21	11	9,5	10/15/20/25/30
06210-408X	**06210-508X**	L	M8	40	13,5	25	13	10	15/20/25/30/40/50
06210-410X	**06210-510X**	L	M10	50	19	32	17	12	20/25/30/40/50/60
06210-412X	**06210-512X**	L	M12	63	19	37	18	12	20/25/30/40/50/60

06210-10

Star grips, plastic

with clamping force intensifier



Star grips with integrated clamping force intensifier can achieve double the clamping force compared to standard star grips.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the star grip.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Due to the modular construction many special designs are available.

Material:
Star grip polyamide thermoplastic, black.
Steel parts 5.8 steel or stainless steel 1.4305.

Version:
Metal parts trivalent blue passivated steel or bright stainless steel.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06210-10-406X20 (include length L.)

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Other thread lengths.

Drawing reference:
Form K: tapped bush
Form L: external thread

Plastic star grip with clamping force intensifier, Form K

Order No. steel	Order No. stainless steel	Form	D	D1	D2	H	H2	T	T1
06210-10-206	**06210-10-306**	K	M6	32	24	31	21	22	10
06210-10-208	**06210-10-308**	K	M8	40	25	35	23	22	10
06210-10-210	**06210-10-310**	K	M10	50	30	42	27	27	10
06210-10-212	**06210-10-312**	K	M12	63	35	47	28	27	10

Plastic star grip with clamping force intensifier, Form L

Order No. steel	Order No. stainless steel	Form	D	D1	D2	H	H2	L
06210-10-406X	**06210-10-506X**	L	M6	32	24	31	21	10/20
06210-10-408X	**06210-10-508X**	L	M8	40	25	35	23	15/30
06210-10-410X	**06210-10-510X**	L	M10	50	30	42	27	20/30
06210-10-412X	**06210-10-512X**	L	M12	63	35	47	28	20/30

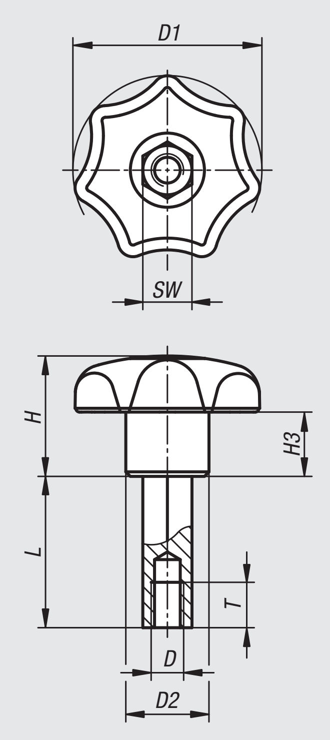
Star grips

with extended collar

Material:
Thermoplastic, black.
Extension piece, 1.0718 free-cutting steel .

Version:
Extension piece, trivalent blue passivated.

Sample order:
nlm 06211-320508020
(include length L e.g. 020 for L = 20 mm.)

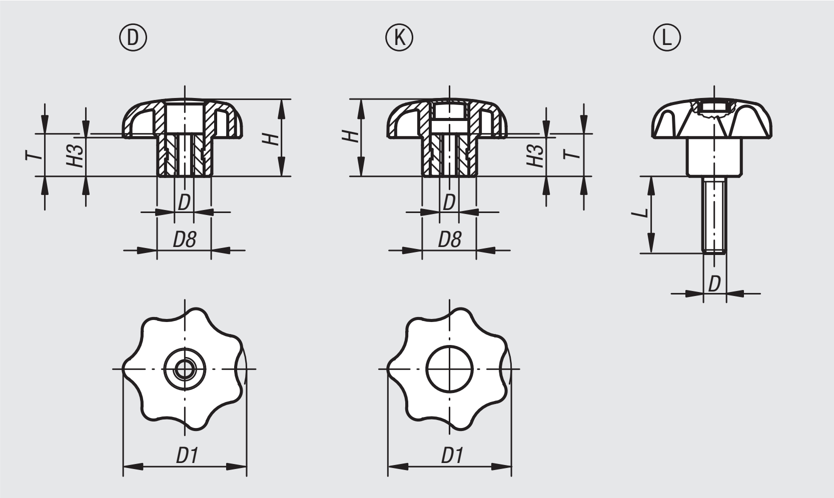


Order No.	D	D1	D2	H	H3	L	SW	T
06211-320508* **	M5	32	14	20	10	20/25/30	8	8
06211-400610* **	M6	40	18	25	13	20/25/30/40/50	10	9
06211-500813* **	M8	50	22	32	17	20/25/30/40/50/80	13	12
06211-631016* **	M10	63	26	40	21	25/30/40/50/80/100	16	15

06212

Star grips

metal parts stainless steel, similar to DIN 6336



Material:
Black thermoplastic.
Bush and screw stainless steel 1.4305.

Version:
Bush and screw bright.

Sample order:
nlm 06212-4067X30
(cap colour colza yellow; include length L)

Note:
Δ Add the desired cap colour code here. No colour code is required for black caps.

On request:
Other colours or designs, such as company logo.

Drawing reference:
Form D: tapped bush without cap
Form K: tapped bush with cap
Form L: external thread

black	light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7
	 RAL 7035	 RAL 3020	 RAL 1021

Order No.	Form	D	D1	D8	H	H3	T
06212-505	D	M5	25	12	16	8	10
06212-506	D	M6	32	14	20	10	10
06212-508	D	M8	40	18	25	13	14
06212-510	D	M10	50	22	32	17	14
06212-512	D	M12	63	26	40	21	18

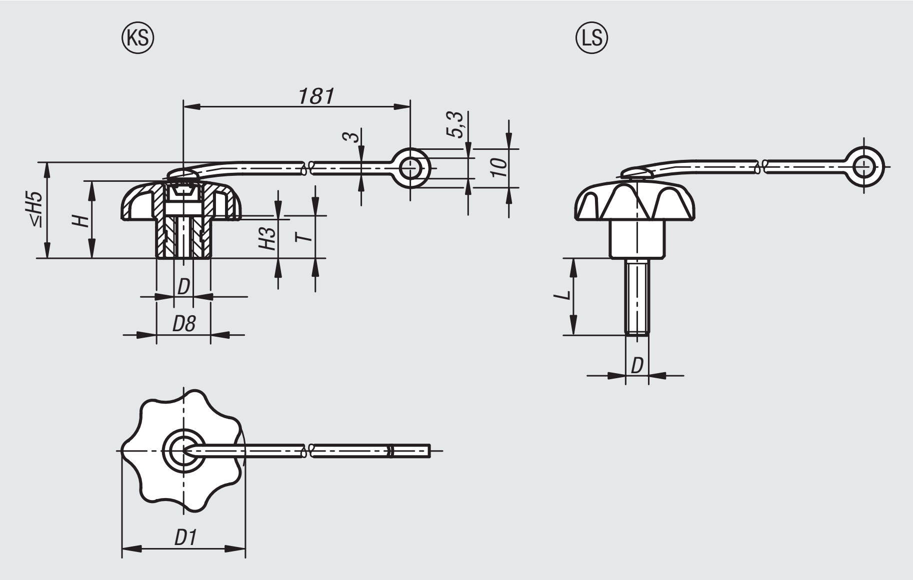
Order No.	Form	D	D1	D8	H	H3	T
06212-205Δ	K	M5	25	12	16	8	10
06212-206Δ	K	M6	32	14	20	10	10
06212-208Δ	K	M8	40	18	25	13	14
06212-210Δ	K	M10	50	22	32	17	14
06212-212Δ	K	M12	63	26	40	21	18

Order No.	Form	D	D1	D8	H	H3	L
06212-405ΔX	L	M5	25	12	16	8	15/20
06212-406ΔX	L	M6	32	14	20	10	20/30
06212-408ΔX	L	M8	40	18	25	13	15/20/25/30/40/60
06212-410ΔX	L	M10	50	22	32	17	25/30/40/50/60

06212

Star grips with safety cable

metal parts stainless steel, similar to DIN 6336



Material:
Grip thermoplastic.
Bush and screw stainless steel 1.4305.
Safety cable elastic TPU.

Version:
Bush and screw bright.

Sample order:
nlm 06212-7056X15 (cap colour: traffic red; include length L)

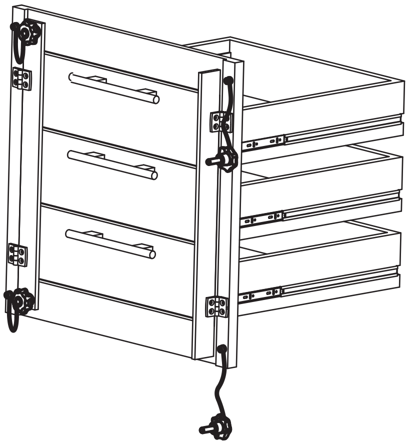
Note:
Δ Add the desired cap colour code here. No colour code is required for black caps.

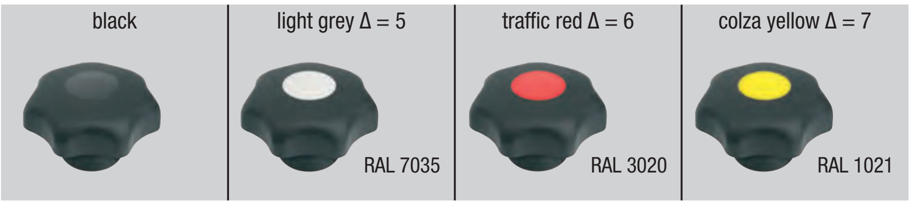
Attach the safety cable to a base to make the star grip unlosable.
The star grip cannot be moved far from the object to which it belongs, simplifying screwing and unscrewing of the grip and ensuring against loss.

Assembly:
Do not stretch the band during assembly.
Make sure that the anchor is not too far from where the star grip is to be used.

Accessories:
The safety cable is also available as an accessory, see 03198-04190.

Drawing reference:
Form KS: tapped bush, with cap
Form LS: male thread





Order No.	Form	D	D1	D8	H	H3	H5 max.	T
06212-605Δ	KS	M5	25	12	16	8	22	10
06212-606Δ	KS	M6	32	14	20	10	26	10
06212-608Δ	KS	M8	40	18	25	13	31	14
06212-610Δ	KS	M10	50	22	32	17	38	14
06212-612Δ	KS	M12	63	26	40	21	46	18

Order No.	Form	D	D1	D8	H	H3	H5 max.	L
06212-705ΔX	LS	M5	25	12	16	8	22	15/20
06212-706ΔX	LS	M6	32	14	20	10	26	20/30
06212-708ΔX	LS	M8	40	18	25	13	31	15/20/25/30/40/60
06212-710ΔX	LS	M10	50	22	32	17	38	25/30/40/50/60

Star grips

similar to DIN 6336

Material:
Black thermoplastic.
Bush and screw steel.

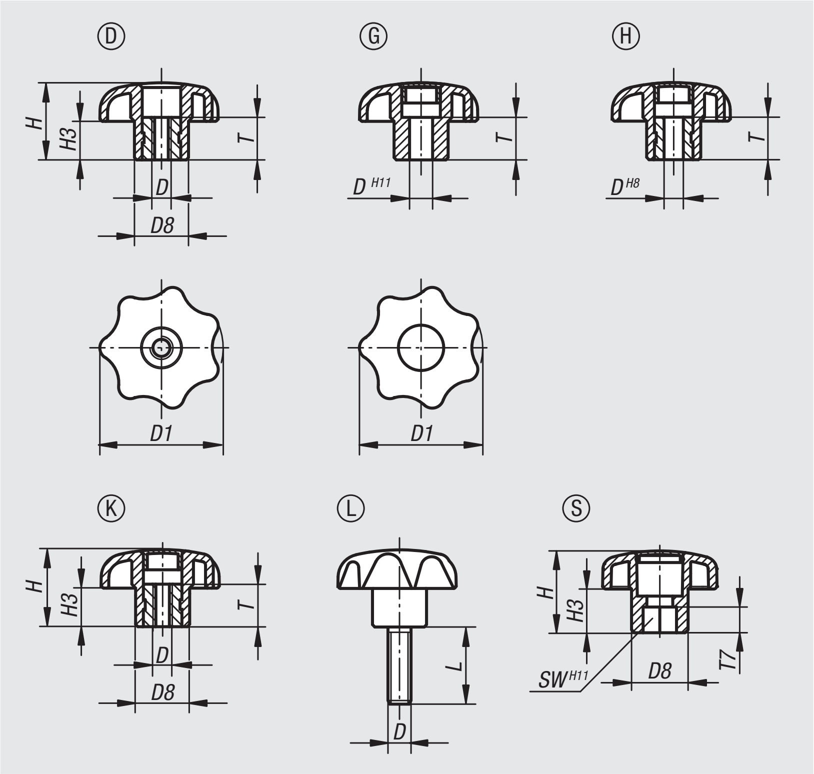
Version:
Bush and screw trivalent blue passivated.

Sample order:
nlm 06220-4127X30 (cap colour colza yellow; include length L)

Note:
˜ Add the desired cap colour code here. No colour code is required for black caps.

On request:
Other colours or designs, such as company logo.

Drawing reference:
Form D: tapped bush without cap
Form G: without bush
Form H: with reamed bush
Form K: tapped bush with cap
Form L: external thread
Form S: hexagon



examples of grip cap designs

black	light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7
	 RAL 7035	 RAL 3020	 RAL 1021

Order No.	Form	D	D1	D8	H	H3	T
06220-504	D	M4	25	12	16	8	10
06220-505	D	M5	25	12	16	8	10
06220-5061	D	M6	25	12	16	8	10
06220-5051	D	M5	32	14	20	10	10
06220-506	D	M6	32	14	20	10	10
06220-508	D	M8	40	18	25	13	14
06220-5101	D	M10	40	18	25	13	14
06220-5081	D	M8	50	22	32	17	14
06220-510	D	M10	50	22	32	17	14
06220-5121	D	M12	50	22	32	17	18
06220-5102	D	M10	63	26	40	21	14
06220-512	D	M12	63	26	40	21	18
06220-516	D	M16	63	26	40	21	18

Star grips

similar to DIN 6336

Order No. Form G	Order No. Form H	D	D1	D8	H	H3	T
06220-305Δ	06220-105Δ	5	25	12	16	8	10
06220-306Δ	06220-106Δ	6	32	14	20	10	10
06220-308Δ	06220-108Δ	8	40	18	25	13	14
06220-310Δ	06220-110Δ	10	50	22	32	17	14
-	06220-1101Δ	10	63	26	40	21	14
06220-312Δ	06220-112Δ	12	63	26	40	21	18

Order No.	Form	D	D1	D8	H	H3	T
06220-204Δ	K	M4	25	12	16	8	10
06220-205Δ	K	M5	25	12	16	8	10
06220-2061Δ	K	M6	25	12	16	8	10
06220-2051Δ	K	M5	32	14	20	10	10
06220-206Δ	K	M6	32	14	20	10	10
06220-208Δ	K	M8	40	18	25	13	14
06220-2101Δ	K	M10	40	18	25	13	14
06220-2081Δ	K	M8	50	22	32	17	14
06220-210Δ	K	M10	50	22	32	17	14
06220-2121Δ	K	M12	50	22	32	17	18
06220-2102Δ	K	M10	63	26	40	21	14
06220-212Δ	K	M12	63	26	40	21	18
06220-216Δ	K	M16	63	26	40	21	18

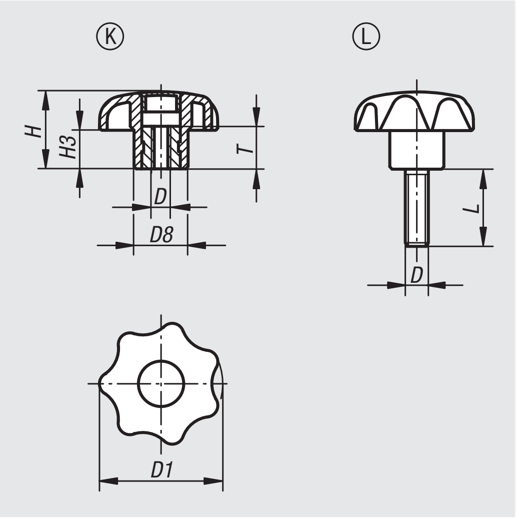
Order No.	Form	D	D1	D8	H	H3	L
06220-405ΔX	L	M5	25	12	16	8	10/15/20/25/30/35/40/45/50/60
06220-406ΔX	L	M6	25	12	16	8	10/15/20/25/30/35/40/45/50/60
06220-4061ΔX	L	M6	32	14	20	10	10/15/20/25/30/35/40/45/50/60
06220-408ΔX	L	M8	32	14	20	10	15/20/25/30/35/40/45/50/60
06220-4081ΔX	L	M8	40	18	25	13	15/20/25/30/35/40/45/50/60
06220-410ΔX	L	M10	40	18	25	13	15/20/25/30/35/40/45/50/60
06220-4101ΔX	L	M10	50	22	32	17	15/20/25/30/35/40/45/50/60
06220-412ΔX	L	M12	50	22	32	17	15/20/25/30/35/40/45/50/60
06220-4102ΔX	L	M10	63	26	40	21	20/25/30/35/40/45/50/60
06220-4121ΔX	L	M12	63	26	40	21	20/25/30/35/40/45/50/60
06220-416ΔX	L	M16	63	26	40	21	30/35/40/45/50/60

Order No.	Form	D1	D8	H	H3	SW	T7
06220-808	S	32	14	20	10	8	5
06220-810	S	40	18	25	13	10	10
06220-813	S	50	22	32	17	13	10
06220-816	S	63	26	40	21	16	15

06220

Star grips antistatic

similar to DIN 6336



Material:
Thermoplastic, graphite black.
Bush or screw steel 5.8.

Version:
Screw blue passivated.

Sample order:
nlm 06220-1120824

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Drawing reference:
Form K: tapped bush, with cap
Form L: external thread

Order No.	Form	D	D1	D8	H	H3	T
06220-1120824	K	M8	40	18	25	13	14

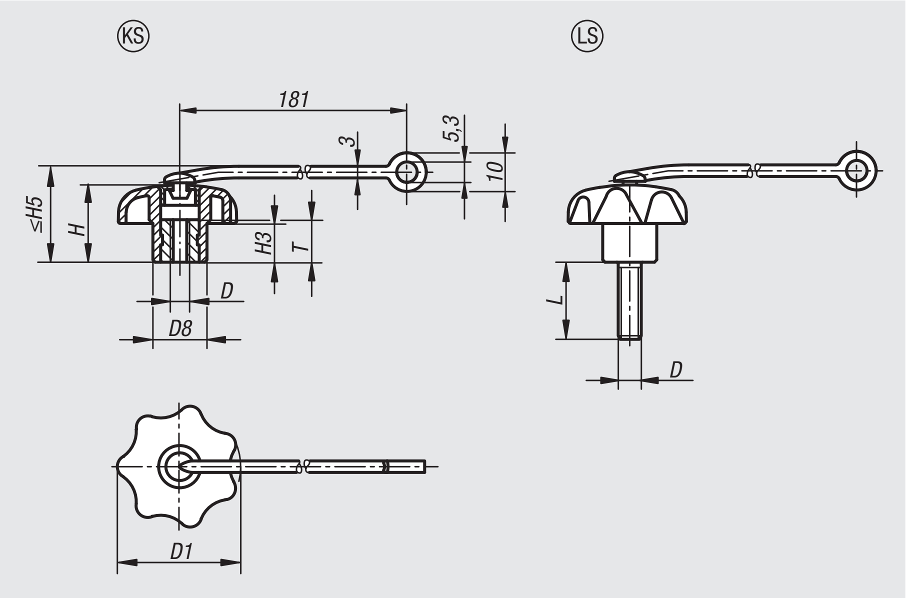
Order No.	Form	D	D1	D8	H	H3	L
06220-11408124X25	L	M8	40	18	25	13	25

Notes

06220

Star grips with safety cable

similar to DIN 6336



Material:
Grip thermoplastic.
Bush and screw steel.
Safety cable elastic TPU.

Version:
Bush and screw bright.

Sample order:
nlm 06220-7056X15
(cap colour traffic red; include length L)

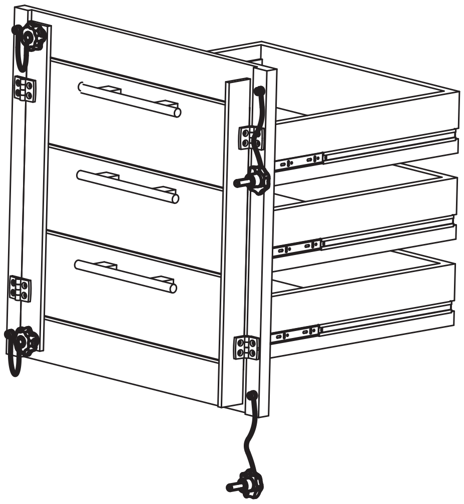
Note:
Δ Add the desired cap colour code here. No colour code is required for black caps.

Attach the safety cable to a base to make the star grip unlosable. The star grip cannot be moved far from the object to which it belongs, simplifying screwing and unscrewing of the grip and ensuring against loss.

Assembly:
Do not stretch the band during assembly.
Make sure that the anchor is not too far from where the star grip is to be used.

Accessories:
The safety cable is also available as an accessory, see 03198-04190.

Drawing reference:
Form KS: tapped bush, with cap
Form LS: male thread



Star grips with safety cable

similar to DIN 6336

black

light grey Δ = 5

traffic red Δ = 6

colza yellow Δ = 7

Order No.	Form	D	D1	D8	H	H3	H5 max.	T
06220-604Δ	KS	M4	25	12	16	8	22	10
06220-605Δ	KS	M5	25	12	16	8	22	10
06220-6061Δ	KS	M6	25	12	16	8	22	10
06220-6051Δ	KS	M5	32	14	20	10	26	10
06220-606Δ	KS	M6	32	14	20	10	26	10
06220-608Δ	KS	M8	40	18	25	13	31	14
06220-6101Δ	KS	M10	40	18	25	13	31	14
06220-6081Δ	KS	M8	50	22	32	17	38	14
06220-610Δ	KS	M10	50	22	32	17	38	14
06220-6121Δ	KS	M12	50	22	32	17	38	14
06220-6102Δ	KS	M10	63	26	40	21	46	14
06220-612Δ	KS	M12	63	26	40	21	46	14
06220-616Δ	KS	M16	63	26	40	21	46	14

Order No.	Form	D	D1	D8	H	H3	H5 max.	L
06220-705ΔX	LS	M5	25	12	16	8	22	10/15/20/25/30/35/40/45/50/60
06220-706ΔX	LS	M6	25	12	16	8	22	10/15/20/25/30/35/40/45/50/60
06220-7061ΔX	LS	M6	32	14	20	10	26	10/15/20/25/30/35/40/45/50/60
06220-708ΔX	LS	M8	32	14	20	10	26	15/20/25/30/35/40/45/50/60
06220-7081ΔX	LS	M8	40	18	25	13	31	15/20/25/30/35/40/45/50/60
06220-710ΔX	LS	M10	40	18	25	13	31	15/20/25/30/35/40/45/50/60
06220-7101ΔX	LS	M10	50	22	32	17	38	15/20/25/30/35/40/45/50/60
06220-712ΔX	LS	M12	50	22	32	17	38	15/20/25/30/35/40/45/50/60
06220-7102ΔX	LS	M10	63	26	40	21	46	20/25/30/35/40/45/50/60
06220-7121ΔX	LS	M12	63	26	40	21	46	20/25/30/35/40/45/50/60
06220-716ΔX	LS	M16	63	26	40	21	46	30/35/40/45/50/60

06222

Star grips quick-acting

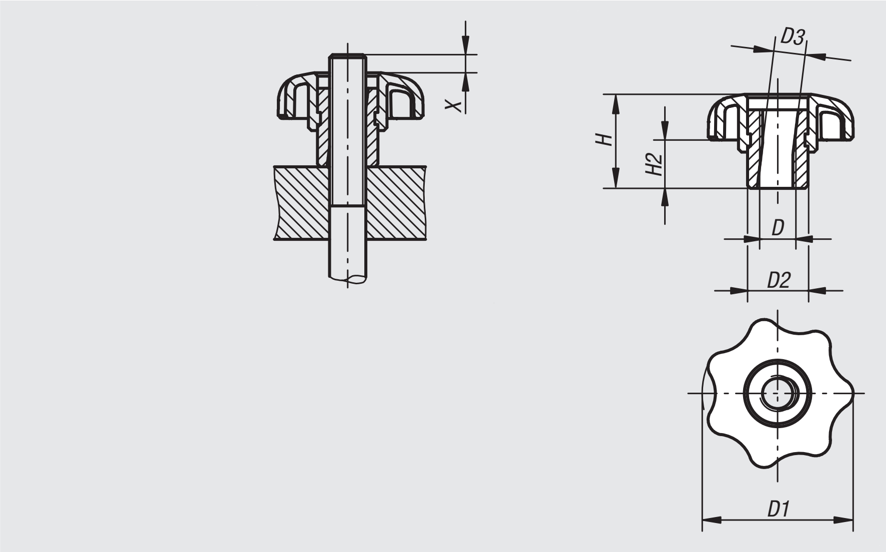
Material:
Black thermoplastic.
Bush steel.

Version:
Bush trivalent blue passivated

Sample order:
nlm 06222-06

Note:
Quick-acting star grips can be used on all fixtures that do not require a high clamping force.
Tilt the grip to slide on, then straighten it to engage the threads.

Drawing reference:
X: The stud should be several mm longer than height "H1"



Order No.	D	D1	D2	D3	H	H2
06222-05	M5	25	10	5,2	16,6	9
06222-06	M6	32	13,5	6,2	20,6	11
06222-08	M8	40	13,5	8,3	24,5	13
06222-10	M10	50	19	10,3	31,2	17
06222-12	M12	63	19	12,7	39,3	21

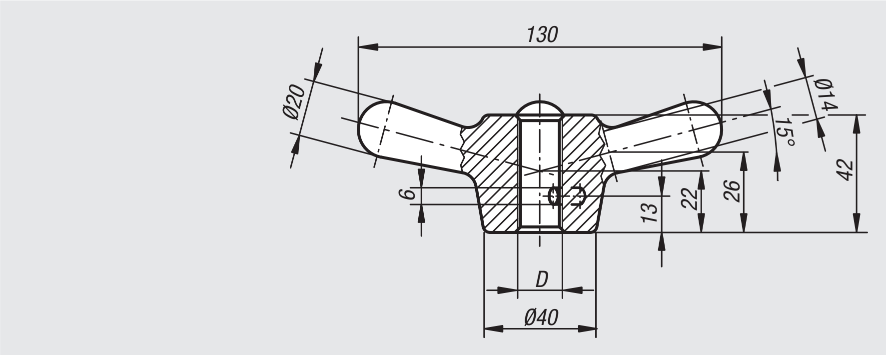
06230

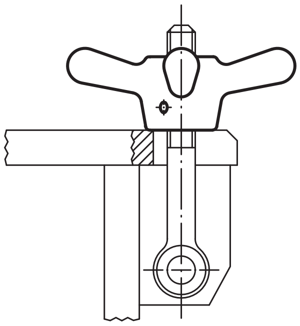
Four-spoked nuts

Material:
GJMW 350 malleable cast iron

Version:
Deburred and sand-blasted

Sample order:
nlm 06230-20





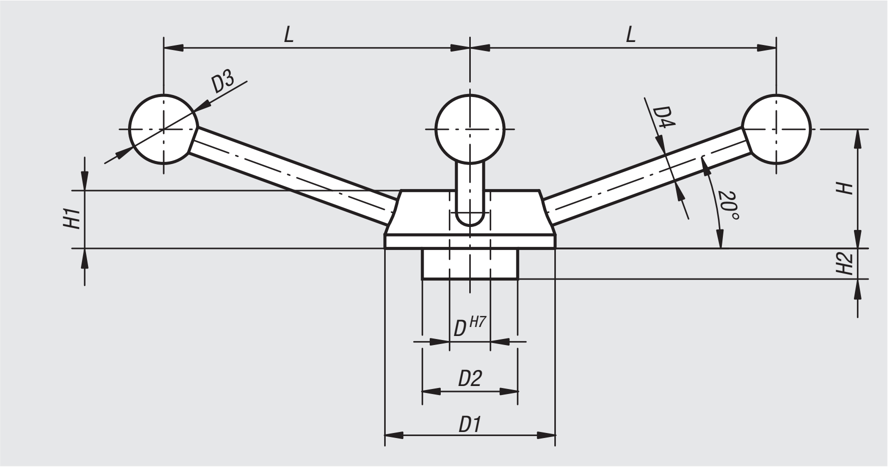
Order No.	D
06230-16	M16
06230-20	M20
06230-24	M24

Capstan wheel

Material:
Wheel steel.
Ball knop thermoplastic.

Version:
Wheel black oxidised.
Ball knob black.

Sample order:
nlm 06235-160



Order No.	D	D1	D2	D3	D4	H	H1	H2	L
06235-120	12	50	28	20	8	35	17	9	90
06235-140	14	55	30	25	10	38	18	10	99
06235-160	16	65	35	30	12	45	20	12	119
06235-200	20	80	44	40	14	56	24	16	150

Notes

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

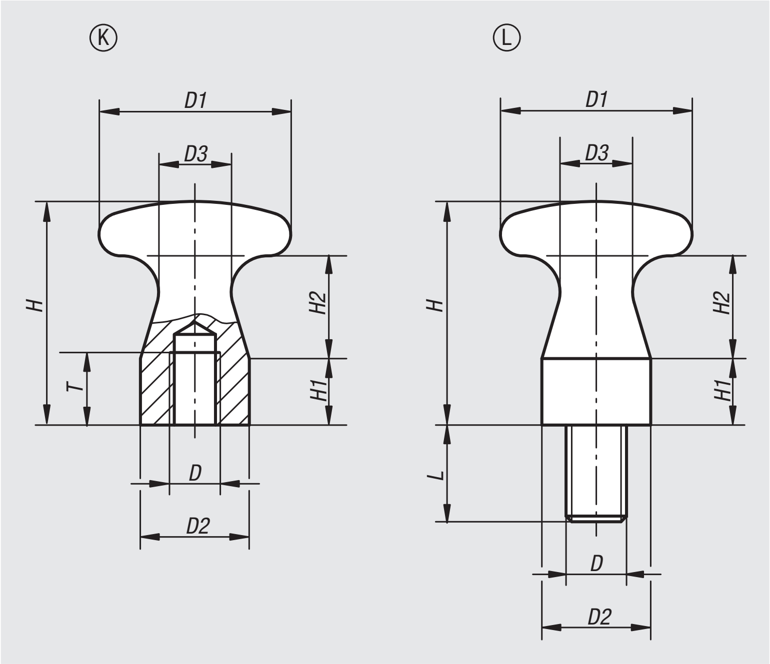
06237

Knobs flat

Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 06237-08



Knobs flat, internal thread

Order No.	Form	D	D1	D2	D3	H	H1	H2	T
06237-05	K	M5	16	10	6	18	5	9	7
06237-06	K	M6	25	14	10	29	9	13	9
06237-08	K	M8	32	18	12	37	11	17	12
06237-10	K	M10	36	20	13	42	12	20	15

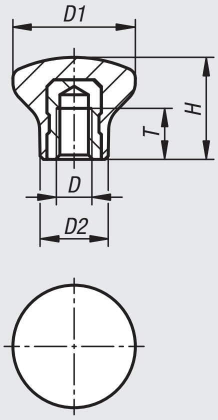
Knobs flat, external thread

Order No.	Form	D	D1	D2	D3	H	H1	H2	L
06237-06010	L	M6	16	10	6	18	5	9	10
06237-08014	L	M8	25	14	10	29	9	13	14
06237-10016	L	M10	32	18	12	37	11	17	16
06237-12018	L	M12	36	20	13	42	12	20	18

06238

Mushroom knobs

internal thread



Material:
Thermoset PF 31.
Steel or stainless steel.

Version:
Thermoset black, high-gloss polished.
Trivalent blue passivated steel or bright stainless steel.

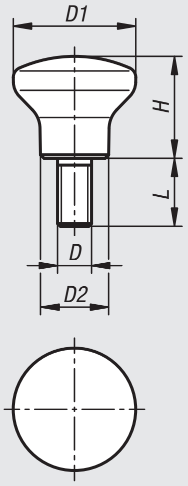
Sample order:
nlm 06238-1805

Order No. steel	Order No. stainless steel	D	D1	D2	H	T
06238-1805	**06238-11805**	M5	18	10	15	7,5
06238-2106	**06238-12106**	M6	21	12	17	9
06238-2506	**06238-12506**	M6	25	14	21	9
06238-3308	**06238-13308**	M8	33	18	29	12

06239

Mushroom knobs

external thread



Material:
Thermoset PF 31.
Steel or stainless steel.

Version:
Thermoset black, high-gloss polished.
Trivalent blue passivated steel or bright stainless steel.

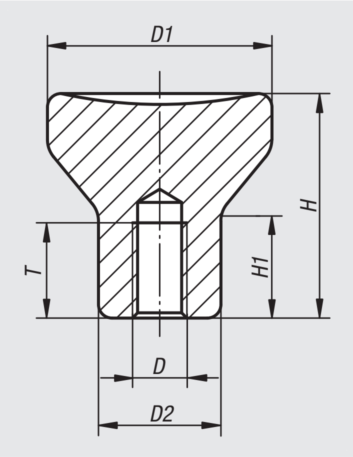
Sample order:
nlm 06239-1805X10

On request:
Other screw lengths.

Order No. steel	Order No. stainless steel	D	D1	D2	H	L
06239-1805X10	**06239-11805X10**	M5	18	10	15	10
06239-2106X10	**06239-12106X10**	M6	21	12	17	10
06239-2506X10	**06239-12506X10**	M6	25	14	21	10
06239-3308X15	**06239-13308X15**	M8	33	18	29	15

Mushroom knobs

with internal thread



Material:
Steel, stainless steel or aluminium.

Version:
Steel trivalent blue passivated.
Stainless steel electropolished or blasted.
Aluminium natural tone anodised.

Sample order:
nlm 06240-104

On request:
With external threads.

Order No.	Main material	Surface finish body	D	D1	D2	H	H1	T
06240-0902	steel	blue-passivated	M2	14	8	14	6,7	4
06240-0003	steel	blue-passivated	M3	18	10	18	8,6	7,5
06240-0104	steel	blue-passivated	M4	21	12	21	10	10
06240-0105	steel	blue-passivated	M5	21	12	21	10	12,5
06240-0206	steel	blue-passivated	M6	25	14	25	12	12
06240-0308	steel	blue-passivated	M8	33	18	33	16	16
06240-0410	steel	blue-passivated	M10	40	24	40	18,7	20
06240-902	stainless steel	electropolished	M2	14	8	14	6,7	4
06240-003	stainless steel	electropolished	M3	18	10	18	8,6	7,5
06240-104	stainless steel	electropolished	M4	21	12	21	10	10
06240-105	stainless steel	electropolished	M5	21	12	21	10	12,5
06240-206	stainless steel	electropolished	M6	25	14	25	12	12
06240-308	stainless steel	electropolished	M8	33	18	33	16	16
06240-410	stainless steel	electropolished	M10	40	24	40	18,7	20
06240-1902	aluminium	anodised	M2	14	8	14	6,7	4
06240-1003	aluminium	anodised	M3	18	10	18	8,6	7,5
06240-1104	aluminium	anodised	M4	21	12	21	10	10
06240-1105	aluminium	anodised	M5	21	12	21	10	12,5
06240-1206	aluminium	anodised	M6	25	14	25	12	12
06240-1308	aluminium	anodised	M8	33	18	33	16	16
06240-1410	aluminium	anodised	M10	40	24	40	18,7	20
06240-2902	stainless steel	blasted	M2	14	8	14	6,7	4
06240-2003	stainless steel	blasted	M3	18	10	18	8,6	7,5
06240-2104	stainless steel	blasted	M4	21	12	21	10	10
06240-2105	stainless steel	blasted	M5	21	12	21	10	12,5
06240-2206	stainless steel	blasted	M6	25	14	25	12	12
06240-2308	stainless steel	blasted	M8	33	18	33	16	16
06240-2410	stainless steel	blasted	M10	40	24	40	18,7	20

06240-10

Mushroom knobs

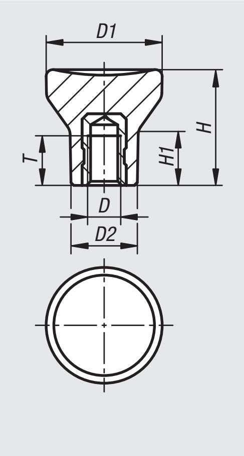
internal thread

Material:
Thermoset PF 31.
Steel or stainless steel.

Version:
Thermoset black, high-gloss polished.
Trivalent blue passivated steel or bright stainless steel.

Sample order:
nlm 06240-10-104

Note:
The version 06240-10-104 has a brass bush.



Order No.	Component material	D	D1	D2	H	H1	T
06240-10-104	brass	M4	21	12	21	10	6
06240-10-105	steel	M5	21	12	21	10	7,5
06240-10-206	steel	M6	25	14	25	12	9
06240-10-308	steel	M8	33	18	33	16	12
06240-10-1104	stainless steel	M4	21	12	21	10	6
06240-10-1105	stainless steel	M5	21	12	21	10	7,5
06240-10-1206	stainless steel	M6	25	14	25	12	9
06240-10-1308	stainless steel	M8	33	18	33	16	12

06240-11

Mushroom knobs

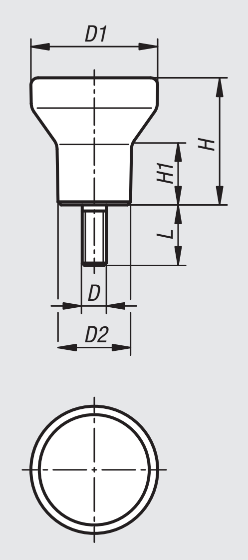
external thread

Material:
Thermoset PF 31.
Steel or stainless steel.

Version:
Thermoset black, high-gloss polished.
Trivalent blue passivated steel or bright stainless steel.

Sample order:
nlm 06240-11-104X10

On request:
Other screw lengths.



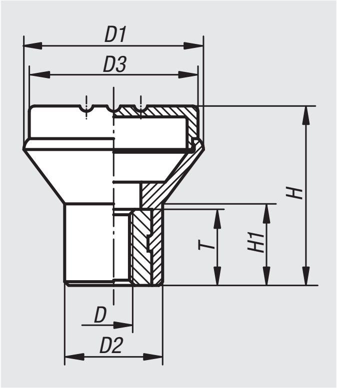
Order No. steel	Order No. stainless steel	D	D1	D2	H	H1	L
06240-11-104X10	**06240-11-1104X10**	M4	21	12	21	10	10
06240-11-105X10	**06240-11-1105X10**	M5	21	12	21	10	10
06240-11-206X10	**06240-11-1206X10**	M6	25	14	25	12	10
06240-11-308X15	**06240-11-1308X15**	M8	33	18	33	16	15

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

06241

Mushroom knobs

internal thread



Material:
Black thermoplastic.
Bush grade 5.8 steel or 1.4305 stainless steel.

Version:
Steel trivalent blue passivated, stainless steel bright.

Sample order:
nlm 06241-046 (cap colour traffic red)

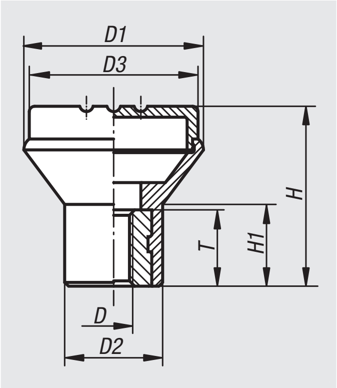
Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.

black grey	pure orange Δ = 1	signal green Δ = 2	traffic blue Δ = 3
● RAL 7021	● RAL 2004	● RAL 6032	● RAL 5017
light grey Δ = 5	**traffic red Δ = 6**	**colza yellow Δ = 7**	
● RAL 7035	● RAL 3020	● RAL 1021	

Order No. steel	Order No. stainless steel	D	D1	D2	D3	H	H1	T
06241-04Δ	**06241-004Δ**	M4	21	12	19	21	10	10
06241-05Δ	**06241-005Δ**	M5	21	12	19	21	10	10
06241-06Δ	**06241-006Δ**	M6	25	14	23	25	12	10
06241-08Δ	**06241-008Δ**	M8	33	19	31	33	15	14

Mushroom knobs antistatic

internal thread



Material:
Thermoplastic, graphite black.
Bush steel 5.8.

Version:
Bush blue passivated

Sample order:
nlm 06241-110524

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Order No.	Main colour	D	D1	D2	D3	H	H1	T
06241-110524	graphite black RAL 9011	M5	21	12	19	21	10	10

06242

Mushroom knobs

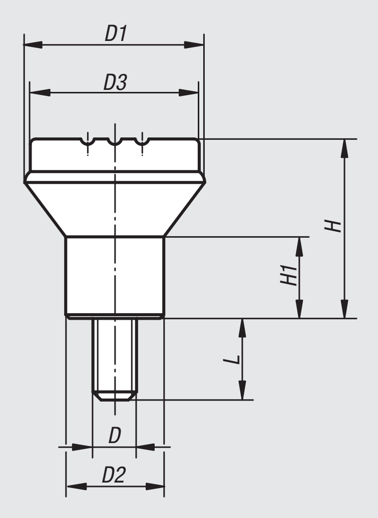
external thread

Material:
Black thermoplastic.
Screw grade 5.8 steel or 1.4305 stainless steel.

Version:
Steel trivalent blue passivated, stainless steel bright.

Sample order:
nlm 06242-046X10
(cap colour traffic red, include length L)

Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.

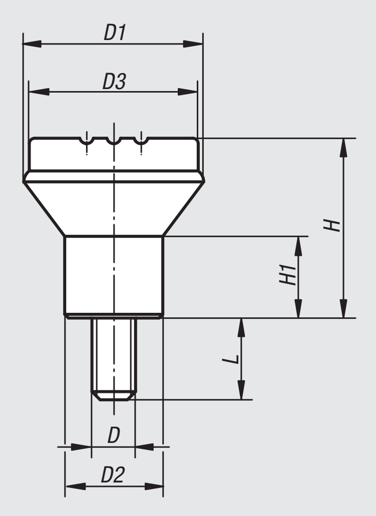


black grey	pure orange Δ = 1	signal green Δ = 2	traffic blue Δ = 3
● RAL 7021	● RAL 2004	● RAL 6032	● RAL 5017
light grey Δ = 5	**traffic red Δ = 6**	**colza yellow Δ = 7**	
● RAL 7035	● RAL 3020	● RAL 1021	

Order No. steel	Order No. stainless steel	D	D1	D2	D3	H	H1	L
06242-04ΔX	**06242-004ΔX**	M4	21	12	19	21	10	10
06242-05ΔX	**06242-005ΔX**	M5	21	12	19	21	10	10
06242-06ΔX	**06242-006ΔX**	M6	25	14	23	25	12	15
06242-08ΔX	**06242-008ΔX**	M8	33	19	31	33	15	15

Mushroom knobs antistatic

external thread



Material:
Thermoplastic, graphite black.
Threaded pin steel 5.8.

Version:
Screw blue passivated.

Sample order:
nlm 06242-110524X10

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

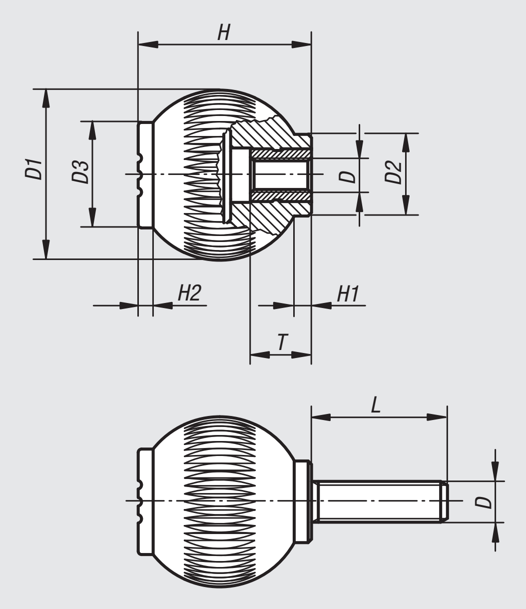
Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Order No.	Main colour	D	D1	D2	D3	H	H1	L
06242-110524X10	graphite black RAL 9011	M5	21	12	19	21	10	10

06245

Spherical knobs



Material:
Black thermoplastic.
Bush and screw 5.8 steel or 1.4305 stainless steel.

Version:
Steel trivalent blue passivated, stainless steel bright.

Sample order:
nlm 06245-1066X15
(cap colour traffic red; include length L)

Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.

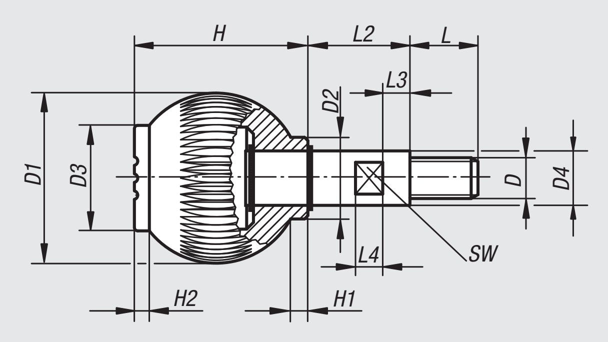
black grey ⚫ RAL 7021	pure orange Δ = 1 🟠 RAL 2004	signal green Δ = 2 🟢 RAL 6032	traffic blue Δ = 3 🔵 RAL 5017
light grey Δ = 5 ⚪ RAL 7035	traffic red Δ = 6 🔴 RAL 3020	colza yellow Δ = 7 🟡 RAL 1021	

Order No. steel	Order No. stainless steel	D	D1	D2	D3	H	H1	H2	T
06245-106Δ	**06245-0106Δ**	M6	25	12	17	25	3	2	10
06245-208Δ	**06245-0208Δ**	M8	32	15,5	19	33	3,5	2,6	14
06245-310Δ	**06245-0310Δ**	M10	40	19	23	41	4	3	14
06245-410Δ	**06245-0410Δ**	M10	50	24	31	51	5,5	4,5	14
06245-412Δ	**06245-0412Δ**	M12	50	24	31	51	5,5	4,5	18

Order No. steel	Order No. stainless steel	D	D1	D2	D3	H	H1	H2	L
06245-106ΔX	**06245-0106ΔX**	M6	25	12	17	25	3	2	15/20/25/30
06245-208ΔX	**06245-0208ΔX**	M8	32	15,5	19	33	3,5	2,6	20/25/30/40
06245-310ΔX	**06245-0310ΔX**	M10	40	19	23	41	4	3	20/30/40
06245-410ΔX	**06245-0410ΔX**	M10	50	24	31	51	5,5	4,5	20/30/40
06245-412ΔX	**06245-0412ΔX**	M12	50	24	31	51	5,5	4,5	20/30/40

Spherical knobs

revolving



Material:
Thermoplastic, black grey.
Axis steel 5.8 or stainless steel 1.4305.

Version:
Trivalent blue passivated steel or bright stainless steel.
Circlips electro zinc-plated, including stainless steel version.

Sample order:
nlm 06246-1066 (cap colour traffic red)

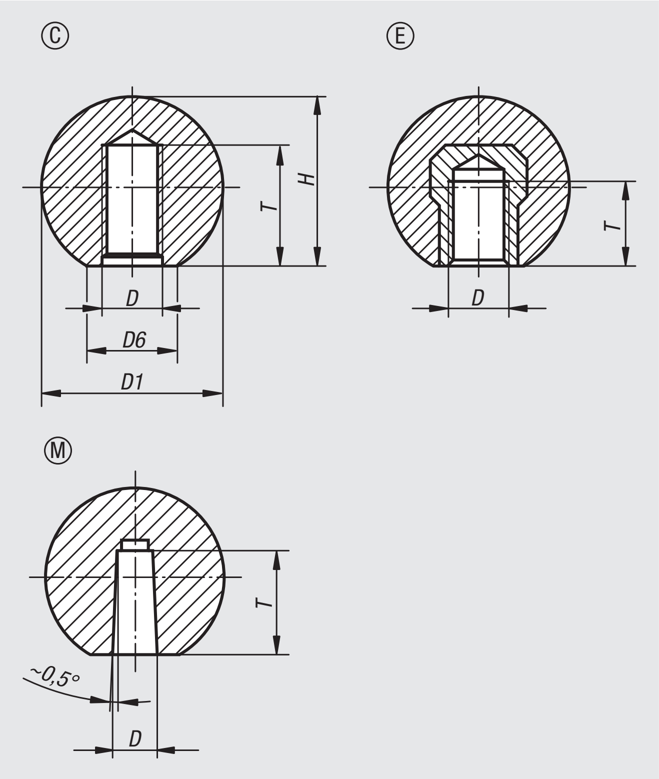
Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.

black grey RAL 7021	pure orange Δ = 1 RAL 2004	signal green Δ = 2 RAL 6032	traffic blue Δ = 3 RAL 5017
light grey Δ = 5 RAL 7035	traffic red Δ = 6 RAL 3020	colza yellow Δ = 7 RAL 1021	

Order No. steel	Order No. stainless steel	D	D1	D2	D3	D4	H	H1	H2	L	L2	L3	L4	SW
06246-106Δ	**06246-0106Δ**	M6	25	12	17	8	25	3	2	10	15	5	5	7
06246-208Δ	**06246-0208Δ**	M8	32	15,5	19	10	33	3,5	2,6	12	20	6	6	8
06246-310Δ	**06246-0310Δ**	M10	40	19	23	13	41	4	3	15	25	7	10	10
06246-412Δ	**06246-0412Δ**	M12	50	24	31	16	51	5,5	4,5	20	30	8	8	13

Ball knobs

thermoplastic DIN 319 enhanced



Material:
Black thermoplastic.
Bush steel.

Version:
Steel electro zinc-plated.

Sample order:
nlm 06247-11604

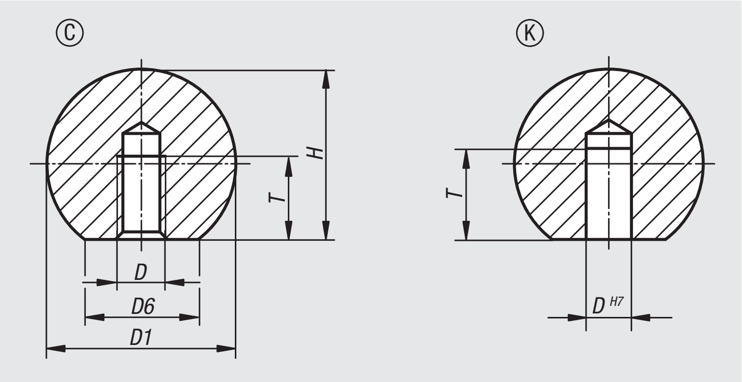
On request:
Other colours.

Drawing reference:
Form C: plastic thread
Form E: tapped bush
Form M: tapered hole

Order No.	Form	D	D1	D6	H	T
06247-11604	C	M4	16	8	15	6
06247-11605	C	M5	16	8	15	7,5
06247-12005	C	M5	20	12	18	7,5
06247-12006	C	M6	20	12	18	9
06247-12506	C	M6	25	15	22,5	9
06247-12508	C	M8	25	15	22,5	12
06247-13208	C	M8	32	18	29	12
06247-13210	C	M10	32	18	29	15
06247-14010	C	M10	40	22	37	15
06247-14012	C	M12	40	22	37	15
06247-22005	E	M5	20	12	18	7,5
06247-22006	E	M6	20	12	18	7,5
06247-22506	E	M6	25	15	22,5	9
06247-22508	E	M8	25	15	22,5	9
06247-23208	E	M8	32	18	29	12
06247-23210	E	M10	32	18	29	12
06247-32005	M	5	20	12	18	12
06247-32506	M	6	25	15	22,5	15
06247-32508	M	8	25	15	22,5	15
06247-33208	M	8	32	18	29	15
06247-33210	M	10	32	18	29	15
06247-34010	M	10	40	22	37	20
06247-34012	M	12	40	22	37	20

Ball knobs

stainless steel or aluminium DIN 319



Material:
Stainless steel 1.4305 or aluminium.

Version:
Polished.

Sample order:
nlm 06247-116043

Drawing reference:
Form C: tapped hole
Form K: reamed hole

Order No.	Form	Main material	Steel code	D	D1	D6	H	T
06247-116044	C	stainless steel	1.4301	M4	16	8	15	7,2
06247-140104	C	stainless steel	1.4301	M10	40	22	37	18
06247-132084	C	stainless steel	1.4301	M8	32	18	29	14,5
06247-150124	C	stainless steel	1.4301	M12	50	28	46	21
06247-125064	C	stainless steel	1.4301	M6	25	15	22,5	11
06247-120054	C	stainless steel	1.4301	M5	20	12	18	9,1
06247-116043	C	aluminium	-	M4	16	8	15	7,2
06247-120053	C	aluminium	-	M5	20	12	18	9,1
06247-125063	C	aluminium	-	M6	25	15	22,5	11
06247-132083	C	aluminium	-	M8	32	18	29	14,5
06247-140103	C	aluminium	-	M10	40	22	37	18
06247-150123	C	aluminium	-	M12	50	28	46	21

Order No.	Form	Main material	Steel code	D	D1	D6	H	T
06247-316042	K	stainless steel	1.4305	6	16	8	15	10
06247-320052	K	stainless steel	1.4305	8	20	12	18	12
06247-325062	K	stainless steel	1.4305	10	25	15	22,5	16
06247-332082	K	stainless steel	1.4305	12	32	18	29	20
06247-340102	K	stainless steel	1.4305	16	40	22	37	25
06247-350122	K	stainless steel	1.4305	20	50	28	46	32
06247-316043	K	aluminium	-	6	16	8	15	10
06247-320053	K	aluminium	-	8	20	12	18	12
06247-325063	K	aluminium	-	10	25	15	22,5	16
06247-332083	K	aluminium	-	12	32	18	29	20
06247-340103	K	aluminium	-	16	40	22	37	25
06247-350123	K	aluminium	-	20	50	28	46	32

06250

Ball knobs smooth

DIN 319 enhanced

Material:
Thermoset PF 31, black or red.
Bush electro zinc-plated steel.

Version:
High-gloss polished.

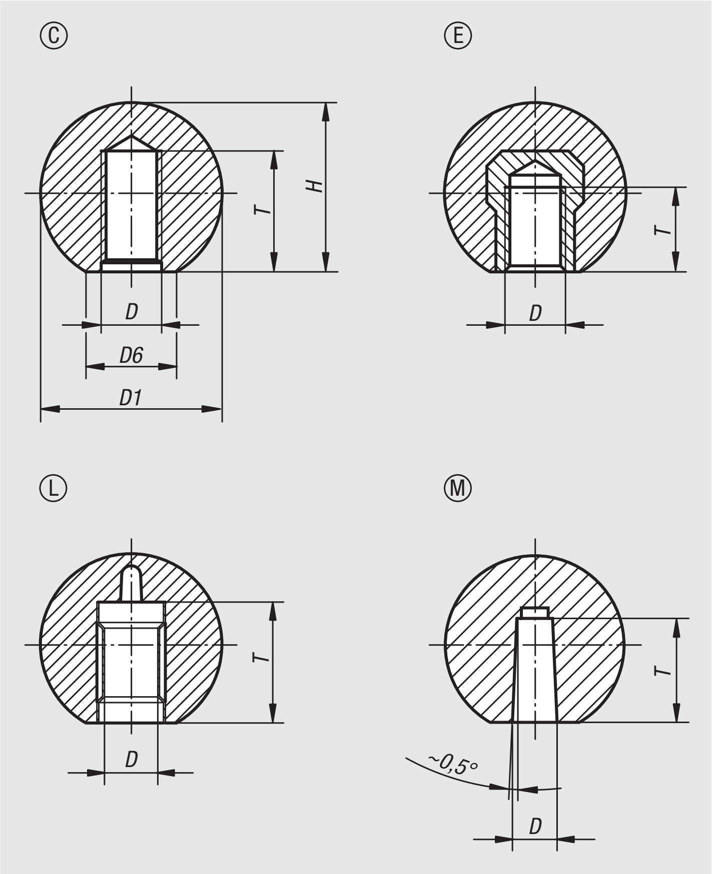
Sample order:
nlm 06250-11604

Assembly:
Assembly Form L: The ball knobs are mounted firmly by tapping a hammer lightly. Please only use a rubber or plastic hammer, with a weight up to 200 g!

The version 06250-21604 has a brass bush.
The versions 06250-23008, 06250-230081, 06250-23508 and 06250-24008 have copper-plated steel bushes.

Shank tolerance:
Ball knobs with press-fit sleeve can be mounted on standard shafts with tolerance h9. The supplied press-fit sleeve assures a firm and reliable fit.

Drawing reference:
Form C: moulded thread
Form E: tapped bush
Form L: press-fit sleeve
Form M: tapered hole



Order No. black	Order No. red	Form	D	D1	D6	H	T
06250-11604	**06250-116041**	C	M4	16	8	15	6
06250-11605	**06250-116051**	C	M5	16	8	15	7,5
06250-12005	**06250-120051**	C	M5	20	12	18	7,5
06250-11606	-	C	M6	16	8	15	9
06250-12006	**06250-120061**	C	M6	20	12	18	9
06250-12506	**06250-125061**	C	M6	25	15	23	9
06250-12508	**06250-125081**	C	M8	25	15	23	12
06250-13008	**06250-130081**	C	M8	30	16	28	12
06250-13208	**06250-132081**	C	M8	32	18	29	12
06250-13508	-	C	M8	36	17	33	18
06250-14008	**06250-140081**	C	M8	40	20	37,5	12
06250-13210	-	C	M10	32	18	29	15
06250-13510	**06250-135101**	C	M10	36	17	33	15
06250-14010	**06250-140101**	C	M10	40	20	37,5	15
06250-14510	-	C	M10	45	20	43	15
06250-15010	**06250-150101**	C	M10	50	22	48	15
06250-14012	-	C	M12	40	20	37,5	18
06250-14512	-	C	M12	45	20	43	18
06250-15012	**06250-150121**	C	M12	50	28	48	18

Ball knobs smooth

DIN 319 enhanced

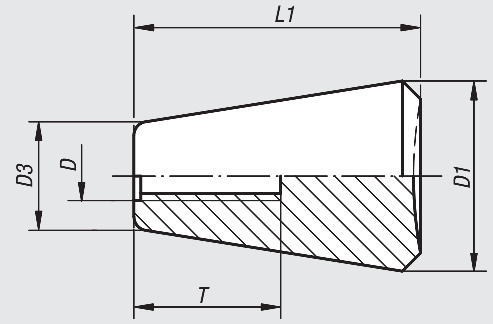
Order No. black	Order No. red	Form	D	D1	D6	H	T
06250-21604	-	E	M4	16	8	15	6
06250-22005	**06250-220051**	E	M5	20	12	18	7,5
06250-22006	-	E	M6	20	12	18	9
06250-22506	**06250-225061**	E	M6	25	15	23	9
06250-22508	-	E	M8	25	15	23	12
06250-23008	**06250-230081**	E	M8	30	16	28	12
06250-23208	-	E	M8	32	18	29	12
06250-23508	-	E	M8	36	17	33	14
06250-24008	-	E	M8	40	20	37,5	14
06250-23210	-	E	M10	32	18	29	15
06250-23510	**06250-235101**	E	M10	36	17	33	14
06250-24010	**06250-240101**	E	M10	40	20	37,5	15
06250-24510	-	E	M10	45	20	43	22
06250-25010	-	E	M10	50	22	48	15
06250-24012	**06250-240121**	E	M12	40	20	37,5	18
06250-24512	-	E	M12	45	20	43	21
06250-25012	**06250-250121**	E	M12	50	28	48	18

Order No.	Form	Main colour	D	D1	D6	H	T
06250-42005	L	black	5	20	12	18	13
06250-42506	L	black	6	25	15	23	16
06250-42508	L	black	8	25	15	23	15
06250-43208	L	black	8	32	18	29	15
06250-43210	L	black	10	32	18	29	20
06250-44010	L	black	10	40	20	37,5	20
06250-44012	L	black	12	40	20	37,5	23
06250-45012	L	black	12	50	28	48	20

Order No.	Form	Main colour	D	D1	D6	H	T
06250-31604	M	black	4	16	8	15	9
06250-32005	M	black	5	20	12	18	12
06250-32506	M	black	6	25	15	23	15
06250-32508	M	black	8	25	15	23	15
06250-33208	M	black	8	32	18	29	15
06250-33210	M	black	10	32	18	29	15
06250-34010	M	black	10	40	20	37,5	20
06250-34012	M	black	12	40	20	37,5	20
06250-35012	M	black	12	50	28	48	22

06251

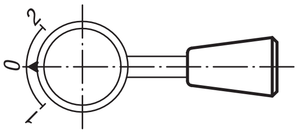
Tapered knobs



Material:
Black thermoset PF 31

Version:
Moulded thread.

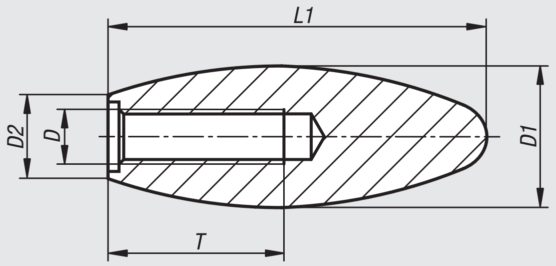
Sample order:
nlm 06251-06



Order No.	D	D1	D3	L1	T
06251-05	M5	20	12	30	15
06251-061	M6	20	12	30	18
06251-06	M6	25	15	38	19
06251-081	M8	25	15	38	18
06251-08	M8	30	18	46	16
06251-101	M10	30	18	46	18
06251-10	M10	35	21	53	19
06251-12	M12	35	21	53	21

06252

Conical knobs



Material:
Black thermoset PF 31

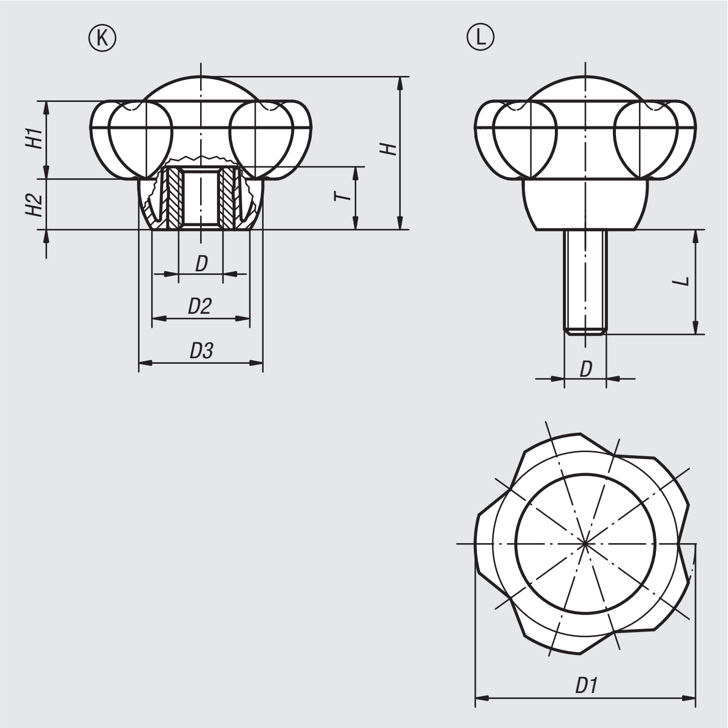
Version:
High-gloss polished.

Sample order:
nlm 06252-120

Order No.	D	D1	D2	L1	T
06252-050	M5	14	7	34	25
06252-060	M6	23	14	60	17
06252-080	M8	22	14	60	25
06252-081	M8	26	16	70	19
06252-100	M10	27	15,5	70	25
06252-101	M10	35	22	85	25
06252-120	M12	27	15,5	70	25
06252-121	M12	35	22	85	25
06252-160	M16	35	22	85	30

06253

Five lobe grips



Material:
Black thermoplastic.
Bush and screw 5.8 steel or 1.4305 stainless steel.

Version:
Steel trivalent blue passivated, stainless steel bright.

Sample order:
nlm 06253-50106X30
(cap colour traffic red; include length L)

Note:
The screw lengths 15, 35 and 45 are not available in stainless steel.
Δ Add the desired cap colour here. No colour code is required for black grey caps.

black grey	light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7
 RAL 7021	 RAL 7035	 RAL 3020	 RAL 1021

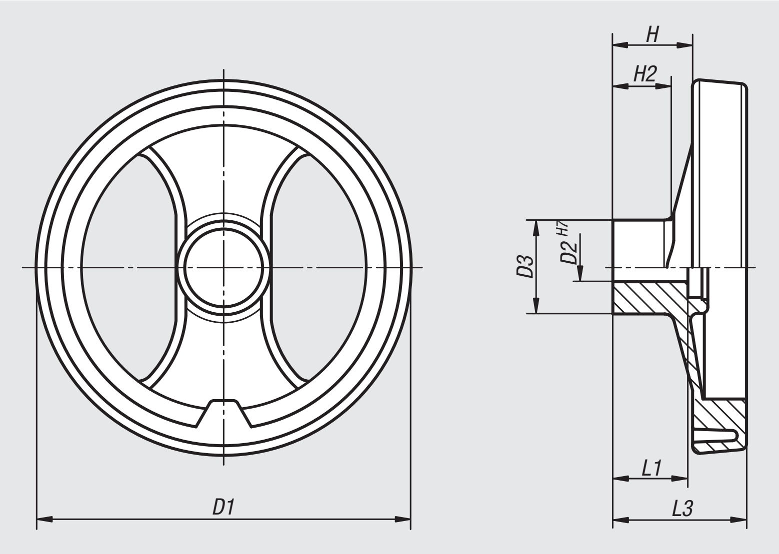
Order No. steel	Order No. stainless steel	Form	D	D1	D2	D3	H	H1	H2	T
06253-5008Δ	**06253-50081Δ**	K	M8	50	22,2	28,2	34,8	17,8	11,5	14
06253-5010Δ	**06253-50101Δ**	K	M10	50	22,2	28,2	34,8	17,8	11,5	14
06253-5012Δ	**06253-50121Δ**	K	M12	50	22,2	28,2	34,8	17,8	11,5	18
06253-6310Δ	**06253-63101Δ**	K	M10	63	28	35,5	44	22,5	14,5	14
06253-6312Δ	**06253-63121Δ**	K	M12	63	28	35,5	44	22,5	14,5	18
06253-6316Δ	-	K	M16	63	28	35,5	44	22,5	14,5	18

Order No. steel	Order No. stainless steel	Form	D	D1	D2	D3	H	H1	H2	L
06253-5010ΔX	**06253-50101ΔX**	L	M10	50	22,2	28,2	34,8	17,8	11,5	15/20/25/30/35/40/45/50/60
06253-5012ΔX	-	L	M12	50	22,2	28,2	34,8	17,8	11,5	15/20/25/30/35/40/45/50/60
06253-6310ΔX	**06253-63101ΔX**	L	M10	63	28	35,5	44	22,5	14,5	20/25/30/35/40/45/50/60
06253-6312ΔX	-	L	M12	63	28	35,5	44	22,5	14,5	20/25/30/35/40/45/50/60

06255

Handwheels 2-spoke

plastic



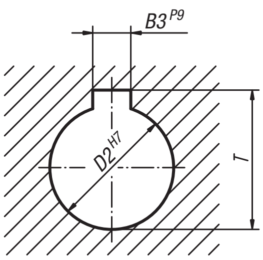
Material:
Handwheel, reinforced and stabilised polyamide.
Centre caps, polyamide.
Centre bushes, steel.

Version:
Handwheel, oil and grease resistant, black (RAL 9011), satin finish.
Centre caps, grey (RAL 7035).
Centre bushes, black oxidised.

Sample order:
nlm 06255-0080X08

On request:
Other cap colours.
Special versions.

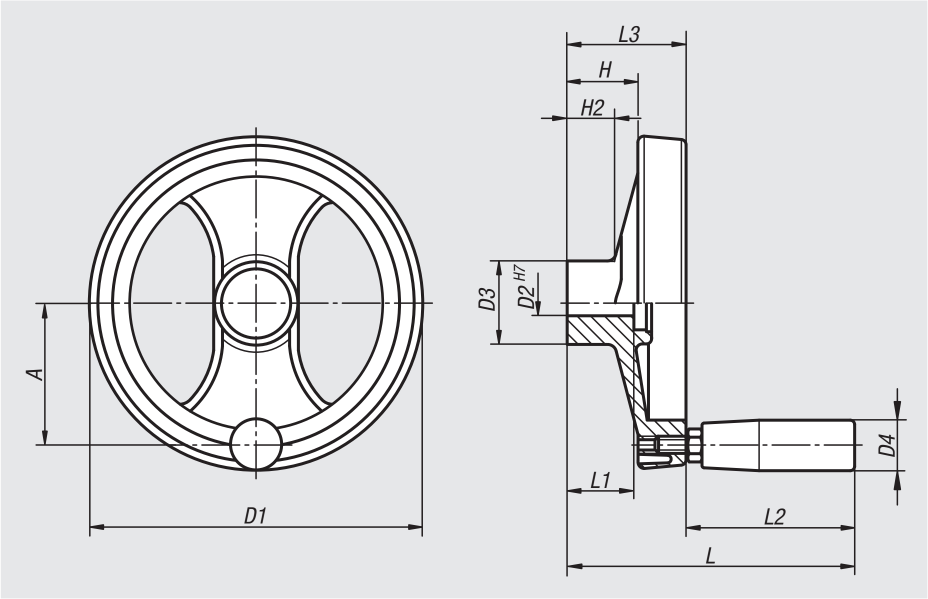
DIN 6885-1



Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	H	H2	L1	L3	B3	T
06255-0080X08	**06255-1080X08**	80	8H7	24,5	20	16	20	34	-/2	-/9
06255-0080X10	**06255-1080X10**	80	10H7	24,5	20	16	20	34	-/3	-/11,4
06255-0100X10	**06255-1100X10**	99	10H7	28	25,5	20	24	42	-/3	-/11,4
06255-0100X12	**06255-1100X12**	99	12H7	28	25,5	20	24	42	-/4	-/13,8
06255-0130X12	**06255-1130X12**	129	12H7	32	30	21	24	50	-/4	-/13,8
06255-0130X14	**06255-1130X14**	129	14H7	32	30	21	24	50	-/5	-/16,3
06255-0160X14	**06255-1160X14**	159	14H7	40	33	22	32	57	-/5	-/16,3
06255-0160X16	**06255-1160X16**	159	16H7	40	33	22	32	57	-/5	-/18,3
06255-0200X16	**06255-1200X16**	198	16H7	51	31	17,5	32	60	-/5	-/18,3
06255-0200X20	**06255-1200X20**	198	20H7	51	31	17,5	32	60	-/6	-/22,8
06255-0250X20	**06255-1250X20**	252	20H7	55,5	39,5	24	36	71	-/6	-/22,8
06255-0250X24	**06255-1250X24**	252	24H7	55,5	39,5	24	36	71	-/8	-/27,3
06255-0345X20	**06255-1345X20**	346	20H7	67,5	42	24	32	79	-/6	-/22,8

Handwheels 2-spoke

plastic, with revolving grip



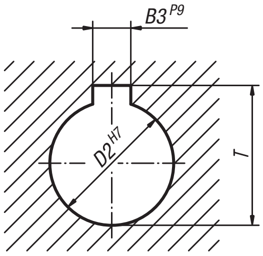
Material:
Handwheel, reinforced and stabilised polyamide.
Centre caps, polyamide.
Centre bushes, steel.
Tapped insert for cylinder grip, brass.

Version:
Handwheel, oil and grease resistant, black (RAL 9011), satin finish.
Centre caps, grey (RAL 7035).
Centre bushes, black oxidised.

Sample order:
nlm 06255-4080X08

On request:
Other cap colours.
Special versions.

DIN 6885-1

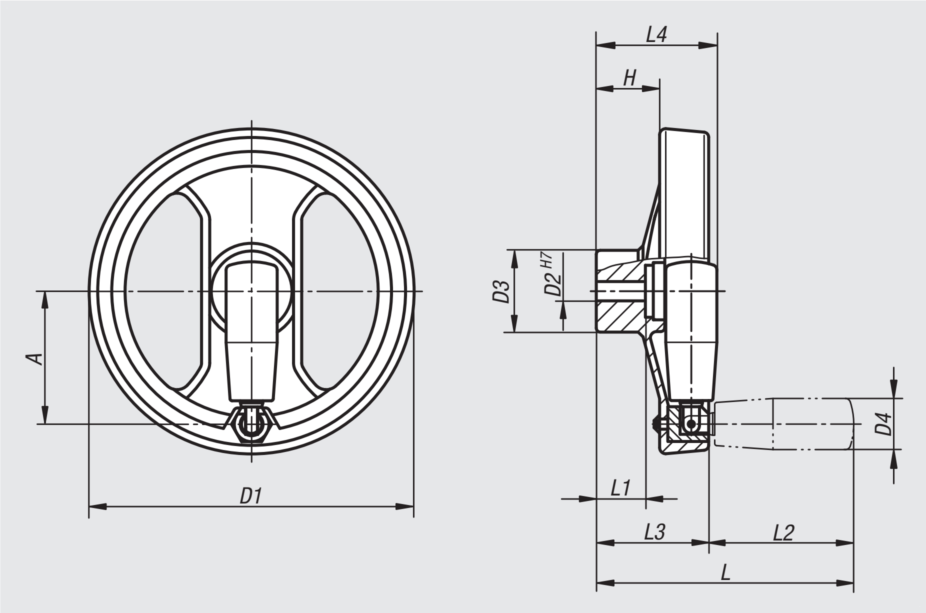


Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	D4	H	H2	A	L	L1	L2	L3	B3	T
06255-4080X08	**06255-5080X08**	80	8H7	24,5	20	20	16	30	85	20	51	34	-/2	-/9
06255-4080X10	**06255-5080X10**	80	10H7	24,5	20	20	16	30	85	20	51	34	-/3	-/11,4
06255-4100X10	**06255-5100X10**	99	10H7	28	20	25,5	20	38	93	24	51	43	-/3	-/11,4
06255-4100X12	**06255-5100X12**	99	12H7	28	20	25,5	20	38	93	24	51	43	-/4	-/13,8
06255-4130X12	**06255-5130X12**	129	12H7	32	23	30	21	55	112	24	62	50	-/4	-/13,8
06255-4130X14	**06255-5130X14**	129	14H7	32	23	30	21	55	112	24	62	50	-/5	-/16,3
06255-4160X14	**06255-5160X14**	159	14H7	40	23	33	22	66	119	32	62	57	-/5	-/16,3
06255-4160X16	**06255-5160X16**	159	16H7	40	23	33	22	66	119	32	62	57	-/5	-/18,3
06255-4200X16	**06255-5200X16**	198	16H7	51	26	31	17,5	82	141	32	81	60	-/5	-/18,3
06255-4200X20	**06255-5200X20**	198	20H7	51	26	31	17,5	82	141	32	81	60	-/6	-/22,8
06255-4250X20	**06255-5250X20**	252	20H7	55,5	27	39,5	24	113	163	36	92	71	-/6	-/22,8
06255-4250X24	**06255-5250X24**	252	24H7	55,5	27	39,5	24	113	163	36	92	71	-/8	-/27,3
06255-4345X20	**06255-5345X20**	346	20H7	67,5	27	42	24	146	171	32	92	79	-/6	-/22,8

06255

Handwheels 2-spoke

plastic, with folding grip



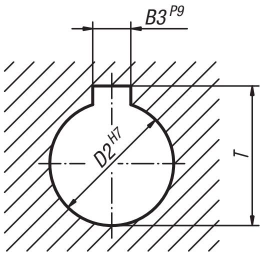
Material:
Handwheel, reinforced and stabilised polyamide.
Centre caps, polyamide.
Centre bush and tapped insert for cylinder grip, steel.

Version:
Handwheel, oil and grease resistant, black (RAL 9011), satin finish.
Centre caps, grey (RAL 7035).
Centre bush and tapeed insert for folding grip, black oxidised.

Sample order:
nlm 06255-6130X12

On request:
Other cap colours.
Special versions.

DIN 6885-1



Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	D4	A	H	L	L1	L2	L3	L4	B3	T
06255-6130X12	**06255-7130X12**	129	12H7	32	20	51	29	111	20	59	52	53	-/4	-/13,8
06255-6130X14	**06255-7130X14**	129	14H7	32	20	51	29	111	20	59	52	53	-/5	-/16,3
06255-6160X14	**06255-7160X14**	159	14H7	40	25	65	31	126	24	71	55	59	-/5	-/16,3
06255-6160X16	**06255-7160X16**	159	16H7	40	25	65	31	126	24	71	55	59	-/5	-/18,3
06255-6200X16	**06255-7200X16**	200	16H7	54,5	27	80	33	160	28	91	69	69	-/5	-/18,3
06255-6200X20	**06255-7200X20**	200	20H7	54,5	27	80	33	160	28	91	69	69	-/6	-/22,8
06255-6345X20	**06255-7345X20**	346	20H7	67,5	27	148	43,5	144	32	91	80	80	-/6	-/22,8

06262

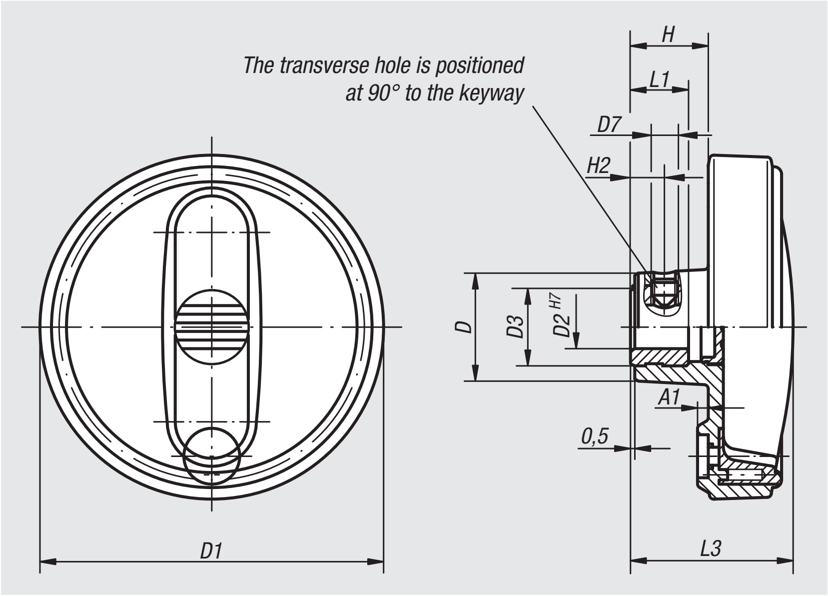
Handwheels

Material:
Black grey thermoplastic.

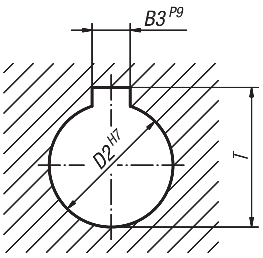
Version:
Steel parts black oxidised.

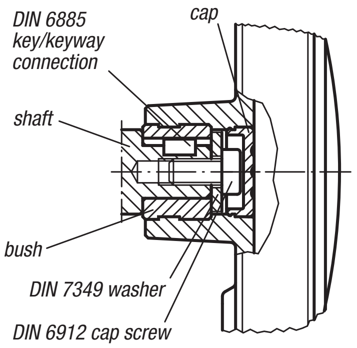
Sample order:
nlm 06262-108008

Note:
The hub cap is supplied loose.
The handwheels can be secured using a transverse pin or by parallel key connection together with a DIN 6912 socket head screw and a DIN 7349 washer.
Versions with transverse bore are fastened using the ISO 4027 (DIN 914) grub screws.



DIN 6885-1





Handwheels

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	A1	H	L1	L3	B3	T
06262-108008	**06262-10800802**	25	80	8H7	19	2,5	17,5	13	37,5	-/2	-/9
06262-108010	**06262-10801003**	25	80	10H7	19	2,5	17,5	13	37,5	-/3	-/11,4
06262-108012	**06262-10801204**	25	80	12H7	19	2,5	17,5	13	37,5	-/4	-/13,8
06262-210010	**06262-21001003**	28	100	10H7	19	3	20	13	44	-/3	-/11,4
06262-210012	**06262-21001204**	28	100	12H7	19	3	20	13	44	-/4	-/13,8
06262-312512	**06262-31251204**	35	125	12H7	25	4	23,5	18,5	53	-/4	-/13,8
06262-312514	**06262-31251405**	35	125	14H7	25	4	23,5	18,5	53	-/5	-/16,3
06262-312516	**06262-31251605**	35	125	16H7	25	4	23,5	18,5	53	-/5	-/18,3
06262-416014	**06262-41601405**	45	160	14H7	25	5,6	28	18,5	64,5	-/5	-/16,3
06262-416016	**06262-41601605**	45	160	16H7	25	5,6	28	18,5	64,5	-/5	-/18,3

Handwheels with transverse bore

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	D7	A1	H	H2	L1	L3	B3	T
06262-1080086	**06262-108008026**	25	80	8H7	19	M6	2,5	17,5	7,5	13	37,5	-/2	-/9
06262-1080106	**06262-108010036**	25	80	10H7	19	M6	2,5	17,5	7,5	13	37,5	-/3	-/11,4
06262-1080126	**06262-108012046**	25	80	12H7	19	M6	2,5	17,5	7,5	13	37,5	-/4	-/13,8
06262-2100106	**06262-210010036**	28	100	10H7	19	M6	3	20	7,5	13	44	-/3	-/11,4
06262-2100126	**06262-210012046**	28	100	12H7	19	M6	3	20	7,5	13	44	-/4	-/13,8
06262-3125126	**06262-312512046**	35	125	12H7	25	M6	4	23,5	7,5	18,5	53	-/4	-/13,8
06262-3125146	**06262-312514056**	35	125	14H7	25	M6	4	23,5	7,5	18,5	53	-/5	-/16,3
06262-3125166	**06262-312516056**	35	125	16H7	25	M6	4	23,5	7,5	18,5	53	-/5	-/18,3
06262-4160146	**06262-416014056**	45	160	14H7	25	M6	5,6	28	7,5	18,5	64,5	-/5	-/16,3
06262-4160166	**06262-416016056**	45	160	16H7	25	M6	5,6	28	7,5	18,5	64,5	-/5	-/18,3

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

06263

Handwheels

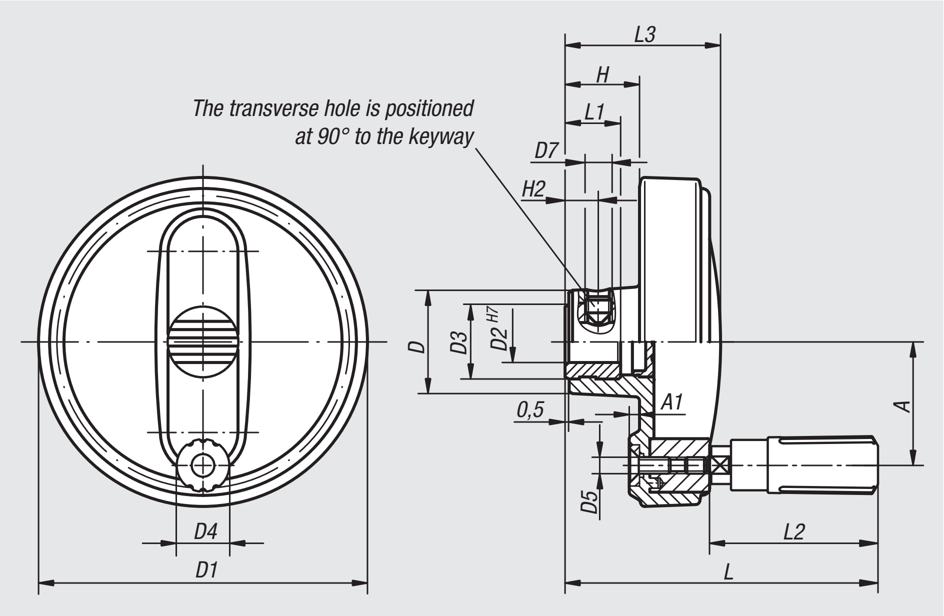
with revolving grip

Material:
Black grey thermoplastic.

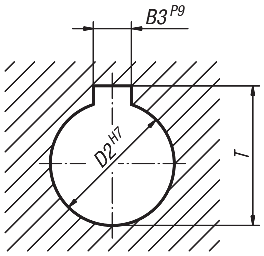
Version:
Steel parts black oxidised.

Sample order:
nlm 06263-108008

Note:
The hub cover and the revolving cylinder grip are supplied unassembled. To assemble, screw the grip into the tapped hole.
The handwheels can be secured using a transverse pin or by parallel key connection together with a DIN 6912 socket head screw and a DIN 7349 washer.
Versions with transverse bore are secured using the ISO 4026 (DIN 913) grub screw.
For assembly example, see 06262.


The transverse hole is positioned at 90° to the keyway

DIN 6885-1



Handwheels with revolving cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	D4	D5	A	A1	H	L	L1	L2	L3	B3	T
06263-108008	**06263-10800802**	25	80	8H7	19	14	M4	30	2,5	17,6	74,6	13	40	36,7	-/2	-/9
06263-108010	**06263-10801003**	25	80	10H7	19	14	M4	30	2,5	17,6	74,6	13	40	36,7	-/3	-/11,4
06263-108012	**06263-10801204**	25	80	12H7	19	14	M4	30	2,5	17,6	74,6	13	40	36,7	-/4	-/13,8
06263-210010	**06263-21001003**	28	100	10H7	19	16	M5	38	3	20,1	90,2	13	49,1	43,5	-/3	-/11,4
06263-210012	**06263-21001204**	28	100	12H7	19	16	M5	38	3	20,1	90,2	13	49,1	43,5	-/4	-/13,8
06263-312512	**06263-31251204**	35	125	12H7	25	20	M6	47,5	4	23,3	110,7	18,5	61,4	52,1	-/4	-/13,8
06263-312514	**06263-31251405**	35	125	14H7	25	20	M6	47,5	4	23,3	110,7	18,5	61,4	52,1	-/5	-/16,3
06263-312516	**06263-31251605**	35	125	16H7	25	20	M6	47,5	4	23,3	110,7	18,5	61,4	52,1	-/5	-/18,3
06263-416014	**06263-41601405**	45	160	14H7	25	25	M8	62	5,6	28	143	18,5	82,5	63,8	-/5	-/16,3
06263-416016	**06263-41601605**	45	160	16H7	25	25	M8	62	5,6	28	143	18,5	82,5	63,8	-/5	-/18,3

Handwheels with revolving cylinder grip with transverse bore

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	D4	D5	D7	A	A1	H	H2	L	L1	L2	L3	B3	T
06263-1080086	**06263-108008026**	25	80	8H7	19	14	M4	M6	30	2,5	17,6	7,5	74,6	13	40	36,7	-/2	-/9
06263-1080106	**06263-108010036**	25	80	10H7	19	14	M4	M6	30	2,5	17,6	7,5	74,6	13	40	36,7	-/3	-/11,4
06263-1080126	**06263-108012046**	25	80	12H7	19	14	M4	M6	30	2,5	17,6	7,5	74,6	13	40	36,7	-/4	-/13,8
06263-2100106	**06263-210010036**	28	100	10H7	19	16	M5	M6	38	3	20,1	7,5	90,2	13	49,1	43,5	-/3	-/11,4
06263-2100126	**06263-210012046**	28	100	12H7	19	16	M5	M6	38	3	20,1	7,5	90,2	13	49,1	43,5	-/4	-/13,8
06263-3125126	**06263-312512046**	35	125	12H7	25	20	M6	M6	47,5	4	23,3	7,5	110,7	18,5	61,4	52,1	-/4	-/13,8
06263-3125146	**06263-312514056**	35	125	14H7	25	20	M6	M6	47,5	4	23,3	7,5	110,7	18,5	61,4	52,1	-/5	-/16,3
06263-3125166	**06263-312516056**	35	125	16H7	25	20	M6	M6	47,5	4	23,3	7,5	110,7	18,5	61,4	52,1	-/5	-/18,3
06263-4160146	**06263-416014056**	45	160	14H7	25	25	M8	M6	62	5,6	28	7,5	143	18,5	82,5	63,8	-/5	-/16,3
06263-4160166	**06263-416016056**	45	160	16H7	25	25	M8	M6	62	5,6	28	7,5	143	18,5	82,5	63,8	-/5	-/18,3

Handwheels

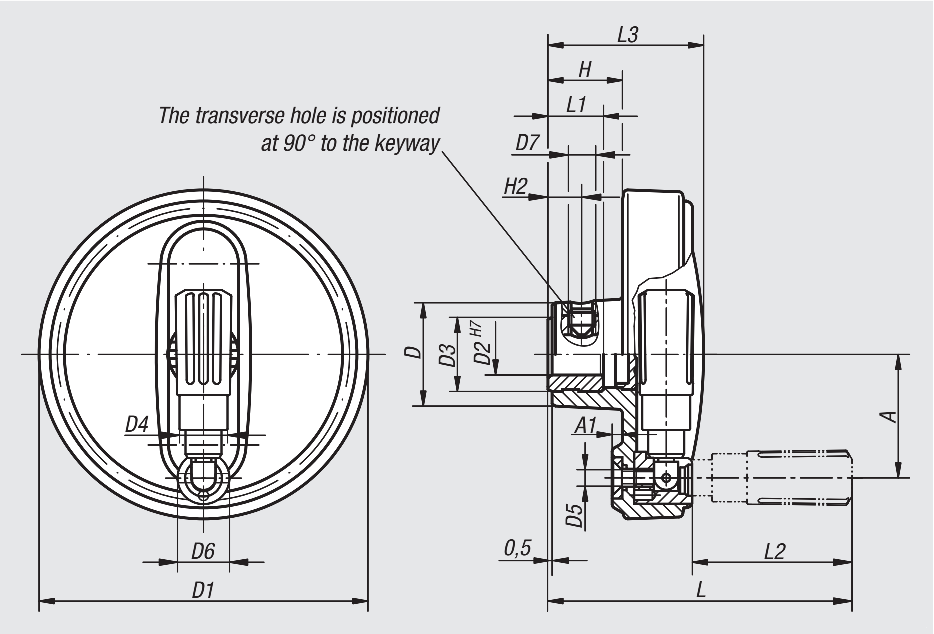
with fold-away grip

Material:
Black grey thermoplastic.

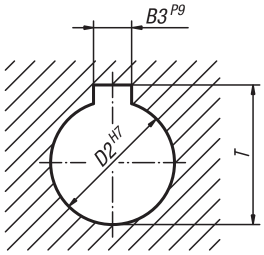
Version:
Steel parts black oxidised.

Sample order:
nlm 06264-108008

Note:
The hub cover is supplied loose.
The handwheels can be secured using a transverse pin or by parallel key connection together with a DIN 6912 socket head screw and a DIN 7349 washer.
Versions with transverse bore are secured using the ISO 4026 (DIN 913) grub screw.
For assembly example, see 06262.



DIN 6885-1



Handwheels with fold-down cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	D4	D5	D6	A	A1	H	L	L1	L2	L3	B3	T
06264-1080086	06264-108008026	25	80	8H7	19	14	M4	13	30	2,5	17,6	74,6	13	40	36,7	-/2	-/9
06264-1080106	06264-108010036	25	80	10H7	19	14	M4	13	30	2,5	17,6	74,6	13	40	36,7	-/3	-/11,4
06264-1080126	06264-108012046	25	80	12H7	19	14	M4	13	30	2,5	17,6	74,6	13	40	36,7	-/4	-/13,8
06264-2100106	06264-210010036	28	100	10H7	19	16	M5	16	38	3	20,1	90,1	13	49	43,5	-/3	-/11,4
06264-2100126	06264-210012046	28	100	12H7	19	16	M5	16	38	3	20,1	90,1	13	49	43,5	-/4	-/13,8
06264-3125126	06264-312512046	35	125	12H7	25	20	M6	20	47,5	4	23,3	108,8	18,5	59,5	52,1	-/4	-/13,8
06264-3125146	06264-312514056	35	125	14H7	25	20	M6	20	47,5	4	23,3	108,8	18,5	59,5	52,1	-/5	-/16,3
06264-3125166	06264-312516056	35	125	16H7	25	20	M6	20	47,5	4	23,3	108,8	18,5	59,5	52,1	-/5	-/18,3
06264-4160146	06264-416014056	45	160	14H7	25	25	M8	26	62	5,6	28	143,5	18,5	83	63,8	-/5	-/16,3
06264-4160166	06264-416016056	45	160	16H7	25	25	M8	26	62	5,6	28	143,5	18,5	83	63,8	-/5	-/18,3

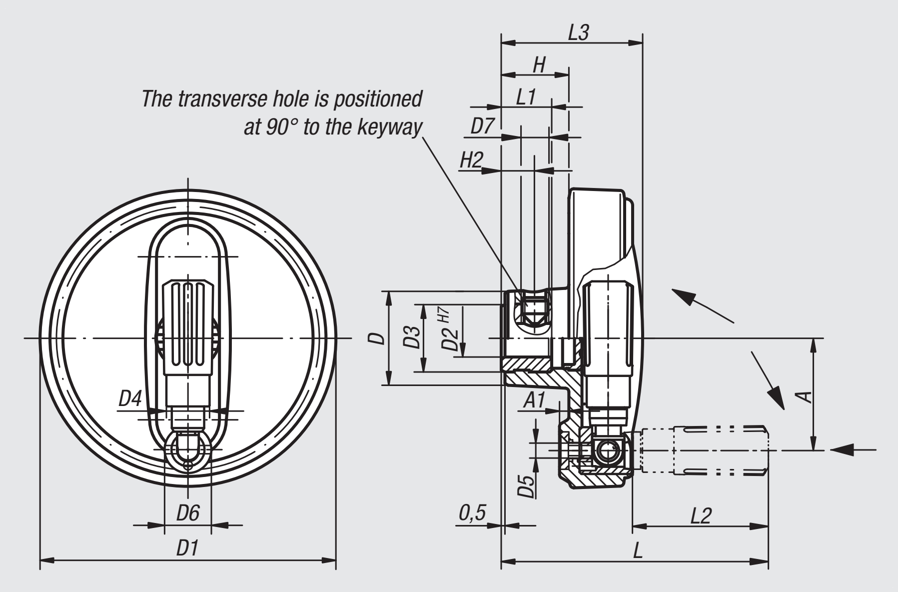
Handwheels with fold-down grip, with transverse bore

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	D4	D5	D6	D7	A	A1	H	H2	L	L1	L2	L3	B3	T
06264-108008	06264-10800802	25	80	8H7	19	14	M4	13		30	2,5	17,6		74,6	13	40	36,7	-/2	-/9
06264-108010	06264-10801003	25	80	10H7	19	14	M4	13		30	2,5	17,6		74,6	13	40	36,7	-/3	-/11,4
06264-108012	06264-10801204	25	80	12H7	19	14	M4	13		30	2,5	17,6		74,6	13	40	36,7	-/4	-/13,8
06264-210010	06264-21001003	28	100	10H7	19	16	M5	16		38	3	20,1		90,1	13	49	43,5	-/3	-/11,4
06264-210012	06264-21001204	28	100	12H7	19	16	M5	16		38	3	20,1		90,1	13	49	43,5	-/4	-/13,8
06264-312512	06264-31251204	35	125	12H7	25	20	M6	20		47,5	4	23,3		108,8	18,5	59,5	52,1	-/4	-/13,8
06264-312514	06264-31251405	35	125	14H7	25	20	M6	20		47,5	4	23,3		108,8	18,5	59,5	52,1	-/5	-/16,3
06264-312516	06264-31251605	35	125	16H7	25	20	M6	20		47,5	4	23,3		108,8	18,5	59,5	52,1	-/5	-/18,3
06264-416014	06264-41601405	45	160	14H7	25	25	M8	26		62	5,6	28		143,5	18,5	83	63,8	-/5	-/16,3
06264-416016	06264-41601605	45	160	16H7	25	25	M8	26		62	5,6	28		143,5	18,5	83	63,8	-/5	-/18,3

06265

Handwheels

with safety grip


The transverse hole is positioned at 90° to the keyway

Material:
Black grey thermoplastic.

Version:
Steel parts black oxidised.

Sample order:
nlm 06265-108008

Note:
The hub cover is supplied unassembled.
The handwheels can be secured using a transverse pin or by parallel key connection together with a DIN 6912 socket head screw and a DIN 7349 washer.Two actions must be made to bring the cylindrical safety grip into an operating position:

- Swing the grip out up to the stop (90°).
- Push the grip in an axial direction into the lock position.

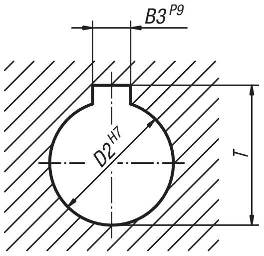
The pushed-in position is the most comfortable for cranking. The grip swings back automatically after releasing.
Versions with transverse bore are secured using the ISO 4026 (DIN 913) grub screw.
For assembly example, see 06262.

06265

Handwheels

with safety grip

DIN 6885-1



Handwheels with safety cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	D4	D5	D6	A	A1	H	L	L1	L2	L3	B3	T
06265-108008	**06265-10800802**	25	80	8H7	19	14	M4	13	30	2,5	17,6	72,6	13	38	36,7	-/2	-/9
06265-108010	**06265-10801003**	25	80	10H7	19	14	M4	13	30	2,5	17,6	72,6	13	38	36,7	-/3	-/11,4
06265-108012	**06265-10801204**	25	80	12H7	19	14	M4	13	30	2,5	17,6	72,6	13	38	36,7	-/4	-/13,8
06265-210010	**06265-21001003**	28	100	10H7	19	16	M5	16	38	3	20,1	88,6	13	47,5	43,5	-/3	-/11,4
06265-210012	**06265-21001204**	28	100	12H7	19	16	M5	16	38	3	20,1	88,6	13	47,5	43,5	-/4	-/13,8
06265-312512	**06265-31251204**	35	125	12H7	25	20	M6	20	47,5	4	23,3	107,7	18,5	58,4	52,1	-/4	-/13,8
06265-312514	**06265-31251405**	35	125	14H7	25	20	M6	20	47,5	4	23,3	107,7	18,5	58,4	52,1	-/5	-/16,3
06265-312516	**06265-31251605**	35	125	16H7	25	20	M6	20	47,5	4	23,3	107,7	18,5	58,4	52,1	-/5	-/18,3
06265-416014	**06265-41601405**	45	160	14H7	25	25	M8	26	62	5,6	28	142	18,5	81,6	63,8	-/5	-/16,3
06265-416016	**06265-41601605**	45	160	16H7	25	25	M8	26	62	5,6	28	142	18,5	81,6	63,8	-/5	-/18,3

Handwheels with safety cylinder grip with transverse bore

Order No. reamed hole	Order No. reamed hole with slot	D	D1	D2	D3	D4	D5	D6	D7	A	A1	H	H2	L	L1	L2	L3	B3	T
06265-1080086	**06265-108008026**	25	80	8H7	19	14	M4	13	M6	30	2,5	17,6	7,5	72,6	13	38	36,7	-/2	-/9
06265-1080106	**06265-108010036**	25	80	10H7	19	14	M4	13	M6	30	2,5	17,6	7,5	72,6	13	38	36,7	-/3	-/11,4
06265-1080126	**06265-108012046**	25	80	12H7	19	14	M4	13	M6	30	2,5	17,6	7,5	72,6	13	38	36,7	-/4	-/13,8
06265-2100106	**06265-210010036**	28	100	10H7	19	16	M5	16	M6	38	3	20,1	7,5	88,6	13	47,5	43,5	-/3	-/11,4
06265-2100126	**06265-210012046**	28	100	12H7	19	16	M5	16	M6	38	3	20,1	7,5	88,6	13	47,5	43,5	-/4	-/13,8
06265-3125126	**06265-312512046**	35	125	12H7	25	20	M6	20	M6	47,5	4	23,3	7,5	107,7	18,5	58,4	52,1	-/4	-/13,8
06265-3125146	**06265-312514056**	35	125	14H7	25	20	M6	20	M6	47,5	4	23,3	7,5	107,7	18,5	58,4	52,1	-/5	-/16,3
06265-3125166	**06265-312516056**	35	125	16H7	25	20	M6	20	M6	47,5	4	23,3	7,5	107,7	18,5	58,4	52,1	-/5	-/18,3
06265-4160146	**06265-416014056**	45	160	14H7	25	25	M8	26	M6	62	5,6	28	7,5	142	18,5	81,6	63,8	-/5	-/16,3
06265-4160166	**06265-416016056**	45	160	16H7	25	25	M8	26	M6	62	5,6	28	7,5	142	18,5	81,6	63,8	-/5	-/18,3

06266

Knurled knobs

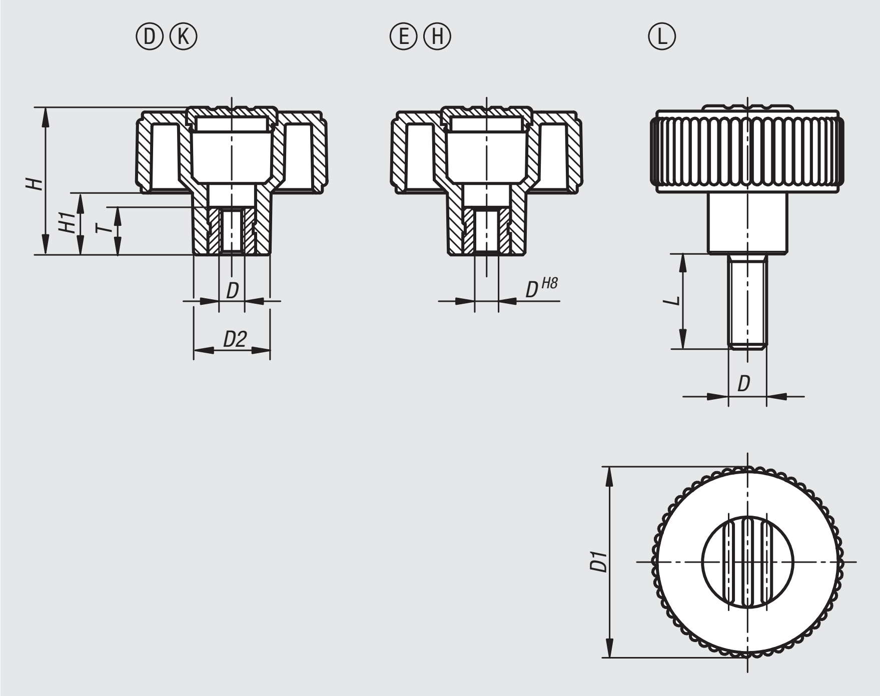
Material:
Black thermoplastic.
Bush and screw grade 5.8 steel.

Version:
Steel trivalent blue passivated.

Sample order:
nlm 06266-41067 (wheel cap colour colza yellow)

Note for ordering:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.

Drawing reference:
Form D: tapped bush without cap
Form K: tapped bush with cap
Form E: reamed bush without cap
Form H: reamed bush with cap
Form L: external thread



black grey	pure orange Δ = 1	signal green Δ = 2	traffic blue Δ = 3
⚫ RAL 7021	🟠 RAL 2004	🟢 RAL 6032	🔵 RAL 5017
light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7	
⚪ RAL 7035	🔴 RAL 3020	🟡 RAL 1021	

Order No.	Form	D	D1	D2	H	H1	T
06266-1105	D	M5	40	16,5	30	13	10
06266-1106	D	M6	40	16,5	30	13	10
06266-1108	D	M8	40	16,5	30	13	14
06266-1208	D	M8	50	18	35	15	14
06266-1210	D	M10	50	18	35	15	14
06266-1310	D	M10	63	22	40	17	14
06266-1312	D	M12	63	22	40	17	18

Knurled knobs

Order No.	Form	D	D1	D2	H	H1	T
06266-2105Δ	K	M5	40	16,5	31	13	10
06266-2106Δ	K	M6	40	16,5	31	13	10
06266-2108Δ	K	M8	40	16,5	31	13	14
06266-2208Δ	K	M8	50	18	36	15	14
06266-2210Δ	K	M10	50	18	36	15	14
06266-2310Δ	K	M10	63	22	41	17	14
06266-2312Δ	K	M12	63	22	41	17	18

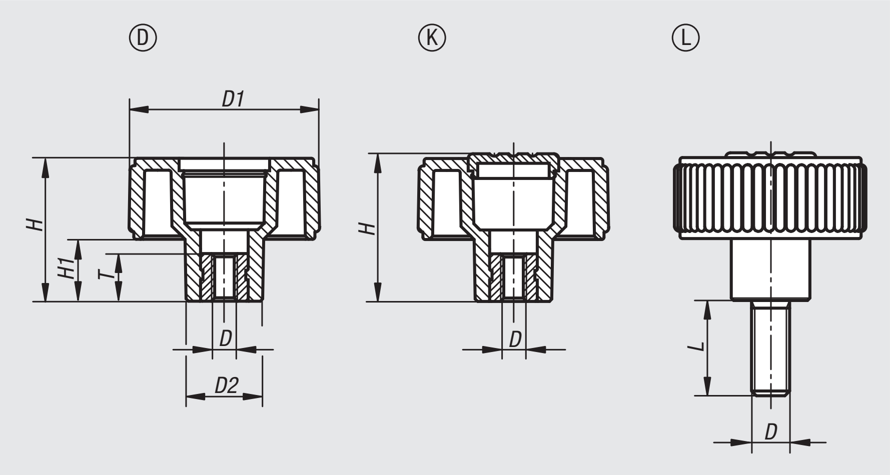
Order No.	Form	D	D1	D2	H	H1	T
06266-3106	E	6	40	16,5	30	13	10
06266-3208	E	8	50	18	35	15	14
06266-3310	E	10	63	22	40	17	14

Order No.	Form	D	D1	D2	H	H1	T
06266-4106Δ	H	6	40	16,5	31	13	10
06266-4208Δ	H	8	50	18	36	15	14
06266-4310Δ	H	10	63	22	41	17	14

Order No.	Form	D	D1	D2	H	H1	L
06266-5105ΔX	L	M5	40	16,5	31	13	10/20/40
06266-5106ΔX	L	M6	40	16,5	31	13	10/20/40
06266-5108ΔX	L	M8	40	16,5	31	13	15/30/60
06266-5208ΔX	L	M8	50	18	36	15	15/30/60
06266-5210ΔX	L	M10	50	18	36	15	20/30/60
06266-5310ΔX	L	M10	63	22	41	17	20/30/60
06266-5312ΔX	L	M12	63	22	41	17	30/60

Knurled knobs

metal parts stainless steel



Material:
Thermoplastic, black grey.
Bush and screw stainless steel 1.4305.

Version:
Stainless steel bright.

Sample order:
nlm 06267-51056X10
(cap colour traffic red; include length L)

Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.

Drawing reference:
Form D: tapped bush without cap
Form K: tapped bush with cap
Form L: external thread

black grey	pure orange Δ = 1	signal green Δ = 2	traffic blue Δ = 3
⚫ RAL 7021	🟠 RAL 2004	🟢 RAL 6032	🔵 RAL 5017
light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7	
⚪ RAL 7035	🔴 RAL 3020	🟡 RAL 1021	

Order No.	Form	D	D1	D2	H	H1	T
06267-1105	D	M5	40	16,5	30	13	10
06267-1106	D	M6	40	16,5	30	13	10
06267-1108	D	M8	40	16,5	30	13	14
06267-1208	D	M8	50	18	35	15	14
06267-1210	D	M10	50	18	35	15	14
06267-1310	D	M10	63	22	40	17	14
06267-1312	D	M12	63	22	40	17	18

Knurled knobs

metal parts stainless steel

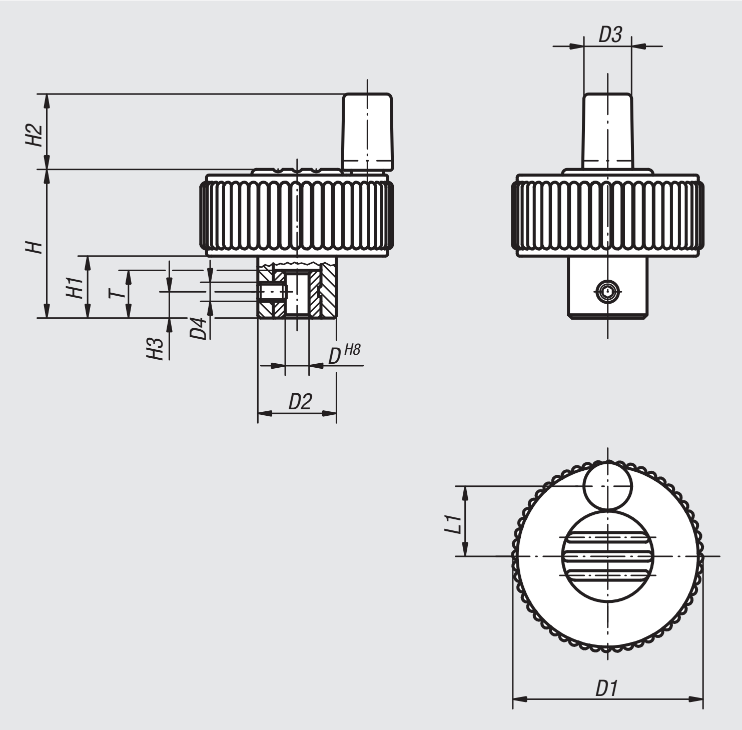
Order No.	Form	D	D1	D2	H	H1	T
06267-2105Δ	K	M5	40	16,5	31	13	10
06267-2106Δ	K	M6	40	16,5	31	13	10
06267-2108Δ	K	M8	40	16,5	31	13	14
06267-2108Δ	K	M8	40	16,5	31	13	10
06267-2208Δ	K	M8	50	18	36	15	14
06267-2210Δ	K	M10	50	18	36	15	14
06267-2310Δ	K	M10	63	22	41	17	14
06267-2312Δ	K	M12	63	22	41	17	18

Order No.	Form	D	D1	D2	H	H1	L
06267-5105ΔX	L	M5	40	16,5	31	13	10/20
06267-5106ΔX	L	M6	40	16,5	31	13	10/20/40
06267-5108ΔX	L	M8	40	16,5	31	13	15/30/60
06267-5208ΔX	L	M8	50	18	36	15	15/30/60
06267-5210ΔX	L	M10	50	18	36	15	20/30/60
06267-5310ΔX	L	M10	63	22	41	17	20/30/60

06268

Knurled knobs

with grip



Material:
Black thermoplastic.
Bush grade 5.8 steel.

Version:
Steel trivalent blue passivated.

Sample order:
nlm 06268-21066 (cap colour traffic red)

Note for ordering:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.

Note:
Form H: without locking grub screw
Form M: with locking grub screw

black grey	pure orange Δ = 1	signal green Δ = 2	traffic blue Δ = 3
⚫ RAL 7021	🟠 RAL 2004	🟢 RAL 6032	🔵 RAL 5017
light grey Δ = 5	**traffic red Δ = 6**	**colza yellow Δ = 7**	
⚪ RAL 7035	🔴 RAL 3020	🟡 RAL 1021	

Order No.	Form	D	D1	D2	D3	D4	H	H1	H2	H3	L1	T
06268-2106Δ	H	6H8	40	16,5	10	-	31	13	16	-	15	10
06268-2206Δ	H	6H8	50	18	10	-	36	15	16	-	18,5	10
06268-2308Δ	H	8H8	63	22	10	-	41	17	16	-	25	14
06268-1106Δ	M	6H8	40	16,5	10	M4	31	13	16	5,5	15	10
06268-1206Δ	M	6H8	50	18	10	M4	36	15	16	5,5	18,5	10
06268-1308Δ	M	8H8	63	22	10	M4	41	17	16	8	25	14

Notes

06271

Handwheels

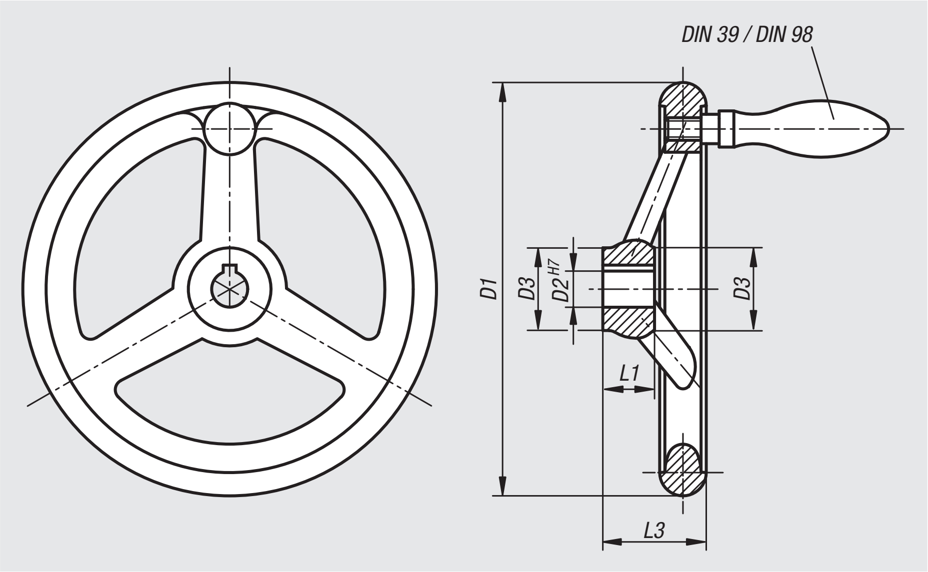
DIN 950, grey cast iron

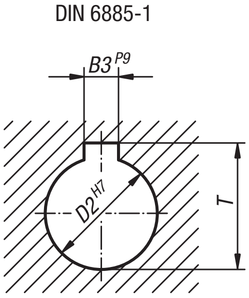
Material:
Handwheel, grey cast iron.
Grip steel.

Version:
Wheel rim turned and polished.
Radial and axial run-out of rim < IT 12.

Sample order:
nlm 06271-4080X10

On request:
Hubs with square socket or powder-coated handwheels.





Handwheels DIN 950 grey cast iron, without grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	No.of spokes
06271-0080X10	**06271-1080X10**	80	10H7	25	16	29	-/3	-/11,4	3
06271-0080X12	**06271-1080X12**	80	12H7	25	16	29	-/4	-/13,8	3
06271-0100X10	**06271-1100X10**	100	10H7	26	17	33	-/3	-/11,4	3
06271-0100X12	**06271-1100X12**	100	12H7	26	17	33	-/4	-/13,8	3
06271-0125X12	**06271-1125X12**	125	12H7	33	18	36	-/4	-/13,8	3
06271-0125X14	**06271-1125X14**	125	14H7	33	18	36	-/5	-/16,3	3
06271-0140X14	**06271-1140X14**	140	14H7	33	19	39	-/5	-/16,3	3
06271-0140X16	**06271-1140X16**	140	16H7	33	19	39	-/5	-/18,3	3
06271-0160X14	**06271-1160X14**	160	14H7	37	20	40	-/5	-/16,3	3
06271-0160X16	**06271-1160X16**	160	16H7	37	20	40	-/5	-/18,3	3
06271-0180X16	**06271-1180X16**	180	16H7	36	22	43	-/5	-/18,3	3
06271-0180X18	**06271-1180X18**	180	18H7	36	22	43	-/6	-/20,8	3
06271-0200X18	**06271-1200X18**	200	18H7	38	24	45	-/6	-/20,8	3
06271-0200X22	**06271-1200X22**	200	22H7	38	24	45	-/6	-/24,8	3
06271-0250X22	**06271-1250X22**	250	22H7	46	28	50	-/6	-/24,8	5
06271-0250X26	**06271-1250X26**	250	26H7	46	28	50	-/8	-/29,3	5
06271-0315X26	**06271-1315X26**	315	26H7	54	33	56	-/8	-/29,3	5
06271-0315X30	**06271-1315X30**	315	30H7	54	33	56	-/8	-/33,3	5
06271-0400X30	**06271-1400X30**	400	30H7	68	38	63	-/8	-/33,3	5
06271-0400X34	**06271-1400X34**	400	34H7	68	38	63	-/10	-/37,3	5
06271-0500X34	**06271-1500X34**	500	34H7	79	45	72	-/10	-/37,3	5
06271-0500X40	**06271-1500X40**	500	40H7	79	45	72	-/12	-/43,3	5

Handwheels

DIN 950, grey cast iron

Handwheels DIN 950 grey cast iron, with fixed grip

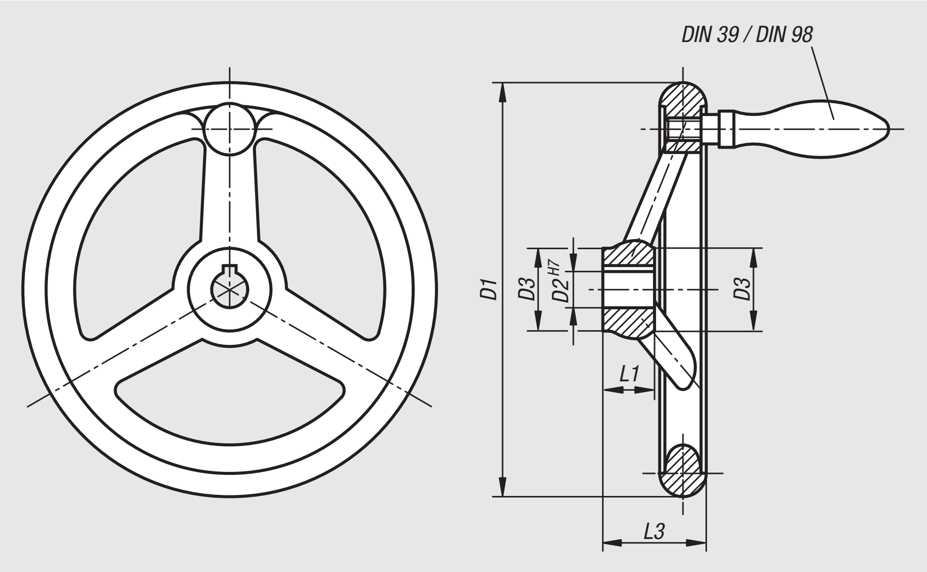
Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	No.of spokes	fixed grip DIN 39 Form E
06271-2080X10	**06271-3080X10**	80	10H7	25	16	29	-/3	-/11,4	3	ø16 x M6 x 50
06271-2080X12	**06271-3080X12**	80	12H7	25	16	29	-/4	-/13,8	3	ø16 x M6 x 50
06271-2100X10	**06271-3100X10**	100	10H7	26	17	33	-/3	-/11,4	3	ø16 x M6 x 50
06271-2100X12	**06271-3100X12**	100	12H7	26	17	33	-/4	-/13,8	3	ø16 x M6 x 50
06271-2125X12	**06271-3125X12**	125	12H7	33	18	36	-/4	-/13,8	3	ø20 x M8 x 64
06271-2125X14	**06271-3125X14**	125	14H7	33	18	36	-/5	-/16,3	3	ø20 x M8 x 64
06271-2140X14	**06271-3140X14**	140	14H7	33	19	39	-/5	-/16,3	3	ø20 x M8 x 64
06271-2140X16	**06271-3140X16**	140	16H7	33	19	39	-/5	-/18,3	3	ø20 x M8 x 64
06271-2160X14	**06271-3160X14**	160	14H7	37	20	40	-/5	-/16,3	3	ø25 x M10 x 80
06271-2160X16	**06271-3160X16**	160	16H7	37	20	40	-/5	-/18,3	3	ø25 x M10 x 80
06271-2180X16	**06271-3180X16**	180	16H7	36	22	43	-/5	-/18,3	3	ø25 x M10 x 80
06271-2180X18	**06271-3180X18**	180	18H7	36	22	43	-/6	-/20,8	3	ø25 x M10 x 80
06271-2200X18	**06271-3200X18**	200	18H7	38	24	45	-/6	-/20,8	3	ø25 x M10 x 80
06271-2200X22	**06271-3200X22**	200	22H7	38	24	45	-/6	-/24,8	3	ø25 x M10 x 80
06271-2250X22	**06271-3250X22**	250	22H7	46	28	50	-/6	-/24,8	5	ø32 x M12 x 100
06271-2250X26	**06271-3250X26**	250	26H7	46	28	50	-/8	-/29,3	5	ø32 x M12 x 100
06271-2315X26	**06271-3315X26**	315	26H7	54	33	56	-/8	-/29,3	5	ø32 x M12 x 100
06271-2315X30	**06271-3315X30**	315	30H7	54	33	56	-/8	-/33,3	5	ø32 x M12 x 100
06271-2400X30	**06271-3400X30**	400	30H7	68	38	63	-/8	-/33,3	5	ø36 x M16 x 112
06271-2400X34	**06271-3400X34**	400	34H7	68	38	63	-/10	-/37,3	5	ø36 x M16 x 112
06271-2500X34	**06271-3500X34**	500	34H7	79	45	72	-/10	-/37,3	5	ø36 x M16 x 112
06271-2500X40	**06271-3500X40**	500	40H7	79	45	72	-/12	-/43,3	5	ø36 x M16 x 112

Handwheels DIN 950 grey cast iron, with revolving grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	No.of spokes	revolving grip DIN 98 Form E
06271-4080X10	**06271-5080X10**	80	10H7	25	16	29	-/3	-/11,4	3	ø16 x M6 x 54.5
06271-4080X12	**06271-5080X12**	80	12H7	25	16	29	-/4	-/13,8	3	ø16 x M6 x 54.5
06271-4100X10	**06271-5100X10**	100	10H7	26	17	33	-/3	-/11,4	3	ø16 x M6 x 54.5
06271-4100X12	**06271-5100X12**	100	12H7	26	17	33	-/4	-/13,8	3	ø16 x M6 x 54.5
06271-4125X12	**06271-5125X12**	125	12H7	33	18	36	-/4	-/13,8	3	ø20 x M8 x 67
06271-4125X14	**06271-5125X14**	125	14H7	33	18	36	-/5	-/16,3	3	ø20 x M8 x 67
06271-4140X14	**06271-5140X14**	140	14H7	33	19	39	-/5	-/16,3	3	ø20 x M8 x 67
06271-4140X16	**06271-5140X16**	140	16H7	33	19	39	-/5	-/18,3	3	ø20 x M8 x 67
06271-4160X14	**06271-5160X14**	160	14H7	37	20	40	-/5	-/16,3	3	ø25 x M10 x 83
06271-4160X16	**06271-5160X16**	160	16H7	37	20	40	-/5	-/18,3	3	ø25 x M10 x 83
06271-4180X16	**06271-5180X16**	180	16H7	36	22	43	-/5	-/18,3	3	ø25 x M10 x 83
06271-4180X18	**06271-5180X18**	180	18H7	36	22	43	-/6	-/20,8	3	ø25 x M10 x 83
06271-4200X18	**06271-5200X18**	200	18H7	38	24	45	-/6	-/20,8	3	ø25 x M10 x 83
06271-4200X22	**06271-5200X22**	200	22H7	38	24	45	-/6	-/24,8	3	ø25 x M10 x 83
06271-4250X22	**06271-5250X22**	250	22H7	46	28	50	-/6	-/24,8	5	ø32 x M12 x 105,5
06271-4250X26	**06271-5250X26**	250	26H7	46	28	50	-/8	-/29,3	5	ø32 x M12 x 105,5
06271-4315X26	**06271-5315X26**	315	26H7	54	33	56	-/8	-/29,3	5	ø32 x M12 x 105,5
06271-4315X30	**06271-5315X30**	315	30H7	54	33	56	-/8	-/33,3	5	ø32 x M12 x 105,5
06271-4400X30	**06271-5400X30**	400	30H7	68	38	63	-/8	-/33,3	5	ø36 x M16 x 117
06271-4400X34	**06271-5400X34**	400	34H7	68	38	63	-/10	-/37,3	5	ø36 x M16 x 117
06271-4500X34	**06271-5500X34**	500	34H7	79	45	72	-/10	-/37,3	5	ø36 x M16 x 117
06271-4500X40	**06271-5500X40**	500	40H7	79	45	72	-/12	-/43,3	5	ø36 x M16 x 117

Handwheels

DIN 950, aluminium



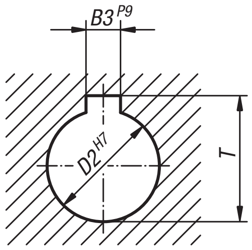
Material:
Handwheel aluminium.
Fixed grip aluminium, centre pin black oxidised steel.
Revolving grip aluminium, centre pin trivalent blue passivated steel.

Version:
Wheel rim turned and polished.
Radial and axial run-out of rim < IT 12.

Sample order:
nlm 06273-4080X10

On request:
Hubs with square socket or powder-coated handwheels.

DIN 6885-1



Handwheels DIN 950 aluminium, without grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	No.of spokes
06273-0080X10	**06273-1080X10**	80	10H7	25	16	29	-/3	-/11,4	3
06273-0080X12	**06273-1080X12**	80	12H7	25	16	29	-/4	-/13,8	3
06273-0100X10	**06273-1100X10**	100	10H7	29	17	33	-/3	-/11,4	3
06273-0100X12	**06273-1100X12**	100	12H7	29	17	33	-/4	-/13,8	3
06273-0125X12	**06273-1125X12**	125	12H7	31	18	36	-/4	-/13,8	3
06273-0125X14	**06273-1125X14**	125	14H7	31	18	36	-/5	-/16,3	3
06273-0140X14	**06273-1140X14**	140	14H7	36	19	39	-/5	-/16,3	3
06273-0140X16	**06273-1140X16**	140	16H7	36	19	39	-/5	-/18,3	3
06273-0160X14	**06273-1160X14**	160	14H7	36	20	40	-/5	-/16,3	3
06273-0160X16	**06273-1160X16**	160	16H7	36	20	40	-/5	-/18,3	3
06273-0180X16	**06273-1180X16**	180	16H7	37	22	43	-/5	-/18,3	3
06273-0180X18	**06273-1180X18**	180	18H7	37	22	43	-/6	-/20,8	3
06273-0200X18	**06273-1200X18**	200	18H7	43	24	45	-/6	-/20,8	3
06273-0200X22	**06273-1200X22**	200	22H7	43	24	45	-/6	-/24,8	3
06273-0250X22	**06273-1250X22**	250	22H7	49	28	50	-/6	-/24,8	5
06273-0250X26	**06273-1250X26**	250	26H7	49	28	50	-/8	-/29,3	5
06273-0315X26	**06273-1315X26**	315	26H7	54	33	56	-/8	-/29,3	5
06273-0315X30	**06273-1315X30**	315	30H7	54	33	56	-/8	-/33,3	5
06273-0400X30	**06273-1400X30**	400	30H7	65	38	63	-/8	-/33,3	5
06273-0400X34	**06273-1400X34**	400	34H7	65	38	63	-/10	-/37,3	5
06273-0500X34	**06273-1500X34**	500	34H7	79	45	72	-/10	-/37,3	5
06273-0500X40	**06273-1500X40**	500	40H7	79	45	72	-/12	-/43,3	5

Handwheels

DIN 950, aluminium

Handwheels DIN 950 aluminium, with fixed grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	No.of spokes	fixed grip DIN 39 Form E
06273-2080X10	**06273-3080X10**	80	10H7	25	16	29	-/3	-/11,4	3	ø16 x M6 x 50
06273-2080X12	**06273-3080X12**	80	12H7	25	16	29	-/4	-/13,8	3	ø16 x M6 x 50
06273-2100X10	**06273-3100X10**	100	10H7	29	17	33	-/3	-/11,4	3	ø16 x M6 x 50
06273-2100X12	**06273-3100X12**	100	12H7	29	17	33	-/4	-/13,8	3	ø16 x M6 x 50
06273-2125X12	**06273-3125X12**	125	12H7	31	18	36	-/4	-/13,8	3	ø20 x M8 x 64
06273-2125X14	**06273-3125X14**	125	14H7	31	18	36	-/5	-/16,3	3	ø20 x M8 x 64
06273-2140X14	**06273-3140X14**	140	14H7	36	19	39	-/5	-/16,3	3	ø20 x M8 x 64
06273-2140X16	**06273-3140X16**	140	16H7	36	19	39	-/5	-/18,3	3	ø20 x M8 x 64
06273-2160X14	**06273-3160X14**	160	14H7	36	20	40	-/5	-/16,3	3	ø25 x M10 x 80
06273-2160X16	**06273-3160X16**	160	16H7	36	20	40	-/5	-/18,3	3	ø25 x M10 x 80
06273-2180X16	**06273-3180X16**	180	16H7	37	22	43	-/5	-/18,3	3	ø25 x M10 x 80
06273-2180X18	**06273-3180X18**	180	18H7	37	22	43	-/6	-/20,8	3	ø25 x M10 x 80
06273-2200X18	**06273-3200X18**	200	18H7	43	24	45	-/6	-/20,8	3	ø25 x M10 x 80
06273-2200X22	**06273-3200X22**	200	22H7	43	24	45	-/6	-/24,8	3	ø25 x M10 x 80
06273-2250X22	**06273-3250X22**	250	22H7	49	28	50	-/6	-/24,8	5	ø32 x M12 x 100
06273-2250X26	**06273-3250X26**	250	26H7	49	28	50	-/8	-/29,3	5	ø32 x M12 x 100
06273-2315X26	**06273-3315X26**	315	26H7	54	33	56	-/8	-/29,3	5	ø32 x M12 x 100
06273-2315X30	**06273-3315X30**	315	30H7	54	33	56	-/8	-/33,3	5	ø32 x M12 x 100
06273-2400X30	**06273-3400X30**	400	30H7	65	38	63	-/8	-/33,3	5	ø36 x M16 x 112
06273-2400X34	**06273-3400X34**	400	34H7	65	38	63	-/10	-/37,3	5	ø36 x M16 x 112
06273-2500X34	**06273-3500X34**	500	34H7	79	45	72	-/10	-/37,3	5	ø36 x M16 x 112
06273-2500X40	**06273-3500X40**	500	40H7	79	45	72	-/12	-/43,3	5	ø36 x M16 x 112

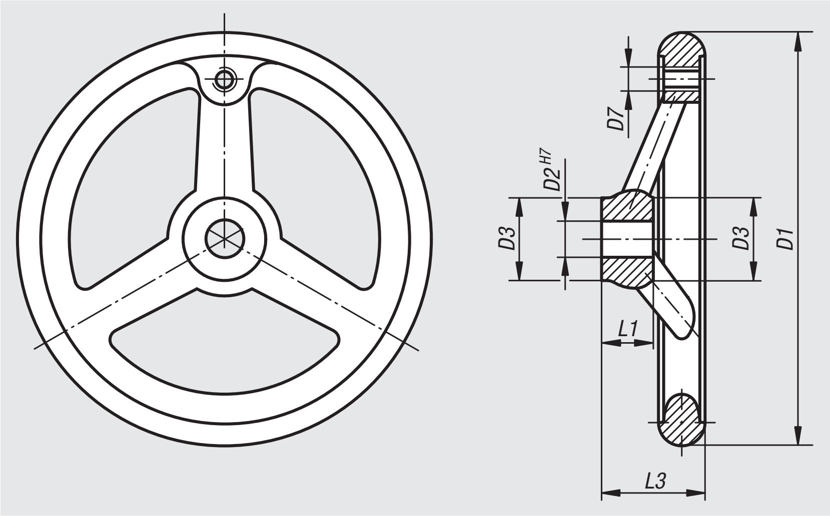
Handwheels DIN 950 aluminium, with revolving grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	No.of spokes	revolving grip DIN 98 Form E
06273-4080X10	**06273-5080X10**	80	10H7	25	16	29	-/3	-/11,4	3	ø16 x M6 x 54.5
06273-4080X12	**06273-5080X12**	80	12H7	25	16	29	-/4	-/13,8	3	ø16 x M6 x 54.5
06273-4100X10	**06273-5100X10**	100	10H7	29	17	33	-/3	-/11,4	3	ø16 x M6 x 54.5
06273-4100X12	**06273-5100X12**	100	12H7	29	17	33	-/4	-/13,8	3	ø16 x M6 x 54.5
06273-4125X12	**06273-5125X12**	125	12H7	31	18	36	-/4	-/13,8	3	ø20 x M8 x 67
06273-4125X14	**06273-5125X14**	125	14H7	31	18	36	-/5	-/16,3	3	ø20 x M8 x 67
06273-4140X14	**06273-5140X14**	140	14H7	36	19	39	-/5	-/16,3	3	ø20 x M8 x 67
06273-4140X16	**06273-5140X16**	140	16H7	36	19	39	-/5	-/18,3	3	ø20 x M8 x 67
06273-4160X14	**06273-5160X14**	160	14H7	36	20	40	-/5	-/16,3	3	ø25 x M10 x 83
06273-4160X16	**06273-5160X16**	160	16H7	36	20	40	-/5	-/18,3	3	ø25 x M10 x 83
06273-4180X16	**06273-5180X16**	180	16H7	37	22	43	-/5	-/18,3	3	ø25 x M10 x 83
06273-4180X18	**06273-5180X18**	180	18H7	37	22	43	-/6	-/20,8	3	ø25 x M10 x 83
06273-4200X18	**06273-5200X18**	200	18H7	43	24	45	-/6	-/20,8	3	ø25 x M10 x 83
06273-4200X22	**06273-5200X22**	200	22H7	43	24	45	-/6	-/24,8	3	ø25 x M10 x 83
06273-4250X22	**06273-5250X22**	250	22H7	49	28	50	-/6	-/24,8	5	ø32 x M12 x 105,5
06273-4250X26	**06273-5250X26**	250	26H7	49	28	50	-/8	-/29,3	5	ø32 x M12 x 105,5
06273-4315X26	**06273-5315X26**	315	26H7	54	33	56	-/8	-/29,3	5	ø32 x M12 x 105,5
06273-4315X30	**06273-5315X30**	315	30H7	54	33	56	-/8	-/33,3	5	ø32 x M12 x 105,5
06273-4400X30	**06273-5400X30**	400	30H7	65	38	63	-/8	-/33,3	5	ø36 x M16 x 117
06273-4400X34	**06273-5400X34**	400	34H7	65	38	63	-/10	-/37,3	5	ø36 x M16 x 117
06273-4500X34	**06273-5500X34**	500	34H7	79	45	72	-/10	-/37,3	5	ø36 x M16 x 117
06273-4500X40	**06273-5500X40**	500	40H7	79	45	72	-/12	-/43,3	5	ø36 x M16 x 117

06274

Handwheels

DIN 950, stainless steel

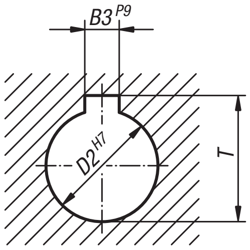


Material:
Stainless steel 1.4401.

Version:
Wheel rim turned
and polished

Sample order:
nlm 06274-0100X10

DIN 6885-1



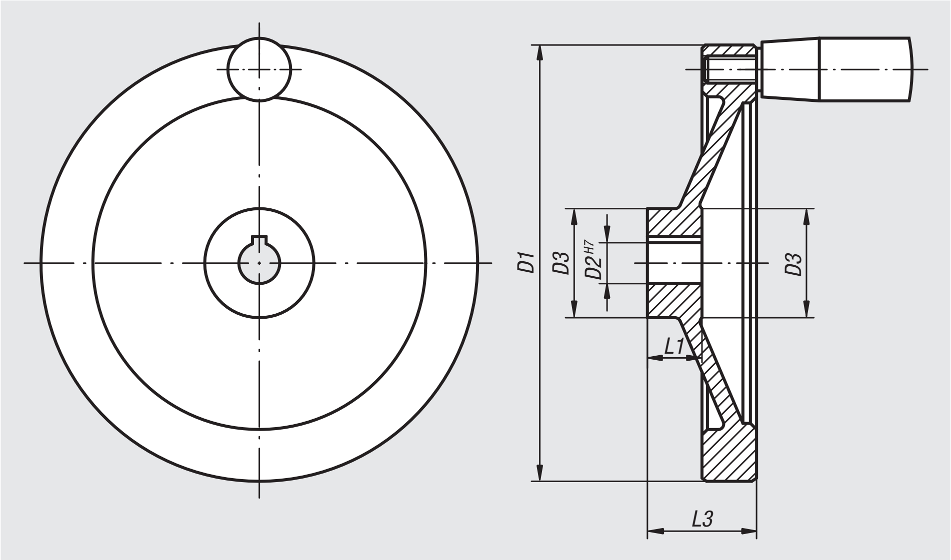
Order No.	Version 1	D1	D2	D3	D7	L1	L3	B3	T	No. of spokes
06274-0100X10	reamed hole	100	10H7	26	M6	17	33	-	-	3
06274-0125X12	reamed hole	125	12H7	28	M8	18	36	-	-	3
06274-0160X16	reamed hole	160	16H7	32	M10	20	40	-	-	3
06274-0200X18	reamed hole	200	18H7	38	M10	24	45	-	-	3
06274-1100X10	reamed hole with slot	100	10H7	26	M6	17	33	3	11,4	3
06274-1125X12	reamed hole with slot	125	12H7	28	M8	18	36	4	13,8	3
06274-1160X16	reamed hole with slot	160	16H7	32	M10	20	40	5	18,3	3
06274-1200X18	reamed hole with slot	200	18H7	38	M10	24	45	6	20,8	3

Notes

06275

Handwheels disc

aluminium



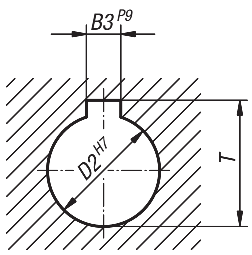
Material:
Disc handwheel aluminium.
Cylinder grip black thermoset PF 31-DIN 7708.
Hub electro zinc-plated steel.

Version:
Wheel rim turned and polished.
Radial and axial run-out of rim < IT 12.

Sample order:
nlm 06275-4080X10

On request:
Hubs with square socket or powder-coated handwheels.

DIN 6885-1



Handwheels disc, aluminium, without grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T
06275-0080X10	**06275-1080X10**	80	10H7	26	16	31	-/3	-/11,4
06275-0080X12	**06275-1080X12**	80	12H7	26	16	31	-/4	-/13,8
06275-0100X10	**06275-1100X10**	100	10H7	31	17	34	-/3	-/11,4
06275-0100X12	**06275-1100X12**	100	12H7	31	17	34	-/4	-/13,8
06275-0125X12	**06275-1125X12**	125	12H7	30	18	37	-/4	-/13,8
06275-0125X14	**06275-1125X14**	125	14H7	30	18	37	-/5	-/16,3
06275-0140X14	**06275-1140X14**	140	14H7	34	19	34	-/5	-/16,3
06275-0140X15	**06275-1140X15**	140	15H7	34	19	34	-/5	-/17,3
06275-0160X15	**06275-1160X15**	160	15H7	40	20	40	-/5	-/17,3
06275-0160X16	**06275-1160X16**	160	16H7	40	20	40	-/5	-/18,3
06275-0200X18	**06275-1200X18**	200	18H7	50	24	46	-/6	-/20,8
06275-0200X20	**06275-1200X20**	200	20H7	50	24	46	-/6	-/22,8
06275-0250X22	**06275-1250X22**	250	22H7	50	28	49	-/6	-/24,8
06275-0250X24	**06275-1250X24**	250	24H7	50	28	49	-/8	-/27,3

Handwheels disc

aluminium

Handwheels disc, aluminium, with fixed cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Fixed cylinder grip
06275-2080X10	**06275-3080X10**	80	10H7	26	16	31	-/3	-/11,4	ø18 x M6 x 40
06275-2080X12	**06275-3080X12**	80	12H7	26	16	31	-/4	-/13,8	ø18 x M6 x 40
06275-2100X10	**06275-3100X10**	100	10H7	31	17	34	-/3	-/11,4	ø18 x M6 x 40
06275-2100X12	**06275-3100X12**	100	12H7	31	17	34	-/4	-/13,8	ø18 x M6 x 40
06275-2125X12	**06275-3125X12**	125	12H7	30	18	37	-/4	-/13,8	ø21 x M8 x 50
06275-2125X14	**06275-3125X14**	125	14H7	30	18	37	-/5	-/16,3	ø21 x M8 x 50
06275-2140X14	**06275-3140X14**	140	14H7	34	19	34	-/5	-/16,3	ø21 x M8 x 50
06275-2140X15	**06275-3140X15**	140	15H7	34	19	34	-/5	-/17,3	ø21 x M8 x 50
06275-2160X15	**06275-3160X15**	160	15H7	40	20	40	-/5	-/17,3	ø26 x M10 x 80
06275-2160X16	**06275-3160X16**	160	16H7	40	20	40	-/5	-/18,3	ø26 x M10 x 80
06275-2200X18	**06275-3200X18**	200	18H7	50	24	46	-/6	-/20,8	ø26 x M10 x 80
06275-2200X20	**06275-3200X20**	200	20H7	50	24	46	-/6	-/22,8	ø26 x M10 x 80
06275-2250X22	**06275-3250X22**	250	22H7	50	28	49	-/6	-/24,8	ø28 x M12 x 90
06275-2250X24	**06275-3250X24**	250	24H7	50	28	49	-/8	-/27,3	ø28 x M12 x 90

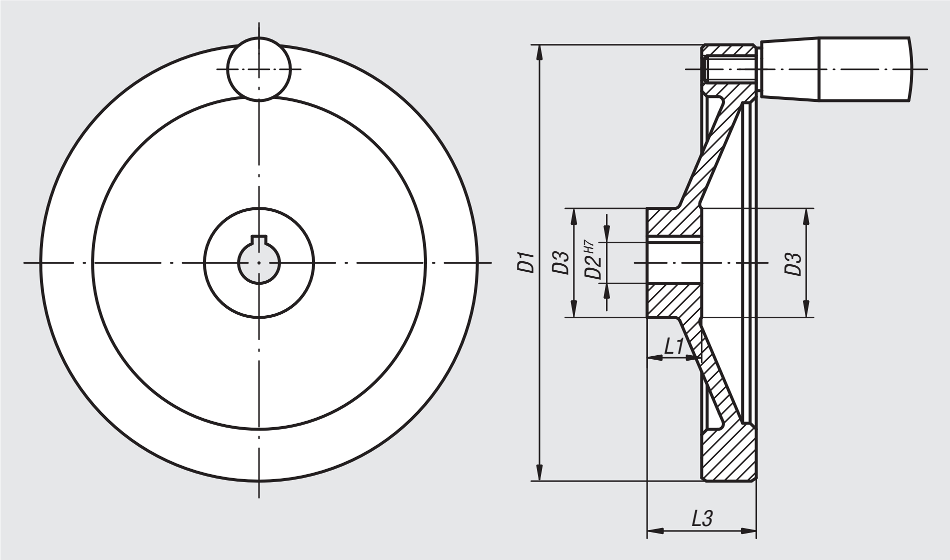
Handwheels disc, aluminium, with revolving cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Revolving cylinder grip
06275-4080X10	**06275-5080X10**	80	10H7	26	16	31	-/3	-/11,4	ø18 x M6 x 40
06275-4080X12	**06275-5080X12**	80	12H7	26	16	31	-/4	-/13,8	ø18 x M6 x 40
06275-4100X10	**06275-5100X10**	100	10H7	31	17	34	-/3	-/11,4	ø18 x M6 x 40
06275-4100X12	**06275-5100X12**	100	12H7	31	17	34	-/4	-/13,8	ø18 x M6 x 40
06275-4125X12	**06275-5125X12**	125	12H7	30	18	37	-/4	-/13,8	ø22 x M8 x 56
06275-4125X14	**06275-5125X14**	125	14H7	30	18	37	-/5	-/16,3	ø22 x M8 x 56
06275-4140X14	**06275-5140X14**	140	14H7	34	19	34	-/5	-/16,3	ø22 x M8 x 56
06275-4140X15	**06275-5140X15**	140	15H7	34	19	34	-/5	-/17,3	ø22 x M8 x 56
06275-4160X15	**06275-5160X15**	160	15H7	40	20	40	-/5	-/17,3	ø26 x M10 x 80
06275-4160X16	**06275-5160X16**	160	16H7	40	20	40	-/5	-/18,3	ø26 x M10 x 80
06275-4200X18	**06275-5200X18**	200	18H7	50	24	46	-/6	-/20,8	ø26 x M10 x 80
06275-4200X20	**06275-5200X20**	200	20H7	50	24	46	-/6	-/22,8	ø26 x M10 x 80
06275-4250X22	**06275-5250X22**	250	22H7	50	28	49	-/6	-/24,8	ø31 x M12 x 102
06275-4250X24	**06275-5250X24**	250	24H7	50	28	49	-/8	-/27,3	ø31 x M12 x 102

06275

Handwheels disc

aluminium



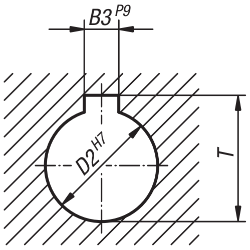
Material:
Disc handwheel aluminium.
Cylinder grip black thermoset PF 31-DIN 7708.
Hub electro zinc-plated steel.

Version:
Black, powder-coated.
Wheel rim turned.
Radial and axial run-out of rim < IT 12.

Sample order:
nlm 06275-01080x10

On request:
Hubs with square socket.

DIN 6885-1



Handwheels disc, aluminium, without grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T
06275-01080X10	**06275-11080X10**	80	10H7	26	16	31	-/3	-/11,4
06275-01080X12	**06275-11080X12**	80	12H7	26	16	31	-/4	-/13,8
06275-01100X10	**06275-11100X10**	100	10H7	31	17	34	-/3	-/11,4
06275-01100X12	**06275-11100X12**	100	12H7	31	17	34	-/4	-/13,8
06275-01125X12	**06275-11125X12**	125	12H7	30	18	37	-/4	-/13,8
06275-01125X14	**06275-11125X14**	125	14H7	30	18	37	-/5	-/16,3
06275-01140X14	**06275-11140X14**	140	14H7	34	19	34	-/5	-/16,3
06275-01140X15	**06275-11140X15**	140	15H7	34	19	34	-/5	-/17,3
06275-01160X15	**06275-11160X15**	160	15H7	40	20	40	-/5	-/17,3
06275-01160X16	**06275-11160X16**	160	16H7	40	20	40	-/5	-/18,3
06275-01200X18	**06275-11200X18**	200	18H7	50	24	46	-/6	-/20,8
06275-01200X20	**06275-11200X20**	200	20H7	50	24	46	-/6	-/22,8
06275-01250X22	**06275-11250X22**	250	22H7	50	28	49	-/6	-/24,8
06275-01250X24	**06275-11250X24**	250	24H7	50	28	49	-/8	-/27,3

Handwheels disc

aluminium

Handwheels disc, aluminium, with fixed cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Fixed cylinder grip
06275-21080X10	**06275-31080X10**	80	10H7	26	16	31	-/3	-/11,4	ø18 x M6 x 40
06275-21080X12	**06275-31080X12**	80	12H7	26	16	31	-/4	-/13,8	ø18 x M6 x 40
06275-21100X10	**06275-31100X10**	100	10H7	31	17	34	-/3	-/11,4	ø18 x M6 x 40
06275-21100X12	**06275-31100X12**	100	12H7	31	17	34	-/4	-/13,8	ø18 x M6 x 40
06275-21125X12	**06275-31125X12**	125	12H7	30	18	37	-/4	-/13,8	ø21 x M8 x 50
06275-21125X14	**06275-31125X14**	125	14H7	30	18	37	-/5	-/16,3	ø21 x M8 x 50
06275-21140X14	**06275-31140X14**	140	14H7	34	19	34	-/5	-/16,3	ø21 x M8 x 50
06275-21140X15	**06275-31140X15**	140	15H7	34	19	34	-/5	-/17,3	ø21 x M8 x 50
06275-21160X15	**06275-31160X15**	160	15H7	40	20	40	-/5	-/17,3	ø26 x M10 x 80
06275-21160X16	**06275-31160X16**	160	16H7	40	20	40	-/5	-/18,3	ø26 x M10 x 80
06275-21200X18	**06275-31200X18**	200	18H7	50	24	46	-/6	-/20,8	ø26 x M10 x 80
06275-21200X20	**06275-31200X20**	200	20H7	50	24	46	-/6	-/22,8	ø26 x M10 x 80
06275-21250X22	**06275-31250X22**	250	22H7	50	28	49	-/6	-/24,8	ø28 x M12 x 90
06275-21250X24	**06275-31250X24**	250	24H7	50	28	49	-/8	-/27,3	ø28 x M12 x 90

Handwheels disc, aluminium, with revolving cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Revolving cylinder grip
06275-41080X10	**06275-51080X10**	80	10H7	26	16	31	-/3	-/11,4	ø18 x M6 x 40
06275-41080X12	**06275-51080X12**	80	12H7	26	16	31	-/4	-/13,8	ø18 x M6 x 40
06275-41100X10	**06275-51100X10**	100	10H7	31	17	34	-/3	-/11,4	ø18 x M6 x 40
06275-41100X12	**06275-51100X12**	100	12H7	31	17	34	-/4	-/13,8	ø18 x M6 x 40
06275-41125X12	**06275-51125X12**	125	12H7	30	18	37	-/4	-/13,8	ø22 x M8 x 56
06275-41125X14	**06275-51125X14**	125	14H7	30	18	37	-/5	-/16,3	ø22 x M8 x 56
06275-41140X14	**06275-51140X14**	140	14H7	34	19	34	-/5	-/16,3	ø22 x M8 x 56
06275-41140X15	**06275-51140X15**	140	15H7	34	19	34	-/5	-/17,3	ø22 x M8 x 56
06275-41160X15	**06275-51160X15**	160	15H7	40	20	40	-/5	-/17,3	ø26 x M10 x 80
06275-41160X16	**06275-51160X16**	160	16H7	40	20	40	-/5	-/18,3	ø26 x M10 x 80
06275-41200X18	**06275-51200X18**	200	18H7	50	24	46	-/6	-/20,8	ø26 x M10 x 80
06275-41200X20	**06275-51200X20**	200	20H7	50	24	46	-/6	-/22,8	ø26 x M10 x 80
06275-41250X22	**06275-51250X22**	250	22H7	50	28	49	-/6	-/24,8	ø31 x M12 x 102
06275-41250X24	**06275-51250X24**	250	24H7	50	28	49	-/8	-/27,3	ø31 x M12 x 102

06276-01

Handwheels disc stainless steel

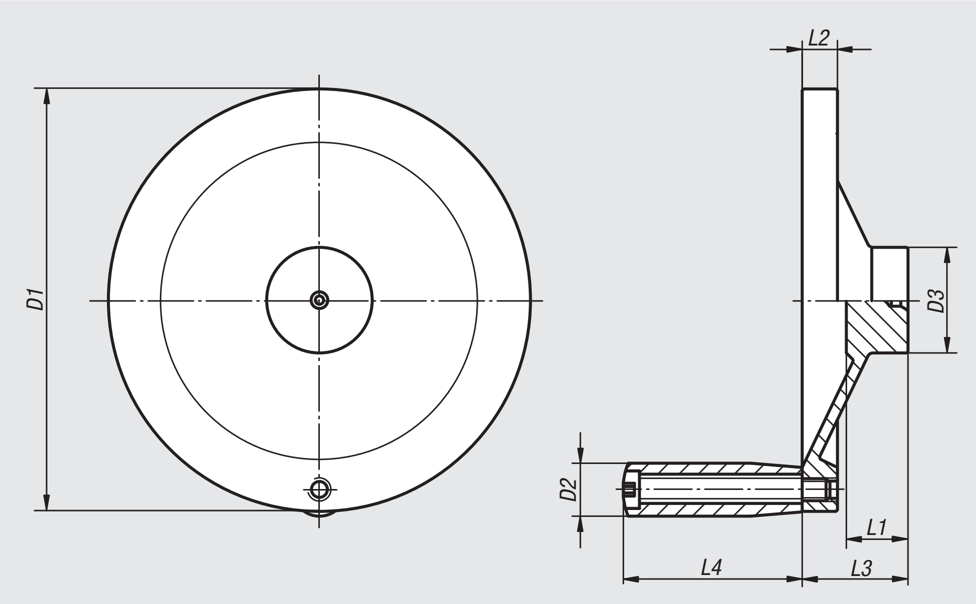
with revolving grip

Material:
Stainless steel 1.4301.

Version:
Turned, bright.
Hub is centre bored.

Sample order:
nlm 06276-01-4076X00

On request:
Stainless steel 1.4401.
Stainless steel 1.4404.
Stainless steel 1.4571.



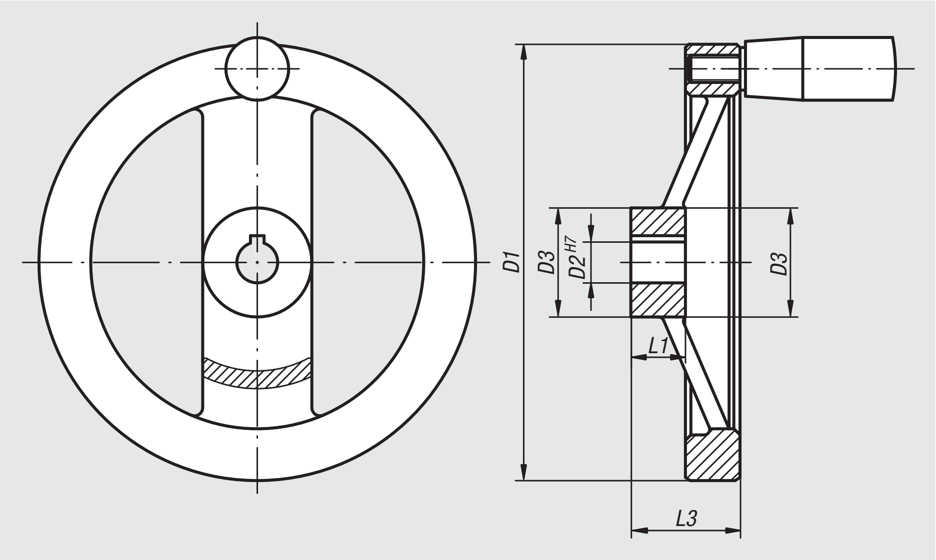
Order No.	D1	D2	D3	L1	L2	L3	L4
06276-01-4076X00	76,2	9,91	22,1	17,02	6,1	27,9	37,9
06276-01-4101X00	101,6	11,94	25,9	18,03	7,87	31,7	39,88
06276-01-4152X00	152,4	19,05	38,1	22,1	12,7	38,1	63,5
06276-01-4203X00	203,2	22,1	45,7	24,13	14,22	45,7	76,2
06276-01-4254X00	254	22,1	50,8	26,67	15,75	50,8	76,2

Notes

06277

Handwheels 2-spoke

aluminium, flat wheel rim



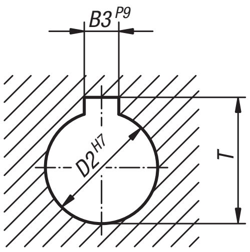
Material:
Handwheels aluminium.
Cylinder grip black thermoset PF 31-DIN 7708, centre pin electro zinc-plated steel.

Version:
Wheel rim turned and polished.
Radial and axial run-out of rim < IT 12.

Sample order:
nlm 06277-4080X10

On request:
Hubs with square socket or powder-coated handwheels.

DIN 6885-1



Handwheels 2-spoke, aluminium, flat wheel rim, without grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T
06277-0080X10	**06277-1080X10**	80	10H7	24	16	28	-/3	-/11,4
06277-0080X12	**06277-1080X12**	80	12H7	24	16	28	-/4	-/13,8
06277-0100X10	**06277-1100X10**	100	10H7	26	17	33	-/3	-/11,4
06277-0100X12	**06277-1100X12**	100	12H7	26	17	33	-/4	-/13,8
06277-0125X12	**06277-1125X12**	125	12H7	31	18	33,5	-/4	-/13,8
06277-0125X14	**06277-1125X14**	125	14H7	31	18	33,5	-/5	-/16,3
06277-0160X14	**06277-1160X14**	160	14H7	40	20	39	-/5	-/16,3
06277-0160X16	**06277-1160X16**	160	16H7	40	20	39	-/5	-/18,3
06277-0200X18	**06277-1200X18**	200	18H7	42	24	45	-/6	-/20,8
06277-0200X20	**06277-1200X20**	200	20H7	42	24	45	-/6	-/22,8
06277-0250X22	**06277-1250X22**	250	22H7	48	28	51	-/6	-/24,8
06277-0250X26	**06277-1250X26**	250	26H7	48	28	51	-/8	-/29,3

Handwheels 2-spoke

aluminium, flat wheel rim

Handwheels 2-spoke, aluminium, flat wheel rim, with fixed cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Fixed cylinder grip
06277-2080X10	**06277-3080X10**	80	10H7	24	16	28	-/3	-/11,4	ø18 x M6 x 40
06277-2080X12	**06277-3080X12**	80	12H7	24	16	28	-/4	-/13,8	ø18 x M6 x 40
06277-2100X10	**06277-3100X10**	100	10H7	26	17	33	-/3	-/11,4	ø18 x M6 x 40
06277-2100X12	**06277-3100X12**	100	12H7	26	17	33	-/4	-/13,8	ø18 x M6 x 40
06277-2125X12	**06277-3125X12**	125	12H7	31	18	33,5	-/4	-/13,8	ø21 x M8 x 50
06277-2125X14	**06277-3125X14**	125	14H7	31	18	33,5	-/5	-/16,3	ø21 x M8 x 50
06277-2160X14	**06277-3160X14**	160	14H7	40	20	39	-/5	-/16,3	ø26 x M10 x 80
06277-2160X16	**06277-3160X16**	160	16H7	40	20	39	-/5	-/18,3	ø26 x M10 x 80
06277-2200X18	**06277-3200X18**	200	18H7	42	24	45	-/6	-/20,8	ø26 x M10 x 80
06277-2200X20	**06277-3200X20**	200	20H7	42	24	45	-/6	-/22,8	ø26 x M10 x 80
06277-2250X22	**06277-3250X22**	250	22H7	48	28	51	-/6	-/24,8	ø28 x M12 x 90
06277-2250X26	**06277-3250X26**	250	26H7	48	28	51	-/8	-/29,3	ø28 x M12 x 90

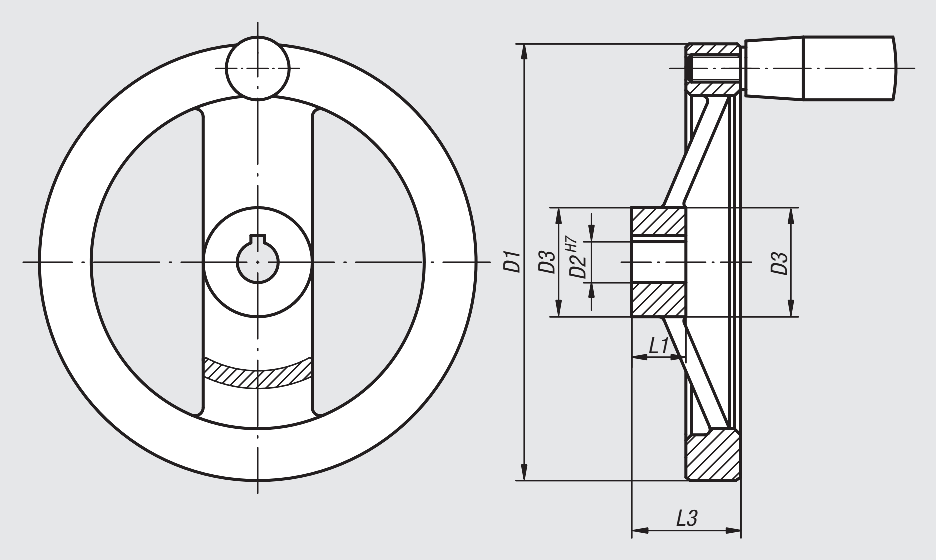
Handwheels 2-spoke, aluminium, flat wheel rim, with revolving cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Revolving cylinder grip
06277-4080X10	**06277-5080X10**	80	10H7	24	16	28	-/3	-/11,4	ø18 x M6 x 40
06277-4080X12	**06277-5080X12**	80	12H7	24	16	28	-/4	-/13,8	ø18 x M6 x 40
06277-4100X10	**06277-5100X10**	100	10H7	26	17	33	-/3	-/11,4	ø18 x M6 x 40
06277-4100X12	**06277-5100X12**	100	12H7	26	17	33	-/4	-/13,8	ø18 x M6 x 40
06277-4125X12	**06277-5125X12**	125	12H7	31	18	33,5	-/4	-/13,8	ø22 x M8 x 56
06277-4125X14	**06277-5125X14**	125	14H7	31	18	33,5	-/5	-/16,3	ø22 x M8 x 56
06277-4160X14	**06277-5160X14**	160	14H7	40	20	39	-/5	-/16,3	ø26 x M10 x 80
06277-4160X16	**06277-5160X16**	160	16H7	40	20	39	-/5	-/18,3	ø26 x M10 x 80
06277-4200X18	**06277-5200X18**	200	18H7	42	24	45	-/6	-/20,8	ø26 x M10 x 80
06277-4200X20	**06277-5200X20**	200	20H7	42	24	45	-/6	-/22,8	ø26 x M10 x 80
06277-4250X22	**06277-5250X22**	250	22H7	48	28	51	-/6	-/24,8	ø31 x M12 x 102
06277-4250X26	**06277-5250X26**	250	26H7	48	28	51	-/8	-/29,3	ø31 x M12 x 102

06277

Handwheels 2-spoke

flat rim, aluminium



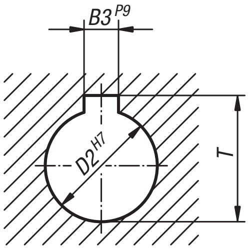
Material:
Handwheels aluminium.
Cylinder grip black thermoset PF 31-DIN 7708,
centre pin electro zinc-plated steel.

Version:
Black, powder-coated.
Wheel rim turned.
Radial and axial run-out of rim < IT 12.

Sample order:
nlm 06277-01080X10

On request:
Hubs with square socket.

DIN 6885-1



Handwheels 2-spoke, aluminium, flat wheel rim, without grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T
06277-01080X10	**06277-11080X10**	80	10H7	24	16	28	-/3	-/11,4
06277-01080X12	**06277-11080X12**	80	12H7	24	16	28	-/4	-/13,8
06277-01100X10	**06277-11100X10**	100	10H7	26	17	33	-/3	-/11,4
06277-01100X12	**06277-11100X12**	100	12H7	26	17	33	-/4	-/13,8
06277-01125X12	**06277-11125X12**	125	12H7	31	18	33,5	-/4	-/13,8
06277-01125X14	**06277-11125X14**	125	14H7	31	18	33,5	-/5	-/16,3
06277-01160X14	**06277-11160X14**	160	14H7	40	20	39	-/5	-/16,3
06277-01160X16	**06277-11160X16**	160	16H7	40	20	39	-/5	-/18,3
06277-01200X18	**06277-11200X18**	200	18H7	42	24	45	-/6	-/20,8
06277-01200X20	**06277-11200X20**	200	20H7	42	24	45	-/6	-/22,8
06277-01250X22	**06277-11250X22**	250	22H7	48	28	51	-/6	-/24,8
06277-01250X26	**06277-11250X26**	250	26H7	48	28	51	-/8	-/29,3

Handwheels 2-spoke

flat rim, aluminium

Handwheels 2-spoke, aluminium, flat wheel rim, with fixed cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Fixed cylinder grip
06277-21080X10	**06277-31080X10**	80	10H7	24	16	28	-/3	-/11,4	ø18 x M6 x 40
06277-21080X12	**06277-31080X12**	80	12H7	24	16	28	-/4	-/13,8	ø18 x M6 x 40
06277-21100X10	**06277-31100X10**	100	10H7	26	17	33	-/3	-/11,4	ø18 x M6 x 40
06277-21100X12	**06277-31100X12**	100	12H7	26	17	33	-/4	-/13,8	ø18 x M6 x 40
06277-21125X12	**06277-31125X12**	125	12H7	31	18	33,5	-/4	-/13,8	ø21 x M8 x 50
06277-21125X14	**06277-31125X14**	125	14H7	31	18	33,5	-/5	-/16,3	ø21 x M8 x 50
06277-21160X14	**06277-31160X14**	160	14H7	40	20	39	-/5	-/16,3	ø26 x M10 x 80
06277-21160X16	**06277-31160X16**	160	16H7	40	20	39	-/5	-/18,3	ø26 x M10 x 80
06277-21200X18	**06277-31200X18**	200	18H7	42	24	45	-/6	-/20,8	ø26 x M10 x 80
06277-21200X20	**06277-31200X20**	200	20H7	42	24	45	-/6	-/22,8	ø26 x M10 x 80
06277-21250X22	**06277-31250X22**	250	22H7	48	28	51	-/6	-/24,8	ø28 x M12 x 90
06277-21250X26	**06277-31250X26**	250	26H7	48	28	51	-/8	-/29,3	ø28 x M12 x 90

Handwheels 2-spoke, aluminium, flat wheel rim, with revolving cylinder grip

Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T	Revolving cylinder grip
06277-41080X10	**06277-51080X10**	80	10H7	24	16	28	-/3	-/11,4	ø18 x M6 x 40
06277-41080X12	**06277-51080X12**	80	12H7	24	16	28	-/4	-/13,8	ø18 x M6 x 40
06277-41100X10	**06277-51100X10**	100	10H7	26	17	33	-/3	-/11,4	ø18 x M6 x 40
06277-41100X12	**06277-51100X12**	100	12H7	26	17	33	-/4	-/13,8	ø18 x M6 x 40
06277-41125X12	**06277-51125X12**	125	12H7	31	18	33,5	-/4	-/13,8	ø22 x M8 x 56
06277-41125X14	**06277-51125X14**	125	14H7	31	18	33,5	-/5	-/16,3	ø22 x M8 x 56
06277-41160X14	**06277-51160X14**	160	14H7	40	20	39	-/5	-/16,3	ø26 x M10 x 80
06277-41160X16	**06277-51160X16**	160	16H7	40	20	39	-/5	-/18,3	ø26 x M10 x 80
06277-41200X18	**06277-51200X18**	200	18H7	42	24	45	-/6	-/20,8	ø26 x M10 x 80
06277-41200X20	**06277-51200X20**	200	20H7	42	24	45	-/6	-/22,8	ø26 x M10 x 80
06277-41250X22	**06277-51250X22**	250	22H7	48	28	51	-/6	-/24,8	ø31 x M12 x 102
06277-41250X26	**06277-51250X26**	250	26H7	48	28	51	-/8	-/29,3	ø31 x M12 x 102

06279

Handwheels disc

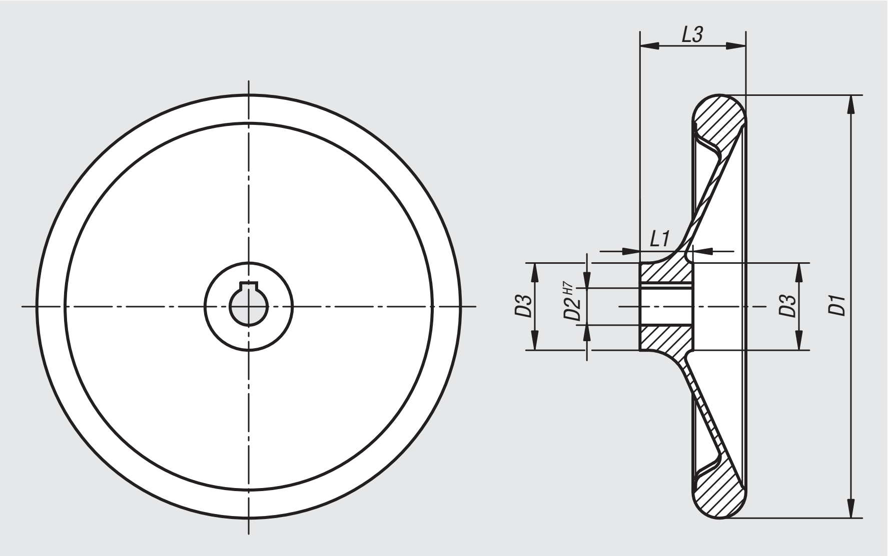
similar to DIN 950, aluminium

Material:
Handwheel aluminium.

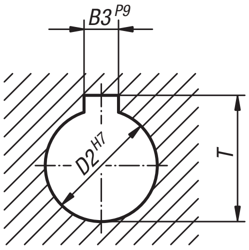
Version:
Wheel rim turned and polished.
Radial and axial run-out of rim < IT 12.

Sample order:
nlm 06279-0080X10

On request:
Hubs with square socket or powder-coated handwheels.



DIN 6885-1



Order No. reamed hole	Order No. reamed hole with slot	D1	D2	D3	L1	L3	B3	T
06279-0080X10	**06279-1080X10**	80	10H7	25	16	30	-/3	-/11,4
06279-0080X12	**06279-1080X12**	80	12H7	25	16	30	-/4	-/13,8
06279-0100X10	**06279-1100X10**	100	10H7	28	17	31	-/3	-/11,4
06279-0100X12	**06279-1100X12**	100	12H7	28	17	31	-/4	-/13,8
06279-0120X12	**06279-1120X12**	120	12H7	27	18	30	-/4	-/13,8
06279-0120X14	**06279-1120X14**	120	14H7	27	18	30	-/5	-/16,3
06279-0160X14	**06279-1160X14**	160	14H7	34	20	40	-/5	-/16,3
06279-0160X16	**06279-1160X16**	160	16H7	34	20	40	-/5	-/18,3
06279-0200X18	**06279-1200X18**	200	18H7	40	24	44	-/6	-/20,8
06279-0200X22	**06279-1200X22**	200	22H7	40	24	44	-/6	-/24,8
06279-0250X22	**06279-1250X22**	250	22H7	49	28	61	-/6	-/24,8
06279-0250X26	**06279-1250X26**	250	26H7	49	28	61	-/8	-/29,3
06279-0280X24	**06279-1280X24**	280	24H7	51	30	38	-/8	-/27,3
06279-0280X28	**06279-1280X28**	280	28H7	51	30	38	-/8	-/31,3
06279-0360X28	**06279-1360X28**	360	28H7	63	35	73	-/8	-/31,3
06279-0360X32	**06279-1360X32**	360	32H7	63	35	73	-/10	-/35,3

Handwheels disc

with revolving grip

Material:
Thermoset PF 31, black.
Hubs and steel parts of grip nickel-plated steel or bright 1.4305 stainless steel.

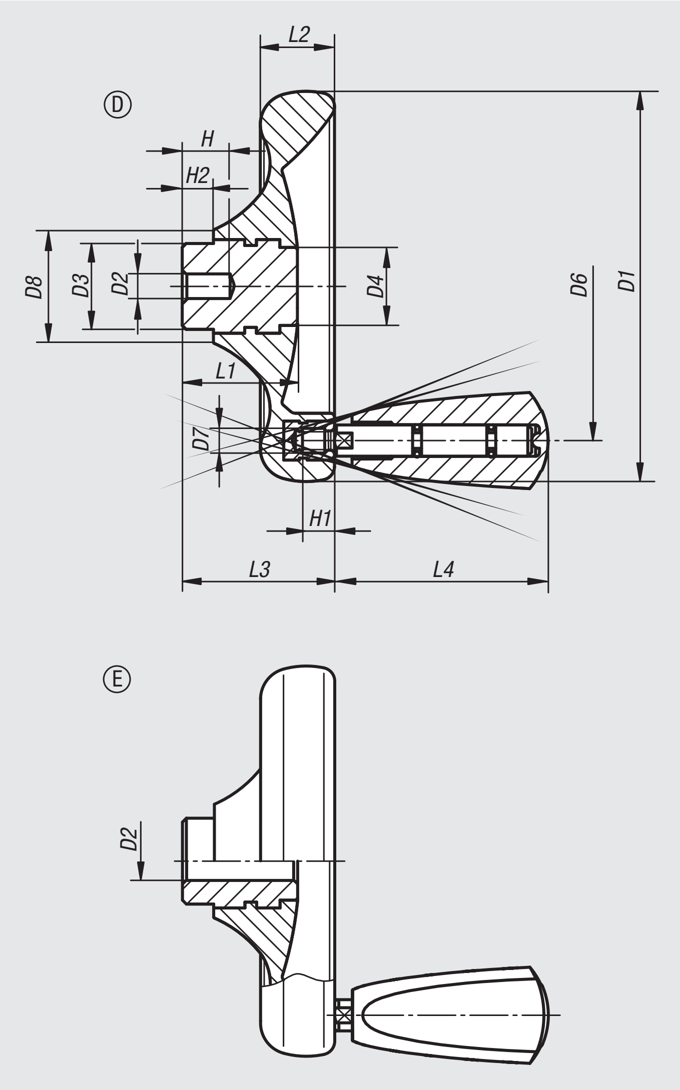
Version:
High-gloss polished.

Sample order:
nlm 06287-0125X08

Note:
The handwheel is supplied with the grip loose.

On request:
Other reamed hole sizes.

Drawing reference:
Form D: pilot hole
Form E: reamed hole



Handwheels disc, with revolving grip

Order No. Form D	Order No. Form E	D1	D2	D3	D4	D6	D7	D8	H	H1	H2	L1	L2	L3	L4
06287-0100X06	**06287-1100X10**	100	6/10H8	22	20	79	M6	29	12/-	9	8	29,5	19	39	54,7
06287-0125X08	**06287-1125X12**	125	8/12H8	26	21	101	M6	34	15/-	9	8	34	24	46	54,7
06287-0140X08	**06287-1140X14**	140	8/14H8	30	25	110	M8	39	16/-	12	8	38,5	27	52	82,2
06287-0160X10	**06287-1160X16**	160	10/16H8	33	30	128	M8	43	20/-	12	8	41,3	30,1	57	82,2
-	**06287-1160X18**	160	18H8	33	30	128	M8	43	-	12	8	41,3	30,1	57	82,2

Handwheels disc, with revolving grip, metal parts stainless steel

Order No. Form D	Order No. Form E	D1	D2	D3	D4	D6	D7	D8	H	H1	H2	L1	L2	L3	L4
06287-2100X06	**06287-3100X10**	100	6/10H7	22	20	79	M6	29	12/-	9	8	29,5	19	39	54,7
06287-2125X08	**06287-3125X12**	125	8/12H7	26	21	101	M6	34	15/-	9	8	34	24	46	54,7
06287-2140X08	**06287-3140X14**	140	8/14H7	30	25	110	M8	39	16/-	12	8	38,5	27	52	82,2
06287-2160X10	**06287-3160X16**	160	10/16H7	33	30	128	M8	43	20/-	12	8	41,3	30,1	57	82,2
-	**06287-3160X18**	160	18H7	33	30	128	M8	43	-	12	8	41,3	30,1	57	82,2

06288

Handwheels disc

without grip

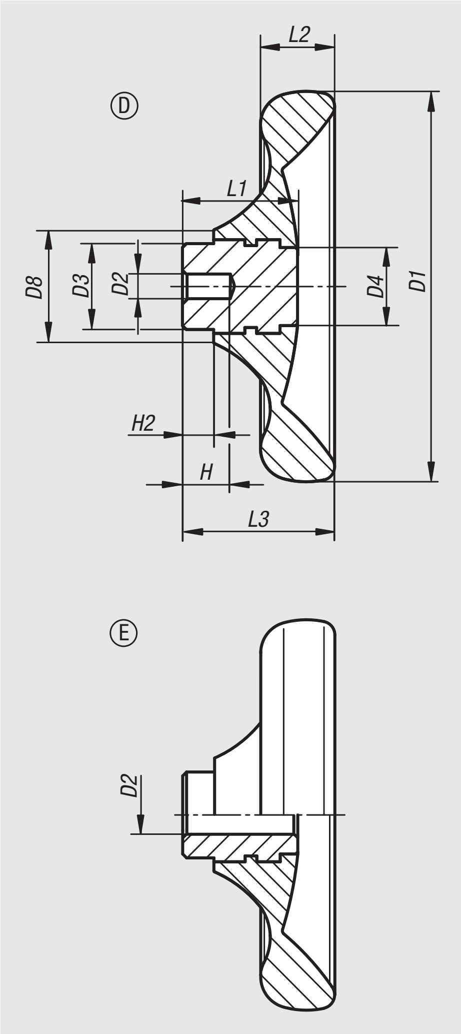
Material:
Black thermoset PF 31.
Hub nickel-plated steel or bright 1.4305 stainless steel.

Version:
High-gloss polished.

Sample order:
nlm 06288-0100X06

On request:
Other reamed hole sizes.

Drawing reference:
Form D: pilot hole
Form E: reamed hole



Handwheels disc, without grip, bush steel

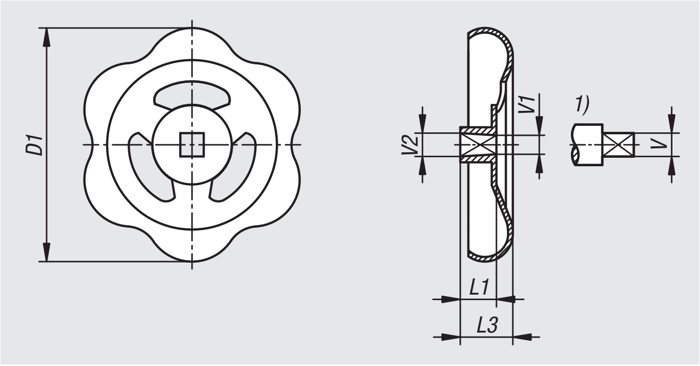
Order No. Form D	Order No. Form E	D1	D2	D3	D4	D8	H	H2	L1	L2	L3
06288-0100X06	**06288-1100X10**	100	6/10H8	22	20	29	12/-	8	29,5	19	39
06288-0125X08	**06288-1125X12**	125	8/12H8	26	21	34	15/-	8	34	24	46
06288-0140X08	**06288-1140X14**	140	8/14H8	30	25	39	16/-	8	38,5	27	52
06288-0160X10	**06288-1160X16**	160	10/16H8	33	30	43	20/-	8	41,3	30,1	57
-	**06288-1160X18**	160	18H8	33	30	43	-	8	41,3	30,1	57

Handwheels disc, without grip, bush stainless steel

Order No. Form D	Order No. Form E	D1	D2	D3	D4	D8	H	H2	L1	L2	L3
06288-2100X06	**06288-3100X10**	100	6/10H7	22	20	29	12/-	8	29,5	19	39
06288-2125X08	**06288-3125X12**	125	8/12H7	26	21	34	15/-	8	34	24	46
06288-2140X08	**06288-3140X14**	140	8/14H7	30	25	39	16/-	8	38,5	27	52
06288-2160X10	**06288-3160X16**	160	10/16H7	33	30	43	20/-	8	41,3	30,1	57
-	**06288-3160X18**	160	18H7	33	30	43	-	8	41,3	30,1	57

06289

Hand wheels, steel, stamped



Material:
Steel.

Version:
Powder-coated black RAL 9005, red RAL 3000 or trivalent blue passivated.

Sample order:
nlm 06289-050060

Note:
Especially suitable for stop valves. The handwheels are made from a single piece. The handwheel is strengthened in the hub area using a special forming process. The tapered hub allows easy mounting and ensures secure seating on the square bar.

Drawing reference:
1) Square on shaft

Order No. passivated	Order No. jet black RAL 9005	Order No. red RAL 3000	D1	L1	L3	V	V1	V2	Number of spokes
06289-130122	**06289-130120**	**06289-130121**	130	15	23	12	11,9	12,15	3
06289-050062	**06289-050060**	**06289-050061**	50	8,5	12	6	5,9	6,15	3
06289-050072	**06289-050070**	**06289-050071**	50	8,5	12	7	6,9	7,15	3
06289-060062	**06289-060060**	**06289-060061**	60	8,5	12	6	5,9	6,15	3
06289-060072	**06289-060070**	**06289-060071**	60	8,5	12	7	6,9	7,15	3
06289-110102	**06289-110100**	**06289-110101**	108	15	23	10	9,9	10,15	3
06289-070072	**06289-070070**	**06289-070071**	69	10	15	7	6,9	7,15	3
06289-100102	**06289-100100**	**06289-100101**	98	13	20	10	9,9	10,15	3
06289-070082	**06289-070080**	**06289-070081**	69	10	15	8	7,9	8,15	3
06289-080082	**06289-080080**	**06289-080081**	78	11	16	8	7,9	8,15	3
06289-080092	**06289-080090**	**06289-080091**	78	11	16	9	8,9	9,15	3
06289-090092	**06289-090090**	**06289-090091**	89	11	16	9	8,9	9,15	3
06289-100092	**06289-100090**	**06289-100091**	98	13	20	9	8,9	9,15	3

06290

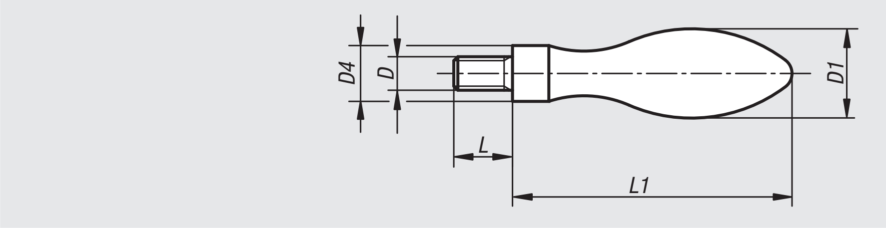
Machine handles fixed

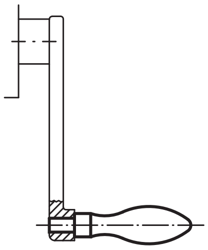
steel, similar to DIN 39

Material:
Steel.

Version:
Polished.

Sample order:
nlm 06290-216



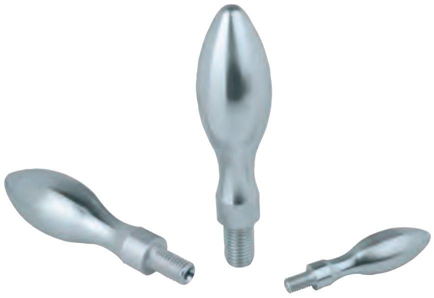


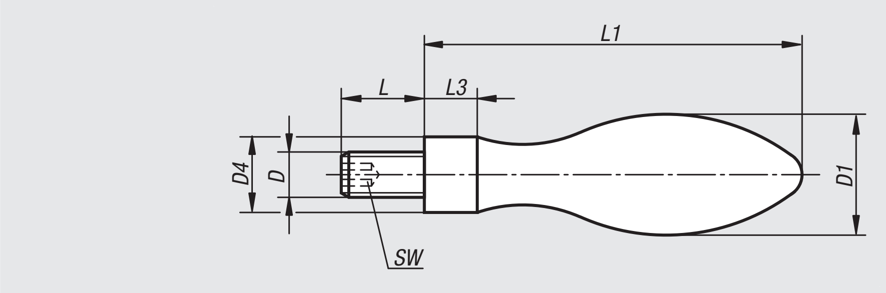
Order No.	D	D1	D4	L	L1
06290-213	M5	13	8	10	40
06290-216	M6	16	10	13	50
06290-220	M8	20	13	15	64
06290-225	M10	25	16	18	80
06290-232	M12	32	20	20	100

06291

Machine handles fixed

steel, DIN 39 Form E





Material:
Grip and screw steel.

Version:
Grip and axle part trivalent blue passivated.

Sample order:
nlm 06291-0616050

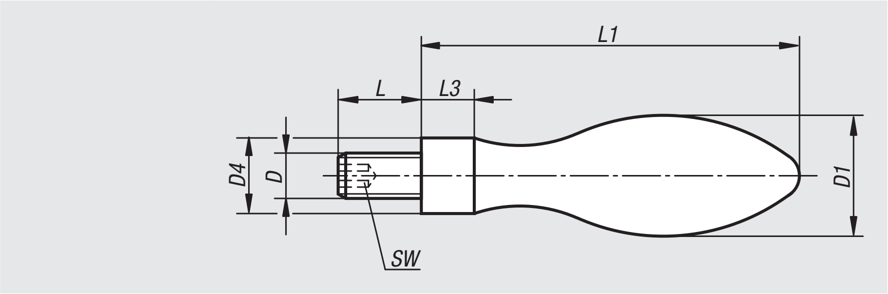
Note:
Machine handle suitable for DIN 950 handwheels.

Order No.	D	D1	D4	L	L1	L3	SW
06291-0616050	M6	16	10	11	50	7	3
06291-0820064	M8	20	13	13	64	8	4
06291-1025080	M10	25	16	14	80	10	5
06291-1232100	M12	32	20	21	100	13	6
06291-1636112	M16	36	22	26	112	14	8

06292

Machine handles fixed

aluminium, DIN 39 Form E



Material:
Grip aluminium.
Screw steel.

Version:
Grip polished.
Screw black.

Sample order:
nlm 06292-0616050

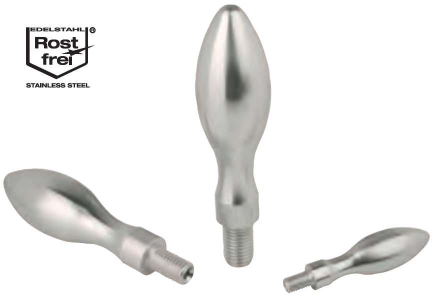
Note:
Machine handle suitable for DIN 950 handwheels.

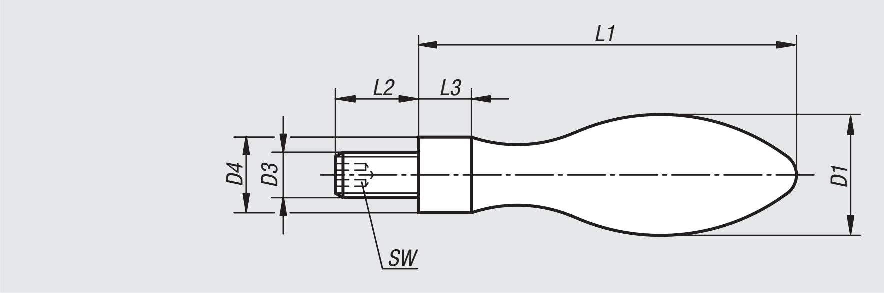
Order No.	D	D1	D4	L	L1	L3	SW
06292-0616050	M6	16	10	11	50	7	3
06292-0820064	M8	20	13	13	64	8	4
06292-1025080	M10	25	16	14	80	10	5
06292-1232100	M12	32	20	21	100	13	6
06292-1636112	M16	36	22	26	112	14	8

06293

Machine handles, fixed,

DIN 39 Form E, stainless steel





Material:
1.4305 or 1.4401 stainless steel.

Version:
Electropolished.

Sample order:
nlm 06293-0616050

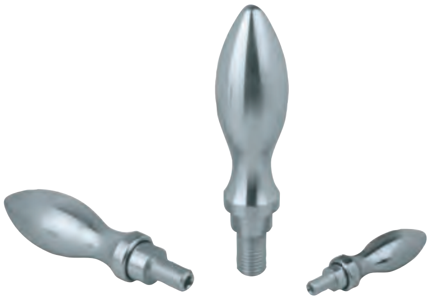
Note:
1.4401 stainless steel, similar to DIN 39.
Grip suitable for DIN 950 handwheels.

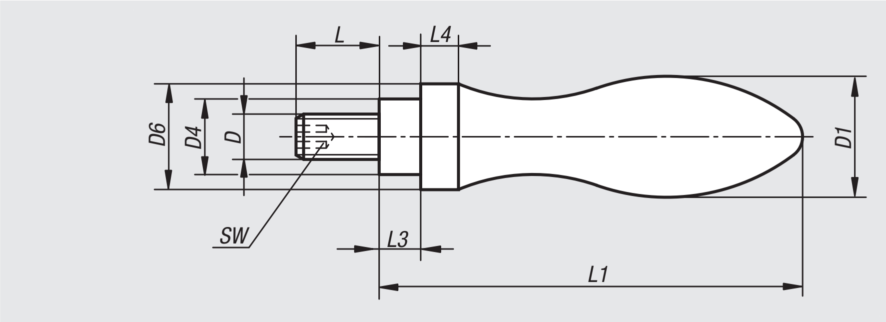
Order No.	Steel code	D	D1	D4	L	L1	L3	SW
06293-0616050	**1.4305**	M6	16	10	11	50	7	3
06293-0820064	**1.4305**	M8	20	13	13	64	8	4
06293-1025080	**1.4305**	M10	25	16	14	80	10	5
06293-10616050	**1.4401**	M6	16	11	13	51	5,1	3
06293-10820064	**1.4401**	M8	21	14	14	67	8,75	4
06293-11025080	**1.4401**	M10	25	16	18	81	9,75	5

06308

Machine handles revolving

similar to DIN 98 Form E, steel





Material:
Grip and screw steel.

Version:
Grip and axle part trivalent blue passivated.

Sample order:
nlm 06308-0616055

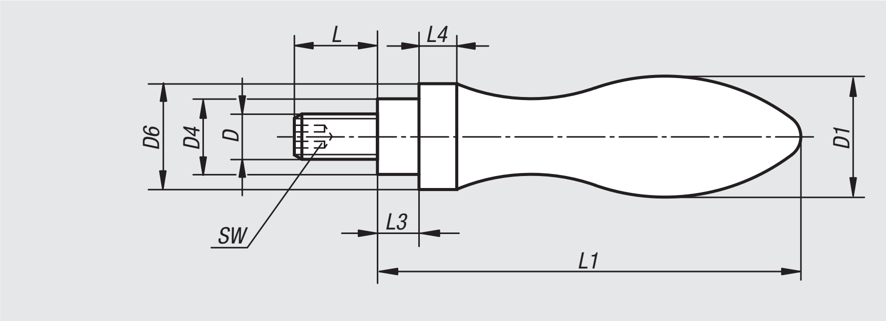
Note:
The handles with D1=25 mm and 32 mm have a thread length L2 that is shorter than the length specified in DIN 98. These machine handles are suitable for DIN 950 handwheels.

Order No.	D	D1	D4	D6	L	L1	L3	L4	SW
06308-0616055	M6	16	10	14	11	54,5	5,5	5	3
06308-0820067	M8	20	13	18	13	67	6	6	4
06308-1025083	M10	25	16	21	13	83	8	6,5	5
06308-1232105	M12	32	20	26	16	105,5	10,5	8	6
06308-1636117	M16	36	22	29	26	117	11	9	8

06309

Machine handles revolving

aluminium, similar to DIN 98 Form E



Material:
Grip aluminium.
Screw steel.

Version:
Grip polished.
Axle trivalent blue passivated.

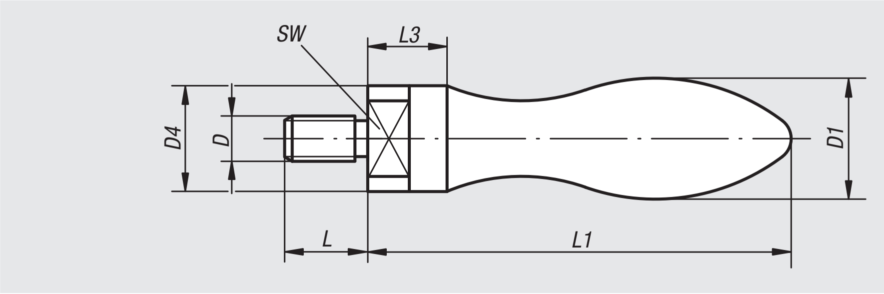
Sample order:
nlm 06309-0616055

Note:
Machine handle suitable for DIN 950 handwheels.

Order No.	D	D1	D4	D6	L	L1	L3	L4	SW
06309-0616055	M6	16	10	14	11	54,5	5,5	5	3
06309-0820067	M8	20	13	18	13	67	6	6	4
06309-1025083	M10	25	16	21	13	83	8	6,5	5
06309-1232105	M12	32	20	26	16	105,5	10,5	8	6
06309-1636117	M16	36	22	29	26	117	11	9	8

Machine handles

revolving similar to DIN 98 Form E, stainless steel



Material:
Stainless steel 1.4404.

Version:
Polished

Sample order:
nlm 06309-01-10616050

Note:
Machine handle suitable for DIN 950 handwheels.

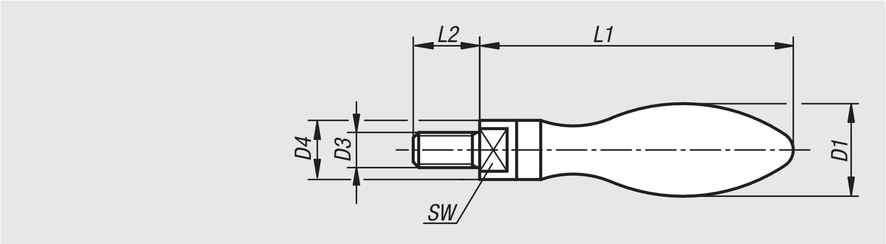
Order No.	D	D1	D4	L	L1	L3	SW
06309-01-10616050	M6	16	11	13	56	11	8
06309-01-10820064	M8	20	13,5	14	72	13	10
06309-01-11025080	M10	24	16	16	86	15	11

Notes

06310

Machine handles revolving

steel, similar to DIN 98



Material:
Steel.

Version:
Polished.

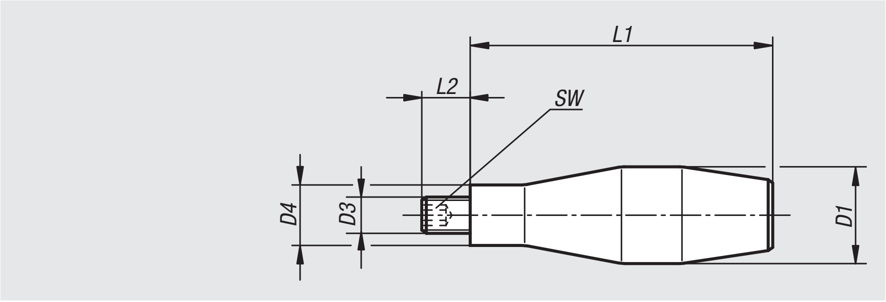
Sample order:
nlm 06310-225

Order No.	D1	D3	D4	L1	L2	SW
06310-216	16	M6	10	53	13	8
06310-220	20	M8	13	66	15	10
06310-225	25	M10	16	85	18	13
06310-232	32	M12	20	107	20	17

06311

Machine handles fixed

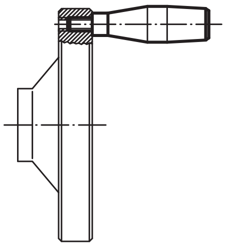
straight form, similar to DIN 39



Material:
Aluminium.
Screw, steel.

Version:
Grip highly polished.

Sample order:
nlm 06311-20

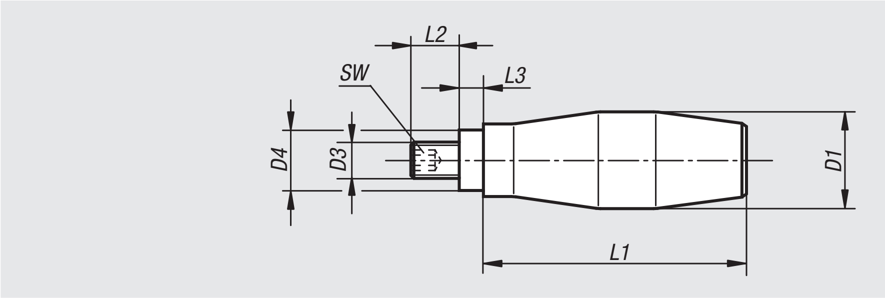


Order No.	D1	D3	D4	L1	L2	SW
06311-16	16	M6	10	52	11	3
06311-20	20	M8	13	66	13	4
06311-25	25	M10	16	80	14	5
06311-29	32	M12	20	100	16	6

06312

Machine handles revolving

straight form, similar to DIN 98



Material:
Aluminium.
Axle, steel

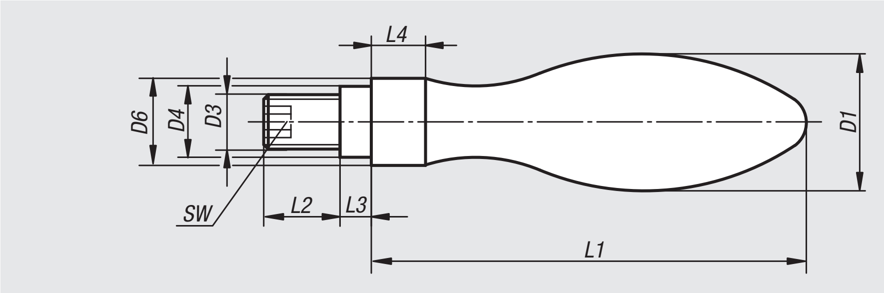
Version:
Grip highly polished.

Sample order:
nlm 06312-24

Order No.	D1	D3	D4	L1	L2	SW
06312-20	20	M8	13	60	13	4
06312-24	24	M10	16	70	13	5
06312-31	31	M12	20	88	16	6

06313

Machine handles revolving



Material:
Grip thermoplastic.
Axle steel.

Version:
Grip black.
Steel chromed.

Sample order:
nlm 06313-208

Order No.	Material	D1	D3	D4	D6	L1	L2	L3	L4	SW
06313-206	thermoplastic	16	M6	10	14	49	11	5,5	5	3
06313-208	thermoplastic	20	M8	13	18	61	13	6	6	4
06313-210	thermoplastic	25	M10	16	21	75	14	8	6,5	5
06313-212	thermoplastic	32	M12	20	26	95	21	10,5	8	6

06314

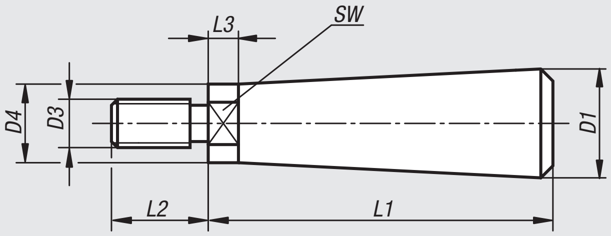
Conical grip

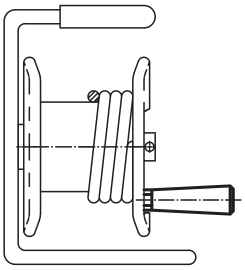
revolving

Material:
Black thermoset PF 31.
Axle steel.

Version:
Centre pin electro zinc-plated.

Sample order:
nlm 06314-18





Order No.	D1	D3	D4	L1	L2	L3	SW
06314-18	18	M8	13	57	16	5	11
06314-23	20	M10	16	69	20	5	13

06315

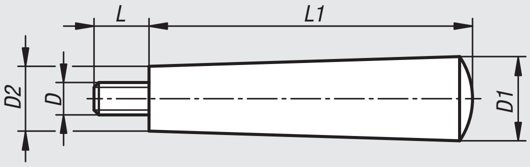
Taper grips

fixed

Material:
Black thermoset PF 31.
Screw electro zinc-plated steel.

Version:
High-gloss polished.

Sample order:
nlm 06315-120408



Order No.	D	D1	D2	L	L1
06315-120408	M4	12	9	8	40
06315-150507	M5	15	11	7	50
06315-180608	M6	18	13	8	64
06315-210610	M6	21	15	10	72
06315-210810	M8	21	15	10	72
06315-250810	M8	25	17	10	90
06315-261012	M10	26	20	12	100

06316

Taper grips

revolving

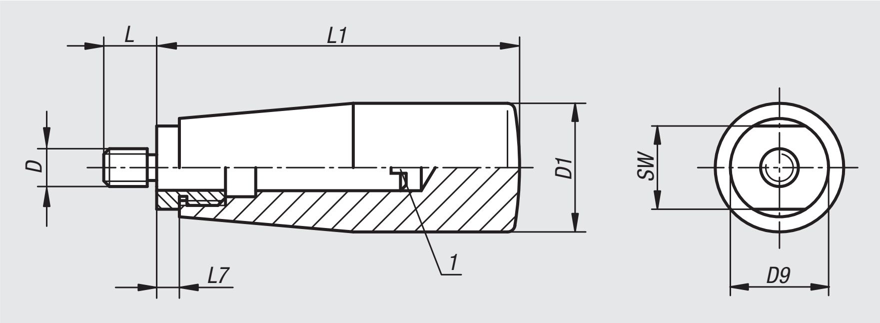
Material:
Black thermoset PF 31.
Centre pin and tapped bush electro zinc-plated steel or bright stainless steel.

Version:
High-gloss polished.

Sample order:
nlm 06316-105007

Note:
To mount unscrew the axle.

Drawing reference:
1) mounting aid



Order No. steel	Order No. stainless steel	D	D1	D9	L	L1	L7	SW
06316-105007	**06316-1105007**	M5	17	15	7	51	5	13
06316-206008	**06316-1206008**	M6	23	18	8	68	6	16
06316-208009	**06316-1208009**	M8	23	18	9	68	6	16
06316-310011	**06316-1310011**	M10	28	21	11	77	7	19

06316

Taper grips

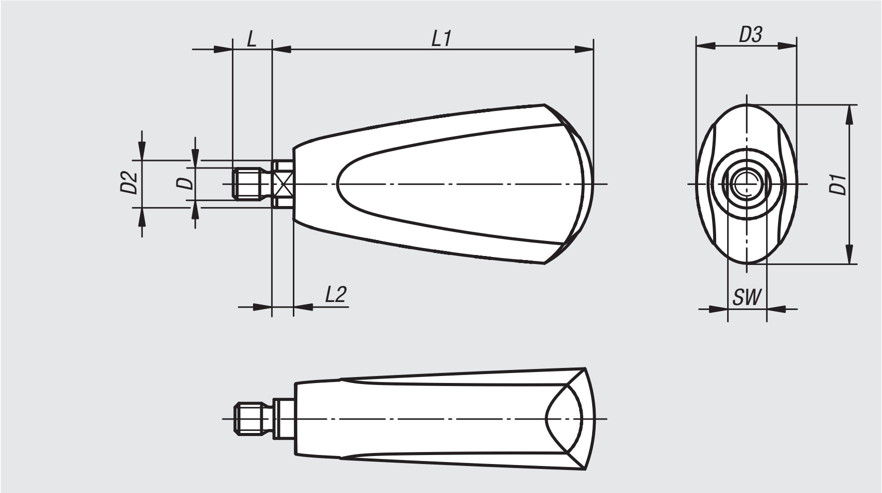
revolving

Material:
Thermoset PF 31, black.
Centre pin nickel-plated steel or bright 1.4305 stainless steel.
Snap ring 1.4310 stainless steel.

Version:
High-gloss polished.

Sample order:
nlm 06316-106009

Note:
The grips are suitable for disc handwheels with revolving taper grip 06287.

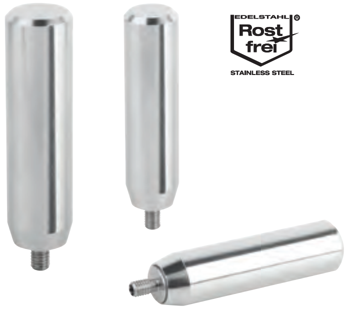


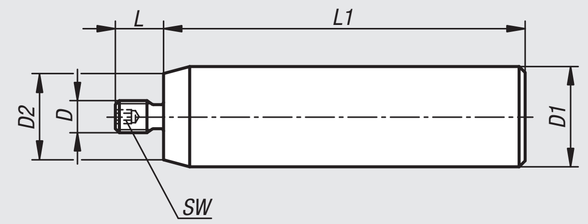
Order No. steel	Order No. stainless steel	D	D1	D2	D3	L	L1	L2	SW
06316-106009	**06316-1106009**	M6	25	8	18	9	54,7	4,5	7
06316-208010	**06316-1208010**	M8	41	12	26	10	82,2	5,5	10

06317

Cylindrical grips revolving

stainless steel





Material:
Axis and revolving grip stainless steel 1.4305.
Snap ring stainless steel 1.4310.

Version:
Bright.

Sample order:
nlm 06317-105

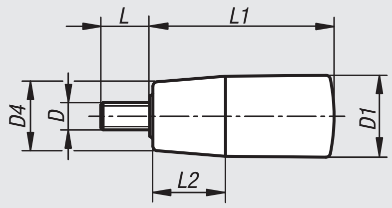
Assembly:
Screw in using hexagon socket in axis.

Order No.	D	D1	D2	L	L1	SW
06317-105	M5	16	12,5	8	60	3
06317-206	M6	20	16,5	9	72	3
06317-308	M8	25	21,5	12	90	3

06318

Conical grips

revolving



Material:
Thermoset PF 31, black.
Centre pin electro zinc-plated steel or bright stainless steel.

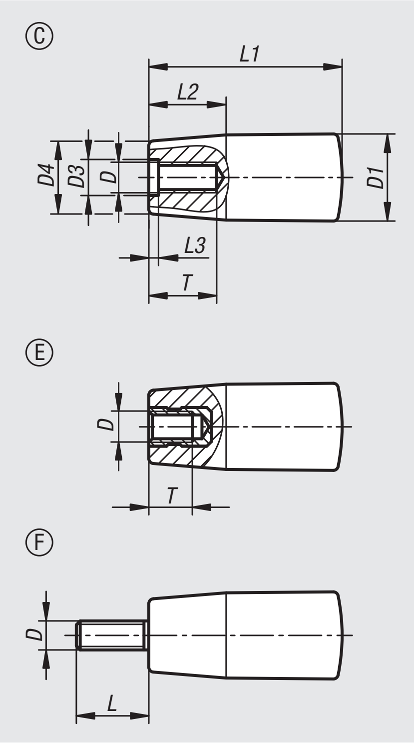
Version:
High-gloss polished.

Sample order:
nlm 06318-10618

Note:
Cylindrical grips can be screwed onto our handwheels, crank handles etc.

Order No. steel	Order No. stainless steel	D	D1	D4	L	L1	L2
06318-0618	**06318-10618**	M6	18	15	11	40,5	16
06318-0823	**06318-10823**	M8	23	19	13	65,5	24
06318-1028	**06318-11028**	M10	28	22	14	90,5	32

Taper grips



Material:
Thermoset PF 31, black.
Steel bush and stud, electro zinc-plated.

Version:
High-gloss polished.

Sample order:
nlm 06319-10818

On request:
Other colours.

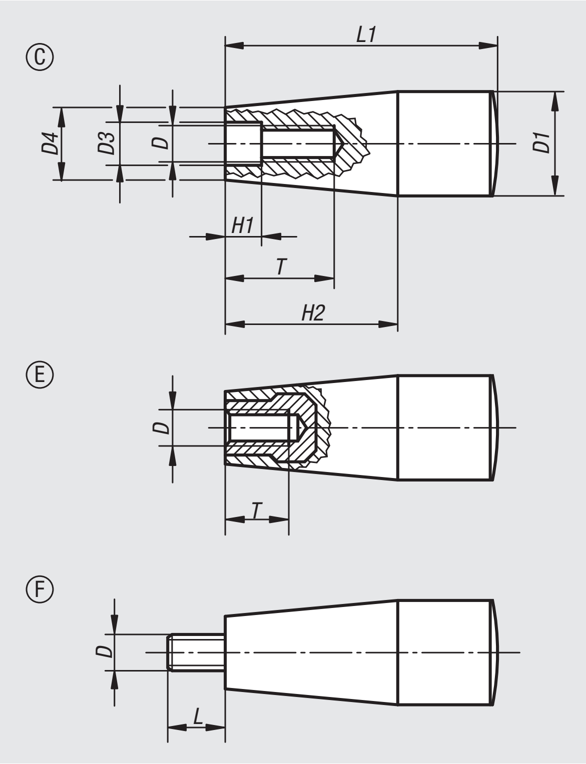
Drawing reference:
Form C: moulded female thread
Form E: tapped bush
Form F: male thread

Order No.	Form	D	D1	D3	D4	L1	L2	L3	T
06319-10618	C	M6	18	6,2	15	40	16	2	14
06319-10818	C	M8	18	8,5	15	40	16	2	18
06319-10823	C	M8	23	8,5	19	65	24	2	18
06319-11028	C	M10	28	10,5	22	90	32	3,5	22
06319-20518	E	M5	18	-	15	40	16	-	7,5
06319-20618	E	M6	18	-	15	40	16	-	9
06319-20823	E	M8	23	-	19	65	24	-	12
06319-20828	E	M8	28	-	22	90	32	-	12
06319-21028	E	M10	28	-	22	90	32	-	15

Order No.	Form	D	D1	D4	L	L1	L2
06319-30618	F	M6	18	15	15	40	16
06319-30823	F	M8	23	19	15	65	24
06319-31028	F	M10	28	22	15	90	32

06320

Taper grips



Material:
Thermoset PF 31, black.
Bush and stud electro zinc-plated steel.
Form E has copper-plated steel or brass bushes.

Version:
High-gloss polished.

Sample order:
nlm 06320-106

Note:
The versions 06320-205 and 06320-206 have a brass bush.
The versions 06320-208 and 06320-2081 have copper-plated steel bushes.

On request:
Other colours.

Drawing reference:
Form C: moulded female thread
Form E: tapped bush
Form F: male thread

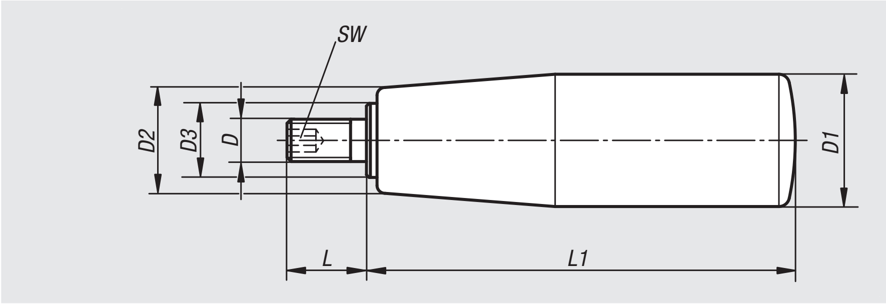
Order No.	Form	D	D1	D3	D4	H1	H2	L1	T
06320-106	C	M6	17	6,2	15	2	26	45	14
06320-108	C	M8	17	8,2	13	2	26	45	16
06320-1081	C	M8	23	8,5	18	2	38	61	24
06320-110	C	M10	29	10,5	21	3,5	42	71	28
06320-205	E	M5	17	-	15	-	26	45	10
06320-206	E	M6	17	-	15	-	26	45	9
06320-208	E	M8	23	-	18	-	38	61	14
06320-2081	E	M8	28	-	21	-	42	71	14

Order No.	Form	D	D1	D4	H2	L	L1
06320-306	F	M6	17	15	26	18	45
06320-308	F	M8	23	18	38	12	61
06320-310	F	M10	29	21	42	20	71

06321

Cylindrical grips revolving

with hexagon socket



Material:
Grip thermoplastic.
Steel parts electro zinc-plated.

Version:
Black satin finished.

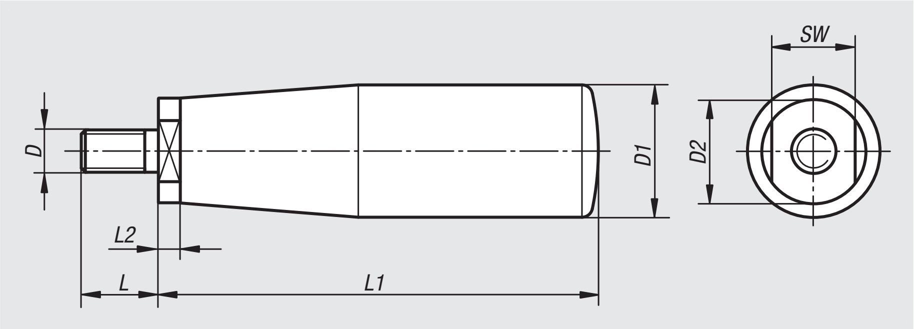
Sample order:
nlm 06321-06200520

Note:
Cylindrical grips can be screwed onto our handwheels, crank handles etc.

Order No.	D	D1	D2	D3	L	L1	SW
06321-06200520	M6	20	15	10	12	51	3
06321-06230620	M6	23	18	10	12	62	3
06321-08230620	M8	23	18	10	15	62	4
06321-08250720	M8	25	19	10	15	71	4
06321-10250720	M10	25	19	10	15	71	4
06321-08250810	M8	26	22	14	15	81	4
06321-10250810	M10	26	22	14	15	81	5
06321-12260820	M12	26	22	14	15	81	5
06321-10270930	M10	27	22	14	15	92	5
06321-12270930	M12	27	22	14	15	92	5

06322

Cylindrical grips revolving



Material:
Grip thermoplastic.
Steel parts electro zinc-plated.

Version:
Black satin finished.

Sample order:
nlm 06322-06200500

Note:
Cylindrical grips can be screwed onto our handwheels, crank handles etc.

Order No.	D	D1	D2	L	L1	L2	SW
06322-06200500	M6	20	12	12	55	5	10
06322-08230600	M8	23	14	15	67	7	13
06322-08250690	M8	25	14	15	77	7	13
06322-10250690	M10	25	14	15	77	7	13
06322-10250800	M10	26	18	15	86	7	16
06322-10270890	M10	27	18	15	97	7	16
06322-12250800	M12	26	18	15	86	7	16
06322-12270890	M12	27	18	15	97	7	16

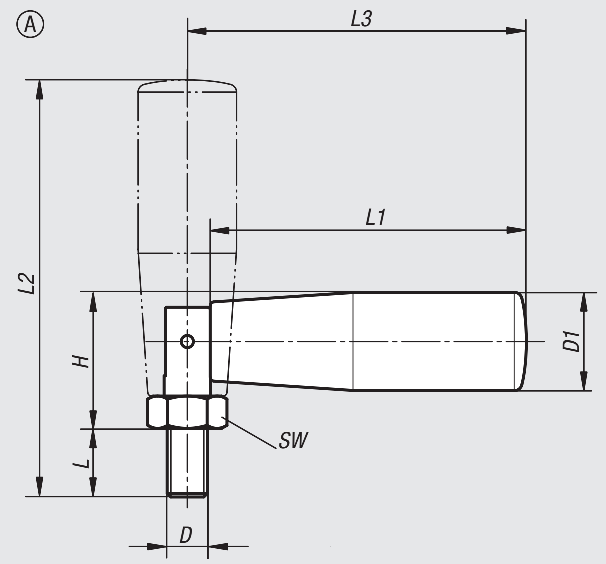
Cylindrical grips fold-down

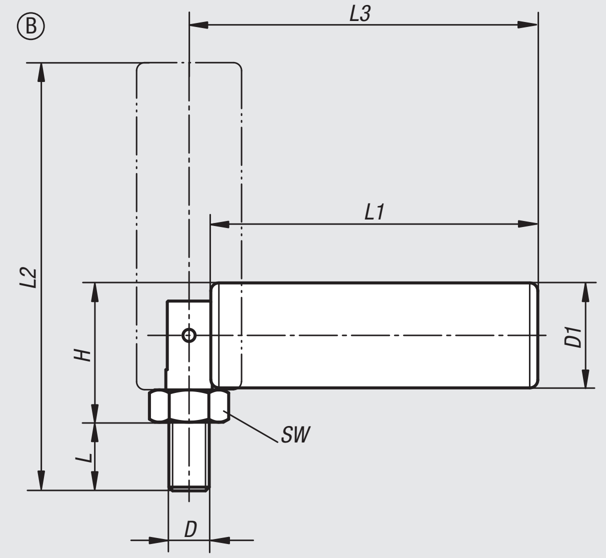
Material:
Grip thermoplastic.
Steel parts black oxidised.

Version:
Black satin finished.

Sample order:
nlm 06323-06200490

Note:
Cylindrical grips can be screwed onto our handwheels, crank handles etc.

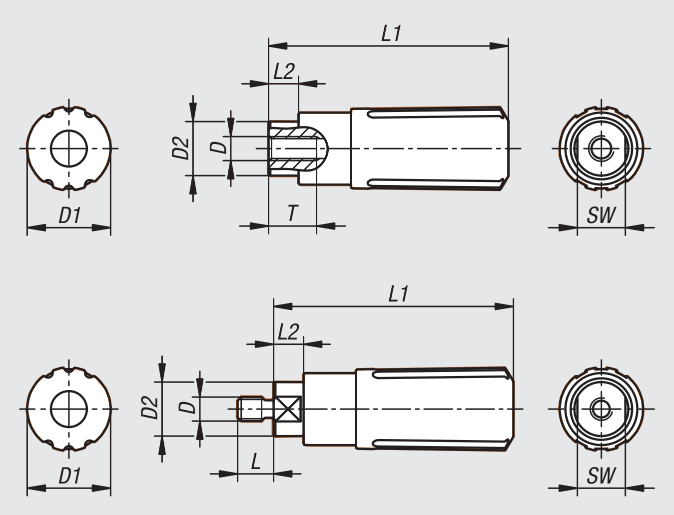




Order No.	Form	D	D1	SW	L	L1	L2	L3	H
06323-06200490	A	M6	20	10	9	49	63	53	24,5
06323-08250690	A	M8	25	13	11	70	87,5	74	28
06323-10260890	B	M10	26	17	16	90	114	96	34

Cylindrical grips, plastic

revolving



Cylindrical grips are supplied assembled and can be screwed onto handwheels, crank handles, etc.
The grooves and conical shape ensure that the cylindrical grips have optimised haptics and good grip.

Material:
Grip, thermoplastic.
Centre pin, steel.

Version:
Grip, black.
Steel parts, black oxidised.

Sample order:
nlm 06325-01-205

Advantages:
Optimised haptics and good grip
Grips for handwheels and cranks
Various thread sizes

Cylindrical grips, plastic revolving, internal thread

Order No.	Thread type	Size	D	D1	D2	L1	L2	T	SW
06325-01-1104	internal thread	1	M4	14	9	40	5	8	8
06325-01-1205	internal thread	2	M5	16	11	49,1	5,1	10	10
06325-01-1306	internal thread	3	M6	20	14	61,4	6,4	12	12
06325-01-1408	internal thread	4	M8	25	18	82,5	12,5	16	15

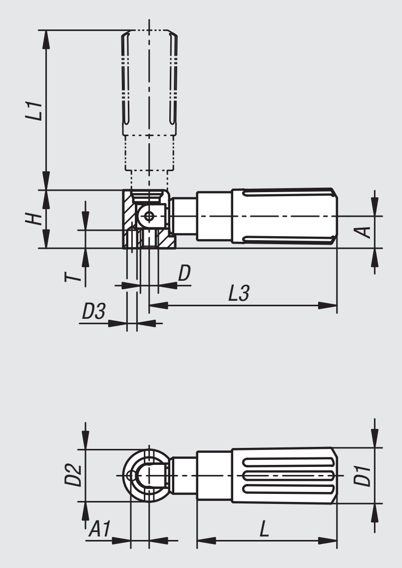
Cylindrical grips, plastic revolving, external thread

Order No.	Thread type	Size	D	D1	D2	L	L1	L2	SW
06325-01-104	external thread	1	M4	14	9	6	40	5	8
06325-01-205	external thread	2	M5	16	11	7,5	49,1	5,1	10
06325-01-306	external thread	3	M6	20	14	9	61,4	6,4	12
06325-01-408	external thread	4	M8	25	18	12	82,5	12,5	15

06326-01

Cylindrical grips, plastic

fold-down



Cylindrical grips are supplied assembled and can be screwed onto handwheels, crank handles, etc.
The grooves and conical shape ensure that the cylindrical grips have optimised haptics and good grip.
The fold-down grip prevents protruding edges, which also minimises the risk of injury.

Material:
Grip, thermoplastic.
Centre pin, steel.

Version:
Grip, black.
Steel parts, black oxidised.

Sample order:
nlm 06326-01-104

Note:
The hole D3 is used for positioning.

Advantages:
Optimised haptics and good grip
Protruding edges prevented
Grips for handwheels and cranks
Various thread sizes

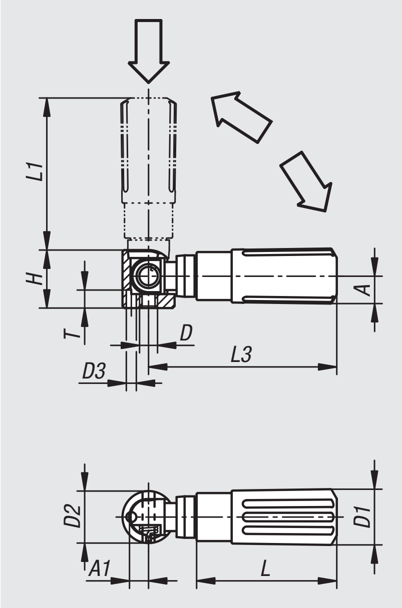
Cylindrical grips, plastic fold-down

Order No.	Size	A	A1	D	D1	D2	D3	H	L	L1	L3	T
06326-01-104	1	8	4,3	M4	14	13	2,5	14,5	35	40	47	4,5
06326-01-205	2	10	5,3	M5	16	16	3,5	18	44	49	58	4,5
06326-01-306	3	12,5	6,5	M6	20	20	4,5	22,5	55	59,5	71,5	6
06326-01-408	4	16	9	M8	25	26	5,5	29	70	83	98	6,5

06328-01

Safety cylindrical grips, plastic

auto-return



Cylindrical grips are supplied assembled and can be screwed onto handwheels, crank handles, etc.
The grooves and conical shape ensure that the cylindrical grips have optimised haptics and good grip.
The auto-return mechanism prevents protruding edges, which also minimises the risk of injury.

Material:
Grip, thermoplastic.
Centre pin, steel.

Version:
Grip, black.
Steel parts, black oxidised.

Sample order:
nlm 06328-01-104

Note:
Two actions must be made to bring the safety cylinder grip into an operating position:
- Swing the grip out around the pivot shaft until it stops (90°).
- Push the grip in an axial direction into the lock position.
  The grip swivels back automatically after releasing.

The hole D3 is used as a location hole.

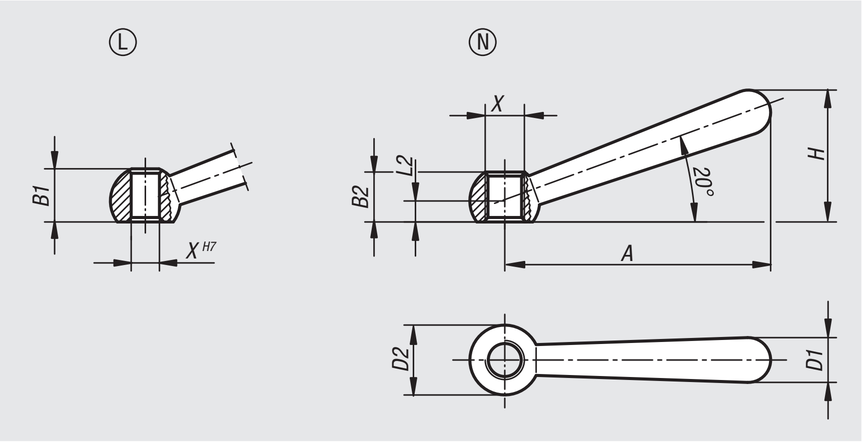
Advantages:
Optimised haptics and good grip
Grips for handwheels and cranks
Auto-return after release
Various thread sizes

Safety cylindrical grips, plastic auto-return

Order No.	Size	A	A1	D	D1	D2	D3	H	L	L1	L3	T
06328-01-104	1	8	4,3	M4	14	13	2,5	14,5	35	38	47	4,5
06328-01-205	2	10	5,3	M5	16	16	3,5	18	44	47,5	58	4,5
06328-01-306	3	12,5	6,5	M6	20	20	4,5	22,5	55	58,5	71,5	6
06328-01-408	4	16	9	M8	25	26	5,5	29	70	82	98	6,5

Levers 20°

DIN 99



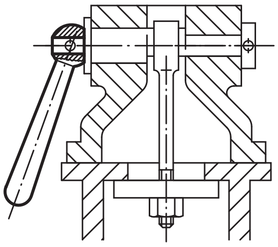
Material:
Steel.

Version:
Polished.

Sample order:
nlm 06330-212

Note:
To fix the lever to another element, gluing is often more cost-effective than pinning.

Drawing reference:
Form L: with hole
Form N: with internal thread



Order No. Form L	Order No. Form N	X	A=handle length	B1	B2	D1	D2 ball	H	L2
06330-106	**06330-206**	6/M6	48	9,5/-	-/9,5	8	12	24	4
06330-108	**06330-208**	8/M8	60	12/-	-/12	10	16	30,5	5
06330-110	**06330-210**	10/M10	76	14,5/-	-/14,5	13	20	38	6
06330-112	**06330-212**	12/M12	95	18,5/-	-/18,5	16	25	47	7,5
06330-116	**06330-216**	16/M16	119	24/-	-/24	20	32	59,5	10
06330-120	**06330-220**	20/M20	152	30/-	-/30	25	40	75,5	12,5

Tension lever

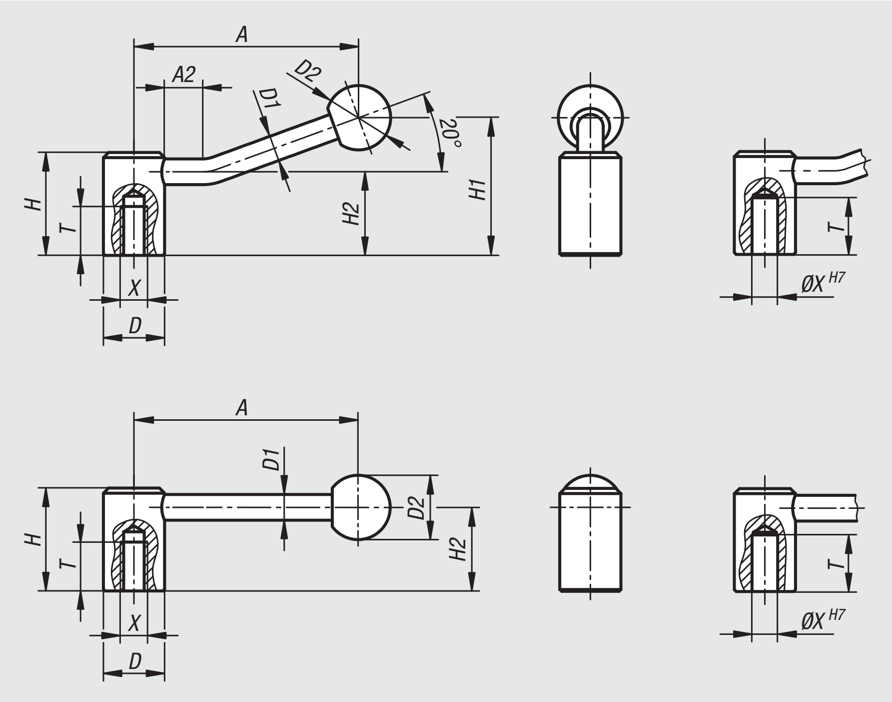
Material:
Steel parts grade 5.8.
Ball knob black plastic.

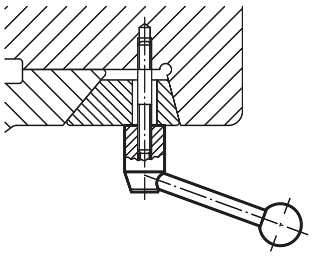
Version:
Black oxidised.

Sample order:
nlm 06340-208

Note:
Tension levers can be used for simple clamping or control operations.
Where applicable, there must be enough space available so that the grip can be rotated 360°.

On request:
Other internal threads, reamed holes and special versions.
Dimension “A” available in other lengths at extra charge.

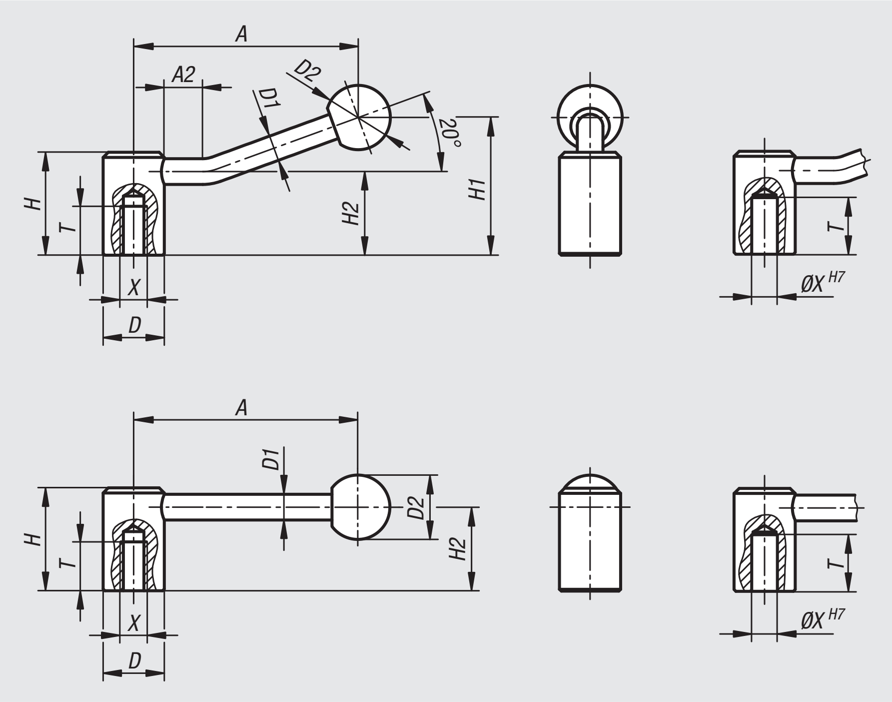




Order No. 0°	Order No. 20°	Kind of fastening	X	T	A=handle length	A2	D	D1	D2	H	H1	H2
06340-2082	**06340-208**	**internal thread**	M8	18	88,1/84,5	-/15	24	10	25	40	-/52,5	32,5
06340-2102	**06340-210**	**internal thread**	M10	18	88,1/84,5	-/15	24	10	25	40	-/52,5	32,5
06340-21012	**06340-2101**	**internal thread**	M10	20	104/100	-/15	28	12	32	46	-/61	36,5
06340-2122	**06340-212**	**internal thread**	M12	20	104/100	-/15	28	12	32	46	-/61	36,5
06340-2162	**06340-216**	**internal thread**	M16	23	126,5/121	-/15	33	13	32	52	-/72	41
06340-2202	**06340-220**	**internal thread**	M20	26	128,5/123	-/15	41	13	32	61	-/80	49
06340-1102	**06340-110**	**reamed hole**	10	22	88,1/84,5	-/15	24	10	25	40	-/52,5	32,5
06340-1122	**06340-112**	**reamed hole**	12	25	104/100	-/15	28	12	32	46	-/61	36,5
06340-1142	**06340-114**	**reamed hole**	14	25	104/100	-/15	28	12	32	46	-/61	36,5
06340-1162	**06340-116**	**reamed hole**	16	28	126,5/121	-/15	33	13	32	52	-/72	41
06340-1202	**06340-120**	**reamed hole**	20	32	128,5/123	-/15	41	13	32	61	-/80	49

06341

Tension levers stainless steel



Material:
Steel parts stainless steel 1.4305.
Ball knob black plastic.

Version:
Stainless steel parts bright.
Ball knob polished.

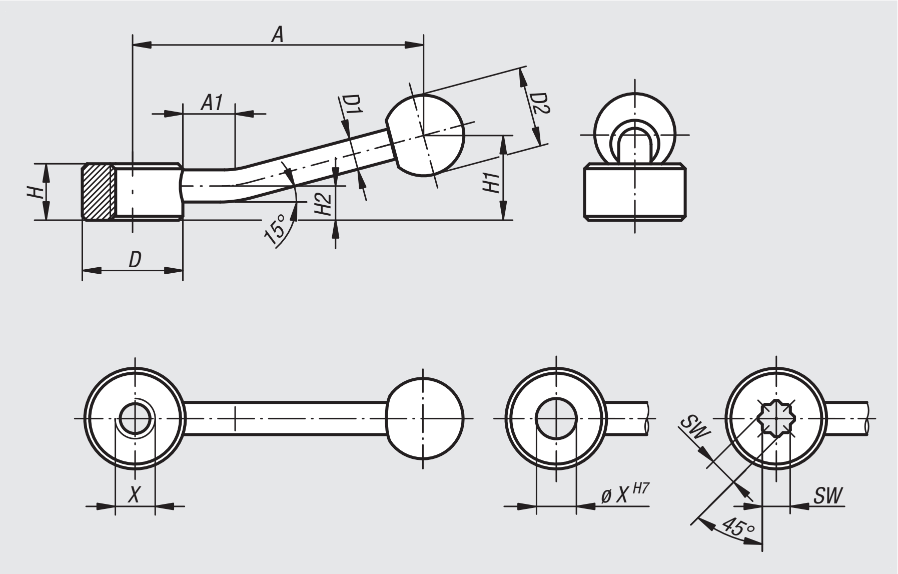
Sample order:
nlm 06341-2082

Note:
Tension levers can be used for simple clamping or control operations.
Where applicable, there must be enough space available so that the grip can be rotated 360°.

On request:
Other internal threads, reamed holes and special versions.
Dimension “A” available in other lengths at extra charge.

Order No. 0°	Order No. 20°	Thread type	X	A	A2	D	D1	D2	H	H1	H2	T
06341-2082	**06341-208**	internal thread	M8	88,1/84,5	-/15	24	10	25	40	-/52,5	32,5	18
06341-2102	**06341-210**	internal thread	M10	88,1/84,5	-/15	24	10	25	40	-/52,5	32,5	18
06341-21012	**06341-2101**	internal thread	M10	104/100	-/15	28	12	32	46	-/61	36,5	20
06341-2122	**06341-212**	internal thread	M12	104/100	-/15	28	12	32	46	-/61	36,5	20
06341-2162	**06341-216**	internal thread	M16	126,5/121	-/15	33	13	32	52	-/72	41	23
06341-2202	**06341-220**	internal thread	M20	128,5/123	-/15	41	13	32	61	-/80	49	26
06341-1102	**06341-110**	reamed hole	10	88,1/84,5	-/15	24	10	25	40	-/52,5	32,5	22
06341-1122	**06341-112**	reamed hole	12	104/100	-/15	28	12	32	46	-/61	36,5	25
06341-1142	**06341-114**	reamed hole	14	104/100	-/15	28	12	32	46	-/61	36,5	25
06341-1162	**06341-116**	reamed hole	16	126,5/121	-/15	33	13	32	52	-/72	41	28
06341-1202	**06341-120**	reamed hole	20	128,5/123	-/15	41	13	32	61	-/80	49	32

Tension levers flat



Material:
Steel parts grade 5.8.
Ball knob black thermoset PF 31

Version:
Black oxidised.

Sample order:
nlm 06342-206

Note:
Flat tension levers can be used for simple clamping or control operations. Where applicable, there must be enough space available so that the grip can be rotated 360°.
The version with star socket is designed to allow a 45° change of position.

On request:
Other internal threads, reamed holes and star sockets.
Dimension "A" available in other lengths at extra charge.

Order No.	Kind of fastening	X	A=handle length	A1	D	D1	D2	H	H1	H2
06342-206	**internal thread**	M6	75	15	25	8	20	14	22	8,5
06342-208	**internal thread**	M8	75	15	25	8	20	14	22	8,5
06342-210	**internal thread**	M10	75	15	25	8	20	14	22	8,5
06342-212	**internal thread**	M12	100	15	33	10	25	17	27	10
06342-216	**internal thread**	M16	100	15	33	10	25	17	27	10
06342-220	**internal thread**	M20	128	15	41	12	30	20	36	11,5
06342-224	**internal thread**	M24	128	15	41	12	30	20	36	11,5

Order No.	Kind of fastening	X	A=handle length	A1	D	D1	D2	H	H1	H2
06342-106	**reamed hole**	6	75	15	25	8	20	14	22	8,5
06342-108	**reamed hole**	8	75	15	25	8	20	14	22	8,5
06342-110	**reamed hole**	10	75	15	25	8	20	14	22	8,5
06342-112	**reamed hole**	12	100	15	33	10	25	17	27	10
06342-116	**reamed hole**	16	100	15	33	10	25	17	27	10
06342-120	**reamed hole**	20	128	15	41	12	30	20	36	11,5
06342-124	**reamed hole**	24	128	15	41	12	30	20	36	11,5

Order No.	Kind of fastening	SW	A=handle length	A1	D	D1	D2	H	H1	H2
06342-305	**star socket**	5,5	75	15	25	8	20	14	22	8,5
06342-307	**star socket**	7	75	15	25	8	20	14	22	8,5
06342-309	**star socket**	9	100	15	33	10	25	17	27	10
06342-311	**star socket**	11	100	15	33	10	25	17	27	10
06342-314	**star socket**	14	128	15	41	12	30	20	36	11,5
06342-319	**star socket**	19	128	15	41	12	30	20	36	11,5

06349

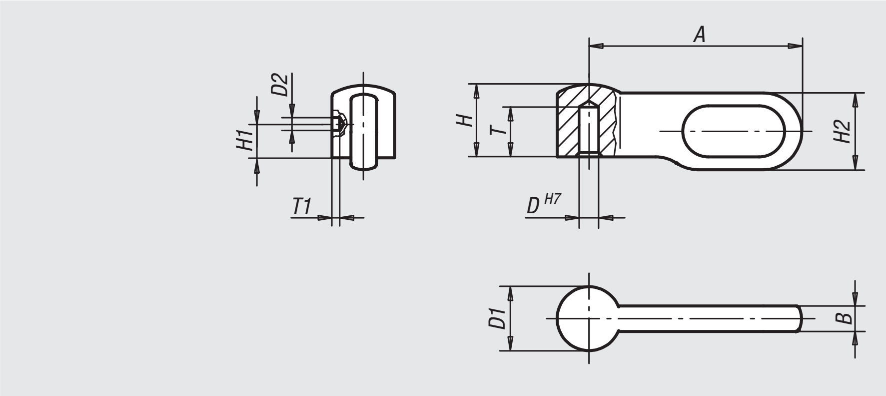
Lock grips

Material:
Stainless steel 1.4308 or steel.

Version:
Stainless steel bright.
Steel black oxidised.

Sample order:
nlm 06349-1040

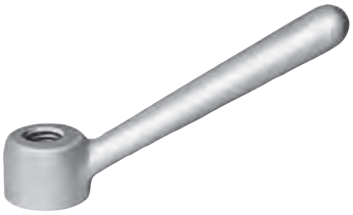
Note:
Lock grips can be used as required. The styled design with recessed grip gives fingers a good purchase and is well suited to modern requirements. High clamping forces can be easily attained. Use the pilot hole in the side to secure the grip by pinning or screw.



Order No.	Main material	Size	A	B	D	D1	D2	H	H1	H2	T	T1
06349-1040	stainless steel	1	25	3	4	7,5	1,5	8,5	3	9	5,5	0,5
06349-2050	stainless steel	2	30	3,6	5	9	2	10,2	4	10,8	6,5	1
06349-3060	stainless steel	3	40	4,8	6	12	2	13,6	5	14,4	8,7	1
06349-4080	stainless steel	4	50	6	8	15	3	17	6	18	10,2	1
06349-1041	steel	1	25	3	4	7,5	1,5	8,5	3	9	5,5	0,5
06349-2051	steel	2	30	3,6	5	9	2	10,2	4	10,8	6,5	1
06349-3061	steel	3	40	4,8	6	12	2	13,6	5	14,4	8,7	1
06349-4081	steel	4	50	6	8	15	3	17	6	18	10,2	1

06350

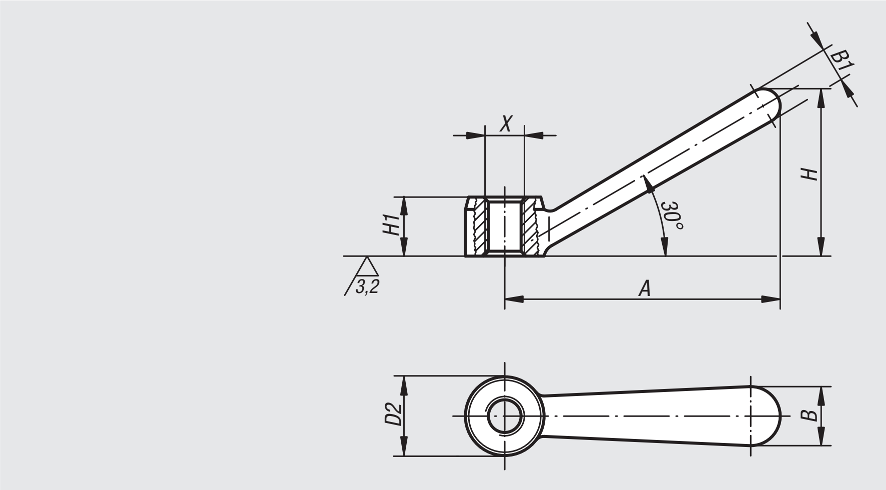
Tension levers

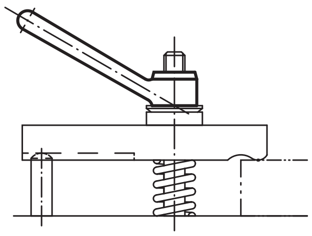


Material:
GJMW 400 malleable cast iron

Version:
Vibratory ground.
Bright.

Sample order:
nlm 06350-16

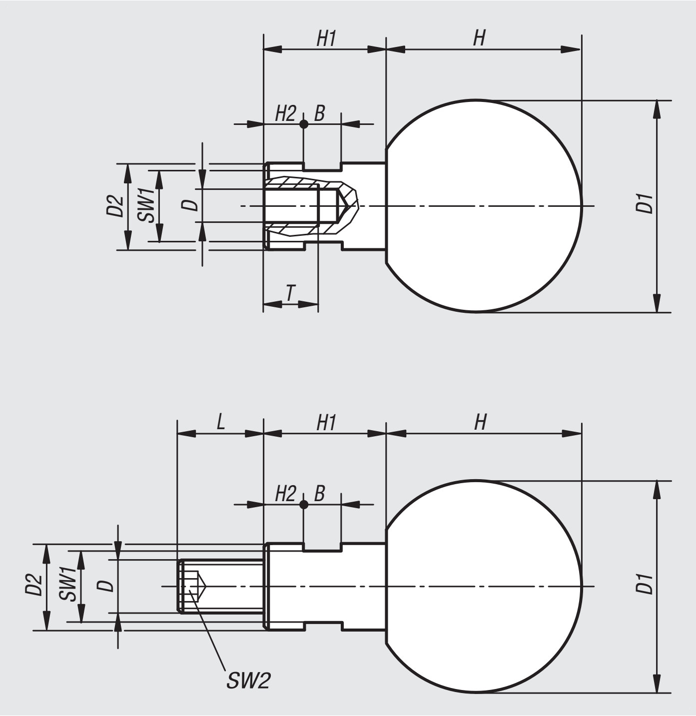




Order No.	X	A=handle length	B	B1	D2	H	H1
06350-08	M8	56	12	7	16	34	12
06350-10	M10	70	14	9	20	42,5	14
06350-12	M12	87	18	11	25	53	18
06350-16	M16	109	22	15	32	66,5	24
06350-20	M20	140	28	18	40	84,5	28

06353

Ball grips revolving



Material:
Ball thermoset PF 31.
Bush and screw steel or stainless steel 1.4305.

Version:
Ball black glossy.
Steel trivalent blue passivated.
Stainless steel bright.

Sample order:
nlm 06353-061

Ball grips revolving with female thread

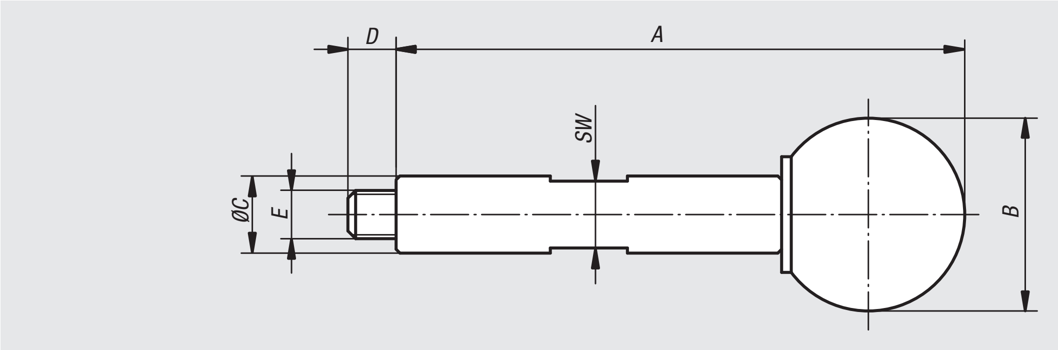
Order No. steel	Order No. stainless steel	B	D	D1	D2	H	H1	H2	SW1	T
06353-060	**06353-1060**	5	M6	25	10	22,5	15	5	8	12,5
06353-080	**06353-1080**	6	M8	32	13	29,5	19	6	10	15
06353-100	**06353-1100**	8	M10	40	16	37	24	8	13	19
06353-120	**06353-1120**	10	M12	50	20	47	31	12	17	21,5

Ball grips revolving with male thread

Order No. steel	Order No. stainless steel	B	D	D1	D2	H	H1	H2	L	SW1	SW2
06353-061	**06353-1061**	5	M6	25	10	22,5	15	5	11	8	3
06353-081	**06353-1081**	6	M8	32	13	29,5	19	6	13	10	4
06353-101	**06353-1101**	8	M10	40	16	37	24	8	14	13	5
06353-121	**06353-1121**	10	M12	50	20	47	31	12	21	17	6

06355

Handles screw-in



Material:
Grip carbon steel.
Ball knob thermoset PF 31.

Version:
Grip, black oxidised.
Ball knob, black.

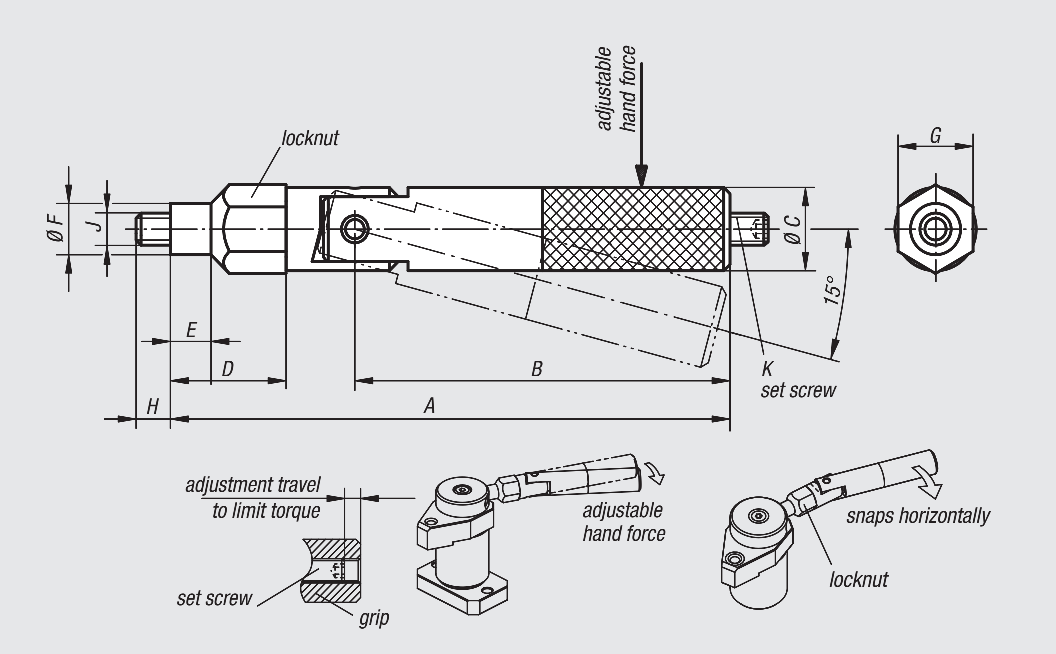
Sample order:
nlm 06355-05059

Order No.	A	B	C	D	E	SW
06355-05059	59	20	8	5	M5	7
06355-06089	89	25	10	6	M6	8

06357

Handles screw-in

with torque limit



Material:
Carbon steel.

Version:
Hardened, black oxidised.

Sample order:
nlm 06357-05090

Note:
The desired clamping force can be set by using the set screw to alter the torque. The handle snaps 15° when the set torque is achieved.

Note:
Ensure that the handle is set to snap horizontally.

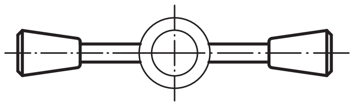
Order No.	A	B	C	D	E	F	G	H	J	K	Hand force FH N
06357-05090	89,5	60	13	18,5	6,5	8	12	5,5	M5	M5x16	0-150
06357-06119	119	84	15	23	8	10	14	6,5	M6	M6x20	0-200

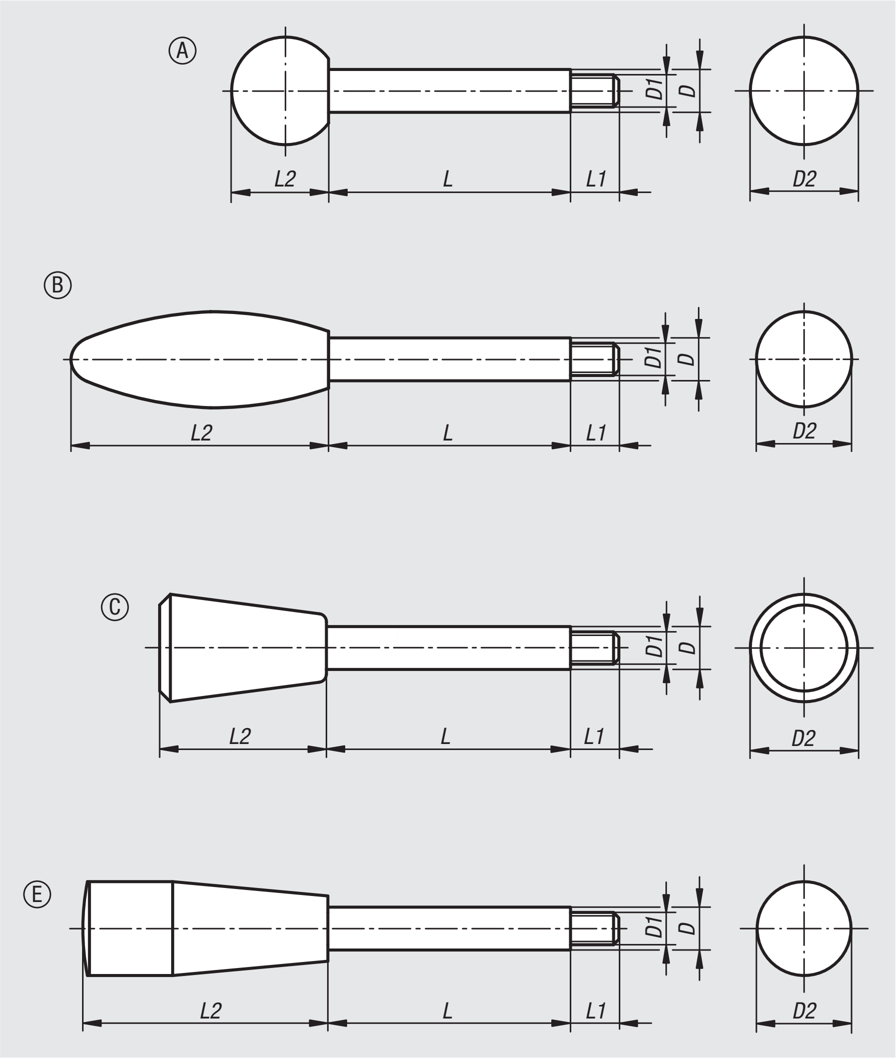
Handles

Material:
Knobs thermoset PF 31.
Rod steel 1.0718 or stainless steel 1.4305.

Version:
Thermoset black, high-gloss polished.
Steel black oxidised or bright stainless steel.

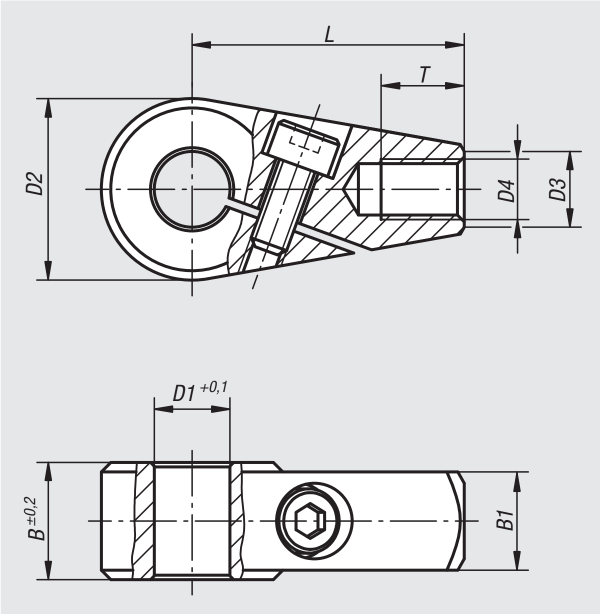
Sample order:
nlm 06360-208X35 (include length L)





Order No. steel	Order No. stainless steel	Form	D	D1	D2	L	L1	L2
06360-208X	**06360-1208X**	A	8	M6	20	35/50/65	9	18
06360-210X	**06360-1210X**	A	10	M8	25	50/65/80/100	13	23
06360-212X	**06360-1212X**	A	12	M10	32	65/80/100/125	15	29
06360-214X	**06360-1214X**	A	14	M12	36	80/100/125/160	16	33
06360-708X	**06360-1708X**	B	8	M6	23	35/50/65	9	60
06360-710X	**06360-1710X**	B	10	M8	26	50/65/80/100	13	70
06360-712X	**06360-1712X**	B	12	M10	35	65/80/100/125	15	85
06360-714X	**06360-1714X**	B	14	M12	35	80/100/125/160	16	85
06360-408X	**06360-1408X**	C	8	M6	20	35/50/65	9	31
06360-410X	**06360-1410X**	C	10	M8	25	50/65/80/100	13	38
06360-412X	**06360-1412X**	C	12	M10	30	65/80/100/125	15	46
06360-414X	**06360-1414X**	C	14	M12	35	80/100/125/160	16	53
06360-608X	**06360-1608X**	E	8	M6	17	35/50/65	9	45
06360-610X	**06360-1610X**	E	10	M8	23	50/65/80/100	13	61
06360-612X	**06360-1612X**	E	12	M10	29	65/80/100/125	15	71
06360-614X	**06360-1614X**	E	14	M12	29	80/100/125/160	16	71

Clamp hubs

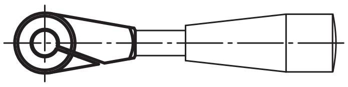


Material:
Carbon steel 1.1206.

Version:
Black oxidised.

Sample order:
nlm 06362-1012

Note:
Clamp hubs can be quickly and easily attached to shafts, adjusted in the proper operating position and then locked.
For secure transmission of torque, shaft tolerance should not exceed h11.
At fastening thread (D2), handles can be screwed on.



Order No.	D1	D2	D3	D4	B	B1	L	T
06362-0810	10	24	10	M8	15,5	13	36	11
06362-0812	12	24	10	M8	15,5	13	36	11
06362-1012	12	28	12	M10	17,5	15	41	14
06362-1014	14	28	12	M10	17,5	15	41	14
06362-1214	14	32	14	M12	19,5	17	45	16
06362-1216	16	32	14	M12	19,5	17	45	16

Tension levers

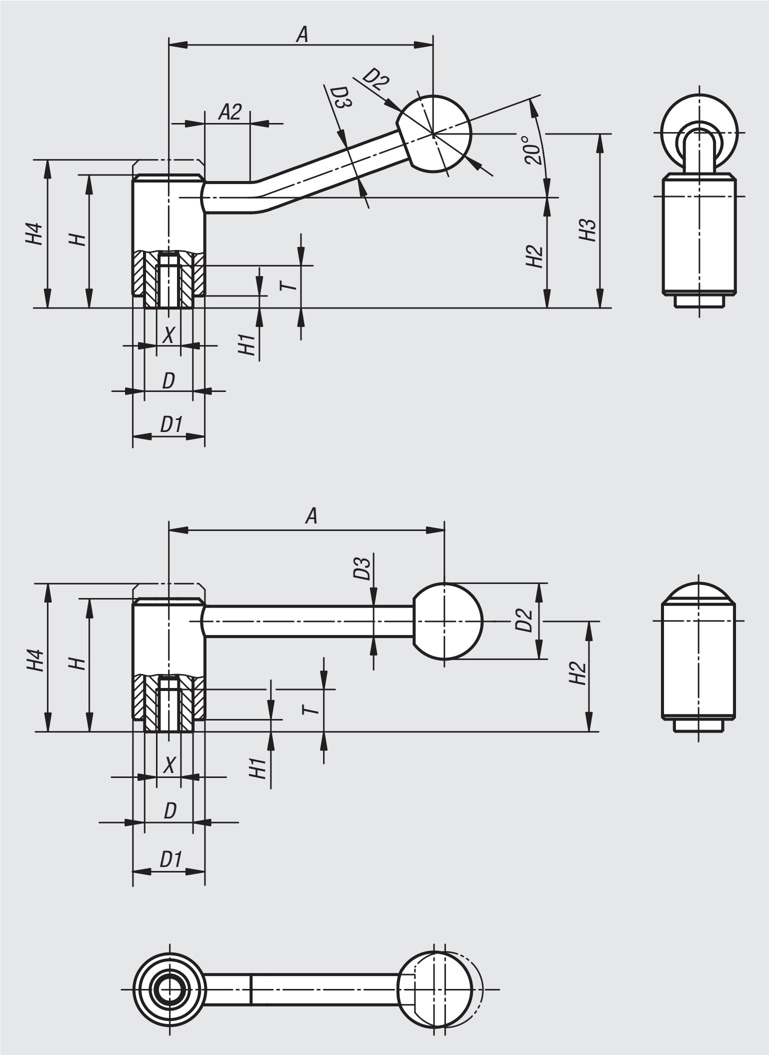
internal thread

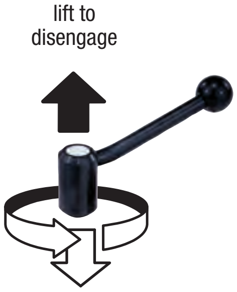
Material:
Steel parts grade 5.8.
Ball knob black plastic.

Version:
Powder-coated with fine texture, black.

Sample order:
nlm 06370-1082

On request:
Other threads and special versions.
Dimensions “H1” and “A” available in other lengths at extra charge.



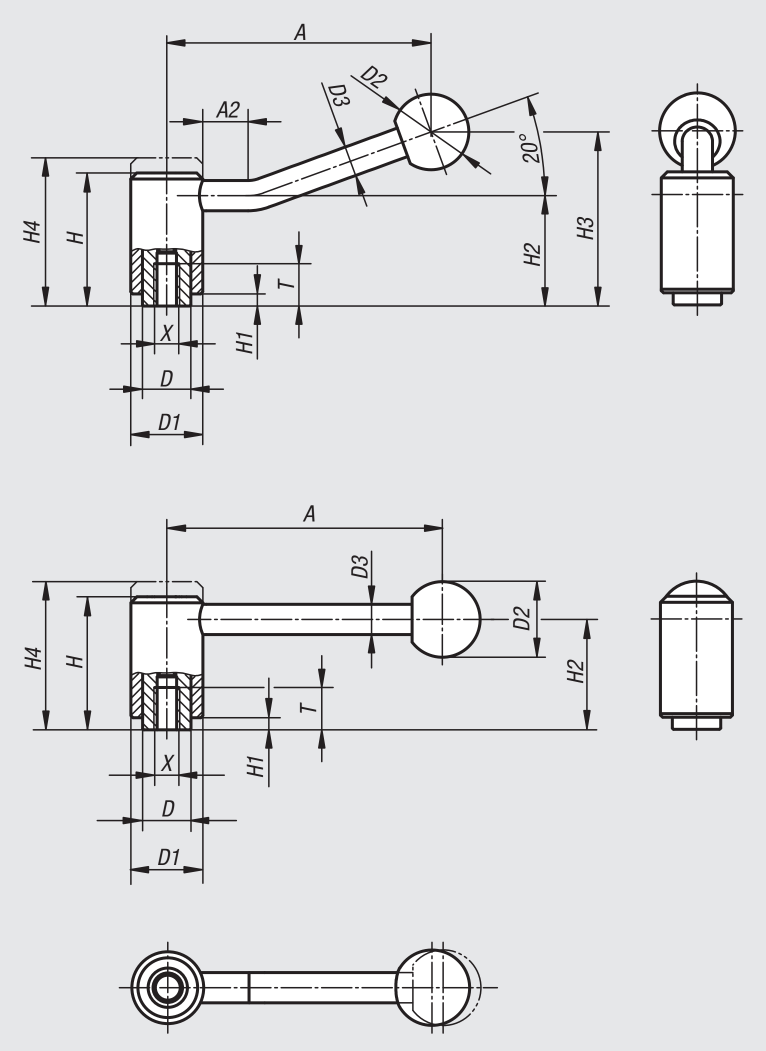


Order No. 0°	Order No. 20°	X	T	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
06370-1082	**06370-1081**	M8	14	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	22
06370-1102	**06370-1101**	M10	14	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	22
06370-2102	**06370-2101**	M10	17	111/106	-/15	19	28	32	12	51,5	5,5	42	-/68,5	57,5	24
06370-2122	**06370-2121**	M12	17	111/106	-/15	19	28	32	12	51,5	5,5	42	-/68,5	57,5	24
06370-3122	**06370-3121**	M12	23	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	26
06370-3162	**06370-3161**	M16	23	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	26
06370-4162	**06370-4161**	M16	27	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	36
06370-4202	**06370-4201**	M20	27	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	36
06370-4242	**06370-4241**	M24	27	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	36

06371

Tension levers

internal thread, stainless steel

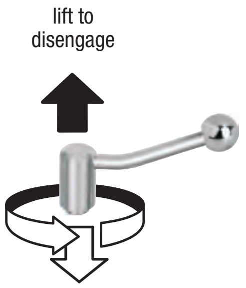


Material:
Steel parts stainless steel 1.4305.
Ball knob black plastic.

Version:
Stainless steel parts bright.
Ball knob polished.

Sample order:
nlm 06371-1082

On request:
Other threads and special versions.
Dimensions “H1” and “A” available in other lengths at extra charge.



Order No. 0°	Order No. 20°	X	T	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
06371-1082	**06371-1081**	M8	14	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	22
06371-1102	**06371-1101**	M10	14	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	22
06371-2102	**06371-2101**	M10	17	111/106	-/15	19	28	32	12	51,5	5,5	42	-/68,5	57,5	24
06371-2122	**06371-2121**	M12	17	111/106	-/15	19	28	32	12	51,5	5,5	42	-/68,5	57,5	24
06371-3122	**06371-3121**	M12	23	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	26
06371-3162	**06371-3161**	M16	23	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	26
06371-4162	**06371-4161**	M16	27	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	36
06371-4202	**06371-4201**	M20	27	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	36

06380

Tension levers

external thread

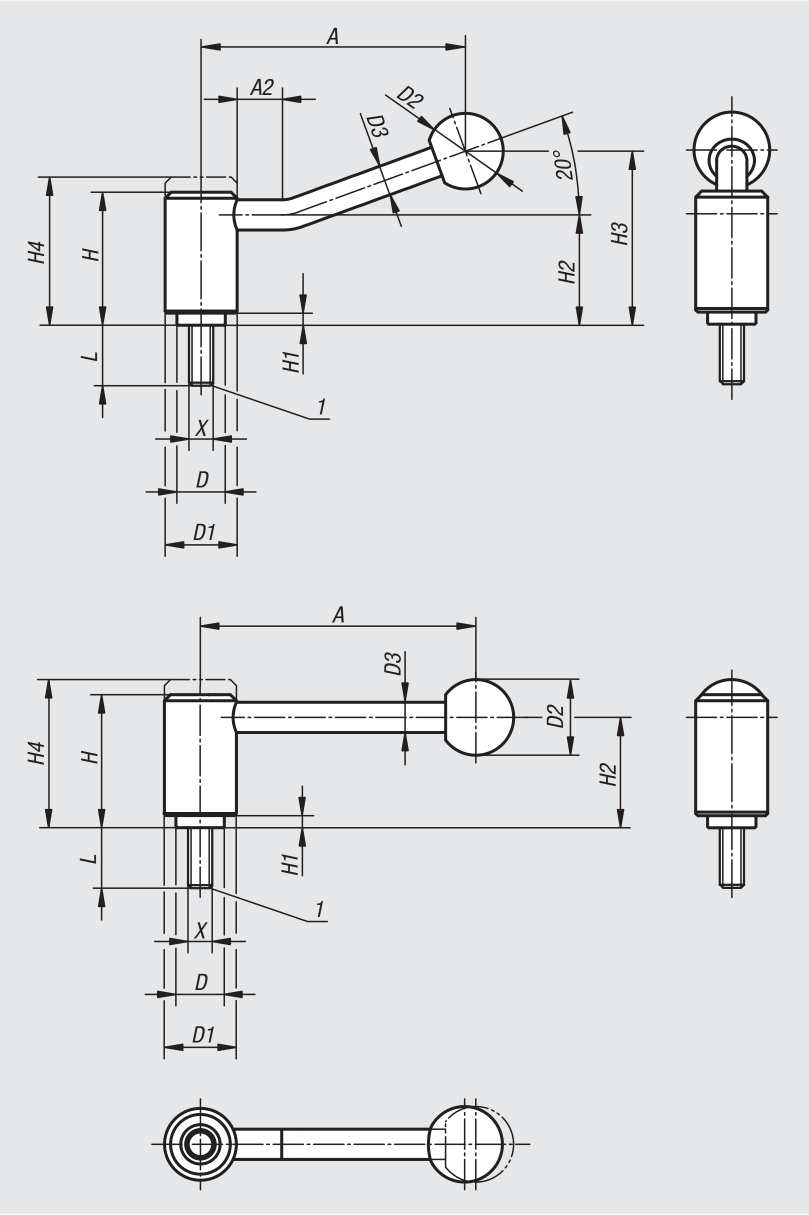
Material:
Steel parts grade 5.8.
Ball knob black plastic.

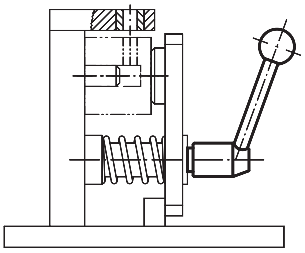
Version:
Powder-coated with fine texture, black.

Sample order:
nlm 06380-1082X30 (include length L)

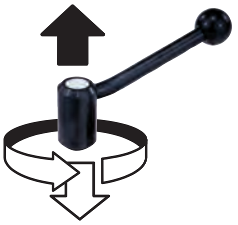
On request:
Other threads, screw lengths and special versions. Dimensions “H1” and “A” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78





lift to
disengage

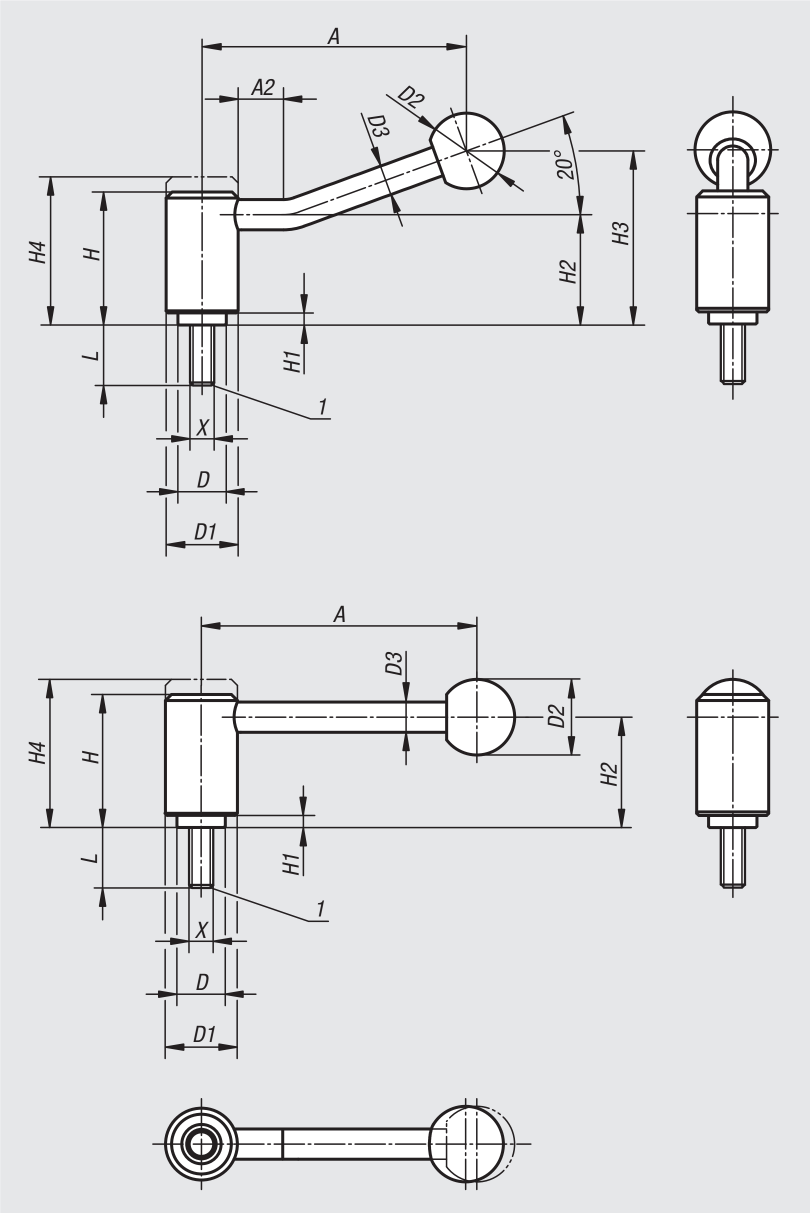


Order No. 0°	Order No. 20°	X	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	L	No. of teeth
06380-1082X	**06380-1081X**	M8	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	15/20/25/30/40/50/60	22
06380-1102X	**06380-1101X**	M10	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	15/20/25/30/40/50/60	22
06380-1122X	**06380-1121X**	M12	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	15/20/25/30/40/50/60	22
06380-2122X	**06380-2121X**	M12	111/106	-/15	19	28	32	12	51,5	5,5	42	-/68,5	57,5	20/25/30/40/50/60	24
06380-3122X	**06380-3121X**	M12	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	20/25/30/40/50/60/70/80/90	26
06380-3162X	**06380-3161X**	M16	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	20/25/30/40/50/60/70/80/90	26
06380-4162X	**06380-4161X**	M16	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	30/40/50/60/70/80/90	36
06380-4202X	**06380-4201X**	M20	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	30/40/50/60/70/80/90	36
06380-4242X	**06380-4241X**	M24	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	30/40/50/60/70/80/90	36

06381

Tension levers

external thread, stainless steel



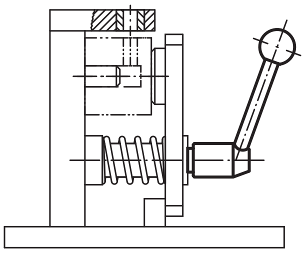
Material:
Steel parts stainless steel 1.4305.
Ball knob black plastic.

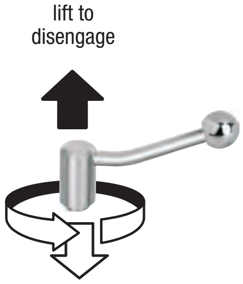
Version:
Stainless steel parts bright.
Ball knob polished.

Sample order:
nlm 06381-1082X30 (include length L)

On request:
Other threads, screw lengths and special versions.
Dimensions “H1” and “A” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

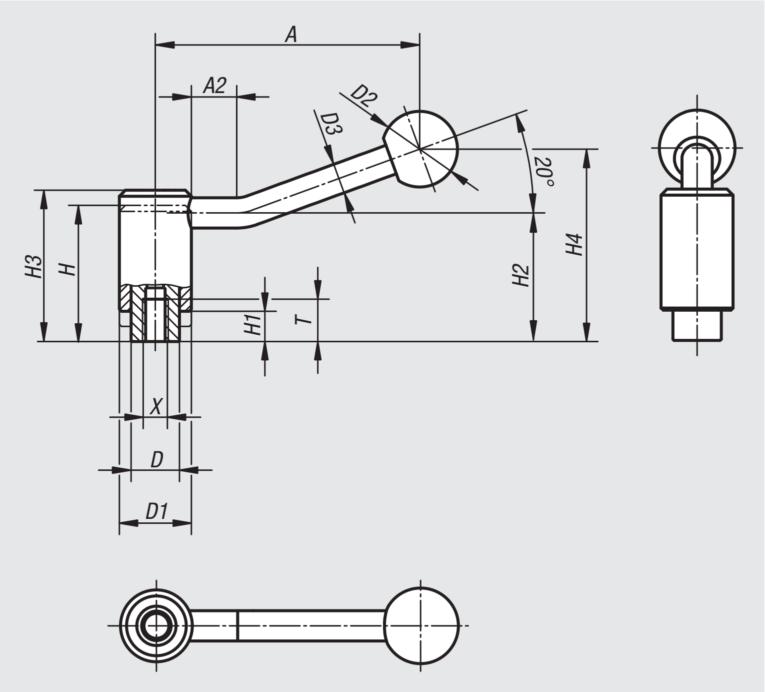




Order No. 0°	Order No. 20°	X	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	L	No. of teeth
06381-1082X	**06381-1081X**	M8	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	15/20/25/30/40/50/60	22
06381-1102X	**06381-1101X**	M10	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	15/20/25/30/40/50/60	22
06381-1122X	**06381-1121X**	M12	92/88	-/15	16	24	25	10	44,5	4,5	37	-/58,5	49,5	15/20/25/30/40/50/60	22
06381-2122X	**06381-2121X**	M12	111/106	-/15	19	28	32	12	51,5	5,5	42	-/68,5	57,5	20/25/30/40/50/60	24
06381-3122X	**06381-3121X**	M12	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	20/25/30/40/50/60/70/80/90	26
06381-3162X	**06381-3161X**	M16	134,5/128,5	-/15	23	33	32	13	58	6	47	-/81	65	20/25/30/40/50/60/70/80/90	26
06381-4162X	**06381-4161X**	M16	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	30/40/50/60/70/80/90	36
06381-4202X	**06381-4201X**	M20	134/128,5	-/15	30	41	32	13	68,5	7,5	56,5	-/89,5	76,5	30/40/50/60/70/80/90	36

Tension levers safety

internal thread



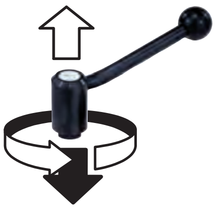
Material:
Steel parts grade 5.8.
Ball knob black plastic.

Version:
Powder-coated with fine texture, black.

Sample order:
nlm 06382-1108

Method of operation:
Press the handle down until the teeth are fully engaged. The object can now be clamped or released. Spring pressure pushes the handle up disengaging the teeth and thereby restoring the safety function (handle can be rotated without engaging).

On request:
Special versions.
Dimensions “H1” and “A” available in other lengths at extra charge.



press to engage (safety function)

Order No.	X	T	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
06382-1108	M8	14	88	15	16	24	25	10	44,5	9,5	49,3	49,5	63,5	22
06382-1110	M10	14	88	15	16	24	25	10	44,5	9,5	49,3	49,5	63,5	22
06382-1210	M10	17	106	15	19	28	32	12	51	10,5	56,3	56,5	74	24
06382-1212	M12	17	106	15	19	28	32	12	51	10,5	56,3	56,5	74	24
06382-1312	M12	23	128,5	15	23	33	32	13	57,5	12,5	64,5	64,5	87,5	26
06382-1316	M16	23	128,5	15	23	33	32	13	57,5	12,5	64,5	64,5	87,5	26

06383

Tension levers safety

external thread

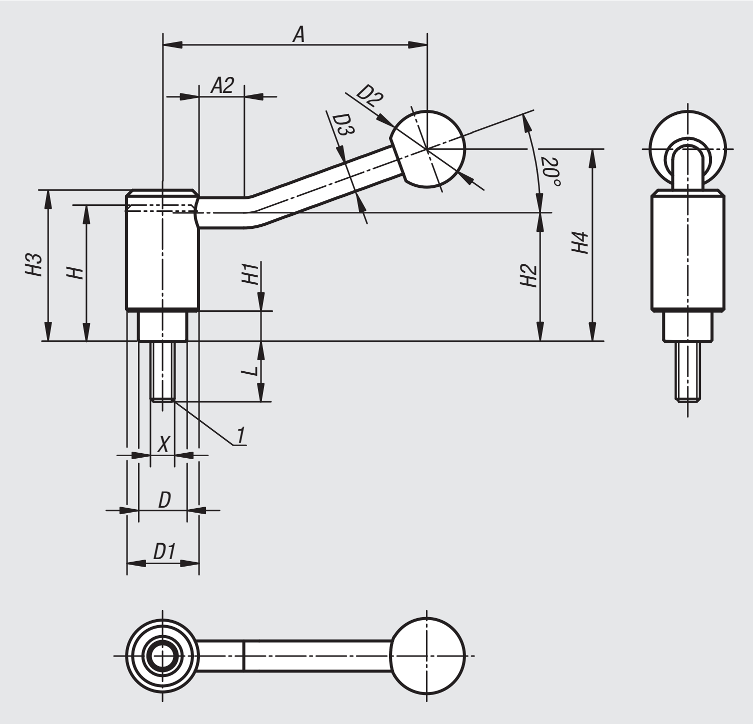
Material:
Steel parts grade 5.8.
Ball knob black plastic.

Version:
Powder-coated with fine texture, black.

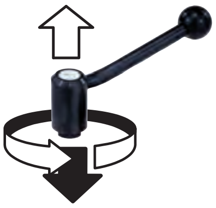
Sample order:
nlm 06383-1108X30 (include length L)

Method of operation:
Press the handle down until the teeth are fully engaged. The object can now be clamped or released. Spring pressure pushes the handle up disengaging the teeth and thereby restoring the safety function (handle can be rotated without engaging).

On request:
Other threads, screw lengths and special versions. Dimensions "H1" and "A" available in other lengths at extra charge.



press to
engage
(safety function)



Order No.	X	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth	L
06383-1108X	M8	88	15	16	24	25	10	44,5	9,5	49,3	49,5	63,5	22	20/25/30/40/50/60
06383-1110X	M10	88	15	16	24	25	10	44,5	9,5	49,3	49,5	63,5	22	20/25/30/40/50/60
06383-1112X	M12	88	15	16	24	25	10	44,5	9,5	49,3	49,5	63,5	22	20/25/30/40/50/60
06383-1212X	M12	106	15	19	28	32	12	51	10,5	56,3	56,5	74	24	20/25/30/40/50/60
06383-1312X	M12	128,5	15	23	33	32	13	57,5	12,5	64,5	64,5	87,5	26	25/30/40/50/60
06383-1316X	M16	128,5	15	23	33	32	13	57,5	12,5	64,5	64,5	87,5	26	25/30/40/50/60

Tension levers flat

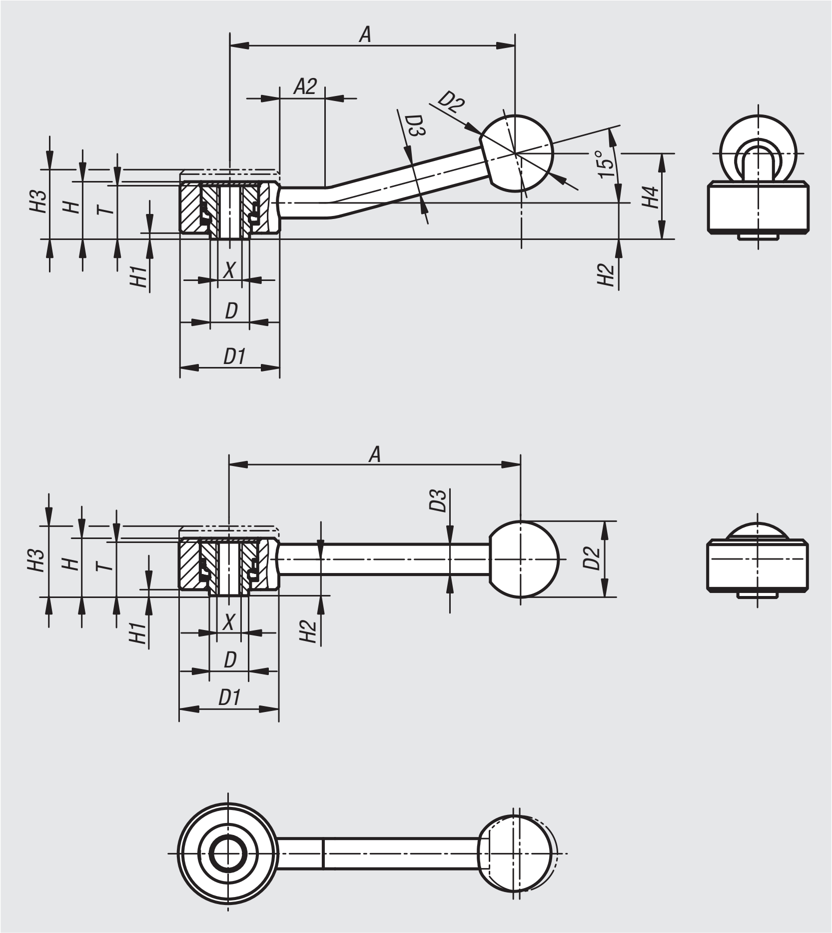
internal thread

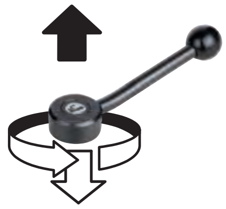
Material:
Steel parts grade 5.8.
Ball knob black plastic.

Version:
Black oxidised.

Sample order:
nlm 06390-1061

On request:
Other threads and special versions.
Dimensions “H1” and “A” available in other lengths at extra charge.

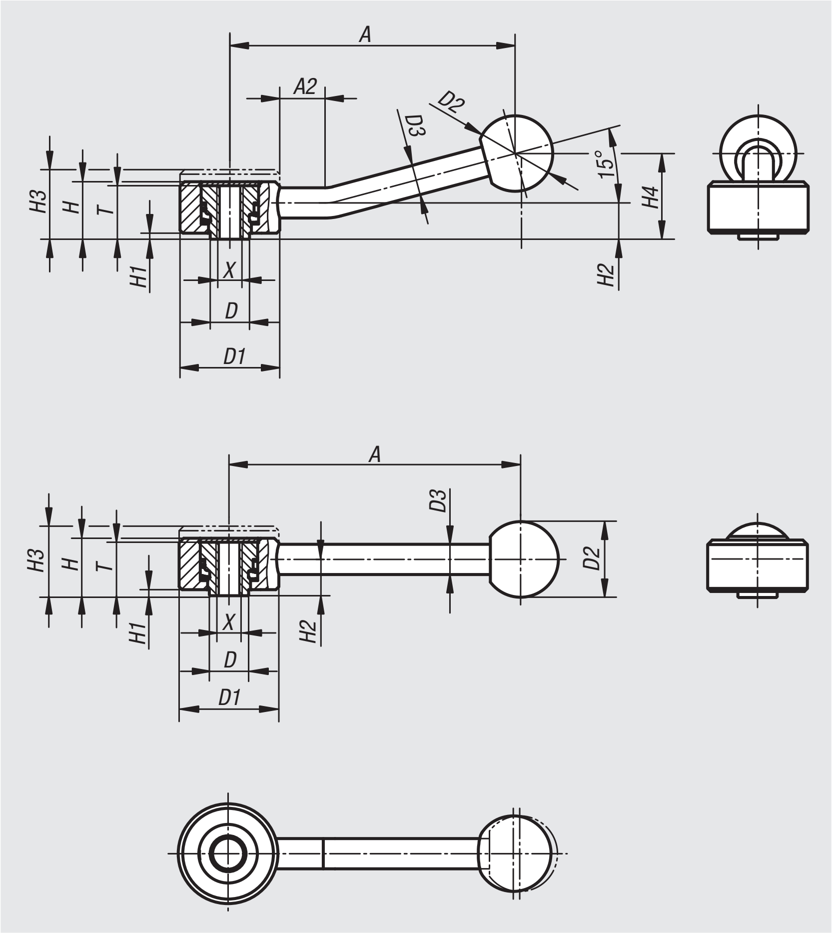




Order No. 0°	Order No. 15°	X	T	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
06390-1061	**06390-1062**	M6	18	102/100	-/15	13,5	33	25	10	19	2	12	23	-/29	26
06390-1081	**06390-1082**	M8	18	102/100	-/15	13,5	33	25	10	19	2	12	23	-/29	26
06390-2101	**06390-2102**	M10	21	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	30
06390-2121	**06390-2122**	M12	21	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	30
06390-3121	**06390-3122**	M12	27	148/145	-/15	23	45	37	14	28	2	17	33	-/48	36
06390-3161	**06390-3162**	M16	27	148/145	-/15	23	45	37	14	28	2	17	33	-/48	36

Tension levers flat

internal thread, stainless steel

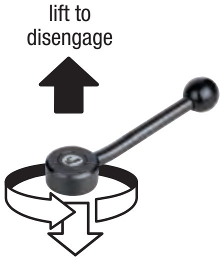


Material:
Steel parts stainless steel 1.4305.
Ball knob black plastic.

Version:
Steel parts bright.

Sample order:
nlm 06391-1081

On request:
Other threads and special versions.
Dimensions “H1” and “A” available in other lengths at extra charge.



Order No. 0°	Order No. 15°	X	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth	T
06391-1081	**06391-1082**	M8	102/100	-/15	13,5	33	25	10	19	2	12	23	-/29	26	18
06391-2101	**06391-2102**	M10	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	30	21
06391-2121	**06391-2122**	M12	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	30	21
06391-3161	**06391-3162**	M16	148/145	-/15	23	45	37	14	28	2	17	33	-/48	36	27

06400

Tension levers flat

external thread

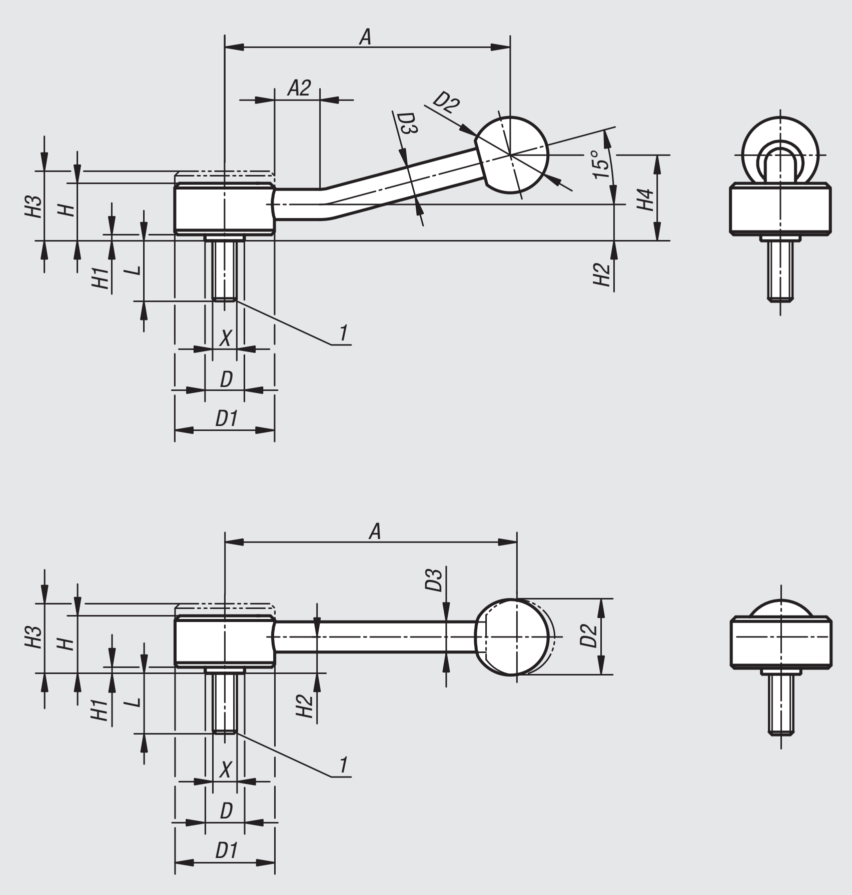
Material:
Steel parts grade 5.8.
Ball knob black plastic.

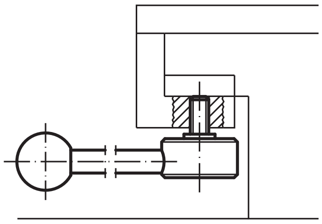
Version:
Black oxidised.

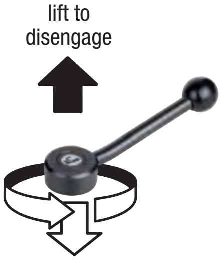
Sample order:
nlm 06400-1081X30 (include length L)

On request:
Other threads, screw lengths and special versions. Dimensions “H1” and “A” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78







Order No. 0°	Order No. 15°	X	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	L	No. of teeth
06400-1081X	**06400-1082X**	M8	102/100	-/15	13,5	33	25	10	19	2	12	23	-/29	15/20/25/30/40/50/60	20
06400-1101X	**06400-1102X**	M10	102/100	-/15	13,5	33	25	10	19	2	12	23	-/29	15/20/25/30/40/50/60	20
06400-2101X	**06400-2102X**	M10	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	20/25/30/40/50/60	24
06400-2121X	**06400-2122X**	M12	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	20/25/30/40/50/60	24
06400-3121X	**06400-3122X**	M12	148/145	-/15	23	45	37	14	28	2	17	33	-/48	20/25/30/40/50/60	26
06400-3161X	**06400-3162X**	M16	148/145	-/15	23	45	37	14	28	2	17	33	-/48	20/25/30/40/50/60	26

Tension levers flat

external thread, stainless steel

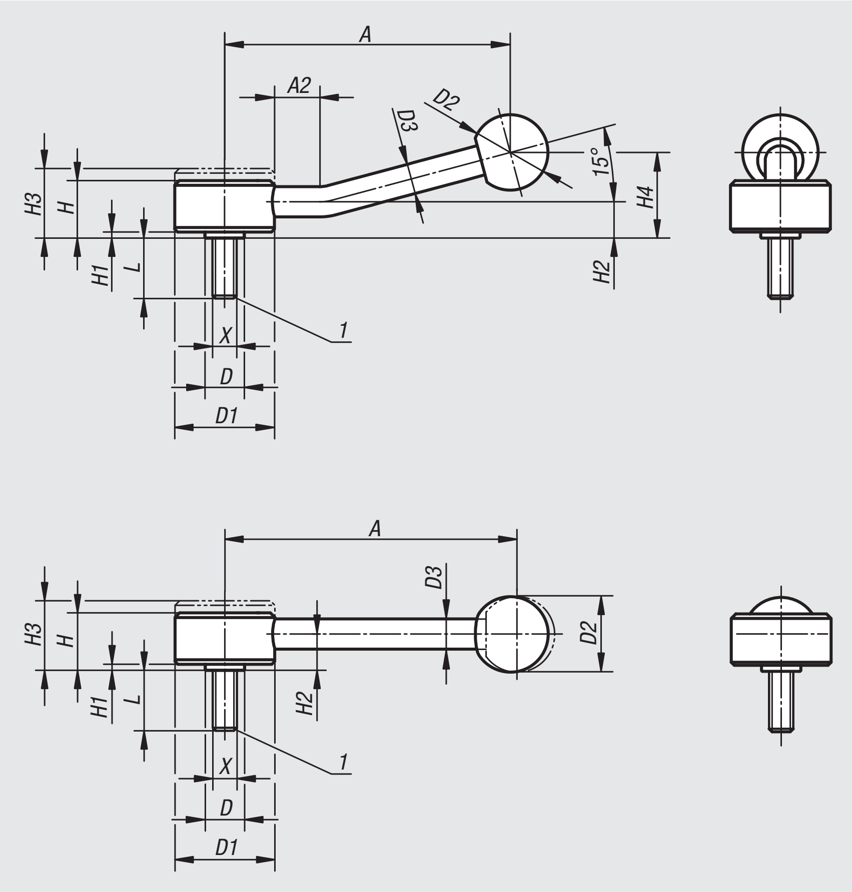
Material:
Steel parts stainless steel 1.4305.
Ball knob black plastic.

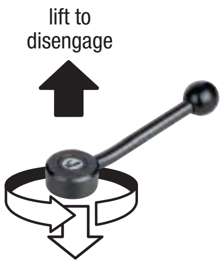
Version:
Steel parts bright.

Sample order:
nlm 06401-1081X40 (include length L)

On request:
Other threads, screw lengths and special versions.
Dimensions “H1” and “A” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

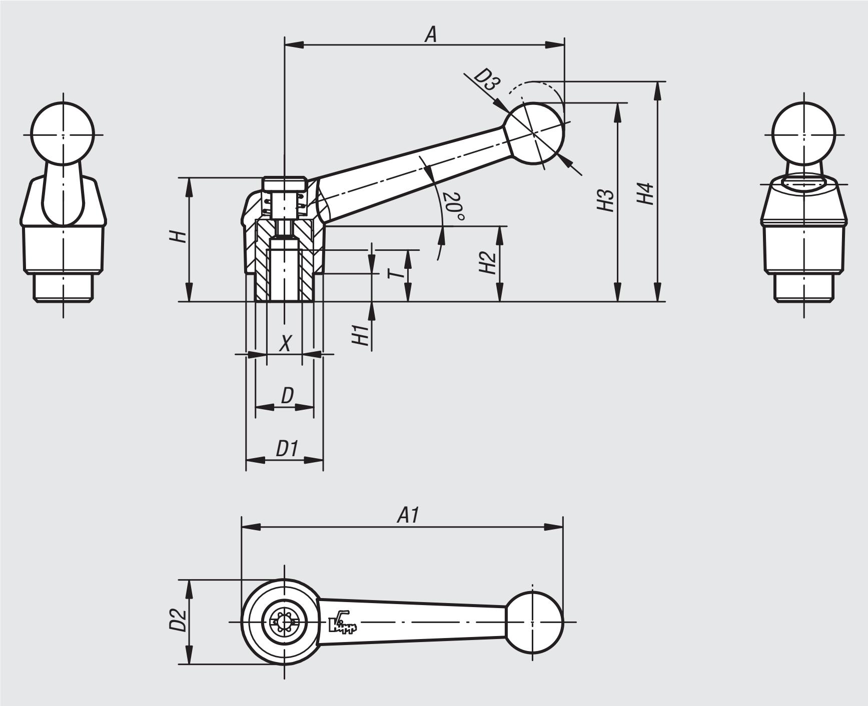




Order No. 0°	Order No. 15°	X	A=handle length	A2	D	D1	D2	D3	H	H1	H2	H3	H4	L	No. of teeth
06401-1081X	**06401-1082X**	M8	102/100	-/15	13,5	33	25	10	19	2	12	23	-/29	30/40/50	26
06401-2101X	**06401-2102X**	M10	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	30/40/50/60	30
06401-2121X	**06401-2122X**	M12	131/127	-/15	19	41	30	12	22	2	13,5	26	-/38	30/40/50/60	30
06401-3161X	**06401-3162X**	M16	148/145	-/15	23	45	37	14	28	2	17	33	-/48	40/50/60	36

Clamping levers

internal thread



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle powder-coated.
Steel parts black oxidised.

Sample order:
nlm 06410-4103

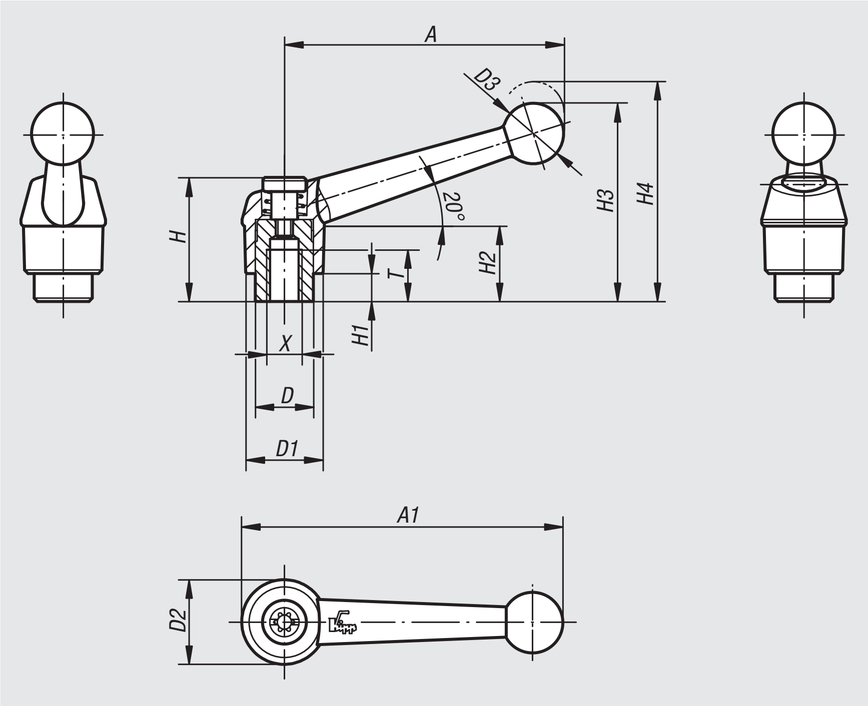
Note:
Standard colours are:
black satin finish, silver metallic.

On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Order No. black	Order No. silver metallic	X	A	A1	T	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
06410-1041	**06410-1043**	M4	39	46	9	10	13	14	10,5	24,5	4	15	32,5	35,5	16
06410-1051	**06410-1053**	M5	39	46	9	10	13	14	10,5	24,5	4	15	32,5	35,5	16
06410-1061	**06410-1063**	M6	39	46	9	10	13	14	10,5	24,5	4	15	32,5	35,5	16
06410-2061	**06410-2063**	M6	64	73	12	13,5	18	18,5	15,5	28,5	6,5	16,5	45,5	49,5	20
06410-2081	**06410-2083**	M8	64	73	12	13,5	18	18,5	15,5	28,5	6,5	16,5	45,5	49,5	20
06410-3081	**06410-3083**	M8	79	90	14	16	21	22	17	37	10	23	57,5	61,5	22
06410-3101	**06410-3103**	M10	79	90	14	16	21	22	17	37	10	23	57,5	61,5	22
06410-4101	**06410-4103**	M10	95	108	17	19	25	26	19	42,5	10	26	67	72	24
06410-4121	**06410-4123**	M12	95	108	17	19	25	26	19	42,5	10	26	67	72	24
06410-5121	**06410-5123**	M12	110	126	23	23	30	31	22	49	12	32	79	84	26
06410-5161	**06410-5163**	M16	110	126	23	23	30	31	22	49	12	32	79	84	26

Clamping levers

internal thread, steel parts stainless steel



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

Version:
Handle powder-coated.
Stainless steel parts bright.

Sample order:
nlm 06411-2061

Note:
Standard colours are:
black satin finish, silver metallic.

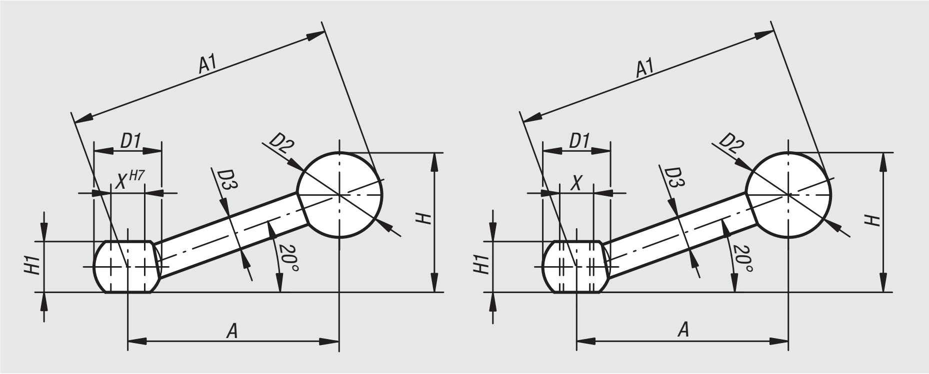
On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Order No. black	Order No. silver metallic	X	A	A1	T	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
06411-1041	**06411-1043**	M4	39	46	9	10	13	14	10,5	24,5	4	15	32,5	35,5	16
06411-1051	**06411-1053**	M5	39	46	9	10	13	14	10,5	24,5	4	15	32,5	35,5	16
06411-1061	**06411-1063**	M6	39	46	9	10	13	14	10,5	24,5	4	15	32,5	35,5	16
06411-2061	**06411-2063**	M6	64	73	12	13,5	18	18,5	15,5	28,5	6,5	16,5	45,5	49,5	20
06411-2081	**06411-2083**	M8	64	73	12	13,5	18	18,5	15,5	28,5	6,5	16,5	45,5	49,5	20
06411-3081	**06411-3083**	M8	79	90	14	16	21	22	17	37	10	23	57,5	61,5	22
06411-3101	**06411-3103**	M10	79	90	14	16	21	22	17	37	10	23	57,5	61,5	22
06411-4101	**06411-4103**	M10	95	108	17	19	25	26	19	42,5	10	26	67	72	24
06411-4121	**06411-4123**	M12	95	108	17	19	25	26	19	42,5	10	26	67	72	24
06411-5121	**06411-5123**	M12	110	126	23	23	30	31	22	49	12	32	79	84	26
06411-5161	**06411-5163**	M16	110	126	23	23	30	31	22	49	12	32	79	84	26

06420

Ball handles

DIN 6337



Material:
Steel.
Ball knob thermoset.

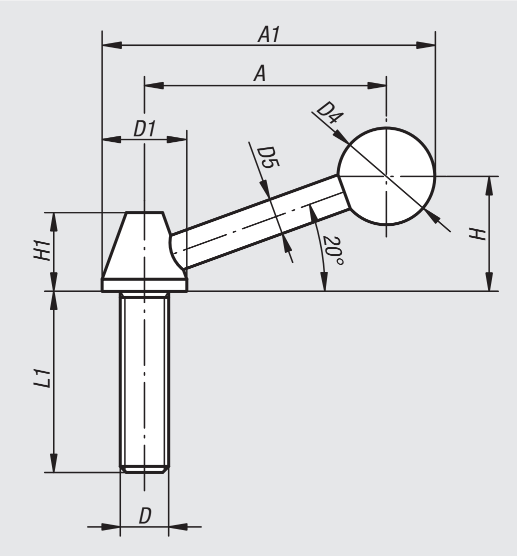
Version:
Black oxidised, ball knob black.

Sample order:
nlm 06420-112

Order No. reamed hole	Order No. internal thread	X	A=handle length	A1	D1	D2	D3	H	H1
06420-108	**06420-208**	8/M8	50	63	16	20	8	33	12
06420-110	**06420-210**	10/M10	66	80	20	20	9	40	14,5
06420-112	**06420-212**	12/M12	82,5	100	25	25	11	50	18,5
06420-116	**06420-216**	16/M16	103	125	32	32	15	63	24

06430

Clamping levers



Material:
Steel.
Ball knob thermoset.

Version:
steel black oxidised.
Ball knob black.

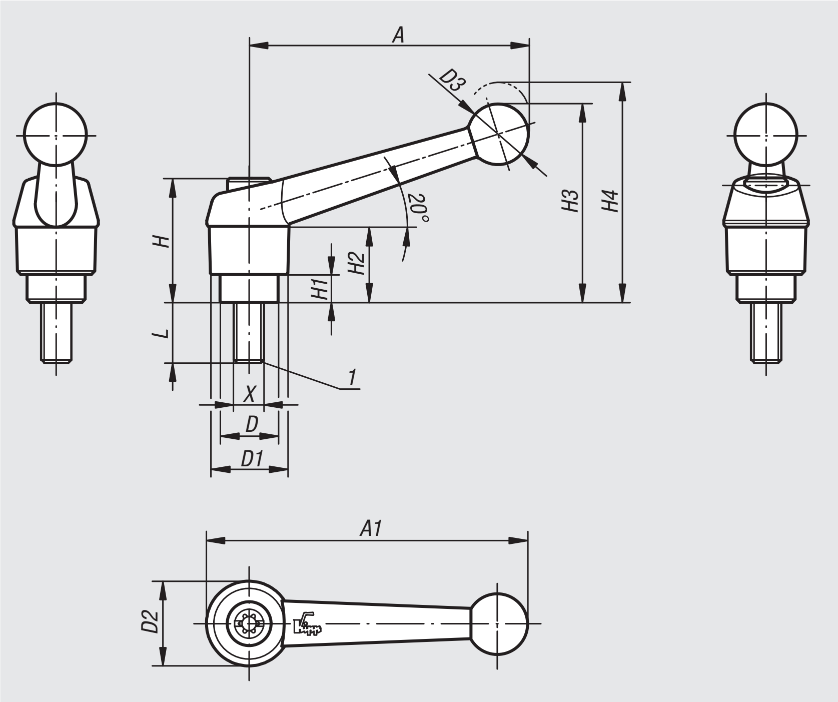
Sample order:
nlm 06430-112

Order No.	A	A1	D	D1	D4	D5	H	H1	L1
06430-108	48	55	M8	14	16	6	19	13	45
06430-110	64	73	M10	18	20	6	24	17	60
06430-112	97	108	M12	22	30	10	42	19	70
06430-116	126	138,5	M16	25	32	12	55	23	75

06430

Clamping levers

external thread



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle powder-coated.
Steel black oxidised.

Sample order:
nlm 06430-1051X20 (include length L)

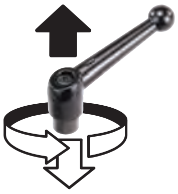
Note:
Standard colours are:
black satin finish, silver metallic.

Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

lift to disengage



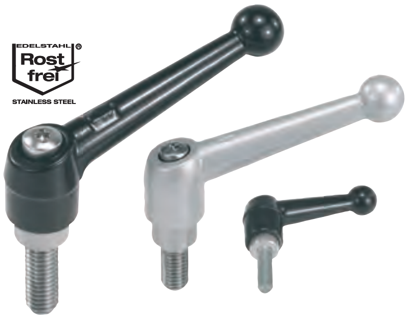
Specifications

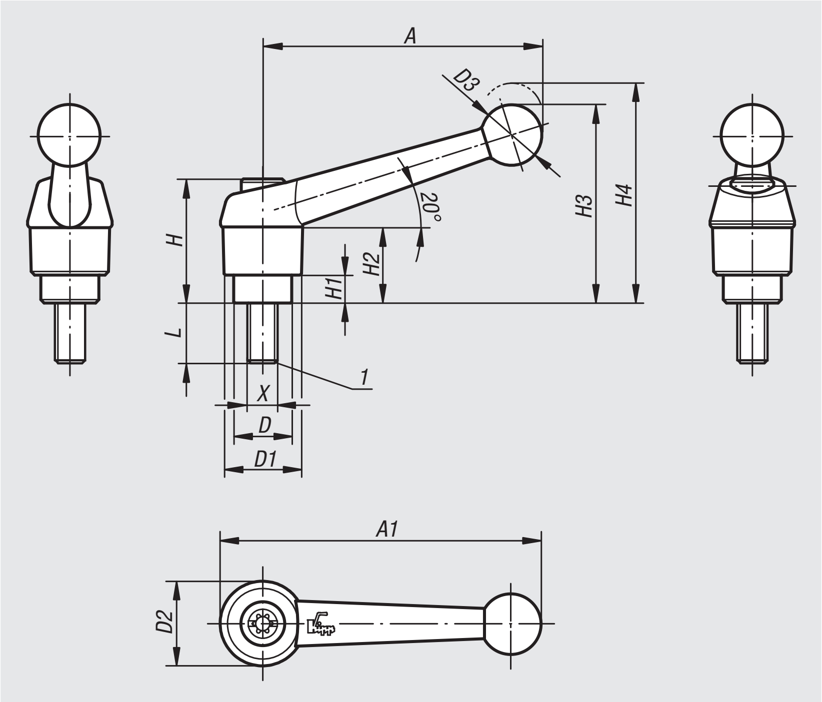
Size	X	A	A1	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
1	M5/M6	39	46	10	13	14	10,5	24,5	4	15	32,5	35,5	16
2	M6/M8/M10	64	73	13,5	18	18,5	15,5	28,5	6,5	16,5	45,5	49,5	20
3	M8/M10	79	90	16	21	22	17	37	10	23	57,5	61,5	22
4	M10/M12	95	108	19	25	26	19	42,5	10	26	67	72	24
5	M12/M16	110	126	23	30	31	22	49	12	32	79	84	26

Order No. black	**Order No. silver metallic**	Size	X	L
06430-1051X	**06430-1053X**	1	M5	10/15/20/25/30/35/40/45/50
06430-1061X	**06430-1063X**	1	M6	10/15/20/25/30/35/40/45/50
06430-2061X	**06430-2063X**	2	M6	15/20/25/30/35/40/45/50/55/60
06430-2081X	**06430-2083X**	2	M8	15/20/25/30/35/40/45/50/55/60
06430-2101X	**06430-2103X**	2	M10	15/20/25/30/35/40/45/50/55/60
06430-3081X	**06430-3083X**	3	M8	15/20/25/30/35/40/45/50/55/60
06430-3101X	**06430-3103X**	3	M10	15/20/25/30/35/40/45/50/55/60
06430-4101X	**06430-4103X**	4	M10	20/25/30/35/40/45/50/55/60/70/80/90
06430-4121X	**06430-4123X**	4	M12	20/25/30/35/40/45/50/55/60/70/80/90
06430-5121X	**06430-5123X**	5	M12	25/30/35/40/45/50/55/60/70/80/90
06430-5161X	**06430-5163X**	5	M16	25/30/35/40/45/50/55/60/70/80/90

Clamping levers

external thread, steel parts stainless steel





Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

Version:
Handle powder-coated.
Stainless steel bright.

Sample order:
nlm 06431-1051X20 (include length L)

Note:
Standard colours are:
black satin finish, silver metallic.

Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension "H1" available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

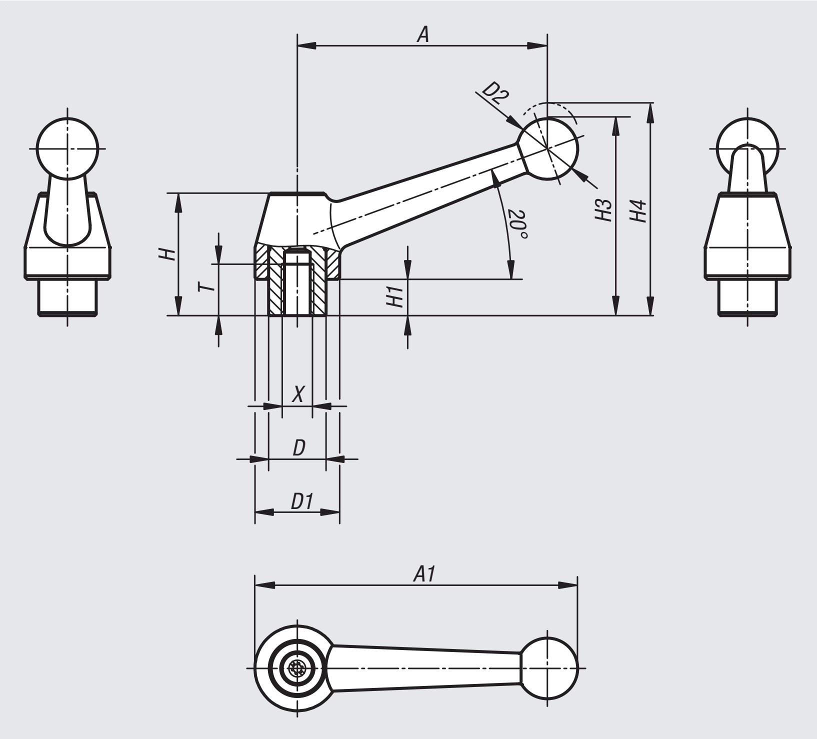
Specifications

Size	X	A	A1	D	D1	D2	D3	H	H1	H2	H3	H4	No. of teeth
1	M5/M6	39	46	10	13	14	10,5	24,5	4	15	32,5	35,5	16
2	M6/M8/M10	64	73	13,5	18	18,5	15,5	28,5	6,5	16,5	45,5	49,5	20
3	M8/M10	79	90	16	21	22	17	37	10	23	57,5	61,5	22
4	M12	95	108	19	25	26	19	42,5	10	26	67	72	24
5	M16	110	126	23	30	31	22	49	12	32	79	84	26

Order No. black	Order No. silver metallic	Size	X	L
06431-1051X	**06431-1053X**	1	M5	10/15/20/25
06431-1061X	**06431-1063X**	1	M6	10/15/20/25/30/40/50
06431-2061X	**06431-2063X**	2	M6	15/20/25/30/40/50/60
06431-2081X	**06431-2083X**	2	M8	15/20/25/30/40/50/60
06431-2101X	**06431-2103X**	2	M10	20/25/30/40/50/60
06431-3081X	**06431-3083X**	3	M8	20/25/30/40/50/60
06431-3101X	**06431-3103X**	3	M10	20/25/30/40/50/60
06431-4121X	**06431-4123X**	4	M12	25/30/40/50/60
06431-5161X	**06431-5163X**	5	M16	30/40/50/60

Clamping levers

internal thread, steel



Material:
Handle steel 1.0401.
All other steel parts grade 5.8.

Version:
Handle painted silver-grey hammer-tone.
Steel parts black oxidised.

Sample order:
nlm 06440-108

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.

Order No.	Main material	X	A	A1	T	D	D1	D2	H	H1	H3	H4	No. of teeth
06440-108	steel	M8	83	107	17	19	28	20	40,5	12	65	68,5	24
06440-110	steel	M10	83	107	17	19	28	20	40,5	12	65	68,5	24
06440-112	steel	M12	83	107	17	19	28	20	40,5	12	65	68,5	24
06440-212	steel	M12	108	138	23	23	35	25	51,5	12	79,5	84	26
06440-216	steel	M16	108	138	23	23	35	25	51,5	12	79,5	84	26
06440-316	steel	M16	132	168	27	30	43	30	60	12	93	97,5	36
06440-320	steel	M20	132	168	27	30	43	30	60	12	93	97,5	36

06440

Clamping levers

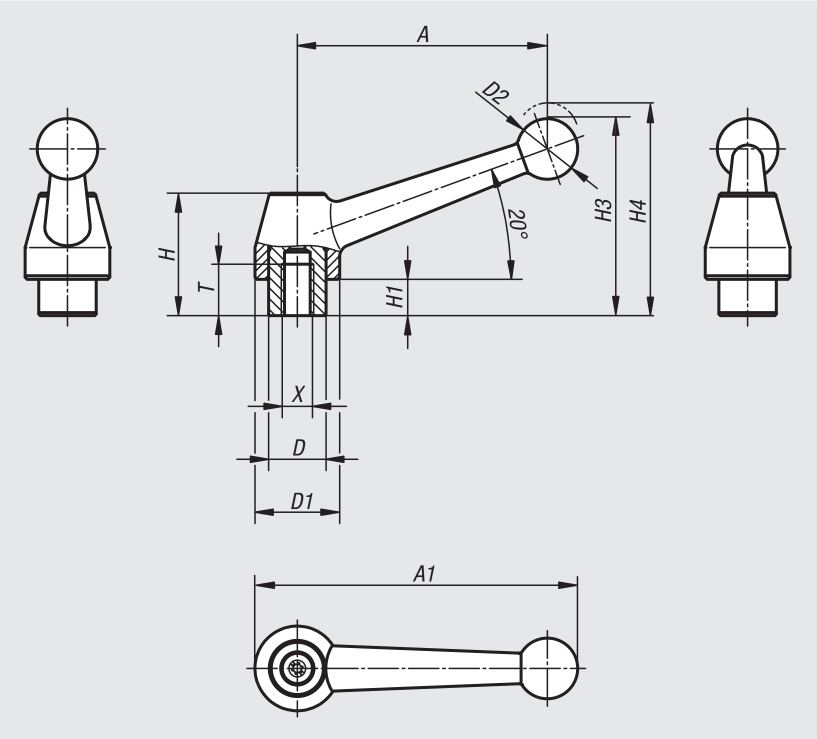
internal thread, stainless steel

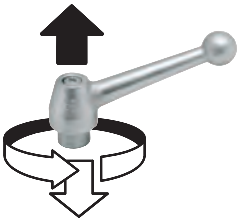
Material:
Handle stainless steel 1.4308.
All other metal parts stainless steel 1.4305.

Version:
Stainless steel grip electropolished.
Steel parts bright.

Sample order:
nlm 06440-1108

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.

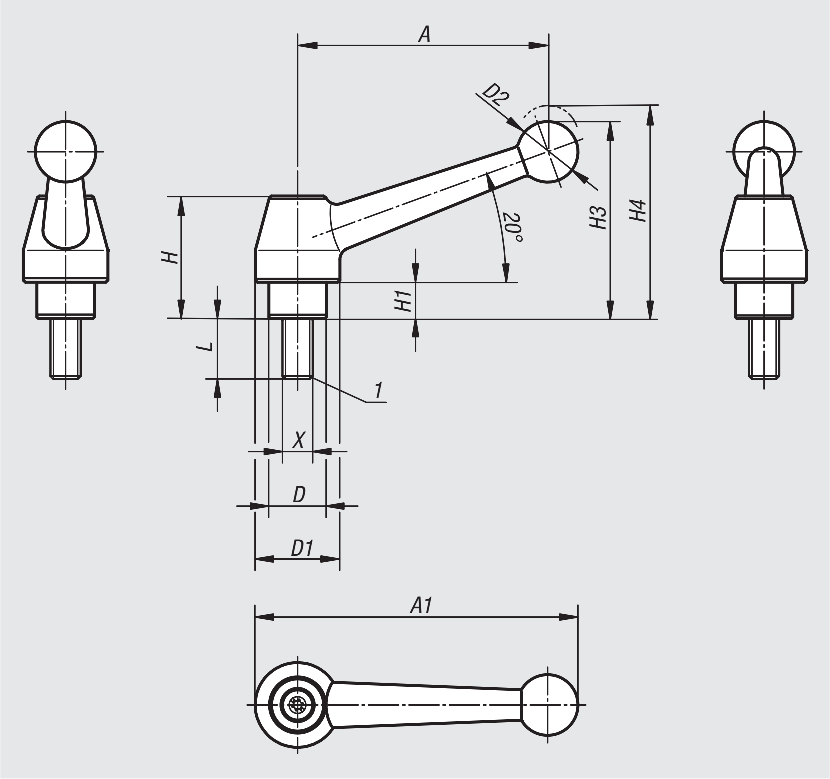




Order No.	Main material	X	A	A1	T	D	D1	D2	H	H1	H3	H4	No. of teeth
06440-1108	stainless steel	M8	83	107	17	19	28	20	40,5	12	65	68,5	24
06440-1110	stainless steel	M10	83	107	17	19	28	20	40,5	12	65	68,5	24
06440-1112	stainless steel	M12	83	107	17	19	28	20	40,5	12	65	68,5	24

Clamping levers

external thread



Material:
Handle steel 1.0401.
All other steel parts grade 5.8.

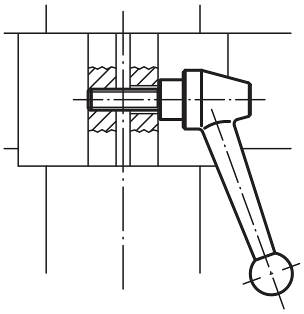
Version:
Handle painted silver-grey hammer-tone.
Steel parts black oxidised.

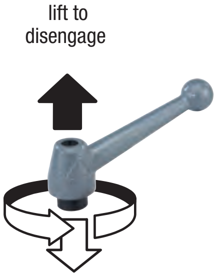
Sample order:
nlm 06441-110X30 (include length L)

Note:
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78





Order No.	Main material	X	A	A1	D	D1	D2	H	H1	H3	H4	No. of teeth	L
06441-110X	steel	M10	83	107	19	28	20	40,5	12	65	68,5	24	20/25/30/35/40/45/50/55/60/70/80/90
06441-112X	steel	M12	83	107	19	28	20	40,5	12	65	68,5	24	20/25/30/35/40/45/50/55/60/70/80/90
06441-212X	steel	M12	108	138	23	35	25	51,5	12	79,5	84	26	25/30/35/40/45/50/55/60/70/80/90
06441-216X	steel	M16	108	138	23	35	25	51,5	12	79,5	84	26	25/30/35/40/45/50/55/60/70/80/90
06441-316X	steel	M16	132	168	30	43	30	60	12	93	97,5	36	30/40/50/60/70/80/90
06441-320X	steel	M20	132	168	30	43	30	60	12	93	97,5	36	30/40/50/60/70/80/90

Clamping levers

external thread, stainless steel

Material:
Handle stainless steel 1.4308.
All other metal parts stainless steel 1.4305.

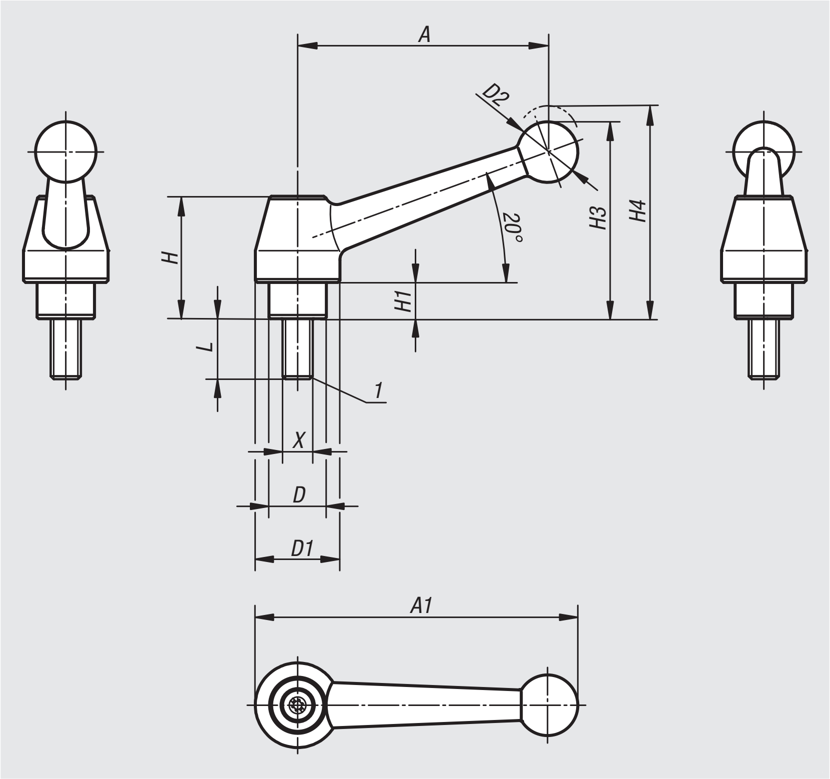
Version:
Stainless steel grip electropolished.
Steel parts bright.

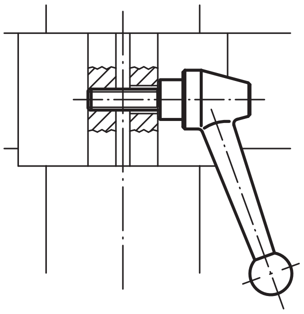
Sample order:
nlm 06441-1110X30 (include length L)

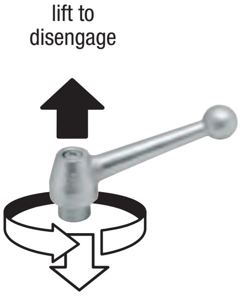
Note:
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78



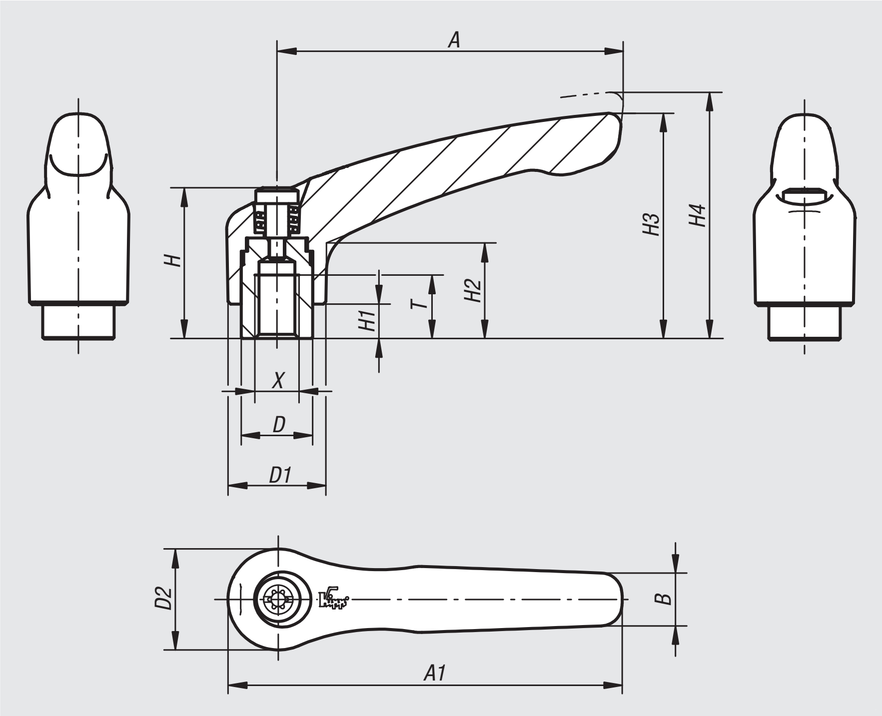




Order No.	Main material	X	A	A1	D	D1	D2	H	H1	H3	H4	No. of teeth	L
06441-1110X	stainless steel	M10	83	107	19	28	20	40,5	12	65	68,5	24	25/30/40/50/60
06441-1112X	stainless steel	M12	83	107	19	28	20	40,5	12	65	68,5	24	25/30/40/50/60

Clamping levers

internal thread, steel



Material:
Handle steel 1.0401.
All other steel parts grade 5.8.

Version:
Handle powder-coated, fine-textured structure.
Steel parts black oxidised.

Sample order:
nlm 06442-1051

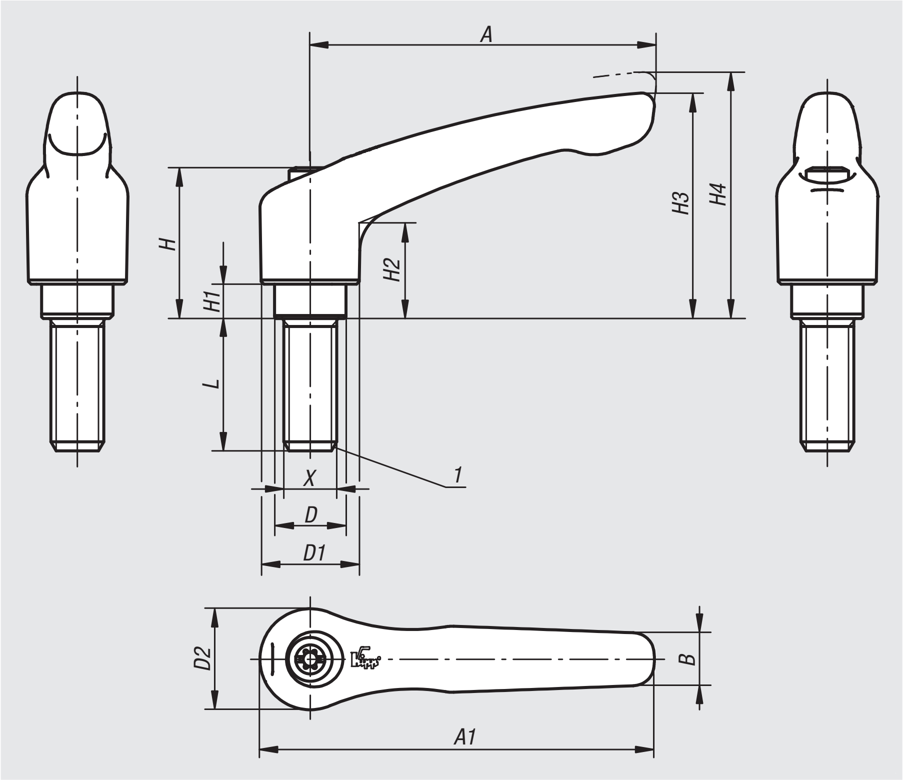
Note:
Standard colours are:
black or ruby red RAL 3003.


lift to disengage

Order No. black	Order No. ruby red	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06442-1041	**06442-10427**	M4	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06442-1051	**06442-10527**	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06442-1061	**06442-10627**	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06442-2061	**06442-20627**	M6	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06442-2081	**06442-20827**	M8	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06442-3081	**06442-30827**	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06442-3101	**06442-31027**	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06442-4101	**06442-41027**	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06442-4121	**06442-41227**	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06442-5121	**06442-51227**	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26
06442-5161	**06442-51627**	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26

Clamping levers

external thread, steel



Material:
Handle steel 1.0401.
All other steel parts grade 5.8.

Version:
Handle powder-coated, fine-textured structure.
Steel parts black oxidised.

Sample order:
nlm 06443-1051X20

Note:
Standard colours are:
black or ruby red RAL 3003.

Where L ≥ 60 mm the thread length is always 60 mm.

Drawing reference:
1) flat point DIN 78

Specifications

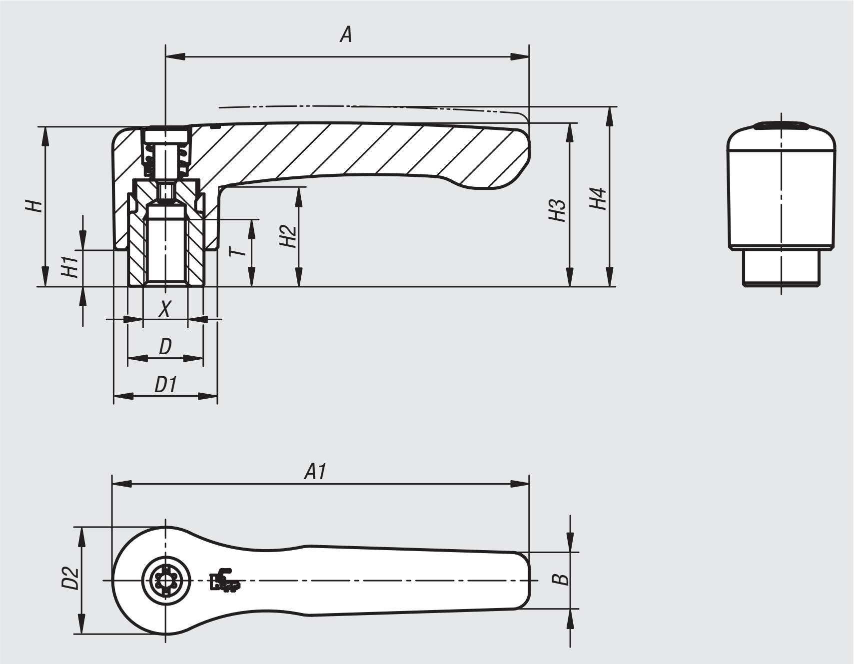
Size	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth
1	M5/M6	40	47	7	10	13	14	24,5	4	14,5	31	34	16
2	M6/M8/M10	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20
3	M8/M10	80	91	11	16	21	22	37	10	24	54,5	58,5	22
4	M10/M12	95	109	13	19	27	27,5	43	10	27	63	67,5	24
5	M12/M16	110	126	15	23	31	32	49	12	31,5	73	77,5	26

Order No. black	**Order No. ruby red**	Size	X	L
06443-1051X	**06443-10527X**	1	M5	10/15/20/25/30/35/40/45/50
06443-1061X	**06443-10627X**	1	M6	10/15/20/25/30/35/40/45/50
06443-2061X	**06443-20627X**	2	M6	15/20/25/30/35/40/45/50/55/60
06443-2081X	**06443-20827X**	2	M8	15/20/25/30/35/40/45/50/55/60
06443-2101X	**06443-21027X**	2	M10	15/20/25/30/35/40/45/50/55/60
06443-3081X	**06443-30827X**	3	M8	15/20/25/30/35/40/45/50/55/60
06443-3101X	**06443-31027X**	3	M10	15/20/25/30/35/40/45/50/55/60
06443-4101X	**06443-41027X**	4	M10	20/25/30/35/40/45/50/55/60/70/80/90
06443-4121X	**06443-41227X**	4	M12	20/25/30/35/40/45/50/55/60/70/80/90
06443-5121X	**06443-51227X**	5	M12	25/30/35/40/45/50/55/60/70/80/90
06443-5161X	**06443-51627X**	5	M16	25/30/35/40/45/50/55/60/70/80/90

06448

Clamping levers flat

internal thread



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle powder-coated.
Steel parts black oxidised.

Sample order:
nlm 06448-2061

Note:
Standard colours are:
black satin finish, orange RAL 2004.

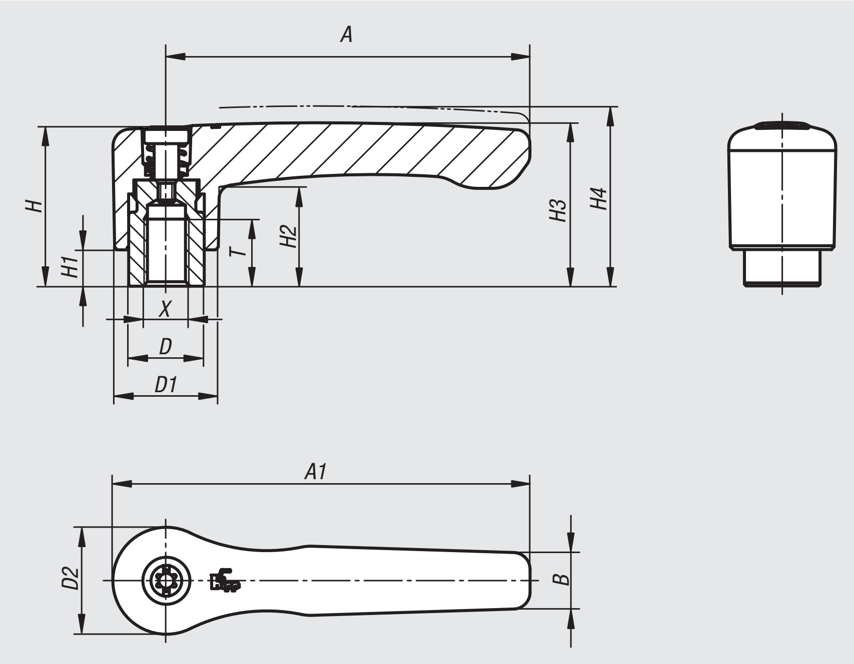
On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

lift to
disengage

Order No. black	Order No. orange RAL 2004	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06448-2061	**06448-2062**	M6	65	74,5	10,1	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	12	20
06448-2081	**06448-2082**	M8	65	74,5	10,1	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	12	20
06448-3081	**06448-3082**	M8	80	91	11,7	16	21,2	22	37	10	23,8	38	42	14	22
06448-3101	**06448-3102**	M10	80	91	11,7	16	21,2	22	37	10	23,8	38	42	14	22

Clamping levers flat

internal thread, steel parts stainless steel



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

Version:
Handle powder-coated.
Stainless steel parts bright.

Sample order:
nlm 06449-2061

Note:
Standard colours are:
black satin finish, orange RAL 2004.

On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Order No. black	Order No. orange RAL 2004	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06449-2061	**06449-2062**	M6	65	74,5	10,1	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	12	20
06449-2081	**06449-2082**	M8	65	74,5	10,1	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	12	20
06449-3081	**06449-3082**	M8	80	91	11,7	16	21,2	22	37	10	23,8	38	42	14	22
06449-3101	**06449-3102**	M10	80	91	11,7	16	21,2	22	37	10	23,8	38	42	14	22

06450

Clamping levers

internal thread

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

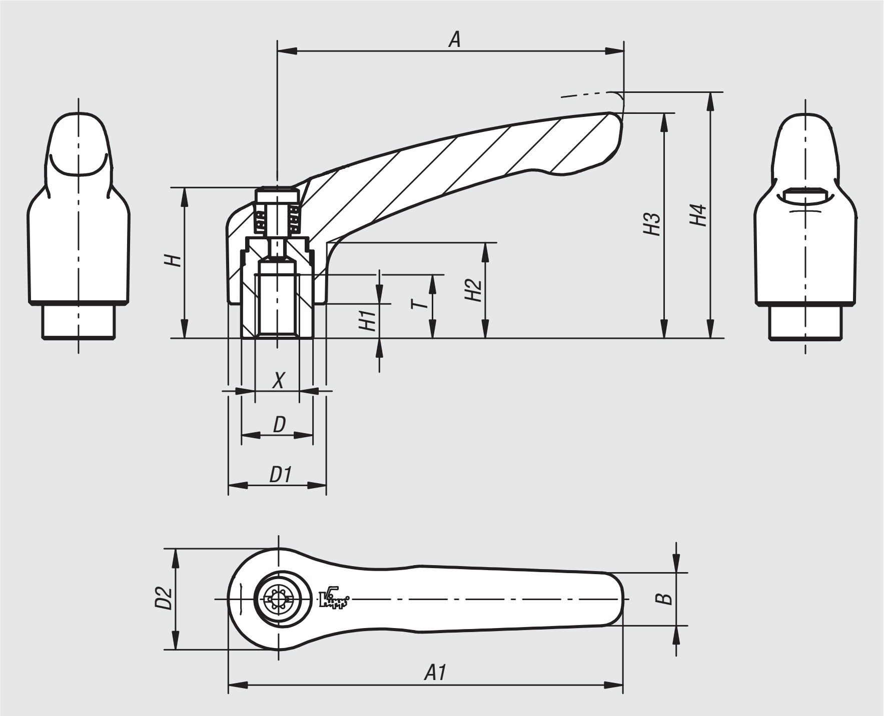
Version:
Handle powder-coated or high-gloss chromed.
Steel parts black oxidised.

Sample order:
nlm 06450-1041 (clamping lever, black satin finish)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

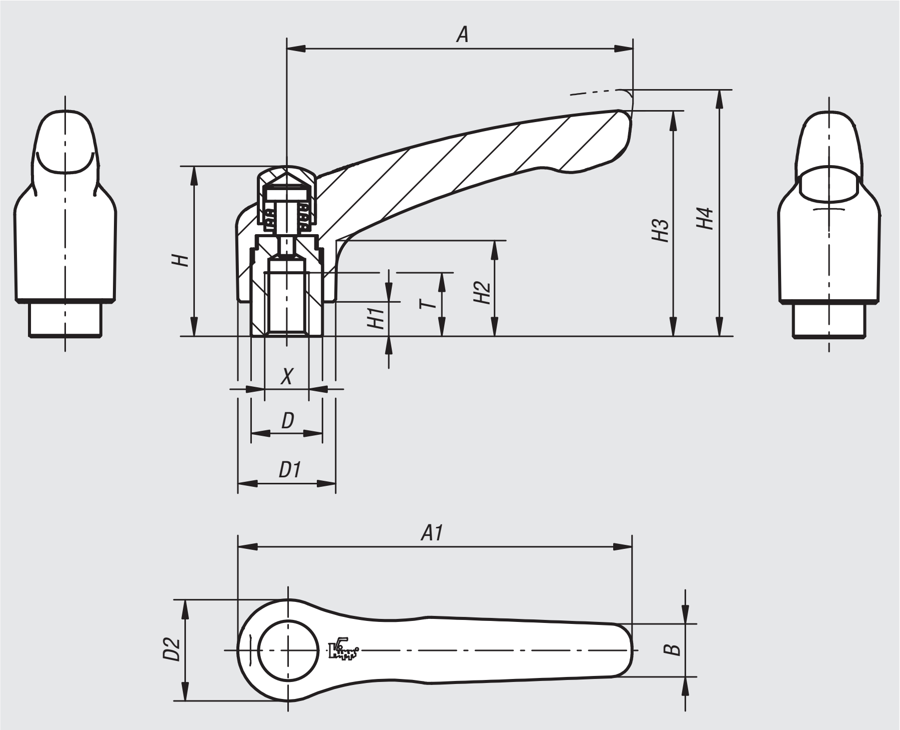


black satin finish Δ = 1	orange Δ = 2	ruby red Δ = 27	silver metallic Δ = 3	high-gloss chromed Δ = 6
	 RAL 2004	 RAL 3003		

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06450-003Δ	M3	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06450-004Δ	M4	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06450-005Δ	M5	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06450-104Δ	M4	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06450-105Δ	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06450-106Δ	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06450-206Δ	M6	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06450-208Δ	M8	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06450-308Δ	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06450-310Δ	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06450-410Δ	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06450-412Δ	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06450-512Δ	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26
06450-516Δ	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26

Clamping levers with protective cap

internal thread



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.
Protective cap stainless steel 1.4305.

Version:
Handle powder-coated.
Steel parts black oxidised.
Caps bright stainless steel.

Sample order:
nlm 06450-92061

Note:
Standard colours are:
black satin finish, orange RAL 2004.

On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Order No. black	Order No. orange RAL 2004	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06450-92061	**06450-92062**	M6	65	74,5	9,5	13,5	18,5	19	-	6,5	17,5	42,5	45,5	12	20
06450-92081	**06450-92082**	M8	65	74,5	9,5	13,5	18,5	19	-	6,5	17,5	42,5	45,5	12	20
06450-93081	**06450-93082**	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06450-93101	**06450-93102**	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22

Clamping levers, zinc

with internal thread, steel parts trivalent blue passivated

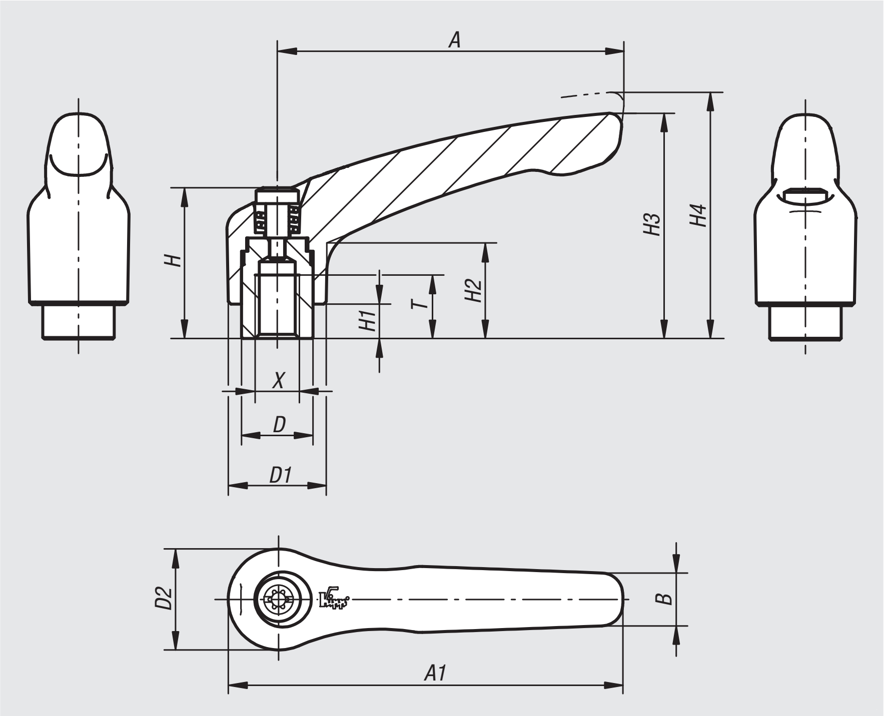
Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle plastic-coated or high-gloss chromed.
Steel parts trivalent blue passivated.

Sample order:
nlm 06450-05-0041

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, silver metallic, high gloss chromed.

On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.



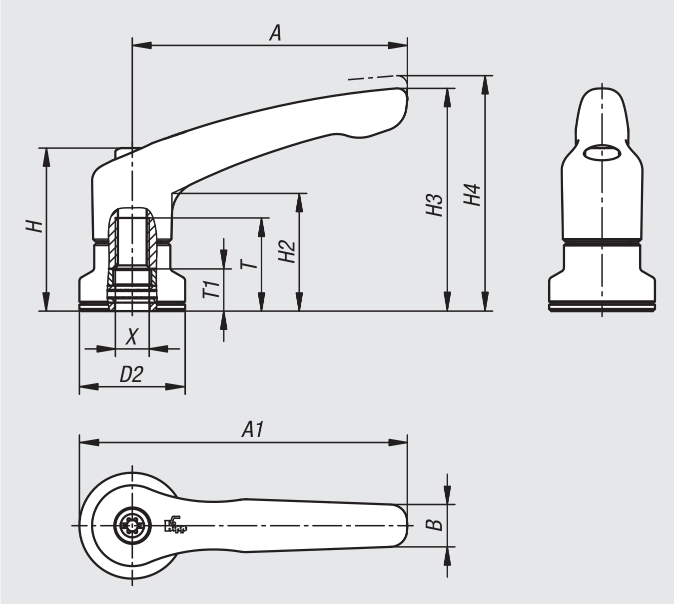
black satin finish = 1	orange = 2	silver metallic = 3	silver = 6
	 RAL 2004		

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06450-05-003Δ	M3	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06450-05-004Δ	M4	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06450-05-005Δ	M5	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06450-05-104Δ	M4	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06450-05-105Δ	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06450-05-106Δ	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06450-05-206Δ	M6	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06450-05-208Δ	M8	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06450-05-308Δ	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06450-05-310Δ	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06450-05-410Δ	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06450-05-412Δ	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06450-05-512Δ	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26
06450-05-516Δ	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26

Notes

Clamping levers, zinc

with female thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle plastic-coated or high-gloss trivalent passivated
Steel parts, black oxidised.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06450-10-5121 (clamping lever, black satin finish)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Method of operation:
In the default position, the handle is engaged with the threaded insert through a toothed ring. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Other colours.

Clamping levers, zinc

with female thread and clamping force intensifier

black satin finish Δ = 1

orange Δ = 2

RAL 2004

ruby red Δ = 27

RAL 3003

silver metallic Δ = 3

high-gloss chromed Δ = 6

Order No.	X	D2	H	H2	H3	H4	A	A1	B	T	T1
06450-10-208Δ	M8	25	38,5	27,7	52,6	55,6	65	77,5	10	22	10
06450-10-310Δ	M10	30	47	33,9	64,6	68,6	80	95	11,2	24	10
06450-10-410Δ	M10	30	53,1	37,2	72,8	77,3	95	110	13,2	27	10
06450-10-512Δ	M12	35	59,1	41,9	83	87,5	110	127,5	15,4	33	10
06450-10-310Δ	M10	30	47	33,9	64,4	68,6	80	95	11,2	24	10
06450-10-310Δ	M10	30	47	33,9	4,4	68,6	80	95	11,2	24	10

06451

Clamping levers

internal thread, steel parts stainless steel

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

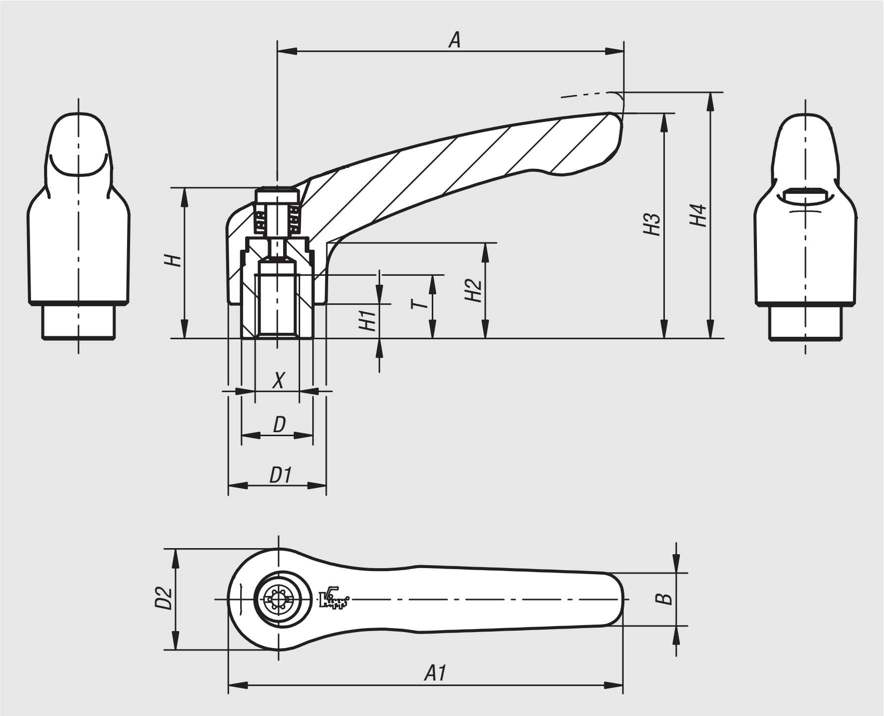
Version:
Handle powder-coated or high-gloss chromed.
Steel parts bright.

Sample order:
nlm 06451-1051 (clamping lever, black satin finish)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.



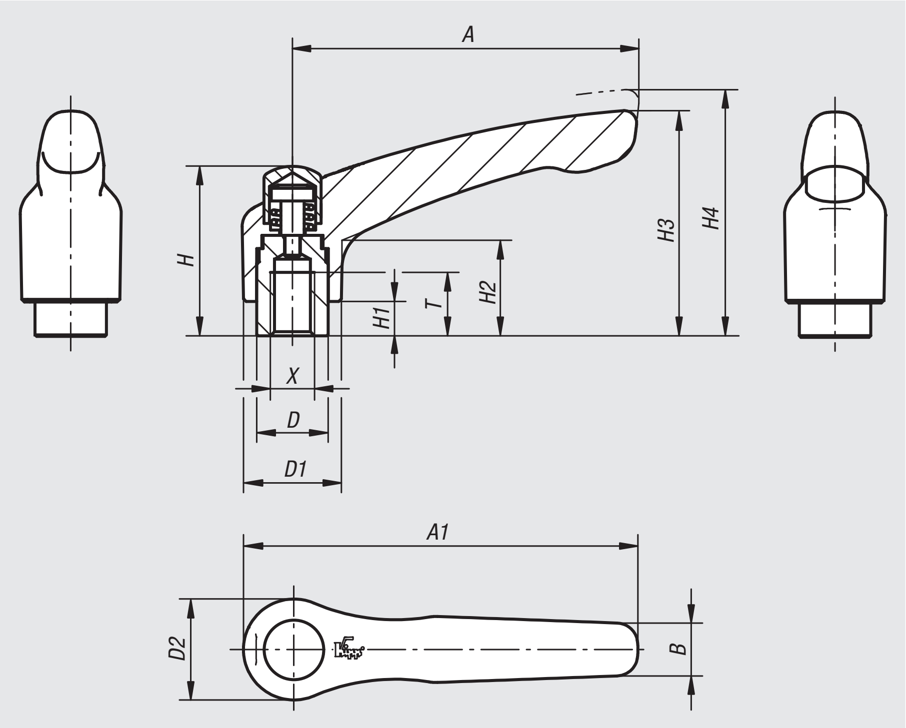
lift to disengage

black satin finish Δ = 1	orange Δ = 2	ruby red Δ = 27	silver metallic Δ = 3	high-gloss chromed Δ = 6
	 RAL 2004	 RAL 3003		

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06451-003Δ	M3	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06451-004Δ	M4	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06451-005Δ	M5	30	37	7	10	13	14	24,5	4	14,5	30	33	9	16
06451-104Δ	M4	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06451-105Δ	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06451-106Δ	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06451-206Δ	M6	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06451-208Δ	M8	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06451-308Δ	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06451-310Δ	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06451-410Δ	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06451-412Δ	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06451-512Δ	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26
06451-516Δ	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26

Clamping levers with protective cap

internal thread, steel parts stainless steel



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts and cap 1.4305 stainless steel.

Version:
Handle powder-coated.
Stainless steel parts bright.

Sample order:
nlm 06451-92081

Note:
Standard colours are:
black satin finish, orange RAL 2004.

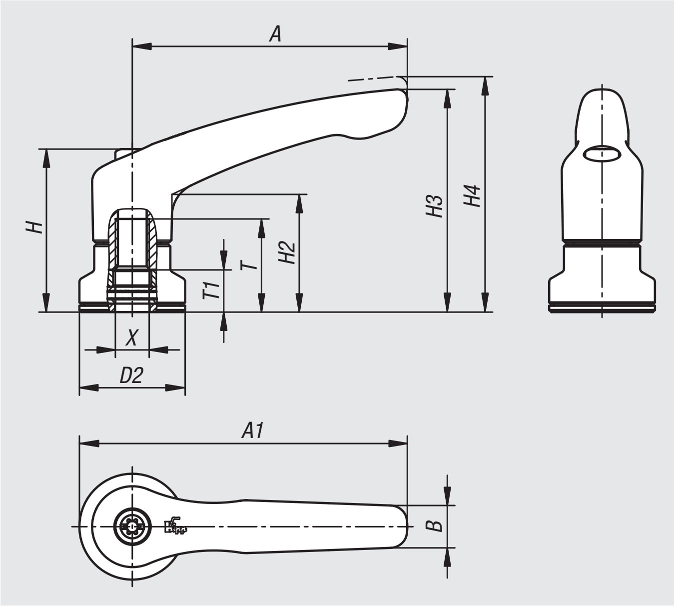
On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

lift to disengage

Order No. black	Order No. orange RAL 2004	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06451-92061	**06451-92062**	M6	65	74,5	9,5	13,5	18,5	19	-	6,5	17,5	42,5	45,5	12	20
06451-92081	**06451-92082**	M8	65	74,5	9,5	13,5	18,5	19	-	6,5	17,5	42,5	45,5	12	20
06451-93081	**06451-93082**	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06451-93101	**06451-93102**	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22

Clamping levers, zinc

with female thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

Version:
Handle plastic-coated or high-gloss trivalent passivated
Steel parts bright.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06451-10-5121 (clamping lever, black satin finish)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Method of operation:
In the default position, the handle is engaged with the threaded insert through a toothed ring. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Other colours.

06451-10

Clamping levers, zinc

with female thread and clamping force intensifier

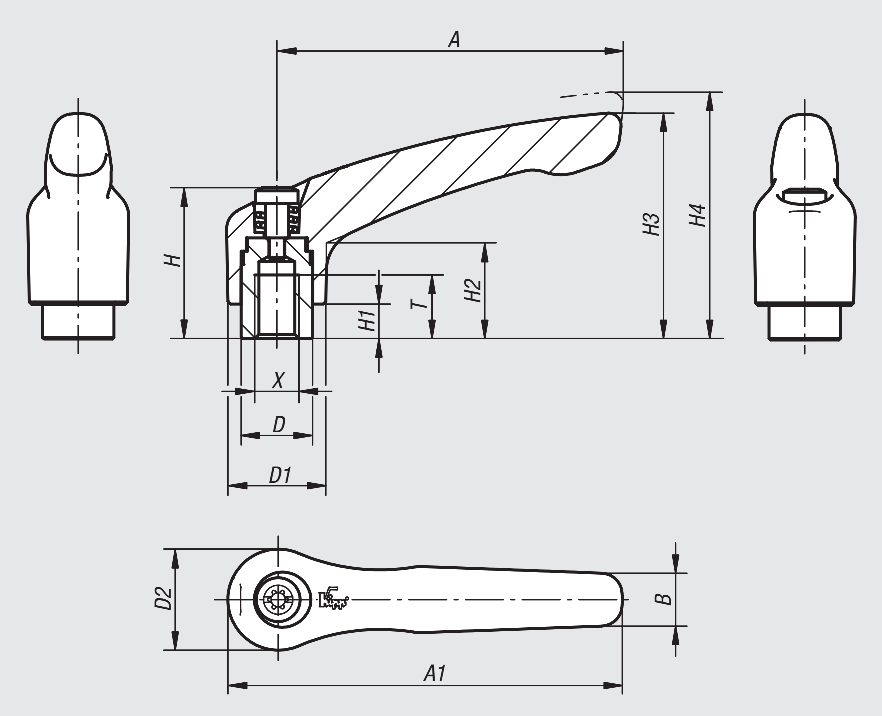
black satin finish Δ = 1	orange Δ = 2	ruby red Δ = 27	silver metallic Δ = 3	high-gloss chromed Δ = 6
	 RAL 2004	 RAL 3003		

Order No.	X	D2	H	H2	H3	H4	A	A1	B	T	T1
06451-10-208Δ	M8	25	38,5	27,7	52,6	55,6	65	77,5	10	22	10
06451-10-310Δ	M10	30	47	33,9	64,6	68,6	80	95	11,2	24	10
06451-10-410Δ	M10	30	53,1	37,2	72,8	77,3	95	110	13,2	27	10
06451-10-512Δ	M12	35	59,1	41,9	83	87,5	110	127,5	15,4	33	10
06451-10-310Δ	M10	30	47	33,9	64,4	68,6	80	95	11,2	24	10
06451-10-310Δ	M10	30	47	33,9	4,4	68,6	80	95	11,2	24	10

06454

Clamping levers

with internal thread, stainless steel



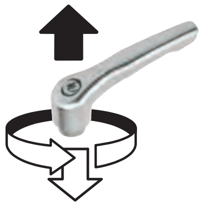
Material:
Handle investment cast 1.4308.
Other steel parts 1.4305.

Version:
Handle electropolished or blasted.
Metal parts bright.

Sample order:
nlm 06454-105

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.

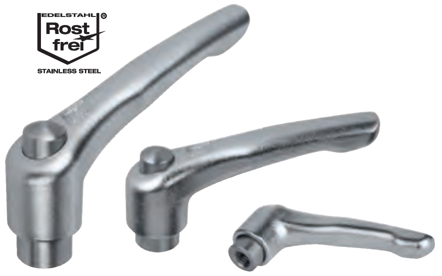
lift to
disengage

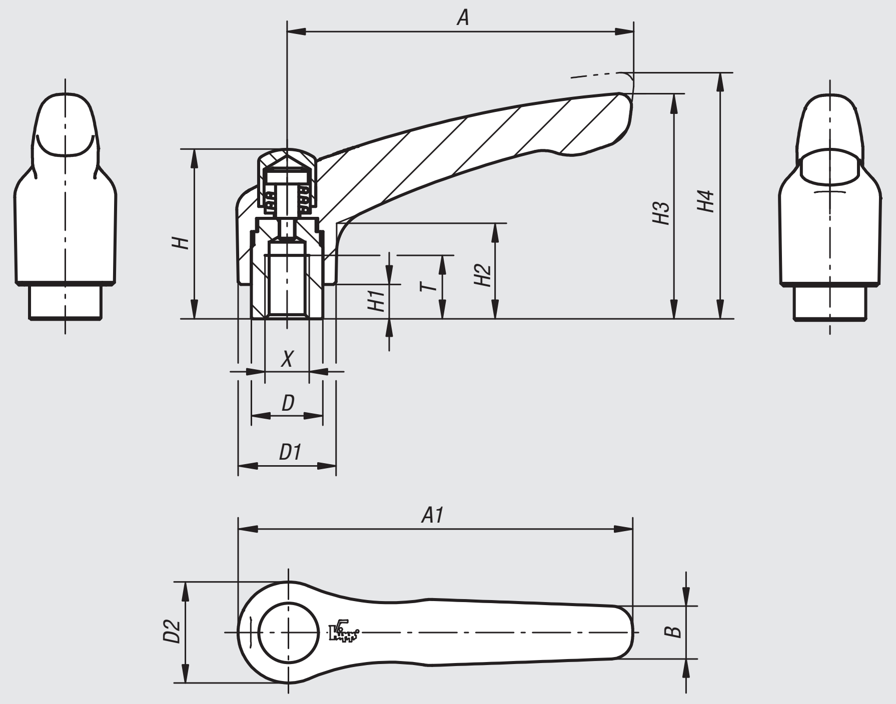


Order No.	Main colour	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06454-104	electropolished	M4	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06454-105	electropolished	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06454-106	electropolished	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06454-206	electropolished	M6	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06454-208	electropolished	M8	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06454-308	electropolished	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06454-310	electropolished	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06454-410	electropolished	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06454-412	electropolished	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06454-512	electropolished	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26
06454-516	electropolished	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26
06454-104153	blasted	M4	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06454-105153	blasted	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06454-106153	blasted	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	9	16
06454-206153	blasted	M6	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06454-208153	blasted	M8	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	12	20
06454-308153	blasted	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06454-310153	blasted	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	14	22
06454-410153	blasted	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06454-412153	blasted	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	17	24
06454-512153	blasted	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26
06454-516153	blasted	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	23	26

Clamping levers with protective cap

with internal thread, stainless steel



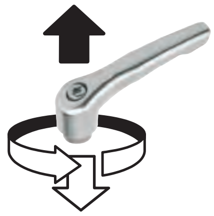


Material:
Handle investment cast 1.4308.
Other steel parts 1.4305.

Version:
Handle electropolished.
Steel parts bright.

Sample order:
nlm 06454-9208

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.



Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06454-9206	M6	65	74,5	10	13,5	18,5	19	32	6,5	17,5	42,5	45,5	12	20
06454-9208	M8	65	74,5	10	13,5	18,5	19	32	6,5	17,5	42,5	45,5	12	20
06454-9308	M8	80	91	11	16	21	22	41,5	10	24	54,5	58,5	14	22
06454-9310	M10	80	91	11	16	21	22	41,5	10	24	54,5	58,5	14	22

Notes

06458

Clamping levers flat

external thread

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle powder-coated.
Steel parts black oxidised.

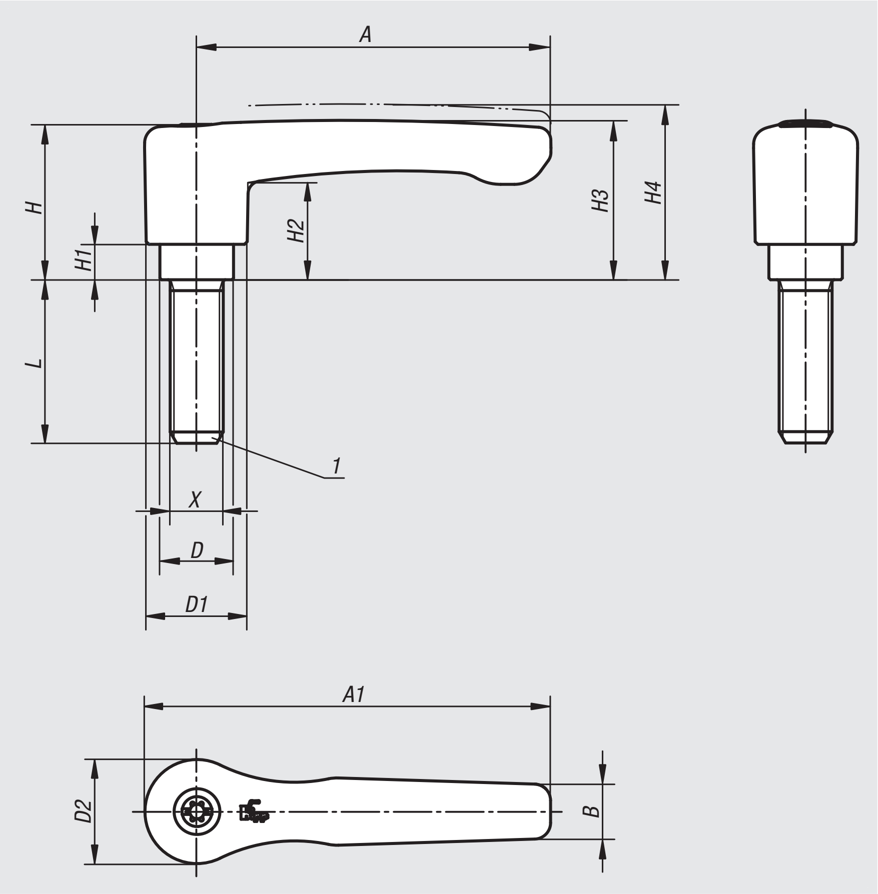
Sample order:
nlm 06458-2061X15 (include length L)

Note:
Standard colours are:
black satin finish, orange RAL 2004.

Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

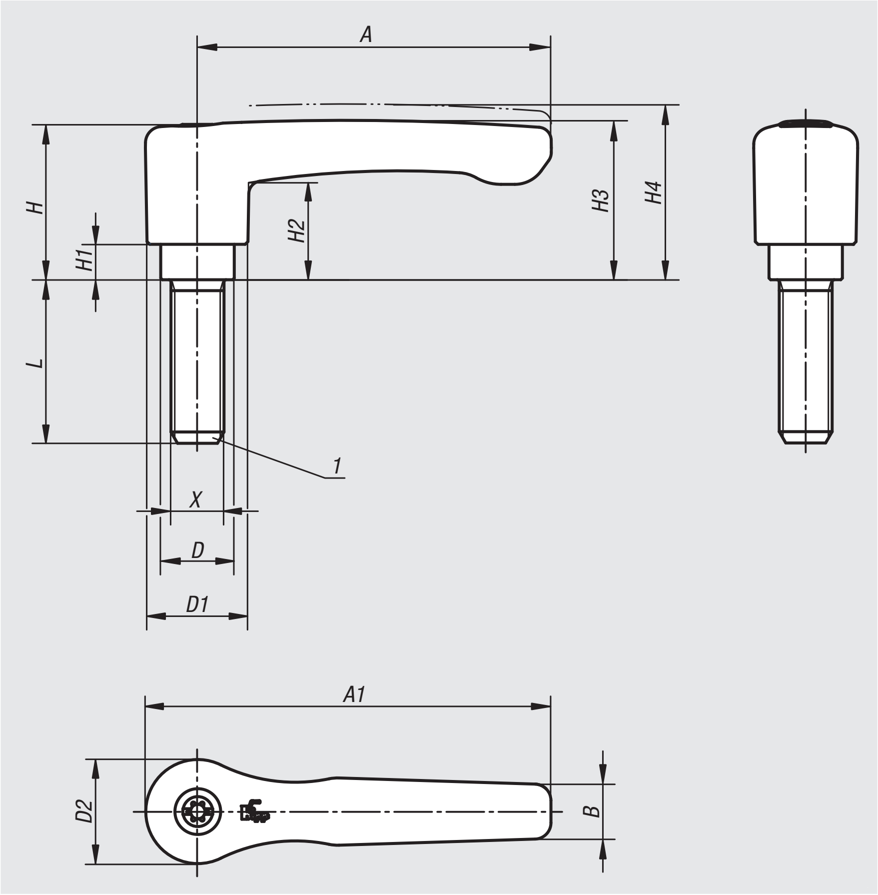


Order No. black	Order No. orange RAL 2004	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06458-2061X	**06458-2062X**	M6	65	74,5	10,1	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	20	15/20/25/30/35/40/45/50/55/60
06458-2081X	**06458-2082X**	M8	65	74,5	10,1	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	20	15/20/25/30/35/40/45/50/55/60
06458-2101X	**06458-2102X**	M10	65	74,5	10,1	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	20	15/20/25/30/35/40/45/50/55/60
06458-3081X	**06458-3082X**	M8	80	91	11,7	16	21,2	22	37	10	23,8	38	42	22	15/20/25/30/35/40/45/50/55/60
06458-3101X	**06458-3102X**	M10	80	91	11,7	16	21,2	22	37	10	23,8	38	42	22	15/20/25/30/35/40/45/50/55/60

06459

Clamping levers flat

external thread, steel parts stainless steel



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

Version:
Handle powder-coated.
Stainless steel parts bright.

Sample order:
nlm 06459-2061X15 (include length L)

Note:
Standard colours are:
black satin finish, orange RAL 2004.

Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

Order No. black	Order No. orange RAL 2004	X	A	A1	D	D1	D2	H	H1	H2	H3	H4	B	No. of teeth	L
06459-2061X	**06459-2062X**	M6	65	74,5	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	10,1	20	15/20/25/30/40/50/60
06459-2081X	**06459-2082X**	M8	65	74,5	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	10,1	20	15/20/25/30/40/50/60
06459-2101X	**06459-2102X**	M10	65	74,5	13,5	18,5	19,1	28,5	6,5	17,8	29,2	32,2	10,1	20	20/25/30/40/50/60
06459-3081X	**06459-3082X**	M8	80	91	16	21,2	22	37	10	23,8	38	42	11,7	22	20/25/30/40/50/60
06459-3101X	**06459-3102X**	M10	80	91	16	21,2	22	37	10	23,8	38	42	11,7	22	20/25/30/40/50/60

Clamping levers

external thread

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle powder-coated or high-gloss chromed.
Steel parts black oxidised.

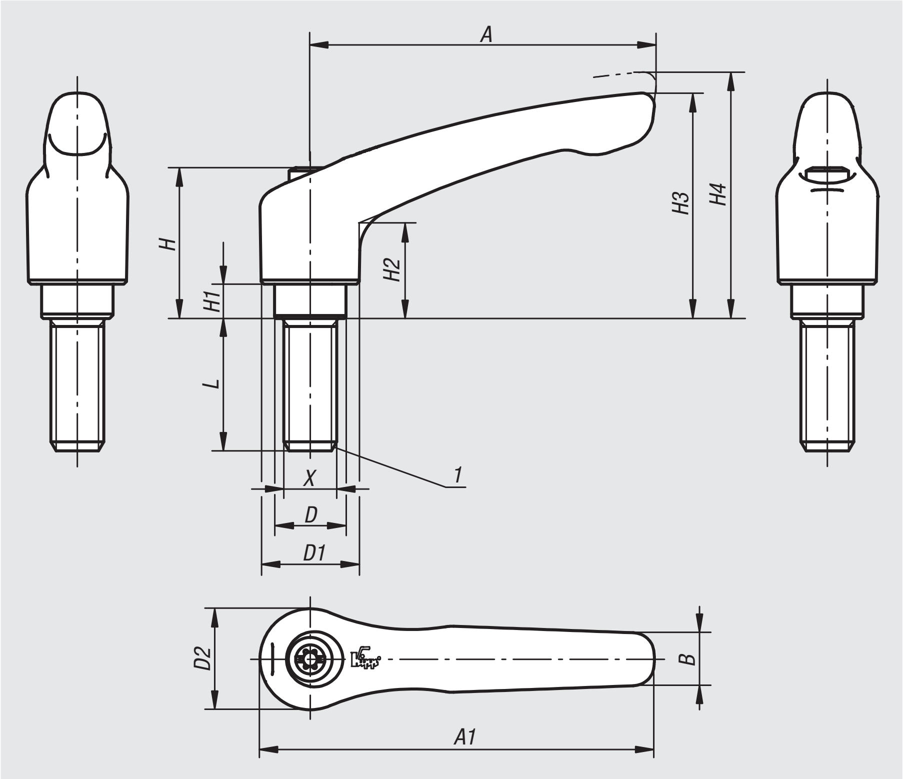
Sample order:
nlm 06460-0041X10 (clamping lever, black satin finish; include length L)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension "H1" available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78



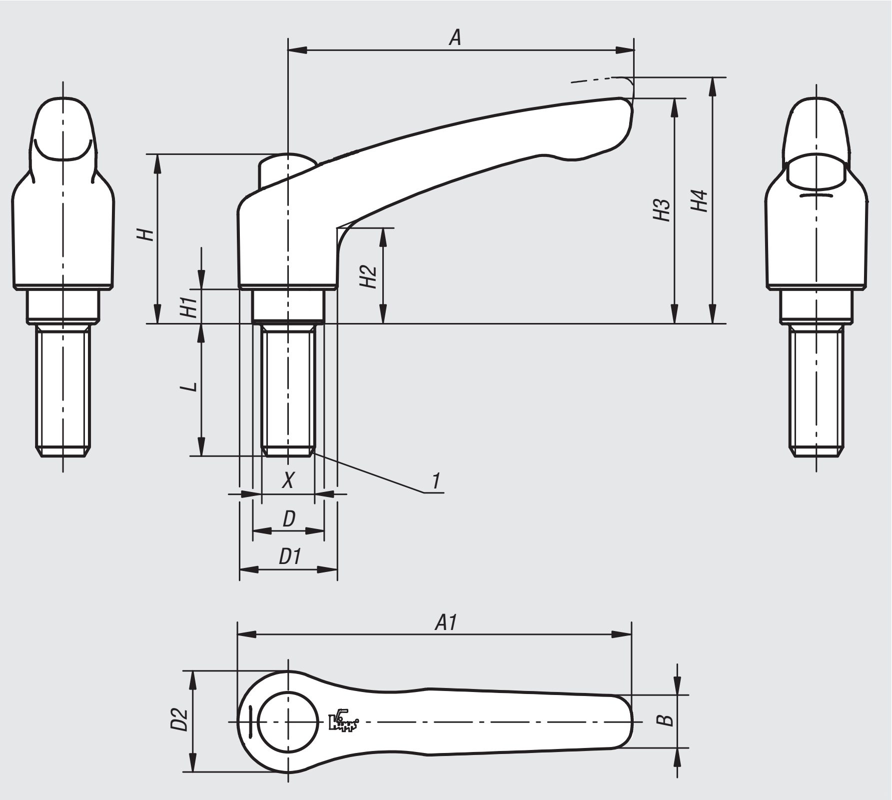
black satin finish Δ = 1	orange Δ = 2	ruby red Δ = 27	silver metallic Δ = 3	high-gloss chromed Δ = 6
	 RAL 2004	 RAL 3003		

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06460-004ΔX	M4	30	37	7	10	13	14	24,5	4	14,5	30	33	16	10/15/20/25/30/35/40/45/50
06460-005ΔX	M5	30	37	7	10	13	14	24,5	4	14,5	30	33	16	10/15/20/25/30/35/40/45/50
06460-105ΔX	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25/30/35/40/45/50
06460-106ΔX	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25/30/35/40/45/50
06460-206ΔX	M6	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06460-208ΔX	M8	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06460-210ΔX	M10	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06460-308ΔX	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	22	15/20/25/30/35/40/45/50/55/60
06460-310ΔX	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	22	15/20/25/30/35/40/45/50/55/60
06460-410ΔX	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	24	20/25/30/35/40/45/50/55/60/70/80/90
06460-412ΔX	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	24	20/25/30/35/40/45/50/55/60/70/80/90
06460-512ΔX	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	26	25/30/35/40/45/50/55/60/70/80/90
06460-516ΔX	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	26	25/30/35/40/45/50/55/60/70/80/90

06460

Clamping levers with protective cap

external thread



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.
Protective cap stainless steel 1.4305.

Version:
Handle powder-coated.
Steel parts black oxidised.
Caps bright stainless steel.

Sample order:
nlm 06460-92081X30 (include length L)

Note:
Standard colours are:
black satin finish, orange RAL 2004.

Where L is ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

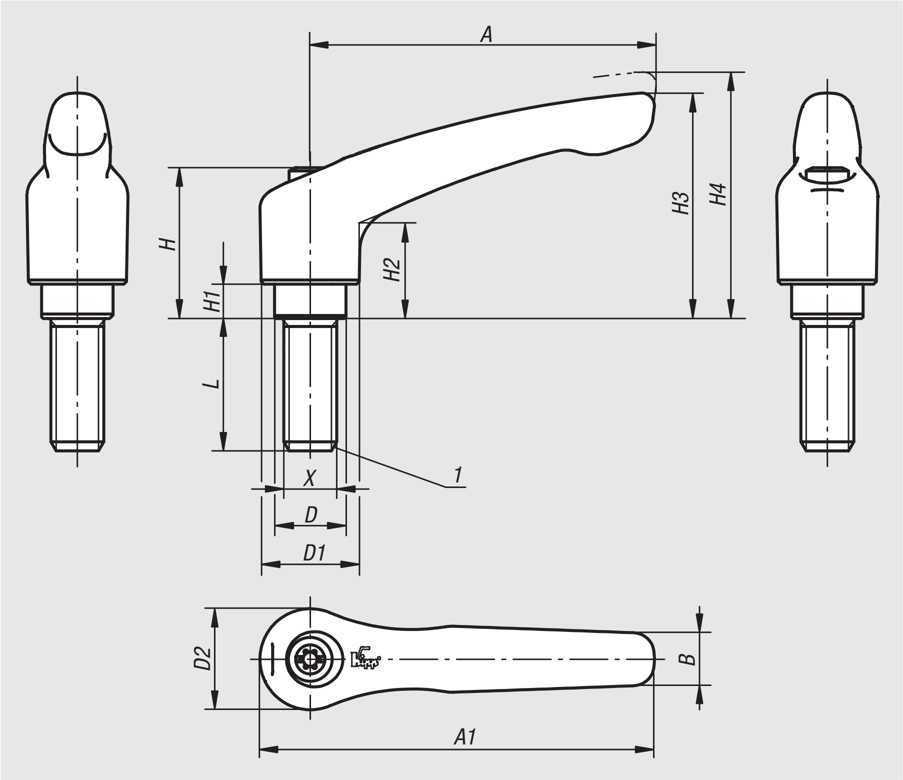
Specifications

Size	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth
2	M6/M8/M10	65	74,5	9,5	13,5	18,5	19	32	6,5	17,5	42,5	45,5	20
3	M8/M10	80	91	11	16	21	22	41,5	10	24	54,5	58,5	22

Order No. black	Order No. orange RAL 2004	Size	X	L
06460-92061X	**06460-92062X**	2	M6	15/20/25/30/35/40/45/50/55/60
06460-92081X	**06460-92082X**	2	M8	15/20/25/30/35/40/45/50/55/60
06460-92101X	**06460-92102X**	2	M10	15/20/25/30/35/40/45/50/55/60
06460-93081X	**06460-93082X**	3	M8	15/20/25/30/35/40/45/50/55/60
06460-93101X	**06460-93102X**	3	M10	15/20/25/30/35/40/45/50/55/60

Clamping levers, zinc

with external thread, steel parts trivalent blue passivated



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle plastic-coated or high-gloss chromed.
Steel parts trivalent blue passivated.

Sample order:
nlm 06460-05-0041X10 (clamping lever, black satin finish; include length L)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, silver metallic, high gloss chromed.
Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

lift to disengage

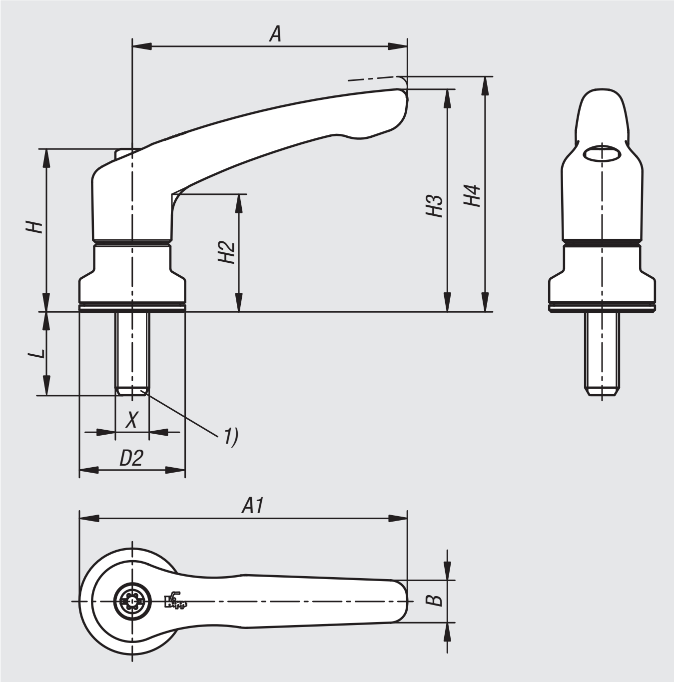
black satin finish = 1	orange = 2	silver metallic = 3	silver = 6
	 RAL 2004		

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06460-05-004ΔX	M4	30	37	7	10	13	14	24,5	4	14,5	30	33	16	10/15/20/25/30/35/40/45/50
06460-05-005ΔX	M5	30	37	7	10	13	14	24,5	4	14,5	30	33	16	10/15/20/25/30/35/40/45/50
06460-05-105ΔX	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25/30/35/40/45/50
06460-05-106ΔX	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25/30/35/40/45/50
06460-05-206ΔX	M6	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06460-05-208ΔX	M8	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06460-05-210ΔX	M10	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06460-05-308ΔX	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	22	15/20/25/30/35/40/45/50/55/60
06460-05-310ΔX	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	22	15/20/25/30/35/40/45/50/55/60
06460-05-410ΔX	M10	95	109	13	19	27	27,5	43	10	27	63	67,5	24	20/25/30/35/40/45/50/55/60/70/80/90
06460-05-412ΔX	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	24	20/25/30/35/40/45/50/55/60/70/80/90
06460-05-512ΔX	M12	110	126	15	23	31	32	49	12	31,5	73	77,5	26	25/30/35/40/45/50/55/60/70/80/90
06460-05-516ΔX	M16	110	126	15	23	31	32	49	12	31,10	73	77,10	26	25/30/35/40/45/50/55/60/70/80/90

06460-10

Clamping levers, zinc

with male thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Due to the modular construction many special designs are available.

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts grade 5.8.

Version:
Handle plastic-coated or high-gloss trivalent passivated
Steel parts, black oxidised.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06460-10-5121X20 (clamping lever, black satin finish; include length L)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Method of operation:
In the default position, the handle is engaged with the threaded insert through a toothed ring. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Other colours and thread lengths.

Drawing reference:
1) flat point DIN 78

06460-10

Clamping levers, zinc

with male thread and clamping force intensifier

+

lift to disengage

black satin finish Δ = 1

orange Δ = 2

RAL 2004

ruby red Δ = 27

RAL 3003

silver metallic Δ = 3

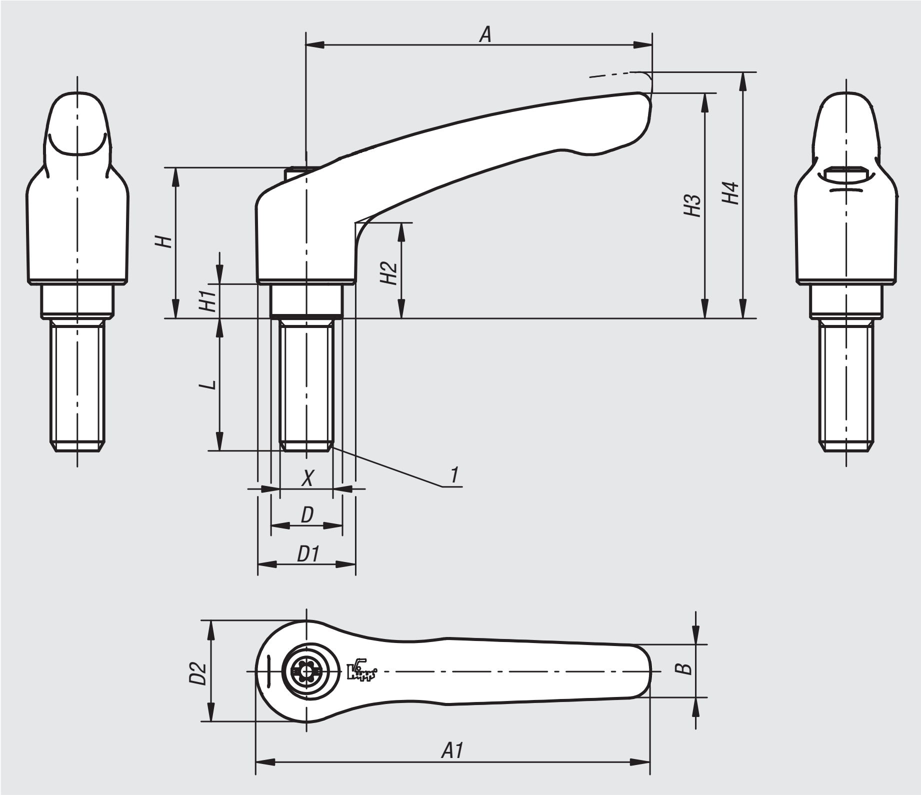
high-gloss chromed Δ = 6

Order No.	X	D2	H	H2	H3	H4	A	A1	B	L
06460-10-208ΔX	M8	25	38,5	27,7	52,6	55,6	65	77,5	10	10/20/30/40
06460-10-310ΔX	M10	30	47	33,9	64,6	68,6	80	95	11,2	15/30/40/50
06460-10-410ΔX	M10	30	53,1	37,2	72,8	77,3	95	110	13,2	20/30/40/50
06460-10-512ΔX	M12	35	59,1	41,9	83	87,5	110	127,5	15,4	20/30/40/50

06461

Clamping levers

external thread, steel parts stainless steel



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

Version:
Handle powder-coated or high-gloss chromed.
Steel parts bright.

Sample order:
nlm 06461-1051X25 (clamping lever, black satin finish; include length L)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

black satin finish Δ = 1

orange Δ = 2

RAL 2004

ruby red Δ = 27

RAL 3003

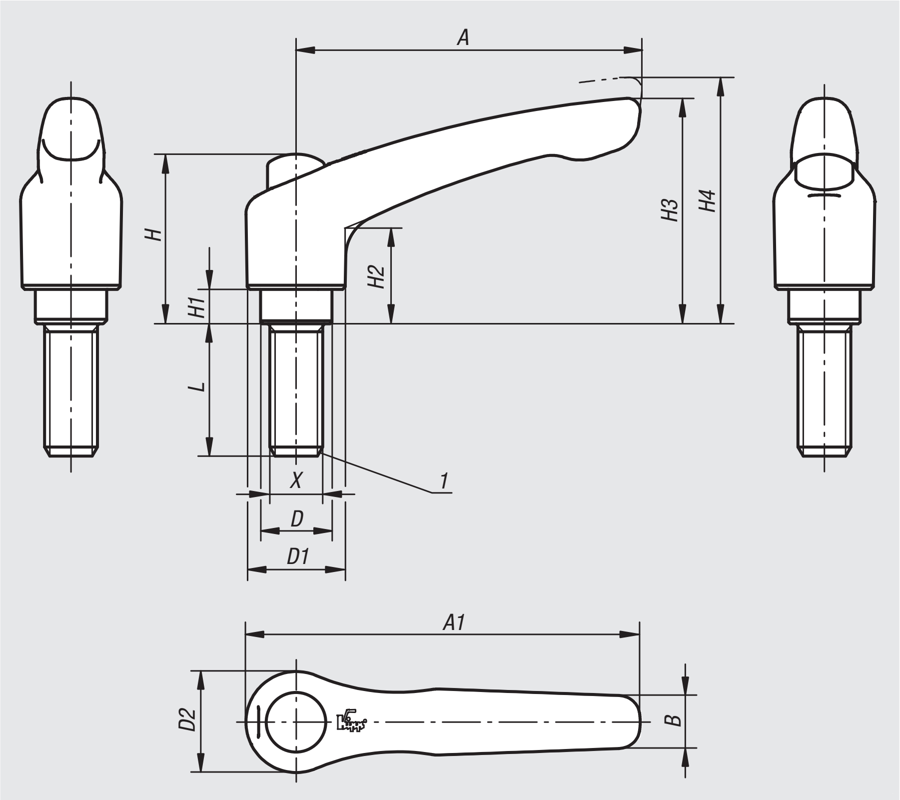
silver metallic Δ = 3

high-gloss chromed Δ = 6

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06461-004ΔX	M4	30	37	7	10	13	14	24,5	4	-	-	33	16	10/15/20/25
06461-005ΔX	M5	30	37	7	10	13	14	24,5	4	14,5	30	33	16	10/15/20/25
06461-105ΔX	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25
06461-106ΔX	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25/30/40/50
06461-206ΔX	M6	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06461-208ΔX	M8	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06461-210ΔX	M10	65	74,5	9,5	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	20/25/30/40/50/60
06461-308ΔX	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	22	20/25/30/40/50/60
06461-310ΔX	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	22	20/25/30/40/50/60
06461-412ΔX	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	24	25/30/40/50/60
06461-516ΔX	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	26	30/40/50/60

Clamping levers with protective cap

with external thread, metal parts stainless steel



Material:
Handle die-cast zinc DIN EN 12844.
Steel parts and cap 1.4305 stainless steel.

Version:
Handle powder-coated.
Stainless steel parts bright.

Sample order:
nlm 06461-92081X30 (include length L)

Note:
Standard colours are:
black satin finish, orange RAL 2004.

Where L is ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, screw lengths, colours and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

lift to disengage

Specifications

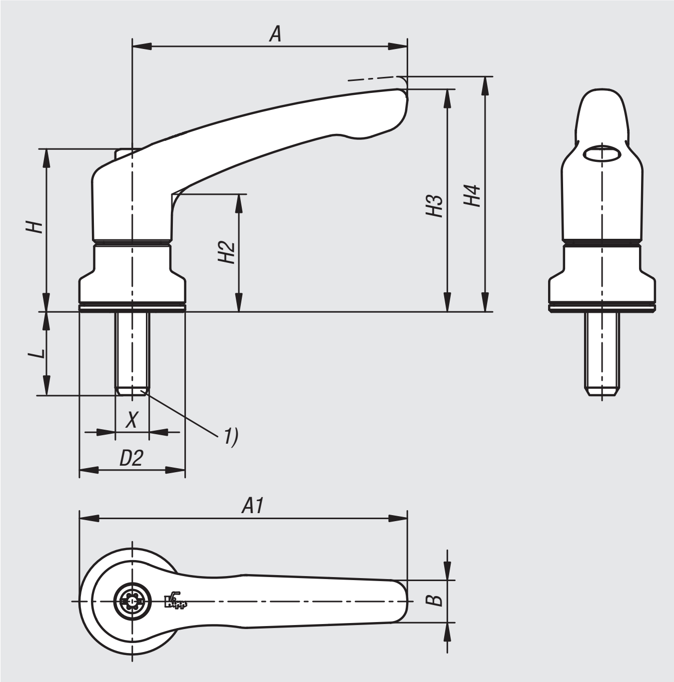
Size	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth
2	M6/M8/M10	65	74,5	9,5	13,5	18,5	19	32	6,5	17,5	42,5	45,5	20
3	M8/M10	80	91	11	16	21	22	41,5	10	24	54,5	58,5	22

Order No. black	Order No. orange RAL 2004	Size	X	L
06461-92061X	**06461-92062X**	2	M6	15/20/25/30/40/50/60
06461-92081X	**06461-92082X**	2	M8	15/20/25/30/40/50/60
06461-92101X	**06461-92102X**	2	M10	20/25/30/40/50/60
06461-93081X	**06461-93082X**	3	M8	20/25/30/40/50/60
06461-93101X	**06461-93102X**	3	M10	20/25/30/40/50/60

06461-10

Clamping levers, zinc

with male thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Due to the modular construction many special designs are available.

Material:
Handle die-cast zinc DIN EN 12844.
Steel parts stainless steel 1.4305.

Version:
Handle plastic-coated or high-gloss trivalent passivated
Steel parts bright.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06461-10-5121X20 (clamping lever, black satin finish; include length L)

Note:
Δ Add the desired lever colour here.
Standard colours are:
black satin finish, orange RAL 2004, ruby red RAL 3003, silver metallic, high gloss chromed.

Method of operation:
In the default position, the handle is engaged with the threaded insert through a toothed ring. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Other colours and thread lengths.

Drawing reference:
1) flat point DIN 78

Clamping levers, zinc

with male thread and clamping force intensifier

lift to disengage

black satin finish Δ = 1

orange Δ = 2

RAL 2004

ruby red Δ = 27

RAL 3003

silver metallic Δ = 3

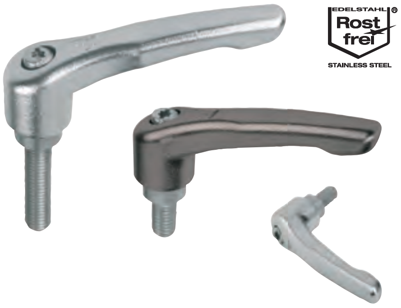
high-gloss chromed Δ = 6

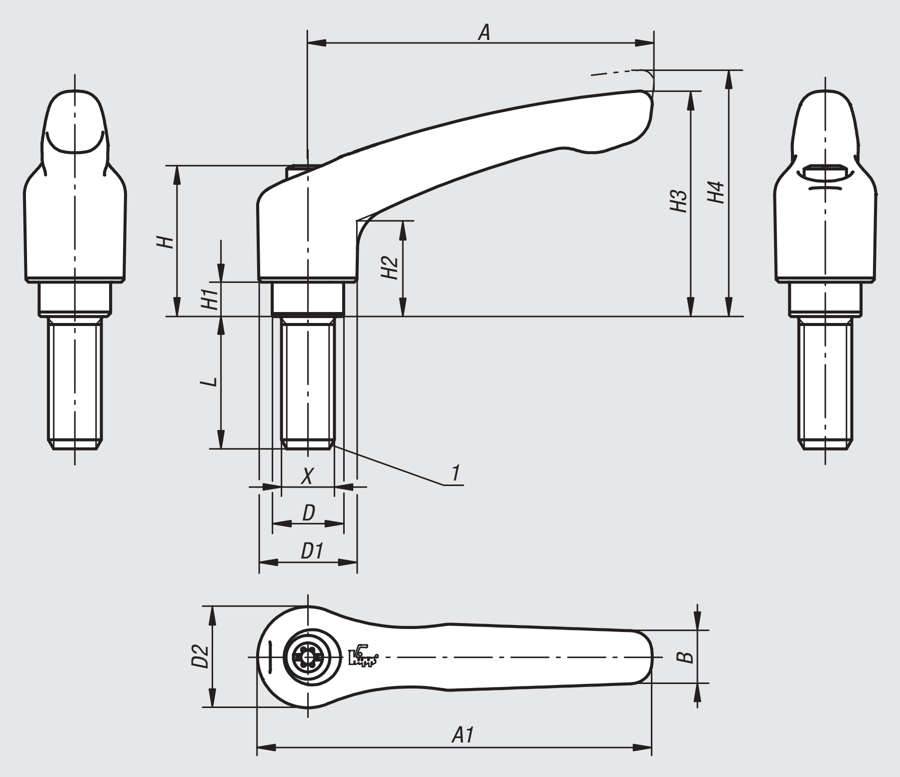
Order No.	X	D2	H	H2	H3	H4	A	A1	B	L
06461-10-208ΔX	M8	25	38,5	27,7	52,6	55,6	65	77,5	10	10/20/30/40
06461-10-310ΔX	M10	30	47	33,9	64,6	68,6	80	95	11,2	15/30/40/50
06461-10-410ΔX	M10	30	53,1	37,2	72,8	77,3	95	110	13,2	20/30/40/50
06461-10-512ΔX	M12	35	59,1	41,9	83	87,5	110	127,5	15,4	20/30/40/50

06464

Clamping levers

with external thread, stainless steel





Material:
Handle investment cast 1.4308.
Other steel parts 1.4305.

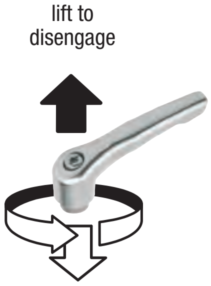
Version:
Handle electropolished or blasted.
Metal parts bright.

Sample order:
nlm 06464-105X10 (include length L)

Note:
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78



Order No.	Main colour	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06464-105X	electropolished	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25
06464-106X	electropolished	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25/30/40/50
06464-206X	electropolished	M6	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06464-208X	electropolished	M8	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06464-210X	electropolished	M10	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	20/25/30/40/50/60
06464-308X	electropolished	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	22	20/25/30/40/50/60
06464-310X	electropolished	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	22	20/25/30/40/50/60
06464-412X	electropolished	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	24	25/30/40/50/60
06464-516X	electropolished	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	26	30/40/50/60
06464-105153X	blasted	M5	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25
06464-106153X	blasted	M6	40	47	7	10	13	14	24,5	4	14,5	31	34	16	10/15/20/25/30/40/50
06464-206153X	blasted	M6	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06464-208153X	blasted	M8	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06464-210153X	blasted	M10	65	74,5	10	13,5	18,5	19	28,5	6,5	17,5	42,5	45,5	20	20/25/30/40/50/60
06464-308153X	blasted	M8	80	91	11	16	21	22	37	10	24	54,5	58,5	22	20/25/30/40/50/60
06464-310153X	blasted	M10	80	91	11	16	21	22	37	10	24	54,5	58,5	22	20/25/30/40/50/60
06464-412153X	blasted	M12	95	109	13	19	27	27,5	43	10	27	63	67,5	24	25/30/40/50/60
06464-516153X	blasted	M16	110	126	15	23	31	32	49	12	31,5	73	77,5	26	30/40/50/60

Clamping levers with protective cap

with external thread, stainless steel

Material:
Handle investment cast 1.4308.
Other steel parts 1.4305.

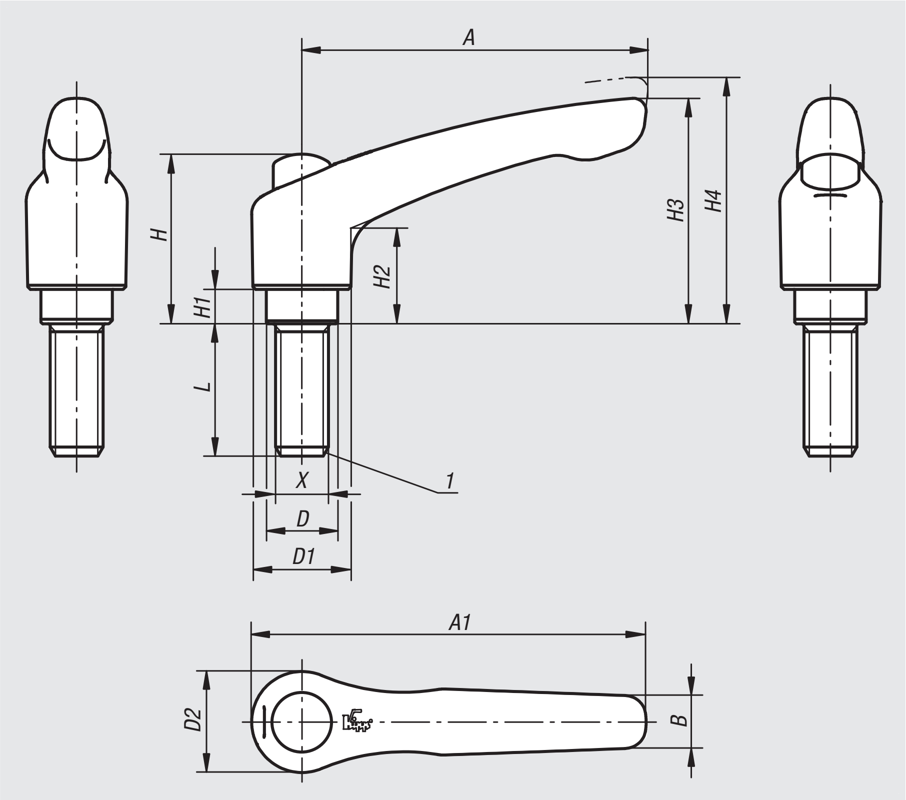
Version:
Handle electropolished.
Steel parts bright.

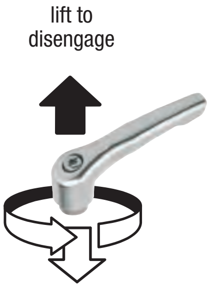
Sample order:
nlm 06464-9208X30 (include length L)

Note:
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

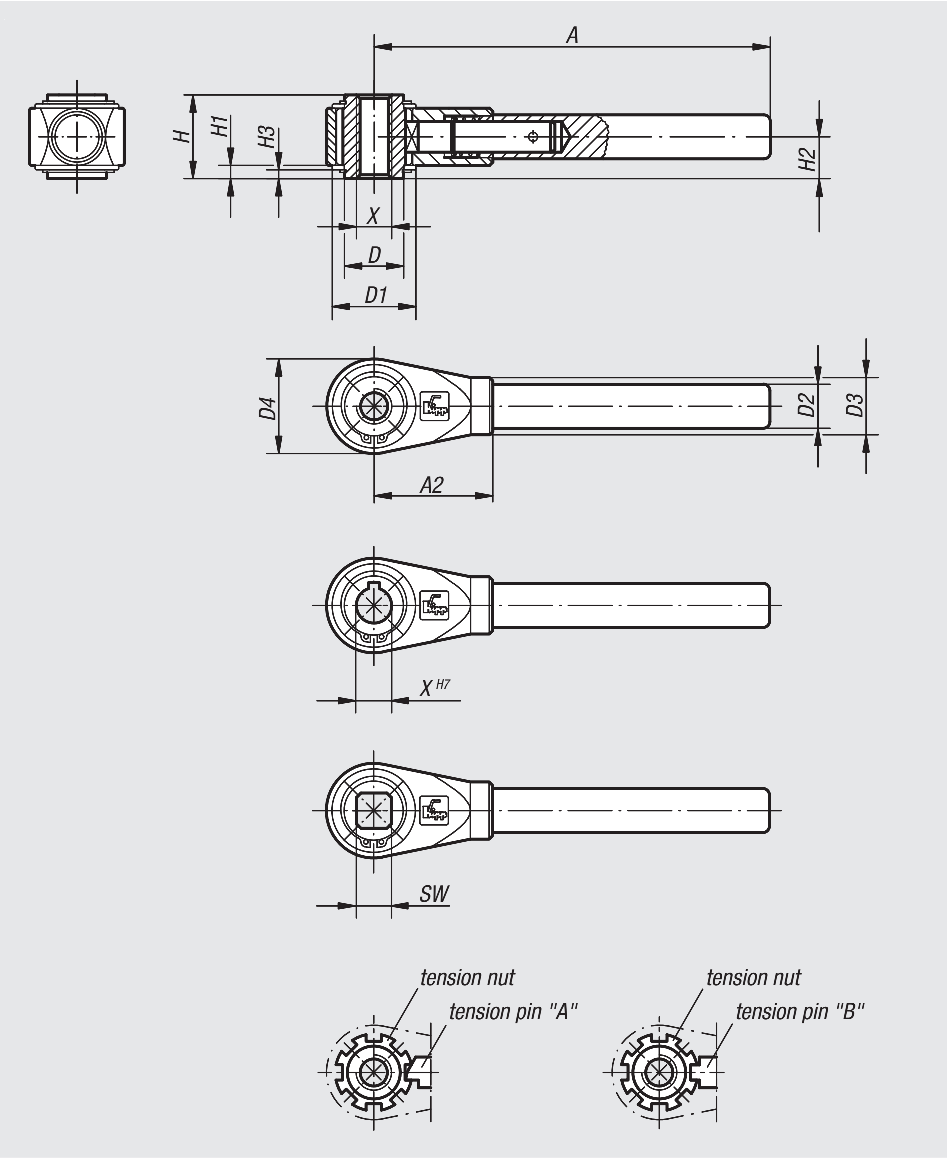




Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06464-9206X	M6	65	74,5	10	13,5	18,5	19	32	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06464-9208X	M8	65	74,5	10	13,5	18,5	19	32	6,5	17,5	42,5	45,5	20	15/20/25/30/40/50/60
06464-9210X	M10	65	74,5	10	13,5	18,5	19	32	6,5	17,5	42,5	45,5	20	20/25/30/40/50/60
06464-9308X	M8	80	91	11	16	21	22	41,5	10	24	54,5	58,5	22	20/25/30/40/50/60
06464-9310X	M10	80	91	11	16	21	22	41,5	10	24	54,5	58,5	22	20/25/30/40/50/60

06470

Ratchet levers



Material:
Housing carbon steel, tension nut and tension pin case-hardened steel.

Version:
Black oxidised.
Matt-finished or high-polish chrome-plated versions available at extra charge.

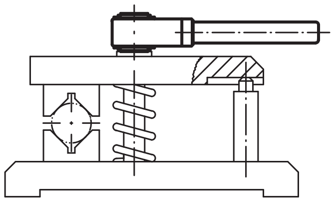
Sample order:
nlm 06470-316

Note:
Tension Pin A standard version (for ratchet action): Use for clamping and releasing in limited space and when considerable travel is involved. In order to change the tightening direction, the handle must be reversed by 180°.

Tension Pin B special version:
Use for clamping and releasing in limited space and when short travel is involved. The handle is not reversed in order to change the tightening direction. It must be pulled out before it can be engaged in the next slot.

Clamp with H7 reamed hole and DIN 6885/1 keyway.

On request:
Other thread, reamed hole and square socket sizes.
Dimension “E” available in other lengths at extra charge.
Special version: Tension pin B.



Ratchet levers

Ratchet levers with internal thread

Order No.	Kind of fastening	X	A=handle length	A2	D	D1	D2	D3	D4	H	H1	H2	H3	No. of index slots
06470-310	**internal thread**	M10	150	48	22	33	17	22	36	31	4,5	15,5	3	7
06470-312	**internal thread**	M12	150	48	22	33	17	22	36	31	4,5	15,5	3	7
06470-314	**internal thread**	M14	180	54	27	38	20	26	43	38	6	19	4	8
06470-316	**internal thread**	M16	180	54	27	38	20	26	43	38	6	19	4	8
06470-318	**internal thread**	M18	230	70	35	45	24	30	51	42	6	21	4	8
06470-320	**internal thread**	M20	230	70	35	45	24	30	51	42	6	21	4	8
06470-322	**internal thread**	M22	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-324	**internal thread**	M24	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-327	**internal thread**	M27	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-330	**internal thread**	M30	400	110	60	75	32	38	82	53	7,5	26,5	5	11
06470-336	**internal thread**	M36	400	110	60	75	32	38	82	53	7,5	26,5	5	11
06470-342	**internal thread**	M42	400	110	60	75	32	38	82	53	7,5	26,5	5	11

Ratchet levers with reamed hole

Order No.	Kind of fastening	X	A=handle length	A2	D	D1	D2	D3	D4	H	H1	H2	H3	No. of index slots
06470-412	**reamed hole with slot**	12	150	48	22	33	17	22	36	31	4,5	15,5	3	7
06470-414	**reamed hole with slot**	14	180	54	27	38	20	26	43	38	6	19	4	8
06470-415	**reamed hole with slot**	15	180	54	27	38	20	26	43	38	6	19	4	8
06470-416	**reamed hole with slot**	16	180	54	27	38	20	26	43	38	6	19	4	8
06470-418	**reamed hole with slot**	18	230	70	35	45	24	30	51	42	6	21	4	8
06470-420	**reamed hole with slot**	20	230	70	35	45	24	30	51	42	6	21	4	8
06470-422	**reamed hole with slot**	22	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-425	**reamed hole with slot**	25	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-427	**reamed hole with slot**	27	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-430	**reamed hole with slot**	30	400	110	60	75	32	38	82	53	7,5	26,5	5	11
06470-436	**reamed hole with slot**	36	400	110	60	75	32	38	82	53	7,5	26,5	5	11

Ratchet levers with square socket

Order No.	Kind of fastening	SW	A=handle length	A2	D	D1	D2	D3	D4	H	H1	H2	H3	No. of index slots
06470-510	**square socket**	10	150	48	22	33	17	22	36	31	4,5	15,5	3	7
06470-512	**square socket**	12	150	48	22	33	17	22	36	31	4,5	15,5	3	7
06470-513	**square socket**	13	180	54	27	38	20	26	43	38	6	19	4	8
06470-514	**square socket**	14	180	54	27	38	20	26	43	38	6	19	4	8
06470-517	**square socket**	17	230	70	35	45	24	30	51	42	6	21	4	8
06470-519	**square socket**	19	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-520	**square socket**	20	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-522	**square socket**	22	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-524	**square socket**	24	300	80	42	56	28	35	61	47	6	23,5	4	9
06470-530	**square socket**	30	400	110	60	75	32	38	82	53	7,5	26,5	5	11
06470-532	**square socket**	32	400	110	60	75	32	38	82	53	7,5	26,5	5	11

Notes

Crank handles offset

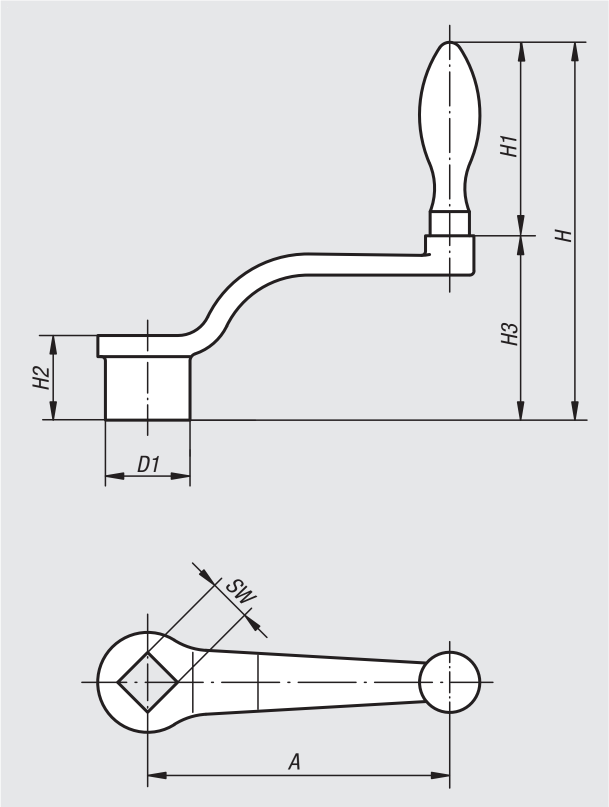
similar to DIN 468

Material:
Crank arm malleable or ductile iron.

Version:
Blasted.

Sample order:
nlm 06480-212X14

Note:
Form D: with revolving handle
Form F: with fixed handle

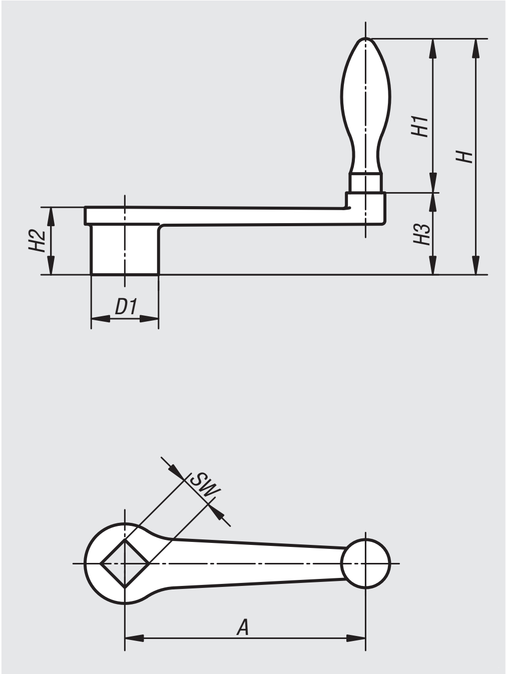


Order No.	Form	A	D1	H	H1	H2	H3	SW	Grip Ø
06480-206X10	D	63	20	92	52	20	40	10 +0,2	16
06480-208X10	D	80	24	109	65	24	44	10 +0,2	20
06480-208X12	D	80	24	109	65	24	44	12 +0,2	20
06480-210X12	D	100	28	120	65	28	55	12 +0,2	20
06480-210X14	D	100	28	120	65	28	55	14 +0,3	20
06480-212X14	D	125	34	141	83	34	58	14 +0,3	25
06480-212X17	D	125	34	141	83	34	58	17 +0,3	25
06480-216X17	D	160	37	153	83	38	70	17 +0,3	25
06480-216X19	D	160	37	153	83	38	70	19 +0,3	25
06480-220X19	D	200	40	189	105	44	84	19 +0,3	32
06480-220X22	D	200	40	189	105	44	84	22 +0,3	32
06480-106X10	F	63	20	92	52	20	40	10 +0,2	16
06480-108X10	F	80	24	109	65	24	44	10 +0,2	20
06480-108X12	F	80	24	109	65	24	44	12 +0,2	20
06480-110X12	F	100	28	120	65	28	55	12 +0,2	20
06480-110X14	F	100	28	120	65	28	55	14 +0,3	20
06480-112X14	F	125	34	141	83	34	58	14 +0,3	25
06480-112X17	F	125	34	141	83	34	58	17 +0,3	25
06480-116X17	F	160	37	153	83	38	70	17 +0,3	25
06480-116X19	F	160	37	153	83	38	70	19 +0,3	25
06480-120X19	F	200	40	189	105	44	84	19 +0,3	32
06480-120X22	F	200	40	189	105	44	84	22 +0,3	32

06490

Crank handles straight

similar to DIN 469



Material:
Crank arm malleable or ductile iron.

Version:
Blasted.

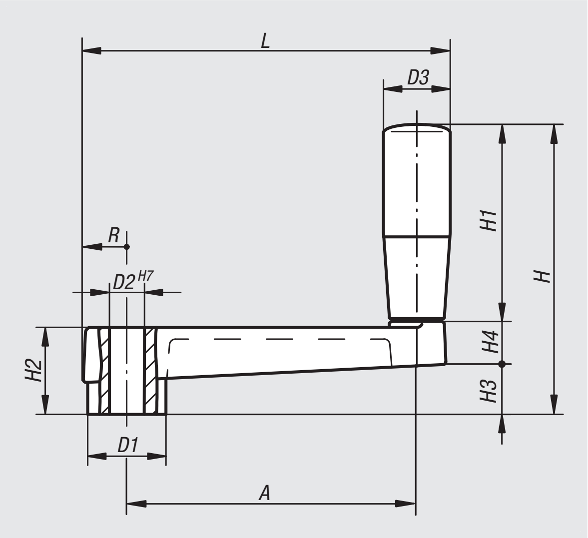
Sample order:
nlm 06490-120X22

Note:
Form D: with revolving handle
Form F: with fixed handle

Order No.	Form	A	D1	H	H1	H2	H3	SW	Grip Ø
06490-206X10	D	63	20	80	52	20	28	10 +0,2	16
06490-208X10	D	80	24	98	65	24	33	10 +0,2	20
06490-208X12	D	80	24	98	65	24	33	12 +0,2	20
06490-210X12	D	100	28	102	65	28	37	12 +0,2	20
06490-210X14	D	100	28	102	65	28	37	14 +0,3	20
06490-212X14	D	125	34	120	80	34	40	14 +0,3	25
06490-212X17	D	125	34	120	80	34	40	17 +0,3	25
06490-216X17	D	160	37	131	83	38	48	17 +0,3	25
06490-216X19	D	160	37	131	83	38	48	19 +0,3	25
06490-220X19	D	200	40	158	105	44	53	19 +0,3	32
06490-220X22	D	200	40	158	105	44	53	22 +0,3	32
06490-106X10	F	63	20	80	52	20	28	10 +0,2	16
06490-108X10	F	80	24	98	65	24	33	10 +0,2	20
06490-108X12	F	80	24	98	65	24	33	12 +0,2	20
06490-110X12	F	100	28	102	65	28	37	12 +0,2	20
06490-110X14	F	100	28	102	65	28	37	14 +0,3	20
06490-112X14	F	125	34	120	80	34	40	14 +0,3	25
06490-112X17	F	125	34	120	80	34	40	17 +0,3	25
06490-116X17	F	160	37	131	83	38	48	17 +0,3	25
06490-116X19	F	160	37	131	83	38	48	19 +0,3	25
06490-120X19	F	200	40	158	105	44	53	19 +0,3	32
06490-120X22	F	200	40	158	105	44	53	22 +0,3	32

Crank handles

aluminium



Material:
Aluminium.
Grip thermoplastic.

Version:
Arm powder-coated, black.
Grip black.

Sample order:
nlm 06492-100

Order No.	A	D1	D2	D3	H	H1	H2	H3	H4	L	R
06492-100	80	23	10	21	81	53	24	14	14	103,5	13
06492-120	100	27	12	23	100	68	28	17	15	126,5	15
06492-140	125	32	14	26	123	83	34	22	18	155,5	17,5

06500

Crank handles

with fold-away grip

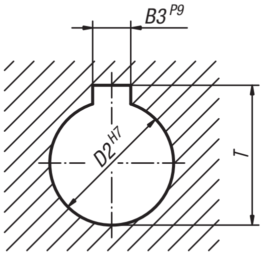
Material:
Black grey thermoplastic.

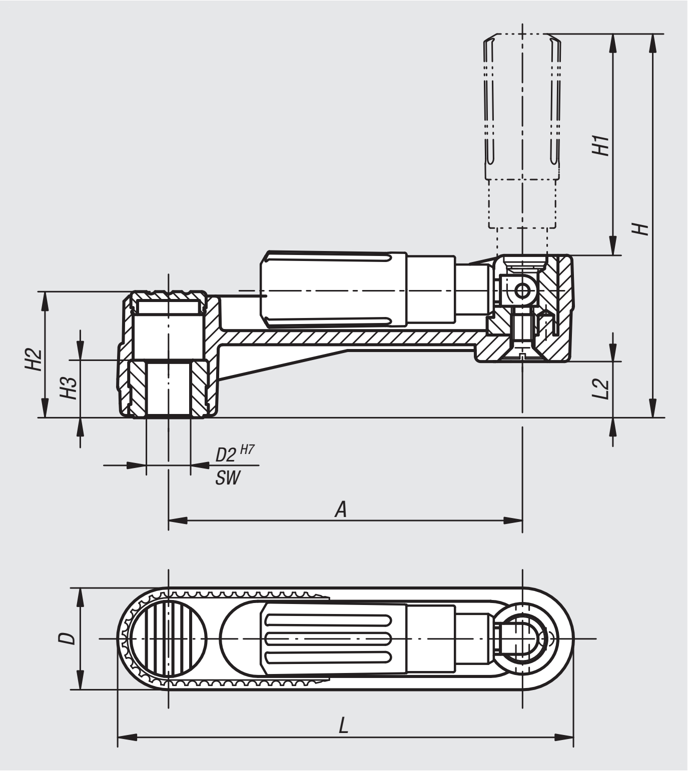
Version:
Steel parts black oxidised.

Sample order:
nlm 06500-1108

Note:
The hub cap is supplied loose.
The crank handle can be secured to a shaft using a transverse pin or by parallel key connection together with a DIN 6912 socket head screw and a DIN 7349 washer.

DIN 6885-1





Order No.	Version 1	A	D	D2	H	H1	H2	H3	L	L2
06500-1108	reamed hole	80	24	8	85.5	49	29	13	104	13
06500-1110	reamed hole	80	24	10	85.5	49	29	13	104	13
06500-1210	reamed hole	100	29	10	105	59,5	36	13	129	16
06500-1212	reamed hole	100	29	12	105	59,5	36	13	129	16
06500-1312	reamed hole	125	36	12	140	83,5	44	18,5	161	19,5
06500-1314	reamed hole	125	36	14	140	83,5	44	18,5	161	19,5

Order No.	Version 1	A	B3	D	D2	H	H1	H2	H3	L	L2	T
06500-110802	reamed hole with slot	80	2	24	8	85.5	49	29	13	104	13	9
06500-111003	reamed hole with slot	80	3	24	10	85.5	49	29	13	104	13	11,4
06500-121003	reamed hole with slot	100	3	29	10	105	59,5	36	13	129	16	11,4
06500-121204	reamed hole with slot	100	4	29	12	105	59,5	36	13	129	16	13,8
06500-131204	reamed hole with slot	125	4	36	12	140	83,5	44	18,5	161	19,5	13,8
06500-131405	reamed hole with slot	125	5	36	14	140	83,5	44	18,5	161	19,5	16,3

Order No.	Version 1	A	D	H	H1	H2	H3	L	L2	SW
06500-2108	square socket	80	24	85.5	49	29	13	104	13	8
06500-2110	square socket	80	24	85.5	49	29	13	104	13	10
06500-2210	square socket	100	29	105	59,5	36	13	129	16	10
06500-2212	square socket	100	29	105	59,5	36	13	129	16	12
06500-2312	square socket	125	36	140	83,5	44	18,5	161	19,5	12
06500-2314	square socket	125	36	140	83,5	44	18,5	161	19,5	14

Crank handles

with revolving grip

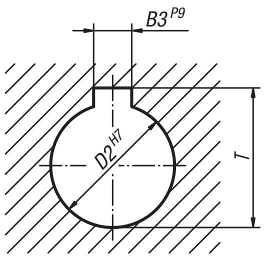
Material:
Black grey thermoplastic.

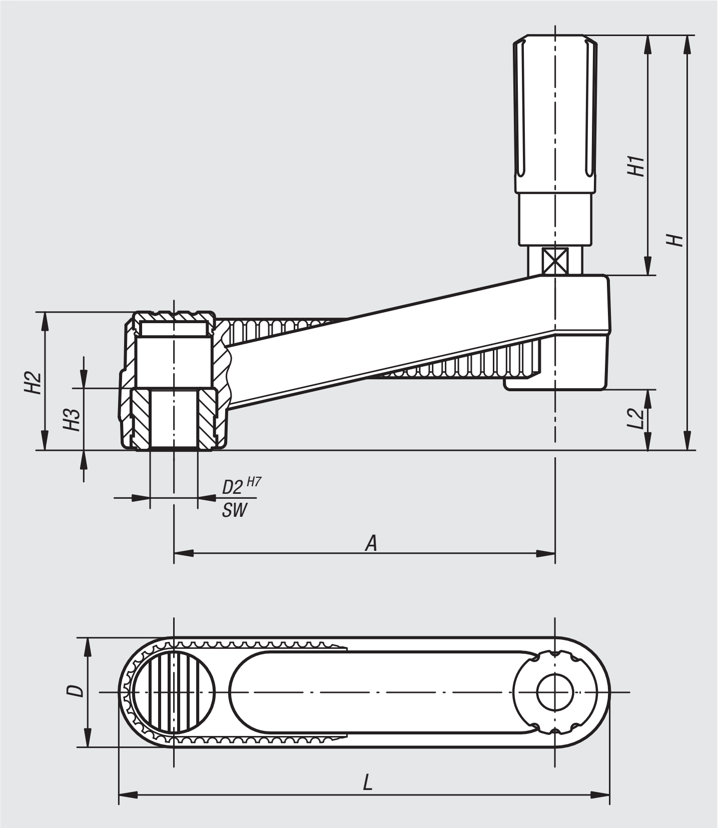
Version:
Steel parts black oxidised.

Sample order:
nlm 06500-3108

Note:
The hub cap and the revolving grip are supplied loose.
To assemble the handle simply screw the grip into the existing hole.
The crank handles can be secured to a shaft by using a transverse pin or by parallel key connection together with a DIN 6912 cap screw and a DIN 7349 washer.

DIN 6885-1





Order No.	Version 1	A	D	D2	H	H1	H2	H3	L	L2
06500-3108	reamed hole	80	24	8	85.5	49	29	13	104	13
06500-3110	reamed hole	80	24	10	85.5	49	29	13	104	13
06500-3210	reamed hole	100	29	10	105	59,5	36	13	129	16
06500-3212	reamed hole	100	29	12	105	59,5	36	13	129	16
06500-3312	reamed hole	125	36	12	140	83,5	44	18,5	161	19,5
06500-3314	reamed hole	125	36	14	140	83,5	44	18,5	161	19,5

Order No.	Version 1	A	B3	D	D2	H	H1	H2	H3	L	L2	T
06500-310802	reamed hole with slot	80	2	24	8	85.5	49	29	13	104	13	9
06500-311003	reamed hole with slot	80	3	24	10	85.5	49	29	13	104	13	11,4
06500-321003	reamed hole with slot	100	3	29	10	105	59,5	36	13	129	16	11,4
06500-321204	reamed hole with slot	100	4	29	12	105	59,5	36	13	129	16	13,8
06500-331204	reamed hole with slot	125	4	36	12	140	83,5	44	18,5	161	19,5	13,8
06500-331405	reamed hole with slot	125	5	36	14	140	83,5	44	18,5	161	19,5	16,3

Order No.	Version 1	A	D	H	H1	H2	H3	L	L2	SW
06500-4108	square socket	80	24	85.5	49	29	13	104	13	8
06500-4110	square socket	80	24	85.5	49	29	13	104	13	10
06500-4210	square socket	100	29	105	59,5	36	13	129	16	10
06500-4212	square socket	100	29	105	59,5	36	13	129	16	12
06500-4312	square socket	125	36	140	83,5	44	18,5	161	19,5	12
06500-4314	square socket	125	36	140	83,5	44	18,5	161	19,5	14

06502

Crank handles

with safety grip

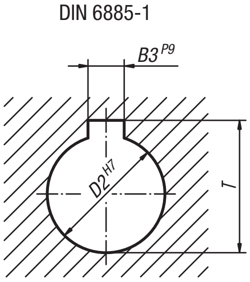
Material:
Arm and grip black grey thermoplastic.

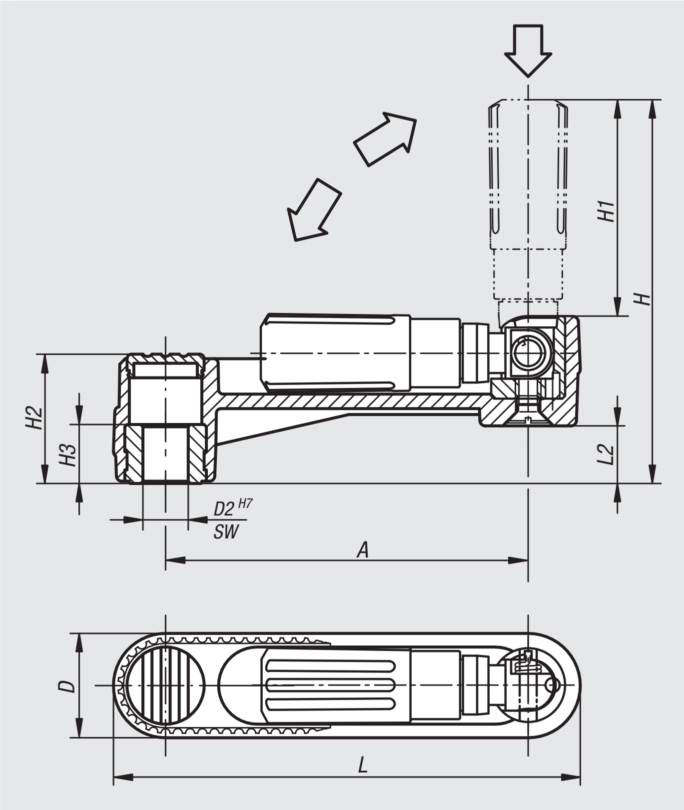
Version:
Steel parts black oxidised.

Sample order:
nlm 06502-1108

Note:
The hub cover is supplied loose.
The crank handles can be secured to the shaft by cross-pinning or by parallel key together with a DIN 6912 socket head screw and DIN 7349 washer.
Two actions must be made to bring the safety grip into an operating position:
- Swing the grip out until it stops (90°).
- Push the grip in until it locks.

The pushed-in position is the most comfortable for cranking. The grip swings back automatically after releasing.





Order No.	Version 1	A	D	D2	H	H1	H2	H3	L	L2
06502-1108	reamed hole	80	24	8	84	47,5	29	13	104	13
06502-1110	reamed hole	80	24	10	84	47,5	29	13	104	13
06502-1210	reamed hole	100	29	10	104	58,5	36	13	129	16
06502-1212	reamed hole	100	29	12	104	58,5	36	13	129	16
06502-1312	reamed hole	125	36	12	138,5	82	44	18,5	161	19,5
06502-1314	reamed hole	125	36	14	138,5	82	44	18,5	161	19,5

Order No.	Version 1	A	B3	D	D2	H	H1	H2	H3	L	L2	T
06502-110802	reamed hole with slot	80	2	24	8	84	47,5	29	13	104	13	9
06502-111003	reamed hole with slot	80	3	24	10	84	47,5	29	13	104	13	11,4
06502-121003	reamed hole with slot	100	3	29	10	104	58,5	36	13	129	16	11,4
06502-121204	reamed hole with slot	100	4	29	12	104	58,5	36	13	129	16	13,8
06502-131204	reamed hole with slot	125	4	36	12	138,5	82	44	18,5	161	19,5	13,8
06502-131405	reamed hole with slot	125	5	36	14	138,5	82	44	18,5	161	19,5	16,3

Order No.	Version 1	A	D	H	H1	H2	H3	L	L2	SW
06502-2108	square socket	80	24	84	47,5	29	13	104	13	8
06502-2110	square socket	80	24	84	47,5	29	13	104	13	10
06502-2210	square socket	100	29	104	58,5	36	13	129	16	10
06502-2212	square socket	100	29	104	58,5	36	13	129	16	12
06502-2312	square socket	125	36	138,5	82	44	18,5	161	19,5	12
06502-2314	square socket	125	36	138,5	82	44	18,5	161	19,5	14

Crank handles aluminium

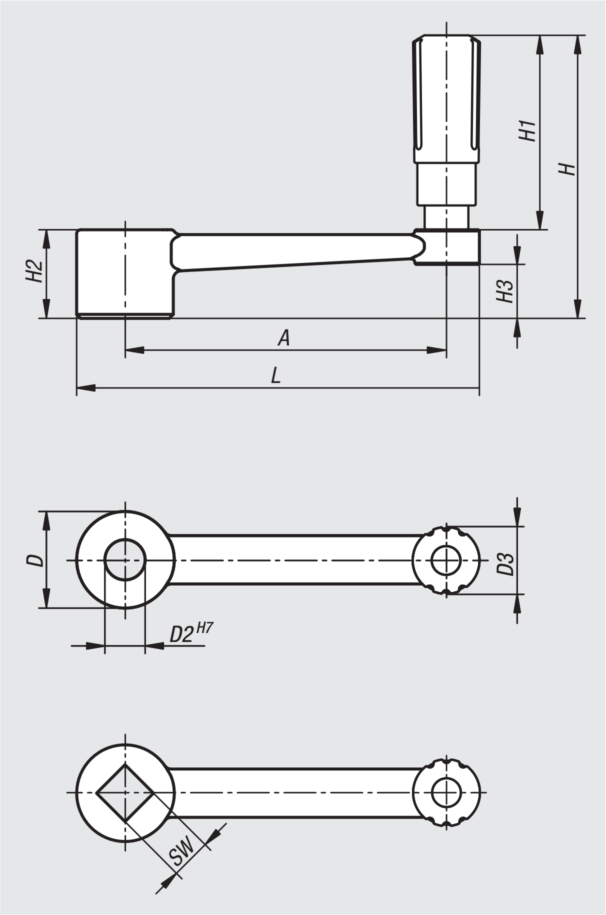
cylindrical revolving grip

Material:
Crank AlSi9Cu3 3.2163.
Revolving grip thermoplastic PA6 and steel 1.0718.

Version:
Crank black powder coated.
Thermoplastic black.
Steel parts black oxidised.

Sample order:
nlm 06503-3110

Note:
Similar to DIN 469.

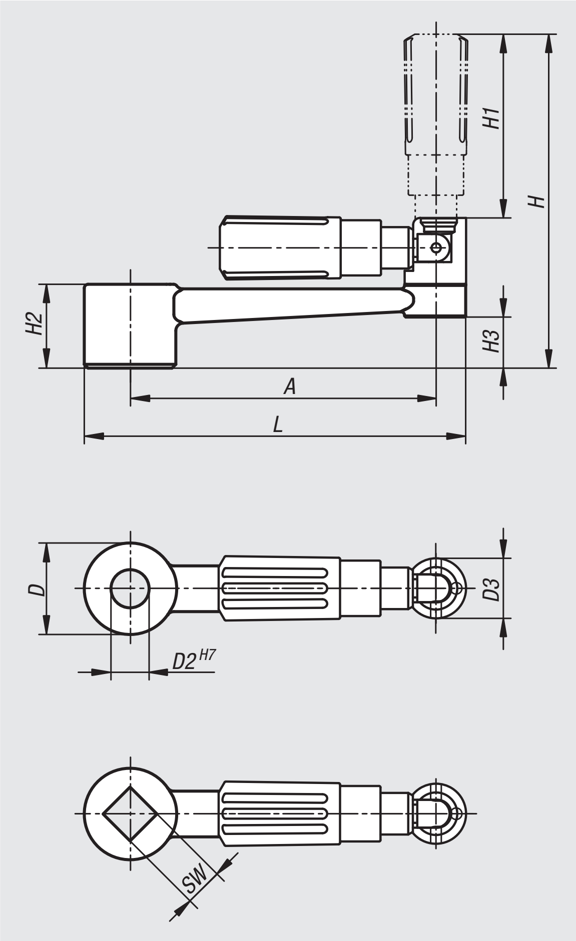


Order No.	Version 1	A	D	D2	D3	H	H1	H2	H3	L
06503-3110	reamed hole	80	24	10	16	71,1	49,1	22	13,4	100
06503-3212	reamed hole	100	28	12	20	87,4	61,4	26	16	124
06503-3314	reamed hole	125	30	14	26	111	83	28	15,8	153
06503-3417	reamed hole	160	34	17	26	115	83	32	19,6	190

Order No.	Version 1	A	D	D3	H	H1	H2	H3	L	SW
06503-4110	square socket	80	24	16	71,1	49,1	22	13,4	100	10
06503-4212	square socket	100	28	20	87,4	61,4	26	16	124	12
06503-4314	square socket	125	30	26	111	83	28	15,8	153	14
06503-4417	square socket	160	34	26	115	83	32	19,6	190	17

Crank handles aluminium

with fold-away cylinder grip



Material:
Crank AlSi9Cu3 3.2163.
Cylinder grip thermoplastic PA6 and steel.

Version:
Crank black powder coated.
Thermoplastic black.
Steel parts black oxidised.

Sample order:
nlm 06503-1110

Note:
Similar to DIN 469.

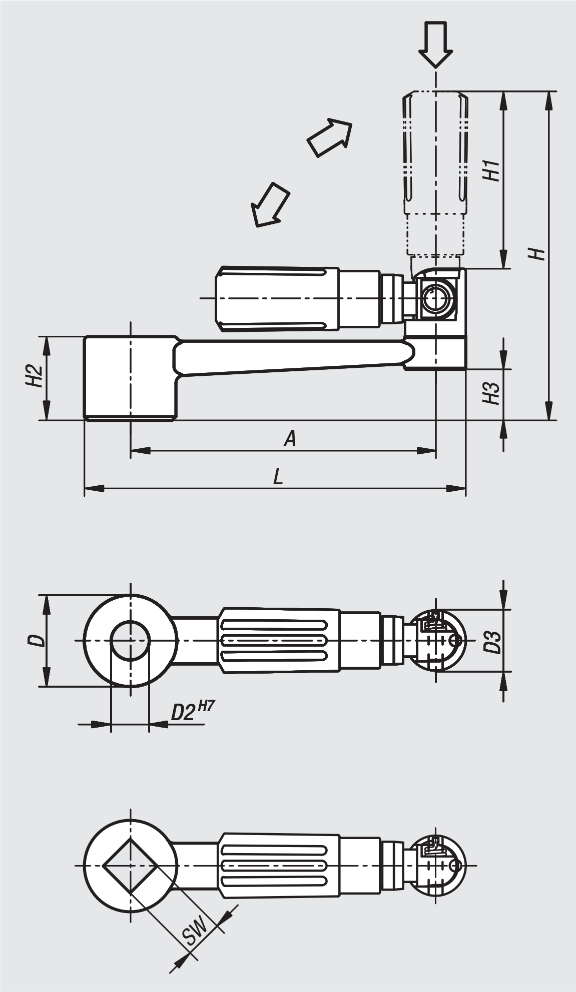
Order No.	Version 1	A	D	D2	D3	H	H1	H2	H3	L
06503-1110	reamed hole	80	24	10	16	89	49	22	13,4	100
06503-1212	reamed hole	100	28	12	20	107,9	59,4	26	16	124
06503-1314	reamed hole	125	30	14	26	140,5	83,5	28	15,8	153
06503-1417	reamed hole	160	34	17	26	144,5	83,5	32	19,6	190

Order No.	Version 1	A	D	D3	H	H1	H2	H3	L	SW
06503-2110	square socket	80	24	16	89	49	22	13,4	100	10
06503-2212	square socket	100	28	20	107,9	59,4	26	16	124	12
06503-2314	square socket	125	30	26	140,5	83,5	28	15,8	153	14
06503-2417	square socket	160	34	26	144,5	83,5	32	19,6	190	17

06504

Crank handles aluminium

with safety cylinder grip



Material:
Crank AlSi9Cu3 3.2163.
Safety cylinder grip thermoplastic PA6 and steel.

Version:
Crank black powder coated.
Thermoplastic black.
Steel parts black oxidised.

Sample order:
nlm 06504-1110

Note:
Similar to DIN 469.

Order No.	Version 1	A	D	D2	D3	H	H1	H2	H3	L
06504-1110	reamed hole	80	24	10	16	87,5	47,5	22	13,4	100
06504-1212	reamed hole	100	28	12	20	106,9	58,4	26	16	124
06504-1314	reamed hole	125	30	14	26	139,1	82,1	28	15,8	153
06504-1417	reamed hole	160	34	17	26	143,1	82,1	32	19,6	190

Order No.	Version 1	A	D	D3	H	H1	H2	H3	L	SW
06504-2110	square socket	80	24	16	87,5	47,5	22	13,4	100	10
06504-2212	square socket	100	28	20	106,9	58,4	26	16	124	12
06504-2314	square socket	125	30	26	139,1	82,1	28	15,8	153	14
06504-2417	square socket	160	34	26	143,1	82,1	32	19,6	190	17

06505

Crank handles stainless steel

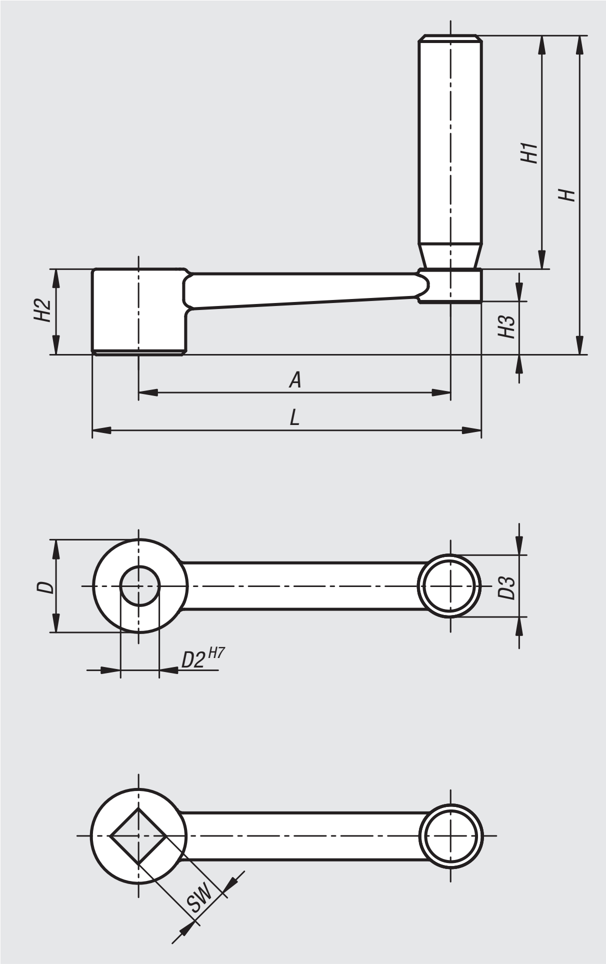
cylindrical revolving grip

Material:
Crank stainless steel 1.4308.
Axle pin and revolving grip stainless steel 1.4305.
Retaining ring stainless steel 1.4310.

Version:
Bright.

Sample order:
nlm 06505-3110

Note:
Similar to DIN 469.

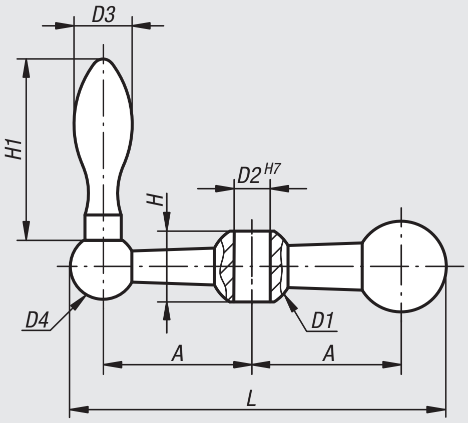


Order No.	Version 1	D	D2	D3	H	H1	H2	H3	A	L
06505-3110	reamed hole	24	10	16	82	60	22	13,4	80	100
06505-3212	reamed hole	28	12	20	98	72	26	16	100	124
06505-3314	reamed hole	30	14	26	118	90	28	15,8	125	153
06505-3417	reamed hole	34	17	26	122	90	32	19,6	160	190

Order No.	Version 1	D	D3	H	H1	H2	H3	A	L	SW
06505-4110	square socket	24	16	82	60	22	13,4	80	100	10
06505-4212	square socket	28	20	98	72	26	16	100	124	12
06505-4314	square socket	30	26	118	90	28	15,8	125	153	14
06505-4417	square socket	34	26	122	90	32	19,6	160	190	17

06510

Crank handles balanced



Material:
Steel.

Version:
Electro zinc-plated.

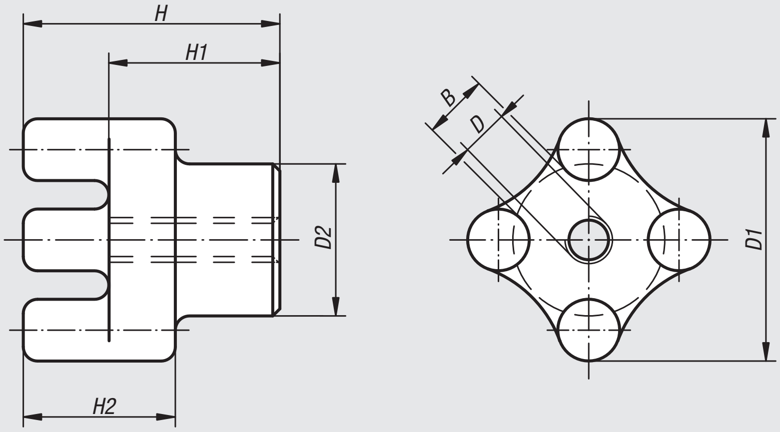
Sample order:
nlm 06510-108

Note:
Fixed handle DIN 39.

Order No.	A	D1	D2	D3	D4	H	H1	L
06510-107	25	16	7	10	13	13	32	65,5
06510-108	34	20	8	14	16	17	46	87
06510-110	41	23	10	16	18	19,5	50	103,5
06510-112	50	26	12	18	20	21,5	56	124

06550

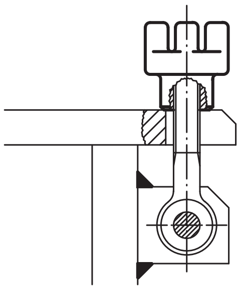
Bar knobs



Material:
Malleable cast iron

Version:
Sand-blasted

Sample order:
nlm 06550-12

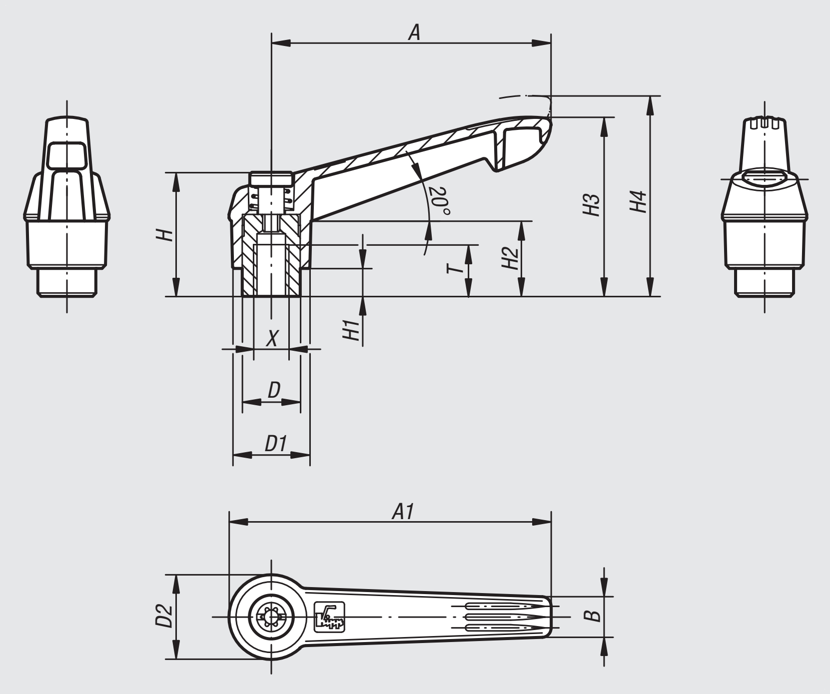


Order No.	B	D	D1	D2	H	H1	H2
06550-10	12	M10	51	32	54	36	32
06550-12	12	M12	51	32	54	36	32
06550-14	12	M14	51	32	54	36	32
06550-16	12	M16	51	32	54	36	32
06550-20	18	M20	64	38	60	40	35
06550-24	30	M24	90	57	70	40	45

06600

Clamping levers with plastic handle

internal thread



Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts grade 5.8.

Version:
Steel parts black oxidised.

Sample order:
nlm 06600-10486 (lever colour signal green)

Note:
Δ Add the desired grip colour here.

On request:
Other threads and special versions.
Dimension "H1" available in other lengths at extra charge.

black grey = 1

RAL 7021

orange = 2

RAL 2004

signal green = 86

RAL 6032

traffic red = 84

RAL 3020

colza yellow = 16

RAL 1021

traffic blue = 87

RAL 5017

light grey = 88

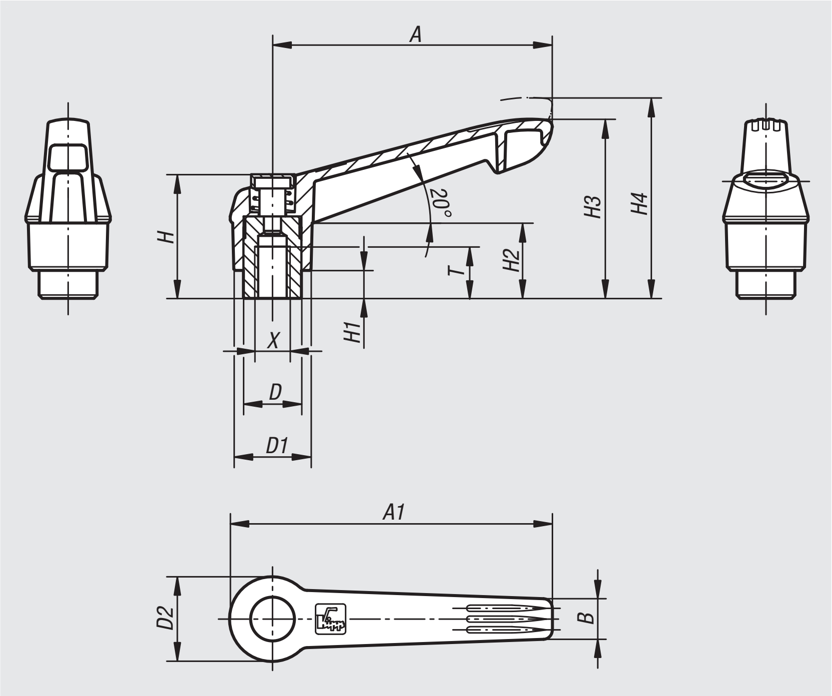
RAL 7035

lift to disengage

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06600-104Δ	M4	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06600-105Δ	M5	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06600-106Δ	M6	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06600-206Δ	M6	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20
06600-208Δ	M8	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20
06600-308Δ	M8	80	91,5	11	16	21,5	23	37	10	24	53,5	58	14	22
06600-310Δ	M10	80	91,5	11	16	21,5	23	37	10	24	53,5	58	14	22
06600-410Δ	M10	95	109	13	19	25,5	27,5	43	10	26	61	66	17	24
06600-412Δ	M12	95	109	13	19	25,5	27,5	43	10	26	61	66	17	24
06600-512Δ	M12	110	126	15,5	23	30	32,5	49	12	33	72	77	23	26
06600-516Δ	M16	110	126	15,5	23	30	32,5	49	12	33	72	77	23	26

Clamping levers with push button

internal thread



Material:
Handle fibreglass reinforced plastic, toothed ring die-cast zinc.
Steel parts grade 5.8.
Push button plastic (POM).

Version:
Steel parts black oxidised.

Sample order:
nlm 06600-71104
(clamping lever black grey, push button traffic red)

Note:
Δ Enter the desired lever colour here.
The standard colours are:
Black grey clamping lever, traffic red push button.
Orange clamping lever, black grey push button.
Traffic red clamping lever, black grey push button.

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.

black grey Δ = 1

RAL 7021

orange Δ = 2

RAL 2004

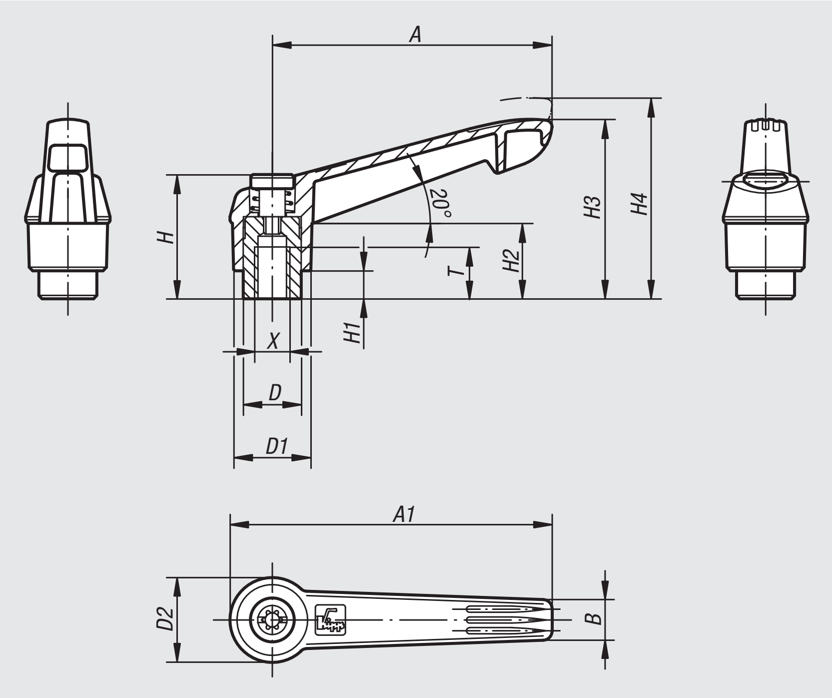
traffic red Δ = 3

RAL 3020

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06600-7Δ104	M4	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	9	16
06600-7Δ105	M5	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	9	16
06600-7Δ106	M6	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	9	16
06600-7Δ206	M6	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	12	20
06600-7Δ208	M8	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	12	20
06600-7Δ308	M8	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	14	22
06600-7Δ310	M10	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	14	22
06600-7Δ410	M10	95	109	13	19	25,5	27,5	44,6	10	26	61	66	17	24
06600-7Δ412	M12	95	109	13	19	25,5	27,5	44,6	10	26	61	66	17	24
06600-7Δ512	M12	110	126	15,5	23	30	32,5	50,6	12	33	72	77	23	26
06600-7Δ516	M16	110	126	15,5	23	30	32,5	50,6	12	33	72	77	23	26

Clamping levers antistatic

internal thread, plastic grip



Material:
Handles reinforced plastic, toothed ring die-cast zinc.
Steel parts grade 5.8.

Version:
Steel parts black oxidised, handles graphite black.

Sample order:
nlm 06600-1120624

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

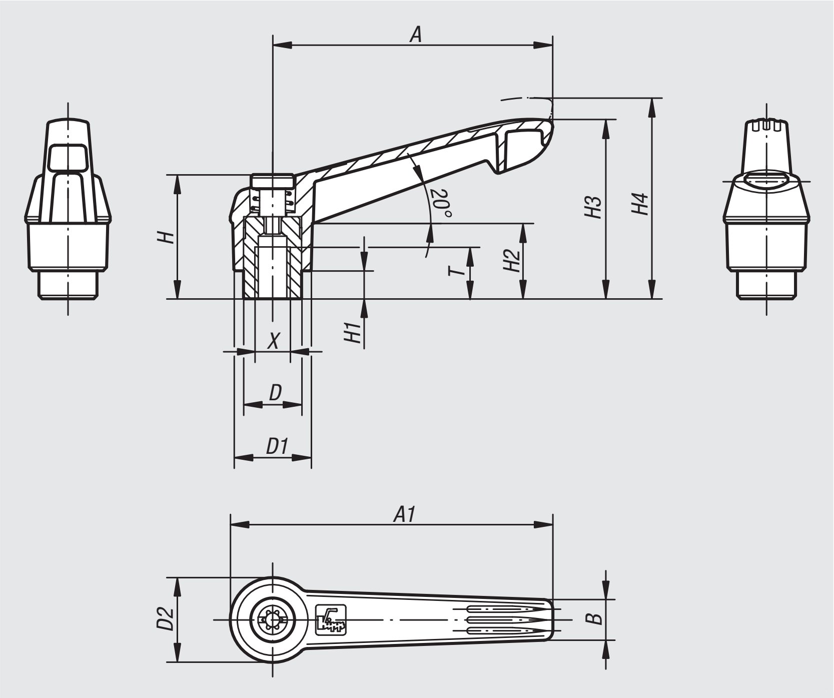
Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06600-1120624	M6	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20
06600-1120824	M8	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20

Clamping levers, plastic

with internal thread, steel parts trivalent blue passivated



Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts grade 5.8.

Version:
Steel parts blue-passivated.

Sample order:
nlm 06600-05-10486 (lever colour signal green)

Note:
Δ Add the desired grip colour here.

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.

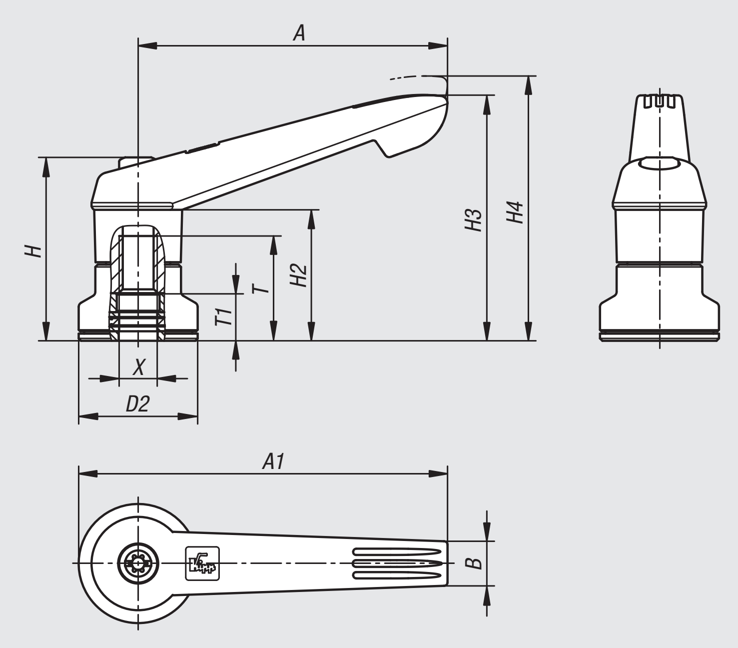
black grey = 1  RAL 7021	orange = 2  RAL 2004	colza yellow = 16  RAL 1021	
traffic red = 84  RAL 3020	signal green = 86  RAL 6032	traffic blue = 87  RAL 5017	light grey = 88  RAL 7035

lift to disengage

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06600-05-104Δ	M4	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06600-05-105Δ	M5	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06600-05-106Δ	M6	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06600-05-206Δ	M6	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20
06600-05-208Δ	M8	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20
06600-05-308Δ	M8	80	91,5	11	16	21,5	23	37	10	24	53,5	58	14	22
06600-05-310Δ	M10	80	91,5	11	16	21,5	23	37	10	24	53,5	58	14	22
06600-05-410Δ	M10	95	109	13	19	25,5	27,5	43	10	26	61	66	17	24
06600-05-412Δ	M12	95	109	13	19	25,5	27,5	43	10	26	61	66	17	24
06600-05-512Δ	M12	110	126	15,5	23	30	32,5	49	12	33	72	77	23	26
06600-05-516Δ	M16	110	126	15,5	23	30	32,5	49	12	33	72	77	23	26

Clamping levers, plastic

with female thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts grade 5.8.

Version:
Steel parts black oxidised.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06600-10-20886 (lever colour signal green)

Note:
Δ Add the desired grip colour here.

Method of operation:
The handle lever is engaged in the toothed insert by means of a toothed ring when not actuated, enabling the thread to be tightened or loosened. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Other colours.

Clamping levers, plastic

with female thread and clamping force intensifier

black grey = 1

RAL 7021

orange = 2

RAL 2004

signal green = 86

RAL 6032

traffic red = 84

RAL 3020

colza yellow = 16

RAL 1021

traffic blue = 87

RAL 5017

light grey = 88

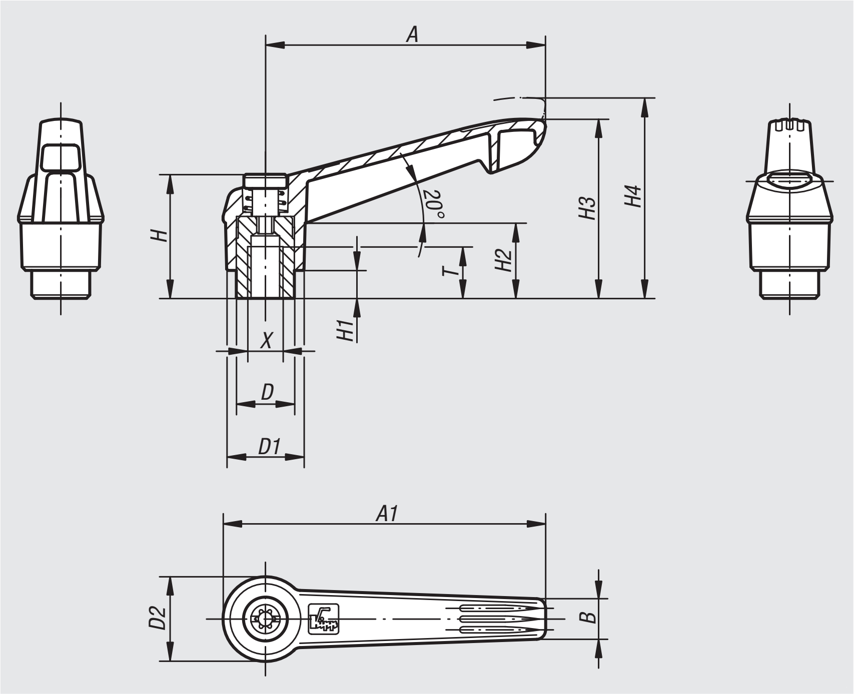
RAL 7035

Order No.	X	D2	H	H2	H3	H4	A	A1	B	T	T1
06600-10-208Δ	M8	25	38,5	27,5	51,6	55,6	65	77,5	9,4	22	10
06600-10-310Δ	M10	30	47	34	63,4	67,9	80	95	11,1	24	10
06600-10-410Δ	M10	30	53,1	36	71,1	76,1	95,4	110,4	13,2	27	10
06600-10-512Δ	M12	35	59,1	43	82,8	87,8	109,9	127,4	15,6	33	10

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Clamping levers with plastic handle

internal thread, metal parts stainless steel



Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts stainless steel 1.4305.

Version:
Stainless steel bright.

Sample order:
nlm 06601-10486 (lever colour signal green)

Note:
Δ Add the desired grip colour here.

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.

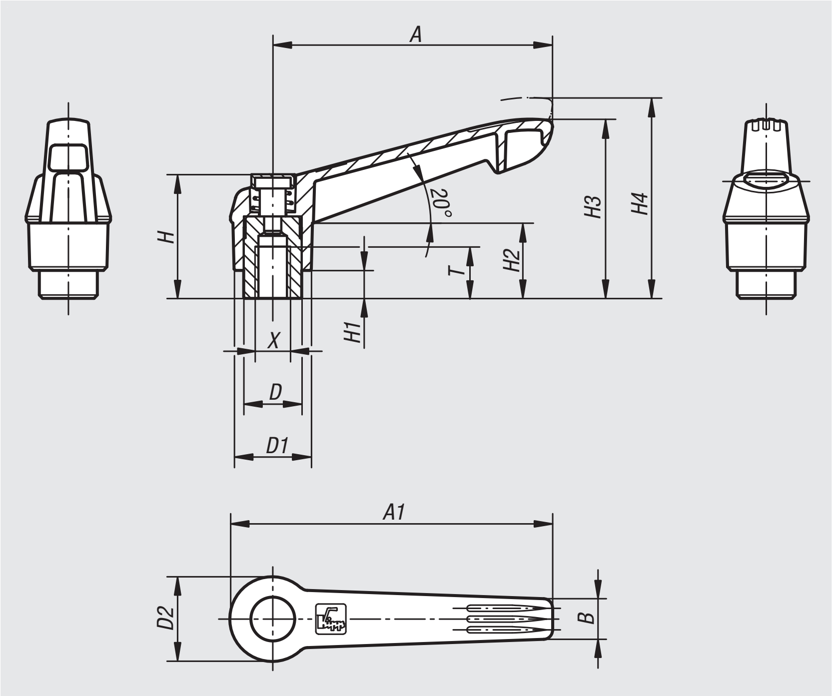
black grey = 1  RAL 7021	orange = 2  RAL 2004	signal green = 86  RAL 6032	
traffic red = 84  RAL 3020	colza yellow = 16  RAL 1021	traffic blue = 87  RAL 5017	light grey = 88  RAL 7035

lift to
disengage

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06601-104Δ	M4	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06601-105Δ	M5	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06601-106Δ	M6	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	9	16
06601-206Δ	M6	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20
06601-208Δ	M8	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	12	20
06601-308Δ	M8	80	91,5	11	16	21,5	23	37	10	24	53,5	58	14	22
06601-310Δ	M10	80	91,5	11	16	21,5	23	37	10	24	53,5	58	14	22
06601-410Δ	M10	95	109	13	19	25,5	27,5	43	10	26	61	66	17	24
06601-412Δ	M12	95	109	13	19	25,5	27,5	43	10	26	61	66	17	24
06601-512Δ	M12	110	126	15,5	23	30	32,5	49	12	33	72	77	23	26
06601-516Δ	M16	110	126	15,5	23	30	32,5	49	12	33	72	77	23	26

Clamping levers with push button

internal thread, metal parts stainless steel



Material:
Handle fibreglass reinforced plastic, toothed ring die-cast zinc. Metal parts stainless steel 1.4305.
Push button plastic (POM).

Version:
Steel parts bright.

Sample order:
nlm 06601-71104
(clamping lever black grey, push button traffic red)

Note:
Δ Enter the desired lever colour here.
The standard colours are:
Black grey clamping lever, traffic red push button.
Orange clamping lever, black grey push button.
Traffic red clamping lever, black grey push button.

On request:
Other threads and special versions.
Dimension “H1” available in other lengths at extra charge.

black grey Δ = 1

RAL 7021

orange Δ = 2

RAL 2004

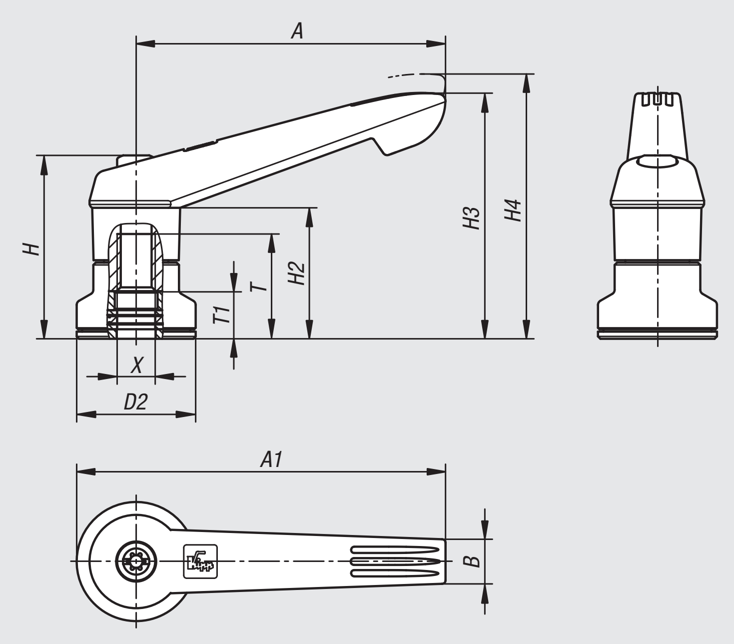
traffic red Δ = 3

RAL 3020

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	T	No. of teeth
06601-7Δ104	M4	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	9	16
06601-7Δ105	M5	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	9	16
06601-7Δ106	M6	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	9	16
06601-7Δ206	M6	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	12	20
06601-7Δ208	M8	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	12	20
06601-7Δ308	M8	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	14	22
06601-7Δ310	M10	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	14	22
06601-7Δ410	M10	95	109	13	19	25,5	27,5	44,6	10	26	61	66	17	24
06601-7Δ412	M12	95	109	13	19	25,5	27,5	44,6	10	26	61	66	17	24
06601-7Δ512	M12	110	126	15,5	23	30	32,5	50,6	12	33	72	77	23	26
06601-7Δ516	M16	110	126	15,5	23	30	32,5	50,6	12	33	72	77	23	26

Clamping levers, plastic

with female thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts stainless steel 1.4305.

Version:
Steel parts bright.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06601-10-20886 (lever colour signal green)

Note:
Δ Add the desired grip colour here.

Method of operation:
The handle lever is engaged in the toothed insert by means of a toothed ring when not actuated, enabling the thread to be tightened or loosened. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Other colours.

Clamping levers, plastic

with female thread and clamping force intensifier


black grey = 1
RAL 7021


orange = 2
RAL 2004


signal green = 86
RAL 6032


traffic red = 84
RAL 3020


colza yellow = 16
RAL 1021


traffic blue = 87
RAL 5017

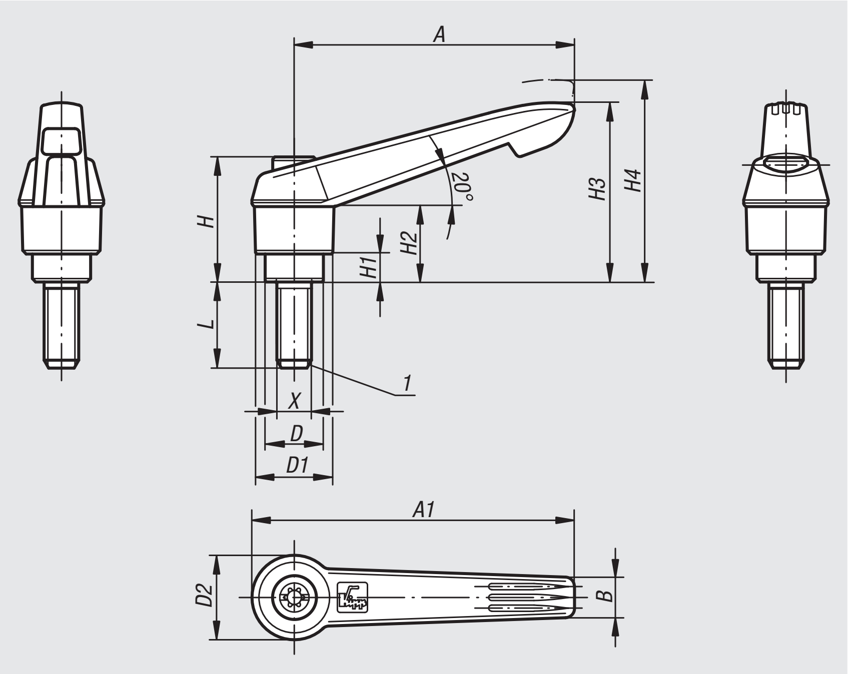

light grey = 88
RAL 7035

Order No.	X	D2	H	H2	H3	H4	A	A1	B	T	T1
06601-10-208Δ	M8	25	38,5	27,5	51,6	55,6	65	77,5	9,4	22	10
06601-10-310Δ	M10	30	47	34	63,4	67,9	80	95	11,1	24	10
06601-10-410Δ	M10	30	53,1	36	71,1	76,1	95,4	110,4	13,2	27	10
06601-10-512Δ	M12	35	59,1	43	82,8	87,8	109,9	127,4	15,6	33	10

06610

Clamping levers with plastic handle

external thread



Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts grade 5.8.

Version:
Steel parts black oxidised.

Sample order:
nlm 06610-1051X40 (lever black grey; include length L)

Note:
Δ Add the desired grip colour here.
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

lift to disengage

black grey = 1

RAL 7021

orange = 2

RAL 2004

signal green = 86

RAL 6032

traffic red = 84

RAL 3020

colza yellow = 16

RAL 1021

traffic blue = 87

RAL 5017

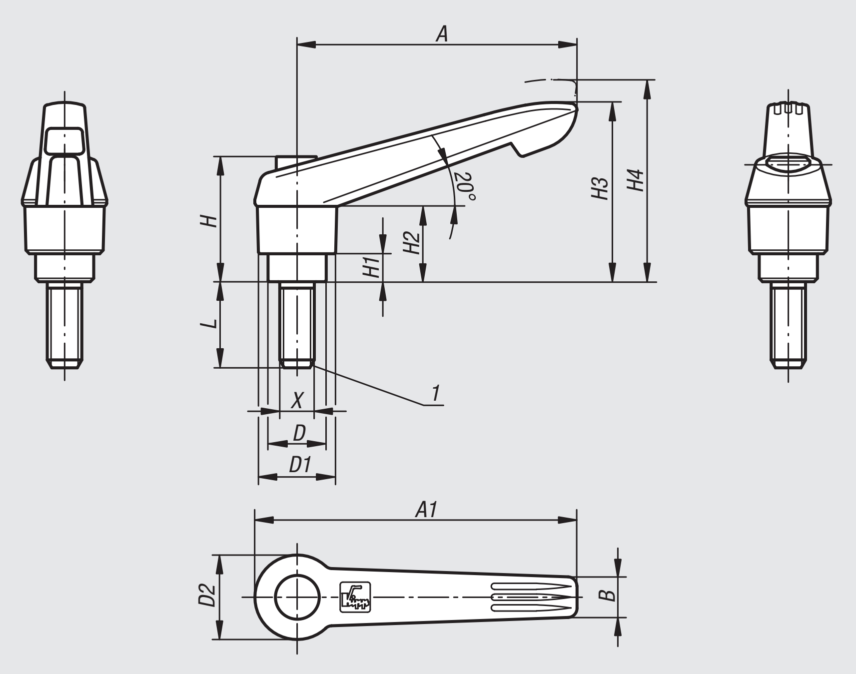
light grey = 88

RAL 7035

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06610-105ΔX	M5	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	16	10/15/20/25/30/35/40/45/50
06610-106ΔX	M6	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	16	10/15/20/25/30/35/40/45/50
06610-206ΔX	M6	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-208ΔX	M8	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-210ΔX	M10	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-308ΔX	M8	80	91,5	11	16	21,5	23	37	10	24	53,5	58	22	15/20/25/30/35/40/45/50/55/60
06610-310ΔX	M10	80	91,5	11	16	21,5	23	37	10	24	53,5	58	22	15/20/25/30/35/40/45/50/55/60
06610-410ΔX	M10	95	109	13	19	25,5	27,5	43	10	26	61	66	24	20/25/30/35/40/45/50/55/60/70/80/90
06610-412ΔX	M12	95	109	13	19	25,5	27,5	43	10	26	61	66	24	20/25/30/35/40/45/50/55/60/70/80/90
06610-512ΔX	M12	110	126	15,5	23	30	32,5	49	12	33	72	77	26	25/30/35/40/45/50/55/60/70/80/90
06610-516ΔX	M16	110	126	15,5	23	30	32,5	49	12	33	72	77	26	25/30/35/40/45/50/55/60/70/80/90

Clamping levers with push button

with external thread



Material:
Handle fibreglass reinforced plastic, toothed ring die-cast zinc.
Steel parts grade 5.8.
Push button plastic (POM).

Version:
Steel parts black oxidised.

Sample order:
nlm 06610.71105X10
(clamping lever black grey, push button traffic red; include length L)

Note:
Δ Enter the desired lever colour here.
The standard colours are:
Black grey clamping lever, traffic red push button.
Orange clamping lever, black grey push button.
Traffic red clamping lever, black grey push button.

Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension “H1” available in other lengths at extra charge.

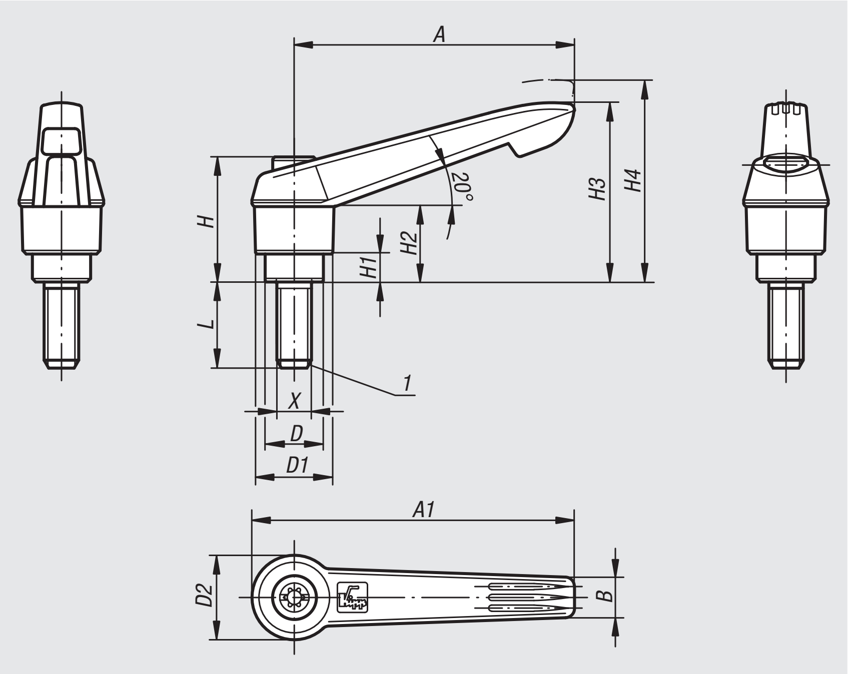
Drawing reference:
1) flat point DIN 78

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06610-7Δ105X	M5	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	16	10/15/20/25/30/35/40/45/50
06610-7Δ106X	M6	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	16	10/15/20/25/30/35/40/45/50
06610-7Δ206X	M6	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-7Δ208X	M8	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-7Δ210X	M10	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-7Δ308X	M8	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	22	15/20/25/30/35/40/45/50/55/60
06610-7Δ310X	M10	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	22	15/20/25/30/35/40/45/50/55/60
06610-7Δ410X	M10	95	109	13	19	25,5	27,5	44,6	10	26	61	66	24	20/25/30/35/40/45/50/55/60/70/80/90
06610-7Δ412X	M12	95	109	13	19	25,5	27,5	44,6	10	26	61	66	24	20/25/30/35/40/45/50/55/60/70/80/90
06610-7Δ512X	M12	110	126	15,5	23	30	32,5	50,6	12	33	72	77	26	25/30/35/40/45/50/55/60/70/80/90
06610-7Δ516X	M16	110	126	15,5	23	30	32,5	50,6	12	33	72	77	26	25/30/35/40/45/50/55/60/70/80/90

06610

Clamping levers antistatic

external thread, plastic grip



Material:
Handles reinforced plastic, toothed ring die-cast zinc.
Steel parts grade 5.8.

Version:
Steel parts black oxidised, handles graphite black.

Sample order:
nlm 06610-1120624X20

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

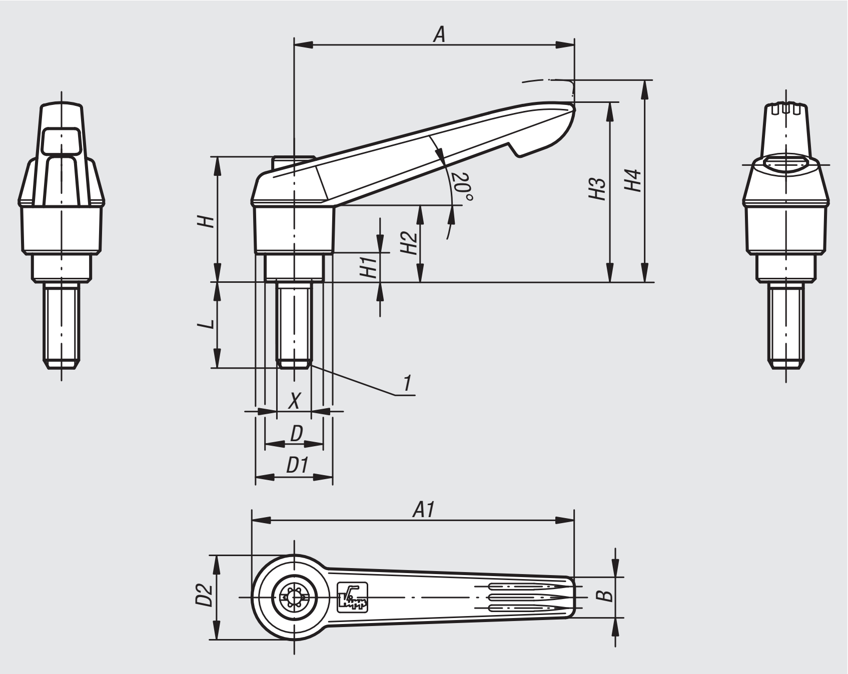
Drawing reference:
1) flat point DIN 78

lift to disengage

Order No.	X=thread	D	D1	D2	H	H1	H2	H3=handle height	H4	A	A1=handle length	B	No. of teeth	L=thread length
06610-1120624X20	M6	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	65	75	9,5	20	20
06610-1120824X20	M8	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	65	75	9,5	20	20
06610-1121024X20	M10	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	65	75	9,5	20	20

Clamping levers, plastic

with external thread, steel parts trivalent blue passivated



Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts grade 5.8.

Version:
Steel parts blue-passivated.

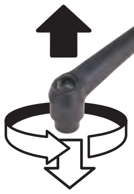
Sample order:
nlm 06610-05-1051X40 (lever black grey; include length L)

Note:
Δ Add the desired grip colour here.
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension "H1" available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

lift to disengage



black grey = 1

RAL 7021

orange = 2

RAL 2004

colza yellow = 16

RAL 1021

traffic red = 84

RAL 3020

signal green = 86

RAL 6032

traffic blue = 87

RAL 5017

light grey = 88

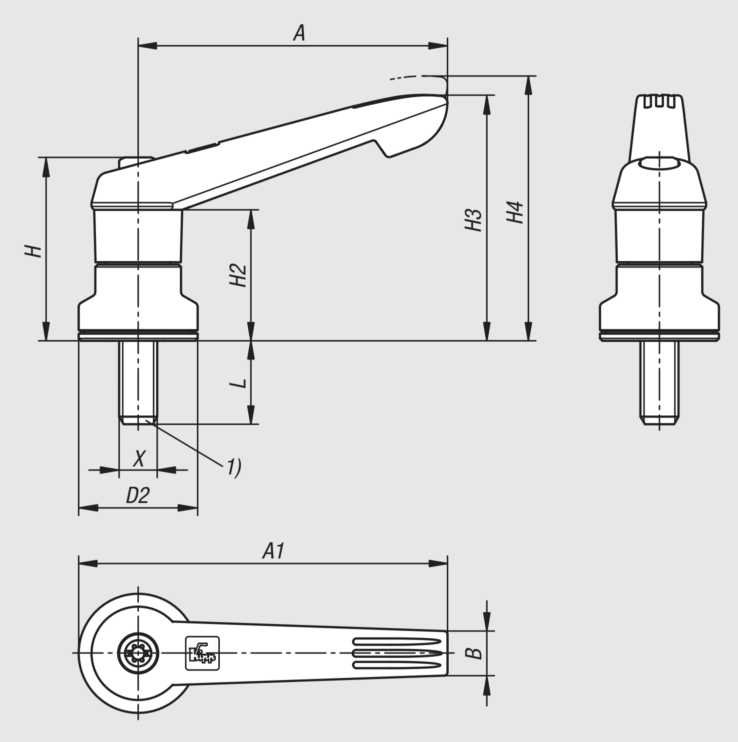
RAL 7035

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06610-05-105ΔX	M5	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	16	10/15/20/25/30/35/40/45/50
06610-05-106ΔX	M6	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	16	10/15/20/25/30/35/40/45/50
06610-05-206ΔX	M6	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-05-208ΔX	M8	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-05-210ΔX	M10	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/35/40/45/50/55/60
06610-05-308ΔX	M8	80	91,5	11	16	21,5	23	37	10	24	53,5	58	22	15/20/25/30/35/40/45/50/55/60
06610-05-310ΔX	M10	80	91,5	11	16	21,5	23	37	10	24	53,5	58	22	15/20/25/30/35/40/45/50/55/60
06610-05-410ΔX	M10	95	109	13	19	25,5	27,5	43	10	26	61	66	24	20/25/30/35/40/45/50/55/60/70/80/90
06610-05-412ΔX	M12	95	109	13	19	25,5	27,5	43	10	26	61	66	24	20/25/30/35/40/45/50/55/60/70/80/90
06610-05-512ΔX	M12	110	126	15,5	23	30	32,5	49	12	33	72	77	26	25/30/35/40/45/50/55/60/70/80/90
06610-05-516ΔX	M16	110	126	15,5	23	30	32,5	49	12	33	72	77	26	25/30/35/40/45/50/55/60/70/80/90

06610-10

Clamping levers, plastic

with male thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Due to the modular construction many special designs are available.

Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts grade 5.8.

Version:
Steel parts black oxidised.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06610-10-2081X40 (lever black grey; include length L)

Note:
Δ Add the desired grip colour here.

Method of operation:
The handle lever is engaged in the toothed insert by means of a toothed ring when not actuated, enabling the thread to be tightened or loosened. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Special versions.
Other colours and thread lengths.

Drawing reference:
1) flat point DIN 78

Clamping levers, plastic

with male thread and clamping force intensifier

black grey = 1

RAL 7021

orange = 2

RAL 2004

signal green = 86

RAL 6032

traffic red = 84

RAL 3020

colza yellow = 16

RAL 1021

traffic blue = 87

RAL 5017

light grey = 88

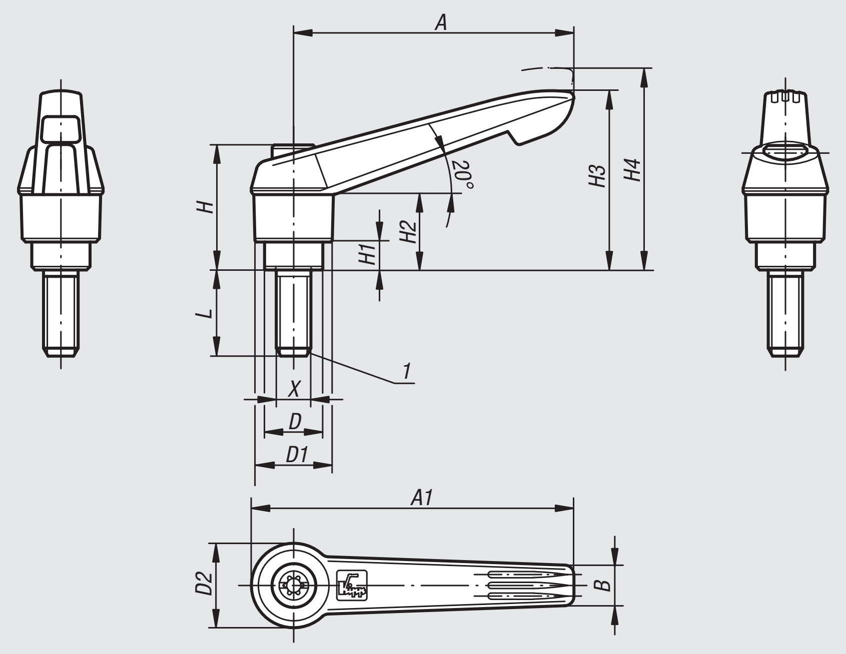
RAL 7035

Order No.	X	D2	H	H2	H3	H4	A	A1	B	L
06610-10-208ΔX	M8	25	38,5	27,5	51,6	55,6	65	77,5	9,4	10/20/30/40
06610-10-310ΔX	M10	30	47	34	63,4	67,9	80	95	11,1	15/30/40/50
06610-10-410ΔX	M10	30	53,1	36	71,1	76,1	95,4	110,4	13,2	20/30/40/50
06610-10-512ΔX	M12	35	59,1	43	82,8	87,8	109,9	127,4	15,6	20/30/40/50

06611

Clamping levers with plastic handle

external thread, metal parts stainless steel



Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts stainless steel 1.4305.

Version:
Stainless steel bright.

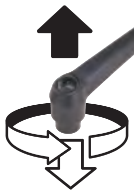
Sample order:
nlm 06611-1051X20 (lever black grey; include length L)

Note:
Δ Add the desired grip colour here.
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension “H1” available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

lift to
disengage



black grey = 1

RAL 7021

orange = 2

RAL 2004

signal green = 86

RAL 6032

traffic red = 84

RAL 3020

colza yellow = 16

RAL 1021

traffic blue = 87

RAL 5017

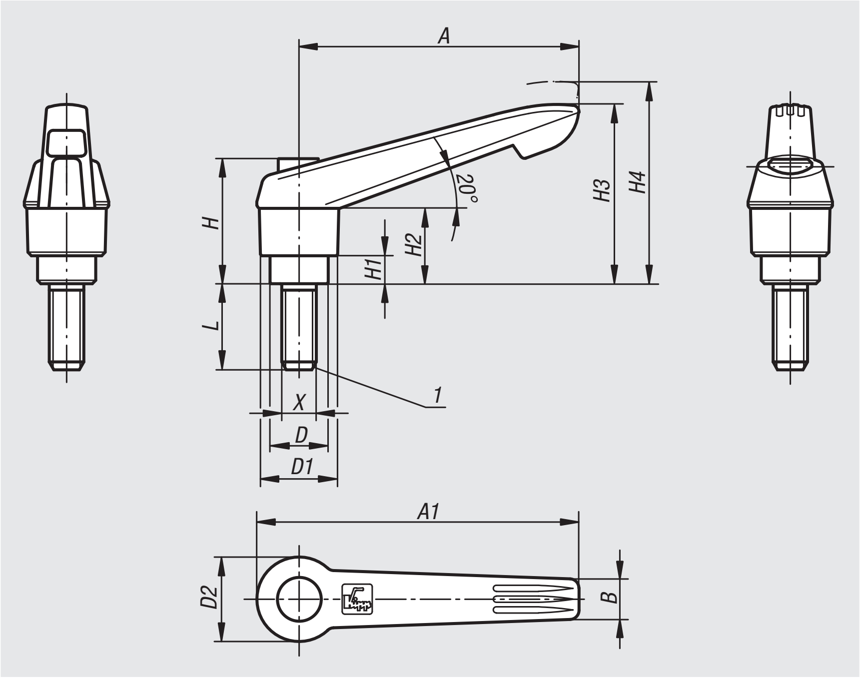
light grey = 88

RAL 7035

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06611-105ΔX	M5	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	16	10/15/20/25
06611-106ΔX	M6	40	47	7,5	10	13	14,5	24,5	4	15	30	33,5	16	10/15/20/25/30/40/50
06611-206ΔX	M6	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/40/50/60
06611-208ΔX	M8	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	15/20/25/30/40/50/60
06611-210ΔX	M10	65	75	9,5	13,5	18	19,5	28,5	6,5	17,5	41,5	45,5	20	20/25/30/40/50/60
06611-308ΔX	M8	80	91,5	11	16	21,5	23	37	10	24	53,5	58	22	20/25/30/40/50/60
06611-310ΔX	M10	80	91,5	11	16	21,5	23	37	10	24	53,5	58	22	20/25/30/40/50/60
06611-412ΔX	M12	95	109	13	19	25,5	27,5	43	10	26	61	66	24	25/30/40/50/60
06611-516ΔX	M16	110	126	15,5	23	30	32,5	49	12	33	72	77	26	30/40/50/60

Clamping levers with push button

external thread, metal parts stainless steel



Material:
Handle fibreglass reinforced plastic, toothed ring die-cast zinc. Metal parts stainless steel 1.4305.
Push button plastic (POM).

Version:
Steel parts bright.

Sample order:
nlm 06611.71105X10
(clamping lever black grey, push button traffic red; include length L)

Note:
Δ Enter the desired lever colour here.
The standard colours are:
Black grey clamping lever, traffic red push button.
Orange clamping lever, black grey push button.
Traffic red clamping lever, black grey push button.

Where L ≥ 60 mm the thread length is 60 mm.

On request:
Other threads, screw lengths and special versions.
Dimension "H1" available in other lengths at extra charge.

Drawing reference:
1) flat point DIN 78

black grey Δ = 1

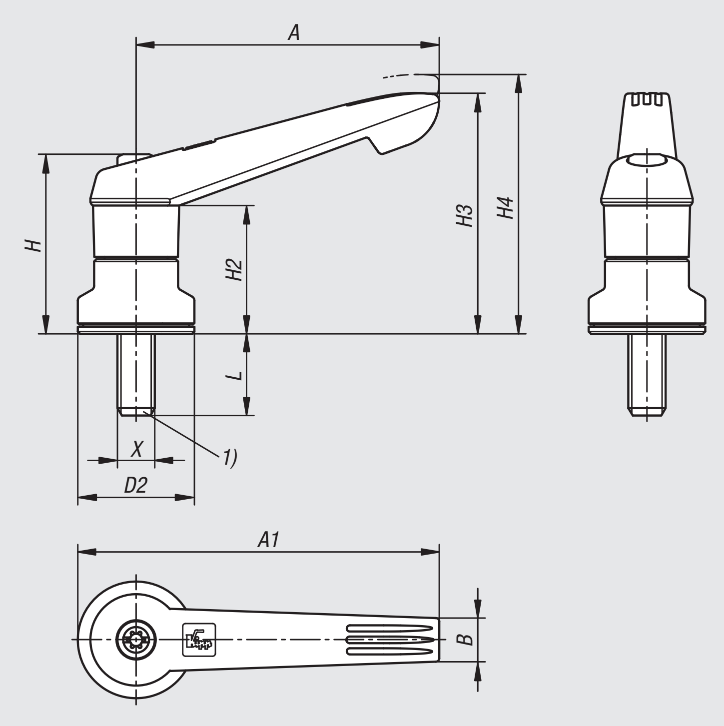
orange Δ = 2

traffic red Δ = 3

Order No.	X	A	A1	B	D	D1	D2	H	H1	H2	H3	H4	No. of teeth	L
06611-7Δ105X	M5	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	16	10/15/20/25
06611-7Δ106X	M6	40	47	7,5	10	13	14,5	25,5	4	15	30	33,5	16	10/15/20/25/30/40/50
06611-7Δ206X	M6	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	20	15/20/25/30/40/50/60
06611-7Δ208X	M8	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	20	15/20/25/30/40/50/60
06611-7Δ210X	M10	65	75	9,5	13,5	18	19,5	29,5	6,5	17,5	41,5	45,5	20	20/25/30/40/50/60
06611-7Δ308X	M8	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	22	20/25/30/40/50/60
06611-7Δ310X	M10	80	91,5	11	16	21,5	23	38,5	10	24	53,5	58	22	20/25/30/40/50/60
06611-7Δ412X	M12	95	109	13	19	25,5	27,5	44,6	10	26	61	66	24	25/30/40/50/60
06611-7Δ516X	M16	110	126	15,5	23	30	32,5	50,6	12	33	72	77	26	30/40/50/60

Clamping levers, plastic

with male thread and clamping force intensifier



By using clamping levers with integrated clamping force intensifier, the clamping force can be increased by up to 75% compared to standard clamping levers.

Furthermore, this product can also be used by persons with limited hand strength (e.g. in rehabilitation) to achieve comparable clamping forces with less effort. Less effort is also needed to loosen the clamping lever.

The increase in clamping force is achieved by the integral needle roller thrust bearing, which generates very low surface friction on a rigid contact surface during clamping. The hardened thrust washers are designed for high clamping forces and the bearing with its high load rating guarantees a long service life.

The clamped component is permanently protected by the large, stationary contact surface. A washer is no longer required.

Due to the modular construction many special designs are available.

Material:
Handle fibreglass reinforced plastic with die-cast zinc toothed ring.
Steel parts stainless steel 1.4305.

Version:
Steel parts bright.
Axial needle bearing with hardened and ground thrust washer.

Sample order:
nlm 06611-10-2081X40 (lever black grey; include length L)

Note:
Δ Add the desired grip colour here.

Method of operation:
The handle lever is engaged in the toothed insert by means of a toothed ring when not actuated, enabling the thread to be tightened or loosened. By lifting the handle, it can be repositioned and re-engaged in the toothed ring by spring force.

Application:
Machine, equipment and plant construction, rehabilitation sector.

Advantages:
Significant increase of the clamping force with the same tightening torque.
High quality axial needle bearing with high load rating and long service life.
The component surface is protected by the stationary lower ring

On request:
Special versions.
Other colours and thread lengths.

Drawing reference:
1) flat point DIN 78

Clamping levers, plastic

with male thread and clamping force intensifier

black grey = 1

RAL 7021

orange = 2

RAL 2004

signal green = 86

RAL 6032

traffic red = 84

RAL 3020

colza yellow = 16

RAL 1021

traffic blue = 87

RAL 5017

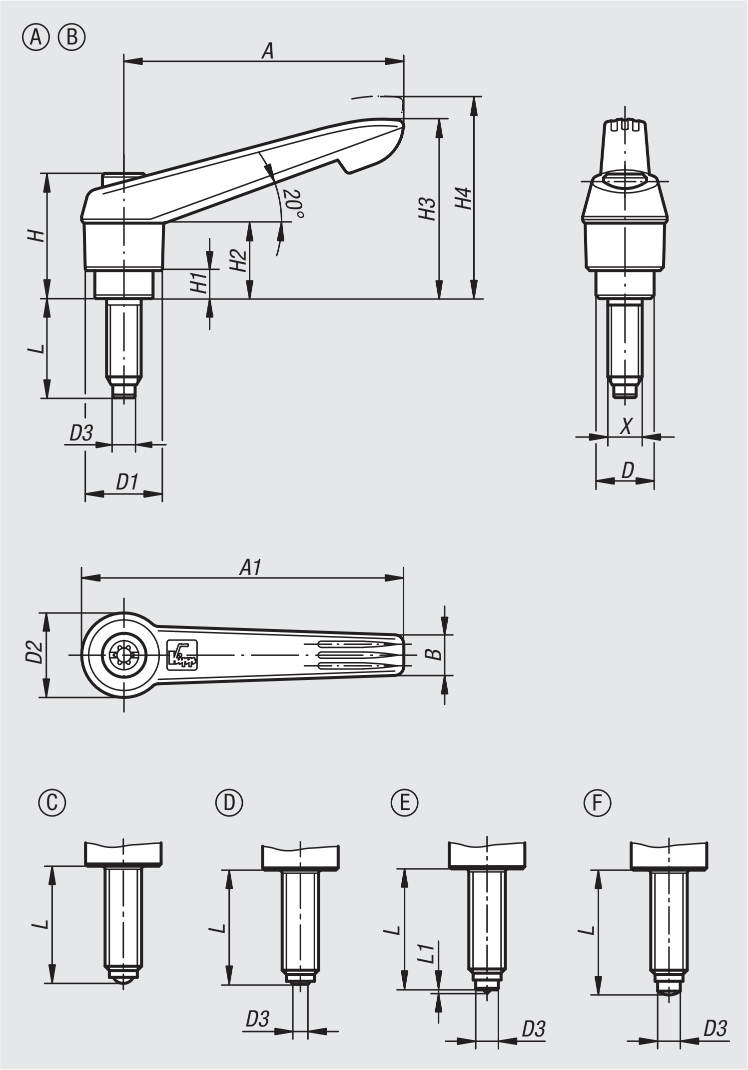
light grey = 88

RAL 7035

Order No.	X	D2	H	H2	H3	H4	A	A1	B	L
06611-10-208ΔX	M8	25	38,5	27,5	51,6	55,6	65	77,5	9,4	10/20/30/40
06611-10-310ΔX	M10	30	47	34	63,4	67,9	80	95	11,1	15/30/40/50
06611-10-410ΔX	M10	30	53,1	36	71,1	76,1	95,4	110,4	13,2	20/30/40/50
06611-10-512ΔX	M12	35	59,1	43	82,8	87,8	109,9	127,4	15,6	20/30/40/50

06612

Clamping levers with thrust pad



Material:
Handles fibreglass reinforced plastic with die-cast zinc toothed rings.
Steel parts grade 5.8.
Thrust pin, brass, steel or POM.
Ball in steel.

Version:
Steel parts black oxidised.

Sample order:
nlm 06612-12061X20 (include length L)

Note:
The various different thrust pins are used to avoid pressure marks, compensate for unevenness or increase the grip on the workpiece.
Where L ≥ 60 mm the thread length is always 60 mm.

On request:
Other threads, screw lengths, clamp lever colours and thrust pin types as well as special versions.
Dimension “H1” available in other lengths at extra cost.

Drawing reference:
Form A: brass thrust pin
Form B: POM thrust pin
Form C: with ball
Form D: with flattened ball
Form E: with point
Form F: with half-dog point

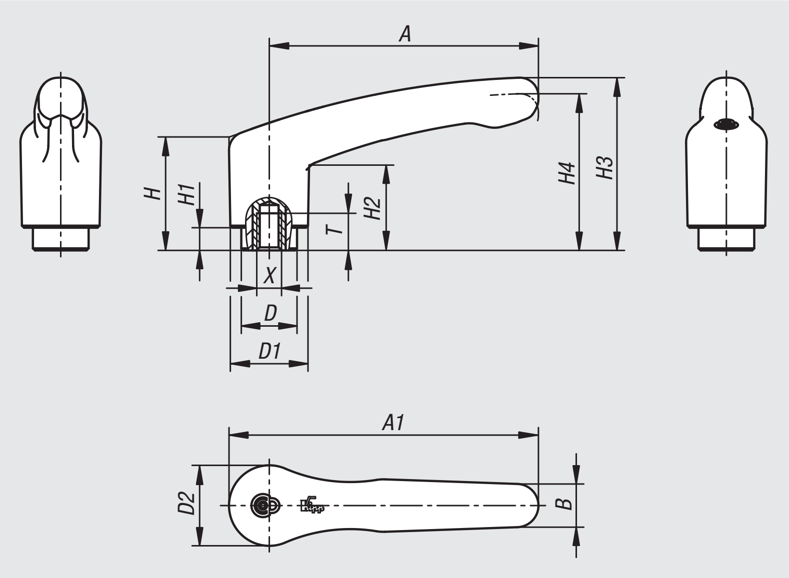
Clamping levers with thrust pad

Order No.	Form	Component material	X	A	A1	B	D	D1	D2	D3	Ball Ø	H	H1	H2	H3	H4	L	L1	No. of teeth
06612-11051X	A	pin brass	M5	40	47	7,5	10	13	14,5	3	-	24,5	4	15	30	33,5	20/30/40/50	-	16
06612-11061X	A	pin brass	M6	40	47	7,5	10	13	14,5	4	-	24,5	4	15	30	33,5	20/30/40/50	-	16
06612-12061X	A	pin brass	M6	65	75	9,5	13,5	18	19,5	4	-	28,5	6,5	17,5	41,5	45,5	20/30/40/50/60	-	20
06612-12081X	A	pin brass	M8	65	75	9,5	13,5	18	19,5	5,5	-	28,5	6,5	17,5	41,5	45,5	20/30/40/50/60	-	20
06612-12101X	A	pin brass	M10	65	75	9,5	13,5	18	19,5	7	-	28,5	6,5	17,5	41,5	45,5	20/30/40/50/60	-	20
06612-21051X	B	pin POM	M5	40	47	7,5	10	13	14,5	3	-	24,5	4	15	30	33,5	20,5/30,5/40,5/50,5	-	16
06612-21061X	B	pin POM	M6	40	47	7,5	10	13	14,5	3,5	-	24,5	4	15	30	33,5	19,8/29,8/39,8/49,8	-	16
06612-22061X	B	pin POM	M6	65	75	9,5	13,5	18	19,5	3,5	-	28,5	6,5	17,5	41,5	45,5	19,8/29,8/39,8/49,8/59,8	-	20
06612-22081X	B	pin POM	M8	65	75	9,5	13,5	18	19,5	5	-	28,5	6,5	17,5	41,5	45,5	19,6/29,6/39,6/49,6/59,6	-	20
06612-22101X	B	pin POM	M10	65	75	9,5	13,5	18	19,5	6,5	-	28,5	6,5	17,5	41,5	45,5	19,9/29,9/39,9/49,9/59,9	-	20
06612-31051X	C	ball steel	M5	40	47	7,5	10	13	14,5	-	3	24,5	4	15	30	33,5	19,5/29,5/39,5/49,5	-	16
06612-31061X	C	ball steel	M6	40	47	7,5	10	13	14,5	-	4	24,5	4	15	30	33,5	19,3/29,3/39,3/49,3	-	16
06612-32061X	C	ball steel	M6	65	75	9,5	13,5	18	19,5	-	4	28,5	6,5	17,5	41,5	45,5	19,3/29,3/39,3/49,3/59,3	-	20
06612-32081X	C	ball steel	M8	65	75	9,5	13,5	18	19,5	-	5,5	28,5	6,5	17,5	41,5	45,5	19,2/29,2/39,2/49,2/59,2	-	20
06612-32101X	C	ball steel	M10	65	75	9,5	13,5	18	19,5	-	7	28,5	6,5	17,5	41,5	45,5	19,7/29,7/39,7/49,7/59,7	-	20
06612-41051X	D	ball steel	M5	40	47	7,5	10	13	14,5	2	3	24,5	4	15	30	33,5	19,1/29,1/39,1/49,1	-	16
06612-41061X	D	ball steel	M6	40	47	7,5	10	13	14,5	3	4	24,5	4	15	30	33,5	18,6/28,6/38,6/48,6	-	16
06612-42061X	D	ball steel	M6	65	75	9,5	13,5	18	19,5	3	4	28,5	6,5	17,5	41,5	45,5	18,6/28,6/38,6/48,6/58,6	-	20
06612-42081X	D	ball steel	M8	65	75	9,5	13,5	18	19,5	4,1	5,5	28,5	6,5	17,5	41,5	45,5	18,3/28,3/38,3/48,3/58,3	-	20
06612-42101X	D	ball steel	M10	65	75	9,5	13,5	18	19,5	5,6	7	28,5	6,5	17,5	41,5	45,5	18,3/28,3/38,3/48,3/58,3	-	20
06612-51051X	E	steel point	M5	40	47	7,5	10	13	14,5	3	-	24,5	4	15	30	33,5	20/30/40/50	0,5	16
06612-51061X	E	steel point	M6	40	47	7,5	10	13	14,5	4	-	24,5	4	15	30	33,5	20/30/40/50	0,8	16
06612-52061X	E	steel point	M6	65	75	9,5	13,5	18	19,5	4	-	28,5	6,5	17,5	41,5	45,5	20/30/40/50/60	0,8	20
06612-52081X	E	steel point	M8	65	75	9,5	13,5	18	19,5	5,5	-	28,5	6,5	17,5	41,5	45,5	20/30/40/50/60	1	20
06612-52101X	E	steel point	M10	65	75	9,5	13,5	18	19,5	7	-	28,5	6,5	17,5	41,5	45,5	20/30/40/50/60	1,5	20
06612-61051X	F	half-dog point steel	M5	40	47	7,5	10	13	14,5	3	-	24,5	4	15	30	33,5	20,5/30,5/40,5/50,5	-	16
06612-61061X	F	half-dog point steel	M6	40	47	7,5	10	13	14,5	4	-	24,5	4	15	30	33,5	20,8/30,8/40,8/50,8	-	16
06612-62061X	F	half-dog point steel	M6	65	75	9,5	13,5	18	19,5	4	-	28,5	6,5	17,5	41,5	45,5	20,8/30,8/40,8/50,8/60,8	-	20
06612-62081X	F	half-dog point steel	M8	65	75	9,5	13,5	18	19,5	5,5	-	28,5	6,5	17,5	41,5	45,5	20,8/30,8/40,8/50,8/60,8	-	20
06612-62101X	F	half-dog point steel	M10	65	75	9,5	13,5	18	19,5	7	-	28,5	6,5	17,5	41,5	45,5	20,9/30,9/40,9/50,9/60,9	-	20

06613-10

Clamping levers, plastic with safety function

with female thread



Clamping levers with safety function prevent changes in the locking point through accidental opening or closing.
In the default position, the lever can be freely rotated and has no connection to the clamping point. The grip lever only engages when pushed down and the clamp can the loosened or tightened.
A spring sets the lever automatically into the default position when released.

Material:
Handle and insert made from reinforced plastic.
Bush, steel.

Sample order:
nlm 06613-10-2051

Advantages:
Protection against accidental opening or closing.
Closed grip contour without protruding edges.

On request:
Special versions.

Order No.	Main colour	X	T	D	D1	D2	H	H1	H2	H3	H4	A	A1	B	No. of teeth
06613-10-2051	black grey RAL 7021	M5	7,5	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	12
06613-10-2061	black grey RAL 7021	M6	9	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	12
06613-10-2081	black grey RAL 7021	M8	9	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	12
06613-10-20584	red RAL 3020	M5	7,5	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	12
06613-10-20684	red RAL 3020	M6	9	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	12
06613-10-20884	red RAL 3020	M8	9	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	12

Clamping levers, plastic with safety function

with male thread

Clamping levers with safety function prevent changes in the locking point through accidental opening or closing.
In the default position, the lever can be freely rotated and has no connection to the clamping point. The grip lever only engages when pushed down and the clamp can the loosened or tightened.
A spring sets the lever automatically into the default position when released.

Material:
Handle and insert reinforced plastic.
Screw steel 5.8.

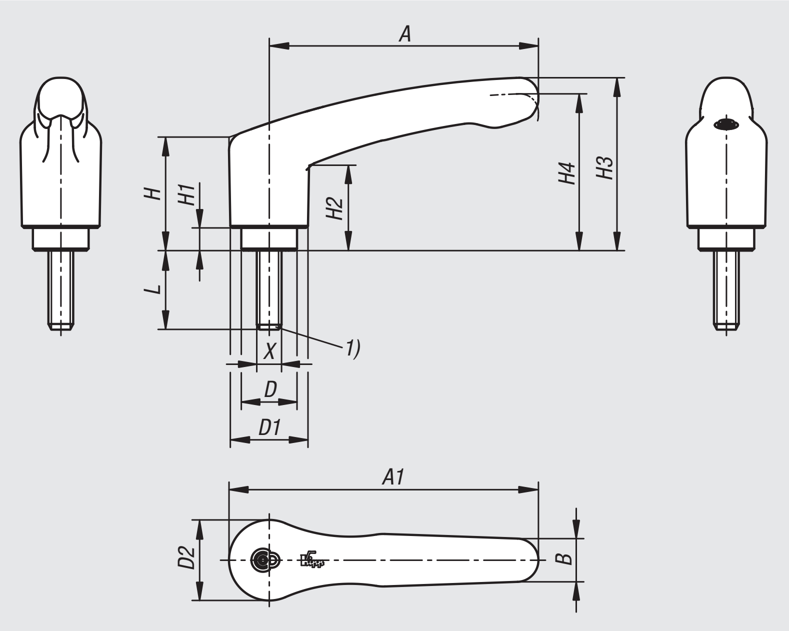
Version:
Steel trivalent blue passivated.

Sample order:
nlm 06613-11-2051X20 (include length L)

Advantages:
Protection against accidental opening or closing.
Closed grip contour without protruding edges.

On request:
Special versions.

Drawing reference:
1) flat point DIN 78

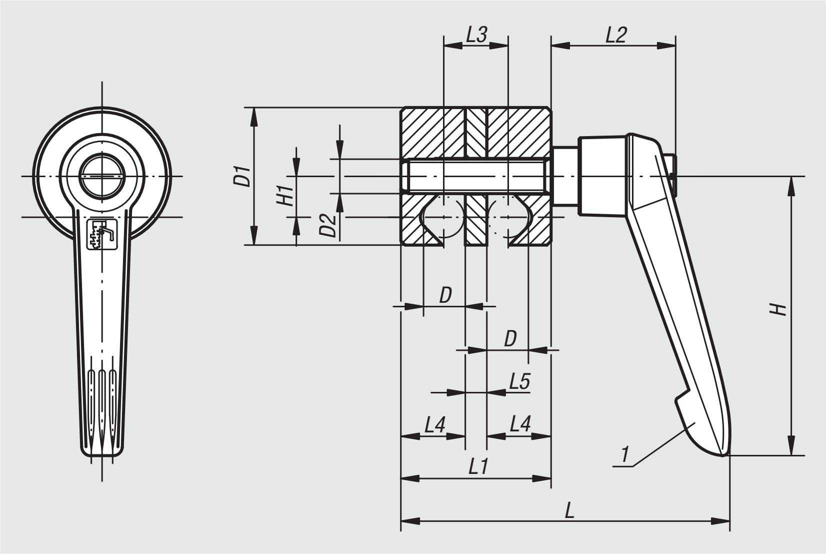


press to
engage
(safety function)

Order No.	Main colour	X	D	D1	D2	H	H1	H2	H3	H4	A	A1	B	L	No. of teeth
06613-11-2051X	black grey RAL 7021	M5	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	10/20/30/40	12
06613-11-2061X	black grey RAL 7021	M6	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	10/20/30/40	12
06613-11-2081X	black grey RAL 7021	M8	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	10/20/30/40	12
06613-11-20584X	red RAL 3020	M5	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	10/20/30/40	12
06613-11-20684X	red RAL 3020	M6	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	10/20/30/40	12
06613-11-20884X	red RAL 3020	M8	13,5	18,8	19,5	27,4	5,5	20,7	41,9	38	65,2	75	10,5	10/20/30/40	12

Notes

Clamping joints



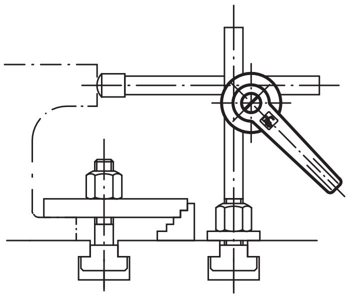
Material:
Clamping lever:
Handle fibreglass reinforced thermoplastic, black grey.
Steel parts:
grade 5.8.
Remaining components:
high-strength aluminium.

Version:
Steel parts black oxidised.
Aluminium nickel silver anodised.

Sample order:
nlm 06620-03

Note:
Clamping joints are used to clamp round cross sections (bars, tubes, etc.) and are infinitely adjustable.
The simple design together with the adjustable clamping lever permits rapid clamping.

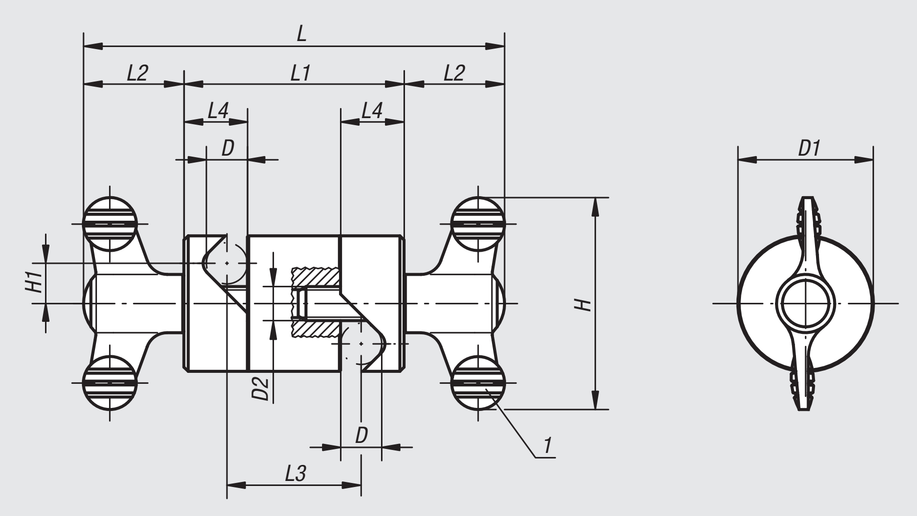
Drawing reference:
1) Clamping lever



Order No.	D	D1	D2	H	H1	L	L1	L2	L3	L4	L5
06620-01	8	28	M8	65	8,5	72	31	29	13	13	5
06620-02	10	32	M8	65	9,5	76	35	29	15	15	5
06620-03	12	36	M8	65	10,5	81	40	29	18	17	6
06620-04	16	45	M10	80	13,5	103	50	37,5	22	22	6
06620-05	20	74	M10	95	22	131	70	42,5	30	30	10

Clamping joints

individually adjustable



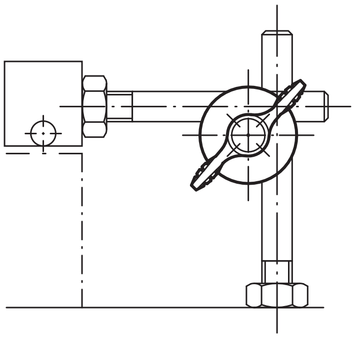
Material:
Wing grip:
grip black grey thermoplastic.
Screw steel 5.8.
Remaining components:
high-strength aluminium.

Version:
Steel parts trivalent blue-passivated.
Aluminium nickel silver anodised.

Sample order:
nlm 06621-02

Note:
Clamping joints are used to clamp round cross sections (bars, tubes, etc.) and are individually and infinitely adjustable.
The simple design together with the wing grip permits rapid clamping.

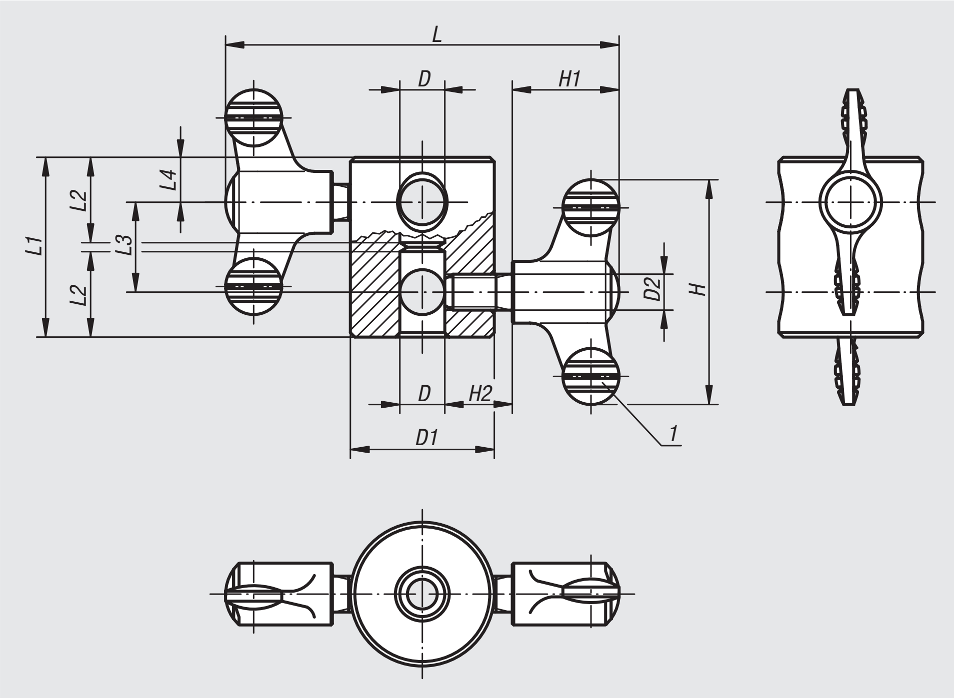
Drawing reference:
1) wing grip



Order No.	D	D1	D2	H	H1	L	L1	L2	L3	L4
06621-01	8	28	M8	50	8,5	90	42	24	24	13
06621-02	10	32	M8	50	9,5	100	52	24	32	15
06621-03	12	36	M8	50	10,5	104	56	24	34	17
06621-04	16	45	M10	75	13,5	143,2	72	35,6	44	22
06621-05	20	74	M10	75	22	173,2	102	35,6	62	30

06622

Multiple connectors



Material:
Wing grip:
grip black grey thermoplastic.
Screw steel 5.8.
Body:
high-strength aluminium.

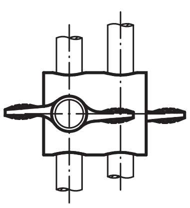
Version:
Steel parts trivalent blue-passivated.
Aluminium nickel silver anodised.

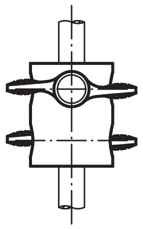
Sample order:
nlm 06622-04

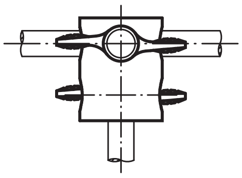
Note:
Multiple connectors are used to extend round cross sections (bars, tubes, etc.) in a coaxial or parallel arrangement.
By a parallel arrangement, a strengthening or stiffening of the construction can be achieved.
The bore system in the body also allows for the production of right-angled connections.

Drawing reference:
1) wing grip

Arrangement:


parallel


coaxial


right-angled

Order No.	D	D1	D2	H	H1	H2	L	L1	L2	L3	L4
06622-01	8	28	M8	50	24	15	86	36	17	20	8
06622-02	10	32	M8	50	24	15	88	40	19	20	10
06622-03	12	36	M8	50	24	15	90	44	21	20	12
06622-04	16	45	M10	75	35,6	20	127,2	56	27	24	16

06648

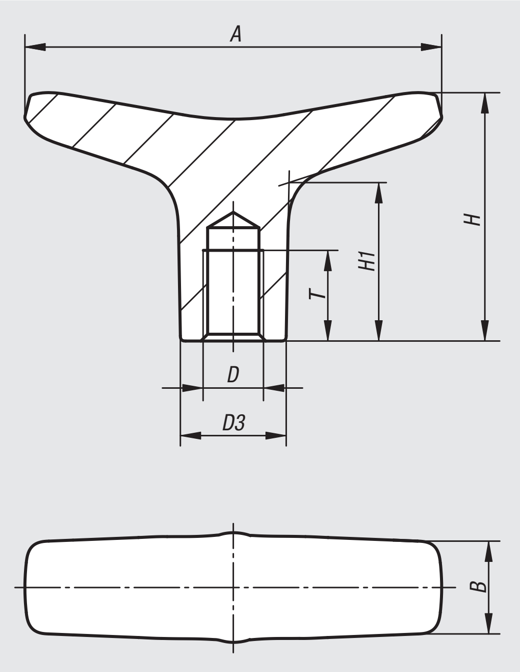
T-grips

stainless steel

Material:
Stainless steel 1.4308.

Version:
Electropolished or blasted.

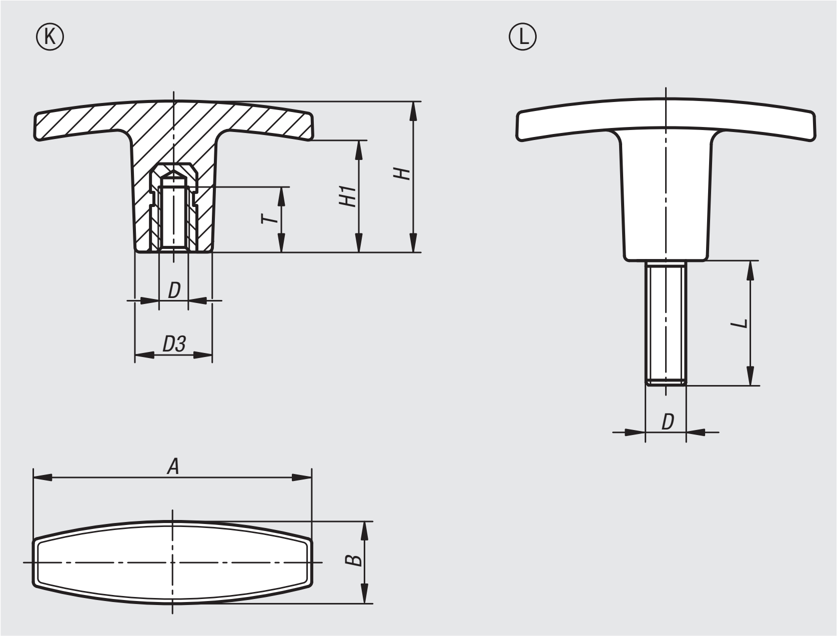
Sample order:
nlm 06648-55061



Order No.	Surface finish body	A	B	D	D3	H	H1	T
06648-55061	blasted	55,2	12,3	M6	14	32,9	21	12
06648-55081	blasted	55,2	12,3	M8	14	32,9	21	12
06648-65061	blasted	65,3	14	M6	16	37	22,7	16
06648-65081	blasted	65,3	14	M8	16	37	22,7	16
06648-65101	blasted	65,3	14	M10	16	37	22,7	16
06648-75101	blasted	75,3	17,8	M10	20	41,2	24,9	16
06648-75121	blasted	75,3	17,8	M12	20	41,2	24,9	16
06648-55062	electropolished	55,2	12,3	M6	14	32,9	21	12
06648-55082	electropolished	55,2	12,3	M8	14	32,9	21	12
06648-65062	electropolished	65,3	14	M6	16	37	22,7	16
06648-65082	electropolished	65,3	14	M8	16	37	22,7	16
06648-65102	electropolished	65,3	14	M10	16	37	22,7	16
06648-75102	electropolished	75,3	17,8	M10	20	41,2	24,9	16
06648-75122	electropolished	75,3	17,8	M12	20	41,2	24,9	16

06649

T-grips

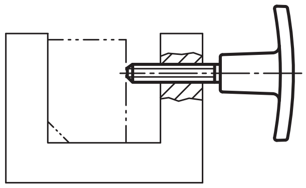


Material:
Fibreglass reinforced thermoplastic.
Tapped bush brass.
Screw steel.

Version:
Grip, black.
Screw electro zinc-plated.

Sample order:
nlm 06649-25005X15 (include length L)

On request:
Grip colour red, yellow, green, blue, white or grey (min. quanitity 1000).

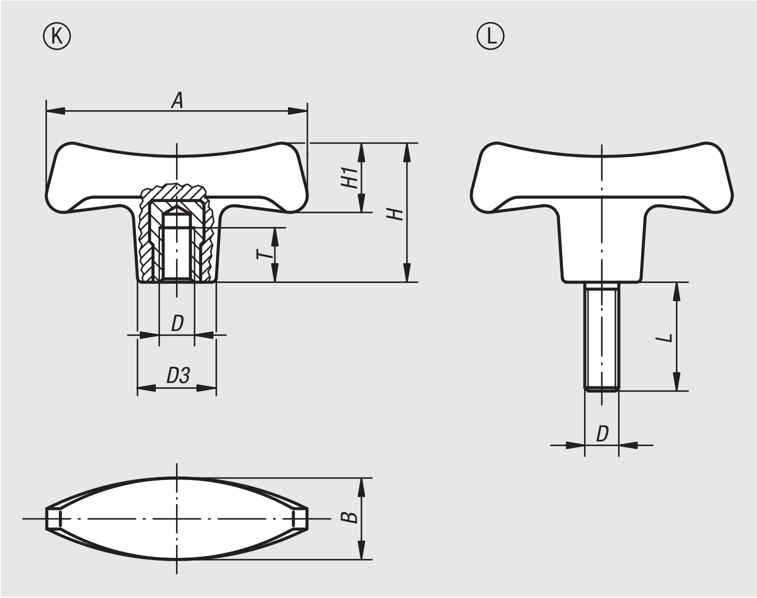


Order No.	Form	A	B	D	D3	H	H1	T
06649-14005	K	40	13	M5	13	30,5	20	10
06649-15005	K	50	15	M5	14	24	16	10
06649-16006	K	60	17	M6	16	31,5	23	12
06649-17108	K	71	19,5	M8	20	36	19	20
06649-17110	K	71	19,5	M10	20	36	19	20
06649-18010	K	80	26	M10	26	39,5	26	25
06649-18012	K	80	26	M12	26	39,5	26	25

Order No.	Form	A	B	D	D3	H	H1	L
06649-24005X	L	40	13	M5	13	30,5	20	15
06649-25005X	L	50	15	M5	14	24	16	15/20
06649-26006X	L	60	17	M6	16	31,5	23	20/25
06649-27108X	L	71	19,5	M8	20	36	19	20/30
06649-27110X	L	71	19,5	M10	20	36	19	20/30
06649-28010X	L	80	26	M10	26	39,5	26	30
06649-28012X	L	80	26	M12	26	39,5	26	40

06650

T-grips

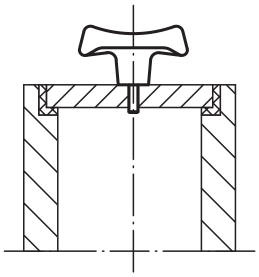


Material:
Thermoset PF 31, black.
Steel bush and stud, electro zinc-plated.

Version:
High-gloss polished.

Sample order:
nlm 06650-27006X18 (include length L)

On request:
Other screw sizes, screw lengths and colours.



Order No.	Form	A	B	D	D3	H	H1	T
06650-17006	K	70	22	M6	19,6	38,8	20,2	12
06650-17008	K	70	22	M8	19,6	38,8	20,2	14
06650-17010	K	70	22	M10	19,6	38,8	20,2	14
06650-18008	K	80	25	M8	22,3	44	23	14
06650-18010	K	80	25	M10	22,3	44	23	22
06650-19010	K	90	28	M10	25	49,6	26	22
06650-19012	K	90	28	M12	25	49,6	26	21

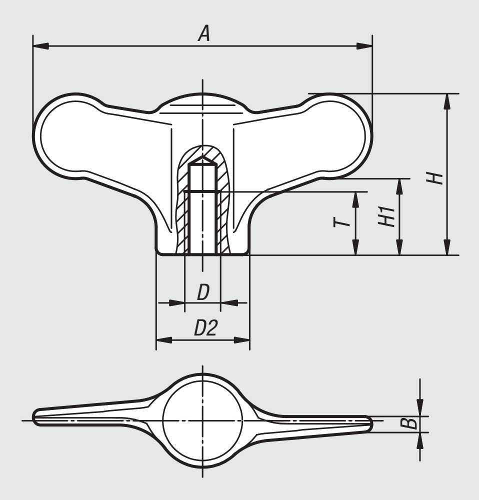
Order No.	Form	A	B	D	D3	H	H1	L
06650-27006X	L	70	22	M6	19,6	38,8	20,2	18
06650-27008X	L	70	22	M8	19,6	38,8	20,2	24
06650-28010X	L	80	25	M10	22,3	44	23	20/30
06650-29010X	L	90	28	M10	25	49,6	26	30
06650-29012X	L	90	28	M12	25	49,6	26	24

06651

Wing grips

internal thread, stainless steel

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Stainless steel 1.4308.

Version:
Abrasive blasted or ground and polished.

Sample order:
nlm 06651-105

On request:
With external threads.

Order No.	Finish	A	B	D	D2	H	H1	T
06651-904	polished	38	1,7	M4	10,5	18	8,5	9
06651-905	polished	38	1,7	M5	10,5	18	8,5	9
06651-906	polished	38	1,7	M6	10,5	18	8,5	9
06651-105	polished	50	2,3	M5	14	24	11,5	12
06651-106	polished	50	2,3	M6	14	24	11,5	12
06651-208	polished	75	3,4	M8	21	35	16,5	15
06651-210	polished	75	3,4	M10	21	35	16,5	15
06651-9041	blasted	38	1,7	M4	10,5	18	8,5	9
06651-9051	blasted	38	1,7	M5	10,5	18	8,5	9
06651-9061	blasted	38	1,7	M6	10,5	18	8,5	9
06651-1051	blasted	50	2,3	M5	14	24	11,5	12
06651-1061	blasted	50	2,3	M6	14	24	11,5	12
06651-2081	blasted	75	3,4	M8	21	35	16,5	15
06651-2101	blasted	75	3,4	M10	21	35	16,5	15

06652

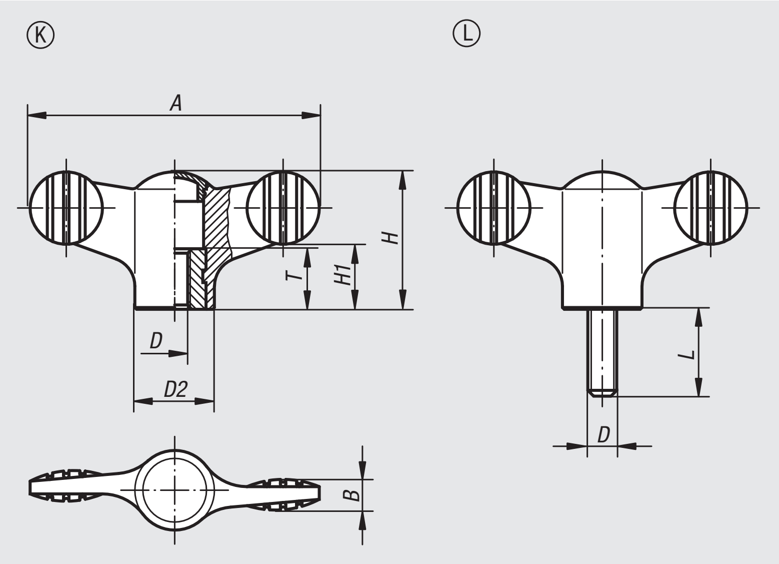
Wing grips

Material:
Grip black thermoplastic.
Bush and screw steel 5.8 or stainless steel 1.4305.

Version:
Bush or screw trivalent blue passivated steel or bright stainless steel.

Sample order:
nlm 06652-1057X20 (cap colour colza yellow; include length L)

Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.



black grey	light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7
 RAL 7021	 RAL 7035	 RAL 3020	 RAL 1021

Wing grips with internal thread

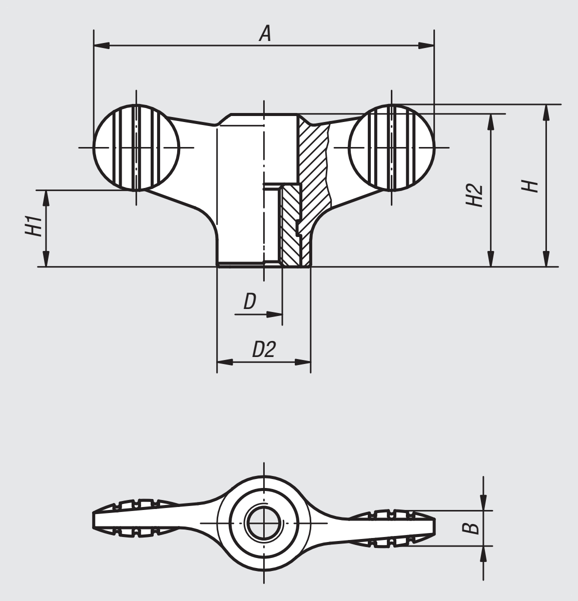
Order No. steel	Order No. stainless steel	A	B	D	D2	H	H1	T
06652-904Δ	**06652-0904Δ**	38	4,5	M4	12	18	8,5	10
06652-905Δ	**06652-0905Δ**	38	4,5	M5	12	18	8,5	10
06652-906Δ	**06652-0906Δ**	38	4,5	M6	12	18	8,5	10
06652-105Δ	**06652-0105Δ**	50	5	M5	14	24	11,5	10
06652-106Δ	**06652-0106Δ**	50	5	M6	14	24	11,5	10
06652-208Δ	**06652-0208Δ**	75	7	M8	21	35,6	16,5	14
06652-210Δ	**06652-0210Δ**	75	7	M10	21	35,6	16,5	14

Wing grips with external thread

Order No. steel	Order No. stainless steel	A	B	D	D2	H	H1	L
06652-904ΔX	**06652-0904ΔX**	38	4,5	M4	12	18	8,5	10/15
06652-905ΔX	**06652-0905ΔX**	38	4,5	M5	12	18	8,5	15/20/30
06652-906ΔX	**06652-0906ΔX**	38	4,5	M6	12	18	8,5	20/30/40
06652-105ΔX	**06652-0105ΔX**	50	5	M5	14	24	11,5	15/20
06652-106ΔX	**06652-0106ΔX**	50	5	M6	14	24	11,5	20/30/40
06652-108ΔX	**06652-0108ΔX**	50	5	M8	14	24	11,5	20/30/40
06652-208ΔX	**06652-0208ΔX**	75	7	M8	21	35,6	16,5	20/30/40
06652-210ΔX	**06652-0210ΔX**	75	7	M10	21	35,6	16,5	20/30/40/50

Wing grips

with tapped through bush



Material:
Grip thermoplastic.
Bush steel 5.8 or stainless steel 1.4305.

Version:
Steel trivalent blue passivated, stainless steel bright.

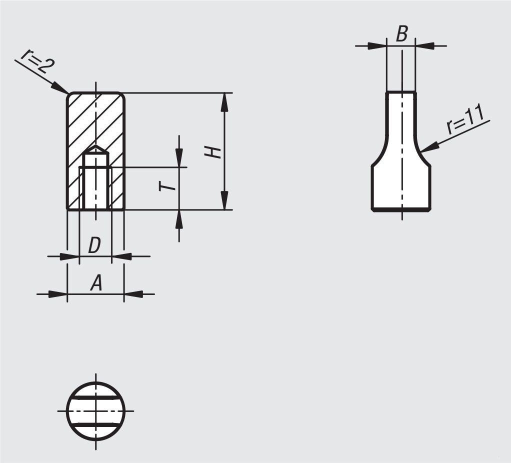
Sample order:
nlm 06652-1904

Order No.	Component material	A	B	D	D2	H	H1	H2
06652-1904	steel	38	4,5	M4	12	18	8,5	16,1
06652-1905	steel	38	4,5	M5	12	18	8,5	16,1
06652-1906	steel	38	4,5	M6	12	18	8,5	16,1
06652-1105	steel	50	5	M5	14	24	11,5	22
06652-1106	steel	50	5	M6	14	24	11,5	22
06652-1208	steel	75	7	M8	21	35,6	17	33,3
06652-1210	steel	75	7	M10	21	35,6	17	33,3
06652-10904	stainless steel	38	4,5	M4	12	18	8,5	16,1
06652-10905	stainless steel	38	4,5	M5	12	18	8,5	16,1
06652-10906	stainless steel	38	4,5	M6	12	18	8,5	16,1
06652-10105	stainless steel	50	5	M5	14	24	11,5	22
06652-10106	stainless steel	50	5	M6	14	24	11,5	22
06652-10208	stainless steel	75	7	M8	21	35,6	17	33,3
06652-10210	stainless steel	75	7	M10	21	35,6	17	33,3

06651-03

Wing nuts narrow

in Hygienic DESIGN



Material:
Stainless steel 1.4404.

Version:
Polished.

Sample order:
nlm 06651-03-04

Note:
The wing nut makes simple screw connections feasible. They can be easily opened or re-tightened without tools.
The complete surface is polished with a surface finish of less than Ra 0.8 µm. The contour is rounded with smooth transitions. Due to the polished surface dirt and residue from products or cleaners seldom adheres. Easy cleaning is ensured.

On request:
Inch threads, external threads.

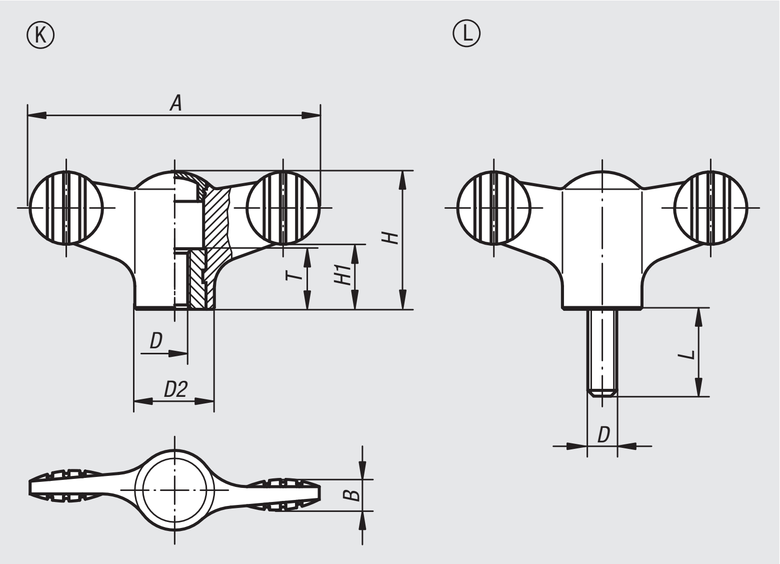
Wing nuts narrow in Hygienic DESIGN

Order No.	A	B	D	H	T
06651-03-04	9	4,5	M4	20	6
06651-03-05	10	4,5	M5	22	6
06651-03-06	12	5,5	M6	22	7
06651-03-08	16	8	M8	25	9
06651-03-10	20	10	M10	30	11

Notes

06652

Wing grips antistatic



Material:
Thermoplastic, graphite black.
Bush or screw steel 5.8.

Version:
Screw blue passivated.

Sample order:
nlm 06652-1110624X20

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Wing grips antistatic with internal thread

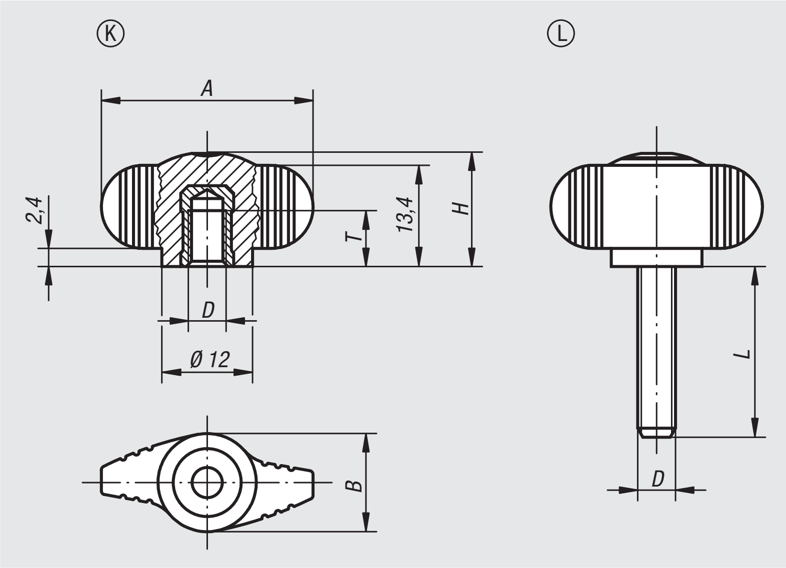
Order No.	Form	A	B	D	D2	H	H1	T
06652-1110624	K	50	5	M6	14	24	11,5	10

Wing grips antistatic with external thread

Order No.	Form	A	B	D	D2	H	H1	L
06652-1110624X20	L	50	5	M6	14	24	11,5	20

06652

Wing grips “Miniwing”



Material:
Grip black grey thermoplastic.
Bush brass or stainless steel 1.4305.
Screw steel 5.8 or stainless steel 1.4305.

Version:
Steel trivalent blue passivated.
Stainless steel, bright.

Sample order:
nlm 06652-005X10 (include length L)

Wing grips “Miniwing” with internal thread

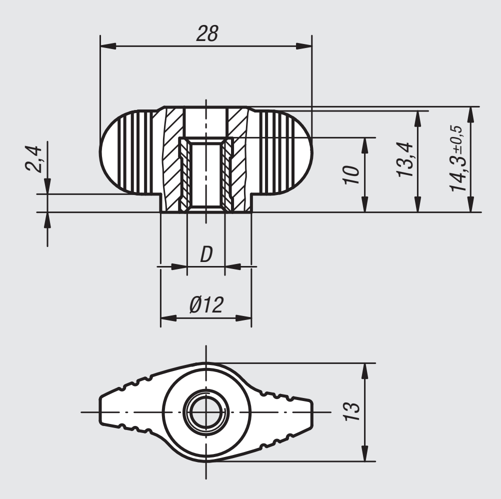
Order No.	Form	Component material	A	B	D	H	T
06652-004	K	brass	28	13	M4	15	6
06652-005	K	brass	28	13	M5	15	7,5
06652-006	K	brass	28	13	M6	15	9
06652-0004	K	stainless steel	28	13	M4	15	6
06652-0005	K	stainless steel	28	13	M5	15	7,5
06652-0006	K	stainless steel	28	13	M6	15	9

Wing grips “Miniwing” with external thread

Order No. steel	Order No. stainless steel	Form	A	B	D	H	L
06652-004X	**06652-0004X**	L	28	13	M4	15	8
06652-005X	**06652-0005X**	L	28	13	M5	15	10/15/20
06652-006X	**06652-0006X**	L	28	13	M6	15	10/15/20/25/30
06652-008X	**06652-0008X**	L	28	13	M8	15	20/25/30/40

Wing grips “Miniwing”

with tapped through bush



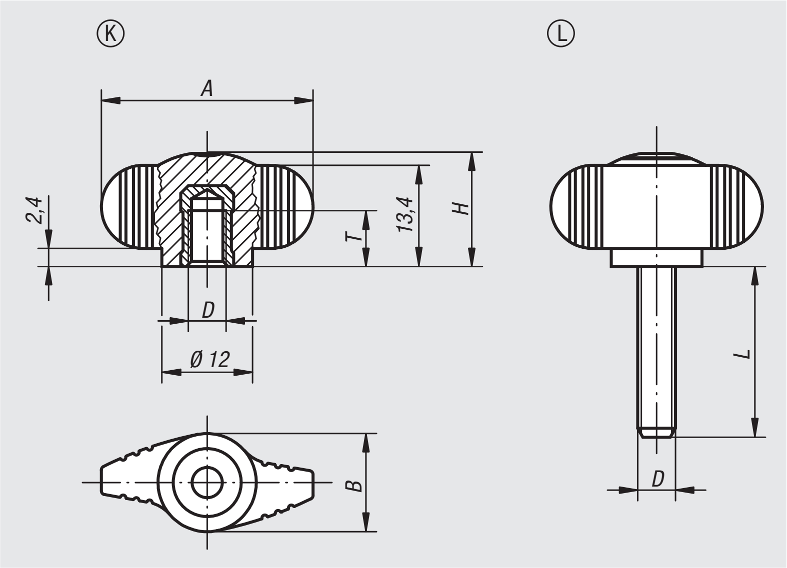
Material:
Grip thermoplastic.
Bush steel 5.8 or stainless steel 1.4305.

Version:
Steel trivalent blue passivated.
Stainless steel, bright.

Sample order:
nlm 06652-1004

Order No.	Component material	D
06652-1004	steel	M4
06652-1005	steel	M5
06652-1006	steel	M6
06652-10004	stainless steel	M4
06652-10005	stainless steel	M5
06652-10006	stainless steel	M6

Wing grips “Miniwing” antistatic



Material:
Thermoplastic, graphite black.
Bushes steel or threaded pins steel 5.8.

Version:
Screw blue passivated.

Sample order:
nlm 06652-1100624X15

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Wing grips “Miniwing” antistatic with internal thread

Order No.	A	B	D	H	T
06652-1100624	28	13	M6	15	9

Wing grips “Miniwing” antistatic with external thread

Order No.	A	B	D	H	L
06652-1100624X15	28	13	M6	15	15

06660

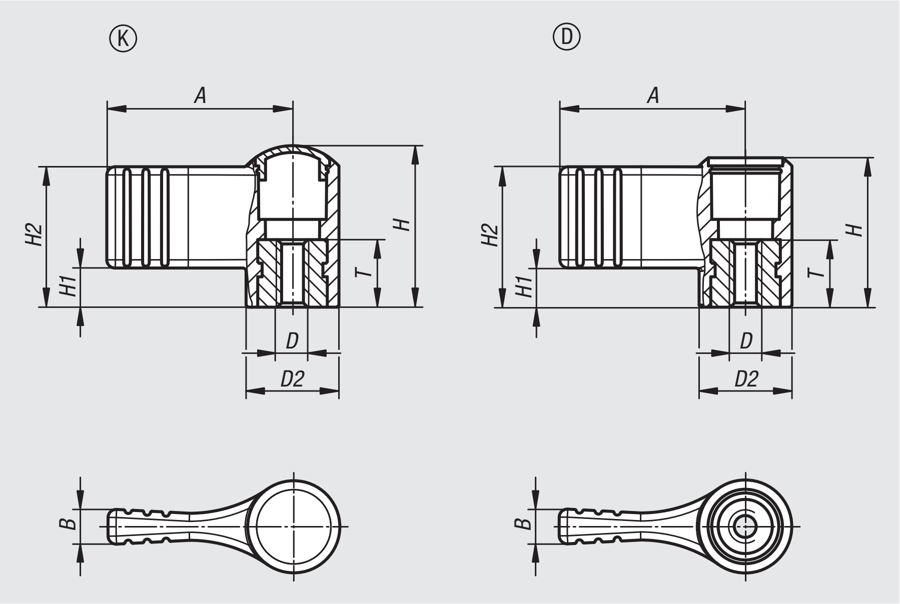
Wing grips one-sided

Material:
Thermoplastic.
Bush steel 5.8 or stainless steel 1.4305.

Version:
Steel trivalent blue passivated, stainless steel bright.

Sample order:
nlm 06660-09046 (Bush M4 stainless steel, cap traffic red.)

Note:
Δ Add the desired cap colour here.
No colour code is required for black grey caps.



black grey	light grey Δ = 5	traffic red Δ = 6	colza yellow Δ = 7
			
RAL 7021	RAL 7035	RAL 3020	RAL 1021

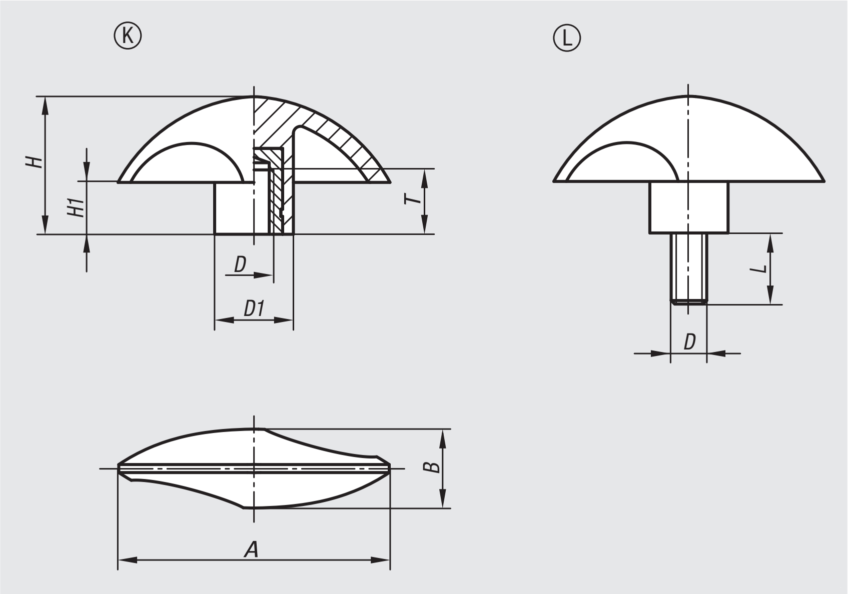
Wing grips, one-sided with cap

Order No. steel	Order No. stainless steel	Form	D	D2	A	B	H	H1	H2	T
06660-904Δ	**06660-0904Δ**	K	M4	12	22	4,4	18	4,5	15,5	10
06660-905Δ	**06660-0905Δ**	K	M5	12	22	4,4	18	4,5	15,5	10
06660-906Δ	**06660-0906Δ**	K	M6	12	22	4,4	18	4,5	15,5	10
06660-105Δ	**06660-0105Δ**	K	M5	14	27,5	5,1	24	5,8	20,8	10
06660-106Δ	**06660-0106Δ**	K	M6	14	27,5	5,1	24	5,8	20,8	10
06660-208Δ	**06660-0208Δ**	K	M8	21	37,5	6,3	36	8,5	30,5	14
06660-210Δ	**06660-0210Δ**	K	M10	21	37,5	6,3	36	8,5	30,5	14

Wing grips, one-sided without cap

Order No. steel	Order No. stainless steel	Form	A	B	D	D2	H	H1	H2	T
06660-1904	**06660-10904**	D	22	4,4	M4	12	16,1	4,5	15,5	10
06660-1905	**06660-10905**	D	22	4,4	M5	12	16,1	4,5	15,5	10
06660-1906	**06660-10906**	D	22	4,4	M6	12	16,1	4,5	15,5	10
06660-1105	**06660-10105**	D	27,5	5,1	M5	14	22,1	5,8	20,8	10
06660-1106	**06660-10106**	D	27,5	5,1	M6	14	22,1	5,8	20,8	10
06660-1208	**06660-10208**	D	37,5	6,3	M8	21	33,3	8,5	30,5	14
06660-1210	**06660-10210**	D	37,5	6,3	M10	21	33,3	8,5	30,5	14

Wing grips



Material:
Grip polyamide, glass bead reinforced.
Bush brass or steel.
Screw steel.

Version:
Steel electro zinc-plated.

Sample order:
nlm 06665-15006

Note:
Temperature resistance from -50 °C to 130 °C.
Resistant to common chemicals and oils.

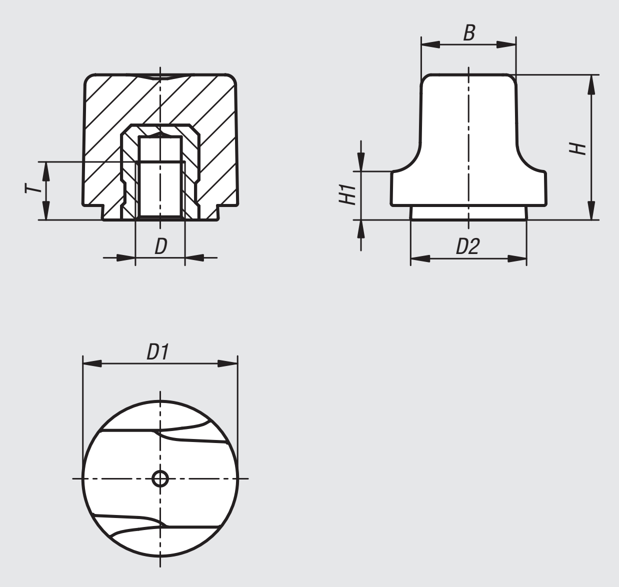
Wing grips with internal thread

Order No.	Form	A	B	D	D1	H	H1	T
06665-15006	K	51	15	M6	15	25,5	9,5	14
06665-16008	K	61,5	18	M8	18	31	11,5	14
06665-17510	K	76	22	M10	22	38,5	14,5	14

Wing grips with external thread

Order No.	Form	A	B	D	D1	H	H1	L
06665-25006X15	L	51	15	M6	15	25,5	9,5	15
06665-26008X20	L	61,5	18	M8	18	31	11,5	20
06665-27510X20	L	76	22	M10	22	38,5	14,5	20

Grip nuts



Material:
Thermoplastic black.
Bush steel, stainless steel or brass.

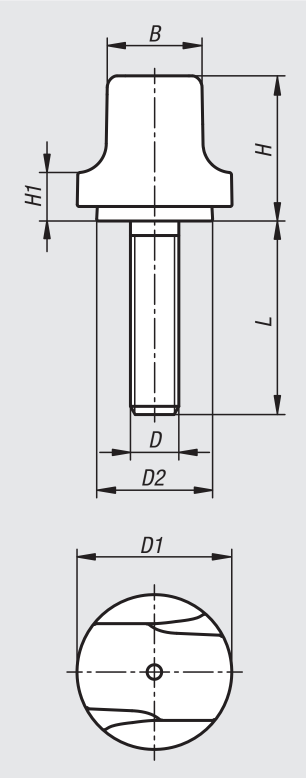
Version:
Bush blue passivated steel, stainless steel and brass bright.

Sample order:
nlm 06666-103

Order No.	Component material	B	D	D1	D2	H	H1	T
06666-103	brass	10	M3	16	12	15	5	4,5
06666-104	brass	10	M4	16	12	15	5	6
06666-204	brass	12,3	M4	20	15	18,5	6	6
06666-205	brass	12,3	M5	20	15	18,5	6	6
06666-305	steel	15,3	M5	25	18,7	22,9	7,3	8,5
06666-306	steel	15,3	M6	25	18,7	22,9	7,3	9
06666-1003	stainless steel	10	M3	16	12	15	5	4,5
06666-1004	stainless steel	10	M4	16	12	15	5	6
06666-2004	stainless steel	12,3	M4	20	15	18,5	6	6
06666-2005	stainless steel	12,3	M5	20	15	18,5	6	6
06666-3005	stainless steel	15,3	M5	25	18,7	22,9	7,3	8,5
06666-3006	stainless steel	15,3	M6	25	18,7	22,9	7,3	9

06666

Grip screws



Material:
Thermoplastic black. Screw steel or stainless steel.

Version:
Screw blue passivated steel or bright stainless steel.

Sample order:
nlm 06666-103X8 (include length L)

Order No. steel	Order No. stainless steel	B	D	D1	D2	H	H1	L
06666-103X	**06666-1003X**	10	M3	16	12	15	5	8/10/12/15
06666-104X	**06666-1004X**	10	M4	16	12	15	5	10/15/20
06666-105X	**06666-1005X**	10	M5	16	12	15	5	10/15/20
06666-204X	**06666-2004X**	12,3	M4	20	15	18,5	6	10/15/20
06666-205X	**06666-2005X**	12,3	M5	20	15	18,5	6	10/15/20/25
06666-206X	**06666-2006X**	12,3	M6	20	15	18,5	6	10/15/20/25
06666-305X	**06666-3005X**	15,3	M5	25	18,7	22,9	7,3	10/15/20/25
06666-306X	**06666-3006X**	15,3	M6	25	18,7	22,9	7,3	10/15/20/25
06666-308X	**06666-3008X**	15,3	M8	25	18,7	22,9	7,3	15/20/25/30

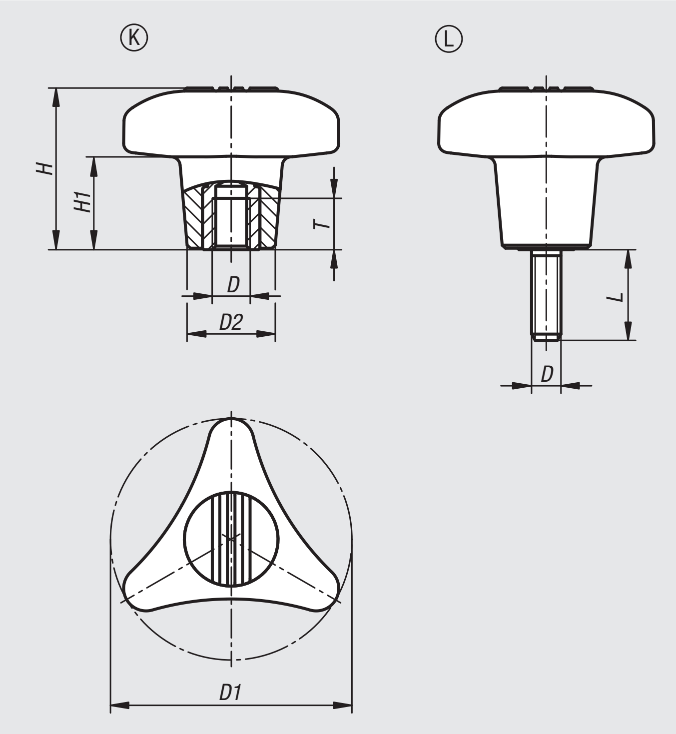
Triangular grips

Material:
Grip glass-bead reinforced thermoplastic.
Cap thermoplastic.
Steel parts grade 5.8.

Version:
Grip and cap black grey (RAL 7021).
Steel parts blue-passivated.

Sample order:
nlm 06699-18010X15 (include length L)

On request:
Other screw lengths and colours.
Metal parts stainless steel.



Triangular grips with internal thread

Order No.	Form	D	D1	D2	H	H1	T
06699-18008	K	M8	80	29,2	53,5	31	17
06699-18010	K	M10	80	29,2	53,5	31	17
06699-18012	K	M12	80	29,2	53,5	31	17

Triangular grips with external thread

Order No.	Form	D	D1	D2	H	H1	L
06699-18008X	L	M8	80	29,2	53,5	31	15/20/30/40/50
06699-18010X	L	M10	80	29,2	53,5	31	15/20/30/40/50
06699-18012X	L	M12	80	29,2	53,5	31	15/20/30/40/50

06702

Triangular grips

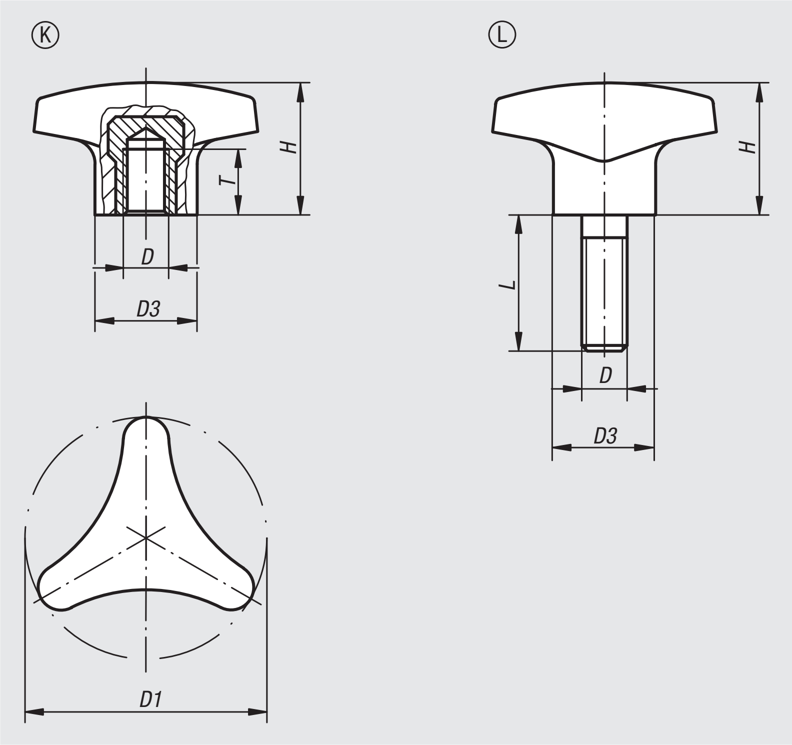
with high collar

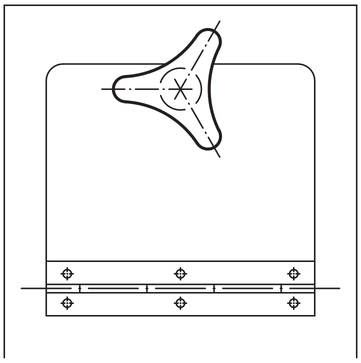
Material:
Black thermoset PF 31.
Bush and screw electro zinc-plated steel or bright stainless steel.

Version:
High-gloss polished.

Sample order:
nlm 06702-14008X20

On request:
Other screw sizes, screw lengths and colours.





Triangular grips with high collar, internal thread

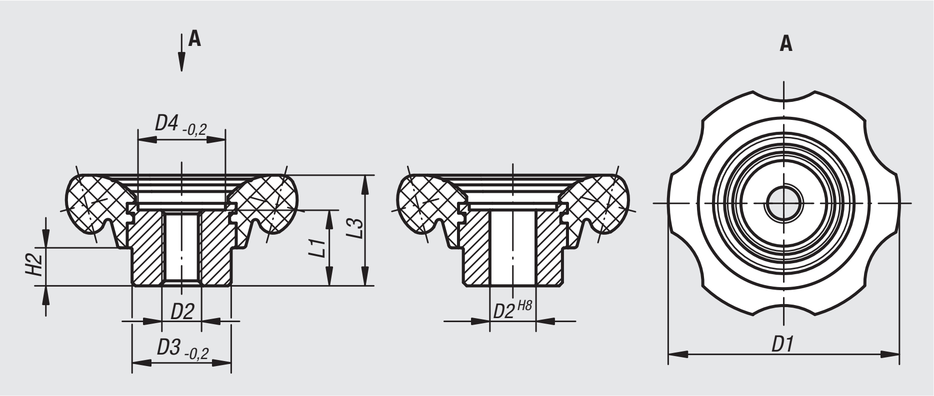
Order No.	Form	Component material	D	D1	D3	H	T
06702-14006	K	steel	M6	40	14	22	12
06702-15008	K	steel	M8	50	18	28	14
06702-16210	K	steel	M10	62	22	35	14
06702-24006	K	stainless steel	M6	40	12	22	9
06702-25008	K	stainless steel	M8	50	15	28	13
06702-26210	K	stainless steel	M10	62	18	35	13

Triangular grips with high collar, external thread

Order No.	Form	Component material	D	D1	D3	H	L
06702-14006X15	L	steel	M6	40	14	22	15
06702-14008X20	L	steel	M8	40	14	22	20
06702-15008X20	L	steel	M8	50	18	28	20
06702-15010X25	L	steel	M10	50	22	28	25
06702-16210X25	L	steel	M10	62	22	35	25
06702-24006X20	L	stainless steel	M6	40	12	22	20
06702-24008X20	L	stainless steel	M8	40	12	22	20
06702-25008X20	L	stainless steel	M8	50	15	28	20
06702-25010X30	L	stainless steel	M10	50	15	28	30
06702-26210X30	L	stainless steel	M10	62	18	35	30

06830

Handwheels

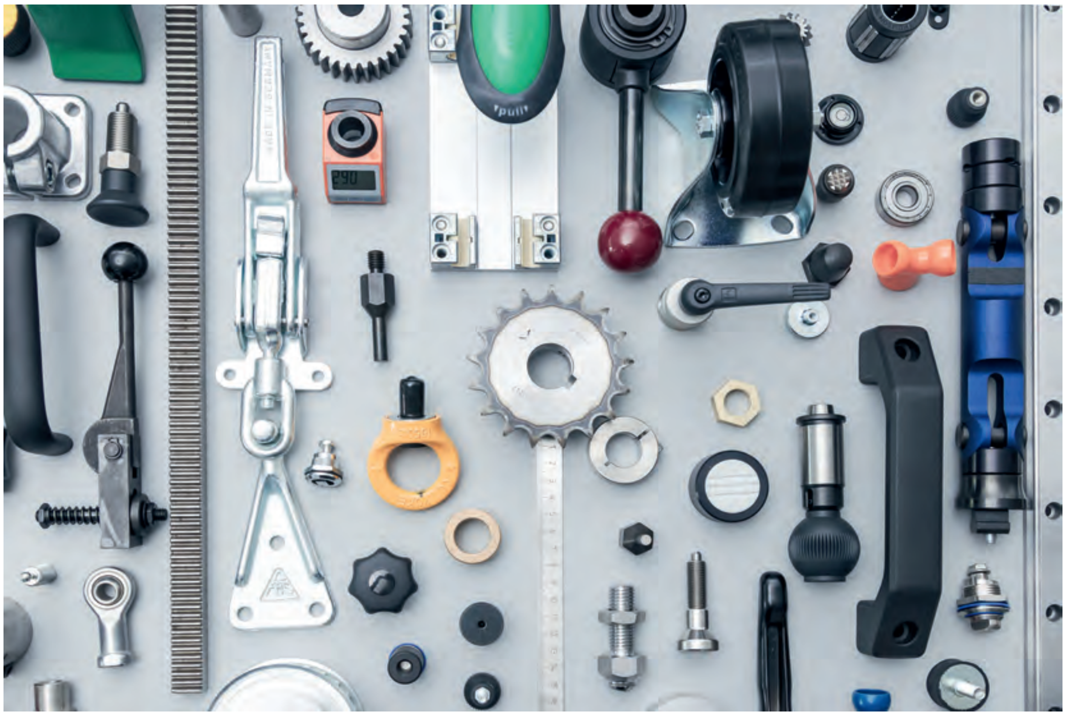


Material:
Handwheel thermoset PF 31.
Bush steel, black oxidised.

Version:
High-gloss polished, black.

Sample order:
nlm 06830-70112

Order No.	Version 1	D1	D2	D3	D4	H2	L1	L3
06830-70110	internal thread	70	M10	30	26,5	11,5	23	33,5
06830-70112	internal thread	70	M12	30	26,5	11,5	23	33,5
06830-83112	internal thread	83	M12	35	31,5	14	28	40
06830-83116	internal thread	83	M16	35	31,5	14	28	40
06830-70212	reamed hole	70	12H8	30	26,5	11,5	23	33,5
06830-70214	reamed hole	70	14H8	30	26,5	11,5	23	33,5
06830-83214	reamed hole	83	14H8	35	31,5	14	28	40
06830-83216	reamed hole	83	16H8	35	31,5	14	28	40



Five lobe grips

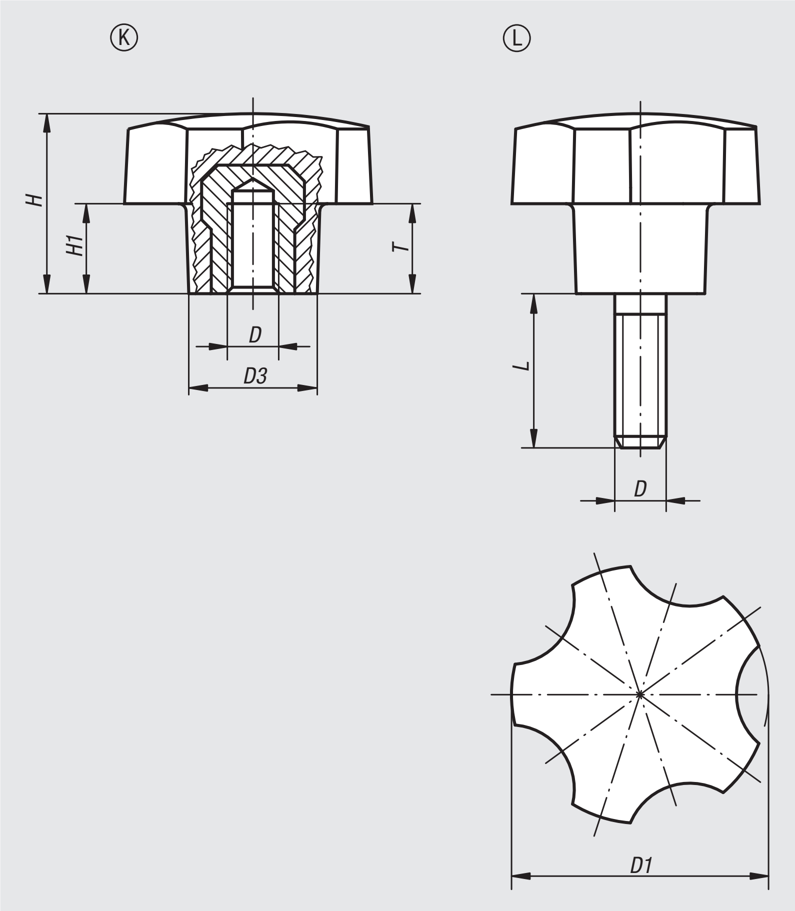
Material:
Thermoset PF 31, black.
Steel bush and stud, electro zinc-plated.

Version:
High-gloss polished.

Sample order:
nlm 06850-3206X12 (include length L)

Note:
The versions 06850-3205 and 06850-3206 have a brass bush.

On request:
Other screw sizes, screw lengths and colours.



Five lobe grips with internal thread

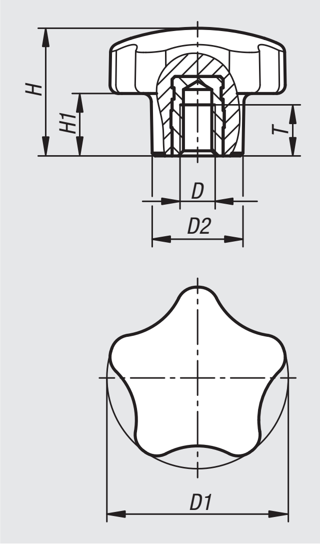
Order No.	Form	D	D1	D3	H	H1	T
06850-3205	K	M5	32	16	22,4	11,2	10
06850-3206	K	M6	32	16	22,4	11,2	9
06850-4006	K	M6	40	20	28	14	12
06850-4008	K	M8	40	20	28	14	14
06850-4010	K	M10	40	20	28	14	14
06850-5008	K	M8	50	25	35	17,5	14
06850-5010	K	M10	50	25	35	17,5	14

Five lobe grips with external thread

Order No.	Form	D	D1	D3	H	H1	L
06850-3206X	L	M6	32	16	22,4	11,2	12/18
06850-3208X	L	M8	32	16	22,4	11,2	16/24
06850-4006X	L	M6	40	20	28	14	18
06850-4008X	L	M8	40	20	28	14	16/20/24
06850-4010X	L	M10	40	20	28	14	30
06850-5008X	L	M8	50	25	35	17,5	16/24
06850-5010X	L	M10	50	25	35	17,5	20/30

Five lobe grips

with internal thread



Material:
Thermoset PF 31.
Steel or stainless steel.

Version:
Thermoset black, high-gloss polished.
Trivalent blue passivated steel or bright stainless steel.

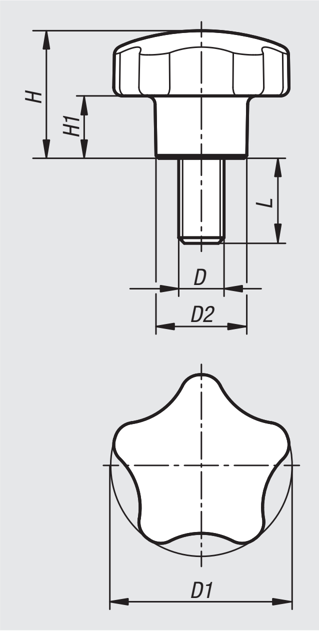
Sample order:
nlm 06851-3205

Order No. steel	Order No. stainless steel	D	D1	D2	H	H1	T
06851-3205	**06851-13205**	M5	32	16	22,5	11	7,5
06851-3206	**06851-13206**	M6	32	16	22,5	11	9
06851-4006	**06851-14006**	M6	40	20	28	14	9
06851-4008	**06851-14008**	M8	40	20	28	14	12
06851-4010	**06851-14010**	M10	40	20	28	14	15
06851-5008	**06851-15008**	M8	50	25	35	17,5	12
06851-5010	**06851-15010**	M10	50	25	35	17,5	15
06851-6012	**06851-16012**	M12	60	30	37	18,5	18

06851-01

Five lobe grips

with external thread



Material:
Thermoset PF 31.
Steel or stainless steel.

Version:
Thermoset black, high-gloss polished.
Trivalent blue passivated steel or bright stainless steel.

Sample order:
nlm 06851-01-3206X10 (include length L)

On request:
Other screw lengths.

Order No. steel	Order No. stainless steel	D	D1	D2	H	H1	L
06851-01-3206X	**06851-01-13206X**	M6	32	16	22,5	11	10/15/20/35
06851-01-3208X	**06851-01-13208X**	M8	32	16	22,5	11	15/25
06851-01-4006X	**06851-01-14006X**	M6	40	20	28	14	15
06851-01-4008X	**06851-01-14008X**	M8	40	20	28	14	15/20/25/30/35/45
06851-01-4010X	**06851-01-14010X**	M10	40	20	28	14	30
06851-01-5008X	**06851-01-15008X**	M8	50	25	35	17,5	15/25
06851-01-5010X	**06851-01-15010X**	M10	50	25	35	17,5	20/30/40/50
06851-01-6012X	**06851-01-16012X**	M12	60	30	37	18,5	30/40/50

01000
02000
03000
04000
05000
06000
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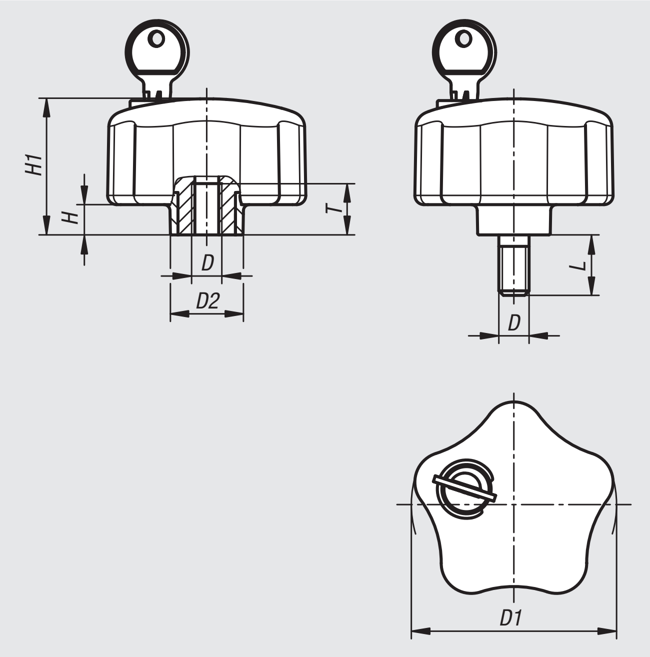
08000
09000
10000
12000

Five lobe grips plastic lockable



Material:
Grip thermoplastic.
Bush and threaded pin steel grade 5.8 or stainless steel 1.4305.

Version:
Grip black grey RAL 7021 or red similar to RAL 3020.
Steel parts trivalent blue passivated.
Stainless steel bright.

Sample order:
nlm 06852-6810X20

Note:
Lockable five lobe grips prevent unauthorised loosening of the screw connection.
The cylinder lock forms a positive lock between grip and screw.
When unlocked the grip rotates freely without driving the screw, preventing unauthorised opening of the screw connection.

The lockable five lobe grips are supplied with 2 keys each.
The key can be removed in the open and closed position.
The locks are a single-key system, i.e. the same key works in all locks.

On request:
Other versions.

Five lobe grips, plastic, lockable, with female thread

Order No. steel	Order No. stainless steel	Main colour	D	D1	D2	H	H1	T
06852-6806	**06852-06806**	black grey	M6	68	24	10	45,5	17
06852-6808	**06852-06808**	black grey	M8	68	24	10	45,5	17
06852-6810	**06852-06810**	black grey	M10	68	24	10	45,5	17
06852-846806	**06852-0846806**	red	M6	68	24	10	45,5	17
06852-846808	**06852-0846808**	red	M8	68	24	10	45,5	17
06852-846810	**06852-0846810**	red	M10	68	24	10	45,5	17

Five lobe grips, plastic, lockable, with male thread

Order No. steel	Order No. stainless steel	Main colour	D	D1	D2	H	H1	L
06852-6808X20	**06852-06808X20**	black grey	M8	68	24	10	45,5	20
06852-6810X20	**06852-06810X20**	black grey	M10	68	24	10	45,5	20
06852-846808X20	**06852-0846808X20**	red	M8	68	24	10	45,5	20
06852-846810X20	**06852-0846810X20**	red	M10	68	24	10	45,5	20

06853

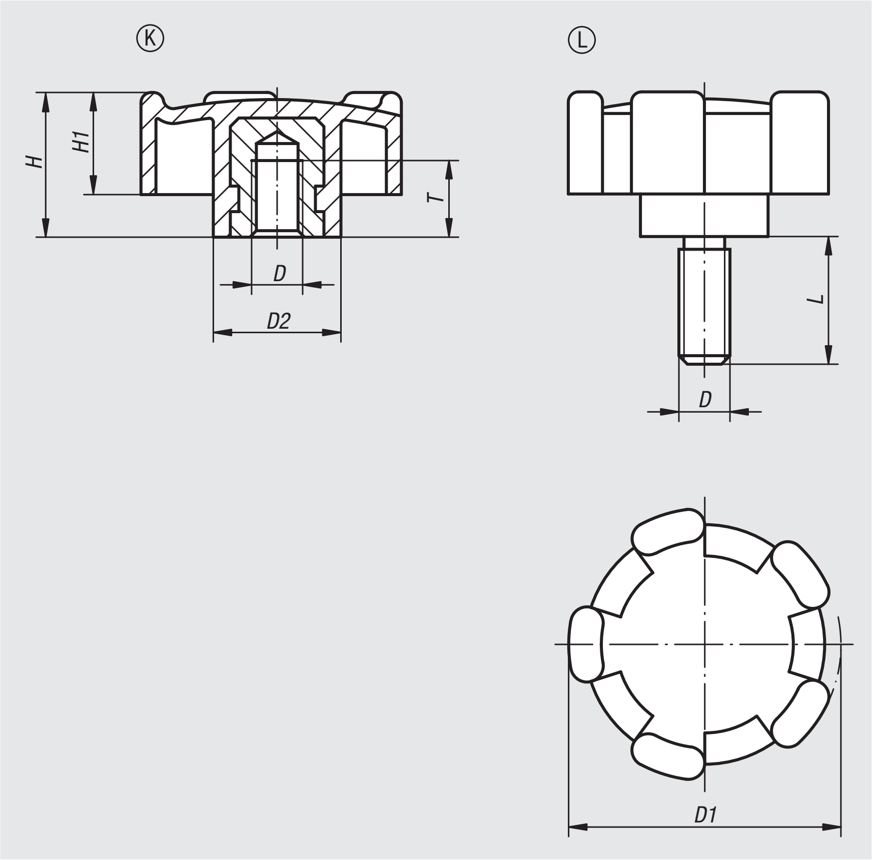
Five lobe grips

Material:
Grip black grey thermoplastic.
Bush steel or brass.
Screw 5.8 steel.

Version:
Steel bush electro zinc-plated.
Screw trivalent blue passivated.

Sample order:
nlm 06853-3206

Note:
The version 06853-3206 has a brass bush.



Five lobe grips with internal thread

Order No.	Form	D	D1	D2	H	H1	T
06853-3206	K	M6	32	15	17	12	9
06853-4008	K	M8	40	18	20,5	14,5	11
06853-5010	K	M10	50	20	25	18	14

Five lobe grips with external thread

Order No.	Form	D	D1	D2	H	H1	L
06853-320615	L	M6	32	15	17	12	15
06853-400816	L	M8	40	18	20,5	14,5	16
06853-501020	L	M10	50	20	25	18	20

06895

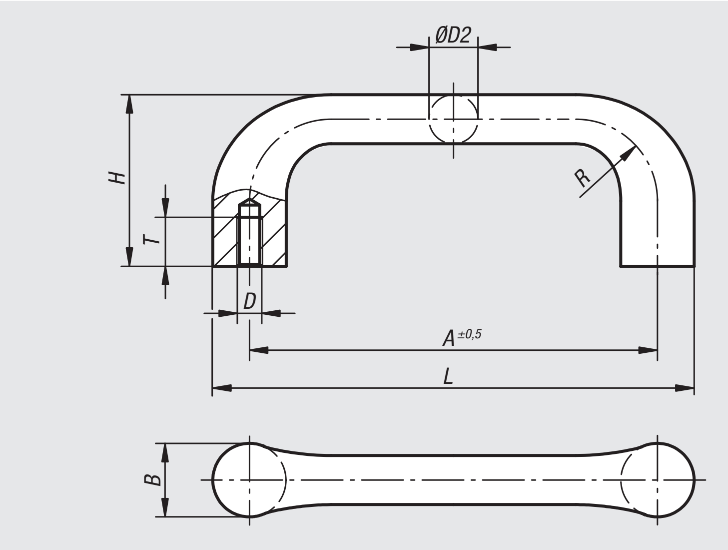
Pull handles

Material:
GJS 400

Version:
Vibratory ground or black powder-coated.
End faces machined.

Sample order:
nlm 06895-12510

Assembly:
From the rear.



Order No. bright	Order No. black	A	B	D	D2	H	L	R	T	Load capacity N
06895-10006	**06895-100061**	100	18	M6	12	42	118	20	12	1000
06895-11208	**06895-112081**	112	20	M8	14	47	132	22	15	1000
06895-12510	**06895-125101**	125	22	M10	16	53	147	24	18	1000
06895-14012	**06895-140121**	140	25	M12	18	59	165	26	20	1000

06900

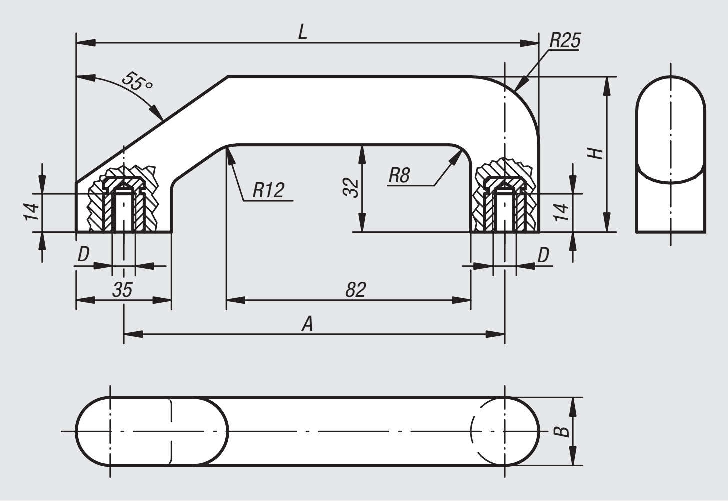
Pull handles

Material:
Thermoset PF 31, black.
Bushes brass or electro zinc-plated steel.

Version:
High-gloss polished.

Sample order:
nlm 06900-101

Assembly:
From the rear.



Order No.	Component material	A	B	D	H	L	Load capacity N
06900-101	brass	140	25	M8	57	170	300
06900-201	steel	140	25	M8	57	170	300

06900

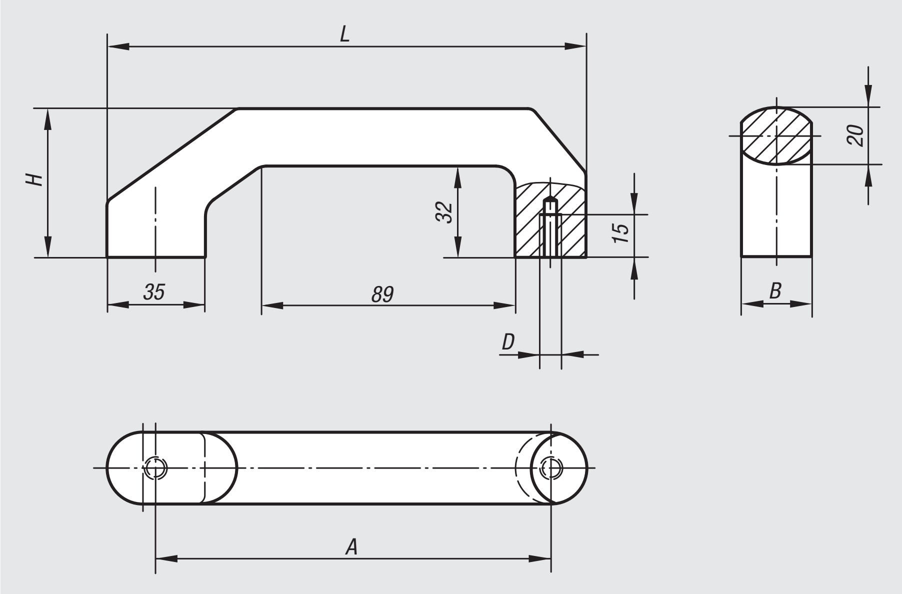
Pull handles

Material:
Die-cast aluminium EN AW-5754.

Version:
Surface tumbled and black powder-coated or left bright.

Sample order:
nlm 06900-140066

Assembly:
From the rear.



Order No.	Main colour	A	B	D	H	L	Load capacity N
06900-140066	black	140	25	M6	57	170	1000
06900-140067	bright	140	25	M6	57	170	1000

06901

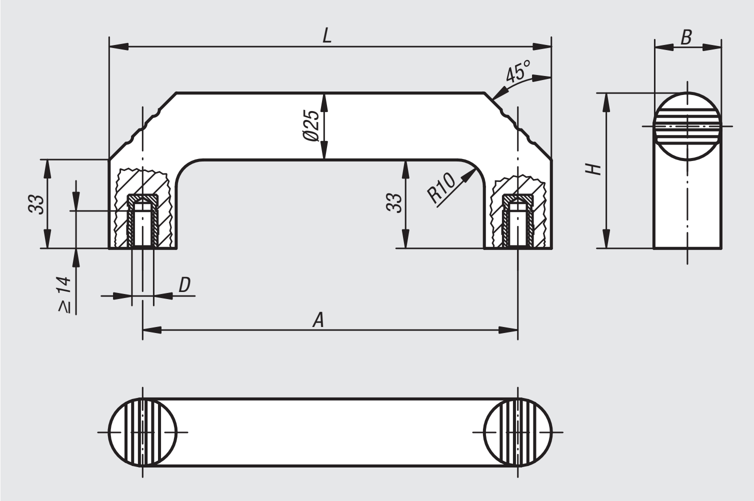
Pull handles

Material:
Thermoset PF 31, black.
Bushes brass or electro zinc-plated steel.

Version:
High-gloss polished.

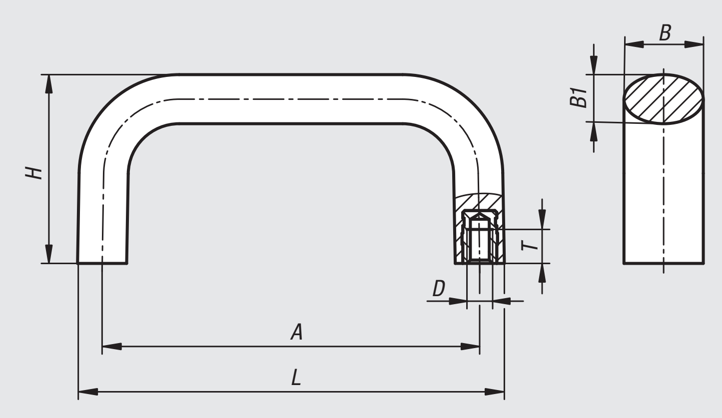
Sample order:
nlm 06901-114008

Assembly:
From the rear.



Order No.	Component material	A	B	D	H	L	Load capacity N
06901-114008	brass	140	25	M8	58	165	500
06901-214008	steel	140	25	M8	58	165	500

Pull handles, plastic oval



Material:
Thermoset PF 31.
Tapped bush, steel or stainless steel.

Version:
Thermoset black, high-gloss polished.
Trivalent blue passivated steel or bright stainless steel.

Sample order:
nlm 06901-01-21280621

Temperature range:
Permanent application temperature 140 °C.
Temporary operating temperature max. 160 °C.

Assembly:
From the rear.

Order No.	Component material	A	B	B1	D	H	L	T	Load capacity N
06901-01-21000621	steel	100	21	13	M6	50	113	9	500
06901-01-21200621	steel	120	21	13	M6	50	133	9	500
06901-01-21280621	steel	128	21	13	M6	50	141	9	500
06901-01-21600825	steel	160	25	17	M8	55	177	12	500
06901-01-31000621	stainless steel	100	21	13	M6	50	113	9	500
06901-01-31200621	stainless steel	120	21	13	M6	50	133	9	500
06901-01-31280621	stainless steel	128	21	13	M6	50	141	9	500
06901-01-31600825	stainless steel	160	25	17	M8	55	177	12	500

06902

Pull handles

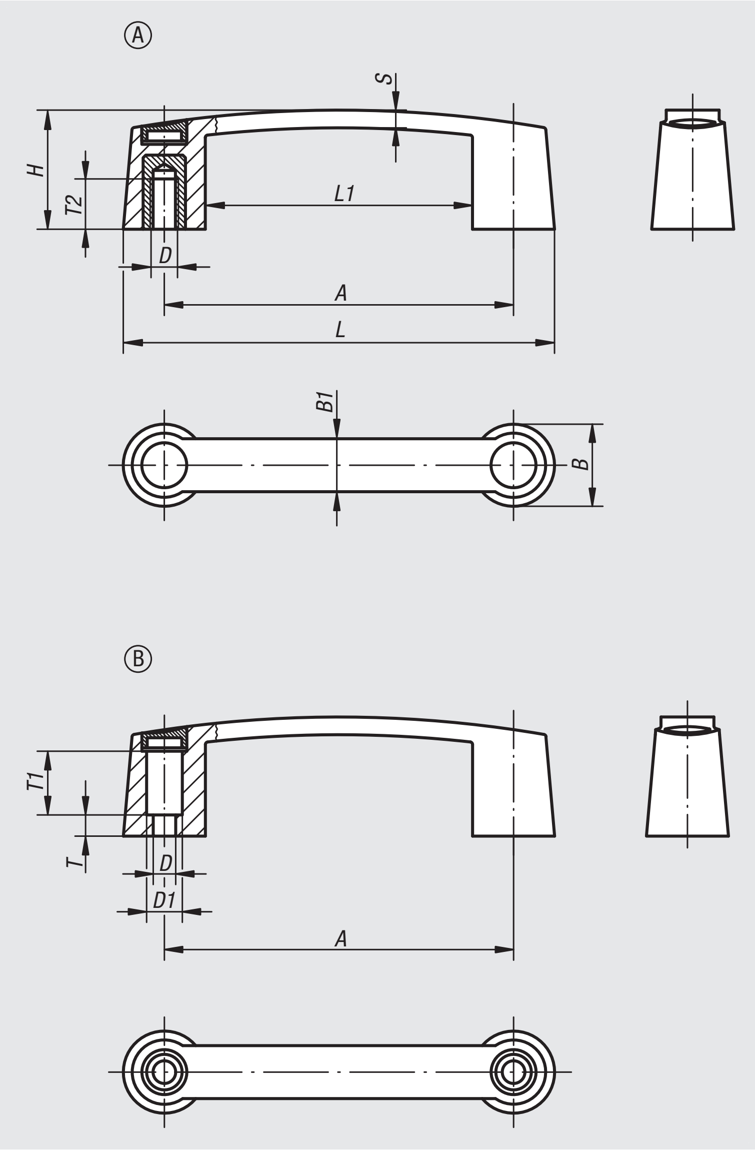
Material:
Thermoplastic.
Bushing brass.

Version:
Handle and cap black.

Sample order:
nlm 06902-109406

Assembly:
Form A from the rear.
Form B from the front.

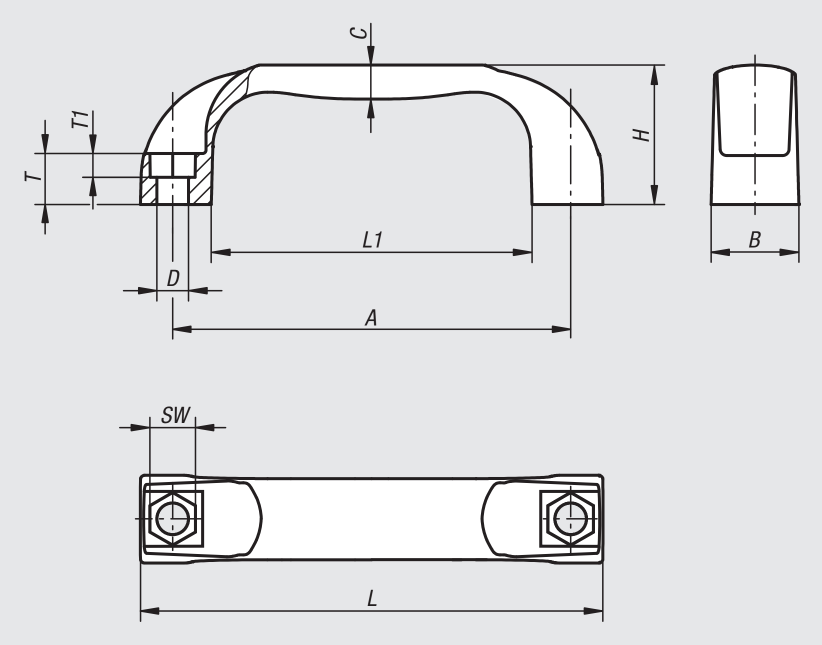
On request:
Other handle or cap colours.



Order No.	Form	A	B	B1	D	D1	H	L	L1	S	T	T1	T2	Load capacity N
06902-109406	A	93,5	26	17	M6	-	35	119,5	67,5	5,8	-	-	15,5	320
06902-111706	A	117	29	19	M6	-	40	145	89	6,4	-	-	15,5	320
06902-111708	A	117	29	19	M8	-	40	145	89	6,4	-	-	16	870
06902-113206	A	132	31	20	M6	-	45	163	101	6,7	-	-	15,5	320
06902-113208	A	132	31	20	M8	-	45	163	101	6,7	-	-	16	870
06902-117910	A	179	35	22	M10	-	50	213	145	7,1	-	-	22	1200
06902-209406	B	93,5	26	17	6,8	12	35	119,5	67,5	5,8	4,5	19	-	500
06902-211708	B	117	29	19	8,5	13,5	40	145	89	6,4	8	23	-	950
06902-213208	B	132	31	20	8,5	13,5	45	163	101	6,7	8	22	-	950
06902-217908	B	179	35	22	8,5	13,5	50	213	145	7,1	12	22	-	950

06903

Pull handles



Material:
Glass-bead reinforced thermoplastic PA (polyamide) or fiberglass reinforced PP (polypropylene).

Version:
Black grey

Sample order:
nlm 06903-113208

Note:
The fastening hole is designed to accept the head of a cap or hexagon head screw or a hexagon nut.

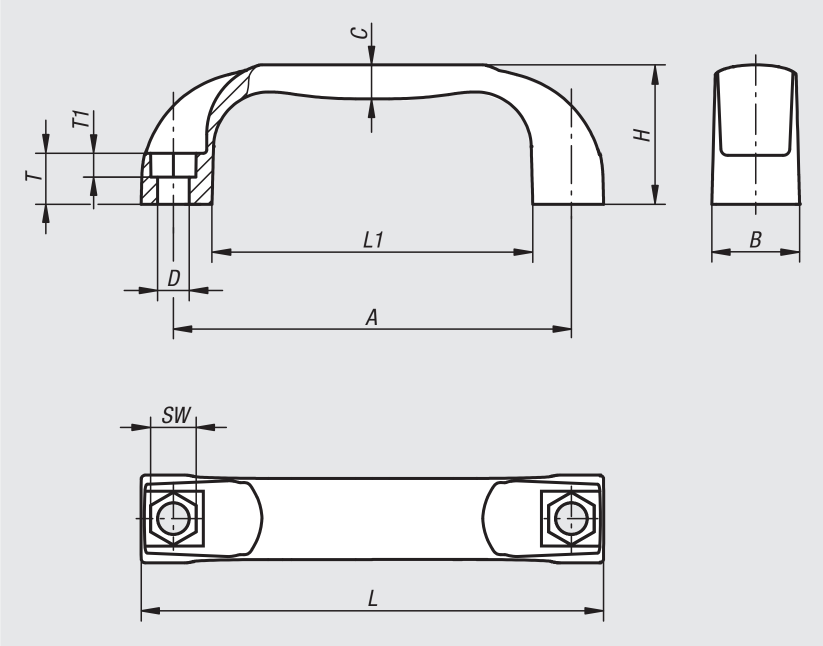
Assembly:
From the front or rear.

On request:
Other colours.

Order No.	Main material	A	B	C	D	H	L	L1	SW	T	T1	Load capacity N
06903-109406	polyamide	94	21	8	6,6	36	109	76	10	13	6	1000
06903-111708	polyamide	117	26	10	9	41	136	94	13	15	8	1500
06903-113208	polyamide	132	27	11	9	44	154	112	13	16	8	1500
06903-115008	polyamide	150	27	11	9	44	172	132	13	16	8	1500
06903-117908	polyamide	179	28	11	9	50	197	156	13	17	8	1500
06903-209406	polypropylene	94	21	8	6,6	36	109	76	10	13	6	500
06903-211708	polypropylene	117	26	10	9	41	136	94	13	15	8	800
06903-213208	polypropylene	132	27	11	9	44	154	112	13	16	8	800
06903-215008	polypropylene	150	27	11	9	44	172	132	13	16	8	800
06903-217908	polypropylene	179	28	11	9	50	197	156	13	17	8	800

Pull handles

high temperature resistant



Material:
Thermoplastic PPA (resistant to high temperatures), fibreglass reinforced.

Version:
black.

Sample order:
nlm 06903-311708

Note:
The fastening hole is designed to accept the head of a cap or hexagon head screw or a hexagon nut.

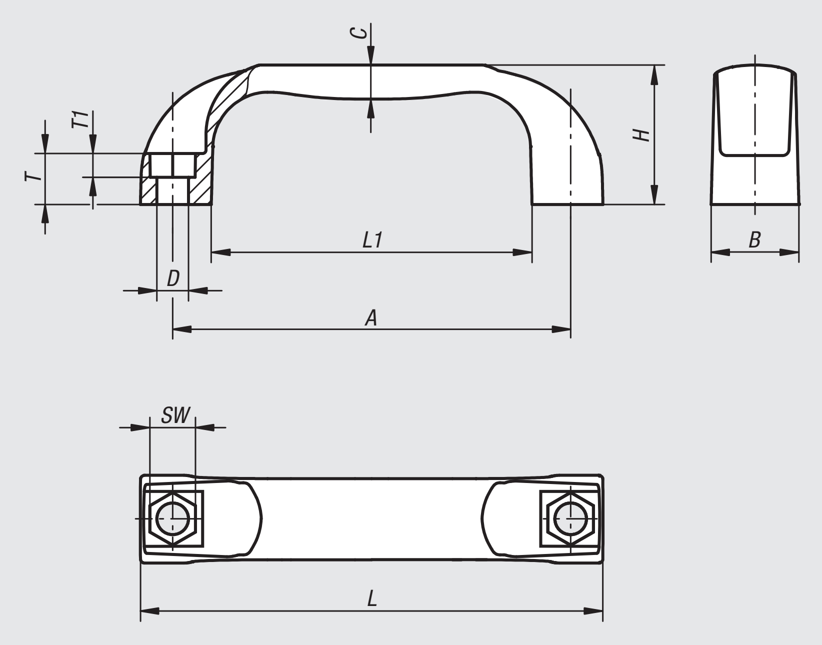
Temperature range:
Continuous operating temperature acc. to IEC 216 max. 150°C - 160°C.
Temporary operating temperature max. 250°C.

Assembly:
From the front or rear.

Order No.	A	B	C	D	H	L	L1	SW	T	T1	Load capacity N
06903-311708	117	26	10	9	41	136	94	13	15	8	1500
06903-313208	132	27	11	9	44	154	112	13	16	8	1500
06903-315008	150	27	11	9	44	172	132	13	16	8	1500

06903

Pull handles antistatic



Material:
Thermoplastic PA (polyamide) reinforced.

Version:
graphite black.

Sample order:
nlm 06903-111170824

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Safety:
These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.
Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.
Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.
These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability.

Target groups:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Order No.	Main colour	A	B	C	D	H	L	L1	SW	T	T1	Load capacity N
06903-111170824	graphite black RAL 9011	117	26	10	9	41	136	94	13	15	8	1500
06903-111500824	graphite black RAL 9011	150	27	11	9	44	172	132	13	16	8	1500

Pull handles

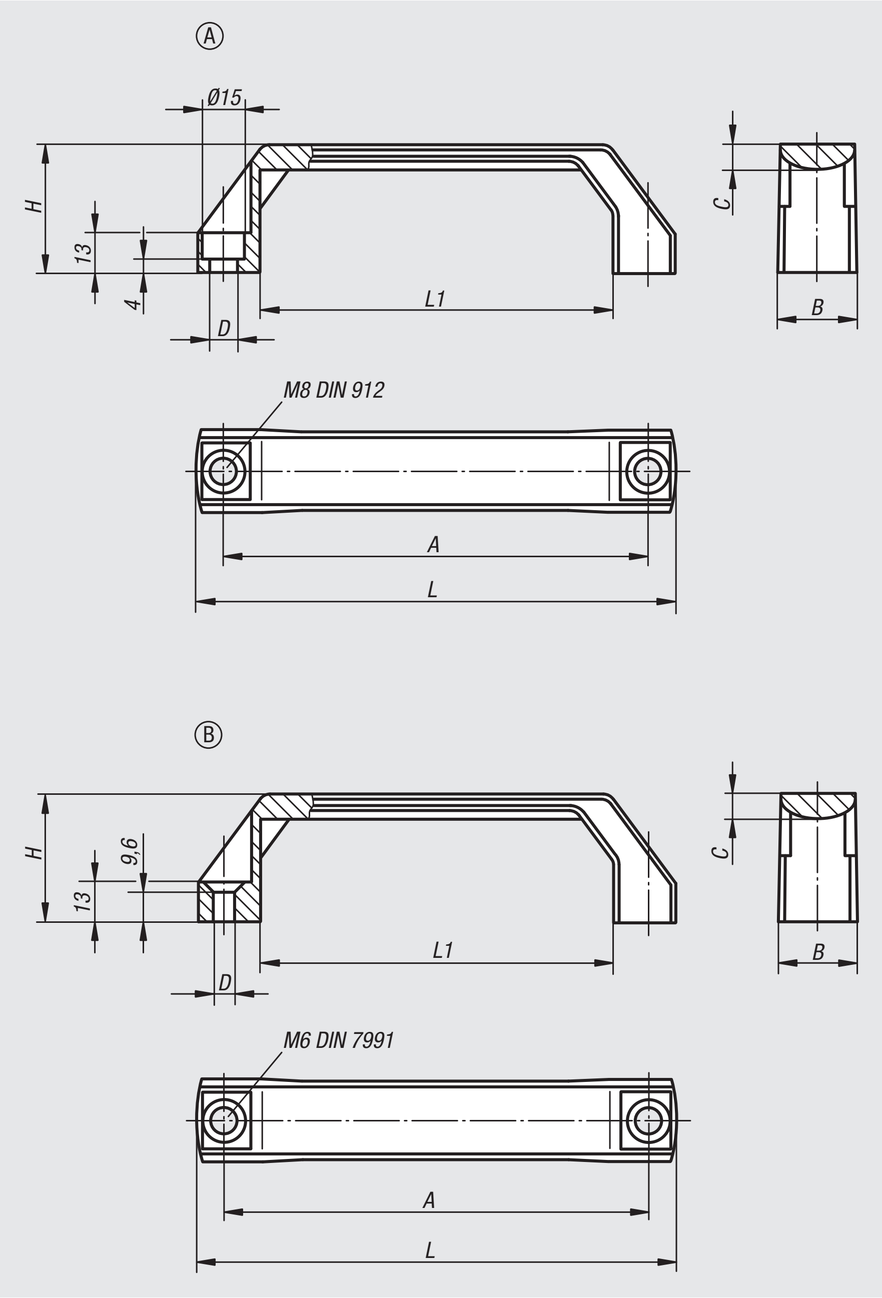
Material:
Glass bead reinforced thermoplastic.

Version:
Black RAL 7021 or orange.

Sample order:
nlm 06904-1120081

Note:
Dimension "A" applies after mounting. Before mounting it can be up to 2 mm smaller due to the release of the bending stress.

Assembly:
From the front.



Order No. black grey RAL 7021	Order No. orange	Form	A	B	C	D	H	L	L1	Load capacity N
06904-1120081	**06904-1120082**	A	120	26	8	9	42	138	96	1000
06904-1140081	**06904-1140082**	A	140	26	8	9	42	158	116	1000
06904-1160081	**06904-1160082**	A	160	28	9	9	45	178	136	1000
06904-2120061	**06904-2120062**	B	120	26	8	6,6	42	138	96	1000
06904-2140061	**06904-2140062**	B	140	26	8	6,6	42	158	116	1000
06904-2160061	**06904-2160062**	B	160	28	9	6,6	45	178	136	1000

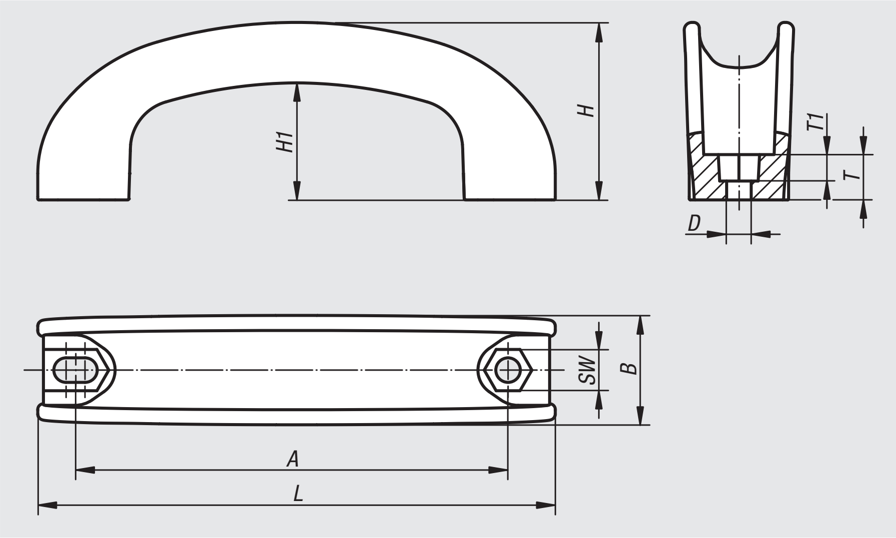
06907

Pull handles arch

Material:
Black thermoplastic.

Sample order:
nlm 06907-09006

Assembly:
From the front.

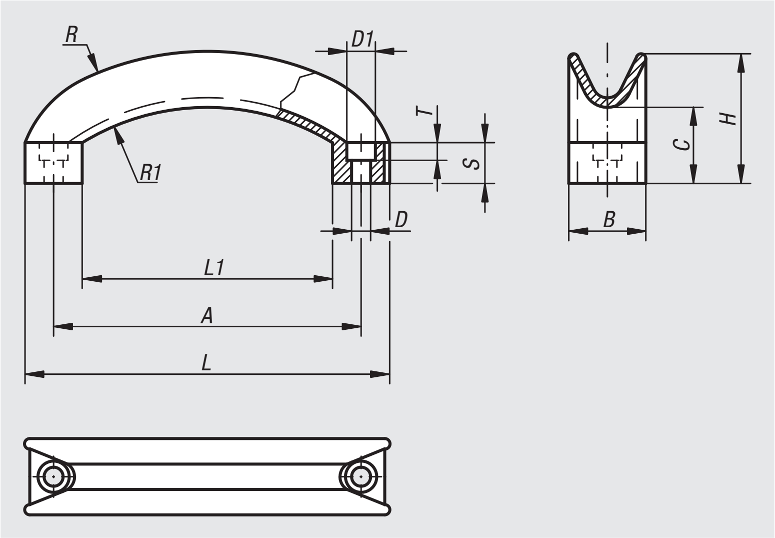


Order No.	A	B	D	H	H1	L	T	T1	SW	Load capacity N
06907-09006	90-95	26,6	6,5	42	29	115	10	6,4	10,2	1000
06907-11206	112-117	29	6,5	47	31	137	12	7	10,2	1000
06907-17708	177-182	30	8,5	48,1	31	208	14	9	13,2	1000

Notes

06909

Pull handles arch



Material:
Black grey thermoplastic.

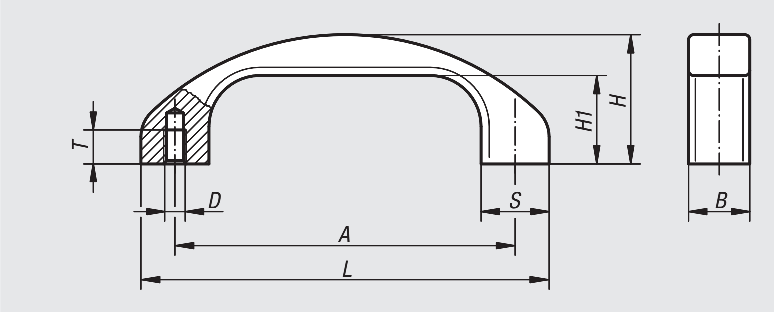
Sample order:
nlm 06909-11406

Assembly:
From the front.

Order No.	A	B	C	D	D1	H	L	L1	R	R1	S	T	Load capacity N
06909-11406	114	28	29	6,5	10,5	48	134	92	117	79	15	6,5	1000

06910

Pull handles



Material:
Profile aluminium EN AW-6060

Version:
High quality anodised version, glass-bead blasted, semi-gloss finish.

Sample order:
nlm 06910-120061

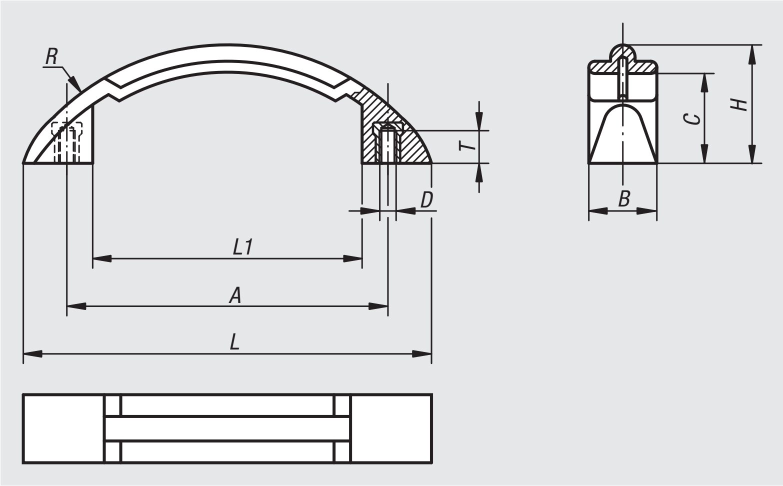
Assembly:
From the rear.

Order No.	Main colour	A	B	D	H	H1	L	S	T	Load capacity N
06910-120061	black anodised	120	22	M6	46	31	144	24	12	1000
06910-140081	black anodised	140	25	M8	53	36	168	28	15	1000
06910-120063	natural anodized	120	22	M6	46	31	144	24	12	1000
06910-140083	natural anodized	140	25	M8	53	36	168	28	15	1000

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

06911

Pull handles arch



Material:
Thermoplastic, black grey.
Bushes electro zinc-plated steel.

Sample order:
nlm 06911-11906

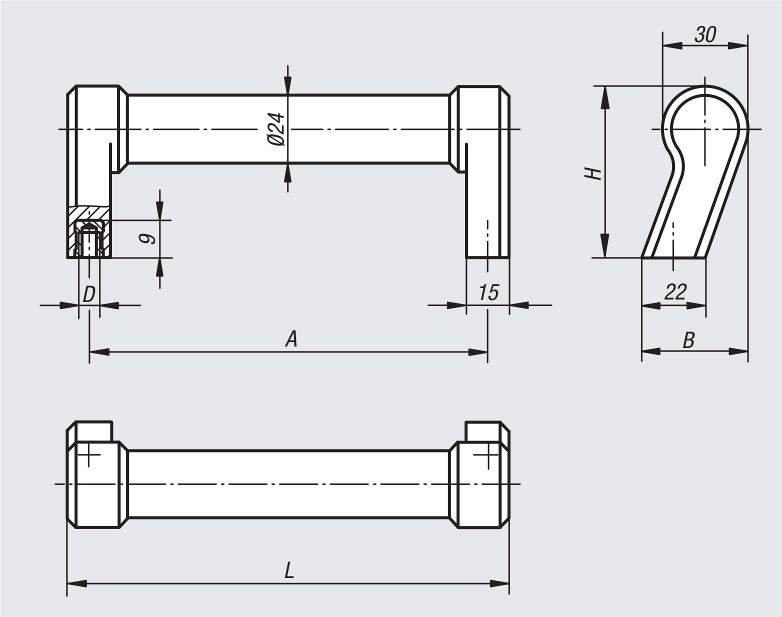
Assembly:
From the rear.

Order No.	A	B	C	D	H	L	L1	R	T	Load capacity N
06911-11906	119	25	33	M6	43,5	150	98	94	10	1000

06912

Pull handles

oblique



Material:
Grip glass-bead reinforced thermoplastic.
Bushing brass.

Version:
Matt black or light grey

Sample order:
nlm 06912-140061

Note:
Oblique, robust polyamide handle. Tube and legs form one unit. The oblique contact faces allow mounting under cramped conditions e.g. in corners.

Assembly:
From the rear.

Order No.	Main colour	A	B	D	H	L	Load capacity N
06912-140061	black grey RAL 7021	140	37	M6	60	155	1000
06912-140062	light grey RAL 7035	140	37	M6	60	155	1000

Pull handles

with soft inner face

Material:
Hard components glass-bead reinforced thermoplastic.
Soft components SEBS

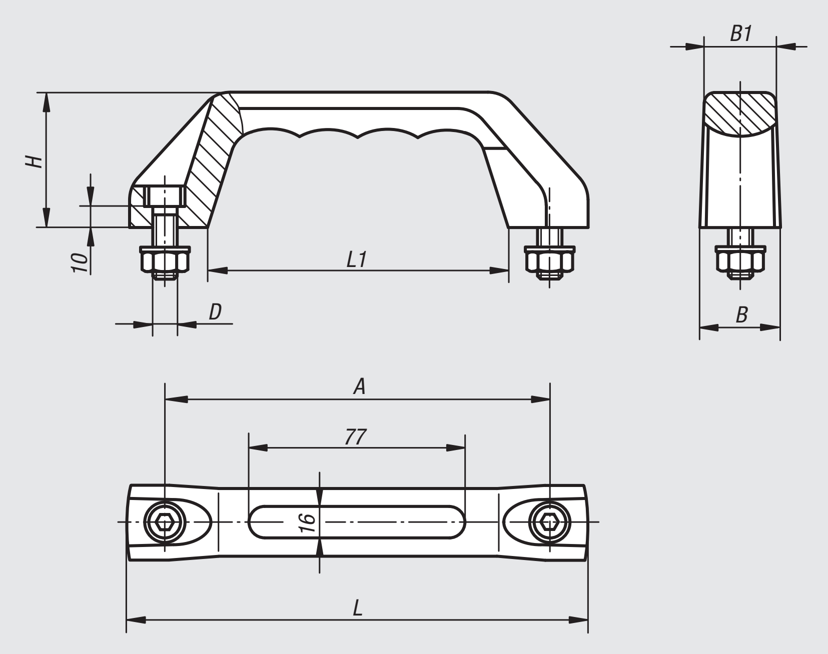
Version:
Hard component matt black, soft component basalt grey.

Sample order:
nlm 06913-515008

Note:
Heavy-duty polyamide handle. Excellent carrying and gripping comfort thanks to its soft inner surface.
Black electro zinc-plated cap screws, nuts and washers are supplied.
For wet areas, the fastening material is supplied in stainless steel (1.4301).

Assembly:
From the front.

On request:
With individual caption, embossed or raised on the soft material. Hard and soft components are available in all RAL colours.



Order No.	Version 2	A	B	B1	D	L	L1	H	Load capacity N
06913-515008	standard	150	29	25,5	M8x25	178	118	53	500
06913-615008	wet area	150	29	25,5	M8x25	178	118	53	500

06914

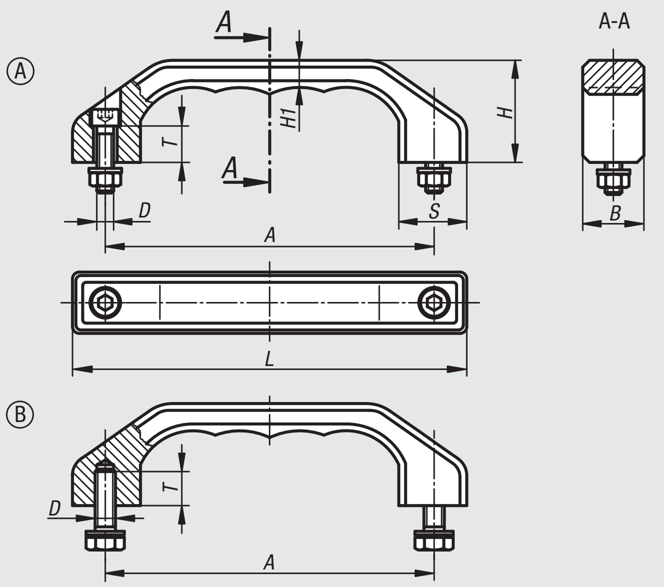
Pull handles stainless steel

Material:
Investment cast 1.4308 stainless steel.
Fasteners 1.4301 stainless steel.

Version:
Abrasive cleaned and matt gloss electropolished.

Sample order:
nlm 06914-140081

Assembly:
Form A from the front.
Form B from the rear.



Order No.	Form	A	B	D	H	H1	L	S	T	Load capacity N
06914-140081	A	140	25	M8x30	45	12	170	28	15	1000
06914-180101	A	180	32	M10x40	58	15	218	36	18	1000
06914-140082	B	140	25	M8x18	45	12	170	28	15	1000
06914-180102	B	180	32	M10x20	58	15	218	36	18	1000

06915

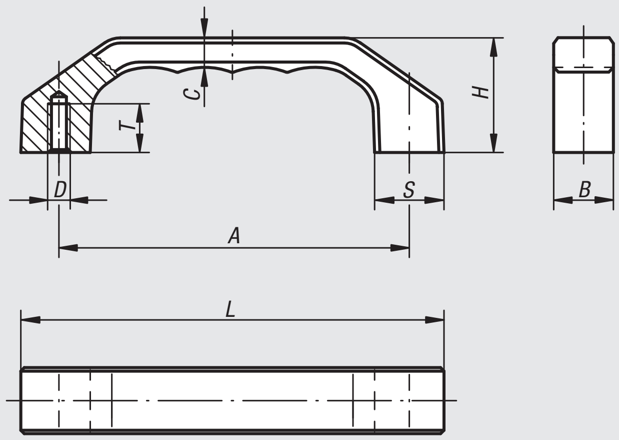
Pull handles

Material:
EN AW-6060

Version:
Matt-finished and anodised or powder-coated

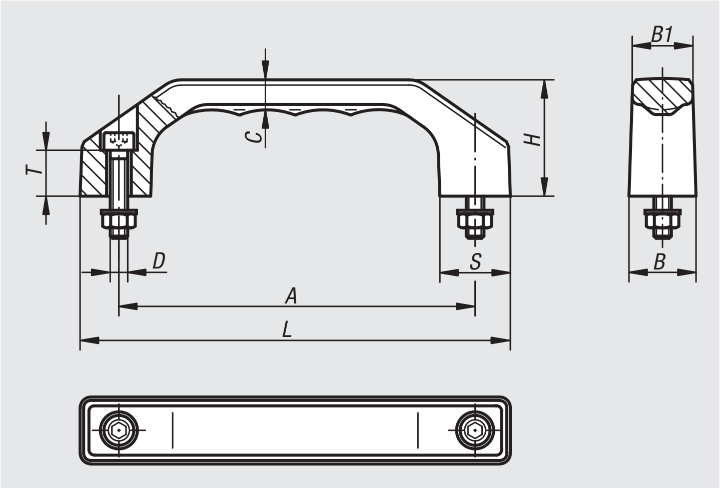
Sample order:
nlm 06915-140082

Assembly:
From the rear.



Order No. natural	Order No. black	Order No. titanium	A	B	C	D	H	L	S	T	Load capacity N
06915-120061	**06915-120062**	**06915-120063**	120	22	10,5	M6	39	146	24	15	1000
06915-140081	**06915-140082**	**06915-140083**	140	25	12	M8	45	170	28	16	1000
06915-160081	**06915-160082**	**06915-160083**	160	28	13,5	M8	52	194	32	16	1000

Pull handles



Material:
Glass bead reinforced thermoplastic.

Version:
Matt black with fine texture.

Sample order:
nlm 06916-140082

Note:
These handles are extremely flex-resistant and very user friendly. Fastening screws, nuts and washers are supplied. Stainless steel fasteners are supplied for wet areas.

Assembly:
From the front.

Order No. -	Order No. wet area	A	B	B1	C	D	H	L	S	T	Load capacity N
06916-100051	**06916-100052**	100	19	17	8,5	M5X22	35	122	20	13	1000
06916-120061	**06916-120062**	120	23	20,5	10,5	M6X25	39	146	24	15	1000
06916-140081	**06916-140082**	140	27	24	12	M8X30	45	170	28	16	1000
06916-160081	**06916-160082**	160	31	27,5	13,5	M8X35	52	194	32	20	1000
06916-180081	**06916-180082**	180	35	31	15,5	M10X40	58	218	36	20	1000

06916-01

Pull handles

Material:
Thermoplastic PA (polyamide), glass-bead reinforced.
Bush, screw, washer and nut steel or stainless steel.

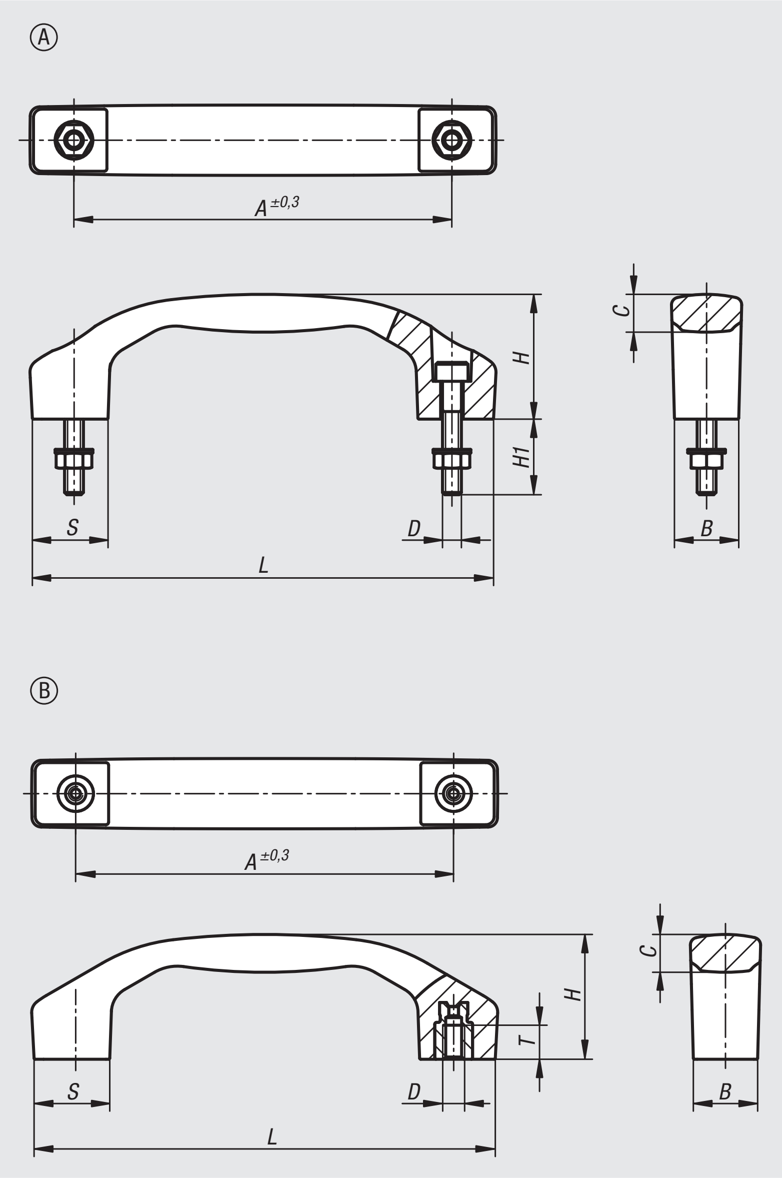
Version:
Black grey

Sample order:
nlm 06916-01-1100051

Note:
This pull handle is characterised by its large size and pleasant haptics.

Form A is supplied with fastening screws, washers and nuts.

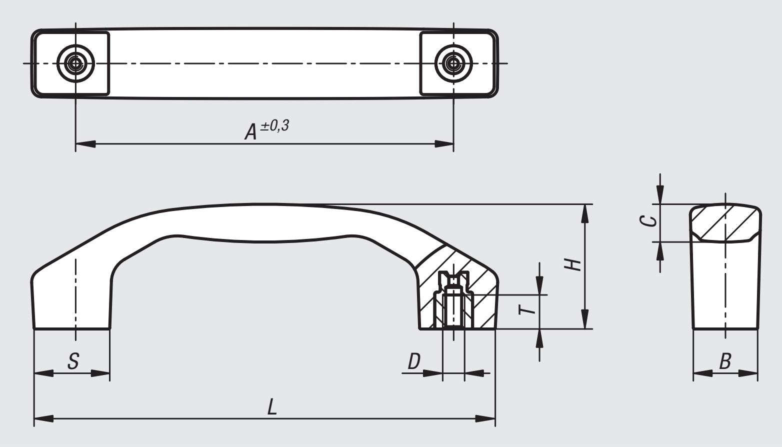
Assembly:
Form A from the front.
Form B from the rear.



Order No.	Form	Component material	A	B	C	D	H	H1	L	S	T	Load capacity N
06916-01-1100051	A	steel	100	17	9,5	M5	33	20	122	20	-	1000
06916-01-1120061	A	steel	120	21	11,4	M6	39	25	146	24	-	1000
06916-01-1140081	A	steel	140	24	14,2	M8	45	30	170	28	-	1000
06916-01-1100052	A	stainless steel	100	17	9,5	M5	33	20	122	20	-	1000
06916-01-1120062	A	stainless steel	120	21	11,4	M6	39	25	146	24	-	1000
06916-01-1140082	A	stainless steel	140	24	14,2	M8	45	30	170	28	-	1000
06916-01-2100051	B	steel	100	17	9,5	M5	33	-	122	20	9	1000
06916-01-2120061	B	steel	120	21	11,4	M6	39	-	146	24	12	1000
06916-01-2140081	B	steel	140	24	14,2	M8	45	-	170	28	12	1000
06916-01-2100052	B	stainless steel	100	17	9,5	M5	33	-	122	20	9	1000
06916-01-2120062	B	stainless steel	120	21	11,4	M6	39	-	146	24	12	1000
06916-01-2140082	B	stainless steel	140	24	14,2	M8	45	-	170	28	12	1000

Pull handles

high temperature resistant



Material:
Thermoplastic PPA (resistant to high temperatures), fibreglass reinforced.
Bush, stainless steel.

Version:
black.

Sample order:
nlm 06916-01-2100054

Note:
This pull handle is characterised by its large size and pleasant haptics.
Easy to clean due to its closed, smooth design (suitable for e.g. foodstuff production and medical technology).

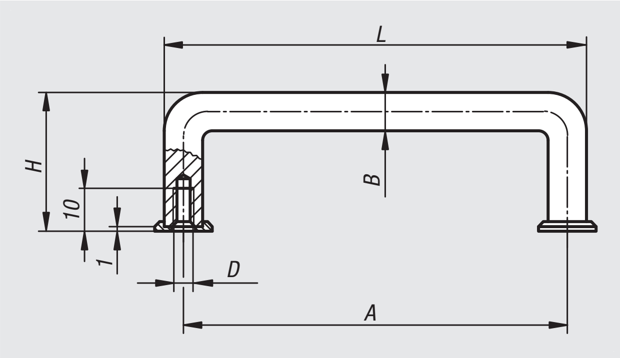
Temperature range:
Continuous operating temperature acc. to IEC 216 max. 160 °C.
Short-term operating temperature: max. 250 °C.
Suitable for steam sterilisation (medical technology).

Assembly:
From the rear.

Order No.	Form	A	B	C	D	H	L	S	T	Load capacity N
06916-01-2100054	B	100	17	10,3	M5	34	122,5	20	9	1000
06916-01-2120064	B	120	21	12,4	M6	41	146	24	12	1000
06916-01-2140084	B	140	24	15,4	M8	46,5	170	28	12	1000

06917

Pull handles round



Material:
Round aluminium

Version:
Surface matt-finished and natural colour or black anodised

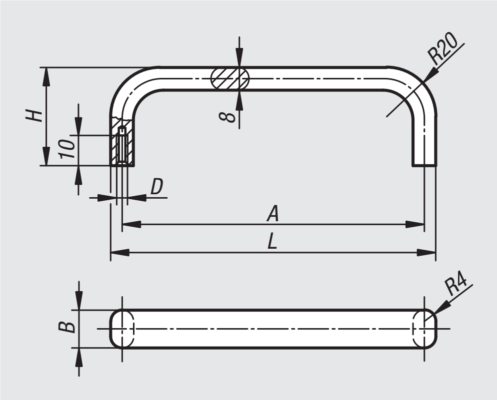
Sample order:
nlm 06917-055051

Note:
End washers not included.

Assembly:
From the rear.

Order No.	Main colour	A	B	D	H	L	Load capacity N	Order No. end washer
06917-055051	black	55	10	M5	40	65	500	06917-1
06917-088051	black	88	10	M5	40	98	500	06917-1
06917-100051	black	100	10	M5	40	110	500	06917-1
06917-120051	black	120	10	M5	40	130	500	06917-1
06917-180051	black	180	10	M5	40	190	500	06917-1
06917-200051	black	200	10	M5	40	210	500	06917-1
06917-235051	black	235	10	M5	40	245	500	06917-1
06917-250051	black	250	10	M5	41	260	500	06917-1
06917-055053	natural	55	10	M5	40	65	500	06917-3
06917-088053	natural	88	10	M5	40	98	500	06917-3
06917-100053	natural	100	10	M5	40	110	500	06917-3
06917-120053	natural	120	10	M5	40	130	500	06917-3
06917-180053	natural	180	10	M5	40	190	500	06917-3
06917-200053	natural	200	10	M5	40	210	500	06917-3
06917-235053	natural	235	10	M5	40	245	500	06917-3
06917-250053	natural	250	10	M5	40	260	500	06917-3

Pull handles oval



Material:
Oval aluminium.

Version:
Surface matt-finished and natural colour or black anodised.

Sample order:
nlm 06918-055051

Assembly:
From the rear.

Order No. black	Order No. natural	A	B	D	H	L	Load capacity N
06918-055051	**06918-055053**	55	12	M5	40	63	500
06918-088051	**06918-088053**	88	12	M5	40	96	500
06918-100051	**06918-100053**	100	12	M5	40	108	500
06918-120051	**06918-120053**	120	12	M5	40	128	500
06918-180051	**06918-180053**	180	12	M5	40	188	500
06918-200051	**06918-200053**	200	12	M5	40	208	500
06918-235051	**06918-235053**	235	12	M5	40	243	500
06918-250051	**06918-250053**	250	12	M5	40	258	500

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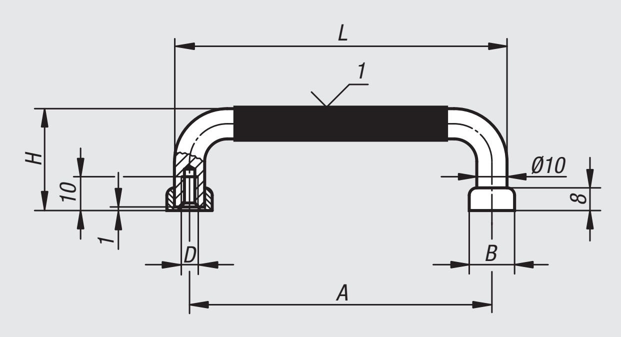
06919

Pull handles round



Material:
Round steel

Version:
Surface very finely ground and matt-polish chrome-plated.
Grip plastic coated.

Sample order:
nlm 06919-05505

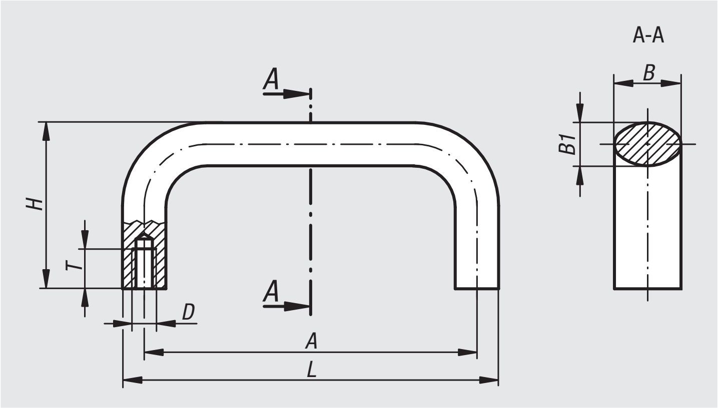
Note:
High quality handles for front panels and similar applications.

Assembly:
From the rear.

Drawing reference:
1) plastic coating

Order No.	A	B	D	H	L	Load capacity N
06919-05505	55	14	M5	41	65	1000
06919-08805	88	14	M5	41	98	1000
06919-10005	100	14	M5	41	110	1000
06919-10205	102	14	M5	41	112	1000
06919-11505	115	14	M5	41	125	1000
06919-12005	120	14	M5	41	130	1000
06919-13605	136	14	M5	41	146	1000
06919-18005	180	14	M5	41	190	1000
06919-20005	200	14	M5	41	210	1000
06919-23505	235	14	M5	41	245	1000
06919-25005	250	14	M5	41	260	1000

Pull handles oval



Material:
Oval aluminium EN AW-6060

Version:
Black or ruby red RAL 3003 powder-coated or natural colour anodised.

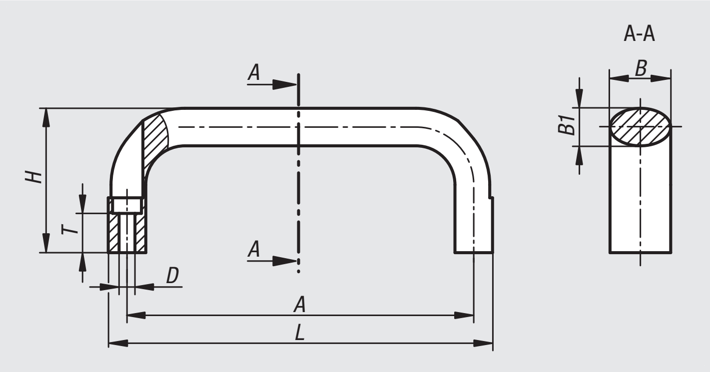
Sample order:
nlm 06920-10001

Note:
These handles are extremely robust and can be used where heavy duty equipment is called for.

Assembly:
From the rear.

Order No. black powder-coated	Order No. natural anodised	Order No. ruby red powder-coated	A	B	B1	D	H	T	L	Load capacity N
06920-10001	**06920-110003**	**06920-10027**	100	21	13	M6	50	12	113	1000
06920-11201	**06920-111203**	**06920-11227**	112	21	13	M6	50	12	125	1000
06920-1120108	**06920-11120308**	**06920-1122708**	112	25	17	M8	55	14	129	1000
06920-12001	**06920-112003**	**06920-12027**	120	21	13	M6	50	12	133	1000
06920-1200108	**06920-11200308**	**06920-1202708**	120	25	17	M8	55	14	137	1000
06920-12801	**06920-112803**	**06920-12827**	128	21	13	M6	50	12	141	1000
06920-1280108	**06920-11280308**	**06920-1282708**	128	25	17	M8	55	14	145	1000
06920-1600106	**06920-11600306**	**06920-1602706**	160	21	13	M6	50	12	173	1000
06920-16001	**06920-116003**	**06920-16027**	160	25	17	M8	55	14	177	1000
06920-18001	**06920-118003**	**06920-18027**	180	25	17	M8	55	14	197	1000
06920-19201	**06920-119203**	**06920-19227**	192	25	17	M8	55	14	209	1000
06920-35001	**06920-135003**	**06920-35027**	350	25	17	M8	55	14	367	1000

Pull handles oval



Material:
Oval aluminium EN AW-6060

Version:
Black or ruby red RAL 3003, powder-coated.

Sample order:
nlm 06920-11000105

Assembly:
From the front.

Accessories:
Use ISO 4762-M5/M6 cap screws for mounting the handles.

Order No. black	Order No. ruby red	A	B	B1	D	H	L	T	Load capacity N
06920-11000105	**06920-11002705**	100	21	13	5,5	50	113	13,6	1000
06920-11120105	**06920-11122705**	112	21	13	5,5	50	125	13,6	1000
06920-11120106	**06920-11122706**	112	25	17	6,6	55	129	11	1000
06920-11200105	**06920-11202705**	120	21	13	5,5	50	133	13,6	1000
06920-11200106	**06920-11202706**	120	25	17	6,6	55	137	11	1000
06920-11280105	**06920-11282705**	128	21	13	5,5	50	141	13,6	1000
06920-11280106	**06920-11282706**	128	25	17	6,6	55	145	11	1000
06920-11600105	**06920-11602705**	160	21	13	5,5	50	173	13,6	1000
06920-11600106	**06920-11602706**	160	25	17	6,6	55	177	11	1000
06920-11800106	**06920-11802706**	180	25	17	6,6	55	197	11	1000

06920

Pull handles oval

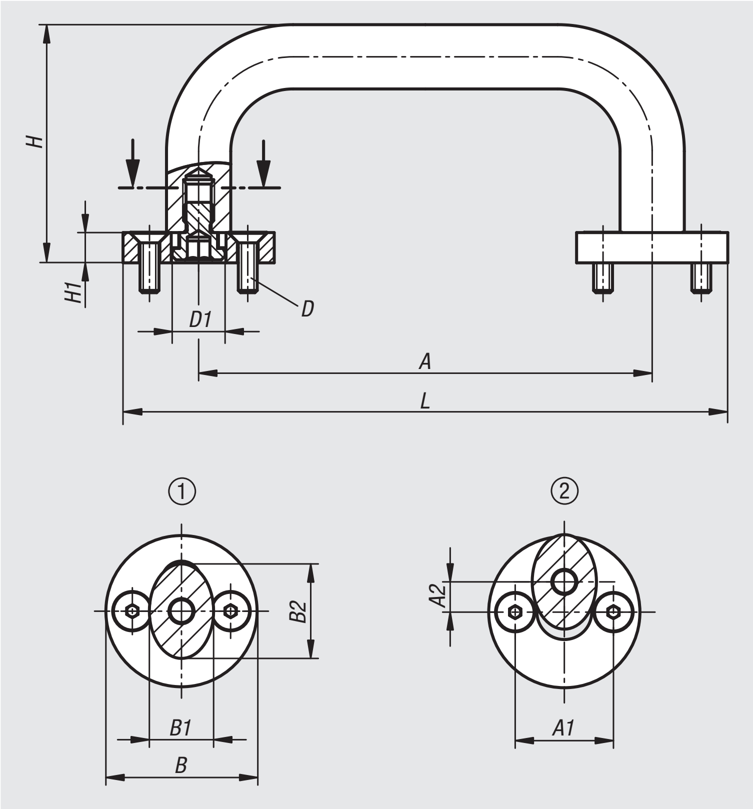
detachable

Material:
Pull handle oval aluminium EN AW-6060.
Locating pin free-cutting steel 1.0718.
Blanking disc free-cutting steel 1.0718.

Version:
Pull handle black powder-coated.
Locating pin and blanking disc black oxidised.

Sample order:
nlm 06920-10012001

Note:
The pull handles are mounted on an object by a push-fit system.
Dismantling is carried out when no load is applied.



Order No.	A	A1	A2	B	B1	B2	D	D1	H	H1	L	Load capacity N
06920-10012001	100	24	7	35	13	21	M5x16	12	58	8	135	1000
06920-11212001	112	24	7	35	13	21	M5x16	12	58	8	147	1000
06920-11214001	112	26	8	40	15	25	M5x16	14	63	8	152	1000
06920-12012001	120	24	7	35	13	21	M5x16	12	58	8	155	1000
06920-12014001	120	26	8	40	17	25	M5x16	14	63	8	160	1000
06920-12812001	128	24	7	35	13	21	M5x16	12	58	8	163	1000
06920-12814001	128	26	8	40	17	25	M5x16	14	63	8	168	1000
06920-16012001	160	24	7	35	13	21	M5x16	12	58	8	195	1000
06920-16014001	160	26	8	40	17	25	M5x16	14	63	8	200	1000
06920-18014001	180	26	8	40	17	25	M5x16	14	63	8	220	1000
06920-19214001	192	26	8	40	17	25	M5x16	14	63	8	232	1000
06920-35014001	350	26	8	40	17	25	M5x16	14	63	8	390	1000

Pull handles oval

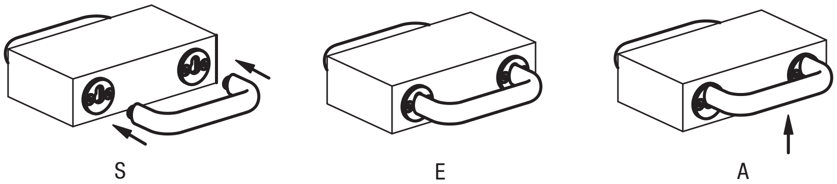
detachable

Application:
Insert the pull handle into the opening until the grip makes contact with the blanking disc.
Lock by holding the handle parallel and pulling up.
The grip can only be subject to vertical loads.
To release, follow the previous instructions in reverse.

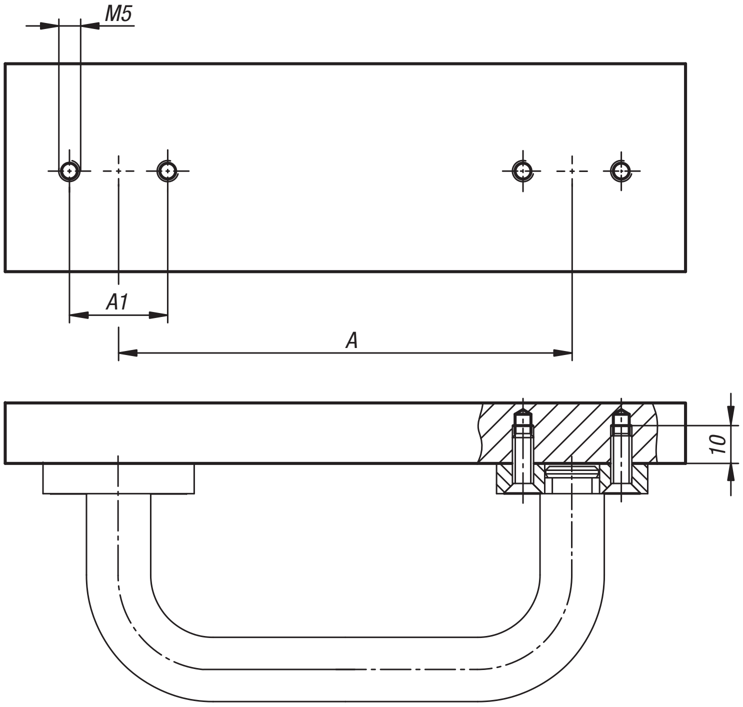
Assembly:
An object must be prepared before the blanking disc can be mounted.
See mounting instructions drawing.

Drawing reference:
1) Position disengaged
2) Position engaged

S = insert
E = engage
A = lift

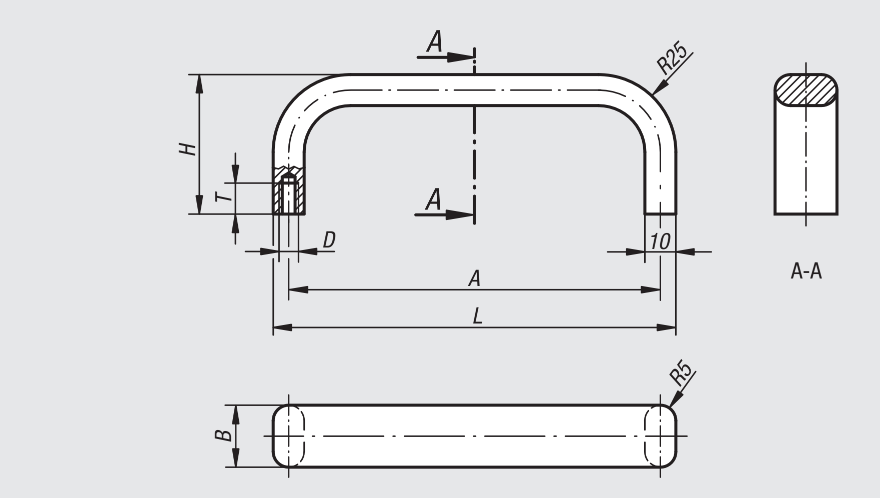


mounting instructions:



06921

Pull handles



Material:
Profile aluminium EN AW-6060

Version:
Matt-finished, black or natural colour anodised

Sample order:
nlm 06921-18001

Note:
These elegant flat profile aluminium handles are especially suitable for machines, fixtures, equipment etc.

Assembly:
From the rear.

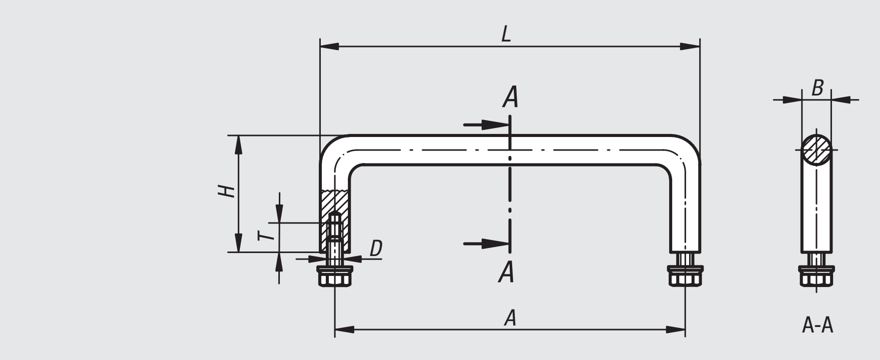
Order No. black	Order No. natural	A	B	D	H	L	T	Load capacity N
06921-12001	**06921-12003**	120	20	M5	45	130	10	500
06921-18001	**06921-18003**	180	20	M5	45	190	10	500
06921-20001	**06921-20003**	200	20	M5	45	210	10	500
06921-35001	**06921-35003**	350	20	M6	45	360	12	500

06922

Pull handles

stainless steel

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Pull handle 1.4404 stainless steel.
Fastening material grade A4.

Version:
Semi-gloss vibratory ground.

Sample order:
nlm 06922-120

Note:
Stainless steel pull handles are used mainly on equipment in the medical and food industry as well as in laboratories and neuclear technology.

Assembly:
From the rear.

Order No.	A	B	D	H	L	T	Load capacity N
06922-100	100	8	M5x10	35	108	10	1000
06922-120	120	10	M5x10	40	130	10	1000
06922-250	250	10	M5x10	40	260	10	1000
06922-350	350	10	M5x10	40	360	10	1000

06923

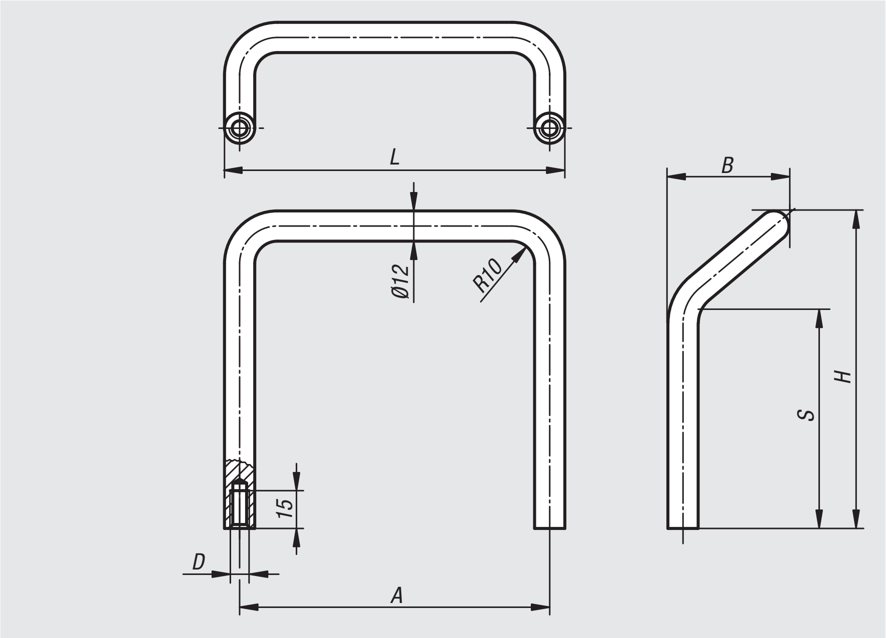
Pull handles angled

Material:
Round steel

Version:
Finely ground and high-gloss chrome-plated.

Sample order:
nlm 06923-06008

Assembly:
From the rear.



Order No.	A	B	D	H	L	S	Load capacity N
06923-06008	120	47	M8	66	132	27	1000
06923-12008	120	47	M8	126	132	87	1000

06924

Pull handles

stainless steel

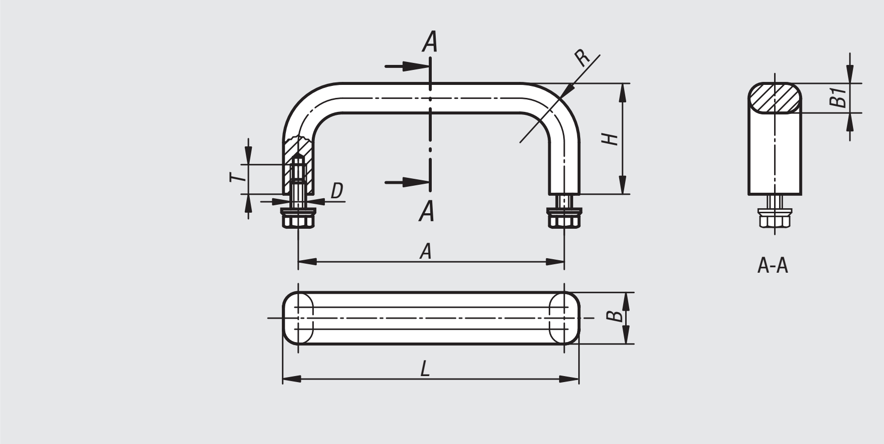
EDELSTAHL Rost frei STAINLESS STEEL

Material:
Handle stainless steel 1.4404.
Fastening material 1.4301.

Version:
Vibratory ground semi-gloss finish.

Sample order:
nlm 06924-10005

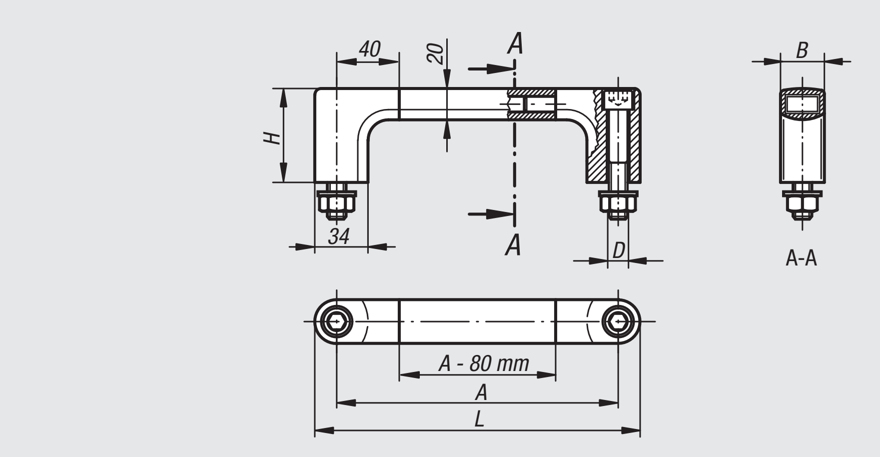
Assembly:
From the rear.



Order No.	A	B	B1	D	H	L	R	T	Load capacity N
06924-10005	100	12	8	M5x10	40	108	22	10	1000
06924-12005	120	12	8	M5x10	40	128	22	10	1000
06924-15005	150	12	8	M5x10	40	158	22	10	1000
06924-18005	180	12	8	M5x10	40	188	22	10	1000
06924-25005	250	12	8	M5x10	40	258	22	10	1000
06924-10006	100	19,5	10	M6x12	45	110	24	12	1000
06924-12006	120	19,5	10	M6x12	45	130	24	12	1000
06924-15006	150	19,5	10	M6x12	45	160	24	12	1000
06924-18006	180	19,5	10	M6x12	45	190	24	12	1000
06924-25006	250	19,5	10	M6x12	45	260	24	12	1000

06925

Pull handles tubular



Material:
Aluminium.

Version:
Leg black powder-coated.
Grip natural colour anodised.

Sample order:
nlm 06925-300

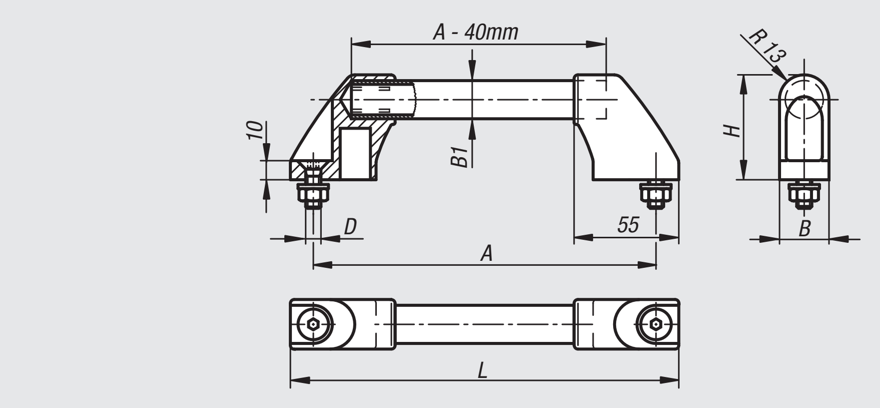
Note:
Black electro zinc-plated M12x70 cap screws, suitable washers and nuts for fastening are supplied.

Assembly:
From the front.

Order No.	A	B	D	H	L	Load capacity N
06925-180	180	28	M12	60	208	1000
06925-200	200	28	M12	60	228	1000
06925-250	250	28	M12	60	278	1000
06925-300	300	28	M12	60	328	1000
06925-350	350	28	M12	60	378	1000
06925-400	400	28	M12	60	428	1000
06925-500	500	28	M12	60	528	1000
06925-600	600	28	M12	60	628	1000

06926

Pull handles tubular



Material:
Legs black glass-bead reinforced thermoplastic.
Grip tube aluminium.

Version:
Grip, ground and natural colour anodised
Grip with serrated plastic sheath, black

Sample order:
nlm 06926-200

Note:
The legs have 4 webs in the hole for the grip tube. When pushing the tube in, these are trimmed off and produce a precise seating.
Black electro zinc-plated fastening screws, suitable washers and nuts are supplied.

Assembly:
From the front.

Order No. ground and anodised	Order No. serrated plastic sleeve	A	B	B1	D	H	L	Load capacity N
06926-180	**06926-1803**	180	26	20X2	M8x20	55	204	500
06926-200	**06926-2003**	200	26	20X2	M8x20	55	224	500
06926-250	**06926-2503**	250	26	20X2	M8x20	55	274	500
06926-300	**06926-3003**	300	26	20X2	M8x20	55	324	500
06926-350	**06926-3503**	350	26	20X2	M8x20	55	374	500
06926-400	**06926-4003**	400	26	20X2	M8x20	55	424	500
06926-500	**06926-5003**	500	26	20X2	M8x20	55	524	500
06926-600	**06926-6003**	600	26	20X2	M8x20	55	624	500

06927

Pull handles tubular

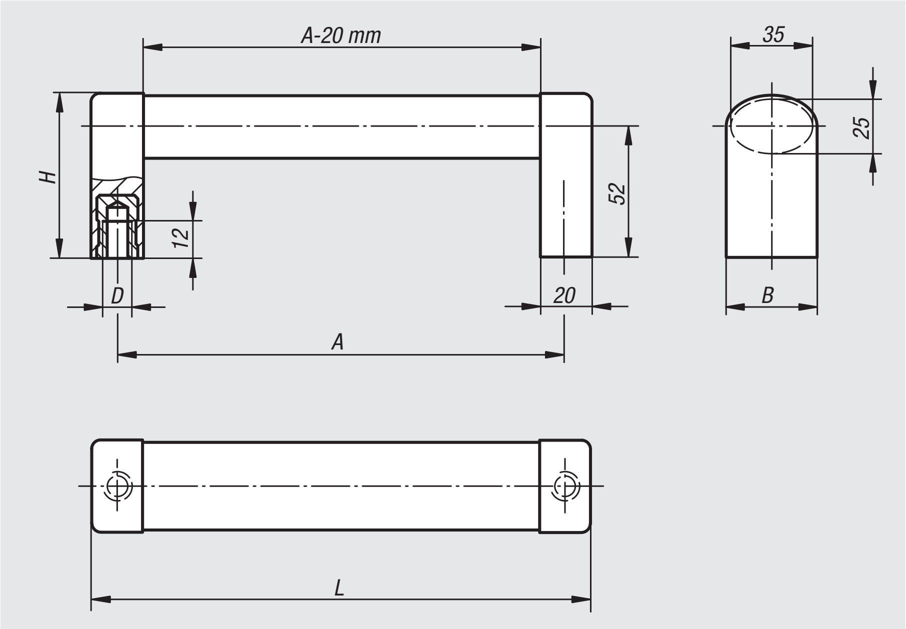
Material:
Grip aluminium EN AW-6060.
Legs polyamide glass-bead reinforced.
Bushing brass.
Clamping sleeves stainless steel.

Version:
Grip natural colour or black anodised.
Legs aluminium colour or black.

Sample order:
nlm 06927-1200081

Note:
Oval-profile handles for joining together. Version with plastic legs and aluminium oval grip.

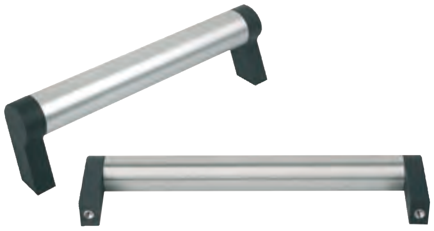
Assembly:
From the rear.

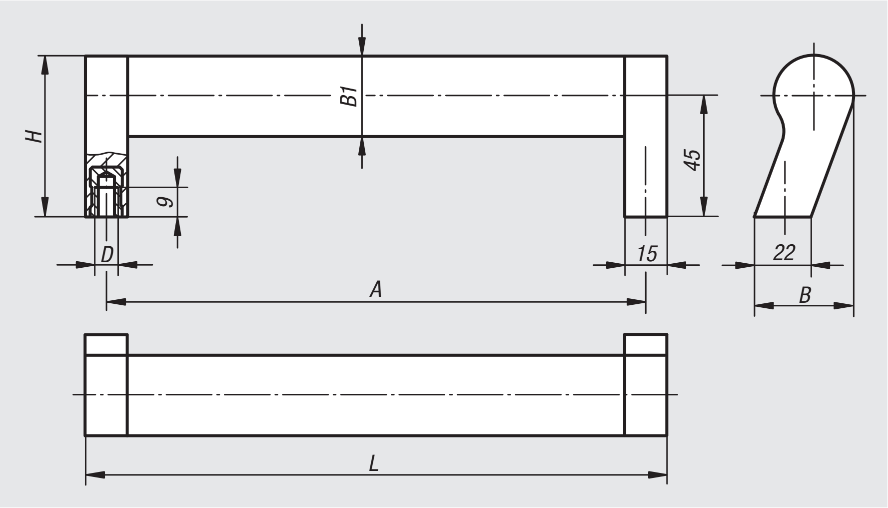


Order No.	Main colour	Component colour	A	B	D	H	L	Load capacity N
06927-1200081	natural	aluminium tone	200	36	M8	65	220	1000
06927-1250081	natural	aluminium tone	250	36	M8	65	270	1000
06927-1300081	natural	aluminium tone	300	36	M8	65	320	1000
06927-1400081	natural	aluminium tone	400	36	M8	65	420	1000
06927-1500081	natural	aluminium tone	500	36	M8	65	520	1000
06927-1200082	natural	black	200	36	M8	65	220	1000
06927-1250082	natural	black	250	36	M8	65	270	1000
06927-1300082	natural	black	300	36	M8	65	320	1000
06927-1400082	natural	black	400	36	M8	65	420	1000
06927-1500082	natural	black	500	36	M8	65	520	1000
06927-1200083	black	black	200	36	M8	65	220	1000
06927-1250083	black	black	250	36	M8	65	270	1000
06927-1300083	black	black	300	36	M8	65	320	1000
06927-1400083	black	black	400	36	M8	65	420	1000
06927-1500083	black	black	500	36	M8	65	520	1000

Pull handles tubular

oblique





Material:
Grip tube aluminium EN AW-6060;
Legs polyamide, glass-bead reinforced;
Bushing brass

Version:
Tube matt-polished anodised.
Legs black

Sample order:
nlm 06928-2150061

Note:
Oblique tubular pull handles in modern industrial design. Webs on the leg spigot provide a precision fit for the tube.

Assembly:
From the rear.

Order No.	A	B	B1	D	H	L	Load capacity N
06928-2150061	150	37	30X1,5	M6	60	165	800
06928-2200061	200	37	30X1,5	M6	60	215	800
06928-2250061	250	37	30X1,5	M6	60	265	800
06928-2300061	300	37	30X1,5	M6	60	315	800
06928-2350061	350	37	30X1,5	M6	60	365	800
06928-2400061	400	37	30X1,5	M6	60	415	800

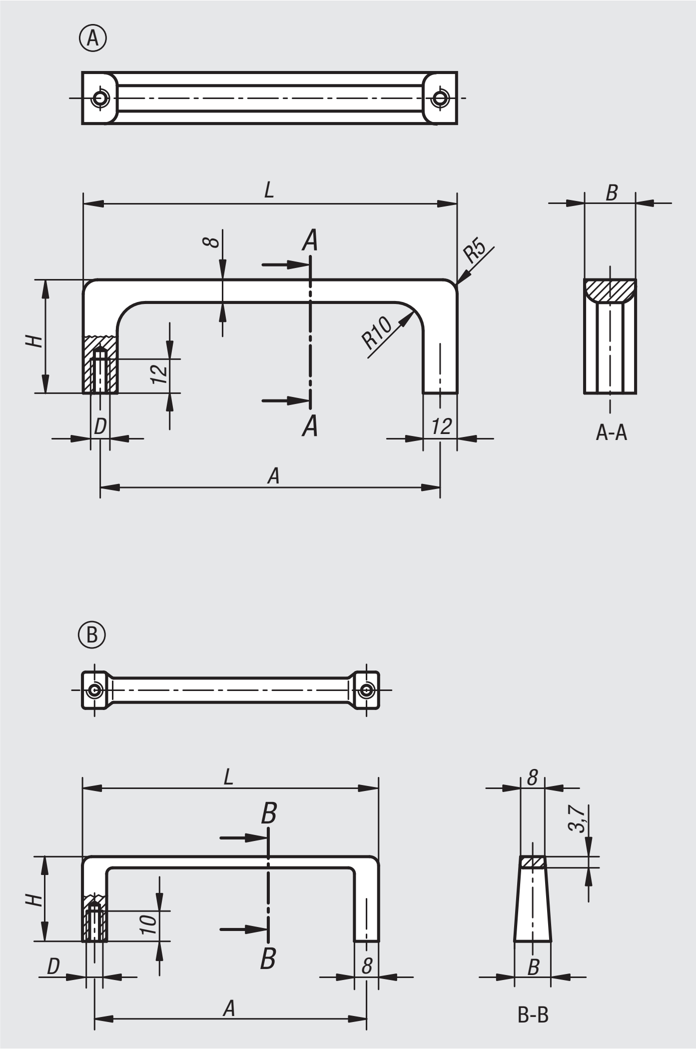
Pull handles

Material:
Profile aluminium EN AW-6060

Version:
Matt-finished, anodised black or natural tone.

Sample order:
nlm 06929-12001

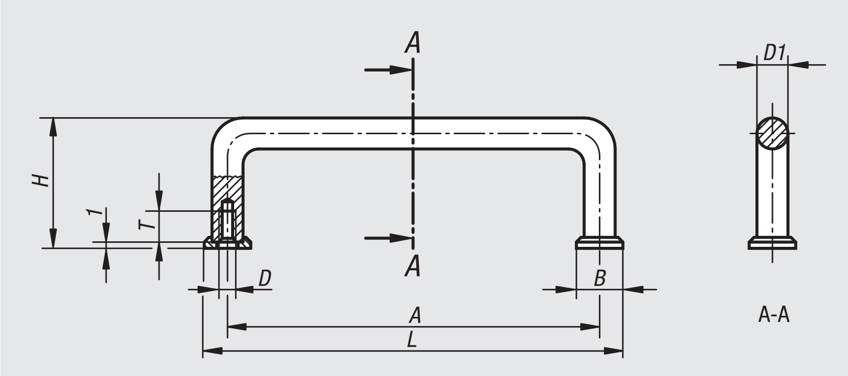
Assembly:
From the rear.



Order No.	Form	Main colour	A	B	D	H	L	Load capacity N
06929-12001	A	black	120	18	M6	40	132	500
06929-09001	B	black	90	12	M5	28	98	300
06929-12003	A	natural	120	18	M6	40	132	500
06929-09003	B	natural	90	12	M5	28	98	300

Pull handles

high-gloss chromed



Material:
Steel.

Version:
Disc very finely ground.
Pull handle high-gloss chromed.

Sample order:
nlm 06930-10204

Note:
These pull handles are used primarily on optical devices, laboratory installations, audio, video and hi-fi equipment, etc. The end washers are supplied loose.

Assembly:
From the rear.

On request:
Other surface finishes.

Order No.	A	B	D	D1	H	L	T	Load capacity N
06930-03203	32	8	M3	5	21	40	6	1000
06930-04203	42	8	M3	5	25	50	6	1000
06930-05503	55	8	M3	5	25	63	6	1000
06930-07603	76	8	M3	5	25	84	6	1000
06930-08803	88	8	M3	5	25	96	6	1000
06930-03204	32	12,5	M4	8	33	44,5	8	1000
06930-05504	55	12,5	M4	8	33	67,5	8	1000
06930-06404	64	12,5	M4	8	33	76,5	8	1000
06930-08804	88	12,5	M4	8	33	100,5	8	1000
06930-09604	96	12,5	M4	8	33	108,5	8	1000
06930-09804	98	12,5	M4	8	33	110,5	8	1000
06930-10204	102	12,5	M4	8	33	114,5	8	1000
06930-12004	120	12,5	M4	8	33	132,5	8	1000
06930-12804	128	12,5	M4	8	33	140,5	8	1000
06930-13604	136	12,5	M4	8	33	148,5	8	1000
06930-05505	55	15	M5	10	41	70	10	1000
06930-08805	88	15	M5	10	41	103	10	1000
06930-10005	100	15	M5	10	41	115	10	1000
06930-10205	102	15	M5	10	41	117	10	1000
06930-11505	115	15	M5	10	41	130	10	1000
06930-12005	120	15	M5	10	41	135	10	1000
06930-13605	136	15	M5	10	41	151	10	1000
06930-18005	180	15	M5	10	41	195	10	1000
06930-20005	200	15	M5	10	41	215	10	1000
06930-23505	235	15	M5	10	41	250	10	1000
06930-25005	250	15	M5	10	41	265	10	1000

06931

Pull handles

stainless steel

Material:
Pull Handle and fasteners 1.4404 stainless steel.

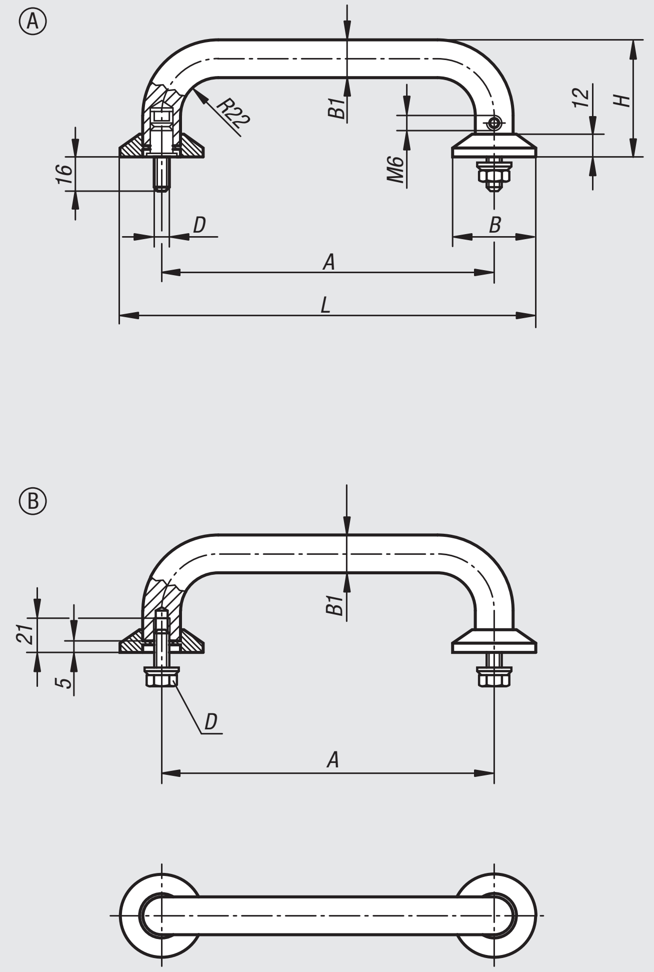
Version:
Ground and satin brushed finish.

Sample order:
nlm 06931-2001

Note:
These stainless steel pull handles are ideal for all technical applications where highest load and high chemical or corrosive resistance is required.

Assembly:
From the rear.

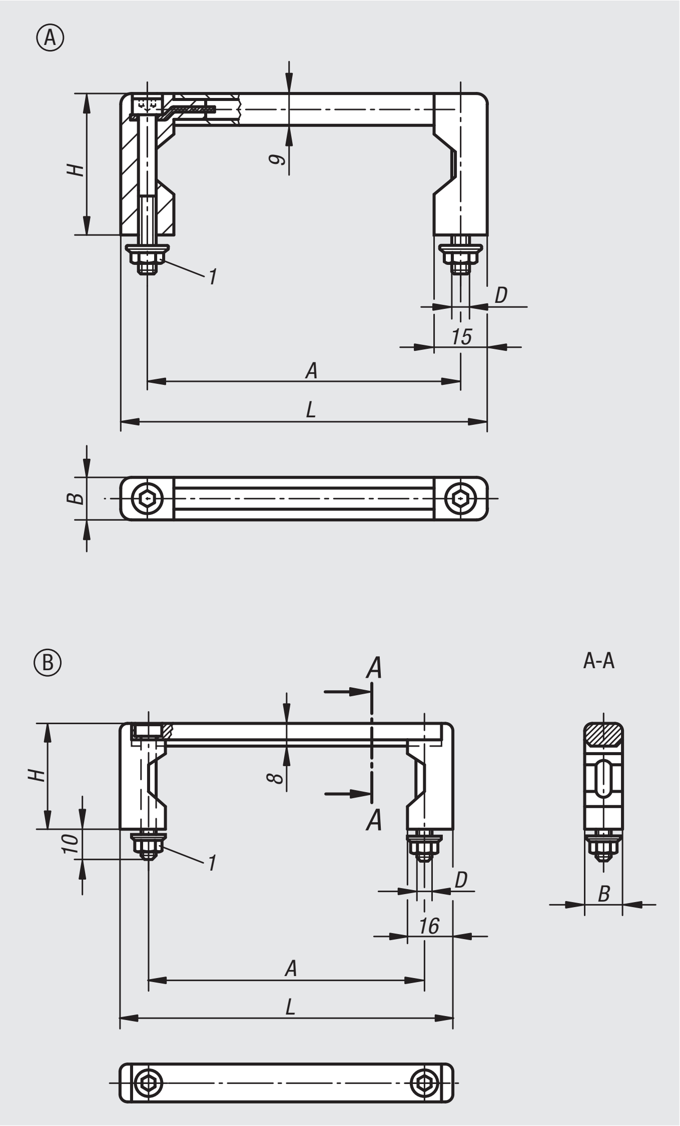
Drawing reference:
Form A
fastening from the front.
Form B
fastening from the rear.



Order No.	Form	A	B	B1	D	H	L	Load capacity N
06931-2001	A	200	50	20	M8	75	250	1000
06931-2501	A	250	50	20	M8	75	300	1000
06931-2002	B	200	50	20	M8	75	250	1000
06931-2502	B	250	50	20	M8	75	300	1000

Pull handles

19″



Material:
Grip aluminium.
Legs glass-bead reinforced polyamide.

Version:
Grip matt-finished and natural tone or black anodised.
Legs fine structure semi-matt, black.

Sample order:
nlm 06932-10001

Assembly:
From the front.

Drawing reference:
1) Toothed locknut

Order No. black	Order No. natural	Form	A	B	D	H	L	Load capacity N
06932-05501	06932-05503	A	55	12	M5	40	70	1000
06932-08801	06932-08803	A	88	12	M5	40	103	1000
06932-10001	06932-10003	A	100	12	M5	40	115	1000
06932-12001	06932-12003	A	120	12	M5	40	135	1000
06932-18001	06932-18003	A	180	12	M5	40	195	1000
06932-23501	06932-23503	A	235	12	M5	40	250	1000
06932-055101	06932-055103	B	55	12	M5	40	75	1000
06932-088101	06932-088103	B	88	12	M5	40	108	1000
06932-100101	06932-100103	B	100	12	M5	40	120	1000
06932-120101	06932-120103	B	120	12	M5	40	140	1000
06932-180101	06932-180103	B	180	12	M5	40	200	1000
06932-235101	06932-235103	B	235	12	M5	40	255	1000

06932

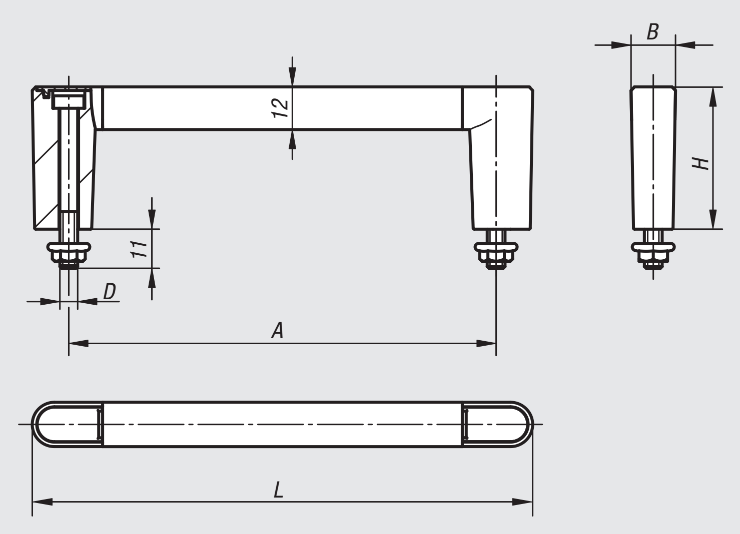
Pull handles

Material:
Grip aluminium.
Legs and cap PA 6.
Screw and flange nut steel.

Version:
Grip natural colour or black anodised.
Screw and flange nut electro zinc-plated.

Sample order:
nlm 06932-120203

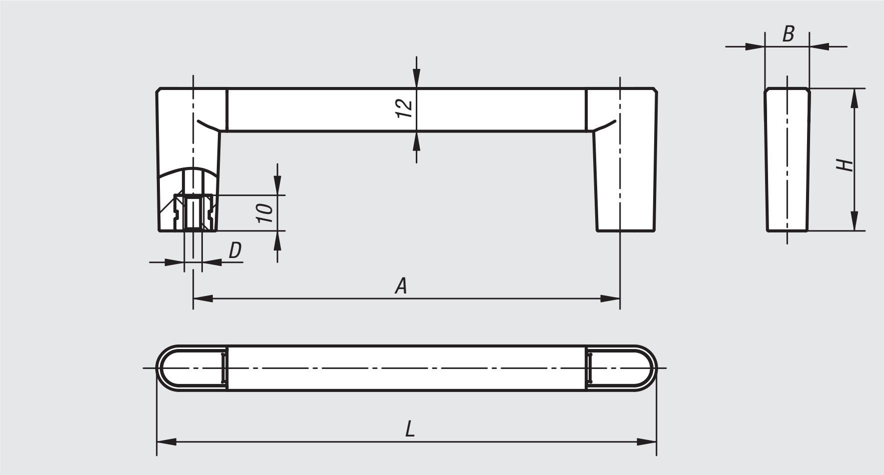
Note:
- 19“
- Closed design
- Simple assembly
- The cap is tapped on using a plastic hammer



Order No. black	Order No. natural	A	B	D	H	L	Load capacity N
06932-055201	**06932-055203**	55	12,5	M5	40	75,5	1000
06932-088201	**06932-088203**	88	12,5	M5	40	108,5	1000
06932-100201	**06932-100203**	100	12,5	M5	40	120,5	1000
06932-120201	**06932-120203**	120	12,5	M5	40	140,5	1000
06932-180201	**06932-180203**	180	12,5	M5	40	200,5	1000
06932-235201	**06932-235203**	235	12,5	M5	40	255,5	1000

06933

Pull handles



Material:
Grip aluminium.
Legs and cap PA 6.
Tapped bush steel.

Version:
Grip natural colour or black anodised.
Tapped bush electro zinc-plated.

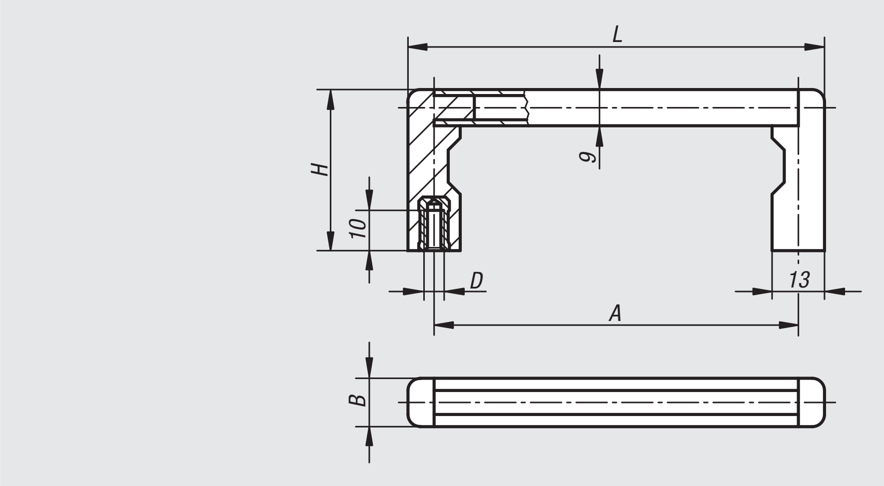
Sample order:
nlm 06933-120101

Note:
- 19“
- Closed design
- Simple assembly
- The cap is tapped on using a plastic hammer

Order No. black	Order No. natural	A	B	D	H	L	Load capacity N
06933-055101	**06933-055103**	55	12,5	M5	40	75,5	1000
06933-088101	**06933-088103**	88	12,5	M5	40	108,5	1000
06933-100101	**06933-100103**	100	12,5	M5	40	120,5	1000
06933-120101	**06933-120103**	120	12,5	M5	40	140,5	1000
06933-180101	**06933-180103**	180	12,5	M5	40	200,5	1000
06933-235101	**06933-235103**	235	12,5	M5	40	255,5	1000

06933

Pull handles



Material:
Grip aluminium.
Legs high-strength plastic

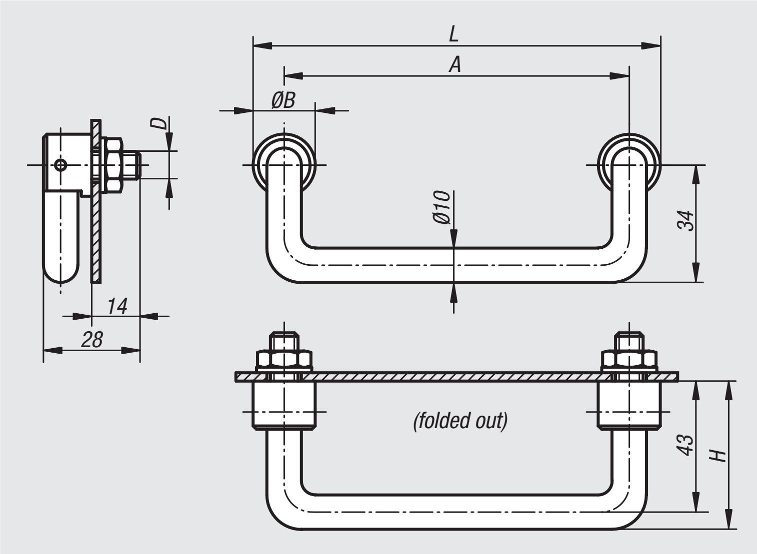
Sample order:
nlm 06933-05501

Assembly:
From the rear.

Order No. black	Order No. natural	A	B	D	H	L	Load capacity N
06933-05501	**06933-05503**	55	12	M5	40	69	1000
06933-08801	**06933-08803**	88	12	M5	40	102	1000
06933-10001	**06933-10003**	100	12	M5	40	114	1000
06933-12001	**06933-12003**	120	12	M5	40	134	1000
06933-18001	**06933-18003**	180	12	M5	40	194	1000
06933-23501	**06933-23503**	235	12	M5	40	249	1000

06934

Pull handles fold-down



Material:
Steel or 1.4305 stainless steel

Version:
Steel version:
Surface finely ground and high-gloss chromed or with a smooth plastic cover on the grip.

Stainless steel version:
Surface semi-gloss score-free vibratory ground.

Sample order:
nlm 06934-1201

Note:
Steel or stainless steel fastening material is provided.
Spring lock in both end positions.

Assembly:
From the rear.

Order No. steel	Order No. steel with plastic cover	Order No. stainless steel	A	B	D	H	L	Load capacity N
06934-1001	**06934-1002**	**06934-1003**	100	18	M10x1	48	118	500
06934-1201	**06934-1202**	**06934-1203**	120	18	M10x1	48	138	500
06934-1801	**06934-1802**	**06934-1803**	180	18	M10x1	48	198	500

06935

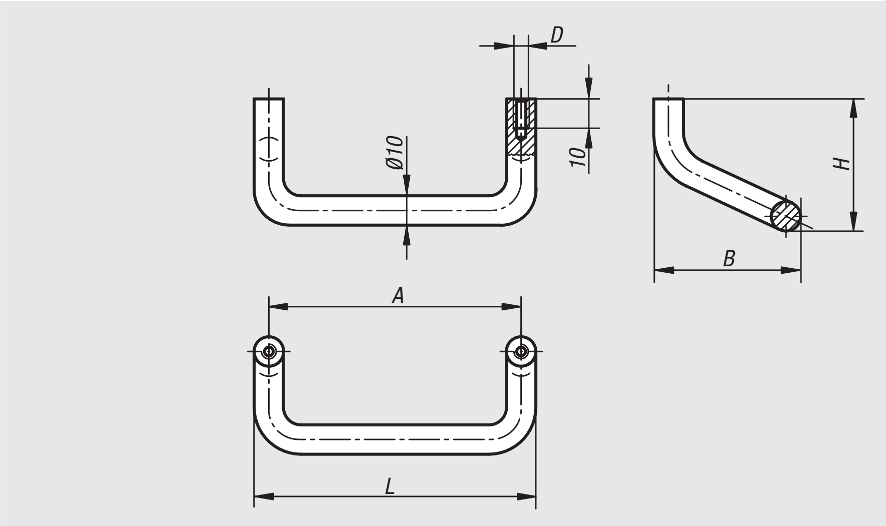
Pull handles angled

Material:
Aluminium.

Version:
Matt-finished, anodised black or natural tone.

Sample order:
nlm 06935-12001

Assembly:
From the rear.



Order No. black	Order No. natural	A	B	D	H	L	Load capacity N
06935-08601	**06935-08603**	86	40	M5	45	96	500
06935-12001	**06935-12003**	120	40	M5	45	130	500
06935-18001	**06935-18003**	180	40	M5	45	190	500

06936

Pull handles tubular angled

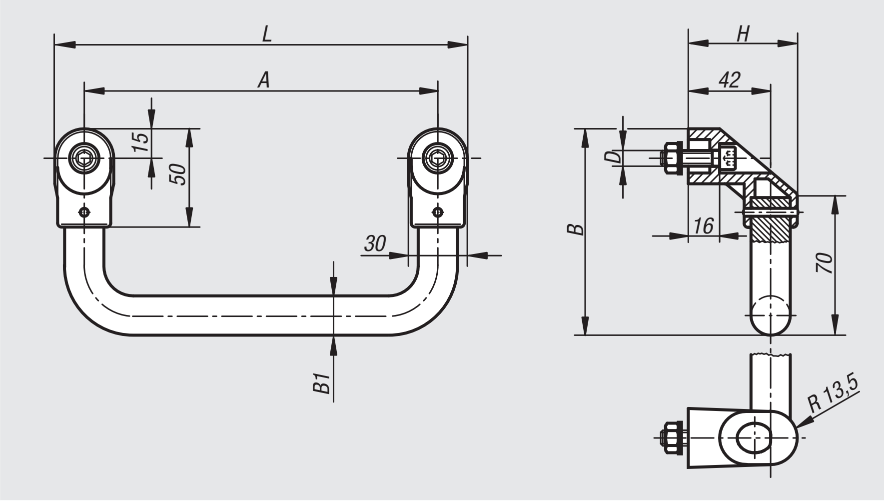
Material:
Leg glass-bead reinforced thermoplastic.
Grip aluminium tube.

Version:
Black thermoplastic.
Anodised aluminium.

Sample order:
nlm 06936-3002

Note:
The legs are pinned to the aluminium tube. Black electro zinc-plated cap screws, nuts and washers are supplied.

Assembly:
From the front.



Order No. natural	Order No. black	A	B	B1	D	H	L	Load capacity N
06936-2001	**06936-2002**	200	115	20	M8X30	55,5	230	800
06936-2501	**06936-2502**	250	115	20	M8X30	55,5	280	800
06936-3001	**06936-3002**	300	115	20	M8X30	55,5	330	800
06936-3501	**06936-3502**	350	115	20	M8X30	55,5	380	800
06936-4001	**06936-4002**	400	115	20	M8X30	55,5	430	800

06937

Pull handles tubular

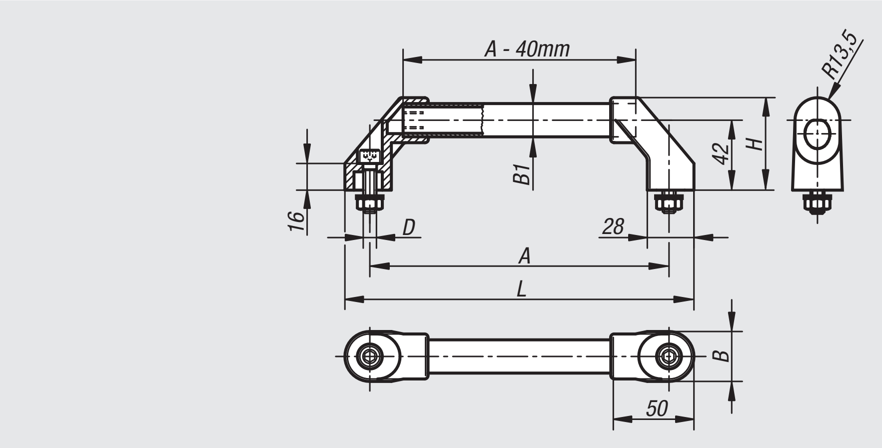
Material:
Legs black glass-bead reinforced thermoplastic.
Grip aluminium EN AW-6060.

Version:
Grip, ground and natural colour anodised
Grip with serrated plastic sheath, black

Sample order:
nlm 06937-3001

Note:
The legs have 4 webs in the hole for the grip tube. When pushing the tube in these are trimmed off and produce a precise seating. Black electro zinc-plated fastening screws, suitable washers and nuts are supplied.

Assembly:
From the front.



Order No. ground and anodised	Order No. serrated plastic sleeve	A	B	B1	D	H	L	Load capacity N
06937-1801	**06937-1802**	180	30	20X2	M8X30	55,5	210	1000
06937-2001	**06937-2002**	200	30	20X2	M8X30	55,5	230	1000
06937-2501	**06937-2502**	250	30	20X2	M8X30	55,5	280	1000
06937-3001	**06937-3002**	300	30	20X2	M8X30	55,5	330	1000
06937-3501	**06937-3502**	350	30	20X2	M8X30	55,5	380	1000
06937-4001	**06937-4002**	400	30	20X2	M8X30	55,5	430	1000
06937-5001	**06937-5002**	500	30	20X2	M8X30	55,5	530	1000
06937-6001	**06937-6002**	600	30	20X2	M8X30	55,5	630	1000

06938

Pull handles tubular

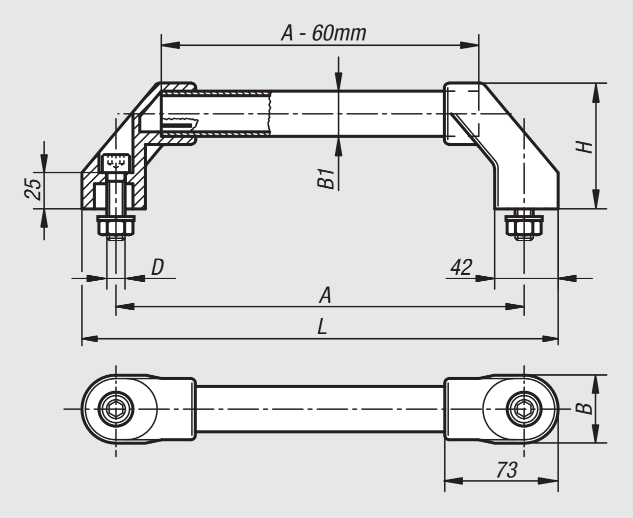
Material:
Legs black glass-bead reinforced thermoplastic.
Grip aluminium EN AW-6060 or stainless steel 1.4301.

Version:
Connecting tube aluminium, ground and natural tone anodised or with serrated plastic cover.
Connecting tube stainless steel, fine ground.

Sample order:
nlm 06938-3501

Note:
The legs have 4 webs in the hole for the grip tube. When pushing the tube in these are trimmed off and produce a precise seating.
Black electro zinc-plated fastening screws together with washers and nuts are supplied.

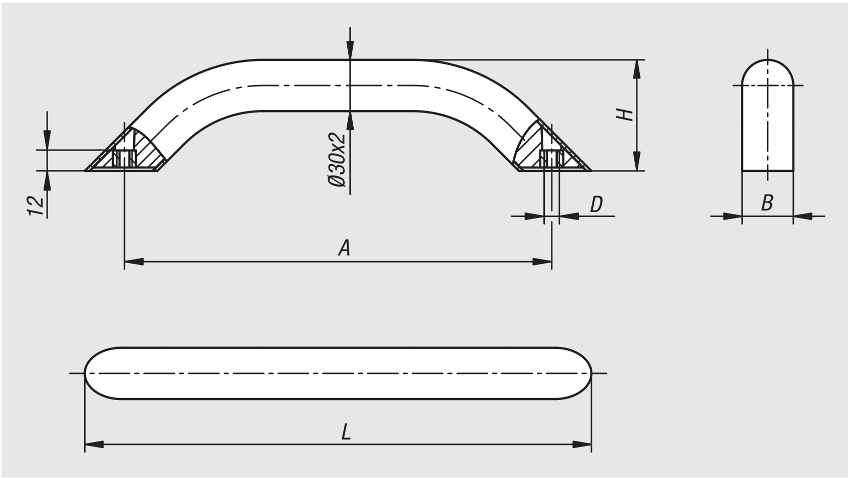
Assembly:
From the front.



Order No. aluminium ground and anodised	Order No. aluminium serrated plastic sleeve	Order No. stainless steel	A	B	B1	D	H	L	Load capacity N
06938-2501	**06938-2502**	**06938-2503**	250	44	30X1,5	M10x45	80	294	1000
06938-3001	**06938-3002**	**06938-3003**	300	44	30X1,5	M10x45	80	344	1000
06938-3501	**06938-3502**	**06938-3503**	350	44	30X1,5	M10x45	80	394	1000
06938-4001	**06938-4002**	**06938-4003**	400	44	30X1,5	M10x45	80	444	1000
06938-5001	**06938-5002**	**06938-5003**	500	44	30X1,5	M10x45	80	544	1000
06938-6001	**06938-6002**	**06938-6003**	600	44	30X1,5	M10x45	80	644	1000

Tubular handles round,

aluminium



The machine grip impresses with a combination of solid appearance, high stability and extreme lightness. The patented fastening system enables the handles to be installed from the rear with no screws visible from the front. With its easy-to-clean and abrasion-resistant surface, the handle also blends in perfectly with its surroundings.

Material:
Round tube aluminum EN AW-6060.
steel tapped bushing.

Version:
Anodised natural tone or powder-coated black, ruby red RAL 3003 or traffic red RAL 3020.

Sample order:
nlm 06938-01-300083

Note:
Mounting materials are not included with delivery!! For secure and long-term stability, socket head screws with LONG-LOK thread lock are recommended.

Assembly:
The machine handle can be mounted from the rear. DIN socket head screws or hexagon head bolts with thread size M8 are provided for this purpose.

Advantages:
Solid appearance combined with low weight

Timeless elegant design.
Ergonomic handle shape.
Patented fastening system for rear mounting.

Accessories:
07160 socket head screws, DIN 912 / DIN EN ISO 4762
LONG-LOK thread lock
07160 socket head screws, DIN 912 / DIN EN ISO 4762
07171 hexagon head bolts DIN 933 / DIN-EN-ISO 4017

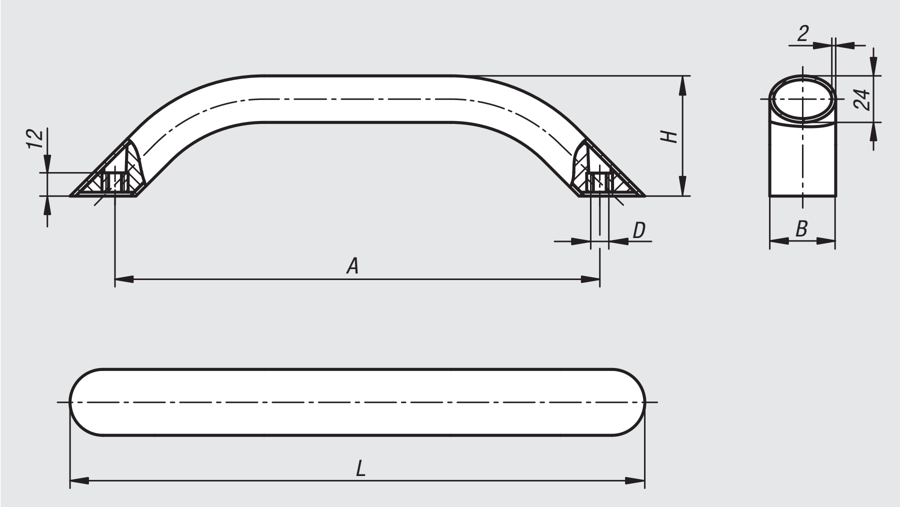
Tubular handles round, aluminium

Order No. natural anodised	Order No. black powder-coated	Order No. ruby red powder-coated	Order No. red RAL 3020 powder-coated	A	B	D	H	L	Load capacity N
06938-01-250083	**06938-01-250081**	**06938-01-2500827**	**06938-01-2500884**	250	30	M8	65	296,4	1000
06938-01-300083	**06938-01-300081**	**06938-01-3000827**	**06938-01-3000884**	300	30	M8	65	346,4	1000
06938-01-400083	**06938-01-400081**	**06938-01-4000827**	**06938-01-4000884**	400	30	M8	65	446,4	1000
06938-01-500083	**06938-01-500081**	**06938-01-5000827**	**06938-01-5000884**	500	30	M8	65	546,4	1000

06938-02

Tubular handles oval,

aluminium



The machine grip impresses with a combination of solid appearance, high stability and extreme lightness. The patented fastening system enables the handles to be installed from the rear with no screws visible from the front. With its easy-to-clean and abrasion-resistant surface, the handle also blends in perfectly with its surroundings.

Material:
Oval tube aluminium EN AW-6060.
Tapped bushes steel.

Version:
Anodised natural tone or powder-coated black, ruby red RAL 3003 or traffic red RAL 3020.

Sample order:
nlm 06838-02-400083

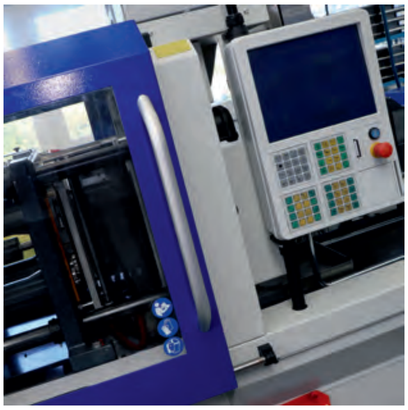
Note:
Mounting materials are not included with delivery!! For secure and long-term stability, socket head screws with LONG-LOK thread lock are recommended.

Assembly:
The machine handle can be mounted from the rear. DIN socket head screws or hexagon head bolts with thread size M8 are provided for this purpose.

Advantages:
Solid appearance combined with low weight

Timeless elegant design.
Ergonomic handle shape.
Patented fastening system for rear mounting.

Accessories:
07160 socket head screws, DIN 912 / DIN EN ISO 4762
LONG-LOK thread lock
07160 socket head screws, DIN 912 / DIN EN ISO 4762
07171 hexagon head bolts DIN 933 / DIN-EN-ISO 4017



Tubular handles oval, aluminium

Order No. natural anodised	Order No. black powder-coated	Order No. ruby red powder-coated	Order No. red RAL 3020 powder-coated	A	B	D	H	L	Load capacity N
06938-02-250083	**06938-02-250081**	**06938-02-2500827**	**06938-02-2500884**	250	34	M8	62	296,4	1000
06938-02-300083	**06938-02-300081**	**06938-02-3000827**	**06938-02-3000884**	300	34	M8	62	346,4	1000
06938-02-400083	**06938-02-400081**	**06938-02-4000827**	**06938-02-4000884**	400	34	M8	62	446,4	1000
06938-02-500083	**06938-02-500081**	**06938-02-5000827**	**06938-02-5000884**	500	34	M8	62	546,4	1000

06939

Pull handles tubular

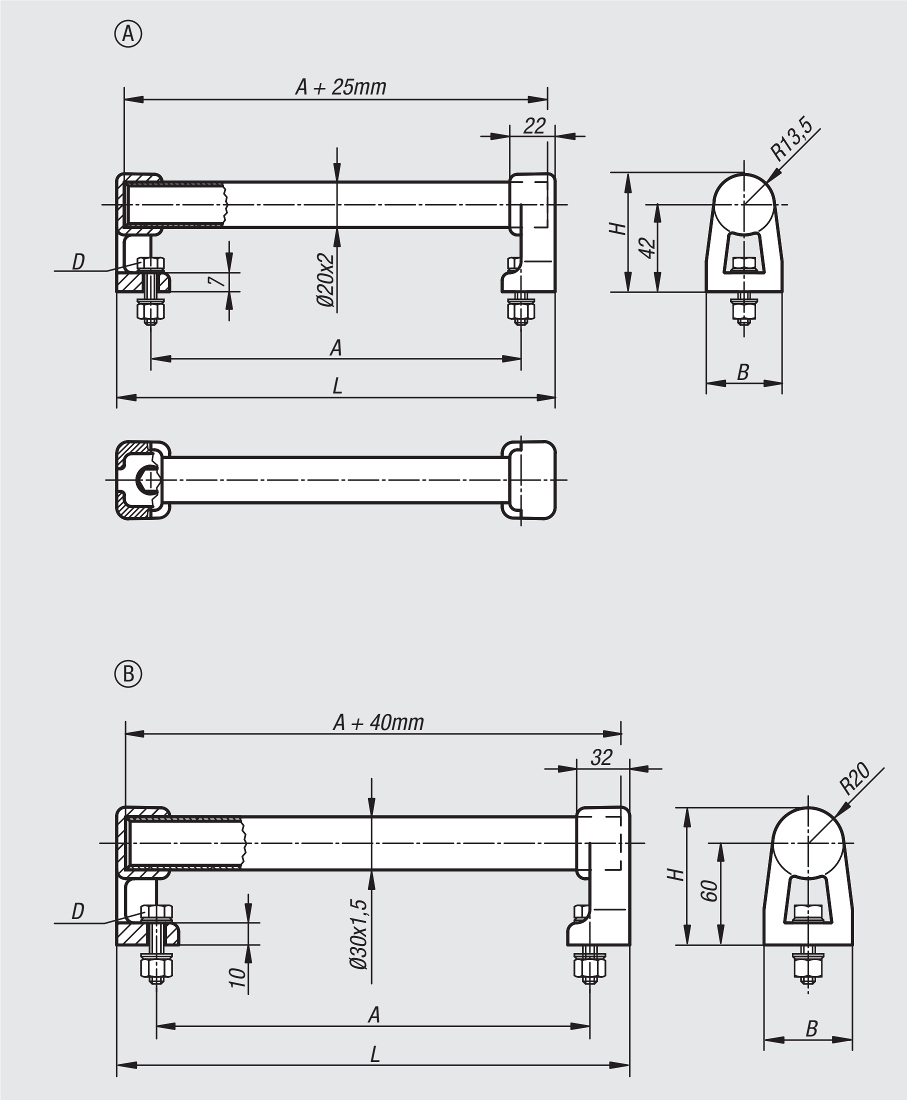
Material:
Grip aluminium EN AW-6060.
Legs glass-bead reinforced polyamide.

Version:
Grip natural colour anodised or with black serrated plastic cover.

Sample order:
nlm 06939-150203

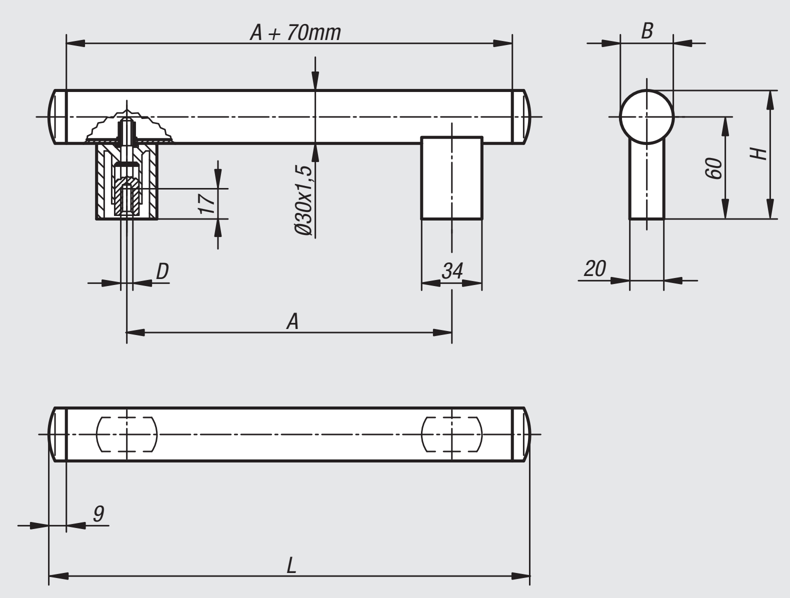
Note:
The legs have 2 or 4 PVC profile pins in the hole for the grip tube. When pushing the tube in these are trimmed off and produce a precise seating.
Black electro zinc-plated fastening screws, suitable washers and nuts are supplied.

Assembly:
From the front.



Order No. natural	Order No. black	Form	A	B	D	H	L	Load capacity N
06939-150203	**06939-150202**	A	150	32	M5x20	55,5	184	1000
06939-200203	**06939-200202**	A	200	32	M5x20	55,5	234	1000
06939-300203	**06939-300202**	A	300	32	M5x20	55,5	334	1000
06939-400203	**06939-400202**	A	400	32	M5x20	55,5	434	1000
06939-500203	**06939-500202**	A	500	32	M5x20	55,5	534	1000
06939-150303	**06939-150302**	B	150	48	M8x25	80	200	1000
06939-300303	**06939-300302**	B	300	48	M8x25	80	350	1000
06939-400303	**06939-400302**	B	400	48	M8x25	80	450	1000
06939-200303	**06939-200302**	B	200	48	M8x25	80	250	1000
06939-500303	**06939-500302**	B	500	48	M8x25	80	550	1000

Pull handles tubular



Material:
Legs and tube cap glass-bead reinforced polyamide.
Grip aluminium EN AW-6060.

Version:
Grip finely ground and anodised black or natural tone.
Legs and tube cap semi-matt with fine texture, black.

Sample order:
nlm 06940-200061

Note:
The legs and tube are fastened together with pull-out resistant rivet nuts.

Assembly:
From the rear.

Order No.	Main colour	A	B	D	H	L	Load capacity N
06940-200061	black anodised	200	30	M6	75	288	800
06940-250061	black anodised	250	30	M6	75	338	800
06940-300061	black anodised	300	30	M6	75	388	800
06940-400061	black anodised	400	30	M6	75	488	800
06940-500061	black anodised	500	30	M6	75	588	800
06940-200063	natural anodised	200	30	M6	75	288	800
06940-250063	natural anodised	250	30	M6	75	338	800
06940-300063	natural anodised	300	30	M6	75	388	800
06940-400063	natural anodised	400	30	M6	75	488	800
06940-500063	natural anodised	500	30	M6	75	588	800

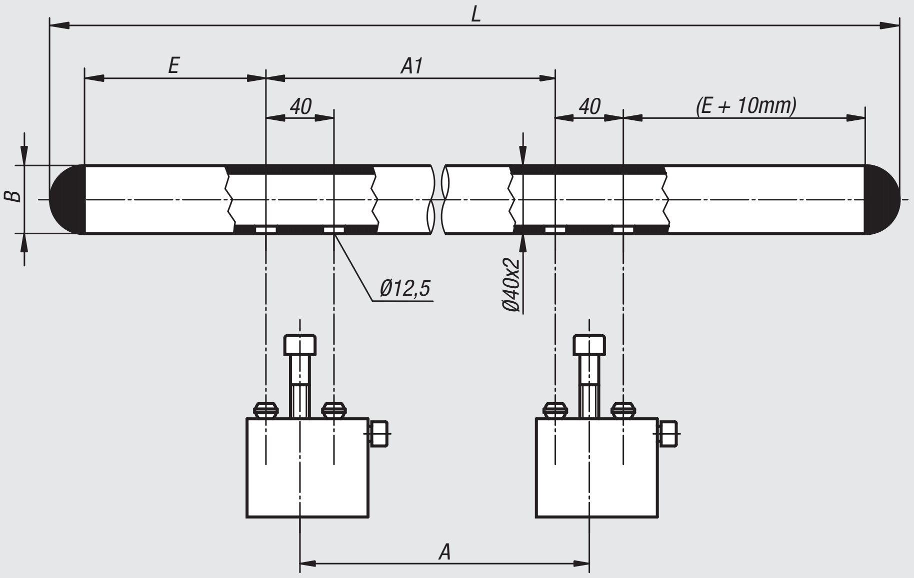
Pull handles tubular

Material:
Grip stainless steel 1.4301.
Legs die-cast aluminium.
End caps glass-bead reinforced plastic.
Screws and locking pins steel.

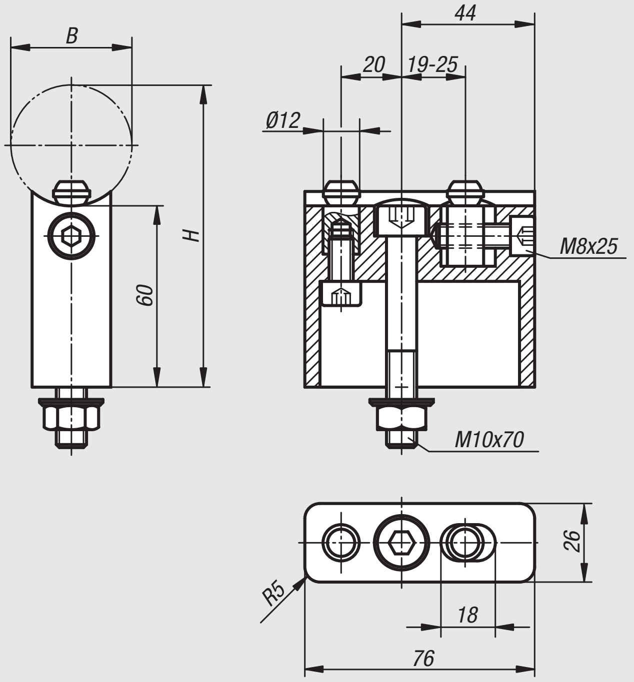
Version:
Grip finely ground.
Legs black powder-coated.
End cap black.
Screws and pins trivalent passivated.

Sample order:
nlm 06941-0600101

Note:
Heavy duty tubular pull handles for machine and plant construction. Easy mounting from the front. Adjustable leg spacing by the same grip length.



Leg locking diagram:



Order No.	A	A1	B	E	H	L	Load capacity N
06941-0600101	380	380	40	85	100	640	1000
06941-0700101	480	480	40	85	100	740	1000
06941-0800101	500	500	40	125	100	840	1000
06941-0900101	600	600	40	125	100	940	1000
06941-1000101	700	700	40	125	100	1040	1000

Pull handles tubular

Material:
Legs glass-bead reinforced thermoplastic.
Grip stainless steel 1.4301.
Inserts stainless steel 1.4305.

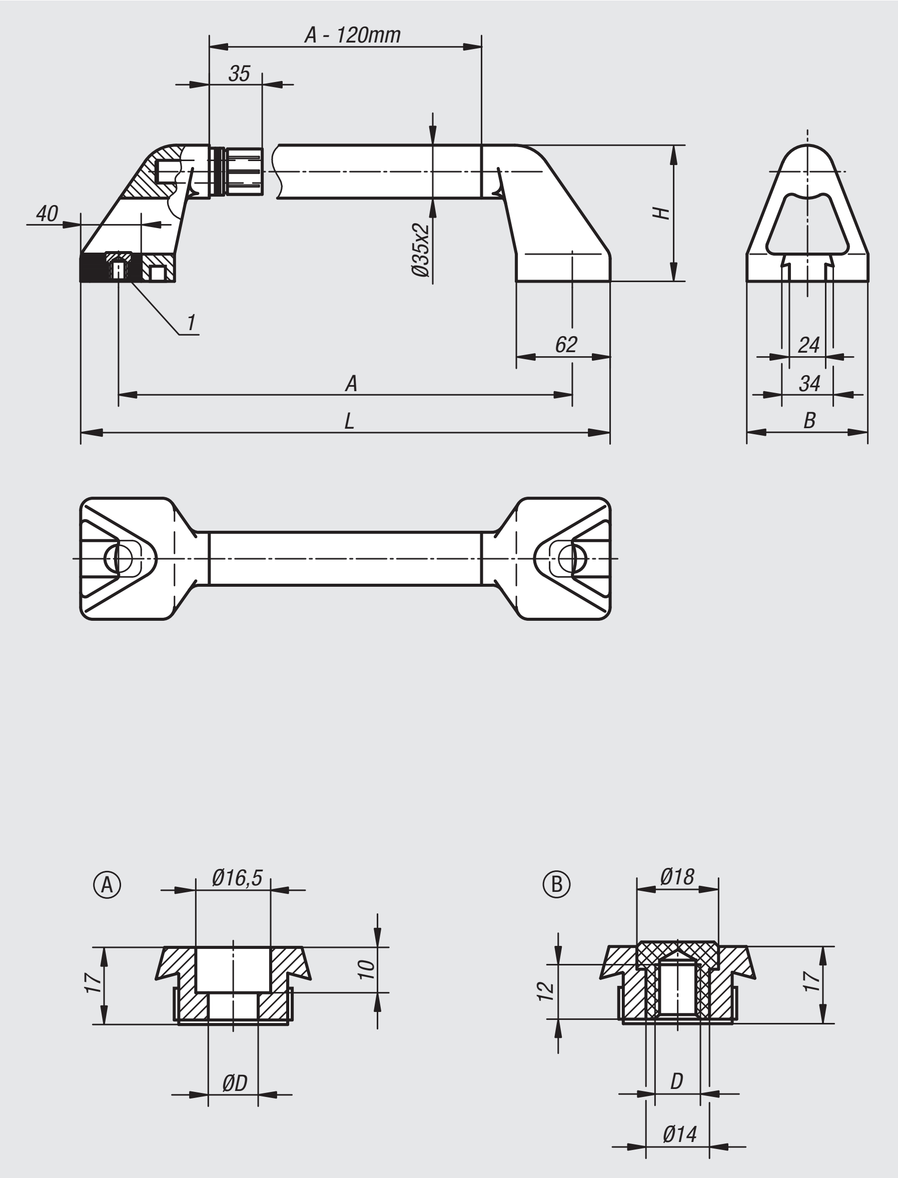
Version:
Legs fine structured, black.
Grip fine ground.
Inserts fine turned.

Sample order:
nlm 06942-300101

Note:
Locking webs allow a precision fit of the tube on the plastic leg boss.
Splash-proof with O-ring seals.
Different fastening inserts allow mounting from the front, rear or with each other.
Handles with through hole inserts (Form A) are supplied with stainless steel fasteners.
Handles with tapped inserts (Form B) are supplied without fasteners.

Drawing reference:
Form A: screw head insert
Form B: threaded insert

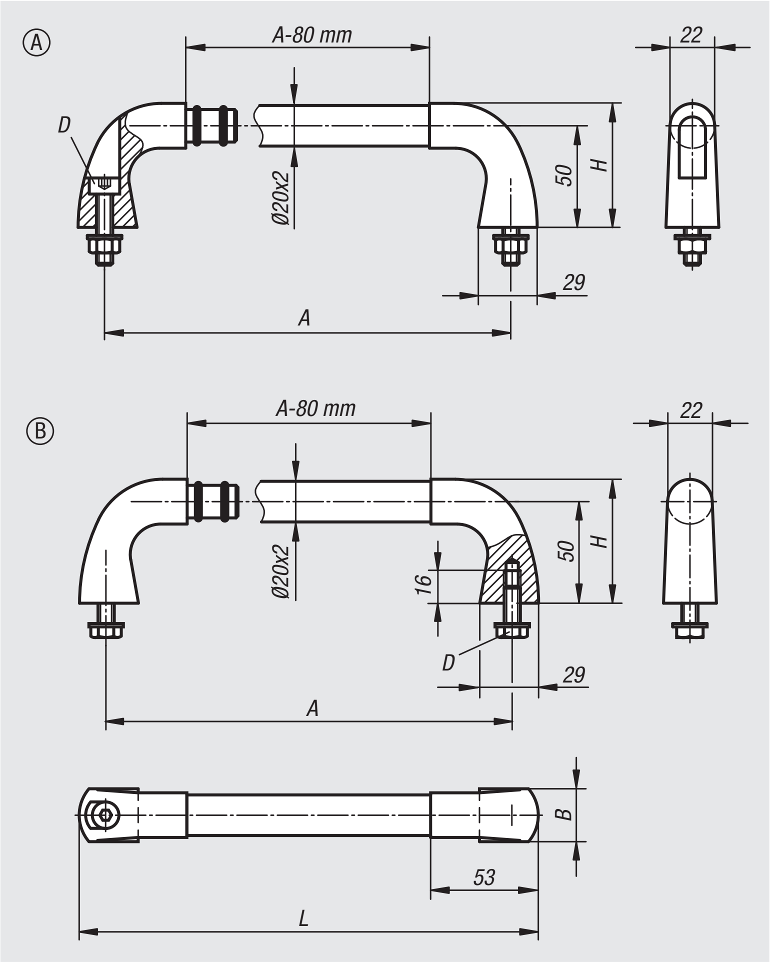
1) Screw head insert (A) or threaded insert (B).



Order No.	Form	A	B	D	H	L	Load capacity N
06942-300101	A	300	80	11	90	350	1000
06942-350101	A	350	80	11	90	400	1000
06942-400101	A	400	80	11	90	450	1000
06942-500101	A	500	80	11	90	550	1000
06942-600101	A	600	80	11	90	650	1000
06942-300102	B	300	80	M10	90	350	1000
06942-350102	B	350	80	M10	90	400	1000
06942-400102	B	400	80	M10	90	450	1000
06942-500102	B	500	80	M10	90	550	1000
06942-600102	B	600	80	M10	90	650	1000

06943

Pull handles tubular stainless steel



Material:
Grip and fasteners 1.4301 stainless steel.
Legs investment cast 1.4581 stainless steel.

Version:
Grip finely ground or with ribbed black plastic sleeve.
Legs abrasive cleaned and matt-gloss electropolished.

Sample order:
nlm 06943-200081

Note:
Cap screws with nuts and washers are supplied for Form A handles.
Hexagon head screws and washers are supplied for Form B handles.

Assembly:
Form A from the front.
Form B from the rear.

Order No.	Form	Main colour	A	B	D	H	L	Load capacity N
06943-200081	A	ground	200	26	M8x35	60	226	1000
06943-300081	A	ground	300	26	M8x35	60	326	1000
06943-400081	A	ground	400	26	M8x35	60	426	1000
06943-200082	A	black plastic ribbed	200	26	M8x35	60	226	1000
06943-300082	A	black plastic ribbed	300	26	M8x35	60	326	1000
06943-400082	A	black plastic ribbed	400	26	M8x35	60	426	1000
06943-200083	B	ground	200	26	M8x20	60	226	1000
06943-300083	B	ground	300	26	M8x20	60	326	1000
06943-400083	B	ground	400	26	M8x20	60	426	1000
06943-200084	B	black plastic ribbed	200	26	M8x20	60	226	1000
06943-300084	B	black plastic ribbed	300	26	M8x20	60	326	1000
06943-400084	B	black plastic ribbed	400	26	M8x20	60	426	1000

06944

Pull handles

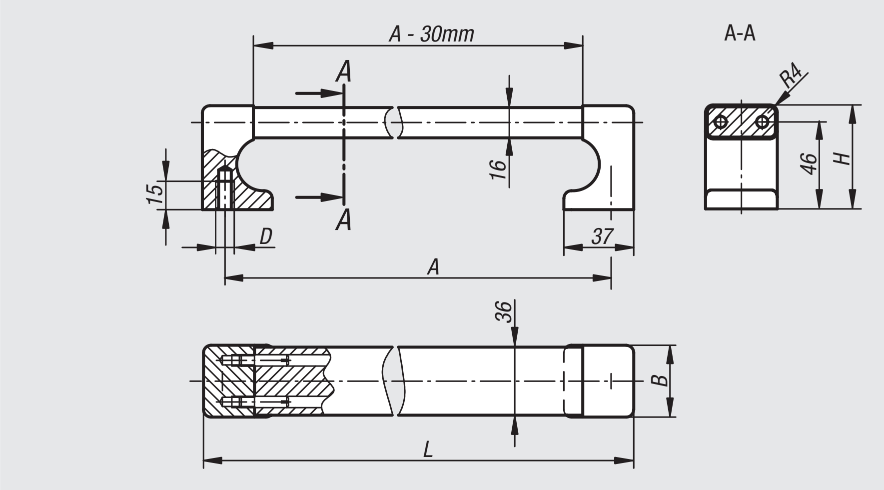
Material:
Legs and grip aluminium EN AW-6060.
Connecting pins stainless steel.

Version:
Legs and grip finely ground, anodised black or natural tone.

Sample order:
nlm 06944-250081

Note:
The solid construction permits this handle series to also be used as edge protectors.

Assembly:
From the rear.



Order No. black anodised	Order No. natural anodised	A	B	D	H	L	Load capacity N
06944-250081	**06944-250083**	250	38	M8	55	274	1000
06944-300081	**06944-300083**	300	38	M8	55	324	1000
06944-400081	**06944-400083**	400	38	M8	55	424	1000
06944-500081	**06944-500083**	500	38	M8	55	524	1000
06944-600081	**06944-600083**	600	38	M8	55	624	1000

06945

Pull handles angled

Material:
Round aluminium EN AW-6060

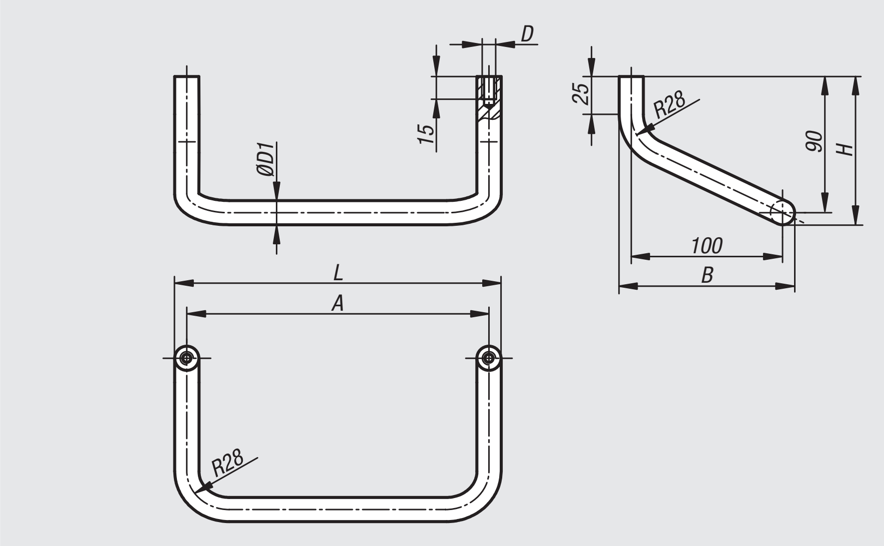
Version:
Ground, glass blasted and matt-gloss black anodised.

Sample order:
nlm 06945-20016

Note:
End washers not included.

Assembly:
From the rear.

On request:
Any handle length.



Order No.	A	B	D	D1	H	L	Load capacity N	Order No. end washer
06945-20016	200	116	M8	16	98	216	1000	06945-16
06945-25016	250	116	M8	16	98	266	1000	06945-16
06945-30016	300	116	M8	16	98	316	1000	06945-16
06945-40016	400	116	M8	16	98	416	1000	06945-16
06945-50018	500	118	M8	18	99	518	1000	06945-18

06946

Pull handles

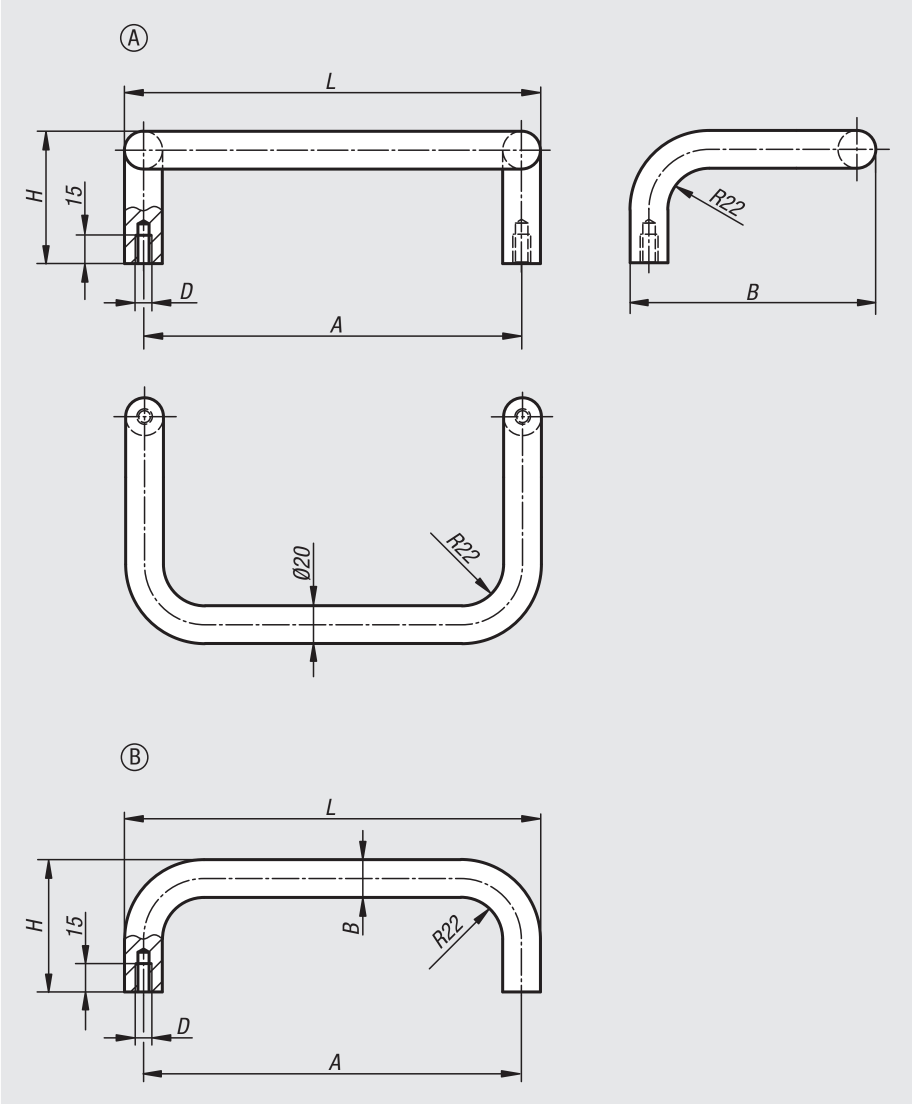
Material:
Round steel

Version:
Ground, brushed and matt-chromed or black powder-coated with fine texture

Sample order:
nlm 06946-200081

Note:
Available as straight or right-angled handle.

Assembly:
From the rear.



Order No.	Form	Main colour	A	B	D	H	L	Load capacity N
06946-200081	A	matt chromed	200	130	M8	70	220	1000
06946-350081	A	matt chromed	350	130	M8	70	370	1000
06946-200082	A	black powder-coated	200	130	M8	70	220	1000
06946-350082	A	black powder-coated	350	130	M8	70	370	1000
06946-200083	B	matt chromed	200	20	M8	70	220	1000
06946-250083	B	matt chromed	250	20	M8	70	270	1000
06946-300083	B	matt chromed	300	20	M8	70	320	1000
06946-350083	B	matt chromed	350	20	M8	70	370	1000
06946-200084	B	black powder-coated	200	20	M8	70	220	1000
06946-250084	B	black powder-coated	250	20	M8	70	270	1000
06946-300084	B	black powder-coated	300	20	M8	70	320	1000
06946-350084	B	black powder-coated	350	20	M8	70	370	1000

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

06947

Pull handles tubular

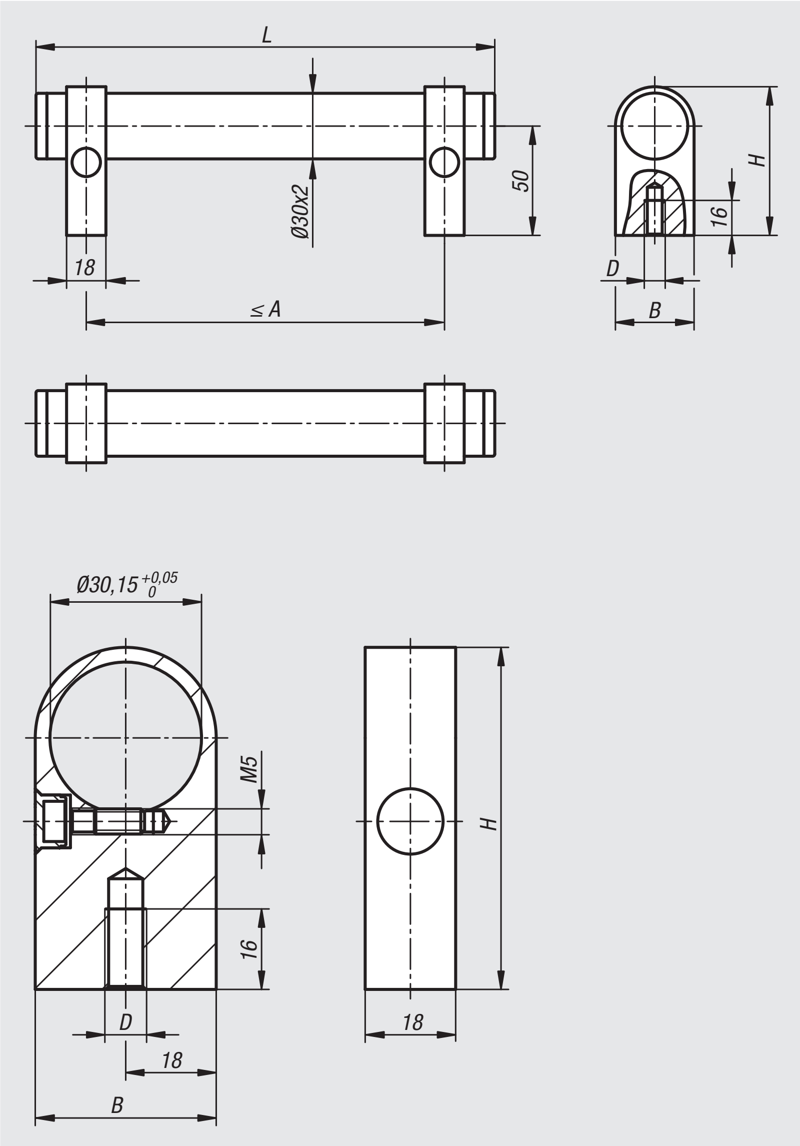
adjustable

Material:
Grip tube EN AW-6060.
Mounting bracket EN AW-6063.
End caps thermoplastic.
Grub screw ISO 4766-14H.

Version:
Grip tube anodised natural tone.
Mounting brackets anodised natural tone or black.
Grip end piece, black.
Bracket end cap light grey or black.

Sample order:
nlm 06947-2503011

Note:
The adjustable tubular handles are supplied unassembled.
The centre distance for the tubular handles can be freely determined.
The recommended maximum centre distance can be found in the table under A max.
Additional mounting brackets can be included for long handle lengths or high loads.
The mounting brackets are supplied unassembled.



Tubular handles adjustable

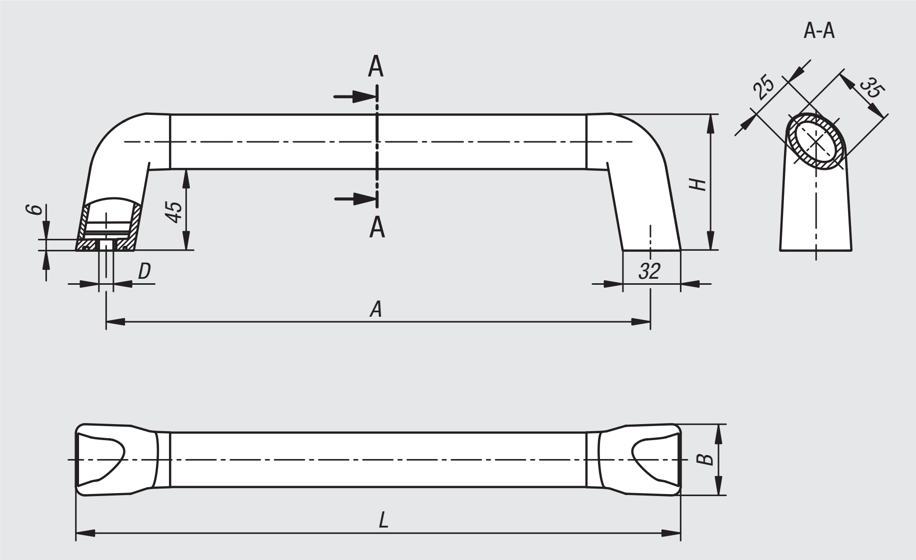
Order No.	Main colour	Component colour	A max.	B	D	H	L	Load capacity N
06947-2503011	natural anodised	natural anodised	220	36	M8	68	250	1000
06947-3003011	natural anodised	natural anodised	270	36	M8	68	300	1000
06947-4003011	natural anodised	natural anodised	370	36	M8	68	400	1000
06947-5003011	natural anodised	natural anodised	470	36	M8	68	500	1000
06947-6003011	natural anodised	natural anodised	570	36	M8	68	600	1000
06947-2503012	natural anodised	black anodised	220	36	M8	68	250	1000
06947-3003012	natural anodised	black anodised	270	36	M8	68	300	1000
06947-4003012	natural anodised	black anodised	370	36	M8	68	400	1000
06947-5003012	natural anodised	black anodised	470	36	M8	68	500	1000
06947-6003012	natural anodised	black anodised	570	36	M8	68	600	1000

Mounting brackets

Order No.	Main colour	B	D	H
06947-08301	natural anodised	36	M8	68
06947-08302	black anodised	36	M8	68

Notes

Tubular handles “Bighand”



The newly designed Bighand tubular handle with its ergonomic oval shape and selected tube size provides a secure and comfortable grip. Its timeless elegant design makes it attractive and the variable colour scheme means it can be optimally adapted to its surroundings.

Material:
Oval tube aluminium.
End piece thermoplastic polyamide.
End cap thermoplastic polyamide.
Adapter bush stainless steel.

Version:
Oval tube black grey powder-coated (glossy), black anodised (matt) or natural tone anodised (matt).
End piece black grey RAL 7021.
End cap black grey RAL7021, pure orange RAL 2004, rape yellow RAL 1021, traffic red RAL 3020, signal green RAL 6032 or traffic blue RAL 5017.

Sample order:
nlm 06948-01-18084 (cap colour traffic red.)

Note for ordering:
Δ Enter the required colour code here.

Note:
Fastening materials are not provided.
Cap screws with LONG-LOK thread lock are recommended for a secure and permanent hold.

Temperature range:
Permanent temperature max. 100 °C.
Short time use up to 180 °C.

Assembly:
The end pieces are designed so that the tubular handle can be fastened either from the front or rear. DIN M8 cap screws or hex head screws are provided for this purpose. After mounting, the end caps can be pressed in by hand. Slots are provided on both sides of the end caps so that they can be removed with a screwdriver without damaging them.

On request:
Special lengths “A”.

Accessories:
07160 DIN 912 / DIN EN ISO 4762 cap screws, LONG-LOK thread lock
07160 DIN 912 / DIN EN ISO 4762 cap screws
07171 DIN 933 / DIN-EN-ISO 4017 hex head screws
07210 DIN 934 / DIN EN ISO 4032 / DIN EN 24032 hex nuts
07300 DIN 125 / DIN EN ISO 7089 Form A washers

colour codes:

black Grey
Δ = 1
RAL 7021

Pure orange
Δ = 2
RAL 2004

colza yellow
Δ = 16
RAL 1021

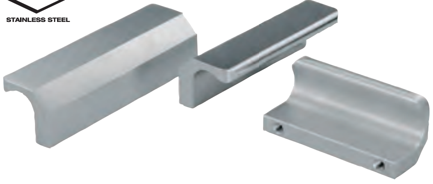
traffic red
Δ = 84
RAL 3020

signal green
Δ = 86
RAL 6032

traffic blue
Δ = 87
RAL 5017

Order No. black grey	Order No. black	Order No. natural	A	B	D	H	L	Load capacity N
06948-01-180Δ	**06948-01-18001Δ**	**06948-01-18003Δ**	180	39,2	8	75,5	213,4	1000
06948-01-200Δ	**06948-01-20001Δ**	**06948-01-20003Δ**	200	39,2	8	75,5	233,4	1000
06948-01-250Δ	**06948-01-25001Δ**	**06948-01-25003Δ**	250	39,2	8	75,5	283,4	1000
06948-01-300Δ	**06948-01-30001Δ**	**06948-01-30003Δ**	300	39,2	8	75,5	333,4	1000
06948-01-350Δ	**06948-01-35001Δ**	**06948-01-35003Δ**	350	39,2	8	75,5	383,4	1000
06948-01-400Δ	**06948-01-40001Δ**	**06948-01-40003Δ**	400	39,2	8	75,5	433,4	1000
06948-01-500Δ	**06948-01-50001Δ**	**06948-01-50003Δ**	500	39,2	8	75,5	533,4	1000
06948-01-600Δ	**06948-01-60001Δ**	**06948-01-60003Δ**	600	39,2	8	75,5	633,4	1000

Ledge handles stainless steel



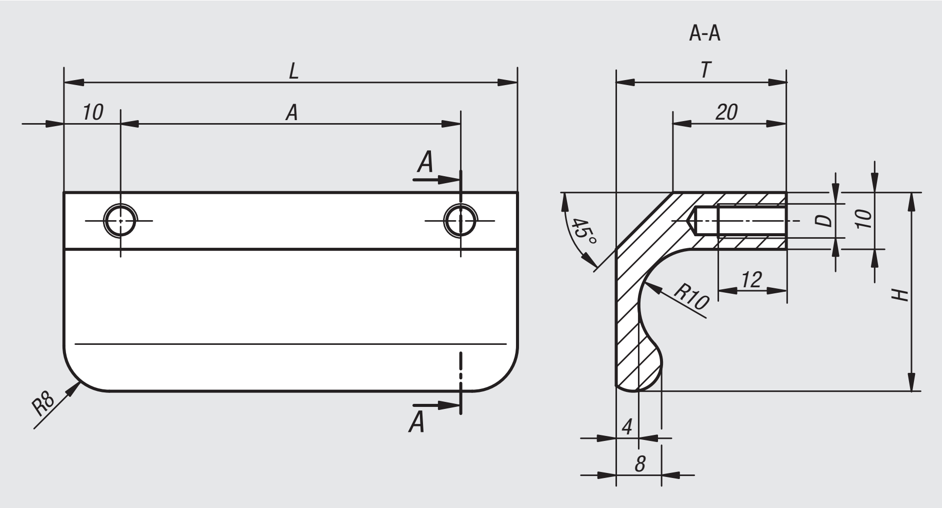
Material:
Profile stainless steel 1.4404.

Version:
Abrasive cleaned and matt-gloss electropolished.

Sample order:
nlm 06951-06006

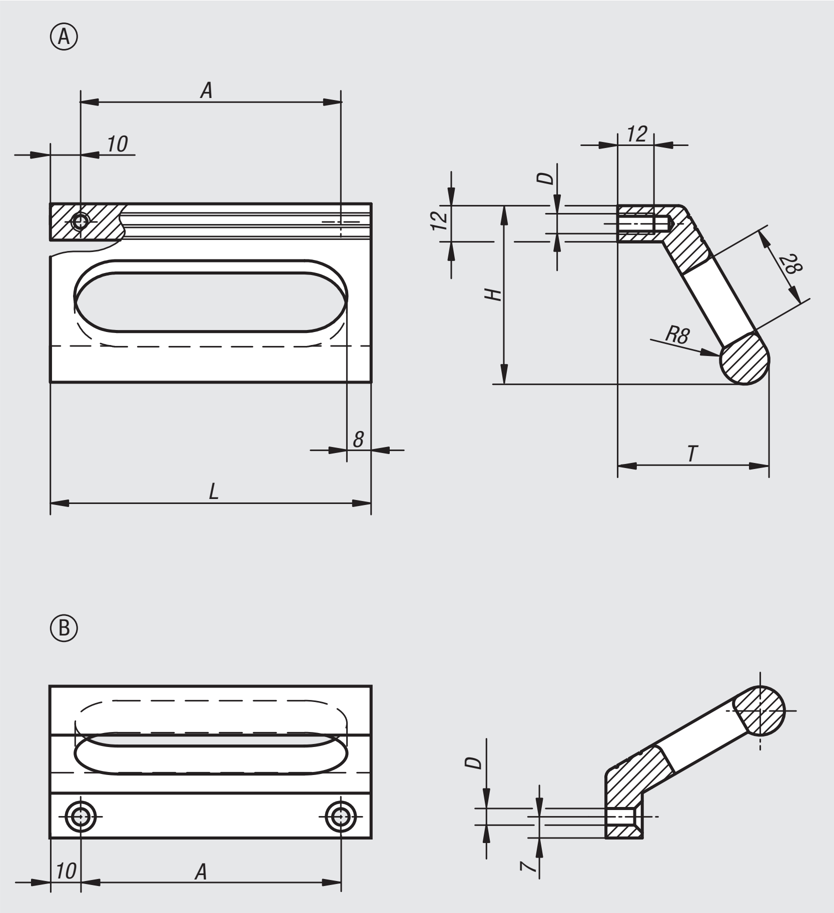
Assembly:
From the rear.

On request:
Any other lengths.



Order No.	A	D	H	L	T	Load capacity N
06951-06006	60	M6	35	80	30	1000
06951-08006	80	M6	35	100	30	1000
06951-10006	100	M6	35	120	30	1000
06951-13006	130	M6	35	150	30	1000

Ledge handles



Material:
Profile aluminium EN AW-6060

Version:
Matt-gloss anodised.

Sample order:
nlm 06952-086061

Note:
These ledge handles are available with M6 internal thread or with through hole for M5 countersunk screws for front mounting.

Assembly:
Form A from the rear.
Form B from the front.

Order No.	Form	Main colour	A	D	H	L	T	Load capacity N
06952-086061	A	black anodised	86	M6	59	106	50	500
06952-100061	A	black anodised	100	M6	59	120	50	500
06952-120061	A	black anodised	120	M6	59	140	50	500
06952-086063	A	natural anodised	86	M6	59	106	50	500
06952-100063	A	natural anodised	100	M6	59	120	50	500
06952-120063	A	natural anodised	120	M6	59	140	50	500
06952-086051	B	black anodised	86	5,5	59	106	50	500
06952-100051	B	black anodised	100	5,5	59	120	50	500
06952-120051	B	black anodised	120	5,5	59	140	50	500
06952-086053	B	natural anodised	86	5,5	59	106	50	500
06952-100053	B	natural anodised	100	5,5	59	120	50	500
06952-120053	B	natural anodised	120	5,5	59	140	50	500

06956

Tubular handles angled

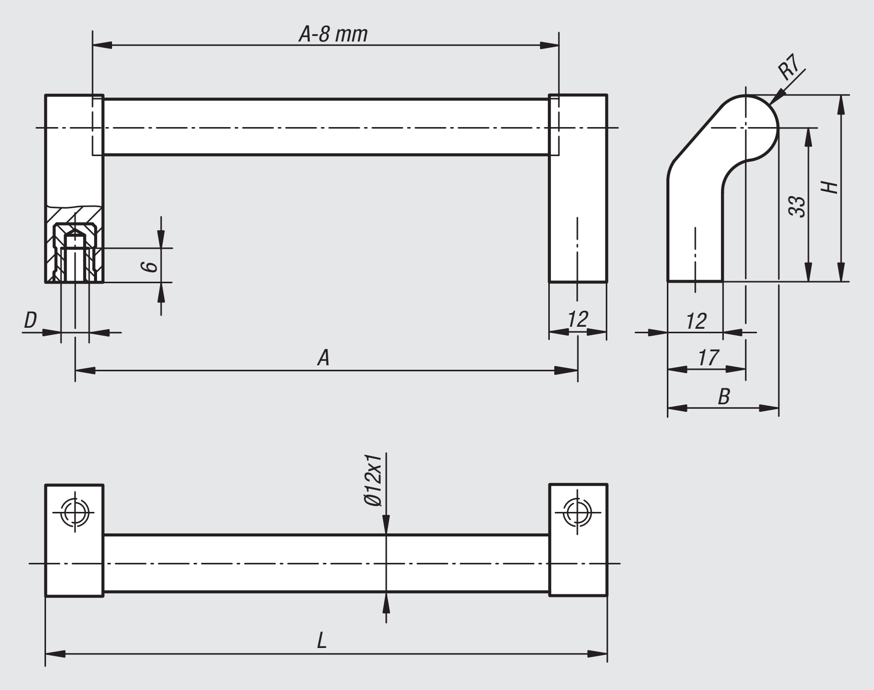
Material:
Grip aluminium EN AW-6060 or stainless steel 1.4301.
Legs polyamide glass-bead reinforced.
Bushing brass.

Version:
Grip natural colour, black anodised or finely ground stainless steel.
Legs matt black.

Sample order:
nlm 06956-088041

Note:
Clamping webs give a precision fit of tube to legs.

Assembly:
From the rear.



Order No.	Main material	Main colour	A	B	D	H	L	Load capacity N
06956-088041	aluminium	natural anodised	88	24	M4	40	100	200
06956-096041	aluminium	natural anodised	96	24	M4	40	108	200
06956-120041	aluminium	natural anodised	120	24	M4	40	132	200
06956-128041	aluminium	natural anodised	128	24	M4	40	140	200
06956-160041	aluminium	natural anodised	160	24	M4	40	172	200
06956-180041	aluminium	natural anodised	180	24	M4	40	192	200
06956-088042	aluminium	black anodised	88	24	M4	40	100	200
06956-096042	aluminium	black anodised	96	24	M4	40	108	200
06956-120042	aluminium	black anodised	120	24	M4	40	132	200
06956-128042	aluminium	black anodised	128	24	M4	40	140	200
06956-160042	aluminium	black anodised	160	24	M4	40	172	200
06956-180042	aluminium	black anodised	180	24	M4	40	192	200
06956-088043	stainless steel	ground	88	24	M4	40	100	200
06956-096043	stainless steel	ground	96	24	M4	40	108	200
06956-120043	stainless steel	ground	120	24	M4	40	132	200
06956-128043	stainless steel	ground	128	24	M4	40	140	200
06956-160043	stainless steel	ground	160	24	M4	40	172	200
06956-180043	stainless steel	ground	180	24	M4	40	192	200

Pull handles

open-ended screw on

Material:
Glass-bead reinforced thermoplastic.
Fastening material 1.4301.

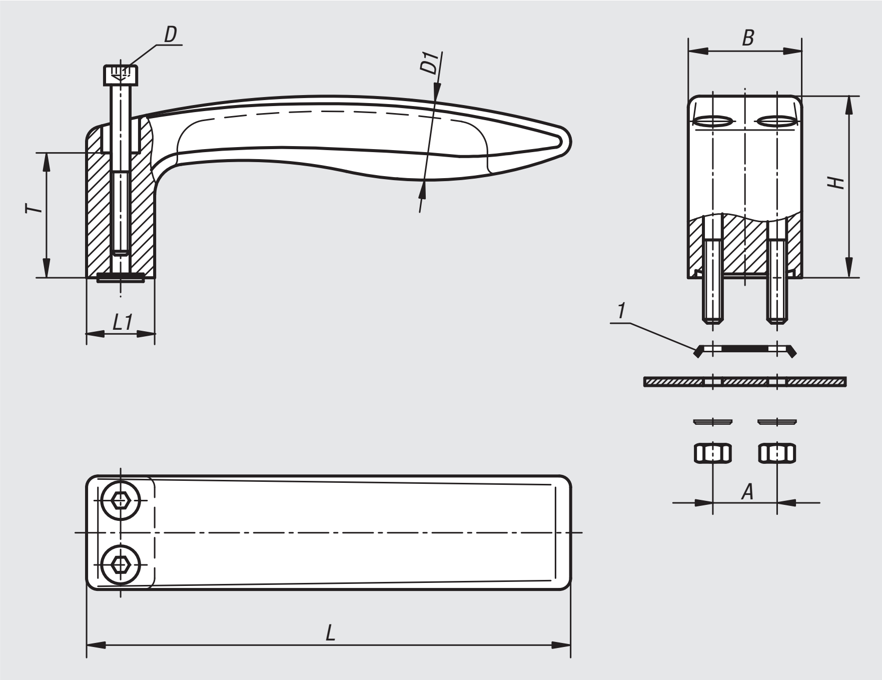
Version:
Matt black with fine texture.

Sample order:
nlm 06959-12805

Note:
These open-ended handles can be mounted right or left. They are form stable and have a high load rating. Fastening bolts, nuts and washers are supplied as is a locking plate to prevent twisting.

Assembly:
From the front.

Drawing reference:
1) locking plate



Order No.	A	B	D	D1	H	L	L1	T	Load capacity N
06959-12805	17	30	M5x45	20	48	128	18	33	800
06959-15606	20	36	M6x55	24	58	156	22	40	1000

06960

Recessed handles

Material:
Grip aluminium profile.
End caps polyamide.
Form A: rubber profile for mounting.
Form B: 2 steel countersunk screws for mounting.

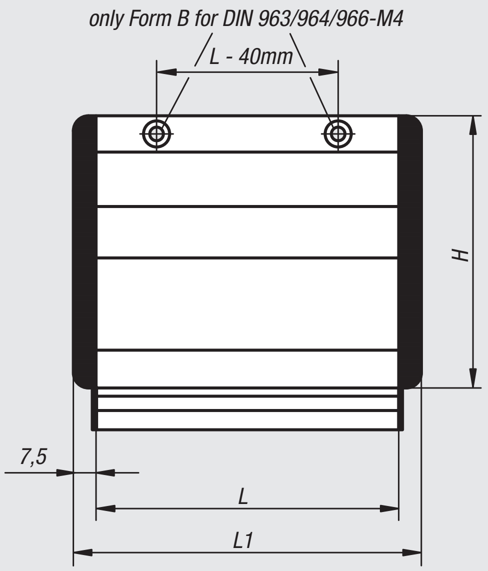
Version:
Handle glass-bead blasted, satin finish and anodised black or natural colour.
Rubber profile black.
Fastening screws electro zinc-plated.

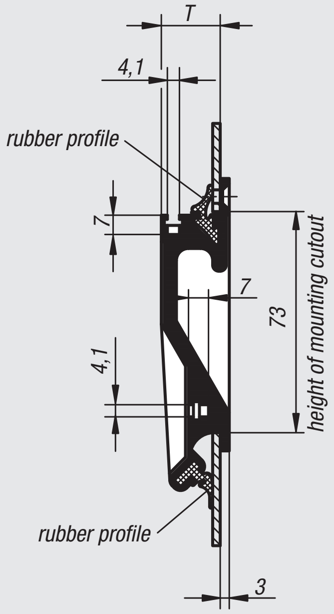
Sample order:
nlm 06960-10011

Note:
The Form A handles can be mounted without screws by material thicknesses of 1 - 2.5 mm. Two rubber profiles ensure an absolutely firm hold.
The Form B handles can be mounted from the front with 2 countersunk screws.

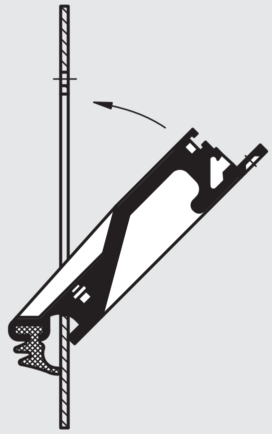
Two cross-slots offset by 90° for M4 screws allow an earthing cable to be connected and can serve as mounting aids for additional parts.

Assembly:
After fitting the lower rubber profile, press the two side caps onto the handle. Next press the handle over the lower edge of the mounting cutout at a 45° angle and then push it up against the housing panel.
Now, depending on which type is being used, push the 2nd rubber profile into the upper groove or fix in place with 2 countersunk screws.

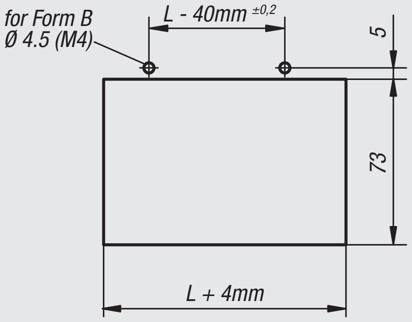




installation



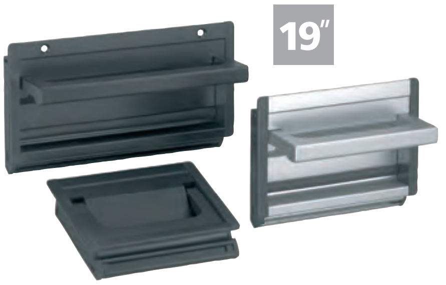
mounting cutout



Order No. black anodised	Order No. natural anodised	Form	Version 2	H	L	L1	T	Mounting cutout	Load capacity N
06960-10011	**06960-10013**	A	plug-in	90	100	115	19,5	104 x 73	500
06960-11811	**06960-11813**	A	plug-in	90	118	133	19,5	122 x 73	500
06960-16711	**06960-16713**	A	plug-in	90	167	182	19,5	171 x 73	500
06960-10021	**06960-10023**	B	screw on	90	100	115	19,5	104 x 73	500
06960-11821	**06960-11823**	B	screw on	90	118	133	19,5	122 x 73	500
06960-16721	**06960-16723**	B	screw on	90	167	182	19,5	171 x 73	500

06961

Recessed handles fold-down



Material:
Tray and grip aluminium profile.
End caps polyamide.
Form A: Rubber profile for mounting.
Form B: 2 steel countersunk screws for mounting.

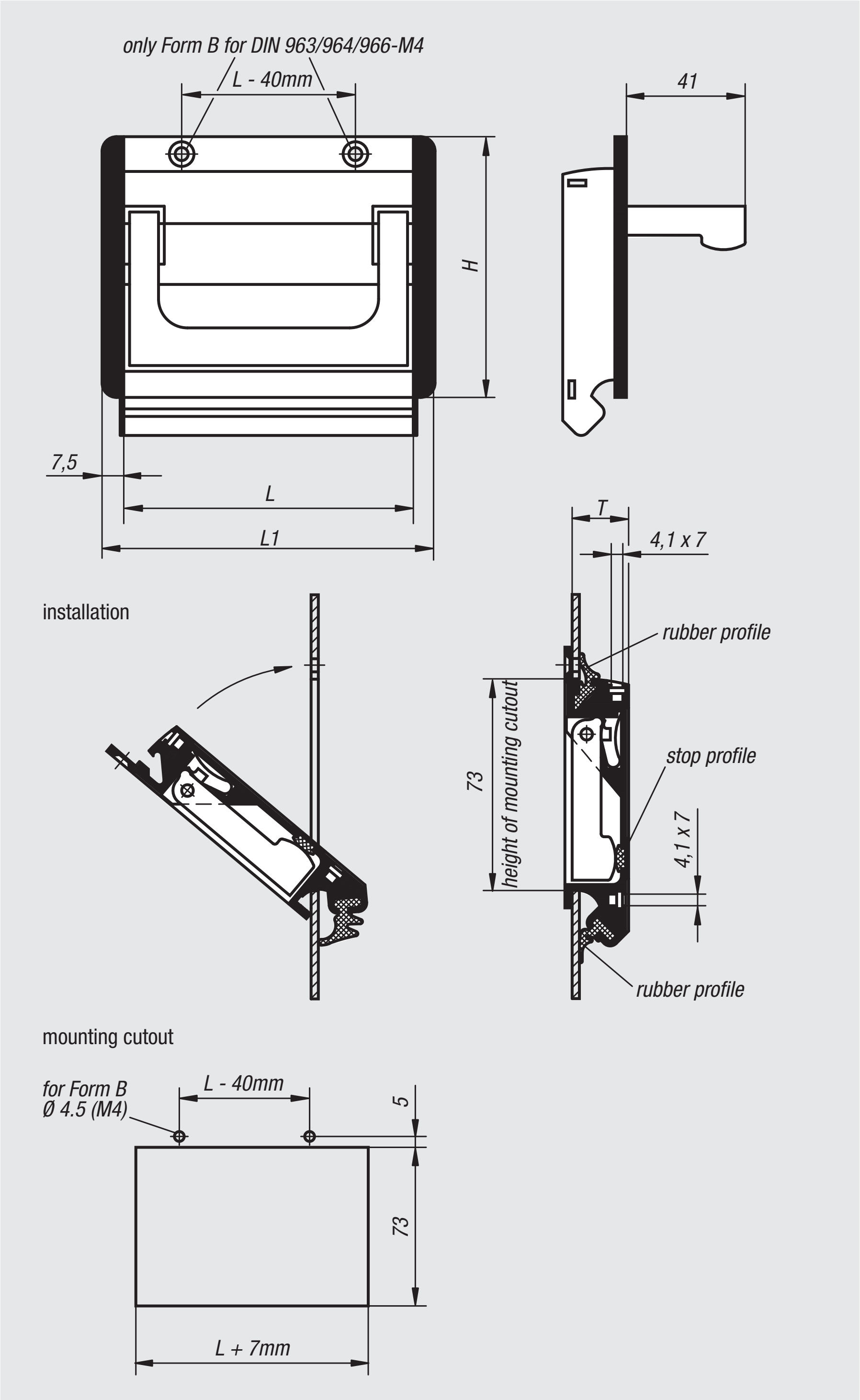
Version:
Tray and grip glass-bead blasted, satin finish and anodised black or natural colour.
Rubber profile black.
Fastening screws electro zinc-plated.

Sample order:
nlm 06961-10011

Note:
Form A handles can be mounted without screws for material thicknesses of 1 - 2.5 mm using 2 rubber profiles.
Form B handles can be mounted from the front with 2 countersunk screws.

Two cross-slots for M4 screws allow earthing connection and can serve as a mounting aid for additional parts.

Assembly:
After fitting the lower rubber profile, press the two side caps onto the handle. Next press the handle over the lower edge of the mounting cutout at a 45° angle and then push it up against the housing panel.
Now push the 2nd rubber profile into the upper groove or fix in place with 2 countersunk screws.

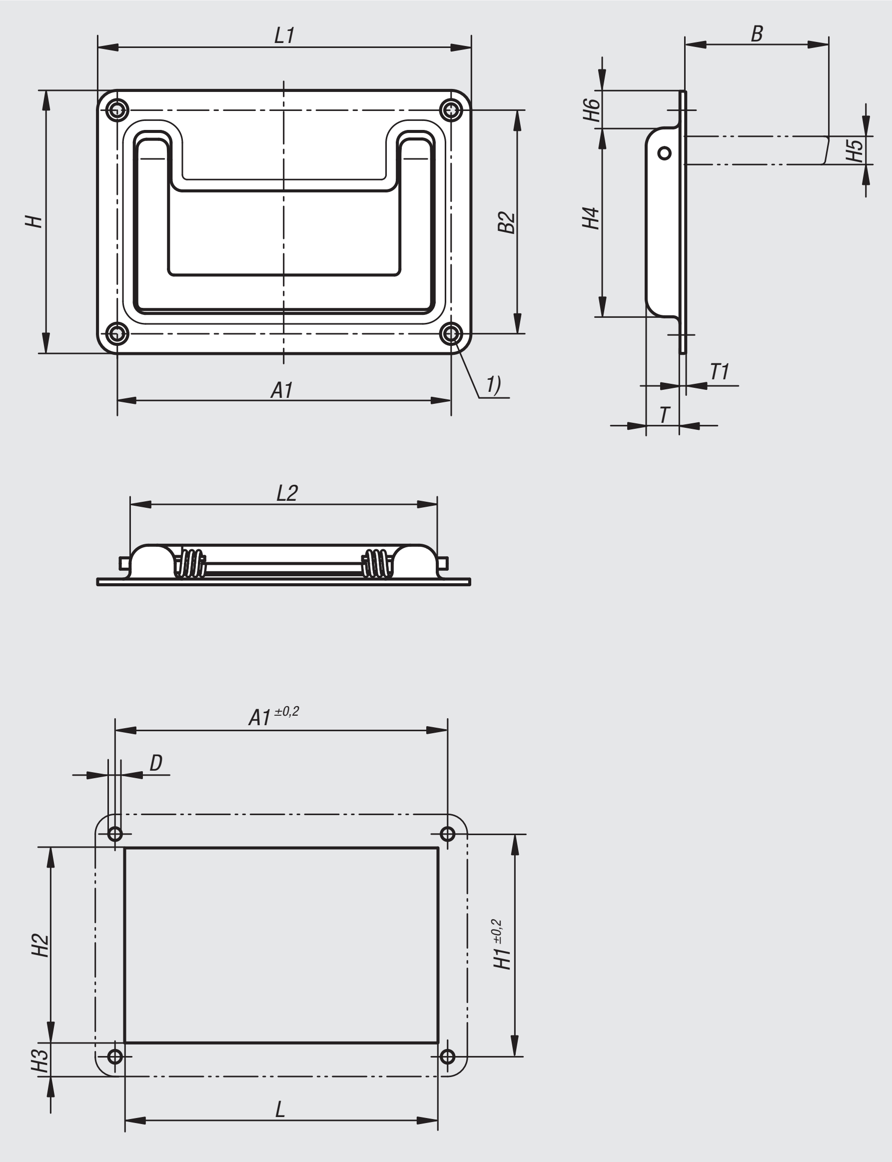


Order No. black anodised	Order No. natural anodised	Form	Version 2	H	L	L1	T	Mounting cutout	Load capacity N
06961-10011	**06961-10013**	A	plug-in	90	100	115	19,5	107 x 73	500
06961-11811	**06961-11813**	A	plug-in	90	118	133	19,5	125 x 73	500
06961-16711	**06961-16713**	A	plug-in	90	167	182	19,5	174 x 73	500
06961-10021	**06961-10023**	B	screw on	90	100	115	19,5	107 x 73	500
06961-11821	**06961-11823**	B	screw on	90	118	133	19,5	125 x 73	500
06961-16721	**06961-16723**	B	screw on	90	167	182	19,5	174 x 73	500

06961-01

Recessed handles

fold-down, stainless steel



Material:
Stainless steel 1.4301.

Version:
High-gloss electropolished.

Sample order:
nlm 06961-01-132

Note:
Stainless steel retractable grips with marginal installation depth. For base and mounting plates or drawers. With return spring. The grip automatically swivels back into its resting position after use.

Drawing reference:
1) for countersunk screws M4

Order No.	A1	B	B2	D	H	H1	H2	H3	H4	H5	H6	L	L1	L2	T	T1
06961-01-132	118±0,2	51	79	4,5	93	79±0,2	72	10,5	67	10	13	115	132	109	12	1,5

Recessed handles fold-down

Material:
Die-cast aluminium.

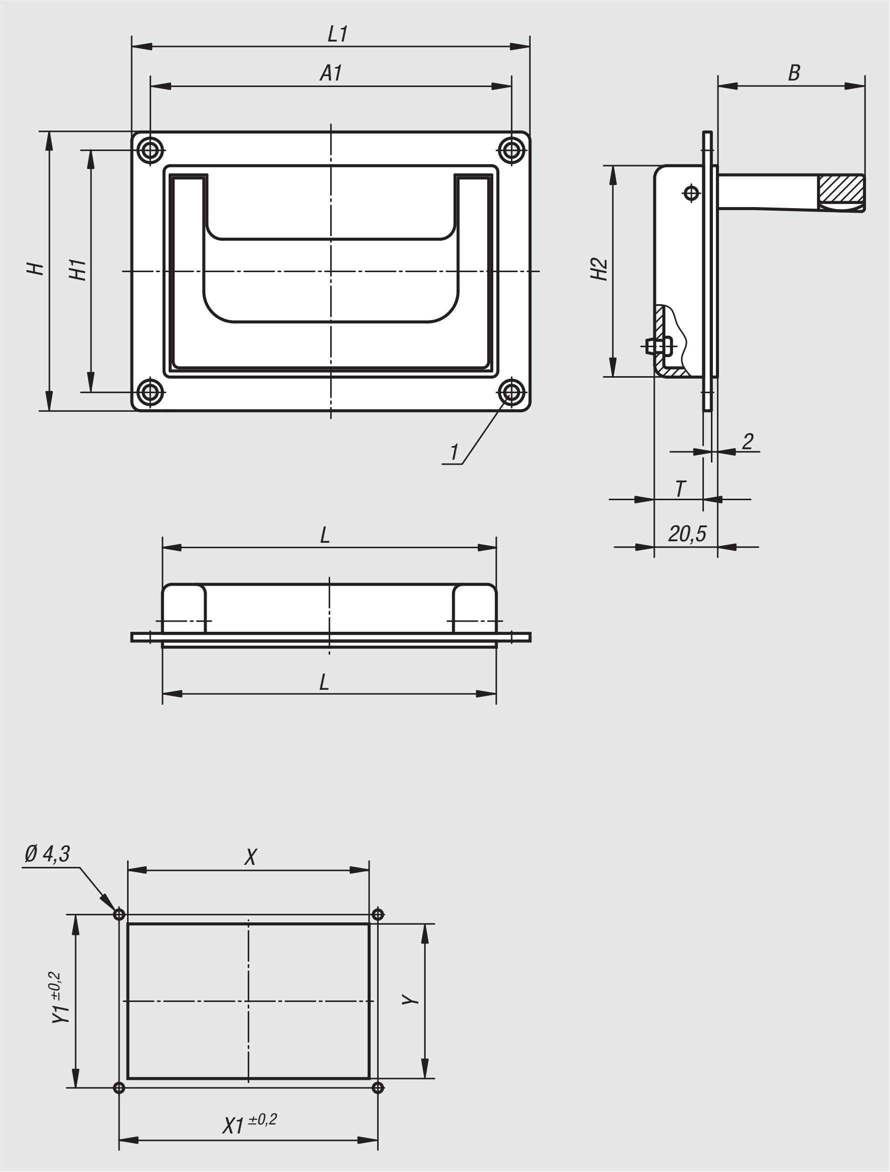
Version:
Tray and handle black or light grey powder-coated, semi-matt.

Sample order:
nlm 06962-05018411

Note:
With their modern design recessed fold-down handles can be used wherever solid and attractive handles are required.
Handles Form A snap into both resting and working positions.
Handles Form B swivel back into the resting position automatically after use.

Assembly:
The handles can be installed from the front or rear of the housing panel with the same housing cutout.

Drawing reference:
1) for countersunk screws M4



Order No.	Form	Main colour	A1	B	H	H1	H2	L	L1	T	X	X1	Y	Y1	Load capacity N
06962-07911811	A	black	118	48	91	79	69	109	130	16	110	118	70,5	79	500
06962-05018411	A	black	184	51	80	50	72	170	200	16	171	184	73	50	500
06962-07911812	A	light grey RAL 7035	118	48	91	79	69	109	130	16	110	118	70,5	79	500
06962-05018412	A	light grey RAL 7035	184	51	80	50	72	170	200	16	171	184	73	50	500
06962-07911821	B	black	118	48	91	79	69	109	130	16	110	118	70,5	79	500
06962-05018421	B	black	184	51	80	50	72	170	200	16	171	184	73	50	500
06962-07911822	B	light grey RAL 7035	118	48	91	79	69	109	130	16	110	118	70,5	79	500
06962-05018422	B	light grey RAL 7035	184	51	80	50	72	170	200	16	171	184	73	50	500

06965

Recessed handles

Material:
Glass bead reinforced thermoplastic.

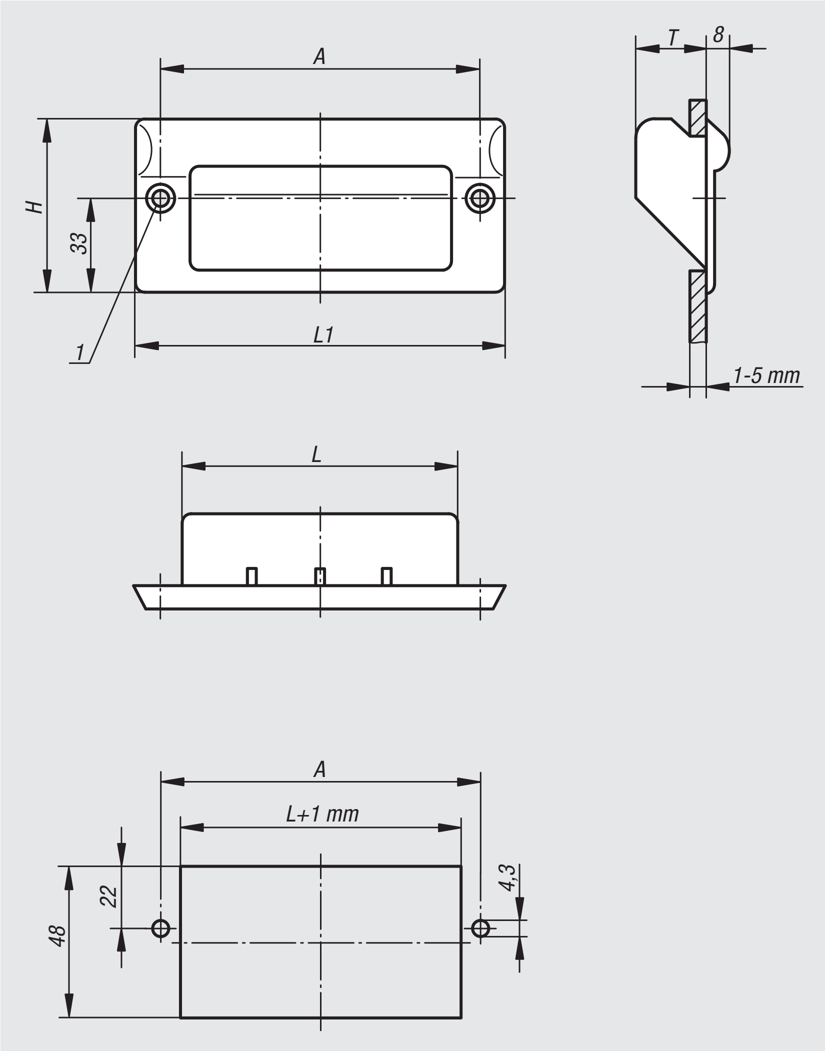
Version:
Semi-matt, black or light grey.

Sample order:
nlm 06965-1082041

Note:
These ergonomically shaped handles are ideally suited for wall thicknesses of 1-5 mm.

Assembly:
The handle is inserted in the cutout of the housing panel and then fixed from the front with 2 countersunk screws (not supplied).

Drawing reference:
1) for countersunk screws M4



Order No.	Main colour	A	H	L	L1	T	Load capacity N
06965-1082041	black	82	61	67	100	25	1000
06965-1112041	black	112	61	97	130	25	1000
06965-1082042	light grey RAL 7035	82	61	67	100	25	1000
06965-1112042	light grey RAL 7035	112	61	97	130	25	1000

Recessed grips

clip-in

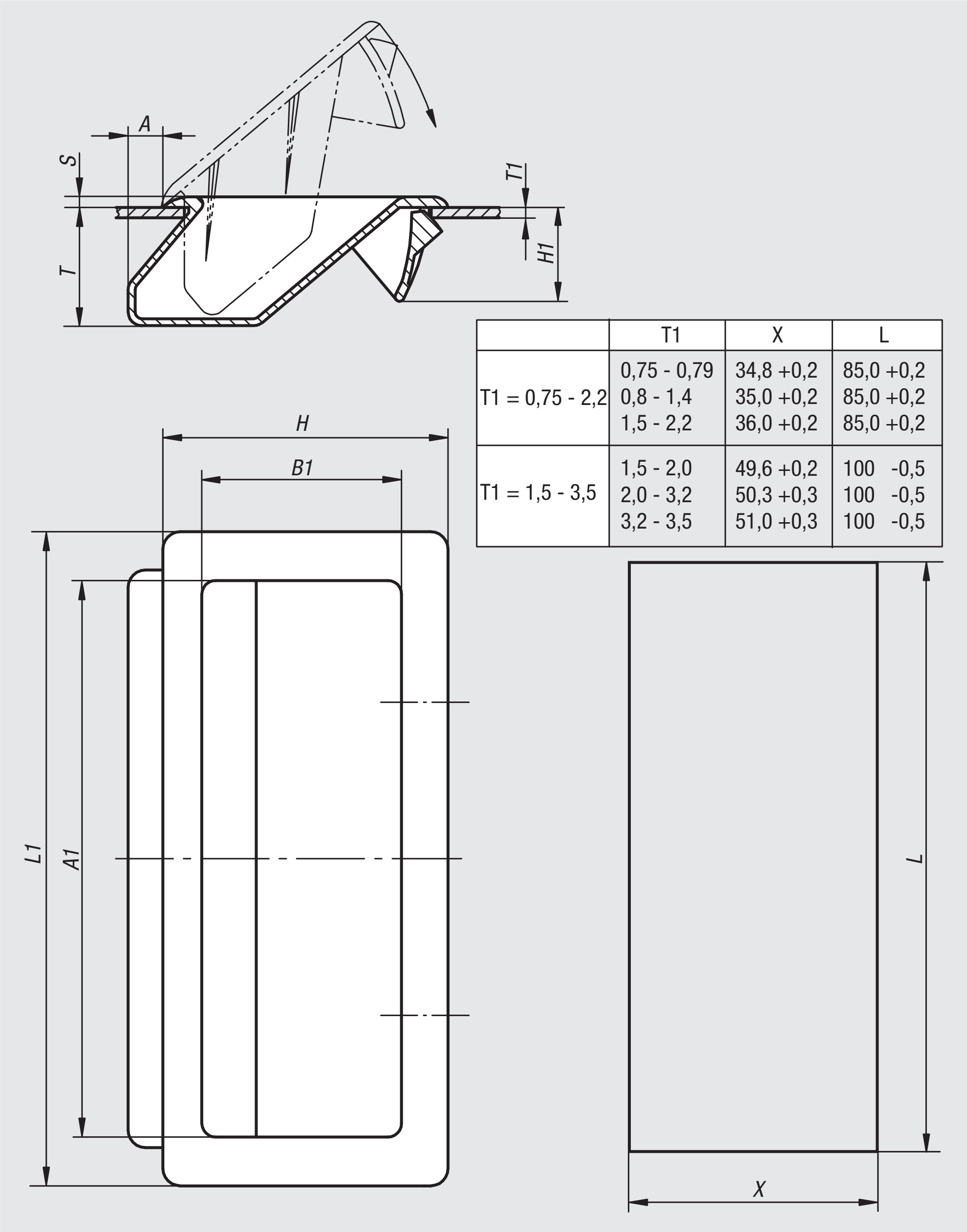
Material:
Polyamide.

Version:
black.

Sample order:
nlm 06966-01-09441

Note:
Recessed grips for clipping into material with a thickness 0.75 to 3.5 mm.

See drawing for installation cut-out dimensions for the various material thicknesses.

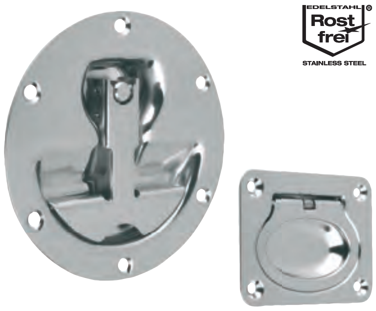


	T1	X	L
T1 = 0,75 - 2,2	0,75 - 0,79	34,8 +0,2	85,0 +0,2
	0,8 - 1,4	35,0 +0,2	85,0 +0,2
	1,5 - 2,2	36,0 +0,2	85,0 +0,2
T1 = 1,5 - 3,5	1,5 - 2,0	49,6 +0,2	100 -0,5
	2,0 - 3,2	50,3 +0,3	100 -0,5
	3,2 - 3,5	51,0 +0,3	100 -0,5

Order No.	A	A1	B1	H	H1	L1	S	T
06966-01-09441	5	80	28,7	41	13,5	94	1,5	17
06966-01-11057	10	94	40,3	57	18,65	110	2	26

Recessed handles fold-down

stainless steel

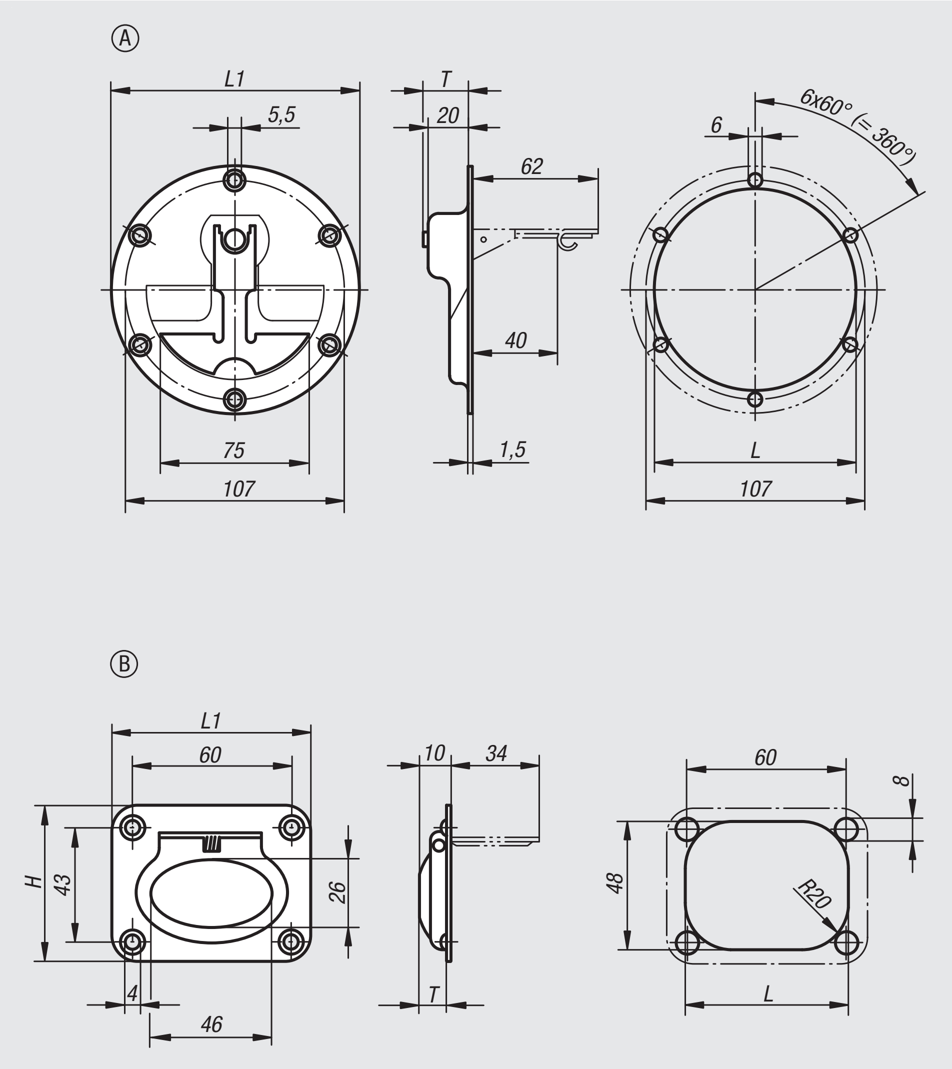


Material:
Stainless steel 1.4301.

Version:
High-gloss electropolished.

Sample order:
nlm 06970-1120000

Note:
Stainless steel retractable grips with marginal installation depth. For base and mounting plates or drawers. With return spring. The grip automatically swivels back into its resting position after use.

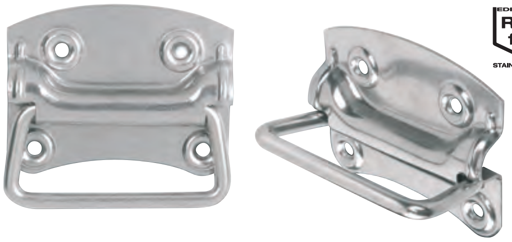


Order No.	Form	Version 2	H	L	L1	T	Load capacity N
06970-1120000	A	screw on	120	98	120	22	200
06970-2075058	B	screw on	58	63	75	9	200

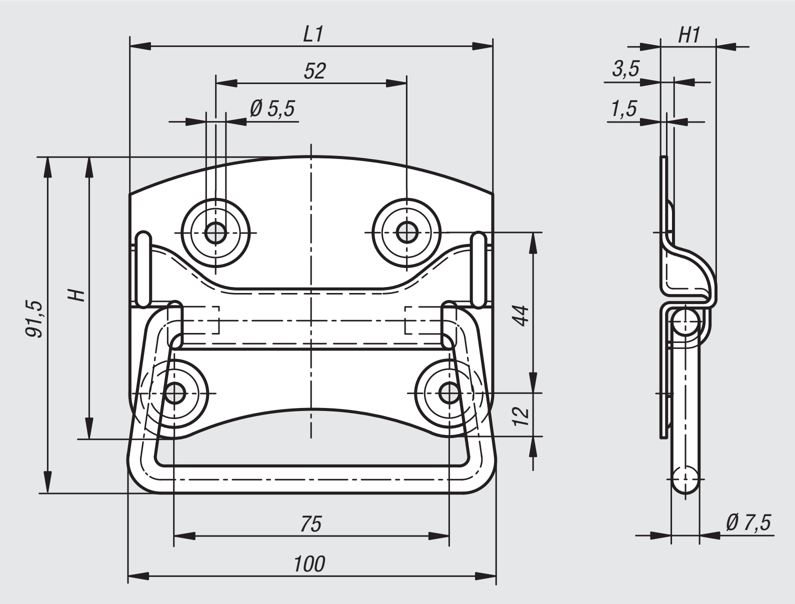
06970-01

Recessed handles, fold down

DIN 3136



EDELSTAHL Rost frei STAINLESS STEEL



Material:
Stainless steel 1.4301.

Version:
Bright.

Sample order:
nlm 06970-01-100

Applications:
Crates, chests, lids.

Order No.	H	H1	L1	Load capacity N
06970-01-100	77	14	100	500

06975

Pull handles angled

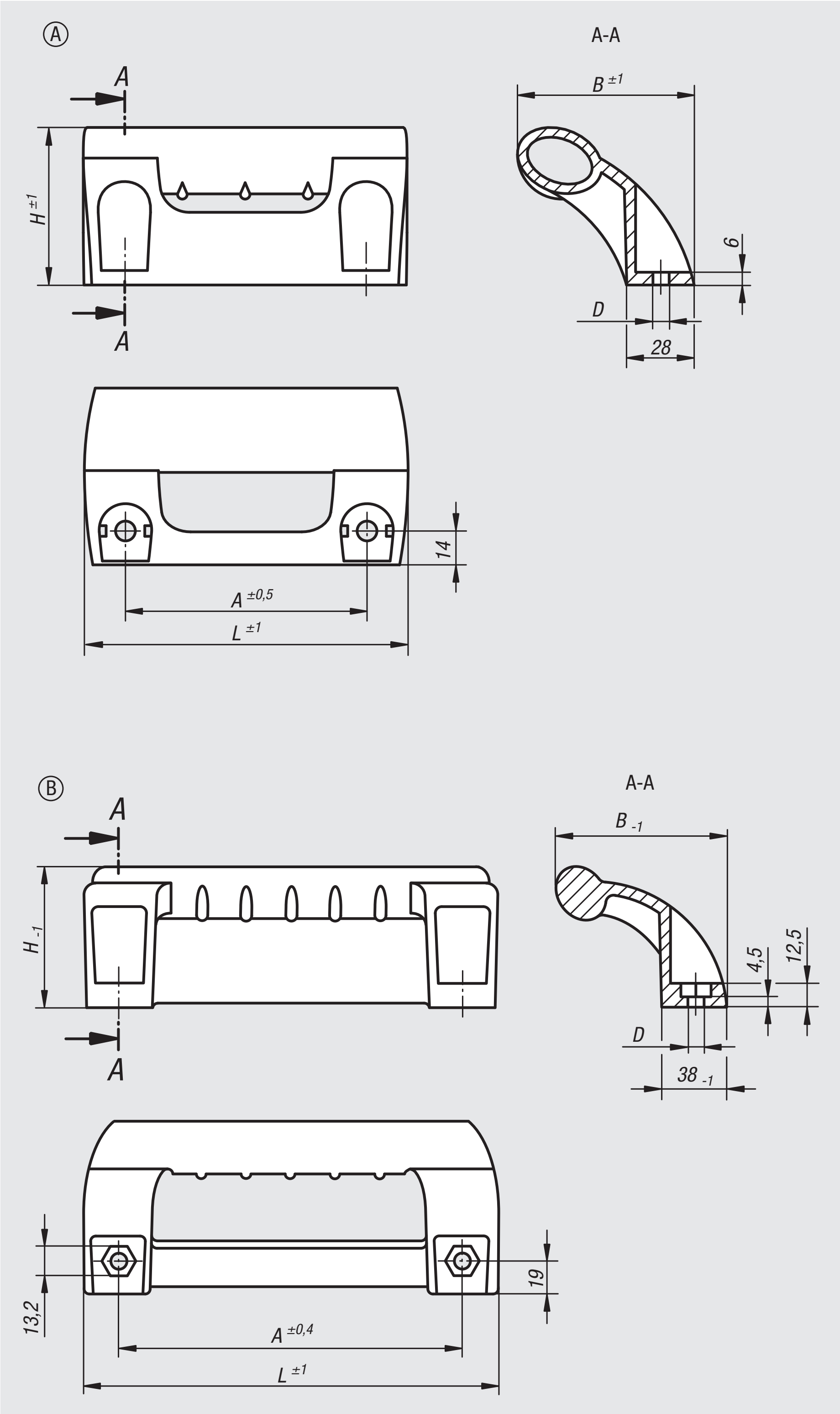
Material:
Glass-bead reinforced thermoplastic PA

Version:
black.

Sample order:
nlm 06975-100081
nlm 06975-1 (caps, 2 per pack)

Note:
Ergonomic design pull handles with finger shield. For mounting on doors, hatches and aluminium profiles. Ideal for double-leaf doors. Fastening with hexagon or socket head M8 bolts.

Cover caps are not supplied with the handle, please order separately.



Order No.	Form	A	B	D	H	L	Load capacity N	Order No. cover caps
06975-100081	A	100	73	8,5	65	134	1000	06975-1
06975-198081	B	198	100	8,8	80	236	1000	06975-3

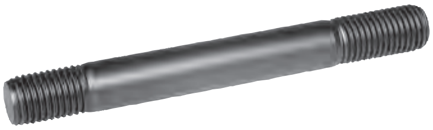
07000

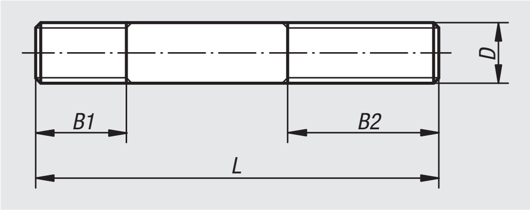
Fasteners
Ball-end thrust screws
Thrust screws and thrust pads
Grippers
Torque bolts
Threaded inserts
Lifting bolts
Swivel bales
Ring bolts

Notes

07020

Studs





Material:
Carbon steel 1.1181.

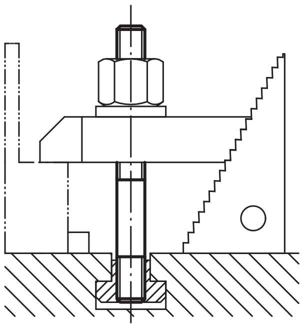
Version:
Tempered to 8.8 and black oxidised.

Sample order:
nlm 07020-308

Note:
Permissible loading see Technical Information.
Thread end with oval point is permissible.

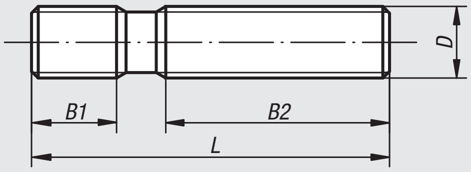
On request:
Stainless steel.

Order No.	D	L	B1	B2
07020-105	M5	20	7	10
07020-205	M5	30	7	10
07020-106	M6	25	10	12
07020-206	M6	35	10	12
07020-306	M6	45	10	12
07020-406	M6	60	10	12
07020-108	M8	40	12	25
07020-208	M8	50	12	25
07020-308	M8	70	12	25
07020-408	M8	80	12	25
07020-110	M10	50	15	30
07020-210	M10	67	15	30
07020-310	M10	80	15	30
07020-410	M10	100	15	30
07020-112	M12	56	18	30
07020-212	M12	67	18	30
07020-312	M12	80	18	30
07020-412	M12	100	18	30
07020-512	M12	125	18	30
07020-114	M14	60	20	30
07020-214	M14	80	20	30
07020-314	M14	100	20	30
07020-414	M14	125	20	30
07020-514	M14	150	20	30
07020-116	M16	75	25	30
07020-216	M16	100	25	30
07020-316	M16	125	25	30
07020-416	M16	150	25	30
07020-120	M20	100	30	40
07020-220	M20	125	30	40
07020-320	M20	150	30	40
07020-420	M20	180	30	40



Studs

DIN 6379



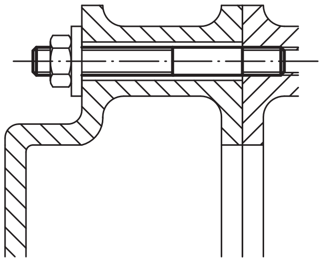
Material:
Carbon steel.

Version:
Thread rolled.
M6-M12 tempered to 10.9, black.
M14-M36 tempered to 8.8, black.

Sample order:
nlm 07030-12125

Note:
Permissible load: see Technical Information.

Order No.	D	L	B1	B2
07030-0632	M6	32	9	16
07030-0640	M6	40	9	20
07030-0650	M6	50	9	30
07030-0663	M6	63	9	40
07030-0680	M6	80	9	50
07030-06100	M6	100	9	63
07030-0840	M8	40	11	20
07030-0863	M8	63	11	40
07030-0880	M8	80	11	50
07030-08100	M8	100	11	63
07030-08125	M8	125	11	75
07030-08160	M8	160	11	100
07030-1050	M10	50	13	25
07030-1080	M10	80	13	50
07030-10100	M10	100	13	75
07030-10125	M10	125	13	75
07030-10160	M10	160	13	100
07030-10200	M10	200	13	125
07030-1250	M12	50	15	25
07030-1263	M12	63	15	32
07030-1280	M12	80	15	50
07030-12100	M12	100	15	63
07030-12125	M12	125	15	75
07030-12160	M12	160	15	100
07030-12200	M12	200	15	125
07030-1463	M14	63	17	32
07030-1480	M14	80	17	50
07030-14100	M14	100	17	63
07030-14125	M14	125	17	75
07030-14160	M14	160	17	100
07030-14200	M14	200	17	125
07030-14250	M14	250	17	160
07030-1663	M16	63	19	32
07030-1680	M16	80	19	50
07030-16100	M16	100	19	63
07030-16125	M16	125	19	75
07030-16160	M16	160	19	100
07030-16200	M16	200	19	125
07030-16250	M16	250	19	160
07030-16315	M16	315	19	180
07030-16350	M16	350	19	200
07030-16500	M16	500	20	315



Studs

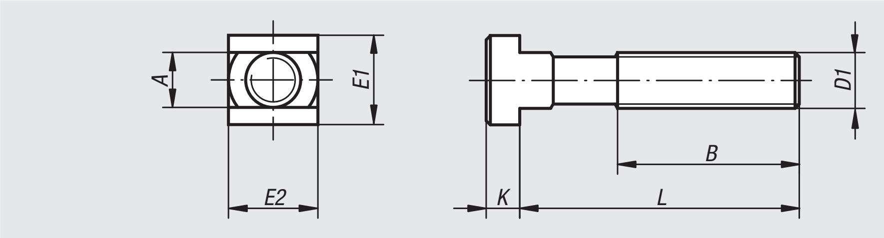
DIN 6379

Order No.	D	L	B1	B2
07030-1880	M18	80	23	50
07030-18125	M18	125	23	75
07030-18160	M18	160	23	100
07030-18200	M18	200	23	125
07030-18250	M18	250	23	150
07030-18315	M18	315	23	180
07030-2080	M20	80	27	32
07030-20125	M20	125	27	70
07030-20160	M20	160	27	100
07030-20200	M20	200	27	125
07030-20250	M20	250	27	160
07030-20315	M20	315	27	200
07030-20400	M20	400	27	250
07030-20500	M20	500	27	315
07030-22100	M22	100	31	45
07030-22160	M22	160	31	100
07030-22200	M22	200	31	125
07030-22250	M22	250	31	160
07030-22315	M22	315	31	180
07030-22400	M22	400	31	250
07030-24100	M24	100	35	45
07030-24125	M24	125	35	63
07030-24160	M24	160	35	100
07030-24200	M24	200	35	125
07030-24250	M24	250	35	160
07030-24315	M24	315	35	200
07030-24400	M24	400	35	250
07030-24500	M24	500	35	315
07030-24630	M24	630	35	315
07030-27125	M27	125	39	56
07030-27200	M27	200	39	125
07030-27315	M27	315	39	200
07030-27400	M27	400	39	250
07030-27500	M27	500	39	315
07030-30125	M30	125	43	56
07030-30200	M30	200	43	125
07030-30315	M30	315	43	200
07030-30500	M30	500	43	315
07030-30700	M30	700	43	400
07030-301000	M30	1000	44	400
07030-36160	M36	160	51	80
07030-36200	M36	200	51	125
07030-36250	M36	250	51	160
07030-36315	M36	315	51	200
07030-36400	M36	400	51	250
07030-36500	M36	500	51	315
07030-36700	M36	700	51	400

07040

T-slot bolts

DIN 787



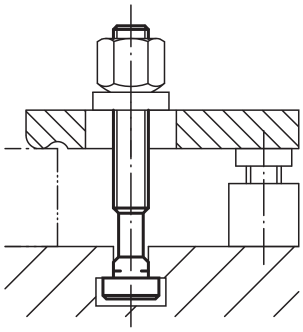
Material:
Carbon steel.

Version:
Forged and milled, rolled thread.
M6-M12 tempered to 10.9, black.
M14-M36 tempered to 8.8, black.

Sample order:
nlm 07040-1263

Note:
Permissible load: see Technical Information.

Order No.	Slot width	D1	L	A	B	E1/E2	K
07040-0625	6	M6	25	5,7	15	10	4
07040-0640	6	M6	40	5,7	28	10	4
07040-0663	6	M6	63	5,7	40	10	4
07040-0832	8	M8	32	7,7	22	13	6
07040-0850	8	M8	50	7,7	35	13	6
07040-0880	8	M8	80	7,7	50	13	6
07040-1040	10	M10	40	9,7	30	15	6
07040-1063	10	M10	63	9,7	45	15	6
07040-10100	10	M10	100	9,7	60	15	6
07040-1250	12	M12	50	11,7	35	18	7
07040-1263	12	M12	63	11,7	40	18	7
07040-1280	12	M12	80	11,7	55	18	7
07040-12100	12	M12	100	11,7	65	18	7
07040-12125	12	M12	125	11,7	75	18	7
07040-12160	12	M12	160	11,7	100	18	7
07040-12200	12	M12	200	11,7	120	18	7
07040-1450	14	M12	50	13,7	35	22	8
07040-1463	14	M12	63	13,7	45	22	8
07040-1480	14	M12	80	13,7	55	22	8
07040-14100	14	M12	100	13,7	65	22	8
07040-14125	14	M12	125	13,7	75	22	8
07040-14160	14	M12	160	13,7	100	22	8
07040-14200	14	M12	200	13,7	120	22	8
07040-16631	16	M14	63	15,7	45	25	9
07040-16801	16	M14	80	15,7	55	25	9
07040-161001	16	M14	100	15,7	65	25	9
07040-161251	16	M14	125	15,7	75	25	9
07040-161601	16	M14	160	15,7	100	25	9
07040-162501	16	M14	250	15,7	150	25	9
07040-1663	16	M16	63	15,7	45	25	9
07040-1680	16	M16	80	15,7	55	25	9
07040-16100	16	M16	100	15,7	65	25	9
07040-16125	16	M16	125	15,7	85	25	9
07040-16160	16	M16	160	15,7	100	25	9
07040-16200	16	M16	200	15,7	125	25	9
07040-16250	16	M16	250	15,7	150	25	9
07040-1863	18	M16	63	17,7	45	28	10
07040-1880	18	M16	80	17,7	55	28	10
07040-18100	18	M16	100	17,7	65	28	10
07040-18125	18	M16	125	17,7	85	28	10
07040-18160	18	M16	160	17,7	100	28	10



T-slot bolts

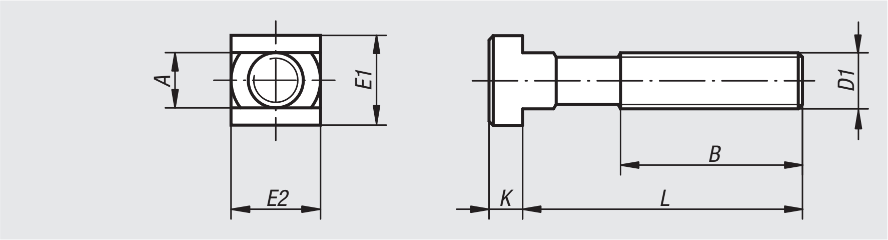
DIN 787

Order No.	Slot width	D1	L	A	B	E1/E2	K
07040-18200	18	M16	200	17,7	125	28	10
07040-18250	18	M16	250	17,7	150	28	10
07040-2080	20	M20	80	19,7	55	32	12
07040-20100	20	M20	100	19,7	65	32	12
07040-20125	20	M20	125	19,7	85	32	12
07040-20160	20	M20	160	19,7	110	32	12
07040-20200	20	M20	200	19,7	125	32	12
07040-20250	20	M20	250	19,7	150	32	12
07040-20315	20	M20	315	19,7	190	32	12
07040-2280	22	M20	80	21,7	55	35	14
07040-22100	22	M20	100	21,7	65	35	14
07040-22125	22	M20	125	21,7	85	35	14
07040-22160	22	M20	160	21,7	110	35	14
07040-22200	22	M20	200	21,7	125	35	14
07040-22250	22	M20	250	21,7	150	35	14
07040-22315	22	M20	315	21,7	190	35	14
07040-24100	24	M24	100	23,7	70	40	16
07040-24125	24	M24	125	23,7	85	40	16
07040-24160	24	M24	160	23,7	110	40	16
07040-24200	24	M24	200	23,7	125	40	16
07040-24250	24	M24	250	23,7	150	40	16
07040-24315	24	M24	315	23,7	190	40	16
07040-24400	24	M24	400	23,7	240	40	16
07040-28100	28	M24	100	27,7	70	44	18
07040-28125	28	M24	125	27,7	85	44	18
07040-28160	28	M24	160	27,7	110	44	18
07040-28200	28	M24	200	27,7	125	44	18
07040-28250	28	M24	250	27,7	150	44	18
07040-28315	28	M24	315	27,7	190	44	18
07040-28400	28	M24	400	27,7	240	44	18
07040-36125	36	M30	125	35,6	80	54	22
07040-36160	36	M30	160	35,6	110	54	22
07040-36200	36	M30	200	35,6	135	54	22
07040-36250	36	M30	250	35,6	150	54	22
07040-36315	36	M30	315	35,6	200	54	22
07040-36500	36	M30	500	35,6	300	54	22
07040-42160	42	M36	160	41,6	100	65	26
07040-42250	42	M36	250	41,6	175	65	26
07040-42400	42	M36	400	41,6	250	65	26

07040

T-slot bolts

DIN 787, 12.9



Material:
Carbon steel.

Version:
Forged and milled, rolled thread, tempered to 12.9, black.

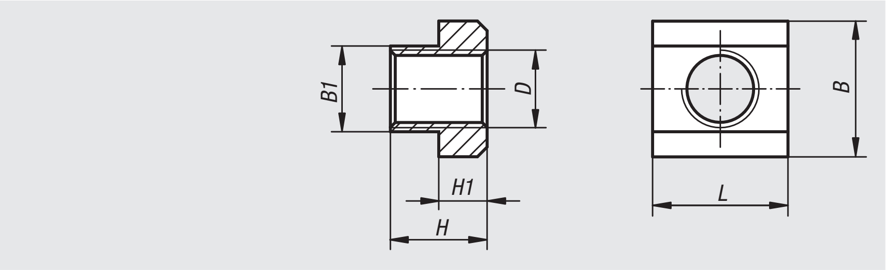
Sample order:
nlm 07040-112125

Note:
Permissible load: see Technical Information.

Order No.	Slot width	D1	L	A	B	E1/E2	K
07040-11250	12	M12	50	11,7	35	18	7
07040-11280	12	M12	80	11,7	55	18	7
07040-112100	12	M12	100	11,7	65	18	7
07040-112125	12	M12	125	11,7	75	18	7
07040-112160	12	M12	160	11,7	100	18	7
07040-112200	12	M12	200	11,7	120	18	7
07040-11450	14	M12	50	13,7	35	22	8
07040-11480	14	M12	80	13,7	55	22	8
07040-114100	14	M12	100	13,7	65	22	8
07040-114125	14	M12	125	13,7	75	22	8
07040-114160	14	M12	160	13,7	100	22	8
07040-114200	14	M12	200	13,7	120	22	8
07040-11663	16	M16	63	15,7	45	25	9
07040-116100	16	M16	100	15,7	65	25	9
07040-116125	16	M16	125	15,7	85	25	9
07040-116160	16	M16	160	15,7	100	25	9
07040-116250	16	M16	250	15,7	150	25	9
07040-11863	18	M16	63	17,7	45	28	10
07040-118100	18	M16	100	17,7	65	28	10
07040-118125	18	M16	125	17,7	85	28	10
07040-118160	18	M16	160	17,7	100	28	10
07040-118250	18	M16	250	17,7	150	28	10
07040-12080	20	M20	80	19,7	55	32	12
07040-120125	20	M20	125	19,7	85	32	12
07040-120200	20	M20	200	19,7	125	32	12
07040-120315	20	M20	315	19,7	190	32	12
07040-12280	22	M20	80	21,7	55	35	14
07040-122125	22	M20	125	21,7	85	35	14
07040-122200	22	M20	200	21,7	125	35	14
07040-122315	22	M20	315	21,7	190	35	14
07040-124100	24	M24	100	23,7	70	40	16
07040-124160	24	M24	160	23,7	110	40	16
07040-124250	24	M24	250	23,7	150	40	16
07040-124400	24	M24	400	23,7	240	40	16
07040-128100	28	M24	100	27,7	70	44	18
07040-128160	28	M24	160	27,7	110	44	18
07040-128250	28	M24	250	27,7	150	44	18
07040-128400	28	M24	400	27,7	240	44	18

Nuts for T-slots

DIN 508 enhanced

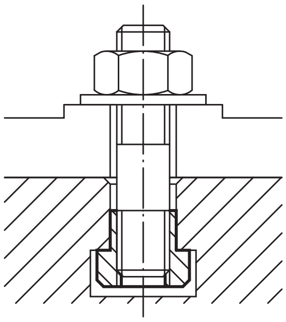


Material:
Carbon steel grade 10, EN AW-7075 or stainless steel 1.4305.

Version:
Steel black.
Aluminium and stainless steel bright.

Sample order:
nlm 07060-20

Note:
Nuts for T-slots in aluminium have threaded steel inserts.

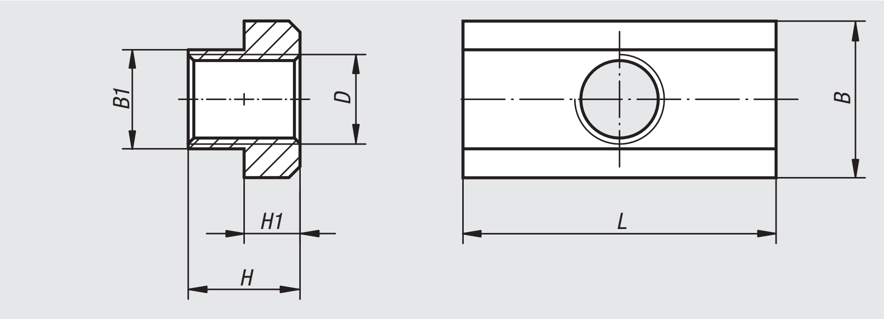


Order No. steel	Order No. aluminium	Order No. stainless steel	Slot width	B	B1	D	H	H1	L
07060-05	**07060-204**	-	6	10	5,6	M5/M4	8	4	10
07060-06	**07060-206**	**07060-806**	8	13	7,6	M6	10	6	13
07060-061	**07060-2061**	-	10	15	9,6	M6	12	6	15
07060-08	-	**07060-808**	10	15	9,6	M8	12	6	15
07060-081	**07060-208**	-	12	18	11,6	M8	14	7	18
07060-10	-	**07060-810**	12	18	11,6	M10	14	7	18
07060-082	-	-	14	22	13,6	M8	16	8	22
07060-101	**07060-210**	-	14	22	13,6	M10	16	8	22
07060-12	-	**07060-812**	14	22	13,6	M12	16	8	22
07060-121	-	-	16	25	15,6	M12	18	9	25
07060-14	-	**07060-814**	16	25	15,6	M14	18	9	25
07060-122	-	-	18	28	17,6	M12	20	10	28
07060-141	-	-	18	28	17,6	M14	20	10	28
07060-16	-	**07060-816**	18	28	17,6	M16	20	10	28
07060-123	-	-	20	32	19,6	M12	24	12	32
07060-161	-	-	20	32	19,6	M16	24	12	32
07060-18	-	-	20	32	19,6	M18	24	12	32
07060-124	**07060-216**	-	22	35	21,6	M12/M16	28	14	35
07060-181	-	-	22	35	21,6	M18	28	14	35
07060-20	-	-	22	35	21,6	M20	28	14	35
07060-163	-	-	24	40	23,6	M16	32	16	40
07060-201	-	-	24	40	23,6	M20	32	16	40
07060-22	-	-	24	40	23,6	M22	32	16	40
07060-164	-	-	28	44	27,6	M16	36	18	44
07060-202	-	-	28	44	27,6	M20	36	18	44
07060-24	-	-	28	44	27,6	M24	36	18	44
07060-27	-	-	32	50	31,5	M27	40	20	50
07060-241	-	-	36	54	35,5	M24	44	22	54
07060-30	-	-	36	54	35,5	M30	44	22	54
07060-36	-	-	42	65	41,5	M36	52	26	65

07061

Nuts for T-slots

long



Material:
Carbon steel.

Version:
Tempered to 10.

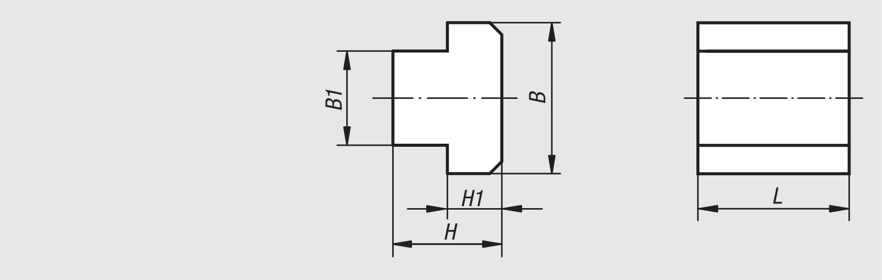
Sample order:
nlm 07061-12

Order No.	Slot width	B	B1	D	H	H1	L
07061-08	10	15	9,7	M8	12	6	30
07061-10	12	18	11,7	M10	14	7	36
07061-12	14	22	13,7	M12	16	8	44
07061-14	16	25	15,7	M14	18	9	50
07061-16	18	28	17,7	M16	20	10	56
07061-18	20	32	19,7	M18	24	12	64
07061-20	22	35	21,7	M20	28	14	70
07061-24	28	44	27,7	M24	36	18	88
07061-30	36	54	35,6	M30	44	22	108

07070

Nuts for T-slots

blanks



Material:
High carbon steel or stainless steel 1.4305.

Sample order:
nlm 07070-16

Note:
These blank nuts are used to make nuts for T-slots with all sorts of thread sizes cost-effectively.

Order No. high carbon steel	Order No. stainless steel	Slot width	B	B1	H	H1	L
07070-06	-	6	10	5,6	8	4	10
07070-08	**07070-808**	8	13	7,6	10	6	13
07070-10	**07070-810**	10	15	9,6	12	6	15
07070-12	**07070-812**	12	18	11,5	14	7	18
07070-14	**07070-814**	14	22	13,5	16	8	22
07070-16	-	16	25	15,6	18	9	25
07070-18	-	18	28	17,5	20	10	28
07070-20	-	20	32	19,6	24	12	32
07070-22	-	22	35	21,6	28	14	35
07070-24	-	24	40	23,6	32	16	40
07070-28	-	28	44	27,6	36	18	44
07070-36	-	36	54	35,5	44	22	54
07070-42	-	42	65	41,6	52	26	65

Slot nuts

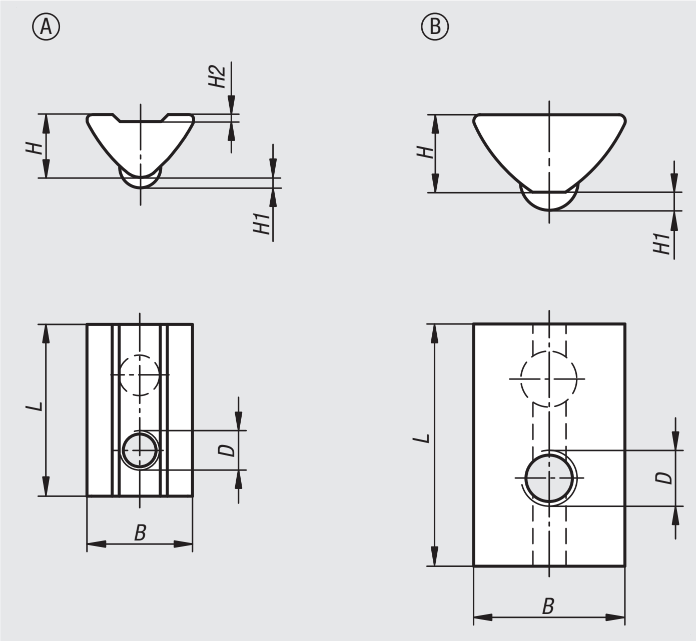
twist-in Type I

Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07071-0604

Note:
The slot nut is twisted into the profile slot and so can be subsequently inserted into existing systems. The spring-loaded ball allows the nut to be fixated anywhere in the profile slot.



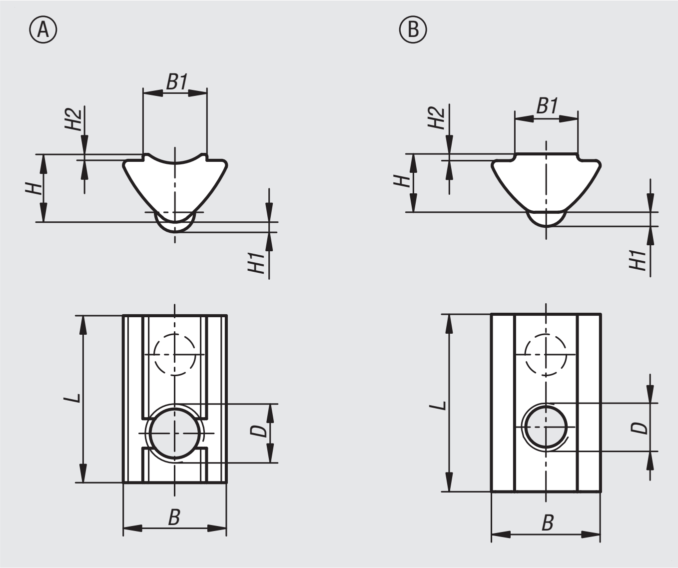
Order No.	Form	Slot width	D	B	H	H1	H2	L
07071-0604	A	6	M4	10,5	6,3	1	0,7	17
07071-0605	A	6	M5	10,5	6,3	1	0,7	17
07071-0606	A	6	M6	10,5	6,3	1	0,7	17
07071-0804	B	8	M4	13,7	7	1,7	0,7	22
07071-0805	B	8	M5	13,7	7	1,7	0,7	22
07071-0806	B	8	M6	13,7	7	1,7	0,7	22
07071-0808	B	8	M8	13,7	7	1,7	0,7	22

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

07073

Slot nuts

twist-in, keyed Type I

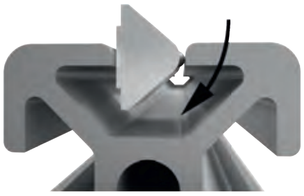


Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07073-0604

Note:
The slot nut is twisted into the profile slot and so can be subsequently inserted into existing systems. The spring-loaded ball allows the nut to be fixated anywhere in the profile slot. The key centres the nut in the profile slot and keeps it neatly seated.



Order No.	Form	Slot width	D	B	B1	H	H1	H2	L
07073-0604	A	6	M4	10,5	6,5	6,9	1	0,6	17
07073-0605	A	6	M5	10,5	6,5	6,9	1	0,6	17
07073-0606	A	6	M6	10,5	6,5	6,9	1	0,6	17
07073-0803	B	8	M3	13,5	7,8	7,2	1,75	0,8	22
07073-0804	B	8	M4	13,5	7,8	7,2	1,75	0,8	22
07073-0805	B	8	M5	13,5	7,8	7,2	1,75	0,8	22
07073-0806	B	8	M6	13,5	7,8	7,2	1,75	0,8	22
07073-0808	B	8	M8	13,5	7,8	7,2	1,75	0,8	22

07075

Slot nuts

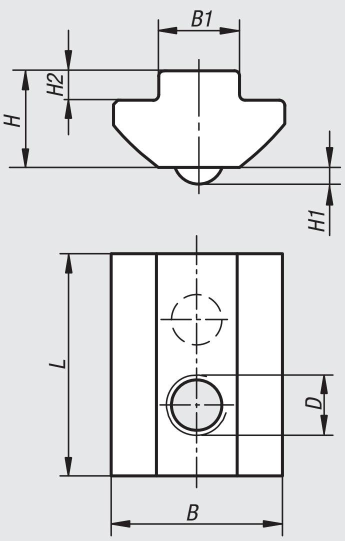
strong Type I

Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07075-0804

Note:
Suitable for high load connections. Since the key passes to the slot form of the profile, forces are transferred to the profile. The total height allows more threads to be engaged. The slot key can only be inserted into the profile slot from the end. The spring-loaded ball allows the slot key to be fixated anywhere in the profile slot.



Order No.	Slot width	B	B1	D	H	H1	H2	L
07075-0804	8	17	8	M4	9,6	1,65	2,9	22
07075-0805	8	17	8	M5	9,6	1,65	2,9	22
07075-0806	8	17	8	M6	9,6	1,65	2,9	22
07075-0808	8	17	8	M8	9,6	1,65	2,9	22

07076

Slot key profile

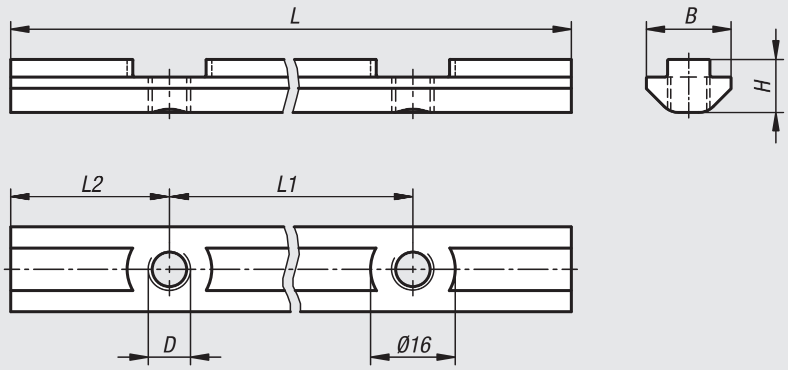
type I

Material:
Steel.

Version:
Coated.

Sample order:
nlm 07076-084008X1000

Note:
The slot profiles has a tapped hole pitch of 40 mm or 60 mm.
The profiles are particularly suitable for maintaining a constant centre distance by the bearing flanges 10400 for transport rollers.

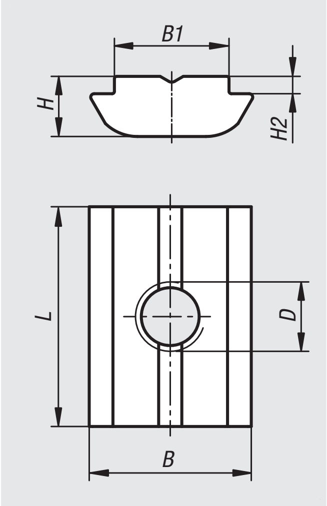


Order No.	Slot width	B	D	H	L	L1	L2	No. of holes
07076-084008X1000	8	16	M8	9,5	1000	40	20	25
07076-086008X1000	8	16	M8	9,5	1000	60	30	17

07077

Slot nuts

twist-in Type B



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07077-1004

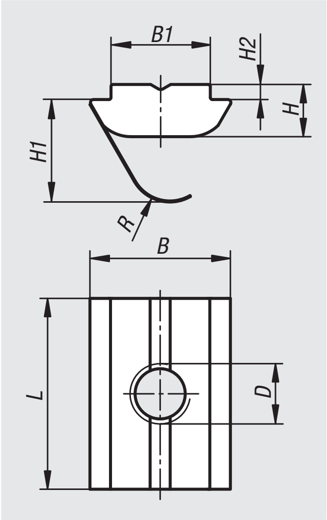
Note:
The slot nut is twisted into the profile slot and so can be subsequently inserted into existing systems.

Order No.	Slot width	B	B1	D	H	H2	L
07077-0804	8	11,6	7,9	M4	4,6	1	16
07077-0805	8	11,6	7,9	M5	4,6	1	16
07077-0806	8	11,6	7,9	M6	4,6	1	16
07077-0808	8	11,6	7,9	M8	4,6	1	16
07077-1004	10	14	9,9	M4	5,2	1,5	19
07077-1005	10	14	9,9	M5	5,2	1,5	19
07077-1006	10	14	9,9	M6	5,2	1,5	19
07077-1008	10	14	9,9	M8	5,2	1,5	19

07078

Slot nuts

twist-in with spring Type B



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07078-1004

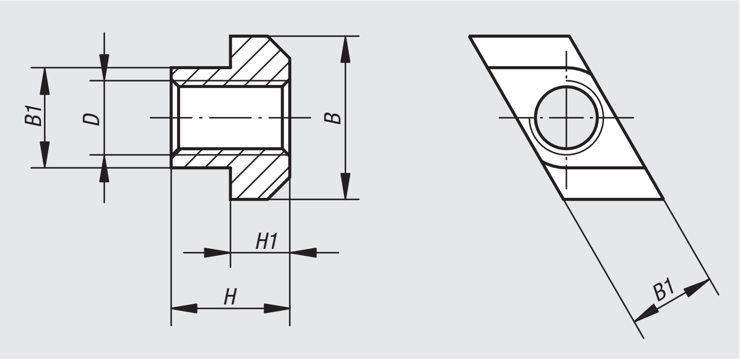
Note:
The slot nut is twisted into the profile slot and so can be subsequently inserted into existing systems. The spring allows the nut to be fixated anywhere in the profile slot.

Order No.	Slot width	B	B1	D	H	H1	H2	L	R
07078-0804	8	11,6	7,9	M4	4,6	8,8	1	16	3
07078-0805	8	11,6	7,9	M5	4,6	8,8	1	16	3
07078-0806	8	11,6	7,9	M6	4,6	8,8	1	16	3
07078-0808	8	11,6	7,9	M8	4,6	8,8	1	16	3
07078-1004	10	14	9,9	M4	5,2	10,2	1,5	19	4
07078-1005	10	14	9,9	M5	5,2	10,2	1,5	19	4
07078-1006	10	14	9,9	M6	5,2	10,2	1,5	19	4
07078-1008	10	14	9,9	M8	5,2	10,2	1,5	19	4

07080

Nuts for T-slots

rhombic form



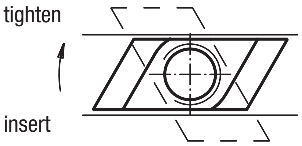
Material:
Carbon steel.

Version:
Tempered to 8 and black oxidised.

Sample order:
nlm 07080-114

Note:
The benefit of rhombic nuts for T-slots is that they can be fitted in the slot from the top. They are particularly useful for long T-slots, or when the configuration on the machine table does not permit clamping screws or nuts for T-slots to be inserted from the side.

Application:
Insert from above then twist in the slot until it stops.



Order No.	Slot width	B	B1	D	H	H1
07080-105	6	10	5,6	M5	8	4
07080-106	8	13	7,6	M6	10	6
07080-108	10	15	9,7	M8	12	6
07080-110	12	18	11,7	M10	14	7
07080-210	14	22	13,5	M10	16	8
07080-310	18	28	17,5	M10	20	10
07080-112	14	22	13,7	M12	16	8
07080-114	16	25	15,7	M14	18	9
07080-116	18	28	17,7	M16	20	10
07080-216	20	32	19,7	M16	24	12
07080-316	22	35	21,5	M16	28	14
07080-416	28	44	27,5	M16	36	18
07080-118	20	32	19,7	M18	24	12
07080-120	22	35	21,7	M20	28	14
07080-124	28	44	27,7	M24	36	18
07080-130	36	54	35,6	M30	44	22
07080-136	42	65	41,5	M36	52	26

07090

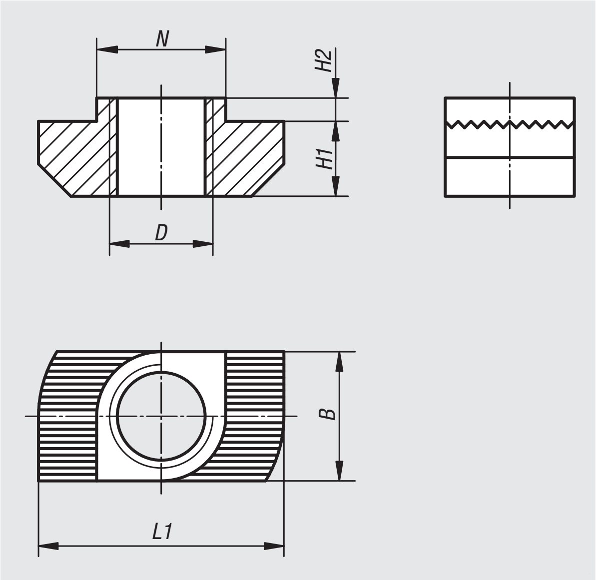
T-nuts

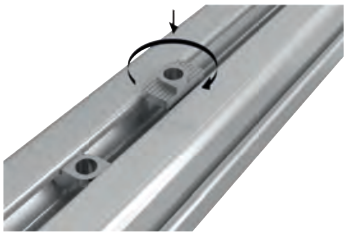
Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07090-0804015

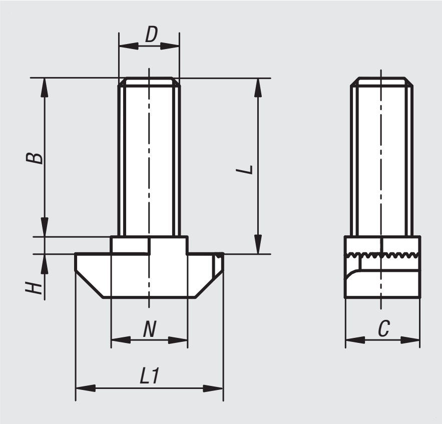
Note:
Universal fastening element. The T-nut is twisted into the profile slot and so can be subsequently inserted into existing systems. The serrations break through the anodised film and creates a secure, electrical conductive connection.





Order No.	Type	Slot width	B	D	H1	H2	L1	N
07090-0804015	B	8	7,7	M4	4,5	1,5	16	7,7
07090-0805015	B	8	7,7	M5	4,5	1,5	16	7,7
07090-0806015	B	8	7,7	M6	4,5	1,5	16	7,7
07090-1004030	B	10	9,7	M4	5,8	3	19	9,7
07090-1005017	-	10	9,7	M5	5,8	1,5	19	9,7
07090-1005030	B	10	9,7	M5	5,8	3	19	9,7
07090-1006017	-	10	9,7	M6	5,8	1,5	19	9,7
07090-1006030	B	10	9,7	M6	5,8	3	19	9,7
07090-1008017	-	10	9,7	M8	5,8	1,5	19	9,7
07090-1008030	B	10	9,7	M8	5,8	3	19	9,7

Hammer-head screws

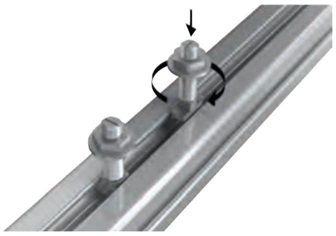


Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07094-0806015X16

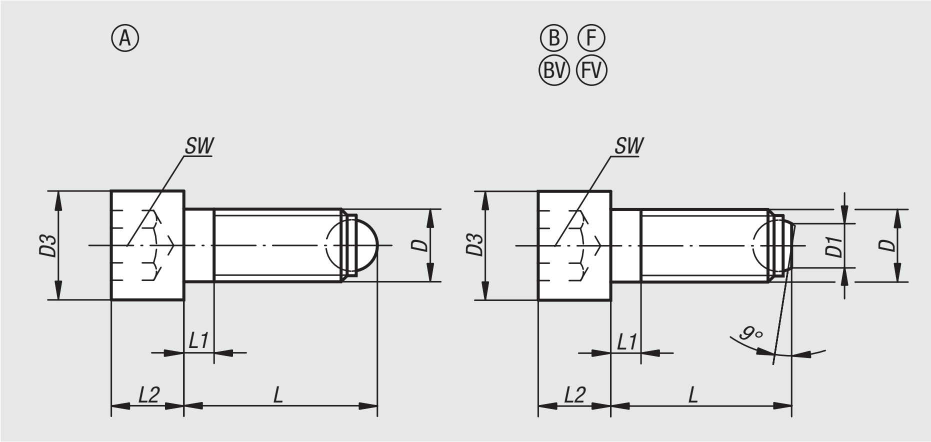
Note:
Universal fastening element. The hammer-headed screw is twisted into the profile slot and so can mounted into an existing systems at a later date. The serrations break through the anodised film and creates a secure, electrical conductive connection.



Order No.	Type	Slot width	B	C	D	H	L	L1	N
07094-0806015X16	B	8	14,5	7,7	M6	1,5	16	16	7,7
07094-0806015X20	B	8	18,5	7,7	M6	1,5	20	16	7,7
07094-0806015X25	B	8	23,5	7,7	M6	1,5	25	16	7,7
07094-1008030X20	B	10	17	8,5	M8	3	20	19	9,7
07094-1008030X25	B	10	22	8,5	M8	3	25	19	9,7
07094-1008030X30	B	10	27	8,5	M8	3	30	19	9,7
07094-1008030X40	B	10	37	8,5	M8	3	40	19	9,7
07094-1008030X60	B	10	57	8,5	M8	3	60	19	9,7

07100

Ball-end thrust screws with head



Material:
Screw carbon steel.
Ball ball-bearing steel.

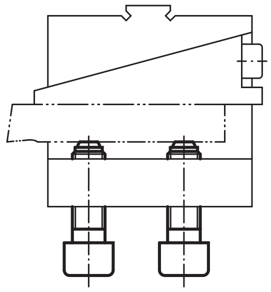
Version:
Screw grade min. 10.9, black.
Ball hardened, bright.

Sample order:
nlm 07100-10820

Note:
Form A with full ball is used when a clean, polished contact surface is required. Surfaces which are not flat and parallel can be firmly clamped or supported with Form B with flattened ball, the movable ball can adapt itself up to 9°.

Drawing reference:
Form A: full ball
Form B: flattened ball
Form BV: flattened ball, rotation lock
Form F: serrated flattened ball
Form FV: serrated flattened ball, rotation lock

Order No.	Form	D	D3	L	L1	L2	Ball-Ø	SW	Load rating max. kN (static load only)
07100-10410	Form A	M4	7	9,9	2,1	4	2,5	3	3,5
07100-10416	Form A	M4	7	15,9	2,1	4	2,5	3	3,5
07100-10420	Form A	M4	7	19,9	2,1	4	2,5	3	3,5
07100-10512	Form A	M5	8,5	12,1	2,4	5	3	4	4,5
07100-10516	Form A	M5	8,5	16,1	2,4	5	3	4	4,5
07100-10520	Form A	M5	8,5	20,1	2,4	5	3	4	4,5
07100-10620	Form A	M6	10	20,8	3	6	4	5	9
07100-10630	Form A	M6	10	30,8	3	6	4	5	9
07100-10640	Form A	M6	10	40,8	16	6	4	5	9
07100-10820	Form A	M8	13	21,2	3,5	8	5,5	6	15
07100-10835	Form A	M8	13	36,2	3,5	8	5,5	6	15
07100-10850	Form A	M8	13	51,2	22	8	5,5	6	15
07100-11025	Form A	M10	16	26,7	4,5	10	7	8	20
07100-11040	Form A	M10	16	41,7	4,5	10	7	8	20
07100-11060	Form A	M10	16	61,7	28	10	7	8	20
07100-11230	Form A	M12	18	32	5	12	8,5	10	30
07100-11250	Form A	M12	18	52	5	12	8,5	10	30
07100-11280	Form A	M12	18	82	44	12	8,5	10	30
07100-11640	Form A	M16	24	43,3	6	16	12	14	60
07100-11660	Form A	M16	24	63,3	6	16	12	14	60
07100-11680	Form A	M16	24	83,3	36	16	12	14	60
07100-12050	Form A	M20	30	54,2	7,5	20	15	17	90
07100-12080	Form A	M20	30	84,2	28	20	15	17	90
07100-120100	Form A	M20	30	104,2	48	20	15	17	90
07100-12460	Form A	M24	36	64,7	9	24	18	19	120
07100-12490	Form A	M24	36	94,7	30	24	18	19	120
07100-124120	Form A	M24	36	124,7	60	24	18	19	120



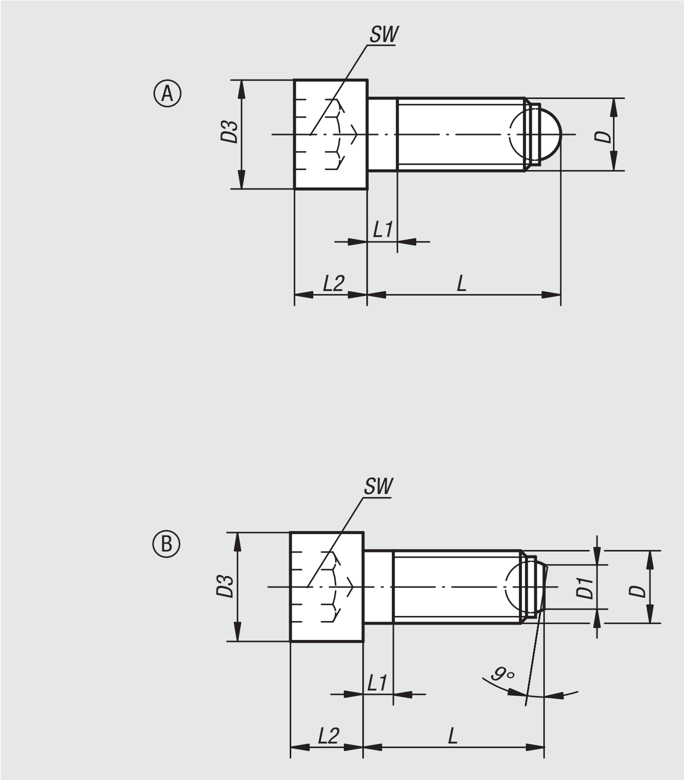
Ball-end thrust screws with head

Order No. Form B	Order No. Form F	D	D1	D3	L	L1	L2	Ball-Ø	SW	Load rating max. kN (static load only)
07100-20410	-	M4	1,4	7	11,7	2,1	4	2,5	3	3,5
07100-20416	-	M4	1,4	7	15,7	2,1	4	2,5	3	3,5
07100-20420	-	M4	1,4	7	19,7	2,1	4	2,5	3	3,5
07100-20512	-	M5	2	8,5	11,7	2,4	5	3	4	4,5
07100-20516	-	M5	2	8,5	15,7	2,4	5	3	4	4,5
07100-20520	-	M5	2	8,5	19,7	2,4	5	3	4	4,5
07100-20620	-	M6	3,2	10	20	3	6	4	5	9
07100-20630	-	M6	3,2	10	30	3	6	4	5	9
07100-20640	-	M6	3,2	10	40	16	6	4	5	9
07100-20820	-	M8	4,5	13	20	3,5	8	5,5	6	15
07100-20835	-	M8	4,5	13	35	3,5	8	5,5	6	15
07100-20850	-	M8	4,5	13	50	22	8	5,5	6	15
07100-21025	**07100-31025**	M10	6	16	25	4,5	10	7	8	20
07100-21040	**07100-31040**	M10	6	16	40	4,5	10	7	8	20
07100-21060	**07100-31060**	M10	6	16	60	28	10	7	8	20
07100-21230	**07100-31230**	M12	7,2	18	30	5	12	8,5	10	30
07100-21250	**07100-31250**	M12	7,2	18	50	5	12	8,5	10	30
07100-21280	**07100-31280**	M12	7,2	18	80	44	12	8,5	10	30
07100-21640	**07100-31640**	M16	10,7	24	40	6	16	12	14	60
07100-21660	**07100-31660**	M16	10,7	24	60	6	16	12	14	60
07100-21680	**07100-31680**	M16	10,7	24	80	36	16	12	14	60
07100-22050	-	M20	13,5	30	50	7,5	20	15	17	90
07100-22080	-	M20	13,5	30	80	28	20	15	17	90
07100-220100	-	M20	13,5	30	100	48	20	15	17	90
07100-22460	-	M24	15,8	36	60	9	24	18	19	120
07100-22490	-	M24	15,8	36	90	30	24	18	19	120
07100-224120	-	M24	15,8	36	120	60	24	18	19	120

Order No. Form BV	Order No. Form FV	D	D1	D3	L	L1	L2	Ball-Ø	SW	Load rating max. kN (static load only)
07100-40820	-	M8	4,5	13	20	3,5	8	5,5	6	9
07100-40835	-	M8	4,5	13	35	3,5	8	5,5	6	9
07100-40850	-	M8	4,5	13	50	22	8	5,5	6	9
07100-41025	**07100-51025**	M10	6	16	25	4,5	10	7	8	12
07100-41040	**07100-51040**	M10	6	16	40	4,5	10	7	8	12
07100-41060	**07100-51060**	M10	6	16	60	28	10	7	8	12
07100-41230	**07100-51230**	M12	7,2	18	30	5	12	8,5	10	18
07100-41250	**07100-51250**	M12	7,2	18	50	5	12	8,5	10	18
07100-41280	**07100-51280**	M12	7,2	18	80	44	12	8,5	10	18
07100-41640	**07100-51640**	M16	10,7	24	40	6	16	12	14	36
07100-41660	**07100-51660**	M16	10,7	24	60	6	16	12	14	36
07100-41680	**07100-51680**	M16	10,7	24	80	36	16	12	14	36

Ball-end thrust screws with head

stainless steel



Material:
Stainless steel

Version:
Bright.

Sample order:
nlm 07101-11230

Note:
Form A with full ball is used when a clean, polished contact surface is required. Surfaces which are not flat and parallel can be firmly clamped or supported with Form B with flattened ball, the movable ball can adapt itself up to 9°.

Drawing reference:
Form A: with full ball
Form B: with flattened ball

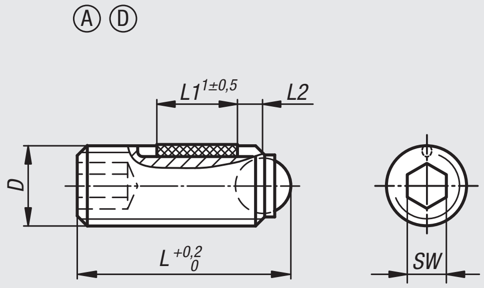
Order No. Form A	D	D3	L	L1	L2	Ball-Ø	SW
07101-10410	M4	7	9,9	2,1	4	2,5	3
07101-10416	M4	7	15,9	2,1	4	2,5	3
07101-10420	M4	7	19,9	2,1	4	2,5	3
07101-10512	M5	8,5	12,1	2,4	5	3	4
07101-10516	M5	8,5	16,1	2,4	5	3	4
07101-10520	M5	8,5	20,1	2,4	5	3	4
07101-10620	M6	10	20,8	3	6	4	5
07101-10630	M6	10	30,8	3	6	4	5
07101-10640	M6	10	40,8	16	6	4	5
07101-10820	M8	13	21,2	3,5	8	5,5	6
07101-10835	M8	13	36,2	3,5	8	5,5	6
07101-10850	M8	13	51,2	22	8	5,5	6
07101-11025	M10	16	26,7	4,5	10	7	8
07101-11040	M10	16	41,7	4,5	10	7	8
07101-11060	M10	16	61,7	28	10	7	8
07101-11230	M12	18	32	5	12	8,5	10
07101-11250	M12	18	52	5	12	8,5	10
07101-11280	M12	18	82	44	12	8,5	10
07101-11640	M16	24	43,3	6	16	12	14
07101-11660	M16	24	63,3	6	16	12	14
07101-11680	M16	24	83,3	36	16	12	14

Order No. Form B	D	D1	D3	L	L1	L2	Ball-Ø	SW
07101-20410	M4	1,4	7	9,7	2,1	4	2,5	3
07101-20416	M4	1,4	7	15,7	2,1	4	2,5	3
07101-20420	M4	1,4	7	19,7	2,1	4	2,5	3
07101-20512	M5	2	8,5	11,7	2,4	5	3	4
07101-20516	M5	2	8,5	15,7	2,4	5	3	4
07101-20520	M5	2	8,5	19,7	2,4	5	3	4
07101-20620	M6	3,2	10	20	3	6	4	5
07101-20630	M6	3,2	10	30	3	6	4	5
07101-20640	M6	3,2	10	40	16	6	4	5
07101-20820	M8	4,5	13	20	3,5	8	5,5	6
07101-20835	M8	4,5	13	35	3,5	8	5,5	6
07101-20850	M8	4,5	13	50	22	8	5,5	6
07101-21025	M10	6	16	25	4,5	10	7	8
07101-21040	M10	6	16	40	4,5	10	7	8
07101-21060	M10	6	16	60	28	10	7	8
07101-21230	M12	7,2	18	30	5	12	8,5	10
07101-21250	M12	7,2	18	50	5	12	8,5	10
07101-21280	M12	7,2	18	80	44	12	8,5	10
07101-21640	M16	10,7	24	40	6	16	12	14
07101-21660	M16	10,7	24	60	6	16	12	14
07101-21680	M16	10,7	24	80	36	16	12	14

07105

Ball-end thrust screws without head

with full ball, LONG-LOK secured



Material:
Screw carbon steel, grade 10.9
Ball, ball-bearing steel or POM.
LONG-LOK thread lock nylon.

Version:
Screw black.
Ball hardened, bright.

Sample order:
nlm 07105-1046

Note:
Ball-end thrust screws with full ball are used when a clean, polished contact surface is required.

Drawing reference:
Form A: steel ball
Form D: POM ball

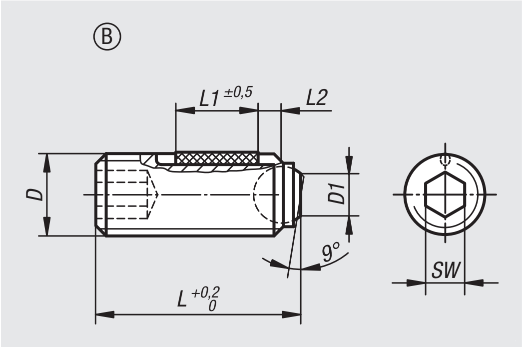
L2 = approx. 2x pitch

Order No. Form A	Order No. Form D	D	L	L1	Ball-Ø	SW	Load rating max. kN (static load only)
07105-1046	**07105-3046**	M4	6	2,5	2,5	2	3,5/0,3
07105-10410	**07105-30410**	M4	10	3,5	2,5	2	3,5/0,3
07105-10416	**07105-30416**	M4	16	5	2,5	2	3,5/0,3
07105-1058	**07105-3058**	M5	8	3,5	3	2,5	4,5/0,5
07105-10512	**07105-30512**	M5	12	5	3	2,5	4,5/0,5
07105-10520	**07105-30520**	M5	20	6	3	2,5	4,5/0,5
07105-10610	**07105-30610**	M6	10,8	3,5	4	3	9/0,9
07105-10616	**07105-30616**	M6	16,8	7	4	3	9/0,9
07105-10620	**07105-30620**	M6	20,8	7	4	3	9/0,9
07105-10625	**07105-30625**	M6	25,8	7	4	3	9/0,9
07105-10650	-	M6	50,8	7	4	3	9
07105-10660	-	M6	60,8	7	4	3	9
07105-10810	**07105-30810**	M8	11,2	3,5	5,5	4	10/1,5
07105-10812	**07105-30812**	M8	13,2	5	5,5	4	10/1,5
07105-10820	**07105-30820**	M8	21,2	8	5,5	4	15/1,5
07105-10825	**07105-30825**	M8	26,2	8	5,5	4	15/1,5
07105-10830	**07105-30830**	M8	31,2	8	5,5	4	15/1,5
07105-10850	-	M8	51,2	8	5,5	4	15
07105-10860	-	M8	61,2	8	5,5	4	15
07105-10880	-	M8	81,2	8	5,5	4	15
07105-11012	**07105-31012**	M10	13,7	5	7	5	20/2
07105-11016	**07105-31016**	M10	17,7	9	7	5	20/2
07105-11020	**07105-31020**	M10	21,7	9	7	5	20/2
07105-11025	**07105-31025**	M10	26,7	9	7	5	20/2
07105-11035	**07105-31035**	M10	36,7	9	7	5	20/2
07105-11216	**07105-31216**	M12	18	8	8,5	6	30/3
07105-11220	**07105-31220**	M12	22	10	8,5	6	30/3
07105-11230	**07105-31230**	M12	32	10	8,5	6	30/3
07105-11240	**07105-31240**	M12	42	10	8,5	6	30/3
07105-11620	-	M16	23,3	10	12	8	60
07105-11625	-	M16	28,3	14	12	8	60
07105-11635	-	M16	38,3	14	12	8	60
07105-11650	-	M16	53,3	14	12	8	60

07105

Ball-end thrust screws without head

with flattened ball LONG-LOK secured



Material:
Screw carbon steel, grade 10.9
Ball, ball-bearing steel.
LONG-LOK thread lock nylon.

Version:
Screw black.
Ball hardened, bright.

Sample order:
nlm 07105-20610

Note:
Surfaces which are not flat and parallel can be firmly clamped or supported with a flattened ball, the movable ball can adapt itself up to 9°.

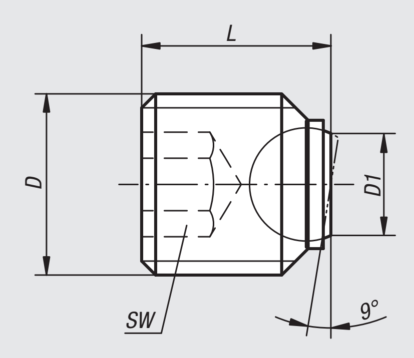
Drawing reference:
Form B: with flattened ball

L2 = approx. 2x pitch

Order No. Form B	D	D1	L	L1	Ball-Ø	SW	Load rating max. kN (static load only)
07105-20610	M6	3	10,1	3,5	4	3	9
07105-20616	M6	3	16,1	7	4	3	9
07105-20620	M6	3	20,1	7	4	3	9
07105-20625	M6	3	25,1	7	4	3	9
07105-20650	M6	3	50,1	7	4	3	9
07105-20660	M6	3	60,1	7	4	3	9
07105-20810	M8	4,1	10,3	3,5	5,5	4	10
07105-20812	M8	4,1	12,3	5	5,5	4	10
07105-20820	M8	4,1	20,3	8	5,5	4	15
07105-20825	M8	4,1	25,3	8	5,5	4	15
07105-20830	M8	4,1	30,3	8	5,5	4	15
07105-20850	M8	4,1	50,3	8	5,5	4	15
07105-20860	M8	4,1	60,3	8	5,5	4	15
07105-20880	M8	4,1	80,3	8	5,5	4	15
07105-21012	M10	5,6	12,3	5	7	5	20
07105-21016	M10	5,6	16,3	9	7	5	20
07105-21020	M10	5,6	20,3	9	7	5	20
07105-21025	M10	5,6	25,3	9	7	5	20
07105-21035	M10	5,6	35,3	9	7	5	20
07105-21216	M12	7	16,2	8	8,5	6	30
07105-21220	M12	7	20,2	10	8,5	6	30
07105-21230	M12	7	30,2	10	8,5	6	30
07105-21240	M12	7	40,2	10	8,5	6	30
07105-21620	M16	10,7	20	10	12	8	60
07105-21625	M16	10,7	25	14	12	8	60
07105-21635	M16	10,7	35	14	12	8	60
07105-21650	M16	10,7	50	14	12	8	60

Ball-end thrust screws without head

short version

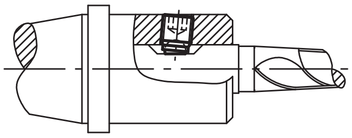


Material:
Screw carbon steel, ball ball-bearing steel.

Version:
Screw grade 12.9, black oxidised.
Ball hardened, bright.

Sample order:
nlm 07109-1416

Note:
Short ball-end thrust screws are particularly suited to DIN 1835 E straight milling cutter shanks together with e.g. Whistle Notch or Weldon tool holders.

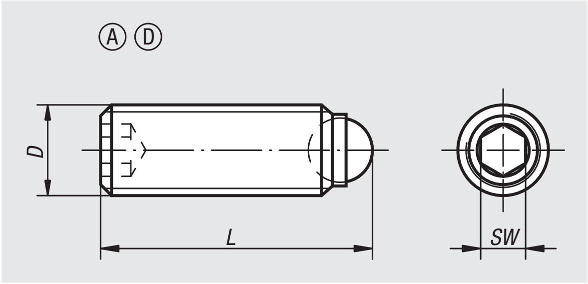


Order No.	D	D1	L	Ball-Ø	SW	Load rating max. kN (static load only)
07109-1416	M14	7,2	16	8,5	6	30
07109-1616	M16	7,2	16	8,5	8	30
07109-1820	M18X2	10,7	20	12	10	60
07109-2020	M20X2	10,7	20	12	10	60
07109-2025	M20X2	10,7	25	12	10	60
07109-2425	M24x2	13,5	25	15	12	90

07110

Ball-end thrust screws without head

with full ball



Material:
Screw, high-carbon steel, grade 10.9
Ball, ball-bearing steel or POM.

Version:
Screw black.
Ball hardened, bright.

Sample order:
nlm 07110-10810

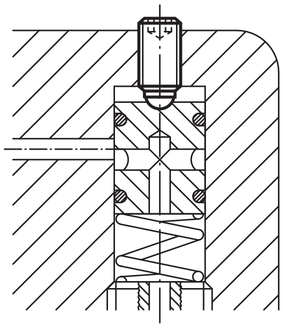
Note:
Ball-end thrust screws with full ball are used when a clean, polished contact surface is required.
Longer versions have been specially designed to be glued in, allowing mechanical connecting elements with external thread to be made cost-effectively for small and medium-sized series.

Drawing reference:
Form A: steel ball
Form D: POM ball

Order No. Form A	Order No. Form D	D	L	Ball-Ø	SW	Load rating max. kN (static load only)
07110-1046	**07110-3046**	M4	6	2,5	2	3,5/0,3
07110-1048	**07110-3048**	M4	8	2,5	2	3,5/0,3
07110-10410	**07110-30410**	M4	10	2,5	2	3,5/0,3
07110-10412	**07110-30412**	M4	12	2,5	2	3,5/0,3
07110-10416	**07110-30416**	M4	16	2,5	2	3,5/0,3
07110-1058	**07110-3058**	M5	8	3	2,5	4,5/0,5
07110-10510	**07110-30510**	M5	10	3	2,5	4,5/0,5
07110-10512	**07110-30512**	M5	12	3	2,5	4,5/0,5
07110-10516	**07110-30516**	M5	16	3	2,5	4,5/0,5
07110-10520	**07110-30520**	M5	20	3	2,5	4,5/0,5
07110-10525	**07110-30525**	M5	25	3	2,5	4,5/0,5
07110-10610	**07110-30610**	M6	10,8	4	3	9/0,9
07110-10612	**07110-30612**	M6	12,8	4	3	9/0,9
07110-10616	**07110-30616**	M6	16,8	4	3	9/0,9
07110-10620	**07110-30620**	M6	20,8	4	3	9/0,9
07110-10625	**07110-30625**	M6	25,8	4	3	9/0,9
07110-10650	**-**	M6	50,8	4	3	9/0,9
07110-10660	**-**	M6	60,8	4	3	9/0,9
07110-10680	**-**	M6	80,8	4	3	9/0,9
07110-10810	**07110-30810**	M8	11,2	5,5	4	10/15/1,5
07110-10812	**07110-30812**	M8	13,2	5,5	4	10/15/1,5
07110-10816	**07110-30816**	M8	17,2	5,5	4	10/15/1,5
07110-10820	**07110-30820**	M8	21,2	5,5	4	10/15/1,5
07110-10825	**07110-30825**	M8	26,2	5,5	4	10/15/1,5
07110-10830	**07110-30830**	M8	31,2	5,5	4	10/15/1,5
07110-10850	**-**	M8	51,2	5,5	4	10/15/1,5
07110-10860	**-**	M8	61,2	5,5	4	10/15/1,5
07110-10880	**-**	M8	81,2	5,5	4	10/15/1,5

Ball-end thrust screws without head

with full ball

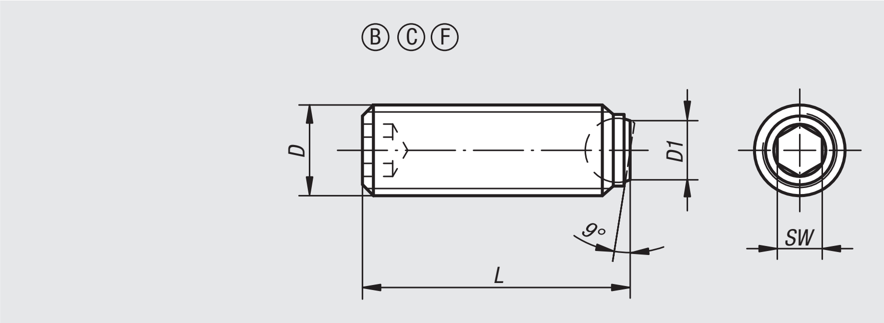


Order No. Form A	Order No. Form D	D	L	Ball-Ø	SW	Load rating max. kN (static load only)
07110-11012	**07110-31012**	M10	13,7	7	5	20/2
07110-11016	**07110-31016**	M10	17,7	7	5	20/2
07110-11020	**07110-31020**	M10	21,7	7	5	20/2
07110-11025	**07110-31025**	M10	26,7	7	5	20/2
07110-11035	**07110-31035**	M10	36,7	7	5	20/2
07110-11216	**07110-31216**	M12	18	8,5	6	30/3
07110-11220	**07110-31220**	M12	22	8,5	6	30/3
07110-11225	-	M12	27	8,5	6	30/3
07110-11230	**07110-31230**	M12	32	8,5	6	30/3
07110-11232	-	M12	34	8,5	6	30/3
07110-11240	**07110-31240**	M12	42	8,5	6	30/3
07110-11620	-	M16	23,3	12	8	60
07110-11625	-	M16	28,3	12	8	60
07110-11635	-	M16	38,3	12	8	60
07110-11650	-	M16	53,3	12	8	60
07110-12030	-	M20	34,2	15	10	90
07110-12040	-	M20	44,2	15	10	90
07110-12060	-	M20	64,2	15	10	90
07110-12435	-	M24	39,7	18	12	120
07110-12450	-	M24	54,7	18	12	120
07110-12480	-	M24	84,7	18	12	120

07110

Ball-end thrust screws without head

with flattened ball



Material:
Screw carbon steel, grade 10.9
Ball, ball-bearing steel or POM.

Version:
Screw black.
Ball hardened, bright.

Sample order:
nlm 07110-41012

Note:
Surfaces which are not flat and parallel can be firmly clamped or supported with Form B, C or F with flattened ball, the movable ball can adapt itself up to 9°.
Longer versions have been specially designed to glue in, allowing mechanical connecting elements with external thread to be made cost-effectively for small and medium-sized series.

Drawing reference:
Form B: steel ball
Form C: POM ball
Form F: steel ball diamond grip

Order No.	Form	D	D1	L	Ball-Ø	SW	Load rating max. kN (static load only)
07110-70410	C	M4	1,8	9,9	2,5	2	0,3
07110-70412	C	M4	1,8	11,9	2,5	2	0,3
07110-70416	C	M4	1,8	15,9	2,5	2	0,3
07110-7046	C	M4	1,8	5,9	2,5	2	0,3
07110-7048	C	M4	1,8	7,9	2,5	2	0,3
07110-70512	C	M5	2,1	11,8	3	2,5	0,5
07110-70516	C	M5	2,1	15,8	3	2,5	0,5
07110-70520	C	M5	2,1	19,8	3	2,5	0,5
07110-70525	C	M5	2,1	24,8	3	2,5	0,5
07110-70510	C	M5	2,1	9,8	3	2,5	0,5
07110-7058	C	M5	2,1	7,8	3	2,5	0,5
07110-70610	C	M6	3	10,3	4	3	0,9
07110-70612	C	M6	3	12,3	4	3	0,9
07110-70616	C	M6	3	16,3	4	3	0,9
07110-70620	C	M6	3	20,3	4	3	0,9
07110-70625	C	M6	3	25,3	4	3	0,9
07110-70810	C	M8	4,2	10,4	5,5	4	1,5
07110-70830	C	M8	4,2	30,4	5,5	4	1,5
07110-70812	C	M8	4,2	12,4	5,5	4	1,5
07110-70816	C	M8	4,2	16,4	5,5	4	1,5
07110-70820	C	M8	4,2	20,4	5,5	4	1,5
07110-70825	C	M8	4,2	25,4	5,5	4	1,5

Order No.	Form	D	D1	L	Ball-Ø	SW	Load rating max. kN (static load only)
07110-41012	F	M10	6	12	7	5	20
07110-41016	F	M10	6	16	7	5	20
07110-41025	F	M10	6	25	7	5	20
07110-41035	F	M10	6	35	7	5	20
07110-41216	F	M12	7,2	16	8,5	6	30
07110-41220	F	M12	7,2	20	8,5	6	30
07110-41240	F	M12	7,2	40	8,5	6	30
07110-41230	F	M12	7,2	30	8,5	6	30
07110-41620	F	M16	10,7	20	12	8	60
07110-41625	F	M16	10,7	25	12	8	60
07110-41635	F	M16	10,7	35	12	8	60
07110-41650	F	M16	10,7	50	12	8	60

Ball-end thrust screws without head

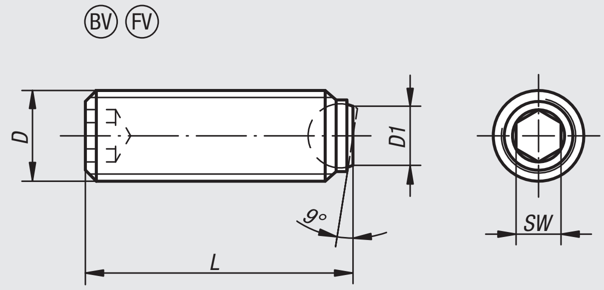
with flattened ball

Order No.	Form	D	D1	L	Ball-Ø	SW	Load rating max. kN (static load only)
07110-2046	B	M4	1,4	5,8	2,5	2	3,5
07110-2048	B	M4	1,4	7,8	2,5	2	3,5
07110-20410	B	M4	1,4	9,8	2,5	2	3,5
07110-20412	B	M4	1,4	11,8	2,5	2	3,5
07110-20416	B	M4	1,4	15,8	2,5	2	3,5
07110-20510	B	M5	2	9,6	3	2,5	4,5
07110-20512	B	M5	2	11,6	3	2,5	4,5
07110-20516	B	M5	2	15,6	3	2,5	4,5
07110-2058	B	M5	2	7,6	3	2,5	4,5
07110-20520	B	M5	2	19,6	3	2,5	4,5
07110-20525	B	M5	2	24,6	3	2,5	4,5
07110-20612	B	M6	3	12,1	4	3	9
07110-20616	B	M6	3	16,1	4	3	9
07110-20610	B	M6	3	10,1	4	3	9
07110-20620	B	M6	3	20,1	4	3	9
07110-20680	B	M6	3	80,1	4	3	9
07110-20625	B	M6	3	25,1	4	3	9
07110-20650	B	M6	3	50,1	4	3	9
07110-20660	B	M6	3	60,1	4	3	9
07110-20812	B	M8	4,1	12,3	5,5	4	10
07110-20816	B	M8	4,1	16,3	5,5	4	15
07110-20820	B	M8	4,1	20,3	5,5	4	15
07110-20810	B	M8	4,1	10,3	5,5	4	10
07110-20825	B	M8	4,1	25,3	5,5	4	15
07110-20880	B	M8	4,1	80,3	5,5	4	15
07110-20830	B	M8	4,1	30,3	5,5	4	15
07110-20850	B	M8	4,1	50,3	5,5	4	15
07110-20860	B	M8	4,1	60,3	5,5	4	15
07110-21016	B	M10	5,6	16,3	7	5	20
07110-21020	B	M10	5,6	20,3	7	5	20
07110-21025	B	M10	5,6	25,3	7	5	20
07110-21012	B	M10	5,6	12,3	7	5	20
07110-21035	B	M10	5,6	35,3	7	5	20
07110-21216	B	M12	7	16,2	8,5	6	30
07110-21220	B	M12	7	20,2	8,5	6	30
07110-21230	B	M12	7	30,2	8,5	6	30
07110-21240	B	M12	7	40,2	8,5	6	30
07110-21620	B	M16	10,7	20	12	8	60
07110-21650	B	M16	10,7	50	12	8	60
07110-21625	B	M16	10,7	25	12	8	60
07110-21635	B	M16	10,7	35	12	8	60
07110-22040	B	M20	13,5	40	15	10	90
07110-22030	B	M20	13,5	30	15	10	90
07110-22060	B	M20	13,5	60	15	10	90
07110-22435	B	M24	15,8	35	18	12	120
07110-22450	B	M24	15,8	50	18	12	120
07110-22480	B	M24	15,8	80	18	12	120

07110

Ball-end thrust screws without head

with flattened ball and rotation lock



Material:
Screw, high-carbon steel, grade 10.9
Ball, ball-bearing steel.

Version:
Screw black.
Ball hardened, bright.

Sample order:
nlm 07110-50820

Note:
Surfaces which are not flat and parallel can be firmly clamped or supported with with a flattened ball, the movable ball can adapt itself up to 9°.
Longer versions have been designed especially to be glued in. This allows mechanical connecting elements with external thread to be made cost-effectively for small and medium-sized series.
The ball has a rotation lock.

Drawing reference:
Form BV: flattened ball non-rotating
Form FV: flattened ball diamond grip non-rotating

Order No. Form BV	Order No. Form FV	D	D1	L	Ball-Ø	SW	Load rating max. kN (static load only)
07110-50616	-	M6	3	16,1	4	3	6
07110-50620	-	M6	3	20,1	4	3	6
07110-50612	-	M6	3	12,1	4	3	6
07110-50625	-	M6	3	25,1	4	3	6
07110-50816	**07110-60816**	M8	4,1	16,3	5,5	4	9
07110-50820	**07110-60820**	M8	4,1	20,3	5,5	4	9
07110-50825	**07110-60825**	M8	4,1	25,3	5,5	4	9
07110-50830	**07110-60830**	M8	4,1	30,3	5,5	4	9
07110-51025	**07110-61025**	M10	5,6	25,3	7	5	12
07110-51020	**07110-61020**	M10	5,6	20,3	7	5	12
07110-51035	**07110-61035**	M10	5,6	35,3	7	5	12
07110-51040	**07110-61040**	M10	5,6	40,2	7	5	12
07110-51220	**07110-61220**	M12	7	20,2	8,5	6	18
07110-51230	**07110-61230**	M12	7	30,2	8,5	6	18
07110-51240	**07110-61240**	M12	7	40,2	8,5	6	18
07110-51250	**07110-61250**	M12	7	50	8,5	6	18
07110-51635	**07110-61635**	M16	10,7	35	12	8	36
07110-51650	**07110-61650**	M16	10,7	50	12	8	36
07110-52030	**07110-62030**	M20	13,5	30	15	10	60
07110-52040	**07110-62040**	M20	13,5	40	15	10	60
07110-52050	**07110-62050**	M20	13,5	50	15	10	60
07110-52060	**07110-62060**	M20	13,5	60	15	10	60
07110-52435	**07110-62435**	M24	15,8	35	18	12	80
07110-52480	**07110-62480**	M24	15,8	80	18	12	80
07110-52450	**07110-62450**	M24	15,8	50	18	12	80

Ball-end thrust screws without head

stainless steel with full ball

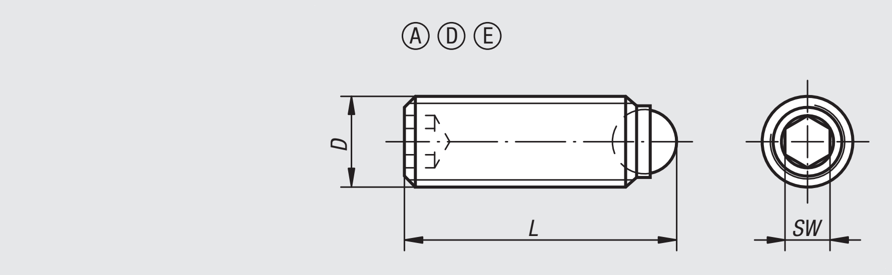
Material:
Screw stainless steel.
Ball stainless steel, POM or ceramic Si_3N_4.

Version:
Stainless steel bright.

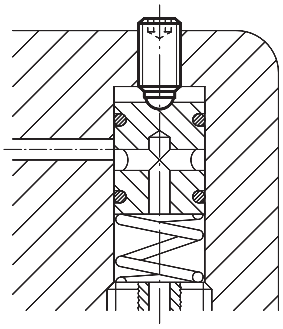
Sample order:
nlm 07111-1046

Note:
Ball-end thrust screws with full ball are used when a clean, polished contact surface is required. Longer versions have been designed especially to be glued in, allowing mechanical connecting elements with external threads to be made cost-effectively for small and medium-sized runs. Silicon nitride (Si_3N_4) is characterised by a combination of excellent properties, these include high resilience and strength, excellent wear resistance and good chemical resistance.

Drawing reference:
Form A: stainless steel ball
Form D: POM ball
Form E: ceramic ball

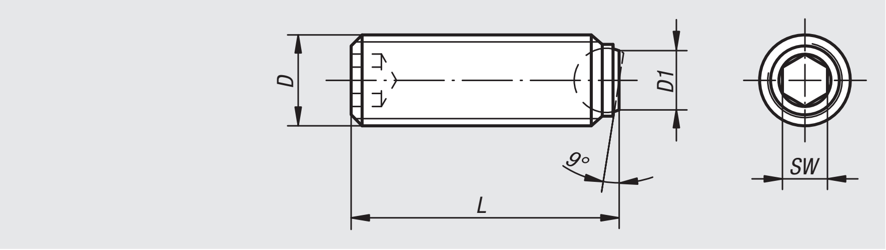


Order No. Form A	Order No. Form D	Order No. Form E	D	L	Ball-Ø	SW	Load rating max. kN (static load only)
07111-10412	07111-30412	-	M4	12	2,5	2	-/0,3
07111-10416	07111-30416	-	M4	16	2,5	2	-/0,3
07111-1046	07111-3046	-	M4	6	2,5	2	-/0,3
07111-1048	07111-3048	-	M4	8	2,5	2	-/0,3
07111-10510	07111-30510	-	M5	10	3	2,5	-/0,5/4,5
07111-10512	07111-30512	07111-80512	M5	12	3	2,5	-/0,5/4,5
07111-10516	07111-30516	-	M5	16	3	2,5	-/0,5/4,5
07111-10520	07111-30520	07111-80520	M5	20	3	2,5	-/0,5/4,5
07111-10525	07111-30525	-	M5	25	3	2,5	-/0,5/4,5
07111-1058	07111-3058	07111-8058	M5	8	3	2,5	-/0,5/4,5
07111-10610	07111-30610	07111-80610	M6	10,8	4	3	-/0,9/9
07111-10612	07111-30612	-	M6	12,8	4	3	-/0,9/9
07111-10616	07111-30616	07111-80616	M6	16,8	4	3	-/0,9/9
07111-10620	07111-30620	07111-80620	M6	20,8	4	3	-/0,9/9
07111-10625	07111-30625	07111-80625	M6	25,8	4	3	-/0,9/9
07111-10650	-	-	M6	50,8	4	3	-/0,9/9
07111-10660	-	-	M6	60,8	4	3	-/0,9/9
07111-10680	-	-	M6	80,8	4	3	-/0,9/9
07111-10810	07111-30810	07111-80810	M8	11,2	5,5	4	-/1,5/10/15
07111-10812	07111-30812	07111-80812	M8	13,2	5,5	4	-/1,5/10/15
07111-10816	07111-30816	-	M8	17,2	5,5	4	-/1,5/10/15
07111-10820	07111-30820	07111-80820	M8	21,2	5,5	4	-/1,5/10/15
07111-10825	07111-30825	07111-80825	M8	26,2	5,5	4	-/1,5/10/15
07111-10830	07111-30830	07111-80830	M8	31,2	5,5	4	-/1,5/10/15
07111-10850	-	-	M8	51,2	5,5	4	-/1,5/10/15
07111-10860	-	-	M8	61,2	5,5	4	-/1,5/10/15
07111-10880	-	-	M8	81,2	5,5	4	-/1,5/10/15
07111-11012	-	07111-81012	M10	13,7	7	5	-/20
07111-11016	-	07111-81016	M10	17,7	7	5	-/20
07111-11020	-	07111-81020	M10	21,7	7	5	-/20
07111-11025	-	07111-81025	M10	26,7	7	5	-/20
07111-11035	-	07111-81035	M10	36,7	7	5	-/20
07111-11216	-	07111-81216	M12	18	8,5	6	-/30
07111-11220	-	07111-81220	M12	22	8,5	6	-/30
07111-11225	-	-	M12	27	8,5	6	-/30
07111-11230	-	07111-81230	M12	32	8,5	6	-/30
07111-11232	-	-	M12	34	8,5	6	-/30
07111-11240	-	07111-81240	M12	42	8,5	6	-/30
07111-11620	-	-	M16	23,3	12	8	-
07111-11625	-	-	M16	28,3	12	8	-
07111-11635	-	-	M16	38,3	12	8	-
07111-10410	07111-30410	-	M4	10	2,5	2	-/0,3
07111-11650	-	-	M16	53,3	12	8	-



Ball-end thrust screws without head

stainless steel with flattened ball



Material:
Screw and ball stainless steel.

Version:
Stainless steel bright.

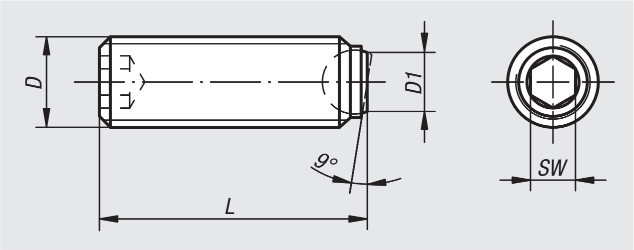
Sample order:
nlm 07111-2046

Note:
Surfaces which are not flat and parallel can be firmly clamped or supported with a flattened ball, the movable ball can adapt itself up to 9°.
Longer versions have been designed especially to be glued in. This enables mechanical connecting elements with male thread to be made cost-effectively for small and medium-sized series.

Order No.	Form	D	D1	L	Ball-Ø	SW
07111-2046	B	M4	1,4	5,8	2,5	2
07111-2048	B	M4	1,4	7,8	2,5	2
07111-20410	B	M4	1,4	9,8	2,5	2
07111-20412	B	M4	1,4	11,8	2,5	2
07111-20416	B	M4	1,4	15,8	2,5	2
07111-2058	B	M5	2	7,6	3	2,5
07111-20510	B	M5	2	9,6	3	2,5
07111-20512	B	M5	2	11,6	3	2,5
07111-20516	B	M5	2	15,6	3	2,5
07111-20520	B	M5	2	19,6	3	2,5
07111-20525	B	M5	2	24,6	3	2,5
07111-20610	B	M6	3	10,1	4	3
07111-20612	B	M6	3	12,1	4	3
07111-20616	B	M6	3	16,1	4	3
07111-20620	B	M6	3	20,1	4	3
07111-20625	B	M6	3	25,1	4	3
07111-20650	B	M6	3	50,1	4	3
07111-20660	B	M6	3	60,1	4	3
07111-20680	B	M6	3	80,1	4	3
07111-20810	B	M8	4,1	10,3	5,5	4
07111-20812	B	M8	4,1	12,3	5,5	4
07111-20816	B	M8	4,1	16,3	5,5	4
07111-20820	B	M8	4,1	20,3	5,5	4
07111-20825	B	M8	4,1	25,3	5,5	4
07111-20830	B	M8	4,1	30,3	5,5	4
07111-20850	B	M8	4,1	50,3	5,5	4
07111-20860	B	M8	4,1	60,3	5,5	4
07111-20880	B	M8	4,1	80,3	5,5	4
07111-21012	B	M10	5,6	12,3	7	5
07111-21016	B	M10	5,6	16,3	7	5
07111-21020	B	M10	5,6	20,3	7	5
07111-21025	B	M10	5,6	25,3	7	5
07111-21035	B	M10	5,6	35,3	7	5
07111-21216	B	M12	7	16,2	8,5	6
07111-21220	B	M12	7	20,2	8,5	6
07111-21230	B	M12	7	30,2	8,5	6
07111-21240	B	M12	7	40,2	8,5	6
07111-21620	B	M16	10,7	20	12	8
07111-21625	B	M16	10,7	25	12	8
07111-21635	B	M16	10,7	35	12	8
07111-21650	B	M16	10,7	50	12	8

Ball-end thrust screws without head

stainless steel with flattened ball and rotation lock



Material:
Screw and ball stainless steel.

Version:
Stainless steel bright.

Sample order:
nlm 07111-50612

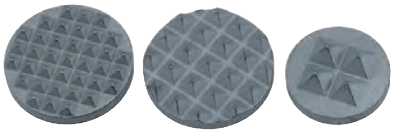
Note:
Surfaces which are not flat and parallel can be firmly clamped or supported with with a flattened ball, the movable ball can adapt itself up to 9°.
Longer versions have been designed especially to be glued in. This allows mechanical connecting elements with external thread to be made cost-effectively for small and medium-sized series.
The ball has a rotation lock.

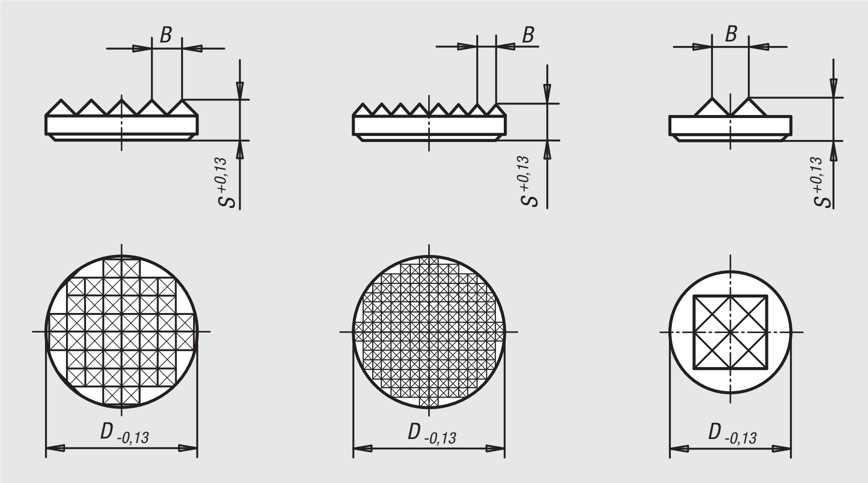
Order No.	Form	D	D1	L	Ball-Ø	SW
07111-50612	BV	M6	3	12,1	4	3
07111-50616	BV	M6	3	16,1	4	3
07111-50620	BV	M6	3	20,1	4	3
07111-50625	BV	M6	3	25,1	4	3
07111-50816	BV	M8	4,1	16,3	5,5	4
07111-50820	BV	M8	4,1	20,3	5,5	4
07111-50825	BV	M8	4,1	25,3	5,5	4
07111-50830	BV	M8	4,1	30,3	5,5	4
07111-51020	BV	M10	5,6	20,3	7	5
07111-51025	BV	M10	5,6	25,3	7	5
07111-51035	BV	M10	5,6	35,3	7	5
07111-51040	BV	M10	5,6	40,2	7	5
07111-51220	BV	M12	7	20,2	8,5	6
07111-51230	BV	M12	7	30,2	8,5	6
07111-51240	BV	M12	7	40,2	8,5	6
07111-51250	BV	M12	7	50	8,5	6
07111-51635	BV	M16	10,7	35	12	8
07111-51650	BV	M16	10,7	50	12	8

07112

Gripper pads round

carbide





Material:
Carbide.

Version:
sintered.

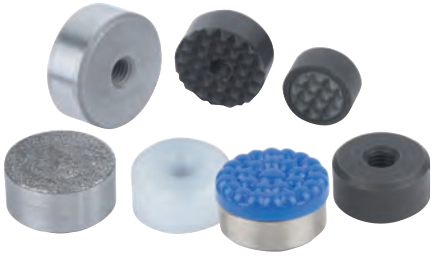
Sample order:
nlm 07112-211

Note:
These carbide gripper pads are available as 4-point or serrated. They have many uses i.e. they can be glued onto cast iron base plates.

Order No.	Version 2	D	S	B
07112-110	serrated	6,35	3,2	2,3
07112-111	serrated	7,9	3,2	2,3
07112-112	serrated	9,5	3,2	3
07112-113	serrated	12,7	3,2	3
07112-114	serrated	19,05	3,2	3
07112-211	fine serrated	7,9	3,2	1,5
07112-212	fine serrated	9,5	3,2	2,3
07112-213	fine serrated	12,7	3,2	2,3
07112-214	fine serrated	19,05	3,2	2,3
07112-215	fine serrated	25,4	4	2,3
07112-411	4-point contact	7,9	3,2	3
07112-412	4-point contact	9,5	3,2	3
07112-413	4-point contact	12,7	4	3,5

Notes

Grippers and inserts round



Material:
Form C, F, M tool steel
Form E, O, P stainless steel
Form K POM

Version:
Form C hardened and black oxidised.
Form E hardened, bright.
Form K white.
Form O with diamond impregnated surface comparable to 100 grade abrasive grit.
Form P with polyurethane surface, hardness Shore 60.
Form F, hardened and black oxidised.
Form M with carbide serrations, black oxidised.

Sample order:
nlm 07113-2510

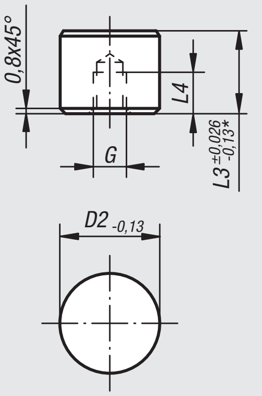
Note:
Grippers and inserts are ideal for use in clamping arms, gripping systems, clamping fixtures, clamping jaws and self-aligning pads. The use of grippers allows the transfer of very high torque values and above average grip, even with hard materials and surface irregularities.

Form O: The abrasive diamond surface is bonded firmly to the base. It is ideally suited to supporting smooth or slippery applications with a minimum of clamping pressure. This allows the diamond particles to get a firm grip on a very small area with minimum damage to the surface.
The diamond surface offers excellent wear resistance.

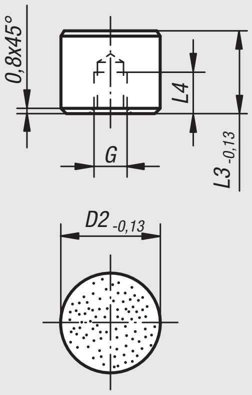
Form P: The polyurethane surface is vulcanised firmly to the ball. It is abrasion-resistant and does not discolour. It offers optimum protection against damage to delicate surfaces. The pearl-like surface gives a firm grip and allows air to escape so as to prevent any suction effect between the contact surface and the self-aligning pads.

Grippers and inserts can be fitted in the following self-aligning pads:
Order No. 02003-117X022 up to 02003-936X036
Order No. 02007-110X015 up to 02007-924X100
Order No. 02007-120X030 up to 02007-924X080

Form C, E, K

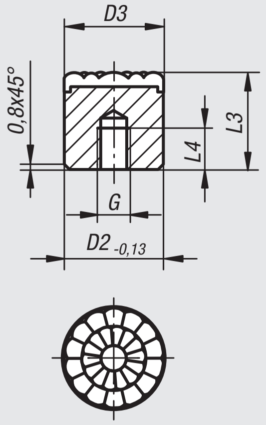


Form O
stainless steel insert
diamond impregnated

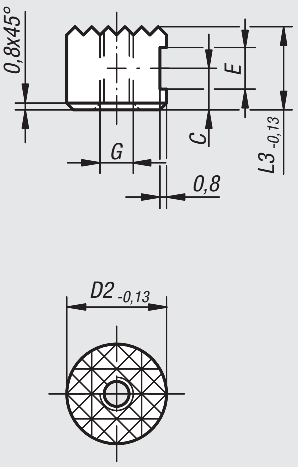


* Applies to Form K

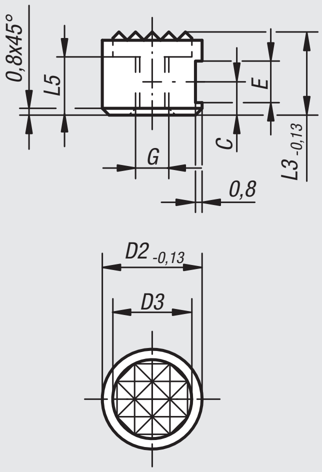
Form P
stainless steel insert,
PUR surface



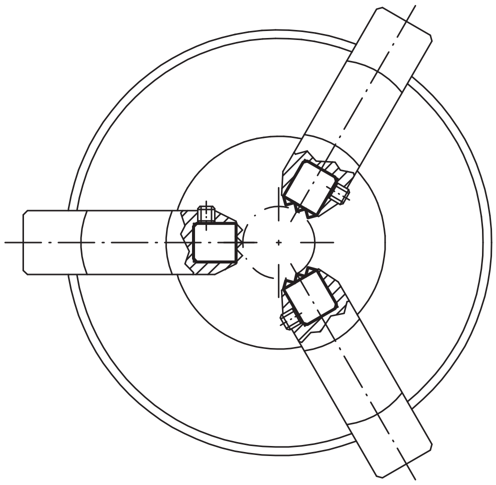
Form F
diamond grip insert



Form M
carbide steel
diamond grip insert



Grippers and inserts round



Order No. Form C	Order No. Form E	Order No. Form K	Order No. Form O	D2	L3	L4	G
07113-10108	**07113-10102**	**07113-10109**	**07113-10105**	10	10	5	M5
07113-10128	**07113-10122**	**07113-10129**	**07113-10125**	10	12	6,4	M5
07113-12108	**07113-12102**	**07113-12109**	**07113-12105**	12	10	5	M5
07113-12128	**07113-12122**	**07113-12129**	**07113-12125**	12	12	6,4	M5
07113-16108	**07113-16102**	**07113-16109**	**07113-16105**	16	10	5	M6
07113-16128	**07113-16122**	**07113-16129**	**07113-16125**	16	12	6,4	M6
07113-20108	**07113-20102**	**07113-20109**	**07113-20105**	20	10	5	M6
07113-20128	**07113-20122**	**07113-20129**	**07113-20125**	20	12	6,4	M6
07113-25108	**07113-25102**	**07113-25109**	**07113-25105**	25	10	5	M6
07113-25128	**07113-25122**	**07113-25129**	**07113-25125**	25	12	6,4	M6

Order No.	Form	D2	D3	L3	L4	G
07113-08126	P	8	8	12	6	M4
07113-10126	P	10	10	12	6	M5
07113-12126	P	12	13	12	6	M5
07113-16126	P	16	16	12	6	M6
07113-20126	P	20	21	12	6	M6
07113-25126	P	25	27	12	6	M6

Order No. Form F	Order No. Form M	D2	D3	L3	L5	C	E	G
07113-1010	**07113-10107**	10	-/7,9	10	-/6	4,5	4,75	M5
07113-1210	**07113-12107**	12	-/9,5	10	-/6	4,5	4,75	M5
07113-1212	**07113-12127**	12	-/9,5	12	-/7	6	4,75	M5
07113-1610	**07113-16107**	16	-/12,7	10	-/6	4,5	4,75	M6
07113-2010	**07113-20107**	20	-/15,9	10	-/6	4,5	4,75	M6
07113-2510	**07113-25107**	25	-/19	10	-/6	4,5	4,75	M6

07113

Grippers and inserts round

with counterbore

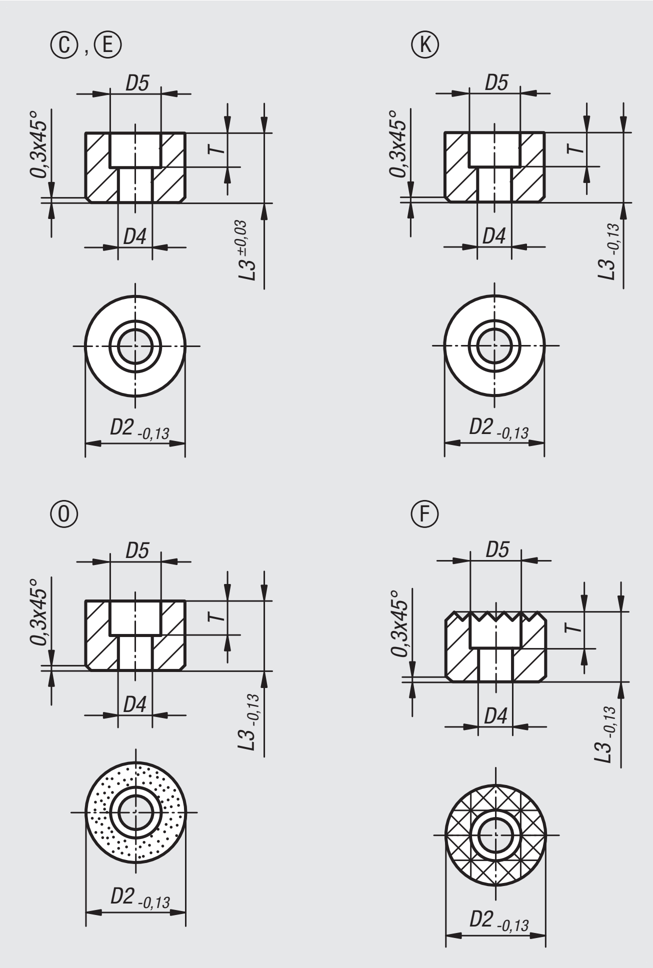
Material:
Form C, F tool steel
Form E, O stainless steel
Form K POM

Version:
Form C, F hardened and black oxidised.
Form E, hardened, bright.
Form K white.
Form O with diamond impregnated surface comparable to 100 grade abrasive grit.

Sample order:
nlm 07113-110108

Note:
Grippers and inserts are ideal for use in clamping arms, gripping systems, clamping fixtures, clamping jaws and self-aligning pads. The use of grippers allows the transfer of very high torque values and above average grip, even with hard materials and surface irregularities.

Form O: The abrasive diamond surface is bonded firmly to the base. It is ideally suited to supporting smooth or slippery applications with a minimum of clamping pressure. This allows the diamond particles to get a firm grip on a very small area with minimum damage to the surface.
The diamond surface offers excellent wear resistance.

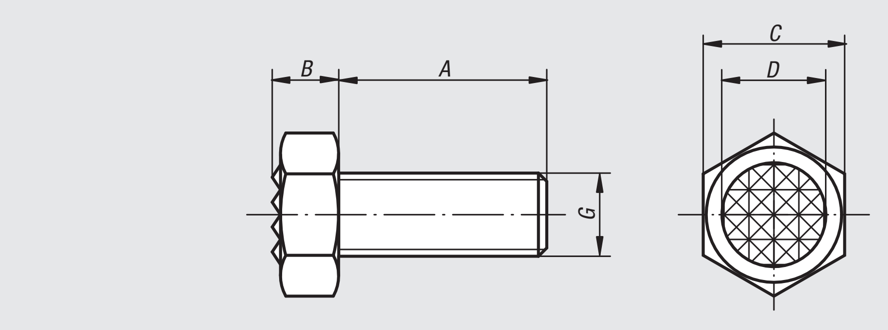


Order No. Form C	Order No. Form E	Order No. Form K	Order No. Form O	D2	D4	D5	L3	T
07113-110108	**07113-110102**	**07113-110109**	**07113-110105**	10	3,4	6	10	5
07113-110128	**07113-110122**	**07113-110129**	**07113-110125**	10	3,4	6	12	5
07113-112108	**07113-112102**	**07113-112109**	**07113-112105**	12	4,5	9	10	5,6
07113-112128	**07113-112122**	**07113-112129**	**07113-112125**	12	4,5	9	12	5,6
07113-116108	**07113-116102**	**07113-116109**	**07113-116105**	16	5,5	11	10	6,6
07113-116128	**07113-116122**	**07113-116129**	**07113-116125**	16	5,5	11	12	6,6
07113-120108	**07113-120102**	**07113-120109**	**07113-120105**	20	6,6	11	10	7,6
07113-120128	**07113-120122**	**07113-120129**	**07113-120125**	20	6,6	11	12	7,6
07113-125108	**07113-125102**	**07113-125109**	**07113-125105**	25	6,6	11	10	7,6
07113-125128	**07113-125122**	**07113-125129**	**07113-125125**	25	6,6	11	12	7,6

Round grippers

Order No.	Form	D2	D4	D5	L3	T
07113-11210	F	12	4,5	8	10	5,6
07113-11212	F	12	4,5	8	12	5,6
07113-11610	F	16	4,5	8	10	5,6
07113-11612	F	16	4,5	8	12	5,6
07113-12010	F	20	5,5	10	10	6,6
07113-12012	F	20	5,5	10	12	6,6
07113-12510	F	25	6,6	11	10	7,6
07113-12512	F	25	6,6	11	12	7,6

Grippers hexagonal



Material:
Hex head screw, grade 10.9.
Serrations carbide, hardness 72-74 HRC.

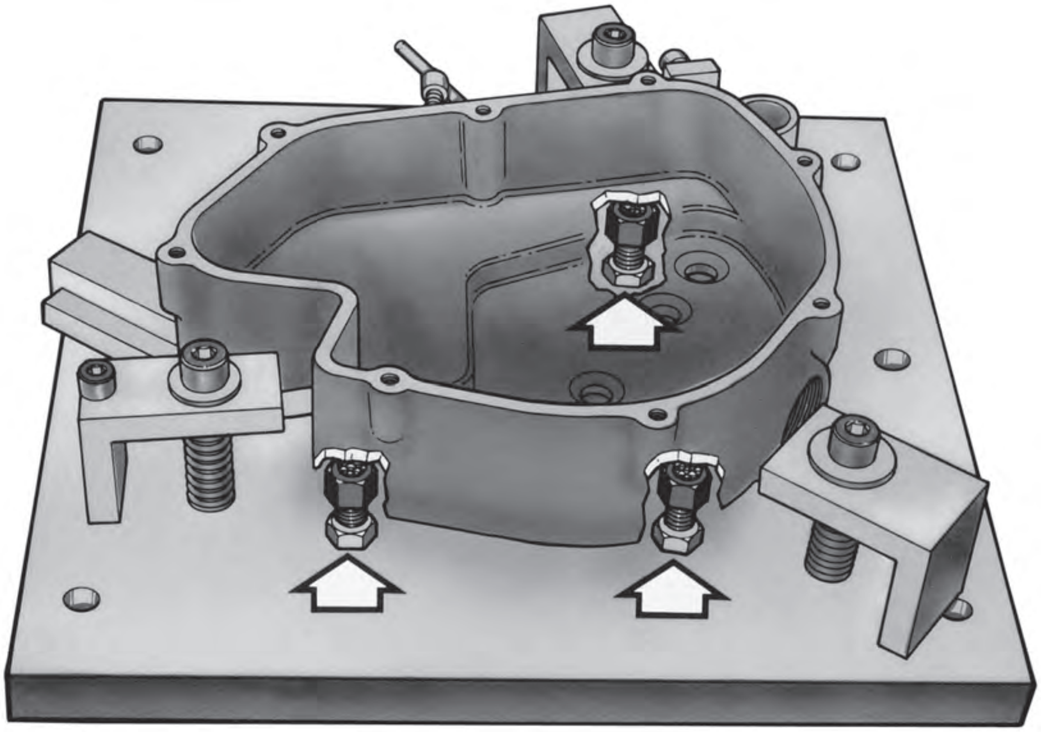
Version:
Black oxidised.

Sample order:
nlm 07114-1710

Note:
The serrated carbide tips are soldered in.

Order No.	A	B	C	D	G	Serration
07114-1006	25	5	10	7,9	M6	extra fine
07114-1308	25	6,4	13	9,5	M8	fine
07114-1710	25	8,3	17	12,7	M10	fine
07114-17102	40	8,3	17	12,7	M10	fine
07114-1912	25	8,7	19	15,9	M12	fine
07114-19122	40	8,7	19	15,9	M12	fine
07114-2416	35	11	24	19	M16	fine
07114-24162	50	11	24	19	M16	fine
07114-3020	40	13,7	30	25,4	M20	extra fine
07114-30202	60	13,7	30	25,4	M20	extra fine

Application: norelem grippers



07115

Grippers square

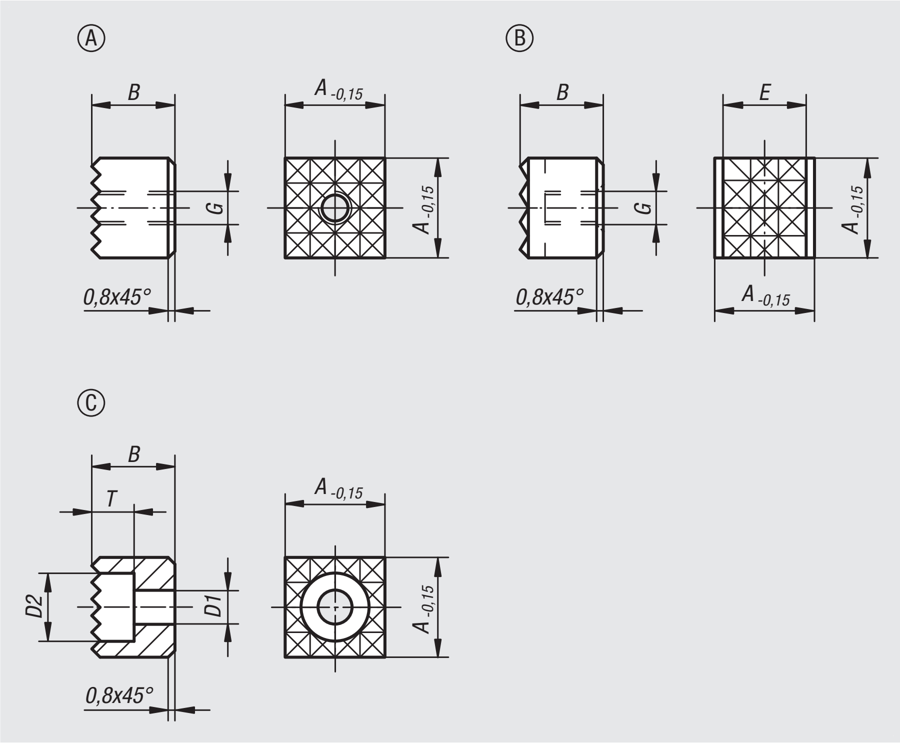
Material:
Hardened tool steel or carbide.

Version:
Black oxidised.

Sample order:
nlm 07115-2506

Note:
Grippers and inserts are ideal for use in clamping arms, gripping systems, clamping fixtures, clamping jaws and self-aligning pads.
Grippers transfer very high torque values,even with hard materials and surface irregularities. Grippers guarantee above average holding forces at high cutting forces.
The serrated carbide tips are soldered in.

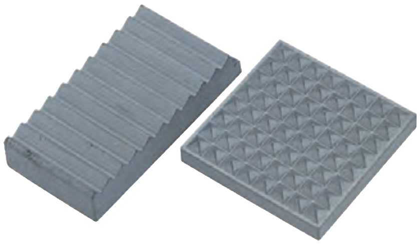
Drawing reference:
Form A: tool steel
Form B: tool steel, carbide diamond grip
Form C: tool steel

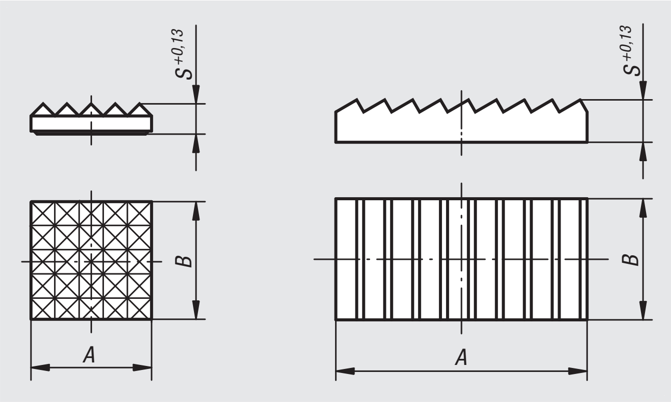


Order No.	Form	A	B	D1	D2	E	G	T	Serration
07115-1005	A	10	10	-	-	-	M5	-	extra fine
07115-101205	A	10	12	-	-	-	M5	-	extra fine
07115-1205	A	12	10	-	-	-	M5	-	fine
07115-121205	A	12	12	-	-	-	M5	-	fine
07115-1606	A	16	10	-	-	-	M6	-	fine
07115-161206	A	16	12	-	-	-	M6	-	fine
07115-2005	A	20	10	-	-	-	M5	-	fine
07115-201205	A	20	12	-	-	-	M5	-	fine
07115-2506	A	25	10	-	-	-	M6	-	fine
07115-251206	A	25	12	-	-	-	M6	-	fine
07115-12057	B	12	10	-	-	10,3	M5	-	fine
07115-1210048	C	12	10	4,5	8	-	-	5,6	fine
07115-1212048	C	12	12	4,5	8	-	-	5,6	fine
07115-1610048	C	16	10	4,5	8	-	-	5,6	fine
07115-1612048	C	16	12	4,5	8	-	-	5,6	fine
07115-2010058	C	20	10	5,5	10	-	-	6,6	fine
07115-2012058	C	20	12	5,5	10	-	-	6,6	fine
07115-2510068	C	25	10	6,6	11	-	-	7,6	fine
07115-2512068	C	25	12	6,6	11	-	-	7,6	fine

Gripper pads square

carbide





Material:
Carbide.

Version:
sintered.

Sample order:
nlm 07116-201

Note:
These carbide gripper pads are available as serrated or wedge grips. They have many uses i.e. they can be glued onto cast iron base plates.

Order No.	Version 2	A	B	S
07116-101	serrated	9,5 -0,13	9,5 -0,13	3,2
07116-102	serrated	12,7 -0,13	12,7 -0,13	3,2
07116-201	fine serrated	9,5 -0,13	9,5 -0,13	3,2
07116-202	fine serrated	12,7 -0,13	12,7 -0,13	3,2
07116-203	fine serrated	15,9 -0,13	15,9 -0,13	3,2
07116-206	fine serrated	19,05 -0,13	19,05 -0,13	4
07116-207	fine serrated	25,4 -0,13	25,4 -0,13	4
07116-308	wedge-shaped	25,7 +0,5	13,05 -0,13	4,8
07116-309	wedge-shaped	38,4 +0,5	19,5	6,35

Grippers adjustable

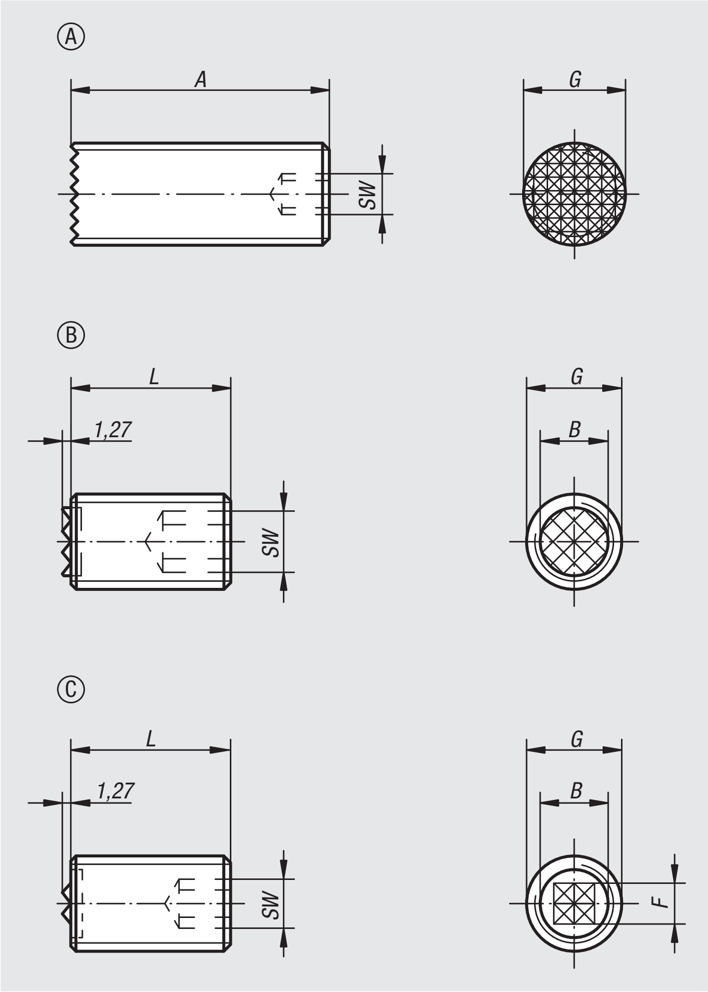
Material:
Hardened tool steel or carbide.

Version:
Black oxidised.

Sample order:
nlm 07117-5012

Note:
The full thread on the grippers allows exact adjustment to the clamping application.
The carbide tips are soldered in.

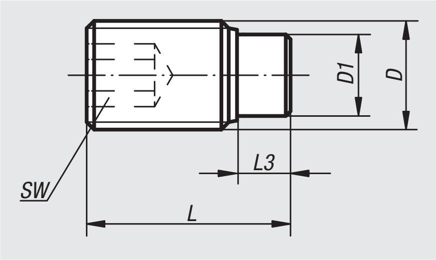
Drawing reference:
Form A: tool steel
Form B: tool steel, carbide diamond grip
Form C: 4-point carbide insert



Order No.	Form	A	L	B	G	F	SW
07117-4010	A	40	-	-	M10	-	3
07117-4012	A	40	-	-	M12	-	5
07117-4016	A	40	-	-	M16	-	6
07117-4020	A	40	-	-	M20	-	8
07117-2510	B	-	25	6,4	M10	-	5
07117-5010	B	-	50	6,4	M10	-	5
07117-2512	B	-	25	7,9	M12	-	6
07117-5012	B	-	50	7,9	M12	-	6
07117-2516	B	-	25	11,2	M16	-	8
07117-5016	B	-	50	11,2	M16	-	8
07117-2520	B	-	25	12,7	M20	-	10
07117-5020	B	-	50	12,7	M20	-	10
07117-25124	C	-	25	7,9	M12	6,5	6
07117-50124	C	-	50	7,9	M12	6,5	6
07117-25164	C	-	25	11,2	M16	8	8
07117-50164	C	-	50	11,2	M16	8	8
07117-25204	C	-	25	12,7	M20	8	10
07117-50204	C	-	50	12,7	M20	8	10

07119

Thrust screws

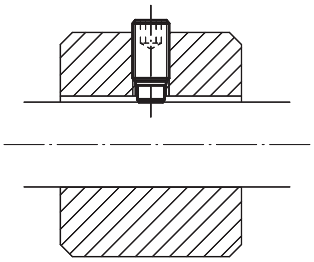


Material:
Screw grade 10.9.
Thrust pin brass or polyacetal.

Version:
Screw black oxidised.

Sample order:
nlm 07119-04X105 (include length L)

Note:
Thrust screws are ideal for clamping or exerting pressure on threaded spindles, axles, shafts and treated surfaces without marring.

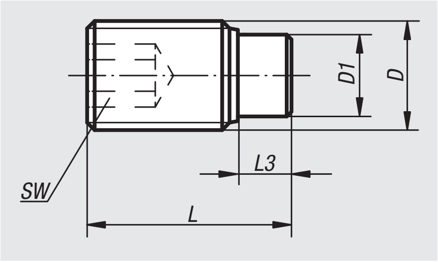


Order No.	Component material	D	D1	L	L3	SW
07119-04X	brass	M4	2,5	6,5/10,5/16,5/30,5/40,5	1,2	2
07119-05X	brass	M5	3	12,5/20,5/30,5/40,5/8,5	1,3	2,5
07119-06X	brass	M6	4	11,5/17,5/26,5/41,5/51,5/61,5	1,9	3
07119-08X	brass	M8	5,5	12/22/32/52/62/82	2,4	4
07119-10X	brass	M10	7	14/18/27/37/52/62/82	2,6	5
07119-12X	brass	M12	8,5	18,318,5/22,5/32,5/42,5/52,5/62,5/82,5	3,3	6

Order No.	Component material	D	D1	L	L3	SW
07119-104X	POM	M4	2	11/13/17/31/41/7/9	1,7	2
07119-105X	POM	M5	3	11/13/17/21/31/41/9	1,8	2,5
07119-106X	POM	M6	3,5	11,3/13,3/17,3/21,3/26,3/41,3/51,3/61,3	1,7	3
07119-108X	POM	M8	5	13,6/17,6/21,6/26,6/33,6/51,6/61,6/81,6	2	4
07119-110X	POM	M10	6,5	17,9/21,9/26,9/33,9/41,9/51,9/61,9/81,9	2,5	5
07119-112X	POM	M12	8	22,1/27,1/34,1/42,1/52,1/62,1/82,1	2,9	6

07119

Thrust screws stainless steel



Material:
Screw stainless steel.
Pin brass or polyacetal.

Version:
Screw bright.

Sample order:
nlm 07119-041X105 (include length L)

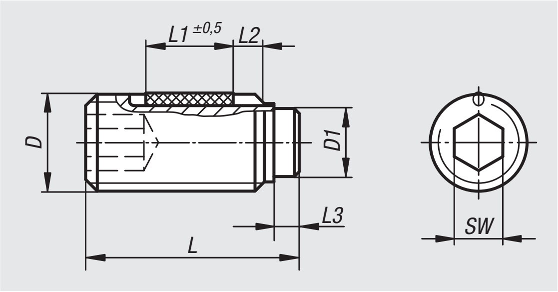
Note:
Thrust screws are ideal for clamping or exerting pressure on threaded spindles, axles, shafts and treated surfaces without marring.

Order No.	Component material	D	D1	L	L3	SW
07119-041X	brass	M4	2,5	6,5/10,5/16,5/30,5/40,5	1,2	2
07119-051X	brass	M5	3	8,5/12,5/20,5/30,5/40,5	1,3	2,5
07119-061X	brass	M6	4	11,5/13,5/17,5/21,5/26,5/41,5/51,5/61,5	1,9	3
07119-081X	brass	M8	5,5	12/22/32/52/62/82	2,4	4
07119-101X	brass	M10	7	14/18/27/37	2,6	5
07119-121X	brass	M12	8,5	22,5/32,5/42,5	3,3	6

Order No.	Component material	D	D1	L	L3	SW
07119-1041X	POM	M4	2	7/9/11/13/17/31/41	1,7	2
07119-1051X	POM	M5	3	9/11/13/17/21/31/41	1,8	2,5
07119-1061X	POM	M6	3,5	11,3/13,3/17,3/21,3/26,3/41,3/51,3/61,3	1,7	3
07119-1081X	POM	M8	5	13,6/17,6/21,6/26,6/33,6/51,6/61,6/81,6	2	4
07119-1101X	POM	M10	6,5	17,9/21,9/26,9/36,9	2,5	5
07119-1121X	POM	M12	8	22,1/32,1/42,1	2,9	6

Thrust screws

LONG-LOK secured



Material:
Screw grade 10.9.
Pin brass or POM.
LONG-LOK thread lock nylon.

Version:
Screw black oxidised.

Sample order:
nlm 07119-204X65 (include length L)

Note:
Thrust screws are ideal for clamping or exerting pressure on threaded spindles, axles, shafts and treated surfaces without marring.

Drawing reference:
L2 = approx. 2x thread pitch

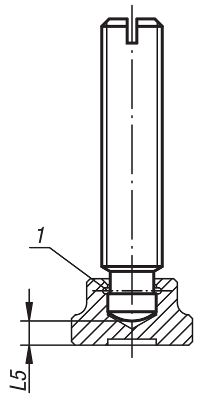
Order No.	Component material	D	D1	L	L1	L3	SW
07119-204X	brass	M4	2,5	6,5/10,5/16,5/30,5/40,5	2,5/3,5/5/5/5	1,2	2
07119-205X	brass	M5	3	8,5/12,5/20,5/30,5/40,5	3,5/5/6/6/6	1,3	2,5
07119-206X	brass	M6	4	11,5/17,5/26,5/41,5/51,5/61,5	3,5/7/7/7/7/7	1,9	3
07119-208X	brass	M8	5,5	12/22/32/52/62/82	3,5/8/8/8/8/8	2,4	4
07119-210X	brass	M10	7	14/18/27/37/52/62/82	5/9/9/9/9/9/9	2,6	5
07119-212X	brass	M12	8,5	18,318,5/22,5/32,5/42,5/52,5/62,5/82,5	8/10/10/10/10/10/10	3,3	6

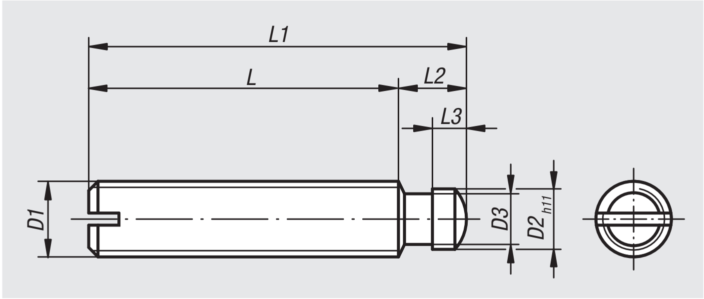
Order No.	Component material	D	D1	L	L1	L3	SW
07119-304X	POM	M4	2	7/9/11/13/17/31/41	2,5/3,5/3,5/5/5/5/5	1,7	2
07119-305X	POM	M5	3	9/11/13/17/21/31/41	3,5/3,5/5/6/6/6/6	1,8	2,5
07119-306X	POM	M6	3,5	11,3/13,3/17,3/21,3/26,3/41,3/51,3/61,3	3,5/5/7/7/7/7/7/7	1,7	3
07119-308X	POM	M8	5	13,6/17,6/21,6/26,6/33,6/51,6/61,6/81,6	5/8/8/8/8/8/8/8	2	4
07119-310X	POM	M10	6,5	17,9/21,9/26,9/33,9/41,9/51,9/61,9/81,9	9/9/9/9/9/9/9/9	2,5	5
07119-312X	POM	M12	8	22,1/27,1/34,1/42,1/52,1/62,1/82,1	10/10/10/10/10/10/10	2,9	6

07120

Grub screws

with thrust point DIN 6332





Material:
Steel or stainless steel.

Version:
Steel: thrust point case-hardened, black.
Stainless steel: bright.

Sample order:
nlm 07120-12X60 (include length L1)

Note:
The thrust pin of the DIN 6332 grub screws is designed for direct clamping and for use together with thrust pads 07140.

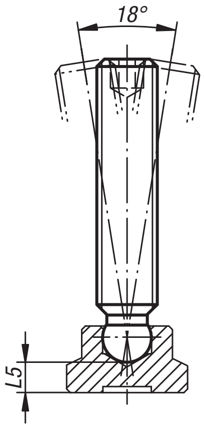
Drawing reference:
1) snap ring

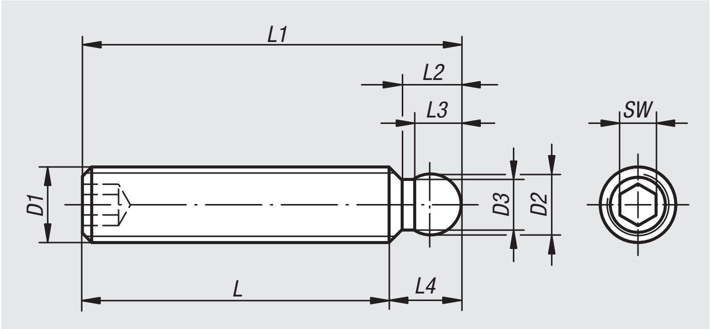
Order No. steel	Order No. stainless steel	D1	L1	D2	D3	L	L2	L3	L5
07120-06X	**07120-061X**	M6	30/35/40/50	4,5	4	24	6	2,5	2,2
07120-08X	**07120-081X**	M8	35/40/45/50/60	6	5,4	27,5	7,5	3	3
07120-10X	**07120-101X**	M10	50/55/60/65/80	8	7,2	41	9	4,5	3,6
07120-12X	**07120-121X**	M12	60/65/70/80/100	8	7,2	50	10	4,5	4,5
07120-14X	**07120-141X**	M14	60/80/100	10	9	48	12	5	5
07120-16X	**07120-161X**	M16	65/70/80/100/125	12	11	53	12	5	5,3
07120-20X	**07120-201X**	M20	80/90/100/125/150	15,5	14,4	66	14	5,5	5,6

07121

Grub screws

with ball thrust point





Material:
Steel grade 5.8.

Version:
Black oxidised.

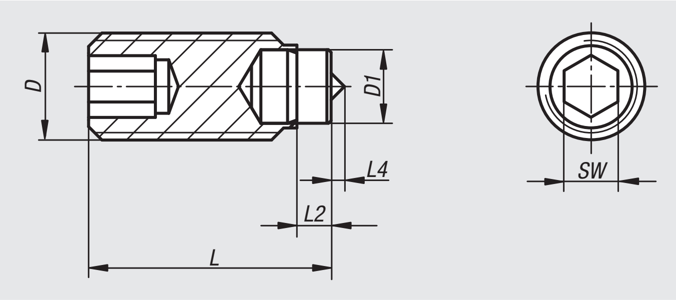
Sample order:
nlm 07121-06X50 (include length L1)

Note:
These grub screws are used together with the thrust pads 07142 for clamping.

Order No.	D1	L1	D2	D3	L	L2	L3	L4	L5	SW
07121-06X	M6	30/35/40/50	4,5	3,5	24,5	4,3	3,7	5,5	3,8	3
07121-08X	M8	35/40/45/50/60	6	4,8	27,6	5,8	4,8	7,4	4,4	4
07121-10X	M10	50/55/60/65/80	8	6,5	41	7,2	6,3	9	5	5
07121-12X	M12	60/65/70/80	8	6,5	50,2	7,2	6,3	9,8	6,9	6

Thrust screws

with point



Material:
Screw steel grade 10.9.
Pin tool steel.

Version:
Pin, hardened.
Screw and pin black oxidised.

Sample order:
nlm 07122-05X09

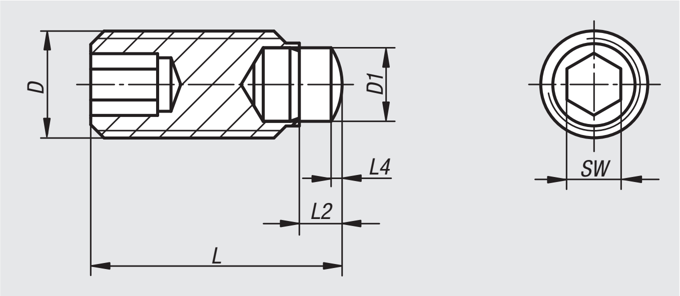
Note:
These thrust screws with point are used when additional positive fixation is required.

Order No.	D	D1	L	L2	L4	SW	Load rating max. kN (static load only)
07122-05X09	M5	3	8,5	1,3	0,5	2,5	4,5
07122-05X13	M5	3	12,5	1,3	0,5	2,5	4,5
07122-05X17	M5	3	16,5	1,3	0,5	2,5	4,5
07122-05X21	M5	3	20,5	1,3	0,5	2,5	4,5
07122-06X14	M6	4	13,5	1,9	0,8	3	9
07122-06X18	M6	4	17,5	1,9	0,8	3	9
07122-06X22	M6	4	21,5	1,9	0,8	3	9
07122-06X27	M6	4	26,5	1,9	0,8	3	9
07122-08X14	M8	5,5	14	2,4	1	4	15
07122-08X18	M8	5,5	18	2,4	1	4	15
07122-08X22	M8	5,5	22	2,4	1	4	15
07122-08X27	M8	5,5	27	2,4	1	4	15
07122-08X34	M8	5,5	34	2,4	1	4	15
07122-10X18	M10	7	18	2,6	1,5	5	20
07122-10X22	M10	7	22	2,6	1,5	5	20
07122-10X27	M10	7	27	2,6	1,5	5	20
07122-10X34	M10	7	34	2,6	1,5	5	20
07122-10X42	M10	7	42	2,6	1,5	5	20

07123

Thrust screws

with radiused half-dog point



Material:
Screw steel grade 10.9.
Pin tool steel.

Version:
Pin, hardened.
Screw and pin black oxidised.

Sample order:
nlm 07123-05X09

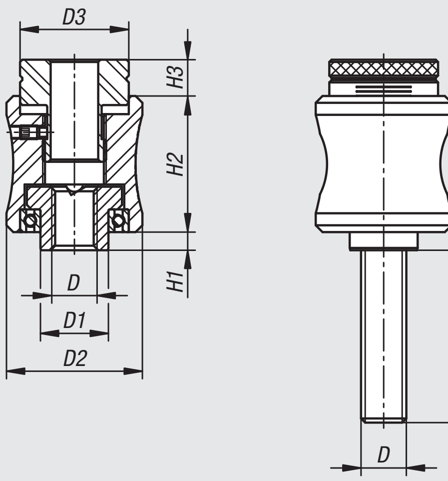
Note:
These rounded half-dog point thrust screws are used when a punctiform thrust or support point are required.

Order No.	D	D1	L	L2	L4	SW	Load rating max. kN (static load only)
07123-05X09	M5	3	9	1,8	0,5	2,5	4,5
07123-05X13	M5	3	13	1,8	0,5	2,5	4,5
07123-05X17	M5	3	17	1,8	0,5	2,5	4,5
07123-05X21	M5	3	21	1,8	0,5	2,5	4,5
07123-06X14	M6	4	14,3	2,7	0,8	3	9
07123-06X18	M6	4	18,3	2,7	0,8	3	9
07123-06X22	M6	4	22,3	2,7	0,8	3	9
07123-06X27	M6	4	27,3	2,7	0,8	3	9
07123-08X15	M8	5,5	14,8	3,2	0,8	4	15
07123-08X19	M8	5,5	18,8	3,2	0,8	4	15
07123-08X23	M8	5,5	22,8	3,2	0,8	4	15
07123-08X28	M8	5,5	27,8	3,2	0,8	4	15
07123-08X35	M8	5,5	34,8	3,2	0,8	4	15
07123-10X19	M10	7	18,9	3,5	1,1	5	20
07123-10X23	M10	7	22,9	3,5	1,1	5	20
07123-10X28	M10	7	27,9	3,5	1,1	5	20
07123-10X35	M10	7	34,9	3,5	1,1	5	20
07123-10X43	M10	7	42,9	3,5	1,1	5	20

07124

Torque grips

precision version



Material:
Grip and set screw aluminium.
Bush and pin steel 5.8.

Version:
Grip and set screw anodised.
Bushes black oxidised, pins electro zinc-plated.

Sample order:
nlm 07124-106X30

Note:
The required torque is set by a set screw and a graduated scale. The set value can be secured using the lateral clamping screw. When the set torque is reached the grip audibly and palpably releases. The loosening torque is higher than the tightening torque so that the torque handle can be released without any problems.

The internal thread version has a hole in the set screw so that the torque handle can also be used on threaded rods.

Set torque accuracy ± 5%.

On request:
Other thread lengths.

Internal thread

Order No.	D	D1	D2	D3	H1	H2	H3	Torque Nm
07124-105	M5	10	26	20	2	26	8	0,05 - 0,1
07124-106	M6	10	26	20	2	26	8	0,1 - 0,25
07124-208	M8	15	30	24	4	30	8	0,25 - 0,5
07124-210	M10	15	30	24	4	30	8	0,5 - 1

External thread

Order No.	D	D1	D2	D3	H1	H2	H3	L	Torque Nm
07124-105X30	M5	10	26	20	2	26	8	30	0,05 - 0,15
07124-105X40	M5	10	26	20	2	26	8	40	0,05 - 0,15
07124-106X30	M6	10	26	20	2	26	8	30	0,1 - 0,25
07124-106X40	M6	10	26	20	2	26	8	40	0,1 - 0,25
07124-208X40	M8	15	30	24	4	30	8	40	0,25 - 0,5
07124-208X50	M8	15	30	24	4	30	8	50	0,25 - 0,5
07124-210X40	M10	15	30	24	4	30	8	40	0,5 - 1
07124-210X50	M10	15	30	24	4	30	8	50	0,5 - 1

07125

Knurled torque knobs

Material:
Thermoplastic, black grey.
Bush and screw steel 5.8.

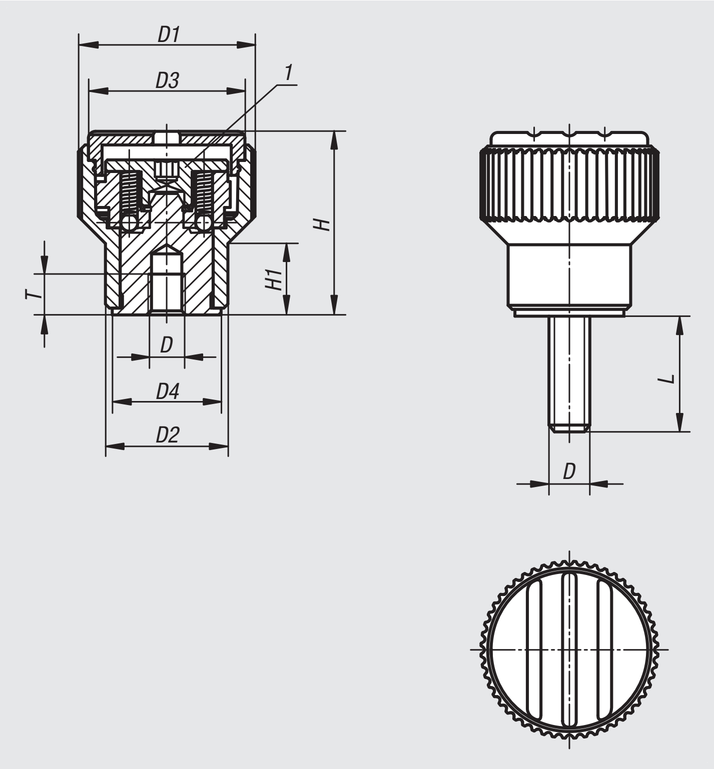
Version:
Bush black oxidised.
Screw trivalent blue passivated.

Sample order:
nlm 07125-2056X30 (cap colour traffic red; include length L)

Note:
The set screw sets the required torque. The knob de-clutches and turns freely when the desired torque is reached.

Δ Add the desired cap colour here. No colour code is required for black grey caps.

Drawing reference:
1) adjusting screw for setting the torque



black grey ⬛ RAL 7021	pure orange Δ = 1 🟧 RAL 2004	signal green Δ = 2 🟩 RAL 6032	traffic blue Δ = 3 🟦 RAL 5017
light grey Δ = 5 ⬜ RAL 7035	traffic red Δ = 6 🟥 RAL 3020	colza yellow Δ = 7 🟨 RAL 1021	

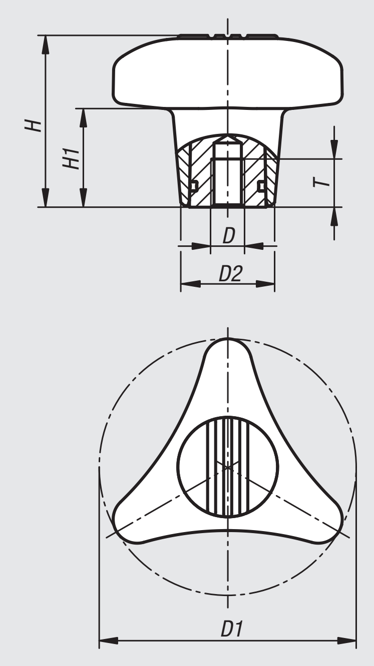
Internal thread

Order No.	Component material	D	D1	D2	D3	D4	H	H1	T	Torque Nm
07125-205Δ	steel	M5	26	18	23	16	27	10,5	5	0,1 - 0,3
07125-206Δ	steel	M6	26	18	23	16	27	10,5	6	0,1 - 0,3
07125-306Δ	steel	M6	34	22	31	20	37,5	14,5	10	0,1 - 0,3
07125-308Δ	steel	M8	34	22	31	20	37,5	14,5	14	0,1 - 0,3

External thread

Order No.	Component material	D	D1	D2	D3	D4	H	H1	L	Torque Nm
07125-205ΔX	steel	M5	26	18	23	16	27	10,5	30/50	0,1 - 0,3
07125-206ΔX	steel	M6	26	18	23	16	27	10,5	30/50	0,1 - 0,3
07125-306ΔX	steel	M6	34	22	31	20	37,5	14,5	40/60	0,1 - 0,3
07125-308ΔX	steel	M8	34	22	31	20	37,5	14,5	40/60	0,1 - 0,3

Triangular torque grips



Material:
Grip glass-bead reinforced thermoplastic.
Cap thermoplastic.
Metal parts hardened stainless steel.

Version:
Grip and cap, black grey (RAL 7021).
Stainless steel parts, electropolished.

Sample order:
nlm 07126-180085

Note:
An audible click signals when the maximum torque has been reached. The grip can only be tightened with the maximum torque specified in the table.

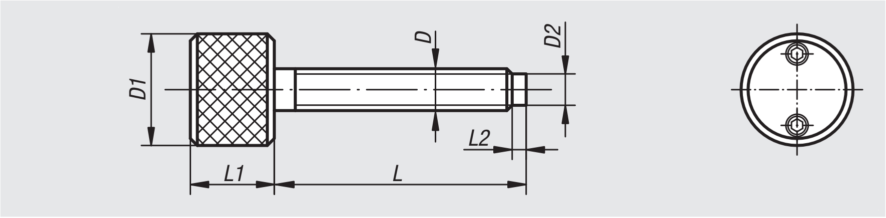
On request:
Other internal threads, maximum torques and colours.

Order No.	D	D1	D2	H	H1	T	Torque Nm
07126-180085	M8	80	29,2	53,5	31	13	5
07126-180105	M10	80	29,2	53,5	31	13	5
07126-180125	M12	80	29,2	53,5	31	13	5

07130

Torque screws

with thrust point



Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 07130-08X60 (include length L)

Note:
The torque required for the knurled screw is generated by two spring-mounted thrust balls.
As soon as the adjustable final pressure is reached, the grip runs free.
The final pressure is set using the set screws located in the head.

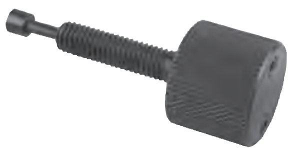
Forces:
F1 = Minimum final pressure
F2 = Maximum final pressure

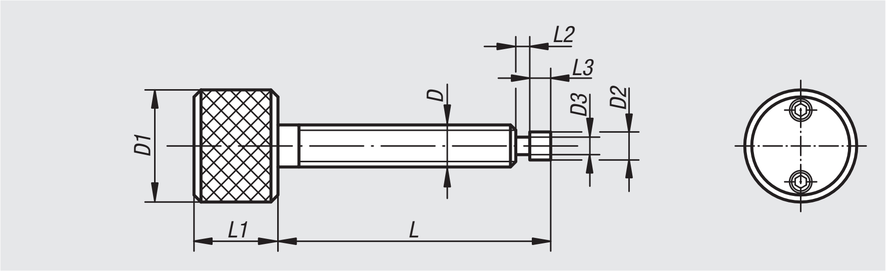
Order No.	D	D1	D2	L	L1	L2	F1 N	F2 N
07130-06X	M6	25	4,7	40/60	20	3	40	800
07130-08X	M8	25	6,5	40/60/80	20	3	40	650
07130-10X	M10	25	8,2	40/60/80	20	3	40	550
07130-12X	M12	25	10	40/60/80/100	20	3	40	450

07131

Torque screws

with slot coupling





Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 07131-06

Note:
The torque required for the knurled screw is generated by two spring-mounted thrust balls.
As soon as the adjustable final pressure is reached, the grip runs free.
The final pressure is set using the set screws located in the head.

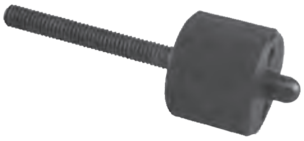
Forces:
F1 = Minimum final pressure
F2 = Maximum final pressure

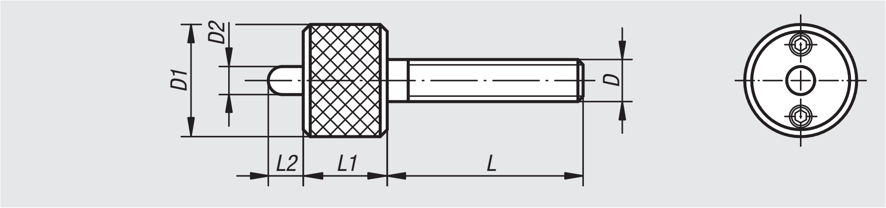
Order No.	D	D1	D2	D3	L	L1	L2	L3	F1 N	F2 N
07131-06	M6	25	4,7	2,5	45	20	8	5	40	800
07131-10	M10	25	7,7	4,5	45	20	8	5	40	550

07132

Torque screws

with support pin





Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 07132-06

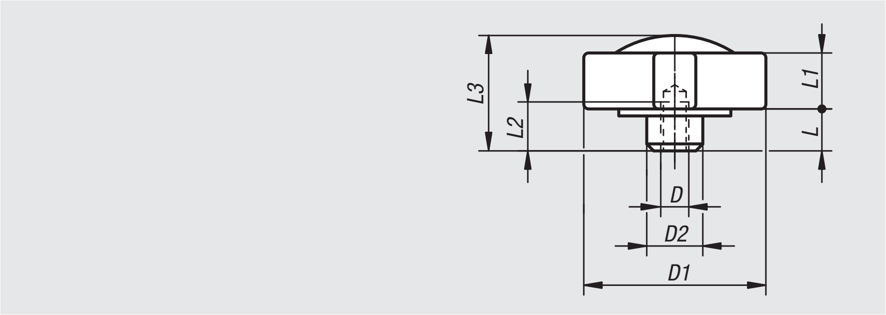
Note:
The torque required for the knurled screw is generated by two spring-mounted thrust balls.
As soon as the adjustable final pressure is reached, the grip runs free.
The final pressure is set using the set screws located in the head.

Forces:
F1 = Minimum final pressure
F2 = Maximum final pressure

Order No.	D	D1	D2	L	L1	L2	F1 N	F2 N
07132-06	M6	25	6	45	20	8	40	800
07132-10	M10	25	6	45	20	8	40	550
07132-12	M12	25	6	45	20	8	40	450

07133

Torque grips



Material:
Nut: free cutting steel.
Handle: grey cast GJL 250.

Version:
Nut black oxidised.
Grip bright.

Sample order:
nlm 07133-08

Note:
The torque required for the grip is generated by two spring-mounted thrust balls.
As soon as the adjustable final pressure is reached, the grip runs free.
The final pressure is set using the set screws located in the head.

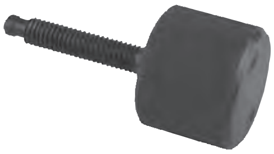
Forces:
F1 = Minimum final pressure
F2 = Maximum final pressure

Order No.	D	D1	D2	L	L1	L2	L3	F1 N	F2 N
07133-08	M8	60	20	12	22	13	40	40	900
07133-10	M10	60	20	12	22	13	40	40	700
07133-12	M12	60	20	12	22	13	40	40	500

07134

Torque screws

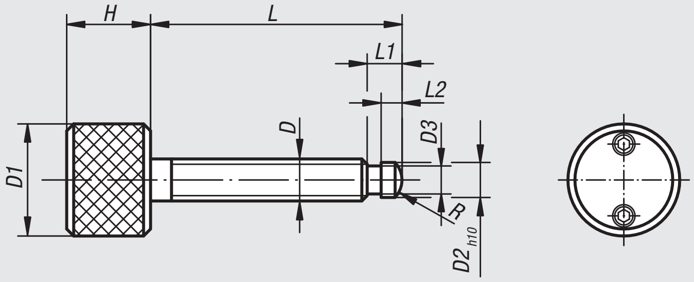
with ball thrust points



Material:
Steel.

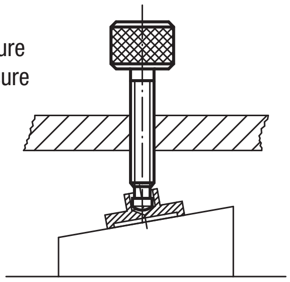
Version:
Black oxidised.

Sample order:
nlm 07134-08X60 (include length L)



Note:
The torque required for the knurled screw is generated by two spring-mounted thrust balls.
As soon as the adjustable final pressure is reached, the grip runs free.
The final pressure is set using the set screws located in the head.
These torque screws are particularly useful when used together with thrust pads (07138, 07140 or 07141) for clamping sloping surfaces.

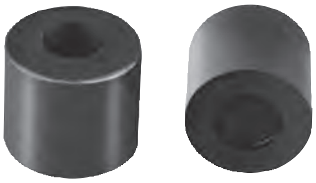
Forces:
F1 = Minimum final pressure
F2 = Maximum final pressure

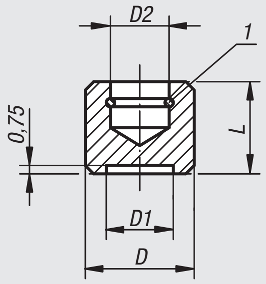


Order No.	D	D1	D2	D3	H	L	L1	L2	F1 N	F2 N	R
07134-06X	M6	25	4,5	4,1	20	40/60	6	2,5	40	800	3
07134-08X	M8	25	6	5,3	20	60/80	7,5	3	40	650	5
07134-10X	M10	25	8	7,2	20	60/80	9	4,5	40	550	6
07134-12X	M12	25	8	7,2	20	80/100	10	4,5	40	450	6

07138

Thrust pads





Material:
Thrust pad steel.
Snap ring spring steel.

Version:
Surface hardened and black oxidised.

Sample order:
nlm 07138-10

Note:
These thrust pads press lightly onto torque screws with ball thrust pins (07134) or grub screws with thrust pins (07120).
The ball end allows the thrust pad to adapt to the clamping surface.

Drawing reference:
1) snap ring

Order No.	D	D1	D2	L	Suitable for
07138-10	10	5	4,5	8	07120-06, 07134-06
07138-12	12	6	6	9	07120-08, 07134-08
07138-14	14	8	8	11	07120-10, 07120-12, 07134-1

07140

Thrust pads

DIN 6311 enhanced

Material:
Steel: case-hardened. Snap ring spring steel.
Stainless steel: bright. Snap ring stainless steel.

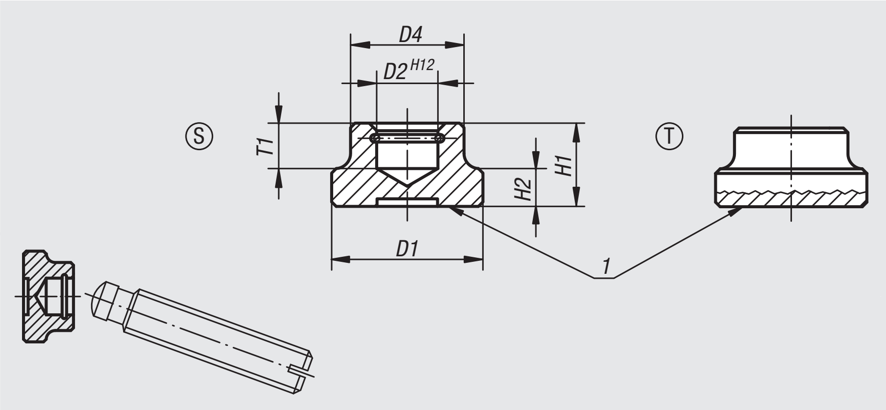
Version:
Steel black oxidised.
Stainless steel bright.

Sample order:
nlm 07140-12

Note:
To press onto a thrust point, incline the point as far as possible over the snap ring opening and twist in. The snap ring is supplied assembled.

Drawing reference:
Form S: standard thrust pad
Form T: low version, large thrust face

1) thrust face



Order No. steel	Order No. stainless steel	Form	D1	D2	D4	H1	H2	T1	For grub screws with trust point DIN 6332
07140-06	**07140-061**	S	12	4,6	10	7	2,5	4	M6
07140-08	**07140-081**	S	16	6,1	12	9	4	5	M8
07140-10	**07140-101**	S	20	8,1	15	11	5	6	M10
07140-12	**07140-121**	S	25	8,1	18	13	7	7	M12
07140-16	**07140-161**	S	32	12,1	22	15	7	7,5	M16
07140-20	**07140-201**	S	40	15,6	28	16	9	8	M20
07140-108	-	T	25	6,1	12	8	4	4,5	M8
07140-110	-	T	32	8,1	18	10	6	6	M10 / M12
07140-116	-	T	40	12,1	22	12	7	7	M16

07141

Thrust pads

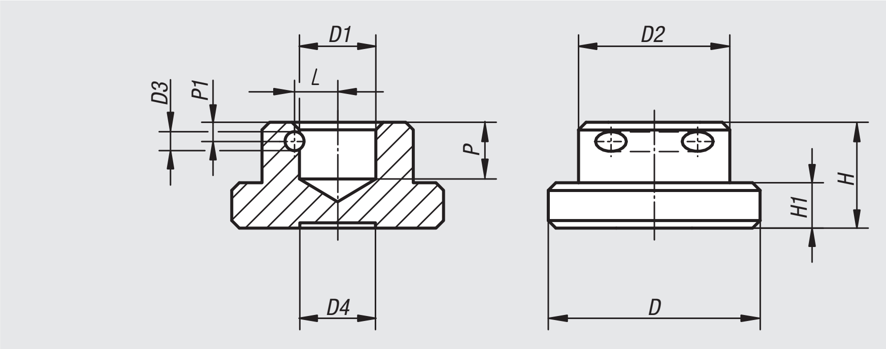
with retaining pin

Material:
Steel.

Version:
Case-hardened and black oxidised.

Sample order:
nlm 07141-10

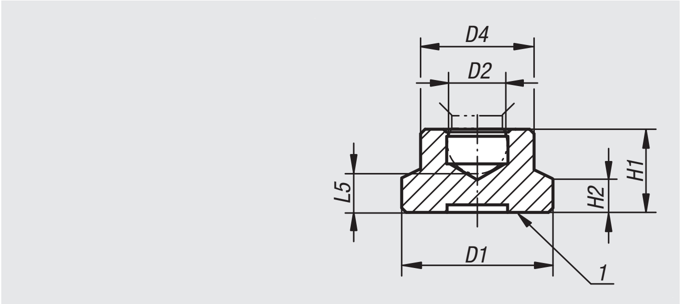
Note:
The pin is used to hold the pad on screw 07120.



Order No.	D	D1	D2	D3	D4	H	H1	L	P	P1
07141-06	12	4,6	10	2	5	7	2,5	3	4	1,6
07141-08	16	6,1	12	2	7	9	4	3,5	5	2
07141-10	20	8,1	15	2	8	11	5	4,6	7	2,7
07141-12	25	8,1	18	2	10	13	6	4,6	7	2,7
07141-14	28	-	20	2,5	10	14	6	5,7	7,5	2,5
07141-16	32	12,1	22	2,5	14	15	7	6,7	7,5	2,5
07141-20	40	15,6	28	2,5	18	16	9	8,3	8	3

07142

Thrust pads

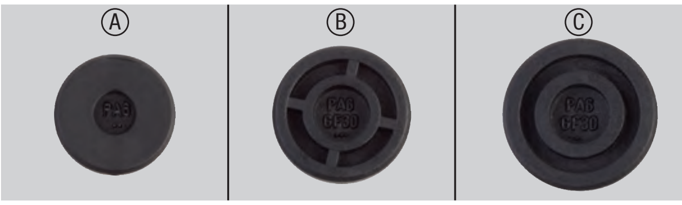


Material:
Steel.
PA 6 plastic.

Version:
Black oxidised.
Black plastic.

Sample order:
nlm 07142-08

Drawing reference:
1) thrust face



Order No.	Form	Main material	D1	D2	D4	H1	H2	L5	Suitable for grub screws
07142-06	A	steel	15	4,4	8,6	7,6	2,5	3,8	M6
07142-08	A	steel	18	5,9	12	9	3,5	4,4	M8
07142-10	A	steel	21	7,9	15	11	4	5	M10
07142-12	A	steel	25	7,9	18	13	5	6,9	M12
07142-206	A	polyamide	15	4,4	8,6	7,6	2,5	3,8	M6
07142-208	B	polyamide	18	5,9	12	9	3,5	4,4	M8
07142-210	C	polyamide	21	7,9	15	11	4	5	M10
07142-212	C	polyamide	25	7,9	18	13	5	6,9	M12

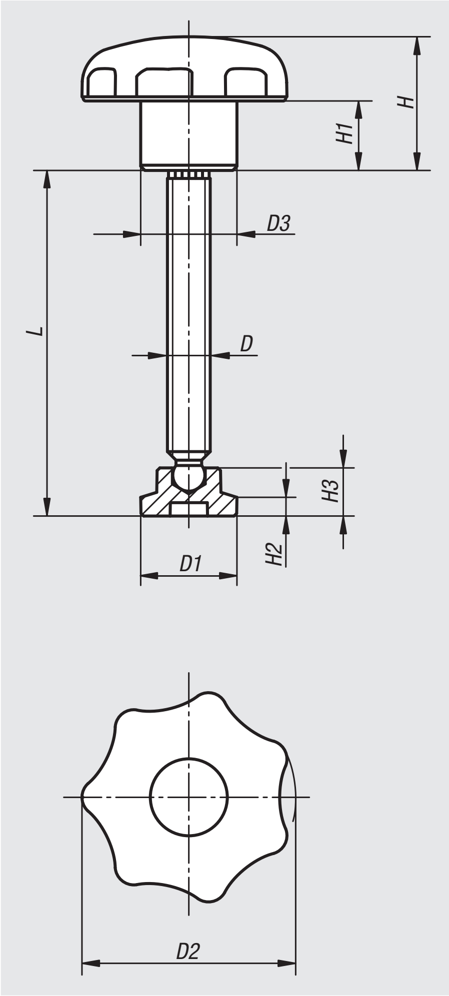
Thrust spindles

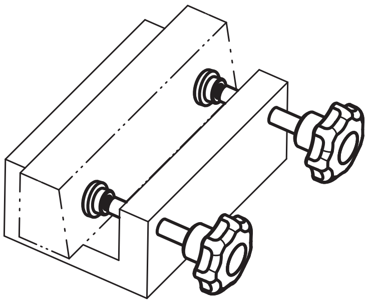
Material:
Star grip: thermoplastic.
Bush: steel.
Grub screw: steel, grade 5.8.
Thrust pad: plastic PA 6.

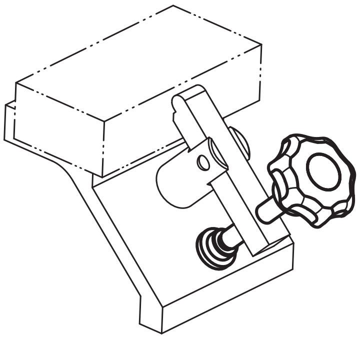
Version:
Star grip, thrust pad black.
Bush trivalent blue passivated.
Grub screw black oxidised.

Sample order:
nlm 07143-06053

Note:
The thrust pad is supplied loose. It can be lightly pressed onto the end of the spindle.



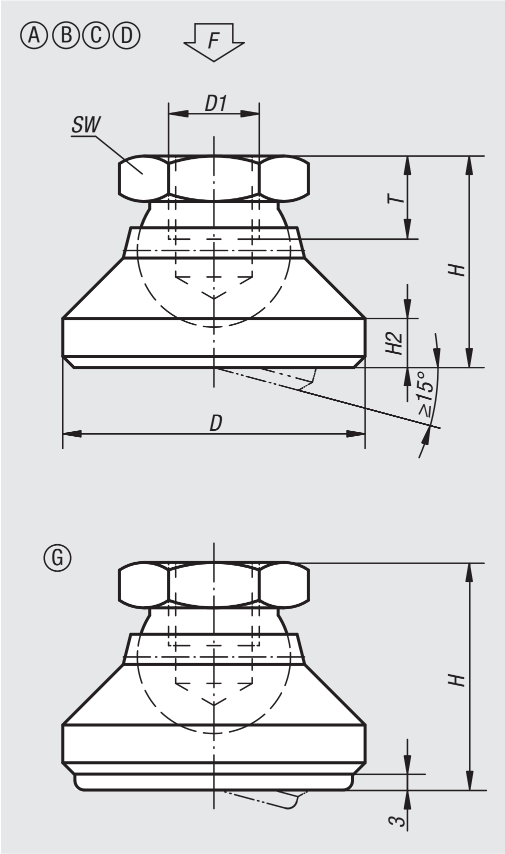




Order No.	D	D1	D2	D3	L	H	H1	H2	H3
07143-06053	M6	15	32	14	53,8	20	10	2,5	7,6
07143-08064	M8	18	40	18	64,6	25	13	3,5	9
07143-10070	M10	21	50	22	70,1	32	17	4	11
07143-12086	M12	25	63	26	86	40	21	5	13

07144

Swivel feet



Material:
Form A,G: Foot high carbon steel, ball element free-cutting steel.
Form B: All stainless steel
Form C: Foot POM, ball element free-cutting steel.
Form D: Foot POM, ball element stainless steel.

Anti-slip plate thermoplastic elastomer.

Version:
Form A: Ball element case-hardened and black oxidised.
Form B: Bright.
Form C: Ball element case-hardened and black oxidised.
Form D: Ball element bright.
Form G: Ball element case hardened and black oxidised, foot with anti-slip plate.

Sample order:
nlm 07144-112

Note:
The anti-slip plate absorbs vibrations and prevents the swivel foot slipping
The loading indicated in the table is a recommendation up to which permanent static load the swivel foot can be used.

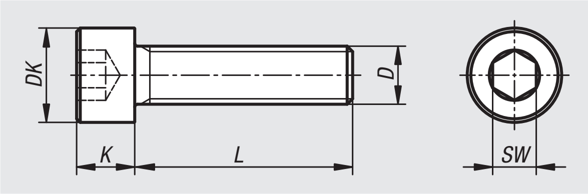
Order No. Form A	Order No. Form B	D	D1	H	H2	T	SW	Load rating max. kN
07144-106	**07144-306**	20	M6	15	2,5	8,5	10	10
07144-108	**07144-308**	25	M8	18	4	9	13	18
07144-110	**07144-310**	32	M10	22	5	10	17	20
07144-112	**07144-312**	40	M12	26	6	12	19	35
07144-116	**07144-316**	50	M16	32	7	14	24	45
07144-120	**07144-320**	60	M20	42	8	18	30	55

Order No. Form C	Order No. Form D	D	D1	H	H2	T	SW	Load rating max. kN
07144-506	**07144-206**	20	M6	15	2,5	8,5	10	4
07144-508	**07144-208**	25	M8	18	4	9	13	7
07144-510	**07144-210**	32	M10	22	5	10	17	10
07144-512	**07144-212**	40	M12	26	6	12	19	18
07144-516	**07144-216**	50	M16	32	7	14	24	20
07144-520	**07144-220**	60	M20	42	8	18	30	22

Order No. Form G	D	D1	H	H2	T	SW	Load rating max. kN (static load only)
07144-410	32	M10	25	5	10	17	12
07144-412	40	M12	29	6	12	19	17
07144-416	50	M16	35	7	14	24	20
07144-420	60	M20	45	8	18	30	24

Socket head screws

full thread, DIN 912 / DIN EN ISO 4762



Material:
Steel.

Version:
Grade 8.8, black or electro zinc-plated.

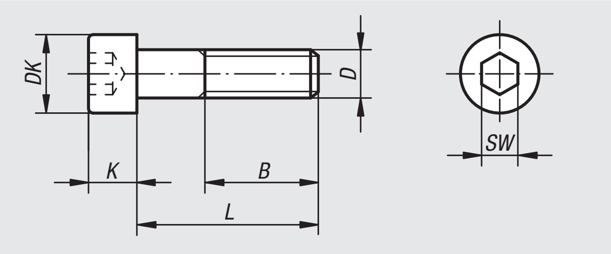
Sample order:
nlm 07159-05X40 (include length L)

Order No.	Main colour	D	DK	K	L	SW
07159-05X	black	M5	8,5	5	40/50/60/80	4
07159-06X	black	M6	10	6	40/50/60/70/90/100	5
07159-08X	black	M8	13	8	50/60/70/80/90	6
07159-10X	black	M10	16	10	50/60/70/80/90/100	8
07159-12X	black	M12	18	12	80/90/100	10
07159-405X	-	M5	8,5	5	40/70/80	4
07159-406X	-	M6	10	6	40/50/60/70/80/90/100	5
07159-408X	-	M8	13	8	50/60/70/80/90/100	6
07159-410X	-	M10	16	10	50/60/70/80/90/100	8
07159-412X	-	M12	18	12	70/80/90/100	10

07160

Socket head screws

DIN 912 / DIN EN ISO 4762, steel or stainless steel

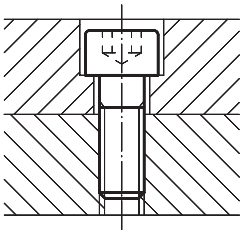


Material:
Steel or stainless steel (A 2)

Version:
Steel grade 8.8, black or electro zinc-plated.
Steel grade 10.9, black or electro zinc-plated.
Stainless steel A 2-70, bright.

Sample order:
nlm 07160-08X40 (include length L)

Note:
Screws where the dimension L is < B are threaded up to the head.
The screw length or thread length is specified by the dimension L.
Screws where L is > B have a shaft.



Order No. 8.8	Main material	Main colour	Surface finish body	D	L	B	DK	K	SW
07160-404X	steel	-	galvanised	M4	10/12/16/18/20/25	20	7	4	3
07160-405X	steel	-	galvanised	M5	10/12/16/18/20/25/30/40	22	8,5	5	4
07160-406X	steel	-	galvanised	M6	10/12/16/18/20/25/30/35/40/45/50/55/60	24	10	6	5
07160-408X	steel	-	galvanised	M8	16/18/20/25/30/35/40/45/50/60/70/80	28	13	8	6
07160-410X	steel	-	galvanised	M10	16/18/20/25/30/35/40/45/50/60/70/80/90/100	32	16	10	8
07160-412X	steel	-	galvanised	M12	20/25/30/35/40/45/50/60/70/80/90/100/110/120	36	18	12	10
07160-414X	steel	-	galvanised	M14	50/80/120	40	21	14	12
07160-416X	steel	-	galvanised	M16	30/35/40/45/50/60/70/80/90/100/110/120	44	24	16	14
07160-420X	steel	-	galvanised	M20	40/45/50/60/70/80/90/100/110/120	52	30	20	17
07160-04X	steel	black	-	M4	10/12/16/18/20/25	20	7	4	3
07160-05X	steel	black	-	M5	10/12/16/18/20/25/30/40	22	8,5	5	4
07160-06X	steel	black	-	M6	10/12/16/18/20/25/30/35/40/45/50/55/60	24	10	6	5
07160-08X	steel	black	-	M8	16/18/20/25/30/35/40/45/50/60/70/80	28	13	8	6
07160-10X	steel	black	-	M10	16/18/20/25/30/35/40/45/50/60/70/80/90/100	32	16	10	8
07160-12X	steel	black	-	M12	20/25/30/35/40/45/50/60/70/80/90/100/110/120	36	18	12	10
07160-14X	steel	black	-	M14	50/80/120	40	21	14	12
07160-16X	steel	black	-	M16	30/35/40/45/50/60/70/80/90/100/110/120	44	24	16	14
07160-20X	steel	black	-	M20	40/45/50/60/70/80/90/100/110/120	52	30	20	17

07160

Socket head screws

DIN 912 / DIN EN ISO 4762, steel or stainless steel

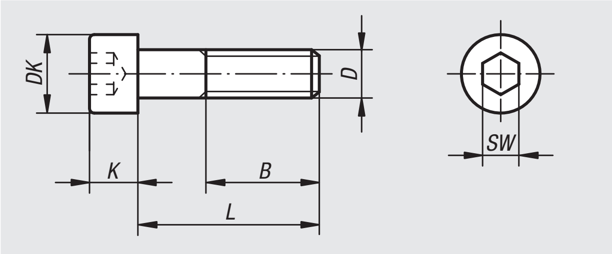
Order No. 10.9	Main material	Main colour	Surface finish body	D	L	B	DK	K	SW
07160-504X	steel	-	galvanised	M4	10/12/16/18/20/25	20	7	4	3
07160-505X	steel	-	galvanised	M5	10/12/16/18/20/25/30/40	22	8,5	5	4
07160-506X	steel	-	galvanised	M6	10/12/16/18/20/25/30/35/40/45/50/55/60	24	10	6	5
07160-508X	steel	-	galvanised	M8	16/20/25/30/35/40/45/50/60/70/80	28	13	8	6
07160-510X	steel	-	galvanised	M10	16/18/20/25/30/35/40/45/50/60/70/80/90/100	32	16	10	8
07160-512X	steel	-	galvanised	M12	20/25/30/35/40/45/50/60/70/80/90/100/110/120	36	18	12	10
07160-514X	steel	-	galvanised	M14	50/80/120	40	21	14	12
07160-516X	steel	-	galvanised	M16	30/35/40/45/50/60/70/80/90/100/110/120	44	24	16	14
07160-520X	steel	-	galvanised	M20	40/45/50/60/70/80/90/100/110/120	52	30	20	17
07160-304X	steel	black	-	M4	10/12/16/18/20/25	20	7	4	3
07160-305X	steel	black	-	M5	10/12/16/18/20/25/30/40	22	8,5	5	4
07160-306X	steel	black	-	M6	10/12/16/18/20/25/30/35/40/45/50/55/60	24	10	6	5
07160-308X	steel	black	-	M8	16/18/20/25/30/35/40/45/50/60/70/80	28	13	8	6
07160-310X	steel	black	-	M10	16/18/20/25/30/35/40/45/50/60/70/80/90/100	32	16	10	8
07160-312X	steel	black	-	M12	20/25/30/35/40/45/50/60/70/80/90/100/110/120	36	18	12	10
07160-314X	steel	black	-	M14	50/80/120	40	21	14	12
07160-316X	steel	black	-	M16	30/35/40/45/50/60/70/80/90/100/110/120	44	24	16	14
07160-320X	steel	black	-	M20	40/45/50/60/70/80/90/100/110/120	52	30	20	17

Order No.	Main material	D	L	B	DK	K	SW
07160-104X	stainless steel	M4	10/12/16/18/20/25	20	7	4	3
07160-105X	stainless steel	M5	10/12/16/18/20/25/30/40	22	8,5	5	4
07160-106X	stainless steel	M6	10/12/16/18/20/25/30/35/40/45/50/55/60	24	10	6	5
07160-108X	stainless steel	M8	16/18/20/25/30/35/40/45/50/60/70/80	28	13	8	6
07160-110X	stainless steel	M10	16/18/20/25/30/35/40/45/50/60/70/80/90/100	32	16	10	8
07160-112X	stainless steel	M12	20/25/30/35/40/45/50/60/70/80/90/100/110/120	36	18	12	10

07160

Socket head screws

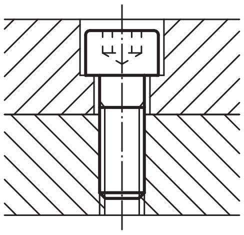
DIN 912/DIN EN ISO 4762



Material:
Steel.

Version:
Steel grade 12.9, black.

Sample order:
nlm 07160-206X40 (include length L)

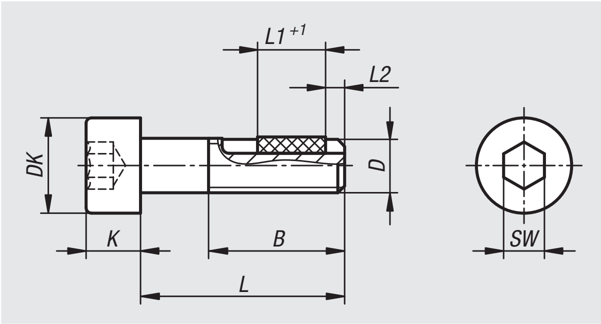


Order No.	D	B	DK	K	L	SW
07160-206X	M6	24	10	6	18/20/25/30/35/40/45/50/55/60/65/70/80/90/100	5
07160-208X	M8	28	13	8	20/25/30/35/40/45/50/55/60/65/70/80/90/100/120	6
07160-210X	M10	32	16	10	30/35/40/45/50/55/60/65/70/75/80/90/100/110/120/130/140	8
07160-212X	M12	36	18	12	30/35/40/45/50/55/60/65/70/75/80/90/100/110/120/130/140	10
07160-216X	M16	44	24	16	35/40/45/50/55/60/65/70/75/80/90/100/110/120/130/140/150/160/170/180/200	14
07160-218X	M18	48	27	18	35/40/45/50/55/60/65/70/75/80/90/100/110/120/130/140/150/160/170/180/200	14
07160-220X	M20	52	30	20	40/45/50/55/60/65/70/75/80/90/100/110/120/130/140/150/160/170/180/200	17

07160

Socket head screws

DIN 912 / EN ISO 4762, LONG-LOK secured



Material:
Steel or stainless steel (A 2).

LONG-LOK thread lock nylon.

Version:
Steel grade 8.8, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07160-306X20 (include length L)

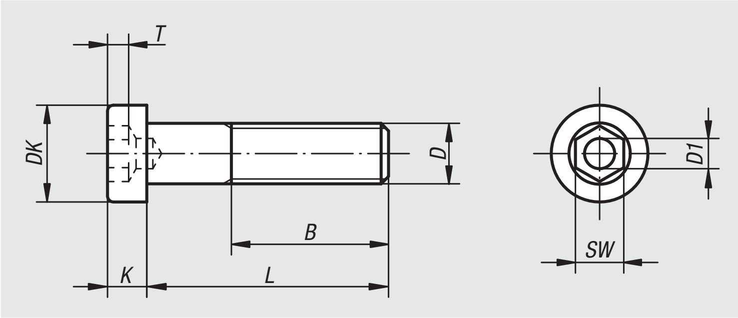
Drawing reference:
L2 = approx. 2x thread pitch

Order No. steel	Order No. stainless steel	D	B	DK	K	L	L1	SW	Tightening torque approx. Nm	Loosening torque approx. Nm
07160-804X	**07160-904X**	M4	-	7	4	10/12/16/20/25	5/5/6/7/7	3	0,15	0,22
07160-805X	**07160-905X**	M5	-/22	8,5	5	10/12/16/20/25/30/40	5/6/7/7/8/8/8	4	0,25	0,1
07160-806X	**07160-906X**	M6	-/24	10	6	10/12/16/20/25/30/35/40/45/50	5/6/7/7/8/8/8/8/8/8	5	0,45	0,25
07160-808X	**07160-908X**	M8	-/28	13	8	16/20/25/30/35/40/45	7/8/8/8/10/10/10	6	0,8	0,4
07160-810X	**07160-910X**	M10	-/32	16	10	25/30/40/50	10/10/12/12	8	1,7	0,9
07160-812X	**07160-912X**	M12	-	18	12	30/40/50	10/12/12	10	1,8	0,9

07161

Socket head screws

low head DIN 6912



Material:
Steel or stainless steel (A 2)

Version:
Steel grade 8.8, black or electro zinc-plated.
Steel grade 10.9, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07161-110X20 (include length L)

Note:
Screws where the dimension L is < B are threaded up to the head.
The screw length or thread length is specified by the dimension L.
Screws where L is > B have a shaft.

Socket head screws with low head DIN 6912, stainless steel

Order No.	Main material	D	D1	DK	K	SW	T
07161-104X	stainless steel	M4	2	7	2,8	3	1,48
07161-105X	stainless steel	M5	2,5	8,5	3,5	4	1,88
07161-106X	stainless steel	M6	3	10	4	5	2,38
07161-108X	stainless steel	M8	4	13	5	6	2,88
07161-110X	stainless steel	M10	5	16	6,5	8	3,35
07161-112X	stainless steel	M12	6	18	7,5	10	3,85

Order No.	Main material	D	B	L
07161-104X	stainless steel	M4	6,5/8,5/12.5/14/14	10/12/16/20/25
07161-105X	stainless steel	M5	5,8/7,85/11,8/15,8/16/16	10/12/16/20/25/30
07161-106X	stainless steel	M6	4,5/6,5/10,5/14,5/19,5/18/18/18/18/18/18	10/12/16/20/25/30/35/40/45/50/60
07161-108X	stainless steel	M8	/5/9/22/22/22/22/22/22/22/22/22	10/12/16/20/25/30/35/40/45/50/60/70
07161-110X	stainless steel	M10	8/12/17/22/27/26/26/26/26/26	16/20/25/30/35/40/45/50/60/70
07161-112X	stainless steel	M12	10,5/15,5/30/25,5/30,5/30/30/30/30	20/25/30/35/40/45/50/60/70

Socket head screws

low head DIN 6912

Socket head screws with low head DIN 6912, steel

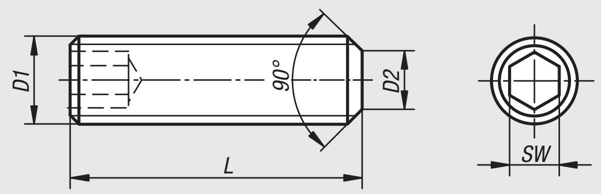
Order No. Grade 8.8 steel	Order No. Grade 10.9 steel	D	D1	DK	K	SW	T
07161-04X	-	M4	2	7	2,8	3	1,48
07161-05X	-	M5	2,5	8,5	3,5	4	1,88
07161-06X	**07161-306X**	M6	3	10	4	5	2,38
07161-08X	**07161-308X**	M8	4	13	5	6	2,88
07161-10X	**07161-310X**	M10	5	16	6,5	8	3,35
07161-12X	**07161-312X**	M12	6	18	7,5	10	3,85
07161-16X	**07161-316X**	M16	8	24	10	14	5,35
07161-20X	**07161-320X**	M20	10	30	12	17	6,32

Order No. steel bright	Order No. steel galvanised	Grade	D	B	L
07161-04X	**07161-404X**	8.8	M4	6,5/8,5/12.5/14	10/12/16/20/25
07161-05X	**07161-405X**	8.8	M5	5,8/7,85/11,8/15,8/16	10/12/16/20/25/30
07161-06X	**07161-406X**	8.8	M6	4,5/6,5/10,5/14,5/19,5/18	10/12/16/20/25/30/35/40/45/50/60
07161-08X	**07161-408X**	8.8	M8	4/5/9/13/22	10/12/16/20/25/30/35/40/45/50/60/70/80
07161-10X	**07161-410X**	8.8	M10	12/17/22/27/26	20/25/30/35/40/45/50/60/70/80/90/100
07161-12X	**07161-412X**	8.8	M12	10,5/15,5/20,5/25,5/30,5/30	20/25/30/35/40/45/50/60/70/80/90/100/110/120
07161-16X	**07161-416X**	8.8	M16	19/24/38	30/35/40/45/50/60/70/80/90/100/110/120
07161-20X	**07161-420X**	8.8	M20	26/36/46	40/45/50/60/70/80/90/100/110/120
07161-306X	-	10.9	M6	4,5/6,5/10,5/14,5/19,5/18	10/12/16/20/25/30/35/40
07161-308X	-	10.9	M8	9/13/22	16/20/25/30/35/40/45/50/60
07161-310X	-	10.9	M10	12/17/22/27/26	20/25/30/35/40/45/50/60
07161-312X	-	10.9	M12	15,5/20,5/25,5/30,5/30	25/30/35/40/45/50/60
07161-316X	-	10.9	M16	19/24/38	30/35/40/45/50/60/70/80
07161-320X	-	10.9	M20	26/36/46	40/50/60/70

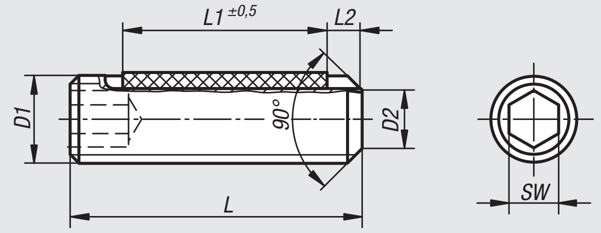
07165

Grub screws with flat point

hexagon socket DIN 913



LONG-LOK



Material:
Steel or stainless steel (A 2).

LONG-LOK thread lock nylon.

Version:
Steel class 45 H, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07165-110X20 (include length L)

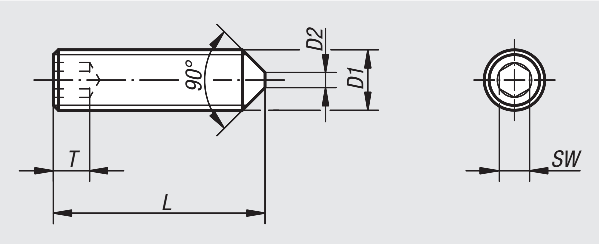
Drawing reference:
L2 = approx. 2x thread pitch

Order No.	Main material	D1	D2	L	SW
07165-03X	steel	M3	2	5/6/8/10/12/16/20	1,5
07165-04X	steel	M4	2,5	5/6/8/10/12/16/20/25	2
07165-05X	steel	M5	3,5	5/6/8/10/12/16/20/25/30	2,5
07165-06X	steel	M6	4	6/8/10/12/16/20/25/30/35/40/45/50/60	3
07165-08X	steel	M8	5,5	8/10/12/16/20/25/30/35/40/45/50/60/70/80	4
07165-10X	steel	M10	7	10/12/16/20/25/30/35/40/45/50/60/70/80/90/100	5
07165-103X	stainless steel	M3	2	5/6/8/10/12	1,5
07165-104X	stainless steel	M4	2,5	5/6/8/10/12/16/20	2
07165-105X	stainless steel	M5	3,5	5/6/8/10/12/16/20/25/30	2,5
07165-106X	stainless steel	M6	4	6/8/10/12/16/20/25/30/35/40	3
07165-108X	stainless steel	M8	5,5	8/10/12/16/20/25/30/35/40/45/50	4
07165-110X	stainless steel	M10	7	10/12/16/20/25/30/35/40/45/50	5

Order No.	Version 2	Main material	D1	D2	L	L1	SW
07165-203X	long-lok	steel	M3	2	5/6/8/10/12	2/3/4/4/4	1,5
07165-204X	long-lok	steel	M4	2,5	5/6/8/10/12/16	2/2,5/3,5/5/5/5	2
07165-205X	long-lok	steel	M5	3,5	5/6/8/10/12/16	2/3/3,5/3,5/5/6	2,5
07165-206X	long-lok	steel	M6	4	6/8/10/12/16/20	2,5/3/3,5/5/7/7	3
07165-208X	long-lok	steel	M8	5,5	8/10/12/16/20	3/3,5/5/8/8	4
07165-210X	long-lok	steel	M10	7	10/12/16/20	5/5/9/9	5
07165-303X	long-lok	stainless steel	M3	2	5/6/8/10/12	2/3/4/4/4	1,5
07165-304X	long-lok	stainless steel	M4	2,5	5/6/8/10/12/16	2/2,5/3,5/5/5/5	2
07165-305X	long-lok	stainless steel	M5	3,5	5/6/8/10/12/16	2/3/3,5/3,5/5/6	2,5
07165-306X	long-lok	stainless steel	M6	4	6/8/10/12/16/20	2,5/3/3,5/5/7/7	3
07165-308X	long-lok	stainless steel	M8	5,5	8/10/12/16/20	3/3,5/5/8/8	4
07165-310X	long-lok	stainless steel	M10	7	10/12/16/20	5/5/9/9	5

Grub screw with hexagon socket and pointed end

DIN 914 / DIN EN ISO 4027

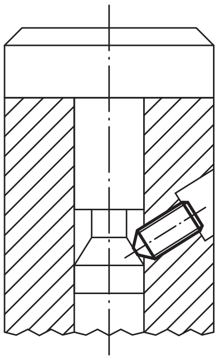


Material:
Steel or stainless steel (A 2)

Version:
Steel class 45 H, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07166-110X12 (include length L)

Note:
By M4x5, M5x5, M5x6, M6x6, M8x8, M10x10 the point angle is 120°.

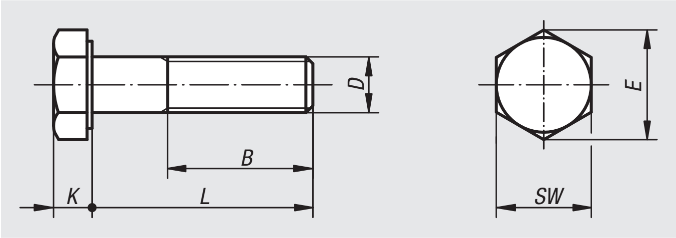


Order No. steel	Order No. stainless steel	D1	D2	L	T	SW
07166-03X	**07166-103X**	M3	-	5/6/8/10/12/16/20	1,2	1,5
07166-04X	**07166-104X**	M4	-	5/6/8/10/12/16/20/25	1,5	2
07166-05X	**07166-105X**	M5	-	5/6/8/10/12/14/16/20/25/30	2	2,5
07166-06X	**07166-106X**	M6	1,5	6/8/10/12/16/20/25/30/35/40/45/50/60	2	3
07166-08X	**07166-108X**	M8	2	8/10/12/14/16/20/25/30/35/40/45/50/60	3	4
07166-10X	**07166-110X**	M10	2,5	10/12/16/20/25/30/35/40/45/50/60/70/80	4	5

07170

Hexagon head bolts

DIN 931/DIN EN ISO 4014/DIN EN 24014



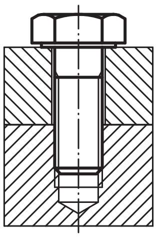
Material:
Steel or stainless steel (A 2)

Version:
Steel grade 8.8, black or electro zinc-plated.
Steel grade 10.9, black or electro zinc-plated.
Steel grade 12.9, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07170-110X50 (include length L)

Note:
Screws where the dimension L is < B are threaded up to the head.
The screw length or thread length is specified by the dimension L.
Screws where L is > B have a shaft.

On request:
DIN ISO 272 spanner sizes.



Order No. steel Grade 8.8	Order No. steel Grade 10.9	Surface finish body	D	B	E	K	L	SW
07170-04X	**-**	bright	M4	14	7,66	2,8	25/30/35/40/45/50	7
07170-05X	**-**	bright	M5	16	8,79	3,5	25/30/35/40/45/50/60	8
07170-06X	**07170-306X**	bright	M6	18	11,05	4	30/35/40/45/50/60/70	10
07170-08X	**07170-308X**	bright	M8	22	14,38	5,3	35/40/45/50/60/70/80	13
07170-10X	**07170-310X**	bright	M10	26	18,9	6,4	40/45/50/60/70/80/90/100	17
07170-12X	**07170-312X**	bright	M12	30	21,1	7,5	45/50/60/70/80/90/100/110/120	19
07170-16X	**07170-316X**	bright	M16	38	26,75	10	60/70/80/90/100/110/120	24
07170-20X	**07170-320X**	bright	M20	46	33,53	12,5	70/80/90/100/110/120	30
07170-404X	**-**	galvanised	M4	14	7,66	2,8	25/30/35/40/45/50	7
07170-405X	**-**	galvanised	M5	16	8,79	3,5	25/30/35/40/45/50/60	8
07170-406X	**07170-506X**	galvanised	M6	18	11,05	4	30/35/40/45/50/60/70	10
07170-408X	**07170-508X**	galvanised	M8	22	14,38	5,3	35/40/45/50/60/70/80	13
07170-410X	**07170-510X**	galvanised	M10	26	18,9	6,4	40/45/50/60/70/80/90/100	17
07170-412X	**07170-512X**	galvanised	M12	30	21,1	7,5	45/50/60/70/80/90/100/110/120	19
07170-416X	**07170-516X**	galvanised	M16	38	26,75	10	60/70/80/90/100/110/120	24
07170-420X	**07170-520X**	galvanised	M20	46	33,53	12,5	70/80/90/100/110/120	30

07170

Hexagon head bolts

DIN 931/DIN EN ISO 4014/DIN EN 24014

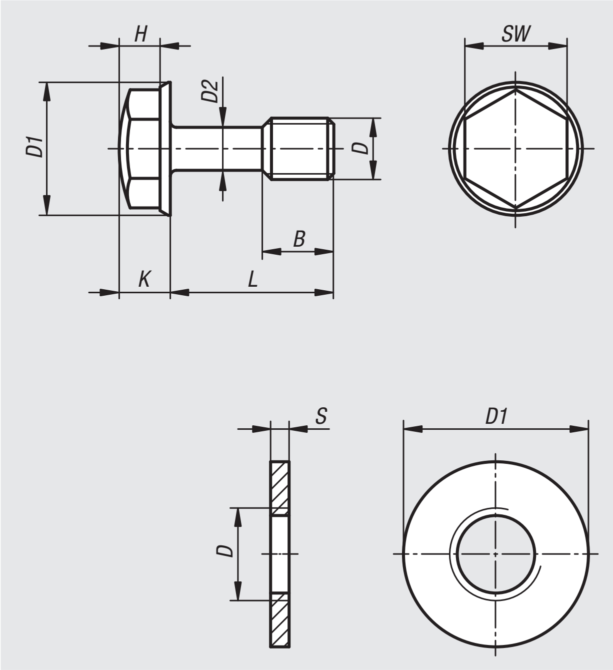
Order No. steel Grade 12.9	Surface finish body	D	B	E	K	L	SW
07170-210X	bright	M10	26	18,9	6,4	40/45/50/60/70/80/90/100	17
07170-212X	bright	M12	30	21,1	7,5	45/50/60/70/80/90/100/120	19
07170-216X	bright	M16	38	26,75	10	60/70/80/90/100/120	24
07170-220X	bright	M20	46	33,53	12,5	70/80/90/100/120	30

Order No. stainless steel	D	B	E	K	L	SW
07170-105X	M5	16	8,79	3,5	25/30/35/40/45/50/60	8
07170-106X	M6	18	11,05	4	30/35/40/45/50/60/70	10
07170-108X	M8	22	14,38	5,3	35/40/45/50/60/70/80	13
07170-110X	M10	26	18,9	6,4	40/45/50/60/70/80/90/100	17
07170-112X	M12	30	21,1	7,5	45/50/60/70/80/90/100/110/120	19
07170-116X	M16	38	26,75	10	60/70/80/90/100/110/120	24

07170-02

Hexagon bolts with narrow shaft

in Hygienic DESIGN



Material:
Stainless steel 1.4404.

Version:
Polished.

Sample order:
nlm 07170-02-06X30 (include length L)

Note:
Narrow shaft bolts are preferably secured against unintentional loss with a retaining element. This satisfies the EU standard 2006/42/EG. With the optionally available retaining washer the bolt is permanently combined with the component before screwing in. The washer is screwed over the threaded section and can then move freely on the narrow shaft. The shaft is not damaged by e.g. notching caused by a spring effect. By manual operation it is not possible that the washer screws itself out again. However, by careful manipulation the washer can be removed from the bolt without damaging either.
The surface of the hexagon head bolt is polished and, with regard to design optimised for the use in hygienic environments. The bolt head is convex on the top face and the collar has a conical formed top surface. Instead of troublesome embossing or indentations, the bolt head is smooth with a surface finish of less than Ra 0.8 µm. Dirt and residue from products or cleaners seldom adheres and easy cleaning is ensured.

On request:
Inch threads, thread lengths, shaft lengths

Accessories:
Locking washer 07170-03.

Attention:
From M12 with centre bore.

Hexagon bolts with narrow shaft

in Hygienic DESIGN

Hexagon bolts with narrow shaft in Hygienic DESIGN

Order No.	D	D1	D2	B	H	K	L	SW
07170-02-04X	M4	9,2	3,1	5	3	4	8/10/12/16	7
07170-02-04X	M4	9,2	3,1	14	3	4	20	7
07170-02-05X	M5	10,5	3,7	6	3,7	4,7	10/12/16/20	8
07170-02-05X	M5	10,5	3,7	16	3,7	4,7	25	8
07170-02-06X	M6	13	4,2	7	4	5	12/16/20	10
07170-02-06X	M6	13	4,2	18	4	5	25/30/35/40/45/50/60	10
07170-02-08X	M8	16,8	6	9,5	5,5	6,5	16/20/25	13
07170-02-08X	M8	16,8	6	22	5,5	6,5	30/35/40/45/50/60/70	13
07170-02-10X	M10	20,6	7,7	12	7,3	8,3	20/25/30/35	16
07170-02-10X	M10	20,6	7,7	26	7,3	8,3	40/45/50/60/70/80	16

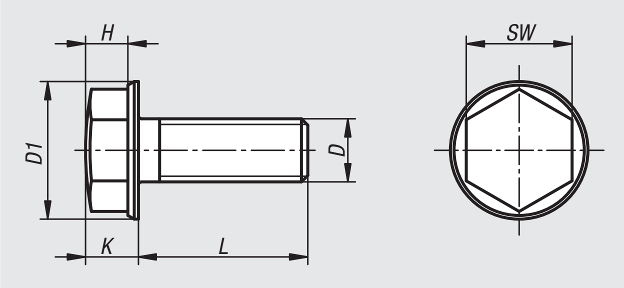
Retaining washers for narrow shank screws

Order No.	D	D1	S
07170-03-03	M3	6	1,5
07170-03-04	M4	8	1,5
07170-03-05	M5	10	1,5
07170-03-06	M6	12	1,5
07170-03-08	M8	16	2
07170-03-10	M10	20	2

07170-15

Hexagon head screws, stainless steel

in Hygienic DESIGN



Material:
Stainless steel 1.4404

Version:
Polished.

Sample order:
nlm 07170-15-03X06
(include length L e.g. 06 for L = 6 mm.)

Note:
The surface of the hexagon head bolt is polished and, with regard to design optimised for the use in hygienic environments.
The bolt head is convex on the top face and the collar has a conical formed top surface.
Instead of troublesome embossing or indentations, the bolt head is smooth with a surface finish of Ra 0.8 µm. Dirt and residue from products or cleaners seldom adheres and easy cleaning is ensured.

Attention:
From M12 with centre bore.

Hexagon head screws, stainless steel in Hygienic DESIGN

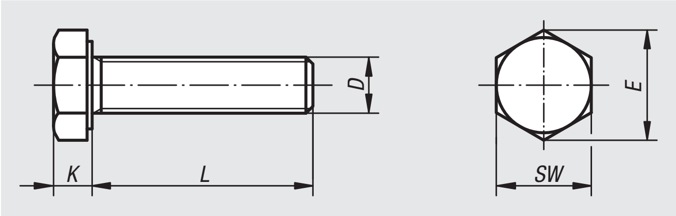
Order No.	D	D1	H	K	L	SW
07170-15-03X	M3	7	3	3,8	6/8/12/16/20/25/30	5,5
07170-15-04X	M4	9,2	3	4	8/12/16/20/25/30/35/40	7
07170-15-05X	M5	10,5	3,7	4,7	12/16/20/25/30/35/40/45/50	8
07170-15-06X	M6	13	4	5	12/16/20/25/30/35/40/45/50/60	10
07170-15-08X	M8	16,8	5,5	6,5	16/20/25/30/35/40/45/50/60	13
07170-15-10X	M10	20,6	7,3	8,3	20/25/30/35/40/45/50/60	16

Notes

07171

Hexagon head bolts

DIN 933



Material:
Steel or stainless steel (A 2)

Version:
Steel grade 8.8, black or electro zinc-plated.
Steel grade 10.9, black or electro zinc-plated.
Steel grade 12.9, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07171-04X10 (include length L)

Order No. steel Grade 8.8	Order No. steel Grade 10.9	Main colour	D	E	K	L	SW
07171-04X	**-**	black	M4	7,66	2,8	10/12/16/18/20/25	7
07171-05X	**-**	black	M5	8,79	3,5	10/12/16/18/20/25/30/35/40	8
07171-06X	**07171-306X**	black	M6	11,05	4	10/12/16/18/20/25/30/35/40/45/50/55/60	10
07171-08X	**07171-308X**	black	M8	14,38	5,3	16/18/20/25/30/35/40/45/50/60/70/80/90/100	13
07171-10X	**07171-310X**	black	M10	18,9	6,4	16/18/20/25/30/35/40/45/50/60/70/80/90/100	17
07171-12X	**07171-312X**	black	M12	21,1	7,5	20/25/30/35/40/45/50/60/70/80/90/100/110/120	19
07171-14X	**-**	black	M14	24,49	8,8	30/35/40/45/50/60/70/80/90/100/110/120	22
07171-16X	**07171-316X**	black	M16	26,75	10	30/35/40/45/50/60/70/80/90/100/110/120	24
07171-20X	**07171-320X**	black	M20	33,53	12,5	40/45/50/60/70/80/90/100/110/120	30
07171-404X	**-**	-	M4	7,66	2,8	10/12/16/18/20/25	7
07171-405X	**-**	-	M5	8,79	3,5	10/12/16/18/20/25/30/35/40	8
07171-406X	**07171-506X**	-	M6	11,05	4	10/12/16/18/20/25/30/35/40/45/50/55/60	10
07171-408X	**07171-508X**	-	M8	14,38	5,3	16/18/20/25/30/35/40/45/50/60/70/80/90/100	13
07171-410X	**07171-510X**	-	M10	18,9	6,4	16/18/20/25/30/35/40/45/50/60/70/80/90/100	17
07171-412X	**07171-512X**	-	M12	21,1	7,5	20/25/30/35/40/45/50/60/70/80/90/100/110/120	19
07171-414X	**-**	-	M14	24,49	8,8	30/35/40/45/50/60/70/80/90/100/110/120	22
07171-416X	**07171-516X**	-	M16	26,75	10	30/35/40/45/50/60/70/80/90/100/110/120	24
07171-420X	**07171-520X**	-	M20	33,53	12,5	40/45/50/60/70/80/90/100/110/120	30

Hexagon head bolts

DIN 933

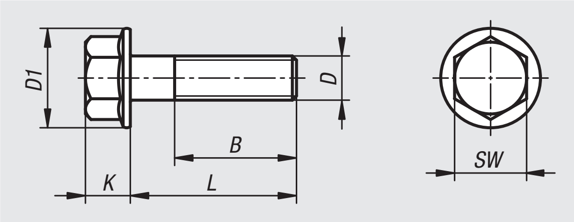
Order No.	Main material	Grade	D	E	K	L	SW
07171-206X	steel	12.9	M6	11,05	4	12/16/20/25/30	10
07171-208X	steel	12.9	M8	14,38	5,3	16/20/25/30/35/40/45/50/60	13
07171-210X	steel	12.9	M10	18,9	6,4	20/25/30/35/40/45/50/60	17
07171-212X	steel	12.9	M12	21,1	7,5	25/30/35/40/45/50/60	19
07171-216X	steel	12.9	M16	26,75	10	30/35/40/45/50/60/70/80/90/100	24
07171-220X	steel	12.9	M20	33,53	12,5	40/45/50/60/70/80/90/100	30

Order No.	Main material	D	E	K	L	SW
07171-104X	stainless steel	M4	7,66	2,8	10/12/16/18/20/25	7
07171-105X	stainless steel	M5	8,79	3,5	10/12/16/18/20/25/30/35/40	8
07171-106X	stainless steel	M6	11,05	4	10/12/16/18/20/25/30/35/40/45/50/55/60	10
07171-108X	stainless steel	M8	14,38	5,3	16/18/20/25/30/35/40/45/50/60/70/80/90/100	13
07171-110X	stainless steel	M10	18,9	6,4	16/18/20/25/30/35/40/45/50/60/70/80/90/100	17
07171-112X	stainless steel	M12	21,1	7,5	20/25/30/35/40/45/50/60/70/80/90/100/110/120	19
07171-116X	stainless steel	M16	26,75	10	30/35/40/45/50/60/70/80/90/100/110/120	24
07171-120X	stainless steel	M20	33,53	12,5	40/45/50/60/70/80/90/100/110/120	30

07172

Hexagon head bolts with flange

EN 1665



Material:
Steel or stainless steel (A 2)

Version:
Steel grade 8.8, electro zinc-plated.
Steel grade 10.9, electro zinc-plated.
Bright stainless steel.

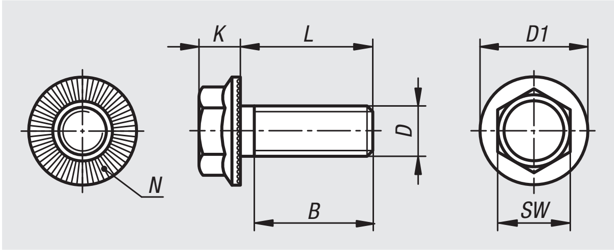
Sample order:
nlm 07172-06X12 (include length L)

Note:
Screws where the dimension L is < B are threaded up to the head.
The screw length or thread length is specified by the dimension L.
Screws where L is > B have a shaft.

Order No.	Main material	Grade	B	D	D1	K	SW	L
07172-406X	steel	8.8	18	M6	14,2	6,6	10	12/16/20/25/30
07172-408X	steel	8.8	22	M8	18	8,1	13	12/16/20/25/30/35/40/50/60
07172-410X	steel	8.8	26	M10	22,3	10,4	16	20/25/30/35/40/50
07172-412X	steel	8.8	30	M12	26,6	11,8	18	20/25/30/40/50
07172-416X	steel	8.8	38	M16	35	15,4	24	30/35/40/45/50/70
07172-506X	steel	10.9	18	M6	14,2	6,6	10	12/16/20/25/30
07172-508X	steel	10.9	22	M8	18	8,1	13	12/16/20/25/30/35/40
07172-510X	steel	10.9	26	M10	22,3	10,4	16	25/30/40
07172-512X	steel	10.9	30	M12	26,6	11,8	18	20/35/40/45/50
07172-516X	steel	10.9	38	M16	35	15,4	24	30/35/40/45/50/60
07172-106X	stainless steel	-	18	M6	14,2	6,6	10	12/16/20/25/30
07172-108X	stainless steel	-	22	M8	18	8,1	13	16/20/25/30/35/40/50
07172-110X	stainless steel	-	26	M10	22,3	10,4	16	20/25/30/35/40/50/60

Hexagon head bolts

with serrated flange



Material:
Steel.

Version:
Bright or electro zinc-plated.
Surface hardened min. 550 HV.

Sample order:
nlm 07173-305X10 (include length L)

Note:
The serrations bite into the contact face resulting in a positive locking connection that prevents self-loosening. Can be re-used several times.

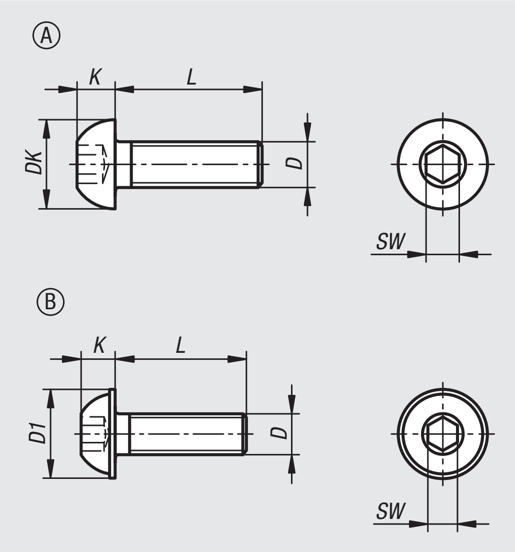
Grade 100 corresponds to ca. grade 10.9.

Order No.	Main colour	B	D	D1	K	L	N (number)	SW
07173-305X	-	8,4	M5	11,2	4,3	10/12/16/20	28	8
07173-306X	-	8	M6	14,2	5,5	10/12/16/20/25	36	10
07173-308X	-	9,5	M8	18,2	7	12/16/20/25/30/35/40	48	13
07173-310X	-	13	M10	21	8,5	16/20/25/30/35/40/45/50	48	15
07173-312X	-	16,5	M12	24	10	20/25/30/35/40/45/50/55/60/75	60	17
07173-316X	-	21	M16	31	14	25/30/35/40/45/50/55/60/65/70	72	22
07173-505X	galvanised	8,4	M5	11,2	4,3	10/12/16/20	28	8
07173-506X	galvanised	8	M6	14,2	5,5	10/12/16/20/25	36	10
07173-508X	galvanised	9,5	M8	18,2	7	12/16/20/25/30/40	48	13
07173-510X	galvanised	13	M10	21	8,5	16/20/25/30/35/40/50	48	15
07173-512X	galvanised	16,5	M12	24	10	20/25/30/35/40/45/50/60/75	60	17
07173-516X	galvanised	21	M16	31	14	25/35/40/45/50/55/60/70	72	22

07174

Button head screws

EN ISO 7380



Material:
Steel or stainless steel (A 2)

Version:
Steel grade 10.9, bright or electro zinc-plated.
Stainless steel A 2-70, bright.

Sample order:
nlm 07174-1303X8 (include length L)

Note:
EN ISO 7380-1 Form A: Hexagon socket button head screws.
EN ISO 7380-2 Form B:Hexagon socket button head screws with collar.

Order No.	Form	Main material	Finish	Grade	D	DK	K	L	SW
07174-1303X	A	steel	-	10.9	M3	5,7	1,65	8/10/12/16/20	2
07174-1304X	A	steel	-	10.9	M4	7,6	2,2	8/10/12/16/20/25/30	2,5
07174-1305X	A	steel	-	10.9	M5	9,5	2,75	8/10/12/16/20/25/30/35/40	3
07174-1306X	A	steel	-	10.9	M6	10,5	3,3	8/10/12/16/20/25/30/35/40/45/50/55/60	4
07174-1308X	A	steel	-	10.9	M8	14	4,4	8/10/12/16/20/25/30/35/40/45/50/55/60	5
07174-1310X	A	steel	-	10.9	M10	17,5	5,5	12/16/20/25/30/35/40/45/50/55/60	6
07174-1503X	A	steel	galvanised	10.9	M3	5,7	1,65	8/10/12/16/20	2
07174-1504X	A	steel	galvanised	10.9	M4	7,6	2,2	8/10/12/16/20/25/30	2,5
07174-1505X	A	steel	galvanised	10.9	M5	9,5	2,75	8/10/12/16/20/25/30/35/40/45	3
07174-1506X	A	steel	galvanised	10.9	M6	10,5	3,3	8/10/12/16/20/25/30/35/40/45/50/55/60	4
07174-1508X	A	steel	galvanised	10.9	M8	14	4,4	8/10/12/16/20/25/30/35/40/45/50/55/60	5
07174-1510X	A	steel	galvanised	10.9	M10	17,5	5,5	12/16/20/25/30/35/40/45/50/55/60	6
07174-1512X	A	steel	galvanised	10.9	M12	21	6,6	16/20/25/30/35/40/45/50/60	8
07174-1516X	A	steel	galvanised	10.9	M16	28	8,8	30/40/45/50/60	10

Button head screws

EN ISO 7380

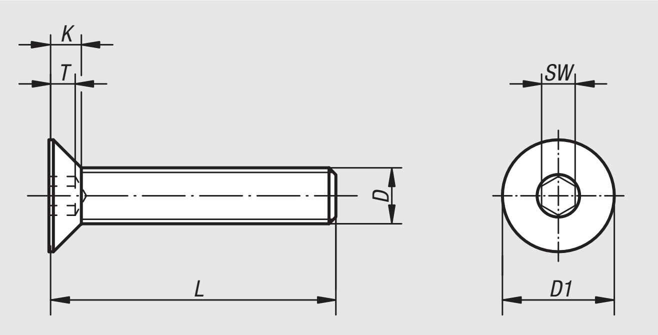
Order No.	Form	Main material	Finish	Grade	D	D1	K	L	SW
07174-2304X	B	steel	-	10.9	M4	9,4	2,2	8/10/12/16/20/25/30	2,5
07174-2305X	B	steel	-	10.9	M5	11,8	2,75	8/10/12/16/20/25/30/35	3
07174-2306X	B	steel	-	10.9	M6	13,6	3,3	8/10/12/16/20/25/30/35/40	4
07174-2308X	B	steel	-	10.9	M8	17,8	4,4	12/16/20/25/30/35/40/50/60	5
07174-2310X	B	steel	-	10.9	M10	21,9	5,5	25/30/35	6
07174-2504X	B	steel	galvanised	10.9	M4	9,4	2,2	8/10/12/16/20/25/30	2,5
07174-2505X	B	steel	galvanised	10.9	M5	11,8	2,75	8/10/12/16/20/25/30/35	3
07174-2506X	B	steel	galvanised	10.9	M6	13,6	3,3	8/10/12/16/20/25/30/35/40	4
07174-2508X	B	steel	galvanised	10.9	M8	17,8	4,4	12/16/20/25/30/35/40/50/60	5
07174-2510X	B	steel	galvanised	10.9	M10	21,9	5,5	20/30/35/40/50	6
07174-2512X	B	steel	galvanised	10.9	M12	26	6,6	20/25/30/40/50/60	8

Order No.	Form	Main material	Grade	D	DK	D1	K	L	SW
07174-1103X	A	stainless steel	70	M3	5,7	-	1,65	8/10/12/16/20	2
07174-1104X	A	stainless steel	70	M4	7,6	-	2,2	8/10/12/16/20/25/30	2,5
07174-1105X	A	stainless steel	70	M5	9,5	-	2,75	8/10/12/16/20/25/30/40/45	3
07174-1106X	A	stainless steel	70	M6	10,5	-	3,3	8/10/12/16/20/25/30/35/40/45/50/60	4
07174-1108X	A	stainless steel	70	M8	14	-	4,4	10/12/16/20/25/30/35/40/45/50/60	5
07174-1110X	A	stainless steel	70	M10	17,5	-	5,5	16/20/25/30/40/50	6
07174-2103X	B	stainless steel	70	M3	-	6,9	1,65	8/10	2
07174-2104X	B	stainless steel	70	M4	-	9,4	2,2	8/10/12/16/20/25	2,5
07174-2105X	B	stainless steel	70	M5	-	11,8	2,75	8/10/12/16/20/25	3
07174-2106X	B	stainless steel	70	M6	-	13,6	3,3	8/10/12/16/20/25/30/35/40/45	4
07174-2108X	B	stainless steel	70	M8	-	17,8	4,4	10/12/16/20/25	5

07175

Screws with countersunk head

hexagon socket DIN EN ISO 10642



Material:
Steel or stainless steel (A 2)

Version:
Steel grade 8.8, black or electro zinc-plated.
Steel grade 10.9, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07175-106X20 (include length L)

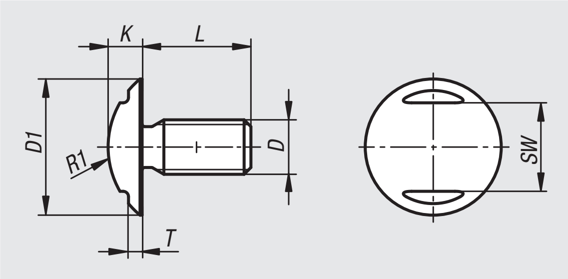
Note:
Contrary to DIN EN ISO 10642, the following screw lengths are thread up to the head:
By M4 from L = 25
By M5 from L = 30
By M6 from L = 30
By M8 from L = 35
By M10 from L = 40
By M12 from L = 45
By M16 from L = 60

Order No. steel Grade 8.8	**Order No. steel Grade 10.9**	Main colour	D	L	D1	K	T	SW
07175-04X	**07175-304X**	black	M4	10/12/16/20/25	8	2,3	1,8	2,5
07175-05X	**07175-305X**	black	M5	10/12/16/20/25/30	10	2,8	2,3	3
07175-06X	**07175-306X**	black	M6	10/12/16/20/25/30/35/40/45/50/60	12	3,3	2,5	4
07175-08X	**07175-308X**	black	M8	16/20/25/30/35/40/45/50/60	16	4,4	3,5	5
07175-10X	**07175-310X**	black	M10	16/20/25/30/35/40/45/50/60/70	20	5,5	4,4	6
07175-12X	**07175-312X**	black	M12	20/25/30/35/40/45/50/60/70/80	24	6,5	4,6	8
07175-16X	**07175-316X**	black	M16	30/35/40/45/50/60/70/80	30	7,5	5,3	10
07175-404X	**-**	-	M4	10/12/16/20/25	8	2,3	1,8	2,5
07175-405X	**-**	-	M5	10/12/16/20/25/30	10	2,8	2,3	3
07175-406X	**-**	-	M6	10/12/16/20/25/30/35/40/45/50/60	12	3,3	2,5	4
07175-408X	**-**	-	M8	16/20/25/30/35/40/45/50/60	16	4,4	3,5	5
07175-410X	**-**	-	M10	16/20/25/30/35/40/45/50/60/70	20	5,5	4,4	6
07175-412X	**-**	-	M12	20/25/30/35/40/45/50/60/70/80	24	6,5	4,6	8
07175-416X	**-**	-	M16	30/35/40/45/50/60/70/80	30	7,5	5,3	10

Order No.	Main material	D	L	K	T	D1	SW
07175-104X	stainless steel	M4	10/12/16/20/25	2,3	1,8	8	2,5
07175-105X	stainless steel	M5	10/12/16/20/25/30	2,8	2,3	10	3
07175-106X	stainless steel	M6	10/12/16/20/25/30/35/40/45/50/60	3,3	2,5	12	4
07175-108X	stainless steel	M8	16/20/25/30/35/40/45/50/60	4,4	3,5	16	5
07175-110X	stainless steel	M10	16/20/25/30/35/40/45/50/60/70	5,5	4,4	20	6
07175-112X	stainless steel	M12	20/25/30/35/40/45/50/60/70/80	6,5	4,6	24	8
07175-116X	stainless steel	M16	30/35/40/45/50/60/70/80	7,5	5,3	30	10

Ball head screw

in Hygienic DESIGN



Material:
Stainless steel 1.4404.

Version:
Polished.

Sample order:
nlm 07175-02-06X20 (include length L)

Note:
Ideal elements for fastening cladding panels, Plexiglas covers etc. The oversized flange and the thread undercut ensure a stress-free, uniform force distribution on the respective surfaces. Projecting edges are kept to a minimum by the head height being kept as low as possible. An open-end spanner is used to screw the fastener in.
The surface of the ball head screw is polished and, with regard to design optimised for the use in hygienic environments. The surface is polished to a surface finish of less than Ra 0.8 µm. Dirt and residue from products or cleaners seldom adheres and easy cleaning is ensured.

Ball head screw in Hygienic DESIGN

Order No.	D	D1	K	T	SW	R1	L
07175-02-03X	M3	8	2	0,6	5	5,2	6/8/10
07175-02-04X	M4	11	3	1	6	6,7	8/10/12
07175-02-05X	M5	14	4	1	8	8,6	10/12/16
07175-02-06X	M6	17	5	1,5	10	10	12/16/20
07175-02-08X	M8	20	5	1,5	13	13	16/20/25
07175-02-10X	M10	22	6	1,5	15	13,5	20/25/30
07175-02-12X	M12	27	7,5	1,5	19	16,3	25/30/35
07175-02-16X	M16	36	9	1,5	24	23	30/35/40

Notes

Eye bolts

DIN 444, Form B

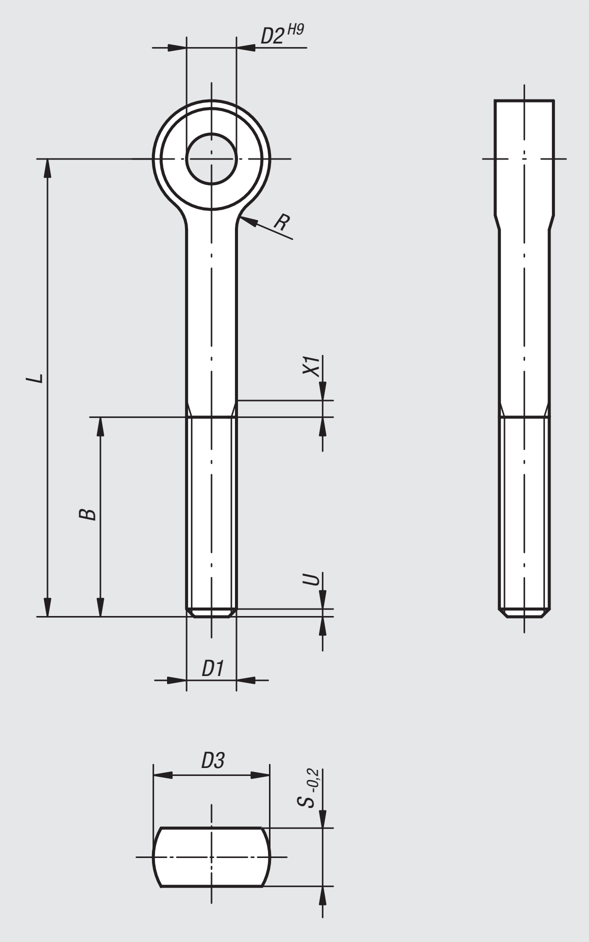
Material:
Steel, grade 8.8 or stainless steel.

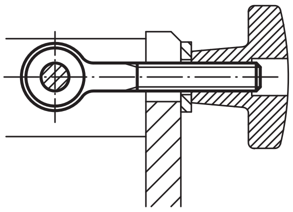
Version:
Steel black oxidised.
Stainless steel bright.

Sample order:
nlm 07180-12100

Note:
Suitable hinge pin, see 04250.

Drawing reference:
U = max. 2 P (incomplete thread)
X1 = to DIN 76 part 1

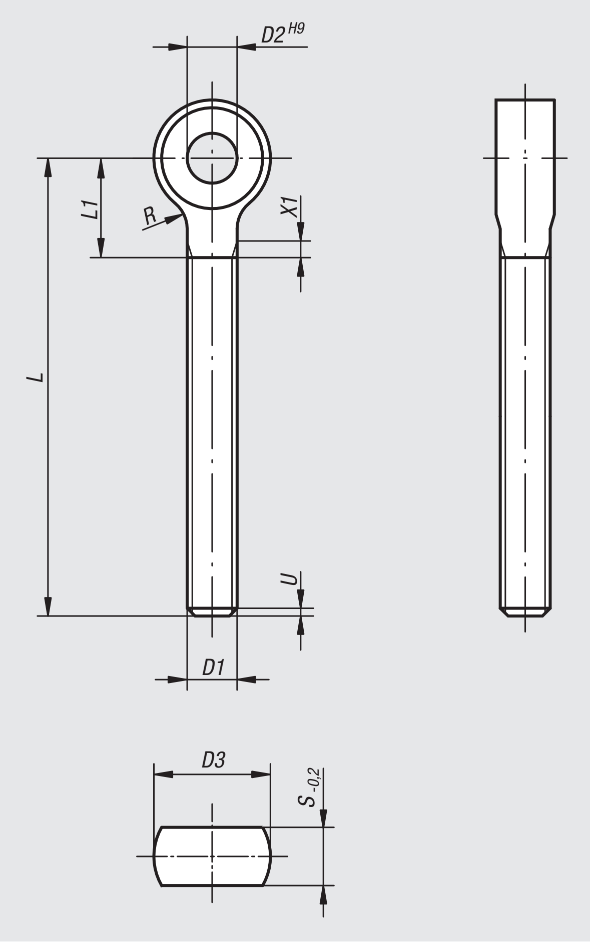




Order No. steel 8.8	Order No. stainless steel	B	D1	D2	D3	L	R	S
07180-0550	**07180-10550**	16	M5	5	12	50	2,5	6
07180-0575	**-**	16	M5	5	12	75	2,5	6
07180-0650	**07180-10650**	18	M6	6	14	50	4	7
07180-0675	**07180-10675**	18	M6	6	14	75	4	7
07180-0850	**07180-10850**	22	M8	8	18	50	4	9
07180-0875	**07180-10875**	22	M8	8	18	75	4	9
07180-1075	**07180-11075**	26	M10	10	20	75	4	12
07180-10100	**07180-110100**	26	M10	10	20	100	4	12
07180-1275	**07180-11275**	30	M12	12	25	75	6	14
07180-12100	**07180-112100**	30	M12	12	25	100	6	14
07180-12120	**07180-112120**	30	M12	12	25	120	6	14
07180-12130	**07180-112130**	36	M12	12	25	130	6	14
07180-1475	**07180-11475**	36	M14	14	28	75	6	16
07180-14130	**07180-114130**	36	M14	14	28	130	6	16
07180-16130	**07180-116130**	44	M16	16	32	130	6	17
07180-20140	**07180-120140**	52	M20	18	40	140	6	22

Eye bolts DIN 444, Form B

with long thread



Material:
Steel or 1.4305 stainless steel

Version:
Steel grade 8.8, black oxidised.
Stainless steel bright.

Sample order:
nlm 07181-0650

Note:
Eye bolts with thread up to the eye.
Suitable hinge pin, see 04250.

Drawing reference:
U = max. 2 P (incomplete thread)
X1 = to DIN 76 part 1

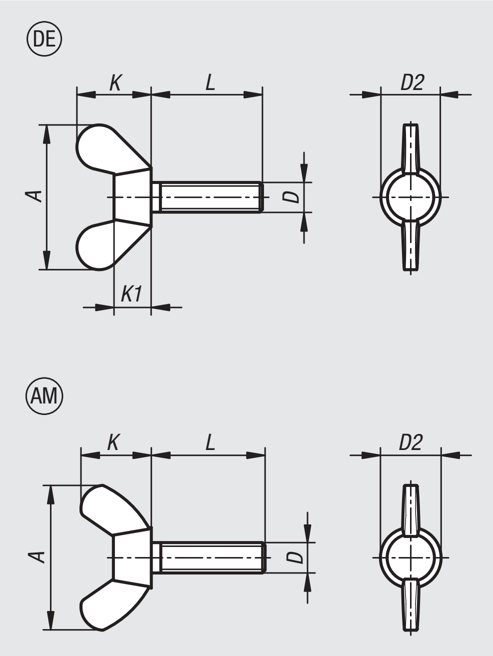
Eye bolts DIN 444, Form B

with long thread

Order No. steel	Order No. stainless steel	D1	D2	D3	L	L1 max.	R	S
07181-0650	**07181-10650**	M6	6	14	50	14	4	7
07181-0660	**07181-10660**	M6	6	14	60	14	4	7
07181-0670	**07181-10670**	M6	6	14	70	14	4	7
07181-0680	**07181-10680**	M6	6	14	80	14	4	7
07181-0850	**07181-10850**	M8	8	18	50	16	4	9
07181-0860	**07181-10860**	M8	8	18	60	16	4	9
07181-0870	**07181-10870**	M8	8	18	70	16	4	9
07181-0880	**07181-10880**	M8	8	18	80	16	4	9
07181-08100	**07181-108100**	M8	8	18	100	16	4	9
07181-1050	**07181-11050**	M10	10	20	50	18	4	12
07181-1060	**07181-11060**	M10	10	20	60	18	4	12
07181-1070	**07181-11070**	M10	10	20	70	18	4	12
07181-1080	**07181-11080**	M10	10	20	80	18	4	12
07181-10100	**07181-110100**	M10	10	20	100	18	4	12
07181-10120	**07181-110120**	M10	10	20	120	18	4	12
07181-1250	**07181-11250**	M12	12	25	50	23	6	14
07181-1260	**07181-11260**	M12	12	25	60	23	6	14
07181-1270	**07181-11270**	M12	12	25	70	23	6	14
07181-1280	**07181-11280**	M12	12	25	80	23	6	14
07181-12100	**07181-112100**	M12	12	25	100	23	6	14
07181-12120	**07181-112120**	M12	12	25	120	23	6	14
07181-12130	**07181-112130**	M12	12	25	130	23	6	14
07181-1670	**07181-11670**	M16	16	32	70	27	6	17
07181-1680	**07181-11680**	M16	16	32	80	27	6	17
07181-16100	**07181-116100**	M16	16	32	100	27	6	17
07181-16120	**07181-116120**	M16	16	32	120	27	6	17
07181-16140	**07181-116140**	M16	16	32	140	27	6	17
07181-16160	**07181-116160**	M16	16	32	160	27	6	17
07181-20100	**07181-120100**	M20	18	40	100	32	6	22
07181-20120	**07181-120120**	M20	18	40	120	32	6	22
07181-20140	**07181-120140**	M20	18	40	140	32	6	22
07181-20160	**07181-120160**	M20	18	40	160	32	6	22
07181-24160	-	M24	22	45	160	40	10	25
07181-24240	-	M24	22	45	240	40	10	25

07199

Wing screws



Material:
Steel (German type: malleable iron head, steel shaft) min. grade 4.6 or stainless steel (A 2).

Version:
Electro zinc-plated steel.
Bright stainless steel.

Sample order:
nlm 07199-104X8 (include length L)

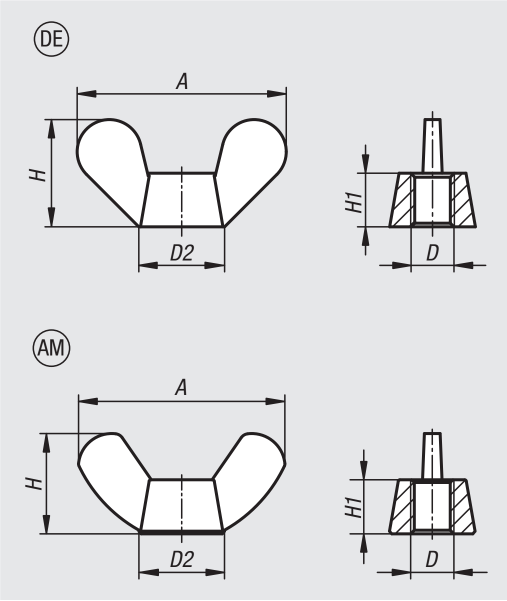
Note:
The wing screws can be tightened and (generally) loosened by hand.

Drawing reference:
DE = German style similar to DIN 316
AM = US style

Order No.	Form	Main material	D	L	A max.	D2 max.	K	K1
07199-104X	DE	steel	M4	8/10/12/16/20/25/30	20	7	9,5	3,9
07199-105X	DE	steel	M5	10/12/16/20/25/30/35/40/50	25	9,5	12	5,3
07199-106X	DE	steel	M6	10/12/16/20/25/30/35/40/50	31,5	11,5	16	6,5
07199-108X	DE	steel	M8	10/12/16/20/25/30/35/40/50/60	37	14,5	19	8,3
07199-110X	DE	steel	M10	16/20/25/30/35/40/50/60/70	49,5	18,5	24	10
07199-112X	DE	steel	M12	16/20/25/30/40/50/60/70/80	63,5	21,5	32,3	12

Order No.	Form	Main material	D	L	A max.	D2 max.	K
07199-204X	AM	steel	M4	10/12/15/20/25/30	22	9,5	10,5
07199-205X	AM	steel	M5	10/12/15/20/25/30/35/40	22	9,5	10,5
07199-206X	AM	steel	M6	10/12/15/20/25/30/35/40/50	26,8	11,9	12,9
07199-208X	AM	steel	M8	10/12/15/20/25/30/35/40/45/50/60	30,3	13,5	14,8
07199-210X	AM	steel	M10	15/20/25/30/35/40/50/60	35,3	15,3	17,3
07199-212X	AM	steel	M12	20/25/30/35/40/50/60	47,5	20,5	22,5
07199-1204X	AM	stainless steel	M4	10/12/16/20/25/30	22	9,5	10,5
07199-1205X	AM	stainless steel	M5	10/12/16/20/25/30/35/40	22	9,5	10,5
07199-1206X	AM	stainless steel	M6	10/12/16/20/25/30/35/40/45/50	26,8	11,9	12,9
07199-1208X	AM	stainless steel	M8	10/12/16/20/25/30/35/40/45/50/60	30,3	13,5	14,8
07199-1210X	AM	stainless steel	M10	16/20/25/30/35/40/45/50/60	35,3	15,3	17,3

Wing nuts



Material:
Steel (German type from M12 malleable iron) or stainless steel (A 2).

Version:
Steel and malleable iron electro zinc-plated.
Stainless steel bright.

Sample order:
nlm 07200-104

Note:
The wing nuts can be tightened and (generally) loosened tool-free.

Drawing reference:
DE = German style similar to DIN 315
AM = US style

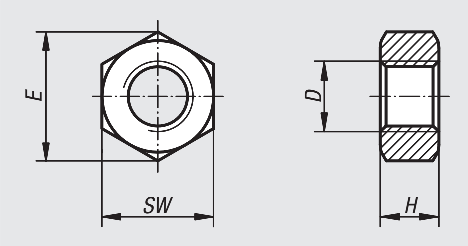
Order No. steel	Order No. malleable iron	Order No. stainless steel	Form	D	A max.	D2 max.	H	H1
07200-104	-	**07200-1104**	DE	M4	20	8	10,5	4,6
07200-105	-	**07200-1105**	DE	M5	26	11	13	6,5
07200-106	-	**07200-1106**	DE	M6	33	13	17	8
07200-108	-	**07200-1108**	DE	M8	39	16	20	10
07200-110	-	**07200-1110**	DE	M10	51	20	25	12
-	**07200-112**	**07200-1112**	DE	M12	65	23	33,5	14
-	**07200-116**	**07200-1116**	DE	M16	73	29	37,5	17
-	**07200-120**	**07200-1120**	DE	M20	90	35	46,5	21

Order No. steel	Order No. stainless steel	Form	A max.	D	D2 max.	H	H1
07200-204	**07200-1204**	AM	18,5	M4	8	8,8	3
07200-205	**07200-1205**	AM	22	M5	11	10,5	4
07200-206	**07200-1206**	AM	26,8	M6	13	12,9	4,9
07200-208	**07200-1208**	AM	30,3	M8	14	14,8	5,4
07200-210	**07200-1210**	AM	35,3	M10	16,5	17,3	6,3
07200-212	**07200-1212**	AM	47,5	M12	22,5	22,5	7,9

07210

Hexagon nuts

DIN 934/DIN EN ISO 4032/DIN EN 24032



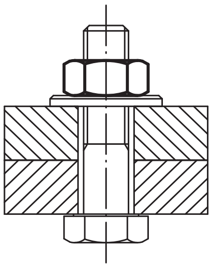
Material:
Steel or stainless steel (A 2)

Version:
Steel grade 8, bright or electro zinc-plated.
Steel grade 10, bright or electro zinc-plated.
Steel grade 12, bright.
Stainless steel A 2-70, bright.

Sample order:
nlm 07210-10

Note:
The nut grade must always be the same or higher than the bolt grade, i.e. bolts with grade 8.8 are always paired with nuts grade 8 or higher, but never less.

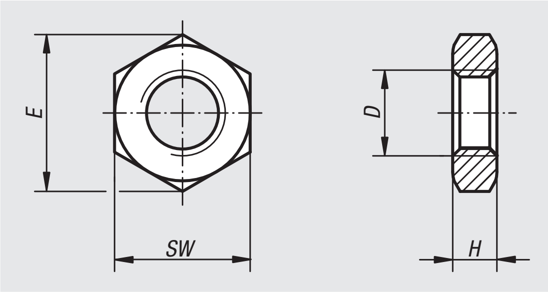
On request:
DIN ISO 272 spanner sizes.



Order No. steel Grade 8	Order No. steel Grade 10	Order No. steel Grade 12	Order No. stainless steel Grade 70	Surface finish body	D	E	H	SW
07210-03	**07210-403**	-	**07210-103**	bright	M3	6,01	2,4	5,5
07210-04	**07210-404**	-	**07210-104**	bright	M4	7,66	3,2	7
07210-05	**07210-405**	-	**07210-105**	bright	M5	8,79	4	8
07210-06	**07210-406**	**07210-506**	**07210-106**	bright	M6	11,05	5	10
07210-08	**07210-408**	**07210-508**	**07210-108**	bright	M8	14,38	6,5	13
07210-10	**07210-410**	**07210-510**	**07210-110**	bright	M10	18,9	8	17
07210-12	**07210-412**	**07210-512**	**07210-112**	bright	M12	21,1	10	19
07210-14	**07210-414**	-	**07210-114**	bright	M14	23,9	11	22
07210-16	**07210-416**	**07210-516**	**07210-116**	bright	M16	26,76	13	24
07210-20	**07210-420**	**07210-520**	**07210-120**	bright	M20	32,95	16	30
07210-22	**07210-422**	-	**07210-122**	bright	M22	35	18	32
07210-24	**07210-424**	**07210-524**	**07210-124**	bright	M24	39,6	19	36
07210-27	**07210-427**	**07210-527**	**07210-127**	bright	M27	45,2	22	41
07210-30	**07210-430**	**07210-530**	**07210-130**	bright	M30	50,9	24	46
07210-33	**07210-433**	-	**07210-133**	bright	M33	55,4	26	50
07210-36	**07210-436**	**07210-536**	**07210-136**	bright	M36	60,8	29	55
07210-203	-	-	-	galvanized	M3	6,01	2,4	5,5
07210-204	**07210-304**	-	-	galvanized	M4	7,66	3,2	7
07210-205	**07210-305**	-	-	galvanized	M5	8,79	4	8
07210-206	**07210-306**	-	-	galvanized	M6	11,05	5	10
07210-208	**07210-308**	-	-	galvanized	M8	14,38	6,5	13
07210-210	**07210-310**	-	-	galvanized	M10	18,9	8	17
07210-212	**07210-312**	-	-	galvanized	M12	21,1	10	19
07210-214	**07210-314**	-	-	galvanized	M14	23,9	11	22
07210-216	**07210-316**	-	-	galvanized	M16	26,76	13	24
07210-220	**07210-320**	-	-	galvanized	M20	32,95	16	30
07210-222	**07210-322**	-	-	galvanized	M22	35	18	32
07210-224	**07210-324**	-	-	galvanized	M24	39,6	19	36
07210-227	**07210-327**	-	-	galvanized	M27	45,2	22	41
07210-230	**07210-330**	-	-	galvanized	M30	50,9	24	46
07210-233	**07210-333**	-	-	galvanized	M33	55,4	26	50
07210-236	**07210-336**	-	-	galvanized	M36	60,8	29	55

Hexagon nuts

thin type DIN 439



Material:
Steel or stainless steel (A 2)

Version:
Steel grade 04, electro zinc-plated or black oxidised.
Stainless steel A2, bright.

Sample order:
nlm 07212-10

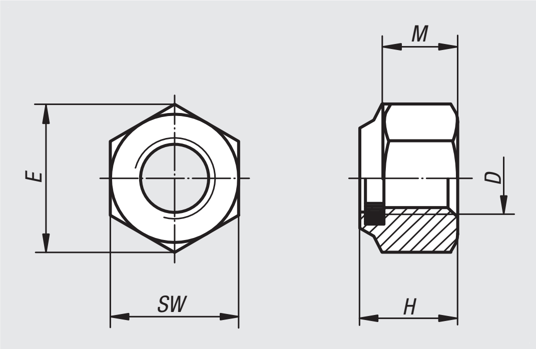
Note:
These hexagon nuts are used in screw connections exposed to limited loads, e.g. as a locknut for clevis joints or rod ends.

Order No. steel galvanised	Order No. stainless steel bright	Order No. steel black oxidised	Version 2	D	E	H	SW
07212-05	**07212-105**	**07212-205**	RH thread	M5	8,79	2,7	8
07212-06	**07212-106**	**07212-206**	RH thread	M6	11,05	3,2	10
07212-006	**07212-1062**	**07212-2063**	RH thread	M6x0,75	11,05	3,2	10
07212-08	**07212-108**	**07212-208**	RH thread	M8	14,38	4	13
07212-008	**07212-1083**	**07212-2083**	RH thread	M8x1	14,38	4	13
07212-10	**07212-110**	**07212-210**	RH thread	M10	18,9	5	17
07212-103	**07212-1103**	**07212-2103**	RH thread	M10x1	18,9	5	17
07212-104	**07212-1104**	-	RH thread	M10x1,25	18,9	5	17
07212-12	**07212-112**	**07212-212**	RH thread	M12	21,1	6	19
07212-123	**07212-1123**	-	RH thread	M12x1,25	21,1	6	19
07212-124	**07212-1124**	**07212-2124**	RH thread	M12x1,5	21,1	6	19
07212-14	**07212-114**	-	RH thread	M14	24,49	7	22
07212-16	**07212-116**	**07212-216**	RH thread	M16	26,76	8	24
07212-163	**07212-1163**	**07212-2163**	RH thread	M16x1,5	26,76	8	24
07212-183	-	-	RH thread	M18x1,5	29,56	9	27
07212-20	**07212-120**	-	RH thread	M20	32,95	10	30
07212-203	**07212-1203**	**07212-2203**	RH thread	M20x1,5	32,95	10	30
07212-223	**07212-1223**	-	RH thread	M22x1,5	36,9	10	32
07212-24	**07212-1244**	-	RH thread	M24	39,55	12	36
-	**07212-1243**	**07212-2243**	RH thread	M24x2	39,6	12	36
07212-30	-	-	RH thread	M30	50,85	15	46
07212-061	**07212-1061**	-	LH thread	M6	11,05	3,2	10
07212-081	**07212-1081**	-	LH thread	M8	14,38	4	13
07212-101	**07212-1101**	-	LH thread	M10	18,9	5	17
07212-1031	**07212-11031**	-	LH thread	M10x1	18,9	5	17
07212-1041	**07212-11041**	-	LH thread	M10x1,25	18,9	5	17
07212-121	**07212-1121**	-	LH thread	M12	21,1	6	19
07212-1231	**07212-11231**	-	LH thread	M12x1,25	21,1	6	19
07212-1241	**07212-11241**	-	LH thread	M12x1,5	21,1	6	19
07212-161	**07212-1161**	-	LH thread	M16	26,76	8	24
07212-2031	**07212-12031**	-	LH thread	M20x1,5	32,95	10	30
07212-2231	**07212-12231**	-	LH thread	M22x1,5	36,9	10	32

07213

Hexagon nuts with polyamide thread lock

high type, DIN 982 / stainless steel similar to DIN 982



Material:
Steel or stainless steel (A 2)

Version:
Electro zinc-plated steel.
Bright stainless steel.

Sample order:
nlm 07213-204

Note:
When screwing the nuts onto the thread, the thread lock is plastically and elastically deformed. The elastic deformation causes a radial frictional lock against the nuts being loosened.

The plastic thread lock is only effective when the nuts are fully screwed onto the male thread. The screw length must be selected so that at least two full threads protrude from the nut.

Due to the plastic deformation of the thread lock, these nuts should only be used once.

Temperature range:
-50°C to +120°C.

Order No.	Main material	DIN	Grade	D	E	H	M	SW
07213-204	steel	DIN 982	6-8	M4	7,66	6	2,9	7
07213-205	steel	DIN 982	8	M5	8,79	6,3	4,4	8
07213-206	steel	DIN 982	8	M6	11,05	8	4,9	10
07213-208	steel	DIN 982	8	M8	14,38	9,5	6,44	13
07213-210	steel	DIN 982	8	M10	18,9	11,5	8,04	17
07213-212	steel	DIN 982	8	M12	21,1	14	10,37	19
07213-214	steel	DIN 982	8	M14	23,9	16	12,1	22
07213-216	steel	DIN 982	8	M16	26,76	18	14,1	24
07213-220	steel	DIN 982	8	M20	32,95	22	16,9	30
07213-224	steel	DIN 982	8	M24	39,55	28	20,2	36
07213-310	steel	DIN 982	10	M10	18,9	11,5	8,04	17
07213-312	steel	DIN 982	10	M12	21,1	14	10,37	19
07213-316	steel	DIN 982	10	M16	26,76	18	14,1	24
07213-320	steel	DIN 982	10	M20	32,95	22	16,9	30
07213-324	steel	DIN 982	10	M24	39,55	28	20,2	36
07213-105	stainless steel	similar to DIN 982	-	M5	8,79	6,3	4,4	8
07213-106	stainless steel	similar to DIN 982	-	M6	11,05	8	4,9	10
07213-108	stainless steel	similar to DIN 982	-	M8	14,38	9,5	6,44	13
07213-110	stainless steel	similar to DIN 982	-	M10	18,9	11,5	8,04	17
07213-112	stainless steel	similar to DIN 982	-	M12	21,1	14	10,37	19
07213-116	stainless steel	similar to DIN 982	-	M16	26,76	18	14,1	24
07213-120	stainless steel	similar to DIN 982	-	M20	32,95	22	16,9	30

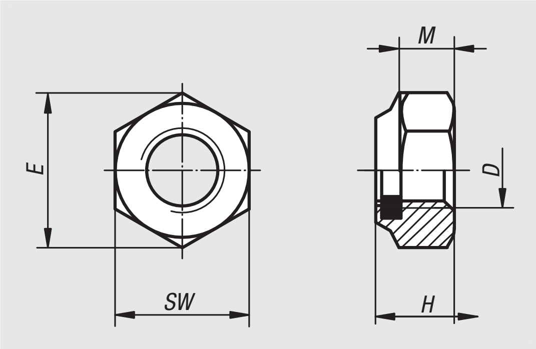
Hexagon nuts with polyamide thread lock

thin type, DIN 985

Material:
Steel or stainless steel (A 2)

Version:
Electro zinc-plated steel.
Bright stainless steel.

Sample order:
nlm 07214-203



Note:
When screwing the nuts onto the thread, the thread lock is plastically and elastically deformed. The elastic deformation causes a radial frictional lock against the nuts being loosened.

The plastic thread lock is only effective when the nuts are fully screwed onto the male thread. The screw length must be selected so that at least two full threads protrude from the nut.

Due to the plastic deformation of the thread lock, these nuts should only be used once.

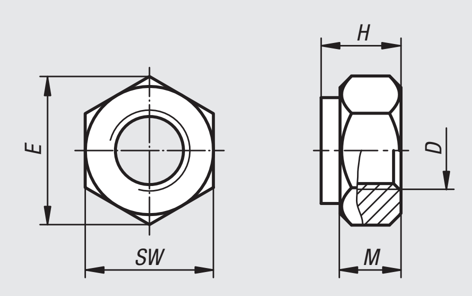
Temperature range:
-50°C to +120°C.

Order No. steel Grade 6-8	Order No. steel Grade 8	Order No. steel Grade 10	D	E	H	M	SW
07214-203	-	-	M3	6,08	4	2,4	5,5
07214-204	-	-	M4	7,66	5	2,9	7
07214-205	-	-	M5	8,79	5	3,2	8
-	**07214-206**	**07214-306**	M6	11,05	6	4	10
-	**07214-208**	**07214-308**	M8	14,38	8	5,5	13
-	**07214-210**	**07214-310**	M10	18,9	10	6,5	17
-	**07214-212**	**07214-312**	M12	21,1	12	8	19
-	**07214-214**	**07214-314**	M14	23,9	14	9,5	22
-	**07214-216**	**07214-316**	M16	26,76	16	10,5	24
-	**07214-220**	**07214-320**	M20	32,95	20	14	30
-	**07214-224**	-	M24	39,55	24	15	36
-	**07214-227**	**07214-327**	M27	45,2	27	17	41
-	**07214-230**	**07214-330**	M30	50,85	30	19	46
-	-	**07214-324**	M24	35	24	15	36

Order No.	Main material	D	E	H	M	SW
07214-103	stainless steel	M3	6,08	4	2,4	5,5
07214-104	stainless steel	M4	7,66	5	2,9	7
07214-105	stainless steel	M5	8,79	5	3,2	8
07214-106	stainless steel	M6	11,05	6	4	10
07214-108	stainless steel	M8	14,38	8	5,5	13
07214-110	stainless steel	M10	18,9	10	6,5	17
07214-112	stainless steel	M12	21,1	12	8	19
07214-114	stainless steel	M14	23,9	14	9,5	22
07214-116	stainless steel	M16	26,76	16	10,5	24
07214-120	stainless steel	M20	32,95	20	14	30
07214-124	stainless steel	M24	39,55	24	15	36
07214-127	stainless steel	M27	45,2	27	17	41
07214-130	stainless steel	M30	50,85	30	19	46

Hexagon nuts with thread lock

DIN 980



Material:
Steel or stainless steel (A 2)

Version:
Electro zinc-plated steel.
Bright stainless steel.

Sample order:
nlm 07215-204

Note:
Hexagon nuts with thread lock DIN 980, Form V (all-metal nut, one piece).

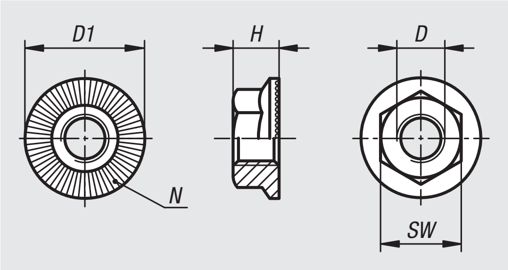
Order No. steel Grade 8	Order No. steel Grade 10	D	E	H	M	SW
07215-204	**-**	M4	7,66	4,2	2,2	7
07215-205	**-**	M5	8,79	5,1	2,75	8
07215-206	**-**	M6	11,05	6	3,3	10
07215-208	**07215-308**	M8	14,38	8	4,4	13
07215-210	**07215-310**	M10	18,9	10	5,5	17
07215-212	**07215-312**	M12	21,1	12	6,6	19
07215-214	**07215-314**	M14	23,9	14	7,7	22
07215-216	**07215-316**	M16	26,76	16	8,8	24
07215-220	**07215-320**	M20	32,95	20	11	30
07215-224	**07215-324**	M24	39,55/35	24	13,2	36
07215-227	**07215-327**	M27	45,2	27	14,8	41
07215-230	**07215-330**	M30	50,85	30	16,5	46

Order No.	Main material	D	E	H	M	SW
07215-104	stainless steel	M4	7,66	4,2	2,2	7
07215-105	stainless steel	M5	8,79	5,1	2,75	8
07215-106	stainless steel	M6	11,05	6	3,3	10
07215-108	stainless steel	M8	14,38	8	4,4	13
07215-110	stainless steel	M10	18,9	10	5,5	17
07215-112	stainless steel	M12	21,1	12	6,6	19
07215-114	stainless steel	M14	23,9	14	7,7	22
07215-116	stainless steel	M16	26,76	16	8,8	24
07215-120	stainless steel	M20	32,95	20	11	30
07215-124	stainless steel	M24	39,55	24	13,2	36

07216

Hexagon nut

with serrated flange



Material:
Steel.

Version:
Bright or electro zinc-plated.
Surface hardened min. 550 HV.

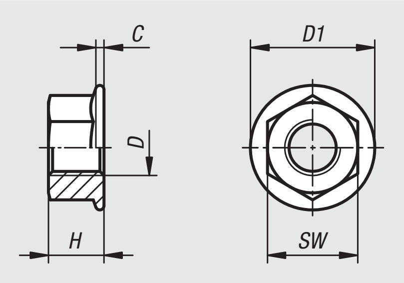
Sample order:
nlm 07216-405

Note:
The serrations bite into the contact face resulting in a positive locking connection that prevents self-loosening. Can be re-used several times.

Order No.	Grade	Surface finish body	D	D1	H	SW	N (number)
07216-405	10	bright	M5	11,2	4,3	8	28
07216-406	10	bright	M6	14,2	5,5	10	36
07216-408	10	bright	M8	18,2	7	13	48
07216-410	10	bright	M10	21	8,5	15	48
07216-412	10	bright	M12	24	10	17	60
07216-416	10	bright	M16	31	14	22	72
07216-305	10	galvanised	M5	11,2	4,3	8	28
07216-306	10	galvanised	M6	14,2	5,5	10	36
07216-308	10	galvanised	M8	18,2	7	13	48
07216-310	10	galvanised	M10	21	8,5	15	48
07216-312	10	galvanised	M12	24	10	17	60
07216-316	10	galvanised	M16	31	14	22	72

Hexagon nuts with flange

EN 1661



Material:
Steel or stainless steel (A 2)

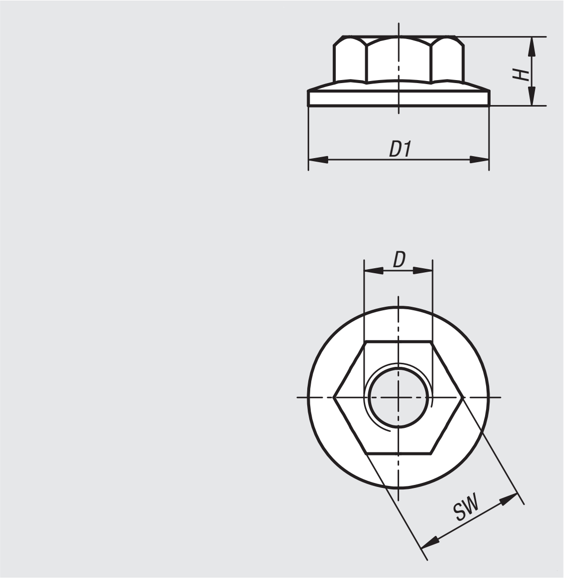
Version:
Steel grade 8, electro zinc-plated.
Bright stainless steel.

Sample order:
nlm 07217-204

Order No. steel	Order No. stainless steel	D	D1	C	H	SW
07217-204	**07217-104**	M4	10	0,9	4,65	7
07217-205	**07217-105**	M5	11,8	1	5	8
07217-206	**07217-106**	M6	14,2	1,1	6	10
07217-208	**07217-108**	M8	17,9	1,2	8	13
07217-210	**07217-110**	M10	21,8	1,5	10	15
07217-212	**07217-112**	M12	26	1,8	12	18
07217-216	**-**	M16	34,5	2,4	16	24
07217-220	**-**	M20	42,8	3	20	30

07218

Hexagon nuts with flange



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07218-08

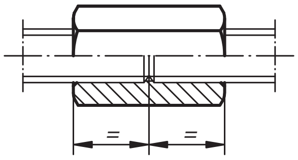
Note:
Nut with a large collar. Ideal together with a hammer-head screw.

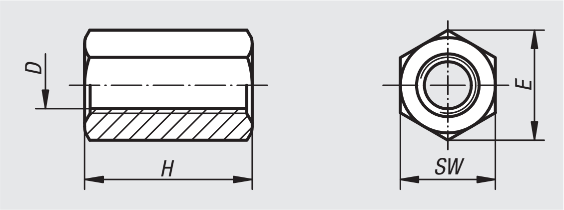
Order No.	Type	Slot width	D	D1	H	SW
07218-08	B	10	M8	21	8	13

07220

Extension nuts

height 3xD





Material:
Carbon steel.

Version:
Steel grade 10, black oxidised.

Sample order:
nlm 07220-16

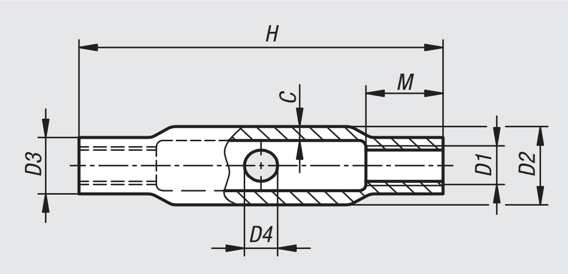
Note:
For functional and safety reasons screws should be screwed into a maximum of half the nut height from both sides. Minimum thread depth 1x diameter.

On request:
DIN ISO 272 spanner sizes.

Order No.	D	H = 3 x D	SW	E
07220-06	M6	18	10	11,5
07220-08	M8	24	13	15
07220-10	M10	30	17	19,6
07220-12	M12	36	19	21,9
07220-14	M14	42	22	25,4
07220-16	M16	48	24	27,7
07220-18	M18	54	27	31,2
07220-20	M20	60	30	34,6
07220-22	M22	66	32	36,9
07220-24	M24	72	36	41,6
07220-27	M27	81	41	47,3
07220-30	M30	90	46	53,1
07220-36	M36	108	55	63,5

Turnbuckle nuts

steel tube, closed form DIN 1478



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07221-06

Note:
These steel tube turnbuckle nuts are closed form and have a RH thread one end and LH thread other end.

The turnbuckle nuts conform with the German BRL (A) and bear the Ü symbol (ÜZ – Certificate of conformity from a recognised certification authority).

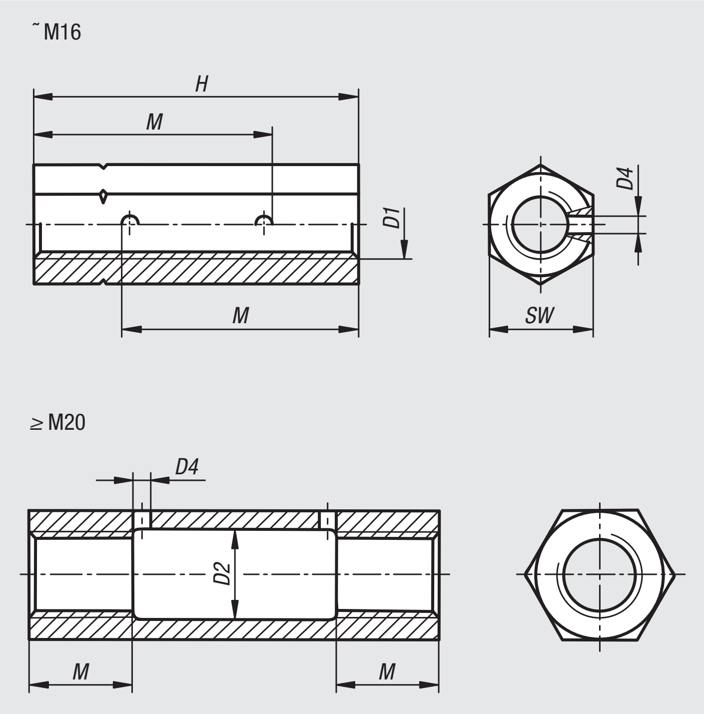
The core Ø of the female thread may be slightly larger than standard, this does not effect the function.

Order No.	C	D1	D2	D3	D4	H	M	Load capacity N
07221-08	3,6	M8	17,2	12	8	110	10	10000
07221-10	4	M10	21,3	15	8	125	12	16000
07221-12	4	M12	25	18	10	125	15	24000
07221-16	4,5	M16	30	22,5	10	170	20	44000
07221-20	5	M20	33,7	27	12	200	24	69000
07221-24	5,6	M24	42,4	32	12	255	29	100000
07221-30	6,3	M30	51	38	16	255	36	158000

07222

Turnbuckle nuts

hexagonal DIN 1479



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 07222-06

Note:
Turnbuckle nuts with hexagon. RH thread one end LH thread other end.

The turnbuckle nuts correspond to the specifications of the German Construction Products List (BRL) A and bear the Ü symbol (ÜZ – Certificate of compliance awarded by a recognised certification provider).

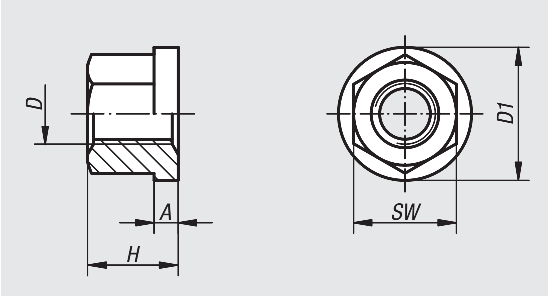
The core Ø of the female thread may be slightly larger, this does not affect the function.

Order No.	D1	D2	D4	H	M	SW	Load capacity N
07222-06	M6	-	4	30	22,5	10	3900
07222-08	M8	-	4	35	25	13	7200
07222-10	M10	-	4	45	33	17	11400
07222-12	M12	-	4	55	40	19	16500
07222-16	M16	-	4	75	55	24	30700
07222-20	M20	21	4	95	24	30	48000
07222-24	M24	26	4	115	29	36	69000
07222-30	M30	32	4	125	36	46	110000

07240

Hexagon nuts with collar

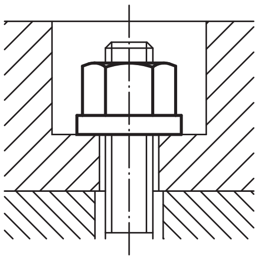
height 1.5xD, DIN 6331 enhanced



Material:
High-carbon steel, stainless steel 1.4301 or 1.4401.

Version:
Steel grade 10, black.
Stainless steel bright.

Sample order:
nlm 07240-16

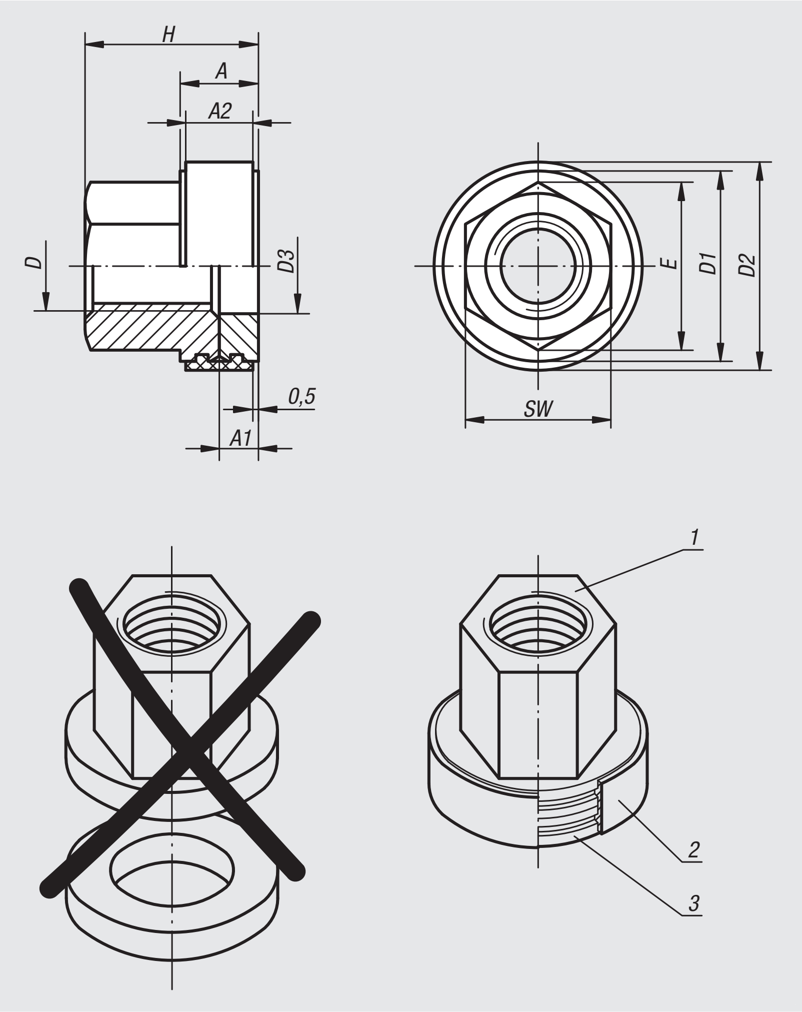


Order No. high carbon steel -	Order No. stainless steel 1.4301	Order No. stainless steel 1.4401	D	H = 1,5 x D	A	D1	SW
07240-05	**-**	**-**	M5	7,5	2	12	9
07240-06	**07240-806**	**-**	M6	9	3	14	10
07240-08	**07240-808**	**07240-908**	M8	12	3,5	18	13
07240-10	**07240-810**	**-**	M10	15	4	22	16
07240-101	**07240-811**	**07240-910**	M10	15	4	22	17
07240-12	**07240-812**	**-**	M12	18	4	25	18
07240-121	**07240-8121**	**07240-912**	M12	18	4	25	19
07240-14	**-**	**-**	M14	21	4,5	28	22
07240-16	**07240-816**	**07240-916**	M16	24	5	31	24
07240-18	**-**	**-**	M18	27	5	34	27
07240-20	**07240-820**	**07240-920**	M20	30	6	37	30
07240-22	**-**	**-**	M22	33	6	40	34
07240-24	**-**	**-**	M24	36	6	45	36
07240-30	**-**	**-**	M30	45	8	58	46
07240-36	**-**	**-**	M36	54	10	68	55

07242

Hexagon nuts

with no-loss washer



Material:
Hex nut and washer carbon steel.
Retaining ring PA 6 black.

Version:
Hexagonal nut and washer tempered, black oxidised.
Hexagonal nut grade 10.

Sample order:
nlm 07242-12

Advantages:
We bring together what belongs together. A nut and washer in a single unit.
- A compact unit.
- The washer is permanently attached to the hexagonal nut by a retaining ring.
- Components such as expensive special claw clamps, clamping disks, flanges etc. are protected by the hex nut with washer. The reduced wear leads to cost advantages.
- Other cost advantages in procurement - a single ordering process where previously two were required.

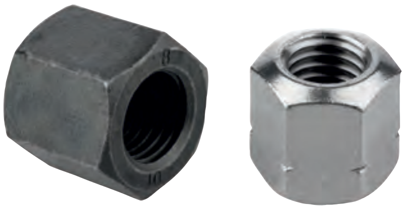
Drawing reference:
1) hexagonal nut
2) retaining ring
3) washer

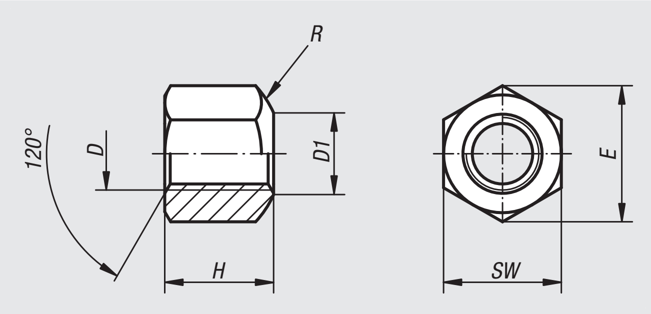
Order No.	D	A	A1	A2	D1	D2	D3	E	H	SW
07242-08	M8	7	3,5	6	17	18,6	8,5	15	15,5	13
07242-10	M10	8	4	7	21	22,7	10,5	18,5	19	16
07242-12	M12	8	4	7	24	25,7	12,5	20,8	22	18
07242-16	M16	10	5	9	30	32	16,5	27,7	29	24
07242-20	M20	12	6	11	36	38	20,5	34,6	36	30
07242-24	M24	12	6	11	44	46	24,5	41,6	42	36

07260

Hexagon nuts

height 1.5xD, DIN 6330 enhanced





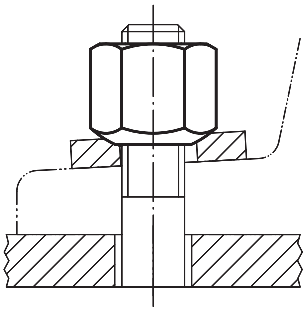
Material:
Carbon steel or stainless steel (A2).

Version:
Steel grade 10, black.
Stainless steel A 2-70, bright.

Sample order:
nlm 07260-12

Note:
These nuts can be used with spherical washers 07420 Form D and G.

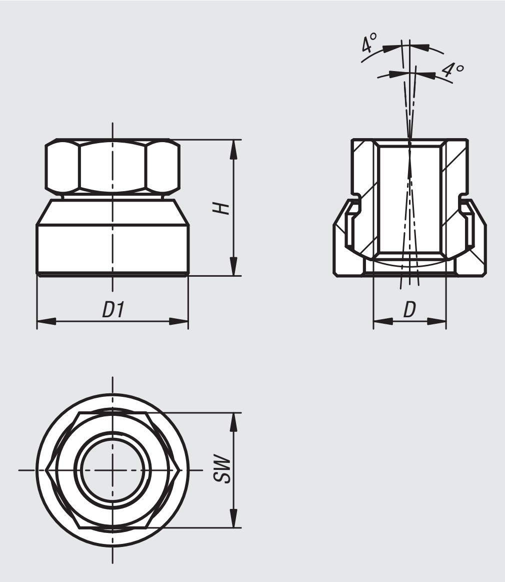
Features:
Form B: with spherical face one end



Order No.	Main material	D	H = 1,5 x D	D1	SW	E	R
07260-05	high carbon steel	M5	7,5	6,5	9	10,4	7
07260-06	high carbon steel	M6	9	7	10	11,5	9
07260-08	high carbon steel	M8	12	9	13	15	11
07260-10	high carbon steel	M10	15	11,5	16	18,4	15
07260-101	high carbon steel	M10	15	11,5	17	19,6	15
07260-12	high carbon steel	M12	18	14	18	20,7	17
07260-121	high carbon steel	M12	18	14	19	21,9	17
07260-14	high carbon steel	M14	21	16	22	25,4	20
07260-16	high carbon steel	M16	24	18	24	27,7	22
07260-18	high carbon steel	M18	27	20	27	31,2	24,5
07260-20	high carbon steel	M20	30	22	30	34,6	27
07260-22	high carbon steel	M22	33	24	32	36,9	29
07260-24	high carbon steel	M24	36	26	36	41,6	32
07260-30	high carbon steel	M30	45	32	46	53,1	41
07260-36	high carbon steel	M36	54	38	55	63,5	50
07260-806	stainless steel	M6	9	7	10	11,5	9
07260-808	stainless steel	M8	12	9	13	15	11
07260-810	stainless steel	M10	15	11,5	16	18,4	15
07260-811	stainless steel	M10	15	11,5	17	19,6	15
07260-812	stainless steel	M12	18	14	18	20,7	17
07260-816	stainless steel	M16	24	18	24	27,7	22
07260-820	stainless steel	M20	30	22	30	34,6	27

Hexagon nuts

with spherical seat

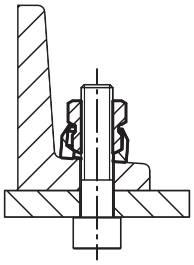


Material:
Carbon steel or stainless steel.

Version:
Steel version:
tempered to 900 N/mm², black oxidised.
Stainless steel version:
tempered to 900 N/mm², bright.

Sample order:
nlm 07265-12

Note:
Captive components (one-piece).

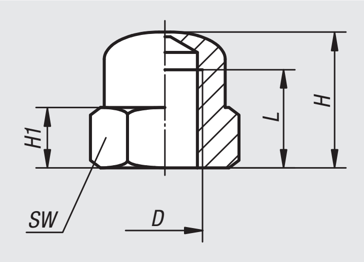


Order No.	Main material	D	D1	H	SW
07265-08	steel	M8	18	15	13
07265-10	steel	M10	22	18,5	17
07265-12	steel	M12	25	22,5	19
07265-16	steel	M16	31	29	24
07265-808	stainless steel	M8	18	15	13
07265-810	stainless steel	M10	22	18,5	17
07265-812	stainless steel	M12	25	22,5	19
07265-816	stainless steel	M16	31	29	24

07280

Hexagon domed cap nuts

similar to DIN 1587



Material:
Steel.

Version:
Steel grade 8, black oxidised.

Sample order:
nlm 07280-10

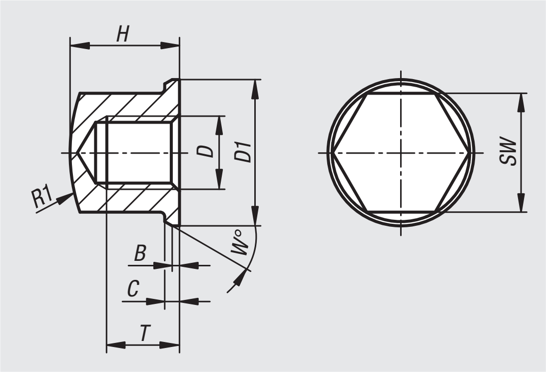
Order No.	D	H	H1	L	SW
07280-05	M5	10	4	6,5	9
07280-06	M6	12	5	8	10
07280-08	M8	15	6,5	11	13
07280-10	M10	18	8	13	17
07280-12	M12	22	10	16	19
07280-14	M14	25	11	18	22
07280-16	M16	28	13	21	24
07280-20	M20	34	16	26	30

Notes

07280-04

Cap nut compact

in Hygienic DESIGN



Material:
Stainless steel 1.4404.

Version:
Polished.

Sample order:
nlm 07280-04-08

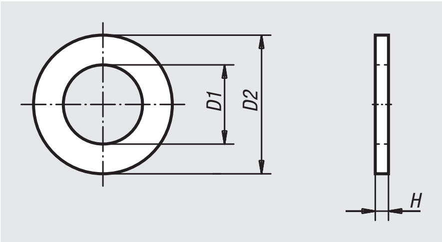
Note:
The surface of the cap nut is polished and, with regard to design optimised for the use in hygienic environments. The top of the nut is spherical and the collar has a conical formed top face. The nut has been designed as a low version so as to keep troublesome corners as few as possible. Due to the extremely high quality surface finish of much less than Ra 0.8 µm, hardly any dirt particles adhere to the surface.

On request:
Inch threads, high versions.

Order No.	D	D1	B	C	H	R1	SW	T	W
07280-04-03	M3	6,8	0,25	0,5	4,95	8,8	5,5	3	20
07280-04-04	M4	9	0,3	0,8	6,5	10	7	4	30
07280-04-05	M5	10	0,5	1	7	16	8	4	30
07280-04-06	M6	12	0,8	1	9	16	10	6	30
07280-04-08	M8	16	0,8	1,6	12	20	13	8	30
07280-04-10	M10	20	1	2	14	32	16	10	30
07280-04-12	M12	24	1	2,5	16	35	19	11	30

Washers

medium DIN EN ISO 7089 A



Material:
Steel 140 HV or stainless steel (A 2-70)

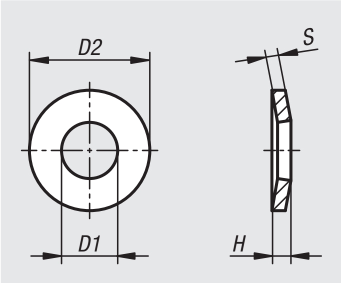
Version:
Bright.

Sample order:
nlm 07300-10

Order No. steel	Order No. stainless steel	for screws	D1	D2	H
07300-03	**07300-103**	M3	3,2	7	0,5
07300-04	**07300-104**	M4	4,3	9	0,8
07300-05	**07300-105**	M5	5,3	10	1
07300-06	**07300-106**	M6	6,4	12	1,6
07300-08	**07300-108**	M8	8,4	16	1,6
07300-10	**07300-110**	M10	10,5	20	2
07300-12	**07300-112**	M12	13	24	2,5
07300-14	**07300-114**	M14	15	28	2,5
07300-16	**07300-116**	M16	17	30	3
07300-20	**07300-120**	M20	21	37	3
07300-24	**07300-124**	M24	25	44	4
07300-30	**07300-130**	M30	31	56	4
07300-36	**07300-136**	M36	37	66	5

Conical spring washers

DIN 6796



Material:
Spring steel

Version:
Hardened, bright, oiled or mechanically galvanised.

Sample order:
nlm 07303-03

Note:
The special shape (formed like a disc spring) enables the conical spring washer to achieve a high spring effect. The spring force resulting from the flattening load washer amounts to 70–90% of the corresponding contact pressure of a screw of grade 8.8–10.9.

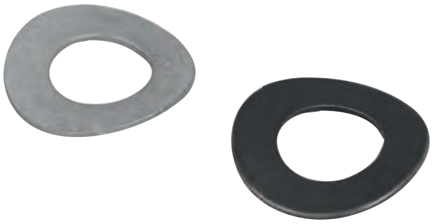
Conical spring washers are used to compensate for subsidence formation in screw connections and to prevent a loosening or unfastening of the connection. The locking effect is purely frictional.

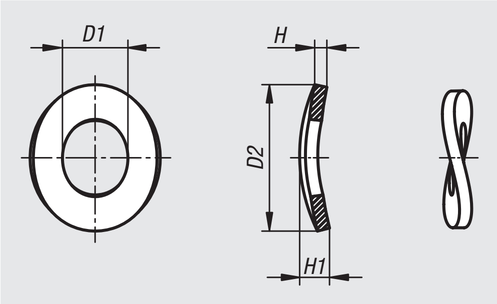
Order No. hardened, bright and oiled	Order No. passivated	for screws	D1	D2	H	S
07303-04	**07303-104**	M4	4,3	9	1,3	1
07303-05	**07303-105**	M5	5,3	11	1,55	1,2
07303-06	**07303-106**	M6	6,4	14	2	1,5
07303-08	**07303-108**	M8	8,4	18	2,6	2
07303-10	**07303-110**	M10	10,5	23	3,2	2,5
07303-12	**07303-112**	M12	13	29	3,95	3
07303-14	**07303-114**	M14	15	35	4,65	3,5
07303-16	**07303-116**	M16	17	39	5,25	4
07303-18	**07303-118**	M18	19	42	5,8	4,5
07303-20	**07303-120**	M20	21	45	6,4	5
07303-22	**07303-122**	M22	23	49	7,05	5,5
07303-24	**07303-124**	M24	25	56	7,75	6
07303-30	**07303-130**	M30	31	70	9,2	7

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Spring washers

DIN 137 B





Material:
Spring steel

Version:
Bright or mechanically galvanised.

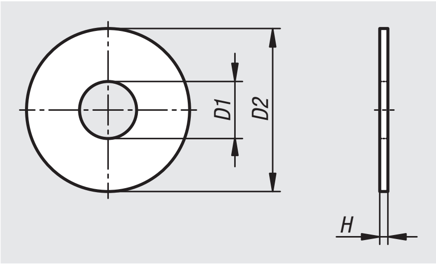
Sample order:
nlm 07304-03

Note:
Spring washers Form B = corrugated.

Order No. bright	Order No. galvanised	for screws	D1	D2	H	H1
07304-03	**07304-103**	M3	3,2	8	0,5	1,6
07304-04	**07304-104**	M4	4,3	9	0,5	2
07304-05	**07304-105**	M5	5,3	11	0,5	2,2
07304-06	**07304-106**	M6	6,4	12	0,5	2,6
07304-08	**07304-108**	M8	8,4	15	0,8	3
07304-10	**07304-110**	M10	10,5	18	1	4,2
07304-12	**07304-112**	M12	13	24	1,2	5
07304-14	**07304-114**	M14	15	28	1,6	6
07304-16	**07304-116**	M16	17	30	1,6	6,4
07304-18	**07304-118**	M18	19	34	1,6	6,6
07304-20	**07304-120**	M20	21	36	1,6	7,4
07304-22	**07304-122**	M22	23	40	1,8	7,8
07304-24	**07304-124**	M24	25	44	1,8	8,2
07304-27	**07304-127**	M27	28	50	2	9,4
07304-30	**07304-130**	M30	31	56	2,2	10

Washers large OD

DIN 9021



Material:
Steel or stainless steel (A 2)

Version:
Electro zinc-plated steel.
Hardness
D1 ≤ 14 = 140 HV.
D1 > 17 = 100 HV.
Stainless steel, bright.

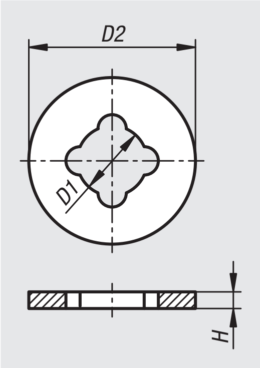
Sample order:
nlm 07305-03

Note:
The pulleys have an OD of D2 = ~3 × D1.

Order No. steel	Order No. stainless steel	for screws	D1	D2	H
07305-03	**07305-103**	M3	3,2	9	0,8
07305-04	**07305-104**	M4	4,3	12	1
07305-05	**07305-105**	M5	5,3	15	1,2
07305-06	**07305-106**	M6	6,4	18	1,6
07305-08	**07305-108**	M8	8,4	24	2
07305-10	**07305-110**	M10	10,5	30	2,5
07305-12	**07305-112**	M12	13	37	3
07305-14	**07305-114**	M14	15	44	3
07305-16	**07305-116**	M16	17	50	3
07305-18	**07305-118**	M18	20	56	4
07305-20	**07305-120**	M20	22	60	4
07305-24	**07305-124**	M24	26	72	5
07305-30	**-**	M30	33	92	6

Washers plastic

captive



Material:
Polyamide.

Version:
white

Sample order:
nlm 07306-05

Note:
The washers are vibration dampers and protect the screw connection during e.g. pre-assembly.
The washers also protect the surface from damage.
Only suitable for threads with undercut i.e. ring bolts

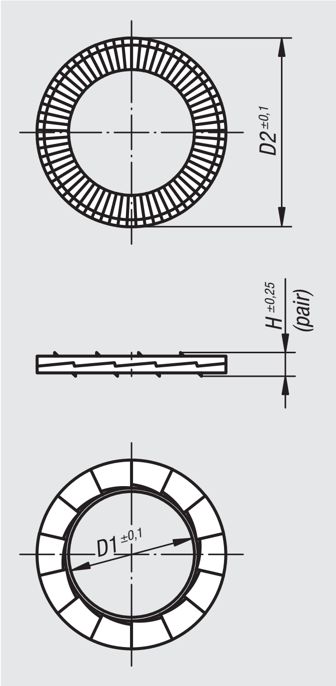
Application:
Press or twist the washers over the thread.

Attention:
When shim washers with rings bolts are used, the forces specified for the ring bolts cannot be guaranteed.

Order No.	D1	D2	G	H
07306-05	4,3	10	M5	0,5
07306-06	5,1	12	M6	0,5
07306-08	6,2	14	M8	0,5
07306-10	8,4	20	M10	1
07306-12	9,8	20	M12	1
07306-16	13,5	28	M16	1

Wedge lock washers

DIN 25201



Material:
Steel or stainless steel.

Version:
Steel electro zinc-plated, hardness ≥ 465 HV 1.
Stainless steel hardness ≥ 520 HV 0.05.

Sample order:
nlm 07310-0817261

Note:
These lock washers ensure that bolts and screws subjected to transverse loads, chattering or vibrations do not work loose. A joint is also secure at low levels of tension. If the bolt (nut) tends to loosen independently in bolted joints under dynamic stress, the bolt (nut) carries its positive-locking washer with it, the sloped surfaces of which run directly up against the angled surfaces of the counter-washer. In other words, the more a bolted joint tries to loosen itself, the more securely the wedge action of the washer blocks the attempt.

Supplied glued together in pairs.

Order No.	Main material	for screws	for screws inch	D1	D2	H
07310-030718	steel	M3	1/8	3,4	7	1,8
07310-050918	steel	M5	3/16	5,4	9	1,8
07310-061118	steel	M6	1/4	6,5	10,8	1,8
07310-081426	steel	M8	5/16	8,7	13,5	2,5
07310-101726	steel	M10	3/8	10,7	16,6	2,5
07310-122026	steel	M12	1/2	13	19,5	2,5
07310-162537	steel	M16	5/8	17	25,4	3,4
07310-182937	steel	M18	11/16	19,5	29	3,4
07310-203137	steel	M20	3/4	21,4	30,7	3,4
07310-030722	stainless steel	M3	1/8	3,4	7	2,2
07310-050922	stainless steel	M5	3/16	5,4	9	2,2
07310-061122	stainless steel	M6	1/4	6,5	10,8	2,2
07310-081422	stainless steel	M8	5/16	8,7	13,5	2,2
07310-101722	stainless steel	M10	3/8	10,7	16,6	2,2
07310-122022	stainless steel	M12	1/2	13	19,5	2,2
07310-162532	stainless steel	M16	5/8	17	25,4	3,2
07310-182932	stainless steel	M18	11/16	19,5	29	3,2
07310-203132	stainless steel	M20	3/4	21,4	30,7	3,2
07310-040918	steel	M4	5/32	4,4	9	1,8
07310-061426	steel	M6	1/4	6,5	13,5	2,5
07310-0817261	steel	M8	5/16	8,7	16,6	2,5
07310-1021261	steel	M10	3/8	10,7	21	2,5
07310-1225371	steel	M12	1/2	13	25,4	3,4
07310-1631371	steel	M16	5/8	17	30,7	3,4
07310-040922	stainless steel	M4	5/32	4,4	9	2,2
07310-061422	stainless steel	M6	1/4	6,5	13,5	2,2
07310-081722	stainless steel	M8	5/16	8,7	16,6	2,2
07310-122532	stainless steel	M12	1/2	13	25,4	3,2
07310-163132	stainless steel	M16	5/8	17	30,7	3,2

Mounting examples for DIN 25201 wedge lock washers

Tapped holes
Wedge lock washers secure the screw against the seating face.

Counterbores
The OD of the standard wedge lock washers is designed to fit into DIN 974 type counterbores. The washers fit under the head of standard screws.

Through holes
Two pairs of wedge lock washers are need for drilled through holes – one pair secures the screw head and the other pair secures the nut.

To prevent additional settling, the nuts and bolts should be mounted so that the wedge faces of the lock washer pairs interlock completely.

Studs
The nut is secured without the need to glue the stud.

Elongated holes

Soft surfaces

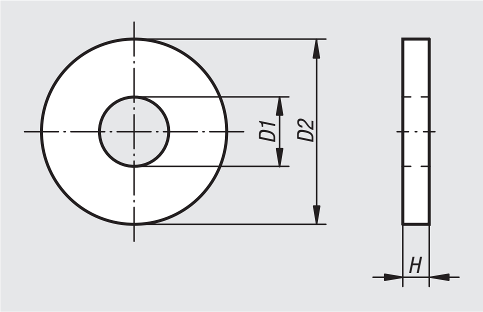
Applications with elongated holes/soft surfaces
To optimise the surface pressure on elongated holes or soft materials e.g. aluminium, the use of wedge lock washers with a larger seating face in combination with a flange nut/screw is recommended.

Applications where the wedge lock washer principle does not work

- Non-fixed surfaces (see image on left)
- Surface hardness greater than washer hardness
- Very soft surfaces such as wood or plastic
- Applications with extremely high setting behaviour

Washers for clamps

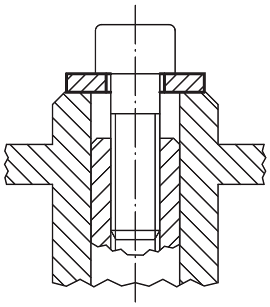
steel or aluminium DIN 6340



Material:
Steel or EN AW-7022

Version:
Stamped steel: pressed flat and tempered to 1200-1400 N/mm², black.
Turned steel: black oxidised.
Turned aluminium: anodised.

Sample order:
nlm 07320-16

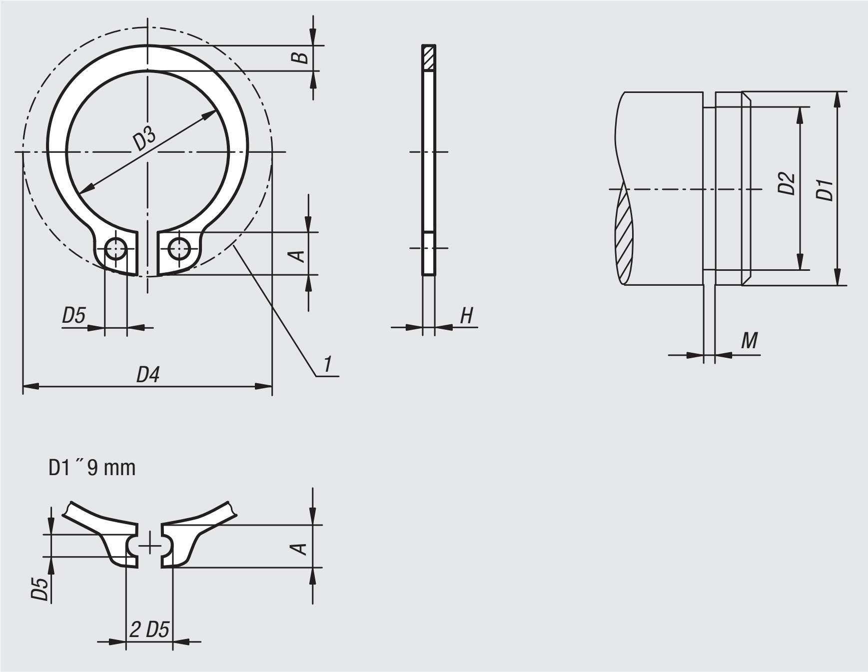


Order No. steel	Order No. Aluminium	Order No. steel turned	D1	D2	H	for screw
07320-06	**07320-206**	**07320-306**	6,4	17	3	M6
07320-08	**07320-208**	**07320-308**	8,4	23	4	M8
07320-10	**07320-210**	**07320-310**	10,5	28	4	M10
07320-12	**07320-212**	**07320-312**	13	35	5	M12
07320-14	**07320-214**	**07320-314**	15	40	5	M14
07320-16	**07320-216**	**07320-316**	17	45	6	M16
07320-18	**07320-218**	**07320-318**	19	45	6	M18
07320-20	**07320-220**	**07320-320**	21	50	6	M20
07320-22	**07320-222**	-	23	50	8	M22
07320-24	**07320-224**	-	25	60	8	M24
07320-30	**07320-230**	-	31	68	10	M30
07320-36	**07320-236**	-	38	80	10	M36

07330

Circlips for shafts

DIN 471



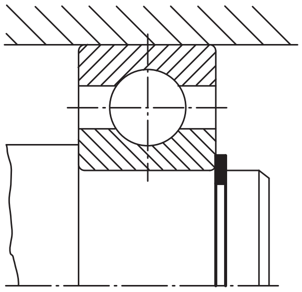
Material:
Spring steel or 1.4122 stainless steel.

Version:
Phosphated spring steel.
Bright stainless steel.

Sample order:
nlm 07330-050600

Note:
DIN 471 circlips are retaining rings mounted in a groove on a shaft OD. They withstand high axial forces between machine elements (e.g. bearings) and the groove in which the ring is mounted.

Drawing reference:
1) installation space



Circlips for shafts

DIN 471

Order No. steel	Order No. stainless steel	A	B	D1	D2	D3	D4	D5	H	M
07330-030400	-	1,9	0,8	3	2,8	2,7	7	1	0,4	0,5
07330-040400	07330-040401	2,2	0,9	4	3,8	3,7	8,6	1	0,4	0,5
07330-050600	07330-050601	2,5	1,1	5	4,8	4,7	10,3	1	0,6	0,7
07330-060700	07330-060701	2,7	1,3	6	5,7	5,6	11,7	1,2	0,7	0,8
07330-070800	07330-070801	3,1	1,4	7	6,7	6,5	13,5	1,2	0,8	0,9
07330-080800	07330-080801	3,2	1,5	8	7,6	7,4	14,7	1,2	0,8	0,9
07330-091000	07330-091001	3,3	1,7	9	8,6	8,4	16	1,2	1	1,1
07330-101000	07330-101001	3,3	1,8	10	9,6	9,3	17	1,5	1	1,1
07330-121000	07330-121001	3,3	1,8	12	11,5	11	19	1,7	1	1,1
07330-141000	07330-141001	3,5	2,1	14	13,4	12,9	21,4	1,7	1	1,1
07330-151000	07330-151001	3,6	2,2	15	14,3	13,8	22,6	1,7	1	1,1
07330-161000	07330-161001	3,7	2,2	16	15,2	14,7	23,8	1,7	1	1,1
07330-171000	07330-171001	3,8	2,3	17	16,2	15,7	25	1,7	1	1,1
07330-181200	07330-181201	3,9	2,4	18	17	16,5	26,2	2	1,2	1,3
07330-191200	07330-191201	3,9	2,5	19	18	17,5	27,2	2	1,2	1,3
07330-201200	07330-201201	4	2,6	20	19	18,5	28,4	2	1,2	1,3
07330-221200	07330-221201	4,2	2,8	22	21	20,5	30,8	2	1,2	1,3
07330-241200	07330-241201	4,4	3	24	22,9	22,2	33,2	2	1,2	1,3
07330-251200	07330-251201	4,4	3	25	23,9	23,2	34,2	2	1,2	1,3
07330-261200	07330-261201	4,5	3,1	26	24,9	24,2	35,5	2	1,2	1,3
07330-281500	07330-281501	4,7	3,2	28	26,6	25,9	37,9	2	1,5	1,6
07330-301500	07330-301501	5	3,5	30	28,6	27,9	40,5	2	1,5	1,6
07330-321500	07330-321501	5,2	3,6	32	30,3	29,6	43	2,5	1,5	1,6
07330-351500	07330-351501	5,6	3,9	35	33	32,2	46,8	2,5	1,5	1,6
07330-381750	07330-381751	5,8	4,2	38	36	35,2	50,2	2,5	1,75	1,85
07330-401750	07330-401751	6	4,4	40	37,5	36,5	52,6	2,5	1,75	1,85
07330-451750	07330-451751	6,7	4,7	45	42,5	41,5	59,1	2,5	1,75	1,85
07330-471750	-	6,8	4,9	47	44,5	43,5	-	2,5	1,75	1,85
07330-502000	07330-502001	6,9	5,1	50	47	45,8	64,5	2,5	2	2,15
07330-552000	07330-552001	7,2	5,4	55	52	50,8	70,2	2,5	2	2,15
07330-602000	07330-602001	7,4	5,8	60	57	55,8	75,6	2,5	2	2,15
07330-752500	07330-752501	8,4	7	75	72	70,5	92,7	3	2,5	2,65

07331

Circlips for bores

DIN 472

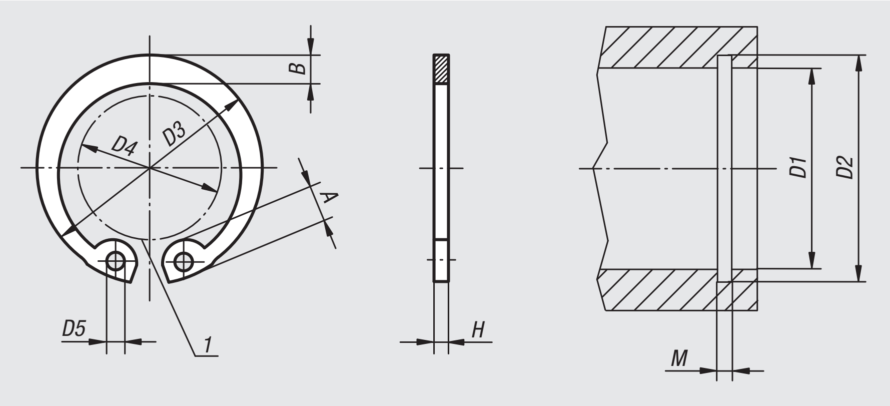
Material:
Spring steel or 1.4122 stainless steel.

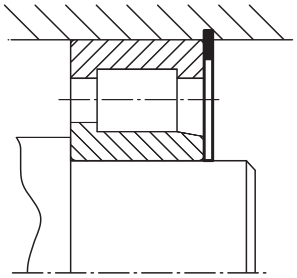
Version:
Phosphated spring steel.
Bright stainless steel.

Sample order:
nlm 07331-080800

Note:
DIN 472 circlips are retaining rings which are mounted in a groove in a bore. They can withstand high axial forces between machine elements (e.g. bearings) and the groove in the ID in which the ring is mounted.

Drawing reference:
1) installation space

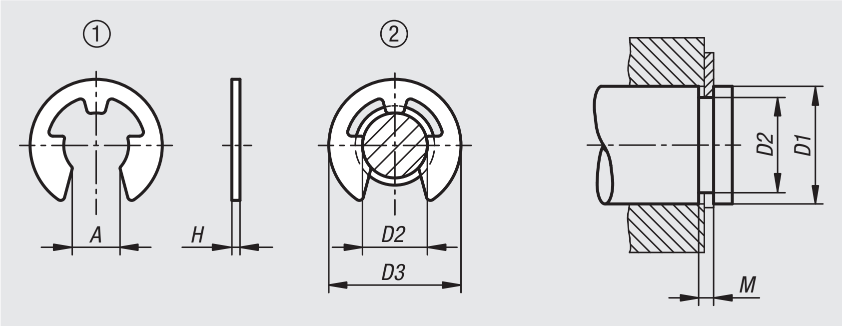




Order No. steel	Order No. stainless steel	A	B	D1	D2	D3	D4	D5	H	M
07331-080800	**07331-080801**	2,4	1,1	8	8,4	8,7	3	1	0,8	0,9
07331-091000	**07331-091001**	2,5	1,3	9	9,4	9,8	3,7	1	0,8	0,9
07331-101000	**07331-101001**	3,2	1,4	10	10,4	10,8	3,3	1,2	1	1,1
07331-121000	**07331-121001**	3,4	1,7	12	12,5	13	4,9	1,5	1	1,1
07331-141000	**07331-141001**	3,7	1,9	14	14,6	15,1	6,2	1,7	1	1,1
07331-151000	**07331-151001**	3,7	2	15	15,7	16,2	7,2	1,7	1	1,1
07331-161000	**07331-161001**	3,8	2	16	16,8	17,3	8	1,7	1	1,1
07331-171000	**07331-171001**	3,9	2,1	17	17,8	18,3	8,8	1,7	1	1,1
07331-181000	-	4,1	2,2	18	19	19,5	9,4	2	1	1,1
07331-191000	**07331-191001**	4,1	2,2	19	20	20,5	10,4	2	1	1,1
07331-201000	**07331-201001**	4,2	2,3	20	21	21,5	11,2	2	1	1,1
07331-221000	**07331-221001**	4,2	2,5	22	23	23,5	13,2	2	1	1,1
07331-241200	**07331-241201**	4,4	2,6	24	25,2	25,9	14,8	2	1,2	1,3
07331-251200	**07331-251201**	4,5	2,7	25	26,2	26,9	15,5	2	1,2	1,3
07331-261200	**07331-261201**	4,7	2,8	26	27,2	27,9	16,1	2	1,2	1,3
07331-281200	**07331-281201**	4,8	2,9	28	29,4	30,1	17,9	2	1,2	1,3
07331-301200	**07331-301201**	4,8	3	30	31,4	32,1	19,9	2	1,2	1,3
07331-321200	**07331-321201**	5,4	3,2	32	33,7	34,4	20,6	2,5	1,2	1,3
07331-351500	**07331-351501**	5,4	3,4	35	37	37,8	23,6	2,5	1,5	1,6
07331-381500	**07331-381501**	5,5	3,7	38	40	40,8	26,4	2,5	1,5	1,6
07331-401750	**07331-401751**	5,8	3,9	40	42,5	43,5	27,8	2,5	1,75	1,85
07331-451750	**07331-451751**	6,2	4,3	45	47,5	48,5	32	2,5	1,75	1,85
07331-471750	-	6,4	4,4	47	49,5	50,5	33,5	2,5	1,75	1,85
07331-502000	**07331-502001**	6,5	4,6	50	53	54,2	36,3	2,5	2	2,15
07331-552000	**07331-552001**	6,8	5	55	58	59,2	40,7	2,5	2	2,15
07331-602000	**07331-602001**	7,3	5,4	60	63	64,2	44,7	2,5	2	2,15
07331-752500	**07331-752501**	7,8	6,6	75	78	79,5	58,6	3	2,5	2,65

Circlips E-type

DIN 6799



Material:
Spring steel or 1.4122 stainless steel.

Version:
Spring steel electro zinc-plated.
Stainless steel bright.

Sample order:
nlm 07332-0230

Note:
E-type circlips are pushed into a groove on a shaft. They are DIN 6799 standard elements and are designed for use on small shafts.

Nominal size = groove ID D2

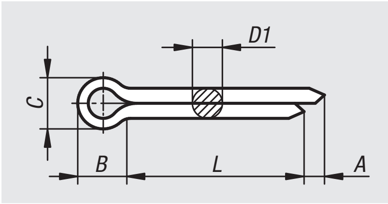
Drawing reference:
1) loose
2) on shaft

Order No. stainless steel	Order No. steel	A	D1	D2	D3	H	M
07332-0151	-	1,28	2-2,5	1,5	4,25	0,4	0,44
07332-0191	-	1,61	2,5-3	1,9	4,8	0,5	0,54
07332-0231	**07332-0230**	1,94	3-4	2,3	6,3	0,6	0,64
07332-0321	**07332-0320**	2,7	4-5	3,2	7,3	0,6	0,64
07332-0401	**07332-0400**	3,34	5-7	4	9,3	0,7	0,74
07332-0501	**07332-0500**	4,11	6-8	5	11,3	0,7	0,74
07332-0601	**07332-0600**	5,26	7-9	6	12,3	0,7	0,74
07332-0701	**07332-0700**	5,84	8-11	7	14,3	0,9	0,94
07332-0801	**07332-0800**	6,52	9-12	8	16,3	1	1,05
07332-0901	**07332-0900**	7,63	10-14	9	18,8	1,1	1,15
07332-1001	**07332-1000**	8,32	11-15	10	20,4	1,2	1,25
07332-1201	**07332-1200**	10,45	13-18	12	23,4	1,3	1,35

07336

Split pins

EN ISO 1234



Material:
Steel or stainless steel 1.4310.

Version:
Steel electro zinc-plated.
Stainless steel bright.

Sample order:
nlm 07336-1010X10 (include length L)

Note:
Split pins are used in machine construction and automotive engineering as retaining elements. They are often used for securing castle nuts. After the split pin is pushed through a hole, the ends are bent over to ensure a secure lock.

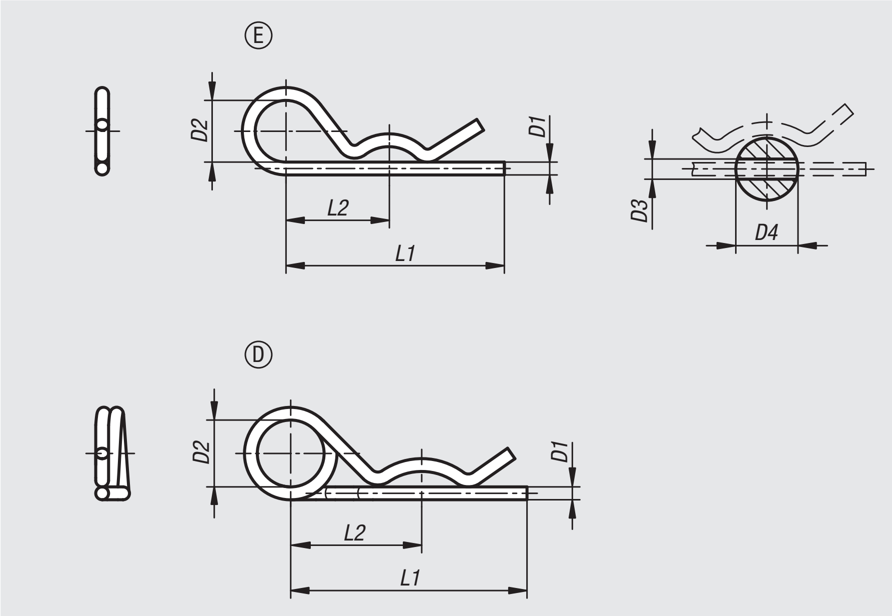
The split pin can be shortened. As a rule, the split pin should be roughly double the length of the hole.

As the material structure can weaken through bending and straightening, the split pins should not be reused after they have been removed from the hole.

Order No.	Main material	Hole diameters	D1 max.	L	A min.	B	C max.	for screws	for screw Ø
07336-1010X	steel	1	0,9	10/12/16/20/25	0,8	3	1,8	3,5-4,5	3-4
07336-1016X	steel	1,6	1,4	12/16/20/25/32	1,25	3,2	2,8	5,5-7	5-6
07336-1020X	steel	2	1,8	10/16/20/25/32/36/40/50	1,25	4	3,6	7-9	6-8
07336-1025X	steel	2,5	2,3	20/25/32/36/40/50	1,25	5	4,6	9-11	8-9
07336-1032X	steel	3,2	2,9	16/20/25/32/36/40/50/63	1,6	6,4	5,8	11-14	9-12
07336-1040X	steel	4	3,7	20/25/32/36/40/50/63/80	2	8	7,4	14-20	12-17
07336-1050X	steel	5	4,6	25/32/36/40/50/63/80	2	10	9,2	20-27	17-23
07336-1063X	steel	6,3	5,9	32/36/40/50/63/80/100	2	12,6	11,8	27-39	23-29
07336-1080X	steel	8	7,5	50/63/80/100	2	16	15	39-56	29-44
07336-2010X	stainless steel	1	0,9	16/20	0,8	3	1,8	3,5-4,5	3-4
07336-2016X	stainless steel	1,6	1,4	12/16/20/25/32	1,25	3,2	2,8	5,5-7	5-6
07336-2020X	stainless steel	2	1,8	10/16/20/25/32/40	1,25	4	3,6	7-9	6-8
07336-2025X	stainless steel	2,5	2,3	20/25/32	1,25	5	4,6	9-11	8-9
07336-2032X	stainless steel	3,2	2,9	16/20/25/32/36/40/50/63	1,6	6,4	5,8	11-14	9-12
07336-2040X	stainless steel	4	3,7	20/25/32/40/50/63	2	8	7,4	14-20	12-17
07336-2050X	stainless steel	5	4,6	32/36/40/50/63	2	10	9,2	20-27	17-23
07336-2063X	stainless steel	6,3	5,9	36/40/50/63/80	2	12,6	11,8	27-39	23-29
07336-2080X	stainless steel	8	7,5	50/80/100	2	16	15	39-56	29-44

R-clips

similar to DIN 11024



Material:
Steel or stainless steel 1.4310.

Version:
Steel electro zinc-plated.
Stainless steel bright.

Sample order:
nlm 07337-11200

Note:
R-clips are used for securing bolts and axles. They are easy to install and can be reused. The ends have no sharp edges.

Double coil R-clips have a flatter spring characteristics and are easier to install. The double coil allows a tether cable to be attached to prevent loss.

Drawing reference:
Form E: with single coil.
Form D: with double coil (coil direction can differ from the drawing).

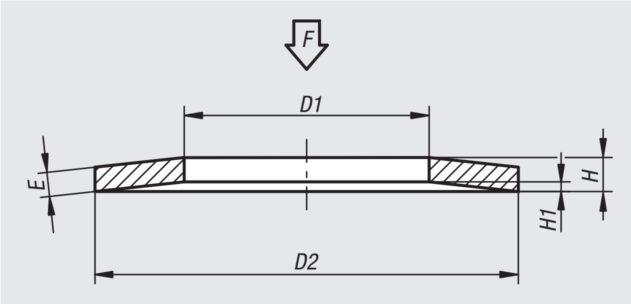
Order No.	Form	Main material	D1	D2	D3	D4=for screw Ø	L1	L2
07337-11200	E	steel	2	10	2,5	9-14	50	25
07337-11300	E	steel	3	18	3,5	10-16	60	28
07337-11400	E	steel	4	20	4,5	16-20	60	30
07337-11500	E	steel	5	24	6	20-28	85	40
07337-11600	E	steel	6	30	7	28-40	105	50
07337-11700	E	steel	7	30	8	28-45	105	50
07337-21200	E	stainless steel	2	10	2,5	7-8	40	25
07337-21250	E	stainless steel	2,5	11	3	10-16	46	24
07337-21300	E	stainless steel	3	16	3,5	16-18	60	34
07337-21400	E	stainless steel	4	19	4,5	18-20	64	36
07337-21500	E	stainless steel	5	26	6	20-28	82	45
07337-21600	E	stainless steel	6	30	7	28-40	110	60

Order No.	Form	Main material	D1	D2	D3	D4=for screw Ø	L1	L2
07337-12225	D	steel	2,25	20	2,5	9-11,2	42	24
07337-12280	D	steel	2,8	20	3,2	11,2-14	48	26
07337-12360	D	steel	3,6	20	4	14-20	64	32
07337-12450	D	steel	4,5	25	5	20-26	80	39
07337-12560	D	steel	5,6	25	6,3	26-34	97	45
07337-12630	D	steel	6,3	30	7	34-45	125	56
07337-12700	D	steel	7	30	8	45-56	150	63
07337-22225	D	stainless steel	2,25	20	2,5	7-9	42	24
07337-22280	D	stainless steel	2,8	20	3,2	11-14	48	26
07337-22360	D	stainless steel	3,6	20	4	14-20	64	32
07337-22450	D	stainless steel	4,5	25	5	20-26	80	39
07337-22560	D	stainless steel	5,6	25	6,3	26-34	97	45

07360

Disc springs

DIN EN 16983



Material:
Spring steel

Version:
Phosphated and oiled.

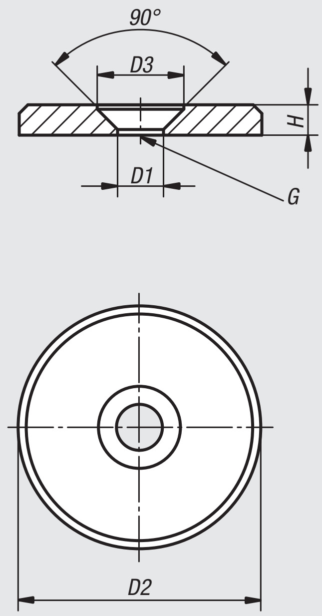
Sample order:
nlm 07360-080

Note:
If several disc springs are assembled to form a spring packet i.e. concave face to convex face, the spring force of a single disc can be multiplied by the number of discs giving high spring force with short spring travel.
If several disc springs are assembled to form a spring column i.e. concave face to concave face and convex face to convex face, the spring force of the entire column is the same as that of a single disc giving low spring force with long spring travel.

F = 0.25 x H

Order No.	D1	D2	E	H	H1	F N
07360-030	3,2	8	0,4	0,6	0,2	69,2
07360-050	5,2	10	0,4	0,7	0,3	87,8
07360-051	5,2	15	0,7	1,25	0,55	340,2
07360-060	6,2	12,5	0,5	0,85	0,35	120
07360-061	6,2	12	0,5	0,85	0,35	133,5
07360-070	7,2	14	0,8	1,1	0,3	283,8
07360-080	8,2	16	0,9	1,25	0,35	362,5
07360-081	8,2	16	0,6	1,05	0,45	172
07360-090	9,2	18	1	1,4	0,4	450,6
07360-100	10,2	20	1,1	1,55	0,45	548,2
07360-101	10,2	20	0,9	1,45	0,55	411,7
07360-102	10,2	20	0,8	1,35	0,55	304,3
07360-120	12,2	25	1,5	2,05	0,55	1040
07360-121	12,2	23	1,25	1,85	0,6	863,4
07360-123	12,2	23	1	1,6	0,6	474,7
07360-140	14,2	28	1,5	2,15	0,65	1033
07360-141	14,2	28	1	1,8	0,8	490
07360-160	16,3	31,5	1,75	2,45	0,7	1391
07360-161	16,3	31,5	1,25	2,15	0,9	790,5
07360-180	18,3	35,5	2	2,8	0,8	1864
07360-182	18,3	35,5	1,25	2,25	1	730,9
07360-200	20,4	40	2,25	3,15	0,9	2336
07360-220	22,4	45	2,5	3,5	1	2773
07360-250	25,4	50	3	4,1	1,1	4255
07360-251	25,4	50	2,5	3,9	1,4	3473
07360-280	28,5	56	2	3,6	1,6	1910
07360-310	31	63	2,5	4,25	1,75	2942
07360-360	40,5	70	4	5,7	1,7	9025

Handwheel washers



Material:
Steel 1.0718.
Stainless steel 1.4305.

Version:
Steel black oxidised.
Stainless steel bright.

Sample order:
nlm 07375-00416

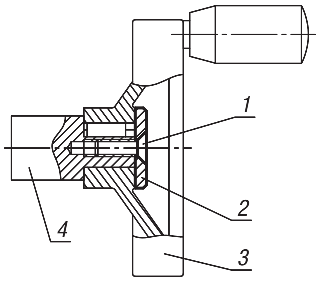
Note:
These washers are used together with DIN EN ISO 2009 or DIN EN ISO 10642 countersunk screws on the end of shafts with keyways to secure handwheels and crank handles.

The washers can be used with the handwheels 06262, 06263, 06264, 06265, 06271, 06273, 06275, 06277, 06279, 06287, 06288 and crank handles 06500, 06502.

The steel washers can be used as counterparts to magnets.

Drawing reference:
D3 = for countersunk screw ISO 2009 and ISO 10642

1) countersunk screw ISO 2009 and ISO 10642
2) washer
3) handwheel
4) shaft

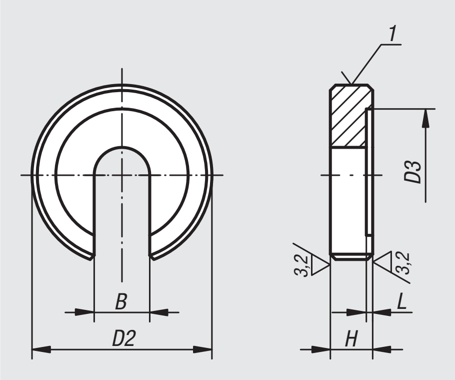


Order No.	Main material	D1	D2	D3	H	G
07375-00310	steel	3,2	10	6	2	M3
07375-00313	steel	3,2	13	6	2	M3
07375-00416	steel	4,3	16	8,4	3	M4
07375-00420	steel	4,3	20	8,4	3	M4
07375-00522	steel	5,3	22	10	3,5	M5
07375-00525	steel	5,3	25	10	3,5	M5
07375-00528	steel	5,3	28	10	3,5	M5
07375-00632	steel	6,4	32	12	4	M6
07375-00636	steel	6,4	36	12	4	M6
07375-00640	steel	6,4	40	12	5	M6
07375-00645	steel	6,4	45	12	6	M6
07375-00652	steel	6,4	52	12	6	M6
07375-10310	stainless steel	3,2	10	6	2	M3
07375-10313	stainless steel	3,2	13	6	2	M3
07375-10416	stainless steel	4,3	16	8,4	3	M4
07375-10420	stainless steel	4,3	20	8,4	3	M4
07375-10522	stainless steel	5,3	22	10	3,5	M5
07375-10525	stainless steel	5,3	25	10	3,5	M5
07375-10528	stainless steel	5,3	28	10	3,5	M5
07375-10632	stainless steel	6,4	32	12	4	M6
07375-10636	stainless steel	6,4	36	12	4	M6
07375-10640	stainless steel	6,4	40	12	5	M6
07375-10645	stainless steel	6,4	45	12	6	M6
07375-10652	stainless steel	6,4	52	12	6	M6

07380

C-washers

DIN 6372 enhanced

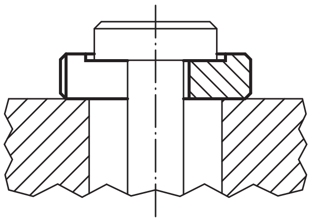


Material:
Carbon steel.

Version:
Tempered and black oxidised.

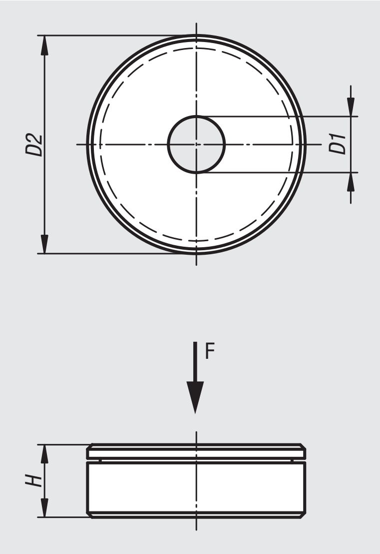
Sample order:
nlm 07380-12

Drawing reference:
1) cross knurl



Order No.	B	D2	D3	H	L
07380-05	5,25	17	12	5	0,75
07380-06	6,4	22	16	6	0,8
07380-08	8,4	28	21	7	1
07380-10	10,5	34	25	8	1,2
07380-12	13	40	30	9	1,8
07380-14	14,5	48	33	12	1,8
07380-16	17	56	37	12	1,8
07380-20	21	64	45	14	2
07380-24	25	75	52	16	2
07380-30	31	90	65	18	2
07380-36	37	100	75	20	2,5

Clamping force intensifiers



Material:
Bearing housing steel.

Version:
Black oxidised.

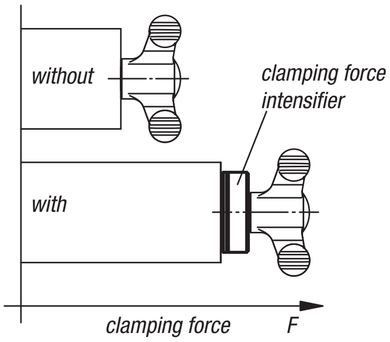
Sample order:
nlm 07415-06

Note:
As a rule, the clamping force intensifier is used together with tightening or clamping elements. The integrated axial needle roller thrust bearing unit can achieve ca. twice the clamping force by the same lever length.

Advantages:
The component surface is protected by the stationary lower ring. The higher preload force causes a lower tendency for material relaxation in the thread.

Clamping levers, wing and star grips, knurled knobs or hexagonal and socket head screws etc. can be used as tightening or clamping elements.

With constant torque

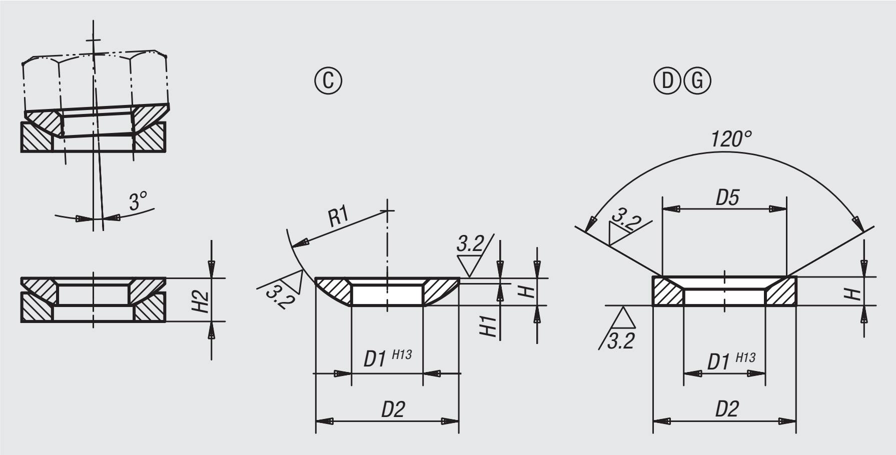


Order No.	D1	D2	H	Dynamic load rating N	Static load rating N
07415-06	6	24	8	6800	15500
07415-08	8	25	8	7800	19400
07415-10	10	30	8	9200	25500
07415-12	12	35	8	9900	29000

07420

Spherical washers

DIN 6319, edition 10/01



Material:
Mild steel, Q&T steel or stainless steel.

Version:
Mild steel, case hardened, manganese-phosphated.
Tempered steel (HV 390 ±40), manganese-phosphated.
Stainless steel, bright.

Sample order:
nlm 07420-216

Note:
Conical seat Form G should be used over slots.

Drawing reference:
Form C: spherical washer
Form D: conical seat
Form G: conical seat for slots

Order No. mild steel	**Order No. stainless steel**	Form	D1	D2	H	H1	R1	Load rating max. kN (static load only)
07420-105	**-**	C	5,25	10,5	2	0,4	7,5	6,5
07420-106	**07420-0106**	C	6,4	12	2,3	0,7	9	9/6
07420-108	**07420-0108**	C	8,4	17	3,2	0,6	12	17/12
07420-110	**07420-0110**	C	10,5	21	4	0,8	15	26/16
07420-112	**07420-0112**	C	13	24	4,6	1,1	17	38/24
07420-114	**-**	C	15	28	5	1,2	22	53
07420-116	**07420-0116**	C	17	30	5,3	1,3	22	73/45
07420-120	**07420-0120**	C	21	36	6,3	2	27	117/71
07420-124	**07420-0124**	C	25	44	8,2	2,4	32	168/105
07420-130	**07420-0130**	C	31	56	11,2	3,6	41	269/191
07420-136	**07420-0136**	C	37	68	14	4,6	50	394/-
07420-142	**07420-0142**	C	43	78	17	6,5	58	542/-
07420-148	**07420-0148**	C	50	92	21	8	67	714/-
07420-156	**-**	C	58	103	23	9,5	79	960
07420-164	**-**	C	66	120	27	12	93	1269

Spherical washers

DIN 6319, edition 10/01

Order No. mild steel	Order No. stainless steel	Form	D1	D2	D5	H	H2	Load rating max. kN (static load only)
07420-205	**-**	D	6	10,5	9,25	2,1	3,1	6,5
07420-206	**07420-0206**	D	7,1	12	11	2,8	4	9/6
07420-208	**07420-0208**	D	9,6	17	14,5	3,5	5,6	17/12
07420-210	**07420-0210**	D	12	21	18,5	4,2	6,3	26/16
07420-212	**07420-0212**	D	14,2	24	20	5	8	38/24
07420-214	**-**	D	16,5	28	24,8	5,6	8,2	53
07420-216	**07420-0216**	D	19	30	26	6,2	9,3	73/45
07420-220	**07420-0220**	D	23,2	36	31	7,5	11,6	117/71
07420-224	**07420-0224**	D	28	44	37	9,5	15	168/105
07420-230	**07420-0230**	D	35	56	49	12	18,9	269/191
07420-236	**07420-0236**	D	42	68	60	15	23,3	394/-
07420-242	**07420-0242**	D	49	78	70	18	28,3	542/-
07420-248	**07420-0248**	D	56	92	82	22	35,2	714/-
07420-256	**-**	D	65	103	92	25	39,7	960
07420-264	**-**	D	75	120	110	30	46,5	1269

Order No. high carbon steel	Order No. stainless steel	Form	D1	D2	D5	H	H2	Load rating max. kN (static load only)
07420-305	**-**	G	6	15	9,25	2,5	3,5	6,5
07420-306	**07420-0306**	G	7,1	17	11	4	5,2	9/6
07420-308	**07420-0308**	G	9,6	24	14,5	5	6,8	17/12
07420-310	**07420-0310**	G	12	30	18,5	5	7,1	26/16
07420-312	**07420-0312**	G	14,2	36	20	6	9	38/24
07420-314	**-**	G	16,5	40	24,8	6	8,6	53
07420-316	**07420-0316**	G	19	44	26	7	10,1	73/45
07420-320	**07420-0320**	G	23,2	50	31	8	12	117/71
07420-324	**07420-0324**	G	28	60	37	10	15,5	168/105
07420-330	**07420-0330**	G	35	68	49	12	18,7	269/191
07420-336	**-**	G	42	80	60	12	20,3	394

07460

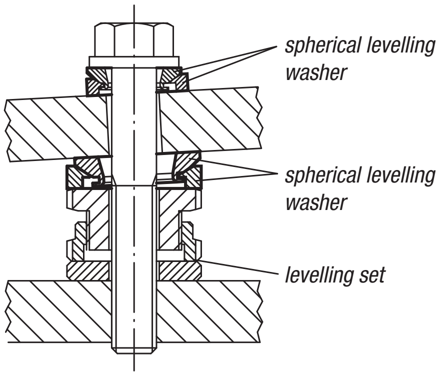
Spherical levelling washers

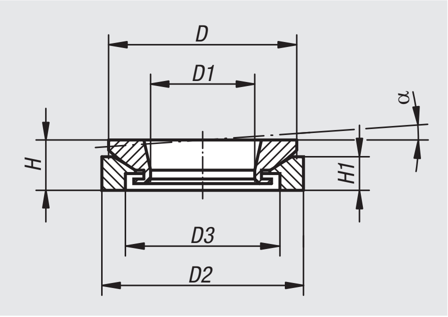
Material:
Steel 1.7225.
Stainless steel 1.4305.

Version:
Steel trivalent blue passivated.
Stainless steel, bright.

Sample order:
nlm 07460-401

Note:
Spherical levelling washers are for exact positioning when mounting up to 4° inclined surfaces. A second spherical levelling washer is recommended as support to correct the bolt angle if the angle of D3 is > 1°. The two washers cannot be detached from each other.





Order No. steel	Order No. stainless steel	H	H1	D	D1	D2	D3	α
07460-151	**07460-152**	8	5,5	23	8,5	25	15	4°
07460-201	**07460-202**	10	6,2	30	13	32	20	4°
07460-301	**07460-302**	12,5	9	40	20	45	30	4°
07460-401	**07460-402**	16	13	52	29	58	38	4°
07460-501	**07460-502**	20	14	65	36	70	48	4°

07520

C-washers captive

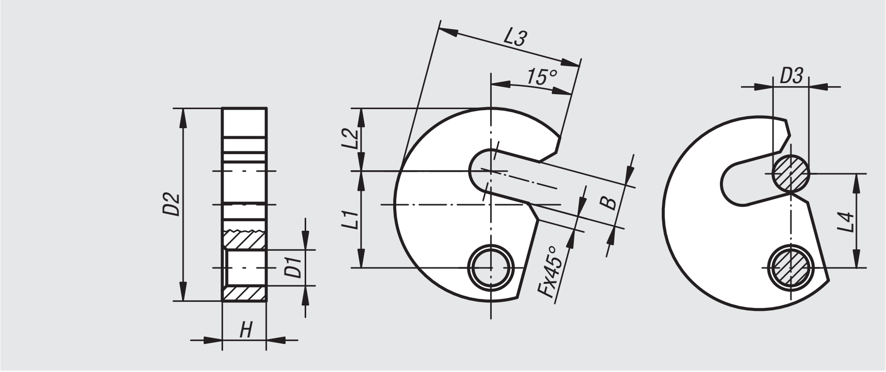
DIN 6371

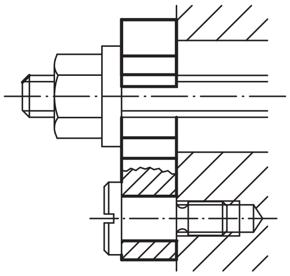
Material:
Carbon steel 1.0760.

Version:
Nitrided and black oxidised.

Sample order:
nlm 07520-12

Note:
07520-14 is not a DIN standard.
For suitable shoulder screws see 07530.

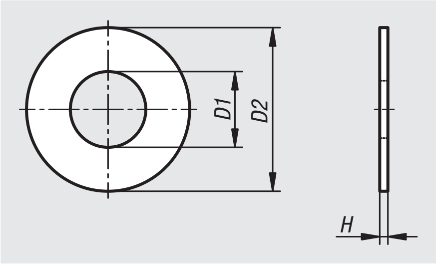




Order No.	B	D1	D2	D3	F	H	L1	L2	L3	L4
07520-06	7,5	9	38	6	3	9,8	19,6	11	29	19
07520-08	9,5	9	43	8	3	9,8	21,6	14	32,5	21
07520-10	11,5	9	48	10	3	9,8	23,6	17	36,5	23
07520-12	13,5	11	61	12	3	11,8	29,6	22	45	29
07520-14	15,5	11	65	14	3	11,8	31,6	23	49	31
07520-16	17,5	11	68	16	3	11,8	33,6	25	50	33
07520-20	21,5	11	74	20	4	11,8	36,6	28	55	36

Shim washers

DIN 988



Material:
Steel.

Version:
Bright.

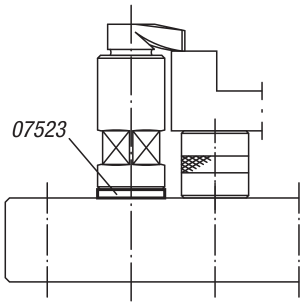
Sample order:
nlm 07305-0306010
(include dimension H e.g. 010 for H = 0,1 mm.)

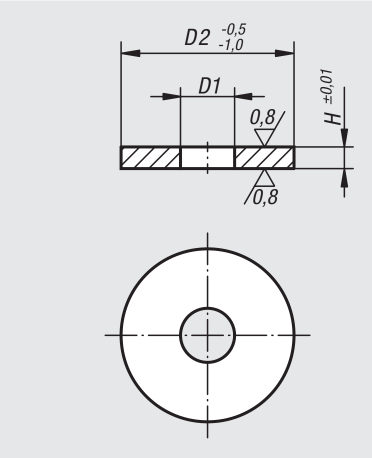
Note:
With shim washers, an existing axial backlash can be significantly reduced. They are available with a thicknesses from 0.1 mm. Any thicknesses can made by combining several shim washers.

Order No.	Main material	D1	D2	H
07522-0306* **	steel	3	6	0,1/0,15/0,2/0,25/0,3/0,5/1
07522-0408* **	steel	4	8	0,1/0,15/0,2/0,3/0,5/1
07522-0510* **	steel	5	10	0,1/0,15/0,2/0,25/0,3/0,5/1
07522-0612* **	steel	6	12	0,1/0,2/0,25/0,3/0,5/1
07522-0713* **	steel	7	13	0,1/0,2/0,3/0,5/1
07522-0814* **	steel	8	14	0,1/0,15/0,2/0,25/0,3/0,5/1
07522-0915* **	steel	9	15	0,1/0,15/0,2/0,3/0,5/1
07522-1016* **	steel	10	16	0,1/0,15/0,2/0,25/0,3/0,5/1
07522-1117* **	steel	11	17	0,1/0,2/0,25/0,3/0,5/1
07522-1218* **	steel	12	18	0,1/0,15/0,2/0,25/0,3/0,5/1
07522-1319* **	steel	13	19	0,1/0,15/0,2/0,25/0,3/0,5/1
07522-1420* **	steel	14	20	0,1/0,15/0,2/0,25/0,3/0,5/1
07522-1521* **	steel	15	21	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2
07522-1622* **	steel	16	22	0,15/0,2/0,25/0,3/0,5/1/1,2
07522-1724* **	steel	17	24	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2
07522-1825* **	steel	18	25	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2
07522-1926* **	steel	19	26	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2
07522-2028* **	steel	20	28	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5
07522-2230* **	steel	22	30	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5
07522-2535* **	steel	25	35	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5
07522-2637* **	steel	26	37	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5
07522-2840* **	steel	28	40	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5
07522-3042* **	steel	30	42	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-3245* **	steel	32	45	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-3545* **	steel	35	45	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-3645* **	steel	36	45	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-3747* **	steel	37	47	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-4050* **	steel	40	50	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-4252* **	steel	42	52	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-4555* **	steel	45	55	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-4860* **	steel	48	60	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2
07522-5062* **	steel	50	62	0,1/0,15/0,2/0,25/0,3/0,5/1/1,2/1,5/2

07523

Spacer washers ground





Material:
Carbon steel.

Version:
Tempered, black oxidised.
Contact faces ground.

Sample order:
nlm 07523-16005

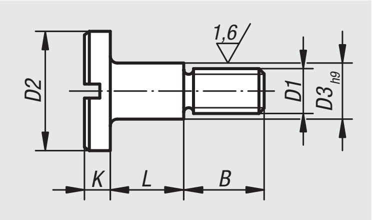
Note:
The spacing washer is used to alter the clamping range of hook clamps and hook holders. When a spacing washer is inserted between the base and the hook holder or riser cylinder it prevents damage to the support face.

Order No.	D1	D2	H
07523-12001	12,5	40	1
07523-12003	12,5	40	3
07523-12005	12,5	40	5
07523-16001	16,5	50	1
07523-16003	16,5	50	3
07523-16005	16,5	50	5
07523-16105	16,5	60	5

07530

Shoulder screws with slotted flat head

DIN 923

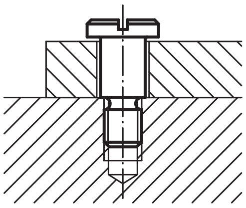


Material:
Steel.

Version:
Black oxidised, grade 5.8.

Sample order:
nlm 07530-08

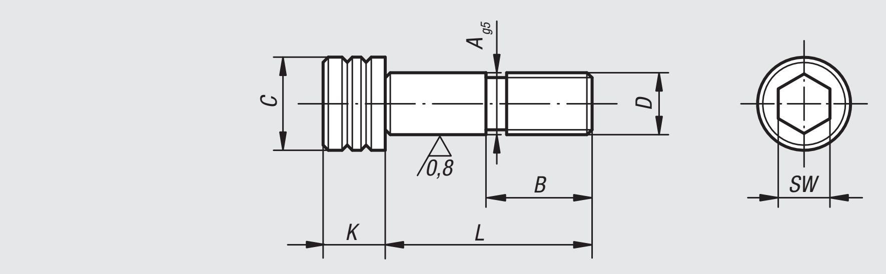
Note:
For use with captive C-washers 07520.



Order No.	D1	D2	D3	L	B	K
07530-06	M6	13	8	10 +0,15/+0,07	9	3,1
07530-08	M8	16	10	12 +0,2/+0,1	11	3,8
07530-10	M10	20	13	16 +0,2/+0,1	13,5	4,6

07533

Shoulder screws Form B



Material:
Carbon steel.

Version:
Tempered, black oxidised.
Precision diameters ground.

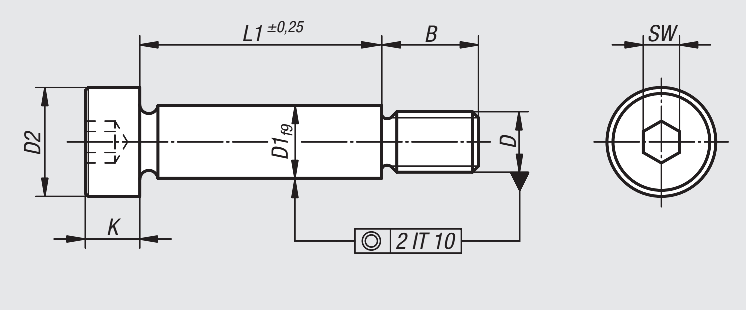
Sample order:
nlm 07533-12065

Order No.	Form	A	B	C	D	K	L	SW	Tightening torque max. Nm
07533-12045	B	12	22	18	M12	12	45	10	88
07533-12055	B	12	22	18	M12	12	55	10	88
07533-12065	B	12	22	18	M12	12	65	10	88
07533-12075	B	12	22	18	M12	12	75	10	88
07533-16055	B	16	25	24	M16	16	55	14	216
07533-16065	B	16	25	24	M16	16	65	14	216
07533-16075	B	16	25	24	M16	16	75	14	216

Notes

Shoulder screws

similar to DIN ISO 7379



Material:
Steel or stainless steel (A 2)

Version:
Grade 12.9. Shaft OD ground and bright.
Bright stainless steel or tempered steel.

Sample order:
nlm 07534-06X20 (include length L1)

Note:
Hexagon socket head shoulder screws are precision construction elements for many applications. As they can simplify complicated constructions, they are frequently chosen as the most cost-effective solution. Shoulder screws provide the decisive rationalising effect required today.

Order No.	Main material	D1	D	D2	B	K	SW	L1
07534-04X	steel	4	M3	7	7	3	2	6/8/10/12/16/20
07534-05X	steel	5	M4	9	8 6	4	2,5	8/10/16/20/30/40
07534-06X	steel	6	M5	10	9,5	4,5	3	16/20/25/30/40/50/60
07534-08X	steel	8	M6	13	11	5,5	4	16/20/25/30/40/50/60
07534-10X	steel	10	M8	16	13	7	5	16/20/25/30/40/50/60/70/80
07534-12X	steel	12	M10	18	16	9	6	16/20/25/30/40/50/60/70/80/90/100
07534-16X	steel	16	M12	24	18	11	8	30/40/50/60/70/80/90/100/120
07534-20X	steel	20	M16	30	22	14	10	30/40/50/60/70/80/90/100/120
07534-104X	stainless steel	4	M3	7	7	3	2	6/8/10/16/20
07534-105X	stainless steel	5	M4	9	8 6	4	2,5	8/10/16/20/30/40
07534-106X	stainless steel	6	M5	10	9,5	4,5	3	16/20/25/30/40/50/60
07534-108X	stainless steel	8	M6	13	11	5,5	4	16/20/25/30/40/50/60
07534-110X	stainless steel	10	M8	16	13	7	5	16/20/25/30/40/50/60/70/80
07534-112X	stainless steel	12	M10	18	16	9	6	16/20/25/30/40/50/60/70/80/90/100
07534-116X	stainless steel	16	M12	24	18	11	8	30/40/50/60/70/80/90/100/120
07534-120X	stainless steel	20	M16	30	22	14	10	30/40/50/60/70/80/90/100/120

Shoulder screws

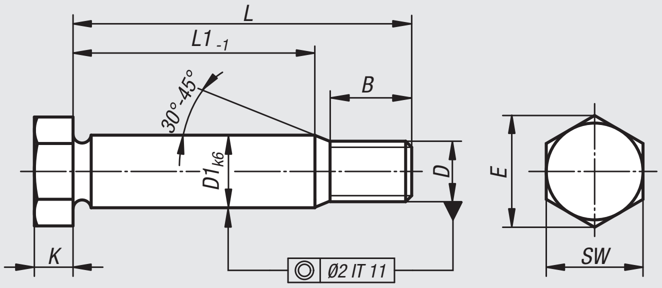
with hexagon head similar to DIN 609

Material:
Steel.

Version:
Grade 8.8, black oxidised.
Shaft OD ground.

Sample order:
nlm 07535-09X40 (include length L)

Note:
Shoulder screws are used if the screw connection is subjected to transverse forces or if workpieces must be positioned relative to each other.

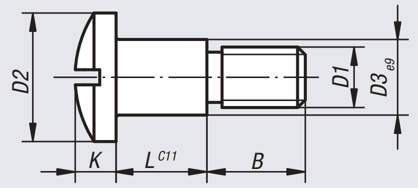


Order No.	B	D1	D	E	K	L	L1	SW
07535-09X25	14,5	9	M8	14,38	5,3	25	8	13
07535-09X30	14,5	9	M8	14,38	5,3	30	13	13
07535-09X35	14,5	9	M8	14,38	5,3	35	18	13
07535-09X40	14,5	9	M8	14,38	5,3	40	23	13
07535-09X45	14,5	9	M8	14,38	5,3	45	28	13
07535-09X50	14,5	9	M8	14,38	5,3	50	33	13
07535-09X60	16,5	9	M8	14,38	5,3	60	41	13
07535-11X30	17,5	11	M10	17,77	6,4	30	10	17
07535-11X35	17,5	11	M10	17,77	6,4	35	15	17
07535-11X40	17,5	11	M10	17,77	6,4	40	20	17
07535-11X45	17,5	11	M10	17,77	6,4	45	25	17
07535-11X50	17,5	11	M10	17,77	6,4	50	30	17
07535-11X60	19,5	11	M10	17,77	6,4	60	38	17
07535-11X70	19,5	11	M10	17,77	6,4	70	48	17
07535-11X80	19,5	11	M10	17,77	6,4	80	58	17
07535-11X90	19,5	11	M10	17,77	6,4	90	68	17
07535-11X100	19,5	11	M10	17,77	6,4	100	78	17
07535-13X35	20,5	13	M12	19,85	7,5	35	11,5	19
07535-13X40	20,5	13	M12	19,85	7,5	40	16,5	19
07535-13X45	20,5	13	M12	19,85	7,5	45	21,5	19
07535-13X50	20,5	13	M12	19,85	7,5	50	26,5	19
07535-13X60	22,5	13	M12	19,85	7,5	60	34,5	19
07535-13X70	22,5	13	M12	19,85	7,5	70	44,5	19
07535-13X80	22,5	13	M12	19,85	7,5	80	54,5	19
07535-13X90	22,5	13	M12	19,85	7,5	90	64,5	19
07535-13X100	22,5	13	M12	19,85	7,5	100	74,5	19
07535-17X40	25	17	M16	26,17	10	40	11,5	24
07535-17X45	25	17	M16	26,17	10	45	16,5	24
07535-17X50	25	17	M16	26,17	10	50	21,5	24
07535-17X60	27	17	M16	26,17	10	60	29,5	24
07535-17X70	27	17	M16	26,17	10	70	39,5	24
07535-17X80	27	17	M16	26,17	10	80	49,5	24
07535-17X90	27	17	M16	26,17	10	90	59,5	24
07535-17X100	27	17	M16	26,17	10	100	69,5	24
07535-21X50	28,5	21	M20	32,95	12,5	50	17,5	30
07535-21X60	30,5	21	M20	32,95	12,5	60	25,5	30
07535-21X70	30,5	21	M20	32,95	12,5	70	35,5	30
07535-21X80	30,5	21	M20	32,95	12,5	80	45,5	30
07535-21X90	30,5	21	M20	32,95	12,5	90	55,5	30
07535-21X100	30,5	21	M20	32,95	12,5	100	65,5	30
07535-21X120	30,5	21	M20	32,95	12,5	120	85,5	30
07535-25X60	36,5	25	M24	39,35	15	60	19	36
07535-25X70	36,5	25	M24	39,35	15	70	29	36
07535-25X80	36,5	25	M24	39,35	15	80	39	36
07535-25X90	36,5	25	M24	39,35	15	90	49	36
07535-25X100	36,5	25	M24	39,35	15	100	59	36
07535-25X120	36,5	25	M24	39,35	15	120	79	36

07540

Shoulder screws

with slotted domed head



Material:
Carbon steel.

Version:
Black oxidised.

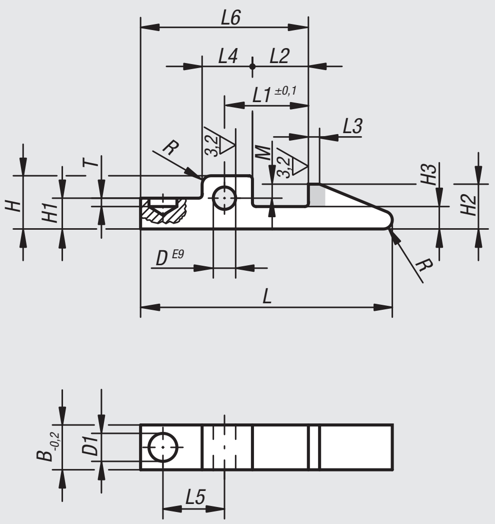
Sample order:
nlm 07540-10

Order No.	D1	D2	D3	L	B	K
07540-06	M6	14	8	10,2	9,89	6
07540-08	M8	18	10	12,2	11,8	7
07540-10	M10	22	12	14,2	14,8	9
07540-12	M12	22	14	16,2	15,8	9

07560

Snapper catch with spring

DIN 6310

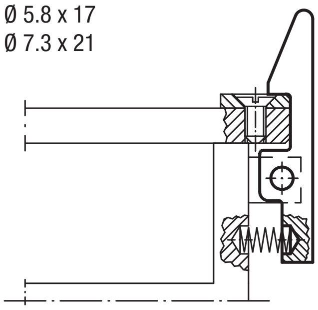


Material:
Carbon steel 1.2067

Version:
Black oxidised, snapper nose hardened (see grey region).

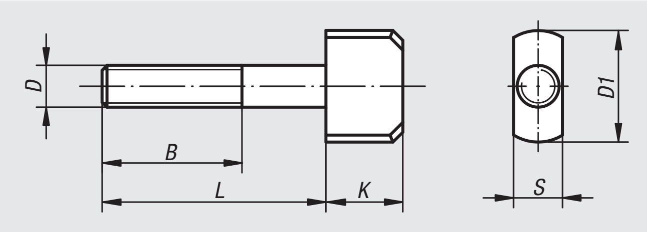
Sample order:
nlm 07560-02

Note:
The spring is supplied.
Spring dimensions:
Ø 4.8 x 14
Ø 5.8 x 17
Ø 7.3 x 21



Order No.	B	D	D1	H	H1	H2	H3	L	L1	L2	L3	L4	L5	L6	T	R	M
07560-01	8	4	5	9,5	5,5	8	4	45	15	10	2	9	11	30	1,5	1,6	2,5
07560-02	10	5	6,3	12	7	10	5	60	20	14	3	11	15	40	3	2,5	3
07560-03	14	6	8	15	9	14	7	80	30	22	5	14	23	60	5	4	5

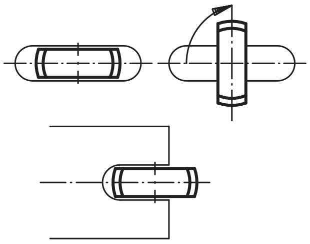
Quarter-turn screws



Material:
Carbon steel 1.1191

Version:
Tempered to 8.8 and black oxidised.

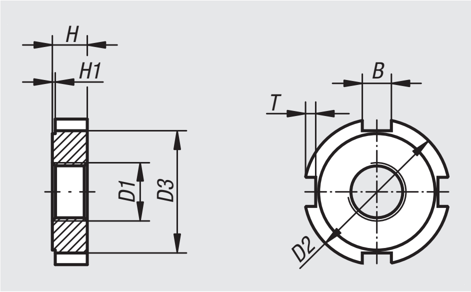
Sample order:
nlm 07570-10



Order No.	B	D	D1	K	L	S
07570-06	25	M6	20	14	30	6,5
07570-08	30	M8	25	16	40	8,5
07570-10	40	M10	28	16	50	10,5
07570-12	50	M12	32	20	60	12,5

Slotted round nuts

DIN 1804



Material:
Steel.

Version:
Form W = black oxidised.
Form H = hardened and ground both sides.

Sample order:
nlm 07590-120

Note:
Form H is case hardened, apart from the thread.

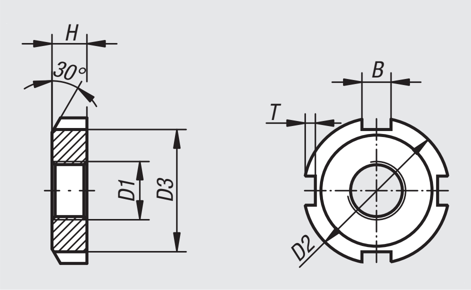
Order No. Form W	Order No. Form H	Slot width B DIN 650	D1	D2	D3	H	H1	T
07590-110	**07590-210**	5	M10x1	25	20	6	0,5	2
07590-112	**07590-212**	5	M12x1,5	28	23	6	0,5	2
07590-114	**07590-214**	5	M14x1,5	30	25	7	0,5	2
07590-116	**07590-216**	5	M16x1,5	32	27	7	0,5	2
07590-118	**07590-218**	6	M18x1,5	34	28	8	0,5	2,5
07590-120	**07590-220**	6	M20x1,5	36	30	8	0,5	2,5
07590-122	**07590-222**	6	M22x1,5	40	34	9	0,5	2,5
07590-124	**07590-224**	6	M24x1,5	42	36	9	0,5	2,5
07590-126	**07590-226**	7	M26x1,5	45	38	10	0,5	3
07590-128	**07590-228**	7	M28x1,5	50	43	10	0,5	3
07590-130	**07590-230**	7	M30x1,5	50	43	10	0,5	3
07590-132	**07590-232**	7	M32x1,5	52	45	11	0,5	3
07590-135	**07590-235**	7	M35x1,5	55	48	11	0,5	3
07590-138	**07590-238**	8	M38x1,5	58	50	11	0,5	3,5
07590-140	**07590-240**	8	M40x1,5	62	54	12	0,5	3,5
07590-142	**07590-242**	8	M42x1,5	62	54	12	0,5	3,5

Notes

07590-01

Slotted round nuts, steel or stainless steel,

DIN 981



Material:
Steel 1.0503.
Stainless steel 1.4301.

Version:
Stainless steel, bright.
Steel, bright.
Steel electro zinc-plated.

Sample order:
nlm 07590-01-0012

Note:
The slotted round nuts are mainly used to fasten bearings to a shaft.
The slotted round nuts can also be used to secure gear wheels, pulleys and other machine components.

Order No. steel bright	Order No. steel galvanised	D1	D2	D3	H	B=slot width	T
07590-01-0010	**07590-01-010**	M10x0,75	18	13,5	4	3	2
07590-01-0012	**07590-01-012**	M12x1	22	17	4	3	2
07590-01-0015	**07590-01-015**	M15X1	25	21	5	4	2
07590-01-0017	**07590-01-017**	M17x1	28	24	5	4	2
07590-01-0020	**07590-01-020**	M20X1	32	26	6	4	2
07590-01-0025	**07590-01-025**	M25X1,5	38	32	7	5	2
07590-01-0030	**07590-01-030**	M30x1,5	45	38	7	5	2
07590-01-0035	**07590-01-035**	M35x1,5	52	44	8	5	2
07590-01-0040	**07590-01-040**	M40x1,5	58	50	9	6	2,5
07590-01-0045	**07590-01-045**	M45x1,5	65	56	10	6	2,5
07590-01-0050	**07590-01-050**	M50x1,5	70	61	11	6	2,5
07590-01-0055	**07590-01-055**	M55x2	75	67	11	7	3
07590-01-0060	**07590-01-060**	M60x2	80	73	11	7	3
07590-01-0065	**07590-01-065**	M65x2	85	79	12	7	3
07590-01-0070	**07590-01-070**	M70x2	92	85	12	8	3,5
07590-01-0075	**07590-01-075**	M75x2	98	90	13	8	3,5
07590-01-0080	**07590-01-080**	M80x2	105	95	15	8	3,5
07590-01-0085	**07590-01-085**	M85x2	110	102	15	8	3,5
07590-01-0090	**07590-01-090**	M90x2	120	108	16	10	4
07590-01-0095	**07590-01-095**	M95x2	125	110	17	10	4
07590-01-0100	**07590-01-100**	M100x2	130	120	18	10	4

07590-01

Slotted round nuts, steel or stainless steel,

DIN 981

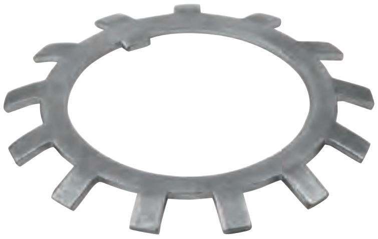
+

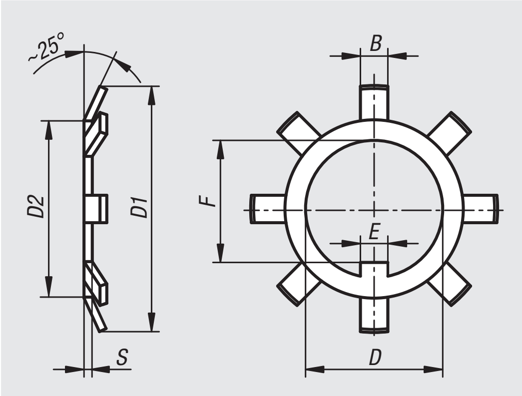
Order No.	Main material	D1	D2	D3	H	B=slot width	T
07590-01-1010	stainless steel	M10x0,75	18	13,5	4	3	2
07590-01-1012	stainless steel	M12x1	22	17	4	3	2
07590-01-1015	stainless steel	M15X1	25	21	5	4	2
07590-01-1017	stainless steel	M17x1	28	24	5	4	2
07590-01-1020	stainless steel	M20X1	32	26	6	4	2
07590-01-1025	stainless steel	M25X1,5	38	32	7	5	2
07590-01-1030	stainless steel	M30x1,5	45	38	7	5	2
07590-01-1035	stainless steel	M35x1,5	52	44	8	5	2
07590-01-1040	stainless steel	M40x1,5	58	50	9	6	2,5
07590-01-1045	stainless steel	M45x1,5	65	56	10	6	2,5
07590-01-1050	stainless steel	M50x1,5	70	61	11	6	2,5
07590-01-1055	stainless steel	M55x2	75	67	11	7	3
07590-01-1060	stainless steel	M60x2	80	73	11	7	3
07590-01-1065	stainless steel	M65x2	85	79	12	7	3
07590-01-1070	stainless steel	M70x2	92	85	12	8	3,5
07590-01-1075	stainless steel	M75x2	98	90	13	8	3,5
07590-01-1080	stainless steel	M80x2	105	95	15	8	3,5
07590-01-1085	stainless steel	M85x2	110	102	15	8	3,5
07590-01-1090	stainless steel	M90x2	120	108	16	10	4
07590-01-1095	stainless steel	M95x2	125	110	17	10	4
07590-01-1100	stainless steel	M100x2	130	120	18	10	4

07590-02

Locking plate steel or stainless steel

DIN 5406





Material:
Steel 1.0503.
Stainless steel 1.4301.

Version:
Stainless steel, bright.
Steel, bright.
Steel electro zinc-plated.

Sample order:
nlm 07590-02-0010

Note:
DIN 5406 locking plates are used to secure the DIN 981 slotted round nuts. To use the locking plates, a keyway must be cut into the screw thread.

Order No. steel bright	Order No. steel galvanised	B	D	D1	D2	E	F	S	Suitable for
07590-02-0010	**07590-02-1010**	3	10	21	13,5	3	8,5	1	07590-01-0010/07590-01-010
07590-02-0012	**07590-02-1012**	3	12	25	17	3	10,5	1	07590-01-0012/07590-01-012
07590-02-0015	**07590-02-1015**	4	15	28	21	4	13,5	1	07590-01-0015/07590-01-015
07590-02-0017	**07590-02-1017**	4	17	32	24	4	15,5	1	07590-01-0017/07590-01-017
07590-02-0020	**07590-02-1020**	4	20	36	26	4	18,5	1	07590-01-0020/07590-01-020
07590-02-0025	**07590-02-1025**	5	25	42	32	5	23	1,25	07590-01-0025/07590-01-025
07590-02-0030	**07590-02-1030**	5	30	49	38	5	27,5	1,25	07590-01-0030/07590-01-030
07590-02-0035	**07590-02-1035**	6	35	57	44	5	32,5	1,25	07590-01-0035/07590-01-035
07590-02-0040	**07590-02-1040**	6	40	62	50	6	37,5	1,25	07590-01-0040/07590-01-040
07590-02-0045	**07590-02-1045**	6	45	69	56	6	42,5	1,25	07590-01-0045/07590-01-045
07590-02-0050	**07590-02-1050**	6	50	74	61	6	47,5	1,25	07590-01-0050/07590-01-050
07590-02-0055	**07590-02-1055**	7	55	81	67	8	52,5	1,5	07590-01-0055/07590-01-055
07590-02-0060	**07590-02-1060**	7	60	86	73	8	57,5	1,5	07590-01-0060/07590-01-060
07590-02-0065	**07590-02-1065**	7	65	92	79	8	62,5	1,5	07590-01-0065/07590-01-065
07590-02-0070	**07590-02-1070**	8	70	98	85	8	66,5	1,5	07590-01-0070/07590-01-070
07590-02-0075	**07590-02-1075**	8	75	104	90	8	71,5	1,5	07590-01-0075/07590-01-075
07590-02-0080	**07590-02-1080**	8	80	112	95	10	76,5	1,75/1,8	07590-01-0080/07590-01-080
07590-02-0085	**07590-02-1085**	8	85	119	102	10	81,8	1,75/1,8	07590-01-0085/07590-01-085
07590-02-0090	**07590-02-1090**	10	90	126	108	10	86,5	1,75/1,8	07590-01-0090/07590-01-090
07590-02-0095	**07590-02-1095**	10	95	133	113	10	91,5	1,75/1,8	07590-01-0095/07590-01-095
07590-02-0100	**07590-02-1100**	10	100	142	120	12	96,5	1,75/1,8	07590-01-0100/07590-01-100

07590-02

Locking plate steel or stainless steel

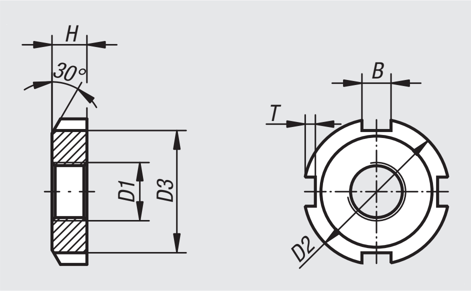
DIN 5406

Order No.	Main material	B	D	D1	D2	E	F	S	Suitable for
07590-02-2010	stainless steel	3	10	21	13,5	3	8,5	1	07590-01-1010
07590-02-2012	stainless steel	3	12	25	17	3	10,5	1	07590-01-1012
07590-02-2015	stainless steel	4	15	28	21	4	13,5	1	07590-01-1015
07590-02-2017	stainless steel	4	17	32	24	4	15,5	1	07590-01-1017
07590-02-2020	stainless steel	4	20	36	26	4	18,5	1	07590-01-1020
07590-02-2025	stainless steel	5	25	42	32	5	23	1,25	07590-01-1025
07590-02-2030	stainless steel	5	30	49	38	5	27,5	1,25	07590-01-1030
07590-02-2035	stainless steel	6	35	57	44	5	32,5	1,25	07590-01-1035
07590-02-2040	stainless steel	6	40	62	50	6	37,5	1,25	07590-01-1040
07590-02-2045	stainless steel	6	45	69	56	6	42,5	1,25	07590-01-1045
07590-02-2050	stainless steel	6	50	74	61	6	47,5	1,25	07590-01-1050
07590-02-2055	stainless steel	7	55	81	67	8	52,5	1,5	07590-01-1055
07590-02-2060	stainless steel	7	60	86	73	8	57,5	1,5	07590-01-1060
07590-02-2065	stainless steel	7	65	92	79	8	62,5	1,5	07590-01-1065
07590-02-2070	stainless steel	8	70	98	85	8	66,5	1,5	07590-01-1070
07590-02-2075	stainless steel	8	75	104	90	8	71,5	1,5	07590-01-1075
07590-02-2080	stainless steel	8	80	112	95	10	76,5	1,8	07590-01-1080
07590-02-2085	stainless steel	8	85	119	102	10	81,8	1,8	07590-01-1085
07590-02-2090	stainless steel	10	90	126	108	10	86,5	1,8	07590-01-1090
07590-02-2095	stainless steel	10	95	133	113	10	91,5	1,8	07590-01-1095
07590-02-2100	stainless steel	10	100	142	120	12	96,5	1,8	07590-01-1100

07590-05

Slotted round nuts, steel,

DIN 70852



Material:
Steel 1.0503

Version:
Steel, bright.
Steel electro zinc-plated.

Sample order:
nlm 07590-05-010

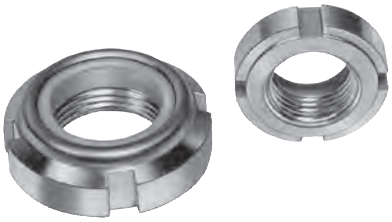
Note:
The slotted round nuts are mainly used to fasten bearings to a shaft.
The slotted round nuts can also be used to secure gear wheels, pulleys and other machine components.

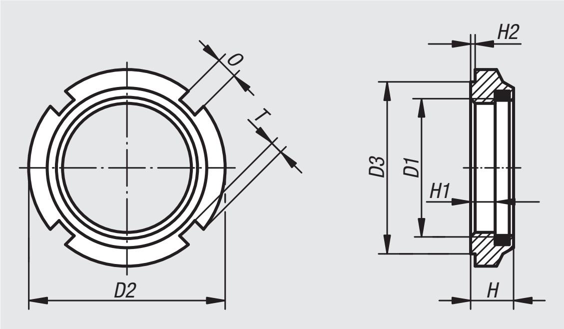
Order No. steel bright	Order No. steel galvanised	D1	D2	D3	H	B=slot width	T
07590-05-010	**07590-05-10**	M10x1	20	16	5	4,5	1,8
07590-05-012	**07590-05-12**	M12x1,5	22	18	6	4,5	1,8
07590-05-014	**07590-05-14**	M14x1,5	24	20	6	4,5	1,8
07590-05-016	**07590-05-16**	M16x1,5	28	23	6	5,5	2,3
07590-05-018	**07590-05-18**	M18x1,5	30	25	6	5,5	2,3
07590-05-020	**07590-05-20**	M20x1,5	32	27	6	5,5	2,3
07590-05-022	**07590-05-22**	M22x1,5	36	30	7	6,5	2,8
07590-05-024	**07590-05-24**	M24x1,5	38	32	7	6,5	2,8
07590-05-026	**07590-05-26**	M26x1,5	40	34	7	6,5	2,8
07590-05-028	**07590-05-28**	M28x1,5	42	36	7	6,5	2,8
07590-05-030	**07590-05-30**	M30x1,5	44	38	7	6,5	2,8
07590-05-032	**07590-05-32**	M32x1,5	48	41	8	7	3,3
07590-05-035	**07590-05-35**	M35x1,5	50	43	8	7	3,3
07590-05-038	**07590-05-38**	M38x1,5	54	47	8	7	3,3
07590-05-040	**07590-05-40**	M40x1,5	56	49	8	7	3,3
07590-05-042	**07590-05-42**	M42x1,5	60	52	8	8	3,3
07590-05-045	**07590-05-45**	M45x1,5	62	54	8	8	3,3
07590-05-048	**07590-05-48**	M48x1,5	65	57	8	8	3,3
07590-05-050	**07590-05-50**	M50x1,5	68	60	8	8	3,3
07590-05-052	**07590-05-52**	M52X1,5	70	62	8	8	3,3
07590-05-055	**07590-05-55**	M55X1,5	75	67	8	8	3,3
07590-05-060	**07590-05-60**	M60x1,5	80	71	9	11	4,3
07590-05-065	**07590-05-65**	M65X1,5	85	76	9	11	4,3
07590-05-070	**07590-05-70**	M70X1,5	90	81	9	11	4,3
07590-05-075	**07590-05-75**	M75X1,5	95	86	10	11	4,3
07590-05-080	**07590-05-80**	M80X1,5	100	91	10	11	4,3

07595

Slotted nuts

with elastic lock





Material:
Free-cutting steel.
Elastic ring polyamide (max. 100 °C).

Version:
Electro zinc-plated.

Sample order:
nlm 07595-24

Note:
Elastic lock slotted nuts have enormous cost advantages. They do not need lock washers with folding tabs and so the expensive milling of a slot is not required.
The polyamide ring is resistant to petrol and oil.
Elastic lock slotted nuts can be used several times. They withstand the strongest vibrations and oscillations irrespective of the tightening torque and are therefore useful as adjustment nuts.

Order No.	D1	D2	D3	H	H2	H1	T	O
07595-10	M10x1	18	15	7,6	0,5	4,4	1,5	3
07595-12	M12x1,5	21	18	9,2	0,5	5,7	1,5	3
07595-14	M14x1,5	24	21	10,7	0,5	6	1,5	4
07595-16	M16x1,5	28	24	10,7	0,5	6	2	4
07595-18	M18x1,5	28	24	10,7	0,5	7,3	2	4
07595-20	M20x1,5	32	27	9,6	0,5	6	2,5	4
07595-22	M22x1,5	38	33	12,7	0,5	7	2,5	5
07595-24	M24x1,5	38	33	10,7	0,5	6,2	2,5	5
07595-28	M28x1,5	44	38	11,2	0,5	6,9	3	5
07595-30	M30x1,5	44	38	11	0,5	6,5	3	5
07595-32	M32x1,5	50	44	11,2	0,5	6,6	3	5
07595-35	M35x1,5	50	44	11	0,5	7	3	5
07595-38	M38x1,5	53	47	12,2	0,5	6,6	3	5
07595-40	M40x1,5	56	50	12	0,5	7	3	6
07595-42	M42x1,5	62	55	15,2	0,5	10,6	3,5	6

Technical information for adjustment nuts

Assembly:

1. Carefully clean the adjustment nut and connection points and lightly oil with a film of standard machine oil without anti-friction additives.
2. Screw the adjustment nut onto the spindle thread but not quite up to the contact face (Fig. 1).
3. Tighten the screws uniformly and crosswise while turning the adjustment nut back and forth until it turns with almost no backlash on the thread (Fig. 2).
4. Now tighten the adjustment nut with a higher than specified torque (ca. +30%) against the contact face, then loosen again and finally tighten with specified torque (Fig. 3). This prevents the need to re-adjust later.
5. Now secure the adjustment nut by uniformly tightening the screws. Highest demands of spindle concentricity can be positively influenced by testing and individually tightening the screws. Possible stresses caused by small lateral run-out errors can be corrected.

Disassembly:

Slightly loosen all the screws crosswise. Now fully loosen all the screws. This prevents the last screw being subjected to the full stress of the membrane and being blocked.

If an adjustment nut has been secured on a spindle thread, after dismantling it can only be used again on the same spindle. The adaption procedure between spindle and adjustment nut can lead to problems when attempting to fit the nut to another.

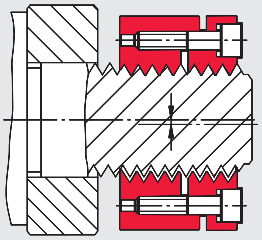


Fig. 1

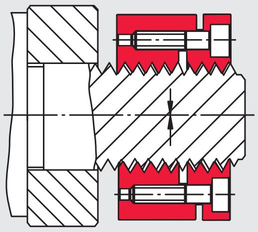


Fig. 2

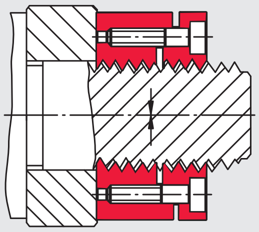


Fig. 3

Setting an axial pre-tension load:

The axial pre-tension of a screw connection is often function critical and therefore must be set accurately. Measuring this value directly during assembly is mostly not possible making an indirect setting necessary. The tightening load for the adjustment screw pre-tension torque must be calculated.

This can be determined by the following formula:

$$M_v = \frac{(F_v + V) \cdot (U + \mu A \cdot rA)}{1000} \quad [\mathrm{Nm}]$$

M_v = Pre-tension torque of the adjustment nut (Nm)
F_v = Required axial pre-tension force of the screw connection (N)
V = Adjustment nut specific supplement (N), compensates the face load alleviation by the securing process
U = Constant (mm), includes the calculation factor for the respective thread (see table)
µA = Coefficient of friction for the locating face of the adjustment nut. Approximate value µA = 0.1 (steel/steel)
rA = Operative frictional radius for the locating face of the adjustment nut (mm)

The securing procedure subjects the spindle thread to stress and produces an intensive flank pressure (= high axial rigidity). This effect simultaniously relieves the contace face of the adjusment nut, which can be easily counterbalanced by correspondingly higher pre-tension torque during assembly. This higher pre-tension torque is calculated by allowance V to the required pre-tension force F_v.

Order No.	Calculation factor U (mm)	Adjustment nut specific supplement V (N)
07598-024101015	0,703	2,457
07598-026121515	0,881	2,438
07598-032141516	0,997	2,995
07598-034161518	1,112	3,962
07598-036181518	1,228	3,931
07598-040201518	1,344	3,900
07598-040221518	1,459	3,869
07598-042241518	1,575	3,838
07598-045261520	1,690	3,806
07598-046281520	1,805	3,775
07598-048301520	1,921	3,744
07598-050321522	2,037	3,713
07598-053351522	2,210	3,666

07598

Adjustment nuts

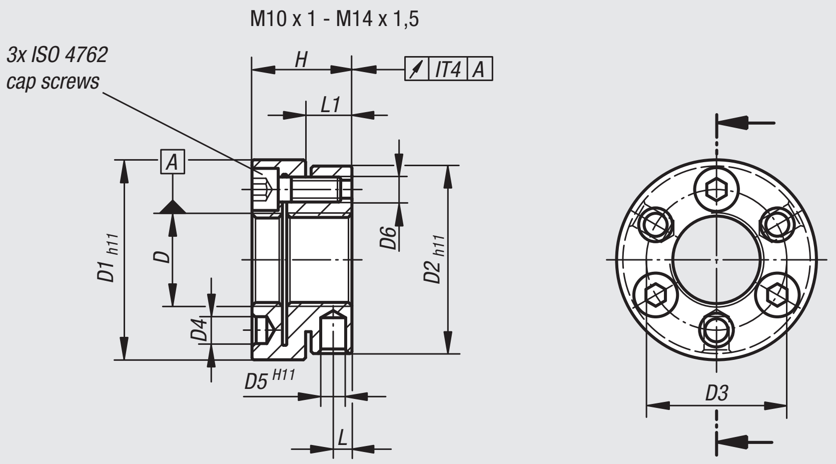
Material:
Steel.
Clamping screws carbon steel.

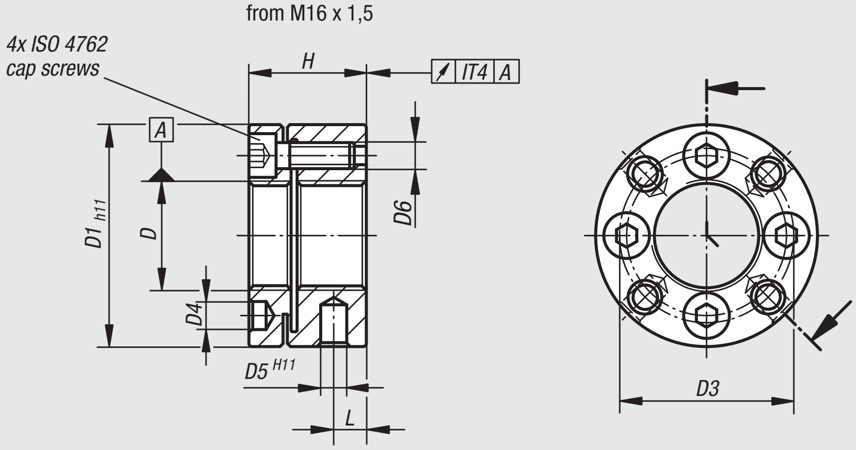
Version:
Black oxidised.
Clamping screws ISO 4762, grade 12.9.

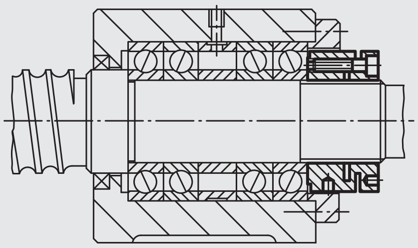
Sample order:
nlm 07598-024101015

Note:
Two screw parts that are elastically connected are tightened against each other with screws.
The adjustment nut is constructed rotationally symmetric. There are no unbalancing keyways or slots.

Attention:
The adjustment nut can be axially deformed and must be handled with care. The clamping screws may only be tightened when the adjustment nut is completely screwed onto the spindle thread, otherwise the adjustment nut could become defective through unacceptable plastic deformation.







Example:
The bearing of the ball bearing spindle gains high axial rigidity due to the assembly with an adjusting nut. During highly dynamic operation the high security factor of the adjusting nut is also very advantageous.

Order No.	D	D1	D2	D3	D4	D5	D6	H	L	L1	Tightening torque of screws Nm	Max. static axial pressure stress N	Max. dynamic axial pressure stress N	Inertia (gcm^2)
07598-024101015	M10x1	24	22	17	3,2	2,5	M3	15	3	6,5	2	15000	12000	27
07598-026121515	M12x1,5	26	25	19	3,2	3	M3	15	3	6,5	2	18000	13000	40
07598-032141516	M14x1,5	32	30	22,5	4,3	4	M4	16	3	7	2,9	22000	17000	96
07598-034161518	M16x1,5	34	-	24,5	4,3	4	M4	18	5	-	2,9	22000	17000	147
07598-036181518	M18x1,5	36	-	26,5	4,3	4	M4	18	5	-	2,9	25000	19000	183
07598-040201518	M20x1,5	40	-	30,5	4,3	4	M4	18	5	-	2,9	28000	18000	283
07598-040221518	M22x1,5	40	-	30,5	4,3	4	M4	18	5	-	2,9	32000	23000	270
07598-042241518	M24x1,5	42	-	32,5	4,3	4	M4	18	5	-	2,9	35000	25000	323
07598-045261520	M26x1,5	45	-	36,5	4,3	5	M4	20	6,5	-	2,9	49000	34000	479
07598-046281520	M28x1,5	46	-	38,5	4,3	5	M4	20	6,5	-	2,9	53000	36000	504
07598-048301520	M30x1,5	48	-	40,5	4,3	5	M4	20	6,5	-	2,9	57000	38000	588
07598-050321522	M32x1,5	50	-	42,5	4,3	5	M4	22	7	-	2,9	64000	44000	743
07598-053351522	M35x1,5	53	-	45,5	4,3	5	M4	22	7	-	2,9	66000	47000	914

07620

Clevis

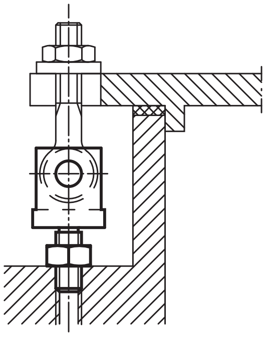
with external thread

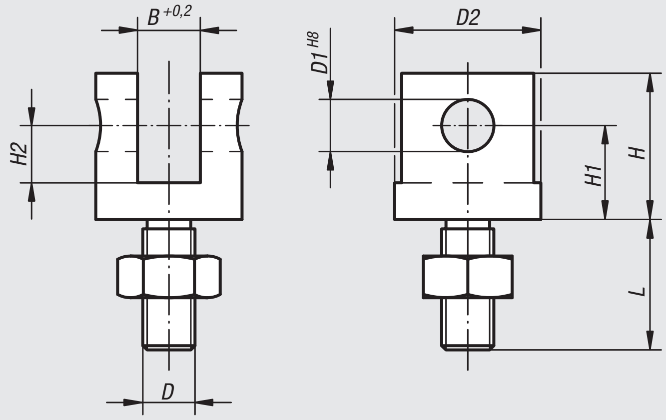
Material:
Carbon steel 1.1191

Version:
Tempered and black oxidised.

Sample order:
nlm 07620-05

Note:
Suitable hinge pin, see 04250.





Order No.	D	D1	D2	B	H	H1	H2	L
07620-05	M5	5	12	6	16	10	7	14,5
07620-06	M6	6	16	7	19	12	8	15
07620-08	M8	8	20	9	23	15	10	20
07620-10	M10	10	28	12	28	18	11	25
07620-12	M12	12	30	14	34	21	13,5	30
07620-14	M14	14	36	16	37	23	15	35
07620-16	M16	16	40	17	42	26	17	40
07620-20	M20	18	50	22	52	32	21	50

07630

Grub screws

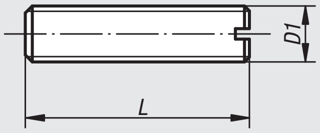
DIN 551

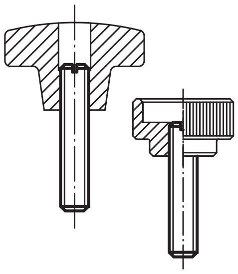
Material:
Steel.

Version:
Bright, grade 5.8.

Sample order:
nlm 07630-10X40 (include length L)

Note:
A solid joint between grub screw and counter-piece can often be made more cost-effectivelly by gluing it.
The LOCTITE products are especially suitable for this. See 97990.





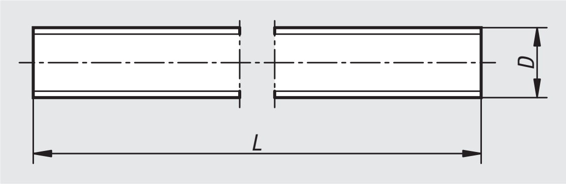
Order No.	D1	L
07630-06X	M6	20/25/30/35/40/45/50/60/70
07630-08X	M8	25/30/35/40/45/50/60/70/80
07630-10X	M10	25/30/35/40/45/50/60/70/80
07630-12X	M12	30/35/40/45/50/60/70/80/100
07630-16X	M16	30/35/40/45/50/60/70/80/100
07630-20X	M20	40/50/60/70/80/90/100

Notes

07640

Threaded rods

steel and stainless steel DIN 976-1



Material:
Steel or stainless steel (A 2)

Version:
Grade 4.6, electro zinc-plated.
Grade 8.8 bright or electro zinc-plated.
Bright stainless steel.

Sample order:
nlm 07640-16

Note:
Threaded rods are only available in 1000 mm lengths.
Threaded rods size M3 and M4 may be slightly bent when delivered.

The blank version may, for technical reasons have a grey to black surface.

Order No. 4.6 galvanised	**Order No. 8.8 galvanised**	**Order No. 8.8 bright**	Main material	Version 1	D	L
07640-031	-	-	steel	rh thread	M3	1000
07640-041	**07640-043**	-	steel	rh thread	M4	1000
07640-051	**07640-053**	**07640-05**	steel	rh thread	M5	1000
07640-061	**07640-063**	**07640-06**	steel	rh thread	M6	1000
07640-081	**07640-083**	**07640-08**	steel	rh thread	M8	1000
07640-101	**07640-103**	**07640-10**	steel	rh thread	M10	1000
07640-121	**07640-123**	**07640-12**	steel	rh thread	M12	1000
-	**07640-143**	**07640-14**	steel	rh thread	M14	1000
07640-161	**07640-163**	**07640-16**	steel	rh thread	M16	1000
-	**07640-183**	**07640-18**	steel	rh thread	M18	1000
07640-201	**07640-203**	**07640-20**	steel	rh thread	M20	1000
-	**07640-223**	**07640-22**	steel	rh thread	M22	1000
07640-241	**07640-243**	**07640-24**	steel	rh thread	M24	1000
07640-301	**07640-303**	-	steel	rh thread	M30	1000
07640-361	**07640-363**	-	steel	rh thread	M36	1000
07640-1041	-	-	steel	lh thread	M4	1000
07640-1051	-	-	steel	lh thread	M5	1000
07640-1061	**07640-1063**	-	steel	lh thread	M6	1000
07640-1081	**07640-1083**	-	steel	lh thread	M8	1000
07640-1101	**07640-1103**	-	steel	lh thread	M10	1000
07640-1121	**07640-1123**	-	steel	lh thread	M12	1000
07640-1161	**07640-1163**	-	steel	lh thread	M16	1000
07640-1201	**07640-1203**	-	steel	lh thread	M20	1000
07640-1241	**07640-1243**	-	steel	lh thread	M24	1000
07640-1301	**07640-1303**	-	steel	lh thread	M30	1000
-	**07640-1363**	-	steel	lh thread	M36	1000

07640

Threaded rods

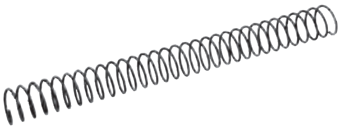
steel and stainless steel DIN 976-1

Order No.	Material	Version 1	D	L
07640-052	stainless steel	rh thread	M5	1000
07640-062	stainless steel	rh thread	M6	1000
07640-082	stainless steel	rh thread	M8	1000
07640-102	stainless steel	rh thread	M10	1000
07640-122	stainless steel	rh thread	M12	1000
07640-162	stainless steel	rh thread	M16	1000
07640-182	stainless steel	rh thread	M18	1000
07640-202	stainless steel	rh thread	M20	1000
07640-222	stainless steel	rh thread	M22	1000
07640-242	stainless steel	rh thread	M24	1000
07640-1042	stainless steel	lh thread	M4	1000
07640-1052	stainless steel	lh thread	M5	1000
07640-1062	stainless steel	lh thread	M6	1000
07640-1082	stainless steel	lh thread	M8	1000
07640-1102	stainless steel	lh thread	M10	1000
07640-1122	stainless steel	lh thread	M12	1000
07640-1162	stainless steel	lh thread	M16	1000
07640-1202	stainless steel	lh thread	M20	1000
07640-1242	stainless steel	lh thread	M24	1000

07650

Springs

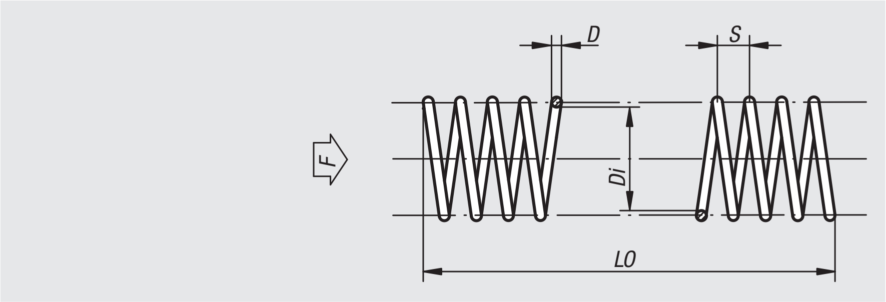
for clamp straps

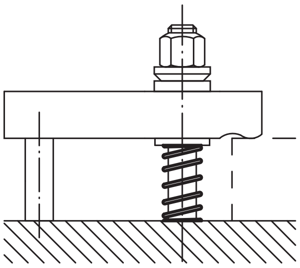


Material:
Spring steel wire EN 10270-1-DH.

Sample order:
nlm 07650-12

Note:
Springs are only available in 400 mm lengths.





Order No.	D	Di	LO	S	Spring force F approx. N	Compression factor under f
07650-06	1	6,5	400	3	32	1,3
07650-08	1	8,5	400	4	25	2,1
07650-10	1,2	10,5	400	4	35	2,7
07650-12	1,4	12,5	400	5	47	3,3
07650-14	1,5	14,5	400	6	50	4
07650-16	1,6	16,5	400	7	53	4,8
07650-18	1,8	18,5	400	7	68	5,4
07650-20	1,8	20,5	400	8	62	6,5
07650-24	2	25	400	9	70	8,6

Notes

07645

HeliCoil®plus threaded inserts

Material:
Stainless steel 1.4301.

Version:
Bright.

Sample order:
nlm 07645-01 (assortment box)

Note:
HeliCoil®plus threaded inserts are an indispensable aid to any metalworking business and restoration shop.
Threaded holes that are torn out, rusted solid or have been drilled too big, can have their original internal thread diameter restored in minutes.
Technically perfect and lasting for an unlimited time, they are also corrosion and heat-resistant.
Expensive products can be repaired and saved from the scrap bin.
The high surface quality guarantees optimal yield strength and high pre-stress of high tensile bolts. HeliCoil®plus threaded inserts are also ideally for transmission threads in all light alloys and cast parts. Instructions for installation and thread are enclosed. Additional dimensions and installation tools available on request.

Assortment Box
Assortment box consisting of M5 to M12 threaded inserts, each in three different thread lengths, spiral drills (only for M5 - M10 inserts), special hand taps, spindle inserts and pin breakers.

Repair Kits
Consisting of one size of threaded inserts, each in three different thread lengths, spiral drills, special hand taps, spindle inserts and pin breakers.


assortment box


repair kits


spare threaded inserts, loose

Order No.	Version	Thread sizes in set	No. off inserts	Insert length assembled mm
07645-01	Assortment Box	M5	10	5 / 7,5 / 10
		M6		6 / 9 / 12
		M8		8 / 12 / 16
		M10		10 / 15 / 20
		M12		12 / 18 / 24

Order No.	Version	Threaded Inserts	No. off inserts	Insert length assembled mm
07645-0523	Repair Set	M5	each length 20	5 / 7,5 / 10
07645-0623	Repair Set	M6	each length 20	6 / 9 / 12
07645-0823	Repair Set	M8	each length 10	8 / 12 / 16
07645-1023	Repair Set	M10	each length 10	10 / 15 / 20
07645-1223	Repair Set	M12	each length 10	12 / 18 / 24

Order No.	Version	Threaded Inserts	Insert length assembled mm
07645-0521	Spare Inserts	M5	5
07645-0531	Spare Inserts	M5	7,5
07645-0541	Spare Inserts	M5	10
07645-0621	Spare Inserts	M6	6
07645-0631	Spare Inserts	M6	9
07645-0641	Spare Inserts	M6	12
07645-0821	Spare Inserts	M8	8
07645-0831	Spare Inserts	M8	12
07645-0841	Spare Inserts	M8	16
07645-1021	Spare Inserts	M10	10
07645-1031	Spare Inserts	M10	15
07645-1041	Spare Inserts	M10	20
07645-1221	Spare Inserts	M12	12
07645-1231	Spare Inserts	M12	18
07645-1241	Spare Inserts	M12	24

before

after

Self-tapping thread inserts

installation information

Installing by hand

1. Drilling

Drill out the old hole with a core drill. If necessary, countersink the hole. By hard and tough materials the thread must be pre-tapped (max. intermediate tap).

2. Screw threaded insert onto the intallation tool

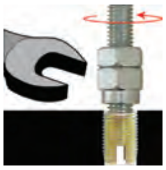
Screw the thread insert onto the installation tool with the slot or hole downwards and lock in place with the locknut using a spanner.

3. Screw in the thread insert

Screw in thread insert into the hole. The thread insert cuts its own thread. The intsallation tool has a ¼“ hexagon spigot and can be driven by a cordless driver, ratchet and socket etc.

4. Screw out the installation tool

Loosen the lock nuts with a spanner and screw the installation tool out. With the thread insert the thread is now more wear resistant, more durable and vibration resistant than the original thread.



Installation on a machine

1. Drilling

Drill out the old hole with a core drill. If necessary countersink the borehole. By hard and tough materials the thread must be pre-tapped (max. intermediate tap).

2. Machine settings and positioning

Position the workpiece under the machine. Set the machine to the screw in depth. Turn the outer sleeve so that the stop pin makes contact and carries the sleeve when screwing in begins. Screw the threaded insert 2 to 4 turns onto the threaded pin.

3. Screw in the thread insert

Allow the machine to run until the threaded insert is screwed into the workpiece. Introduce the tool gently to the workpiecedown to prevent damaging or breaking the thread insert or the installation tool.

4. Screw the tool out

Set the machine into reverse. The outer sleeve is carried by the stop pin and counters the thread insert.

Recommended drilling diameter

<table>
<tr><td colspan="2"></td><td colspan="4">Threaded inserts with cutting slot
case-hardened steel, galvanized, yellow-chromated</td><td colspan="4">Threaded inserts with cutting holes
case-hardened steel, galvanized, yellow-chromated</td></tr>
<tr><td rowspan="8">Materials</td><td rowspan="4">Light metal alloys
tensile strength [N/mm²]</td><td>< 250 N/mm²</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">< 300 N/mm²</td><td></td><td></td><td colspan="2">< 300 N/mm²</td><td></td><td></td></tr>
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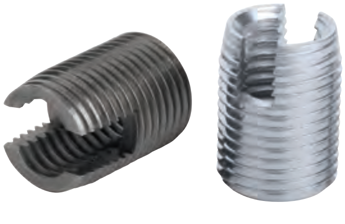
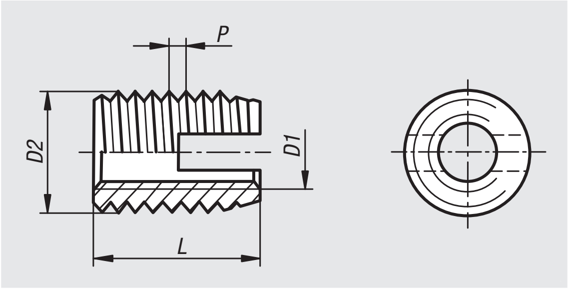
<tr><td></td><td></td><td colspan="2">> 350 N/mm²</td><td></td><td></td><td colspan="2">> 350 N/mm²</td></tr>
<tr><td>Brass, non-ferrous metals, bronze</td><td></td><td></td><td colspan="2">> 350 N/mm²</td><td></td><td></td><td colspan="2">> 350 N/mm²</td></tr>
<tr><td rowspan="3">Cast iron
Brinell hardness [HB]</td><td colspan="2">< 150 HB</td><td></td><td></td><td colspan="2">< 150 HB</td><td></td><td></td></tr>
<tr><td></td><td colspan="2">< 200 HB</td><td></td><td></td><td colspan="2">< 200 HB</td><td></td></tr>
<tr><td></td><td></td><td colspan="2">> 200 HB</td><td></td><td></td><td colspan="2">> 200 HB</td></tr>
<tr><td rowspan="8">Internal thread D</td><td>M3 x 0,5</td><td>-</td><td>4,6 mm</td><td>4,7 mm</td><td>4,8 mm</td><td>4,6 mm</td><td colspan="2">4,7 mm</td><td>4,8 mm</td></tr>
<tr><td>M4 x 0,7</td><td>5,9 mm</td><td>6,0 mm</td><td>6,1 mm</td><td>6,2 mm</td><td>6,0 mm</td><td colspan="2">6,1 mm</td><td>6,2 mm</td></tr>
<tr><td>M5 x 0,8</td><td>7,2 mm</td><td>7,3 mm</td><td>7,5 mm</td><td>7,6 mm</td><td>7,4 mm</td><td>7,5 mm</td><td>7,6 mm</td><td>7,7 mm</td></tr>
<tr><td>M6 x 1,0</td><td>8,8 mm</td><td>9,0 mm</td><td>9,2 mm</td><td>9,4 mm</td><td>9,3 mm</td><td>9,4 mm</td><td>9,5 mm</td><td>9,6 mm</td></tr>
<tr><td>M8 x 1,25</td><td>10,8 mm</td><td>11,0 mm</td><td>11,2 mm</td><td>11,4 mm</td><td>11,1 mm</td><td>11,2 mm</td><td>11,3 mm</td><td>11,5 mm</td></tr>
<tr><td>M10 x 1,5</td><td>12,8 mm</td><td>13,0 mm</td><td>13,2 mm</td><td>13,4 mm</td><td>13,1 mm</td><td>13,2 mm</td><td>13,3 mm</td><td>13,5 mm</td></tr>
<tr><td>M12 x 1,75</td><td>14,8 mm</td><td>15,0 mm</td><td>15,2 mm</td><td>15,4 mm</td><td>15,0 mm</td><td>15,1 mm</td><td>15,2 mm</td><td>15,4 mm</td></tr>
<tr><td>M16 x 2,0</td><td>18,8 mm</td><td>19,0 mm</td><td>19,2 mm</td><td>19,4 mm</td><td>19,0 mm</td><td>19,1 mm</td><td>19,2 mm</td><td>19,4 mm</td></tr>
<tr><td></td><td>Flank coverage</td><td>ca. 60%</td><td>ca. 50%</td><td>ca. 40%</td><td>ca. 30%</td><td>ca. 80%</td><td>ca. 70%</td><td>ca. 60%</td><td>ca. 50%</td></tr>
<tr><td colspan="2"></td><td colspan="4">Lubrication may be required</td><td colspan="4">Lubrication may be required</td></tr>
</table>

Threaded inserts self-tapping

with cutting slot





Material:
Steel or 1.4305 stainless steel

Version:
Steel case hardened, electro zinc-plated.
Stainless steel bright.

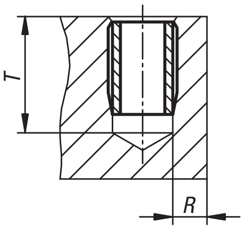
Sample order:
nlm 07652-03

Note:
Self-tapping threaded inserts for making high-strength, wear-free, vibration resistant screw connections in materials with low shear strength such as aluminium and aluminium alloys, brass, bronze, cast iron, duro and thermoplastics.

The threaded inserts are tapered at the bottom and have a cutting slot. By screwing in they cut their own threads inside a receiver hole. This guarantees a completely secure and firm anchoring in the host material.

Internal thread D1 acc. to ISO 6H.

The threaded inserts with cutting slot spring slightly inwards in the slot region in some materials. This results in a screw locking effect. If this is not desired, we recommend the threaded inserts with a cutting bore.



Order No.	Main material	D1 internal thread	D2	L length	P	T min.	R min. light metal	R min. cast iron	R min. plastics	Order No. Hand ass. tool	Order No. M/C ass. tool
07652-03	steel	M3	5	6	0,5	8	1	1,5	1,25	07652-803	07652-903
07652-04	steel	M4	6,5	8	0,75	10	1,3	1,95	1,6	07652-804	07652-904
07652-05	steel	M5	8	10	1	13	1,6	2,4	2	07652-805	07652-905
07652-06	steel	M6	10	14	1,5	17	2	3	2,5	07652-806	07652-906
07652-08	steel	M8	12	15	1,5	18	2,4	3,6	3	07652-808	07652-908
07652-10	steel	M10	14	18	1,5	22	2,8	4,2	3,5	07652-810	07652-910
07652-12	steel	M12	16	22	1,5	26	3,2	4,8	4	07652-812	07652-912
07652-16	steel	M16	20	22	1,5	27	4	6	5	-	07652-916
07652-103	stainless steel	M3	5	6	0,5	8	1	1,5	1,25	07652-803	07652-903
07652-104	stainless steel	M4	6,5	8	0,75	10	1,3	1,95	1,6	07652-804	07652-904
07652-105	stainless steel	M5	8	10	1	13	1,6	2,4	2	07652-805	07652-905
07652-106	stainless steel	M6	10	14	1,5	17	2	3	2,5	07652-806	07652-906
07652-108	stainless steel	M8	12	15	1,5	18	2,4	3,6	3	07652-808	07652-908
07652-110	stainless steel	M10	14	18	1,5	22	2,8	4,2	3,5	07652-810	07652-910
07652-112	stainless steel	M12	16	22	1,5	26	3,2	4,8	4	07652-812	07652-912
07652-116	stainless steel	M16	20	22	1,5	27	4	6	5	-	07652-916

07652

Assembly tools

for self-tapping threaded inserts

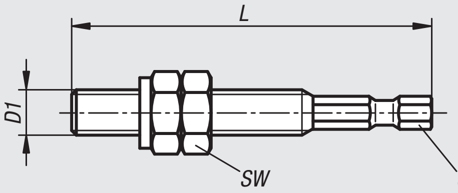
Material:
Steel.

Version:
Hand assembly tool, electro zinc-plated.
Machine assembly tool, black oxidised.

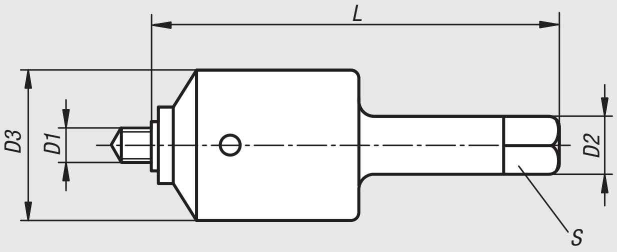
Sample order:
nlm 07652-803

Note:
The turning in by hand is carried out with the manual assembly tool and a cordless screwdriver, ratchet, socket etc. Machine assembly is carried out with the machine assembly tool preferably on a thread-cutting machine.

Hand assembly tool



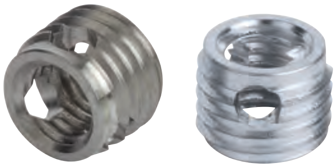
Machine assembly tool

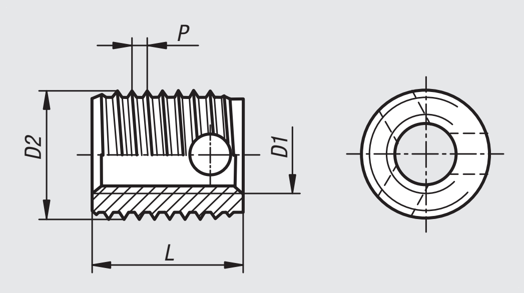


Order No.	Version 1	D1 internal thread	D2	D3	L length	S	SW	Insertion torque ref. values Nm	RPM ref. values for light metal
07652-803	manual operation	M3	-	-	46	1/4	5,5	2,5	-
07652-804	manual operation	M4	-	-	48	1/4	7	5,5	-
07652-805	manual operation	M5	-	-	57	1/4	8	10	-
07652-806	manual operation	M6	-	-	62	1/4	10	15	-
07652-808	manual operation	M8	-	-	72	1/4	13	28	-
07652-810	manual operation	M10	-	-	82	1/4	17	40	-
07652-812	manual operation	M12	-	-	92	1/4	19	60	-
07652-903	machine type	M3	8	18	80	6	-	2,5	650 - 900
07652-904	machine type	M4	8	18	80	6	-	5,5	400 - 600
07652-905	machine type	M5	12,5	30	96,5	10	-	10	400 - 600
07652-906	machine type	M6	12,5	30	96,5	10	-	15	280 - 400
07652-908	machine type	M8	12,5	30	96,5	10	-	28	280 - 400
07652-910	machine type	M10	13	40	110	10	-	40	200 - 300
07652-912	machine type	M12	13	40	110	10	-	60	200 - 300
07652-916	machine type	M16	13	40	110	10	-	160	150 - 200

Threaded inserts self-tapping

with cutting bores





Material:
Steel or 1.4305 stainless steel

Version:
Steel case hardened, electro zinc-plated.
Stainless steel bright.

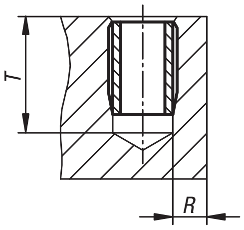
Sample order:
nlm 07653-03

Note:
Self-tapping threaded inserts for making high-strength, wear-free, vibration resistant screw connections in materials with low shear strength such as aluminium and aluminium alloys, brass, bronze, cast iron, duro and thermoplastics.

The threaded inserts are tapered at the bottom and have three cutting bores. They cut their own threads inside a receiver hole. This guarantees a completely secure and firm anchoring in the host material.

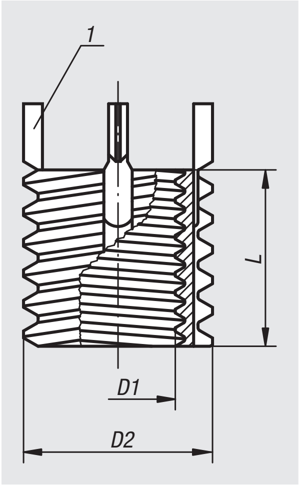
Internal thread D1 acc. to ISO 6H.

The threaded inserts with cutting bores are designed especially for materials difficult to machine. Due to the thicker wall, it can withstand greater force during cutting, which is also distributed over three cutting bores.



Order No.	Main material	D1 internal thread	D2	L length	P	T min.	R min. light metal	R min. cast iron	R min. plastics	Order No. Hand ass. tool	Order No. M/C ass. tool
07653-03	steel	M3	5	4	0,6	6	1	1,5	1,25	07652-803	07652-903
07653-04	steel	M4	6,5	6	0,8	8	1,3	1,95	1,6	07652-804	07652-904
07653-05	steel	M5	8	7	1	9	1,6	2,4	2	07652-805	07652-905
07653-06	steel	M6	10	8	1,25	10	2	3	2,5	07652-806	07652-906
07653-08	steel	M8	12	9	1,5	11	2,4	3,6	3	07652-808	07652-908
07653-10	steel	M10	14	10	1,5	13	2,8	4,2	3,5	07652-810	07652-910
07653-12	steel	M12	16	12	1,75	15	3,2	4,8	4	07652-812	07652-912
07653-103	stainless steel	M3	5	4	0,6	6	1	1,5	1,25	07652-803	07652-903
07653-104	stainless steel	M4	6,5	6	0,8	8	1,3	1,95	1,6	07652-804	07652-904
07653-105	stainless steel	M5	8	7	1	9	1,6	2,4	2	07652-805	07652-905
07653-106	stainless steel	M6	10	8	1,25	10	2	3	2,5	07652-806	07652-906
07653-108	stainless steel	M8	12	9	1,5	11	2,4	3,6	3	07652-808	07652-908
07653-110	stainless steel	M10	14	10	1,5	13	2,8	4,2	3,5	07652-810	07652-910
07653-112	stainless steel	M12	16	12	1,75	15	3,2	4,8	4	07652-812	07652-912

Threaded inserts



Material:
Steel or stainless steel.

Version:
Passivated.

Sample order:
nlm 07660-12 threaded insert
nlm 07660-812 assembly tool

Note:
Threaded inserts allow threaded holes which have been damaged, torn out or jammed to be used again or to be repaired, enabling expensive products to be saved from the scrap heap.

Threaded inserts are suitable for use in various materials, including light metals and castings.

Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.

Permissible deviations:
The medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads.
Other dimensions ±0.25 mm.

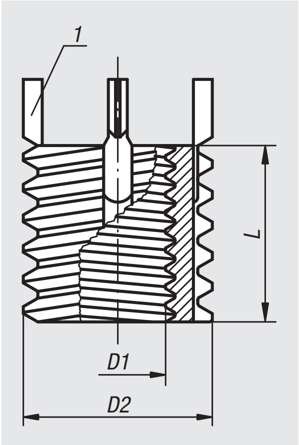
Technical information see operating instructions for threaded inserts.

Advantages:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are required besides the assembly tool.

Drawing reference:
1) locking pin

Order No. steel	**Order No. stainless steel**	D1 internal thread	D2 external thread	L length	Core drill Ø	Counter-sink Ø +0.25	Tap size	Min. thread depth	Removal drill Ø	Removal drilling depth	Order No. assembly tools
07660-05	**07660-105**	M5	M8	8	6,9	8,3	M8	9,5	5,5	4	07660-805
07660-06	**07660-106**	M6	M10x1,25	10	8,8	10,3	M10x1,25	11,5	7,5	4,8	07660-806
07660-08	**07660-108**	M8	M12x1,25	12	10,8	12,3	M12x1,25	13,5	9,5	4,8	07660-808
07660-08X1	**07660-108X1**	M8x1	M12x1,25	12	10,8	12,3	M12x1,25	13,5	9,5	4,8	07660-808
07660-10	**07660-110**	M10	M14x1,5	14	12,8	14,3	M14x1,5	15,5	11,5	4,8	07660-810
07660-10X125	**07660-110X125**	M10x1,25	M14x1,5	14	12,8	14,3	M14x1,5	15,5	11,5	4,8	07660-810
07660-12	**07660-112**	M12	M16x1,5	16	14,8	16,3	M16x1,5	17,5	13,5	4,8	07660-812
07660-12X125	**07660-112X125**	M12x1,25	M16x1,5	16	14,8	16,3	M16x1,5	17,5	13,5	4,8	07660-812

Threaded inserts reinforced



Material:
Steel or stainless steel.

Version:
Passivated.

Sample order:
nlm 07661-12 reinforced threaded insert
nlm 07661-812 assembly tool

Note:
Reinforced threaded inserts allow threaded holes which have been damaged, torn out or jammed to be used again or to be repaired. This makes it possible to recover scrap and rejects of expensive products. Reinforced threaded inserts are suitable for use in various materials, including light metals and casting. Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations:
The medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads. Other dimensions ±0.25 mm.

With reinforced threaded inserts we also offer a version with a stronger cross-section for use in applications with greater stress.

Technical information see operating instructions for threaded inserts.

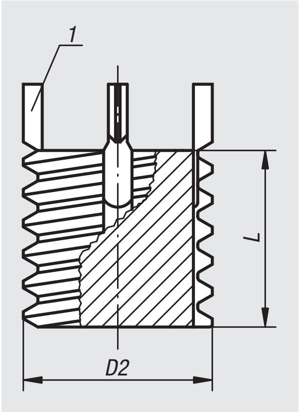
Advantages:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are required besides the assembly tool.

Drawing reference:
1) locking pin

Order No. steel	**Order No. stainless steel**	D1 internal thread	D2 external thread	L length	Core drill Ø	Counter-sink Ø +0.25	Tap size	Min. thread depth	Removal drill Ø	Removal drilling depth	Order No. assembly tools
07661-04	**07661-104**	M4	M8	8	6,9	8,3	M8	9,5	5,5	4	07661-804
07661-05	**07661-105**	M5	M10x1,25	10	8,8	10,3	M10x1,25	12,5	7,5	4,8	07661-805
07661-06	**07661-106**	M6	M12x1,25	12	10,8	12,3	M12x1,25	14,5	9,5	4,8	07661-806
07661-08	**07661-108**	M8	M14x1,5	14	12,8	14,3	M14x1,5	16,5	11,5	4,8	07661-808
07661-08X1	**07661-108X1**	M8x1	M14x1,5	14	12,8	14,3	M14x1,5	16,5	11,5	4,8	07661-808
07661-10	**07661-110**	M10	M16x1,5	16	14,8	16,3	M16x1,5	18,5	13,5	4,8	07661-810
07661-10X125	**07661-110X125**	M10x1,25	M16x1,5	16	14,8	16,3	M16x1,5	18,5	13,5	4,8	07661-810
07661-12	**07661-112**	M12	M18x1,5	18	16,8	18,3	M18x1,5	20,5	15,5	4,8	07661-812
07661-12X125	**07661-112X125**	M12x1,25	M18x1,5	18	16,8	18,3	M18x1,5	20,5	15,5	4,8	07661-812
07661-14	**07661-114**	M14	M20x1,5	20	18,8	20,3	M20x1,5	22,5	17,5	4,8	07661-814
07661-14X15	**07661-114X15**	M14x1,5	M20x1,5	20	18,8	20,3	M20x1,5	22,5	17,5	4,8	07661-814
07661-16	**07661-116**	M16	M22x1,5	22	20,7	22,3	M22x1,5	24,5	17,8	6,4	07661-816
07661-16X15	**07661-116X15**	M16x1,5	M22x1,5	22	20,7	22,3	M22x1,5	24,5	17,8	6,4	07661-816
07661-18X15	**07661-118X15**	M18x1,5	M24x1,5	24	22,5	24,3	M24x1,5	26,5	19,8	6,4	07661-818
07661-20	**07661-120**	M20	M30x2	30	28	30,3	M30x2	34,5	25,8	6,4	07661-820
07661-20X15	**07661-120X15**	M20x1,5	M30x2	30	28	30,3	M30x2	34,5	25,8	6,4	07661-820
07661-22X15	**07661-122X15**	M22x1,5	M32x2	32	30	32,3	M32x2	36,5	27,8	6,4	07661-822
07661-24	**07661-124**	M24	M33x2	33	31	33,3	M33x2	37,5	28,8	6,4	07661-824
07661-24X2	**07661-124X2**	M24x2	M33x2	33	31	33,3	M33x2	37,5	28,8	6,4	07661-824

07662

Threaded inserts solid body



Material:
Steel.

Version:
Passivated.

Sample order:
nlm 07662-10X125 solid body threaded insert
nlm 07662-810 assembly tool

Note:
Solid body threaded inserts allow threaded holes which have been damaged, torn out or jammed to be used again or to be repaired. This makes it possible to recover scrap and rejects of expensive products.
Solid body threaded inserts are suitable for use in various materials, including light metals and castings.
Permissible deviations:
The medium tolerance class applies to the threads listed, i.e. 6g for bolt threads.
Other dimensions ±0.25 mm.

Solid body threaded inserts are used where threaded holes that have been drilled too large or drill hole spacings that have not been observed in workpieces need to be redone.

Technical information see operating instructions for threaded inserts.

Advantages:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are required besides the assembly tool.

Drawing reference:
1) locking pin

Order No.	D2 external thread	L length	Core drill Ø	Counter-sink Ø +0.25	Tap size	Min. thread depth	Removal drill Ø	Removal drilling depth	Order No. assembly tools
07662-08	M8	8	6,9	8,3	M8	9,5	5,5	4	07662-808
07662-10X125	M10x1,25	10	8,8	10,3	M10x1,25	12,5	7,5	4,8	07662-810
07662-12X125	M12x1,25	12	10,8	12,3	M12x1,25	14,5	9,5	4,8	07662-812
07662-14X15	M14x1,5	14	12,8	14,3	M14x1,5	16,5	11,5	4,8	07662-814
07662-16X15	M16x1,5	16	14,8	16,3	M16x1,5	18,5	13,5	4,8	07662-816
07662-18X15	M18x1,5	18	16,8	18,3	M18x1,5	20,5	15,5	4,8	07662-818
07662-20X15	M20x1,5	20	18,8	20,3	M20x1,5	22,5	17,5	4,8	07662-820
07662-22X15	M22x1,5	22	20,7	22,3	M22x1,5	24,5	17,8	6,4	07662-822
07662-24X15	M24x1,5	24	22,5	24,3	M24x1,5	26,5	19,8	6,4	07662-824
07662-30X2	M30x2	30	28	30,3	M30x2	34,5	25,8	6,4	07662-830

Threaded inserts

with internal thread, self-locking

Material:
Stainless steel

Version:
Passivated.

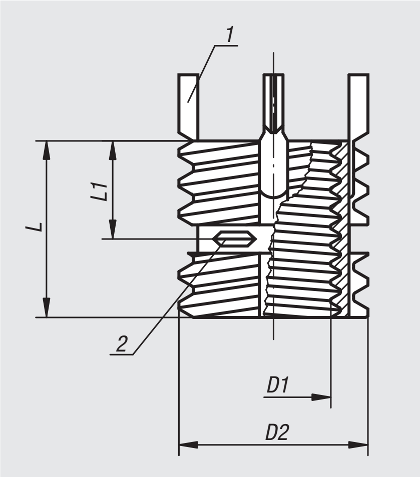
Sample order:
nlm 07663-112 threaded insert
nlm 07660-812 assembly tool

Note:
Threaded inserts allow threaded holes which have been damaged, torn out or jammed to be used again or to be repaired. This makes it possible to recover scrap and rejects of expensive products.
Threaded inserts are suitable for use in various materials, including light metals and casting.
Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations:
the medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads.
Other dimensions ±0.25 mm.

Technical information see operating instructions for threaded inserts.

Advantages:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are required besides the assembly tool.

Drawing reference:
1) locking pin
2) self-locking part of internal thread



Order No.	D1 internal thread	D2 external thread	L1 length	L length	Core drill Ø	Counter-sink Ø +0.25	Tap size	Min. thread depth	Removal drill Ø	Removal drilling depth	Order No. assembly tools
07663-105	M5	M8	4	8	6,9	8,3	M8	9,5	5,5	4	07660-805
07663-106	M6	M10x1,25	5	10	8,8	10,3	M10x1,25	11,5	7,5	4,8	07660-806
07663-108	M8	M12x1,25	6	12	10,8	12,3	M12x1,25	13,5	9,5	4,8	07660-808
07663-110	M10	M14x1,5	7	14	12,8	14,3	M14x1,5	15,5	11,5	4,8	07660-810
07663-112	M12	M16x1,5	8	16	14,8	16,3	M16x1,5	17,5	13,5	4,8	07660-812

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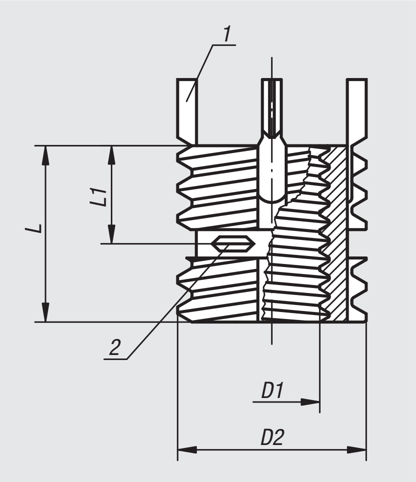
07664

Threaded inserts reinforced

internal thread, self-locking



Material:
Stainless steel

Version:
Passivated.

Sample order:
nlm 07664-110 reinforced threaded insert
nlm 07661-810 assembly tool

Note:
Reinforced threaded inserts allow threaded holes which have been damaged, torn out or jammed to be used again or to be repaired. This makes it possible to recover scrap and rejects of expensive products.
Reinforced threaded inserts are suitable for use in various materials, including light metals and casting.
Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations:
The medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads. Other dimensions ±0.25 mm.

Technical information see operating instructions for threaded inserts.

Advantages:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are required besides the assembly tool.

Drawing reference:
1) locking pin
2) self-locking part of internal thread

Order No.	D1 internal thread	D2 external thread	L1 length	L length	Core drill Ø	Counter-sink Ø +0.25	Tap size	Min. thread depth	Removal drill Ø	Removal drilling depth	Order No. assembly tools
07664-104	M4	M8	4	8	6,9	8,3	M8	9,5	5,5	4	07661-804
07664-105	M5	M10x1,25	5	10	8,8	10,3	M10x1,25	12,5	7,5	4,8	07661-805
07664-106	M6	M12x1,25	6	12	10,8	12,3	M12x1,25	14,5	9,5	4,8	07661-806
07664-108	M8	M14x1,5	7	14	12,8	14,3	M14x1,5	16,5	11,5	4,8	07661-808
07664-110	M10	M16x1,5	8	16	14,8	16,3	M16x1,5	18,5	13,5	4,8	07661-810
07664-112	M12	M18x1,5	9	18	16,8	18,3	M18x1,5	20,5	15,5	4,8	07661-812
07664-114	M14	M20x1,5	10	20	18,8	20,3	M20x1,5	22,5	17,5	4,8	07661-814
07664-116	M16	M22x1,5	11	22	20,7	22,3	M22x1,5	24,5	17,8	6,4	07661-816
07664-116X15	M16x1,5	M22x1,5	11	22	20,7	22,3	M22x1,5	24,5	17,8	6,4	07661-816
07664-118X15	M18x1,5	M24x1,5	12	24	22,5	24,3	M24x1,5	26,5	19,8	6,4	07661-818
07664-120	M20	M30x2	15	30	28	30,3	M30x2	34,5	25,8	6,4	07661-820

Repair kit

Material:
Steel.

Version:
Passivated.

Sample order:
nlm 07666-01

Note:
The repair kit allows threaded holes which have been damaged, torn out or jammed to be used again or to be repaired. This makes it possible to recover scrap and rejects of expensive products.
Threaded inserts are suitable for use in various materials, including light metals and casting.
Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations:
the medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads. Other dimensions ±0.25 mm.

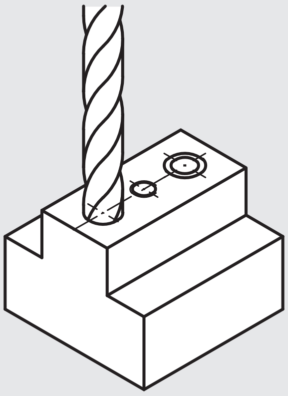
Technical information see operating instructions for threaded inserts.

Advantages:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are required besides the assembly tool.

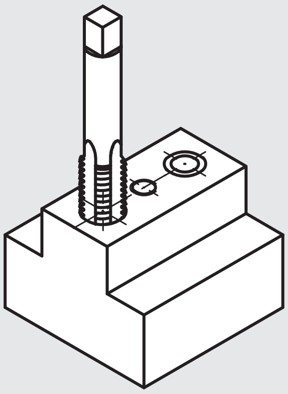
Order No.	Female threads	Male threads	Insert length	Number of inserts	Number of assembly tools	Order No. of individual insert
07666-01	M5	M8	8	8	1	07660-05
	M6	M10X1,25	10	8	1	07660-06
	M8	M12X1,25	12	6	1	07660-08
	M8X1	M12X1,25	12	6	-	07660-08X1
	M10	M14X1,5	14	4	1	07660-10
	M10X1,25	M14X1,5	14	4	-	07660-10X125
	M12	M16X1,5	16	3	1	07660-12
	M12X1,25	M16X1,5	16	3	-	07660-12X125

Operating instructions for threaded inserts

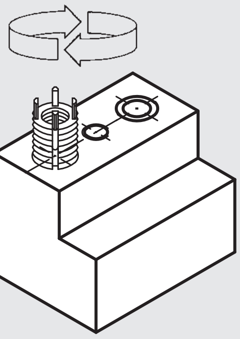
Fitting instructions



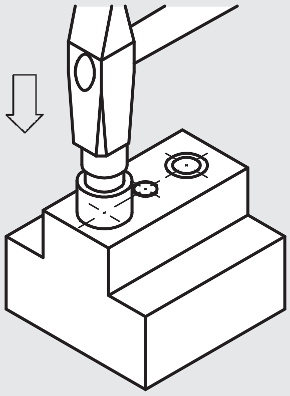
1.*
Rebore the old thread and countersink it (82° – 100°).



2.*
Tap thread with a standard screw tap.



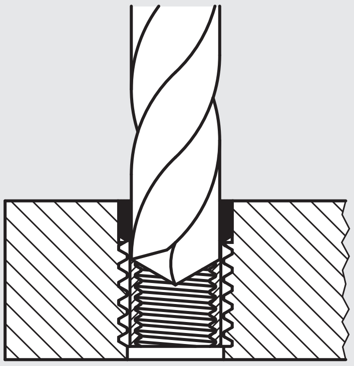
3.
Screw in the insert to just below the surface
(0.3 – 0.7 mm).



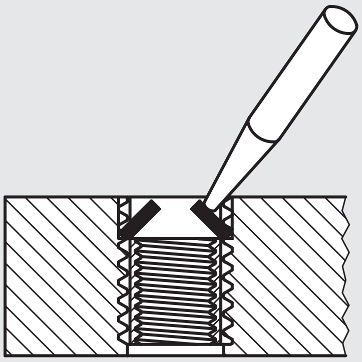
4.
Drive in the locking pins by striking the assembly tool lightly with a hammer.

* For steps 1 and 2 see table under installation of threaded inserts.

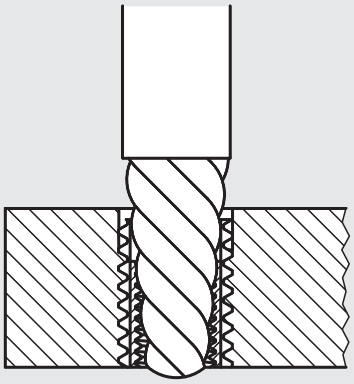
Removal instructions



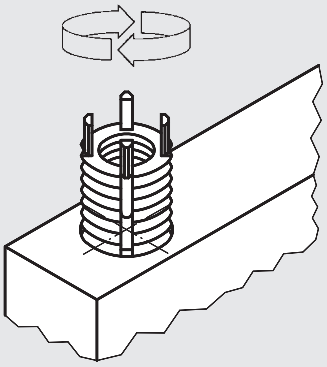
1.*
Rebore the material between the locking pins and the internal thread to the specified depth.



2.
Bend the locking pins inwards and break them off.



3.
Remove the old insert with a screw extractor.

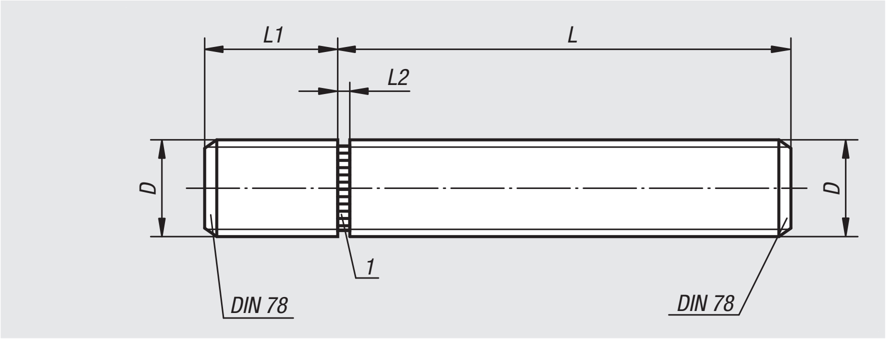


4.
Install a new threaded insert in the original threaded hole.

* For step 1 see tables under “removal drilling depth”

Studs

with screw-in stop for gluing in



Material:
Steel or 1.4305 stainless steel

Version:
Steel trivalent blue passivated.
Stainless steel, bright.

Sample order:
nlm 07670-1040201

Note:
Studs with screw-in stop have been designed especially for gluing-in. They allow mechanical connecting elements with external thread to be made cost-effectively for small and medium-sized series.
The LOCTITE products 638 and 648 (see 97990) have proven themselves in practice as successful bonding agents.

Drawing reference:
1) screw-in stop

Order No. steel	Order No. stainless steel	D	L	L1	L2
07670-1040201	07670-1040202	M4	20	6	1
07670-1040301	07670-1040302	M4	30	6	1
07670-1040401	07670-1040402	M4	40	6	1
07670-1040501	07670-1040502	M4	50	6	1
07670-1050201	07670-1050202	M5	20	8	1
07670-1050301	07670-1050302	M5	30	8	1
07670-1050401	07670-1050402	M5	40	8	1
07670-1050501	07670-1050502	M5	50	8	1
07670-1050601	07670-1050602	M5	60	8	1
07670-1060201	07670-1060202	M6	20	9	1,5
07670-1060301	07670-1060302	M6	30	9	1,5
07670-1060401	07670-1060402	M6	40	9	1,5
07670-1060501	07670-1060502	M6	50	9	1,5
07670-1060601	07670-1060602	M6	60	9	1,5
07670-1080201	07670-1080202	M8	20	12	1,5
07670-1080301	07670-1080302	M8	30	12	1,5
07670-1080401	07670-1080402	M8	40	12	1,5
07670-1080501	07670-1080502	M8	50	12	1,5
07670-1080601	07670-1080602	M8	60	12	1,5
07670-1080801	07670-1080802	M8	80	12	1,5
07670-1100201	07670-1100202	M10	20	14	2
07670-1100301	07670-1100302	M10	30	14	2
07670-1100401	07670-1100402	M10	40	14	2
07670-1100501	07670-1100502	M10	50	14	2
07670-1100601	07670-1100602	M10	60	14	2
07670-1100801	07670-1100802	M10	80	14	2
07670-1120301	07670-1120302	M12	30	17	2
07670-1120401	07670-1120402	M12	40	17	2
07670-1120501	07670-1120502	M12	50	17	2
07670-1120601	07670-1120602	M12	60	17	2
07670-1120801	07670-1120802	M12	80	17	2
07670-1160301	07670-1160302	M16	30	22	2
07670-1160401	07670-1160402	M16	40	22	2
07670-1160501	07670-1160502	M16	50	22	2
07670-1160601	07670-1160602	M16	60	22	2
07670-1160801	07670-1160802	M16	80	22	2

Technical information for studs with screw-in stop

Studs with screw-in stop are designed especially as glue-in studs. They allow mechanical connecting elements with external thread to be made cost-effectively for small and medium-sized series.

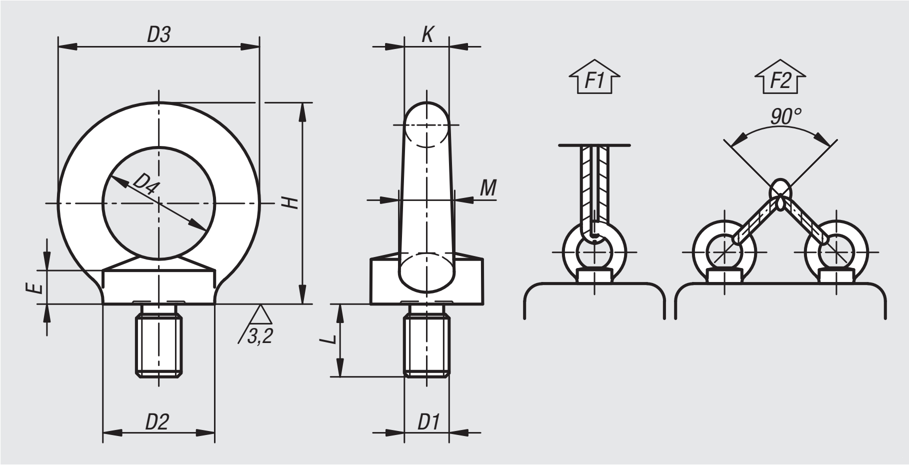
Advantages:
- Defined screw-in length due to the screw-in stop.
- Screwing in against the screw-in stop achieves an optimal bonding gap and hence a permanently safe bond that has been proven a thousandfold.
- Easy and low-cost connection.
- The operating part product line can be quickly and easily supplemented by other external thread variations.

The LOCTITE products 638 and 648 have proven themselves in practice as a successful bonding agent.

07680

Ring bolts

DIN 580



Material:
1.1141 steel, 1.4301 stainless steel or 1.4401 stainless steel.

Version:
Drop forged.
Steel, bright.
Steel electro zinc-plated.

Sample order:
nlm 07680-20

Note:
For high demand hoisting and carrying tasks in safety-relevant areas (machine construction, load handling equipment, lifting tackle).
The CE mark is impressed into the ring bolt.
F2 permissible load under max. 45° per ring bolt.

On request:
Certificate of conformity.

Order No. steel bright	Order No. steel galvanised	D1	L	D2	D3	D4	E	H	K	M	F1 max. kN	F2 max. kN
07680-08	**07680-008**	M8	13	20	36	20	6	36	8	10	1,4	0,95
07680-10	**07680-010**	M10	17	25	45	25	8	45	10	12	2,3	1,7
07680-12	**07680-012**	M12	20,5	30	54	30	10	53	12	14	3,4	2,4
07680-16	**07680-016**	M16	27	35	63	35	12	62	14	16	7	5
07680-20	**07680-020**	M20	30	40	72	40	14	71	16	19	12	8,3
07680-24	**07680-024**	M24	36	50	90	50	18	90	20	24	18	12,7

Order No. stainless steel 1.4301	Order No. stainless steel 1.4401	D1	L	D2	D3	D4	E	H	K	M	F1 max. kN	F2 max. kN
07680-108	**07680-208**	M8	13	20	36	20	6	36	8	10	1,4	0,95
07680-110	**07680-210**	M10	17	25	45	25	8	45	10	12	2,3	1,7
07680-112	**07680-212**	M12	20,5	30	54	30	10	53	12	14	3,4	2,4
07680-116	**07680-216**	M16	27	35	63	35	12	62	14	16	7	5
07680-124	**07680-224**	M24	36	50	90	50	18	90	20	24	18	12,7
07680-120	**07680-220**	M20	30	40	72	40	14	71	16	19	12	8,3

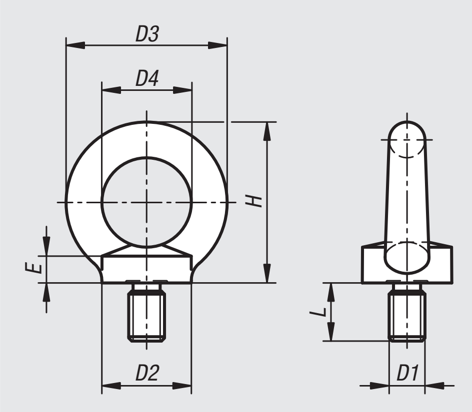
Ring bolts

similar to DIN 580

Material:
Stainless steel 1.4401.

Version:
Bright.

Sample order:
nlm 07680-01-08

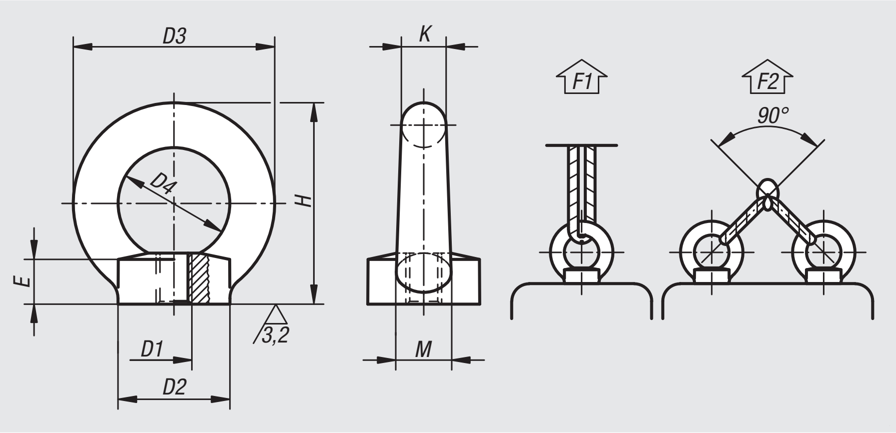


Order No.	D1	D2	D3	D4	E	H	L
07680-01-08	M8	20	36	20	6	36	13
07680-01-10	M10	25	45	25	8	45	17
07680-01-12	M12	30	54	30	10	53	20,5
07680-01-16	M16	35	63	35	12	62	27
07680-01-20	M20	40	72	40	14	71	30

07690

Ring nuts

DIN 582



Material:
1.1141 steel, 1.4301 stainless steel or 1.4401 stainless steel.

Version:
Drop forged.
Steel, bright.
Steel electro zinc-plated.

Sample order:
nlm 07690-10

Note:
For high demand hoisting and carrying tasks in safety-relevant areas (machine construction, load handling equipment, lifting tackle).
The CE mark is impressed into the ring bolt.
F2 permissible load under max. 45° per ring bolt.

On request:
Certificate of conformity.

Order No. steel bright	Order No. steel galvanised	D1	D2	D3	D4	E	H	K	M	F1 max. kN	F2 max. kN
07690-08	**07690-008**	M8	20	36	20	8,5	36	8	10	1,4	0,95
07690-10	**07690-010**	M10	25	45	25	10	45	10	12	2,3	1,7
07690-12	**07690-012**	M12	30	54	30	11	53	12	14	3,4	2,4
07690-16	**07690-016**	M16	35	63	35	13	62	14	16	7	5
07690-20	**07690-020**	M20	40	72	40	16	71	16	19	12	8,3
07690-24	**07690-024**	M24	50	90	50	20	90	20	24	18	12,7

Order No. stainless steel 1.4301	Order No. stainless steel 1.4401	D1	D2	D3	D4	E	H	K	M	F1 max. kN	F2 max. kN
07690-108	**07690-208**	M8	20	36	20	8,5	36	8	10	1,4	0,95
07690-110	**07690-210**	M10	25	45	25	10	45	10	12	2,3	1,7
07690-112	**07690-212**	M12	30	54	30	11	53	12	14	3,4	2,4
07690-116	**07690-216**	M16	35	63	35	13	62	14	16	7	5
07690-120	**07690-220**	M20	40	72	40	16	71	16	19	12	8,3
07690-124	**07690-224**	M24	50	90	50	20	90	20	24	18	12,7

07690-01

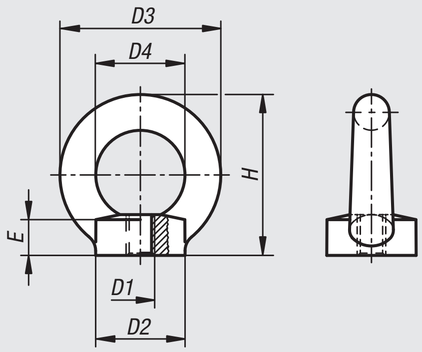
Ring nuts

similar to DIN 582

Material:
Stainless steel 1.4401.

Version:
Bright.

Sample order:
nlm 07690-01-08

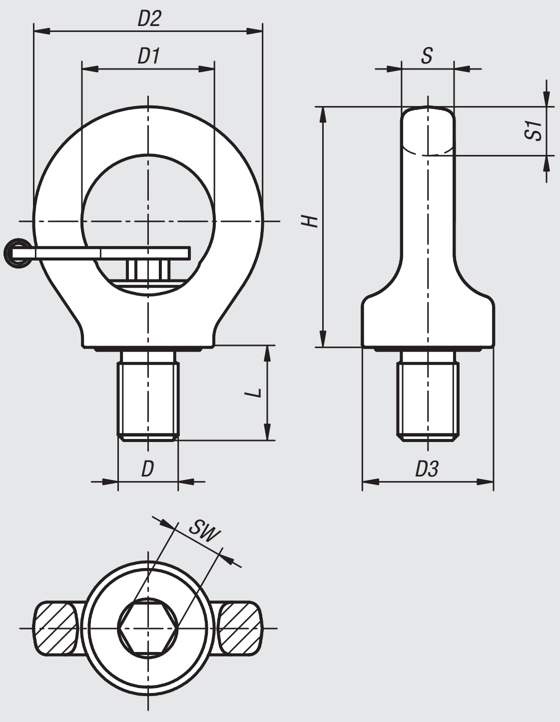


Order No.	D1	D2	D3	D4	E	H
07690-01-08	M8	20	36	20	6	36
07690-01-10	M10	25	45	25	8	45
07690-01-12	M12	30	54	30	10	53
07690-01-16	M16	35	63	35	12	62
07690-01-20	M20	40	72	40	14	71

07695

Ring bolts rotatable

high-strength grade 10



Material:
Ring 1.6541 steel.
Screw steel.

Version:
Ring forged and high tensile tempered.
100% electromagnetic crack tested per EN 1677-1, 4x safety factor.
Plastic-coated.
Thread grade 10.9.

Sample order:
nlm 07695-08151

Note:
In contrast to DIN 580 ring bolts this ring bolt is rotatable, therefore the load direction is adjustable and unintended tightening or loosening is negated.

- 4x safety factor
- lateral loading up to 90° is possible
- ring can rotate 360° with tightened screw

The listed load values apply for a minimum screw length of 1x nominal thread diameter in steel with a minimum tensile strength of 363 N/mm², at an application temperature of -20 °C to +100 °C.

Maximum lifting weight "G" in kg for di“erent sling types

Sling configuration	G	G	G	G	G	G	G	G
No. of slings	1	2	1	2	2	2	3 - 4	3 - 4
Sling angle ∢	0°	0°	90°	90°	0°-45°	45°-60°	0°-45°	45°-60°
M8	1000	2000	300	600	420	300	630	450
M10	1000	2000	400	800	560	400	840	600
M12	2000	4000	750	1500	1000	750	1600	1120
M16	4000	8000	1500	3000	2000	1500	3150	2250
M20	6000	12000	2300	4600	3220	2300	4830	3450
M24	8000	16000	3200	6400	4480	3200	6700	4800
M30	12000	24000	4500	9000	6300	4500	9400	6700

Order No.	Version 2	D	D1	D2	D3	H	L	S	S1	SW	Permissible load kg
07695-08151	with hex key	M8	25	44	25	47	12	9	9,5	6	300
07695-10151	with hex key	M10	25	44	26	47	15	9	9,5	6	400
07695-12181	with hex key	M12	30	52	34	55	18	11	11	8	750
07695-16241	with hex key	M16	35	61	35	64	24	14	13	10	1500
07695-20301	with hex key	M20	40	70	44	74	30	16	15	12	2300
07695-24361	with hex key	M24	48	84	52	91	36	19	18	14	3200
07695-30451	with hex key	M30	60	105	61	112	45	25	22,5	17	4500
07695-08150	without hex key	M8	25	44	25	47	12	8	11	6	300
07695-10150	without hex key	M10	25	44	25	47	15	8	11	6	400
07695-12180	without hex key	M12	30	52	33	55	18	10	13	8	750
07695-16240	without hex key	M16	35	61	35	64	24	14	13	10	1500
07695-20300	without hex key	M20	40	70	44	74	30	16	17	12	2300
07695-24360	without hex key	M24	48	84	52	91	36	19	21	14	3200
07695-30450	without hex key	M30	60	108	62	112	45	27	26	17	4500

Ring bolts

swivel and 360° rotatable, grade 8

Material:
Steel.

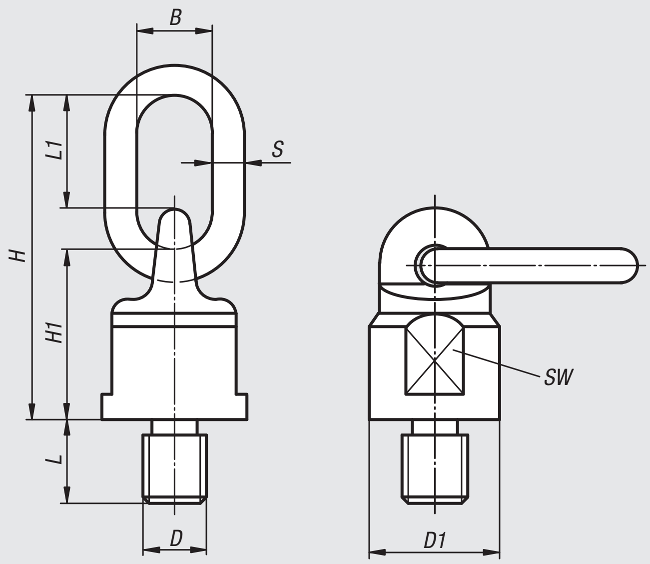
Version:
Quality class 8, ball bearing;
red plastic-coated

Sample order:
nlm 07710-1018

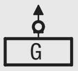
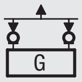
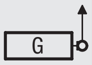
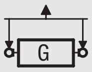
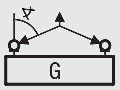
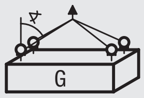
Note:
Compact and light design, full loading on all sides. 4x safety factor against breakage in all loading axis. Rotatable 360°. Link swivel range max. 180°. The ball bearing allows the ring to rotate even under load.

Lifting or securing loads, swivel rings have many uses.

For the loading capacity to be valid it must be ensured that the ring is in line with the load. The swivel face must lie flat on the support beam and the screw must always be screwed in fully.



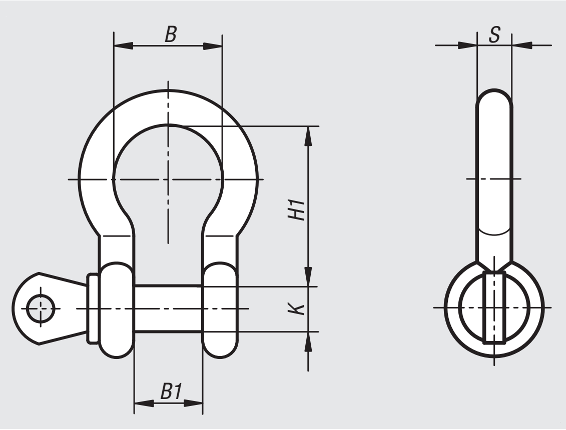
Maximum lifting weight "G" in kg for different sling types

Sling confguration								
No. of slings	1	2	1	2	2	2	3 - 4	3 - 4
sling angle ∢	0°	0°	90°	90°	0°-45°	45°-60°	0°-45°	45°-60°
M10	600	1200	300	600	420	300	630	450
M12	1000	2000	500	1000	750	500	1100	750
M16	2000	4000	1120	2000	1500	1120	2360	1600
M20	4000	8000	2000	4000	2800	2000	4000	3000
M24	6300	12500	3150	6300	4250	3150	6300	4750
M30	10600	21200	5300	10600	7100	5800	11200	8000
M36	12500	25000	8000	16000	11200	8000	16800	12000

Order No.	B	D	D1	H	H1	L	L1	S	SW	Permissible load kg
07710-1018	30	M10	38	105	50	18	46	13	30	300
07710-1218	30	M12	38	105	50	18	46	13	30	500
07710-1620	30	M16	38	105	50	20	46	13	30	1120
07710-2030	34	M20	50	131	61	30	57	16	40	2000
07710-2430	40	M24	58	153	68	30	70	19	48	3150
07710-3035	40	M30	75	165	80	35	65	20	65	5300
07710-3654	50	M36	85	205	95	54	90	22	75	8000

07715

Bow shackles



Material:
Steel.

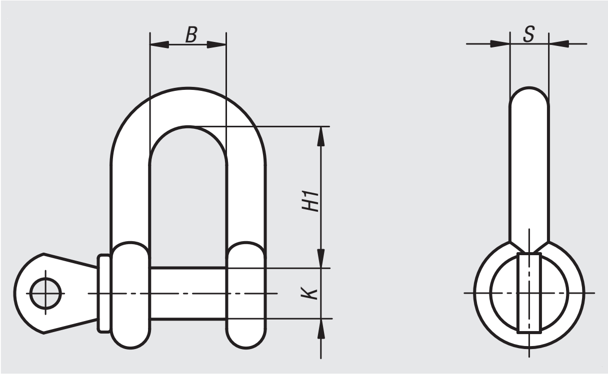
Version:
Bow form.

Sample order:
nlm 07715-0100011

Note:
Shackles and bolts may vary in colour.
Paint may cause the thread to be stiff.

Order No.	B	B1	S	K	H1	Inches	Permissible load kg
07715-0050008	19,8	12	6,4	8	28,7	1/4	500
07715-0075010	21,3	13,5	7,9	9,5	31	5/16	750
07715-0100011	26,2	16,8	9,6	11	36,5	3/8	1000
07715-0150012	29,5	19	11,2	12,7	43	7/16	1500
07715-0200016	33	20,6	12,7	16	48	1/2	2000
07715-0325019	42	27	16	19	60	5/8	3250
07715-0475022	51	31,8	19	22,2	71	3/4	4750
07715-0650025	58	36,6	22	25,4	84	7/8	6500
07715-0850028	68	43	25	28,5	95	1	8500

D-shackles



Material:
Steel.

Version:
D form

Sample order:
nlm 07716-0050008

Note:
Shackles and bolts may vary in colour.
Paint may cause the thread to be stiff.

Order No.	B	S	K	H1	Inches	Permissible load kg
07716-0050008	12	6,7	8	24,6	1/4	500
07716-0075010	13,5	7,9	9,5	27,2	5/16	750
07716-0100011	16,8	9,6	11	32,5	3/8	1000
07716-0150012	19	11,2	12,7	37,6	7/16	1500
07716-0200016	20,6	12,7	16	40,7	1/2	2000
07716-0325019	27	16	19	50	5/8	3250
07716-0475022	31,8	19	22,2	59,5	3/4	4750
07716-0650025	36,6	22	25,4	71	7/8	6500
07716-0850028	43	25	28,5	80,5	1	8500

Weld-on D-rings

Material:
Eye 1.6541 steel.
Welding block, S355JR steel.

Version:
D-ring forged, high tensile tempered, red plastic coated.
Welding block forged, high tensile tempered, bright.

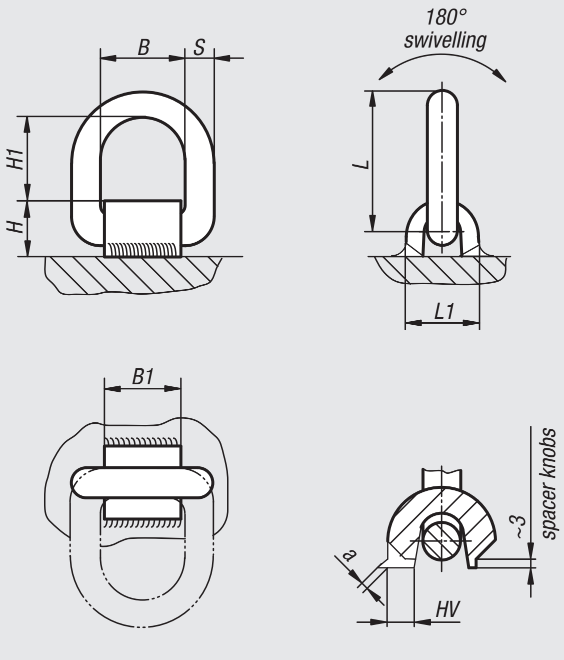
Sample order:
nlm 07720-1000

Note:
Weld-on D-rings enable quick installation.

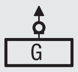
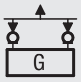
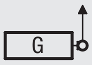
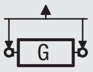
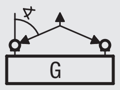
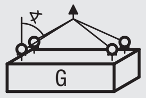
They offer a compact design and can be loaded from all sides, with 4x safety factor against breakage.

The welding block is forged from easy to weld S355JR (St 52-3). The small knobs serve as spacers for the air gap required for fillet welding (ca. 3 mm).
The load data given in the table is clearly marked on the welding block, they apply to worst scenario cases for the lifting type shown.

Welding must be carried out by a proficient welder certified to EN 287-1.



Maximum lifting weight "G" in kg for different sling types

Sling configuration	 G	 G	 G	 G	 G		 G	
No. of slings	1	2	1	2	2	2	3 - 4	3 - 4
Sling angle ∢	0°	0°	90°	90°	0°-45°	45°-60°	0°-45°	45°-60°
07720-1***	1600	3200	1120	2240	1500	1120	2360	1600
07720-2***	3000	6000	2000	4000	2800	2000	4000	3000
07720-3***	4750	9500	3150	6300	4250	3150	6300	4750
07720-5***	8000	16000	5300	10600	7100	5300	11200	8000

Order No. without spring strip	Order No. with spring strip	B	B1	H	H1	L	L1	S	Weld seam	Permissible load kg
07720-1000	**07720-1001**	40	38	32	40	73	38	13	HV 5 + a3	1120
07720-2000	**07720-2001**	41	38	32	45	81	40	13	HV 5 + a3	2000
07720-3000	**07720-3001**	45	43	38	45	87	42	17	HV 8 + a3	3150
07720-5000	**07720-5001**	55	50	48	57	108	60	22	HV 12 + a4	5300

07725

Hoist rings 360° rotation

grade 10

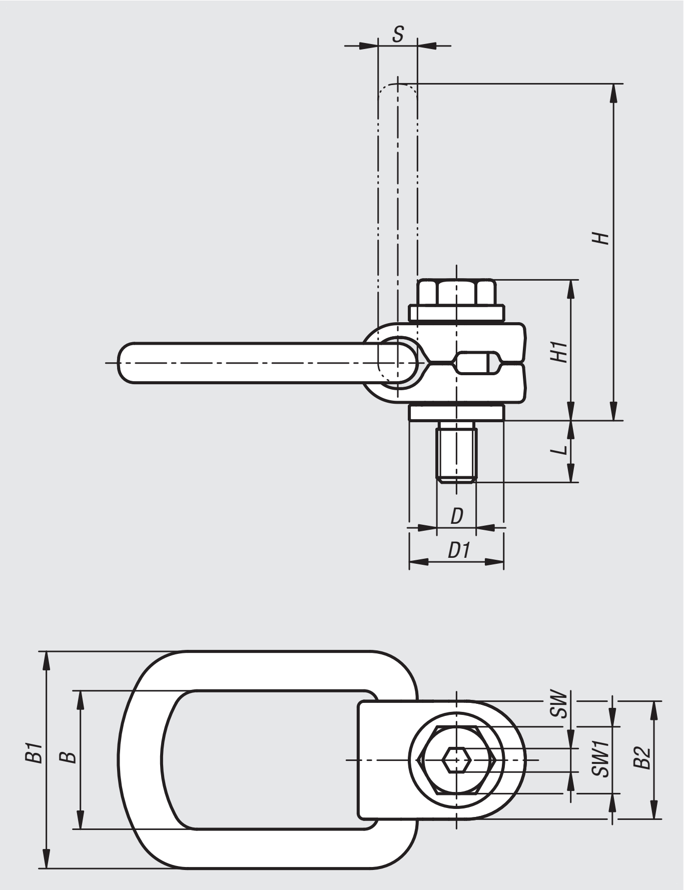
Material:
Ring and attachment shackle steel.
Bolt and bushing steel.

Version:
Ring and shackle forged, hardened and tempered. 100% electromagnetic crack detection, plastic-coating yellow.
Bolt grade 10.9 or higher. 100% electromagnetic crack detection.
Bush electro zinc-plated.

Sample order:
nlm 07725-08016

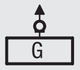
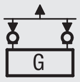
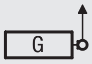
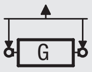
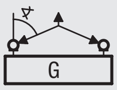
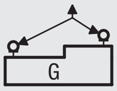
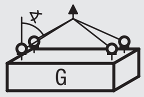
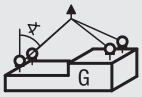
Note:
These hoist rings have full swivel and pivot action and can take the full load from any direction. An integrated spring holds the ring in any position. The working load limit is specified on the hoist ring. This applies to the most unfavourable load rating (see table). The test load is 2.5 times the maximum permissible load. With captive but removable hexagon screw. The hoist rings corresponding to the Machinery Directive and are BG certified.

Temperature range:
from -40 °C to 100 °C = 100% permissible load
up to 200°C = 85% permissible load
up to 250°C = 80% permissible load
up to 350°C = 75% permissible load



The specified load values are valid for a minimum thread depth of 1.5x nominal thread diameter in steel with a minimum tensile strength of 363 N/mm^2.

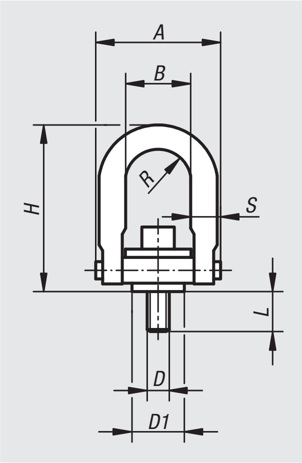
Maximum lifting weight "G" in kg for different sling types

Sling configuration										
No. of slings	1	2	1	2	2	2	2	3 - 4	3 - 4	3 - 4
sling angle ∢	0°	90°	0°	90°	0°-45°	45°-60°	asymmetric	0°-45°	45°-60°	asymmetric
M8	300	600	300	600	420	300	300	630	450	300
M10	630	1260	630	1260	880	630	630	1320	950	630
M12	1000	2000	1000	2000	1400	1000	1000	2100	1500	1000
M16	1500	3000	1500	3000	2100	1500	1500	3150	2250	1500
M20	2500	5000	2500	5000	3500	2500	2500	5250	3750	2500
M24	4000	8000	4000	8000	5600	4000	4000	8400	6000	4000
M30	5000	10000	5000	10000	7000	5000	5000	10500	7500	5000
M36	7000	14000	7000	14000	9800	7000	7000	14700	10500	7000

Order No.	D	D1	B	B1	B2	H	H1	L	S	SW	SW1	max. permissible load kg	Tightening torque Nm
07725-08016	M8	24	35	55	30	85	35	11	10	6	13	300	30
07725-10021	M10	24	35	55	30	85	36	16	10	6	17	630	60
07725-12024	M12	31	37	57	33	98	44	18	13,5	8	19	1000	100
07725-16029	M16	31	37	57	33	98	46	24	13,5	10	24	1500	150
07725-20036	M20	45	54	82	50	140	57	34	16,5	12	30	2500	250
07725-24041	M24	45	54	82	50	140	59	36	16,5	14	36	4000	400
07725-30053	M30	59	65	99	60	170	81	48	22,5	17	46	5000	500
07725-36060	M36	59	65	99	60	172	76	55	22,5	22	55	7000	700

07730

Hoist rings



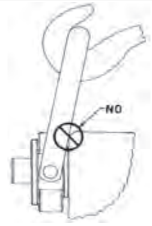
Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 07730-10

Note:
Every hoist ring undergoes an additional visual inspection after load testing (5x safety factor).
A safety data sheet for installation is included with every hoist ring.
Do not use spacer washers between the bush flange and support beam.
Tighten the screws to the stated torque and check and re-tighten regularly.
After installation check if the ring swivels and turns freely in all directions.
Lift with care! Avoid impacts!
In no event must the permissible load stamped on the hoist ring be exceeded.

Important! Never use excessively large hooks, chains or slings, as they could force the U-shaped eye to spread.



Check that the eye turns/swivels freely in all directions.

Avoid excessively acute angles. To carry a load weighing 1000 kg attached at two points at a 30° angle, each sling must be capable of taking a load of 1000 kg.

Order No.	Version	D	D1	A	B	H	L	R	S	max. permissible load kg	Tightening torque Nm
07730-08	standard	M8	19	46,7	22	67,8	12,5	10,9	9,7	400	9,81
07730-10	standard	M10	19	46,7	22	67,8	17,5	10,9	9,7	450	16,7
07730-12	standard	M12	38,1	89,4	46	123	19	22,4	19	1050	37,3
07730-16	standard	M16	38,1	89,4	46	123	29	22,4	19	1900	80,4
07730-201	standard	M20	38,1	89,4	46	123	34	22,4	19	2150	133
07730-20	standard	M20	58,7	130,6	70	163	32	35,6	25,4	3000	133
07730-24	standard	M24	58,7	130,6	70	163	37	35,6	25,4	4200	304
07730-30	standard	M30	81	165,1	90	221,7	46	44,5	31,7	7000	588
07730-36	standard	M36	106,4	217,2	115	316,7	68	57,2	44,4	11000	981
07730-42	standard	M42	106,4	217,2	115	316,7	68	57,2	44,4	12500	981
07730-48	standard	M48	106,4	217,2	115	316,7	88	57,2	44,4	13500	981
07730-112	long	M12	38,1	89,4	46	170,7	19	22,4	19	1050	37,3
07730-116	long	M16	38,1	89,4	46	170,7	29	22,4	19	1900	80,4
07730-1201	long	M20	38,1	89,4	46	170,7	34	22,4	19	2150	133
07730-120	long	M20	58,7	130,6	70	206	32	35,6	25,4	3000	133
07730-124	long	M24	58,7	130,6	70	206	37	35,6	25,4	4200	304

07735

Hoist rings with Envirolox® coating

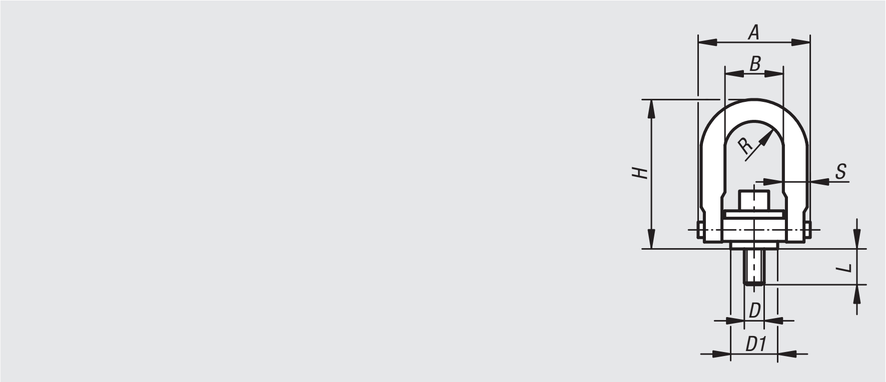
Material:
Carbon steel.

Version:
Hoist ring with Envirolox® protective coating.
Washer chrome plated.

Sample order:
nlm 07735-10

Note:
Every hoist ring undergoes an additional visual inspection after load testing (5x safety factor).
The new Envirolox® protective coating is environmentally friendly and is proven to be effective in extreme conditions.
Possible application areas: in corrosive atmospheres such as maritime freight, chemical industry etc.

Safety:
Safety instructions see 07730.



Order No.	A	B	D	D1	H	L	R	S	max. permissible load kg	Tightening torque Nm
07735-08	46,7	22	M8	19	67,8	12,5	10,9	9,7	400	9,81
07735-10	46,7	22	M10	19	67,8	17,5	10,9	9,7	450	16,7
07735-12	89,4	46	M12	38,1	121,4	19	22,4	19	1050	37,3
07735-16	89,4	46	M16	38,1	121,4	29	22,4	19	1900	80,4
07735-20	89,4	46	M20	38,1	121,4	34	22,4	19	2150	133
07735-120	130,6	70	M20	58,7	165,6	32	35,6	25,4	3000	133
07735-24	130,6	70	M24	58,7	165,6	37	35,6	25,4	4200	304
07735-30	165,1	90	M30	81	221,7	46	44,5	31,7	7000	588

07750

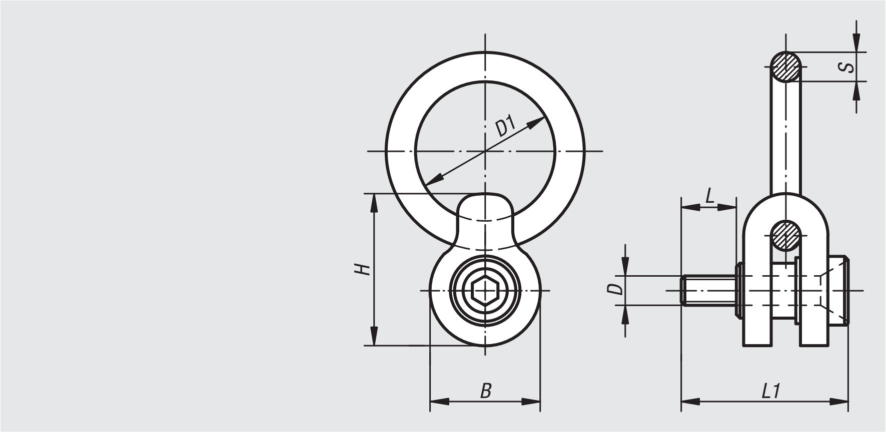
Lifting rings

Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 07750-10

Note:
Every lifting ring undergoes an additional visual inspection after load testing (5x safety factor).
A safety data sheet for installation is included with every lifting ring.
Do not use spacer washers between the bush flange and support surface.
Tighten the screws to the stated torque and check and re-tighten regularly. After installation check if the ring swivels and turns freely in all directions.
Lift with care! Avoid impacts!
In no event must the permissible load stamped on the lifting ring be exceeded.



Order No.	D	D1	B	H	L	L1	S	max. permissible load kg	Tightening torque Nm
07750-08	M8	50,5	38	51	16	61	9,5	325	4,21
07750-10	M10	50,5	38	51	20	63	9,5	500	5,88
07750-12	M12	76	60	81	24	85	16	725	19,61
07750-16	M16	76	60	81	31	94	16	1400	34,32
07750-20	M20	101,5	95	125,5	40	133	25,5	2290	68,65
07750-24	M24	101,5	95	125,5	47	147	25,5	3050	122,6

07752

Swivel bales

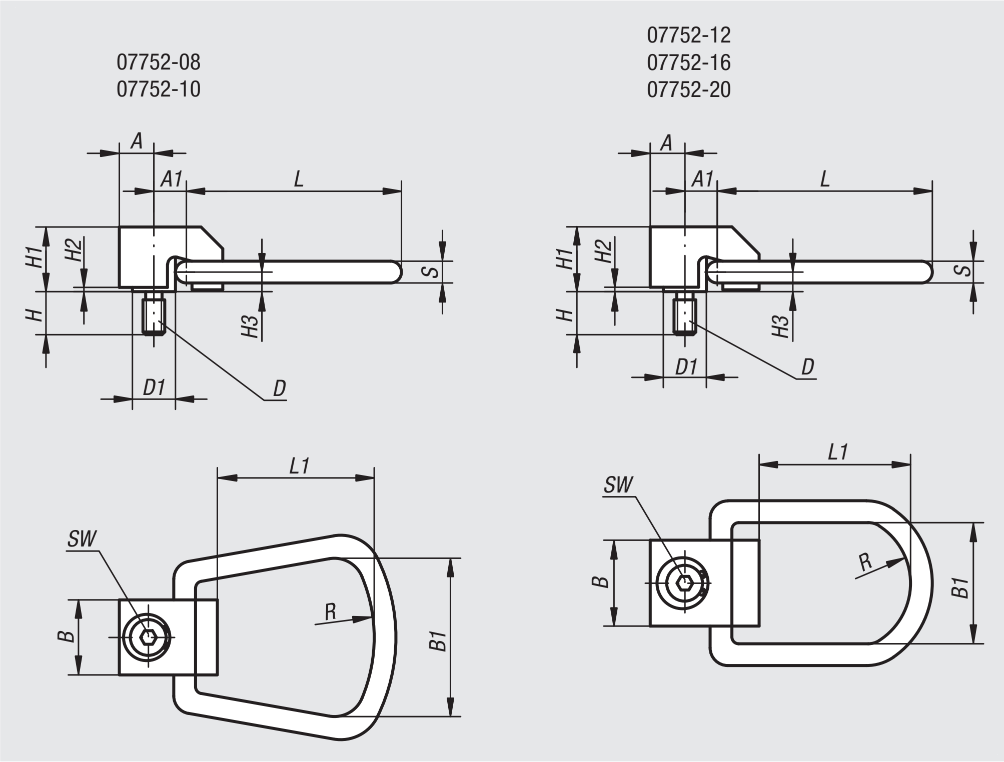
with axial ring

Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 07752-12

Note:
Every swivel bale undergoes an additional visual inspection after load testing (5x safety factor).
A safety data sheet for installation is included with every swivel bale.
Do not use spacer washers between the bush flange and support beam.
Tighten the screws to the stated torque and check and re-tighten regularly. After installation check if the bale swivels and turns freely in all directions.
Lift with care! Avoid impacts!
In no event must the permissible load stamped on the swivel bale be exceeded.



Order No.	A	A1	B	B1	D	D1	H	H1	H2	H3	L	L1	R	S	SW	Tightening torque Nm	max. permissible load kg
07752-08	12,7	12,7	25,4	44,5	M8	15,8	15,8	23,8	1,6	7,2	75,4	52,4	25,4	7,9	6	4,2	325
07752-10	12,7	12,7	25,4	44,5	M10	15,8	19,8	23,8	1,6	7,2	75,4	52,4	25,4	7,9	6	6	500
07752-12	19,8	23,8	41,3	50,8	M12	25,4	23,8	40,1	2	11,1	120,7	82,6	38,1	12,7	10	20	725
07752-16	19,8	23,8	41,3	50,8	M16	25,4	31,8	40,1	2	11,1	120,7	82,6	38,1	12,7	10	40	1400
07752-20	19,8	23,8	41,3	50,8	M20	25,4	39,7	40,1	2	11,1	120,7	82,6	38,1	12,7	10	70	2290

07770

Hoist rings

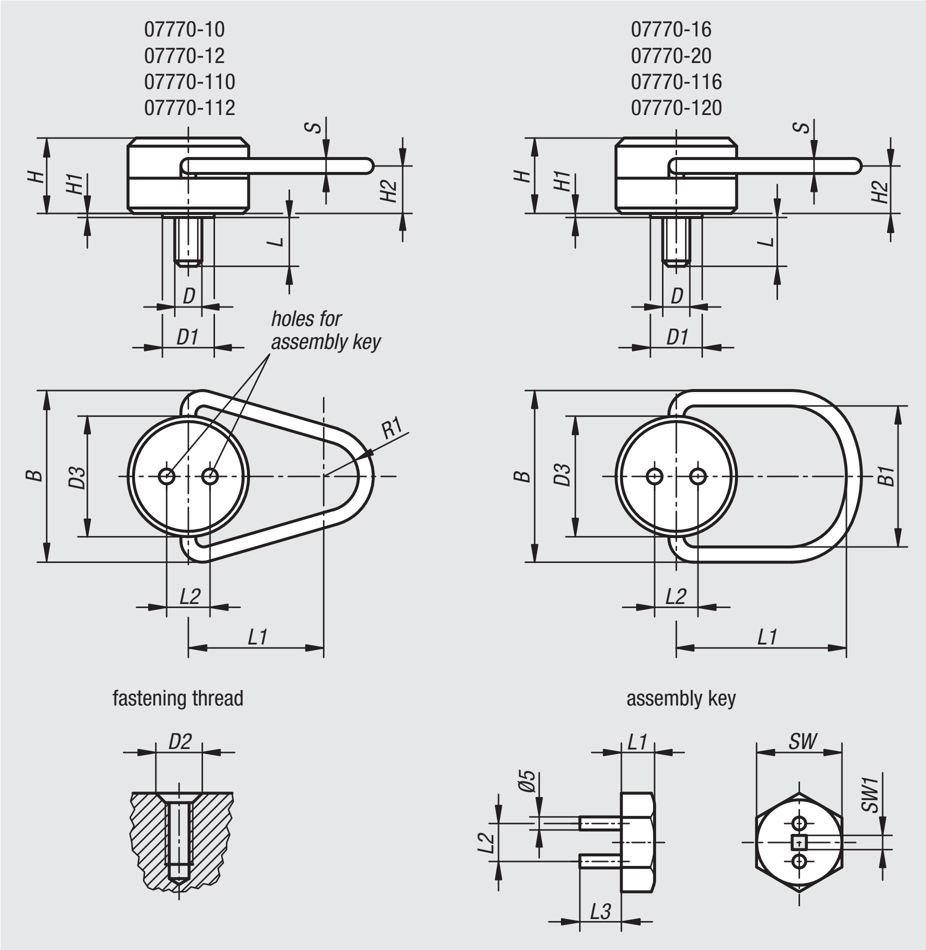
Material:
Carbon steel or stainless steel.

Version:
Steel black oxidised.
Stainless steel bright.

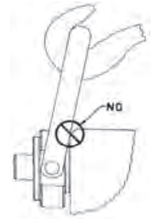
Sample order:
nlm 07770-10 Hoist ring.
nlm 07770-101 Assembly key.

Note hoist ring:
Do not use spacer washers between the bush flange and support surface.
The permissible countersink diameter (D2) for the thread should be retained.
Tighten the screws to the stated torque and check and re-tighten regularly. After installation check if the ring turns and swivels freely in all directions.
Lift with care! Avoid impacts!
In no event must the permissible load stamped on the hoist ring be exceeded.

Note assembly key:
- Insert the assembly key in the holes in the hoist ring.
- Tighten the hoist ring to the recommended torque using a torque wrench.
- The permissible diameter of the countersink must be adhered to.



Important! Never use excessively large hooks, chains or slings, as they could force the U-shaped eye to spread.



Check that the eye turns/swivels freely in all directions.

Avoid excessively acute angles. To carry a load weighing 1000 kg attached at two points at a 30° angle, each sling must be capable of taking a load of 1000 kg.

Hoist ring

Order No.	Material	B	B1	D	D1	D2	D3	H	H1	H2	L	L1	L2	R1	S	max. permissible load kg	Recommended tightening torque Nm	matching assembly key
07770-10	steel	66,7	-	M10	19,1	13	44,5	27,8	1,2	17,9	14,6	50,8	16,3	12,7	7,9	500	10	07770-101
07770-12	steel	66,7	-	M12	19,1	16	44,5	27,8	1,2	17,9	19,1	50,8	16,3	12,7	7,9	700	25	07770-101
07770-16	steel	96,8	70	M16	22,2	19	63,5	38,5	0,8	22,6	23,8	88,9	23,1	-	12,7	1500	50	07770-201
07770-20	steel	96,8	70	M20	25,4	22	63,5	38,5	0,8	22,6	30,2	88,9	23,1	-	12,7	2000	80	07770-201
07770-110	stainless steel	66,7	-	M10	19,1	13	44,5	27,8	1,2	17,9	14,6	50,8	16,3	12,7	7,9	250	10	07770-101
07770-112	stainless steel	66,7	-	M12	19,1	16	44,5	27,8	1,2	17,9	19,1	50,8	16,3	12,7	7,9	350	25	07770-101
07770-116	stainless steel	96,8	70	M16	22,2	19	63,5	38,5	0,8	22,6	23,8	88,9	23,1	-	12,7	750	50	07770-201
07770-120	stainless steel	96,8	70	M20	25,4	22	63,5	38,5	0,8	22,6	30,2	88,9	23,1	-	12,7	1000	80	07770-201

Assembly key

Order No.	L1	L2	L3	SW	SW1
07770-101	14	16,3	17,5	24	1/4
07770-201	16,5	23,1	28,6	32	3/8

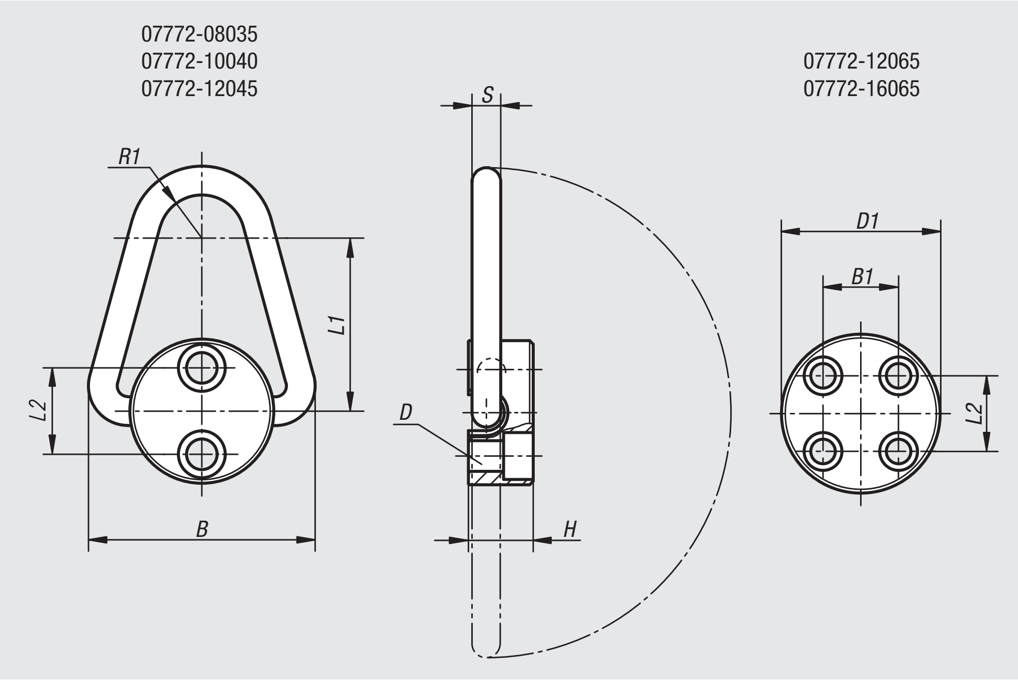
Flip-Flop hoist rings

Material:
Body carbon steel. Bracket steel.

Version:
Black oxidised. Bracket hardened.

Sample order:
nlm 07772-08035

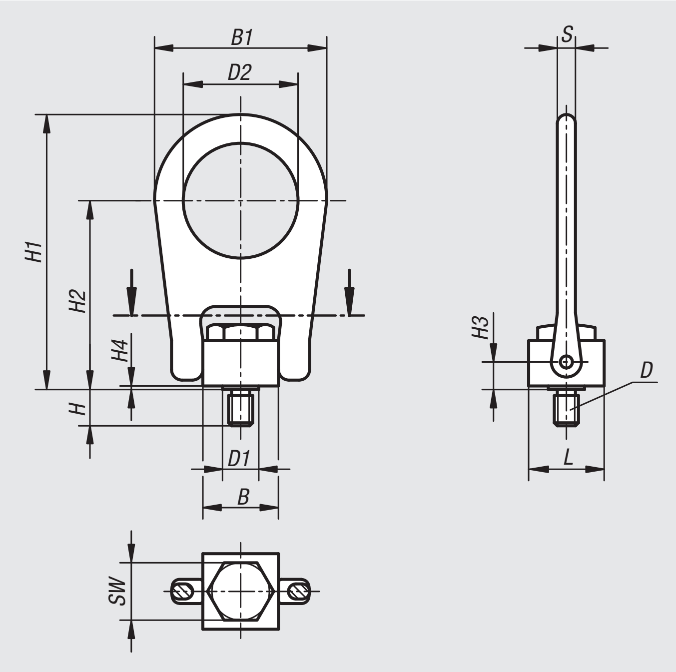
Note:
Every hoist ring undergoes an additional visual inspection after load testing (6x safety factor).
A safety data sheet for installation is included with every hoist ring.
Do not use spacer washers between the bush flange and support beam.
Tighten the screws to the stated torque and check and re-tighten regularly. After installation check if the ring swivels freely in both directions.
Lift with care! Avoid impacts!
In no event must the permissible load stamped on the hoist ring be exceeded.



Order No.	D for screw DIN 912	D1	B	B1	H	L1	L2	R1	S	Tightening torque Nm	max. permissible load kg
07772-08035	M8X35 (2x)	45	65	-	19	51	25,4	13	8	10	900
07772-10040	M10X40 (2x)	57	81	-	22	64	28,6	16	10	15	1100
07772-12045	M12X45 (2x)	64	100	-	29	76	38,1	19	13	35	2250
07772-12065	M12X65 (4x)	80	130	31,8	35	102	41,3	22	19	45	5400
07772-16065	M16X65 (4x)	92	160	31,8	48	127	52,4	25,4	25,4	100	9000

07774

Hoist rings



Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 07774-10

Note:
Every hoist ring undergoes an additional visual inspection after load testing (5x safety factor).
A safety data sheet for installation is included with every hoist ring.
Do not use spacer washers between the bush flange and support surface.
Tighten the screws to the stated torque and check and re-tighten regularly. After installation check if the ring swivels freely in both directions.
Lift with care! Avoid impacts!
In no event must the permissible load stamped on the hoist ring be exceeded.

Order No.	B	B1	D	D1	D2	H	H1	H2	H3	H4	L	S	SW	max. permissible load kg	Tightening torque Nm
07774-08	25,4	57,2	M8	12,7	38,1	12	91,3	62,7	8,7	1,2	25,4	6,3	19	400	10
07774-10	25,4	57,2	M10	12,7	38,1	15	91,3	62,7	8,7	1,2	25,4	6,3	19	450	17
07774-12	50,8	112,7	M12	25,4	76,2	18	161,9	101,6	14,3	1,6	38,1	19	32	1050	37
07774-16	50,8	112,7	M16	25,4	76,2	24	161,9	101,6	14,3	1,6	38,1	19	32	1900	80
07774-20	50,8	112,7	M20	25,4	76,2	30	161,9	101,6	14,3	1,6	38,1	19	32	2150	134

07775

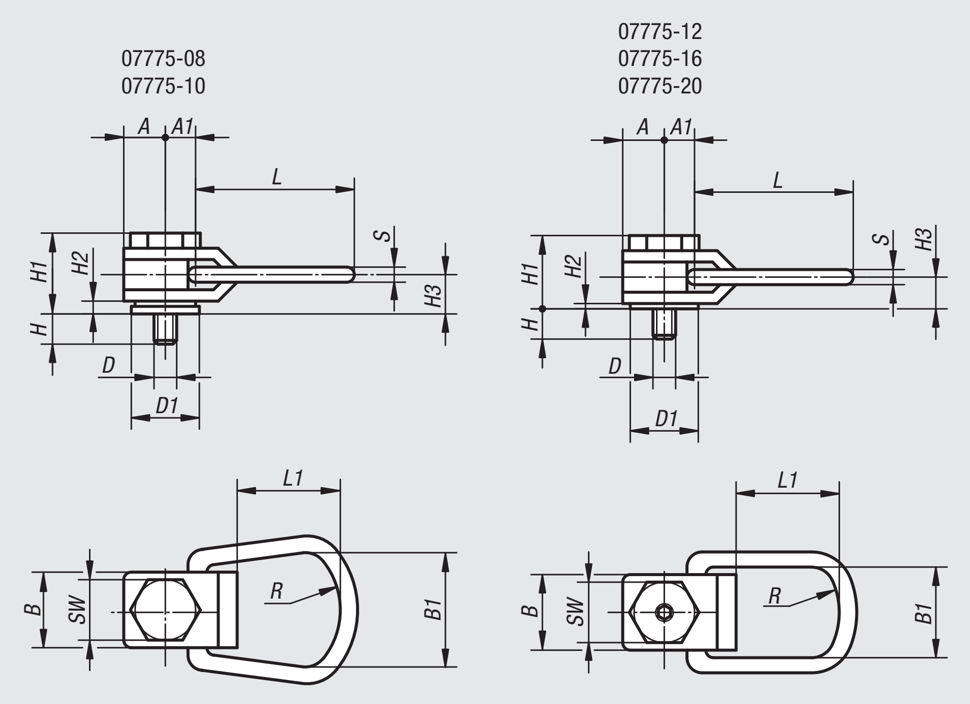
Swivel bales

Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
nlm 07775-10

Note:
Every swivel bale is load tested to 5x safety factor. The flat and light design make this swivel bale easier to use than similar swivel bales. The swivel bale is installed using a spanner or hexagon key depending on type.



Order No.	A	A1	B	B1	D	D1	H	H1	H2	H3	L	L1	R	S	SW	hexagon socket	max. permissible load kg
07775-08	13	13	25	44	M8	21	16	33	3	14	76	52	25	8	19	-	325
07775-10	13	13	25	44	M10	21	20	33	3	14	76	52	25	8	19	-	500
07775-12	22	19	44	51	M12	35	24	48	4	21	110	75	38	13	32	6	725
07775-16	22	19	44	51	M16	35	32	48	4	21	110	75	38	13	32	8	1400
07775-20	29	25	57	67	M20	48	40	59	6	26	145	102	51	16	44	10	2290

Lifting pins

self-locking

Material:
Steel.
Push button in aluminium.

Version:
Steel, manganese phosphate treated.

Sample order:
nlm 07780-2110X50

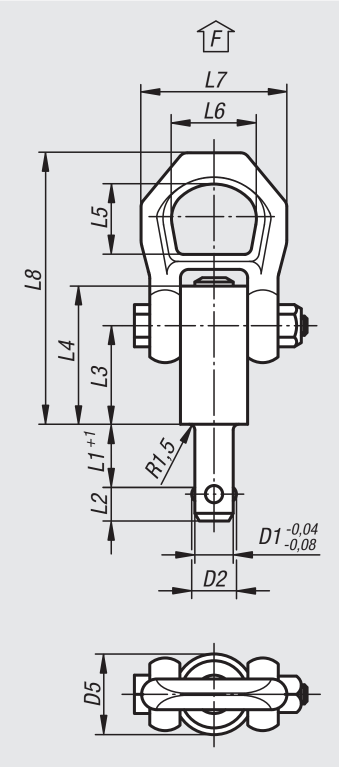
Note:
Self-locking lifting pins are quick and easy lifting devices with swing shackles.
The ball are unlocked by pressing the push button. After releasing the push button the ball is securely locked.
Corrosion protected.

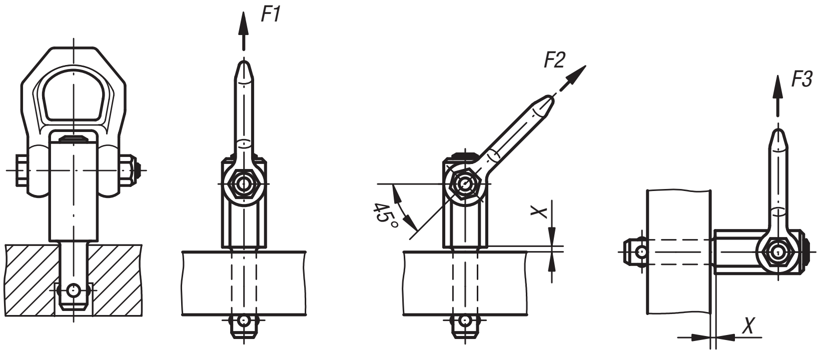
TÜV tested.

Values X min, F1, F2 and F3 with 5x safety factor.

Temperature range:
max. +250 °C.

Accessories:
Receiver bushes 07781.





Order No.	D1	D2	D5	L1	L2	L3	L4	L5	L6	L7	L8	X min.	X max.	Receiving hole H11	F1 kN	F2 kN	F3 kN
07780-2108X10	8	9,35	21,5	10	8,75	25,7	36	27	30	49	87,5	1,5	5	8	1,5	1,2	0,5
07780-2108X15	8	9,35	21,5	15	8,75	25,7	36	27	30	49	87,5	1,5	10	8	1,5	1,2	0,5
07780-2108X25	8	9,35	21,5	25	8,75	25,7	36	27	30	49	87,5	1,5	15	8	1,5	1,2	0,5
07780-2108X35	8	9,35	21,5	35	8,75	25,7	36	27	30	49	87,5	1,5	15	8	1,5	1,2	0,5
07780-2110X15	10	11,7	21,5	15	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-2110X25	10	11,7	21,5	25	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-2110X35	10	11,7	21,5	35	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-2110X50	10	11,7	21,5	50	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-2112X15	12	14,2	21,5	15	11	25,7	36	27	30	49	87,5	1,5	10	12	3,5	3,2	2,8
07780-2112X25	12	14,2	21,5	25	11	25,7	36	27	30	49	87,5	1,5	15	12	3,5	3,2	2,8
07780-2112X35	12	14,2	21,5	35	11	25,7	36	27	30	49	87,5	1,5	15	12	3,5	3,2	2,8
07780-2112X50	12	14,2	21,5	50	11	25,7	36	27	30	49	87,5	1,5	15	12	3,5	3,2	2,8
07780-2516X25	16	18,6	25	25	15,1	31	44,5	27	30	49	92,8	1,5	15	16	4,8	4,5	4,1
07780-2516X50	16	18,6	25	50	15,1	31	44,5	27	30	49	92,8	1,5	35	16	4,8	4,5	4,1
07780-2516X75	16	18,6	25	75	15,1	31	44,5	27	30	49	92,8	1,5	40	16	4,8	4,5	4,1
07780-2520X50	20	24,5	30	50	19,7	36,5	52	32,6	36	56	114	1,5	25	20	10	8,5	6,5
07780-2520X75	20	24,5	30	75	19,7	36,5	52	32,6	36	56	114	1,5	30	20	10	8,5	6,5

Lifting pins

self-locking, stainless steel

Material:
Pin stainless steel 1.4542.
Shackle stainless steel 1.4571.
Push button aluminium.

Version:
Pin hardened.

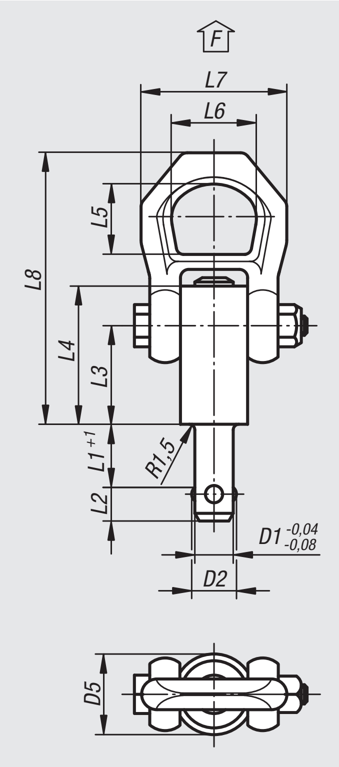
Sample order:
nlm 07780-12110X50

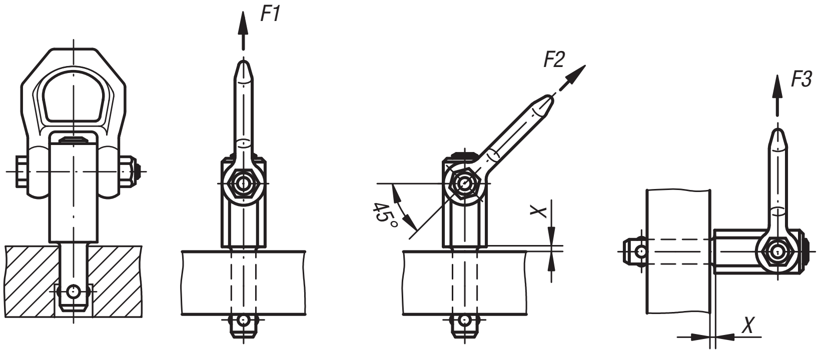
Note:
Ball lifting pins are quick and simple lifting devices with swing shackles.
The balls are unlocked by pressing the push button.
After releasing the push button, the ball is securely locked.
– Protected against corrosion and weather-resistant
– High-strength, hardened, extremely durable pin.
– TÜV-tested.

Values X min., F1, F2 and F3 with 5x safety factor.

Temperature range:
max. +250 °C.

Accessories:
Receiver bushes 07781.



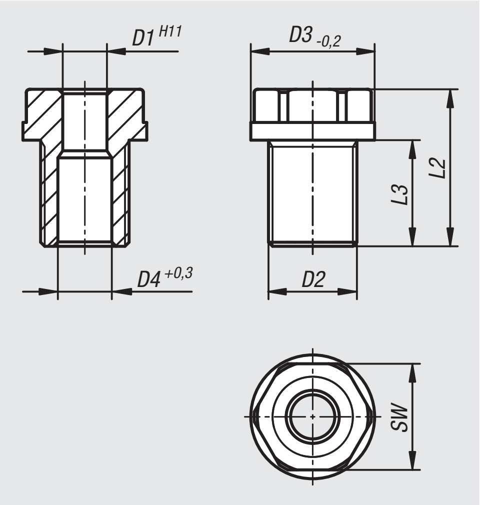


Order No.	D1	D2	D5	L1	L2	L3	L4	L5	L6	L7	L8	X min.	X max.	Receiving hole H11	F1 kN	F2 kN	F3 kN
07780-12108X10	8	9,35	21,5	10	8,75	25,7	36	27	30	49	87,5	1,5	5	8	1,5	1,2	0,5
07780-12108X15	8	9,35	21,5	15	8,75	25,7	36	27	30	49	87,5	1,5	10	8	1,5	1,2	0,5
07780-12108X25	8	9,35	21,5	25	8,75	25,7	36	27	30	49	87,5	1,5	15	8	1,5	1,2	0,5
07780-12108X35	8	9,35	21,5	35	8,75	25,7	36	27	30	49	87,5	1,5	15	8	1,5	1,2	0,5
07780-12110X15	10	11,7	21,5	15	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-12110X25	10	11,7	21,5	25	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-12110X35	10	11,7	21,5	35	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-12110X50	10	11,7	21,5	50	10,2	25,7	36	27	30	49	87,5	1,5	10	10	2,7	2,4	2,1
07780-12112X15	12	14,2	21,5	15	11	25,7	36	27	30	49	87,5	1,5	10	12	3,5	3,2	2,8
07780-12112X25	12	14,2	21,5	25	11	25,7	36	27	30	49	87,5	1,5	15	12	3,5	3,2	2,8
07780-12112X35	12	14,2	21,5	35	11	25,7	36	27	30	49	87,5	1,5	15	12	3,5	3,2	2,8
07780-12112X50	12	14,2	21,5	50	11	25,7	36	27	30	49	87,5	1,5	15	12	3,5	3,2	2,8
07780-12516X25	16	18,6	25	25	15,1	31	44,5	27	30	49	92,8	1,5	15	16	4,8	4,5	4,1
07780-12516X50	16	18,6	25	50	15,1	31	44,5	27	30	49	92,8	1,5	35	16	4,8	4,5	4,1
07780-12516X75	16	18,6	25	75	15,1	31	44,5	27	30	49	92,8	1,5	40	16	4,8	4,5	4,1
07780-13020X50	20	24,5	30	50	19,7	36,5	52	32,6	36	56	114	1,5	25	20	10	8,5	6,5
07780-13020X75	20	24,5	30	75	19,7	36,5	52	32,6	36	56	114	1,5	30	20	10	8,5	6,5

07781

Receiver bushes

for ball lifting pins, stainless steel

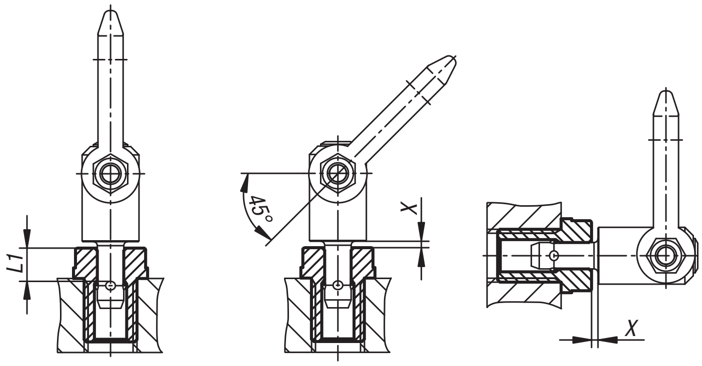


Material:
Stainless steel 1.4542.

Version:
Hardened.

Sample order:
nlm 07781-0810

Note:
The receiver bush is for quick and safe insertion of ball operated lifting pins. They offer an easy and reliable installation in a variety of lifting materials. Also for use with thin walled materials and blind holes.
They are corrosion resistant with low wearing.



Order No.	D1	D2	D3	D4	L1	L2	L3	X	SW	Tightening torque Nm
07781-0810	8	M16x1,5	24	9,8	10	27,5	20	1,5	19	90
07781-0815	8	M16x1,5	24	9,8	15	27,5	20	1,5	19	90
07781-0825	8	M16	24	9,8	25	37,5	25	1,5	19	75
07781-0835	8	M16	24	9,8	35	47,5	35	1,5	19	75
07781-1015	10	M20x1,5	28	12,2	15	35,5	24	1,5	24	145
07781-1025	10	M20x1,5	28	12,2	25	35,5	24	1,5	24	145
07781-1035	10	M20	28	12,2	35	46	29	1,5	24	130
07781-1050	10	M20	28	12,2	50	65	49	1,5	24	130
07781-1215	12	M24x1,5	32	14,7	15	35,5	24	1,5	27	220
07781-1225	12	M24x1,5	32	14,7	25	36,5	24	1,5	27	220
07781-1235	12	M24	32	14,7	35	48,5	36	1,5	27	200
07781-1250	12	M24	32	14,7	50	72,5	60	1,5	27	200
07781-1625	16	M30x2	39	19,2	25	44	29	1,5	30	440
07781-1650	16	M30	39	19,2	50	66	44	1,5	30	400
07781-1675	16	M30	39	19,2	75	96	74	1,5	30	400
07781-2050	20	M36x2	43	26	50	70	55	1,5	36	440
07781-2075	20	M36x2	43	26	75	95	80	1,5	36	440

Locating bushes

for ball lifting pins stainless steel, flat

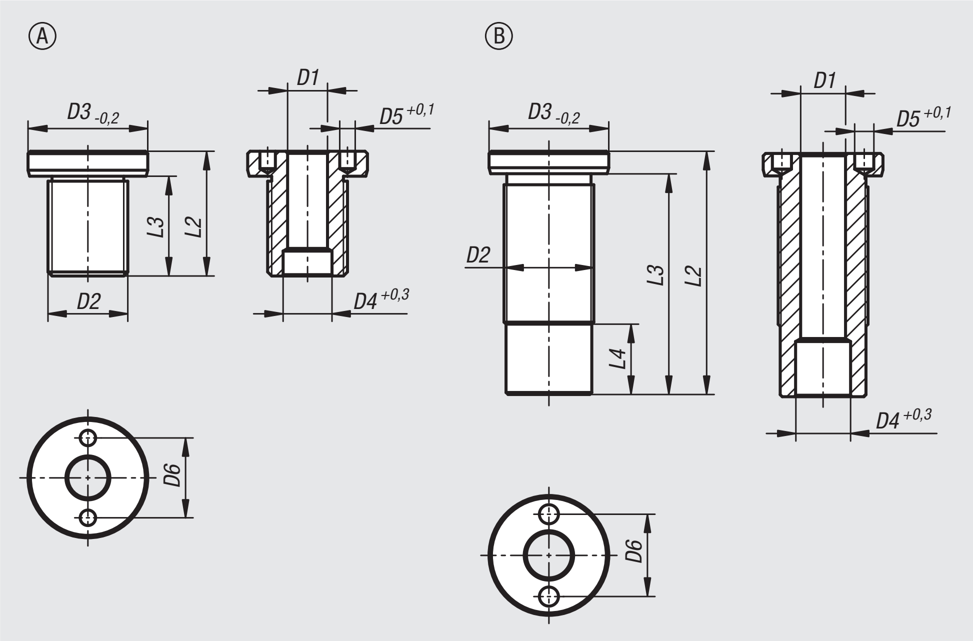
Material:
Stainless steel 1.4542.

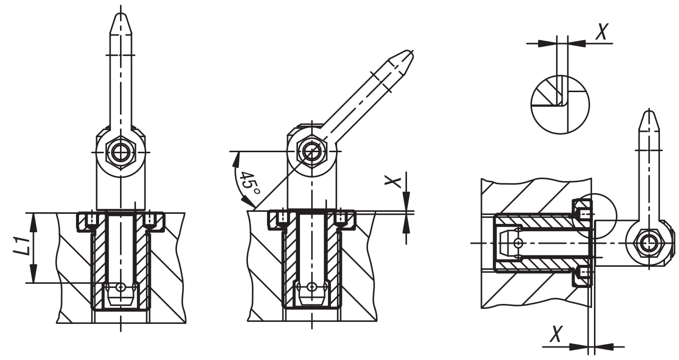
Version:
Hardened.

Sample order:
nlm 07781-10810

Note:
The locating bushes offer a safe and quick option for holding the ball lifting pins. They ensure that installation in a range of supporting materials can be carried out easily and reliably. Can also be used with thin-walled parts and blind holes.
This version is suitable for applications which require a flat surface after having been screwed in.
They are corrosion-resistant and do not wear easily.

Accessories:
Adjustable face pin spanner 96651.





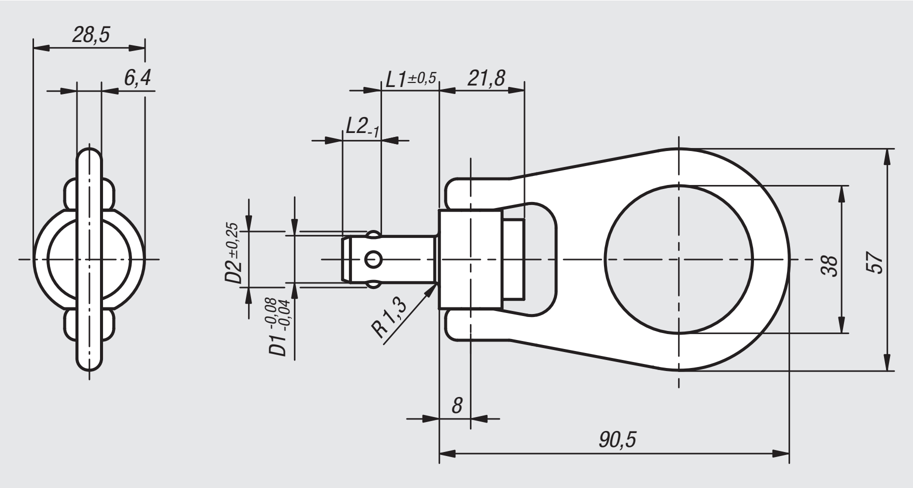
Order No.	Form	D1	D2	D3	D4	D5	D6	L1	L2	L3	L4	X	Tightening torque Nm	Order No. assembly key
07781-10810	A	8	M16x1,5	24	9,8	3,1	16	10	25	20	-	1,5	75	96651-08
07781-10815	A	8	M16x1,5	24	9,8	3,1	16	15	25	20	-	1,5	75	96651-08
07781-10825	A	8	M16	24	9,8	3,1	16	25	35	30	-	1,5	75	96651-08
07781-10835	A	8	M16	24	9,8	3,1	16	35	45	40	-	1,5	75	96651-08
07781-11015	A	10	M20x1,5	28	12,2	5,1	20	15	30	24	-	1,5	100	96651-08
07781-11025	A	10	M20x1,5	28	12,2	5,1	20	25	35	29	-	1,5	100	96651-08
07781-11035	A	10	M20	28	12,2	5,1	20	35	45	39	-	1,5	100	96651-08
07781-11050	A	10	M20	28	12,2	5,1	20	50	60	54	-	1,5	100	96651-08
07781-11215	A	12	M24x1,5	32	14,7	5,1	22	15	32	26	-	1,5	150	96651-08
07781-11225	A	12	M24x1,5	32	14,7	5,1	22	25	40	34	-	1,5	150	96651-08
07781-11625	A	16	M30x2	39	19,2	5,1	30	25	45	39	-	1,5	200	96651-16
07781-11235	B	12	M24	32	14,7	5,1	22	35	50	44	3,8	1,5	150	96651-08
07781-11250	B	12	M24	32	14,7	5,1	22	50	65	59	18,8	1,5	150	96651-08
07781-11650	B	16	M30	39	19,2	5,1	30	50	65	59	6	1,5	200	96651-16
07781-11675	B	16	M30	39	19,2	5,1	30	75	90	84	31	1,5	200	96651-16
07781-12050	B	20	M36x2	43	26	5,1	30	50	70	63	3,5	1,5	200	96651-16
07781-12075	B	20	M36x2	43	26	5,1	30	75	95	88	28,5	1,5	200	96651-16

07782

Lifting pins

self-locking, stainless steel

EDELSTAHL Rost frei STAINLESS STEEL



Material:
Pin and shackle stainless steel 1.4542.
Push button stainless steel 1.4305.
Ball stainless steel 1.4125.
Spring stainless steel 1.4310.

Version:
Pin and balls hardened and passivated

Sample order:
nlm 07782-2812X15
(include length L1)

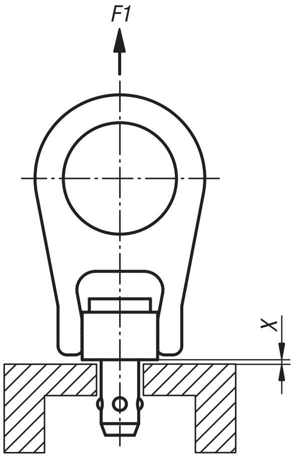
Note:
Quick and easy lifting device with swing shackle and safety bar against unintended release. The balls are unlocked by pressing the push button. When the push button is released the balls are securely locked.

Corrosion and weather resistant.
High tensile, hardened pin for extreme loads with the high wear resistance. Temperature range max. 250 °C.

CE certified.

Values X max, and F1 with 5x safety factor.

Accessories:
Receiver bushes 07784.



Order No.	D1	D2	L1	L2	X max.	F1 kN	Receiving hole
07782-2810X	10	12	15/20/25/30/35/40/75	9	1,5	4,4	10 +0,1
07782-2812X	12	14,27	15/20/25/30/35/40/50/75/100	10	1,5	5,5	12 +0,1
07782-2816X	16	19	15/20/25/30/35/40/50/75/100	14	1,5	6,2	16 +0,1

07784

Receiver bush

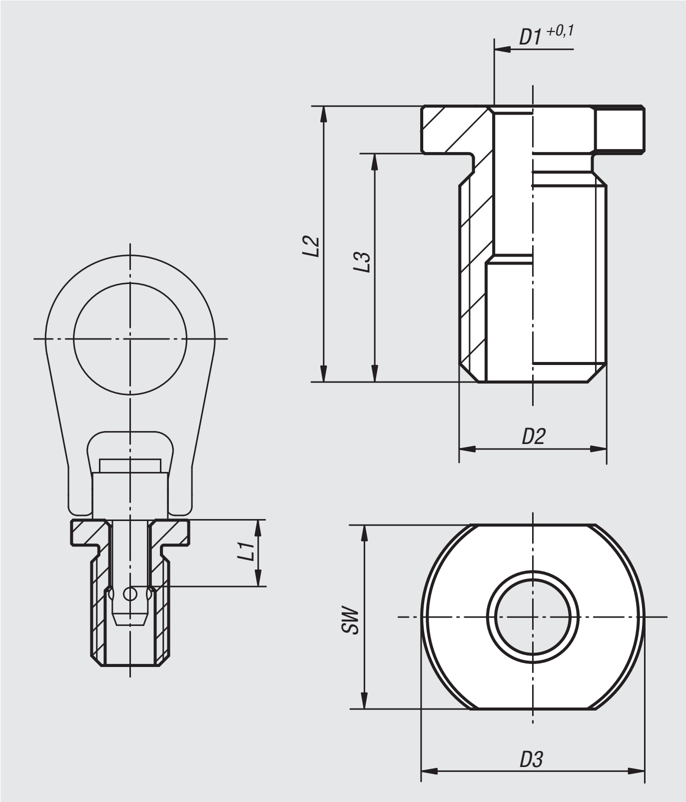
stainless steel, for lifting pins

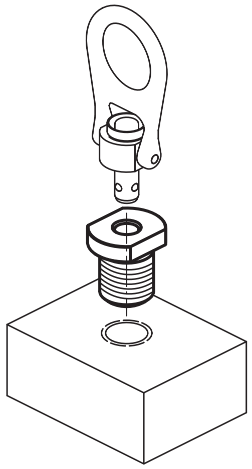
Material:
Stainless steel 1.4542.

Version:
Hardened and passivated.

Sample order:
nlm 07784-1015

Note:
The receiver bush is for quick and safe insertion of ball operated lifting pins. They offer an easy and reliable installation in a variety of lifting materials. Also for use with thin walled materials and blind holes.
They are corrosion resistant with low wearing.



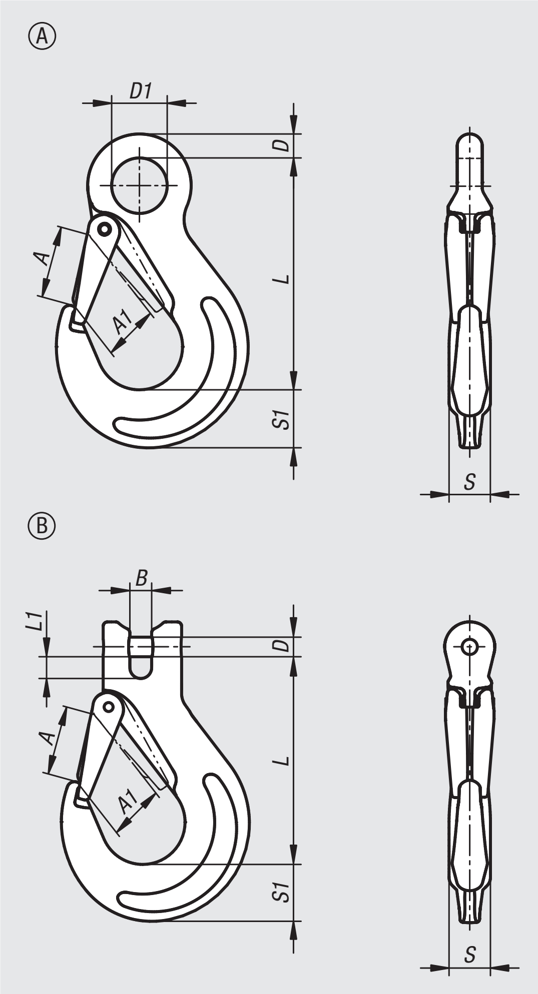


Order No.	D1	D2	D3	L1	L2	L3	SW	Tightening torque Nm	Suitable for
07784-1015	10	M20x2,5	34,8	15	29	22	26	36	07782-2810X15
07784-1215	12	M22x2,5	34,8	15	37	28	30	50	07782-2812X15
07784-1615	16	M27x3	41,2	15	41	31	32	69	07782-2816X15

Notes

Slip hooks

grade 10



Material:
Steel.

Version:
Grade 10.
Plastic-coated, red.
Latch forged and electro zinc-plated.

Sample order:
nlm 07791-11001400

Note:
Slip hooks with forged latch.

The hooks correspond to the Machinery Directive and are BG certified (H stamp).

Temperature range:
From -40°C to 200°C = 100% permissible load
Up to 300°C = 90% permissible load
Up to 400°C = 75% permissible load

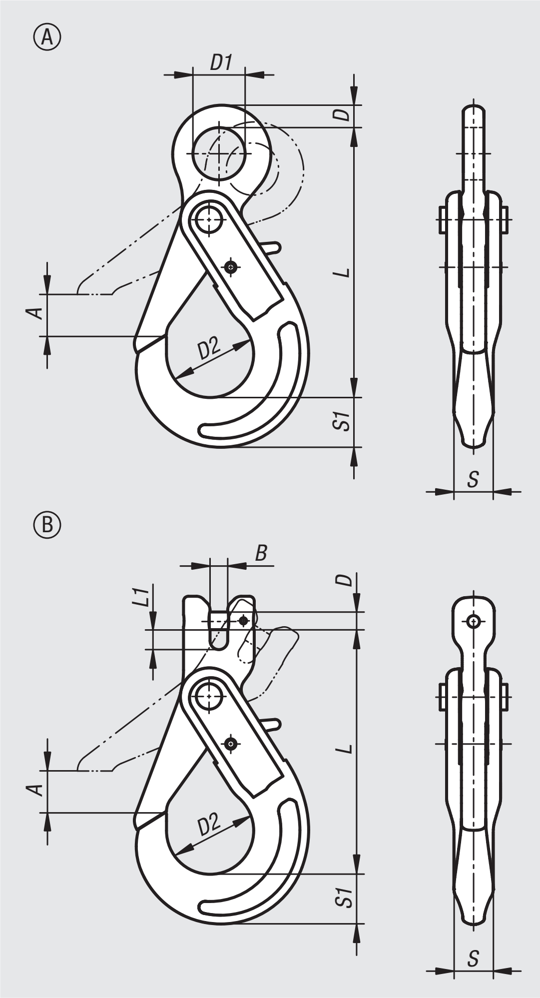
Drawing reference:
Form A: eye hook.
Form B: clevis hook.

Order No.	Version 1	Form	for chain mm	A	A1	B	D	D1	L	L1	S	S1	Permissible load kg
07791-11001400	eye hook	A	6	26	19	-	10	20,5	85	-	16	20	1400
07791-11002500	eye hook	A	7-8	33	26	-	11	25	105	-	19	29	2500
07791-11004000	eye hook	A	10	40	31	-	16	34	131	-	26	33	4000
07791-11006700	eye hook	A	13	51	40	-	19	43	163	-	33	45	6700
07791-11010000	eye hook	A	16	66	45	-	24,5	50	183	-	40	50	10000
07791-21001400	clevis hook	B	6	26	19	7,2	7,5	-	69	8	15	20	1400
07791-21001900	clevis hook	B	7	34	26	9,5	9	-	95	10	19	28	1900
07791-21002500	clevis hook	B	8	34	26	9,5	10	-	95	10	19	28	2500
07791-21004000	clevis hook	B	10	40	31	12	13	-	110	13,5	25	33	4000
07791-21006700	clevis hook	B	13	51	40	15	16	-	136	17	30	40	6700
07791-21010000	clevis hook	B	16	56	45	18	20	-	155	22	37	48	10000

07792

Self-locking hooks

grade 10



Material:
Steel.

Version:
Grade 10.
Plastic-coated, red.

Sample order:
nlm 07792-11001400

Note:
When lifting the load, the safety latch closes automatically and is securely locked by a locking mechanism at the rear of the hook. To open the latch, the locking mechanism must be unlocked manually.

The hooks correspond to the Machinery Directive and are BG certified (H stamp).

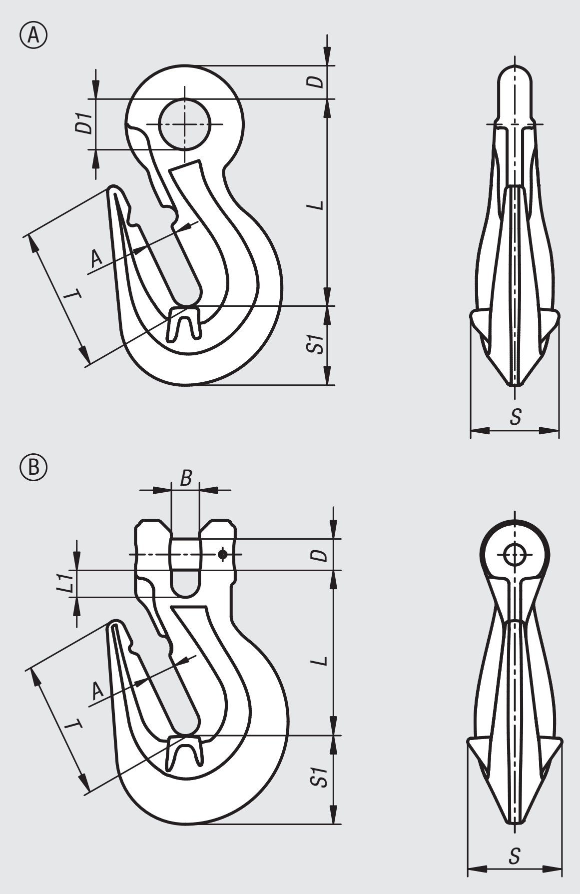
Temperature range:
From -40°C to 200°C = 100% permissible load
Up to 300°C = 90% permissible load
Up to 400°C = 75% permissible load

Drawing reference:
Form A: eye hook.
Form B: clevis hook.

Order No.	Version 1	Form	for chain mm	A	B	D	D1	D2	L	L1	S	S1	Permissible load kg
07792-11001400	eye hook	A	6	28	-	11	21	35	109	-	16	21	1400
07792-11002500	eye hook	A	7-8	34	-	12	25	43	135	-	20	26	2500
07792-11004000	eye hook	A	10	45	-	16	33	56	168	-	25	30	4000
07792-11006700	eye hook	A	13	51	-	20	40	69	205	-	35	40	6700
07792-11010000	eye hook	A	16	60	-	27	50	80	251	-	36	50	10000
07792-21001400	clevis hook	B	6	28	7	7,5	-	35	94	8	16	21	1400
07792-21001900	clevis hook	B	7	34	9	9	-	43	123	10	20	26	1900
07792-21002500	clevis hook	B	8	34	9	10	-	43	123	10	20	26	2500
07792-21004000	clevis hook	B	10	45	12	13	-	56	143	14	25	30	4000
07792-21006700	clevis hook	B	13	51	15	16	-	69	180	17	35	40	6700
07792-21010000	clevis hook	B	16	60	19	21	-	80	215	19	36	50	10000

Shortening hooks

grade 10



Material:
Steel.

Version:
Grade 10.
Plastic-coated, red.

Sample order:
nlm 07793-11001400

Note:
The shortening hook is for incorporating into single or multiple strand chains and is used to shorten the chain.

Shortening hooks are permissible for lifting, but not for lashing since they do not have a latch to prevent unintentional unhooking.

The shortening hooks correspond to the Machinery Directive and are BG certified (H stamp).

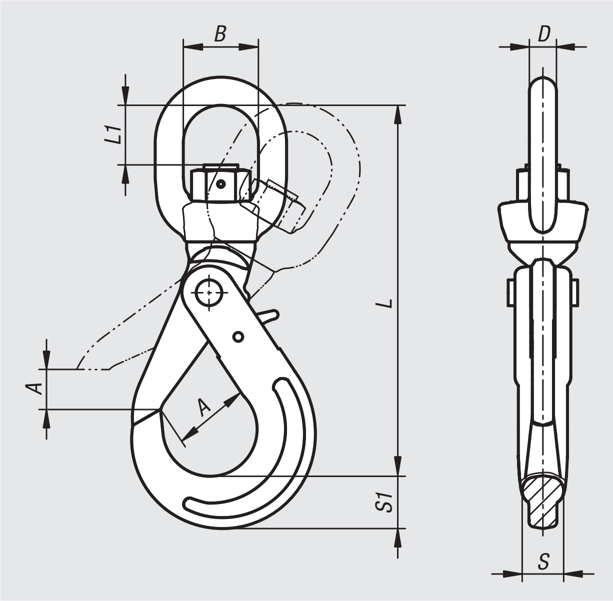
Temperature range:
From -40°C to 200°C = 100% permissible load
Up to 300°C = 90% permissible load
Up to 400°C = 75% permissible load

Drawing reference:
Form A: eye hook.
Form B: clevis hook.

Order No.	Version 1	Form	for chain mm	A	B	D	D1	L	L1	S	S1	T	Permissible load kg
07793-11001400	eye hook	A	6	8	-	8,5	12	51,5	-	22	22	35,5	1400
07793-11002500	eye hook	A	7-8	10	-	11	17	69	-	30	28	47	2500
07793-11004000	eye hook	A	10	13	-	15	22	86,5	-	44	34	55	4000
07793-11006700	eye hook	A	13	17	-	18	26	110,5	-	53	47	81	6700
07793-11010000	eye hook	A	16	19	-	21	32	129	-	64	60	92	10000
07793-21001400	clevis hook	B	6	8	8	7,5	-	51	8,8	22	22	36	1400
07793-21001900	clevis hook	B	7	10	10	9	-	66	11	30	28	47	1900
07793-21002500	clevis hook	B	8	10	10	10	-	65	11	30	28	47	2500
07793-21004000	clevis hook	B	10	13	13	13	-	80	15	44	34	55	4000
07793-21006700	clevis hook	B	13	17	17	16	-	105	18	53	47	81	6700
07793-21010000	clevis hook	B	16	19	19	21	-	112	18	64	60	92	10000

Swivel hooks

grade 10



Material:
Steel.

Version:
Grade 10.
Plastic-coated, red.

Sample order:
nlm 07794-11001400

Note:
Fitted with smooth-running plain bearings. Not suitable for swivelling while under load.

When lifting the load, the safety latch closes automatically and is securely locked by a locking mechanism at the rear of the hook. To open the latch, the locking mechanism must be unlocked manually.

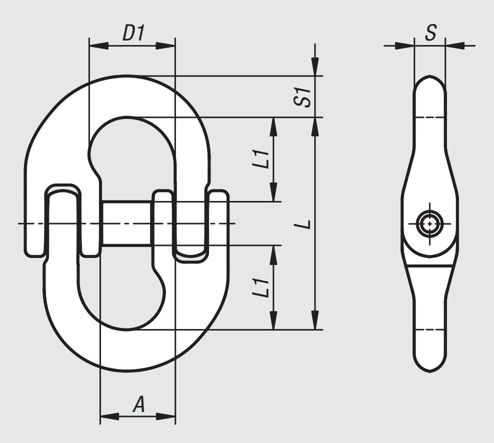
The swivel hooks correspond to the Machinery Directive and are BG certified (H stamp).

Temperature range:
From -40°C to 200°C = 100% permissible load
Up to 300°C = 90% permissible load
Up to 400°C = 75% permissible load

Order No.	for chain mm	A	B	D	L	L1	S	S1	Permissible load kg
07794-11001400	6	28	36	13	158	27	16	21	1400
07794-11002500	7-8	34	36	13	182	27	20	26	2500
07794-11004000	10	45	42	16	217	35	25	30	4000
07794-11006700	13	54	50	21	271	43	35	40	6700
07794-11010000	16	62	62	24	320	58	38	50	10000

Connecting links

grade 10



Material:
Steel.

Version:
Grade 10.
Plastic-coated, red.

Sample order:
nlm 07795-1001400

Note:
The connecting links are inserted as a coupling link in a chain sling between suspension link/chain, chain/chain or load hook/chain.

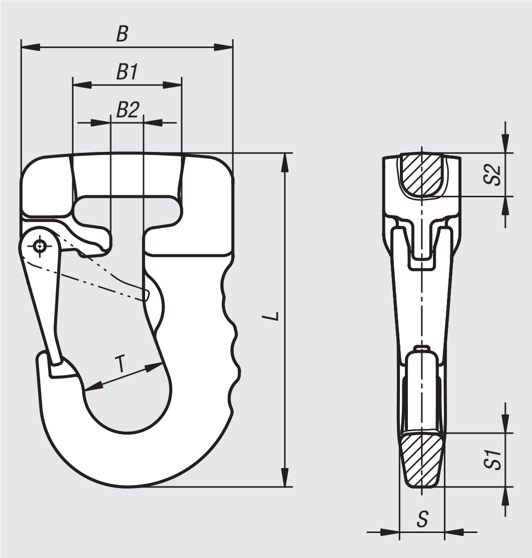
The connecting links correspond to the Machinery Directive and are BG certified (H stamp).

Temperature range:
From -40°C to 200°C = 100% permissible load
Up to 300°C = 90% permissible load
Up to 400°C = 75% permissible load

Order No.	for chain mm	A	D1	L	L1	S	S1	Permissible load kg
07795-1001400	6	14	18	45	18	7,5	8	1400
07795-1001900	7	17,8	20,5	50,5	20	9	10,2	1900
07795-1002500	8	19	23,5	62	25,5	10	11,5	2500
07795-1004000	10	23,8	27,5	72	30	12,6	12,6	4000
07795-1006700	13	28	33,3	87,3	36	16,7	19	6700
07795-1010000	16	34,3	39,5	102	40,5	20,6	20,6	10000

Round sling hooks

grade 8



Material:
Steel.

Version:
Grade 8.
Plastic-coated.

Sample order:
nlm 07796-801000

Note:
Round sling hooks for quick suspension of textile lifting equipment such as hoist belts or round slings. The round sling hook is fitted with a robust, forged safety latch. All edges are rounded to protect the textile slings.

The colour of the round sling hook corresponds to the colour code assigned to textile lifting equipment that signifies the permissible loads.

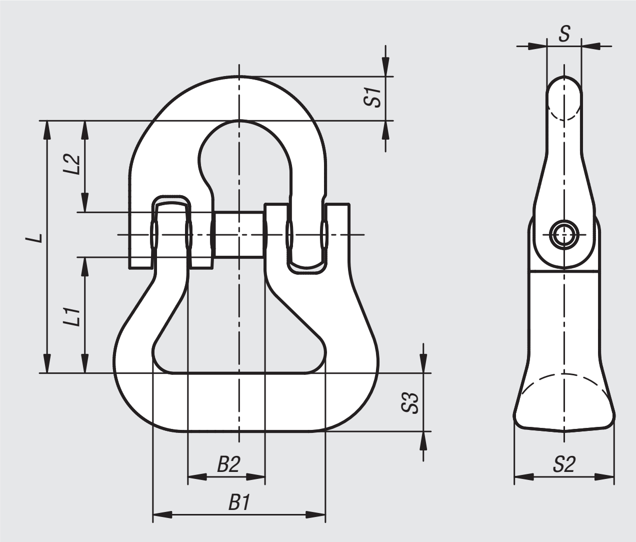
The round sling hooks correspond to the Machinery Directive and are BG certified (H stamp).

Temperature range:
From -40°C to 200°C = 100% permissible load
Up to 300°C = 90% permissible load
Up to 400°C = 75% permissible load

Order No.	Main colour	B	B1	B2	L	S	S1	S2	T	Permissible load kg
07796-801000	violet	78	41	12	123	17	20	16	31	1000
07796-802000	green	91	44	19	148	21	26	17	40	2000
07796-803000	yellow	113	55	21	175	25	32	25	50	3000
07796-804000	grey	133	76	40	223	36	40	36	59,5	4000
07796-805000	red	133	76	40	223	36	40	36	59,5	5000
07796-806000	brown	133	76	40	223	36	40	36	59,5	6000
07796-808000	blue	185	100	50	317	45	63	55	80	8000
07796-810000	orange	185	100	50	317	45	63	55	80	10000

Round sling links

grade 8



Material:
Steel.

Version:
Grade 8.
Plastic-coated, red.

Sample order:
nlm 07797-802000

Note:
For joining hoist belts or round slings to chain components such as chain links or suspension rings.

The round sling links correspond to the Machinery Directive and are BG certified (H stamp).

Temperature range:
From -40°C to 200°C = 100% permissible load
Up to 300°C = 90% permissible load
Up to 400°C = 75% permissible load

Order No.	for chain mm	B1	B2	L	L1	L2	S	S1	S2	S3	Permissible load kg
07797-802000	7-8	40	19	58	27	20	9	10	24	14	2000
07797-803150	10	40	25	77	34	30	11	13	30	12	3150
07797-805300	13	55	28	96	44	36	16	16	36	16	5300
07797-808000	16	67	36	115	53	40	21	21	44	24	8000

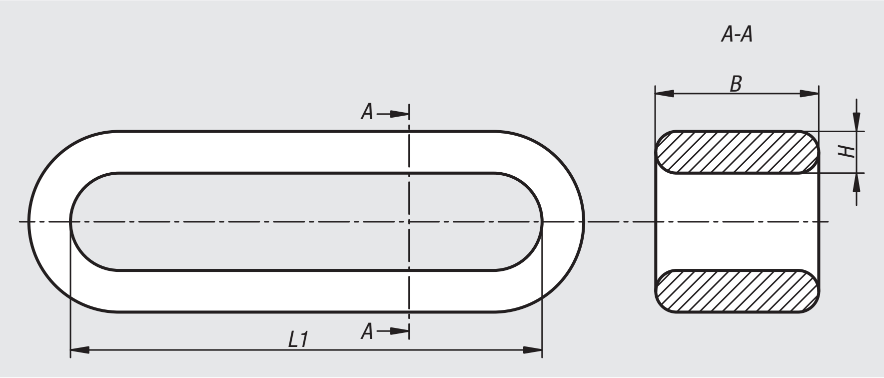
07798

Round slings

Material:
Polyester.

Version:
Single sleeve.

Sample order:
nlm 07798-0100005



Note:
The round slings comply with DIN EN 1492-2. They are made of high-strength endless polyester fibre cords. These polyester fibre cords are protected by a sturdy and seamlessly woven polyester sleeve. This sleeve surface is also impregnated with polyurethane to make it abrasion-proof. The working load limit (WLL) and the cord tonnage (tonne capacity per cord) are either woven into or printed on the protective sleeve of the sling. The safety label with the CE mark and technical data is firmly sewn onto the sling.

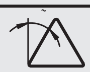
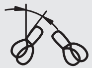
The colour of the round sling corresponds to the colour code scheme for load capacities of textile type slings.

These round slings have high UV resistance and low moisture absorption.

Safety factor 7:1
Example: WLL 1000kg = break load 7000kg.

These round slings carry the CE mark according to the European machinery directive.

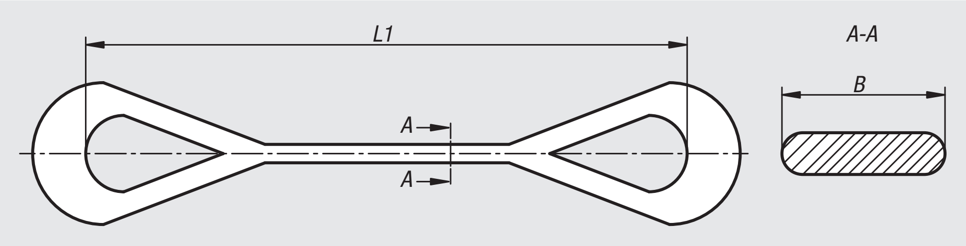
Temperature range:
-40 °C to +100 °C.

		Working load limit (WLL) (t) with round slings							Working load limit (WLL) (t) with 2 round slings			
Sling configuration												
Type		simple direct	simple laced	parallel	*Sling angle ' over 7-45°	over 45-60°	*Sling angle ' over 7-45°	over 45-60°	direct *Sling angle ' over 7-45°	over 45-60°	laced *Sling angle ' over 7-45°	over 45-60°
**load hoisting factor	Colour	1,0	0,8	2,0	1,4	1,0	0,7	0,5	1,4	1,0	1,12	0,8
1 t	violet	1 t	0,8 t	2 t	1,4 t	1 t	0,7 t	0,5 t	1,4 t	1 t	1,12 t	0,8 t
2 t	green	2 t	1,6 t	4 t	2,8 t	2 t	1,4 t	1,0 t	2,8 t	2 t	2,24 t	1,6 t
3 t	yellow	3 t	2,4 t	6 t	4,2 t	3 t	2,1 t	1,5 t	4,2 t	3 t	3,36 t	2,4 t
4 t	grey	4 t	3,2 t	8 t	5,6 t	4 t	2,8 t	2,0 t	5,6 t	4 t	4,48 t	3,2 t
5 t	red	5 t	4,0 t	10 t	7,0 t	5 t	3,5 t	2,5 t	7,0 t	5 t	5,60 t	4,0 t

*inclination angle ˜ reduces the WLL. Inclination angles over 60° are not permitted.
** The load hoisting factor takes into account the change in WLL due to the sling type.

Order No. violet	Order No. green	Order No. yellow	Order No. grey	Order No. red	B	H	L1	Permissible load kg
07798-0100005	**07798-0200005**	**07798-0300005**	**07798-0400005**	**07798-0500005**	47/48/54/70/72	12/18/20/22/28	0,5 m	1000/2000/3000/4000/5000
07798-0100010	**07798-0200010**	**07798-0300010**	**07798-0400010**	**07798-0500010**	47/48/54/70/72	12/18/20/22/28	1 m	1000/2000/3000/4000/5000
07798-0100015	**07798-0200015**	**07798-0300015**	**07798-0400015**	**07798-0500015**	47/48/54/70/72	12/18/20/22/28	1,5 m	1000/2000/3000/4000/5000
07798-0100020	**07798-0200020**	**07798-0300020**	**07798-0400020**	**07798-0500020**	47/48/54/70/72	12/18/20/22/28	2 m	1000/2000/3000/4000/5000
07798-0100025	**07798-0200025**	**07798-0300025**	**07798-0400025**	**07798-0500025**	47/48/54/70/72	12/18/20/22/28	2,5 m	1000/2000/3000/4000/5000
07798-0100030	**07798-0200030**	**07798-0300030**	**07798-0400030**	**07798-0500030**	47/48/54/70/72	12/18/20/22/28	3 m	1000/2000/3000/4000/5000
07798-0100040	**07798-0200040**	**07798-0300040**	**07798-0400040**	**07798-0500040**	47/48/54/70/72	12/18/20/22/28	4 m	1000/2000/3000/4000/5000
07798-0100050	**07798-0200050**	**07798-0300050**	**07798-0400050**	**07798-0500050**	47/48/54/70/72	12/18/20/22/28	5 m	1000/2000/3000/4000/5000

Lifting slings



Material:
Polyester.

Version:
Two layer. Fully reinforced end loops both sides, tapered to half the band width.

Sample order:
nlm 07798-02-0100010

Note:
The lifting slings correspond to DIN EN 1492-1. The are made of high-strength polyester straps. The sling surface is also impregnated with polyurethane to make it abrasion-proof. The working load limit (WLL) and the cord tonnage (tonne capacity per cord) are either woven into or printed on the sling. The safety label with the CE mark and technical data is firmly sewn to the sling.

The colour of the sling corresponds to the colour code scheme for load capacities of textile type slings.

The lifting slings have high UV resistance and low moisture absorption.

Safety factor 7:1
Example: WLL 1000kg = break load 7000kg.

These lifting slings carry the CE mark according to the European machinery directive.

The stated WLL applies to a vertical lift. By a basket lift the WLL is doubled.

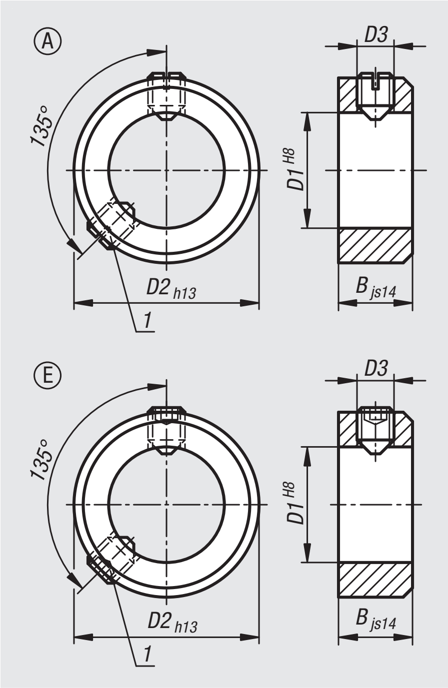
Temperature range:
-40 °C to +100 °C.

Order No.	Main colour	B	L1	Permissible load kg
07798-02-0100010	violet	50	1 m	1000
07798-02-0100020	violet	50	2 m	1000
07798-02-0100030	violet	50	3 m	1000
07798-02-0100040	violet	50	4 m	1000
07798-02-0100050	violet	50	5 m	1000
07798-02-0200010	green	60	1 m	2000
07798-02-0200020	green	60	2 m	2000
07798-02-0200030	green	60	3 m	2000
07798-02-0200040	green	60	4 m	2000
07798-02-0200050	green	60	5 m	2000
07798-02-0300010	yellow	90	1 m	3000
07798-02-0300020	yellow	90	2 m	3000
07798-02-0300030	yellow	90	3 m	3000
07798-02-0300040	yellow	90	4 m	3000
07798-02-0300050	yellow	90	5 m	3000
07798-02-0400010	yellow	120	1 m	4000
07798-02-0400020	grey	120	2 m	4000
07798-02-0400030	grey	120	3 m	4000
07798-02-0400040	grey	120	4 m	4000
07798-02-0400050	grey	120	5 m	4000
07798-02-0500010	red	150	1 m	5000
07798-02-0500020	red	150	2 m	5000
07798-02-0500030	red	150	3 m	5000
07798-02-0500040	red	150	4 m	5000
07798-02-0500050	red	150	5 m	5000

07800

Shaft collars set screw

DIN 705, steel



Material:
Steel.

Version:
Bright or electro zinc-plated, trivalent blue passivated.

Sample order:
nlm 07800-100301

Note:
Form A: with grub screw DIN 553 (recess)
Form E: with grub screw DIN 914 (hexagon socket)

Drawing reference:
1) Second grub screw from D1 ≥ 75

Order No. Form A bright	Order No. Form E bright	Order No. Form E galvanized, blue-passivated	D1	B	D2	D3 grub screw
07800-100301	07800-300301	07800-300303	3	5	7	M2x3
07800-100401	07800-300401	07800-300403	4	5	8	M2,5x3
07800-100501	07800-300501	07800-300503	5	6	10	M3x4
07800-100601	07800-300601	07800-300603	6	8	12	M4x5
07800-100701	07800-300701	07800-300703	7	8	12	M4x5
07800-100801	07800-300801	07800-300803	8	8	16	M4x6
07800-100901	07800-300901	07800-300903	9	10	18	M5x8
07800-101001	07800-301001	07800-301003	10	10	20	M5x8
07800-101101	07800-301101	07800-301103	11	10	20	M5x8
07800-101201	07800-301201	07800-301203	12	12	22	M6x8
07800-101401	07800-301401	07800-301403	14	12	25	M6x8
07800-101501	07800-301501	07800-301503	15	12	25	M6x8
07800-101601	07800-301601	07800-301603	16	12	28	M6x8
07800-101801	07800-301801	07800-301803	18	14	32	M6x8
07800-102001	07800-302001	07800-302003	20	14	32	M6x8

Shaft collars set screw

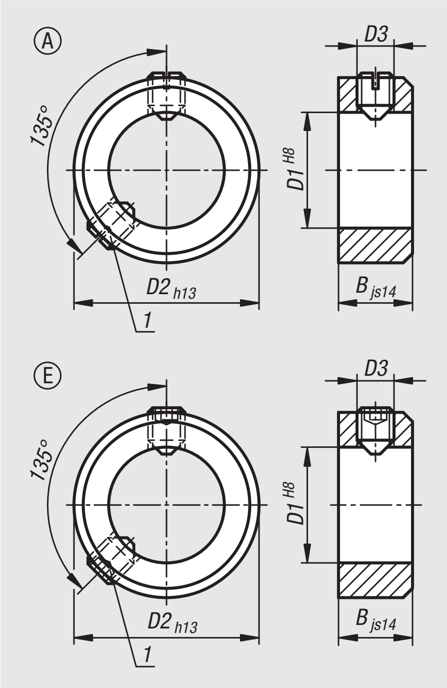
DIN 705, steel

Order No. Form A bright	Order No. Form E bright	Order No. Form E galvanized, blue-passivated	D1	B	D2	D3 grub screw
07800-102401	07800-302401	07800-302403	24	16	40	M8x12
07800-102501	07800-302501	07800-302503	25	16	40	M8x10
07800-102601	07800-302601	07800-302603	26	16	40	M8x10
07800-102801	07800-302801	07800-302803	28	16	45	M8x12
07800-103001	07800-303001	07800-303003	30	16	45	M8x10
07800-103201	07800-303201	07800-303203	32	16	50	M8x12
07800-103501	07800-303501	07800-303503	35	16	56	M8x12
07800-103601	07800-303601	07800-303603	36	16	56	M8x12
07800-103801	07800-303801	07800-303803	38	16	56	M8x12
07800-104001	07800-304001	07800-304003	40	18	63	M10x16
07800-104201	07800-304201	07800-304203	42	18	63	M10x16
07800-104501	07800-304501	07800-304503	45	18	70	M10x16
07800-104801	07800-304801	07800-304803	48	18	70	M10x16
07800-105001	07800-305001	07800-305003	50	18	80	M10x16
07800-105201	07800-305201	07800-305203	52	18	80	M10x16
07800-105501	07800-305501	07800-305503	55	18	80	M10x16
07800-105601	07800-305601	07800-305603	56	18	80	M10x16
07800-105801	07800-305801	07800-305803	58	20	90	M10x16
07800-106001	07800-306001	07800-306003	60	20	90	M10x16
07800-106301	07800-306301	07800-306303	63	20	90	M10x16
07800-106501	07800-306501	07800-306503	65	20	100	M10x20
07800-106801	07800-306801	07800-306803	68	20	100	M10x20
07800-107001	07800-307001	07800-307003	70	20	100	M10x20
07800-107201	07800-307201	07800-307203	72	20	100	M10x20
07800-107501	07800-307501	07800-307503	75	22	110	M12x20
07800-108001	07800-308001	07800-308003	80	22	110	M12x20
07800-108501	07800-308501	07800-308503	85	22	125	M12x25
07800-109001	07800-309001	07800-309003	90	22	125	M12x20
07800-110001	07800-310001	07800-310003	100	25	140	M12x25

07800

Shaft collars set screw

DIN 705, stainless steel



Material:
Stainless steel 1.4305.

Version:
Bright.

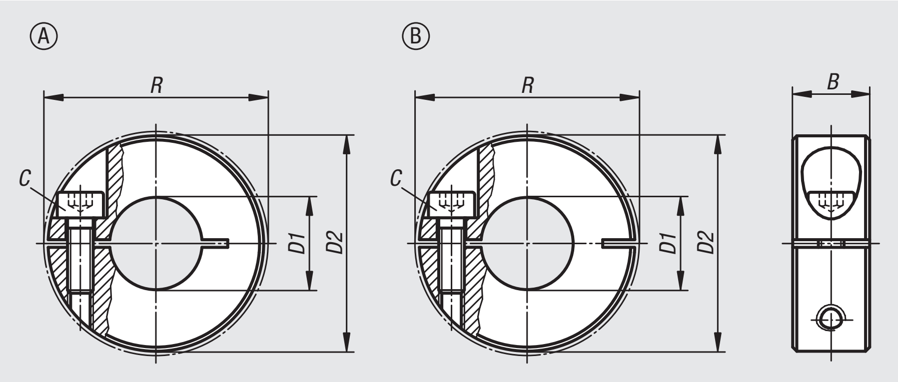
Sample order:
nlm 07800-100302

Note:
Form A: with grub screw DIN 553 (recess)
Form E: with grub screw DIN 914 (hexagon socket)

Drawing reference:
1) Second grub screw from D1 ≥ 75

Order No. Form A	Order No. Form E	D1	B	D2	D3 grub screw
07800-100302	**07800-300302**	3	5	7	M2x3
07800-100402	**07800-300402**	4	5	8	M2,5x3
07800-100502	**07800-300502**	5	6	10	M3x4
07800-100602	**07800-300602**	6	8	12	M4x5
07800-100702	**07800-300702**	7	8	12	M4x5
07800-100802	**07800-300802**	8	8	16	M4x6
07800-100902	**07800-300902**	9	10	18	M5x8
07800-101002	**07800-301002**	10	10	20	M5x8
07800-101102	**07800-301102**	11	10	20	M5x8
07800-101202	**07800-301202**	12	12	22	M6x8
07800-101402	**07800-301402**	14	12	25	M6x8
07800-101502	**07800-301502**	15	12	25	M6x8
07800-101602	**07800-301602**	16	12	28	M6x8
07800-101802	**07800-301802**	18	14	32	M6x8
07800-102002	**07800-302002**	20	14	32	M6x8
07800-102402	**07800-302402**	24	16	40	M8x12
07800-102502	**07800-302502**	25	16	40	M8x10
07800-102602	**07800-302602**	26	16	40	M8x10
07800-102802	**07800-302802**	28	16	45	M8x12
07800-103002	**07800-303002**	30	16	45	M8x10
07800-103202	**07800-303202**	32	16	50	M8x12
07800-103502	**07800-303502**	35	16	56	M8x12
07800-103602	**07800-303602**	36	16	56	M8x12
07800-103802	**07800-303802**	38	16	56	M8x12
07800-104002	**07800-304002**	40	18	63	M10x16
07800-104202	**07800-304202**	42	18	63	M10x16
07800-104502	**07800-304502**	45	18	70	M10x16
07800-104802	**07800-304802**	48	18	70	M10x16
07800-105002	**07800-305002**	50	18	80	M10x16
07800-105202	**07800-305202**	52	18	80	M10x16
07800-105502	**07800-305502**	55	18	80	M10x16
07800-105602	**07800-305602**	56	18	80	M10x16
07800-105802	**07800-305802**	58	20	90	M10x16
07800-106002	**07800-306002**	60	20	90	M10x16
07800-106302	**07800-306302**	63	20	90	M10x16
07800-106502	**07800-306502**	65	20	100	M10x20
07800-106802	**07800-306802**	68	20	100	M10x20
07800-107002	**07800-307002**	70	20	100	M10x20
07800-107202	**07800-307202**	72	20	100	M10x20
07800-107502	**07800-307502**	75	22	110	M12x20
07800-108002	**07800-308002**	80	22	110	M12x20
07800-108502	**07800-308502**	85	22	125	M12x25
07800-109002	**07800-309002**	90	22	125	M12x20
07800-110002	**07800-310002**	100	25	140	M12x25

Shaft collars one-piece



Material:
Steel 1.0718
Stainless steel 1.4305.
Aluminium.

Version:
Steel black oxidised, screw steel 12.9.
Stainless steel bright, screw stainless steel A2-70.
Aluminium bright, screw stainless steel A2-70.

Sample order:
nlm 07810-01001

Note:
One-piece shaft collars surround the shaft with a uniformly distributed clamping force. This leads to a dimensionally precise fit and very high retaining forces without damaging the shaft.

The shaft tolerance should lie within h11.

Form A: Standard shaft collar.
Form B: Shaft collar with a ca. 15% higher clamping force than the standard version by the same tightening torque on the locking screw. The bore remains cylindrical which means that the shaft is precisely enclosed. Less imbalance.

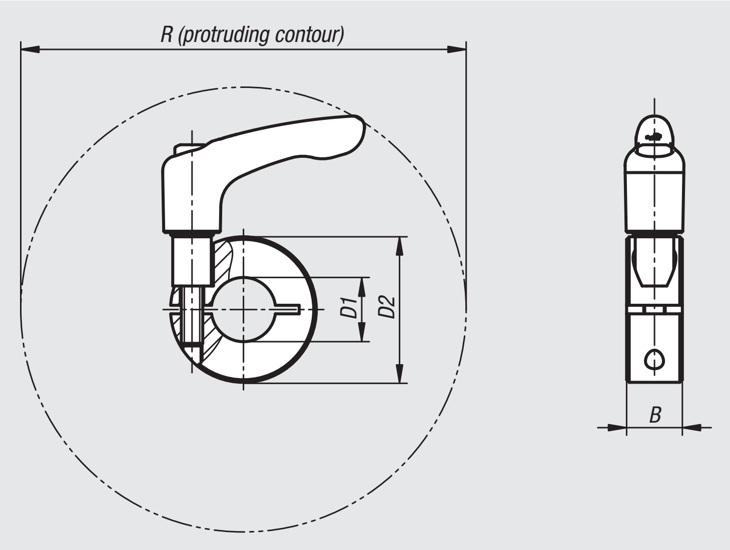
Temperature range:
-40 °C to +175 °C.

On request:
Other dimensions.

Order No. steel	Order No. stainless steel	Order No. aluminium	Form	B	C (DIN 912)	D1	D2	R
07810-00401	07810-00402	07810-00403	A	9	M3x8	4	16	20,7
07810-00501	07810-00502	07810-00503	A	9	M3x8	5	16	20,7
07810-00601	07810-00602	07810-00603	A	9	M3x8	6	16	20,7
07810-00801	07810-00802	07810-00803	A	9	M3x8	8	18	22,4
07810-01001	07810-01002	07810-01003	A	9	M3x10	10	24	26
07810-01201	07810-01202	07810-01203	A	11	M4x12	12	28	31,8
07810-01501	07810-01502	07810-01503	A	13	M5x16	15	34	39,4
07810-01601	07810-01602	07810-01603	A	13	M5x16	16	34	39,4
07810-01801	07810-01802	07810-01803	A	13	M5x16	18	36	41,1
07810-02001	07810-02002	07810-02003	A	15	M6x18	20	40	46,4
07810-02201	07810-02202	07810-02203	A	15	M6x18	22	42	48,1
07810-02501	07810-02502	07810-02503	A	15	M6x18	25	45	50,8
07810-02801	07810-02802	07810-02803	A	15	M6x18	28	48	53,7
07810-03001	07810-03002	07810-03003	A	15	M6x18	30	54	58,6
07810-04001	07810-04002	07810-04003	A	15	M6x18	40	60	65
07810-05001	07810-05002	07810-05003	A	19	M8x25	50	78	87
07810-100401	07810-100402	07810-100403	B	9	M3x8	4	16	20,7
07810-100501	07810-100502	07810-100503	B	9	M3x8	5	16	20,7
07810-100601	07810-100602	07810-100603	B	9	M3x8	6	16	20,7
07810-100801	07810-100802	07810-100803	B	9	M3x8	8	18	22,4
07810-101001	07810-101002	07810-101003	B	9	M3x10	10	24	26
07810-101201	07810-101202	07810-101203	B	11	M4x12	12	28	31,8
07810-101501	07810-101502	07810-101503	B	13	M5x16	15	34	39,4
07810-101601	07810-101602	07810-101603	B	13	M5x16	16	34	39,4
07810-101801	07810-101802	07810-101803	B	13	M5x16	18	36	41,1
07810-102001	07810-102002	07810-102003	B	15	M6x18	20	40	46,4
07810-102201	07810-102202	07810-102203	B	15	M6x18	22	42	48,1
07810-102501	07810-102502	07810-102503	B	15	M6x18	25	45	50,8
07810-102801	07810-102802	07810-102803	B	15	M6x18	28	48	53,7
07810-103001	07810-103002	07810-103003	B	15	M6x18	30	54	58,6
07810-104001	07810-104002	07810-104003	B	15	M6x18	40	60	65
07810-105001	07810-105002	07810-105003	B	19	M8x25	50	78	87

Shaft collars

one-piece, with clamping lever



Material:
Steel 1.0718.
Stainless steel 1.4305.

Version:
Steel black oxidised.
Stainless steel bright.
Insert stainless-steel.

Sample order:
nlm 07810-11001

Note:
One-piece shaft collars surround the shaft with an equal distribution of the clamping force. This leads to a very precise fit and high retaining force without damaging the shaft.

The shaft tolerance should lie within h11.

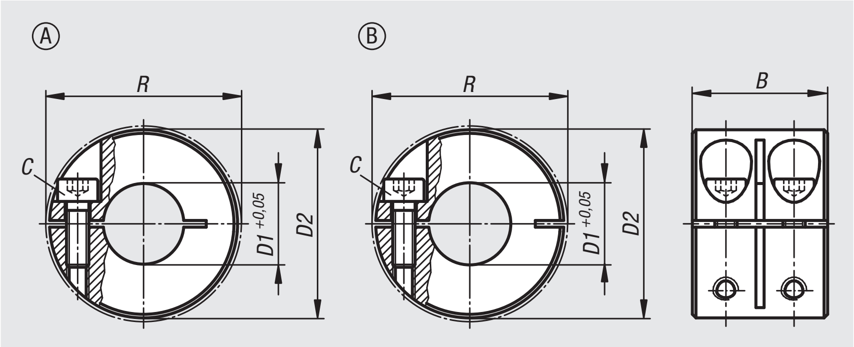
On request:
Other dimensions.

Order No. steel	Order No. stainless steel	B	D1	D2	R
07810-11001	**07810-11002**	9	10	24	44,1
07810-11201	**07810-11202**	11	12	28	90,4
07810-11501	**07810-11502**	13	15	34	105
07810-11601	**07810-11602**	13	16	34	105
07810-11801	**07810-11802**	13	18	36	105,7
07810-12001	**07810-12002**	15	20	40	103,8
07810-12201	**07810-12202**	15	22	42	104,2
07810-12501	**07810-12502**	15	25	45	104,8
07810-12801	**07810-12802**	15	28	48	106,8
07810-13001	**07810-13002**	15	30	54	112,6
07810-14001	**07810-14002**	15	40	60	113,2
07810-15001	**07810-15002**	19	50	78	150,2

07811

Shaft collars one-piece

wide



Material:
Steel 1.0718.
Stainless steel 1.4305.

Version:
Steel black oxidised.
Screw 12.9 steel.
Stainless steel bright.
Screw A2-70 stainless steel.

Sample order:
nlm 07811-01201

Note:
One-piece shaft collars surround the shaft with a uniformly distributed clamping force. This leads to a dimensionally precise fit and very high retaining forces without damaging the shaft.

The shaft tolerance should lie within h11.

Form A: Standard shaft collar.
Form B: Shaft collar with a ca. 15% higher clamping force than the standard version by the same tightening torque on the locking screw. The bore remains cylindrical which means that the shaft is precisely enclosed. Less imbalance.

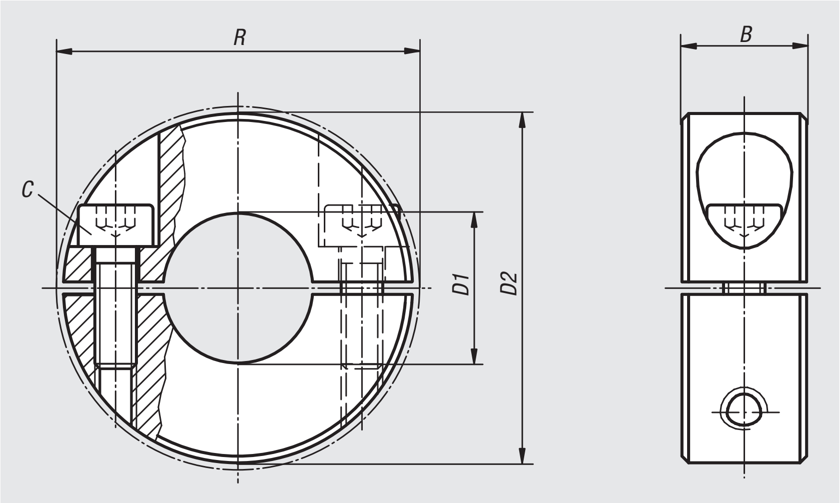
Temperature range:
-40 °C to +175 °C.

On request:
Other dimensions.

Order No. steel	**Order No. stainless steel**	Form	B	C (DIN 912)	D1	D2	R
07811-00801	**07811-00802**	A	20	M3x8	8	18	22,4
07811-01001	**07811-01002**	A	20	M3x10	10	24	26
07811-01201	**07811-01202**	A	24	M4x12	12	28	31,8
07811-01601	**07811-01602**	A	29	M5x16	16	34	39,4
07811-02001	**07811-02002**	A	33	M6x18	20	40	46,4
07811-02501	**07811-02502**	A	33	M6x18	25	45	50,8
07811-03001	**07811-03002**	A	33	M6x18	30	54	58,6
07811-04001	**07811-04002**	A	33	M6x18	40	60	65
07811-05001	**07811-05002**	A	41	M8x25	50	78	87
07811-100801	**07811-100802**	B	20	M3x8	8	18	22,4
07811-101001	**07811-101002**	B	20	M3x10	10	24	26
07811-101201	**07811-101202**	B	24	M4x12	12	28	31,8
07811-101601	**07811-101602**	B	29	M5x16	16	34	39,4
07811-102001	**07811-102002**	B	33	M6x18	20	40	46,4
07811-102501	**07811-102502**	B	33	M6x18	25	45	50,8
07811-103001	**07811-103002**	B	33	M6x18	30	54	58,6
07811-104001	**07811-104002**	B	33	M6x18	40	60	65
07811-105001	**07811-105002**	B	41	M8x25	50	78	87

07812

Shaft collars two-piece



Material:
Steel 1.0718
Stainless steel 1.4305.
Aluminium.

Version:
Steel black oxidised, screw steel 12.9.
Stainless steel bright, screw stainless steel A2-70.
Aluminium bright, screw stainless steel A2-70.

Sample order:
nlm 07812-01001

Note:
Two-piece shaft collars surround the shaft with a uniformly distributed clamping force. This leads to a dimensionally precise fit and very high retaining forces without damaging the shaft.

The shaft tolerance should lie within h11.

Two-piece shaft collars can be quickly and easily mounted or removed without dismantling other components.

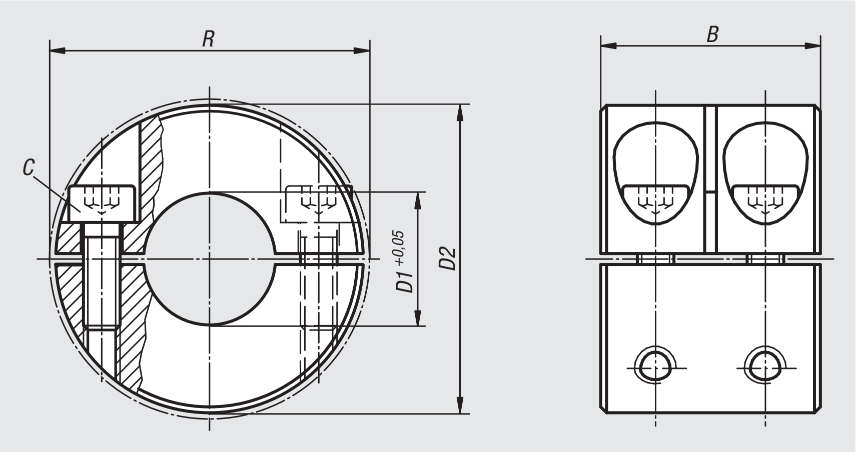
Temperature range:
-40 °C to +175 °C.

On request:
Other dimensions.

Order No. steel	Order No. stainless steel	Order No. aluminium	B	C (DIN 912)	D1	D2	R
07812-00401	**07812-00402**	**07812-00403**	9	M3x8	4	16	20,7
07812-00501	**07812-00502**	**07812-00503**	9	M3x8	5	16	20,7
07812-00601	**07812-00602**	**07812-00603**	9	M3x8	6	16	20,7
07812-00801	**07812-00802**	**07812-00803**	9	M3x8	8	18	22,4
07812-01001	**07812-01002**	**07812-01003**	9	M3x10	10	24	26
07812-01201	**07812-01202**	**07812-01203**	11	M4x12	12	28	31,8
07812-01501	**07812-01502**	**07812-01503**	13	M5x16	15	34	39,4
07812-01601	**07812-01602**	**07812-01603**	13	M5x16	16	34	39,4
07812-01801	**07812-01802**	**07812-01803**	13	M5x16	18	36	41,1
07812-02001	**07812-02002**	**07812-02003**	15	M6x18	20	40	46,4
07812-02201	**07812-02202**	**07812-02203**	15	M6x18	22	42	48,1
07812-02501	**07812-02502**	**07812-02503**	15	M6x18	25	45	50,8
07812-02801	**07812-02802**	**07812-02803**	15	M6x18	28	48	53,7
07812-03001	**07812-03002**	**07812-03003**	15	M6x18	30	54	58,6
07812-04001	**07812-04002**	**07812-04003**	15	M6x18	40	60	65
07812-05001	**07812-05002**	**07812-05003**	19	M8x25	50	78	87

Shaft collars two-piece

wide



Material:
Steel 1.0718.
Stainless steel 1.4305.

Version:
Steel black oxidised.
Screw 12.9 steel.
Stainless steel bright.
Screw A2-70 stainless steel.

Sample order:
nlm 07813-00801

Note:
One-piece shaft collars surround the shaft with a uniformly distributed clamping force. This leads to a dimensionally precise fit and very high retaining forces without damaging the shaft.

The shaft tolerance should lie within h11.

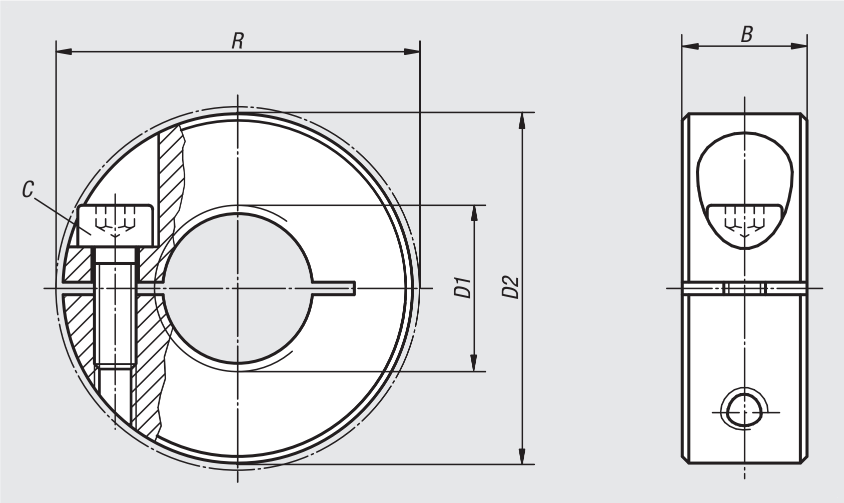
Temperature range:
-40 °C to +175 °C.

On request:
Other dimensions.

Order No. steel	Order No. stainless steel	B	C (DIN 912)	D1	D2	R
07813-00801	**07813-00802**	20	M3x8	8	18	22,4
07813-01001	**07813-01002**	20	M3x10	10	24	26
07813-01201	**07813-01202**	24	M4x12	12	28	31,8
07813-01601	**07813-01602**	29	M5x16	16	34	39,4
07813-02001	**07813-02002**	33	M6x18	20	40	46,4
07813-02501	**07813-02502**	33	M6x18	25	45	50,8
07813-03001	**07813-03002**	33	M6x18	30	54	58,6
07813-04001	**07813-04002**	33	M6x18	40	60	65
07813-05001	**07813-05002**	41	M8x25	50	78	87

Shaft collars

with thread



Material:
Steel 1.0718.
Stainless steel 1.4305.

Version:
Steel black oxidised.
Screw 12.9 steel.
Stainless steel bright.
Screw A2-70 stainless steel.

Sample order:
nlm 07814-0601

Note:
Shaft collars with thread surround the shaft with an equal distribution of clamping forces.
The shaft collars can be used on threaded rods or shafts with a thread tolerance of 6g.

Temperature range:
-40 °C to +175 °C.

Order No. steel	Order No. stainless steel	B	C	D1	D2	R
07814-0401	**07814-0402**	9	M3x8	M4	16	20,7
07814-0501	**07814-0502**	9	M3x8	M5	16	20,7
07814-0601	**07814-0602**	9	M3x8	M6	16	20,7
07814-0801	**07814-0802**	9	M3x8	M8	18	22,4
07814-1001	**07814-1002**	9	M3x10	M10	24	26
07814-1201	**07814-1202**	11	M4x12	M12	28	31,8
07814-1601	**07814-1602**	13	M5x16	M16	34	39,4
07814-2001	**07814-2002**	15	M6x18	M20	40	46,4

Notes

07820

Ratchet elements steel or stainless steel

Ratchet elements are used to connect two components together in any angular position with a positive fit. The ratchet elements with internal toothing (Forms A–D) can be combined with the ratchet elements with external toothing (Forms E–H) in any way depending on the application and installation possibilities. The springs mean that a new angular position can be quickly implemented.

Material:
Ratchet element steel 1.0718 or stainless steel 1.4305.
Spring stainless steel 1.4310.
Cap screws steel or stainless steel A 2.

Version:
Ratchet element black oxidised steel or bright stainless steel.
Spring bright.
Cap screw blackened steel grade 8.8 or bright A 2-70 stainless steel.

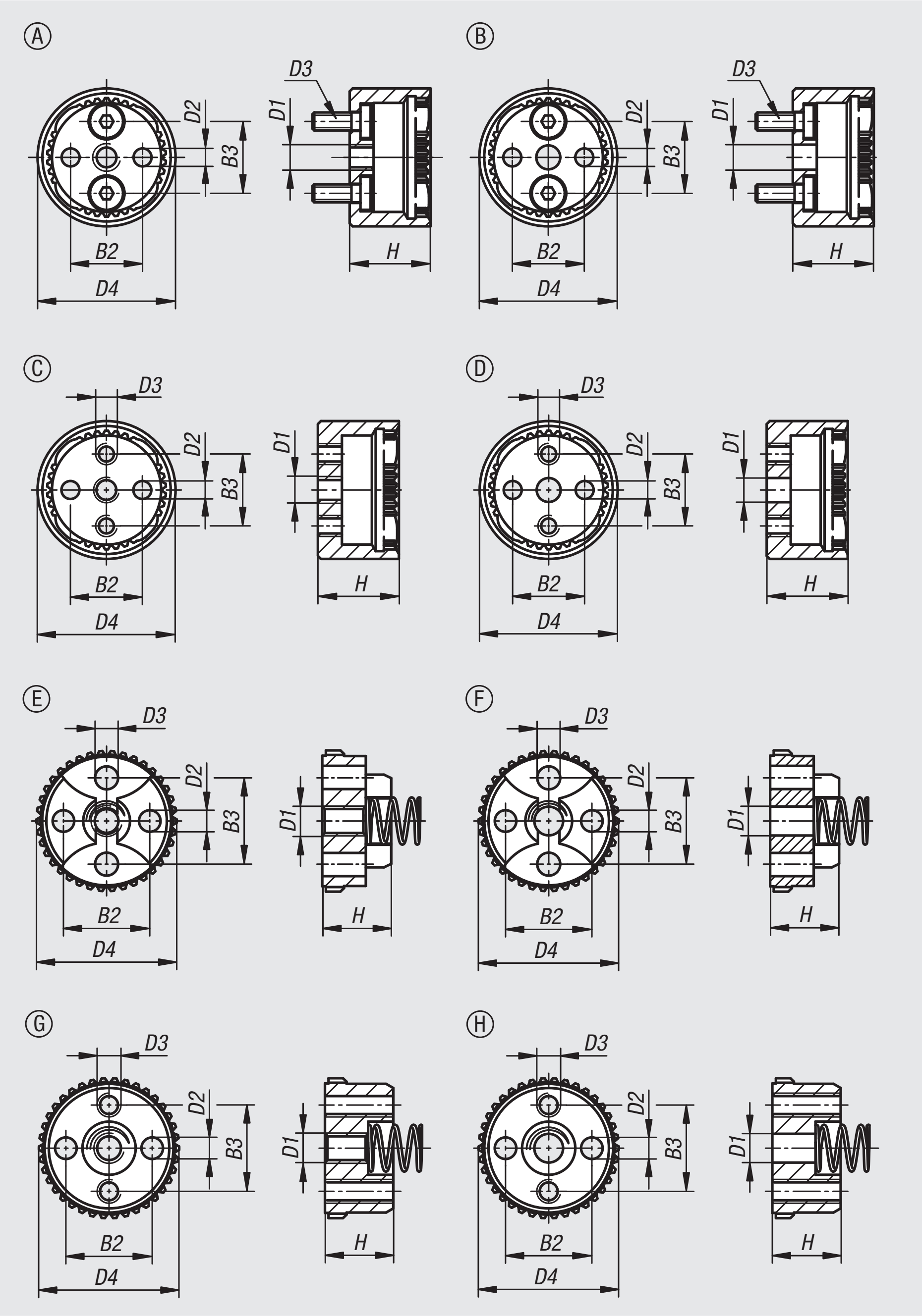
Sample order:
nlm 07820-12338

Note for ordering:
2 cap screws M3x8 or M5x10 are supplied with the internal toothed ratchet elements Forms A and B.
A stainless steel spring is supplied with the external toothed ratchet elements Forms E to H.

Note:
Use DIN 7984 low headed cap screws for fastening the Form A and B ratchet elements.

Function:
The ratchet elements are used for rotary adjustment of components. Fastening options can be arranged according to the application.

Accessories:
DIN 912/DIN EN ISO 4762 cap screws
DIN 6912 cap screws

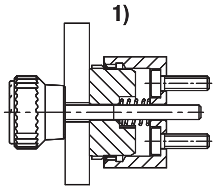


Drawing reference:
Form A: internal toothing, centre tapped hole, 2x counterbores for low headed cap screws, 2x reamed holes
Form B: internal toothing, centre through bore, 2x counterbores for low headed cap screws, 2x reamed holes
Form C: internal toothing, centre tapped hole, 2x tapped holes for fastening, 2x reamed holes
Form D: internal toothing, centre through bore, 2x tapped holes for fastening, 2x reamed holes
Form E: external toothing, centre tapped hole, 2x counterbores for cap screws, 2x reamed holes
Form F: external toothing, centre through bore, 2x counterbores for cap screws, 2x reamed holes
Form G: external toothing, centre tapped hole, 2x tapped holes, 2x reamed holes
Form H: external toothing, centre through bore, 2x tapped holes, 2x reamed holes

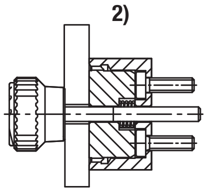
1) disengaged
2) engaged

Ratchet elements steel or stainless steel

1)



2)



Order No.	Form	Main material	B2	B3	D1	D2	D3= Cap screw DIN 7984	D4	H	No. of teeth
07820-12338	A	steel	12	12	M4	3H8	M3	23	13,5	38
07820-13346	A	steel	18	18	M6	5H8	M5	33	19,5	46
07820-112338	A	stainless steel	12	12	M4	3H8	M3	23	13,5	38
07820-113346	A	stainless steel	18	18	M6	5H8	M5	33	19,5	46

Order No.	Form	Main material	B2	B3	drill Ø D1	D2	D3= Cap screw DIN 7984	D4	H	No. of teeth
07820-22338	B	steel	12	12	4,2	3H8	M3	23	13,5	38
07820-23346	B	steel	18	18	6,2	5H8	M5	33	19,5	46
07820-122338	B	stainless steel	12	12	4,2	3H8	M3	23	13,5	38
07820-123346	B	stainless steel	18	18	6,2	5H8	M5	33	19,5	46

Order No.	Form	Main material	B2	B3	D1	D2	D3	D4	H	No. of teeth
07820-32338	C	steel	12	12	M4	3H8	M3	23	13,5	38
07820-33346	C	steel	18	18	M6	5H8	M5	33	19,5	46
07820-132338	C	stainless steel	12	12	M4	3H8	M3	23	13,5	38
07820-133346	C	stainless steel	18	18	M6	5H8	M5	33	19,5	46

Order No.	Form	Main material	B2	B3	drill Ø D1	D2	D3	D4	H	No. of teeth
07820-42338	D	steel	12	12	4,2	3H8	M3	23	13,5	38
07820-43346	D	steel	18	18	6,2	5H8	M5	33	19,5	46
07820-142338	D	stainless steel	12	12	4,2	3H8	M3	23	13,5	38
07820-143346	D	stainless steel	18	18	6,2	5H8	M5	33	19,5	46

Order No.	Form	Main material	B2	B3	D1	D2	D3	D4	H	No. of teeth
07820-52338	E	steel	12	12	M4	3H8	3,2	23	9,5	38
07820-53346	E	steel	18	18	M6	5H8	5,3	33	13	46
07820-152338	E	stainless steel	12	12	M4	3H8	3,2	23	9,5	38
07820-153346	E	stainless steel	18	18	M6	5H8	5,3	33	13	46

Order No.	Form	Main material	B2	B3	drill Ø D1	D2	D3	D4	H	No. of teeth
07820-62338	F	steel	12	12	4,2	3H8	3,2	23	9,5	38
07820-63346	F	steel	18	18	6,2	5H8	5,3	33	13	46
07820-162338	F	stainless steel	12	12	4,2	3H8	3,2	23	9,5	38
07820-163346	F	stainless steel	18	18	6,2	5H8	5,3	33	13	46

Notes

08000

Jig elements
Drill bushes

08050

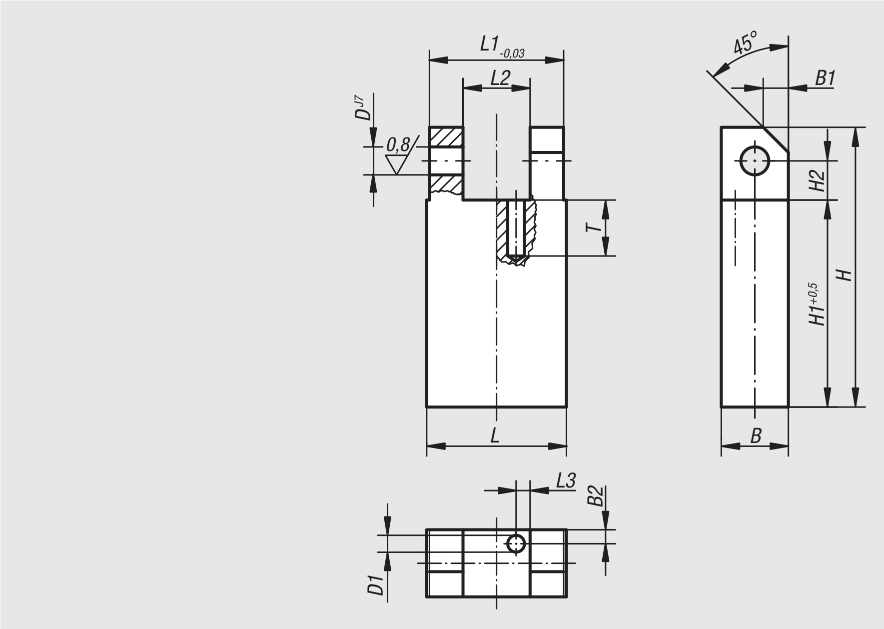
Hinge blocks

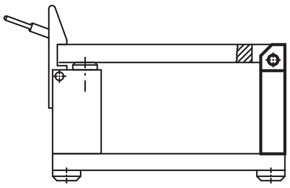
long

Material:
1.0036

Version:
Black oxidised.

Sample order:
nlm 08050-01



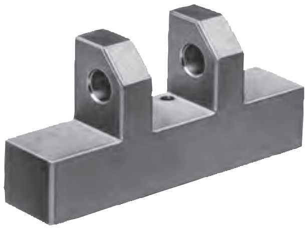


Order No.	L	L1	L2	L3	B	B1	B2	H	H1	H2	D	D1	T
08050-01	25	24	12	2,5	12	4,5	2,5	50	37	7	5	3	10
08050-02	32	31	16	2,5	16	6	2,5	63	46	9	6	3	10
08050-03	50	49	20	2,5	20	8	2,5	100	79	11	8	3	10

08100

Hinge blocks

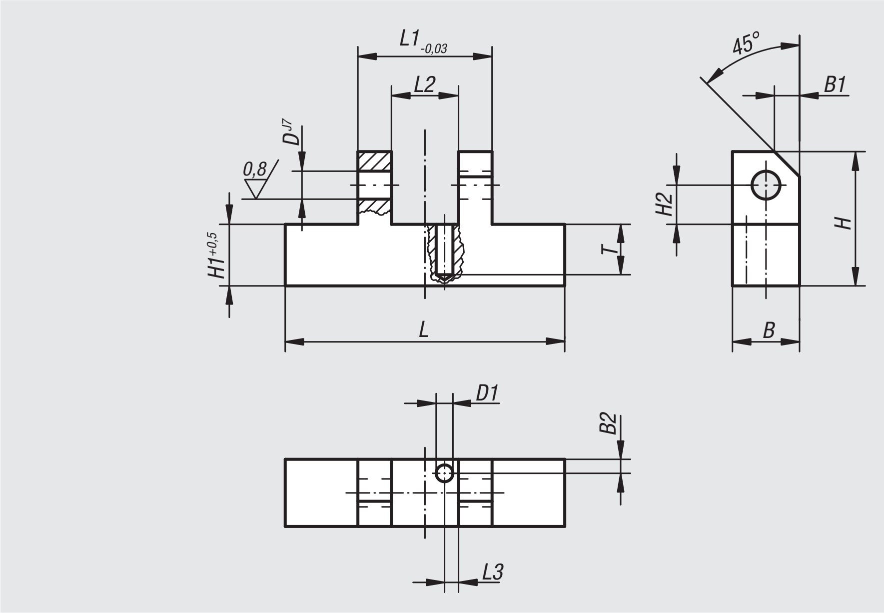
short

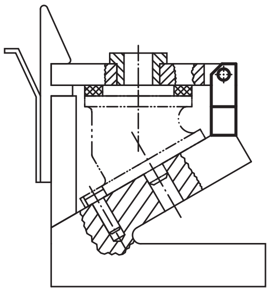


Material:
1.0036

Version:
Phosphated

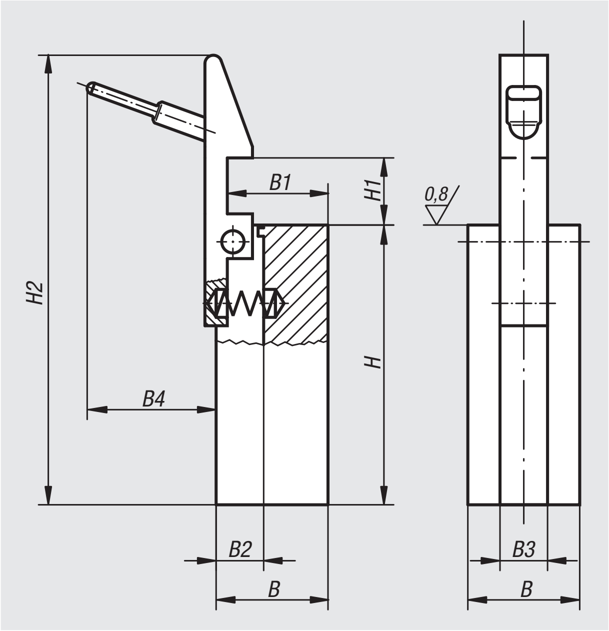
Sample order:
nlm 08100-02





Order No.	L	L1	L2	L3	B	B1	B2	H	H1	H2	D	D1	T
08100-01	50	24	12	2,5	12	4,5	2,5	24	11	7	5	3	9
08100-02	65	31	16	2,5	15	6	2,5	30	13	9	6	3	10
08100-03	100	49	20	2,5	20	8	2,5	48	27	11	8	3	10

Latch

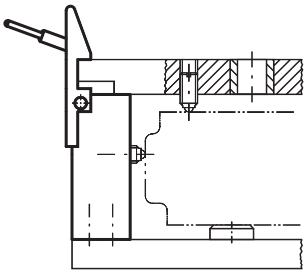


Material:
Body 1.0036, snapper 1.0503

Version:
Body phosphated, snapper black oxidised.

Sample order:
nlm 08150-01

Note:
Missing dimensions for snapper see 07560.



Order No.	B	B1	B2	B3	B4	H	H1	H2
08150-01	20	18	9	8,5	23	50	12	77
08150-02	30	28	11	10,5	24	63	16	99
08150-03	40	36	14	14,5	24	100	25	145

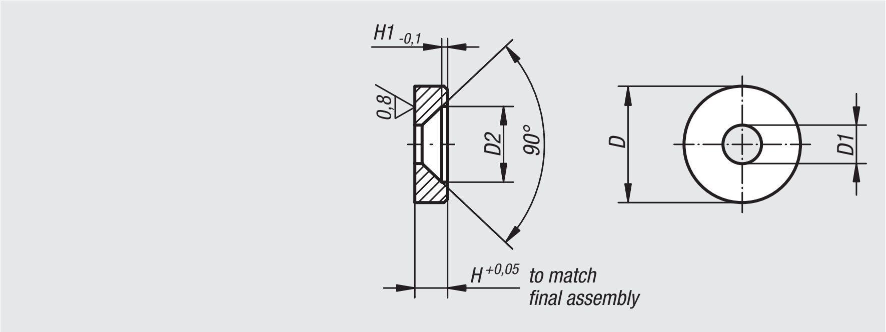
08180

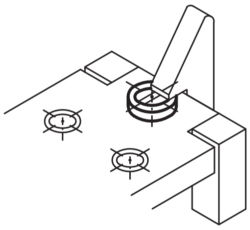
Thrust washers

Material:
Steel.

Version:
Carbonitrided and tempered, black oxidised.
Bottom face ground.

Sample order:
nlm 08180-01





Order No.	D	D1	D2	H	H1
08180-01	12	4,3	8,3	2,5	0,4
08180-02	16	5,3	10,4	4,5	0,8

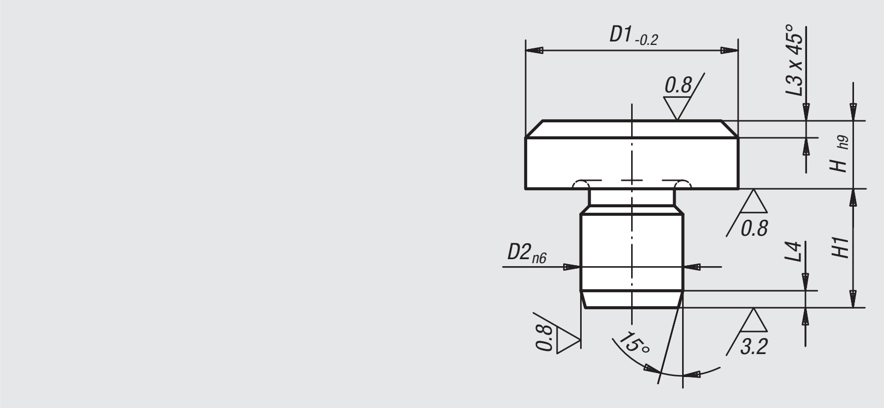
02010

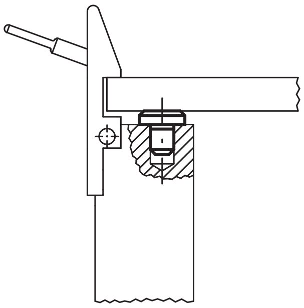
Rest pads

Material:
Tool steel.

Version:
Hardened and ground.
Top face without centerbore.

Sample order:
nlm 02010-041





Order No.	D1	D2	H	H1	L3	L4
02010-041	6	4	2,5	6,5	0,7	1,2
02010-042	6	4	4,5	8,5	0,7	1,2
02010-061	10	6	4,5	8,5	0,9	1,5

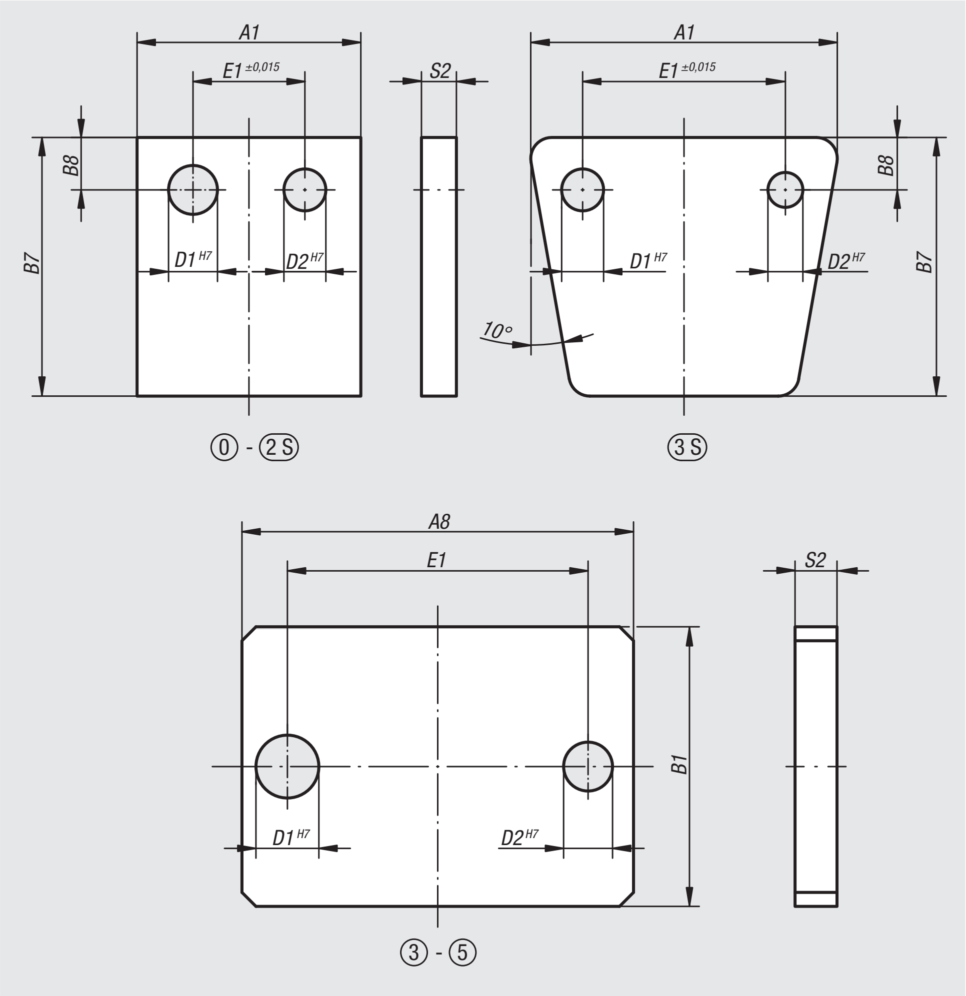
Drilling plates

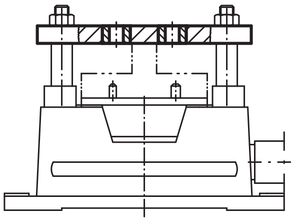
DIN 6348 enhanced

Material:
Steel.

Version:
Black oxidised.
08570-13 bright.

Sample order:
nlm 08570-03





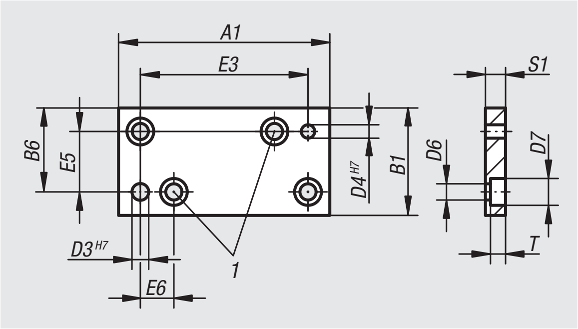
Order No.	Size	Suitable for jig size	Jig dimensions	A1	B7	B8	E1	D1	D2	S2
08570-00	0 - 3S	0	60 x 32	50	56	9	24	10	9	8
08570-01	0 - 3S	1	80 x 50	80	80	14	28	14	14	12
08570-02	0 - 3S	2 2S	100 x 60 100 x 60 x 115	100	96	16	50	16	16	14
08570-13	0 - 3S	3S	125 x 100	168	130	17	132	20	18	15

Order No.	Size	Suitable for jig size	Jig dimensions	A8	B1	E1	D1	D2	S2
08570-03	3 - 5	3	100 x 125	170	125	132 ±0,015	20	18	16
08570-04	3 - 5	4	200 x 160	275	160	236 ±0,015	20	18	16
08570-05	3 - 5	5	300 x 190	380	190	335 ±0,015	24	22	20

08580

Base plates

DIN 6348

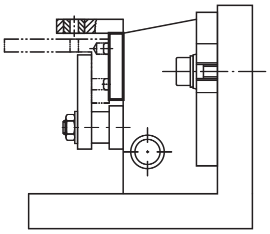


Material:
Steel.

Version:
Black oxidised.

Sample order:
nlm 08580-05

Drawing reference:
1) these two holes only with size 6

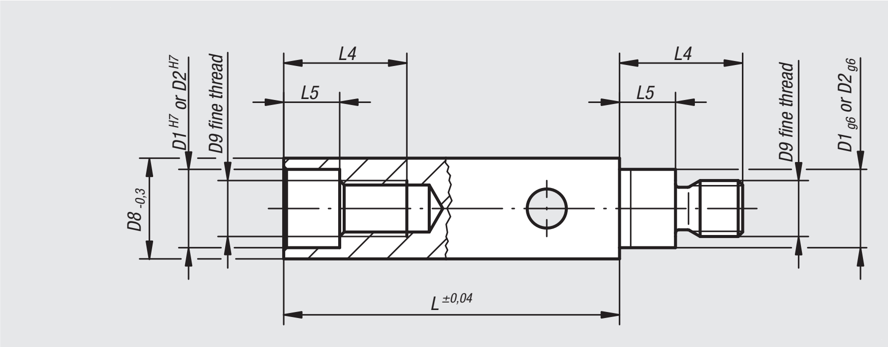


Order No.	Suitable for jig size	Jig dimensions	A1	B1	B6	D3	D4	D6	D7	E3	E5	E6	S1	T
08580-00	0	60 x 32	63	32	25	4	5	4,5	8	50 ±0,01	18 ±0,01	-	6	4,6
08580-01	1	80 x 50	80	50	30	10	8	6,6	11	60 ±0,01	20 ±0,01	-	10	6,8
08580-02	2	100 x 60	100	60	50	10	8	6,6	11	80 ±0,01	40 ±0,01	-	10	6,8
	2S	100 x 60 x 115												
08580-03	3	100 x 125	85	125	100	14	10	6,6	11	60 ±0,015	75 ±0,015	-	10	6,8
	3S	125 x 100												
08580-04	4	200 x 160	188	160	130	14	10	9	15	150 ±0,015	100 ±0,015	-	15	9
08580-05	5	300 x 190	278	190	157,5	20	-	9	15	220 ±0,015	125 ±0,015	-	15	9
08580-06	6	400 x 250	400	250	225	20	18	13,5	20	320 ±0,015	200 ±0,015	40	18	13

08600

Extension columns

short

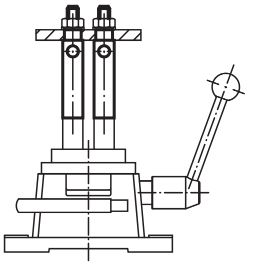


Material:
Hardened steel 1.7139

Version:
Hardened, black oxidised.

Sample order:
nlm 08600-01 (in pairs)

Note:
Supplied in pairs.

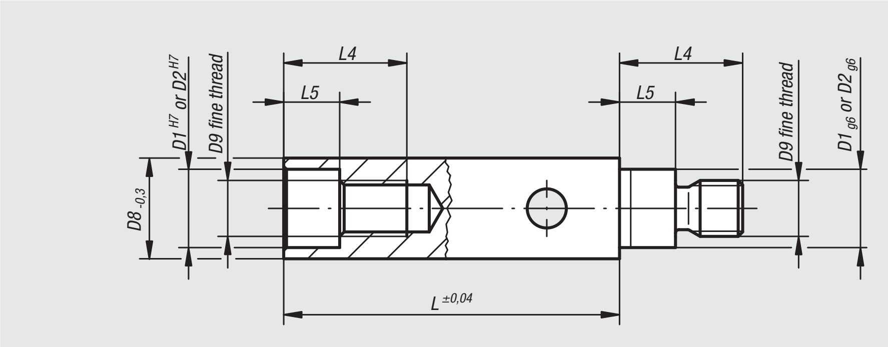


Order No.	Suitable for jig size	D1	D2	D8	D9	L	L4	L5
08600-01	1	14	14	22	M10x1	60	22	10
08600-02	2 + 2S	16	16	25	M14x1,5	60	28	12
08600-03	3 + 3S + 4	20	18	30	M14x1,5	60	32	14,5
08600-05	5	24	22	40	M20x1,5	60	43	18
08600-06	6	26	24	40	M20x1,5	70	46	22

08610

Extension columns

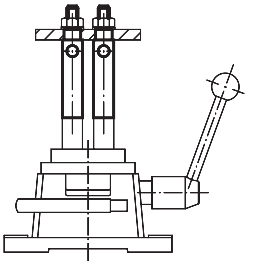
long



Material:
Hardened steel 1.7139

Version:
Hardened, black oxidised.

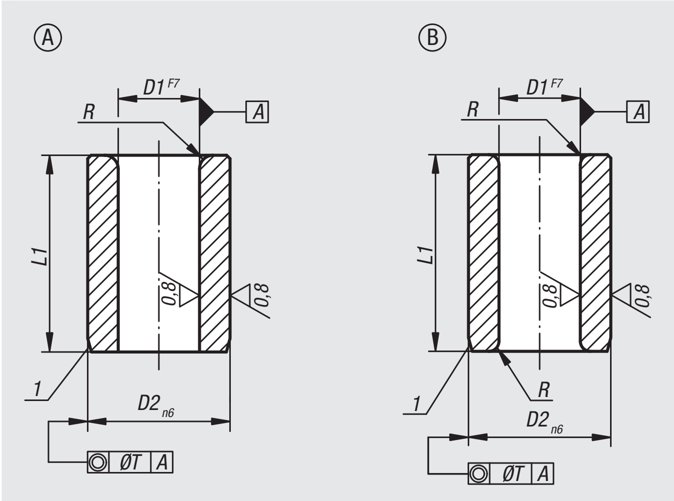
Sample order:
nlm 08610-03 (in pairs)



Order No.	Suitable for jig size	D1	D2	D8	D9	L	L4	L5
08610-02	2 + 2S	16	16	25	M14x1,5	120	28	12
08610-03	3 + 3S + 4	20	18	30	M14x1,5	120	32	14,5
08610-05	5	24	22	40	M20x1,5	120	43	18
08610-06	6	26	24	40	M20x1,5	120	46	22

Drill bushes cylindrical

DIN 179



Material:
Special low carbon steel

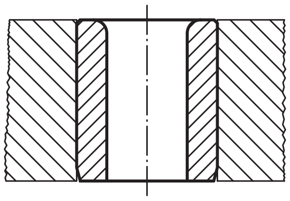
Version:
Hardened to 740 ±80 HV 10 and ground.

Sample order:
nlm 08900-A0120X06
(bush Form A D1 = 1.2 mm and L1 = 6 mm)

Note:
From diameter D1 over 15 mm size increases are 0.5 mm.

Drawing reference:
Form A: hole rounded one end
Form B: hole rounded both ends

1) Chamfer for insert



D1	D2	L1	Product type	R	T
from 0.4 to 0.8	3	6	short	1	0,01
from 0.9 to 1.0	3	6/9	short/medium	1	0,01
from 1.1 to 1.8	4	6/9	short/medium	1	0,01
from 1.9 to 2.6	5	6/9	short/medium	1	0,01
from 2.7 to 3.3	6	8/12/16	short/medium/long	1	0,01
from 3.4 to 4.0	7	8/12/16	short/medium/long	1	0,01
from 4.1 to 5.0	8	8/12/16	short/medium/long	1	0,01
from 5.1 to 6.0	10	10/16/20	short/medium/long	1,5	0,02
from 6.1 to 8.0	12	10/16/20	short/medium/long	1,5	0,02
from 8.1 to 10.0	15	12/20/25	short/medium/long	2	0,02
from 10.1 to 12.0	18	12/20/25	short/medium/long	2	0,02
from 12.1 to 15.0	22	16/28/36	short/medium/long	2	0,02
from 15.5 to 18.0	26	16/28/36	short/medium/long	2	0,02
from 18.5 to 22.0	30	20/36/45	short/medium/long	3	0,02
from 22.5 to 26.0	35	20/36/45	short/medium/long	3	0,02
from 26.5 to 30.0	42	25/45/56	short/medium/long	3	0,02
from 30.5 to 35.0	48	25/45/56	short/medium/long	3	0,04
from 35.5 to 42.0	55	30/56/67	short/medium/long	3,5	0,04
from 42.5 to 48.0	62	30/56/67	short/medium/long	3,5	0,04

Drill bushes flanged

DIN 172

Material:
Special low carbon steel

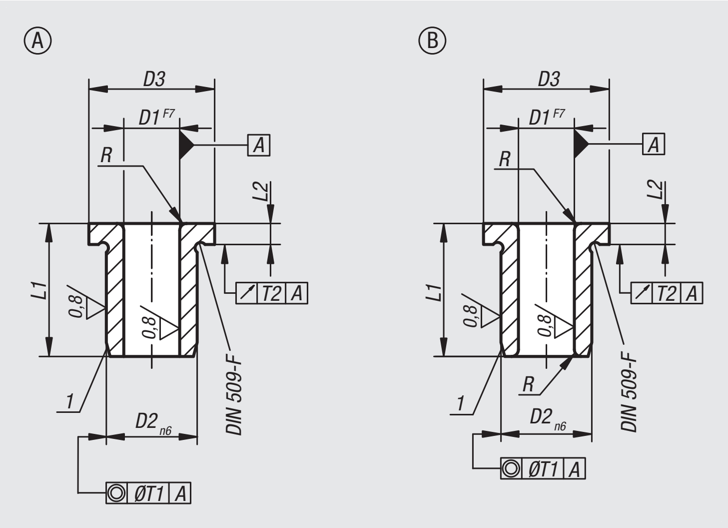
Version:
Hardened to 740 ±80 HV 10 and ground.

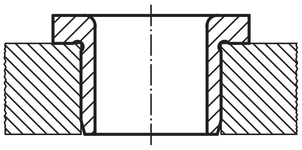
Sample order:
nlm 08910-A0120X09
(bush Form A D1 = 1.2 mm and L1 = 9 mm)

Note:
From diameter D1 over 15 mm size increases are 0.5 mm.

Drawing reference:
Form A: hole rounded one end
Form B: hole rounded both ends

1) Chamfer for insert



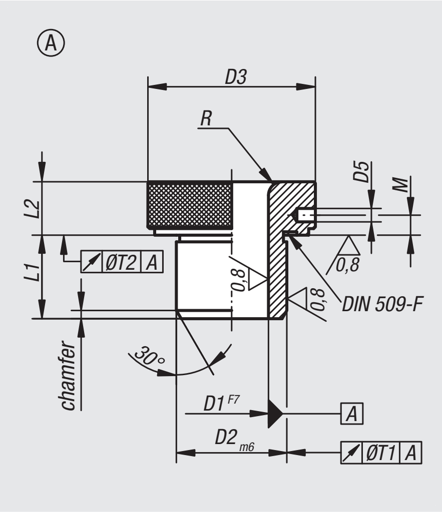


D1	D2	D3	L1	Product type	L2	R	T1	T2
from 0.4 to 0.8	3	6	6	short	2	1	0,01	0,03
from 0.9 to 1.0	3	6	6/9	short/medium	2	1	0,01	0,03
from 1.1 to 1.8	4	7	6/9	short/medium	2	1	0,01	0,03
from 1.9 to 2.6	5	8	6/9	short/medium	2	1	0,01	0,03
from 2.7 to 3.3	6	9	8/12/16	short/medium/long	2,5	1	0,01	0,03
from 3.4 to 4.0	7	10	8/12/16	short/medium/long	2,5	1	0,01	0,03
from 4.1 to 5.0	8	11	8/12/16	short/medium/long	2,5	1	0,01	0,03
from 5.1 to 6.0	10	13	10/16/20	short/medium/long	3	1,5	0,02	0,03
from 6.1 to 8.0	12	15	10/16/20	short/medium/long	3	1,5	0,02	0,03
from 8.1 to 10.0	15	18	12/20/25	short/medium/long	3	2	0,02	0,03
from 10.1 to 12.0	18	22	12/20/25	short/medium/long	4	2	0,02	0,03
from 12.1 to 15.0	22	26	16/28/36	short/medium/long	4	2	0,02	0,03
from 15.5 to 18.0	26	30	16/28/36	short/medium/long	4	2	0,02	0,03
from 18.5 to 22.0	30	34	20/36/45	short/medium/long	5	3	0,02	0,03
from 22.5 to 26.0	35	39	20/36/45	short/medium/long	5	3	0,02	0,05
from 26.5 to 30.0	42	46	25/45/56	short/medium/long	5	3	0,02	0,05
from 30.5 to 35.0	48	52	25/45/56	short/medium/long	5	3	0,04	0,05
from 35.5 to 42.0	55	59	30/56/67	short/medium/long	5	3,5	0,04	0,05
from 42.5 to 48.0	62	66	30/56/67	short/medium/long	6	3,5	0,04	0,05

08920

Drill bushes push-in

DIN 173

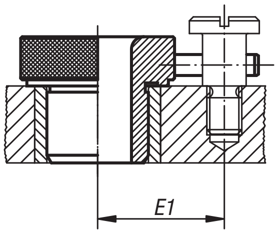


Material:
Special steel

Version:
Hardened to 780 ±40 HV 10 and ground.
Without lead-in groove.

Sample order:
nlm 08920-A1000X15
(bush Form A with D1 = 10 mm and D2 = 15 mm)

Note:
All bushes have the bore size marked on the upper face, e.g. 10.
Diameters D1 over 15 mm increase in size by 0.5 mm.
Supplied with matching retaining pin.



D1	D2	D3	D5	M	L1	L2	E1 centre spacing to shoulder screws	R	T1	T2
from 2.5 to 4.0	8	16	2,5	4	10	10	15	3	0,02	0,005
from 4.1 to 6.0	10	19	2,5	4	12	10	16,5	3	0,02	0,005
from 6.1 to 8.0	12	22	3	4	12	12	19,5	4	0,02	0,005
from 8.1 to 10.0	15	26	3	4	16	12	21,5	5	0,02	0,005
from 10.1 to 12.0	18	30	3	4	16	12	23,5	5	0,02	0,005
from 12.1 to 15.0	22	35	5	5	20	16	28	5	0,02	0,005
from 15.5 to 18.0	26	40	5	5	20	16	30,5	5	0,02	0,005
from 18.5 to 22.0	30	47	5	5	20	16	34	6	0,02	0,005
from 22.5 to 26.0	35	55	6	6	25	20	38	6	0,04	0,008
from 26.5 to 30.0	42	62	6	6	25	20	41,5	6	0,04	0,008
from 30.5 to 35.0	48	69	6	6	30	20	45	8	0,04	0,008
from 35.5 to 42.0	55	77	6	6	30	20	49	8	0,04	0,008
from 42.5 to 48.0	62	85	8	7,5	35	20	53	8	0,04	0,008

Drill bushes push-in

DIN 173-1

Material:
Special steel

Version:
Hardened to 780 ±40 HV 10 and ground.

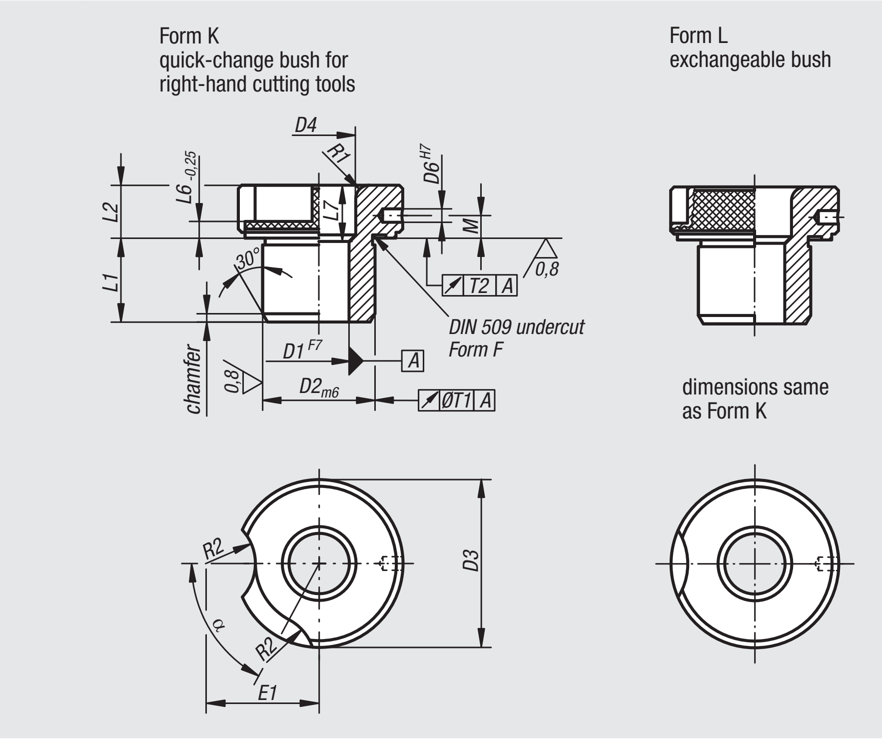
Sample order:
nlm 08920-K0400X16
(bush Form K D1 = 4 mm and L1 = 16 mm)

Note:
All bushes have the bore size marked on the upper face, e.g. 15 F7.
Form K are quick-change bushes. Dowels or coiled spring pins together with DIN 173-1 flathead screws can be used in place of the stop pin.

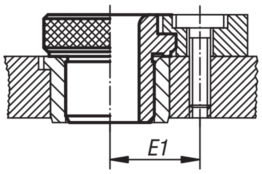
The bayonet mount is secured with DIN 173-1 drill bush clamps together with DIN 912 socket head screws.

E2 = Hole spacing when using dowels or coiled spring pins.

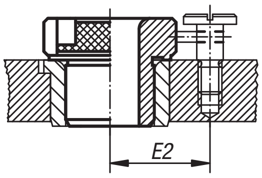
Diameter D1 over 15 mm increase in size by 0.5 mm.



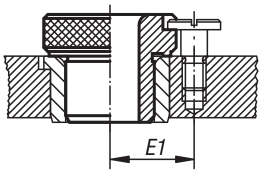
D1	Product type	D2	D3	D4	D6	L1	L2	L6	L7	M	T1	T2	R1	R2	E1	E2	α
from 2.3 to 4.0	short	8	15	-	2,5	10	8	3	-	4,25	0,02	0,005	1,5	7	11,5	15	65°
from 2.3 to 4.0	medium	8	15	4,5	2,5	16	8	3	6	4,25	0,02	0,005	1,5	7	11,5	15	65°
from 4.1 to 6.0	short	10	18	-	2,5	12	8	3	-	4,25	0,02	0,005	2	7	13	17	65°
from 4.1 to 6.0	medium	10	18	6,5	2,5	20	8	3	8	4,25	0,02	0,005	2	7	13	17	65°
from 4.1 to 6.0	long	10	18	6,5	2,5	25	8	3	13	4,25	0,02	0,005	2	7	13	17	65°
from 6.1 to 8.0	short	12	22	-	3	12	10	4	-	6	0,02	0,005	2	8,5	16,5	20	60°
from 6.1 to 8.0	medium	12	22	8,5	3	20	10	4	8	6	0,02	0,005	2	8,5	16,5	20	60°
from 6.1 to 8.0	long	12	22	8,5	3	25	10	4	13	6	0,02	0,005	2	8,5	16,5	20	60°
from 8.1 to 10.0	short	15	26	-	3	16	10	4	-	6	0,02	0,005	2	8,5	18	22	50°
from 8.1 to 10.0	medium	15	26	10,5	3	28	10	4	12	6	0,02	0,005	2	8,5	18	22	50°
from 8.1 to 10.0	long	15	26	10,5	3	36	10	4	20	6	0,02	0,005	2	8,5	18	22	50°
from 10.1 to 12.0	short	18	30	-	3	16	10	4	-	6	0,02	0,005	2	8,5	20	24	50°
from 10.1 to 12.0	medium	18	30	12,5	3	28	10	4	12	6	0,02	0,005	2	8,5	20	24	50°
from 10.1 to 12.0	long	18	30	12,5	3	36	10	4	20	6	0,02	0,005	2	8,5	20	24	50°
from 12.1 to 15.0	short	22	34	-	5	20	12	5,5	-	7	0,02	0,005	3	10,5	23,5	28	35°
from 12.1 to 15.0	medium	22	34	15,5	5	36	12	5,5	16	7	0,02	0,005	3	10,5	23,5	28	35°
from 12.1 to 15.0	long	22	34	15,5	5	45	12	5,5	25	7	0,02	0,005	3	10,5	23,5	28	35°
from 15.5 to 18.0	short	26	39	-	5	20	12	5,5	-	7	0,02	0,005	3	10,5	26	31	35°
from 15.5 to 18.0	medium	26	39	19	5	36	12	5,5	16	7	0,02	0,005	3	10,5	26	31	35°
from 15.5 to 18.0	long	26	39	19	5	45	12	5,5	25	7	0,02	0,005	3	10,5	26	31	35°
from 18.5 to 22.0	short	30	46	-	5	25	12	5,5	-	7	0,02	0,005	3	10,5	29,5	35	30°
from 18.5 to 22.0	medium	30	46	23	5	45	12	5,5	20	7	0,02	0,005	3	10,5	29,5	35	30°
from 18.5 to 22.0	long	30	46	23	5	56	12	5,5	31	7	0,02	0,005	3	10,5	29,5	35	30°
from 22.5 to 26.0	short	35	52	-	6	25	12	5,5	-	7	0,04	0,008	3	10,5	32,5	37	30°
from 22.5 to 26.0	medium	35	52	27	6	45	12	5,5	20	7	0,04	0,008	3	10,5	32,5	37	30°
from 22.5 to 26.0	long	35	52	27	6	56	12	5,5	31	7	0,04	0,008	3	10,5	32,5	37	30°
from 26.5 to 30.0	short	42	59	-	6	30	12	5,5	-	7	0,04	0,008	3	10,5	36	41	30°
from 26.5 to 30.0	medium	42	59	31	6	56	12	5,5	26	7	0,04	0,008	3	10,5	36	41	30°
from 26.5 to 30.0	long	42	59	31	6	67	12	5,5	37	7	0,04	0,008	3	10,5	36	41	30°



Quick-change drill bush Form K
with DIN 172 bush with collar
or DIN 179 bush



Quick-change drill bush Form K
with DIN 172 bush with collar
or DIN 179 bush

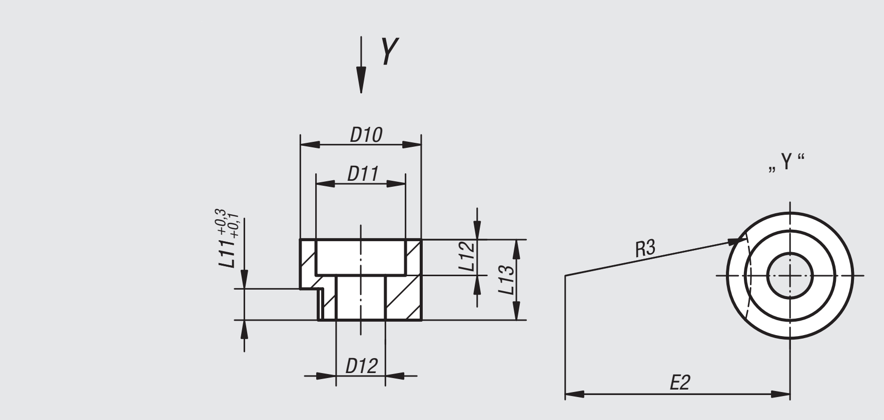


Exchangeable drill bush Form L
with DIN 172 bush with collar
or DIN 179 bush

08926

Drill bush clamps

DIN 173-1



Material:
Bush clamp 1.0711.
Cap screw steel.

Version:
Clamping bush, black oxidised.
Cap screw, electro zinc-plated.

Sample order:
nlm 08926-061X10
(clamping bush D12= 6.1 mm and L13 = 10 mm)

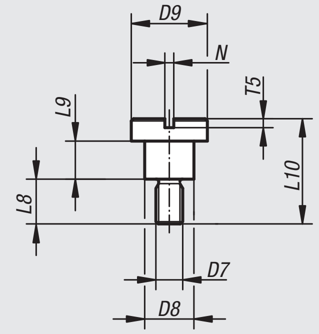
Note:
DIN 912 cap screws are supplied.
The clamping bush 08926-081X12 is left bright.

Order No.	D12	for drill bushes (D1)	D10	D11	L11	L12	L13	E2	R3	Socket head screw DIN 912
08926-051X08	5,1	≤6.0	13	10	3	4	8	13,2	9,5	M5x16
08926-061X10	6,1	> 6,0 ≤ 12,0	16	12	4	5	10	19,7	15	M6x20
08926-081X12	8,1	> 12.0 ≤ 30,0	20	15	5,5	5	12	36,2	30	M8x25

08927

Shoulder screws flathead

for DIN 173 drill bushes



Material:
Steel.

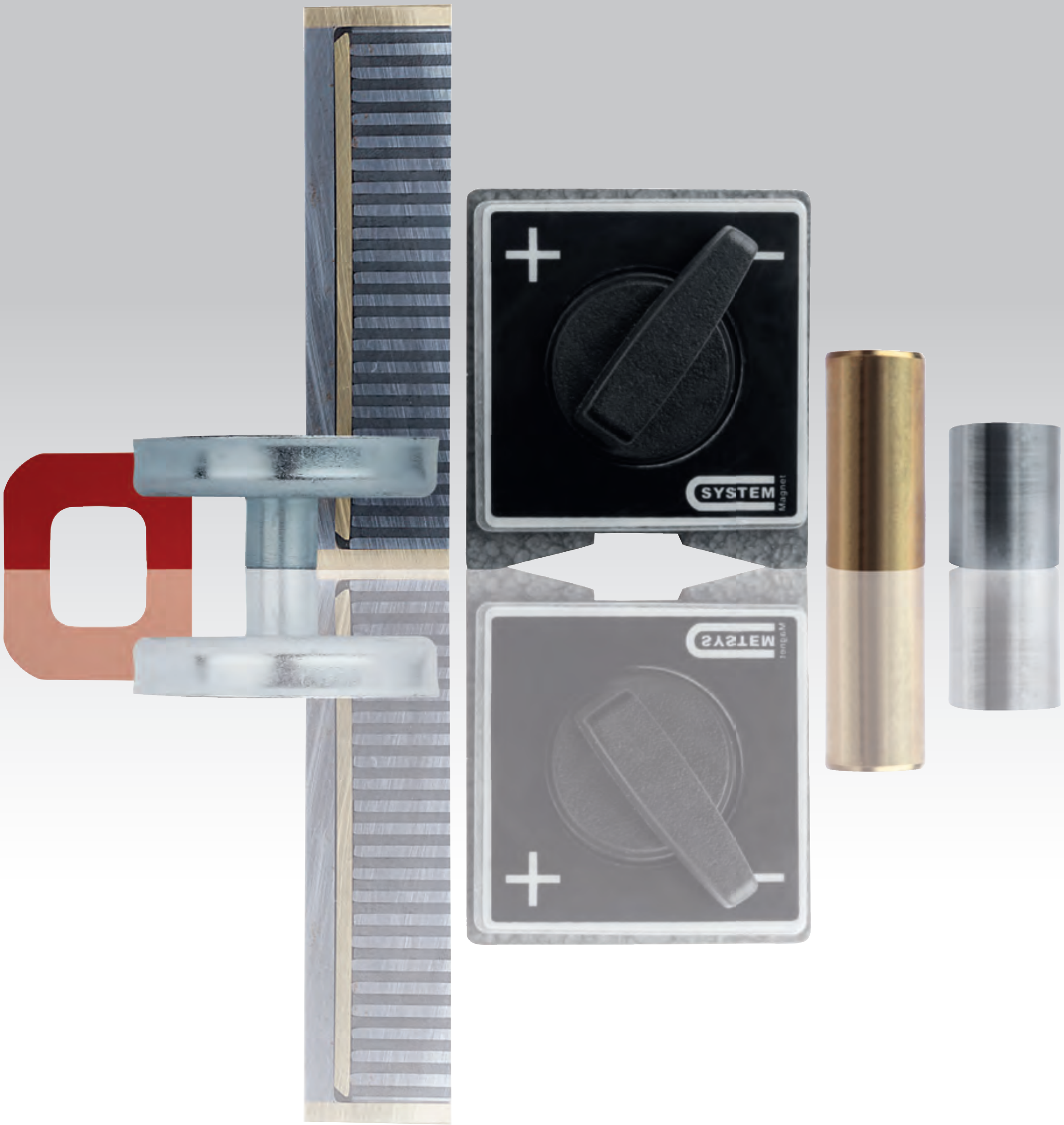
Version:
Bright, grade 10.9

Sample order:
nlm 08927-06X04
(DIN 173-1 screw D7 = M6 and L9 = 4 mm)

Order No.	Product type	D7	for drill bushes (D1)	L8	L9	L10	D8	D9	N	T5
08927-05X03	short	M5	≤6.0	9	3	15	7,5	13	1,6	2
08927-06X04	short	M6	> 6,0 ≤ 12,0	10	4	18	9,5	16	2	2,5
08927-08X55	short	M8	> 12.0 ≤ 30,0	11,5	5,5	22	12	20	2,5	3
08927-05X06	long	M5	≤6.0	9	6	18	7,5	13	1,6	2
08927-06X08	long	M6	> 6,0 ≤ 12,0	10	8	22	9,5	16	2	2,5
08927-08X105	long	M8	> 12.0 ≤ 30,0	11,5	10,5	27	12	20	2,5	3

09000

Magnets



Technical data for retaining magnets and raw magnets

Construction:

Pot magnets are magnetic systems that, due to their technical structure have only one magnetic face. Unlike raw magnets, pot magnets only exert a magnetic force on one face. This design enables the spatial effect of the magnetic field to be limited. This prevents unwanted magnetisation of workpieces or machine elements by the pot magnet.

Raw magnets are not magnetic systems, all the faces are magnetic.

Version:

Shallow pot magnet:

The magnetic core is moulded or pressed into a housing. There is a non-magnetic barrier between the magnet and the housing, ensuring a shielded system.

Retaining magnets:

The magnetic core here is enclosed in a plastic sheath. Their construction makes these magnets particularly suitable for use on noticeboards and thin metal sheets.

Button magnets / horseshoe magnets:

These are unshielded systems with a divided magnetic face.

Magnets with protective rubber jacket:

The magnet is encased in rubber, which helps to protect sensitive surfaces.

Raw magnets:

These are always unshielded systems. All of the faces are magnetic.

Deep pot magnets:

These are magnets with a permanent magnetic core which is isolated from the housing by a non-magnetic shield. This ensures a shielded system.

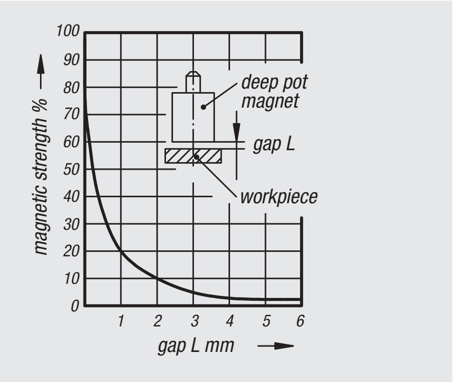
Properties:

Description	Reference to designation	Weak ⟷ Strong			
Magnetic force	Magnetic remanence	Hard ferrite	AlNiCo	SmCo	NdFeB
Repeatable adsorption	Retention force	AlNiCo	Hard ferrite	SmCo	NdFeB
Mechanical strength	-	SmCo	Hard ferrite	NdFeB	AlNiCo
Corrosion resistance	-	NdFeB	AlNiCo	SmCo	Hard ferrite
Temperature stability	Material specific Curie point	NdFeB	SmCo	Hard ferrite	AlNiCo

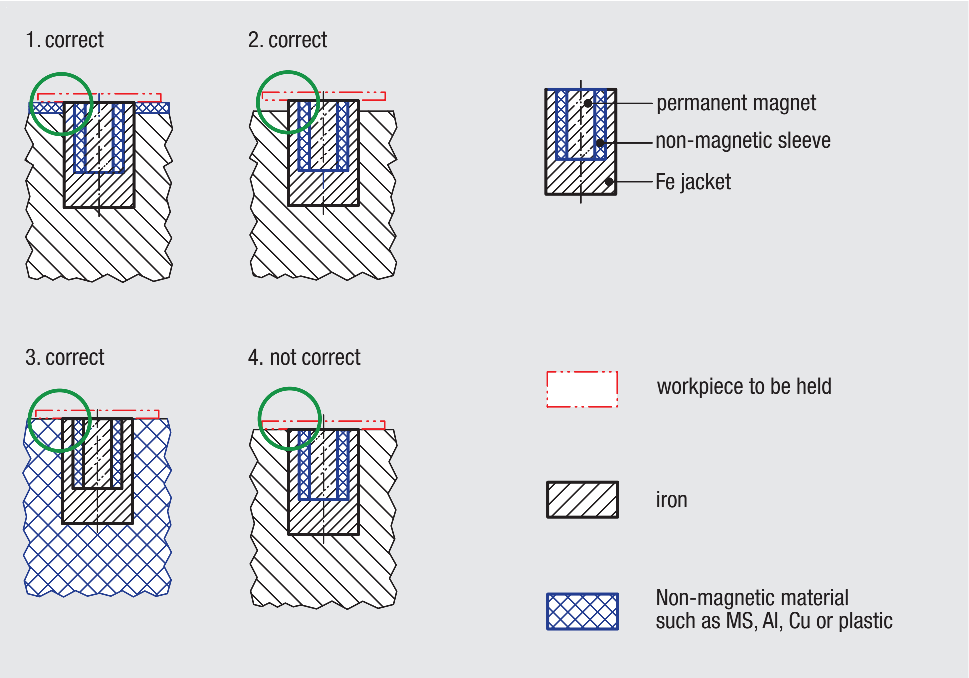
Long-term heating or alternating thermal stresses may lead to mechanical changes in the magnet system. In many cases, however, they have no influence on the function. The same applies to chemical stresses (chemical baths, aggressive gases, etc).

Magnetic strengths:

The indicated magnetic forces are minimum values which are achieved by a vertical pull-off and full face contact. By dirty pole faces or uneven workpieces, air gaps are formed which sharply decrease the magnetic force. In general, the attractive force of a magnet decreases as the air gap increases. It is therefore advisable to always ensure a clean pole face and clean it from time to time. Non-magnetic barriers have the same effect as air gaps.



Mounting instructions for shielded pot magnets without pins



1. Unwanted magnetisation of machine parts and components is prevented through non-magnetisable materials.

2. Sufficiently large air gap between workpiece and magnetisable material.

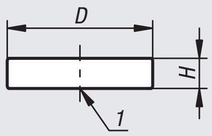
3. Use of non-magnetisable material for the machine parts or components prevents unwanted magnetisation.

4. Unfavourable because the workpiece is placed on a magnetisable material. This causes unwanted magnetisation of machine parts or components.

09000

Magnets raw

NdFeB, disc form



Material:
NdFeB N35 (neodymium).

Version:
Electro zinc-plated.

Sample order:
nlm 09000-05

Note:
Unshielded system.

Temperature range:
max. 80°C.

Assembly:
The magnets can be mounted by press-fit or gluing.

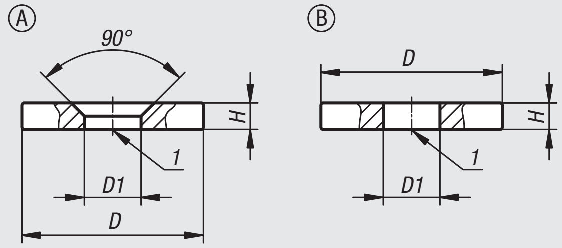
Drawing reference:
1) magnetic face

Order No.	D	H	Magnetic force N
09000-05	5 ±0,1	3 ±0,1	5
09000-06	6 ±0,1	3 ±0,1	7,5
09000-08	8 ±0,1	4 ±0,1	13
09000-10	10 ±0,1	3 ±0,1	15
09000-12	12 ±0,1	3 ±0,1	20
09000-15	15 ±0,1	3 ±0,1	25
09000-18	18 ±0,1	3 ±0,1	33
09000-24	24 ±0,1	3 ±0,1	39

09001

Magnets raw with hole

NdFeB, disc form



Material:
NdFeB N35 (neodymium).

Version:
Electro zinc-plated.

Sample order:
nlm 09001-12

Note:
Unshielded system.

Temperature range:
max. 80°C.

Assembly:
The magnets can be mounted by press-fit, screwing-in or gluing.

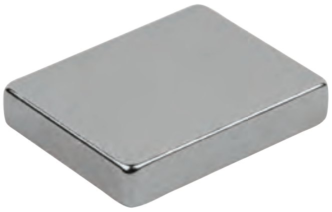
Drawing reference:
1) magnetic face

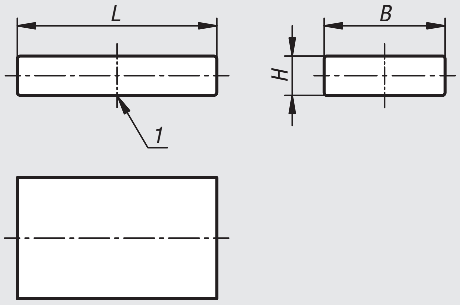
Order No.	Form	D	D1	H	Tightening torque max. Nm	Magnetic force N
09001-12	A	12 ±0,1	3,5 ±0,1	3 ±0,1	3	18
09001-15	A	15 ±0,1	4,5 ±0,1	3,5 ±0,1	3	29
09001-18	A	18 ±0,1	4,5 ±0,1	4 ±0,1	3	41
09001-24	A	24 ±0,1	5,5 ±0,1	4 ±0,1	3	66
09001-32	B	32 ±0,1	10,5 ±0,1	2 ±0,1	3	42
09001-38	B	38 ±0,1	12 ±0,1	4 ±0,1	3	110
09001-48	B	48 ±0,2	15 ±0,1	5 ±0,1	3	165
09001-56	B	56 ±0,2	15 ±0,1	6 ±0,1	3	230

09002

Magnets raw

NdFeB, block form





Material:
NdFeB N35 (neodymium).

Version:
Electro zinc-plated.

Sample order:
nlm 09002-0704

Note:
Unshielded system.

Temperature range:
max. 80°C.

Assembly:
The magnets can be mounted by press-fit or gluing.

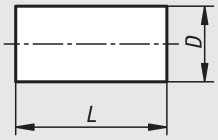
Drawing reference:
1) magnetic face

Order No.	B	H	L	Magnetic force N
09002-0704	4 ±0,1	1,5 ±0,1	7,5 ±0,1	5
09002-0706	6 ±0,1	2 ±0,1	7,5 ±0,1	8
09002-1007	7,5 ±0,1	2 ±0,1	10 ±0,1	11
09002-1209	9,5 ±0,1	2,5 ±0,1	12 ±0,1	17
09002-1612	12,5 ±0,1	2,5 ±0,1	16 ±0,1	24
09002-1816	16,5 ±0,1	4 ±0,1	18 ±0,1	50
09002-2620	20,3 ±0,1	5 ±0,1	26 ±0,1	77
09002-3326	26 ±0,1	6,5 ±0,1	33 ±0,1	125

09003

Magnets raw

AlNiCo, bar type



Material:
AlNiCo (aluminium, nickel, cobalt).

Version:
Bright.

Sample order:
nlm 09003-0310

Note:
Unshielded system.

Temperature range:
max. 450°C.

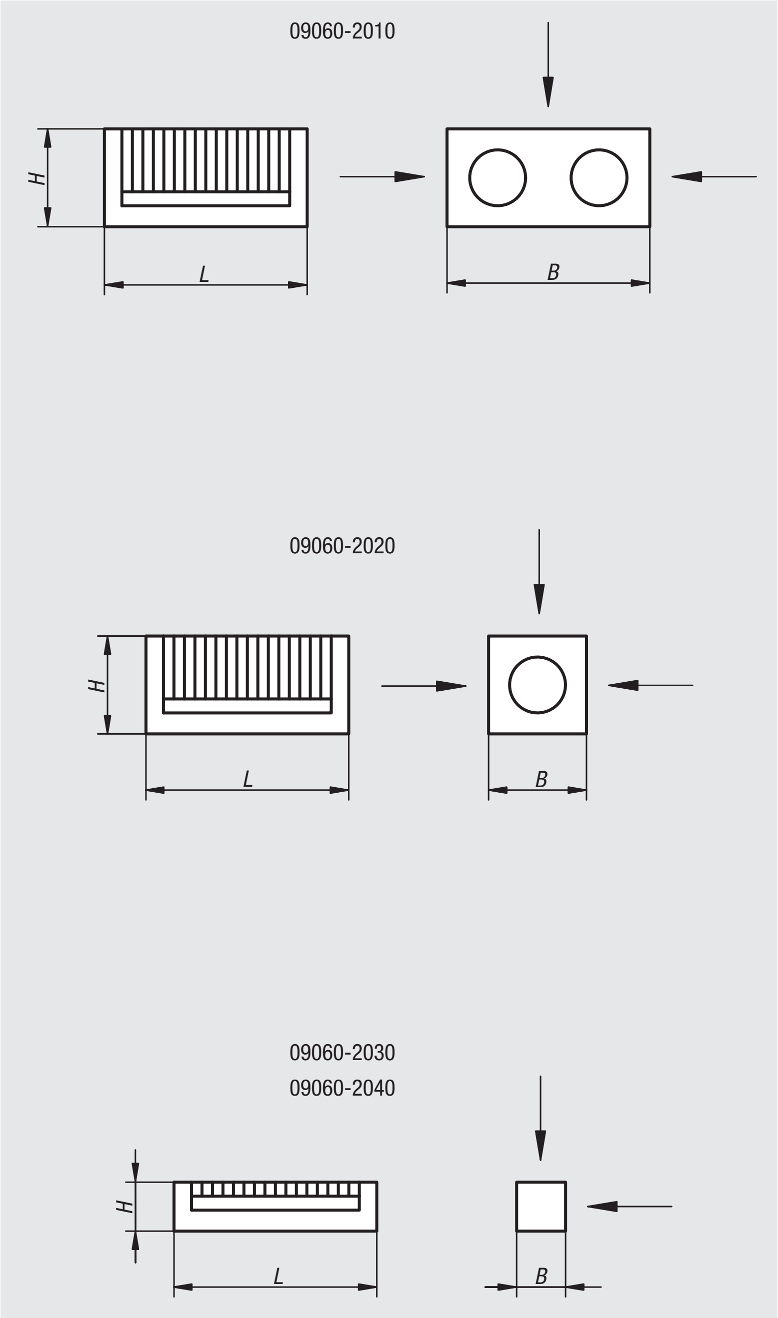
Assembly:
The magnets can be mounted by press-fit or gluing.

Order No.	D	L	Magnetic force N
09003-0310	3 +0/-0,2	10 ±0,1	1,1
09003-0312	3 +0/-0,2	12 ±0,1	1,3
09003-0416	4 +0/-0,2	16 ±0,1	1,9
09003-0420	4 +0/-0,2	20 ±0,1	2
09003-0520	5 +0/-0,2	20 ±0,1	2,3
09003-0615	6 +0/-0,2	15 ±0,1	2,8
09003-0624	6 +0/-0,2	24 ±0,1	2,8
09003-0630	6 +0/-0,2	30 ±0,1	2,8
09003-0825	8 +0/-0,2	25 ±0,1	3,8
09003-1020	10 +0/-0,2	20 ±0,1	5
09003-1040	10 +0/-0,2	40 ±0,1	7
09003-1240	12 +0/-0,2	40 ±0,1	8
09003-1530	15 +0/-0,2	30 ±0,2	10
09003-1560	15 +0/-0,2	60 ±0,2	11
09003-3480	34 +0/-0,2	80 ±0,2	61

09060

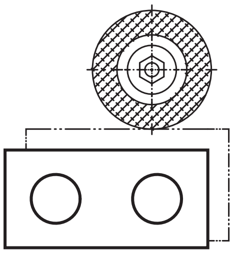
Permanent workholding magnets

with fine pole division



Sample order:
nlm 09060-2020

Note:
The workholding magnets 09060-2010 to 09060-2030 consist of a permanent magnetic system with fine pole divisions (4 mm) which are effective on two or three faces.
To clamp extremely thin steel parts we recommend the magnet 09060-2040 with the finest pole division of 1.3 mm. The magnetic lifespan of the workholding magnets under conditions prevailant in industrial machining is unlimited.
Approximately half the height of the workholding magnets can be ground down or polished away with no significant impairment of the magnetic strength.

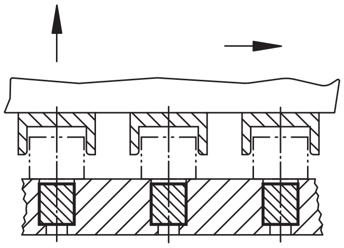


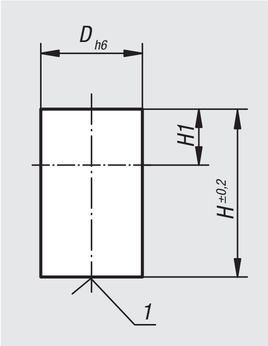
Order No.	L	B	H	Max. angular deviation	Magnetic faces mm
09060-2010	100	100	50	10´	1 face 100 x 100 2 faces 100 x 50
09060-2020	100	50	50	10´	3 faces 100x50
09060-2030	100	25	25	10´	2 faces 100x25
09060-2040	100	25	25	10´	2 faces 100x25

09060

Magnets deep pot

AlNiCo with fitting tolerance





Material:
Housing, steel.
Magnetic core AlNiCo.

Version:
Bright.

Sample order:
nlm 09060-01

Note:
Shielded system. Diameter „D“ ground to a h6 tolerance. Fastening possibilities by press-in, shrink-fit or gluing. Deep pot magnets can be shortened by the dimension „H1“ with no loss of magnetic force.

Temperature range:
max. 450°C.

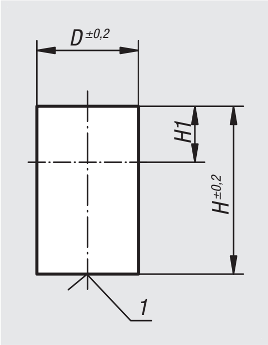
Drawing reference:
1) magnetic face

Order No.	D	H	H1	Magnetic force N
09060-01	6	10	2	1,5
09060-02	8	12	3	3,5
09060-03	10	16	6	7
09060-04	13	18	7	10
09060-05	16	20	5	18
09060-06	20	25	6	42
09060-07	25	30	5	96
09060-08	32	35	3	180
09060-09	40	45	5	240
09060-10	50	50	2	420

09061

Magnets deep pot

AlNiCo without fitting tolerance



Material:
Housing, steel.
Magnetic core AlNiCo.

Version:
Electro zinc-plated.

Sample order:
nlm 09061-01

Note:
Shielded system. Diameter „D“ without fitting tolerance. Fastening possibilities are press-in, shrink-fitting or gluing.
Deep pot magnets can be shortened by the dimension „H1“ with no loss of magnetic force.

Temperature range:
max. 450°C.

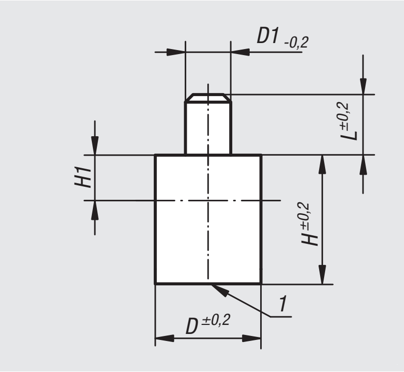
Drawing reference:
1) magnetic face

Order No.	D	H	H1	Magnetic force N
09061-01	6	20	12	1,5
09061-02	8	20	11	3,5
09061-03	10	20	10	7
09061-04	13	20	9	10
09061-05	16	20	5	18
09061-06	20	25	6	42
09061-07	25	35	10	96
09061-08	32	40	8	180
09061-09	40	50	10	240

09063

Magnets deep pot with pin

AlNiCo



Material:
Housing, steel.
Magnetic core AlNiCo.

Version:
Electro zinc-plated.

Sample order:
nlm 09063-01

Note:
Deep pot magnets with smooth pin, shielded system. The magnets can be shortened by the dimension “H1” with no loss of magnetic force.

Temperature range:
max. 450°C.

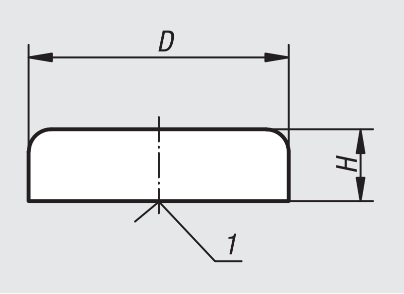
Drawing reference:
1) magnetic face

Order No.	D	D1	L	H	H1	Magnetic force N
09063-01	6	3	8	20	2	1,7
09063-02	8	3	8	20	3	4
09063-03	10	4	8	20	6	8,5
09063-04	13	4	8	20	7	12
09063-05	16	5	8	20	5	20
09063-06	20	6	8	25	6	50
09063-07	25	8	10	35	5	115
09063-08	32	10	10	40	3	200
09063-09	40	15	20	50	5	240
09063-10	50	18	25	60	2	420

09064

Magnets shallow pot

hard ferrite



Material:
Housing, steel.
Magnetic core hard ferrite.

Version:
Housing, electro zinc-plated.

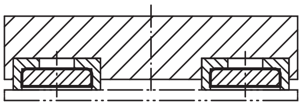
Sample order:
nlm 09064-01

Note:
Shallow pot magnets without threaded bush. These magnets are pressed or glued into the receiving holes.

Hairline cracks in the magnetic material are unavoidable for technical reasons in the D=80 version. They do not impair the attracting function of the magnets in any way.

Temperature range:
max. 200°C.

Drawing reference:
1) magnetic face



Order No.	D	H	Magnetic force N
09064-01	10 ±0,15	4,5	4
09064-02	13 ±0,15	4,5	10
09064-03	16 ±0,15	4,5	18
09064-04	20 ±0,15	6	30
09064-05	25 ±0,15	7	40
09064-06	32 ±0,20	7	80
09064-07	40 ±0,20	8	125
09064-08	50 ±0,20	10	220
09064-09	63 ±0,20	14	350
09064-10	80 ±0,25	18	600

09065

Magnets shallow pot with thread

hard ferrite

Material:
Housing, steel.
Magnetic core hard ferrite.

Version:
Housing, electro zinc-plated.

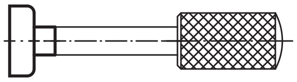
Sample order:
nlm 09065-01

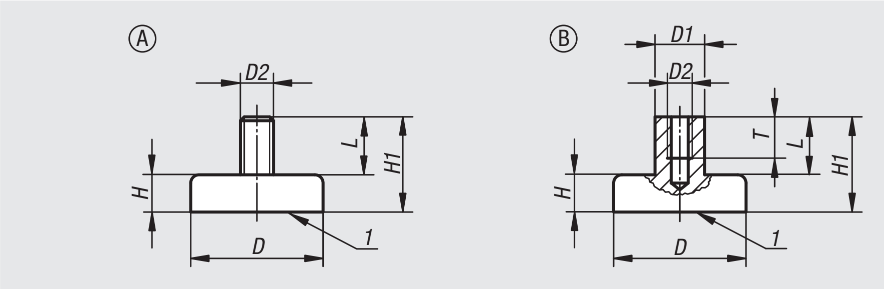
Note:
Shallow pot magnets, shielded system.

Hairline cracks in the magnetic material are unavoidable for technical reasons in D=80, D=100 and D=125 versions. They do not impair the attracting function of the magnets in any way.

Temperature range:
max. 200°C.

Drawing reference:
1) magnetic face





Order No. Form A	Order No. Form B	D	D1	D2	L	H	H1	T	Magnetic force N
09065-21	**09065-01**	10 ±0,15	-/6	M3	7	4,5	11,5	-/5	4
09065-22	**09065-02**	13 ±0,15	-/6	M3	7	4,5	11,5	-/5	10
09065-23	**09065-03**	16 ±0,15	-/6	M3	7	4,5	11,5	-/5	18
09065-24	**09065-04**	20 ±0,15	-/6	M3	7	6	13	-/5	30
09065-25	**09065-05**	25 ±0,15	-/8	M4	8	7	15	-/6	40
09065-26	**09065-06**	32 ±0,20	-/8	M4	8	7	15	-/6	80
-	**09065-07**	40 ±0,20	10	M5	10	8	18	8	125
-	**09065-08**	50 ±0,20	12	M6	12	10	22	10	220
-	**09065-09**	63 ±0,20	15	M8	16	14	30	14	350
-	**09065-10**	80 ±0,25	20	M10	16	18	34	14	600
-	**09065-11**	99 ±0,25	22	M12	20	22	42	17	900
-	**09065-12**	125 ±0,25	25	M14	24	26	50	20	1300

09065-10

Magnets shallow pot with internal thread

hard ferrite with stainless-steel housing

EDELSTAHL Rost frei STAINLESS STEEL

Material:
Housing stainless steel 1.4016.
Screw stainless steel 1.4305.
Magnetic core hard ferrite.

Version:
Bright.

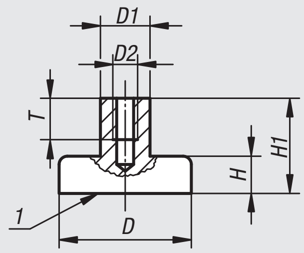
Sample order:
nlm 09065-10-125

Note:
Shallow pot magnets, shielded system.

Temperature range:
max. 220°C.

Assembly:
The magnets can be mounted by press-fit, screwing-in or gluing.

Drawing reference:
1) magnetic face



Order No.	D	D1	D2	H	H1	T	Magnetic force N
09065-10-125	25 ±0,1	8	M5	7	16	10	32
09065-10-132	32 ±0,1	8	M5	7	16	10	64
09065-10-140	40 +0,2/-0,1	8	M5	8	16,5	10	100
09065-10-150	50 +0,2/-0,1	8	M5	10	18,5	10	175
09065-10-163	63 +0,3/-0,1	8	M5	14	22	10	280

09066

Magnets shallow pot

SmCo

Material:
Housing, steel.
Magnetic core, SmCo.

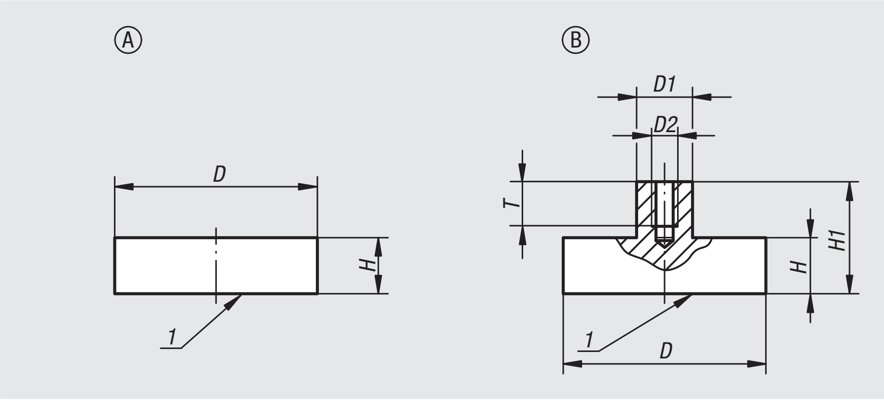
Version:
Housing, electro zinc-plated.

Sample order:
nlm 09066-01

Note:
Shallow pot magnets, shielded system. Magnets with an SmCo core have three to five times the attracting force of AlNiCo or hard ferrite magnets.

Temperature range:
max. 200°C.

Drawing reference:
1) magnetic face



Order No. Form A	Order No. Form B	D	D1	D2	H	H1	T	Magnetic force N
09066-01	**09066-11**	6 ±0,15	-/6	-/M3	4,5	-/11,5	-/6	5
09066-02	**09066-12**	8 ±0,15	-/6	-/M3	4,5	-/11,5	-/6	11
09066-03	**09066-13**	10 ±0,15	-/6	-/M3	4,5	-/11,5	-/6	20
09066-04	**09066-14**	13 ±0,15	-/6	-/M3	4,5	-/11,5	-/6	40
09066-05	**09066-15**	16 ±0,15	-/6	-/M4	4,5	-/11,5	-/6	60
09066-06	**09066-16**	20 ±0,15	-/8	-/M4	6	-/13	-/9	90
09066-07	**09066-17**	25 ±0,15	-/8	-/M4	7	-/14	-/9	150
09066-08	**09066-18**	32 ±0,20	-/10	-/M5	7	-/15,5	-/10	220

09067

Magnets deep pot

SmCo

Material:
Housing brass.
Magnetic core SmCo.

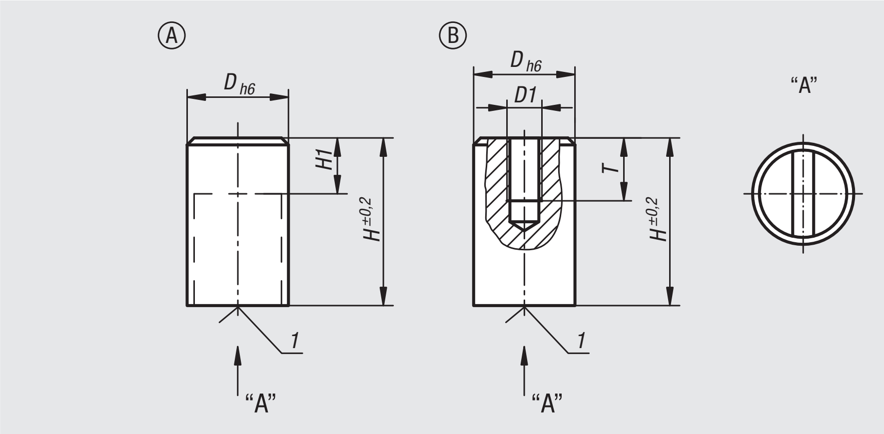
Sample order:
nlm 09067-01

Note:
Smooth design, shielded system. Diameter „D“ ground with h6 tolerance. Under no circumstances may SmCo magnets be pressed directly into iron, loss of attractive force due to magnetic short circuits occurs. SmCo magnets are especially suitable for direct use in spot-welding machines, as no demagnetisation occurs.

Deep pot magnets Form A can be shortened by the dimension „H1“ with no loss of magnetic force.

Temperature range:
max. 200°C.

Drawing reference:
1) magnetic face

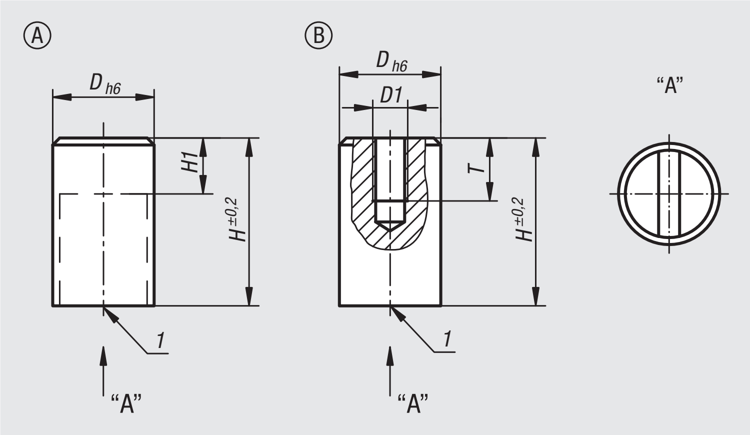


Order No. Form A	Order No. Form B	D	D1	H1	H	T	Magnetic force N	Gap to iron wall mm
09067-01	**09067-02**	6	-/M3	10/-	20	-/5	8	1,5
09067-03	**09067-04**	8	-/M3	10/-	20	-/5	22	1,5
09067-05	**09067-06**	10	-/M4	8/-	20	-/7	40	2
09067-07	**09067-08**	13	-/M4	6/-	20	-/7	60	2,5
09067-09	**09067-10**	16	-/M4	2/-	20/25	-/8	125	3
09067-11	**09067-12**	20	-/M6	5/-	25	-/6	250	4
09067-13	**09067-14**	25	-/M6	7/-	35	-/8	400	5
09067-15	**09067-16**	32	-/M6	4,5/-	40	-/6	600	6

09067-10

Magnets deep pot

NdFeB



Material:
Housing brass.
Magnetic core NdFeB (neodymium).

Version:
Housing smooth.

Sample order:
nlm 09067-10-106

Note:
Smooth design, shielded system.
Under no circumstances may Neodym magnets be pressed directly into iron, loss of attractive force due to magnetic short circuits occurs.

Diameter "D" ground to tolerance h6.

The Form A magnets can be shortened by the dimension "H1" with no loss of magnetic force.

Temperature range:
max. 80°C.

Assembly:
The magnets can be mounted by press-fit, screwing-in or gluing.

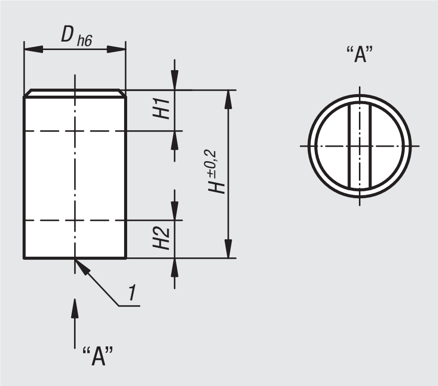
Drawing reference:
1) magnetic face

Order No.	Form	D	D1	H	H1	T	Magnetic force N	Gap to iron wall mm
09067-10-106	A	6	-	20	10	-	10	1,5
09067-10-108	A	8	-	20	10	-	25	1,5
09067-10-110	A	10	-	20	8	-	45	2
09067-10-113	A	13	-	20	6	-	70	2,5
09067-10-116	A	16	-	20	2	-	150	3
09067-10-120	A	20	-	25	5	-	280	4
09067-10-125	A	25	-	35	7	-	450	5
09067-10-132	A	32	-	40	4,5	-	700	6
09067-10-206	B	6	M3	20	-	5	10	1,5
09067-10-208	B	8	M3	20	-	5	25	1,5
09067-10-210	B	10	M4	20	-	7	45	2
09067-10-213	B	13	M4	20	-	7	70	2,5
09067-10-216	B	16	M4	25	-	8	150	3
09067-10-220	B	20	M6	25	-	6	280	4
09067-10-225	B	25	M6	35	-	8	450	5
09067-10-232	B	32	M6	40	-	6	700	6

09067-11

Magnets deep pot with machinable magnetic face

NdFeB



Material:
Housing brass.
Magnetic core NdFeB (neodymium).

Sample order:
nlm 09067-11-06

Note:
Smooth design, shielded system. Under no circumstances may Neodym magnets be pressed directly into iron, loss of attractive force due to magnetic short circuits occurs. Diameter "D" ground to an h6 tolerance.

These magnets can be shortened by the dimensions "H1" and "H2".

Temperature range:
max. 150°C.

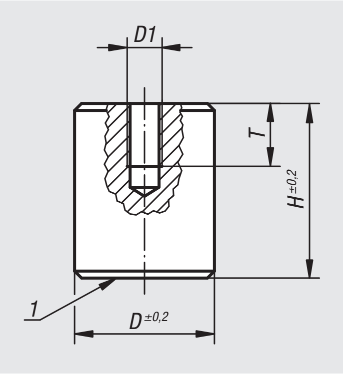
Assembly:
The magnets can be mounted by press-fit, screwing-in or gluing.

Drawing reference:
1) magnetic face

Order No.	D	H	H1	H2	Magnetic force N	Magnetic force at H2 max. N	Gap to iron wall mm
09067-11-06	6	20	10	3	9	12	1,5
09067-11-08	8	20	10	3	22	29	1,5
09067-11-10	10	20	8	5	27	38	2
09067-11-13	13	20	6	5	49	66	2,5
09067-11-16	16	20	2	6	94	108	3
09067-11-20	20	25	5	7	173	235	4
09067-11-25	25	35	7	8	292	380	5
09067-11-32	32	40	4,5	10	529	640	6

Magnets deep pot with internal thread

NdFeB



Material:
Housing, steel.
Magnetic core NdFeB.

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09068-01

Note:
Shielded system. Deep pot magnets are used for mounting in steel and iron. This requirement is principally stipulated in plant and machine construction. Can also be used in blind holes.

Size D=50 has 4 magnets Ø18 mm.

Temperature range:
max. 80°C.

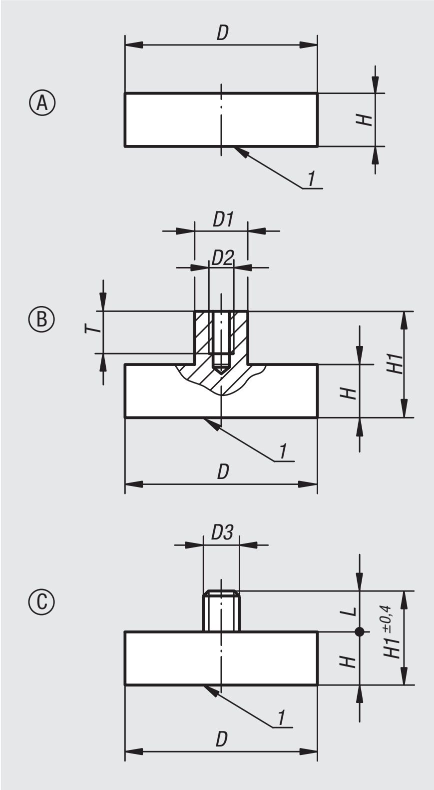
Drawing reference:
1) magnetic face

Order No.	D	D1	H	T	Can be shortened by (mm)	Magnetic force N
09068-01	8	M3	12	5	3	12
09068-02	10	M4	16	7	7	24
09068-03	13	M4	18	7	3	60
09068-04	16	M4	20	7	6	90
09068-05	20	M5	25	9	9	135
09068-06	25	M6	30	9	10	190
09068-07	35	M8	40	13	10	300
09068-08	50	M12	50	13	13	550

09069

Magnets shallow pot

NdFeB



Material:
Housing, steel.
Magnetic core NdFeB.

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09069-01

Note:
Shielded system. With the permanent magnetic material NdFeB the attracive force increases by ca. 10-20 % compared with SmCo.

Temperature range:
max. 80°C.

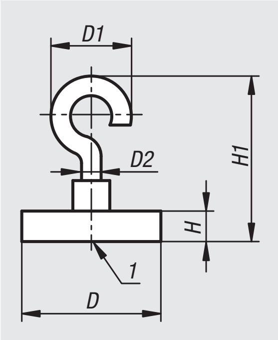
Drawing reference:
1) magnetic face

Order No.	Form	D	D1	D2	D3	H	H1	L	T	Magnetic force N
09069-01	A	6 ±0,15	-	-	-	4,5	-	-	-	5
09069-02	A	8 ±0,15	-	-	-	4,5	-	-	-	13
09069-03	A	10 ±0,15	-	-	-	4,5	-	-	-	25
09069-04	A	13 ±0,15	-	-	-	4,5	-	-	-	60
09069-05	A	16 ±0,15	-	-	-	4,5	-	-	-	95
09069-06	A	20 ±0,15	-	-	-	6	-	-	-	140
09069-07	A	25 ±0,15	-	-	-	7	-	-	-	200
09069-08	A	32 ±0,20	-	-	-	7	-	-	-	350
09069-11	B	6 ±0,15	6	M3	-	4,5	11,5	-	6	5
09069-12	B	8 ±0,15	6	M3	-	4,5	11,5	-	7	13
09069-13	B	10 ±0,15	6	M3	-	4,5	11,5	-	7	25
09069-14	B	13 ±0,15	6	M3	-	4,5	11,5	-	6	60
09069-15	B	16 ±0,15	6	M4	-	4,5	11,5	-	7	95
09069-16	B	20 ±0,15	8	M4	-	6	13	-	9	140
09069-17	B	25 ±0,15	8	M4	-	7	14	-	9	200
09069-18	B	32 ±0,20	10	M5	-	7	15,5	-	10	350
09069-19	B	40 ±0,2	10	M6	-	8	18	-	13	670
09069-20	B	47 ±0,2	12	M6	-	9,2	20,5	-	13	750
09069-21	B	50 ±0,2	15	M8	-	10	22	-	13	1000
09069-23	C	10 ±0,15	-	-	M3	4,5	11,5	7	-	25
09069-24	C	13 ±0,15	-	-	M5	4,5	12,5	8	-	60
09069-25	C	16 ±0,15	-	-	M6	4,5	12,5	8	-	95
09069-26	C	20 ±0,15	-	-	M6	6	16	10	-	140
09069-27	C	25 ±0,15	-	-	M6	7	17	10	-	200
09069-28	C	32 ±0,20	-	-	M6	7	17	10	-	350
09069-29	C	40 ±0,2	-	-	M8	8	20	12	-	670
09069-30	C	47 ±0,2	-	-	M8	9,2	22,2	13	-	790

09069-10

Magnets shallow pot with hook

NdFeB



Material:
Housing and hook steel.
Magnetic core NdFeB (neodymium).

Version:
Housing and hook electro zinc-plated.

Sample order:
nlm 09069-10-10

Note:
Shielded system. With the permanent magnetic material NdFeB the attracive force increases by ca. 10-20 % compared with SmCo.

Temperature range:
max. 80°C.

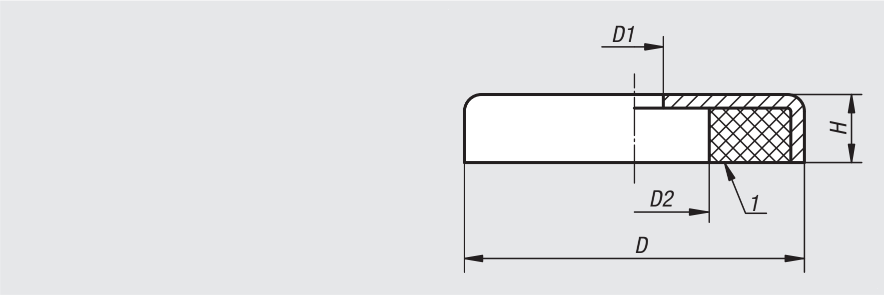
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	H1	Magnetic force N
09069-10-10	10	10	3	4,5	24	25
09069-10-13	13	10	3	4,5	24	60
09069-10-16	16	13	3,5	4,5	27	95
09069-10-20	20	13	3,5	6	27,5	140
09069-10-25	25	13	3,5	7	28	200
09069-10-32	32	18,5	4,5	7	38	350

09070

Magnets shallow pot with counterbore

hard ferrite



Material:
Housing, steel.
Magnetic core hard ferrite.

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09070-50

Note:
Shielded system.

Temperature range:
max. 200°C.

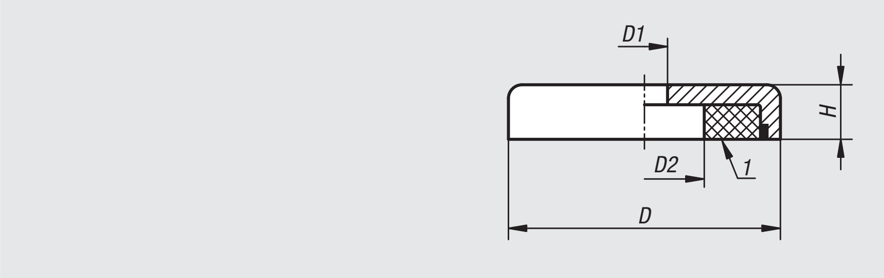
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	Magnetic force N
09070-50	50 ±0,20	8,5	22	10	180
09070-63	63 ±0,20	6,5	24	14	290
09070-80	80 ±0,25	6,5	11,5	18	540

09070-10

Magnets shallow pot with counterbore

SmCo with stainless-steel housing



Material:
Housing stainless steel 1.4104.
Magnetic core SmCo (samarium cobalt).

Sample order:
nlm 09070-10-120

Note:
Shielded system.

Temperature range:
max. 350°C.

Assembly:
The magnets can be mounted by press-fit, screwing-in or gluing.

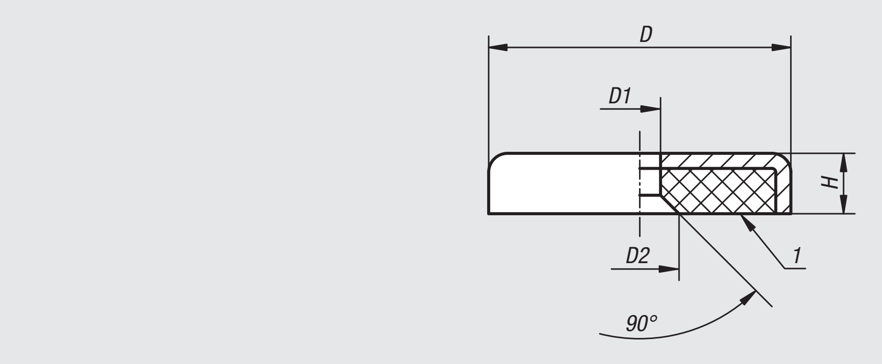
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	Magnetic force N
09070-10-120	20 ±0,15	4,5	8	6	60
09070-10-125	25 ±0,15	4,5	8	7	80
09070-10-132	32 ±0,2	5,5	11	7	200
09070-10-140	40 ±0,2	5,5	10,5	8	420

09071

Magnets shallow pot with countersink

hard ferrite



Material:
Housing, steel.
Magnetic core hard ferrite.

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09071-01

Note:
Shielded system.

Temperature range:
max. 200°C.

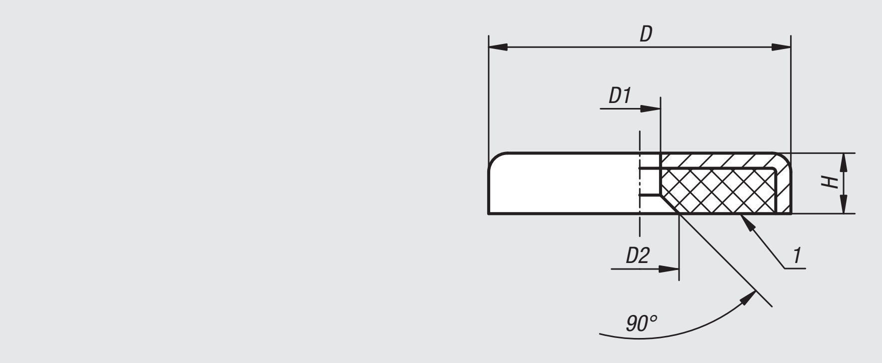
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	Magnetic force N
09071-01	16 ±0,15	3,3±0,2	7	4,5	14
09071-02	20 ±0,15	4,2±0,2	9	6	27
09071-03	25 ±0,15	5,5±0,2	11	7	36
09071-04	32 ±0,20	5,5±0,2	11	7	72
09071-05	40 ±0,20	5,5±0,2	11	8	90

09071-10

Magnets shallow pot with countersink

hard ferrite with stainless-steel housing



Material:
Housing stainless steel 1.4016.
Magnetic core hard ferrite.

Version:
Bright.

Sample order:
nlm 09071-10-120

Note:
Shielded system.

Temperature range:
max. 220°C.

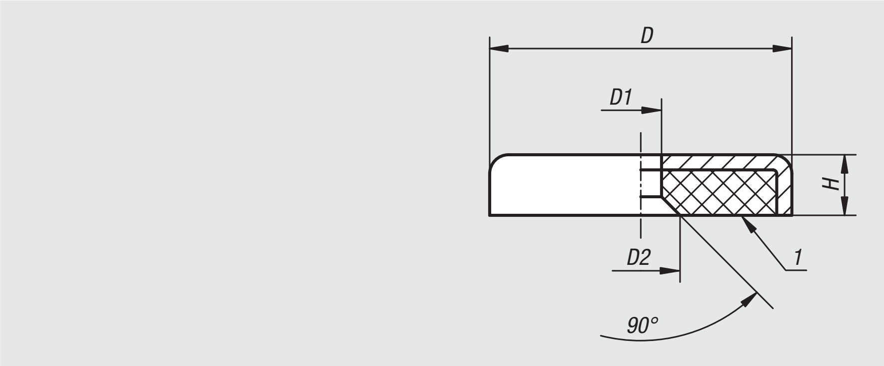
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	Magnetic force N
09071-10-120	20±0,15	4,2	9	6	22
09071-10-125	25±0,15	5,5	11	7	29
09071-10-132	32±0,15	5,5	11	7	58
09071-10-140	40±0,2	5,5	12,5	8	72

09071-20

Magnets shallow pot with countersink

SmCo



Material:
Housing steel.
Magnetic core SmCo (samarium cobalt).

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09071-20-16

Note:
Shallow pot magnets, shielded system. Magnets with an SmCo core have three to five times the attracting force of AlNiCo or hard ferrite magnets.

Temperature range:
max. 280°C.

Assembly:
The magnets can be mounted by press-fit, screwing-in or gluing.

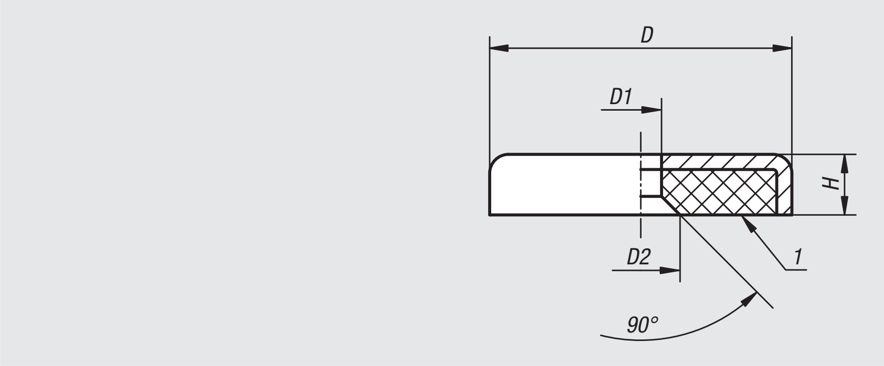
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	Magnetic force N
09071-20-16	16 ±0,15	3,5	6,6	4,5	57
09071-20-20	20 ±0,15	4,5	9,3	6	81
09071-20-25	25 ±0,15	4,5	9,2	7	105
09071-20-32	32 ±0,2	5,5	11,5	7	235
09071-20-40	40 ±0,2	5,5	11,5	8	540

09071-30

Magnets shallow pot with countersink

NdFeB



Material:
Housing, steel.
Magnetic core NdFeB (neodym).

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09071-30-13

Note:
Shielded system. With the permanent magnetic material NdFeB the attractive force increases by ca. 10-20 % compared with SmCo.

Temperature range:
max. 80°C.

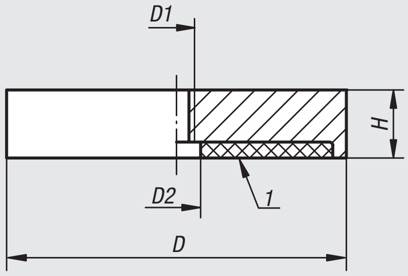
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	Magnetic force N
09071-30-13	13	3,5	6,6	4,5	40
09071-30-16	16	3,5	6,6	4,5	75
09071-30-20	20	4,5	9	6	105
09071-30-25	25	4,5	9	7	160
09071-30-32	32	5,5	11	7	310
09071-30-40	40	5,5	10,6	8	500

09072

Magnets shallow pot with internal thread

NdFeB



Material:
Housing, steel.
Magnetic core NdFeB.

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09072-01

Note:
Shielded system

Temperature range:
max. 80°C.

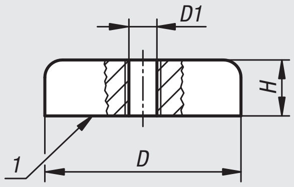
Drawing reference:
1) magnetic face

Order No.	D	D1	D2	H	Magnetic force N
09072-01	32	M5	5,5	7	330
09072-02	40	M5	10,5	8	550
09072-03	63	M10	11,7	14	1100
09072-04	75	M10	13	15	1750

09072-10

Magnets shallow pot with internal thread

hard ferrite



Material:
Housing, steel.
Magnetic core hard ferrite.

Version:
Housing, electro zinc-plated.

Sample order:
nlm 09072-10-2504

Note:
Shielded system.

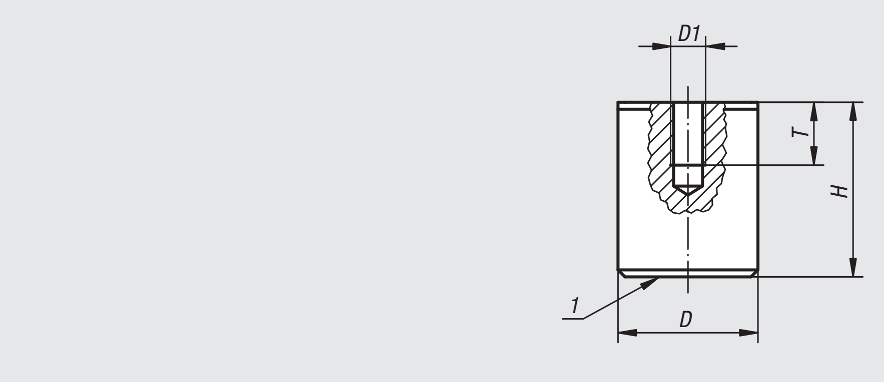
Temperature range:
max. 200°C.

Drawing reference:
1) magnetic face

Order No.	D	D1	H	Magnetic force N
09072-10-2504	25 ±0,15	M4	7	36
09072-10-3204	32 ±0,2	M4	7	75
09072-10-4004	40 ±0,2	M4	8	90
09072-10-5006	50 ±0,2	M6	10	170
09072-10-5008	50 ±0,2	M8	10	170
09072-10-6308	63 ±0,20	M8	14	290
09072-10-8008	80 ±0,25	M8	18	550
09072-10-8010	80 ±0,25	M10	18	550

09094

Magnets deep pot



Material:
Housing, steel.
Magnetic core AlNiCo.

Version:
Housing painted red.

Sample order:
nlm 09094-01

Note:
Hard magnet in aluminium housing and steel jacket. Shielded system. Pot magnets are used for retaining, lifting and mounting in fixtures.
Due to the painted surface, the diameter D can be up to +0.8 mm.

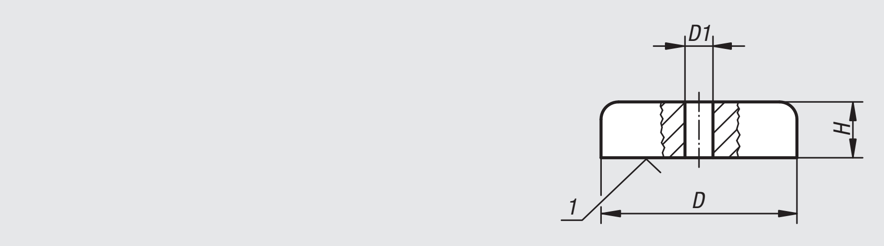
Temperature range:
max. 450°C.

Drawing reference:
1) magnetic face

Order No.	D	D1	H	T	Magnetic force N
09094-01	17	M6	16	4	18
09094-02	21	M6	19	5	28
09094-03	27	M6	25	6	65
09094-04	35	M6	30	9	115
09094-05	65	M12	43	13	400

09096

Magnets shallow pot



Material:
Housing, steel.
Magnetic core AlNiCo.

Version:
Housing painted red.

Sample order:
nlm 09096-01

Note:
Shielded system. Shallow pot magnets are used in fixtures with minimal space.

Temperature range:
max. 450°C.

On request:
Other colours.

Drawing reference:
1) magnetic face

Order No.	D	D1	H	Magnetic force N
09096-01	19	3,5	8	30
09096-02	29	5	9	55
09096-03	38	5	10,5	95

09098

Magnets button

Material:
Magnetic core AlNiCo.

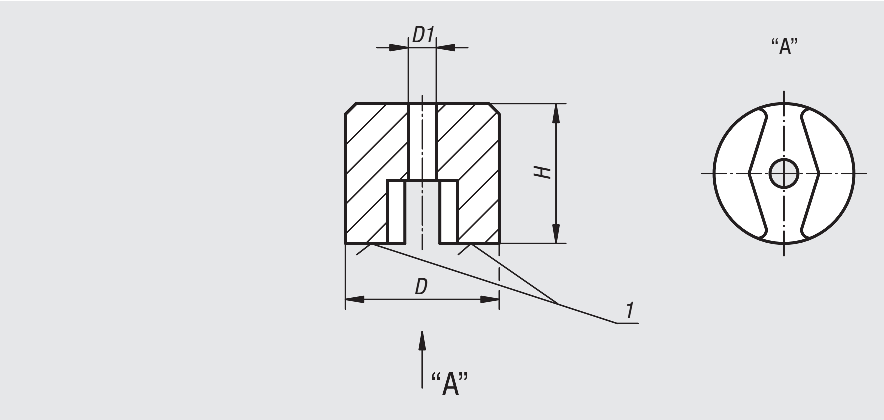
Version:
painted red.

Sample order:
nlm 09098-01

Note:
Split attractive surface with through hole. Non-shielded system. Button magnets are used in laboratories, inspection rooms and for holding metal objects.

Temperature range:
max. 450°C.

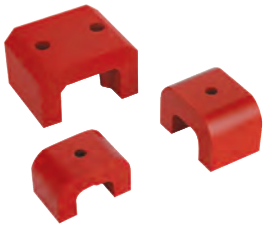
Drawing reference:
1) magnetic face



Order No.	D	D1	H	Magnetic force N
09098-01	13	4,5	10	7
09098-02	19	5,4	13	19
09098-03	25	5,4	16	29
09098-04	32	7	25	66

09100

Magnets strong



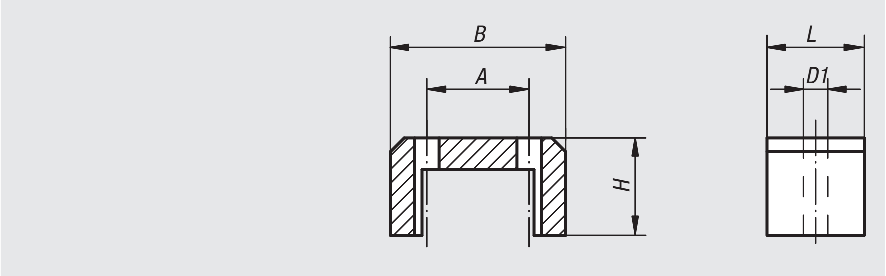
Material:
Magnetic core AlNiCo.

Version:
painted red.

Sample order:
nlm 09100-01

Note:
Horseshoe magnets with high attractive force. Non-shielded system. The magnets are supplied with a electro zinc-plated protective plate and are used for holding, sorting and lifting.
Sizes 1, 2 and 3 have only one attachment hole in the centre.

Temperature range:
max. 450°C.

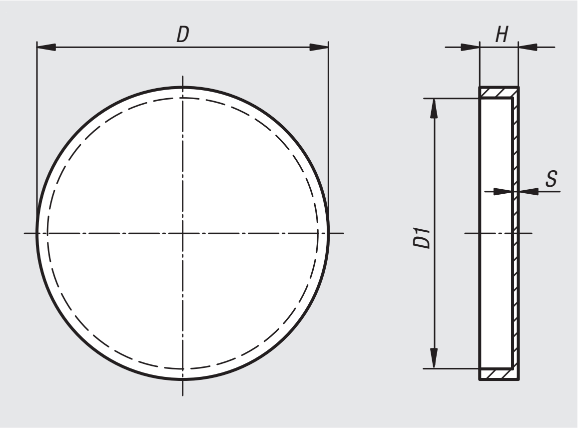


Order No.	Size	A	B	D1	H	L	Magnetic force N
09100-01	1	-	30	5	20	20	45
09100-02	2	-	40	5	25	25	90
09100-03	3	-	45	5	30	29	120
09100-04	4	32	57	8	35	45	230
09100-05	5	38	70	8	41	57	320

09110

Protective rubber caps

for shallow pot magnets



Material:
Synthetic rubber.

Version:
black.

Sample order:
nlm 09110-50

Note:
To protect sensitive surfaces. The protective rubber cap slips over the magnetic face of shallow pot magnets. The shear force required to move the magnet is doubled and achieves almost the original holding force of the magnet.
The protective rubber caps fit all shallow pot magnets with diameter 50, 63 and 80 mm.

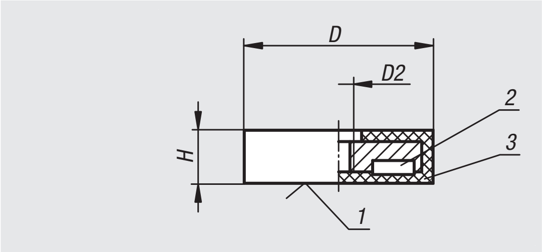
Temperature range:
max. 60°C.

Order No.	D	D1	H	S
09110-50	52	50	6	0,5
09110-63	65	63	8	0,5
09110-80	83	80	11	0,5

09112

Magnets shallow pot with internal thread

NdFeB, with rubber protective jacket



Material:
Housing, steel.
Magnetic core NdFeB (neodym).
Protective rubber jacket, synthetic rubber.

Version:
Housing, electro zinc-plated.
Black protective rubber jacket.

Sample order:
nlm 09112-01

Note:
Magnet with internal thread. Shielded system. With rubber protective jacket for protecting sensitive surfaces. The coefficient of friction is increased by the rubber jacket so that high lateral friction is achieved.

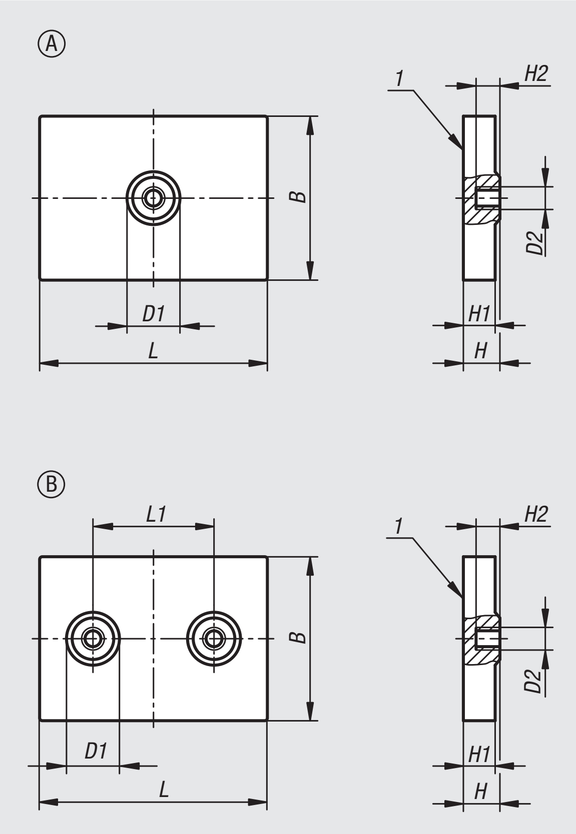
Temperature range:
max. 60°C.

Drawing reference:
1) magnetic face
2) magnet
3) rubber

Order No.	D	D2	H	Magnetic force N
09112-00	18	M4	6	25
09112-01	22	M4	6	35
09112-02	31	M5	6	75
09112-03	43	M4	6	85
09112-04	66	M6	8,5	180
09112-05	88	M6	8	420

Magnets with internal thread

NdFeB, rectangular, with rubber protective jacket



Material:
Housing steel.
Magnetic core NdFeB (neodymium).
Rubber protective jacket TPE.

Version:
Housing, electro zinc-plated.
Black protective rubber jacket.

Sample order:
nlm 09112-10-14331

Note:
Magnet with internal thread. Shielded system. With rubber protective jacket for protecting sensitive surfaces. The coefficient of friction is increased by the rubber jacket so that high lateral friction is achieved.

Temperature range:
max. 60°C.

Assembly:
Optimum hold on thin plate with sensitive surfaces.

Drawing reference:
1) magnetic face

Order No.	Form	B	D1	D2	H	H1	H2	L	L1	Magnetic force N
09112-10-14331	A	31	10	M4	6,9	6	4,5	43	-	105
09112-10-24331	B	31	10	M4	6,9	6	4,5	43	25	146

09114

Magnets shallow pot with tapped pin

NdFeB, with rubber protective jacket

Material:
Housing, steel.
Magnetic core NdFeB (neodym).
Protective rubber jacket, synthetic rubber.

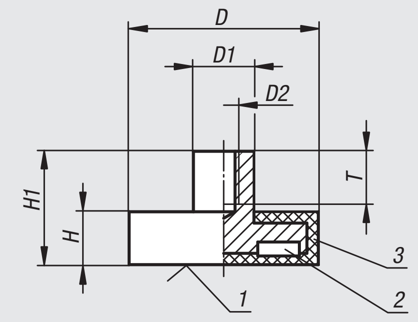
Version:
Housing, electro zinc-plated.
Black protective rubber jacket.

Sample order:
nlm 09114-01

Note:
Shallow pot magnets with tapped pin, shielded system. With rubber protective jacket for protecting sensitive surfaces. The coefficient of friction is increased by the rubber jacket so that high lateral friction is achieved.

Temperature range:
max. 60°C.

Drawing reference:
1) magnetic face
2) magnet
3) rubber



Order No.	D	D1	D2	H	H1	T	Magnetic force N
09114-01	12	8	M4	7	14,8	6	10
09114-07	18	8	M4	6	11,5	6	37
09114-02	22	8	M4	6	11,5	6	50
09114-03	31	8	M4	6	11,5	5	75
09114-04	43	8	M4	6	10,5	5	85
09114-05	66	10	M5	8,2	15	8	180
09114-06	88	12	M8	8,2	17	11	420

09116

Magnets shallow pot with threaded pin

NdFeB, with rubber protective jacket

Material:
Housing, steel.
Magnetic core NdFeB (neodym).
Protective rubber jacket, synthetic rubber.

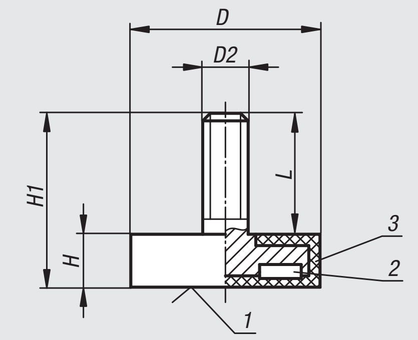
Version:
Housing, electro zinc-plated.
Black protective rubber jacket.

Sample order:
nlm 09116-01

Note:
Shallow pot magnets with threaded pin, shielded system. With rubber protective jacket for protecting sensitive surfaces. The coefficient of friction is increased by the rubber jacket, so that high lateral friction is achieved.

Temperature range:
max. 60°C.

Drawing reference:
1) magnetic face
2) magnet
3) rubber

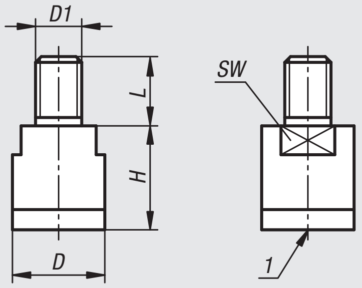


Order No.	D	D2	H	H1	L	Magnetic force N
09116-05	12	M4	7	15,5	8,5	13
09116-06	18	M4	6	12	6	37
09116-01	22	M4	6	12,5	6,5	50
09116-07	31	M6	6	17	11	89
09116-02	43	M6	6	21	15	85
09116-03	66	M8	8,2	23	14,8	180
09116-04	88	M8	8,2	23,5	15,3	420

09117

Magnets deep pot with threaded pin

NdFeB, rubber magnetic face



Material:
Housing stainless steel 1.4104.
Magnetic core NdFeB (neodymium).
Magnetic face rubberised (TPE).

Sample order:
nlm 09117-1306

Note:
Deep pot magnet with external thread, shielded system. With rubber magnetic face to protect sensitive surfaces. The rubber face increases the coefficient of friction resulting in high lateral frictional forces.

Temperature range:
max. 80°C.

Assembly:
The deep pot magnets with rubberised magnetic face can be used as a magnetic stop system.

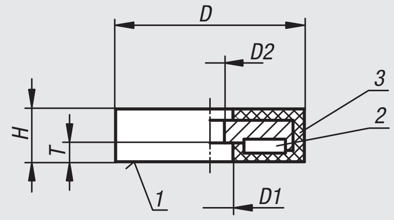
Drawing reference:
1) magnetic face

Order No.	D	D1	H	L	SW	Magnetic force N
09117-1306	13	M6	16	10	11	15
09117-1608	16	M8	18	12	13	23
09117-2010	20	M10	20	14	17	46

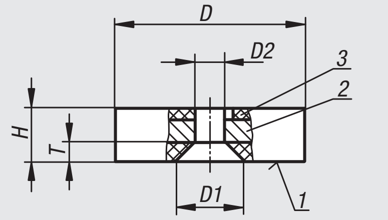
09118

Magnets shallow pot with through hole

NdFeB, with rubber protective jacket



09118-03



Material:
Housing, steel.
Magnetic core NdFeB (neodym).
Protective rubber jacket, synthetic rubber.

Version:
Housing, electro zinc-plated.
Black protective rubber jacket.

Sample order:
nlm 09118-01

Note:
Shallow pot magnets, shielded system. With rubber protective jacket for protecting sensitive surfaces. The coefficient of friction is increased by the rubber jacket so that high lateral friction is achieved.

Temperature range:
max. 60°C.

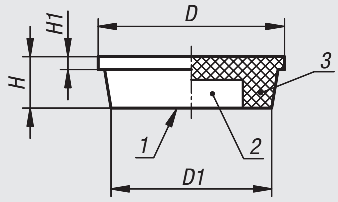
Drawing reference:
1) magnetic face
2) magnet
3) rubber

Order No.	D	D1	D2	H	T	Magnetic force N
09118-01	22	8,2	4	6	3,5	35
09118-02	31	9	6	6	3,5	75
09118-03	43	12,8	7,5	6	4,2	85
09118-04	57	25,3	8	7,6	3,3	175
09118-05	66	22	5,5	8,5	3,2	210

09119

Retaining magnets

hard ferrite



Material:
Housing plastic (ABS).
Magnetic core hard ferrite.

Sample order:
nlm 09119-101

Note:
These magnets are often used on notice boards, whiteboards and magnetic boards.

Temperature range:
max. 100°C.

On request:
Magnetic core NdFeB (neodymium).

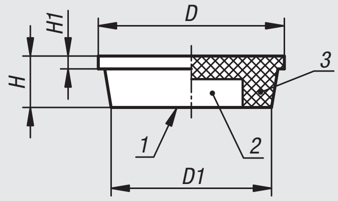
Drawing reference:
1) Magnetic face
2) Magnet
3) Housing

Order No. white	Order No. blue	Order No. red	Order No. black	D	D1	H	H1	Magnetic force N
09119-101	**09119-102**	**09119-103**	**09119-104**	10,5	9,5	7	1,5	0,7
09119-161	**09119-162**	**09119-163**	**09119-164**	16	14,5	7	1,1	1,3
09119-201	**09119-202**	**09119-203**	**09119-204**	20	16	7	2,1	1,5
09119-251	**09119-252**	**09119-253**	**09119-254**	25	22	8	2,2	10
09119-301	**09119-302**	**09119-303**	**09119-304**	30	28	8	2	14
09119-361	**09119-362**	**09119-363**	**09119-364**	36	32,5	9	2,2	9,5

09119-10

Retaining magnets

hard ferrite



Material:
Housing plastic.
Magnetic core hard ferrite.

Sample order:
nlm 09119-10-361

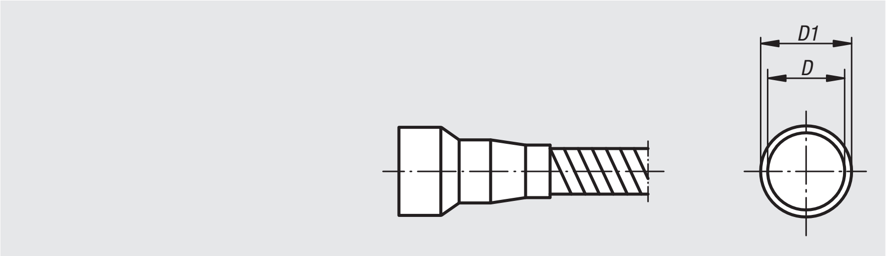
Note:
These magnets are often used on notice boards, whiteboards and magnetic boards.

Drawing reference:
1) Magnetic face
2) Magnet
3) Housing

Order No.	Main colour	D	D1	H	H1	Magnetic force N
09119-10-361	white	36	32,5	9	2,2	9,5

09150

Magnetic Pickup



Version:
Strong permanent magnet with flexible brass tube and black plastic grip. Surface chromed.

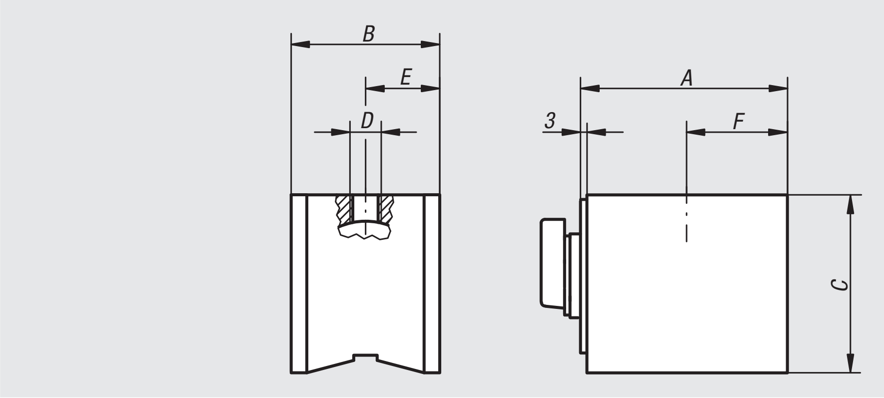
Sample order:
nlm 09150-04

Note:
Pickup magnets are primarily used for removing or searching for steel parts in inaccessible places.

Order No.	Size	D	D1	total length mm	Magnetic force N
09150-01	1	6	8	450	5
09150-02	2	10	12	450	10
09150-03	3	13	15	520	18
09150-04	4	17	19	520	30

09210

Magnetic base, permanent



Version:
Permanent magnetic base with high magnetic force.
On/Off switch.
Surface black.

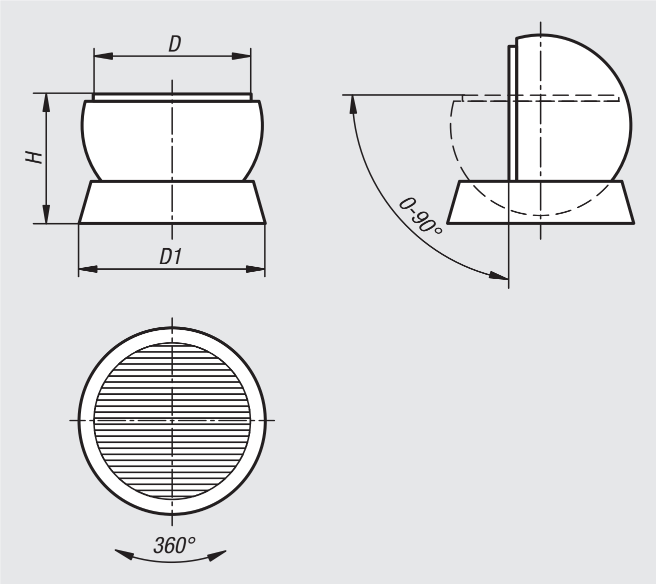
Sample order:
nlm 09210-03

Note:
Permanent magnetic bases are used in fixtures as retaining magnets, as gauge stands etc.

Order No.	A	B	C	D	E	F	Magnetic force N
09210-01	61	50	55	M8 x 8	25	29	600
09210-02	76	50	55	M8 x 8	25	36,5	900
09210-03	76	50	55	M10 x 8	25	36,5	900

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Magnetic clamping balls



Material:
Ball, aluminium.
Magnet, neodymium.
Body, steel.
Holding ring, steel lined with leather.

Version:
Anodised.
Holding ring chemically nickel-plated.

Sample order:
nlm 09230-0801

Note:
The magnetic clamping balls are used to gently hold components in the optimum working position during e.g. polishing, assembling and laser welding. Swivel angles of up to 90° can be set, depending on the workpiece geometry and weight. The magnetic ball can be turned on and off using the T-grip hex key provided.

Order No.	D	D1	H	Magnetic force N	Pole pitch
09230-0801	80	128	104	80	1.5+0.5
09230-1001	100	158	129	100	1.5+0.5
09230-1301	130	188	145	100	1.5+0.5
09230-1601	160	218	164	100	1.5+0.5

10000

Aluminium profiles
Connectors
Covers
Special elements

Technical information for aluminium profiles

Type I and Type B

Tolerances:
Form deviations such as straightness and flatness tolerance acc. to DIN EN 12020 Part 2.

Surface:
The aluminium profiles are natural tone anodised making them permanently scratch-resistant and corrosion proof. The all-round anodise film makes saw cuts particularly low burr.

Anodising: E6EV1

Film thickness: 10 µm

Mechanical values:
(apply only in thrust axis)

Tensile strength Rm: min. 245 N/mm^2

Yield point Rp 0.2: min. 195 N/mm^2

A5: 10% rupture stress

A10: 8% rupture stress

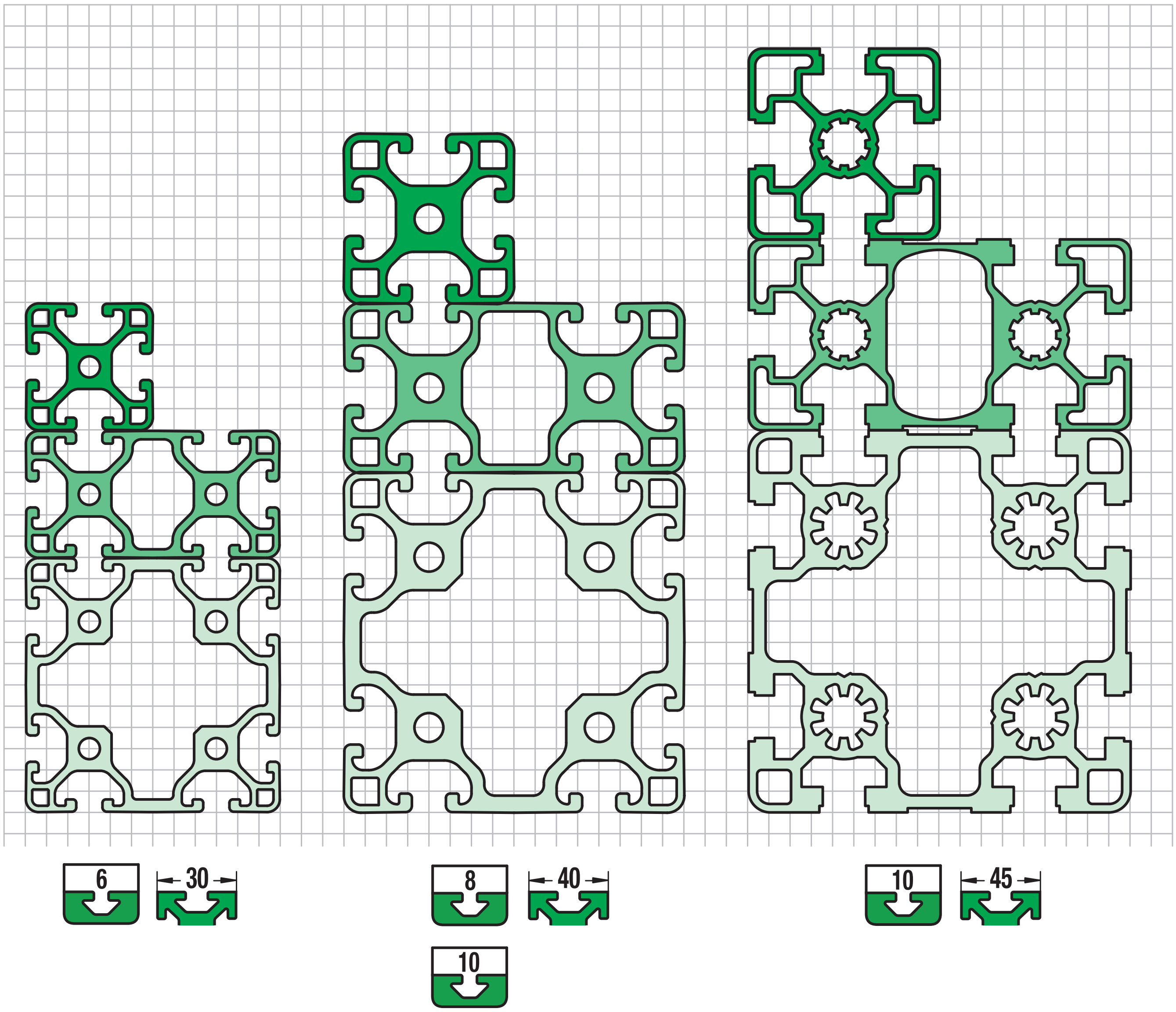
Density: 2.7 kg/dm^3

Linear expansion coefficient: 23.6x10-6 1/K

Elasticity module E: approximately 70,000 N/mm^2

Hardness: approximately 75 HB -2.5/187.5

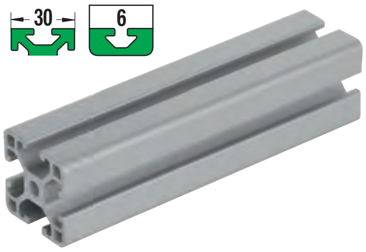
Slot sizes and grid pitches



10025

Aluminium profiles 30x30 light

Type I

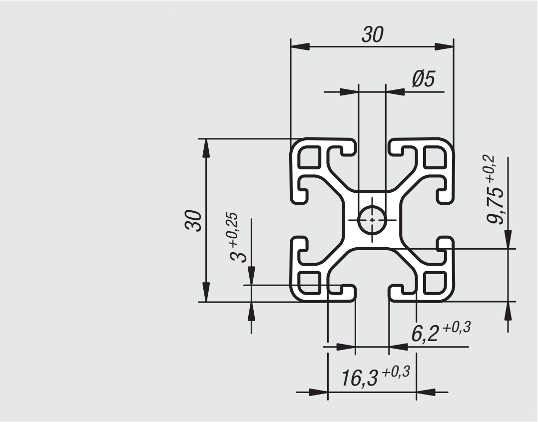


Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

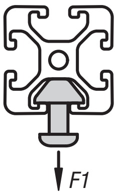
Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10025-063030X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.



On request:
Mitre cuts 15°, 30° and 45°.

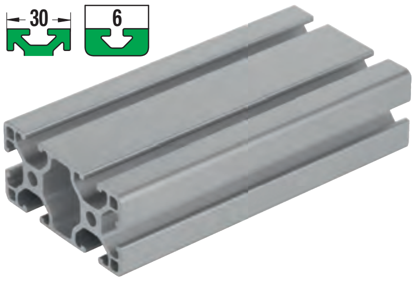


Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10025-063030X****	6	30x30	2,9	2,9	1,94	1,94	3,43	0,5	0,93

10025

Aluminium profiles 30x60 light

Type I

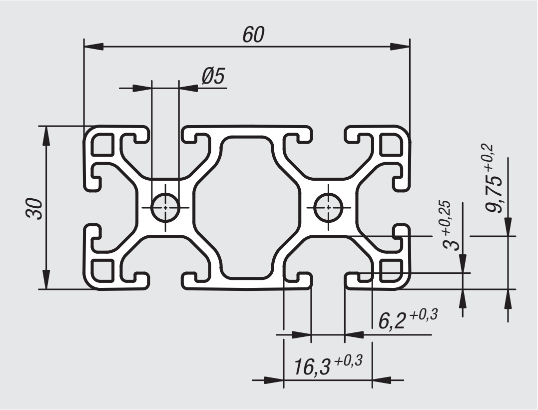


Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

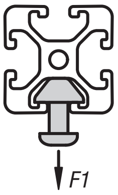
Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10025-063060X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.



On request:
Mitre cuts 15°, 30° and 45°.



Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10025-063060X****	6	30x60	5,54	21,22	3,69	7,07	6,13	0,5	1,65

10025

Aluminium profiles 60x60 light

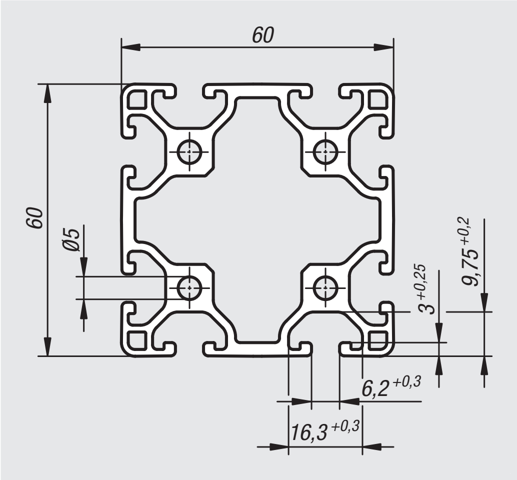
Type I

Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

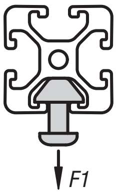
Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10025-066060X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.



On request:
Mitre cuts 15°, 30° and 45°.



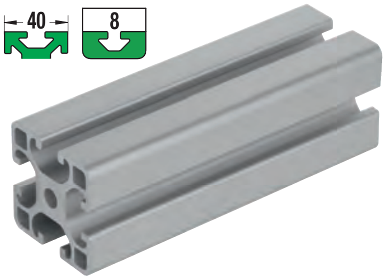
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10025-066060X****	6	60x60	39,47	39,47	13,16	13,16	10,01	0,5	2,70

Notes

10045

Aluminium profiles 40x40 light

Type I

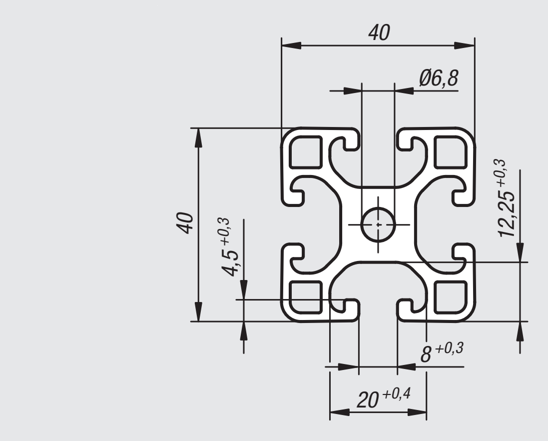


Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

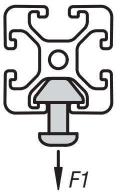
Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10045-084040X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.



On request:
Mitre cuts 15°, 30° and 45°.

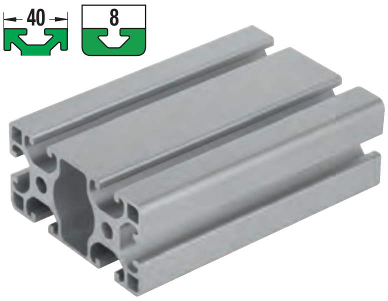


Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10045-084040X****	8	40x40	9,1	9,1	4,55	4,55	6,47	2,5	1,75

10045

Aluminium profiles 40x80 light

Type I

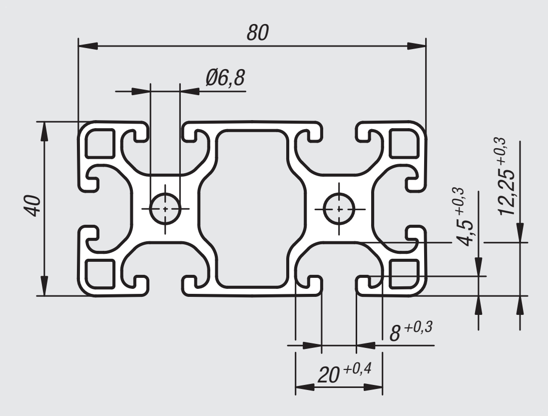


Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

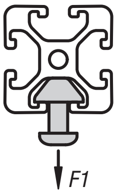
Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10045-084080X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.



On request:
Mitre cuts 15°, 30° and 45°.

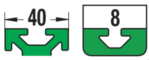


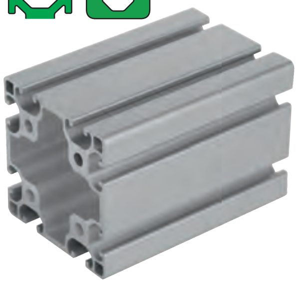
Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10045-084080X****	8	40x80	16,77	70,2	8,45	17,56	11,3	2,5	3,08

10045

Aluminium profiles 80x80 light

Type I



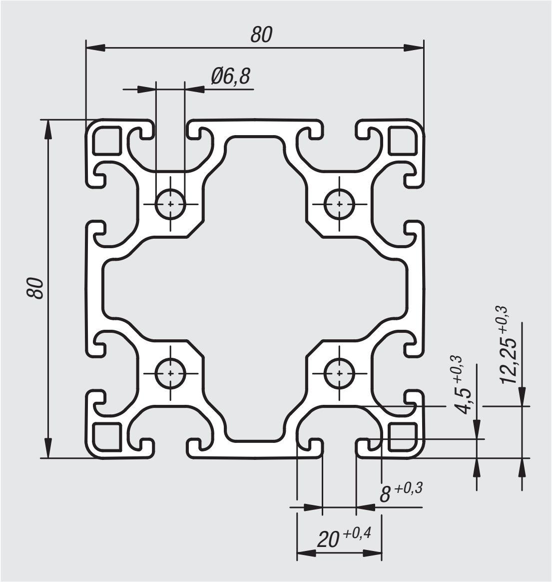


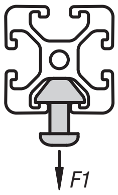
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10045-088080X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.





On request:
Mitre cuts 15°, 30° and 45°.

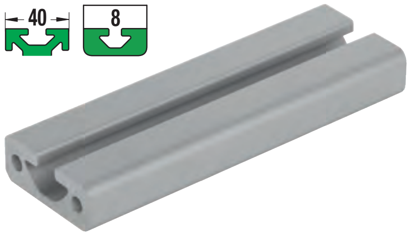
Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10045-088080X****	8	80x80	130,1	130,1	33,2	33,2	19,3	2,5	2,17

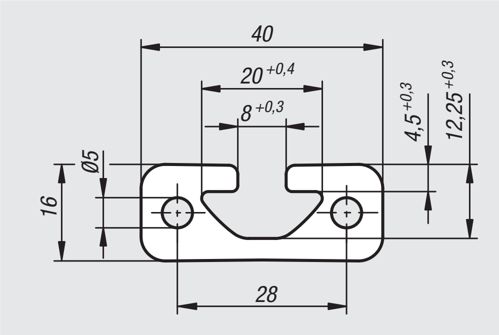
Notes

10048

Aluminium profiles 16x40

Type I





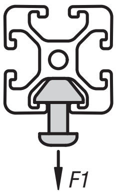
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10048-081640X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

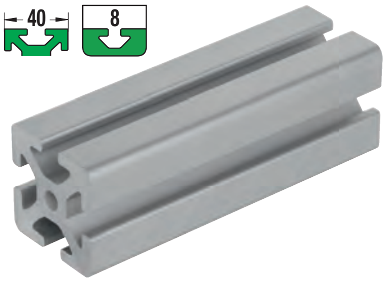


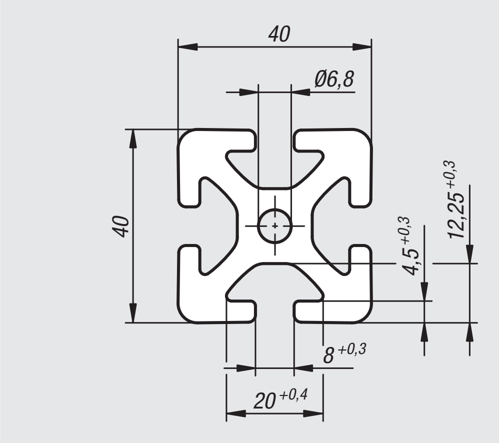
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10048-081640X****	8	16x40	1,06	6,75	1,25	3,37	4,15	5	1,12

10048

Aluminium profiles 40x40

Type I





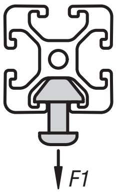
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10048-084040X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

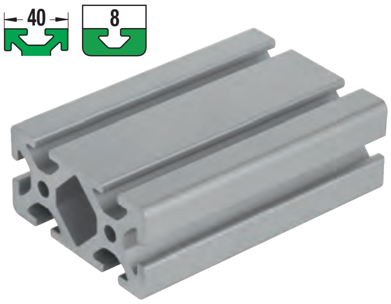


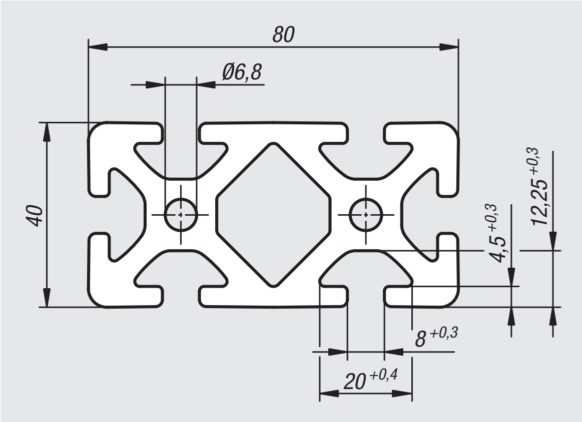
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10048-084040X****	8	40x40	13,85	13,85	6,95	6,95	9,05	2,5	2,45

10048

Aluminium profiles 40x80

Type I





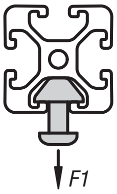
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10048-084080X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

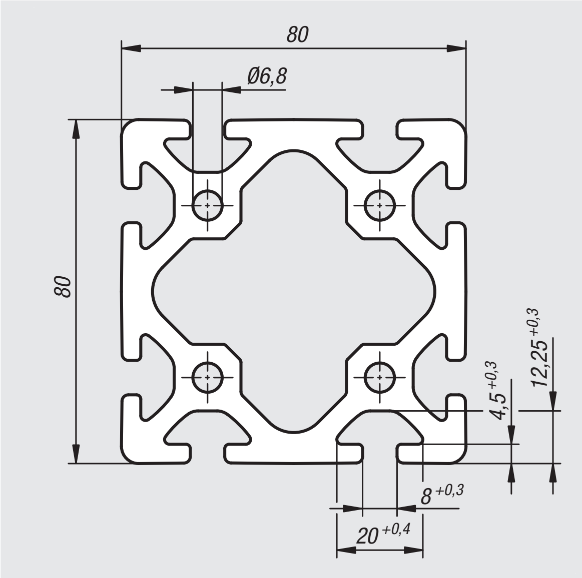


Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10048-084080X****	8	40x80	26,7	101,02	13,39	25,15	16,52	5	4,51

10048

Aluminium profiles 80x80

Type I

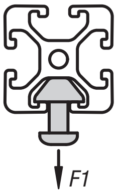


Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10048-088080X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.



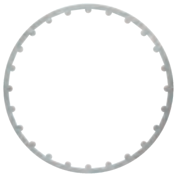
On request:
Mitre cuts 15°, 30° and 45°.

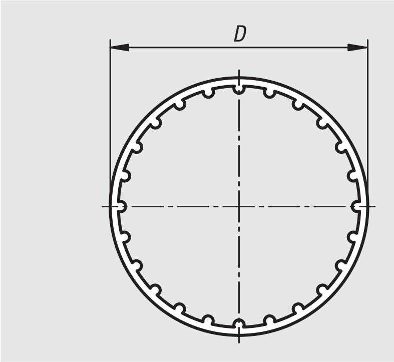
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10048-088080X****	8	80x80	187,8	187,8	46,93	46,93	26,65	5	7,20

10050

Aluminium profiles D50

Type I, tube





Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10050-50x1000

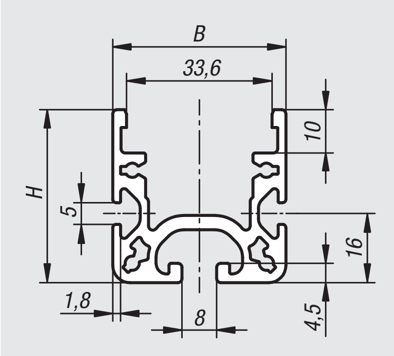
Note:
Aluminium profile for general structures. The round tube, also referred to as a profile tube forms a feed roller when used in combination with bearing flanges (10400).

Order No.	Profile	D	L	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Approx. weight kg/m
10050-50X1000	50	50	1000	8,16	8,16	3,26	3,26	0,760

10051

Aluminium profiles 40x40

for roller rails, Type I



Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10051-084040X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

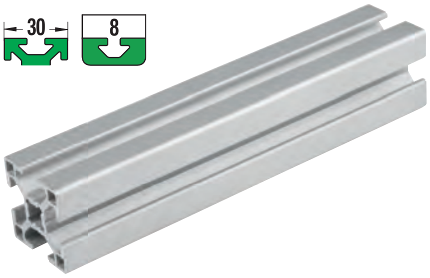
Note:
The aluminium profile is matched to the roller elements. As a result, roller rails and roller tracks can be realised. The different inserts permit modular and flexible setup.

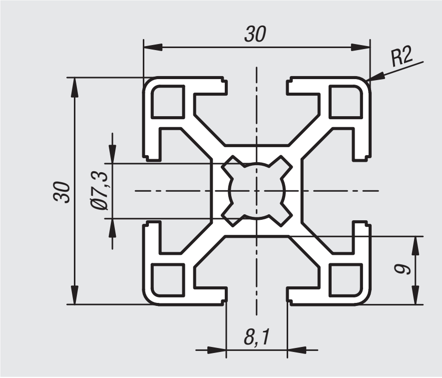
Order No.	Slot width	Profile	B	H	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	Approx. weight kg/m
10051-084040X****	8	40x40	40	40	5,8	10,38	2,3	5,19	4,97	1,34

10140

Aluminium profiles 30x30

Type B





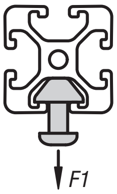
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10140-083030X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

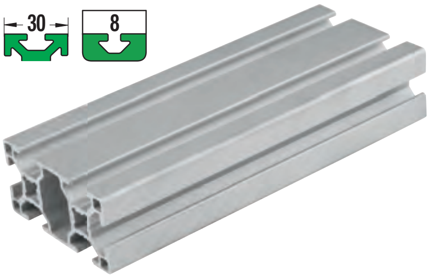


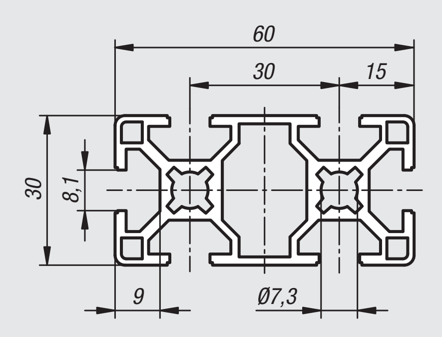
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10140-083030X****	8	30x30	2,77	2,77	1,85	1,85	3,14	6	0,85

10140

Aluminium profiles 30x60

Type B





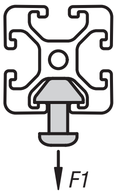
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10140-083060X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

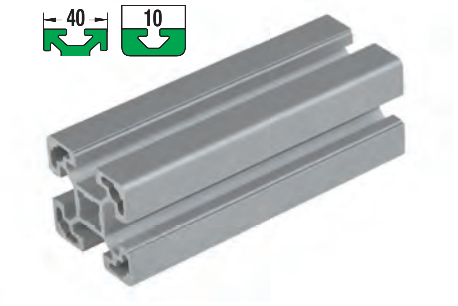


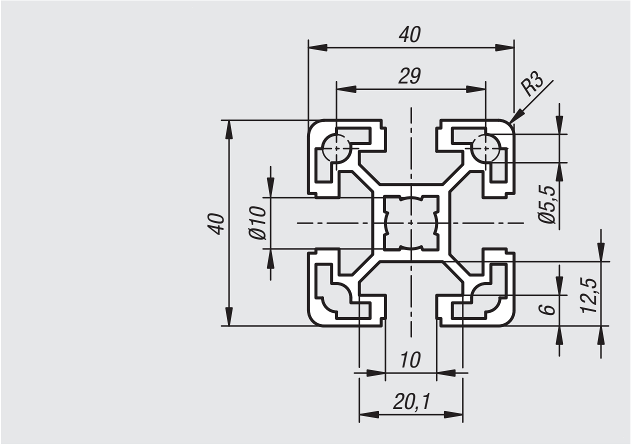
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10140-083060X****	8	30x60	19,66	5,09	6,55	3,39	5,53	6	1,49

10142

Aluminium profiles 40x40 light

Type B





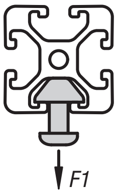
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10142-104040X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.

On request:
Mitre cuts 15°, 30° and 45°.

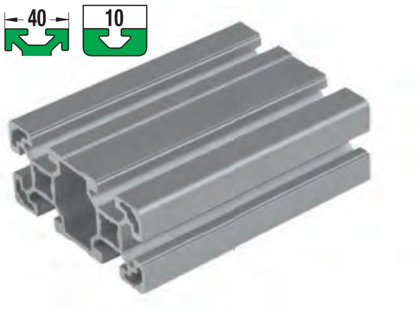


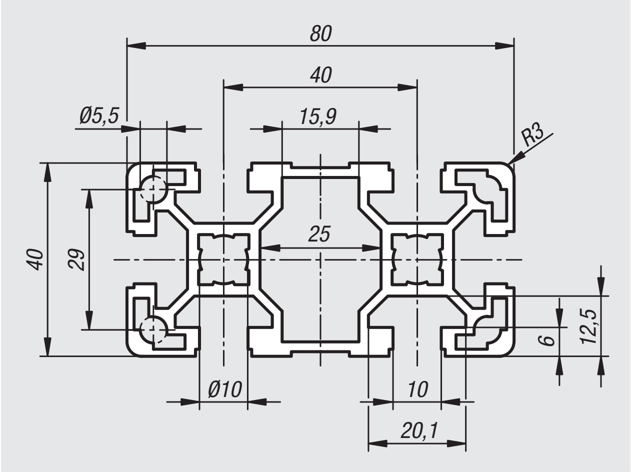
Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10142-104040X****	10	40x40	9,06	9,06	4,53	4,53	5,61	7	1,51

10142

Aluminium profiles 40x80 light

Type B





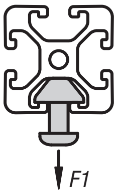
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10142-104080X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.

On request:
Mitre cuts 15°, 30° and 45°.



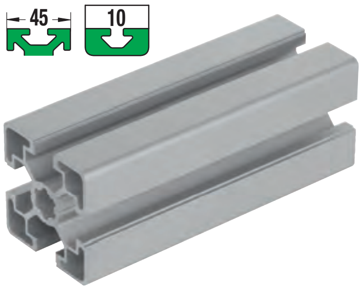
Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10142-104080X****	10	40x80	63,24	17,23	15,81	8,61	9,86	7	2,67

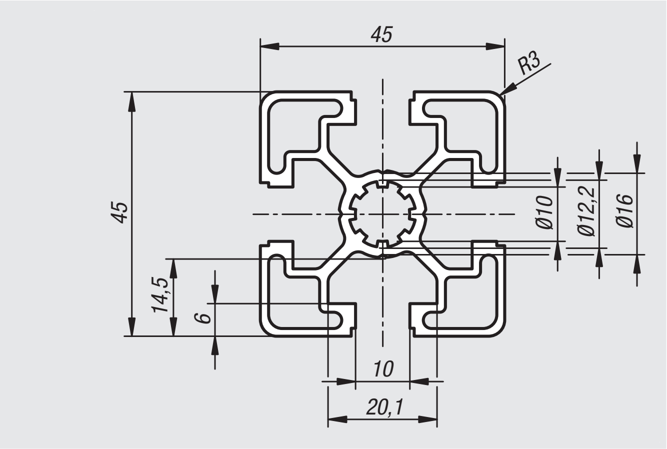
01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

10157

Aluminium profiles 45x45 light

Type B





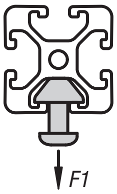
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10157-104545X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.

On request:
Mitre cuts 15°, 30° and 45°.

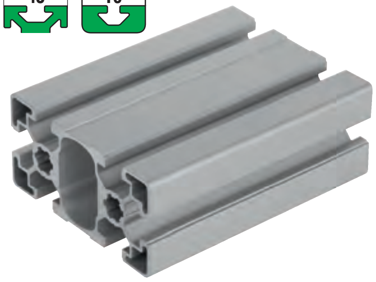


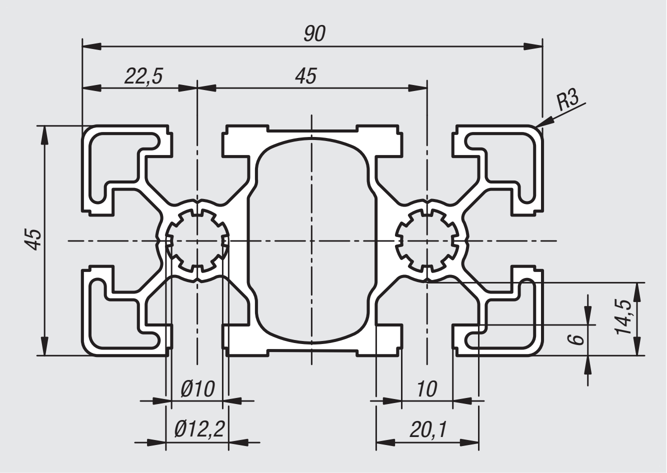
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10157-104545X****	10	45x45	11	11	4,89	4,89	5,73	7	1,55

10157

Aluminium profiles 45x90 light

Type B





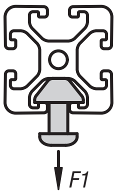
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10157-104590X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.

On request:
Mitre cuts 15°, 30° and 45°.



Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10157-104590X****	10	45x90	81,82	23,53	18,18	1,46	11,29	7	3,05

Aluminium profiles 90x90 light

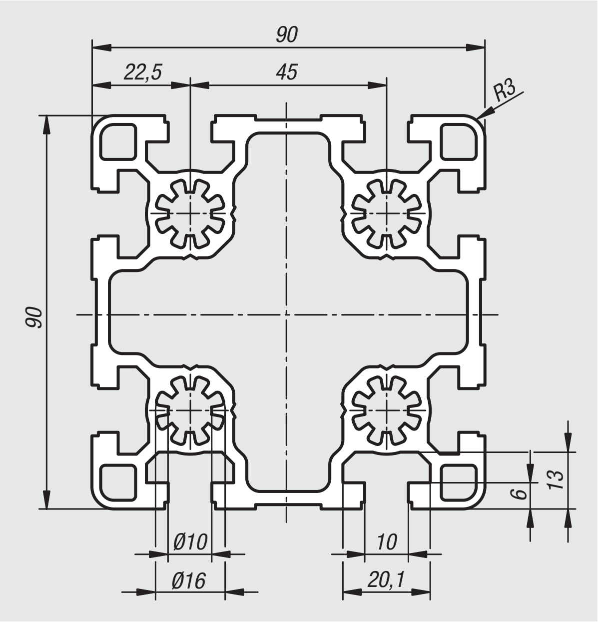
Type B

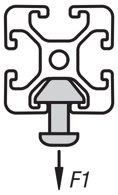
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10157-109090X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Lightweight aluminium profile for weight-optimised constructions.





On request:
Mitre cuts 15°, 30° and 45°.

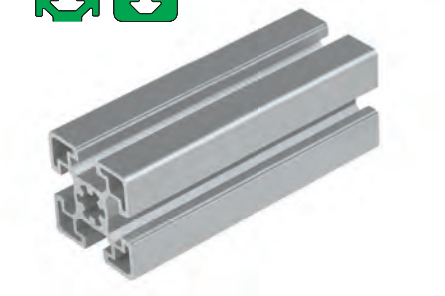
Order No.	Slot width	Profile	Ix cm⁴	Iy cm⁴	Wx cm³	Wy cm³	Profile area cm²	F1 max. kN	Approx. weight kg/m
10157-109090X******	10	90x90	210,5	210,5	46,78	46,78	23,46	12	6,34

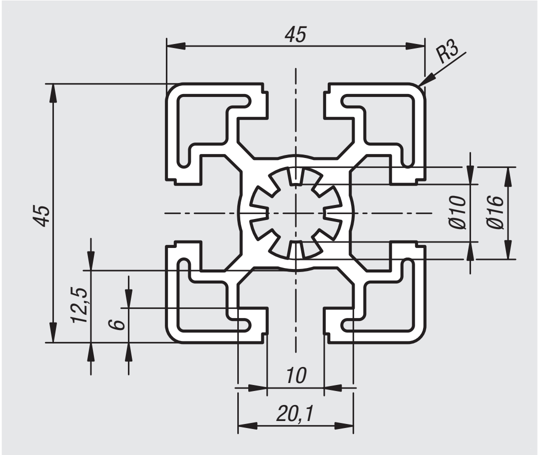
Notes

10160

Aluminium profiles 45x45

Type B





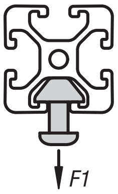
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10160-104545X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

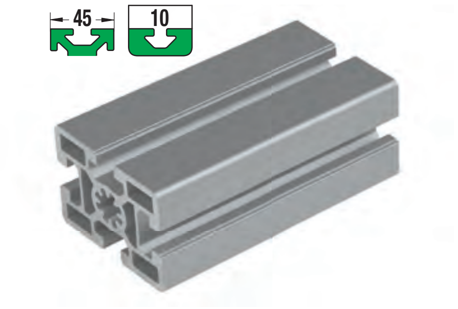


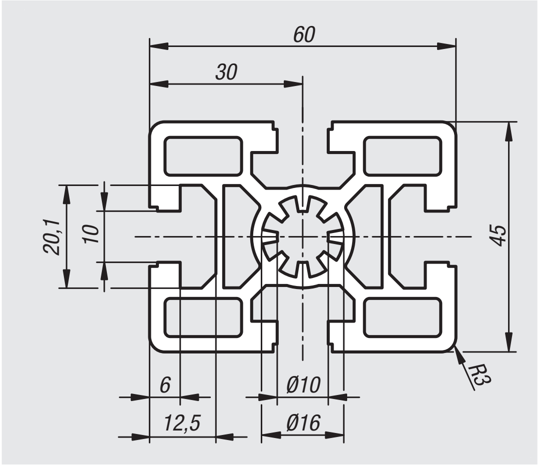
Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10160-104545X****	10	45x45	13,94	13,94	6,91	6,91	7,5	12	2,03

10160

Aluminium profiles 45x60

Type B





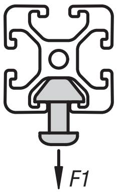
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10160-104560X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

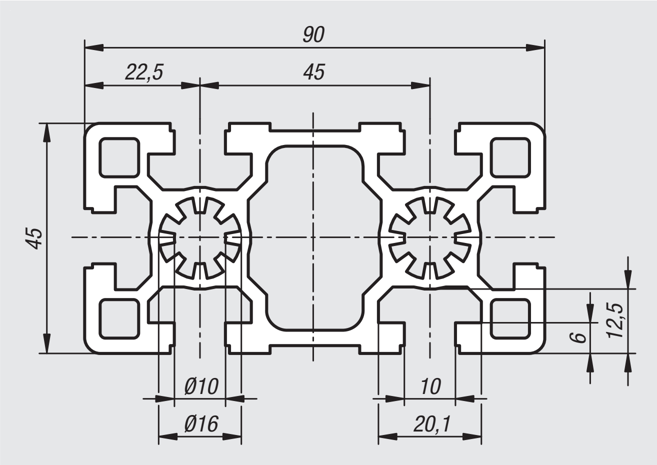


Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10160-104560X****	10	45x60	37,55	22,66	12,52	10,07	11,14	12	3,01

10160

Aluminium profiles 45x90

Type B



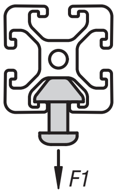
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10160-104590X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

On request:
Mitre cuts 15°, 30° and 45°.

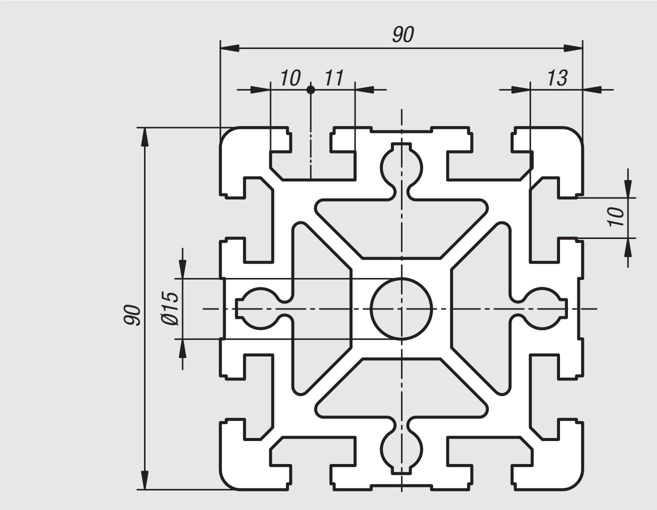


Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10160-104590X****	10	45x90	124,05	32,25	27,57	14,33	15,24	12	4,12

10160

Aluminium profiles 90x90

Type B



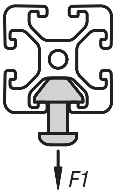
Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10160-109090X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
Aluminium profile for general constructions.

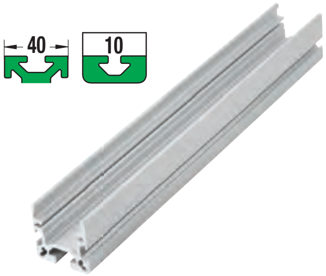
On request:
Mitre cuts 15°, 30° and 45°.

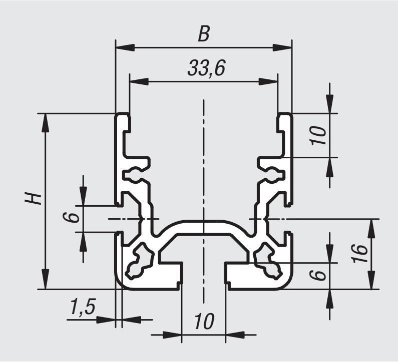


Order No.	Slot width	Profile	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	F1 max. kN	Approx. weight kg/m
10160-109090X****	10	90x90	301,96	301,96	67,07	67,07	38,93	18	10,51

Aluminium profiles 40x40

for roller rails, Type B





Material:
Aluminium EN AW-6063 T66 (AlMgSi 0.5 F25)

Version:
Artificially aged, natural colour anodised.

Sample order:
nlm 10161-104040X*
* Include length only in full mm increments.
Maximum available length 6000 mm.

Note:
The aluminium profile is matched to the roller elements.
As a result, roller rails and roller tracks can be realised.
The different inserts permit modular and flexible setup.

Order No.	Slot width	Profile	B	H	Ix cm^4	Iy cm^4	Wx cm^3	Wy cm^3	Profile area cm^2	Approx. weight kg/m
10161-104040X****	10	40x40	40	40	5,89	10,31	2,31	5,16	5,05	1,36

Notes

Connecting sets standard

Type I

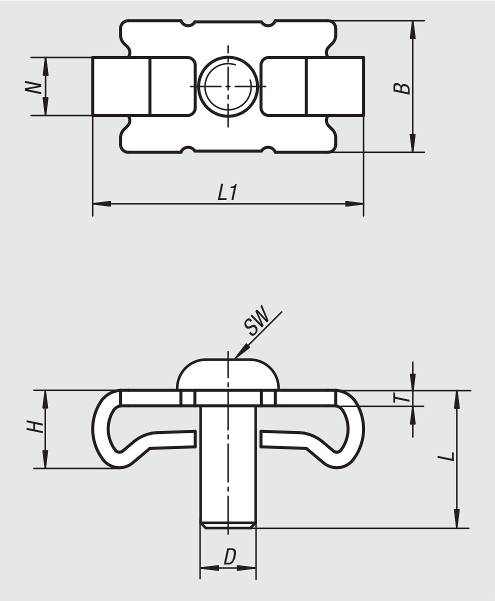
Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 10200-06

Note:
The connecting sets are used for connecting two aluminium profiles at right angles. The connection is non-rotating. For larger profiles several connecting sets can be mounted on the end for greater strength

Low workload. Cut a thread in the end face core hole. Drill a through hole for tightening the screw in the opposing profile.



1.

2.

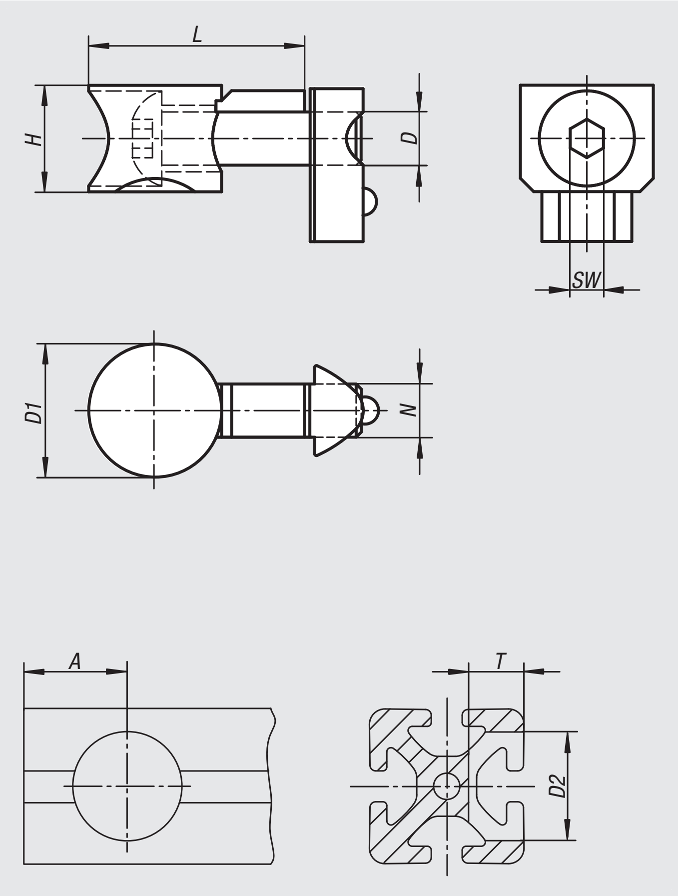
3.

Order No.	Type	Slot width	D	B	H	L	L1	N	T	SW
10200-06	I	6	M6	13	7,3	14	27,5	6	2	4
10200-08	I	8	M8	17	9,5	20	35	8	2	5

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Connecting sets universal

Type I



Material:
Connector die-cast zinc.
Screw and slot nuts steel.

Version:
Electro zinc-plated.

Sample order:
nlm 10202-06

Note:
The connecting sets are used for connecting two aluminium profiles at right angles. They allow a free positioning of profiles. The connection is non-rotating (the rotation lock can be broken off). For larger profiles several connecting sets can be mounted on the end for greater strength. Retrofitting into existing constructions is possible.

Low workload. The connecting set requires only one hole drilled in one end.

Order No.	Type	Slot width	D	D1	H	L	N	SW	A	D2	T
10202-06	I	6	M6	16	12,5	25,2	6,2	4	15	16	12,7
10202-08	I	8	M8	20	16	33,5	8	5	20	20	16

Connecting sets central

Type I

Material:
Steel.

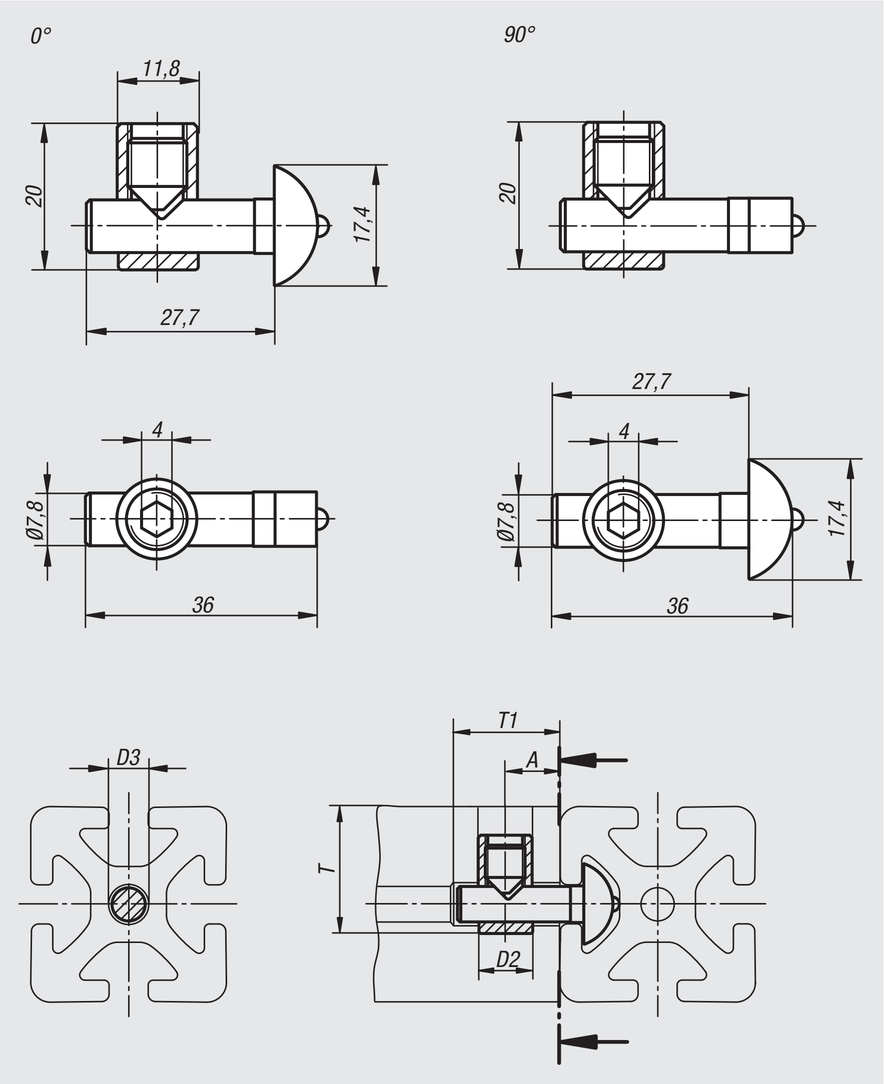
Version:
Electro zinc-plated.

Sample order:
nlm 10204-0800

Note:
The connecting sets are used to connect two aluminium profiles at right angles. They allow free position of the profiles. The profile slots positioned at right-angles to each other remain free. Panel elements can be positioned in the profile grooves without additional machining.

Due to the reduced clamping force and ommited rotation locks, these connecting sets should only be used in combination with panel elements and lightly loaded constructions.

Low workload. To assemble a hole must be drilled into one of the profiles and the core hole must be drilled out.



0°

90°

Order No.	Type	Slot width	Version	A	D2	D3	T	T1
10204-0800	I	8	0°	15	12	8	28	28
10204-0890	I	8	90°	15	12	8	28	28

10205

Connecting sets central

Type B

Material:
Steel.

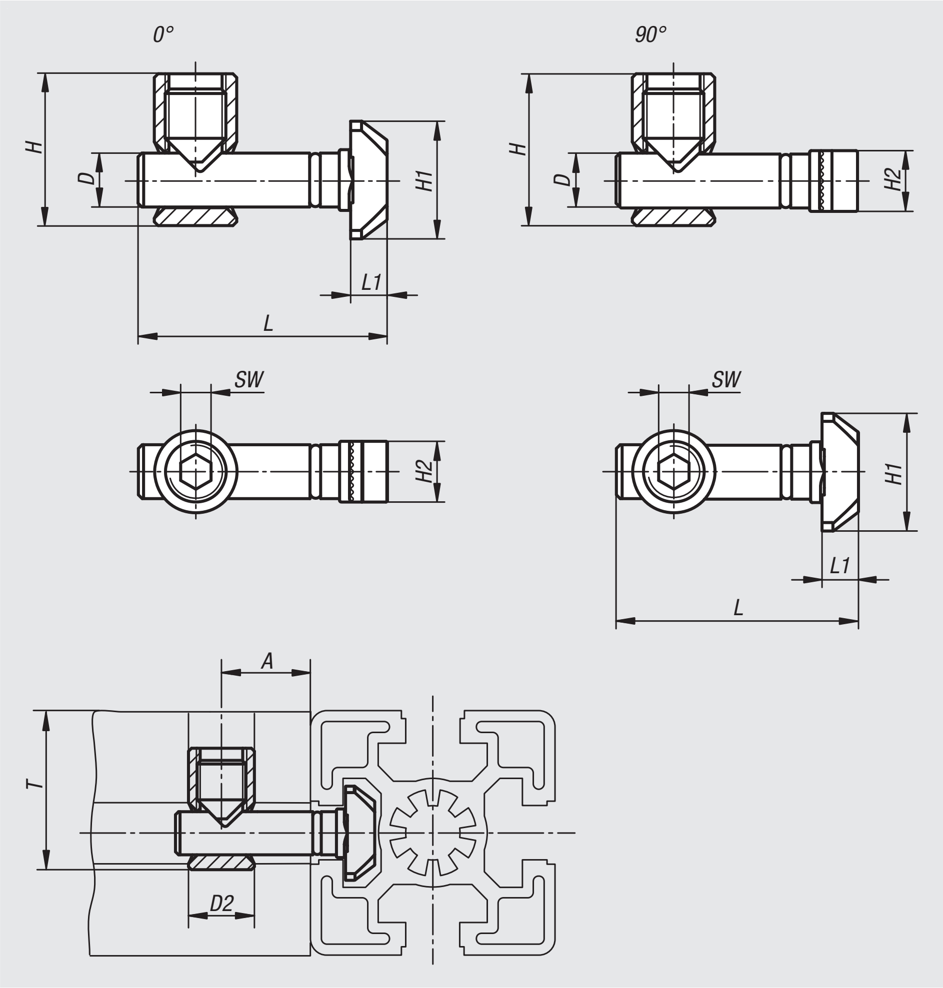
Version:
Electro zinc-plated.

Sample order:
nlm 10205-1000

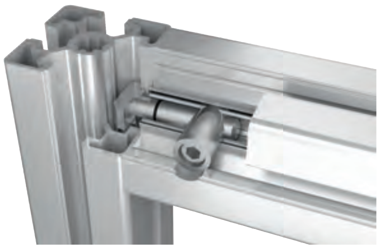
Note:
The connecting sets are used to connect two aluminium profiles at right angles. They allow free position of the profiles. The profile slots positioned at right-angles to each other remain free. Panel elements can be positioned in the profile slots without additional machining.

Due to the reduced clamping force and omitted rotation locks, these connecting sets should only be used in combination with panel elements and lightly loaded constructions.

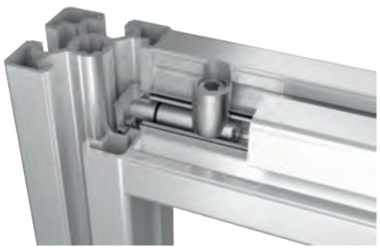
Low workload. To assemble a hole must be drilled into one of the profiles. The D2 hole can also be drilled through.



0°



90°



Order No.	Type	Slot width	Version	A	D	D2	H	H1	H2	L	L1	SW	T for profile 30	T for profile 40	T for profile 45	T for profile 50	T for profile 60
10205-0800	B	8	0°	18	7,1	11	20	15,5	8	33	4,8	4	22	-	-	-	-
10205-0890	B	8	90°	18	7,1	11	20	15,5	8	33	4,8	4	22	-	-	-	-
10205-1000	B	10	0°	22,5	9,7	17	28	19,5	10	45,5	5,5	6	-	31	34	36	41
10205-1090	B	10	90°	22,5	9,7	17	28	19,5	10	45,5	5,5	6	-	31	34	36	41

Connecting sets central

Type B

Material:
Steel.

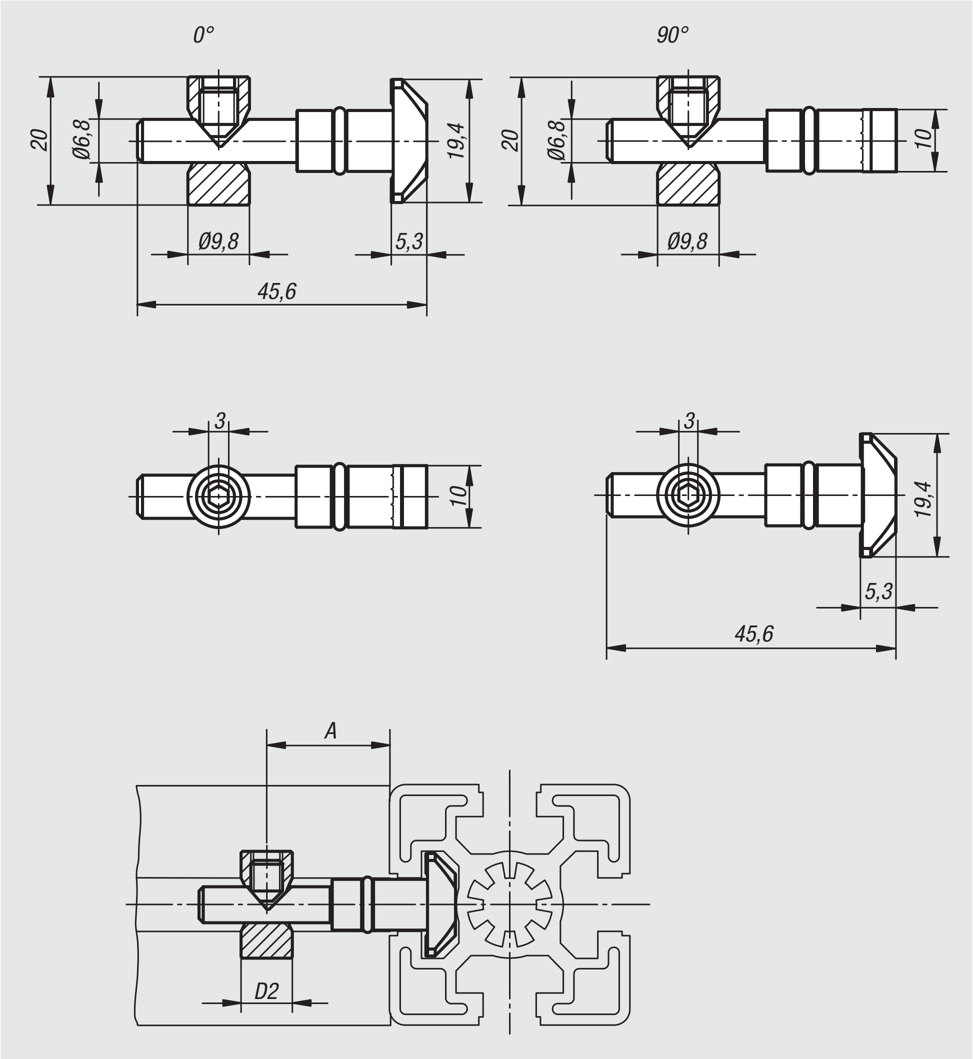
Version:
Electro zinc-plated.

Sample order:
nlm 10206-1000

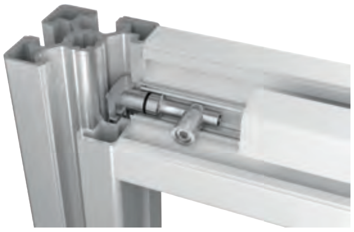
Note:
The connecting sets are used to connect two aluminium profiles at right angles. They allow free position of the profiles. The profile slots positioned at right-angles to each other remain free. Panel elements can be positioned in the profile slots without additional machining.

Due to the reduced clamping force and omitted rotation locks, these connecting sets should only be used in combination with panel elements and lightly loaded constructions.

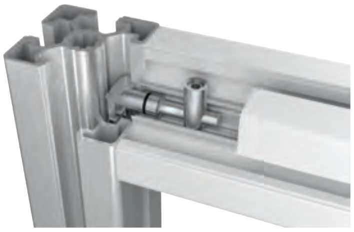
Low workload. To assemble a hole must be drilled into one of the profiles. Due to the reduced pin diameter the slot is not damaged and can be completely covered with a cover profile.



0°



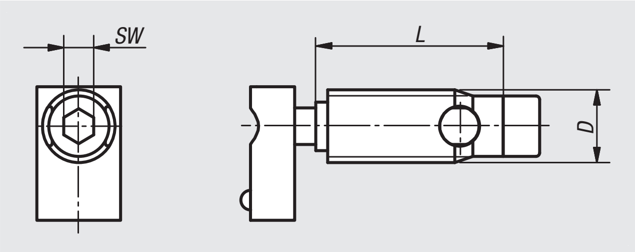
90°



Order No.	Type	Slot width	Version	A	D2
10206-1000	B	10	0°	22,5	9,8
10206-1090	B	10	90°	22,5	9,8

Connecting sets automatic

Type I



Material:
Steel.

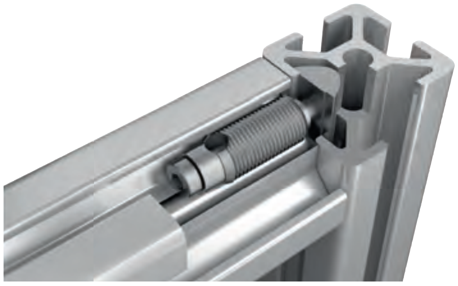
Version:
Electro zinc-plated.

Sample order:
nlm 10210-06

Note:
The connecting sets are used to connect two aluminium profiles at right angles. They allow free position of the profiles.

No profile machining is necessary. The connector is screwed into the profile slot from the front (left-hand thread). The connector has a self-tapping thread. The use of lubricants is recommended.

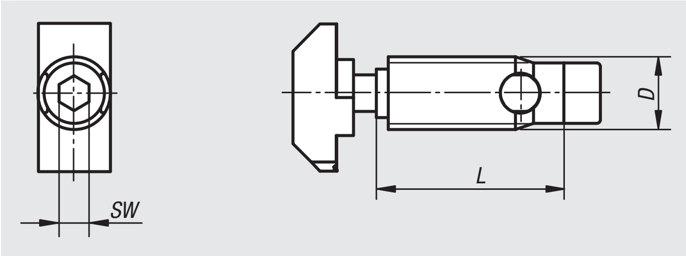
Connecting sets automatic should always be used opposite each other in pairs.



Order No.	Type	Slot width	D	L	SW
10210-06	I	6	10	27	4
10210-08	I	8	12	31	5

Connecting sets automatic

Type B



Material:
Steel.

Version:
Electro zinc-plated.

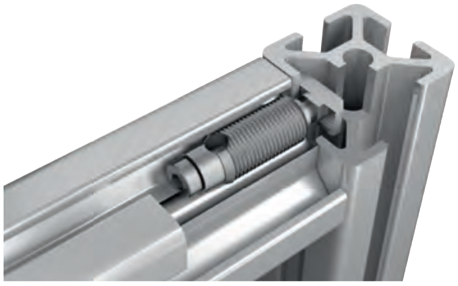
Sample order:
nlm 10212-1012

Note:
The connecting sets are used to connect two aluminium profiles at right angles. They enable free positioning of the profiles.

No machining of the profile is required. The connector is screwed into the profile slot from the front (left-hand thread). The connector has a self-tapping thread. The use of lubricants is recommended.

Automatic connecting sets should always be used opposite each other in pairs.

Connecting set for slot width 8 has a flattened thread to prevent protruding after installation.



Order No.	Type	Slot width	D	L	SW
10212-0810	B	8	10,7	24	4
10212-1012	B	10	12	35	5
10212-1013	B	10 light	13	35	5

10215

Pin connector sets

Type B

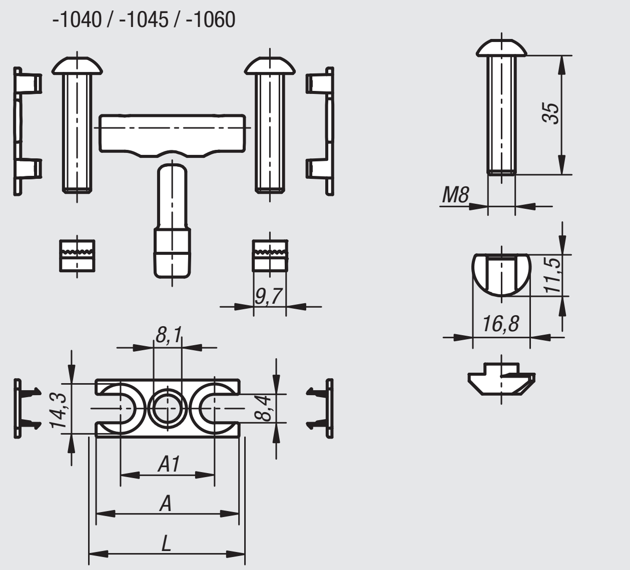
Material:
Pins, screws and T-nuts steel.
Locating pin und end caps polyamide, fibreglass reinforced.

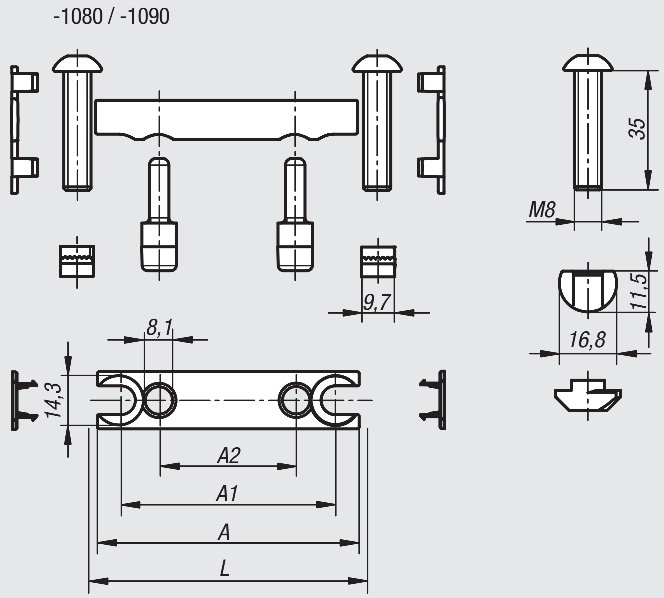
Version:
Pins, screws and T-nuts electro zinc-plated.
Locating pin and end caps black.

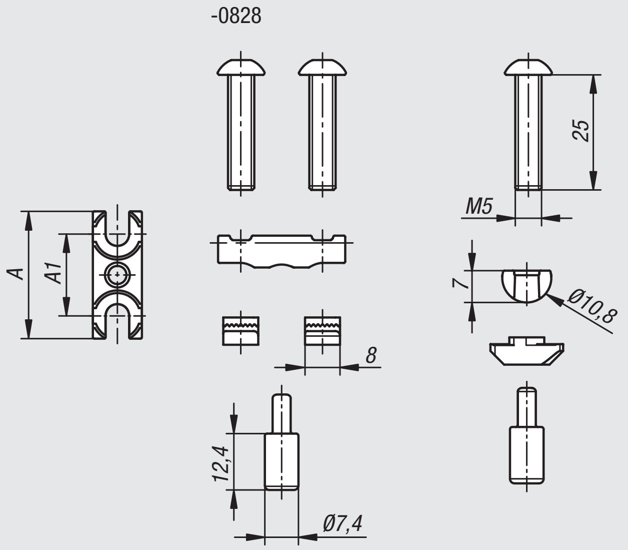
Sample order:
nlm 10215-1040

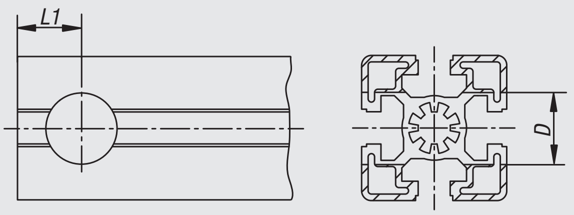
Note:
The connecting sets are used to connect two aluminium profiles at right angles. They allow free position of the profiles. Suitable for high loads and torsional forces.

Low processing workload. The connecting set requires only one Ø17 mm hole drilled in one end for installation.
The connecting set 10215-0828 requires only one Ø11 mm hole drilled in one end for installation.







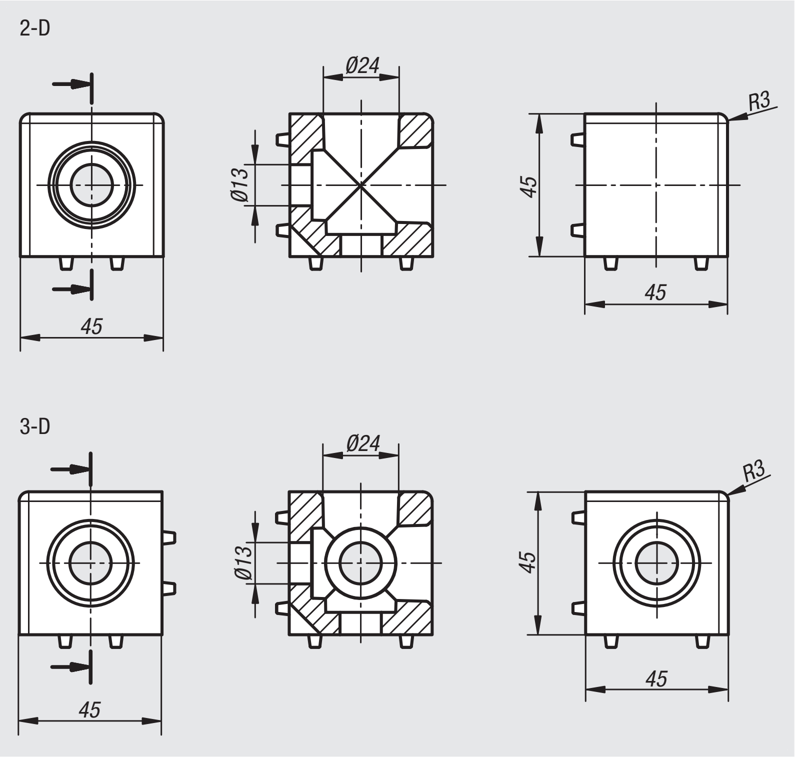


Order No.	Type	Slot width	A	A1	A2	D	L	L1
10215-0828	B	8	28	18	-	11	-	18
10215-1040	B	10	37	23	-	17	40	22,5
10215-1045	B	10	42	28	-	17	45	22,5
10215-1060	B	10	57	43	-	17	60	22,5
10215-1080	B	10	77	63	40	17	80	22,5
10215-1090	B	10	87	73	45	17	90	22,5

10220

Cube connector sets

Type B



Material:
Cube die-cast aluminium.
Screws steel.
End caps polyamide.

Version:
Aluminium bright.
Screws with self-tapping thread.
End cap black.

Sample order:
nlm 10220-102

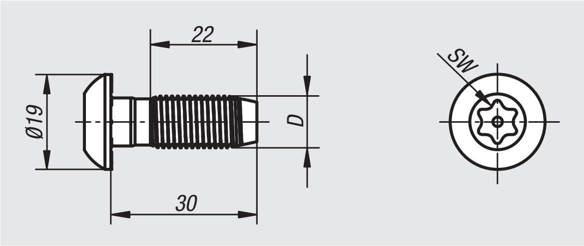
Note:
The cube connector can be used to connect two or three profiles to each other by the end faces. The cube connectors have guide lugs that ensure a perfect and secure installation. Fastening to the profile is carried out by self-tapping screws. The open holes can be closed off with the end caps.

The profile slots positioned at right-angles to each other remain free. Panel elements can be positioned in the profile slots without additional machining.

Order No.	Type	Slot width	Version
10220-102	B	10	2-D
10220-103	B	10	3-D

Central screws

Type B

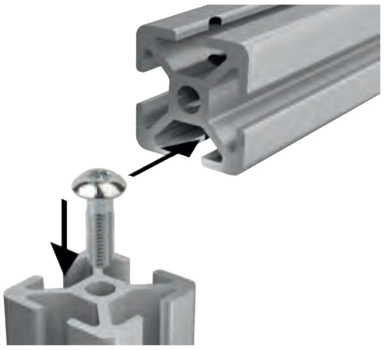


Material:
Steel.

Version:
Electro zinc-plated.

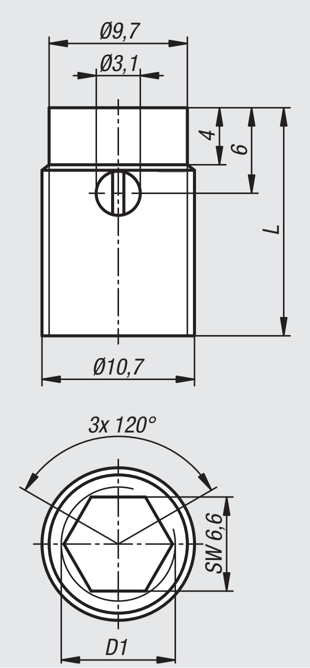
Sample order:
nlm 10228-1012

Note:
Self-tapping screw for end face core hole. Ideal for fastenings without an angle or additional connectors not exposed to high loads.



Order No.	Type	Slot width	D	SW
10228-1012	B	10	S12	T50

Threaded insert, steel, self-tapping, type B



Material:
Steel.

Version:
Steel, case hardened, electro zinc-plated.

Sample order:
nlm 10228-01-08

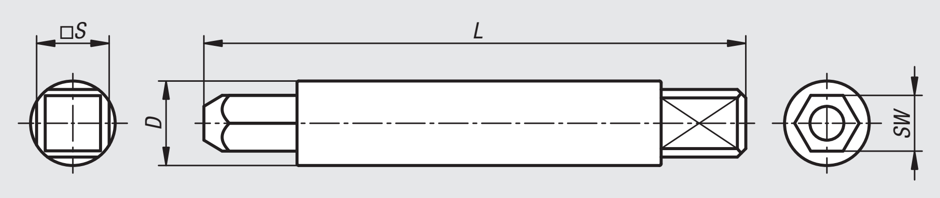
Note:
Self-tapping threaded inserts for making high-strength, wear-free, vibration-resistant fastenings in aluminium profiles.
To reduce the thread size from M10 to M8.
Only suitable for aluminium profiles with a core hole diameter of 10 mm.

Accessories:
Assembly tool 10228-01-808.
Aluminium profiles type B, e.g. 10157

Order No.	D1	L	for Art. No.
10228-01-08	M8	16	10228-01-808

Assembly tool, steel,

for self-tapping threaded inserts type B



Material:
Steel.

Version:
Manual assembly tool, electro zinc-plated.

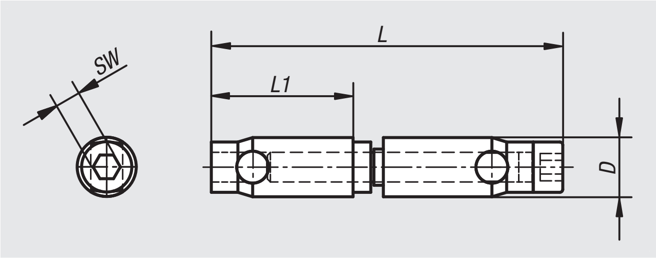
Sample order:
nlm 10228-01-808

Note:
Inserts are screwed in using this manual assembly tool together with a tap wrench, socket set, cordless screwdriver etc.

Order No.	SW	L length	S	D
10228-01-808	6,6	64	8	10

Butt connector sets automatic

Type I



Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 10230-06

Note:
The connecting sets are used to connect two aluminum profiles of the same series from the front.

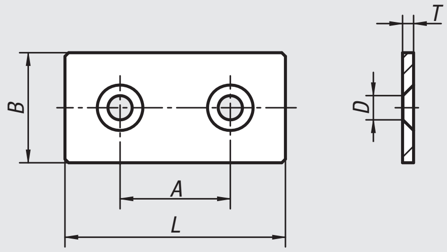
No machining of the profile is necessary. The connector is screwed into the profile slot from the front (connector with through hole left-hand thread. Connector with internal thread right-hand thread). The connector has a self-tapping thread. The use of lubricants is recommended.

Automatic connecting sets should always be used in pairs. More pairs are required for large profiles and loads.

Order No.	Type	Slot width	D	L	L1	SW
10230-06	I	6	10	60	24	4
10230-08	I	8	12	69	27	5

10240

Straps



Material:
Steel.

Version:
black powder-coated.

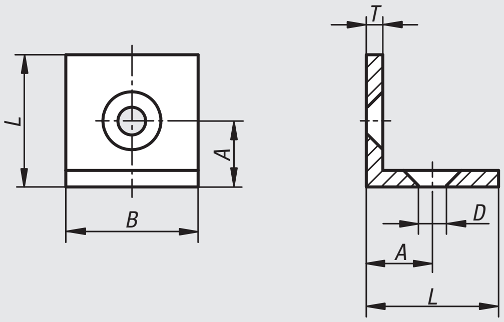
Sample order:
nlm 10240-061

Note:
Universal fastening element for a rigid connection and linkage of profiles, panel elements or lightweight shelving.

Order No.	Type	Slot width	A	B	D for screw	L	T
10240-061	I	6	30	30	M6	60	3
10240-081	B & I	8/10	40	40	M8	80	5
10240-101	B	8/10	45	45	M8	90	5

10242

Angles



Material:
Steel.

Version:
black powder-coated.

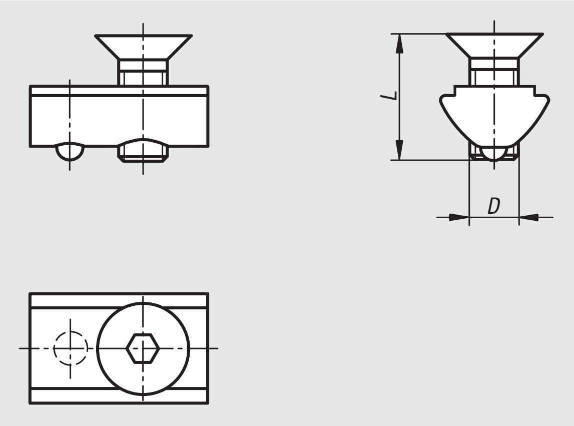
Sample order:
nlm 10242-061

Note:
Universal fastening element for a rigid connection and linkage of profiles, panel elements or lightweight shelving.

Order No.	Type	Slot width	A	B	D for screw	L	T
10242-061	I	6	15	30	M6	30	3
10242-081	I	8/10	20	40	M8	40	5

Fastening sets

for straps und angles



Material:
Steel.

Version:
Slot key electro zinc-plated.
Screw electro zinc-plated, black.

Sample order:
nlm 10244-06

Note:
Consists of two DIN 7991 countersunk screws and two slot nuts.

Order No.	Version 1	Version 2	Slot width	D	L
10244-06	type I	slot key with step	6	M6	10
10244-08	type I	slot key with step	8	M8	14

10250

Angle sets

Type I

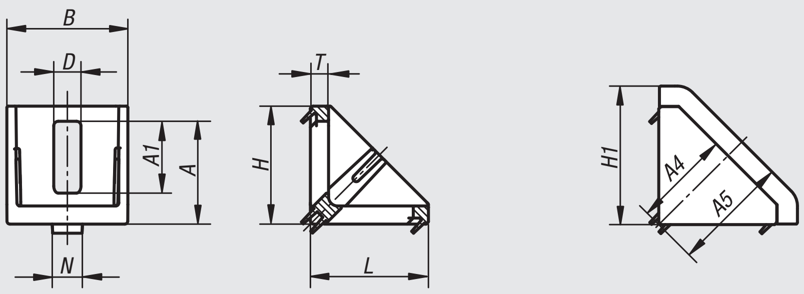
Material:
Angle die-cast zinc.
Screws and slot nuts steel.
End cap polyamide, fibreglass reinforced.

Version:
Angle painted aluminium tone.
Screws and slot nuts electro zinc-plated.
End cap black.

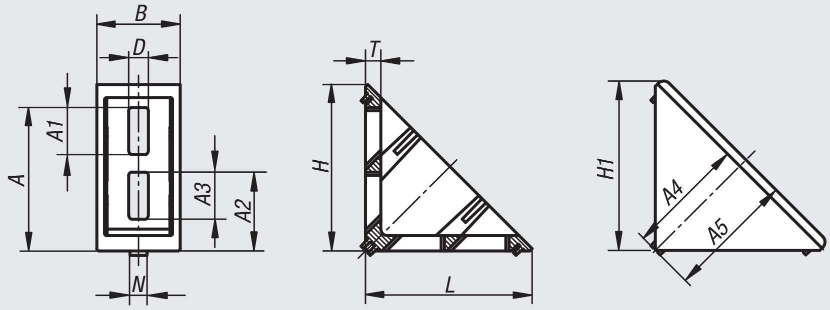
Sample order:
nlm 10250-063030

Note:
Suitable for reinforcing profile constructions and for frictional connection of profiles with each other without machining. Can also be used as fastening element (e.g. bracket) for any components.
The angles have centring lugs for accurate and twist-proof mounting. The centring lugs can be removed if necessary by breaking off i.e. for mounting plates. The open side can be closed off with the end cap.

30x30 / 40x40



40x80

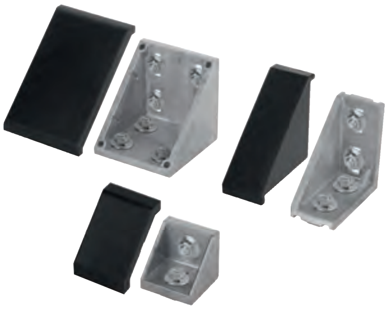


Order No.	Type	Slot width	Version	A	A1	A2	A3	A4	A5	B	D	H	H1	L	N	T
10250-063030	I	6	30x30	22,5	11	-	-	23	27	28	6,5	28	32	28	6	4
10250-084040	I	8	40x40	34	24	-	-	32,5	39	40	9	39	46	39	8	6
10250-088080	I	8	40x80	65,5	21,5	36	21,5	54,5	58,5	38	9	76	78	76	8	7

10252

Angle sets

Type B



Material:
Angle die-cast aluminium.

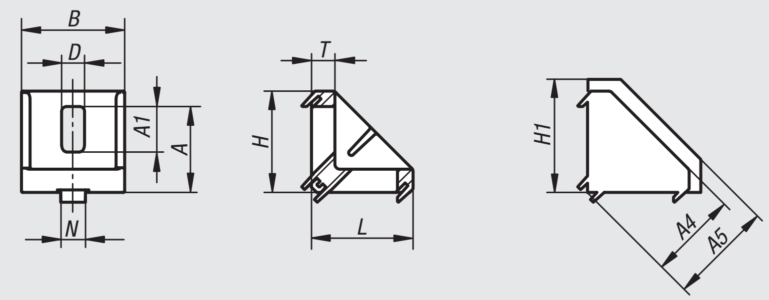
Screws and slot nuts steel.
End cap polyamide, fibreglass reinforced.

Version:
Angle bright.
Screws and slot nuts electro zinc-plated.
End cap black.

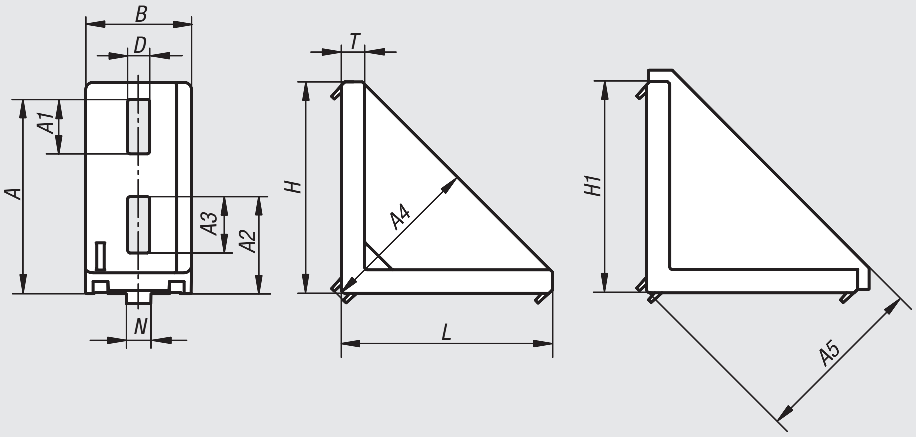
Sample order:
nlm 10252-104040

Note:
Suitable for reinforcing profile constructions and for frictional connection of profiles with each other without machining. Can also be used as fastening element (e.g. bracket) for any components.
The angles have centring lugs for accurate and twist-proof mounting.
The centring lugs can be removed if necessary by breaking off i.e. for mounting plates. The open side can be closed off with the end cap.

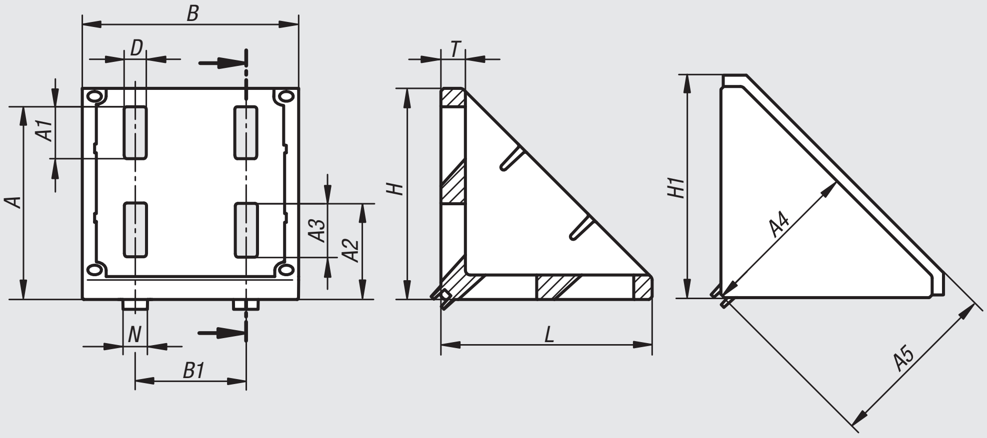
30x30 / 40x40 / 45x45



30x60 / 40x80 / 45x90



80x80 / 90x90



Order No.	Type	Slot width	Version	A	A1	A2	A3	A4	A5	B	B1	D	H	H1	L	N	T
10252-083030	B	8	30x30	22	9,5	-	-	23	29	28	-	6,4	27	30	27	8	6
10252-083060	B	8	30x60	51	11	23	11	44	49	28	-	6,4	57	61	57	8	5,5
10252-104040	B	10	40x40	29,5	20,5	-	-	29,5	36,5	38	-	9	36	41,5	36	10	5,5
10252-104545	B	10	45x45	35	18,5	-	-	35	44,5	42	-	9	41	50,5	41	10	9,5
10252-104080	B	10	40x80	68	20	35	23	59	64	38	-	9	76	80	76	10	8,5
10252-104590	B	10	45x90	79	22	39,5	23	67	72	43	-	9	86	90	86	10	9,5
10252-108080	B	10	80x80	68,5	20	35	20	58,5	65	74	40	9	76	82,5	76	10	8
10252-109090	B	10	90x90	78,5	21	39	22	67	75	88	45	9	86	94,5	86	10	10

10260

Angle elements T1

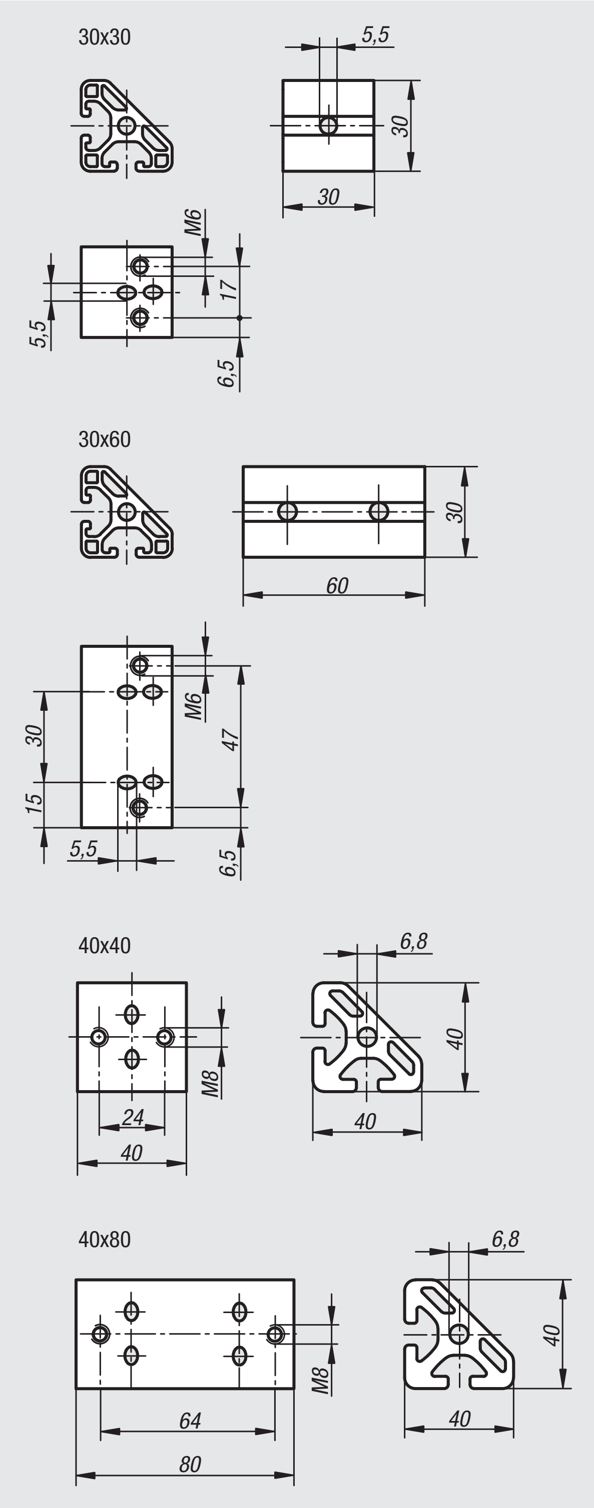
Type I

Material:
Aluminium.

Version:
anodised.

Sample order:
nlm 10260-063030

Note:
Angle element for fastening a profile at a 45° angle and for making struts or ties.
The angle element can be fastened with a universal connector set (remove rotation lock) and with ISO 7380 round-head screws.

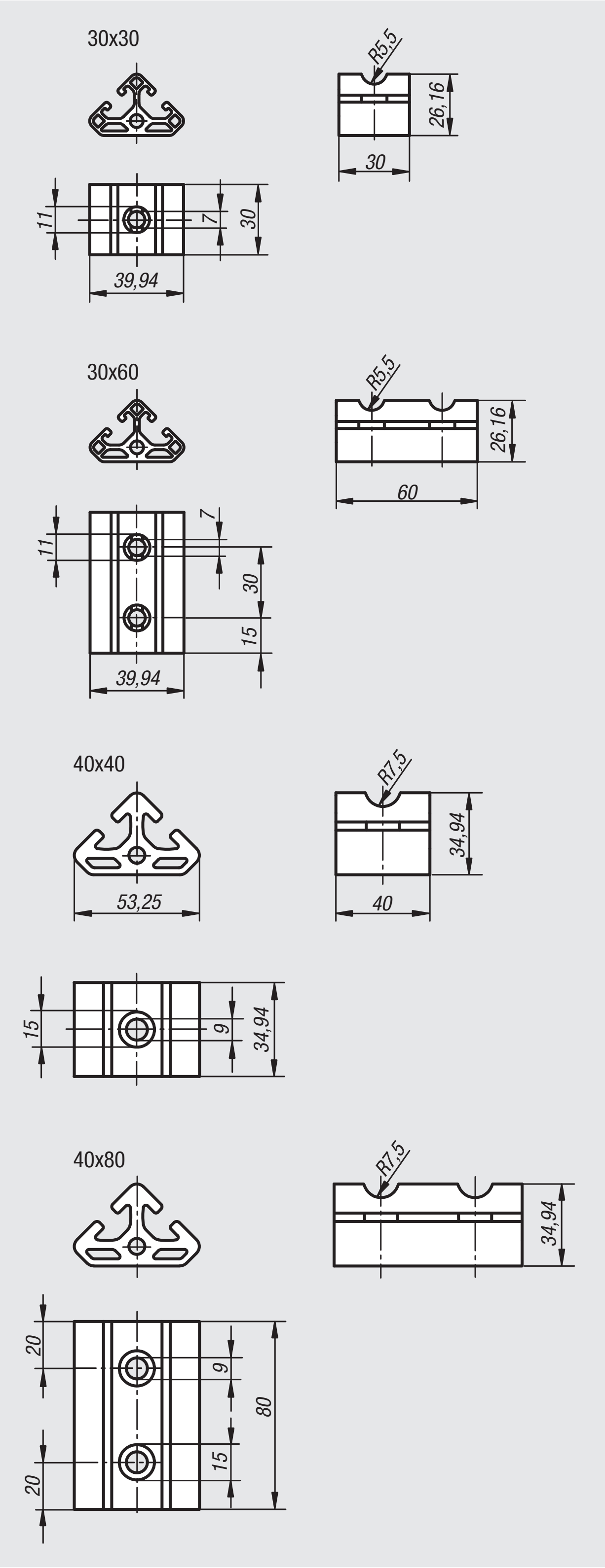


Order No.	Type	Slot width	Version
10260-063030	I	6	30x30
10260-063060	I	6	30x60
10260-084040	I	8	40x40
10260-084080	I	8	40x80

10261

Angle elements T2

Type I



Material:
Aluminium.

Version:
anodised.

Sample order:
nlm 10261-063030

Note:
Angle element for fastening two profiles at a 45° angle and for making struts or ties.
The angle element can be fastened with universal connector sets and ISO 7380 round-head screws.

Order No.	Type	Slot width	Version
10261-063030	I	6	30x30
10261-063060	I	6	30x60
10261-084040	I	8	40x40
10261-084080	I	8	40x80

10265

Clamping angles

Type I

Material:
Clamping angle die-cast zinc.
Grip die-cast zinc DIN EN 12844. Steel parts stainless steel 1.4305.
Cam lever cast aluminium. Body steel.

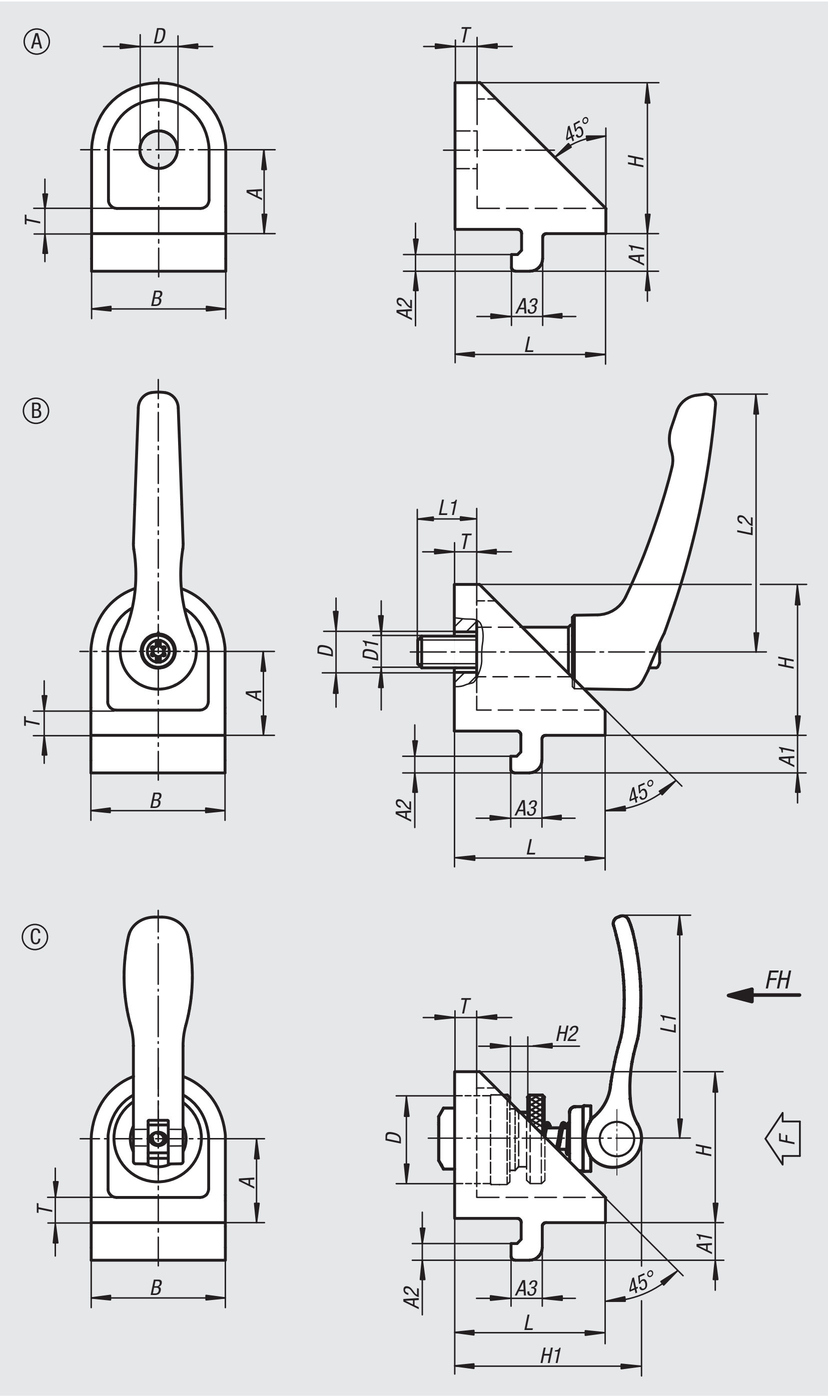
Version:
Clamping angle painted aluminium tone.
Handle powder-coated. Stainless steel bright.
Slot key electro zinc-plated.
Cam lever black powder-coated, steel parts black oxidised.

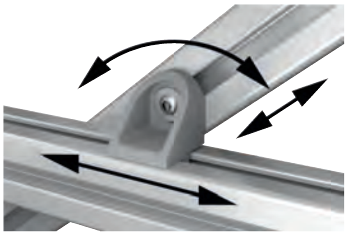
Sample order:
nlm 10265-06

Note:
The clamping angles are used for connecting two profiles of the same series that have contact on the side faces and cross at any angle.

Loosening the screw releases both clamps allowing free rotation and sliding along the slots.

The clamping angles are generally used in pairs or in combination with a joint angle.





Order No.	Type	Slot width	Form	Version 1	A	A1	A2	A3	B	D	D1	H	H1	H2	L	L1	L2	T
10265-06	I	6	A	-	15	6,3	3	5,7	24	7	-	27	-	-	27	-	-	5
10265-08	I	8	A	-	20	9	4	7,5	32	9	-	36	-	-	36	-	-	6
10265-0606	I	6	B	with clamping lever	15	6,3	3	5,7	24	7	M6	27	-	-	27	13	40	5
10265-0808	I	8	B	with clamping lever	20	9	4	7,5	32	9	M8	36	-	-	36	18	65	6
10265-0615	I	6	C	with eccentric clamp	15	6,3	3	5,7	24	15	-	27	34	6	27	36,2	-	5
10265-0820	I	8	C	with eccentric clamp	20	9	4	7,5	32	20	-	36	44	8	36	52,3	-	6

Joint angles

Type I

Material:
Joint angle die-cast zinc.
Pivot bush steel.

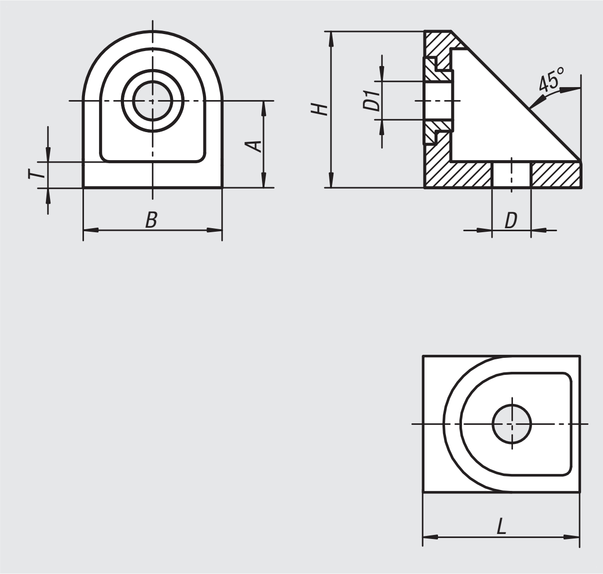
Version:
Joint angle painted aluminium tone.
Pivot bush electro zinc-plated.

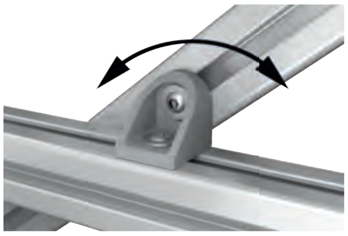
Sample order:
nlm 10266-06

Note:
The joint angles are used for connecting two profiles of the same series that have contact on the side faces and cross at any angle.

The joint angle acts as a fixed pivot point for the crossed profiles. When the screw is tightened the profile can still be freely rotated around the pivot bush.

The joint angles are generally used in combination with a clamping angle.



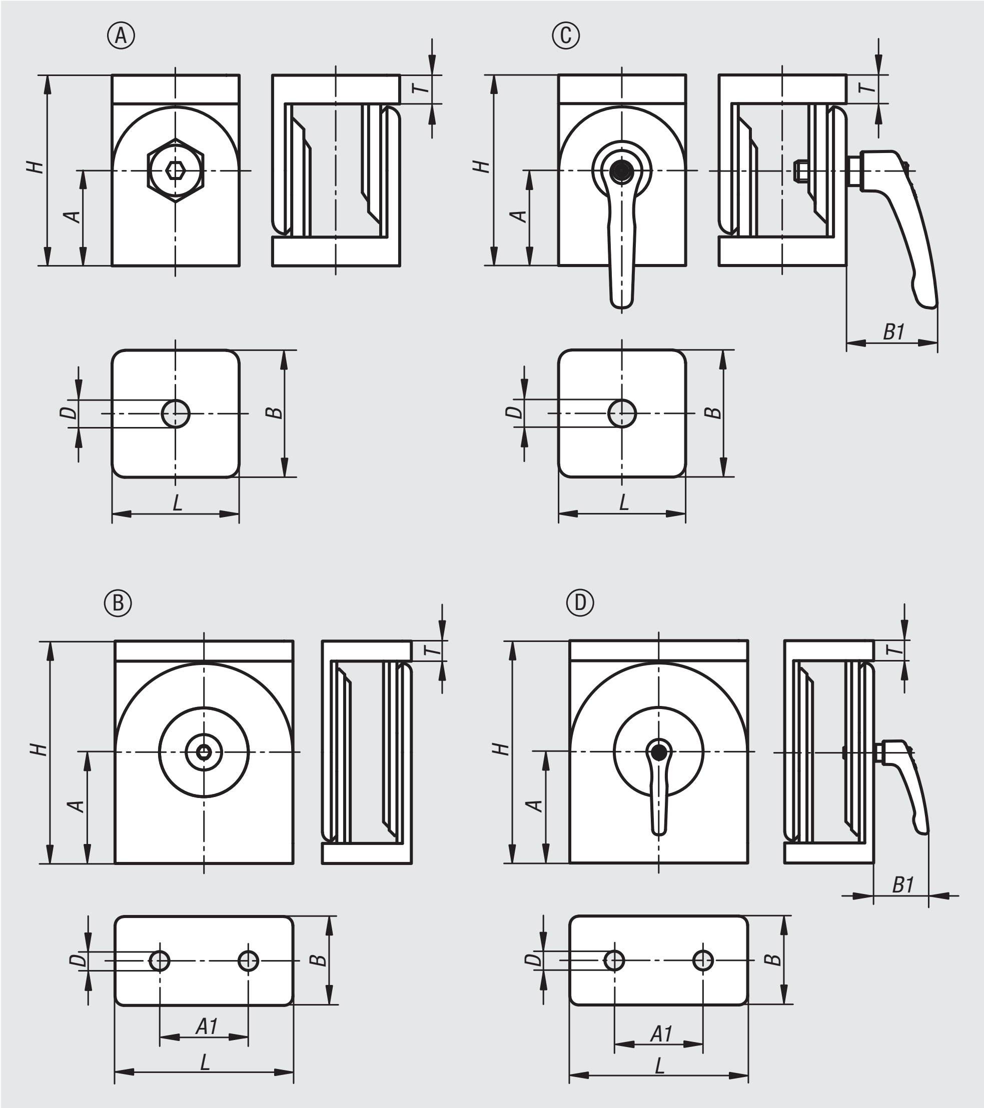


Order No.	Type	Slot width	A	B	D	D1	H	L	T
10266-06	I	6	15	24	7	6,5	27	27	5
10266-08	I	8	20	32	9	8,8	35,2	36	5,5

10270

Joints

Type B and Type I



Material:
Joint die-cast zinc.
Fastenings die-cast zinc.
Spacer rings stainless steel.
Tapped bushes and countersunk screws steel.
Handle die-cast zinc DIN EN 12844. Metal parts stainless steel 1.4305.

Version:
Joint painted aluminium tone.
Fasteners electro zinc-plated.
Spacer rings bright.
Tapped bushes and countersunk screws electro zinc-plated.
Handle powder-coated. Steel parts bright stainless steel.

Sample order:
nlm 10270-063030

Note:
Joints for connecting two profiles at any angle.
The adjustment range is 0° to 180°. The joint can also be used as a heavy hinge.

When the spacer rings are inserted, the joint can move freely. When these are removed, the joint can be used as a rigid angle element. The joints are particularly suitable for use as adjustable brackets, swivel arms or similar applications.

Joints

Type B and Type I

Joints without clamping levers

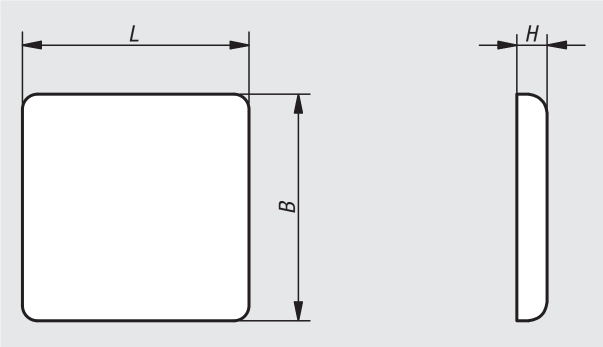
Order No.	Type	Slot width	Form	A	A1	B	D	H	L	T
10270-063030	I	6	A	22,5	-	30	6,4	45	30	7
10270-084040	I	8	A	30	-	40	8,4	60	40	9
10270-084080	I	8	B	50	40	40	8,4	100	80	9
10270-083030	B	8	A	22,5	-	30	8,3	45	30	7
10270-104545	B	10	A	30	-	45	8,5	60	45	8
10270-104590	B	10	B	50	45	45	8,5	100	90	9

Joints with clamping levers

Order No.	Type	Slot width	Form	A	A1	B	B1	D	H	L	T
10270-1063030	I	6	C	22,5	-	30	31	6,4	45	30	7
10270-1084040	I	8	C	30	-	40	31	8,4	60	40	9
10270-2084080	I	8	D	50	40	40	31	8,4	100	80	9
10270-1104545	B	10	C	30	-	45	42,5	8,5	60	45	8
10270-2104590	B	10	D	50	45	45	42,5	8,5	100	90	9

End caps

Type B and Type I



Material:
Polyamide fibreglass reinforced.

Version:
black.

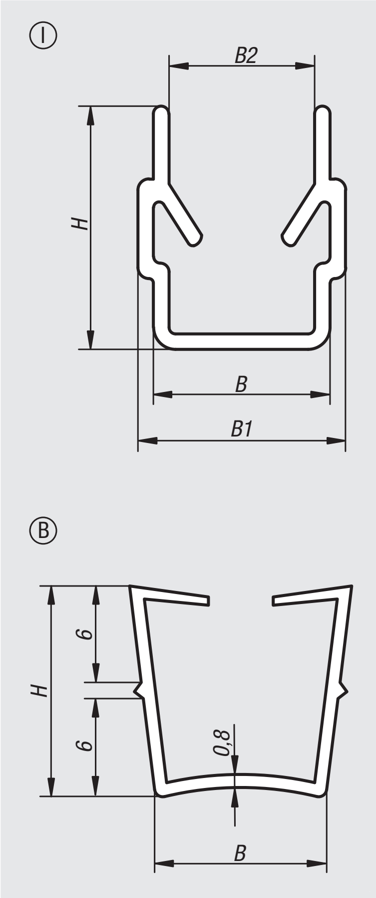
Sample order:
nlm 10300-06303011

Note:
Round edged covers with rotation lock for covering the profile ends. Prevents dirt from penetrating and avoids injuries. Simple clip-on mounting.

Order No.	Type	Slot width	Profile	B	L	H
10300-06303011	I	6	30x30	30	30	3
10300-06306011	I	6	30x60	30	60	3
10300-06606011	I	6	60x60	60	60	3
10300-08164011	I	8	16x40	16	40	4
10300-08404011	I	8	40x40	40	40	4
10300-08408011	I	8	40x80	40	80	4
10300-08808011	I	8	80x80	80	80	4
10300-08303021	B	8	30x30	30	30	4
10300-08306021	B	8	30x60	30	60	4
10300-10404021	B	10	40x40	40	40	4
10300-10408021	B	10	40x80	40	80	4
10300-10454521	B	10	45x45	45	45	4
10300-10456021	B	10	45x60	45	60	4
10300-10459021	B	10	45x90	45	90	4
10300-10909021	B	10	90x90	90	90	4

Cover and adapter profiles

Type B and Type I

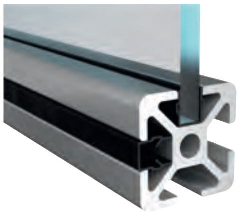


Material:
Type I polypropylene.
Type B polypropylene + TPE.

Version:
black or bright.

Sample order:
nlm 10315-06120351

Note:
The cover and adapter profile made of flexible plastic are used for two different applications. As a cover profile it seals the profile slots against dust and dirt. As an adapter profile with the open side facing out it is used to hold panel elements.

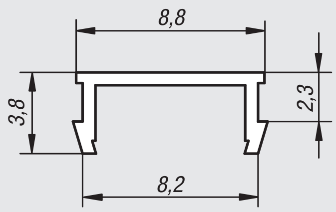


Order No.	Main colour	Type	Slot width	B	B1	B2	H	Length	Panel element
10315-06120351	black	I	6	6	7	4,4	9,1	2000	2,0 - 3,5
10315-06120350	natural	I	6	6	7	4,4	9,1	2000	2,0 - 3,5
10315-08120601	black	I	8	8	9,4	6,6	9,1	2000	2,0 - 6,0
10315-08140601	black	I	8	8	9,4	6,6	11	2000	4,0 - 6,0
10315-08140600	natural	I	8	8	9,4	6,6	11	2000	4,0 - 6,0
10315-10220601	black	B	10	10	-	-	13	2000	2,0 - 6,0

10320

Cover profiles

Type I



Material:
PVC.

Version:
black.

Sample order:
nlm 10320-0811

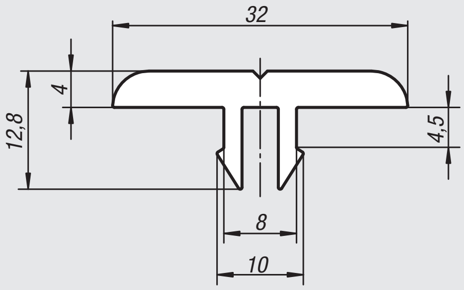
Note:
The cover profile made of flexible plastic is used as a cover for the profile slots to protect against dust and dirt.

Order No.	Type	Slot width	Length
10320-0811	I	8	2000

10330

Slide rails

Type I



Material:
Polyethylene-HD.

Version:
black.

Sample order:
nlm 10330-081321

Note:
Low-wear slide rail with low slide friction for easy handling of goods. Slide rails can also be used as cover protection, impact protection and guide rails.

Order No.	Type	Slot width	Length
10330-081321	I	8	2000

Notes

10347

Foot plates

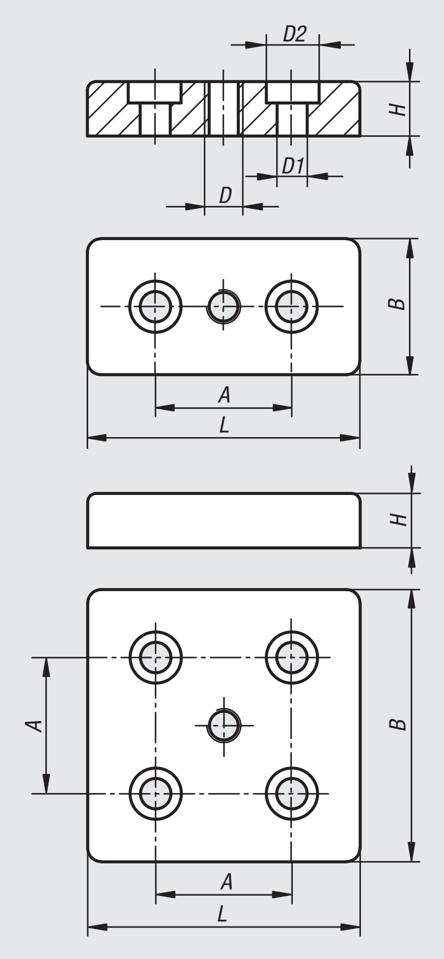
Type B and Type I

Material:
Die-cast zinc.

Version:
bright or black powder-coated.

Sample order:
nlm 10347-0630601081

Note:
Used to mount levelling feet, rollers, eye bolts and other elements. Can also be mounted to the side of a profile using slot nuts.



Order No.	Finish	Type	Slot width	Profile	B	L	H	A	D	D1	D2
10347-0840801080	bright	I	8	40x80	40	80	16	40	M8	9	15
10347-0840801100	bright	I	8	40x80	40	80	16	40	M10	9	15
10347-0840801120	bright	I	8	40x80	40	80	16	40	M12	9	15
10347-0840801160	bright	I	8	40x80	40	80	16	40	M16	9	15
10347-0880801080	bright	I	8	80x80	80	80	16	40	M8	9	15
10347-0880801100	bright	I	8	80x80	80	80	16	40	M10	9	15
10347-0880801120	bright	I	8	80x80	80	80	16	40	M12	9	15
10347-0880801160	bright	I	8	80x80	80	80	16	40	M16	9	15
10347-1040802080	bright	B	10	40x80	40	80	16	40	M8	14,5	20
10347-1040802100	bright	B	10	40x80	40	80	16	40	M10	14,5	20
10347-1040802120	bright	B	10	40x80	40	80	16	40	M12	14,5	20
10347-1040802160	bright	B	10	40x80	40	80	16	40	M16	14,5	20
10347-1045902100	bright	B	10	45x90	45	90	16	45	M10	14,5	20
10347-1045902120	bright	B	10	45x90	45	90	16	45	M12	14,5	20
10347-1045902140	bright	B	10	45x90	45	90	16	45	M14	14,5	20
10347-1045902160	bright	B	10	45x90	45	90	16	45	M16	14,5	20
10347-1045902200	bright	B	10	45x90	45	90	16	45	M20	14,5	20
10347-1090902100	bright	B	10	90x90	90	90	16	45	M10	14,5	20
10347-1090902120	bright	B	10	90x90	90	90	16	45	M12	14,5	20
10347-1090902140	bright	B	10	90x90	90	90	16	45	M14	14,5	20
10347-1090902160	bright	B	10	90x90	90	90	16	45	M16	14,5	20
10347-1090902200	bright	B	10	90x90	90	90	16	45	M20	14,5	20

10347

Foot plates

Type B and Type I

Order No.	Finish	Type	Slot width	Profile	B	L	H	A	D	D1	D2
10347-0630601081	black powder-coated	I	6	30x60	30	60	12	30	M8	6,6	11
10347-0630601101	black powder-coated	I	6	30x60	30	60	12	30	M10	6,6	11
10347-0630601121	black powder-coated	I	6	30x60	30	60	12	30	M12	6,6	11
10347-0630601161	black powder-coated	I	6	30x60	30	60	12	30	M16	6,6	11
10347-0660601081	black powder-coated	I	6	60x60	60	60	12	30	M8	6,6	11
10347-0660601101	black powder-coated	I	6	60x60	60	60	12	30	M10	6,6	11
10347-0660601121	black powder-coated	I	6	60x60	60	60	12	30	M12	6,6	11
10347-0660601161	black powder-coated	I	8	60x60	60	60	16	40	M16	9	15
10347-0840801081	black powder-coated	I	8	40x80	40	80	16	40	M8	9	15
10347-0840801101	black powder-coated	I	8	40x80	40	80	16	40	M10	9	15
10347-0840801121	black powder-coated	I	8	40x80	40	80	16	40	M12	9	15
10347-0840801161	black powder-coated	I	8	40x80	40	80	16	40	M16	9	15
10347-0880801081	black powder-coated	I	8	80x80	80	80	16	40	M8	9	15
10347-0880801101	black powder-coated	I	8	80x80	80	80	16	40	M10	9	15
10347-0880801121	black powder-coated	I	8	80x80	80	80	16	40	M12	9	15
10347-0880801161	black powder-coated	I	8	80x80	80	80	16	40	M16	9	15
10347-0830602081	black powder-coated	B	8	30x60	30	60	12	30	M8	9	15
10347-0830602101	black powder-coated	B	8	30x60	30	60	12	30	M10	9	15
10347-0830602121	black powder-coated	B	8	30x60	30	60	12	30	M12	9	15
10347-1045902101	black powder-coated	B	10	45x90	45	90	16	45	M10	14,5	20
10347-1045902121	black powder-coated	B	10	45x90	45	90	16	45	M12	14,5	20
10347-1045902141	black powder-coated	B	10	45x90	45	90	16	45	M14	14,5	20
10347-1045902161	black powder-coated	B	10	45x90	45	90	16	45	M16	14,5	20
10347-1045902201	black powder-coated	B	10	45x90	45	90	16	45	M20	14,5	20
10347-1090902101	black powder-coated	B	10	90x90	90	90	16	45	M10	14,5	20
10347-1090902121	black powder-coated	B	10	90x90	90	90	16	45	M12	14,5	20
10347-1090902141	black powder-coated	B	10	90x90	90	90	16	45	M14	14,5	20
10347-1090902161	black powder-coated	B	10	90x90	90	90	16	45	M16	14,5	20
10347-1090902201	black powder-coated	B	10	90x90	90	90	16	45	M20	14,5	20

10400

Bearing flange

for feed roller

Material:
Bearing flanges and fastening pieces PA-GF.
Bolts steel.

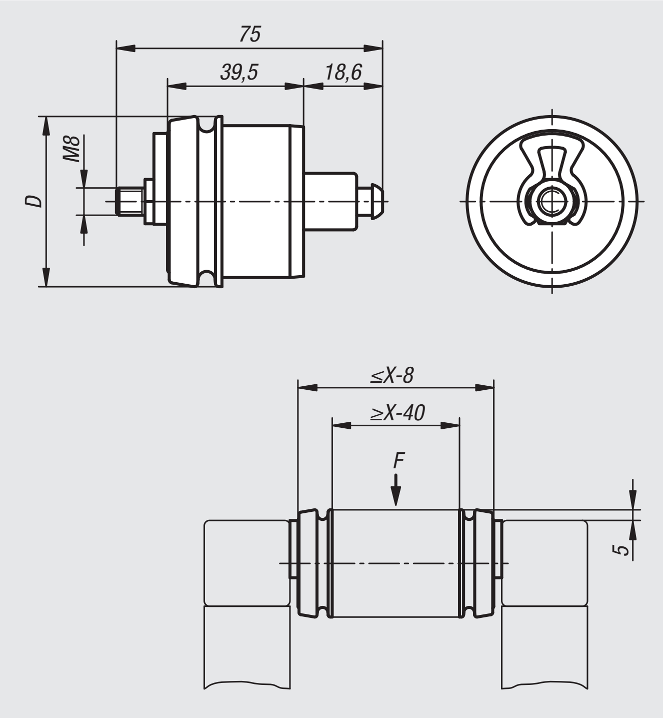
Version:
Black.
Bolts electro zinc-plated.

Sample order:
nlm 10400-5008

Note:
Two bearing flanges combined with a D50 type I aluminium profile tube (10050) form a feed roller (load-bearing roller). The bearing flanges are simply pressed into the aluminium profile tube. These can be used for many conveyance tasks. The bearing flanges have ball bearings and spring-loaded fastening spigots which enable transport rollers to be retrofitted into existing structures.
A roller conveyor is created when several transport rollers are mounted in series.

Two bearing flanges are required for a transport roller.

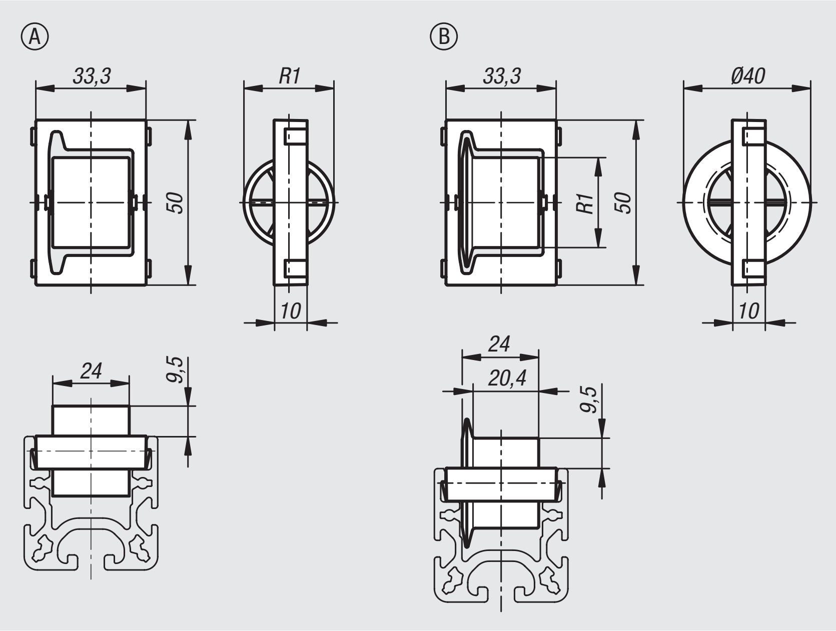
Accessories:
Aluminium profiles D50 10050
Slot key profile 07076



Order No.	Type	Slot width	D	F max. N	X min.	X max.
10400-5008	I	8	50	1000	160	800

Plastic roller elements

for roller rails

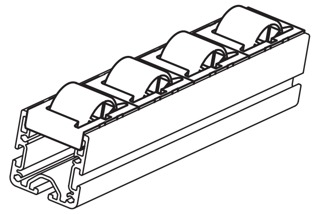


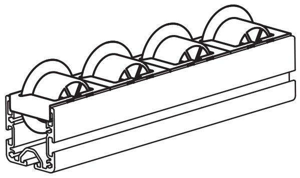
Material:
Roller and cage polyamide, glass-bead reinforced.
Steel axis.

Version:
Cage black.
Roller available in different colours.

Sample order:
nlm 10448-1281

Note:
The roller elements are matched to the aluminium profiles for roller rails and can be mounted on them quickly and easily. No tools required. Suitable for aluminium profiles Type B and I.



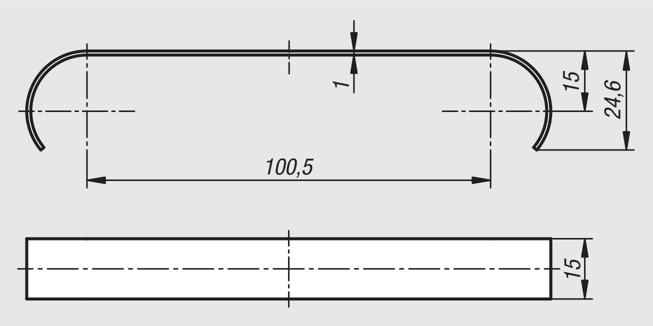


Order No. Form A without wheel flange	Order No. Form B with wheel flange	Main colour	R1	Load capacity N
10448-1281	10448-2281	black	28	150
10448-1282	10448-2282	yellow	28	150
10448-1283	10448-2283	red	28	150
10448-1284	10448-2284	green	28	150
10448-1285	10448-2285	grey	28	150

10448-01

Stainless steel brakes

for roller elements

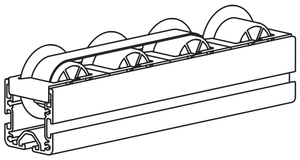


Material:
Stainless steel

Version:
Bright.

Sample order:
nlm 10448-01-10015

Note:
The brake is used in connection with the roller rails. The brake element is pulled over three rollers and ensures soft braking, in particular with heavy workpieces.

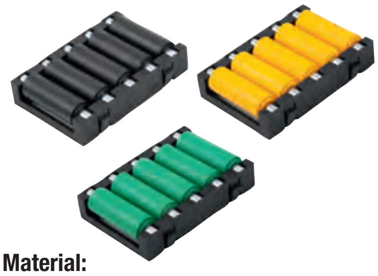


Order No.	Item
10448-01-10015	brake

10448-02

Plastic roller elements, compact

for roller rails

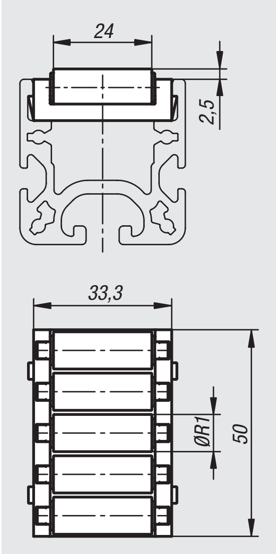


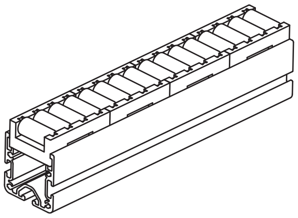
Material:
Roller and cage polyamide, glass-bead reinforced.
Steel axis.

Version:
Cage black.
Roller available in different colours.

Sample order:
nlm 10448-02-091

Note:
The roller elements are matched to the aluminium profiles for roller rails and can be mounted on them quickly and easily. No tools required. The compact design with a small centre distance is optimally designed for the low-vibration conveyance of sensitive items.
Suitable for aluminium profiles Type B and I.





Order No.	Main colour	R1	Load capacity N
10448-02-091	black	9	100
10448-02-092	yellow	9	100
10448-02-093	red	9	100
10448-02-094	green	9	100
10448-02-095	grey	9	100

10448-03

Ball transfer units

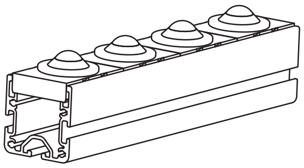
for roller rails

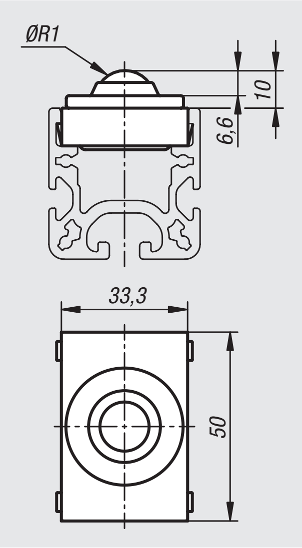
Material:
Ball stainless steel.
Housing steel.
Cage polyamide, carbon-fibre reinforced.

Version:
Cage black.

Sample order:
nlm 10448-03-16

Note:
These ball transfer units are matched to the aluminium profiles for roller rails and can be mounted on them quickly and easily.
For flexible movements in two dimensions. With a low-wear and low-friction ball rollers.
No tools required. Suitable for aluminium profiles Type B and I.





Order No.	R1	Load capacity N
10448-03-16	16	100

10448-04

Brush elements, plastic

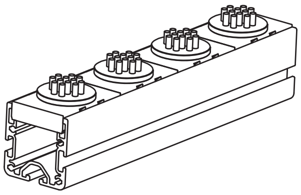
for roller rails

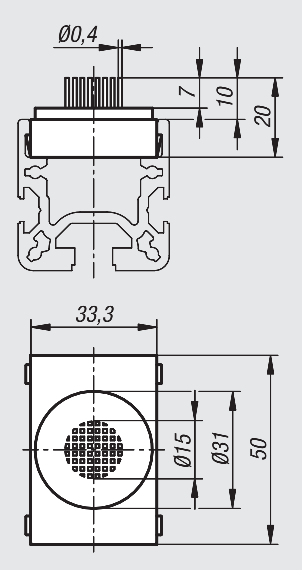
Material:
Polyamide fibres.
Polypropylene brush head.
Polyamide cage, carbon-fibre reinforced.

Version:
black.

Sample order:
nlm 10448-04-15

Note:
The brush element is matched to the aluminium profiles for roller rails and can be mounted on them quickly and easily.
With the elastic brush fibres, scratch-sensitive objects can be moved flexibly in two dimensions.
No tools required. Suitable for aluminium profiles Type B and I.



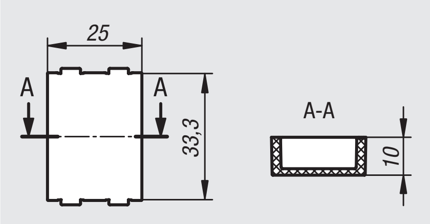


Order No.	Load capacity N
10448-04-15	100

10448-05

Spacers, plastic

for roller rails



Material:
Polyamide fibreglass reinforced.

Version:
black.

Sample order:
nlm 10448-05-3325

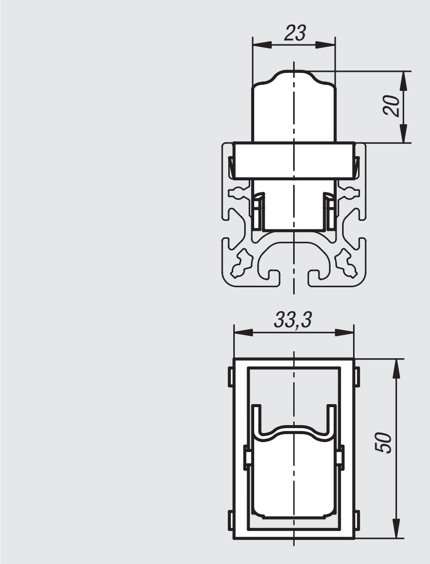
Note:
These spacers are matched to the aluminium profiles for roller rails and can be mounted on them quickly and easily. They are used as spacers between rollers, brushes or ball transfer units. No tools required. Suitable for aluminium profiles Type B and I.

Order No.	Item
10448-05-3325	Spacer

10448-06

Backstop elements, steel

for roller rails



Material:
Backstop steel.
Axis steel.
Cage polyamide, carbon-fibre reinforced.

Version:
Electro zinc-plated
Cage black.

Sample order:
nlm 10448-06-3350

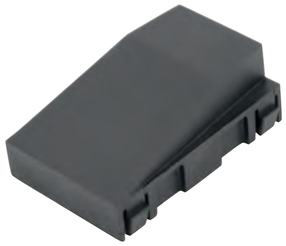
Note:
The backstop element is matched to the aluminium profiles for roller rails and can be mounted on them quickly and easily. It prevents reverse movements of items on the roller tracks. No tools required. Suitable for aluminium profiles Type B and I.

Order No.	Item
10448-06-3350	backstop element

10448-07

Plastic slide ramps

for roller rails

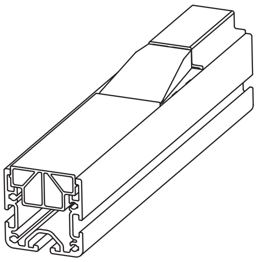


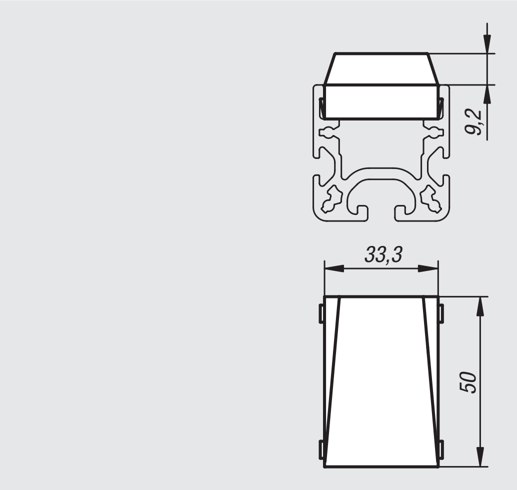
Material:
Polyamide fibreglass reinforced.

Version:
black.

Sample order:
nlm 10448-07-3350

Note:
The slide ramps ensure a soft transition between different heights of the roller tracks.





Order No.	Item
10448-07-3350	Slide ramp

10448-08

Plastic slide rails

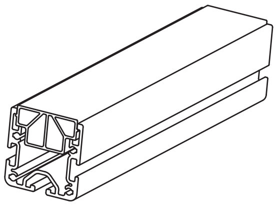
for roller rails

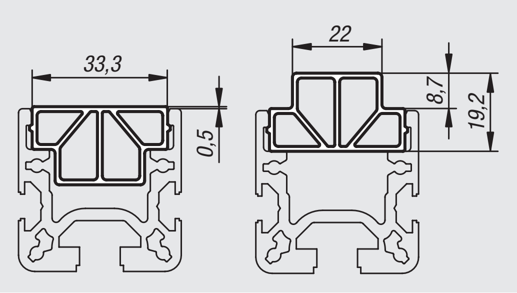
Material:
Polyethylene

Version:
black.

Sample order:
nlm 10448-08-33X2000

Note:
Low-wear slide rail with low slide friction for easy handling of goods. Slide rails can also be used as cover protection, impact protection, guide rails and as a riser plate between ball and brush elements.
The slide rail can be mounted in two different heights.
Suitable for aluminium profiles Type B and I.





Order No.	Length
10448-08-33X2000	2000

10448-50

End plates, steel

for roller rails

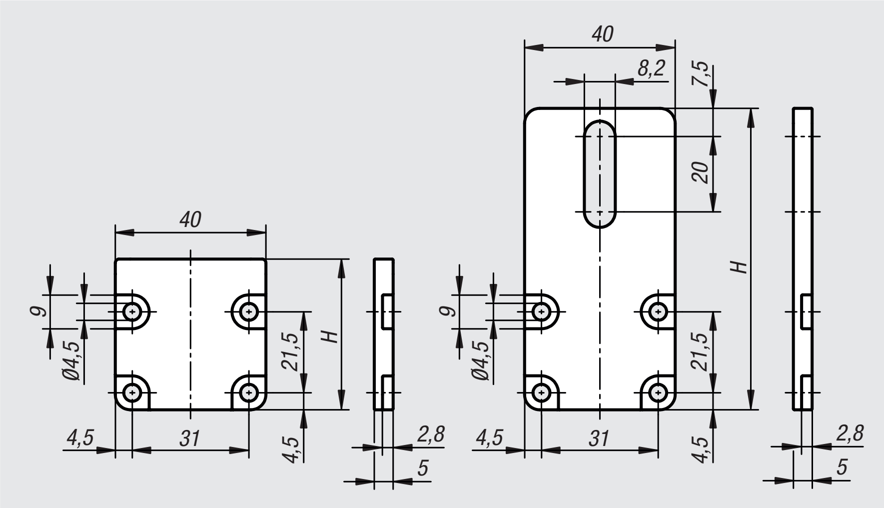
Material:
Steel.

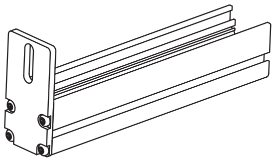
Version:
Electro zinc-plated.

Sample order:
nlm 10448-50-4040

Note:
The end plates seal the ends of aluminium profiles for roller rails. They prevent inserts from sliding out. A rubber buffer can also be mounted to the long version.

A mounting set is supplied.





Order No.	H
10448-50-4040	40
10448-50-4080	80

10448-51

Suspension brackets, steel

for roller rails

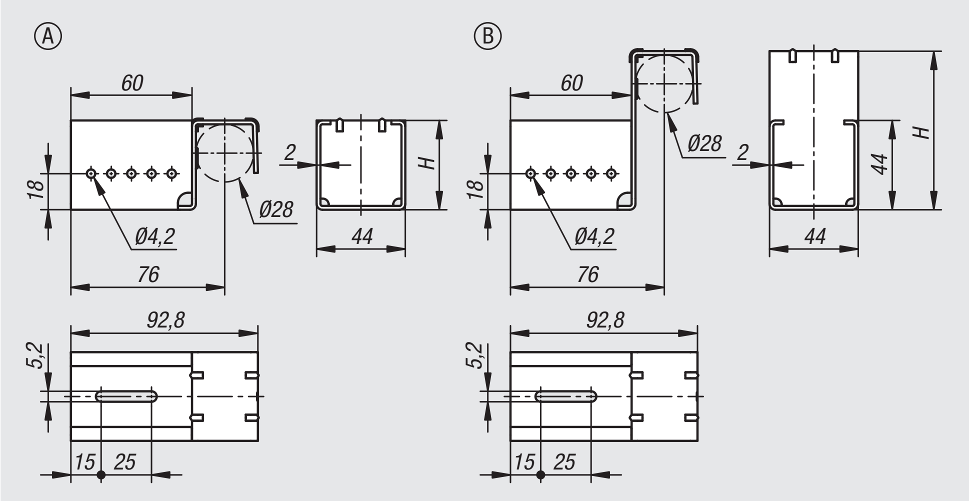
Material:
Steel.

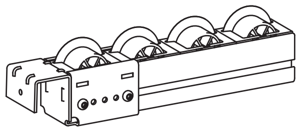
Version:
Electro zinc-plated.

Sample order:
nlm 10448-51-444428

Note:
These brackets are used to hang aluminium profiles for roller rails in a round profile.

A mounting set is supplied.

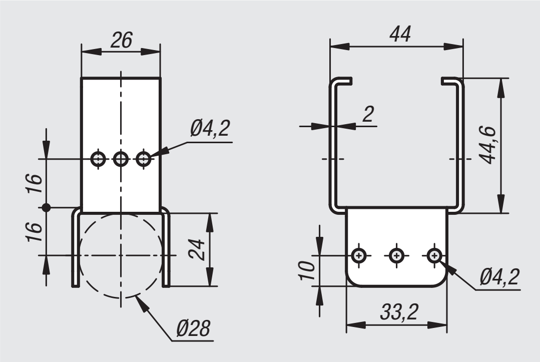




Order No.	Form	Version 2	H
10448-51-444428	A	without stop	44
10448-51-447828	B	with stop	78,7

Mounting brackets, steel

for roller rails



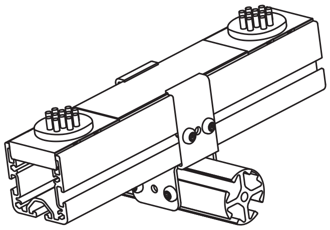
Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 10448-52-4428

Note:
The mounting bracket is used to mount roller rails and round tubes crosswise. They are also used to hang and support the profiles.

A fastening set is supplied.



Order No.	Item
10448-52-4428	Mounting Bracket

10450

Roller elements

Material:
Housing glass-bead reinforced polyamide.
Rollers POM.
Screws steel.

Version:
Housing and rollers black.
Screws electro zinc-plated.

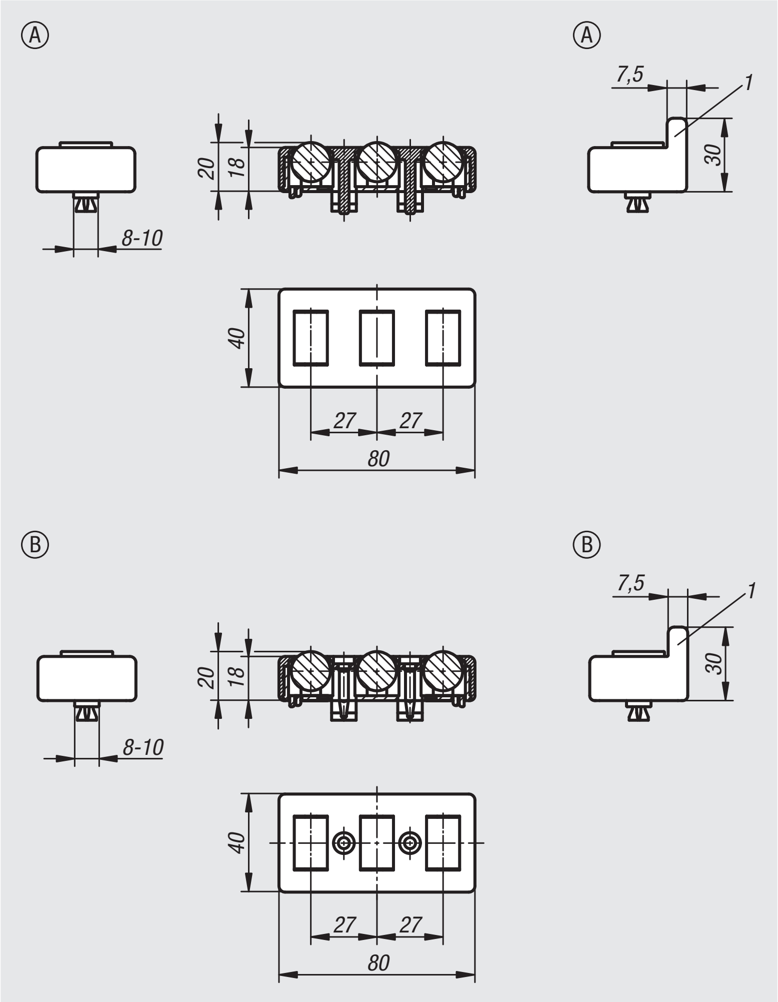
Sample order:
nlm 10450-1000

Note:
The roller elements are ideal for constructing roller conveyors in any length and width. Suitable for aluminium profiles types B and I. The sprung guide tabs underneath universally match slots sized 8 and 10.

Mounting Form A
Insert the lower housing part with rollers into the aluminium profile slot. Set the spread pins on the upper housing part into the lower housing part and press down. The spread pins expand the clamps and locks the roller element in the slot.

Mounting Form B
Insert the lower housing part with rollers into the aluminium profile slot. Set the upper housing part on top and press down. Knocking or screwing the screws in locks and clamps the roller element in the slot. Alternatively, the clamps under the lower housing part can be broken off and the roller element can be securely screwed to the aluminium profile using screws and slot keys.

Drawing reference:
1) lateral guide



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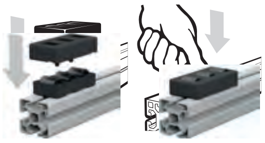

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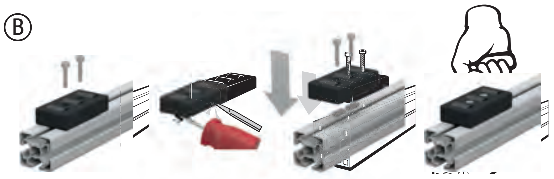
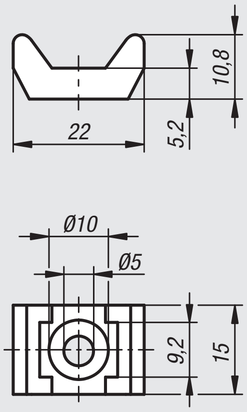


Order No.	Form	Version 1	Slot width	Load capacity N
10450-1000	A	without lateral guide	8/10	100
10450-1100	A	with lateral guide	8/10	100
10450-2000	B	without lateral guide	8/10	100
10450-2100	B	with lateral guide	8/10	100

10451

Cable tie block



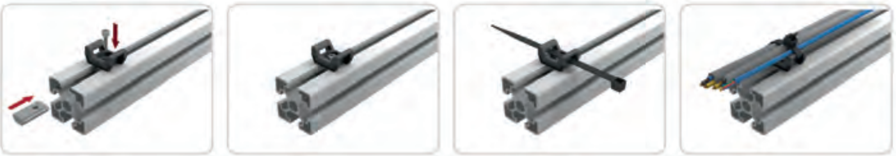
Material:
Polyamide fibreglass reinforced.

Version:
black.

Sample order:
nlm 10451-01

Note:
The cable tie block is a fastening component for cables and hoses. Can be mounted on panel elements or aluminium profiles (5 to 12 mm slots) with a cap screw or pan head screw and a slot key.

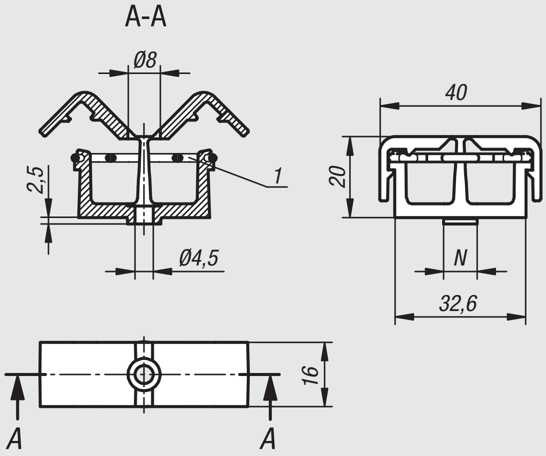
The cables and hoses are held in place using cable ties.



Order No.	Slot width
10451-01	5-12

10453

Cable clips



Material:
Polyamide.
O-ring FPM 70.

Version:
black.

Sample order:
nlm 10453-00

Note:
The cable clip is a fastening component for cables and hoses with a diameter of up to 12 mm.

Can be mounted on panel elements or aluminium profiles (8 or 10 mm slots) with a cap screw or pan head screw and a slot key. The cables are held in place by the stretched O-ring.

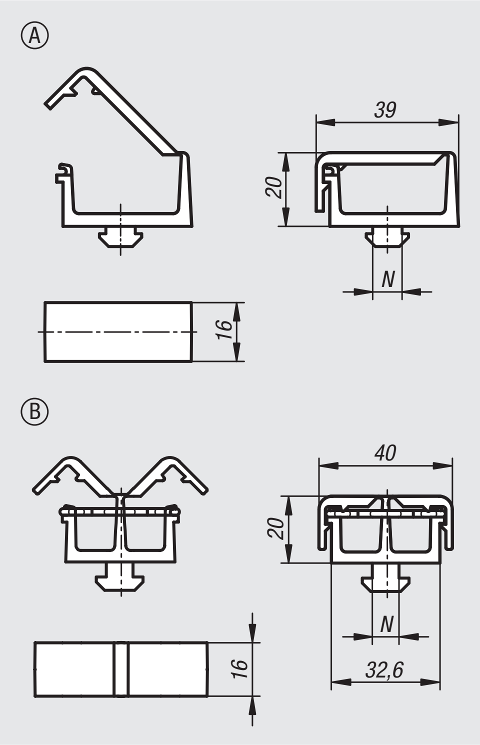
With two separate channels.

Drawing reference:
1) O-ring

Order No.	Slot width	N
10453-00	-	-
10453-08	8	8
10453-10	10	10

10454

Cable clips with T-slot key



Material:
Polyamide.
O-ring FPM 70.

Version:
black.

Sample order:
nlm 10454-1108

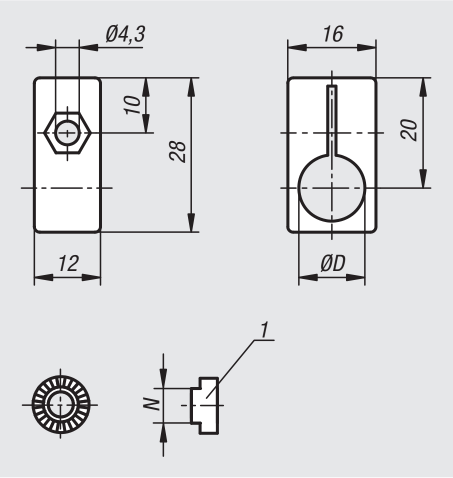
Note:
The cable clip is a fastening component for cables and hoses with a diameter up to 12 mm.

The clip is mounted by inserting the T-key into a T-slot and twisting through 90°. The cables are held in place by the stretched O-ring.

Form A: with one channel.
Form B: with two separate channels.

Order No. Form A	**Order No. Form B**	Version 2	Slot width	N
10454-1108	**10454-2108**	type i	8	8
10454-1208	**10454-2208**	type b	8	8
10454-1210	**10454-2210**	type b	10	10

Sensor holders



Material:
Polyamide fibreglass reinforced.

Version:
black.

Sample order:
nlm 10460-080

Note:
For fastening sensors and limit switches to aluminium profiles or panel elements.

Fastening pieces are available for various aluminium profile slot sizes. The fastening piece provides a positive rotation lock and can be adjusted in 15 increments. With no fastening piece the sensor holder can be infinitely adjusted in the angle.

Drawing reference:
1) Fastening piece

Order No.	Item	D	N
10460-080	Sensor Holder	8	-
10460-120	Sensor Holder	12	-
10460-905	Fastening Piece	-	5
10460-906	Fastening Piece	-	6
10460-908	Fastening Piece	-	8
10460-910	Fastening Piece	-	10

10470

Earthing terminal

Type I

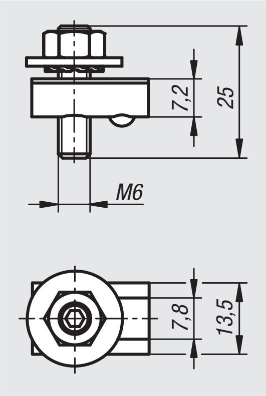
Material:
Slot key, grub screw and serrated washer, steel.
Nut and washer, brass.

Version:
Slot key, grub screw and serrated washer, electro zinc-plated.

Sample order:
nlm 10470-0806

Note:
For protecting installations and persons. Connectors for earthing aluminium profile structures and interconnecting the aluminium profiles by integrating them into the protective earth (PE) system. Conductive contact is established through defined destruction of the oxide layer in the slot base and on the slot flanks.

The cable lug must be positioned between the serrated washer and the washer during assembly.



Order No.	Version 2	Slot width
10470-0806	type i	8

10471

Potential equaliser

Type I

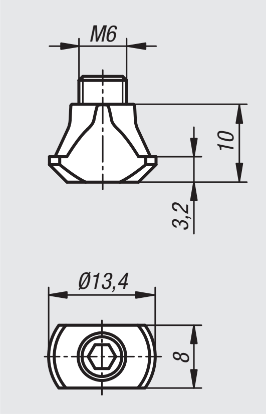
Material:
Steel.

Version:
Electro zinc-plated.

Sample order:
nlm 10471-0806

Note:
For generating electrostatic discharge (ESD). For safely equalising electrostatic charge of profiles. It is swivelled into the slot and screwed against the profiles at a 45° angle. A conductive connection is established by breaking through the oxide layer.

Attention:
A potential equaliser is not an electrical connection of the protective earth (PE) system.



Order No.	Version 2	Slot width
10471-0806	type i	8

Notes

10500

Eccentric clamp modules

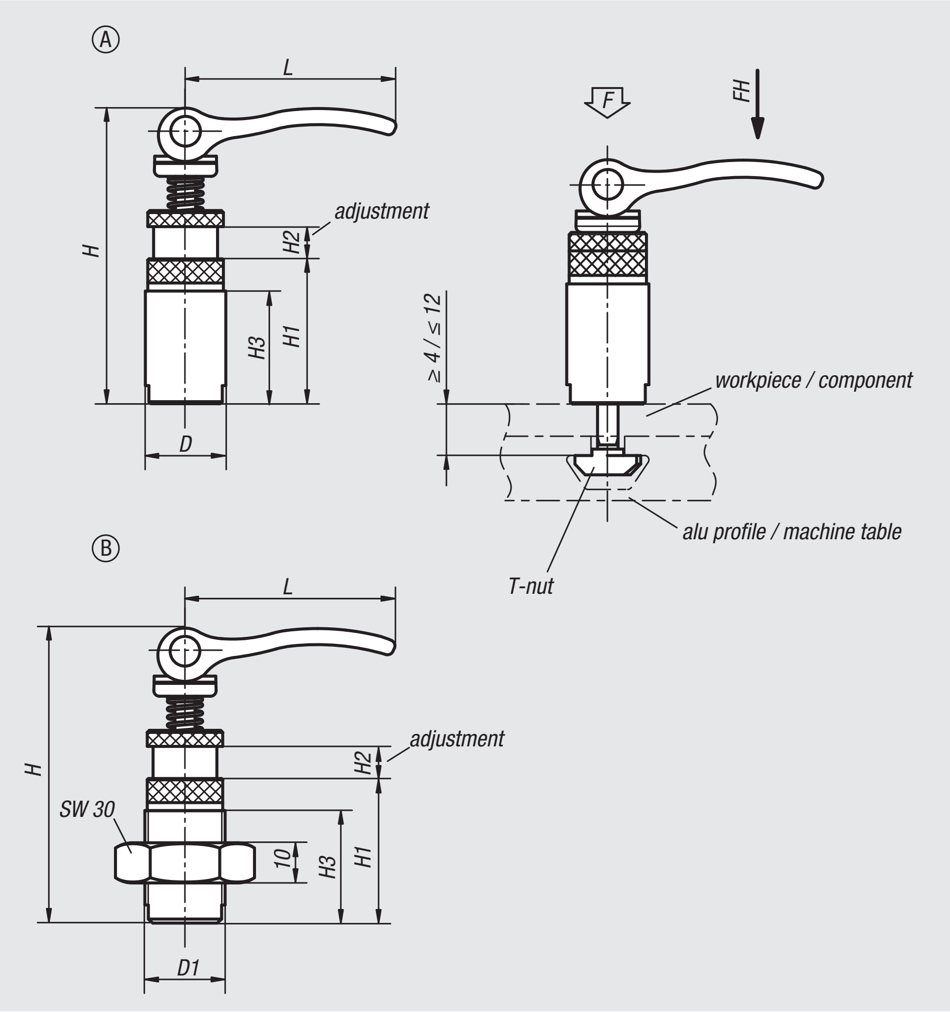
Material:
Body steel.
Cam levers cast aluminium.

Version:
Body black oxidised.
T-nut electro zinc-plated.
Cam levers black powder coated.

Sample order:
nlm 10500-00200808

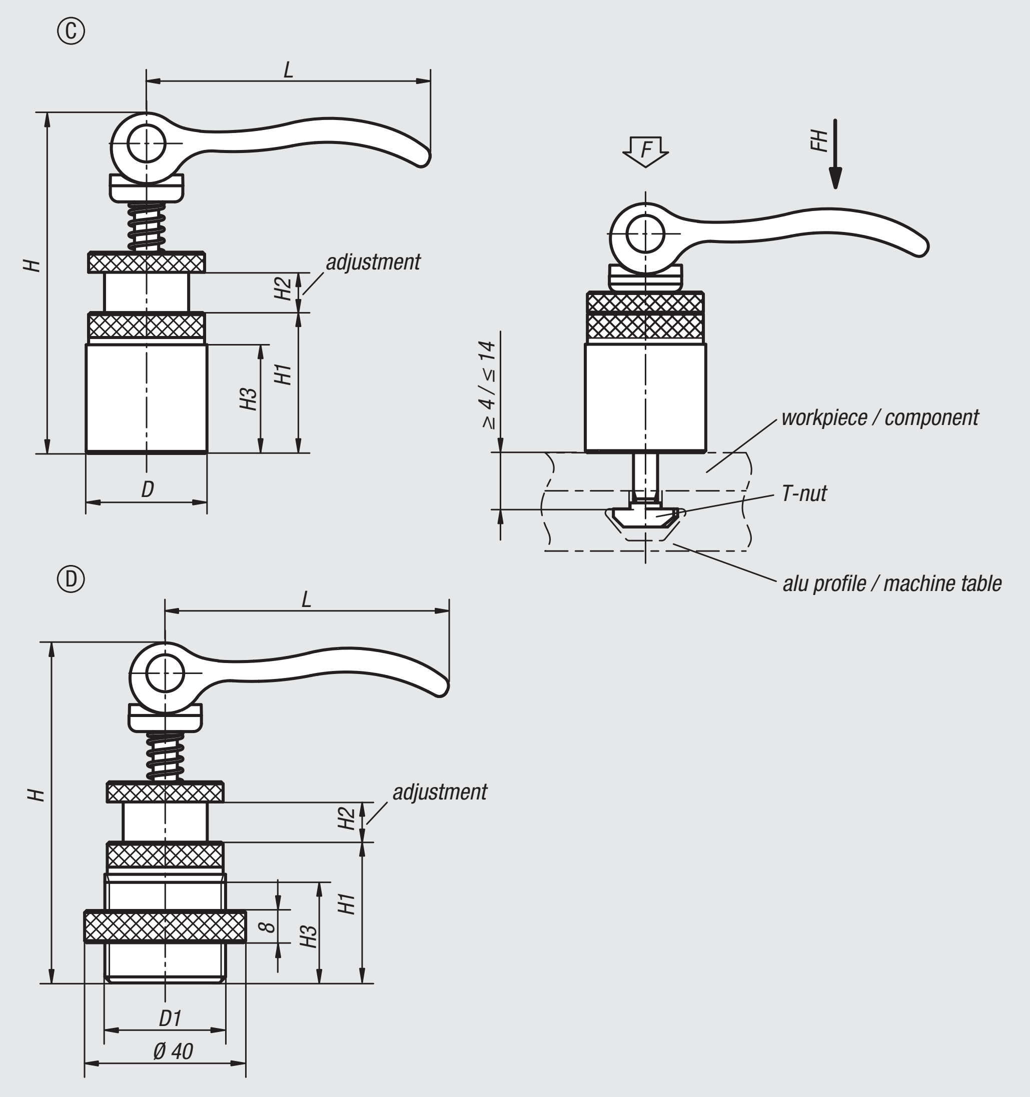
Note:
The clamp module is inserted into the T-slot from above and secured using the cam lever, no other tools required.

Advantages:
The eccentric clamp modules can be used on conventional aluminium profile systems or on T-slot tables as stops, fasteners or clamps for components and workpieces.



Order No.	Form	D	D1	H	H1	H2	H3	L	suitable for slot width	Clamping force F (kN)	Hand force FH N
10500-00200808	A	20	-	73,5	36	8	28	52,3	8	2,5	100
10500-10200808	B	-	M20x1,5	73,5	36	8	28	52,3	8	2,5	100

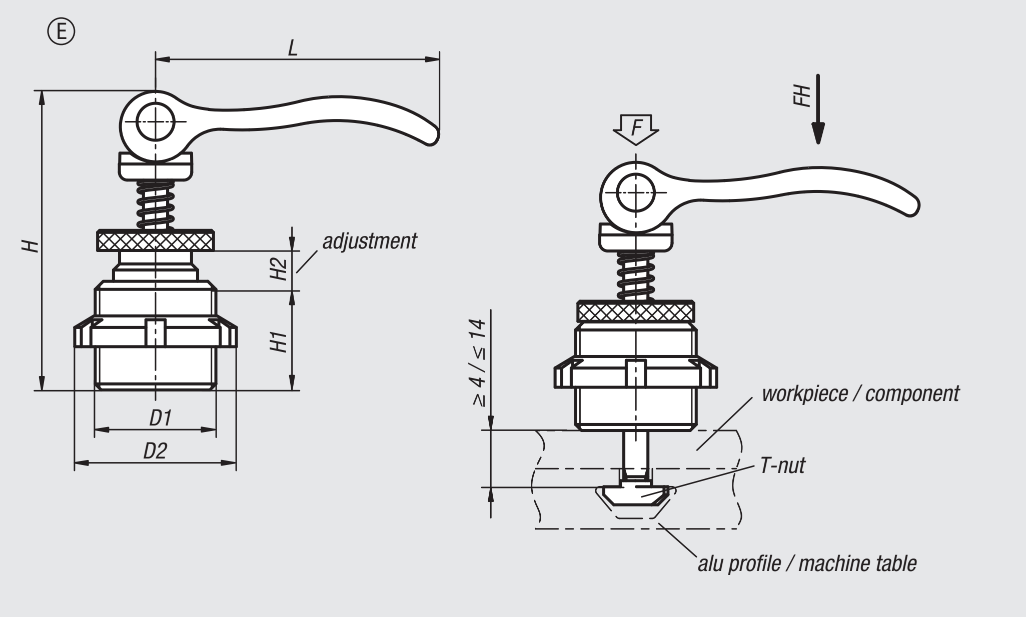
Eccentric clamp modules



Order No.	Form	D	D1	D2	H	H1	H2	H3	L	suitable for slot width	Clamping force F (kN)	Hand force FH N
10500-21150606	C	15	-	-	34	10	6	7	35	6	1,5	90
10500-21201008	C	20	-	-	44	13	8	10	52	8	2,5	100
10500-21301008	C	30	-	-	84,6	35	10	25	70,4	8	4	120
10500-31301008	D	-	M30x2	40	84,6	35	10	25	70,4	8	4	120

10500

Eccentric clamp modules

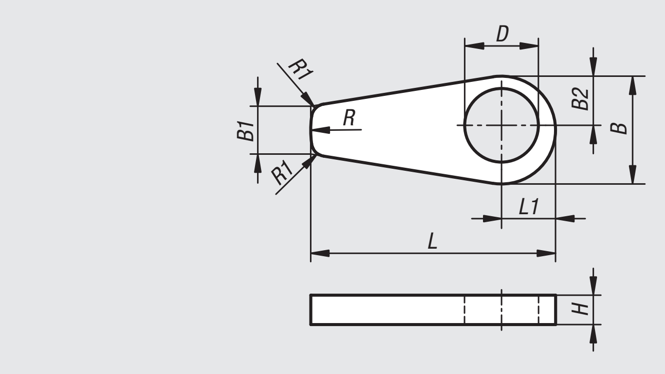


Order No.	Form	D1	D2	H	H1	H2	L	suitable for slot width	Clamping force F (kN)	Hand force FH N
10500-41150706	E	M15X1	25	39	14	7	35	6	1,5	90
10500-41200908	E	M20X1	32	50	18	9	52	8	2,5	100

10505

Cam clamps

for eccentric clamp modules



Material:
Steel or POM

Version:
black oxidised. White.

Sample order:
nlm 10505-2008

Note:
Cam clamps for indirect clamping of sensitive parts in combination with pivot bearings or Form C eccentric clamp modules.

Advantages:
Tool-less operation.

Order No.	Main material	B	B1	B2	D	H	L	L1	R	R1
10505-1506	steel	22,1	10	10,05	15,1	6	50	11,05	22	3
10505-2008	steel	29,4	13,34	13,37	20,1	8	66,67	14,7	29,4	3
10505-3010	steel	44,1	20	20,05	30,1	10	100	22,05	44	3
10505-23010	POM	44,1	20	20,05	30,1	10	100	22,05	44	3

Mounting instructions for eccentric clamp module

Insert by pushing and rotating

Align lever and T-nuts to simplify insertion into the T-slot.

Screwing the adjusting nut in and out adjusts the clamping travel matching it to the component height and T-slot depth.

Part to be clamped

T-nut

Aluminium profile

Swivel down to clamp

Press lever down.
The cam effect clamps the workpiece.

10550

Clip-in shell bins, plastic

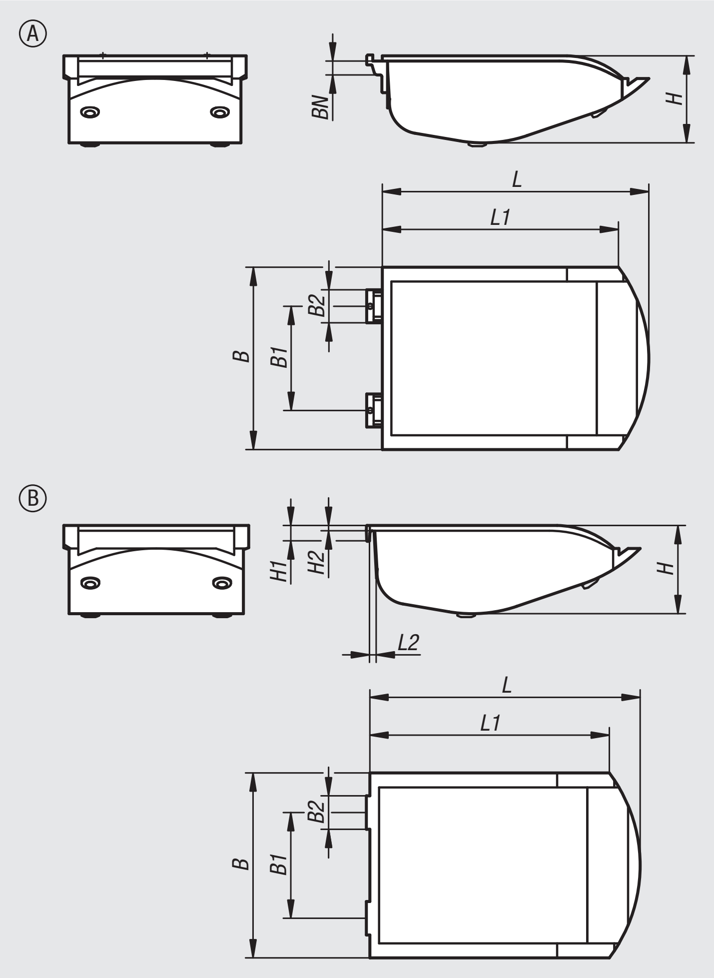
for profile slots type I and type B and mounting profiles

Material:
Trays fibreglass reinforced PA.
Label holder PC.
Elastic buffers PU.

Sample order:
nlm 10550-10

Note:
These bins can be easily clipped into profile slots or mounting profiles.
The bins for mounting profiles can be hooked onto perforated panels.
For holding small parts and selectively picking out the smallest of components.

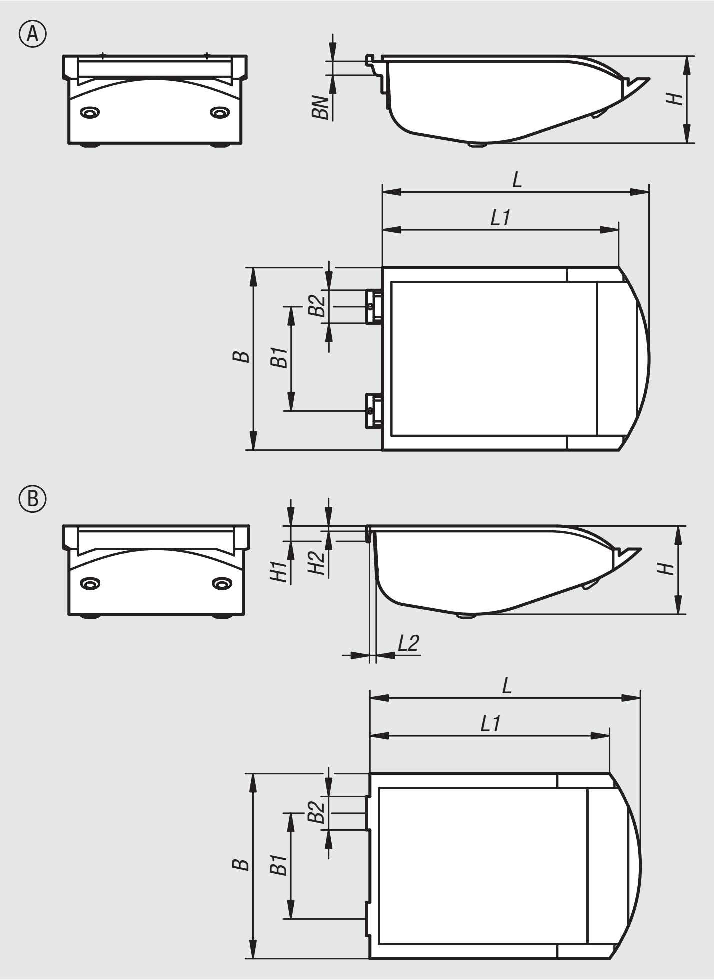
Supplied with:
1x clip-in shell bin
1x label holder
1x label
4x self-adhesive elastic buffers



Order No.	Version 1	Form	B	B1	B2	H	H1	H2	L	L1	L2	BN=Slot width
10550-00	type I	A	105	60	19	50	-	-	153,5	136	-	8
10550-10	type B	A	105	60	19	50	-	-	153,5	136	-	10
10550-20	for mounting profile	B	105	60	19	50	9	3	153,5	136	3	-

Clip-in shell bins, antistatic plastic

for profile slots type I and type B and mounting profiles



Material:
Bins carbon fibre reinforced antistatic PA.
Label holder PC.
Elastic buffers PU.

Sample order:
nlm 10550-11

Note:
These bins can be easily clipped into profile slots or mounting profiles.
The bins for mounting profiles can be hooked onto perforated panels.
For holding small parts and selectively picking out the smallest of components.

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Supplied with:
1x clip-in shell bin
1x label holder
1x label
4x self-adhesive elastic buffers

Applications:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Safety:
These ESD products can also be used for devices, components and protection systems in areas where there is risk of explosion.
These ESD products prevent electrostatic spark discharges, and eliminate the risk of ignition of gases and dust which could lead to explosions in enclosed spaces.
Manufacturers and operators must apply and comply with the ATEX directives for protecting persons working in areas where there is a risk of explosion.

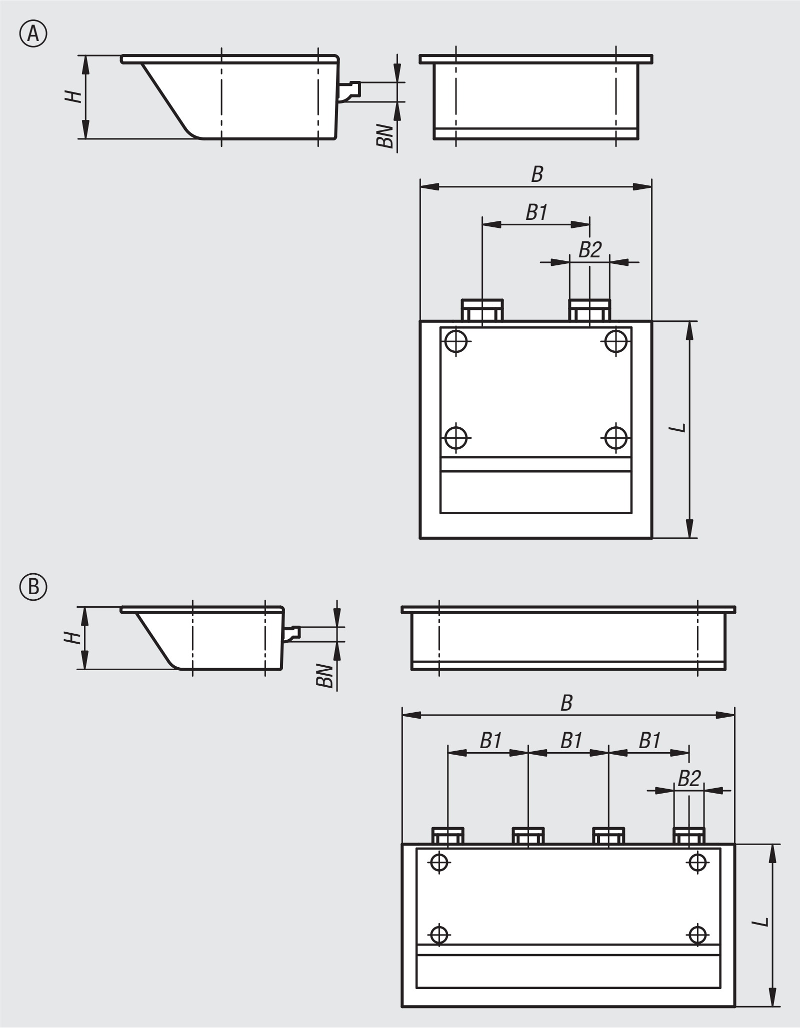
These ESD products have been certified by TÜV-Süd for their electrical discharge capability.

Order No.	Version 1	Form	B	B1	B2	H	H1	H2	L	L1	L2	BN=Slot width
10550-01	type I	A	105	60	19	50	-	-	153,5	136	-	8
10550-11	type B	A	105	60	19	50	-	-	153,5	136	-	10
10550-21	for mounting profile	B	105	60	19	50	9	3	153,5	136	3	-

10550-05

Clip-in bins, plastic

for type I and type B profile slots and mounting profiles



Material:
Bins fibreglass reinforced PA.
Label holders PC.

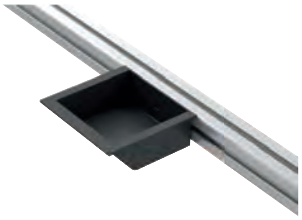
Sample order:
nlm 10550-05-10110103

Note:
These bins can be easily clipped into profile slots or mounting profiles.
The bins for mounting profiles can be hooked onto perforated panels.
For holding small parts.

The bins for mounting profiles can be combined with swivel adapters.

Supplied with:
Form A: 1x clip-in bin.
Form B: 1x clip-in bin.
Form C: 1x clip-in bin, 1x label holder, 1x label.
Form D: 1x clip-in bin, 1x label holder, 1x label.

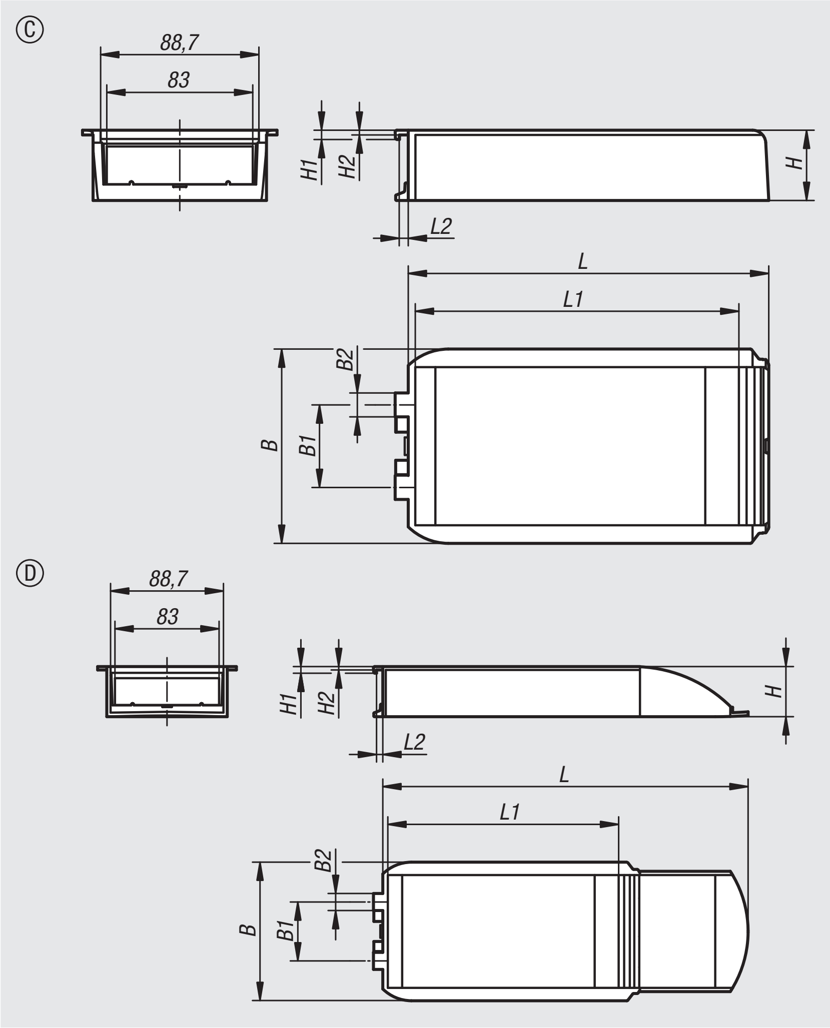
Accessories:
Swivel adapter 10550-10.



Order No.	Version 1	Form	B	B1	B2	H	L	BN=Slot width
10550-05-00110103	type I	A	110	51	19	40	103,1	8
10550-05-10110103	type B	A	110	51	19	40	103,1	10
10550-05-00211103	type I	B	211	51	19	40	103,1	8
10550-05-10211103	type B	B	211	51	19	40	103,1	10

Clip-in bins, plastic

for type I and type B profile slots and mounting profiles



Order No.	Version 1	Form	B	B1	B2	H	H1	H2	L	L1	L2
10550-05-20110205	for mounting profile	C	110,6	47	13,6	40	8	2,7	200	183	5
10550-05-20110291	for mounting profile	D	110,6	47	13,6	40	5,3	2,7	286	183	5

10550-05

Clip-in bins, antistatic plastic

for mounting profiles

+

Material:
Bins carbon fibre reinforced antistatic PA.
Label holders PC.

Sample order:
nlm 10550-05-21110205

Note:
These bins can be easily clipped into profile slots or mounting profiles.
The bins for mounting profiles can be hooked onto perforated panels.
For holding small parts.

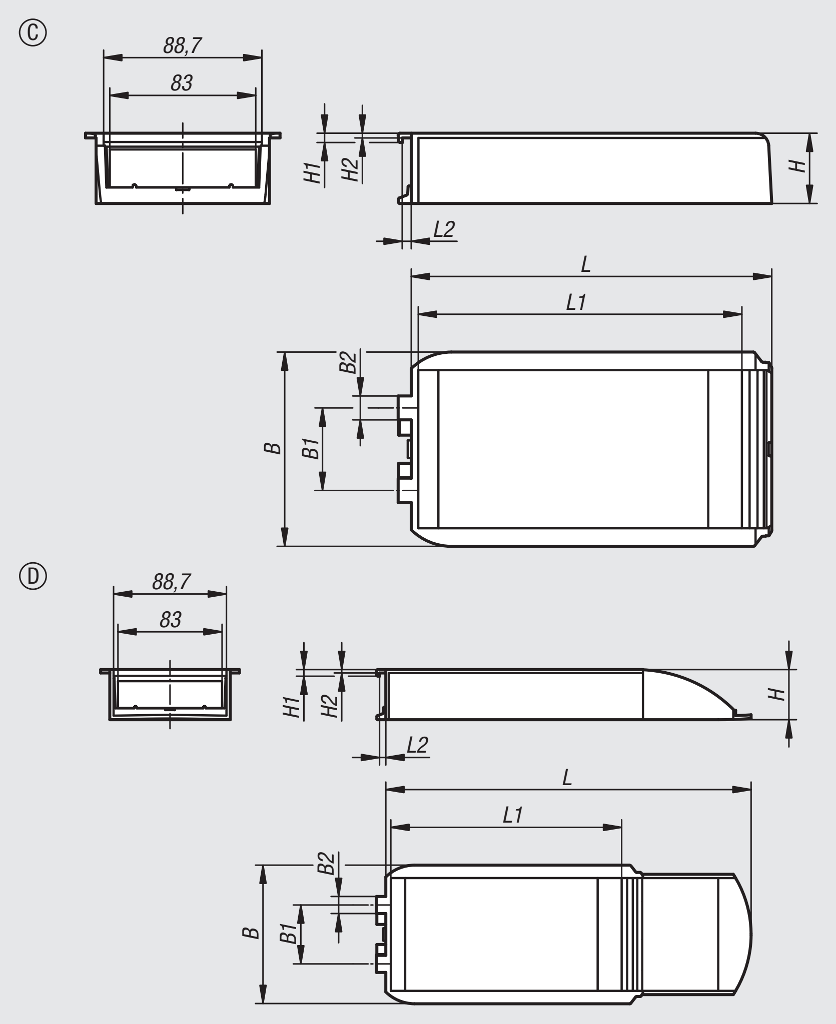
The bins for mounting profiles can be combined with swivel adapters.

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Supplied with:
Form C: 1x clip-in bin, 1x label holder, 1x label.
Form D: 1x clip-in bin, 1x label holder, 1x label.

Accessories:
Swivel adapter 10550-10.

Applications:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.



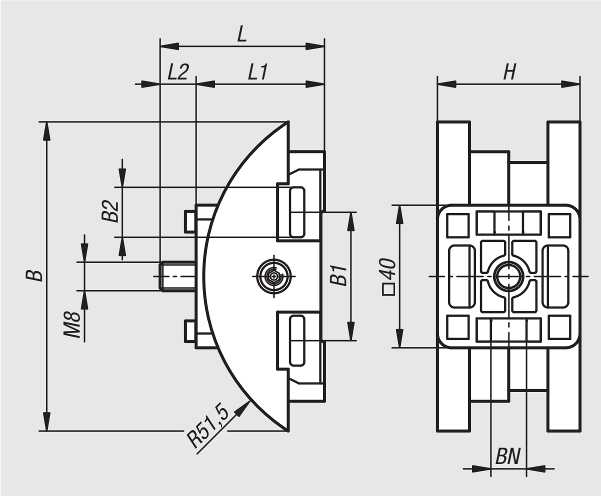
Safety:
These ESD products can also be used for devices, components and protection systems in areas where there is risk of explosion.
These ESD products prevent electrostatic spark discharges, and eliminate the risk of ignition of gases and dust which could lead to explosions in enclosed spaces.
Manufacturers and operators must apply and comply with the ATEX directives for protecting persons working in areas where there is a risk of explosion.

These ESD products have been certified by TÜV-Süd for their electrical discharge capability.

Order No.	Form	B	B1	B2	H	H1	H2	L	L1	L2
10550-05-21110205	C	110,6	47	13,6	40	5,3	2,7	200	183	5
10550-05-21110291	D	110,6	47	13,6	40	5,3	2,7	286	183	5

Swivel adapter, plastic

for profile slots



Material:
Adapter fibreglass reinforced PA.
Slot keys die-cast zinc.
Fastening material steel.

Version:
Steel electro zinc-plated.

Sample order:
nlm 10550-10-510

Note:
These adapters are used to fasten clip-in bins to profile slots (slot size 8 or 10).
The adapter swivels through 45° in both directions.

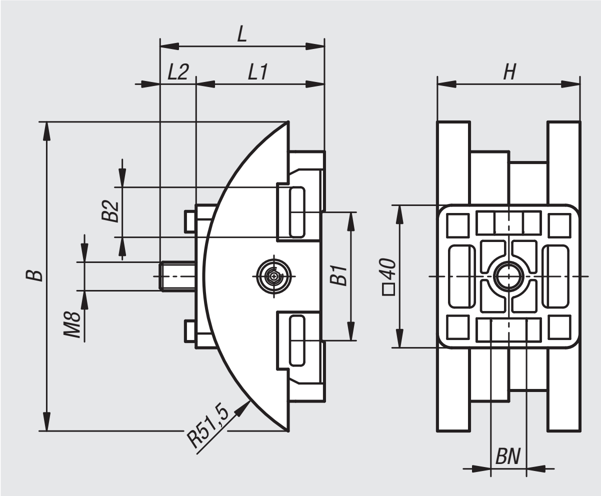
Supplied with:
1x top adapter housing
1x bottom adapter housing
1x adapter flange
1x M4 hex nut
1x M4x35 countersunk screw
4x slot keys, slot size 8/10
1x M8x16 cap screw

Order No.	B	B1	B2	H	L	L1	L2	BN=Slot width
10550-10-510	88	51	14,2	40	40,1	36	10,1	8/10

10550-10

Swivel adapter, antistatic plastic

for profile slots



Material:
Adapter carbon fibre reinforced antistatic PA.
Slot keys die-cast zinc.
Fastening material steel.

Version:
Steel electro zinc-plated.

Sample order:
nlm 10550-10-511

Note:
These adapters are used to fasten clip-in bins to profile slots (slot size 8 or 10).
The adapter swivels through 45° in both directions.

Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Supplied with:
1x top adapter housing.
1x bottom adapter housing.
1x adapter flange.
1x M4 hex nut.
1x M4x35 countersunk screw.
4x slot keys, slot size 8/10.
1x M8x16 cap screw.

Applications:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

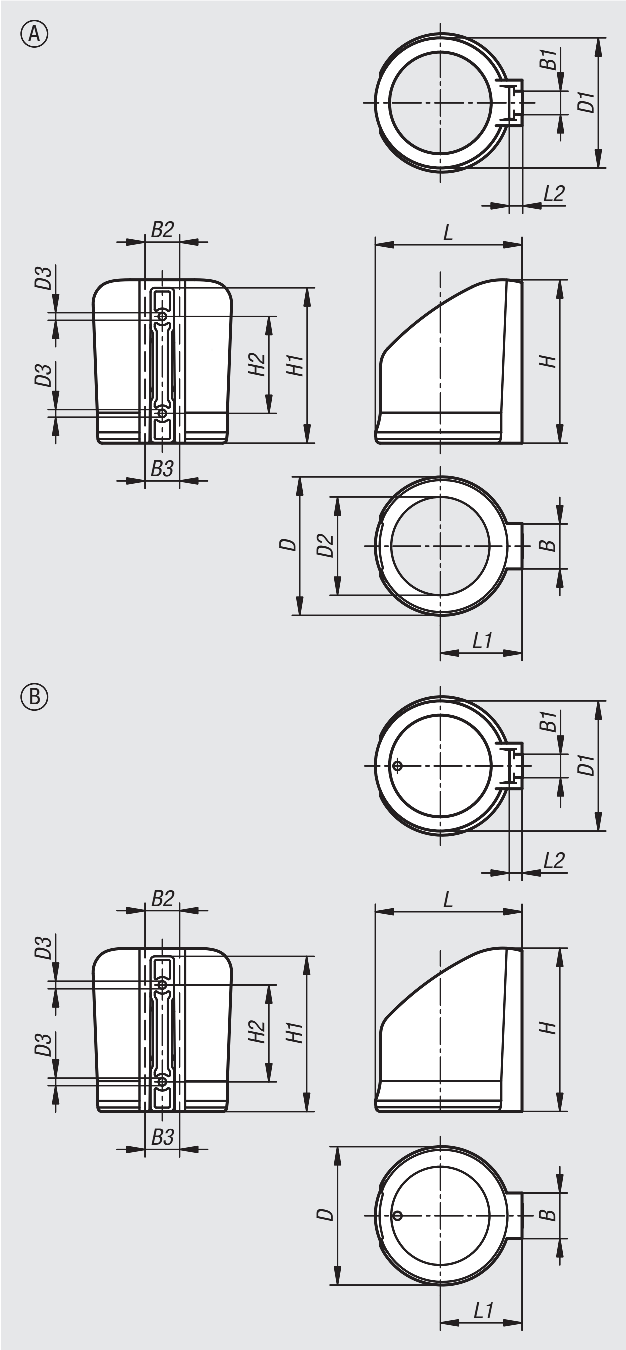
Safety:
These ESD products can also be used for devices, components and protection systems in areas where there is risk of explosion.
These ESD products prevent electrostatic spark discharges, and eliminate the risk of ignition of gases and dust which could lead to explosions in enclosed spaces.
Manufacturers and operators must apply and comply with the ATEX directives for protecting persons working in areas where there is a risk of explosion.

These ESD products have been certified by TÜV-Süd for their electrical discharge capability.

Order No.	B	B1	B2	H	L	L1	L2	BN=Slot width
10550-10-511	88	51	14,2	40	40,1	36	10,1	8/10

Cup holder plastic

for aluminium profiles, closed or open



Material:
Cup holders PA, fibreglass reinforced.

Sample order:
nlm 10550-15-00

Note:
The cup holders are fastened to the aluminium profile (type I and type B) using an M5 countersunk screw (07175) and a slot key (07077 or 07071).

Supplied with:
1x cup holder.
1x mounting.

Order No.	Version 1	B	B1	B2	B3	D	D1	D2	D3	H	H1	H2	L	L1	L2
10550-15-00	open	33	17	25,5	23	100	93	71	5,5	118	112	70	106	59	9,3
10550-15-10	closed	33	17	25,5	23	100	93	-	5,5	118	112	70	106	59	9,3

10550-15

Cup holder plastic, antistatic

for aluminium profiles, closed

Material:
Cup holder antistatic PA, carbon fibre reinforced.

Sample order:
nlm 10550-15-11

Note:
The cup holders are fastened to the aluminium profile (type I and type B) using an M5 countersunk screw (07175) and a slot key (07077 or 07071).

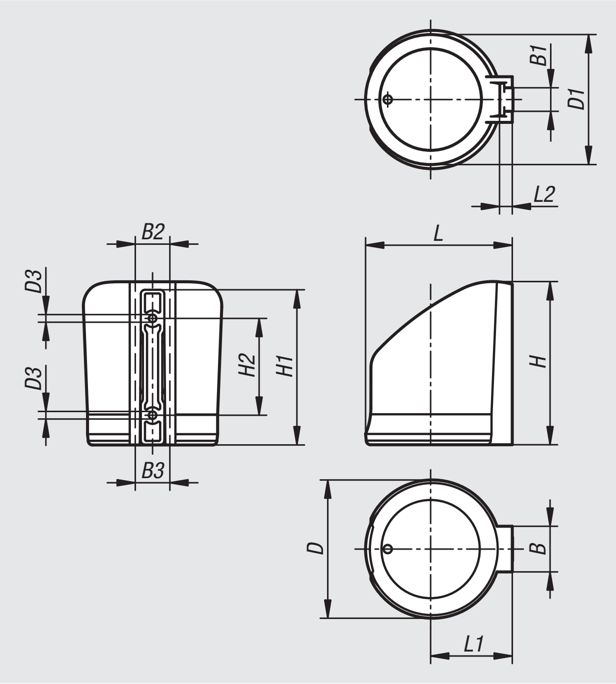
Application:
Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.
Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).
Electrically conductive products which conform to DIN EN 61340-5-1 are essential within electronic environments to prevent an electrostatic discharge.
These products can be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

Supplied with:
1x cup holder.
1x mounting.

Applications:
Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

Safety:
These ESD products can also be used for devices, components and protection systems in areas where there is risk of explosion.
These ESD products prevent electrostatic spark discharges, and eliminate the risk of ignition of gases and dust which could lead to explosions in enclosed spaces.
Manufacturers and operators must apply and comply with the ATEX directives for protecting persons working in areas where there is a risk of explosion.

These ESD products have been certified by TÜV-Süd for their electrical discharge capability.



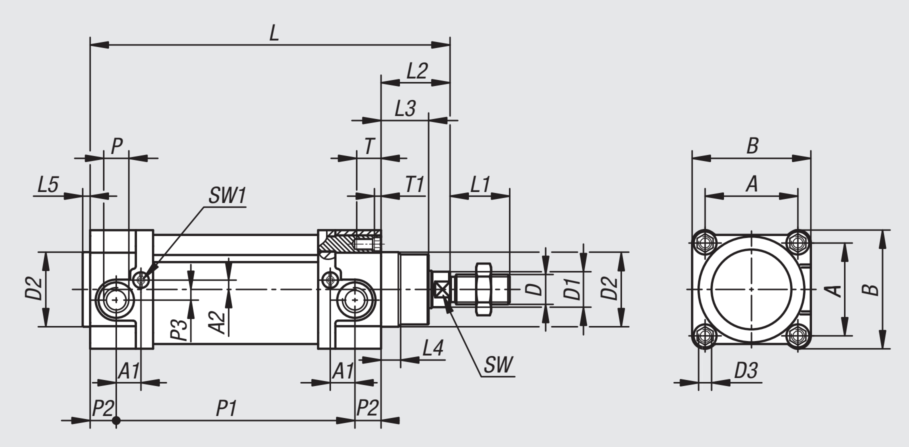
Order No.	Version 1	B	B1	B2	B3	D	D1	D3	H	H1	H2	L	L1	L2
10550-15-11	closed	33	17	25,5	23	100	93	5,5	118	112	70	106	59	9,3

12000

Pneumatic technology

Pneumatic cylinders

DIN ISO 15552 standard cylinder



Material:
Cylinder tube: aluminium.
Endcap: die-cast aluminium.
Piston rod: carbon steel 1.0503.
Piston and piston rod seal: polyurethane.

Version:
Cylinder tube: anodised.
Endcap: painted.
Piston rod: hard trivalent passivated.

Sample order:
nlm 12000-032050

Note:
Double-acting pneumatic cylinder in construction-optimised design acc. to DIN ISO 15552. Piston rod with external thread, position detection and adjustable pneumatic damping.

Due to their robust construction, these cylinders are the preferred choice for numerous applications.

Temperature range:
-20 °C to +80 °C.

Technical data:
Operating principle: double-acting.
Operating medium: filtered and dried air, oiled or not oiled.
Operating pressure: 1 to 10 bar.
Damping: pneumatic damping on both sides, adjustable.
Mounting position: arbitrary.
Position detection: can be used for proximity switch in T-slot from above.
Pneumatic connection: DIN EN ISO 228/1.

Pneumatic cylinders

DIN ISO 15552 standard cylinder

Order No.	Cylinder Ø	Travel S	A	A1	A2	B	D	D1	D2	D3	L	L1	L2	L3	L4	L5
12000-032025	32	25	32,5	11,5	3,5	47	M10x1,25	12	30	M6	145	22	26	18	8	4
12000-032050	32	50	32,5	11,5	3,5	47	M10x1,25	12	30	M6	170	22	26	18	8	4
12000-032080	32	80	32,5	11,5	3,5	47	M10x1,25	12	30	M6	200	22	26	18	8	4
12000-032100	32	100	32,5	11,5	3,5	47	M10x1,25	12	30	M6	220	22	26	18	8	4
12000-032125	32	125	32,5	11,5	3,5	47	M10x1,25	12	30	M6	245	22	26	18	8	4
12000-032160	32	160	32,5	11,5	3,5	47	M10x1,25	12	30	M6	280	22	26	18	8	4
12000-032200	32	200	32,5	11,5	3,5	47	M10x1,25	12	30	M6	320	22	26	18	8	4
12000-032250	32	250	32,5	11,5	3,5	47	M10x1,25	12	30	M6	370	22	26	18	8	4
12000-040025	40	25	38	12,5	7,5	54	M12x1,25	16	35	M6	160	24	30	22	12	4
12000-040050	40	50	38	12,5	7,5	54	M12x1,25	16	35	M6	185	24	30	22	12	4
12000-040080	40	80	38	12,5	7,5	54	M12x1,25	16	35	M6	215	24	30	22	12	4
12000-040100	40	100	38	12,5	7,5	54	M12x1,25	16	35	M6	235	24	30	22	12	4
12000-040125	40	125	38	12,5	7,5	54	M12x1,25	16	35	M6	260	24	30	22	12	4
12000-040160	40	160	38	12,5	7,5	54	M12x1,25	16	35	M6	295	24	30	22	12	4
12000-040200	40	200	38	12,5	7,5	54	M12x1,25	16	35	M6	335	24	30	22	12	4
12000-040250	40	250	38	12,5	7,5	54	M12x1,25	16	35	M6	385	24	30	22	12	4
12000-050025	50	25	46,5	13,25	5	63	M16x1,5	20	40	M8	168	32	37	25,5	10,5	4
12000-050050	50	50	46,5	13,25	5	63	M16x1,5	20	40	M8	193	32	37	25,5	10,5	4
12000-050080	50	80	46,5	13,25	5	63	M16x1,5	20	40	M8	223	32	37	25,5	10,5	4
12000-050100	50	100	46,5	13,25	5	63	M16x1,5	20	40	M8	243	32	37	25,5	10,5	4
12000-050125	50	125	46,5	13,25	5	63	M16x1,5	20	40	M8	268	32	37	25,5	10,5	4
12000-050160	50	160	46,5	13,25	5	63	M16x1,5	20	40	M8	303	32	37	25,5	10,5	4
12000-050200	50	200	46,5	13,25	5	63	M16x1,5	20	40	M8	343	32	37	25,5	10,5	4
12000-050250	50	250	46,5	13,25	5	63	M16x1,5	20	40	M8	393	32	37	25,5	10,5	4
12000-063025	63	25	56,5	8	9	74	M16x1,5	20	45	M8	183	32	37	25	8,5	4
12000-063050	63	50	56,5	8	9	74	M16x1,5	20	45	M8	208	32	37	25	8,5	4
12000-063080	63	80	56,5	8	9	74	M16x1,5	20	45	M8	238	32	37	25	8,5	4
12000-063100	63	100	56,5	8	9	74	M16x1,5	20	45	M8	258	32	37	25	8,5	4
12000-063125	63	125	56,5	8	9	74	M16x1,5	20	45	M8	283	32	37	25	8,5	4
12000-063160	63	160	56,5	8	9	74	M16x1,5	20	45	M8	318	32	37	25	8,5	4
12000-063200	63	200	56,5	8	9	74	M16x1,5	20	45	M8	358	32	37	25	8,5	4
12000-063250	63	250	56,5	8	9	74	M16x1,5	20	45	M8	408	32	37	25	8,5	4
12000-080025	80	25	72	9,25	14	93,5	M20x1,5	25	45	M10	199	40	46	35	10	4
12000-080050	80	50	72	9,25	14	93,5	M20x1,5	25	45	M10	224	40	46	35	10	4
12000-080080	80	80	72	9,25	14	93,5	M20x1,5	25	45	M10	254	40	46	35	10	4
12000-080100	80	100	72	9,25	14	93,5	M20x1,5	25	45	M10	274	40	46	35	10	4
12000-080125	80	125	72	9,25	14	93,5	M20x1,5	25	45	M10	299	40	46	35	10	4
12000-080160	80	160	72	9,25	14	93,5	M20x1,5	25	45	M10	334	40	46	35	10	4
12000-080200	80	200	72	9,25	14	93,5	M20x1,5	25	45	M10	374	40	46	35	10	4
12000-080250	80	250	72	9,25	14	93,5	M20x1,5	25	45	M10	424	40	46	35	10	4

Pneumatic cylinders

DIN ISO 15552 standard cylinder

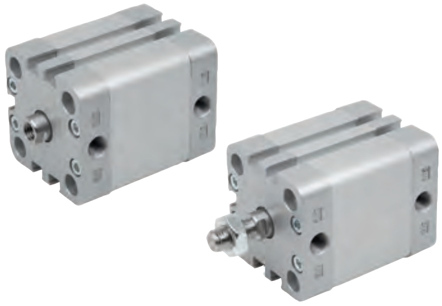
Order No.	P	P1	P2	P3	SW	SW1	T	T1	Piston force at 6 bar (N)	Retraction force at 6 bar (N)
12000-032025	G1/8	94	12,5	-	10	2	16,5	5	458	394
12000-032050	G1/8	119	12,5	-	10	2	16,5	5	458	394
12000-032080	G1/8	149	12,5	-	10	2	16,5	5	458	394
12000-032100	G1/8	169	12,5	-	10	2	16,5	5	458	394
12000-032125	G1/8	194	12,5	-	10	2	16,5	5	458	394
12000-032160	G1/8	229	12,5	-	10	2	16,5	5	458	394
12000-032200	G1/8	269	12,5	-	10	2	16,5	5	458	394
12000-032250	G1/8	319	12,5	-	10	2	16,5	5	458	394
12000-040025	G1/4	102	14	-	13	2,5	16,5	4,5	716	601
12000-040050	G1/4	127	14	-	13	2,5	16,5	4,5	716	601
12000-040080	G1/4	157	14	-	13	2,5	16,5	4,5	716	601
12000-040100	G1/4	177	14	-	13	2,5	16,5	4,5	716	601
12000-040125	G1/4	202	14	-	13	2,5	16,5	4,5	716	601
12000-040160	G1/4	237	14	-	13	2,5	16,5	4,5	716	601
12000-040200	G1/4	277	14	-	13	2,5	16,5	4,5	716	601
12000-040250	G1/4	327	14	-	13	2,5	16,5	4,5	716	601
12000-050025	G1/4	103	14	-	17	2,5	16,5	4,5	1180	939
12000-050050	G1/4	128	14	-	17	2,5	16,5	4,5	1180	939
12000-050080	G1/4	158	14	-	17	2,5	16,5	4,5	1180	939
12000-050100	G1/4	178	14	-	17	2,5	16,5	4,5	1180	939
12000-050125	G1/4	203	14	-	17	2,5	16,5	4,5	1180	939
12000-050160	G1/4	238	14	-	17	2,5	16,5	4,5	1180	939
12000-050200	G1/4	278	14	-	17	2,5	16,5	4,5	1180	939
12000-050250	G1/4	328	14	-	17	2,5	16,5	4,5	1180	939
12000-063025	G3/8	106	20	7	17	2,5	16,5	4,5	1775	1596
12000-063050	G3/8	131	20	7	17	2,5	16,5	4,5	1775	1596
12000-063080	G3/8	161	20	7	17	2,5	16,5	4,5	1775	1596
12000-063100	G3/8	181	20	7	17	2,5	16,5	4,5	1775	1596
12000-063125	G3/8	206	20	7	17	2,5	16,5	4,5	1775	1596
12000-063160	G3/8	241	20	7	17	2,5	16,5	4,5	1775	1596
12000-063200	G3/8	281	20	7	17	2,5	16,5	4,5	1775	1596
12000-063250	G3/8	331	20	7	17	2,5	16,5	4,5	1775	1596
12000-080025	G3/8	116	18,5	6,5	22	4	17	-	2863	2583
12000-080050	G3/8	141	18,5	6,5	22	4	17	-	2863	2583
12000-080080	G3/8	171	18,5	6,5	22	4	17	-	2863	2583
12000-080100	G3/8	191	18,5	6,5	22	4	17	-	2863	2583
12000-080125	G3/8	216	18,5	6,5	22	4	17	-	2863	2583
12000-080160	G3/8	251	18,5	6,5	22	4	17	-	2863	2583
12000-080200	G3/8	291	18,5	6,5	22	4	17	-	2863	2583
12000-080250	G3/8	341	18,5	6,5	22	4	17	-	2863	2583

Notes

12001

Pneumatic compact cylinders

DIN ISO 21287, double-acting with magnetic piston



Material:
Cylinder tube: aluminium.
End cover: die-cast aluminium.
Piston rod: stainless steel 1.4301 (from cylinder Ø 32 mm 1.4021).
Piston and piston rod seal: polyurethane.

Version:
Cylinder tube: anodised.
Endcap: bright.
Piston rod: bright.

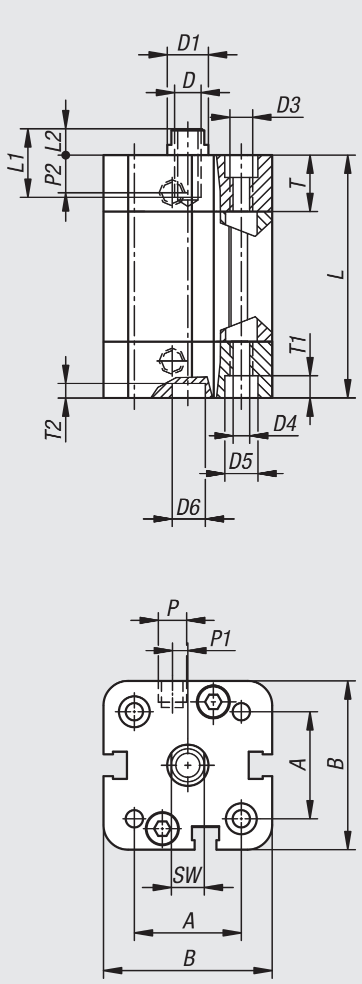
Sample order:
nlm 12001-0200251

Note:
Double-acting pneumatic cylinder acc. to DIN ISO 21287. Piston rod with internal or external thread, position detection for proximity switch and flexible damping on both sides.

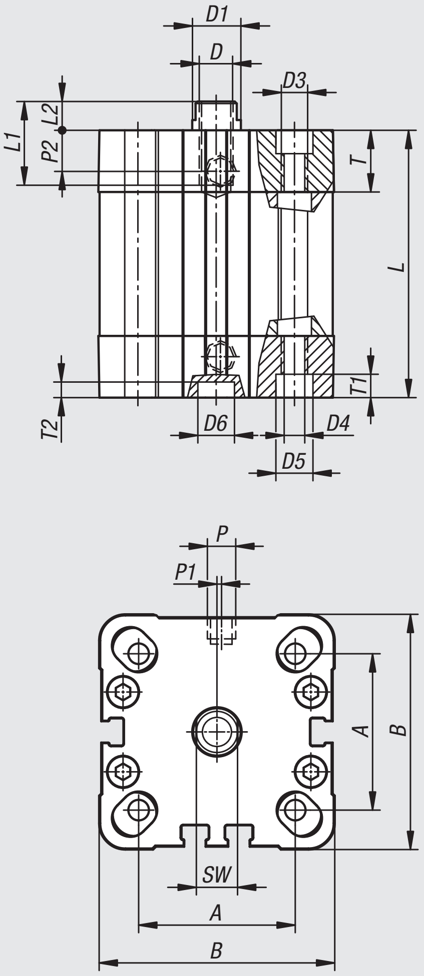
Thanks to their compact structural dimensions, compact cylinders are ideal for use in installation spaces where space is limited.

Temperature range:
-20 °C to +80 °C.

Technical data:
Operating principle: double-acting.
Operating medium: filtered and dried air, oiled or not oiled.
Operating pressure: 1 to 10 bar.
Damping: flexible damping on both sides, adjustable.
Mounting position: arbitrary.
Position detection for proximity switch.
Pneumatic connection: DIN EN ISO 228/1.



Ø 20; 25mm



Ø 32; 40mm

Pneumatic compact cylinders

DIN ISO 21287, double-acting with magnetic piston

Female thread

Order No.	Version 2	Cylinder Ø	Travel S	A	B	D	D1	D3	D4	D5	D6	L	L1	L2
12001-0200101	internal thread	20	10	22	37	M6	10	M5	4,2	7,5	6	47±0,5	10	6
12001-0200251	internal thread	20	25	22	37	M6	10	M5	4,2	7,5	6	62±0,5	10	6
12001-0200501	internal thread	20	50	22	37	M6	10	M5	4,2	7,5	6	87±0,5	10	6
12001-0250101	internal thread	25	10	26	41	M6	10	M5	4,2	7,5	6	49±0,5	10	6
12001-0250251	internal thread	25	25	26	41	M6	10	M5	4,2	7,5	6	64±0,5	10	6
12001-0250501	internal thread	25	50	26	41	M6	10	M5	4,2	7,5	6	89±0,5	10	6
12001-0320101	internal thread	32	10	32,5	49,2	M8	12	M6	5,2	9	6	54±0,5	12	7
12001-0320251	internal thread	32	25	32,5	49,2	M8	12	M6	5,2	9	6	69±0,5	12	7
12001-0320501	internal thread	32	50	32,5	49,2	M8	12	M6	5,2	9	6	94±0,5	12	7
12001-0400101	internal thread	40	10	38	57,2	M8	12	M6	5,2	9	6	55±0,7	12	7
12001-0400251	internal thread	40	25	38	57,2	M8	12	M6	5,2	9	6	70±0,7	12	7
12001-0400501	internal thread	40	50	38	57,2	M8	12	M6	5,2	9	6	95±0,7	12	7

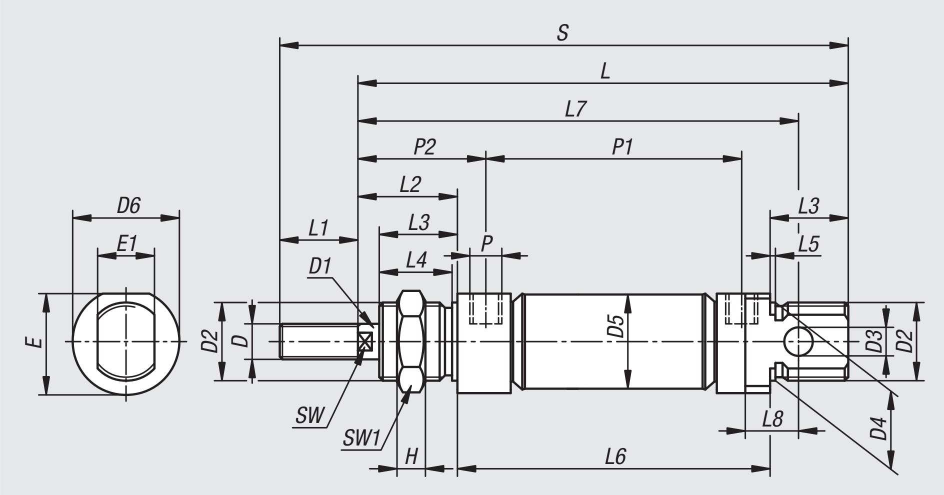
Male thread

Order No.	Version 2	P	P1	P2	T	T1	T2	SW	Piston force at 6 bar (N)	Retraction force at 6 bar (N)
12001-0200102	external thread	M5	4	7	12,3	4,2	2,5	8	188	142
12001-0200252	external thread	M5	4	7	12,3	4,2	2,5	8	188	142
12001-0200502	external thread	M5	4	7	12,3	4,2	2,5	8	188	142
12001-0250102	external thread	M5	3	7,5	13,5	4,2	2,5	8	295	248
12001-0250252	external thread	M5	3	7,5	13,5	4,2	2,5	8	295	248
12001-0250502	external thread	M5	3	7,5	13,5	4,2	2,5	8	295	248
12001-0320102	external thread	G1/8	-	7,5	15	4,5	2	10	482	415
12001-0320252	external thread	G1/8	-	7,5	15	4,5	2	10	482	415
12001-0320502	external thread	G1/8	-	7,5	15	4,5	2	10	482	415
12001-0400102	external thread	G1/8	-	7,5	15	4,2	2	10	754	687
12001-0400252	external thread	G1/8	-	7,5	15	4,2	2	10	754	687
12001-0400502	external thread	G1/8	-	7,5	15	4,2	2	10	754	687

12002

Pneumatic round cylinders

DIN ISO 6432, double-acting with magnetic piston



Material:
Cylinder tube: stainless steel 1.4301.
Endcap: aluminium.
Piston rod: stainless steel 1.4305.
Piston and piston rod seal: polyurethane, NBR.
Cylinder piston: brass.
Piston rod guide bush: sintered bronze.

Version:
Cylinder tube: bright.
Endcap: anodised.
Piston rod: bright.

Sample order:
nlm 12002-010025

Note:
Double-acting pneumatic cylinder acc. to DIN ISO 6432. Piston rod with external thread, position detection for proximity switch and flexible damping on both sides.

Temperature range:
-20 °C to +80 °C.

Technical data:
Operating principle: double-acting.
Operating medium: filtered and dried air, oiled or not oiled.
Operating pressure: 1 to 10 bar.
Damping: flexible damping on both sides, adjustable.
Mounting position: arbitrary.
Position detection for proximity switch.
Pneumatic connection: DIN EN ISO 228/1.

Order No.	Cylinder Ø	Travel S	D	D1	D2	D3	D4	D5	D6	E	E1	H	L	L1	L2	L3
12002-010010	10	10	M4	4	M12x1,5	4	12	11,3	16	15	8	7	84	12	16	12
12002-010025	10	25	M4	4	M12x1,5	4	12	11,3	16	15	8	7	99	12	16	12
12002-012010	12	10	M6	6	M16x1,5	6	16	13,3	19	18	12	5	98	16	22	18
12002-012025	12	25	M6	6	M16x1,5	6	16	13,3	19	18	12	5	113	16	22	18
12002-016010	16	10	M6	6	M16x1,5	6	16	17,3	19	18	12	5	103	16	22	18
12002-016025	16	25	M6	6	M16x1,5	6	16	17,3	19	18	12	5	118	16	22	18
12002-016050	16	50	M6	6	M16x1,5	6	16	17,3	19	18	12	5	143	16	22	18
12002-020010	20	10	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	121	20	24	20

Pneumatic round cylinders

DIN ISO 6432, double-acting with magnetic piston

Order No.	Cylinder Ø	Travel S	D	D1	D2	D3	D4	D5	D6	E	E1	H	L	L1	L2	L3
12002-020025	20	25	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	136	20	24	20
12002-020050	20	50	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	161	20	24	20
12002-020080	20	80	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	191	20	24	20
12002-020100	20	100	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	211	20	24	20
12002-020125	20	125	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	236	20	24	20
12002-020160	20	160	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	271	20	24	20
12002-020200	20	200	M8	8	M22x1,5	8	22	21,3	27	25,5	16	8	311	20	24	20
12002-025010	25	10	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	128	22	28	22
12002-025025	25	25	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	143	22	28	22
12002-025050	25	50	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	168	22	28	22
12002-025080	25	80	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	198	22	28	22
12002-025100	25	100	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	218	22	28	22
12002-025125	25	125	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	243	22	28	22
12002-025160	25	160	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	278	22	28	22
12002-025200	25	200	M10x1,25	10	M22x1,5	8	22	26,5	30	28,5	16	8	318	22	28	22

Order No.	L4	L5	L6	L7	L8	P	P1	P2	SW	SW1	Piston force at 6 bar (N)	Retraction force at 6 bar (N)
12002-010010	11	1	56	74	6	M5	46	21	-	19	40	32
12002-010025	11	1	71	89	6	M5	61	21	-	19	40	32
12002-012010	16,5	1,5	58	85	9	M5	48	27	5	22	54	37
12002-012025	16,5	1,5	73	100	9	M5	63	27	5	22	54	37
12002-016010	16,5	1,5	63	92	9	M5	54	27	5	22	105	88
12002-016025	16,5	1,5	78	107	9	M5	69	27	5	22	105	88
12002-016050	16,5	1,5	103	132	9	M5	94	27	5	22	105	88
12002-020010	18,5	1,5	77	105	12	G1/8	61,5	32	7	27	172	142
12002-020025	18,5	1,5	92	120	12	G1/8	76,5	32	7	27	172	142
12002-020050	18,5	1,5	117	145	12	G1/8	101,5	32	7	27	172	142
12002-020080	18,5	1,5	147	175	12	G1/8	131,5	32	7	27	172	142
12002-020100	18,5	1,5	167	195	12	G1/8	151,5	32	7	27	172	142
12002-020125	18,5	1,5	192	220	12	G1/8	176,5	32	7	27	172	142
12002-020160	18,5	1,5	227	255	12	G1/8	211,5	32	7	27	172	142
12002-020200	18,5	1,5	267	295	12	G1/8	251,5	32	7	27	172	142
12002-025010	20,5	1,5	78	114	12	G1/8	62	36	9	27	265	218
12002-025025	20,5	1,5	93	129	12	G1/8	77	36	9	27	265	218
12002-025050	20,5	1,5	118	154	12	G1/8	102	36	9	27	265	218
12002-025080	20,5	1,5	148	184	12	G1/8	132	36	9	27	265	218
12002-025100	20,5	1,5	168	204	12	G1/8	152	36	9	27	265	218
12002-025125	20,5	1,5	193	229	12	G1/8	177	36	9	27	265	218
12002-025160	20,5	1,5	228	264	12	G1/8	212	36	9	27	265	218
12002-025200	20,5	1,5	268	304	12	G1/8	252	36	9	27	265	218

Notes

Technical data

Index and list of DIN Standards

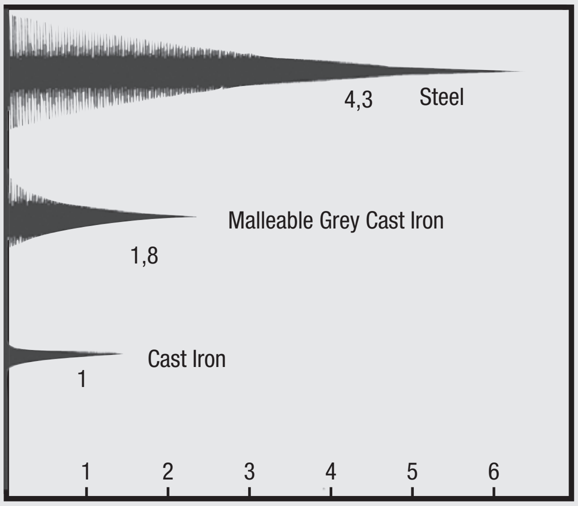
Notes

Technical data for grey cast iron (cast iron with flake graphite)

If cast iron is used for the base of drilling, milling, turning fixtures etc, it can give these crucial advantages over traditional steel fixtures:

- Cast iron has very good vibration damping properties (ratio of cast iron’s damping effect to that of steel = 1 : 4.3. See also the comparative diagram).
- Cast iron has good fail-safe properties and good resistance to corrosion.
- Cast iron is easy to machine.

Comparison diagram of oscillation amplitude



Micrograph of cast iron with flake graphite

Material			GJL 250	GJL 300
Tensile strength	R_m	N/mm²	250 – 350	300 – 400
0.1 technical elastic limit	$R_{p\,0,1}$	N/mm²	–	195 – 260
Elasticity limit 0,1	R_e	N/mm²	165 – 228	195 – 260
Compressive strength	δ_{dB}	N/mm²	840	960
Shearing strength	τ_{aB}	N/mm²	290	345
Modulus of elasticity	E	(kN/mm²)	103 – 118	108 – 137
Density	e	g/cm³	7,2	7,25
Hardness	–	HB 30	180 – 250	200 – 275
Coefficient of linear expansion	α	$1 \cdot 10^{-6}$/K	10	11,7

Length tolerances for special lengths:
Grey iron and aluminium profiles and steel and plastic offcuts (Group 01000) are mostly cut to length with saw cuts and they may therefore have the following length tolerances because of their variations relative to the standard design:

Linear Dimensions	Deviations in mm
100-290	+ 10 + 3
300-590	+ 15 + 8
over 600	+ 50 + 20

All other nominal sizes are according to “DIN ISO 2768-mk”.

ISO fits for standard bores

DK 621.753.2(100) GERMAN STANDARDS August 1966

ISO fits for standard bores

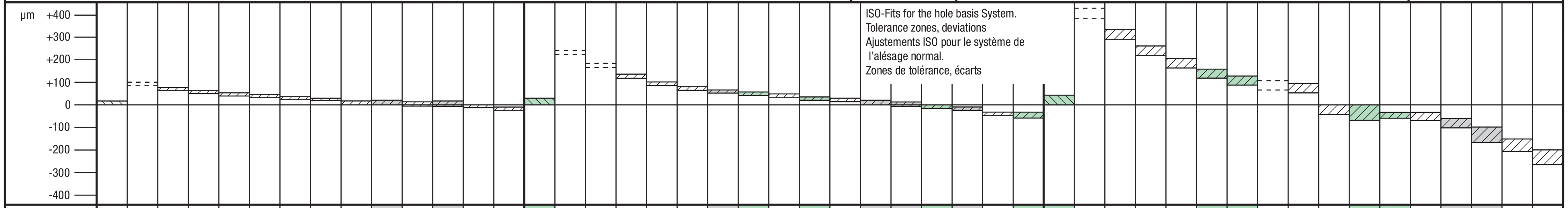
Tolerance ranges
dimensions in µm

DIN 7154
sheet 1

Tolerance examples for nominal diameter 60 mm

▨ ID (bores)
▨ OD (shafts)
┆ Do not apply to nominal diameter 60 mm

Tolerance ranges acc. to DIN 7157 [1]
🟩 Series 1
⬜ Series 2



ISO-Fits for the hole basis System.
Tolerance zones, deviations
Ajustements ISO pour le système de l'alésage normal.
Zones de tolérance, écarts

Amended August 1966:
dimensions coordinated to
ISO recommendations ISO/R 286-1962

Previous editions: DIN 7154: 10.36
DIN 7154 sheet 1: 12.50, 9.56

Nominal dimension range in mm \ Tolerance range	H6	u5	t5	s5	r5	p5	n5	m5	k5	k6	j5	j6	h5	g5
Š 1 Ÿ 3	+6 0	+22 +18	—	+18 +14	+14 +10	+10 +6	+8 +4	+6 +2	+4 0	+6 0	+2 -2	+4 -2	0 -4	-2 -6
> 3 Ÿ 6	+8 0	+28 +23	—	+24 +19	+20 +15	+17 +12	+13 +8	+9 +4	+6 +1	+9 +1	+3 -2	+6 -2	0 -5	-4 -9
> 6 Ÿ 10	+9 0	+34 +28	—	+29 +23	+25 +19	+21 +15	+16 +10	+12 +6	+7 +1	+10 +1	+4 -2	+7 -2	0 -6	-5 -11
> 10 Ÿ 14	+11 0	+41 +33	—	+36 +28	+31 +23	+26 +18	+20 +12	+15 +7	+9 +1	+12 +1	+5 -3	+8 -3	0 -8	-6 -14
> 14 Ÿ 18														
> 18 Ÿ 24	+13 0	+50 +41	—	+44 +35	+37 +28	+31 +22	+24 +15	+17 +8	+11 +2	+15 +2	+5 -4	+9 -4	0 -9	-7 -16
> 24 Ÿ 30		—	+50 +41											
> 30 Ÿ 40	+16 0	—	+59 +48	+54 +43	+45 +34	+37 +26	+28 +17	+20 +9	+13 +2	+18 +2	+6 -5	+11 -5	0 -11	-9 -20
> 40 Ÿ 50			+65 +54											
> 50 Ÿ 65	+19 0	—	+79 +66	+66 +53	+54 +41	+45 +32	+33 +20	+24 +11	+15 +2	+21 +2	+6 -7	+12 -7	0 -13	-10 -23
> 65 Ÿ 80			—	+72 +59	+56 +43									
> 80 Ÿ 100	+22 0	—	—	+86 +71	+66 +51	+52 +37	+38 +23	+28 +13	+18 +3	+25 +3	+6 -9	+13 -9	0 -15	-12 -27
> 100 Ÿ 120				—	+69 +54									

Nominal dimension range in mm \ Tolerance range	H7	za6	z6	x6	u6	t6	s6	r6	p6	n6	m6	k6	j6	h6	g6	f6	f7
Š 1 Ÿ 3	+10 0	+38 +32	+32 +26	+26 +20	+24 +18	—	+20 +14	+16 +10	+12 +6	+10 +4	+8 +2	+6 0	+4 -2	0 -6	-2 -8	-6 -12	-6 -16
> 3 Ÿ 6	+12 0	+50 +42	+43 +35	+36 +28	+31 +23	—	+27 +19	+23 +15	+20 +12	+16 +8	+12 +4	+9 +1	+6 -2	0 -8	-4 -12	-10 -18	-10 -22
> 6 Ÿ 10	+15 0	+61 +52	+51 +42	+43 +34	+37 +28	—	+32 +23	+28 +19	+24 +15	+19 +10	+15 +6	+10 +1	+7 -2	0 -9	-5 -14	-13 -22	-13 -28
> 10 Ÿ 14	+18 0	+75 +64	+61 +50	+51 +40	+44 +33	—	+39 +28	+34 +23	+29 +18	+23 +12	+18 +7	+12 +1	+8 -3	0 -11	-6 -17	-16 -27	-16 -34
> 14 Ÿ 18		+88 +77	+71 +60	+56 +45													
> 18 Ÿ 24	+21 0	—	+86 +73	+67 +54	+54 +41	—	+48 +35	+41 +28	+35 +22	+28 +15	+21 +8	+15 +2	+9 -4	0 -13	-7 -20	-20 -33	-20 -41
> 24 Ÿ 30			+101 +88	+77 +64	+61 +48	+54 +41											
> 30 Ÿ 40	+25 0	—	+128 +112	+96 +80	+76 +60	+64 +48	+59 +43	+50 +34	+42 +26	+33 +17	+25 +9	+18 +2	+11 -5	0 -16	-9 -25	-25 -41	-25 -50
> 40 Ÿ 50			—	+113 +97	+86 +70	+70 +54											
> 50 Ÿ 65	+30 0	—	—	+141 +122	+106 +87	+85 +66	+72 +53	+60 +41	+51 +32	+39 +20	+30 +11	+21 +2	+12 -7	0 -19	-10 -29	-30 -49	-30 -60
> 65 Ÿ 80				—	+121 +102	+94 +75	+78 +59	+62 +43									
> 80 Ÿ 100	+35 0	—	—	—	+146 +124	+113 +91	+93 +71	+73 +51	+59 +37	+45 +23	+35 +13	+25 +3	+13 -9	0 -22	-12 -34	-36 -58	-36 -71
> 100 Ÿ 120					+166 +144	+126 +104	+101 +79	+76 +54									

Nominal dimension range in mm \ Tolerance range	H8	zc8	zb8	za8	z8	x8	u8	t8	s8	h8	h9	f7	f8	e8	d9	c9	b9
Š 1 Ÿ 3	+14 0	+74 +60	+54 +40	—	+40 +26	+34 +20	—	—	+28 +14	0 -14	0 -25	-6 -16	-6 -20	-14 -28	-20 -45	-60 -85	-140 -165
> 3 Ÿ 6	+18 0	+98 +80	+68 +50	—	+53 +35	+46 +28	—	—	+37 +19	0 -18	0 -30	-10 -22	-10 -28	-20 -38	-30 -60	-70 -100	-140 -170
> 6 Ÿ 10	+22 0	+119 +97	+89 +67	+74 +52	+64 +42	+56 +34	—	—	+45 +23	0 -22	0 -36	-13 -28	-13 -35	-25 -47	-40 -76	-80 -116	-150 -186
> 10 Ÿ 14	+27 0	+157 +130	+117 +90	+91 +64	+77 +50	+67 +40	—	—	+55 +28	0 -27	0 -43	-16 -34	-16 -43	-32 -59	-50 -93	-95 -138	-150 -193
> 14 Ÿ 18		+177 +150	+135 +108	+104 +77	+87 +60	+72 +45											
> 18 Ÿ 24	+33 0	+221 +188	+169 +136	+131 +98	+106 +73	+87 +54	—	—	+68 +35	0 -33	0 -52	-20 -41	-20 -53	-40 -73	-65 -117	-110 -162	-160 -212
> 24 Ÿ 30		+251 +218	+193 +160	+151 +118	+121 +88	+97 +64	+81 +48										
> 30 Ÿ 40	+39 0	—	+239 +200	+187 +148	+151 +112	+119 +80	+99 +48	—	+82 +43	0 -39	0 -62	-25 -50	-25 -64	-50 -89	-80 -142	-120 -182	-170 -232
> 40 Ÿ 50			+281 +242	+219 +180	+175 +136	+136 +97	+109 +70									-130 -192	-180 -242
> 50 Ÿ 65	+46 0	—	+346 +300	+272 +226	+218 +172	+168 +122	+133 +87	—	+99 +53	0 -46	0 -74	-30 -60	-30 -76	-60 -106	-100 -174	-140 -214	-190 -264
> 65 Ÿ 80			—	+320 +274	+256 +210	+192 +146	+148 +102	—	+105 +59							-150 -224	-200 -274
> 80 Ÿ 100	+54 0	—	—	+389 +335	+312 +258	+232 +178	+178 +124	—	+125 +71	0 -54	0 -87	-36 -71	-36 -90	-72 -126	-120 -207	-170 -257	-220 -307
> 100 Ÿ 120				—	+364 +310	+264 +210	+198 +144	+158 +104	+133 +79							-180 -267	-240 -327

Black numbers = GO limit
Green numbers = NO-GO limit
Fits for standard bores, fit tolerances (clearances and interferences) see DIN 7154, sheet 2
Fits for standard shaft, see DIN 7155, sheet 1 and sheet 2

Continued on page 2

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[1] DIN 7157 tolerance ranges are recommended.
Series 1 is preferable to Series 2

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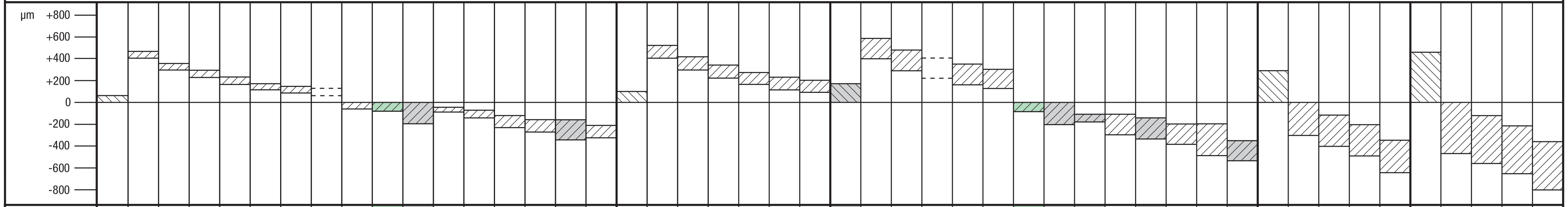
DIN 7154 page2-sheet 1

Tolerance examples for nominal diameter 60 mm

▨ ID (bores)   ▨ OD (shafts)   ┆ Do not apply to nominal diameter 60 mm

Tolerance ranges acc. to DIN 7157 ¹) { Series 1 🟩 / Series 2 ⬜

Dimensions in µm



Nominal dimension range in mm	Tolerance range	H9	zc9	zb9	za9	z9	x9	u9	t9	h8	h9	h11	f8	e9	d10	c10	c11	b10
	‹ 1 › 3	+25 0	+85 +60	+65 +40	—	+51 +26	+45 +20	—	—	0 -14	0 -25	0 -60	-6 -20	-14 -39	-20 -60	-60 -100	-60 -120	-140 -180
	> 3 › 6	+30 0	+110 +80	+80 +50	—	+65 +35	+58 +28	—	—	0 -18	0 -30	0 -75	-10 -28	-20 -50	-30 -78	-70 -118	-70 -145	-140 -188
	> 6 › 10	+36 0	+133 +97	+103 +67	—	+78 +42	+70 +34	—	—	0 -22	0 -36	0 -90	-13 -35	-25 -61	-40 -98	-80 -138	-80 -170	-150 -208
	> 10 › 14	+43 0	+173 +130	+133 +90	—	+93 +50	+83 +40	—	—	0 -27	0 -43	0 -110	-16 -43	-32 -75	-50 -112	-95 -165	-95 -205	-150 -220
	> 14 › 18		+193 +150	+151 +108	—	+103 +60	+88 +45											
	> 18 › 24	+52 0	+240 +188	+188 +136	+150 +98	+125 +73	+106 +54	—	—	0 -33	0 -52	0 -130	-20 -53	-40 -92	-65 -149	-110 -194	-110 -240	-160 -244
	> 24 › 30		+270 +218	+212 +160	+170 +118	+140 +88	+116 +64	+100 +48										
	> 30 › 40	+62 0	+336 +274	+262 +200	+210 +148	+174 +112	+142 +80	+122 +60	—	0 -39	0 -62	0 -160	-25 -64	-50 -112	-80 -180	-120 -220	-120 -280	-170 -270
	> 40 › 50		+387 +325	+304 +242	+242 +180	+198 +136	+159 +97	+132 +70								-130 -230	-130 -290	-180 -280
	> 50 › 65	+74 0	+479 +405	+374 +300	+300 +226	+245 +172	+196 +122	+161 +87	—	0 -46	0 -74	0 -190	-30 -76	-60 -134	-100 -220	-140 -260	-140 -330	-190 -310
	> 65 › 80		—	+434 +360	+348 +274	+284 +210	+220 +146	+176 +102								-150 -270	-150 -340	-200 -320
	> 80 › 100	+87 0	—	+532 +445	+422 +335	+345 +258	+265 +178	+211 +124	—	0 -54	0 -87	0 -220	-36 -90	-72 -159	-120 -260	-170 -310	-170 -390	-220 -360
	> 100 › 120			—	+487 +400	+397 +310	+297 +210	+231 +144								-180 -320	-180 -400	-240 -380

Nominal dimension range in mm	Tolerance range	H10	zc10	zb10	za10	z10	x10	u10
	‹ 1 › 3	+40 0	+100 +60	—	—	+66 +26	—	—
	> 3 › 6	+48 0	+128 +80	—	—	+83 +35	—	—
	> 6 › 10	+58 0	+155 +97	+125 +67	—	+100 +42	—	—
	> 10 › 14	+70 0	+200 +130	+160 +90	—	+120 +42	—	—
	> 14 › 18		+220 +150	+178 +108	—	+130 +60	+115 +45	
	> 18 › 24	+84 0	+272 +188	+220 +136	—	+157 +73	+138 +54	—
	> 24 › 30		+302 +218	+244 +160	—	+172 +88	+148 +64	
	> 30 › 40	+100 0	+374 +274	+300 +200	—	+212 +112	+180 +80	—
	> 40 › 50		+425 +325	+342 +242	+280 +180	+236 +136	+197 +97	+170 +70
	> 50 › 65	+120 0	+525 +405	+420 +300	+346 +226	+292 +172	+242 +122	+207 +87
	> 65 › 80		+600 +480	+480 +360	+394 +274	+330 +210	+266 +146	+222 +102
	> 80 › 100	+140 0	+725 +585	+585 +445	+475 +335	+398 +258	+318 +178	+264 +124
	> 100 › 120		+830 +690	+665 +525	+540 +400	+450 +310	+350 +210	+284 +144

Nominal dimension range in mm	Tolerance range	H11	zc11	zb11	za11	z11	x11	h9	h11	d9	d11	c11	b11	b12	a11
	‹ 1 › 3	+60 0	+120 +60	—	—	—	—	0 -25	0 -60	-20 -45	-20 -80	-60 -120	-140 -200	-140 -240	-270 -330
	> 3 › 6	+75 0	+155 +80	—	—	—	—	0 -30	0 -75	-30 -60	-30 -105	-70 -145	-140 -215	-140 -260	-270 -345
	> 6 › 10	+90 0	+187 +97	+157 +67	—	—	—	0 -36	0 -90	-40 -76	-40 -130	-80 -170	-150 -240	-150 -300	-280 -370
	> 10 › 14	+110 0	+240 +130	+200 +90	—	—	—	0 -43	0 -110	-50 -93	-50 -160	-95 -205	-150 -260	-150 -330	-290 -400
	> 14 › 18		+260 +150	+218 +108											
	> 18 › 24	+130 0	+318 +188	+266 +136	—	—	—	0 -52	0 -130	-65 -117	-65 -195	-110 -240	-160 -290	-160 -370	-300 -430
	> 24 › 30		+348 +218	+290 +160	—	+218 +88									
	> 30 › 40	+160 0	+434 +274	+360 +200	—	+272 +112	—	0 -62	0 -160	-80 -142	-80 -240	-120 -280	-170 -330	-170 -420	-310 -470
	> 40 › 50		+485 +325	+402 +242	—	+296 +136						-130 -290	-180 -340	-180 -430	-320 -480
	> 50 › 65	+190 0	+595 +405	+490 +300	—	+362 +172	+312 +122	0 -74	0 -190	-100 -174	-100 -290	-140 -330	-190 -380	-190 -490	-340 -530
	> 65 › 80		+670 +480	+550 +360	—	+400 +210	+336 +146					-150 -340	-200 -390	-200 -500	-360 -550
	> 80 › 100	+220 0	+805 +585	+665 +445	—	+478 +258	+398 +178	0 -87	0 -220	-120 -207	-120 -340	-170 -390	-220 -440	-220 -570	-380 -600
	> 100 › 120		+910 +690	+745 +525	+620 +400	+530 +310	+430 +210					-180 -400	-240 -460	-240 -590	-410 -630

Nominal dimension range in mm	Tolerance range	H12	h12	d12	b12	a12	H13	h13	d13	b13	a13
	‹ 1 › 3	+100 0	0 -100	-20 -120	-140 -240	-270 -370	+140 0	0 -140	-20 -160	-140 -280	-270 -410
	> 3 › 6	+120 0	0 -120	-30 -150	-140 -260	-270 -390	+180 0	0 -180	-30 -210	-140 -320	-270 -450
	> 6 › 10	+150 0	0 -150	-40 -190	-150 -300	-280 -430	+220 0	0 -220	-40 -260	-150 -370	-280 -500
	> 10 › 14	+180 0	0 -180	-50 -230	-150 -330	-290 -470	+270 0	0 -270	-50 -320	-150 -420	-290 -560
	> 14 › 18										
	> 18 › 24	+210 0	0 -210	-65 -275	-160 -370	-300 -510	+330 0	0 -330	-65 -395	-160 -490	-300 -630
	> 24 › 30										
	> 30 › 40	+250 0	0 -250	-80 -330	-170 -420	-310 -560	+390 0	0 -390	-80 -470	-170 -560	-310 -700
	> 40 › 50				-180 -430	-320 -570				-180 -570	-320 -710
	> 50 › 65	+300 0	0 -300	-100 -400	-190 -490	-340 -640	+460 0	0 -460	-100 -560	-190 -650	-340 -800
	> 65 › 80				-200 -500	-360 -660				-200 -660	-360 -820
	> 80 › 100	+350 0	0 -350	-120 -470	-220 -500	-380 -730	+540 0	0 -540	-120 -660	-220 -760	-380 -920
	> 100 › 120				-240 -590	-410 -760				-240 -780	-410 -950

Black numbers = GO limit
Green numbers = NO-GO limit

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¹) DIN 7157 tolerance ranges are recommended.
Series 1 is preferable to Series 2

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ISO fits for standard shafts

DK 621.753.2(100) GERMAN STANDARDS August 1966

ISO fits for standard shafts

Tolerance ranges
dimensions in µm

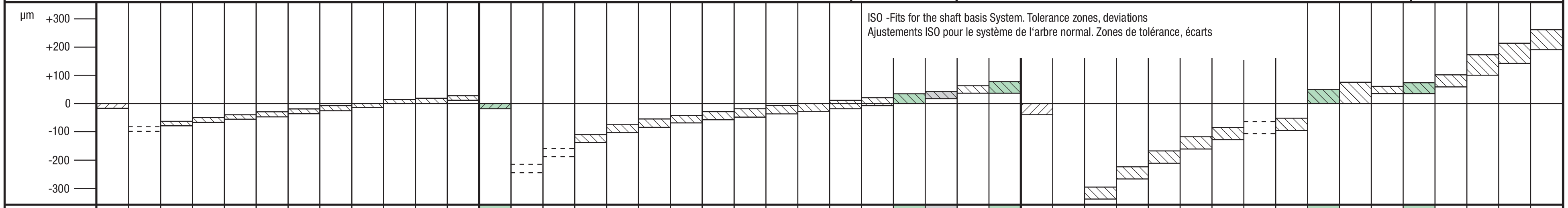
DIN
7155
sheet 1

Tolerance examples for nominal diameter 60 mm

▨ ID (bores)   ▨ OD (shafts)   ⬚ Do not apply to nominal diameter 60 mm

Tolerance ranges acc. to DIN 7157 ¹) { Series 1 🟩 / Series 2 ⬜

ISO -Fits for the shaft basis System. Tolerance zones, deviations
Ajustements ISO pour le système de l'arbre normal. Zones de tolérance, écarts



Nominal dimension range in mm	h5	U6	T6	S6	R6	P6	N6	M6	K6	J6	H6	G6	h6
¡ 1 ¢ 3	0 -4	-18 -24	—	-14 -20	-10 -16	-6 -12	-4 -10	-2 -8	0 -6	+2 -4	+6 0	+8 +2	0 -6
> 3 ¢ 6	0 -5	-20 -28	—	-16 -24	-12 -20	-9 -17	-5 -13	-1 -9	+2 -6	+5 -3	+8 0	+12 +4	0 -8
> 6 ¢ 10	0 -6	-25 -34	—	-20 -29	-16 -25	-12 -21	-7 -16	-3 -12	+2 -7	+5 -4	+9 0	+14 +5	0 -9
> 10 ¢ 14	0 -8	-30 -41	—	-25 -36	-20 -31	-15 -26	-9 -20	-4 -15	+2 -9	+6 -5	+11 0	+17 +6	0 -11
> 14 ¢ 18													
> 18 ¢ 24	0 -9	-37 -50	—	-31 -44	-24 -37	-18 -31	-11 -24	-4 -17	+2 -11	+8 -5	+13 0	+20 +7	0 -13
> 24 ¢ 30		—	-37 -50										
> 30 ¢ 40	0 -11	—	-43 -59	-38 -54	-29 -45	-21 -37	-12 -28	-4 -20	+3 -13	+10 -6	+16 0	+25 +9	0 -16
> 40 ¢ 50			-49 -65										
> 50 ¢ 65	0 -13	—	-60 -79	-47 -66	-35 -54	-26 -45	-14 -33	-5 -24	+4 -15	+13 -6	+19 0	+29 +10	0 -19
> 65 ¢ 80			—	-53 -72	-37 -56								
> 80 ¢ 100	0 -15	—	—	-64 -86	-44 -66	-30 -52	-16 -38	-6 -28	+4 -18	+16 -6	+22 0	+34 +12	0 -22
> 100 ¢ 120				—	-47 -69								

Nominal dimension range in mm	ZA7	Z7	X7	U7	T7	S7	R7	P7	N7	M7	K7	J7	H7	G7	F7	F8
¡ 1 ¢ 3	-32 -42	-26 -36	-20 -30	-18 -28	—	-14 -24	-10 -20	-6 -16	-4 -14	-2 -12	0 -10	+4 -6	+10 0	+12 +2	+16 +6	+20 +6
> 3 ¢ 6	-38 -50	-31 -43	-24 -36	-19 -31	—	-15 -27	-11 -23	-8 -20	-4 -16	0 -12	+3 -9	+6 -6	+12 0	+16 +4	+22 +10	+28 +10
> 6 ¢ 10	-46 -61	-36 -51	-28 -43	-22 -37	—	-17 -32	-13 -28	-9 -24	-4 -19	0 -15	+5 -10	+8 -7	+15 0	+20 +5	+28 +13	+35 +13
> 10 ¢ 14	-57 -75	-43 -61	-33 -51	-26 -44	—	-21 -39	-16 -34	-11 -29	-5 -23	0 -18	+6 -12	+10 -8	+18 0	+24 +6	+34 +16	+43 +16
> 14 ¢ 18	-70 -88	-53 -71	-38 -56													
> 18 ¢ 24	—	-65 -86	-46 -67	-33 -54	—	-27 -48	-20 -41	-14 -35	-7 -28	0 -21	+6 -15	+12 -9	+21 0	+28 +7	+41 +20	+53 +20
> 24 ¢ 30		-80 -101	-56 -77	-40 -61	-33 -54											
> 30 ¢ 40	—	-103 -128	-71 -96	-51 -76	-39 -64	-34 -59	-25 -50	-17 -42	-8 -33	0 -25	+7 -18	+14 -11	+25 0	+34 +9	+50 +25	+64 +25
> 40 ¢ 50		—	-88 -113	-61 -86	-45 -70											
> 50 ¢ 65	—	—	-111 -141	-76 -106	-55 -85	-42 -72	-30 -60	-21 -51	-9 -39	0 -30	+9 -21	+18 -12	+30 0	+40 +10	+60 +30	+76 +30
> 65 ¢ 80			—	-91 -121	-64 -94	-48 -78	-32 -62									
> 80 ¢ 100	—	—	—	-111 -146	-78 -113	-58 -93	-38 -73	-24 -59	-10 -45	0 -35	+10 -25	+22 -13	+35 0	+47 +12	+71 +36	+90 +36
> 100 ¢ 120				-131 -166	-91 -126	-66 -101	-41 -76									

Nominal dimension range in mm	h8	ZC8	ZB8	ZA8	Z8	X8	U8	T8	S8	H8	H9	F7	F8	E8	D9	C9	B9
¡ 1 ¢ 3	0 -14	-60 -74	-40 -54	—	-26 -40	-20 -34	—	—	-14 -28	+14 0	+25 0	+16 +6	+20 +6	+28 +14	+45 +20	+85 +60	+165 +140
> 3 ¢ 6	0 -18	-80 -98	-50 -68	—	-35 -53	-28 -46	—	—	-19 -37	+18 0	+30 0	+22 +10	+28 +10	+38 +20	+60 +30	+100 +70	+170 +140
> 6 ¢ 10	0 -22	-97 -119	-67 -89	-52 -74	-42 -64	-34 -56	—	—	-23 -45	+22 0	+36 0	+28 +13	+35 +13	+47 +25	+76 +40	+116 +80	+186 +150
> 10 ¢ 14	0 -27	-130 -157	-90 -117	-64 -91	-50 -77	-40 -67	—	—	-28 -55	+27 0	+43 0	+34 +16	+43 +16	+59 +32	+93 +50	+138 +95	+193 +150
> 14 ¢ 18		-150 -177	-108 -135	-77 -104	-60 -87	-45 -72											
> 18 ¢ 24	0 -33	-188 -221	-136 -169	-98 -131	-73 -106	-54 -87	—	—	-35 -68	+33 0	+52 0	+41 +20	+53 +20	+73 +40	+117 +65	+162 +110	+212 +160
> 24 ¢ 30		-218 -251	-160 -193	-118 -151	-88 -121	-64 -97	-48 -81										
> 30 ¢ 40	0 -39	—	-200 -239	-148 -187	-112 -151	-80 -119	-60 -99	—	-43 -82	+39 0	+62 0	+50 +25	+64 +25	+89 +50	+142 +80	+182 +120	+232 +170
> 40 ¢ 50			-242 -281	-180 -219	-136 -175	-97 -136	-70 -109									+192 +130	+242 +180
> 50 ¢ 65	0 -46	—	-300 -346	-226 -272	-172 -218	-122 -168	-87 -133	—	-53 -99	+46 0	+74 0	+60 +30	+76 +30	+106 +60	+174 +100	+214 +140	+264 +190
> 65 ¢ 80			—	-274 -320	-210 -256	-146 -192	-102 -148	—	-59 -105							+224 +150	+274 +200
> 80 ¢ 100	0 -54	—	—	-335 -389	-285 -312	-178 -232	-124 -178	—	-71 -125	+54 0	+87 0	+71 +36	+90 +36	+126 +72	+207 +120	+257 +170	+307 +220
> 100 ¢ 120				—	-310 -364	-210 -264	-144 -198	-104 -158	-79 -133							+267 +180	+327 +240

Black numbers = GO limit
Green numbers = NO-GO limit
Fits for standard shaft, fit tolerances (clearances and interferences) see DIN 7155, sheet 2
Fits for standard borehole, see DIN 7154, sheet 1 and sheet 2

¹) DIN 7157 tolerance ranges are recommended.
Series 1 is preferable to Series 2

Continued on page 2

Amended August 1966:
dimensions coordinated to
ISO recommendations ISO/R 286-1962

Previous editions: DIN 7155: 10.36
DIN 7155 sheet 1: 12.50, 9.56

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DIN 7155 sheet 1, Aug. 1966 price group 7

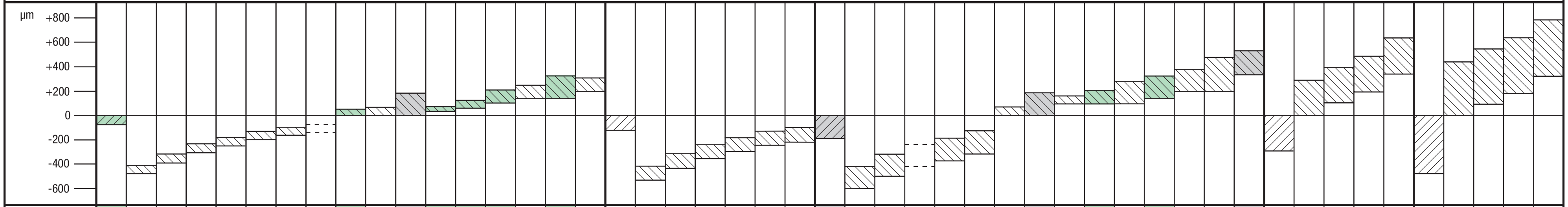
DIN 7155 sheet 1 page 2

Tolerance examples for nominal diameter 60 mm

▨ ID (bores)
▨ OD (shafts)
┆ Do not apply to nominal diameter 60 mm

Tolerance ranges acc. to DIN 7157 ¹) {
🟩 Series 1
⬜ Series 2

Dimensions in µm



Nominal dimension range in mm / Tolerance range	h9	ZC9	ZB9	ZA9	Z9	X9	U9	T9	H8	H9
≥ 1 ≤ 3	0 -25	-60 -85	-40 -65	—	-26 -51	-20 -45	—	—	+14 0	+25 0
> 3 ≤ 6	0 -30	-80 -110	-50 -80	—	-35 -65	-28 -58	—	—	+18 0	+30 0
> 6 ≤ 10	0 -36	-97 -133	-67 -103	—	-42 -78	-34 -70	—	—	+22 0	+36 0
> 10 ≤ 14	0 -43	-130 -173	-90 -133	—	-50 -93	-40 -83	—	—	+27 0	+43 0
> 14 ≤ 18		-150 -193	-108 -151	—	-60 -103	-45 -88				
> 18 ≤ 24	0 -52	-188 -240	-136 -188	-98 -150	-73 -125	-54 -106	—	—	+33 0	+52 0
> 24 ≤ 30		-218 -270	-160 -212	-118 -170	-88 -140	-64 -116	-48 -100			
> 30 ≤ 40	0 -62	-274 -336	-200 -262	-148 -210	-112 -174	-80 -142	-60 -122	—	+39 0	+62 0
> 40 ≤ 50		-325 -387	-242 -304	-180 -242	-136 -198	-97 -159	-70 -132			
> 50 ≤ 65	0 -74	-405 -479	-300 -374	-226 -300	-172 -246	-122 -196	-87 -161	—	+46 0	+74 0
> 65 ≤ 80		—	-360 -434	-274 -348	-210 -284	-146 -220	-102 -179			
> 80 ≤ 100	0 -87	—	-445 -532	-335 -422	-258 -345	-178 -265	-124 -211	—	+54 0	+87 0
> 100 ≤ 120			—	-400 -487	-310 -397	-210 -297	-144 -231			

Nominal dimension range in mm / Tolerance range	H11	F8	E9	D10	C10	C11	B10	h10
≥ 1 ≤ 3	+60 0	+20 +6	+39 +14	+60 +20	+100 +60	+120 +60	+180 +140	0 -40
> 3 ≤ 6	+75 0	+28 +10	+50 +20	+78 +30	+118 +70	+145 +70	+188 +140	0 -48
> 6 ≤ 10	+90 0	+35 +13	+61 +25	+98 +40	+138 +80	+170 +80	+208 +150	0 -58
> 10 ≤ 14	+110 0	+43 +16	+75 +32	+120 +50	+165 +95	+205 +95	+220 +150	0 -70
> 14 ≤ 18								
> 18 ≤ 24	+130 0	+53 +20	+92 +40	+149 +65	+194 +110	+240 +110	+244 +160	0 -84
> 24 ≤ 30								
> 30 ≤ 40	+160 0	+64 +25	+112 +50	+180 +80	+220 +120	+280 +120	+270 +170	0 -100
> 40 ≤ 50					+230 +130	+290 +130	+280 +180	
> 50 ≤ 65	+190 0	+76 +30	+134 +60	+220 +100	+260 +140	+330 +140	+310 +190	0 -120
> 65 ≤ 80					+270 +150	+340 +150	+320 +200	
> 80 ≤ 100	+220 0	+90 +36	+159 +72	+260 +120	+310 +170	+390 +170	+360 +220	0 -140
> 100 ≤ 120					+320 +180	+400 +180	+380 +240	

Nominal dimension range in mm / Tolerance range	ZC10	ZB10	ZA10	Z10	X10	U10	h11
≥ 1 ≤ 3	-60 -100	—	—	-26 -66	—	—	0 -60
> 3 ≤ 6	-80 -128	—	—	-35 -83	—	—	0 -75
> 6 ≤ 10	-97 -155	-67 -125	—	-42 -100	—	—	0 -90
> 10 ≤ 14	-130 -200	-90 -160	—	-50 -120	—	—	0 -110
> 14 ≤ 18	-150 -220	-108 -178	—	-60 -130	-45 -115		
> 18 ≤ 24	-188 -272	-136 -220	—	-73 -157	-54 -138	—	0 -130
> 24 ≤ 30	-218 -302	-160 -244	—	-88 -172	-64 -148		
> 30 ≤ 40	-274 -374	-200 -300	—	-112 -212	-80 -180	—	0 -160
> 40 ≤ 50	-325 -425	-242 -342	-180 -280	-136 -236	-97 -197	-70 -170	
> 50 ≤ 65	-405 -525	-300 -420	-226 -346	-172 -292	-122 -242	-87 -207	0 -190
> 65 ≤ 80	-480 -600	-360 -480	-274 -394	-210 -330	-146 -266	-102 -222	
> 80 ≤ 100	-585 -725	-445 -585	-335 -475	-258 -398	-178 -318	-124 -264	0 -220
> 100 ≤ 120	-690 -830	-525 -665	-400 -540	-310 -450	-210 -350	-144 -284	

Nominal dimension range in mm / Tolerance range	ZC11	ZB11	ZA11	Z11	X11	H9	H11	D9
≥ 1 ≤ 3	-60 -120	—	—	—	—	+25 0	+60 0	+45 +20
> 3 ≤ 6	-80 -155	—	—	—	—	+30 0	+75 0	+60 +30
> 6 ≤ 10	-97 -187	-67 -157	—	—	—	+36 0	+90 0	+76 +40
> 10 ≤ 14	-130 -240	-90 -200	—	—	—	+43 0	+110 0	+93 +50
> 14 ≤ 18	-150 -260	-108 -218						
> 18 ≤ 24	-188 -318	-136 -266	—	—	—	+52 0	+130 0	+117 +65
> 24 ≤ 30	-218 -348	-160 -290	—	-88 -218				
> 30 ≤ 40	-274 -434	-200 -360	—	-112 -272	—	+62 0	+160 0	+142 +80
> 40 ≤ 50	-325 -485	-242 -402	—	-136 -296				
> 50 ≤ 65	-405 -595	-300 -490	—	-172 -362	-122 -312	+74 0	+190 0	+174 +100
> 65 ≤ 80	-480 -670	-360 -550	—	-210 -400	-146 -336			
> 80 ≤ 100	-585 -805	-445 -665	—	-258 -478	-178 -398	+87 0	+220 0	+207 +120
> 100 ≤ 120	-690 -910	-525 -745	-400 -620	-310 -530	-210 -430			

Nominal dimension range in mm / Tolerance range	D10	D11	C11	B11	B12	A11
≥ 1 ≤ 3	+60 +20	+80 +20	+120 +60	+200 +140	+240 +140	+330 +270
> 3 ≤ 6	+78 +30	+105 +30	+145 +70	+215 +140	+260 +140	+345 +270
> 6 ≤ 10	+98 +40	+130 +40	+170 +80	+240 +150	+300 +150	+370 +280
> 10 ≤ 14	+120 +50	+160 +50	+205 +95	+260 +150	+330 +150	+400 +290
> 14 ≤ 18						
> 18 ≤ 24	+149 +65	+195 +65	+240 +110	+290 +160	+370 +160	+430 +300
> 24 ≤ 30						
> 30 ≤ 40	+180 +80	+240 +80	+280 +120	+330 +170	+420 +170	+470 +310
> 40 ≤ 50			+290 +130	+340 +180	+430 +180	+480 +320
> 50 ≤ 65	+220 +100	+290 +100	+330 +140	+380 +190	+490 +190	+530 +340
> 65 ≤ 80			+340 +150	+390 +200	+500 +200	+550 +360
> 80 ≤ 100	+260 +120	+340 +120	+390 +170	+440 +220	+570 +220	+600 +380
> 100 ≤ 120			+400 +180	+460 +240	+590 +240	+630 +410

Nominal dimension range in mm / Tolerance range	h12	H12	D12	B12	A12	h13	H13	D13	B13	A13
≥ 1 ≤ 3	0 -100	+100 0	+120 +20	+240 +140	+370 +270	0 -140	+140 0	+160 +20	+280 +140	+410 +270
> 3 ≤ 6	0 -120	+120 0	+150 +30	+260 +140	+390 +270	0 -180	+180 0	+210 +30	+320 +140	+450 +270
> 6 ≤ 10	0 -150	+150 0	+190 40	+300 +150	+430 +280	0 -220	+220 0	+260 +40	+370 +150	+500 +280
> 10 ≤ 14	0 -180	+180 0	+230 +50	+330 +150	+470 +290	0 -270	+270 0	+320 +50	+420 +150	+560 +290
> 14 ≤ 18										
> 18 ≤ 24	0 -210	+210 0	+275 +65	+370 +160	+510 +300	0 -330	+330 0	+395 65	+490 +160	+630 +300
> 24 ≤ 30										
> 30 ≤ 40	0 -250	+250 0	+330 +80	+420 +170	+560 +310	0 -390	+390 0	+470 +80	+560 +170	+700 +310
> 40 ≤ 50				+430 +180	+570 +320				+570 +180	+710 +320
> 50 ≤ 65	0 -300	+300 0	+400 +100	+490 +190	+640 +340	0 -460	+460 0	+560 +100	+650 +190	+800 +340
> 65 ≤ 80				+500 +200	+660 +360				+660 +200	+820 +360
> 80 ≤ 100	0 -350	+350 0	+470 +120	+570 +220	+730 +380	0 -540	+540 0	+660 +120	+760 +220	+920 +380
> 100 ≤ 120				+590 +240	+760 +410				+780 +240	+950 +410

Black numbers = GO limit
Green numbers = NO-GO limit

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¹) DIN 7157 tolerance ranges are recommended.
Series 1 is preferable to Series 2

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The most recent edition of the standard available from Beuth Verlag GmbH, Burggrafenstraße 4-10, 1000 Berlin 30 is the authoritative version"

Technical Information
General tolerances. Surface finishes

- norelem products are adapted and manufactured in such a way that they are suitable for their general purpose with reference to material and surface finish. As such, they meet all normal tolerance requirements.
- All dimensions are indicated in mm.
- All weights are approx. data.
- The latest DIN standard sheet version applies to all parts made to DIN standards.
- Variations on dimensions without tolerance values are according to „DIN ISO 2768-mk“ (except linear dimensions of grey cast iron- and Al-profiles).

General Tolerances DIN ISO 2768 T1 and T2

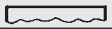
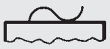
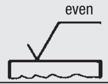
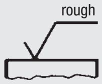
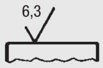
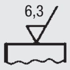
General Tolerances for Linear and Angular Dimensions DIN ISO 2768 T1

Tolerance class		**Linear Dimensions**							
		Permissible deviations in mm for ranges of nominal sizes							
designation	description	0,5 to 3	over 3 to 6	over 6 to 30	over 30 to 120	over 120 to 400	over 400 to 1000	over 1000 to 2000	over 2000 to 4000
f	fine	± 0,05	± 0,05	± 0,1	± 0,15	± 0,2	± 0,3	± 0,5	–
m	medium	± 0,10	± 0,10	± 0,2	± 0,30	± 0,5	± 0,8	± 1,2	± 2
c	coarse	± 0,20	± 0,30	± 0,5	± 0,80	± 1,2	± 2,0	± 3,0	± 4
v	very coarse	–	± 0,50	± 1,0	± 1,50	± 2,5	± 4,0	± 6,0	± 8
Tolerance class		**External Radii and Chamfer Heights**			**Angular Dimensions**				
		Permissible deviations in mm for ranges of nominal sizes			Permissible deviations in degrees or minutes for ranges of nominal sizes (shorten leg)				
designation	description	0,5 to 3	over 3 to 6	over 6	to 10	over 10 to 50	over 50 to 120	over 120 to 400	over 400
f	fine	± 0,2	± 0,5	± 1	± 1°	± 0°30‘	± 0°20‘	± 0°10‘	± 0° 5‘
m	medium								
c	coarse	± 0,4	± 1,0	± 2	± 1°30‘	± 1°30‘	± 0°30‘	± 0°15‘	± 0°10‘
v	very coarse				± 3°30‘	± 2°30‘	± 1°30‘	± 0°30’	± 0°20‘

General Tolerances for Form and Position DIN ISO 2768 T2

Tolerance class	Tolerances in mm for														
	Straightness and Flatness						**Perpendicularity**				**Symmetry**				**Run-out**
	Ranges of nominal sizes in mm						Ranges of nominal sizes in mm				Ranges of nominal sizes in mm				
	to 10	over 10 to 30	over 30 to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000	to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000	to 100	over 100 to 300	over 300 to 1000	over 1000 to 3000	
H	0,02	0,05	0,1	0,2	0,3	0,4	0,2	0,3	0,4	0,5	0,5				0,1
K	0,05	0,10	0,2	0,4	0,6	0,8	0,4	0,6	0,8	1,0	0,6		0,8	1	0,2
L	0,10	0,20	0,4	0,8	1,2	1,6	0,6	1,0	1,5	2,0	0,6	1,0	1,5	2	0,5

Method of Indicating Surface Finish to DIN ISO 1302

Graphical symbol of surface finish to DIN 3141	Surface finish values, R_a for permissible roughness height R_t assignation according to DIN 3141		meaning according to ISO 1302
	line 1	line 2	
(Surface without graphical symbol) 			Surfaces which do not need to meet specific requirements
	 even		Surfaces which only have to meet requirements of general evenness and better appearance
	 rough		Individual raw surfaces which may be remachined
	 6,3		Clean raw surface with higher requirements
	 25	 12,5	Surface with a roughness value which must not exceed the highest permissible medium roughness value
	 6,3	 3,2	
	 1,6	 0,8	

Technical Information Screws and Nuts

The values for clamping forces F_{sp} and tightening torques M_{sp} specified in the table apply to standard metric thread according to DIN 13 and head contact surfaces according to DIN 912, 931-934, 6912, 7984, 7990.

The F_{sp} clamping force values result in a 90% utilisation of yield point σ 0.2 (DIN 267 pg. 3) subject to the respective coefficient of friction in threads.

It can be inferred from the table which screw with which quality is required for a particular coefficient of friction in thread in order to apply a given F_M assembly force ($F_{sp} >= F_M$).

The M_{sp} tightening torques are calculated based on the F_{sp} clamping forces assuming $\mu_G = \mu_K = \mu_{ges}$.

Determination of the M_{sp} tightening torque at 90 % yield point utilisation for a screw specified in size and quality is made according to the table at the right subject to the underhead friction occurring (μ_K), irregardless of a coefficient of friction in thread deviating from it.

To attain the applicable rated load torque it is still necessary to reduce half the spread of the designated torque wrench by the particular tightening torque M_{sp}.

Calculation of the table values and information for applications according to VDI guideline 2230.

Clamping force and tightening torques

Standard thread	μ_{total}* $= \mu_G$ $= \mu_K$	Set screws clamping force F_{sp} in kN by grade			tightening torque M_{sp} in Nm		
		8.8	10.9	12.9	8.8	10.9	12.9
M4	0,08	4,40	6,40	7,5	2,2	3,2	3,8
	0,10	4,20	6,20	7,3	2,5	3,7	4,3
	0,12	4,05	6,00	7,0	2,8	4,1	4,8
	0,14	3,90	5,70	6,7	3,1	4,5	5,3
M5	0,08	7,16	10,50	12,3	4,3	6,3	7,3
	0,10	6,90	10,10	11,9	4,9	7,2	8,5
	0,12	6,63	9,74	11,4	5,5	8,1	9,5
	0,14	6,36	9,34	10,9	6,0	8,9	10,4
M6	0,08	10,10	14,90	17,4	7,4	10,9	12,7
	0,10	9,74	14,30	16,7	8,5	12,5	14,7
	0,12	9,35	13,70	16,1	9,5	14,0	16,4
	0,14	8,97	13,20	15,4	10,4	15,3	17,9
M8	0,08	18,50	27,20	31,9	17,9	26,2	30,7
	0,10	17,90	26,20	30,7	20,6	30,3	35,5
	0,12	17,20	25,20	29,5	23,1	34,0	39,7
	0,14	16,50	24,20	28,3	25,3	37,2	43,6
M10	0,08	29,50	43,30	50,7	36,0	53,0	61,0
	0,10	28,40	41,80	48,9	41,0	61,0	71,0
	0,12	27,30	40,20	47,0	46,0	68,0	80,0
	0,14	26,20	38,50	45,1	51,0	75,0	88,0
M12	0,08	43,00	63,10	73,9	61,0	90,0	105,0
	0,10	41,40	60,90	71,2	71,0	104,0	122,0
	0,12	39,90	58,50	68,5	80,0	117,0	137,0
	0,14	38,30	56,20	65,8	87,0	128,0	150,0
M14	0,08	59,0	86,7	101,0	97	143	167
	0,10	56,9	83,6	97,8	113	165	194
	0,12	54,7	80,4	94,1	127	186	218
	0,14	52,6	77,2	90,3	139	205	239
M16	0,08	81,0	119,0	139,0	147	216	253
	0,10	78,2	115,0	134,0	172	252	295
	0,12	75,3	111,0	130,0	194	285	333
	0,14	72,4	106,0	124,0	214	314	367
M20	0,08	131,0	186,0	218,0	298	424	496
	0,10	126,0	180,0	210,0	347	494	578
	0,12	121,0	173,0	202,0	392	558	653
	0,14	117,0	166,0	194,0	431	615	719
M24	0,08	188,0	268,0	313,0	512	730	854
	0,10	182,0	259,0	303,0	597	850	995
	0,12	175,0	249,0	291,0	673	959	1122
	0,14	168,0	239,0	280,0	742	1057	1237
M30	0,08	300,0	430,0	500,0	1000	1450	1700
	0,10	290,0	415,0	485,0	1190	1700	2000
	0,12	280,0	400,0	465,0	1350	1900	2250
	0,14	270,0	385,0	450,0	1500	2100	2500
M36	0,08	440,0	630,0	730,0	1750	2500	3000
	0,10	425,0	600,0	710,0	2100	3000	3500
	0,12	410,0	580,0	680,0	2350	3300	3900
	0,14	395,0	560,0	660,0	2600	3700	4300

Screw stability according to DIN ISO 20898 T 1 (4.92)

Grades	5.8	6.8	8.8	10.9	12.9
Minimum tensile strength R_m N/mm²	500	600	800	1000	1200
Minimum yield point R_e N/mm²	400	480	640	900	1080
0.2-proof stress $R_{p0,2}$ N/mm²	–	–	640	900	1080
Test stress S_p N/mm²	364	440	582	792	950
Failure strain A_5 %	10	8	12	9	8
Impact strength (ISO test piece) Nm/cm²	–	–	60	40	30

The respective grades mean (as shown with 8.8):

First number 8. $= \dfrac{\text{minimum tensile strength } R_m}{100} = 800\ \text{N/mm}^2$

Second number .8 $= \dfrac{\text{minimum yield point } R_e}{\text{minimum tensile strength } R_m} \cdot 10 = 640\ \text{N/mm}^2$ (80 % von R_m)

Nut stability according to DIN ISO 20898 T 2 (2.94)

Grade ID numbers	5	6	8	10	12
Test stress S_p N/mm²	500	600	800	1000	1200

The grades mean (as shown with 10):

$$10 = \frac{\text{test stress } S_p}{100}$$

This test stress is equal to the minimum tensile strength of a screw that can be loaded when pairing with the corresponding nut up to the minimum yield point of the screw.

Technical Information
Screws and Nuts

The coefficients of friction (see table) fluctuate over a wide range. They fluctuate even when tightening and by production run of the same screws.
Because μ_G and μ_K are generally of different sizes a wide range of tightening torques arise as a result.
Calculation is performed using various coefficients of friction in accordance with VDI guideline 2230. By contrast Illgner/Blume in their „Schrauben Vademecum“ calculate using a coefficient of friction $\mu_{ges} = \mu_G = \mu_K$.

Here it proceeds according to VDI methods. However if μ_G and/or μ_K are unknown,
$\mu_G = 0{,}12$ or $\mu_K = 0{,}12$ would typically be used.

Coefficient of friction μ_G in the thread (according to Strelow or VDI 2230)

μ_G	Thread				External thread (screw)								
	Material				Steel								
		Surface			black tempered or phosphated				electro zinc-plated (Zn6)		electro cadmium-plated (Cd6)		adhesive
			Tapping		rolled			machine-cut	machine-cut or rolled				
Thread	Material	Surface	Tapping	lubrication	dry	lubricated	MoS_2*	lubricated	dry	lubricated	dry	lubricated	dry
Internal thread (nut)	Steel	bright	machine-cut	dry	0,12	0,10*	0,08	0,10	–	0,10	–	0,08	0,16
	Steel	electro cadmium-plated	machine-cut	dry	0,10	–	–	–	0,12	0,10	–	–	0,14
	Steel	electro cadmium-plated	machine-cut	dry	0,08	–	–	–	–	–	0,12	0,12	–
	GJL/GJMB	bright	machine-cut	dry	–	0,10	–	0,10	–	0,10	–	0,08	–
	AlMg	bright	machine-cut	dry	–	0,08	–	–	–	–	–	–	–

* Molybdenum disulfide

Coefficient of friction μ_K on the head or nut engaging surface (according to Strelow or VDI 2230)

μ_K	Support suface				Screw head									
	Material				Steel									
		Surface			black tempered or phosphated						electro zinc-plated (Zn6)		electro cadmium-plated (Cd6)	
			Manu-facture		pressed			turned		smoothed	pressed			
Support suface	Material	Surface	Manuf-acture	lubrication	dry	lubricated	MoS_2*	lubricated	MoS_2*	lubricated	dry	lubricated	dry	lubricated
Counter support	Steel	bright	smoothed	dry	–	0,16	–	0,10	–	0,16	0,10	–	0,08	–
	Steel	bright	machined	dry	0,12	0,10	0,08	0,10	0,08	–	0,10		0,08	0,08
	Steel	electro cadmium-plated	machined	dry	0,10		–	0,10	–	0,10	0,16	0,10	–	–
	Steel	electro cadmium-plated	machined	dry	0,08						–	–	0,12	0,12
	GJL/GJMB	bright	smoothed	dry	–	0,10	–	–	–	0,10 to 0,18			0,08	–
	GJL/GJMB	bright	machined	dry	–	0,14	–	0,10	–	0,14	0,10	0,10	0,08	–
	AlMg	bright	machined	dry	–	0,08				–	–	–	–	–

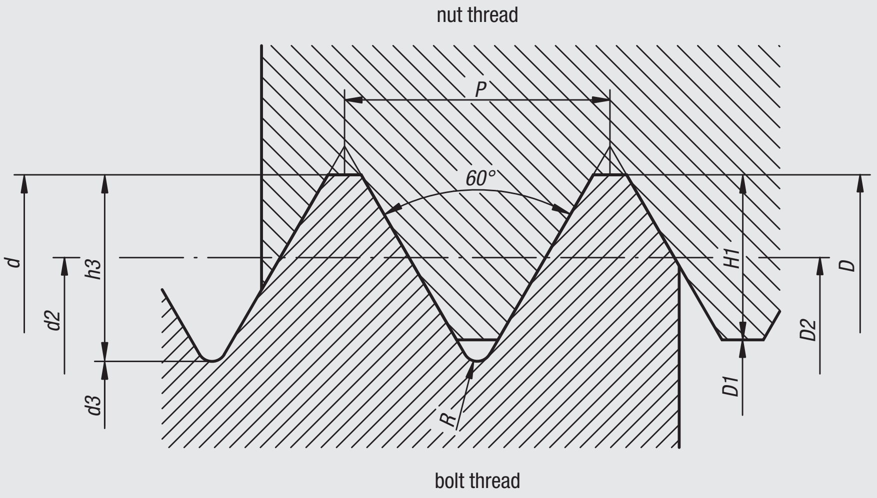
* Molybdenum disulfide

Metric ISO Threads

The medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads. The (metal) threads in this catalogue are manufactured according to these tolerance classes.

Technical Information about threads of aluminium grips:

Especially threads of aluminium grips cannot be true to gauge size due to final surface finish refinement and the removal of material during related pretreatment.
The majority of these threads are moulded in order to strengthen the material. As a result, the tearing resistance of aluminium for a thread with M5 x 10 is higher than 2000 N.



Coarse thread series 1

Thread description d = D	Pitch P	Thread-pitch Ø d2 = D2	Minor Ø		Thread depth		Radius R	Core hole drill Ø
			bolt d3	nut D1	bolt h3	nut H1		
M 3	0,50	2,68	2,39	2,46	0,31	0,27	0,07	2,5
M 4	0,70	3,55	3,14	3,24	0,43	0,38	0,10	3,3
M 5	0,80	4,48	4,02	4,13	0,49	0,43	0,12	4,2
M 6	1,00	5,35	4,77	4,92	0,61	0,54	0,14	5,0
M 8	1,25	7,19	6,47	6,65	0,77	0,68	0,18	6,8
M10	1,50	9,03	8,16	8,38	0,92	0,81	0,22	8,5
M12	1,75	10,86	9,85	10,11	1,07	0,95	0,25	10,2
M16	2,00	14,70	13,55	13,84	1,23	1,08	0,29	14,0
M20	2,50	18,38	16,93	17,29	1,53	1,35	0,36	17,5
M24	3,00	22,05	20,32	20,75	1,84	1,62	0,43	21,0
M30	3,50	27,73	25,71	26,21	2,15	1,89	0,51	26,5
M36	4,00	33,40	31,09	31,67	2,45	2,17	0,58	32,0

Threads
Threads are manufactured to ISO DIN 13 medium tolerance class, i.e. 6H for nut threads and 6g for bolt threads. External threads up to 60 mm are generally supplied fully threaded. Screw lengths of 70 mm and more are supplied with 60 mm long threads.

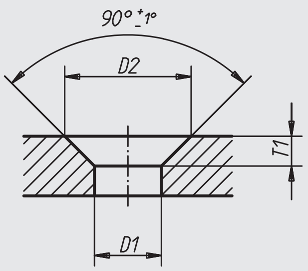
Spot facing for countersunk screws and socket head screws

Spot facing model B:
– for countersunk screws DIN 7991.
Spot facing model J:
– for socket head screws DIN 6912.
Spot facing model K:
– for socket head screws DIN 912.

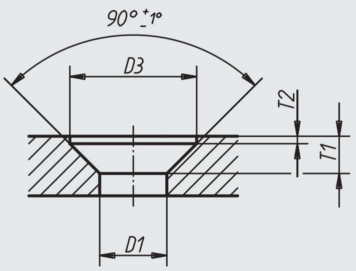
Note:

- * Clearance hole medium according to DIN ISO 273.
- ** Clearance hole fine according to DIN ISO 273.
- *** 90° counterbore or rounded, under 12 mm thread diameter only deburred.

Form A
Medium version (m)

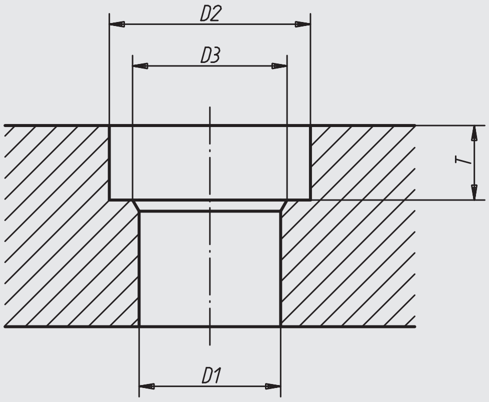


Form B
Fine version (f)



For Thread Ø	medium (m) version			fine (f) versions			
	D1 ^{H13*}	D2 ^{H13}	T1 ≈	D1 ^{H12**}	D3 ^{H12}	T1 ≈	T2 $^{+0,1}$
M3	3,4	6,6	1,6	3,2	6,3	1,7	0,2
M4	4,5	9,0	2,3	4,3	8,3	2,4	0,4
M5	5,5	11,0	2,8	5,3	10,4	2,9	0,5
M6	6,6	13,0	3,2	6,4	12,4	3,3	0,5
M8	9,0	17,2	4,1	8,4	16,5	4,4	0,5
M10	11,0	21,5	5,3	10,5	20,5	5,5	0,5
M12	13,5	25,5	6,0	13,0	25,0	6,5	0,5
M16	17,5	31,5	7,0	17,0	31,0	7,5	0,5
M20	22,0	38,0	8,0	21,0	37,0	8,5	0,5

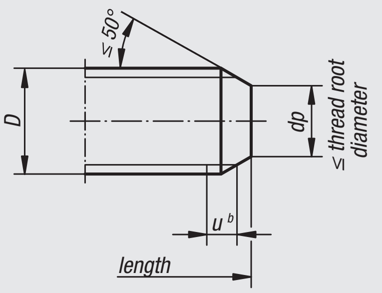
Form J, Form K



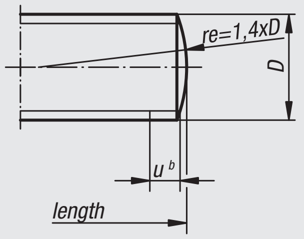
For Thread Ø	D1		D2	D3***	T		acceptable deviation
	medium (m) H13*	fine (f) H12**			model J	model K	
M3	3,4	3,2	6	–	–	3,4	$^{+0,2}_{0}$
M4	4,5	4,3	8	–	3,4	4,6	$^{+0,4}_{0}$
M5	5,5	5,3	10	–	4,2	5,7	$^{+0,4}_{0}$
M6	6,6	6,4	11	–	4,8	6,8	$^{+0,4}_{0}$
M8	9,0	8,4	15	–	6,0	9,0	$^{+0,4}_{0}$
M10	11,0	10,5	18	–	7,5	11,0	$^{+0,4}_{0}$
M12	13,5	13,0	20	16	8,5	13,0	$^{+0,4}_{0}$
M16	17,5	17,0	26	20	11,5	17,5	$^{+0,4}_{0}$
M20	22,0	21,0	33	24	13,5	21,5	$^{+0,4}_{0}$

DIN 78 thread ends
DIN 6332 thrust points

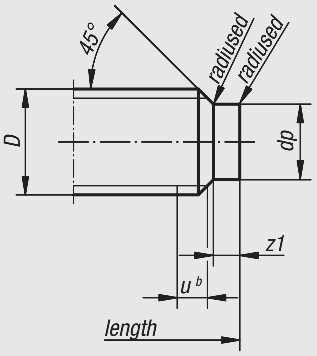
FL flat point



RN rounded end



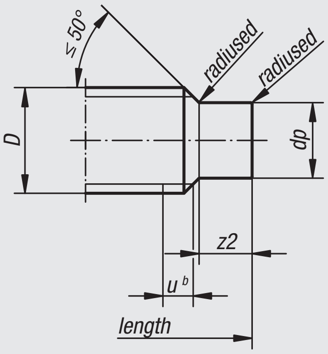
SD short dog



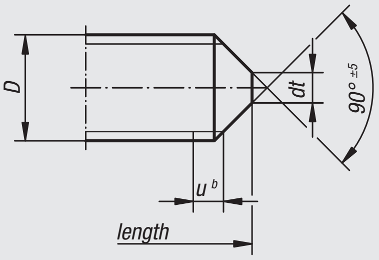
Standard form:
DIN EN ISO 4753 flat point.
Any other thread end available at extra cost, depending on the quantity ordered.

u^b = max. 2P incomplete thread

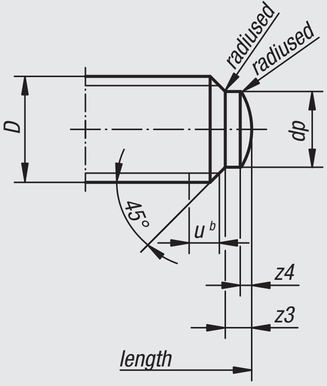
LD long dog



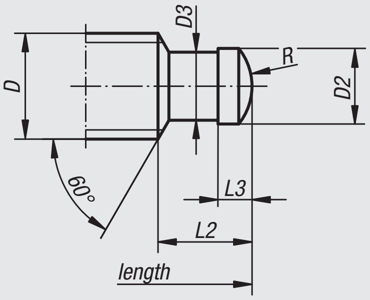
TC truncated cone



Ak rounded dog



thrust point DIN 6332



Thread- Ø	Thread ends to DIN EN ISO 4753						Thread ends with thrust points to DIN 6332				
D	dp h13	dt h16*	z1 + IT14	z2 + IT14	z3 + IT14	z4 ≈	D2 h11	D3 –0,1	L2	L3	R
M4	2,5	–	1,00	2,0	1,00	0,50	–	–	–	–	–
M5	3,5	–	1,25	2,5	1,25	0,60	–	–	–	–	–
M6	4,0	1,5	1,50	3,0	1,50	0,70	4,5	4,0	6,0	2,5	3
M8	5,5	2,0	2,00	4,0	2,00	1,00	6,0	5,4	7,5	3,0	5
M10	7,0	2,5	2,50	5,0	2,50	1,00	8,0	7,2	9,0	4,5	6
M12	8,5	3,0	3,00	6,0	3,00	1,25	8,0	7,2	10,0	4,5	6
M14	10,0	4,0	3,50	7,0	3,50	1,50	–	–	–	–	–
M16	12,0	4,0	4,00	8,0	4,00	1,75	12,0	11,0	12,0	5,0	9
M18	13,0	5,0	4,50	9,0	4,50	2,00	–	–	–	–	–
M20	15,0	5,0	5,00	10,0	5,00	2,00	15,5	14,4	14,0	5,5	13
M22	17,0	6,0	5,50	11,0	5,50	2,50	–	–	–	–	–
M24	18,0	6,0	6,00	12,0	6,00	2,50	–	–	–	–	–
M27	21,0	8,0	6,70	13,5	6,70	3,00	–	–	–	–	–

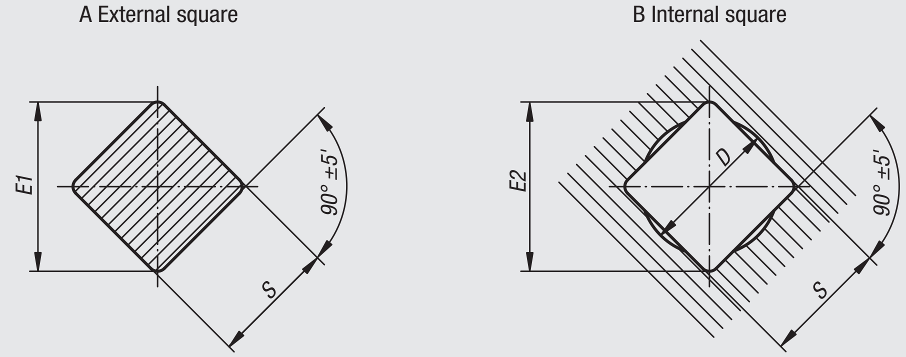
* Point up to 5 mm Ø thread end lightly flattened or lightly rounded.

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

Squares ends for spindles and operating parts

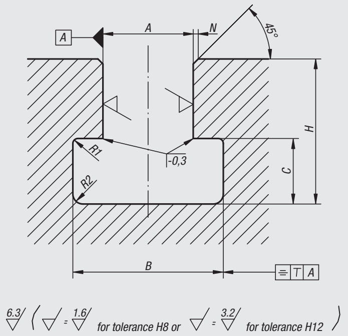
* Internal squares are allowed to be recessed in the middle third of each side. D max. defines the borehole diameter which leaves appropriate clearance when disposed concentrically to the internal square.

** External squares made on round steel bar may fall below the minimum size by the amount of tolerance on the steel bar, i.e. by h11.



S H11/h11	D* max.	E1 max.	 min.**	E2 min.
4,0	4,2	5,0	4,8	5,3
5,0	5,3	6,5	6,0	6,6
5,5	5,8	7,0	6,6	7,2
6,0	6,3	8,0	7,2	8,1
7,0	7,3	9,0	8,4	9,1
8,0	8,4	10,0	9,6	10,1
9,0	9,5	12,0	10,8	12,1
10,0	10,5	13,0	12,0	13,1
11,0	11,6	14,0	13,2	14,1
12,0	12,6	16,0	14,4	16,1
13,0	13,7	17,0	15,6	17,1
14,0	14,7	18,0	16,8	18,1
16,0	16,8	21,0	19,2	21,2
17,0	17,9	22,0	20,4	22,2
19,0	20,0	25,0	22,8	25,2
22,0	23,1	28,0	26,4	28,2

T-slots

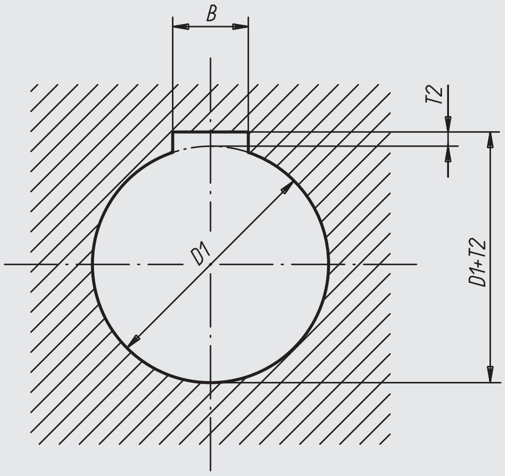


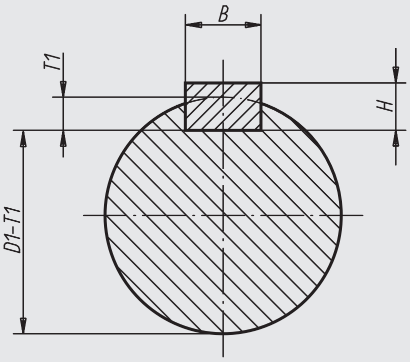
A*	B	adm. dev.	C	adm. dev.	H max.	 min.	N max.	R1 max.	R2 max.	T
6	11,0	+ 1,5 0	5	+ 1 0	13	11	1,0	0,6	1,0	0,5
8	14,5		7		18	15				
10	16,0	+ 2 0	7		21	17				
12	19,0		8		25	20				
14	23,0		9	+ 2 0	28	23	1,6		1,6	
18	30,0		12		36	30		1,0		
22	37,0	+ 3 0	16		45	38			2,5	
28	46,0	+ 4 0	20		56	48				
36	56,0		25	+ 3 0	71	61	2,5			1,0
42	68,0		32		85	74		1,6	4,0	

* Tolerance H8 for tenon and clamping slots, H12 for clamping slots

Keyways and parallel keys

high form (sheet 1), high form for machine tools (sheet 2)





high form (sheet 1)

For shaft Ø D1	Shaft slot B*		Hub slot B*		H	T1	T2	
	tight fit P9	sliding fit N9	tight fit P9	sliding fit JS9		with top clearance	by top clearance	oversize
over 8 to 10	3	3	3	3	3	$1,8^{+0,1}$	$1,4^{+0,1}$	$0,9^{+0,1}$
over 10 to 12	4	4	4	4	4	$2,5^{+0,1}$	$1,8^{+0,1}$	$1,2^{+0,1}$
over 12 to 17	5	5	5	5	5	$3,0^{+0,1}$	$2,3^{+0,1}$	$1,7^{+0,1}$
over 17 to 22	6	6	6	6	6	$3,5^{+0,1}$	$2,8^{+0,1}$	$2,2^{+0,1}$
over 22 to 30	8	8	8	8	7	$4,0^{+0,2}$	$3,3^{+0,2}$	$2,4^{+0,2}$
over 30 to 38	10	10	10	10	8	$5,0^{+0,2}$	$3,3^{+0,2}$	$2,4^{+0,2}$
over 38 to 44	12	12	12	12	8	$5,0^{+0,2}$	$3,3^{+0,2}$	$2,4^{+0,2}$
over 44 to 50	14	14	14	14	9	$5,5^{+0,2}$	$3,8^{+0,2}$	$2,9^{+0,2}$
over 50 to 58	16	16	16	16	10	$6,0^{+0,2}$	$4,3^{+0,2}$	$3,4^{+0,2}$

high form for machine tools (sheet 2)

For shaft Ø D1	Shaft slot B*		Hub slot B*		H	T1	T2
	tight fit P9	sliding fit N9	tight fit P9	sliding fit JS9			
over 10 to 12	4	4	4	4	4	$3,0^{+0,1}$	$1,1^{+0,1}$
over 12 to 17	5	5	5	5	5	$3,8^{+0,1}$	$1,3^{+0,1}$
over 17 to 22	6	6	6	6	6	$4,4^{+0,1}$	$1,7^{+0,1}$
over 22 to 30	8	8	8	8	7	$5,4^{+0,2}$	$1,7^{+0,2}$
over 30 to 38	10	10	10	10	8	$6,0^{+0,2}$	$2,1^{+0,2}$
over 38 to 44	12	12	12	12	8	$6,0^{+0,2}$	$2,1^{+0,2}$
over 44 to 50	14	14	14	14	9	$6,0^{+0,2}$	$2,6^{+0,2}$
over 50 to 58	16	16	16	16	10	$7,5^{+0,2}$	$2,6^{+0,2}$

* The indicated tolerances for slot widths apply, as a rule, for milled slots.
ISO quality IT8 (i.e. P8 instead of P9, N8 instead of N9 and JS8 instead of JS9) are recommended for the width of broached slots.
Tolerance H9 for the shaft keyway and D10 for the hub keyway are recommended for sliding fits.

ESD

Sensitive electrical or electronic equipment, components and devices (ESD sensitive elements) may be damaged or destroyed by electrostatic discharges (ESD) in the immediate vicinity.

Electrostatic discharges can come from people or through handling ESD sensitive components (e.g. during production, assembly, transport, storage etc).

Electrically conductive products which conform to
DIN EN 61340-5-1 – Protection of electronic devices from electrostatic phenomena –
are essential within electronic environments to prevent an electrostatic discharge.

Our products are manufactured from a special, electrically conductive plastic and can therefore be used for ESD applications or in ESD protection areas (EPA) in accordance with DIN EN 61340-5-1.

These high-quality products are regularly tested by us to assess their electrical conductivity in accordance with DIN EN 61340-5-1.

The yellow ESD logo is printed on the side of the product to clearly identify it.

These ESD products can also be used for devices, components and protection systems in areas with high risk of explosion.

Use of these ESD products prevents the occurrence of electrostatic spark discharges, eliminating the potential ignition of gases and dusts which could lead to explosions in enclosed spaces.

Manufacturers and operators must use and conform to ATEX directives for the protection of persons working in areas with high risk of explosion.

These ESD products are certified by TÜV-Süd in relation to their electrical discharge capability accordance with
EN 60079-0:2012+A11:2013 Areas with high risk of explosion-Operating material-General requirements.

Target groups:

Device manufacturers required to conform to ATEX product directive 2014/34/EU.
Operators required to conform to ATEX worker protection directive 1999/92/EC.

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DIN 1804	Slotted round nuts DIN 1804	07590	Book 1	1142
DIN 1810A enhanced	Hook wrench with lug DIN 1810A enhanced	96650	Book 2	1252
DIN 2079	Carrier keys DIN 2079	03290	Book 1	374
DIN 2215	V-belts DIN 2215	22071	Book 2	370
DIN 3133	Latch stainless steel DIN 3133	05530-05	Book 1	614
DIN 3404	Grease nipples button head DIN 3404	97944	Book 2	1276
DIN 3405	Grease nipples flush type, DIN 3405	97942	Book 2	1275
DIN 3760	Grease nipples flush type, DIN 3405	23915	Book 2	681
DIN 5406	Locking plate steel or stainless steel DIN 5406	07590-02	Book 1	1146
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DIN 6310	Snapper catch with spring DIN 6310	07560	Book 1	1140
DIN 6311 enhanced	Thrust pads DIN 6311 enhanced	07140	Book 1	1065
DIN 6314	Clamp straps DIN 6314 straight, steel or aluminium	04080	Book 1	425
DIN 6315	Clamp straps open U DIN 6315, steel or aluminium	04110	Book 1	430
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DIN 6319-10/01	Spherical washers DIN 6319, edition 10/01	07420	Book 1	1132
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	Palm grips stainless steel, similar to DIN 6335	06158	Book 1	731
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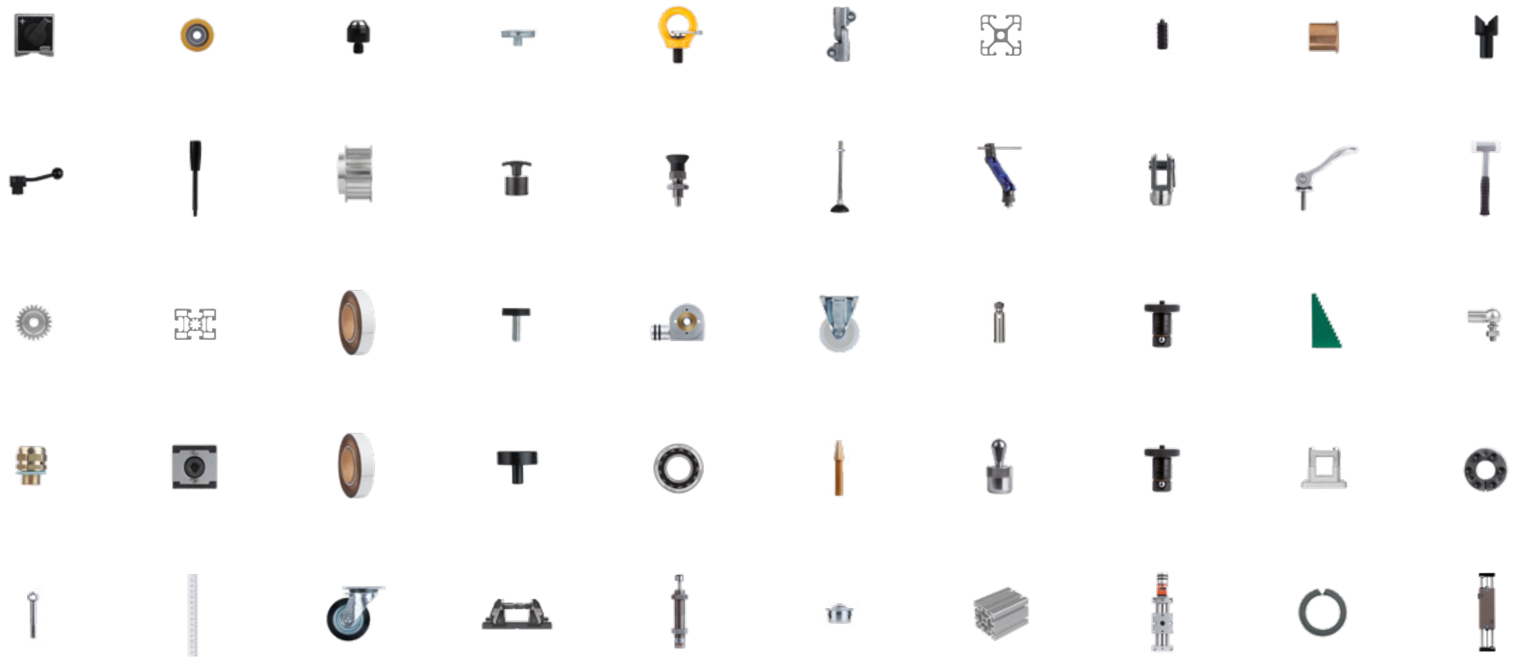

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