

norelem positions

Flexible standard component system

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Page 155



Support element

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Rectangular support elements

02360
Page 156



Workpiece supports

02380
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Workpiece supports

02385
Page 158



Jack screws

02387
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Inserts

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Page 159



Jack screws extended

02390
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Eccentric supports

03000

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



03000
Page 163



Spring plungers
with slot and ball, steel

03001
Page 164



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

03004
Page 165



Spring plungers
with slot and POM ball, plastic

03008
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Spring plungers
with slot and ceramic ball, stainless steel

03010
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Spring plungers
with slot and ball, stainless steel

03011
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Spring plungers
with slot and ball, LONG-LOK secured,
stainless steel

03014
Page 168



Spring plungers
with slot and stainless steel ball, plastic

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Spring plungers
with slot and thrust pin, steel

03020
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Spring plungers
with status sensor

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

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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

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

03040
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Spring plungers with hexagon socket and thrust pin, long version

03040
Page 180



Spring plungers with hexagon socket and thrust pin, steel

03040-02
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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

03059-01
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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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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

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Spring plungers smooth version, double-sided

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Double ball catches

03075-10
Page 204



Ball catch

03075-10
Page 204



Spacer for ball catch

03075-10
Page 205



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



Spring plungers
smooth version, self-clamping, plastic



Spring plungers
smooth version



Eccentric stops



Clamp stops adjustable
for slot profiles



Stops
adjustable



Screw stops
adjustable



Stop screws



Stop screws



Stop screws



5D workpiece stops



Indexing plungers



Indexing plungers



Indexing plungers
with thread lock



Indexing plungers
with extended indexing pin



Indexing plungers
short version



Indexing plungers
short version



Indexing plungers
short version, with thread lock



Indexing plungers stainless steel



Indexing plungers
for thin-walled parts



Indexing plungers - Premium
with cylindrical pin



Bushes cylindrical



Indexing plungers - Premium
with tapered pin



Bushes tapered



Spacer rings



Indexing plungers ECO



Indexing plunger
with lock



Indexing plungers
with rotation lock and lead-in chamfer



Indexing plungers



Indexing plungers
with locked mark



Indexing plungers
with T-grip



Indexing plungers ECO
short version



Indexing plungers



Indexing plungers



Indexing plungers



Indexing plungers
without collar



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

03094
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Indexing plungers without collar

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Indexing plungers, pneumatic

03096
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Indexing plungers without collar

03096
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Indexing plungers without collar

03096-10
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Indexing plunger, stainless steel with remote actuation



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Indexing plungers without collar

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Indexing plungers without collar

03098
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Indexing plungers without collar

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Cam-action indexing plungers

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Cam action indexing plunger with stop

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Cam-action indexing plungers stainless steel

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Cam action indexing plunger stainless steel, with stop

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Mounting brackets steel

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Positioning bushes for indexing plungers

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Mounting brackets aluminium

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Cam-action indexing plungers

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Cam-action indexing plungers stainless steel

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Barrel slide bolts

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Locating pins removable Form A and C

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Locating pins removable Form B and D

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Locating pins with ball-end Form A

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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
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Positioning pins cylindrical not ground

03140
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Positioning pins free-milled ground

03150
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Positioning pins free-milled not ground

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Locating pins expanding

03152-10
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Positioning cones, steel for centring units



03152-11
Page 303



Positioning bush steel for centring units



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Locating cylinder Ball Lock

New/Expanded Items

norelem positions

Flexible standard component system

03000

03153-02
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Locating cylinder, stainless steel
Ball Lock



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Locating cylinders
with quick clamping system

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Centring bushes

03154-02
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Centring bushes stainless steel



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Locating bushes
Form A (pressed in from rear)

03155-02
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Locating bushes, stainless steel
Form A (pressed in from rear)



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Locating bushes
Form B (screwed down from front)

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

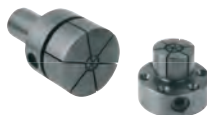


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Mandrel collets

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Mandrel collets
with side lock

03157-10
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Mandrel collet
for small bores

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Mandrel collets, steel
with cam lever



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Centring clamps
with ball or hexagon segments

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Centring clamps
with ball or hexagon segments

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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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Locating bushes
for pneumatic locating cylinder

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Machinable collets, square

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Centring clamps
round

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Centring clamps

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Adapter for collet

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Collet
for external clamping

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Collet
for internal clamping

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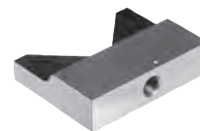
Traction cone
for internal clamping collet

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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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Bushes tapered

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Indexing plungers - Precision
with cylindrical pin

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Bushes cylindrical

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Indexing plunger
with five lobe grip

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Indexing and clamping grip



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Indexing and clamping grip
with optical locked indicator



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Ball lock pins

New/Expanded Items

norelem positions

Flexible standard component system

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Ball lock pins
stainless steel

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Ball lock pins with mushroom grip
stainless steel

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Ball lock pins with grip ring
stainless steel

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Locking pins

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Locking pins
with key ring

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Ball lock pins
with T-grip

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Ball lock pins
with L-grip

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Bushing for ball lock pins

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Bushing for ball lock pins
with LONG-LOK thread lock

03197-05
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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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Key rings

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Retaining cables

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Parallel blocks pair
DIN 6346

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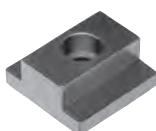
Parallel block sets

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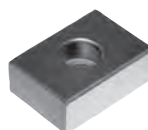
Positioning brackets

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Page 368



T-slot keys

03250
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Slot keys

03252
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Elastic slot keys
Pat. No. 4200676

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Slot keys loose
DIN 6323

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Slot keys
with locating pin

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Parallel keys
DIN 6885 A

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Parallel key, ceramic
similar to DIN 6885 A

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Woodruff keys
DIN 6888

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Carrier keys
DIN 2079

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Roll dowel
heavy duty ISO 8752

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Cylindrical pins
DIN 6325

03320-01
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Ceramic dowel pins
similar to DIN 6325

03325
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Cylindrical pins with internal thread
DIN EN ISO 8735

03325-01
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Ceramic dowel pins with
female thread similar to DIN 7979

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Extractor

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Page 381



Lateral spring plungers

03330
Page 380-382



Eccentric bushes and assembly tools
for lateral spring plungers

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Eccentric bushes
with centre bore

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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	03412 Page 396  Locking pins with magnetic axial lock	03420 Page 408  Ball lock pins with L-grip +	03422 Page 416  Ball lock pins with zinc L-grip
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03338 Page 389  Push-Pull spring plungers	03415 Page 398  Ball lock pins stainless steel with high shear strength +	03420 Page 410  Ball lock pins with T-grip +	03425 Page 420  Locating bushes stainless steel for ball lock pins +
03339 Page 390  Push-Pull spring plungers with rotation lock	03415-10 Page 399  Ball lock pins stainless steel, with headend lock +	03420 Page 411  Ball lock pins with T-grip with high shear strength +	
03340 Page 391  Lateral spring plungers	03418 Page 400  Ball lock pins with mushroom grip stainless steel +	03420-10 Page 412  Ball lock pins stainless steel, with headend lock +	
03350 Page 392  Shaft clamping units	03418 Page 401  Ball lock pins with mushroom grip stainless steel, with high shear strength +	03420-10 Page 414  Ball lock pins with T-grip stainless steel, with head-end lock +	
03351 Page 393  Threaded clamping bushes	03418-10 Page 403  Ball lock pins with mushroom grip stainless steel, adjustable +	03420-10 Page 413  Ball lock pins with L-grip stainless steel, with head-end lock +	
03400 Page 394  Locking pins with folding latch	03418-10 Page 405  Ball lock pins with mushroom grip stainless steel, with high shear strength, adjustable +	03422 Page 418  Ball lock pins with zinc T-grip	
03410 Page 395  Locking pins with axial locking	03420 Page 406  Ball lock pins +	03422 Page 419  Ball lock pins with T-grip with high shear strength +	

+ New/Expanded Items

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. Extremely 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.

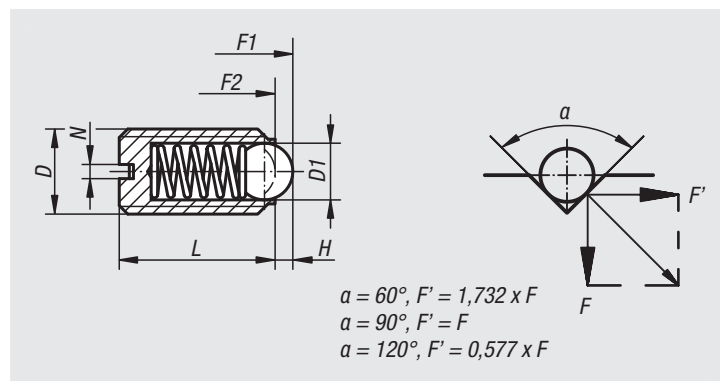
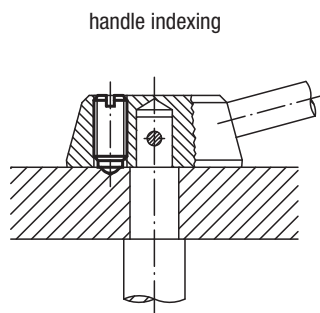
Spring grade D steel wire.

Version:

Black oxidised. Ball hardened.

Sample order:

nlm 03000-203



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

Spring plungers

with slot and ball, LONG-LOCK secured, steel



Material:

Sleeve steel grade 5.8.

Ball steel.

Spring steel wire grade D.

LONG-LOCK thread lock Nylon.

Version:

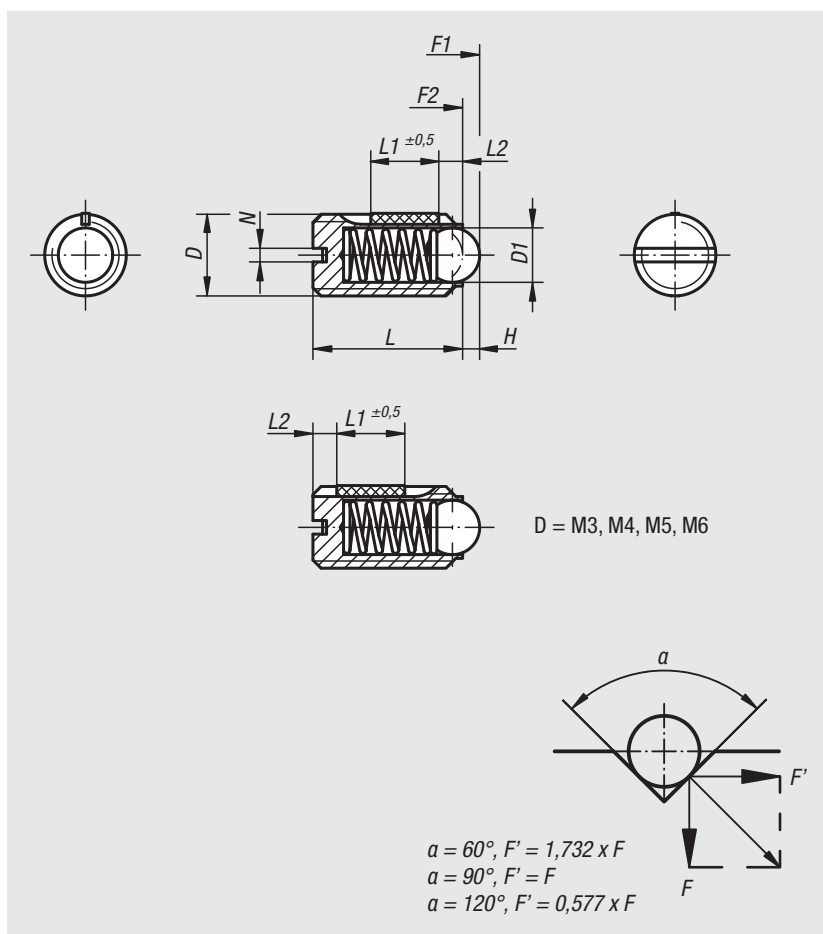
Black oxidised. Ball hardened.

Sample order:

n1m 03001-12

Drawing reference:

L2 = approx. 2x thread pitch



Spring plungers with slot and ball, standard spring, LONG-LOCK 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-LOCK 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

Spring plungers

with slot and POM ball, plastic



Material:

Sleeve plastic.
Ball POM.
Spring 1.4310 wire.

Version:

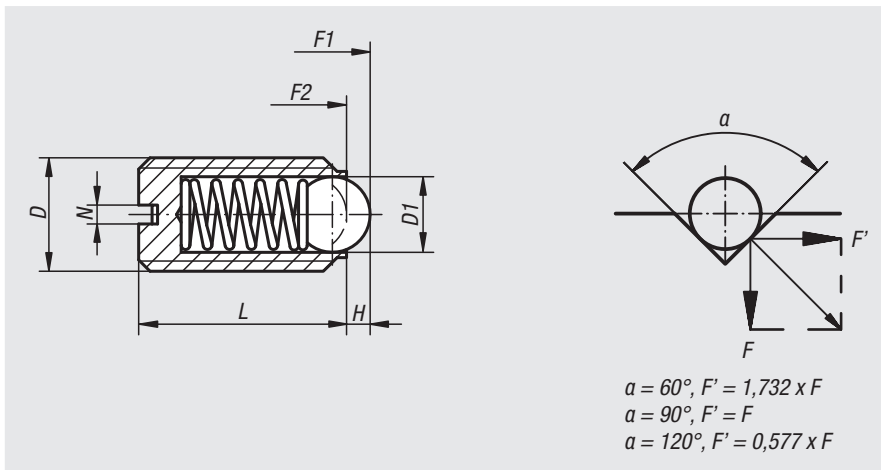
Ball, white.

Sample order:

nIm 03004-10

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
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

Spring plungers

with slot and ceramic ball, stainless steel



Material:

Sleeve 1.4305.
Ceramic ball Si_3N_4 .
Spring 1.4310.

Version:

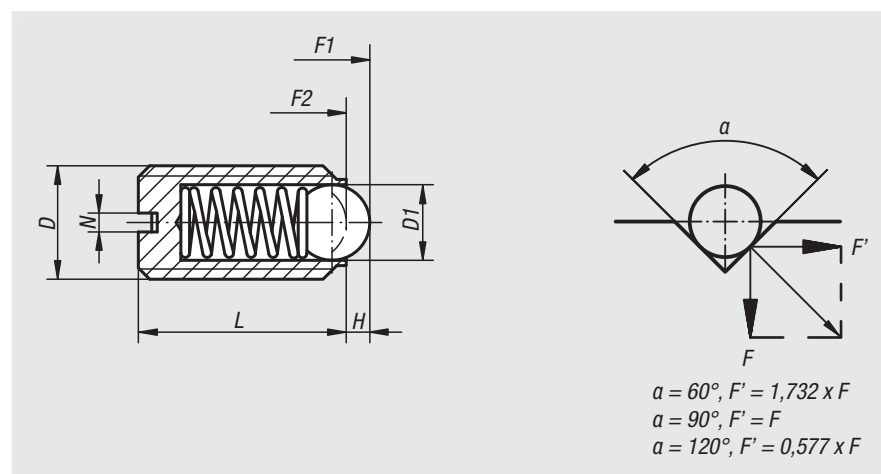
Bright.

Sample order:

nIm 03008-05

Note:

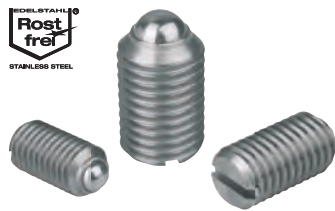
The combination of excellent material properties is a special feature of silicon nitride (Si_3N_4). These include high resilience and stability, excellent wear properties and good chemical resistance.



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

Spring plungers

with slot and ball, stainless steel



Material:

Sleeve 1.4305.

Ball 1.4034.

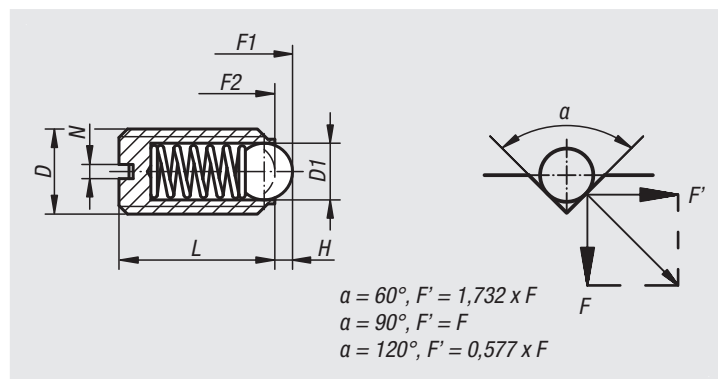
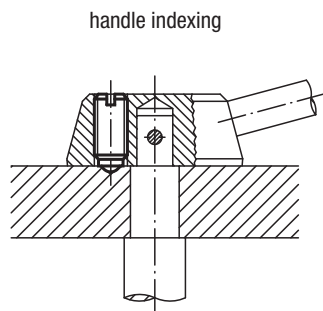
Spring 1.4310.

Version:

Bright. Ball hardened.

Sample order:

nlm 03010-203



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:

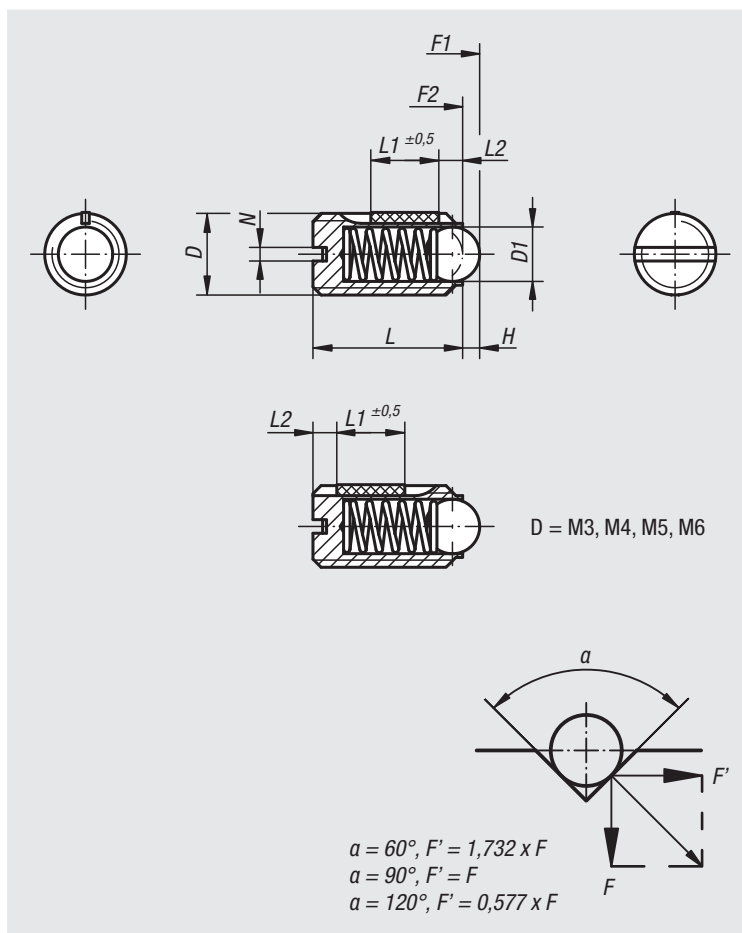
Bright. Ball hardened.

Sample order:

nIm 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:

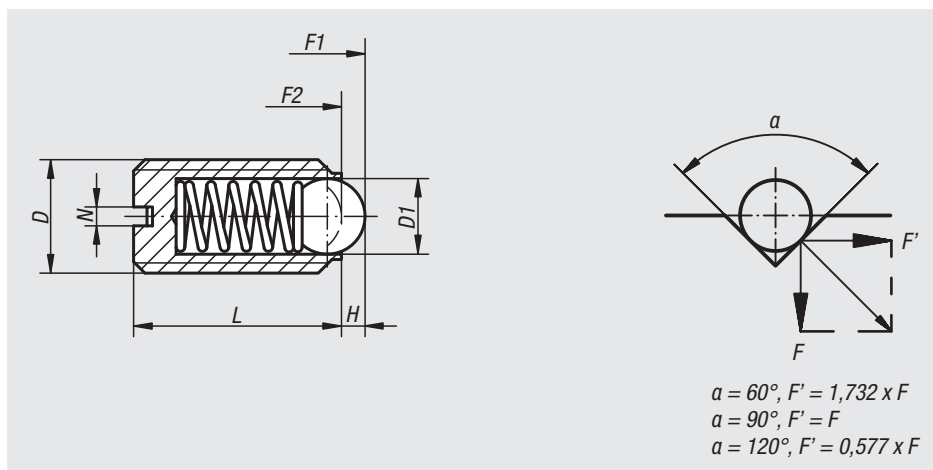
Ball, hardened.

Sample order:

nIm 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.

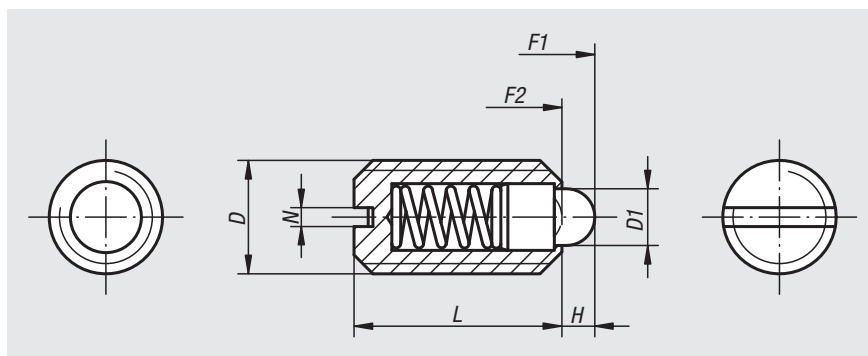
Version:

Black oxidised.

Thrust pin hardened.

Sample order:

nIm 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:

nIm 03020-5081

Note:

An electrical control signal can be sent via the built-in end switch.

Voltage: $U = 10 - 30 \text{ V DC}$

Current: $I_{\text{max.}} = 200 \text{ mA}$

Temperature range: $-25 \text{ °C} - +70 \text{ °C}$

Protection class: IP 67

Safety:

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

Drawing reference:

3) cable $\varnothing 3.5 \text{ mm}$; length ca. 2 m

4) LED-indicator

BN = brown

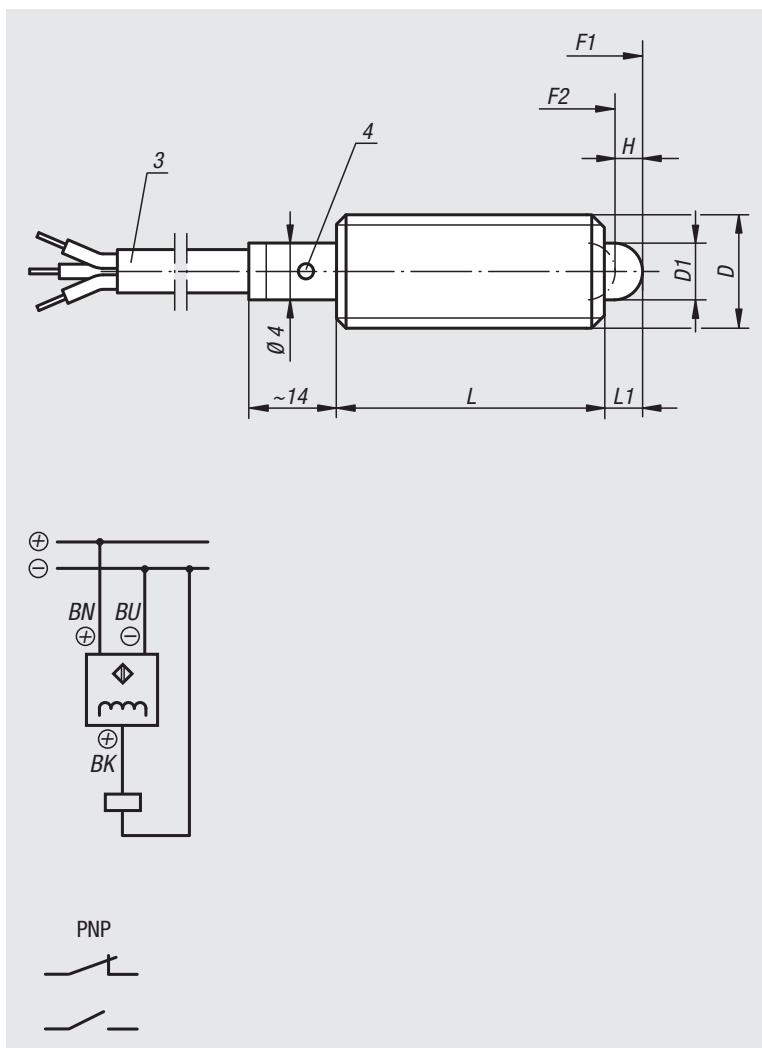
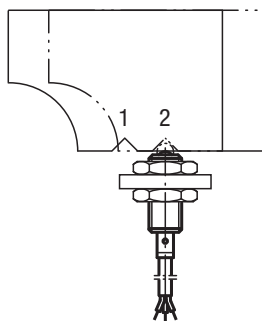
BK = black

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

Spring plungers

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



Material:

Sleeve steel grade 5.8.

Thrust pin steel.

Spring grade D steel wire.

LONG-LOCK thread lock Nylon.

Version:

Black oxidised.

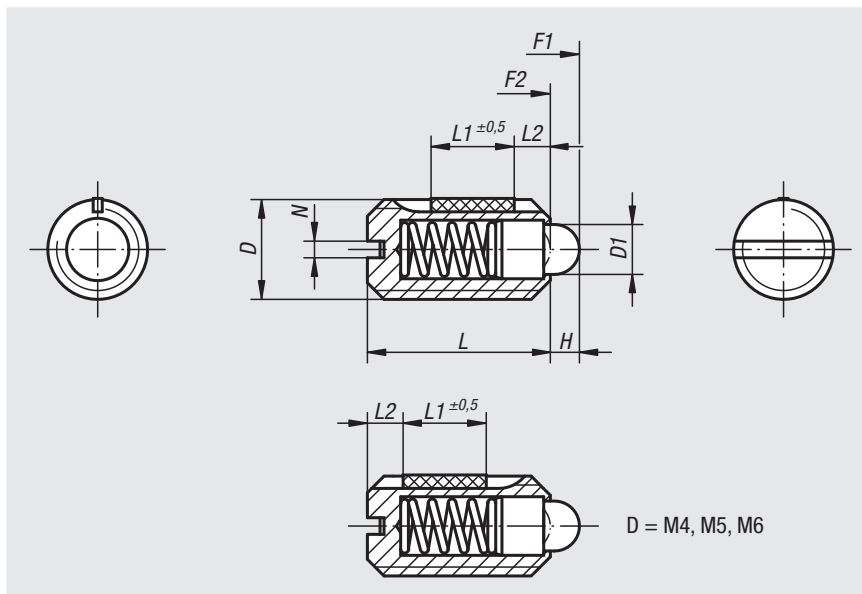
Thrust pin hardened.

Sample order:

n1m 03021-10

Drawing reference:

L2 = approx. 2x thread pitch



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

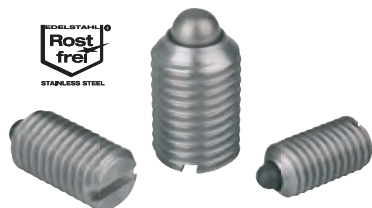
Order No.	D	D1	H	L	L1	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Tightening torque approx. Nm	Loosening torque approx. Nm
03021-104	M4	1,8	1,5	9	5	0,6	3	10	0,18	0,12
03021-105	M5	2,4	2	12	6	0,8	3	10	0,12	0,08
03021-106	M6	2,7	2	14	7	1	4	10	0,44	0,21
03021-108	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-LOCK 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

Spring plungers

with slot and thrust pin, stainless steel



Material:

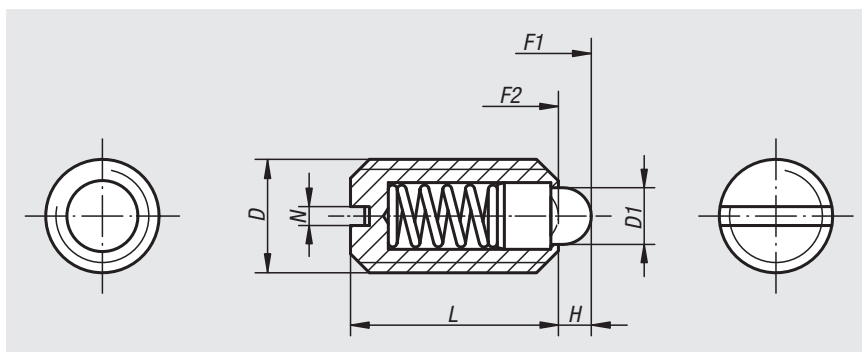
Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

Version:

Bright.
Thrust pin hardened.

Sample order:

nln 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

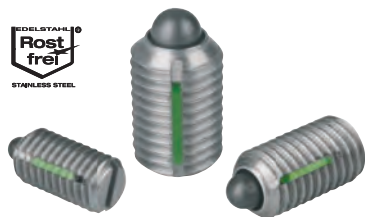
Order No.	D	D1	H	L	N	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03025-104	M4	1,8	1,5	9	0,6	3	10
03025-105	M5	2,4	2	12	0,8	3	10
03025-106	M6	2,7	2	14	1	4	10
03025-108	M8	4	2	16	1,2	7	15
03025-110	M10	4,5	2,5	19	1,6	9	16
03025-112	M12	6	3,5	22	2	14	26
03025-116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



Material:

Sleeve 1.4305.
Thrust pin 1.4034.
Spring 1.4310.

LONG-LOCK thread lock Nylon.

Version:

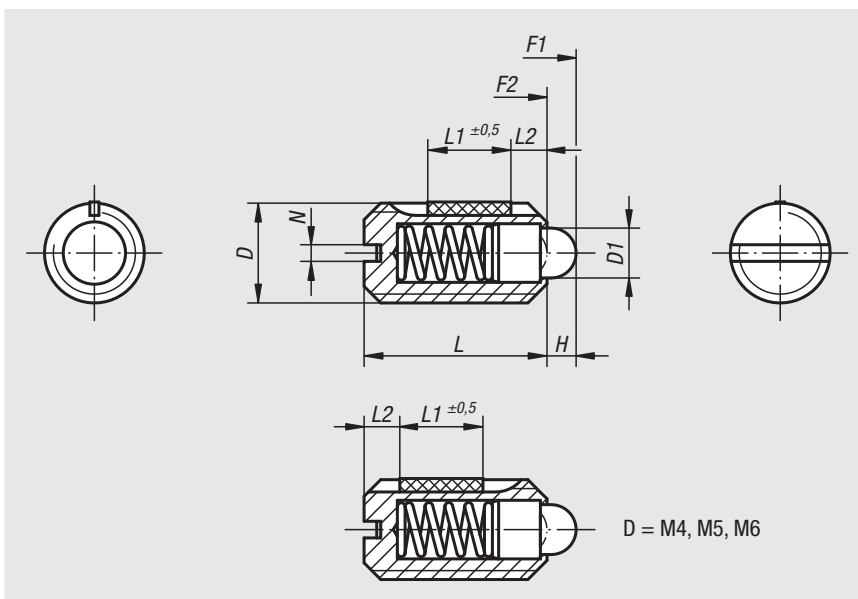
Bright.
Thrust pin hardened.

Sample order:

nIm 03026-10

Drawing reference:

L2 = approx. 2x thread pitch



Spring plungers with slot and thrust pin, standard spring force, LONG-LOCK 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-LOCK 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-LOCK 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.

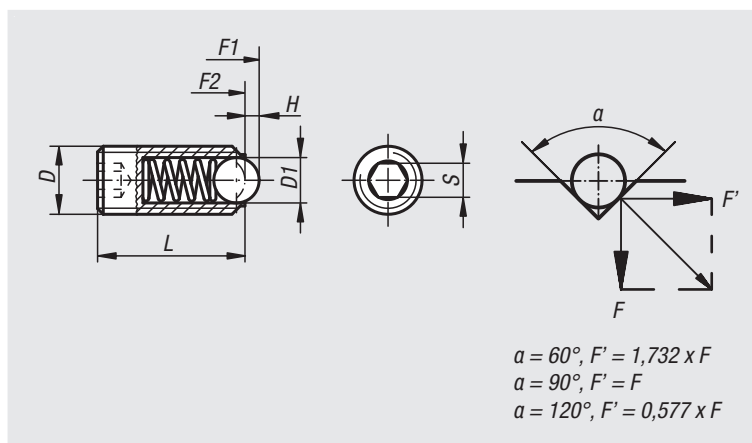
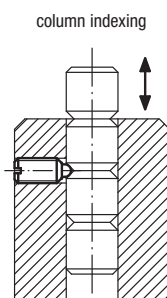
Spring grade D steel wire.

Version:

Black oxidised. Ball hardened.

Sample order:

nIm 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
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

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:

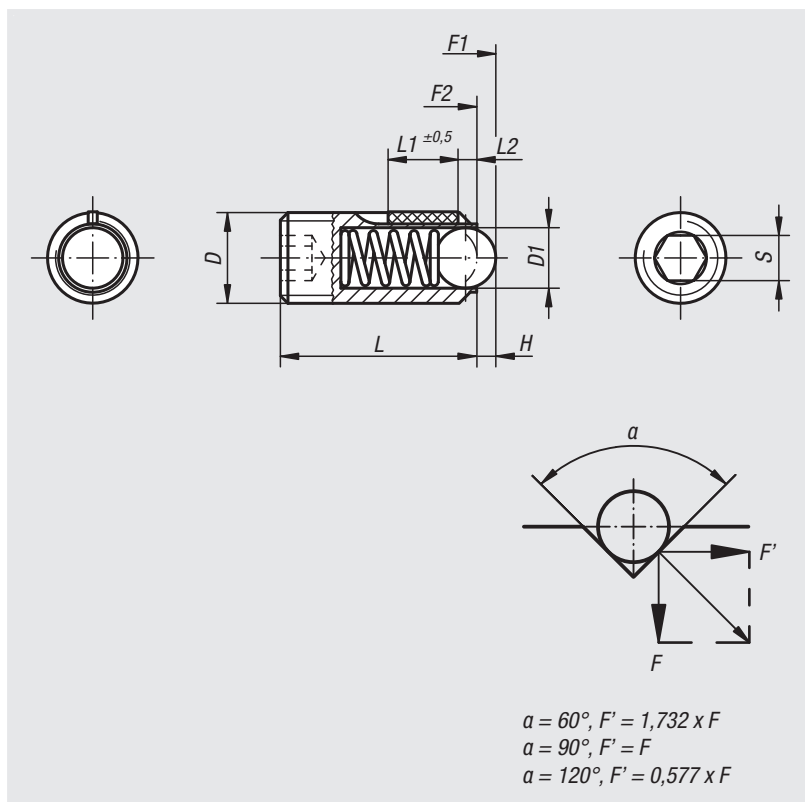
Black oxidised. Ball hardened.

Sample order:

nIm 03031-08

Drawing reference:

L2 = approx. 2x thread pitch



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

Spring plungers

with hexagon socket and ceramic ball, stainless steel



Material:

Sleeve 1.4305.

Ceramic ball Si_3N_4 .

Spring 1.4310.

Version:

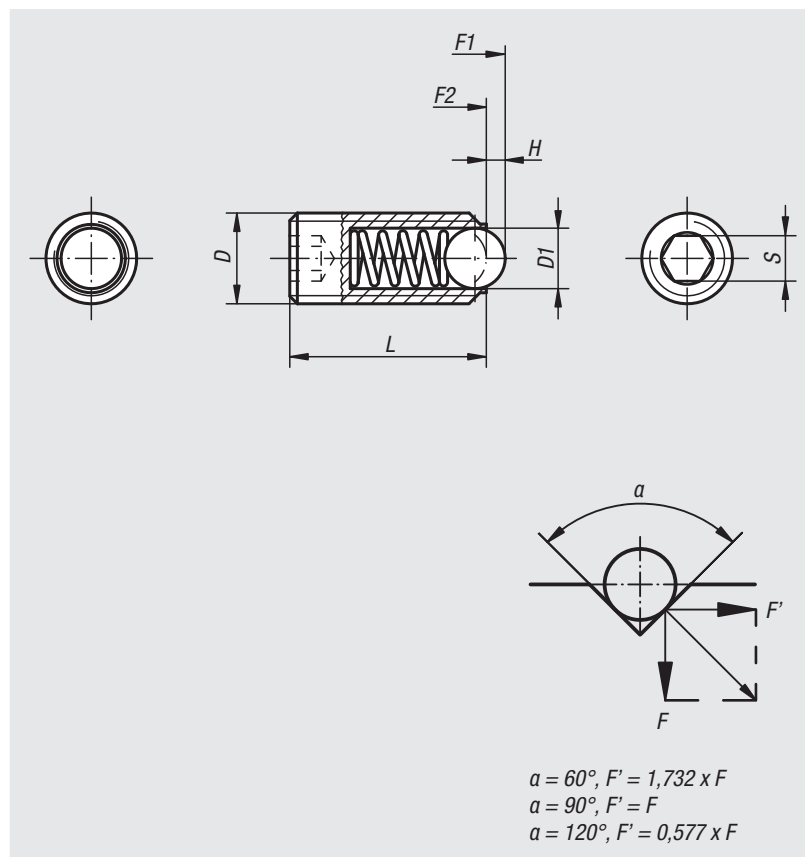
Bright.

Sample order:

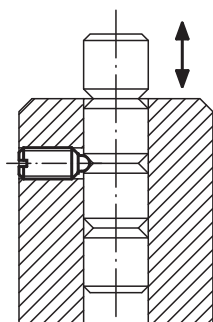
nlm 03033-05

Note:

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



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



Material:

Sleeve 1.4305.

Ball 1.4034.

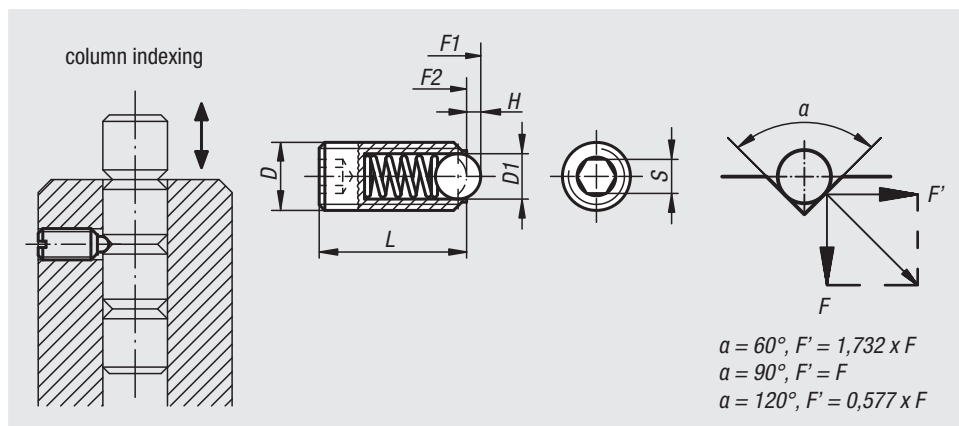
Spring 1.4310.

Version:

Bright. Ball hardened.

Sample order:

nIm 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

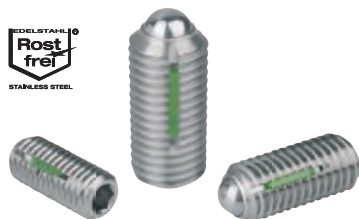
Order No.	D	D1	H	L	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03035-203	M3	1,5	0,4	9	1,5	5	7
03035-204	M4	2,5	0,8	10	2	12	22
03035-205	M5	3	0,9	14	2,5	19	30
03035-206	M6	3,5	1	15	3	28	40
03035-208	M8	5	1,5	18	4	47	73
03035-210	M10	6	2	23	5	66	100
03035-212	M12	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:

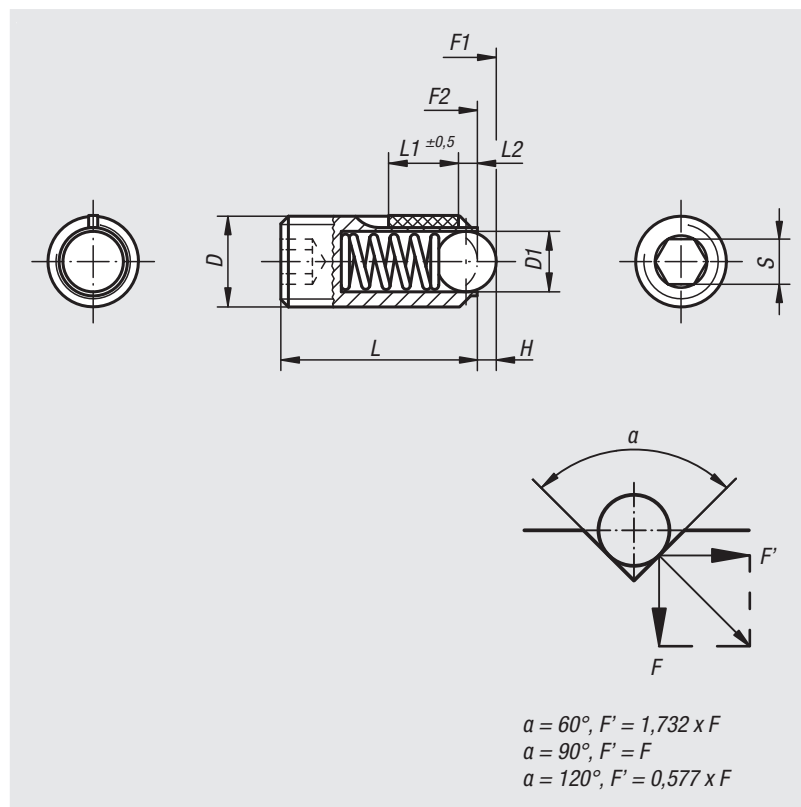
Bright. Ball hardened.

Sample order:

nIm 03036-08

Drawing reference:

L2 = approx. 2x thread pitch



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:

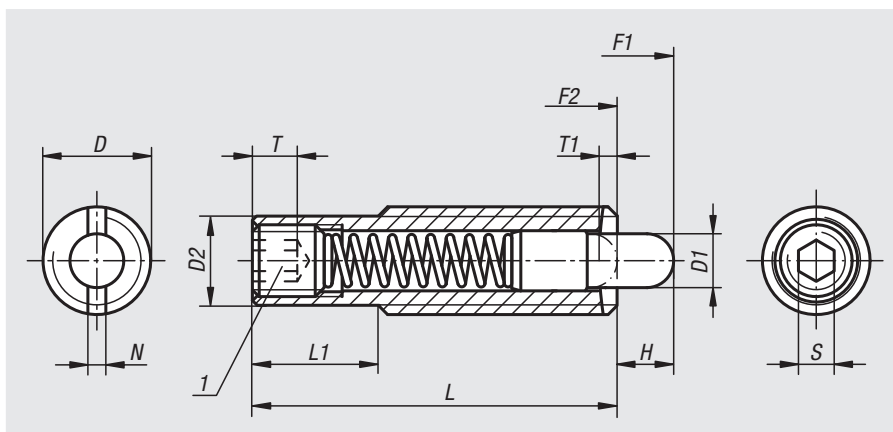
nIm 03040-616X60

Note:

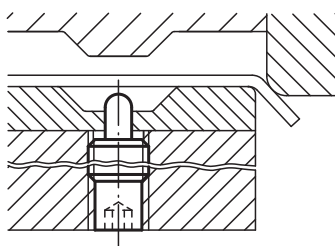
These spring plungers are chiefly used as ejectors and spring stops in machine construction.

Drawing reference:

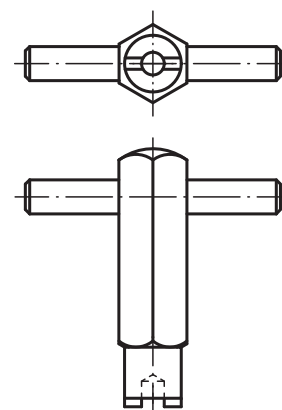
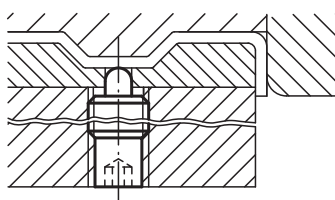
1) grub screw glued in



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

Spring plungers

with hexagon socket and thrust pin, steel



Material:

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

Version:

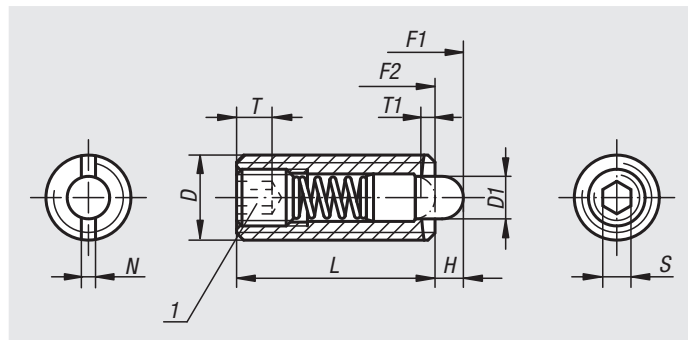
Black oxidised.
Thrust pin hardened.

Sample order:

nln 03040-16

Drawing reference:

1) grub screw glued in



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

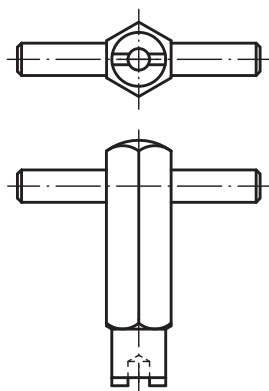
Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03040-03	M3	1	1,5	10	1,5	1	0,4	0,7	0,5	3	03040-903
03040-04	M4	1,5	1,5	15	2	0,6	0,6	1,3	5	16	03040-904
03040-05	M5	2,4	2,3	18	2	0,8	0,8	1,5	6	20	03040-905
03040-06	M6	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

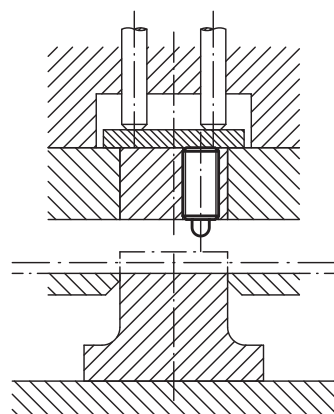
Order No.	D	D1	H	L	T	T1	N	S	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N	Order No. Assembly key
03040-104	M4	1,5	1,5	15	2	0,6	0,6	1,3	2	7	03040-904
03040-105	M5	2,4	2,3	18	2	0,8	0,8	1,5	3	10	03040-905
03040-106	M6	2,7	2,5	20	2,5	1	1	2	3	9	03040-906
03040-108	M8	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	-



application example



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:

nIm 03040-02-16

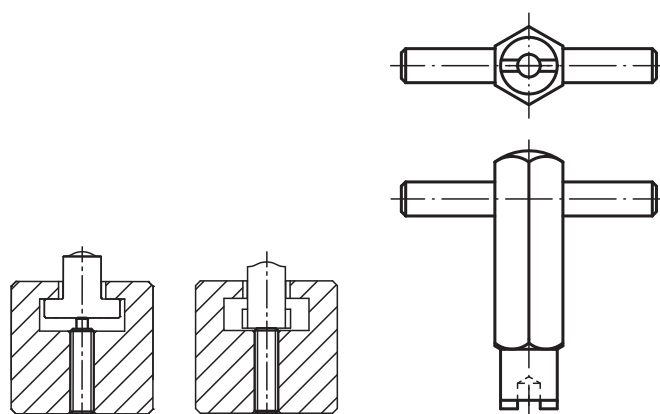
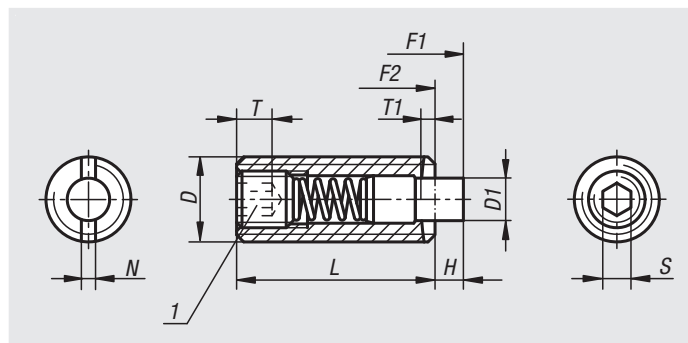
Note:

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	-

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.

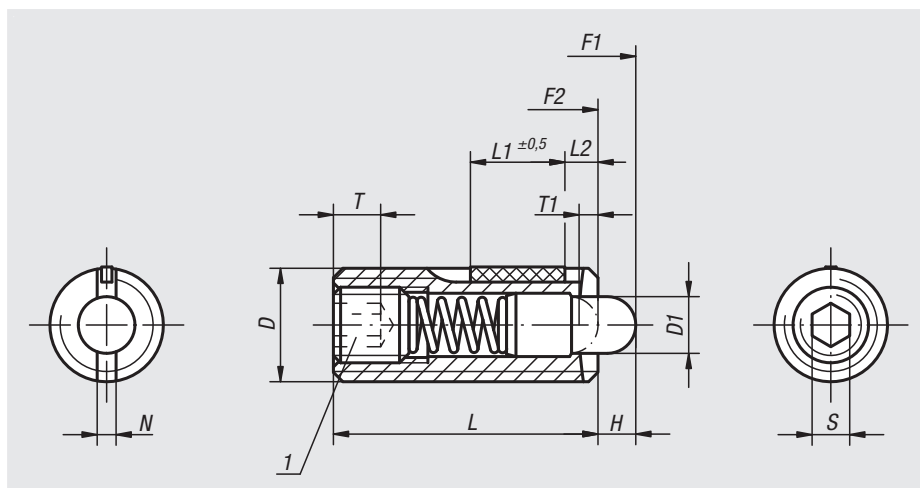
Sample order:

n1m 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:

nIm 03041-01-16

Note:

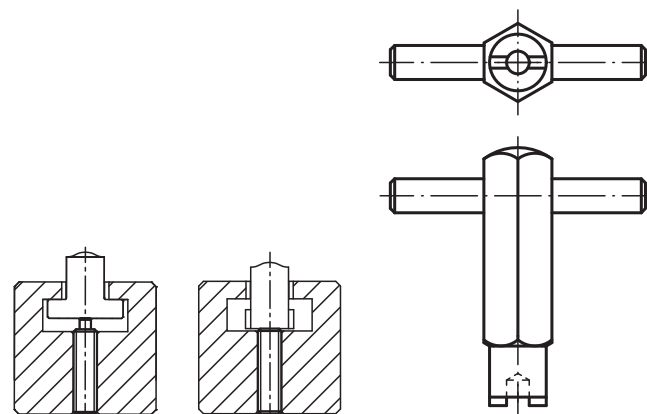
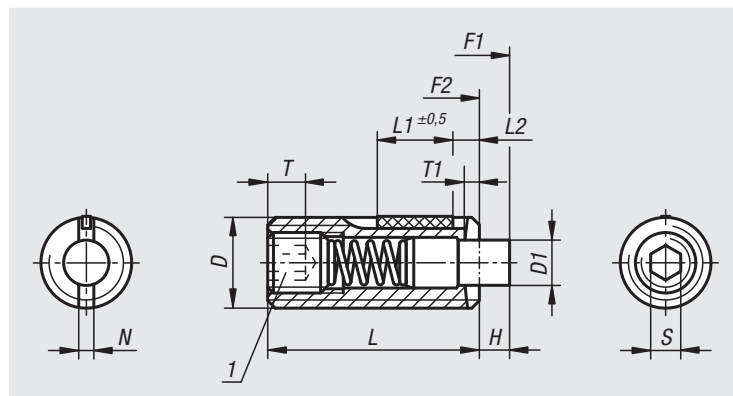
These spring plungers are chiefly used as ejectors and spring stops in machine construction.

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

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:

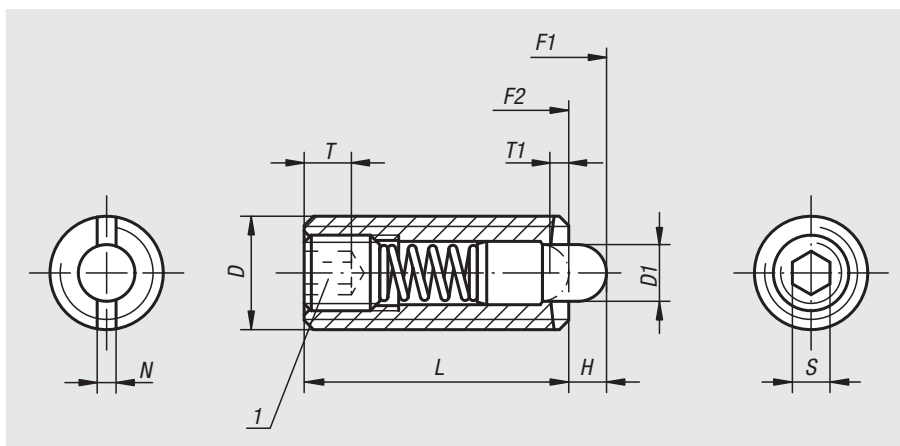
Black oxidised.

Sample order:

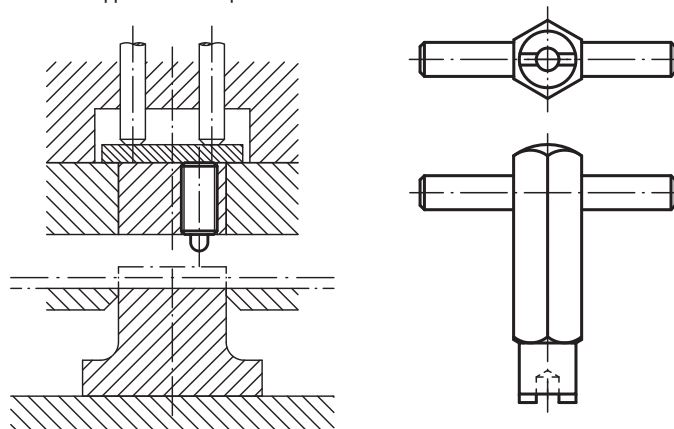
n1m 03050-16

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

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:

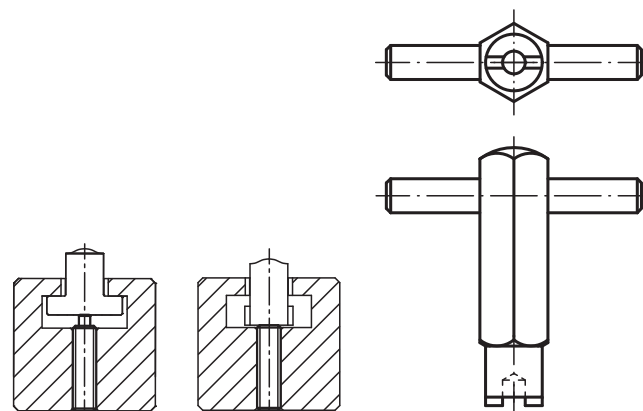
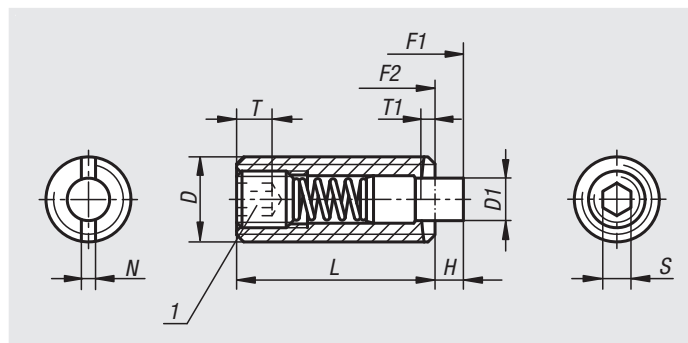
nIm 03050-01-16

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

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.

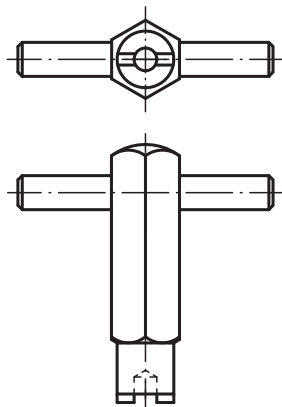
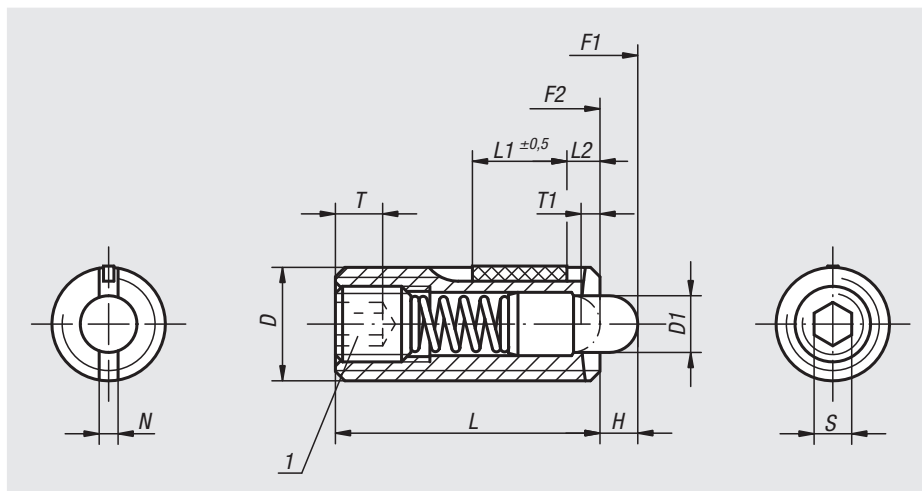
Sample order:

nIm 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:

nIm 03051-01-16

Note:

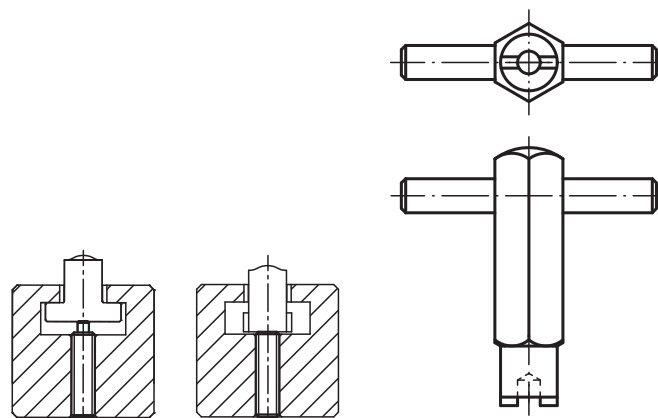
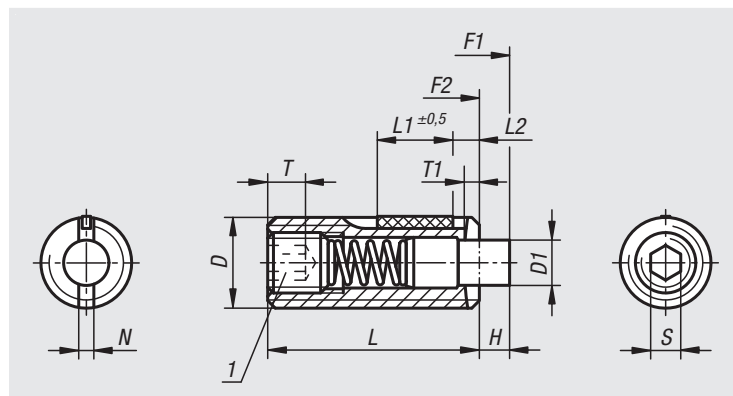
These spring plungers are chiefly used as ejectors and spring stops in machine construction.

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:

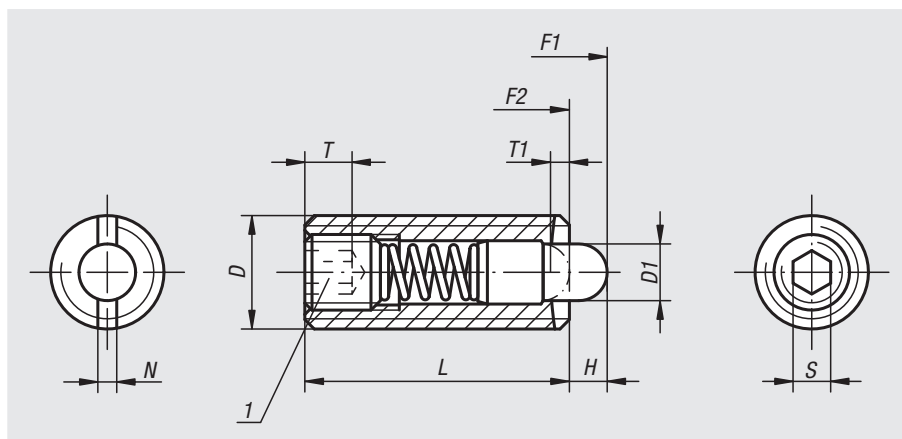
Bright.
Thrust pin hardened.

Sample order:

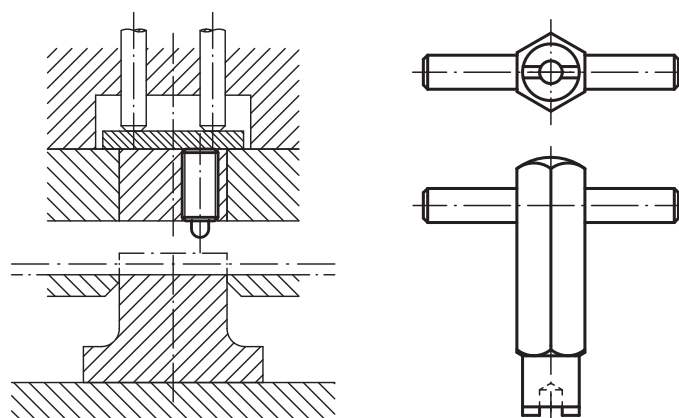
nIm 03055-16

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

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:

nIm 03055-01-16

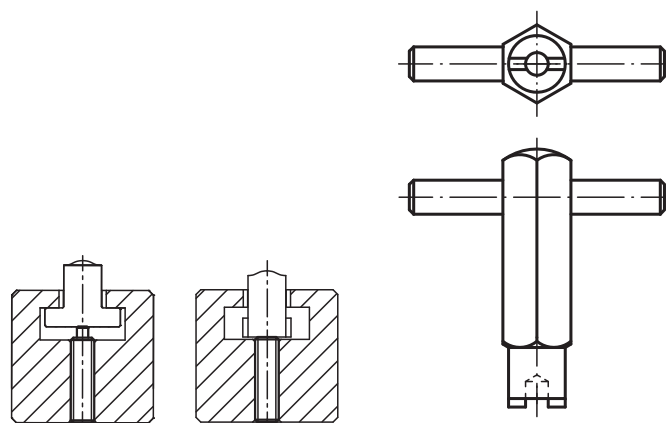
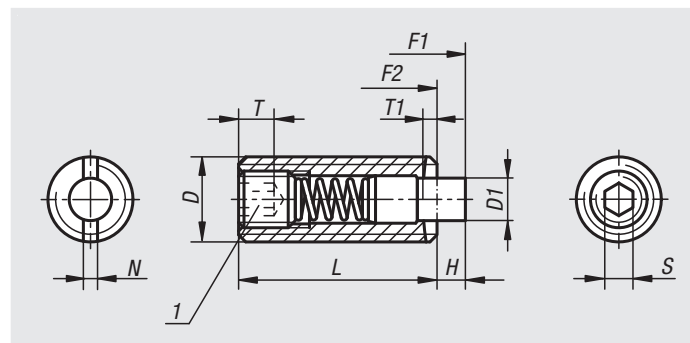
Note:

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

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.

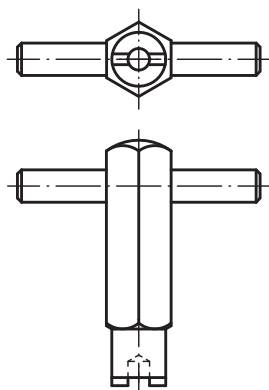
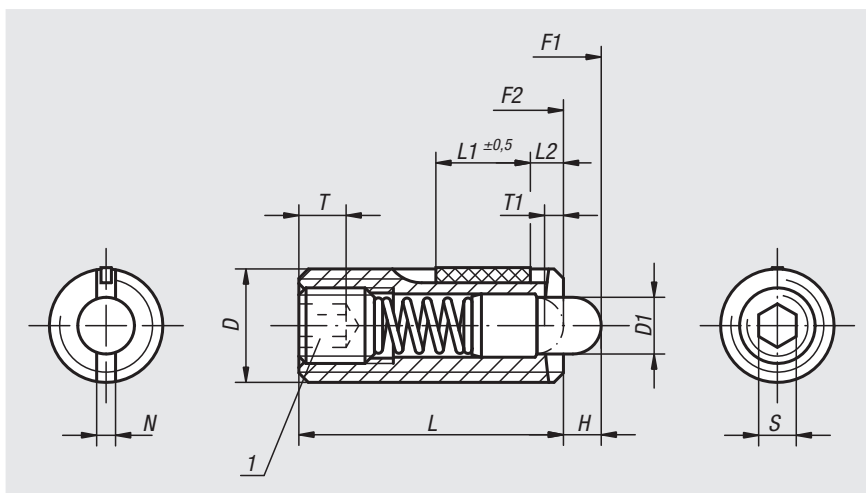
Sample order:

nIm 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:

nIm 03056-01-16

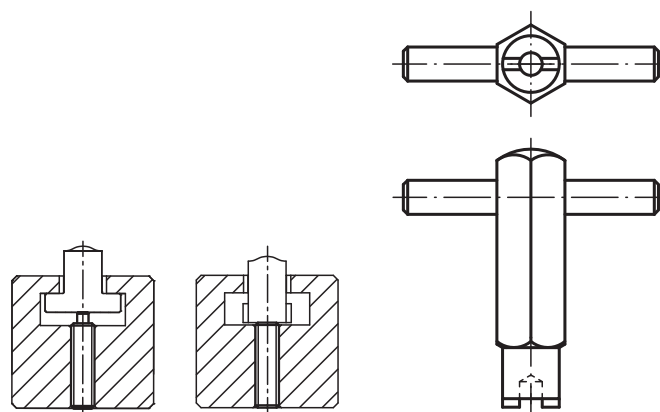
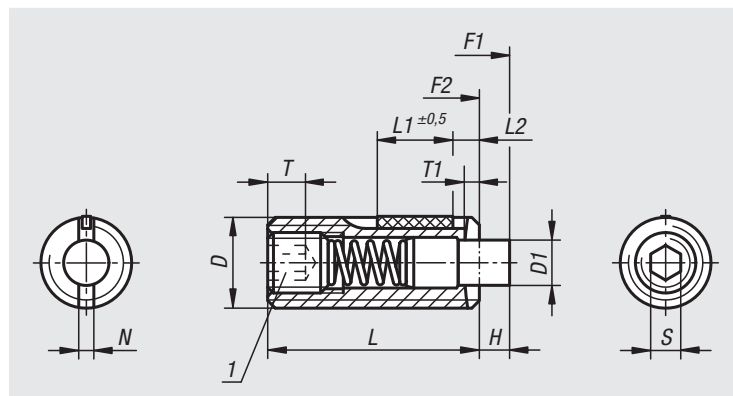
Note:

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

Spring plungers

with hexagon socket and POM thrust pin, stainless steel



Material:

Sleeve 1.4305.
Thrust pin POM.
Spring 1.4310.

Version:

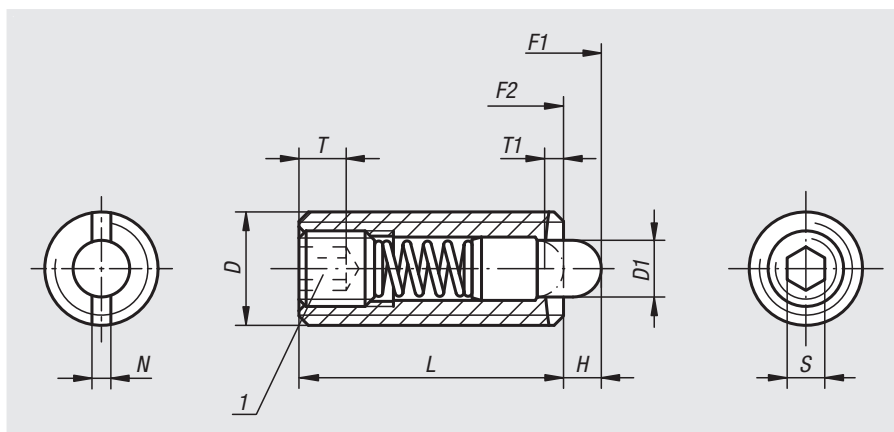
Bright.

Sample order:

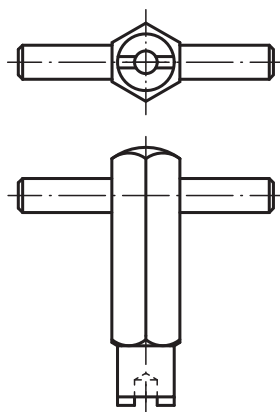
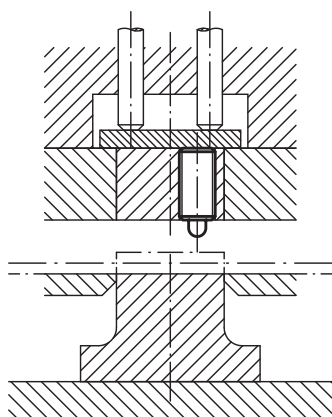
nIm 03058-16

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

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:

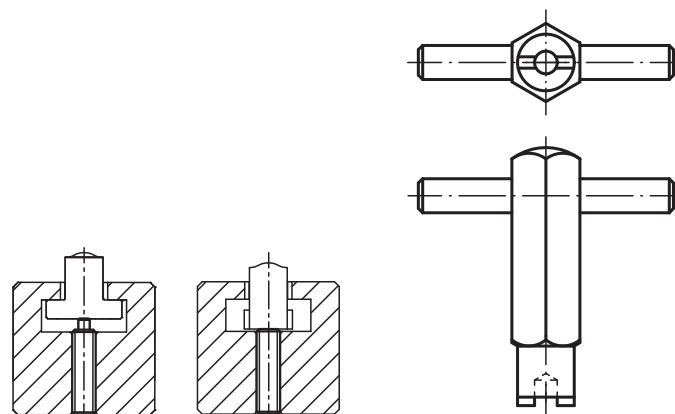
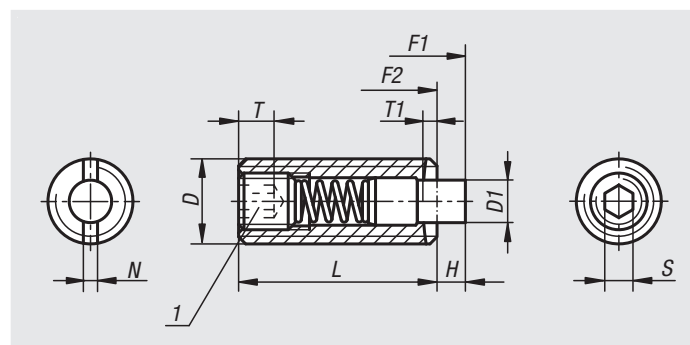
nIm 03058-01-16

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.

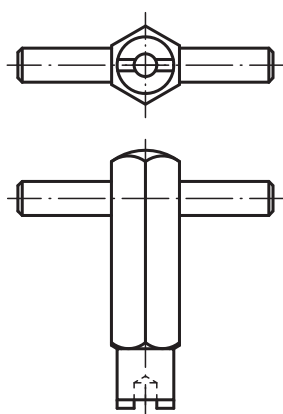
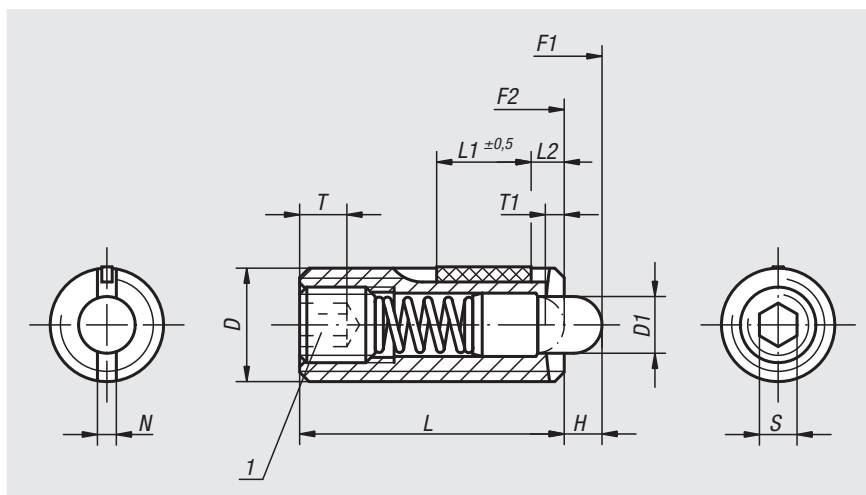
Sample order:

nln 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

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:

nIm 03059-01-16

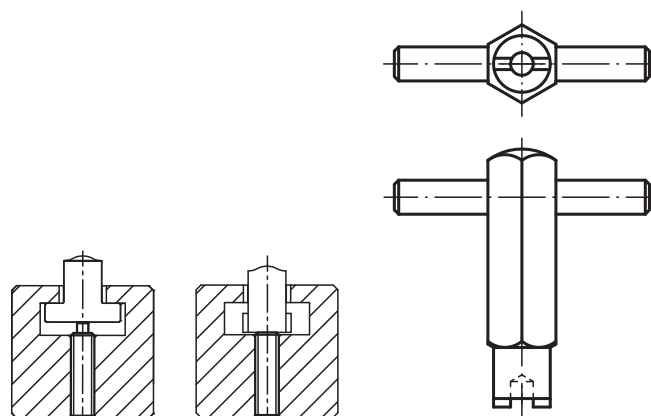
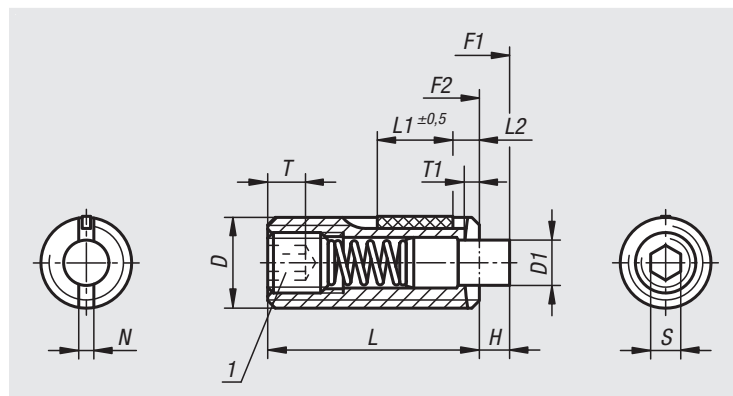
Note:

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

Spring plungers

with head


Material:

Steel.

Version:

Black oxidised.

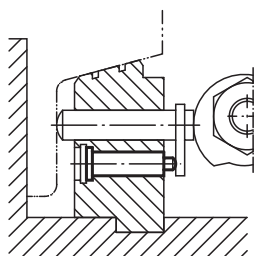
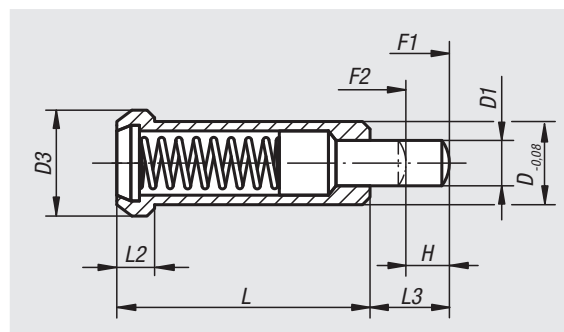
Thrust pin hardened.

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.

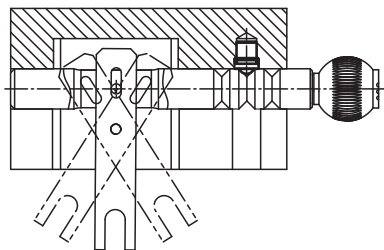
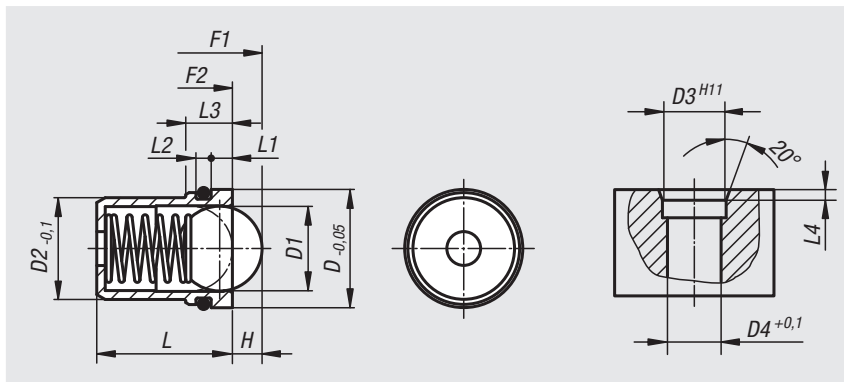
Sample order:

nIm 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

Locators

Material:

Steel.

Version:

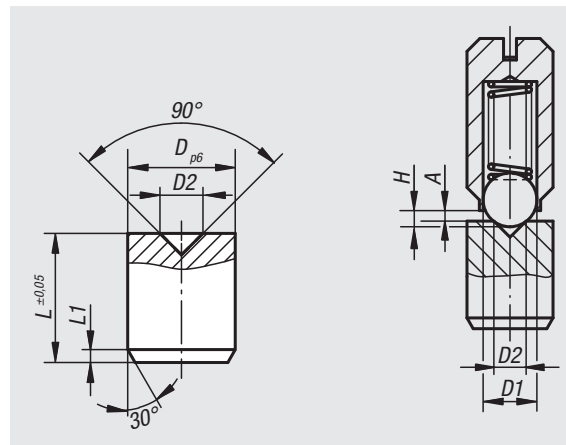
Bright, hardened.

Sample order:

nIm 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:

nIm 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:

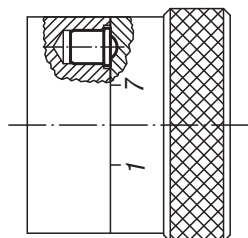
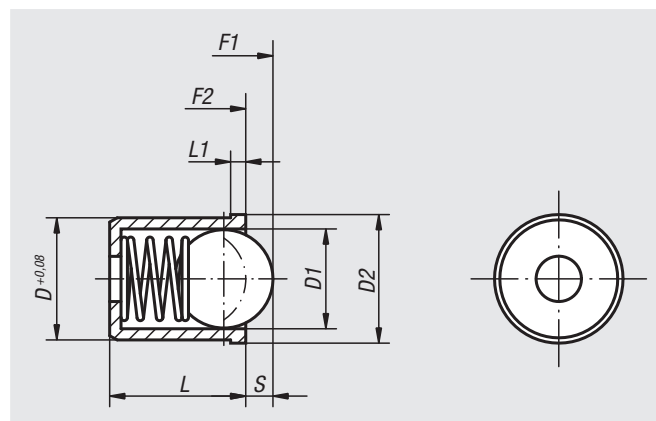
Sleeve and spring stainless steel.
Ball stainless steel or POM.

Version:

Sleeve bright.
Steel ball hardened and bright.

Sample order:

nln 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

Spring plungers

smooth version, plastic



Material:

Sleeve thermoplastic.

Spring stainless steel.

Ball stainless steel or POM.

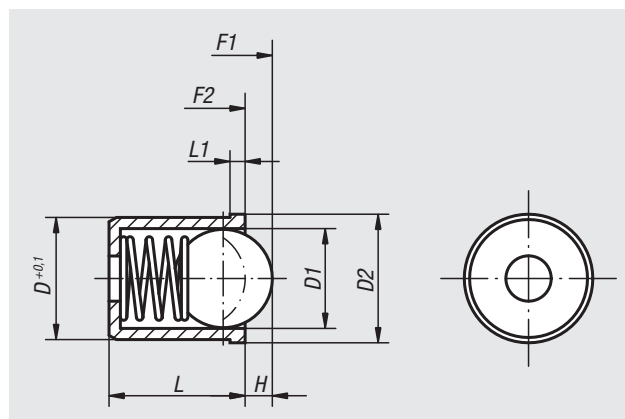
Version:

Sleeve black.

Ball hardened, bright.

Sample order:

nIm 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

Spring plungers

smooth version without collar, stainless steel



Material:

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

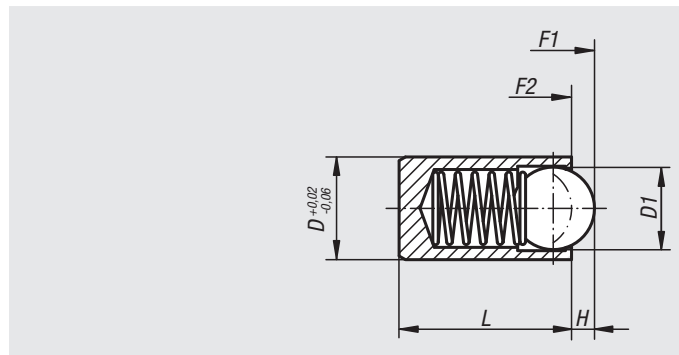
Version:

Ball hardened, bright.

Sample order:

nIm 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:

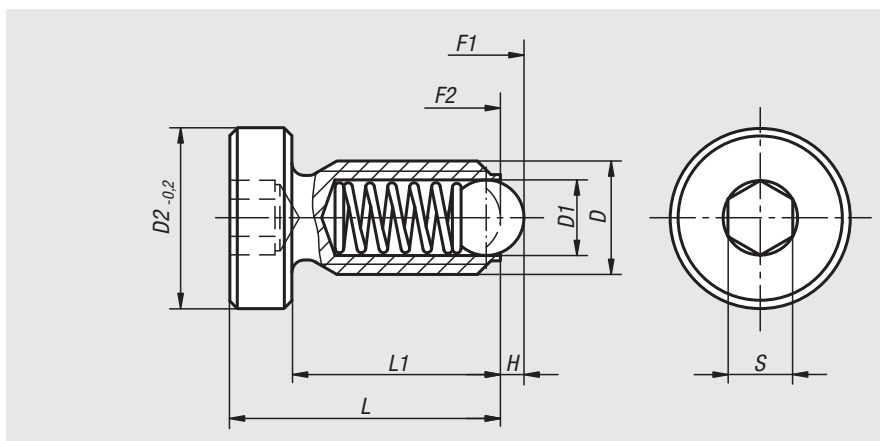
Steel or stainless steel.

Version:

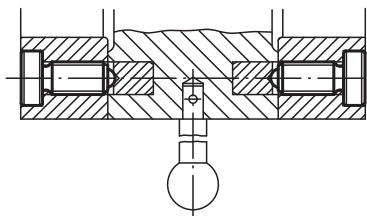
Steel black oxidised.
Stainless steel bright.
Ball steel or stainless steel, hardened, bright.

Sample order:

nIm 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:

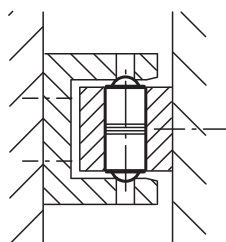
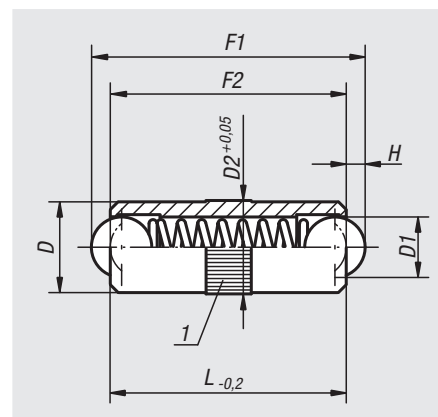
Balls hardened, bright.

Sample order:

nln 03074-05

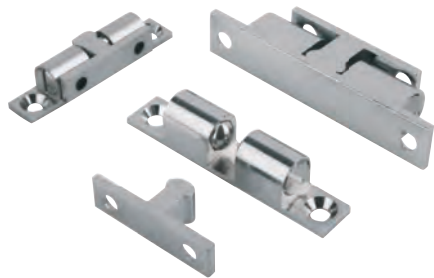
Drawing reference:

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:

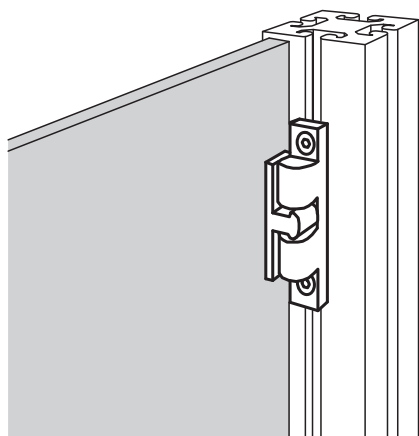
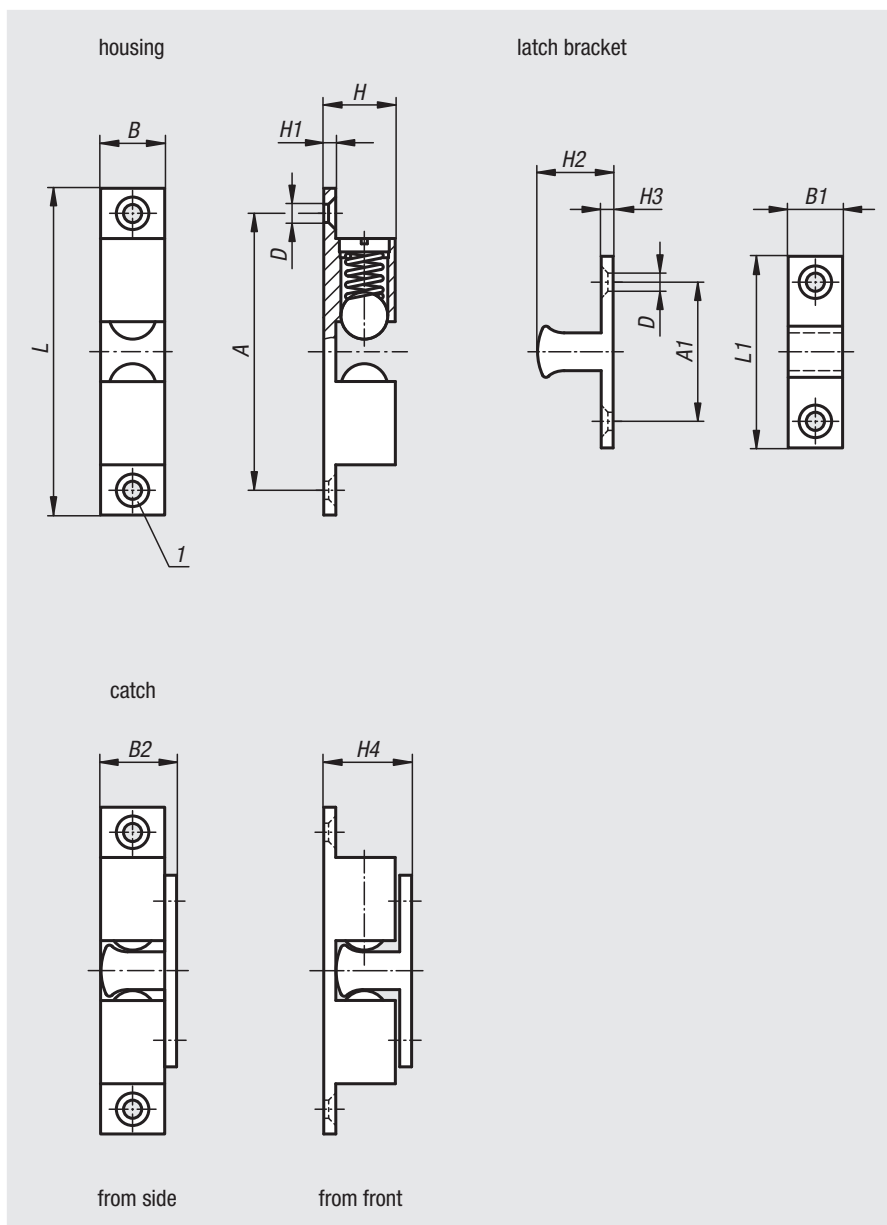
nIm 03075-50

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

Ball catch


Material:

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

Version:

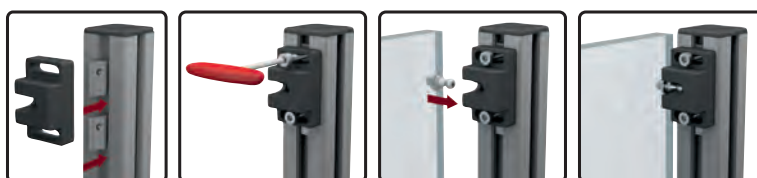
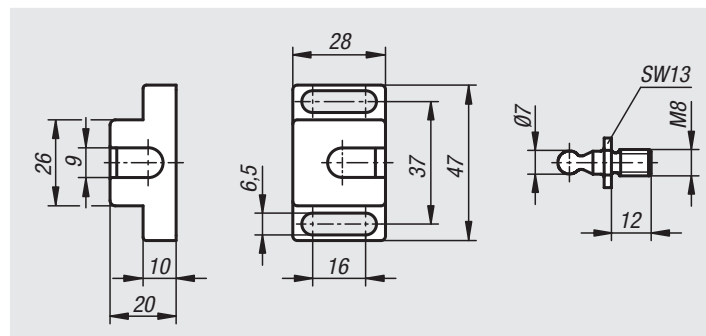
black.

Sample order:

nIm 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:

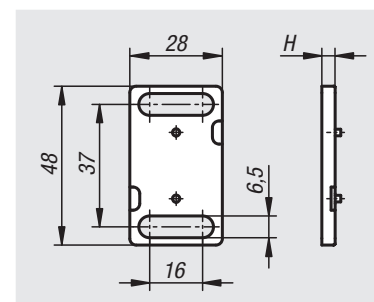
black.

Sample order:

nIm 03075-10-94

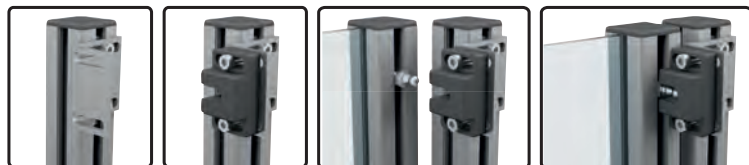
Note:

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



Order No.	H
03075-10-94	4

Angle bracket for ball catch


Material:

Steel.

Version:

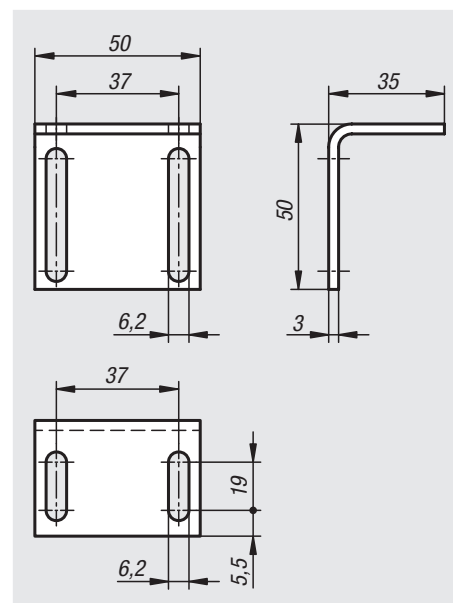
Electro zinc-plated.

Sample order:

nlm 03075-10-9503550

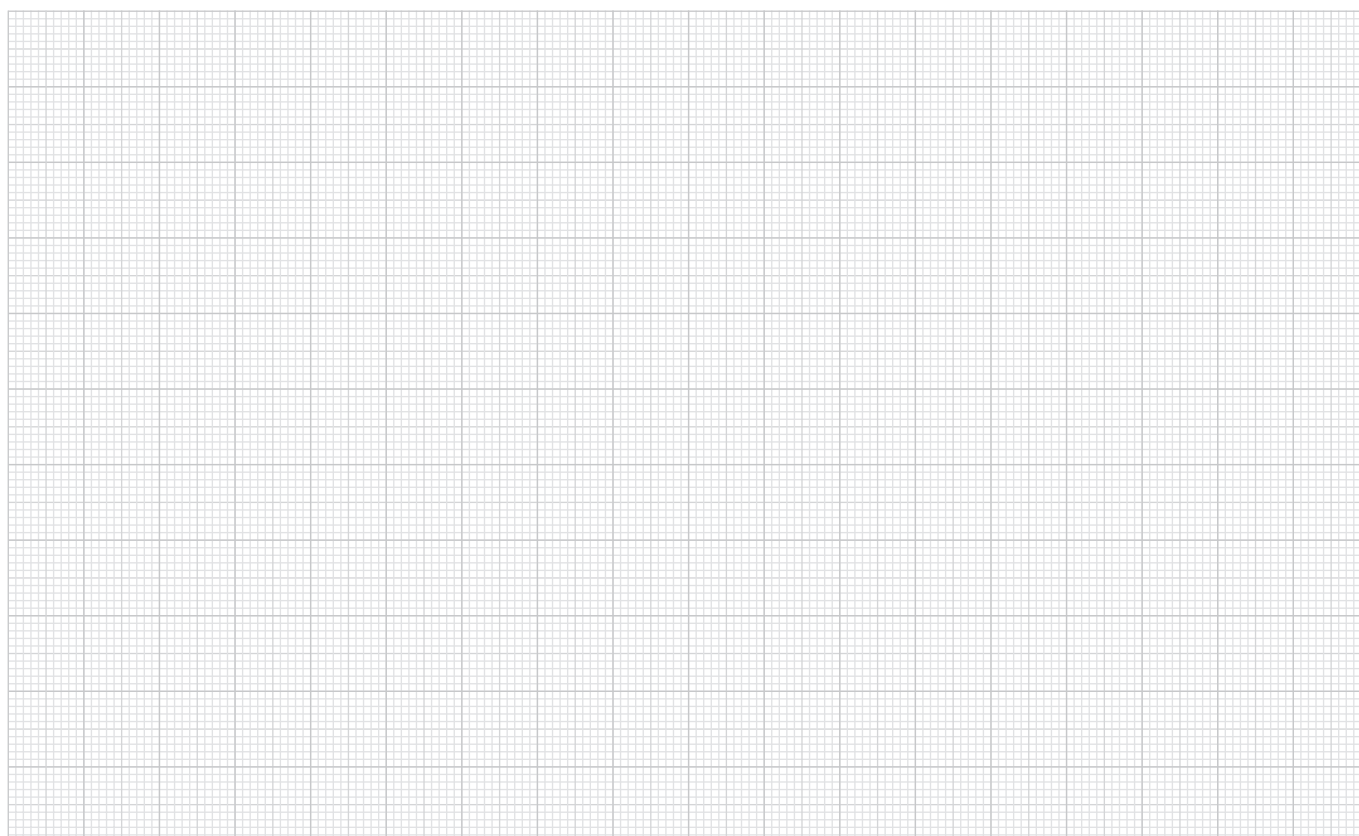
Note:

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



Order No.	Dimensions
03075-10-9503550	see drawing

Notes



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:

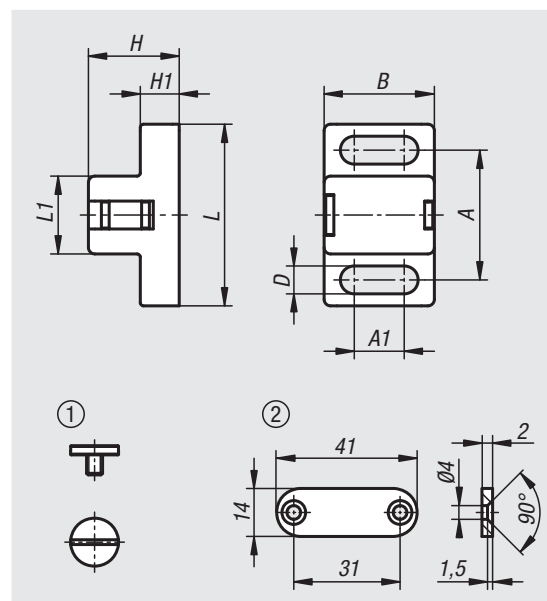
nIm 03075-11-17281

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

Angle bracket for magnetic lock

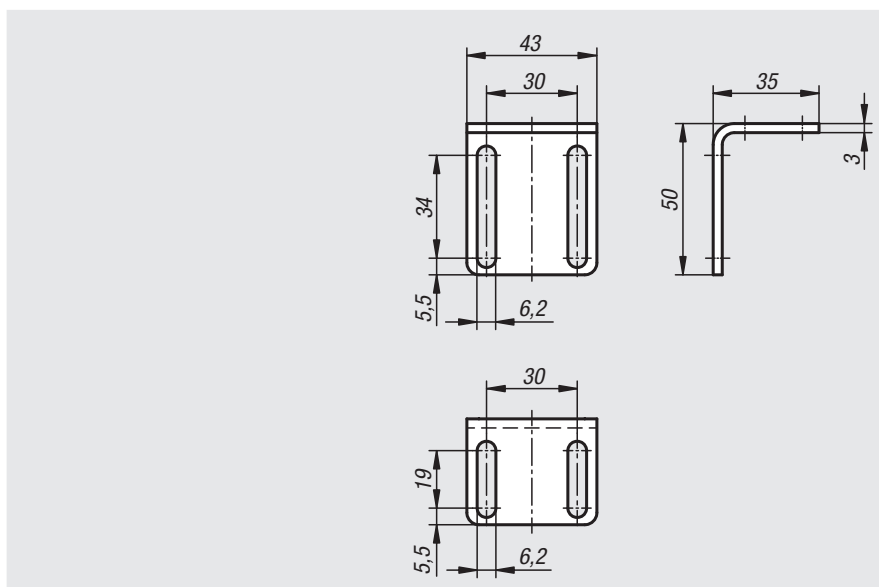


Material:
Steel.

Version:
Electro zinc-plated.

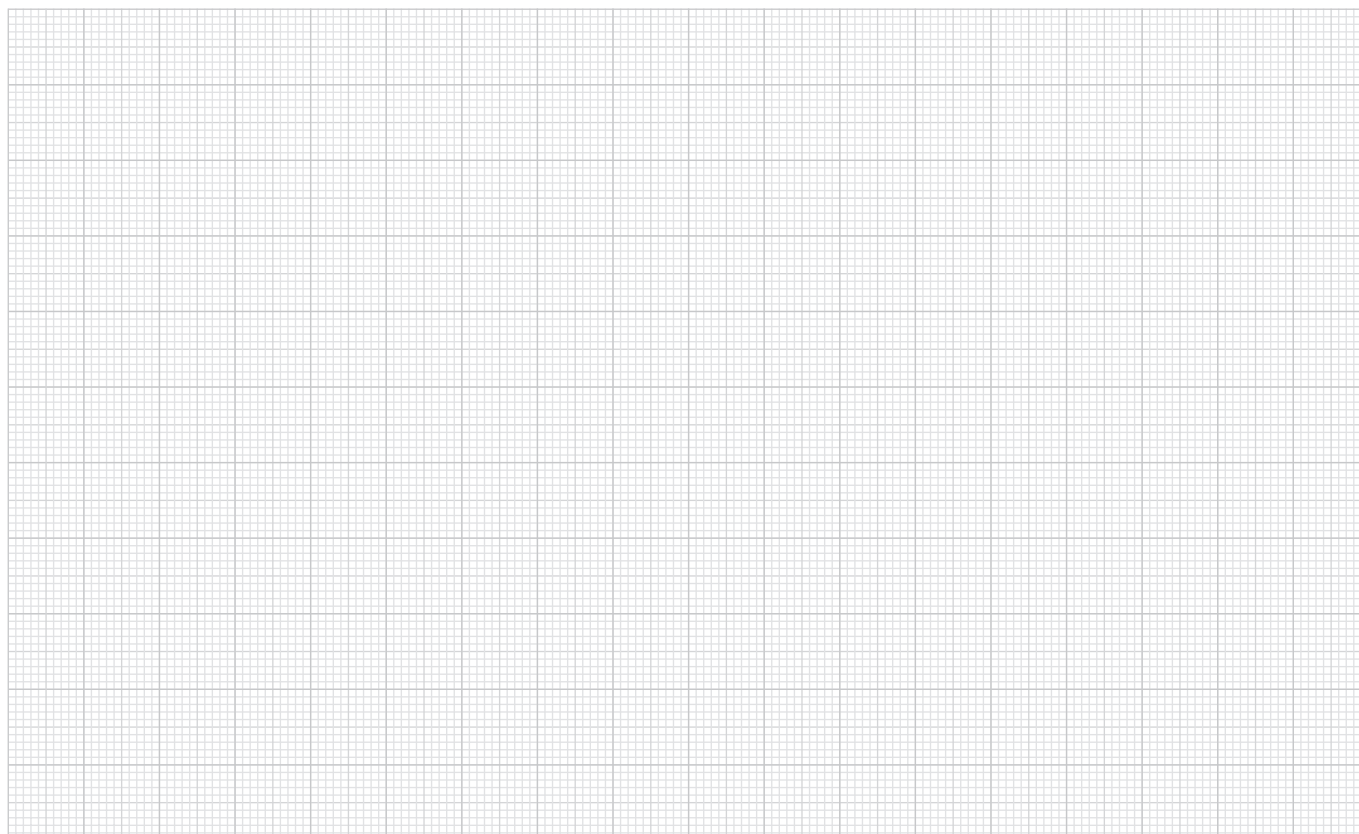
Sample order:
nlm 03075-11-9503543

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



Order No.	Dimensions
03075-11-9503543	see drawing

Notes



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:

nIm 03075-12-0

Note:

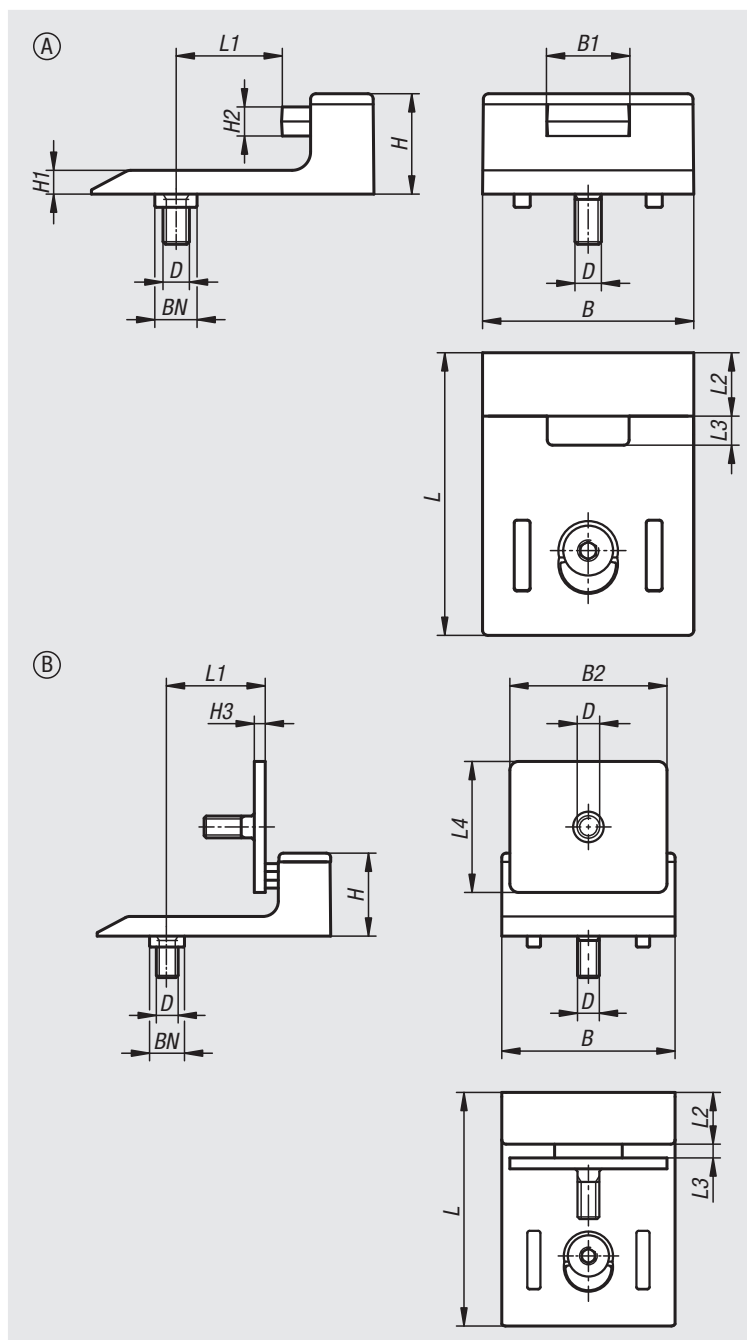
These door stops can be used to close doors or hatches mounted on aluminium profiles softly or magnetically.

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:

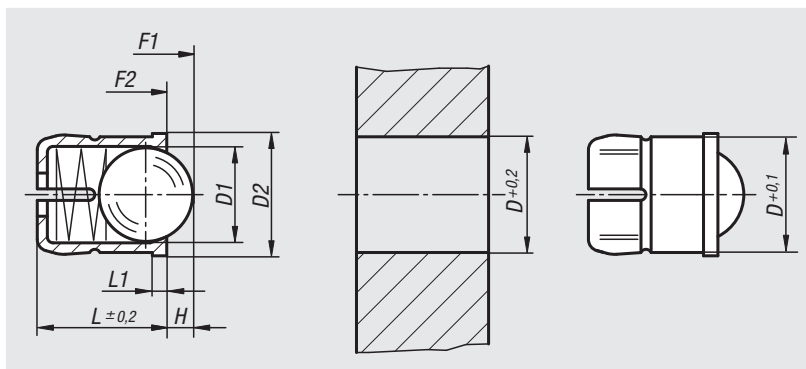
Sleeve black.
Ball hardened, bright.

Sample order:

nln 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

Spring plungers

smooth version



Material:

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

Version:

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

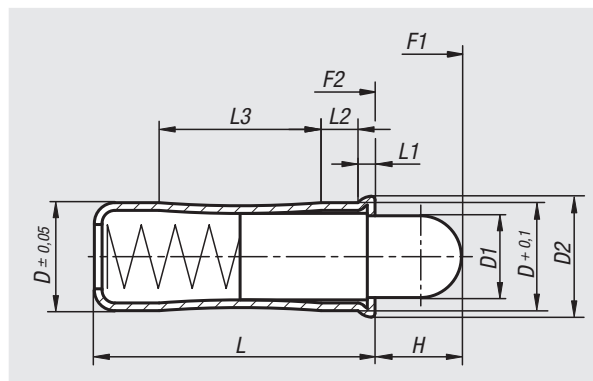
Sample order:

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

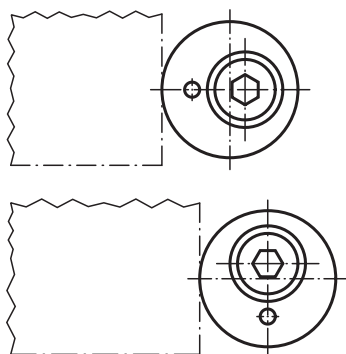
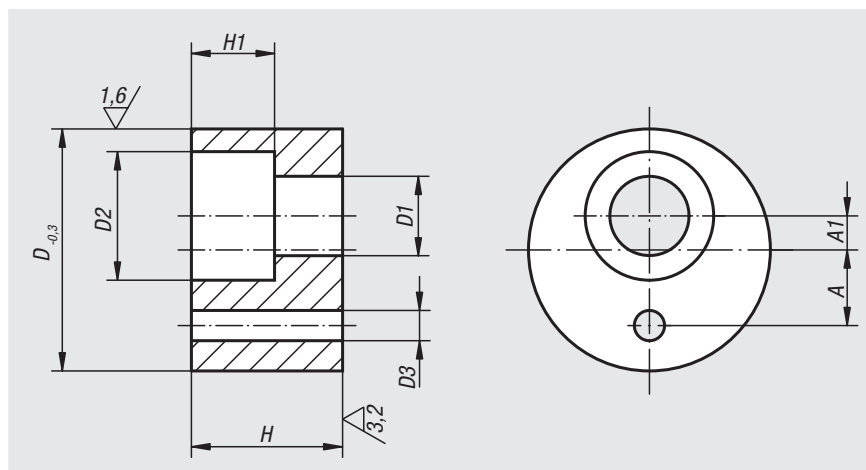
Eccentric stops



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

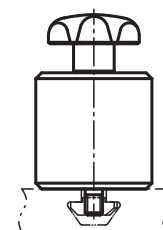
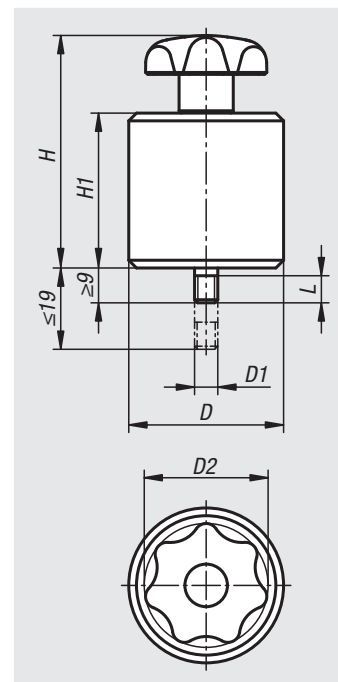
07060-06

07060-061

07060-806

07060-2061

07060-206



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

Stops

adjustable

**Material:**

Body and set screw carbon steel.

Version:

Body black oxidised.

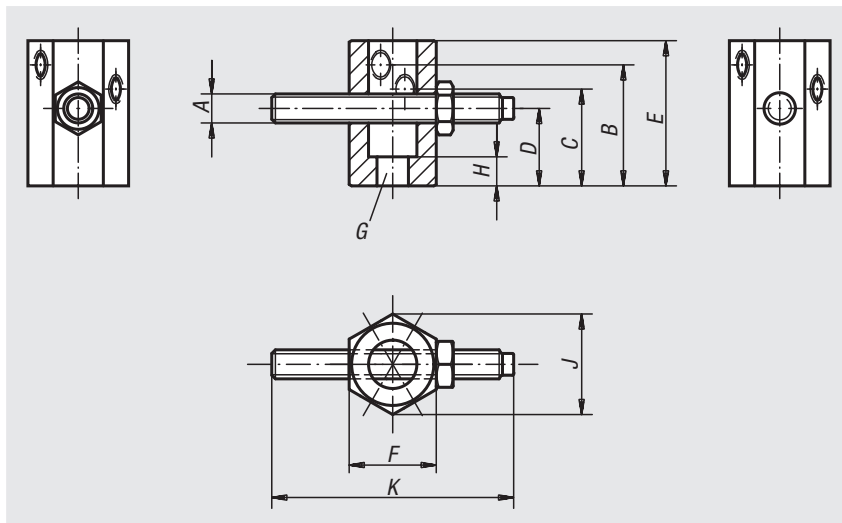
Set screw tempered and black oxidised.

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:**

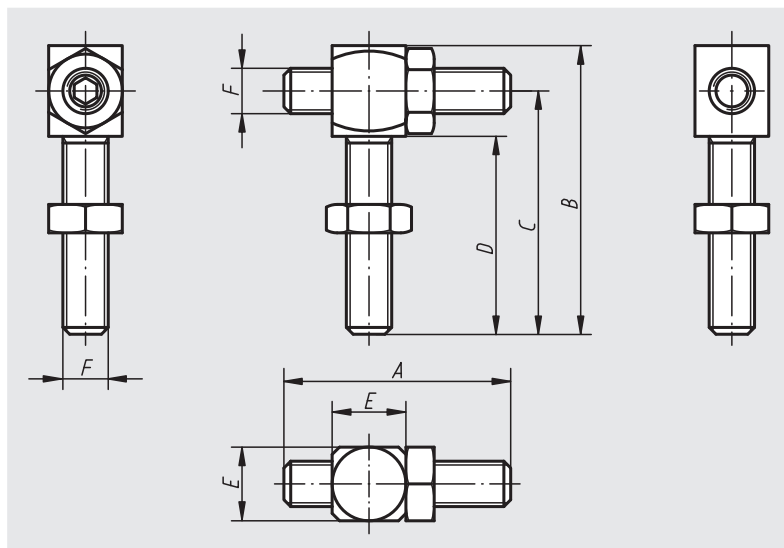
Carbon steel, tempered.

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

Stop screws


Material:

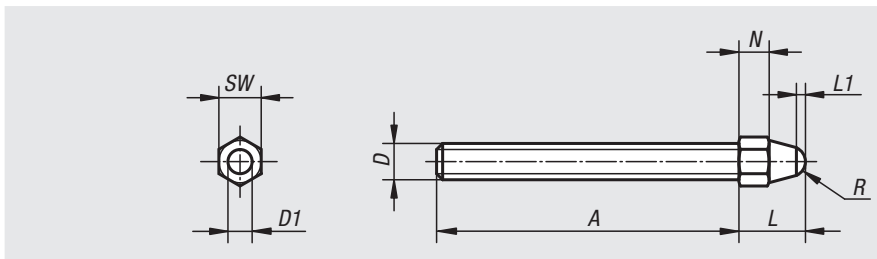
Steel.

Version:

Black oxidised. Domed head hardened.

Sample order:

nIm 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:

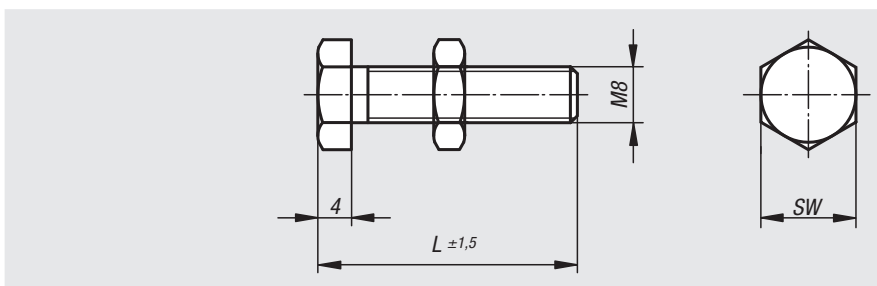
Stop screw black oxidised.
Stop face hardened (52 HRC).
Nut electro zinc-plated.

Sample order:

nIm 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:

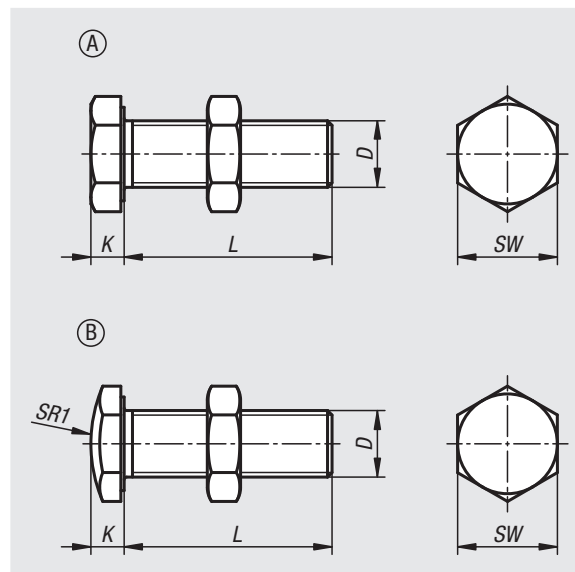
Stop screw black oxidised.
Nut electro zinc-plated.

Sample order:

nIm 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:

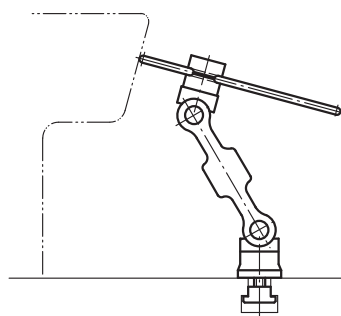
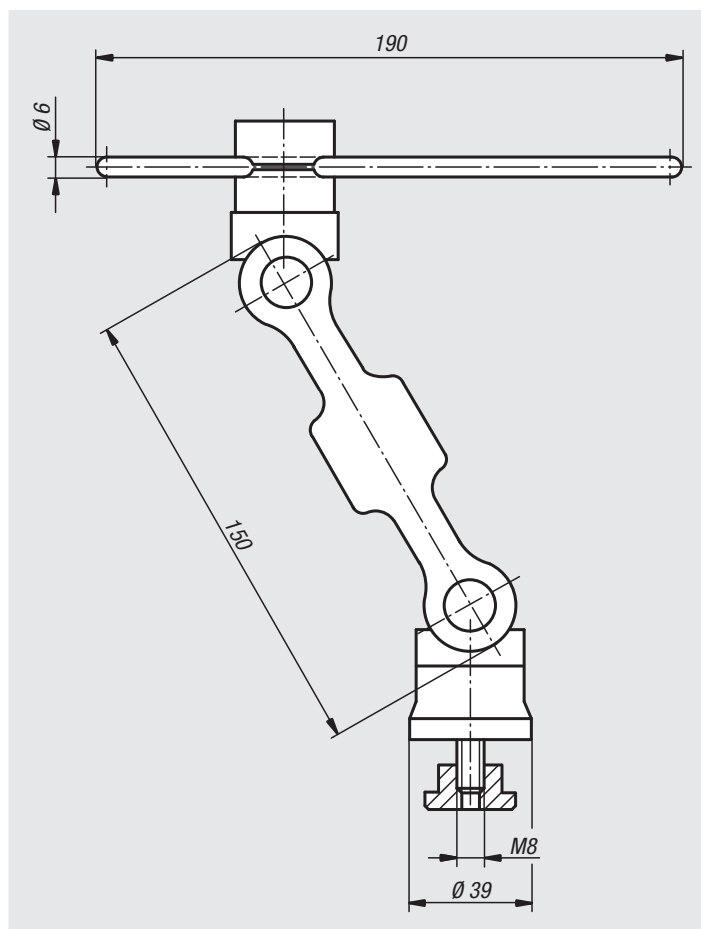
nIm 03088-15012

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.



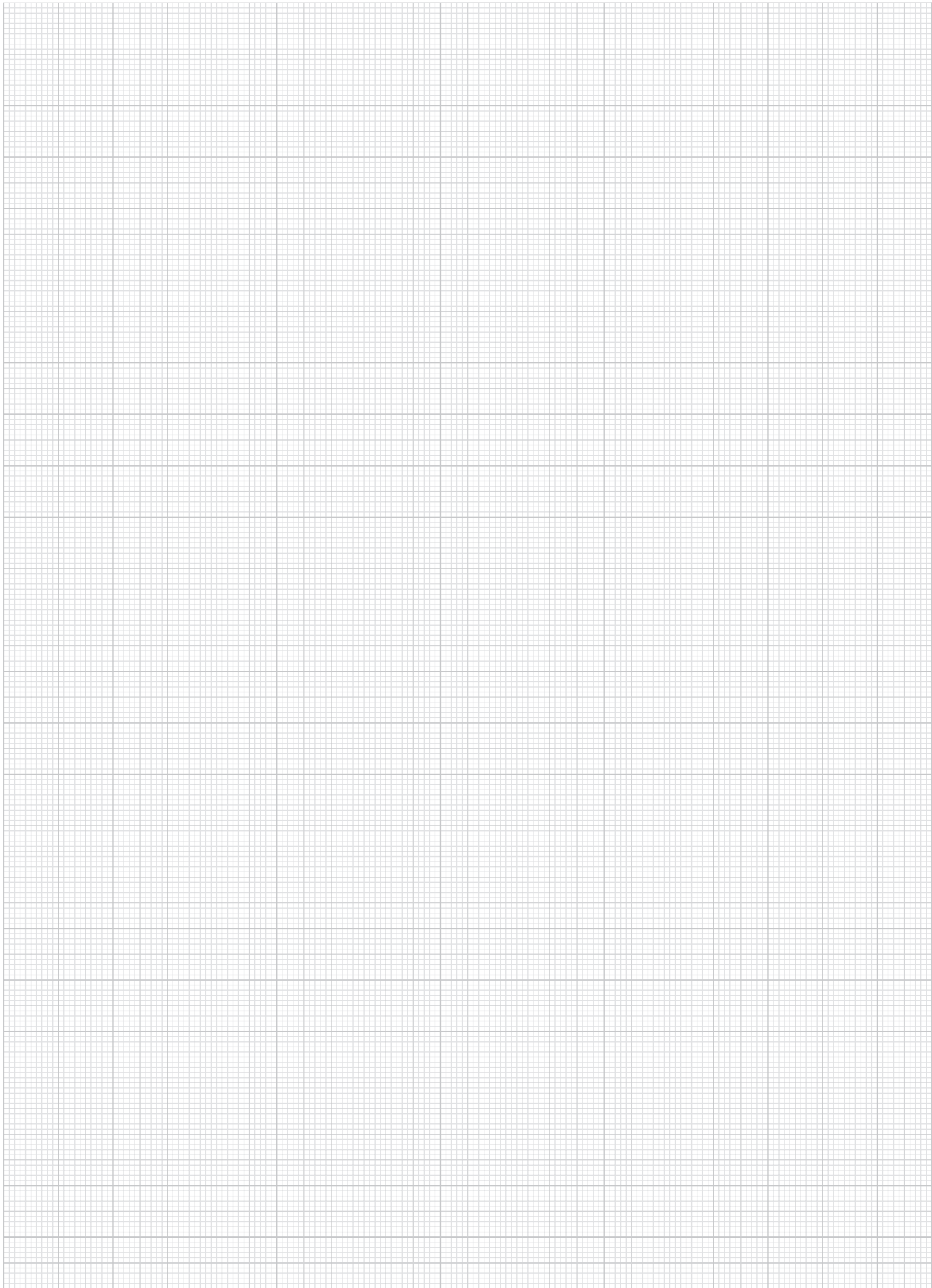
Order No.

Size

03088-15012

150

Notes



01000

02000

03000

04000

05000

06000

07000

08000

09000

10000

12000

14000

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:

nIm 03089-04206

Note:

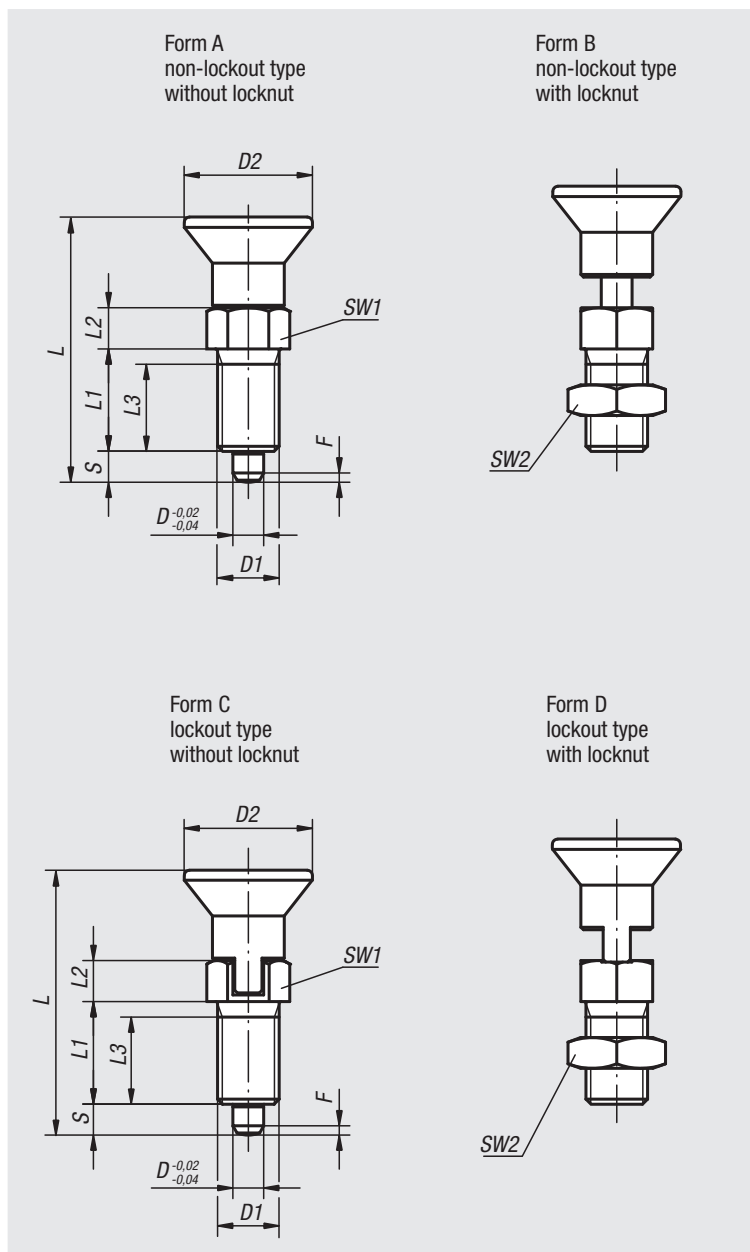
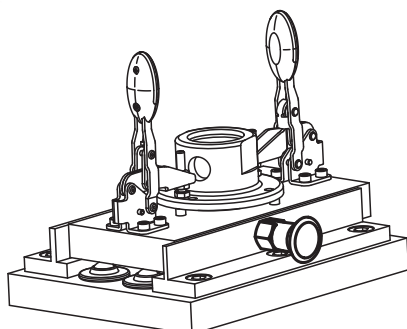
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications where the plunger remains disengaged over a long period and the pin should be prevented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

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:

nIm 03089-0420684

Note:

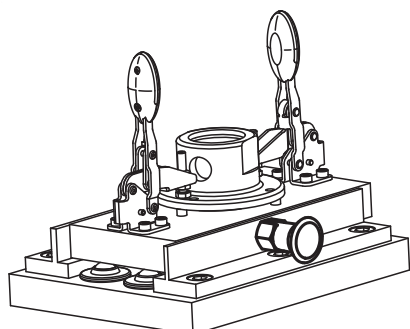
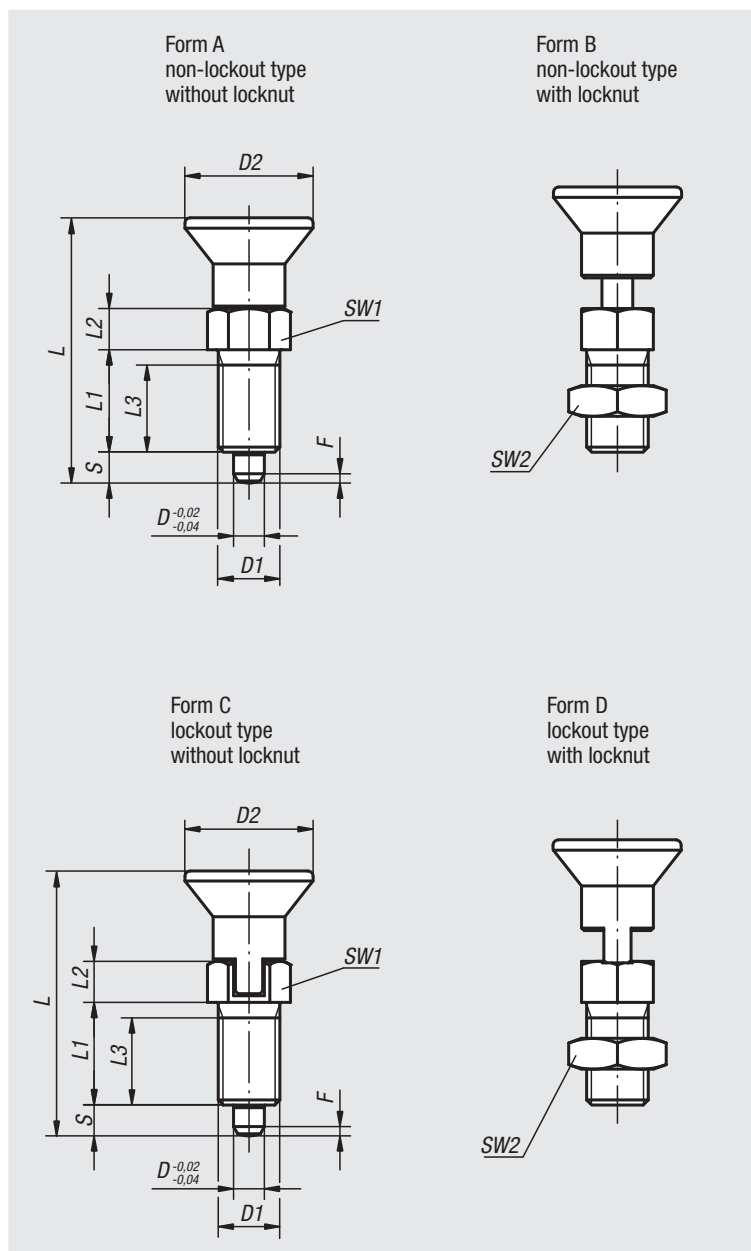
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications where the plunger remains disengaged over a long period and the pin should be prevented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

On request:

Special versions.

Accessories:

Spacer rings 03089



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:

nIm 03089-091206

Note:

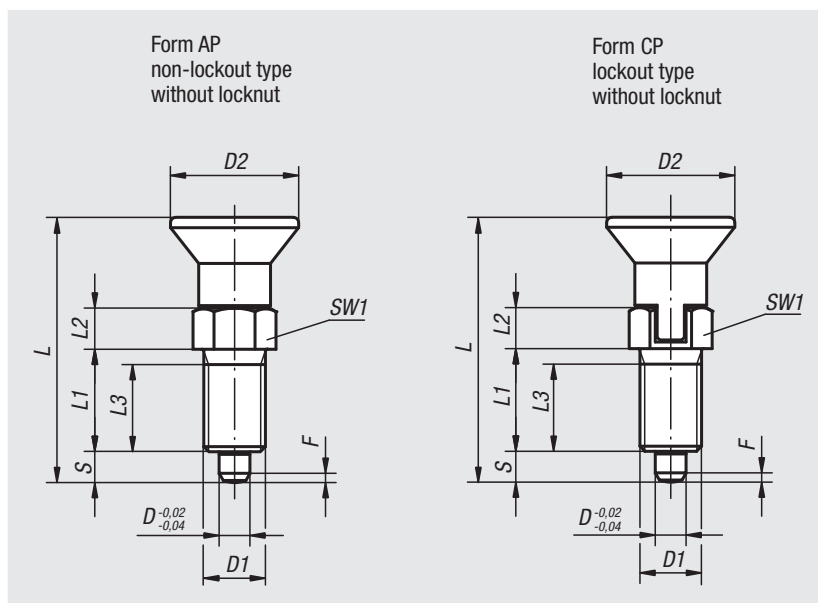
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form CP is recommended for applications where the plunger remains disengaged over a long period and the pin should be prevented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

nIm 03089-21004

Note:

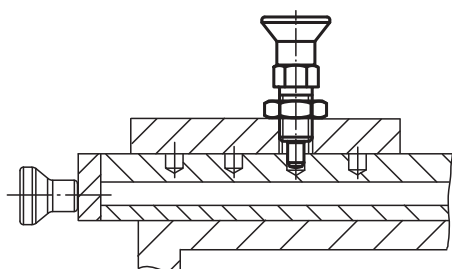
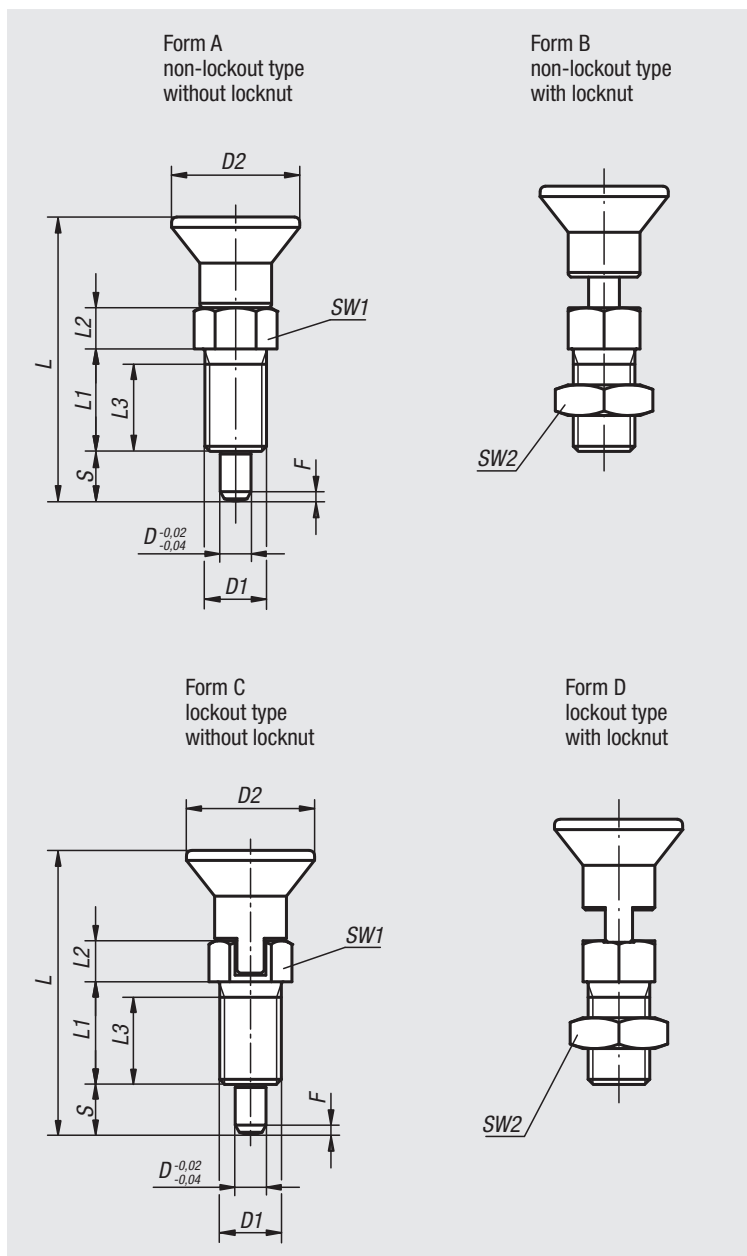
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.

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

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:

nIm 03089-16206

Note:

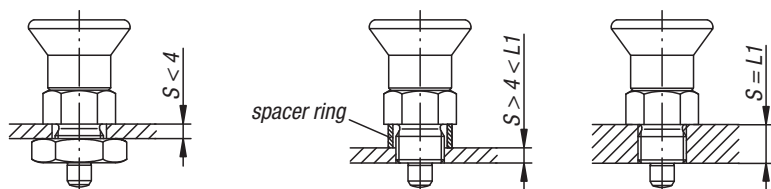
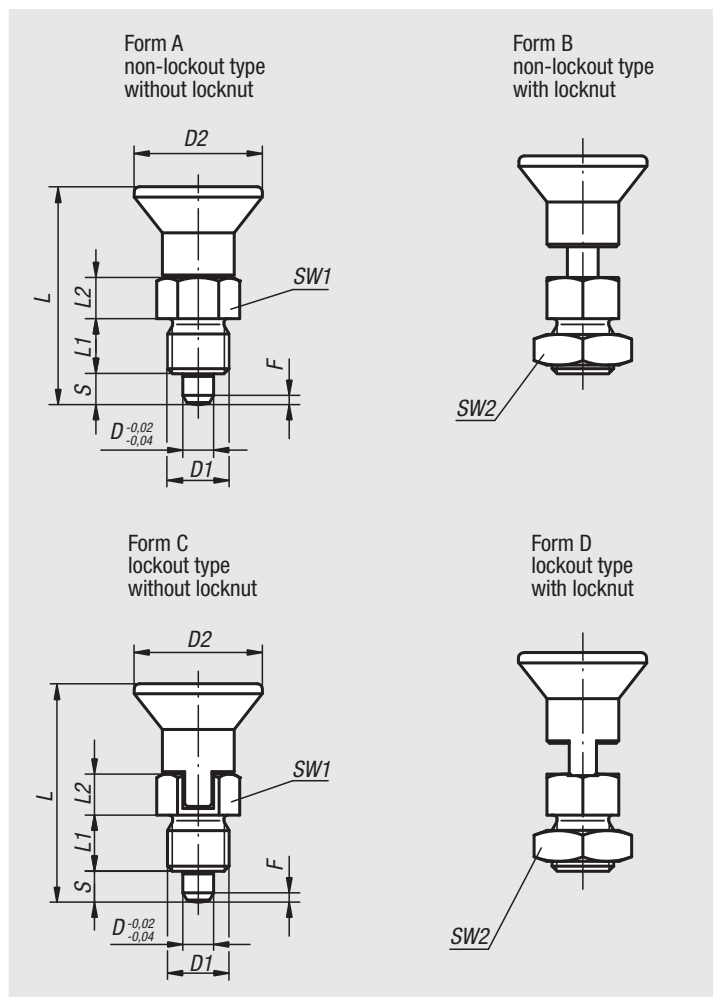
Indexing plungers are used to prevent any change in position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from springing 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:

nIm 03089-1620684

Note:

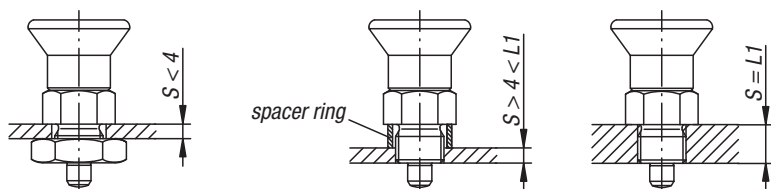
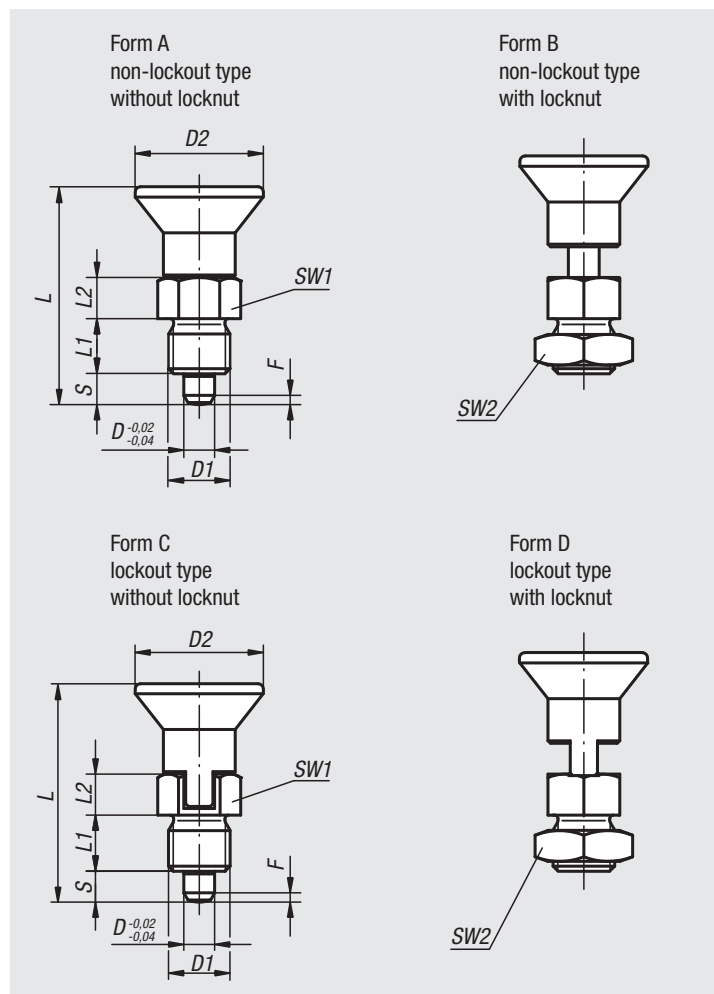
Indexing plungers are used to prevent any change in position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from springing 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:

nln 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.

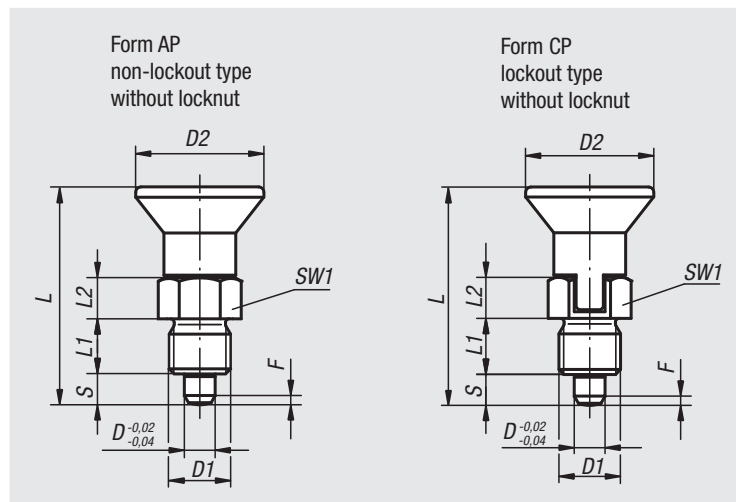
The thread lock is a gripping polyamide coating that is applied punctiform (spot).

On request:

Special versions.

Accessories:

Spacer rings 03089



Indexing plungers

short version, with thread lock

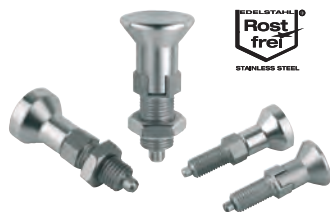
Indexing plungers, short version, with thread lock, steel, indexing pin hardened

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

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:

nIm 03089-001004

Note:

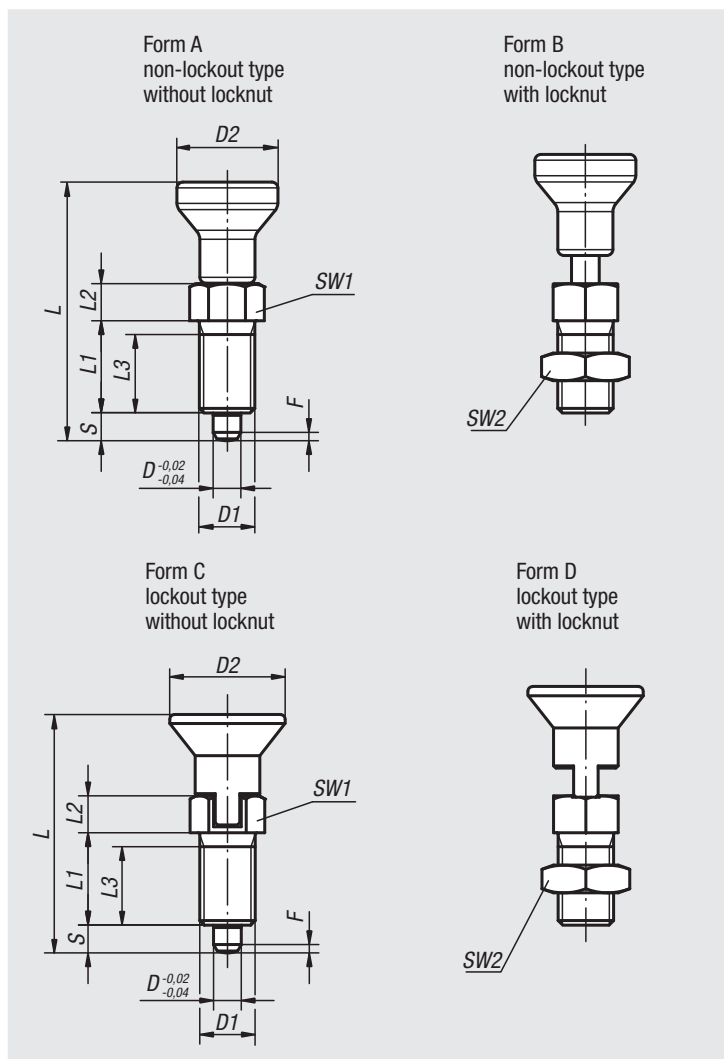
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from 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:

nIm 03089-31105 (indexing plunger)
nIm 03089-91416 (ring spanner)

Note:

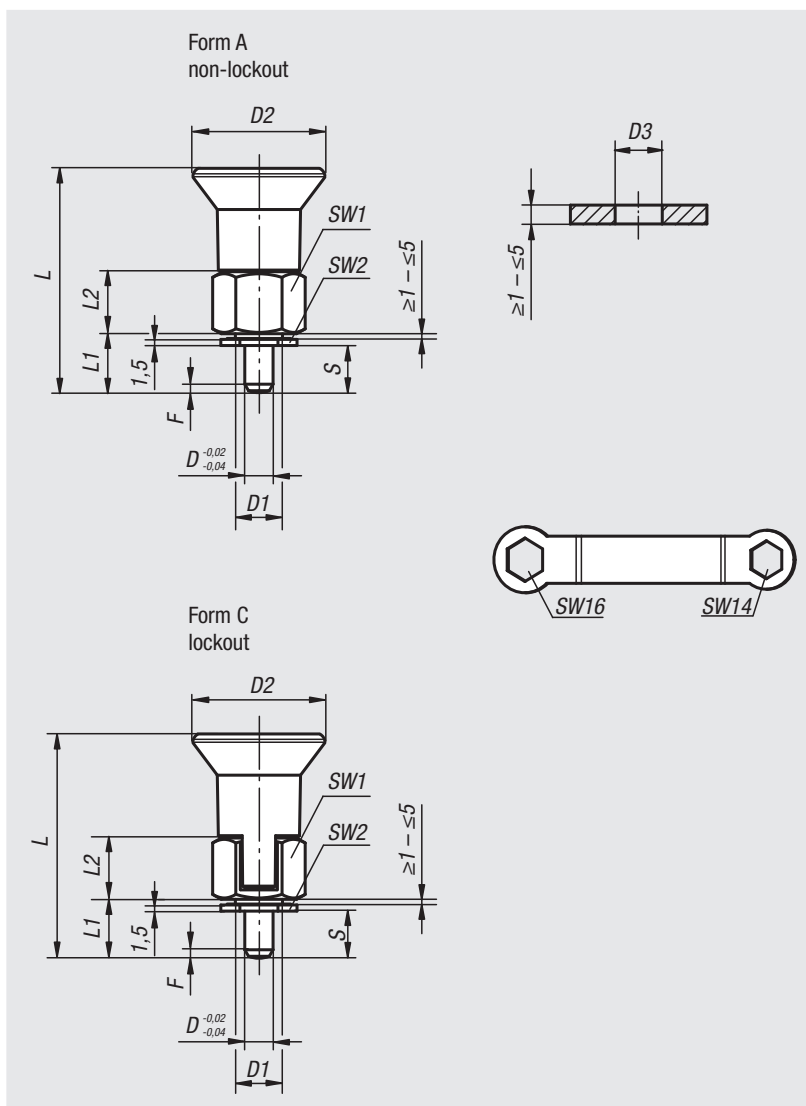
These indexing plungers have been specially designed for assembly in thin-walled parts.

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:

nIm 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.

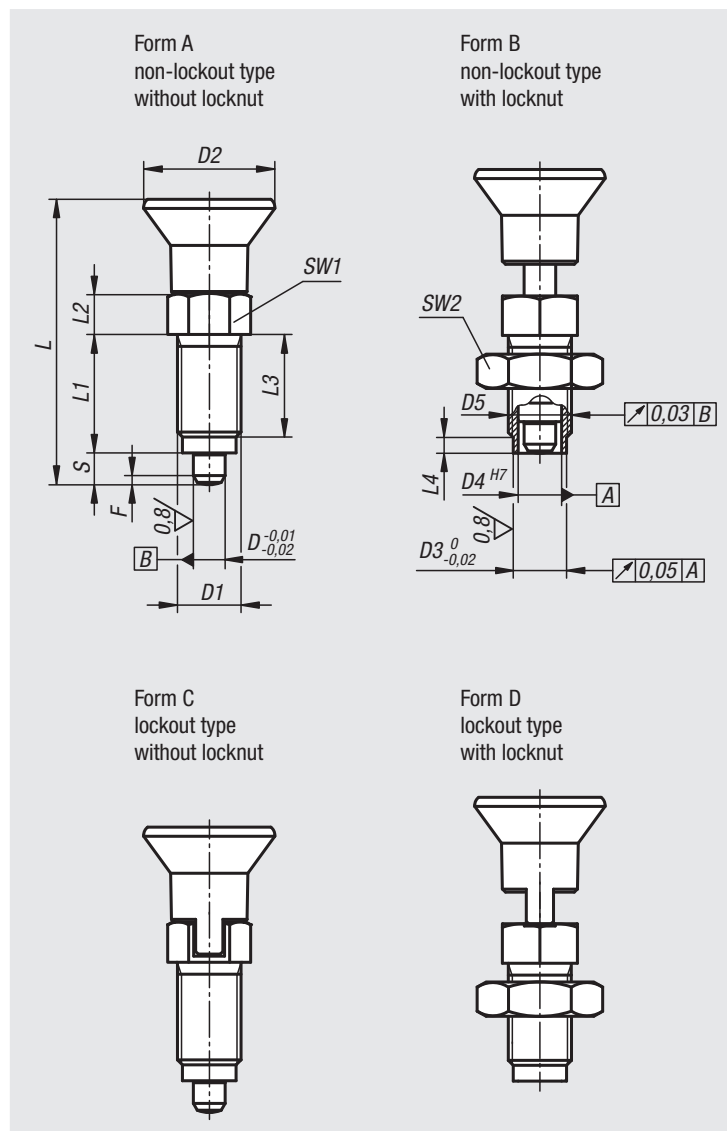
On request:

Special versions and spacer rings.

Accessories:

Matching cylindrical bush 03089.

Locknut 07212-....

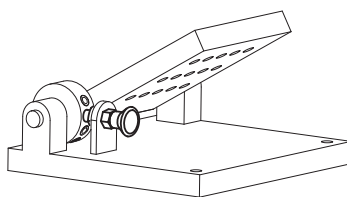


Premium indexing plungers with cylindrical pin, steel, indexing pin hardened

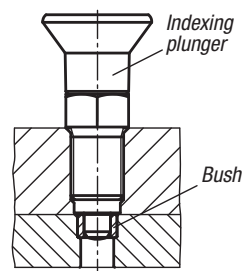
Order No. Form A	Order No. Form B	D	D1	D2	D3	D4	D5	L	L1	L2	L3	L4	Travel S	SW1	SW2	Fx30°	Spring force initial pressure F1 approx. N	Spring force final pressure F2 approx. N
03089-41105	03089-42105	5	M10x1	21	8	6	6 -0,01/-0,02	43,5	17	7	15	3	5	13	-17	1,3	5	12
03089-41206	03089-42206	6	M12x1,5	25	10	8,5	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

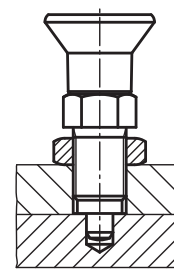
with cylindrical pin



Fixation
with bush:



Fixation
without bush:

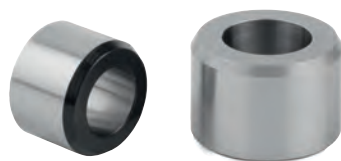


Premium indexing plungers with cylindrical pin, stainless steel, indexing pin hardened

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

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:

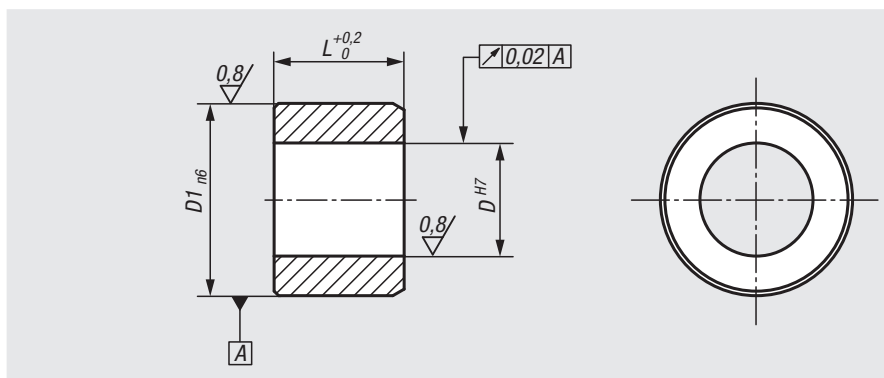
nln 03089-9005

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 simultaneously.



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:

nIm 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:

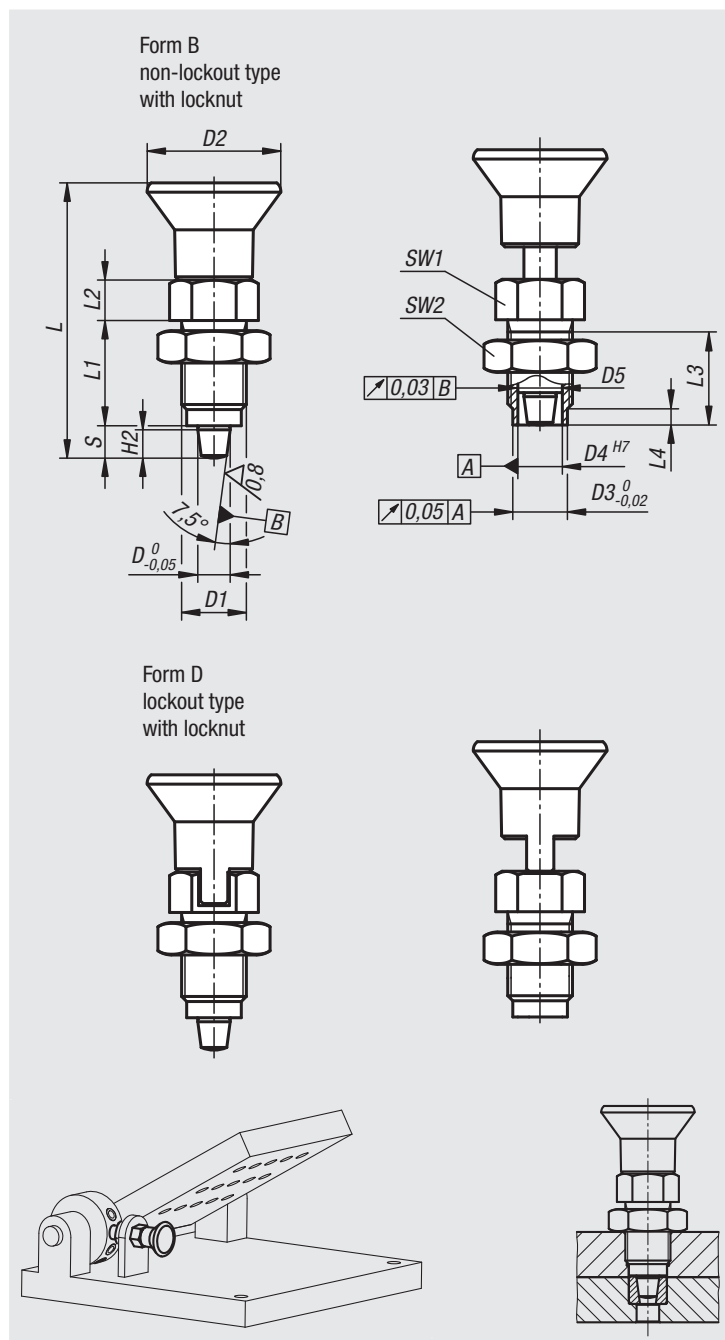
When using the threaded sleeve centring, it is recommended the receiving reamed hole be machined before tapping.
The conical contact surface is aligned by the threaded sleeve and locking nut.

On request:

Special versions and spacer rings.

Accessories:

Matching tapered bush 03089.



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:

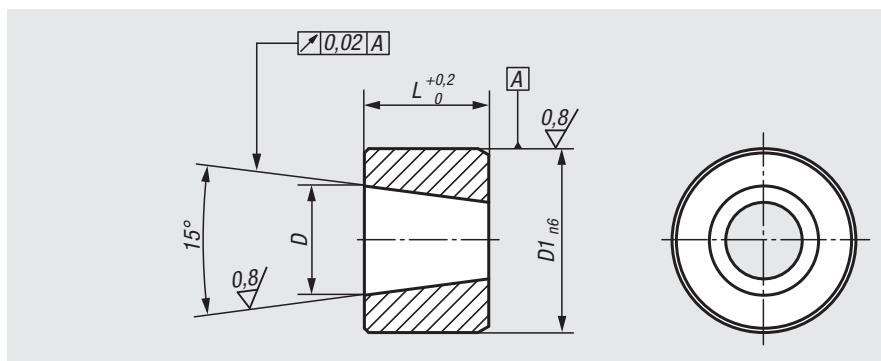
nln 03089-9106

Note:

Matching bush for premium indexing plungers with tapered pin 03089.

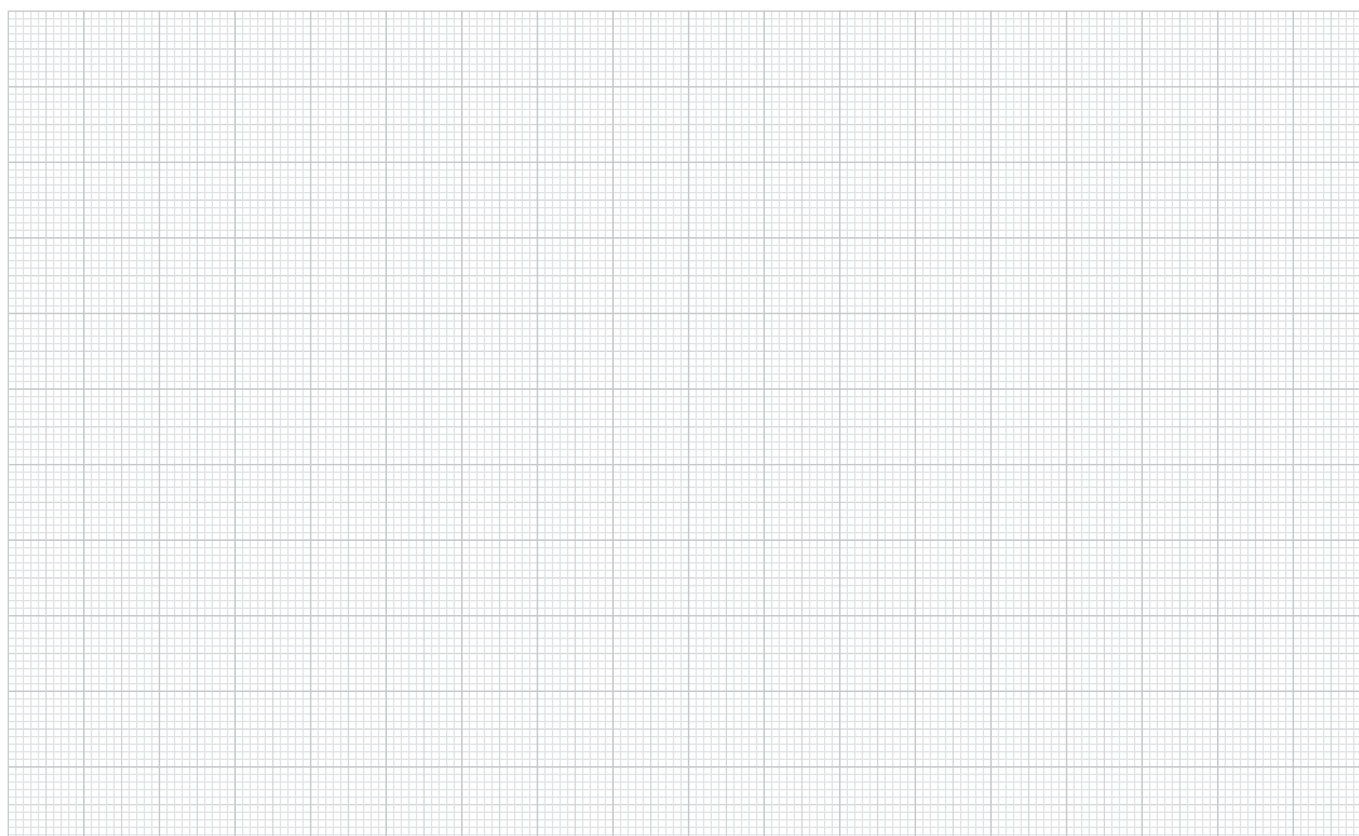
Assembly:

To increase the coaxial alignment accuracy, the holes for the bush and the premium indexing plunger can be machined simultaneously.



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



Spacer rings


Material:

Stainless steel 1.4305.

Version:

Bright.

Sample order:

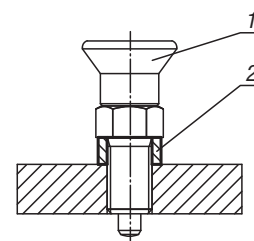
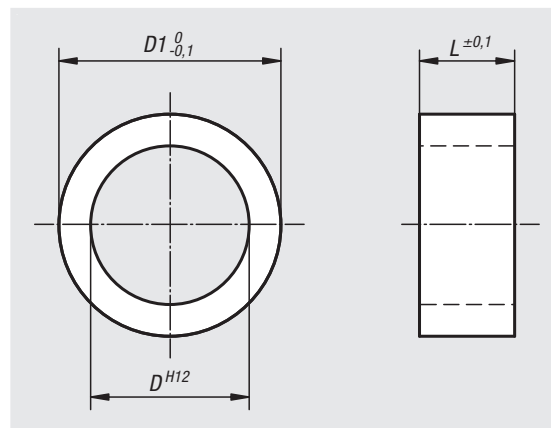
nIm 03089-90811021

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:

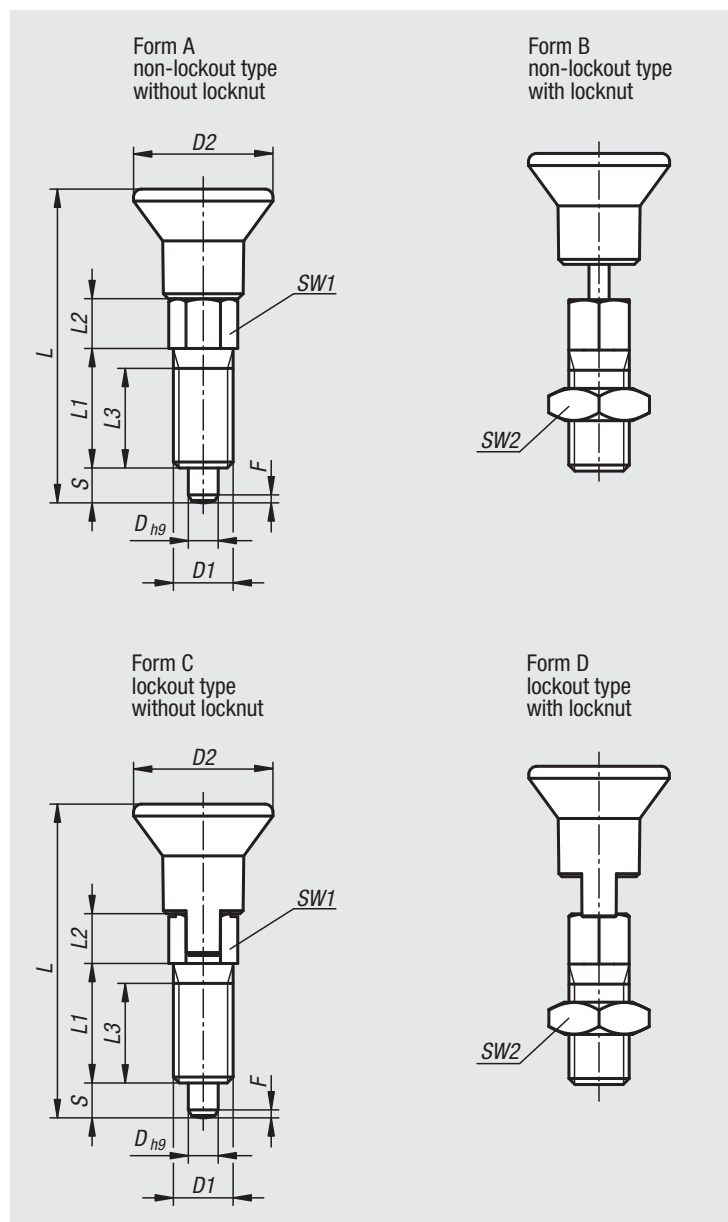
n1m 03089-01903060

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

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:

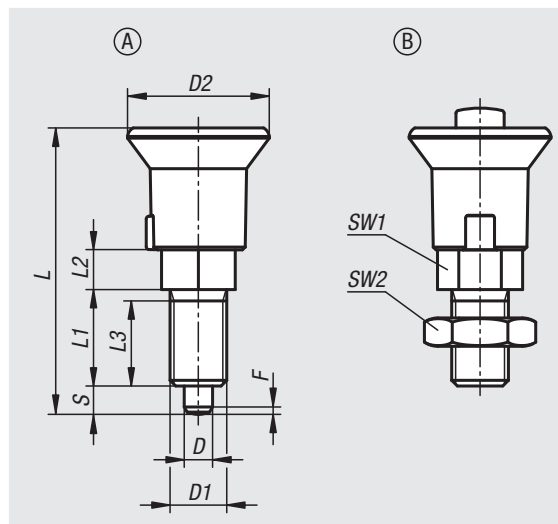
nIm 03089-11051

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:

nIm 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:

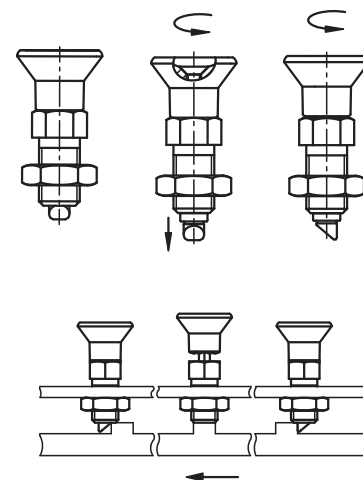
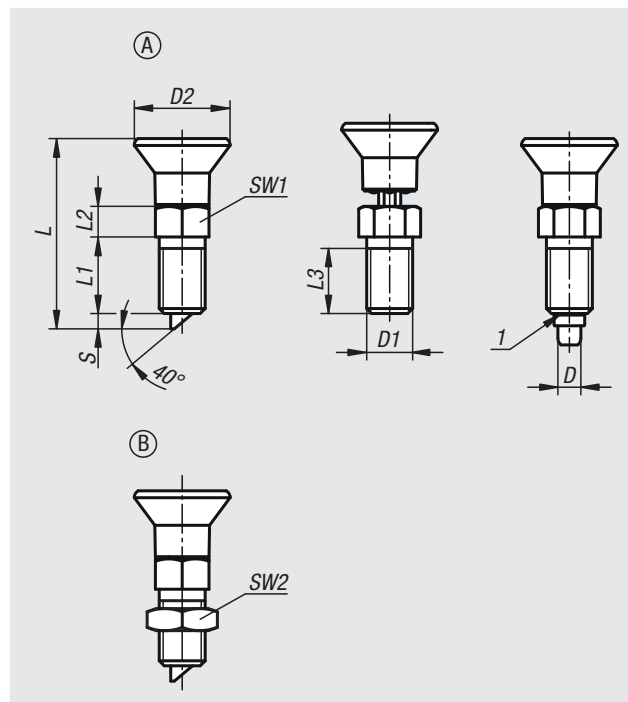
Spacer rings 03089

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:

nIm 03090-04206

Note:

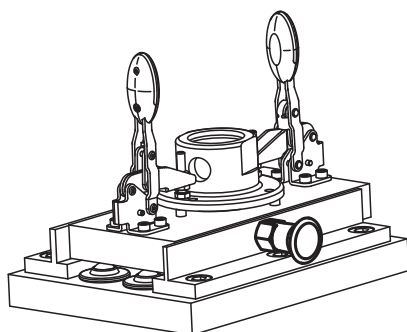
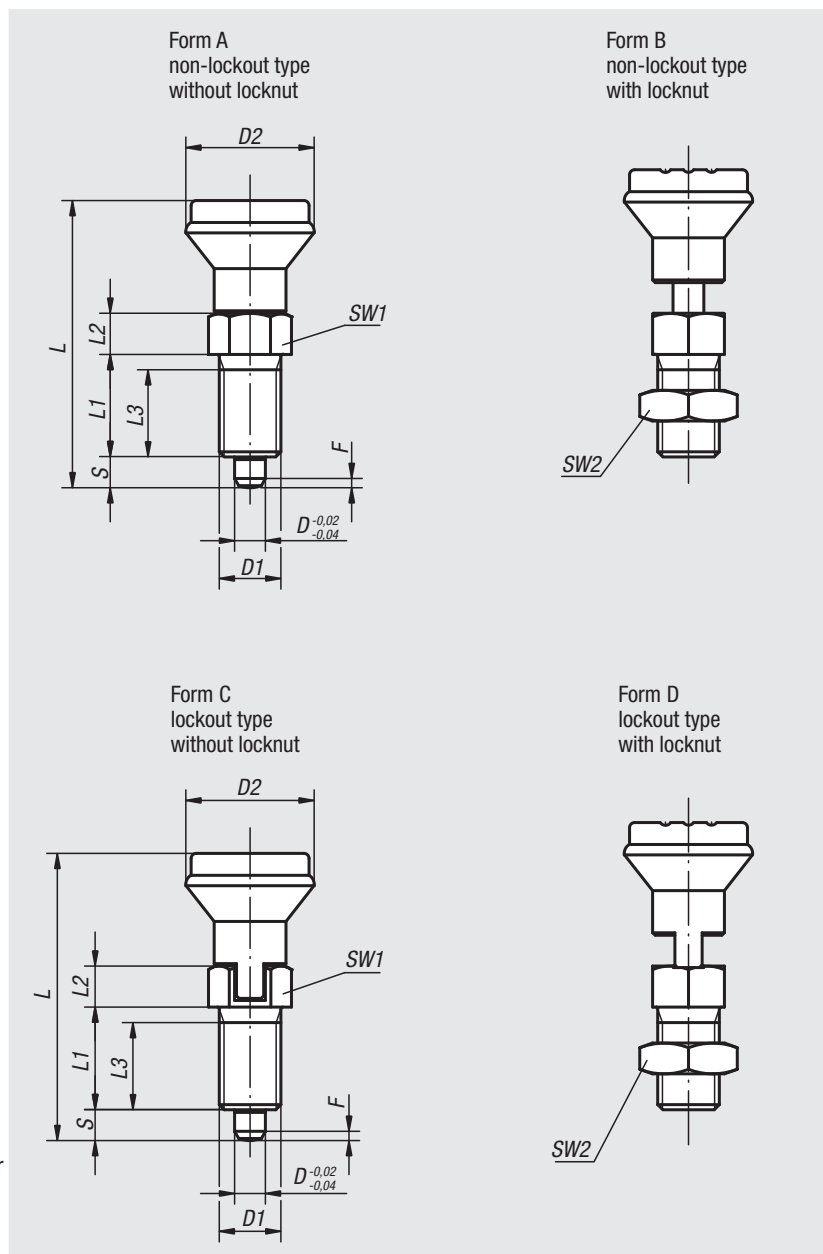
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged. Form C or D is recommended for applications in which the pin is disengaged over extended periods and should be prevented from 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

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:

nIm 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:

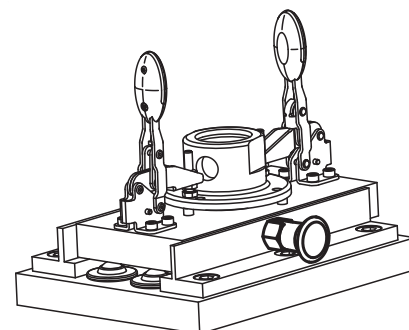
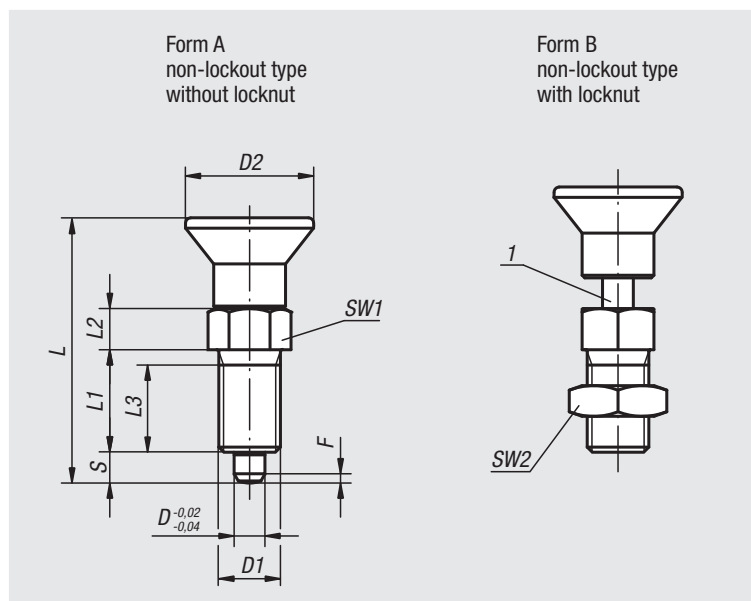
Special versions.

Accessories:

Spacer rings 03089

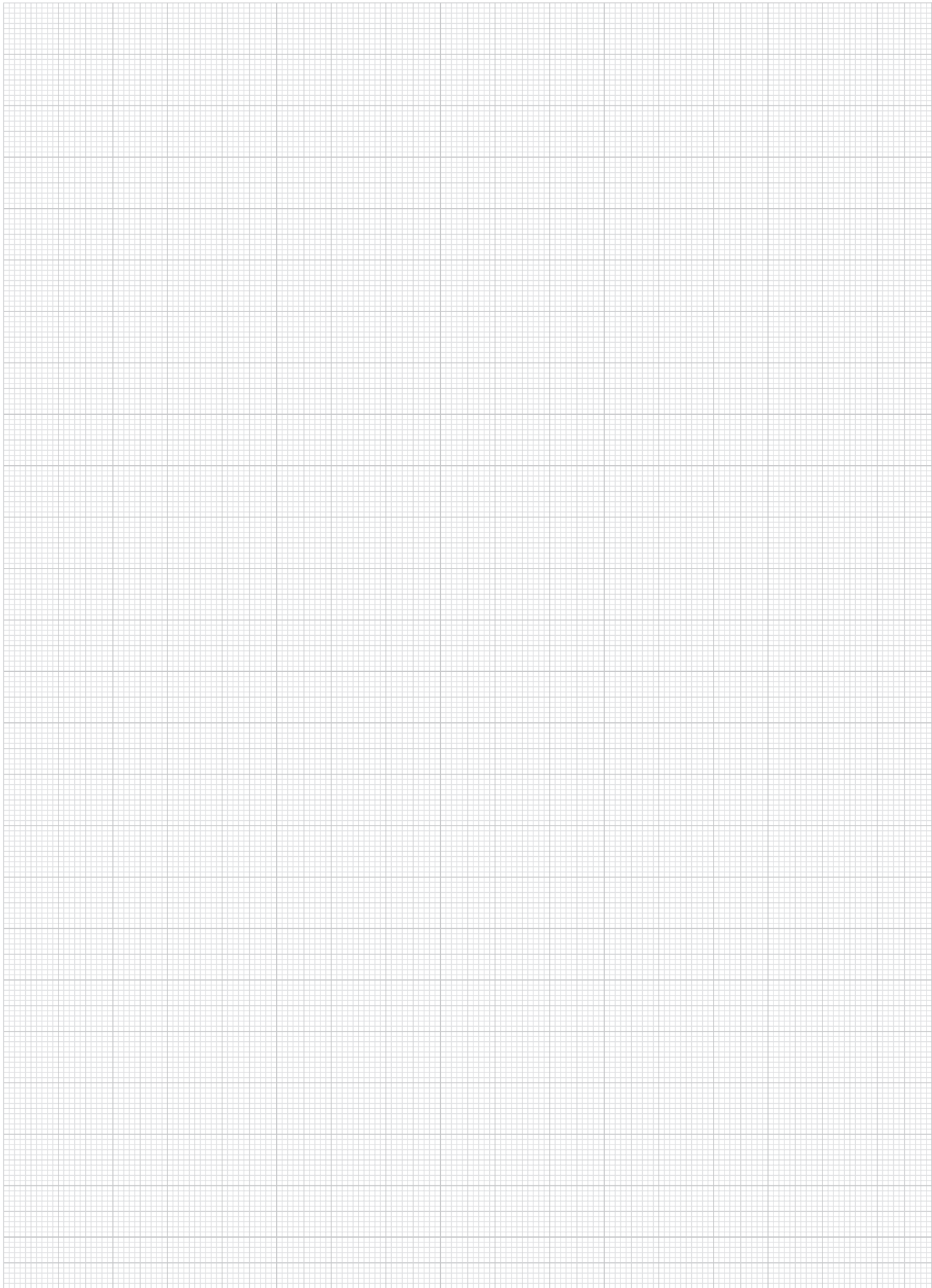
Drawing reference:

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



01000

02000

03000

04000

05000

06000

07000

08000

09000

10000

12000

14000

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:

nIm 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.

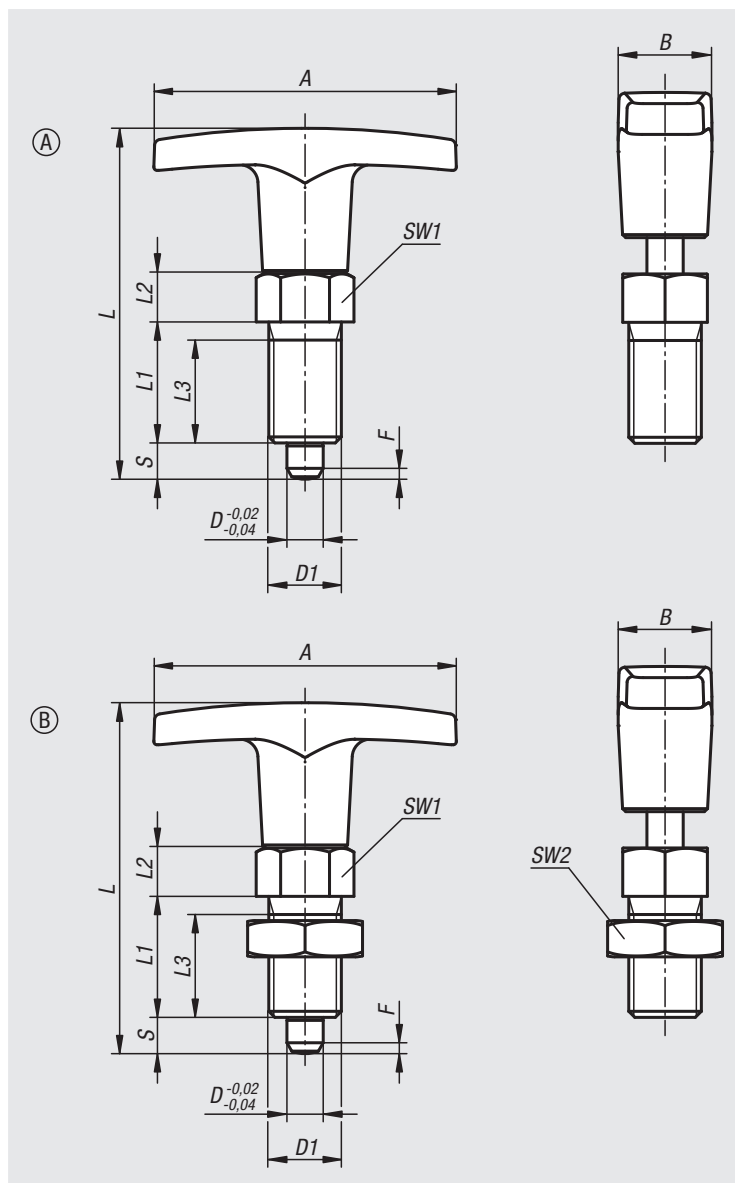
Accessories:

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

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:

nIm 03090-01903060

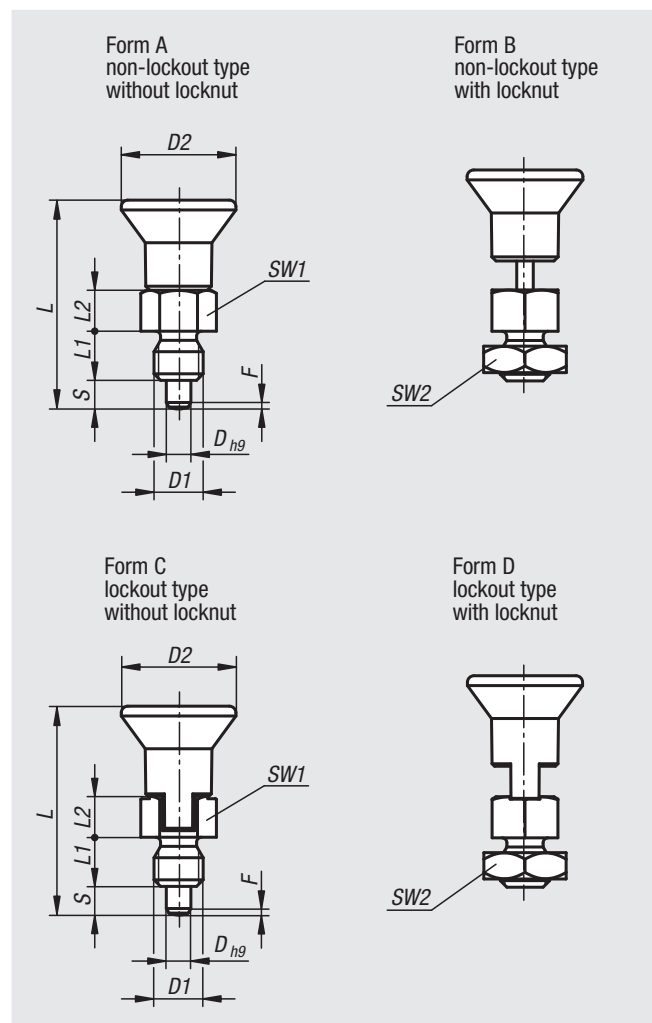
Note:

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:

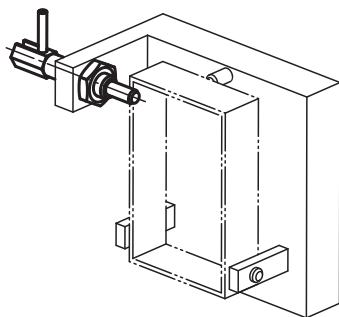
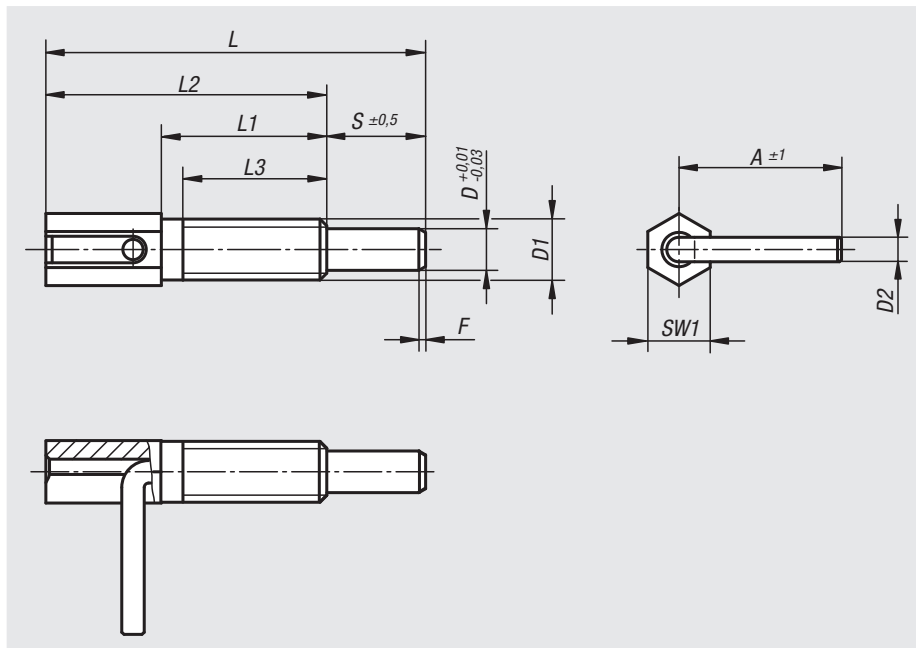
nIm 03091-1206

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:

nln 03092-02308

Note:

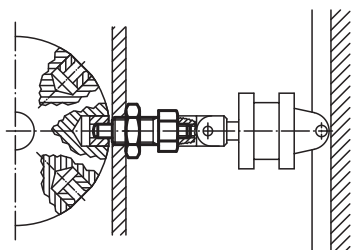
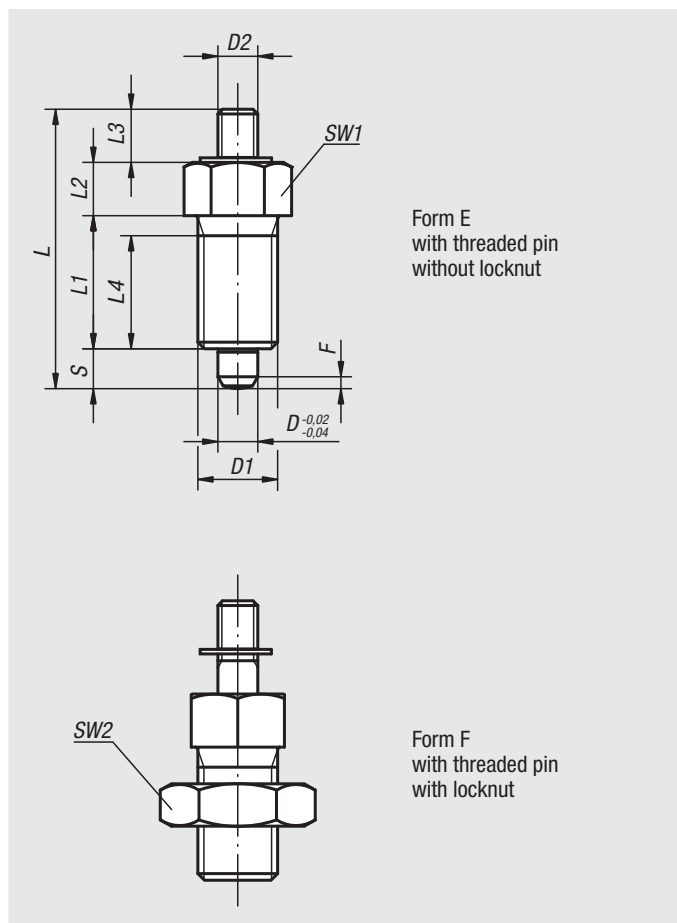
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been disengaged. Special grips can be fitted on the projecting threaded pin. This pin is also suitable for automatic actuation e.g. programme controlled pneumatic cylinder or by remote control using bowden cables.

On request:

Special versions.

Accessories:

Spacer rings 03089



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

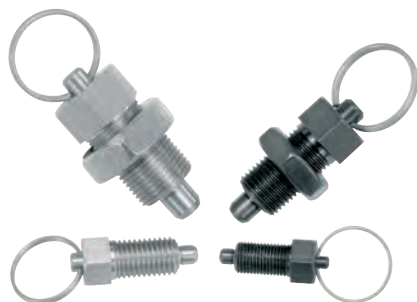
Indexing plungers, stainless steel, indexing pin hardened

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

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:

nIm 03092-03308

Note:

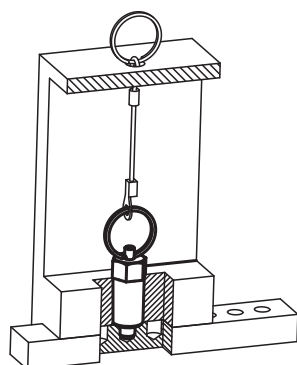
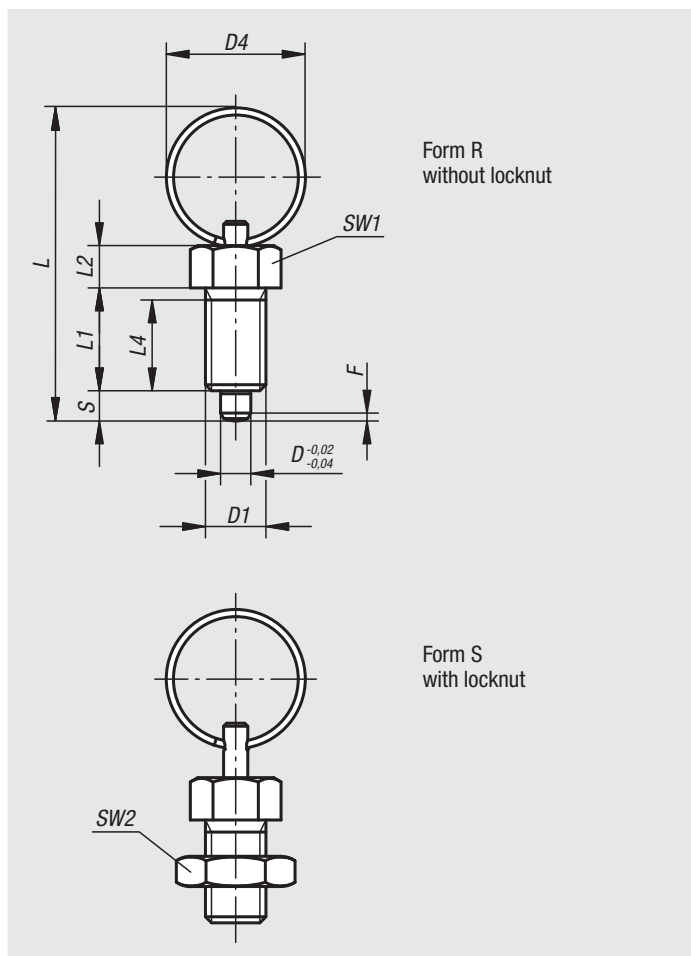
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been disengaged. The key ring is also suitable for automatic actuation of the indexing plunger by e.g. program-controlled pneumatic cylinder or by remote 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:

nIm 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.

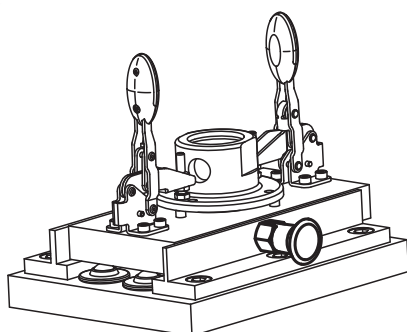
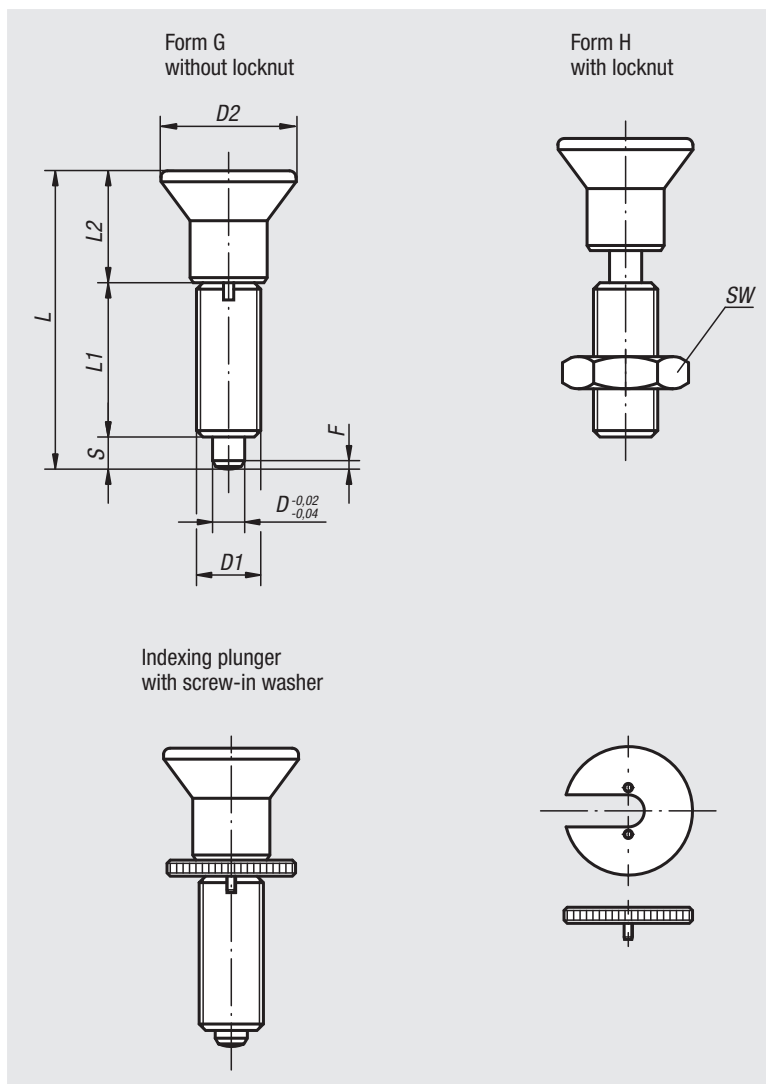
A washer is available to aid by screwing in the indexing plungers. The washer slides beneath the mushroom knob so that the carrier pins engage in the slot.

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

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:

nIm 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.

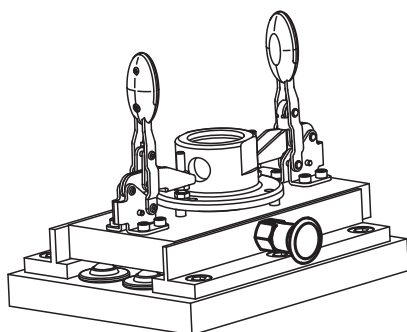
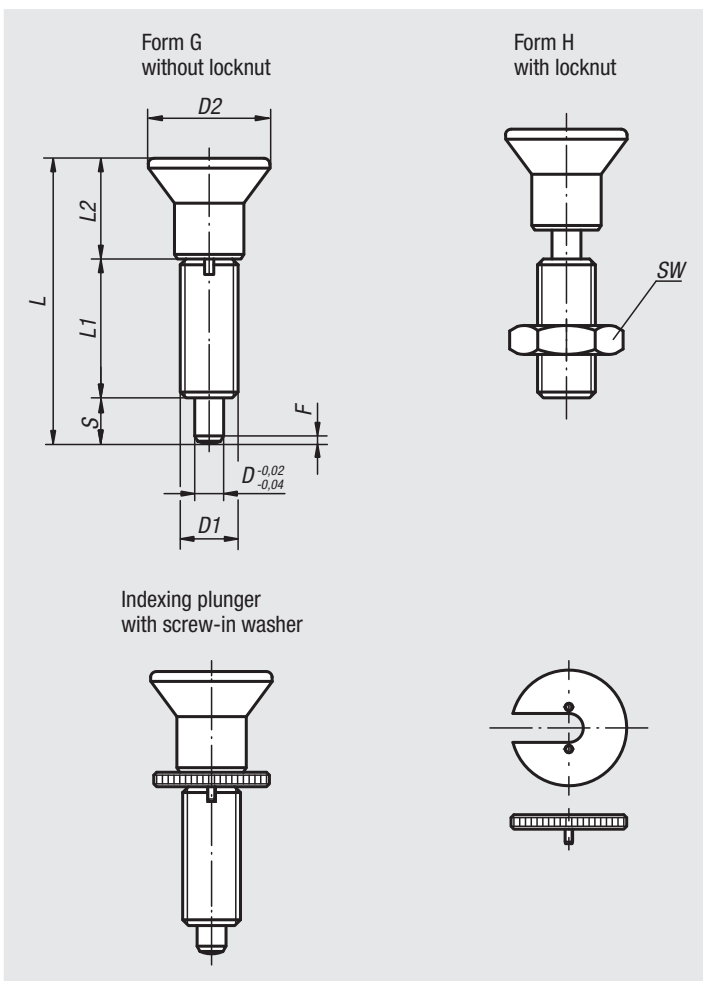
A washer is available to aid by screwing in the indexing plungers. The washer slides beneath the mushroom knob so that the carrier pins engage in the slot.

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

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:

nIm 03093-001004

Note:

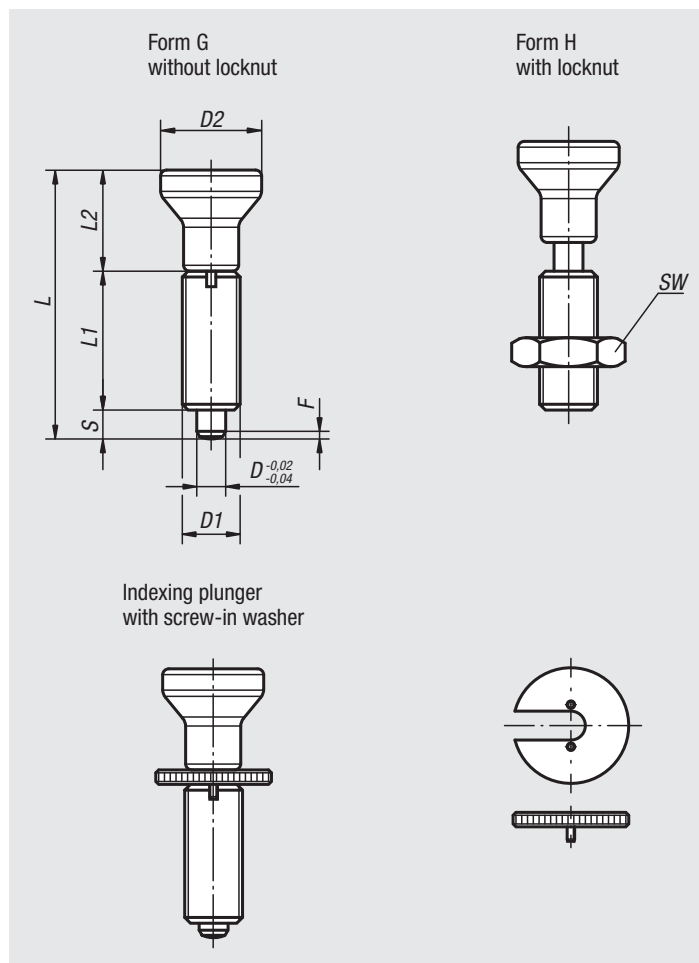
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.
A screw-in washer can be supplied to help screw the indexing plungers in. The washer slides beneath the disengaged mushroom knob 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:

nIm 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.

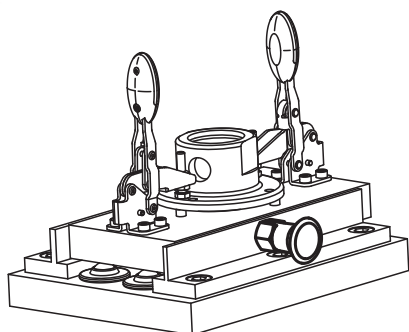
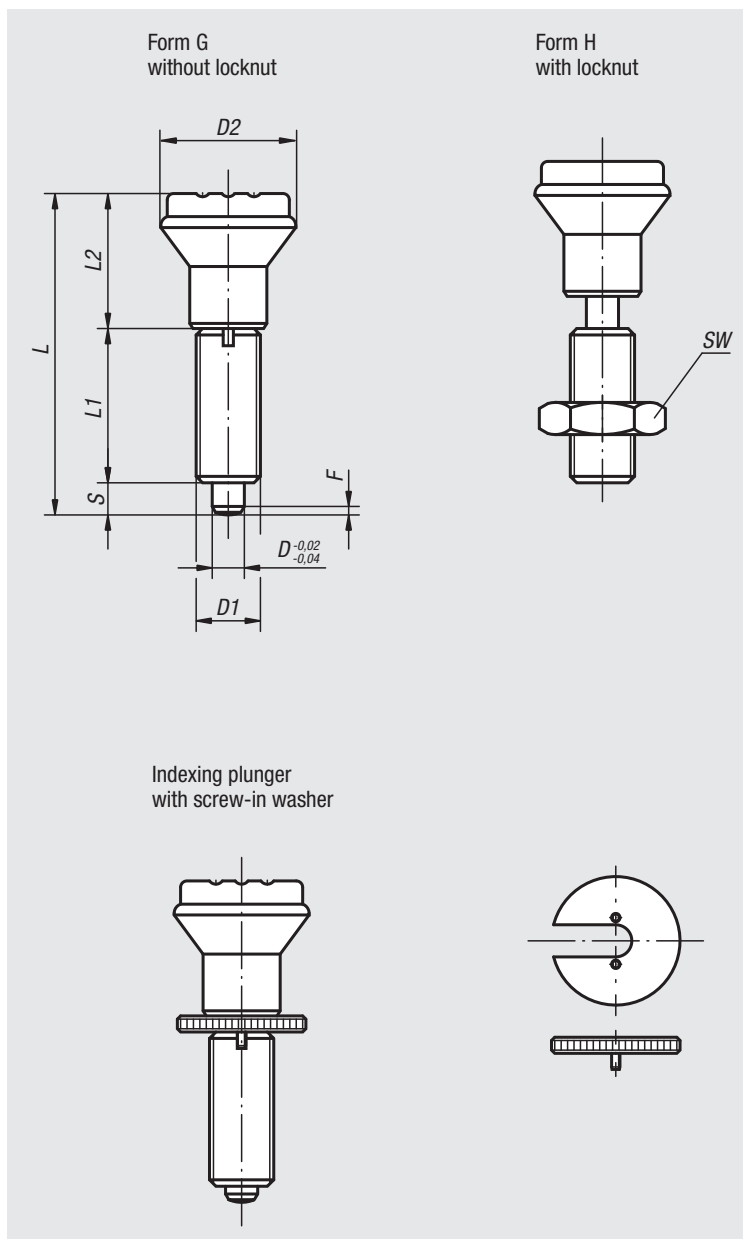
A screw-in washer can be supplied to help screw in the indexing plungers. The washer is slid beneath the disengaged mushroom knob so that the carrier pins engage in the slot.

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

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:

nIm 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.

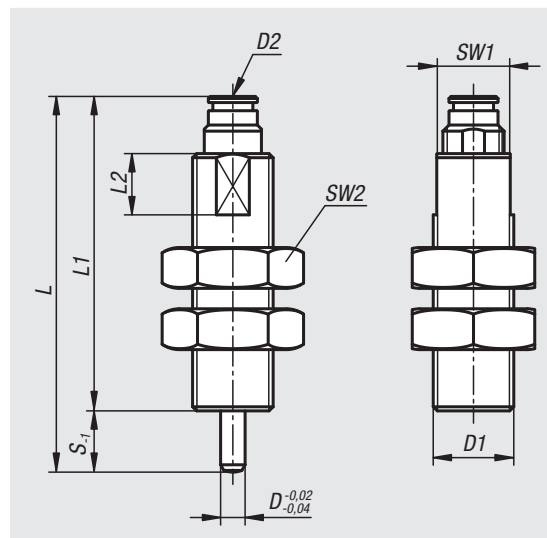
Materials:

cylinder tube, nickel-plated brass,
piston rod, stainless steel
seals, NBR, PU.

Operating medium:

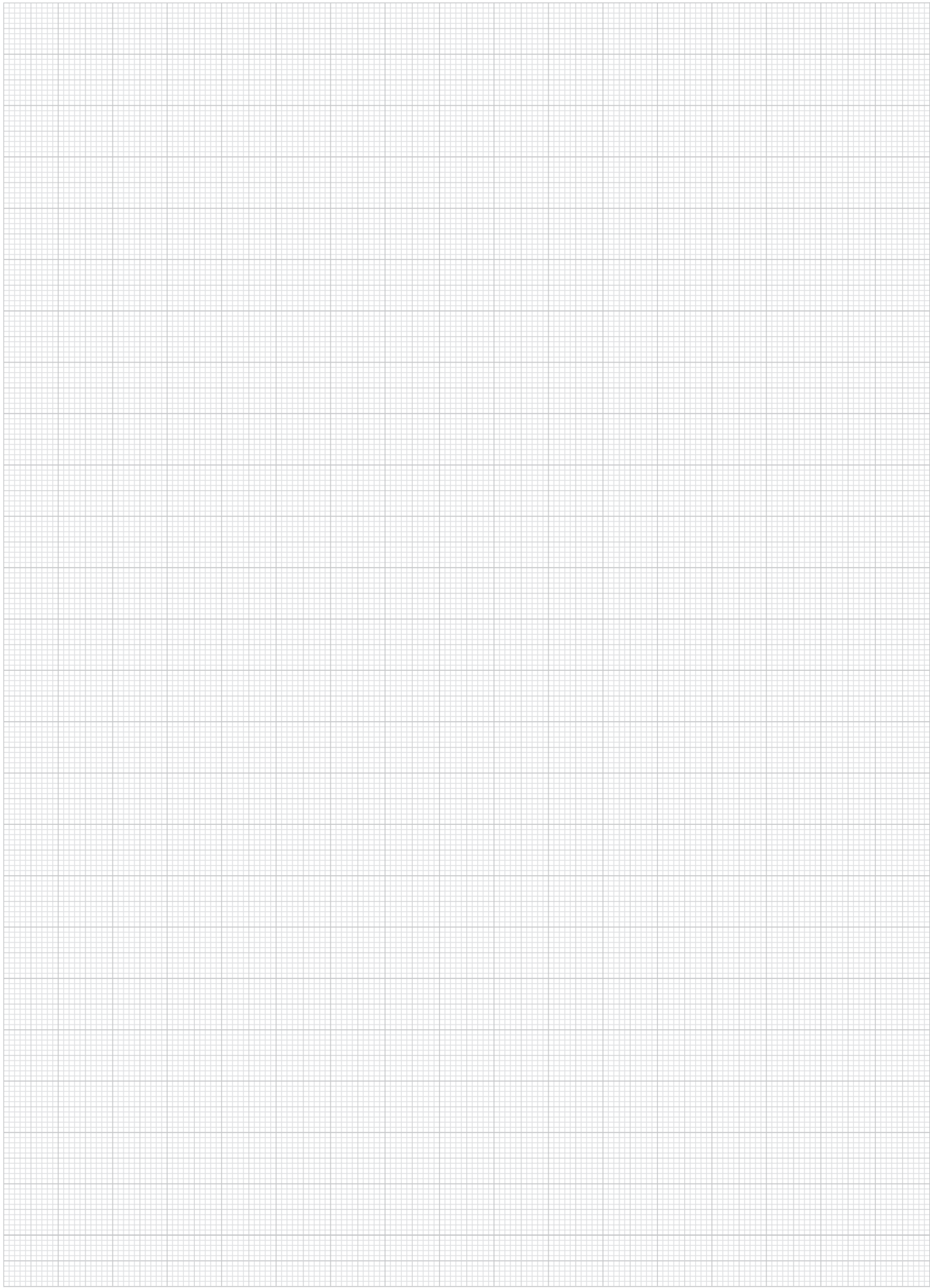
filtered and dried air, oiled or not oiled.

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



01000

02000

03000

04000

05000

06000

07000

08000

09000

10000

12000

14000

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:

nIm 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.

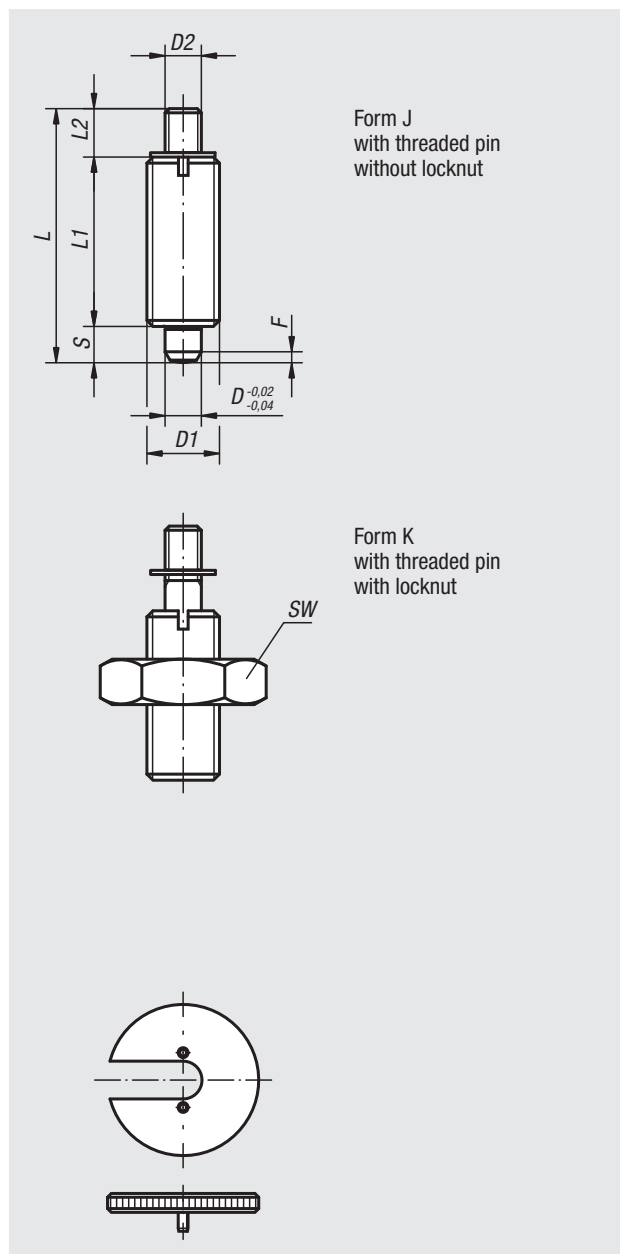
A washer is available to aid screwing in the indexing plungers. The washer is placed on the threaded sleeve so that the carrier pins engage in the slot.

On request:

Special versions.

Accessories:

Spacer rings 03089



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:

nIm 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.

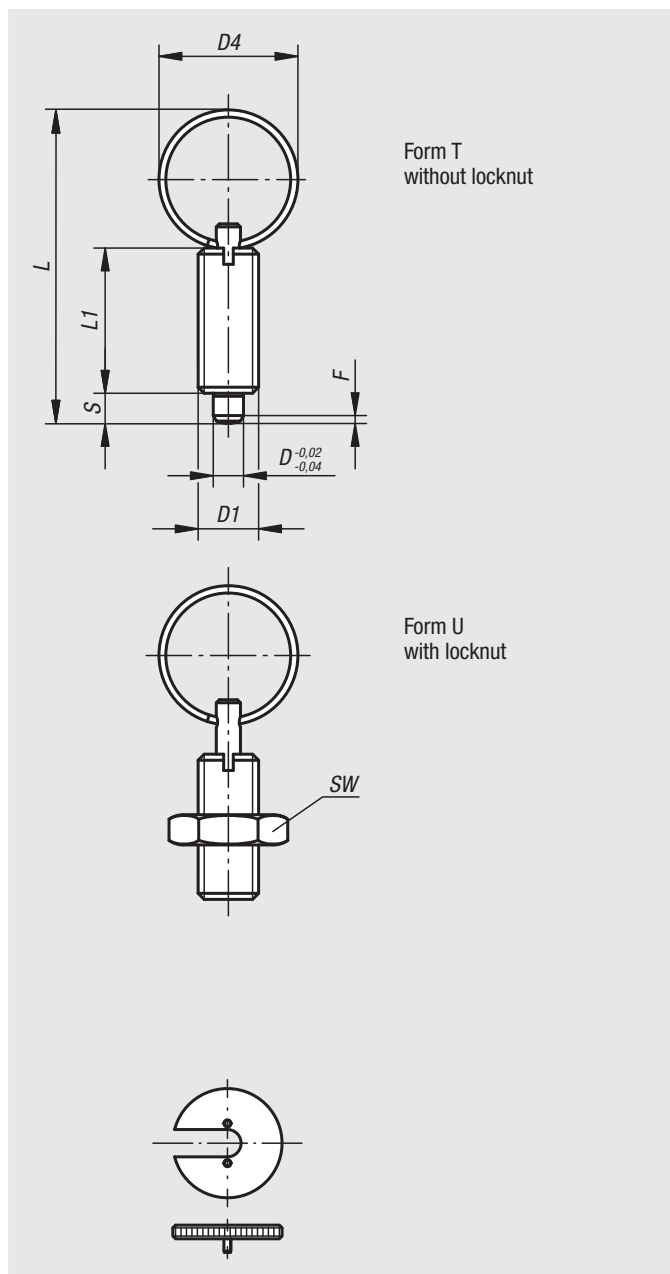
A screw-in washer can be supplied to help screw in the indexing plungers. The washer is fitted onto the threaded sleeve so that the carrier pins engage in the slot.

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

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 ($\varnothing 5 \times 7$ 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:

nIm 03096-10-02206X1000 (include length L)

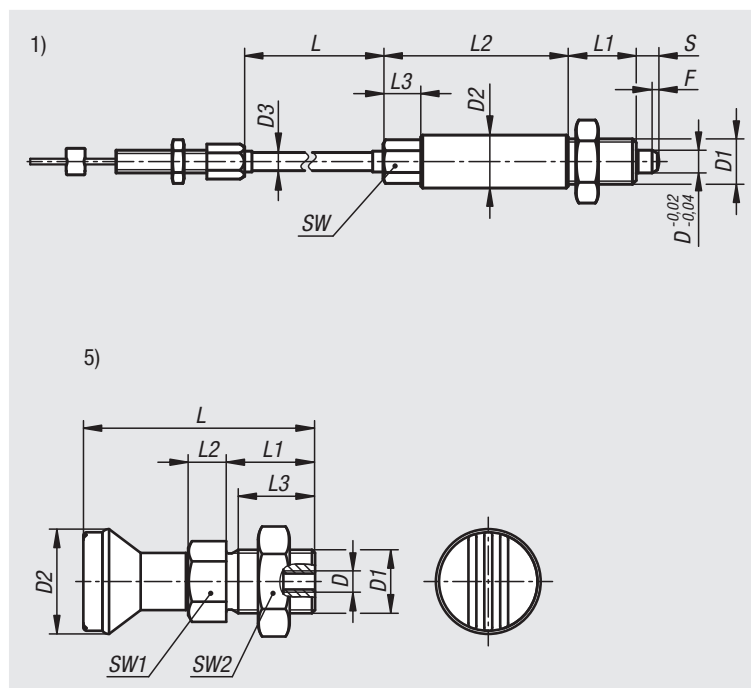
Note for ordering:

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.



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 $R = 65 \text{ mm}$. 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 $\varnothing 5 \times 7 \text{ mm}$.

Actuating element:

Actuating element with plastic cover.

Accessories:

Hexagon nuts 07212.

Mounting brackets 03099.

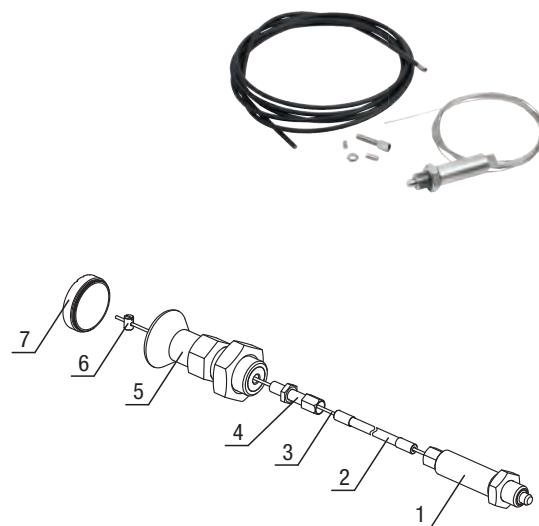
Spacer rings 03089.

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:

n1m 03097-01206

Note:

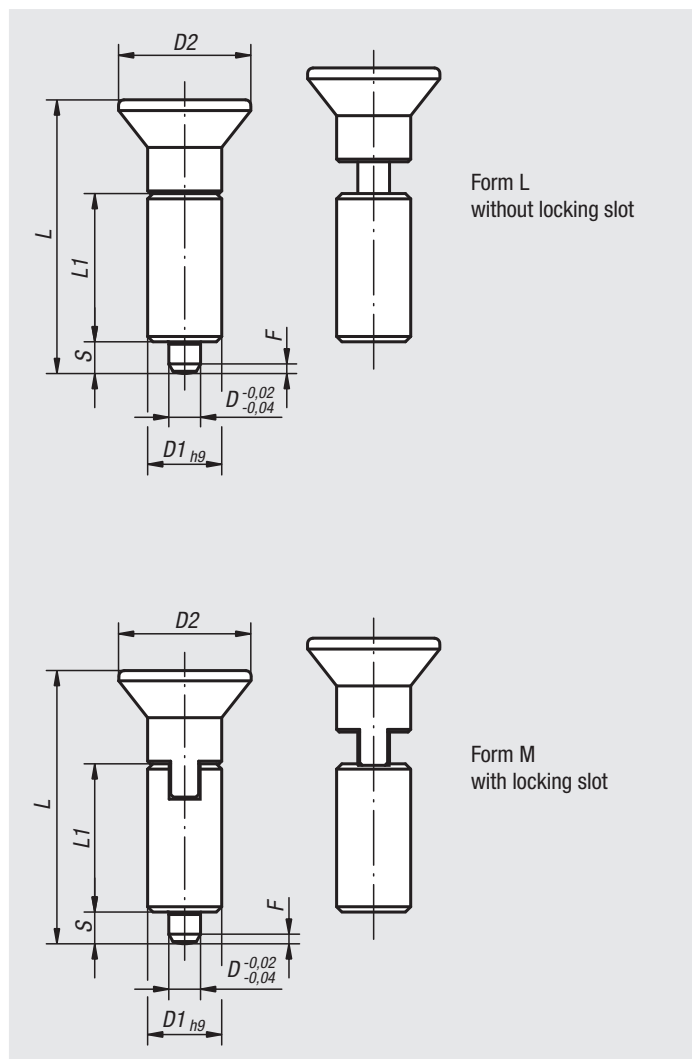
Indexing plungers are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the pin has been manually disengaged.

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.



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

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:

nIm 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.

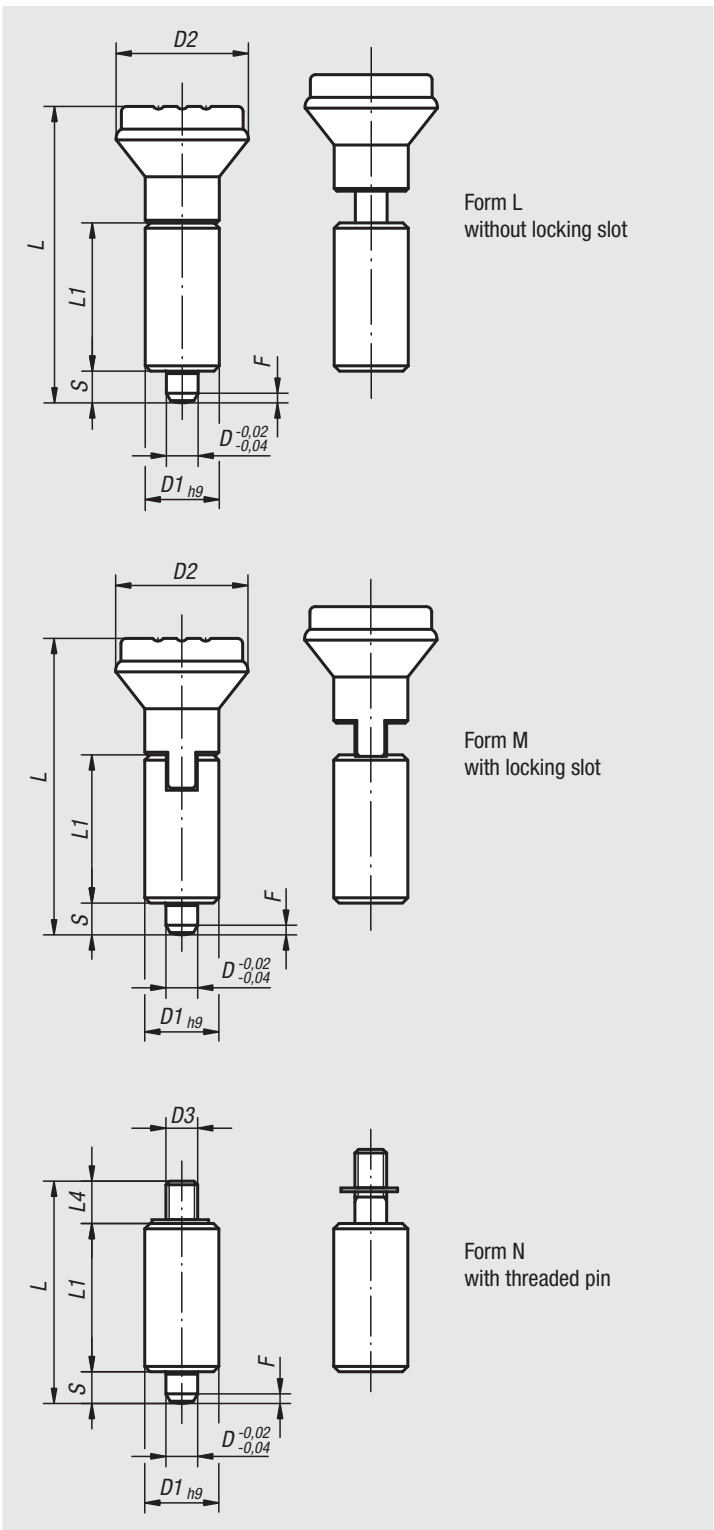
Form M is recommended for applications where the indexing plungers should remain disengaged over an extended period and the pin prevented from springing back.

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.



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

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.

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:

nln 03098-4206

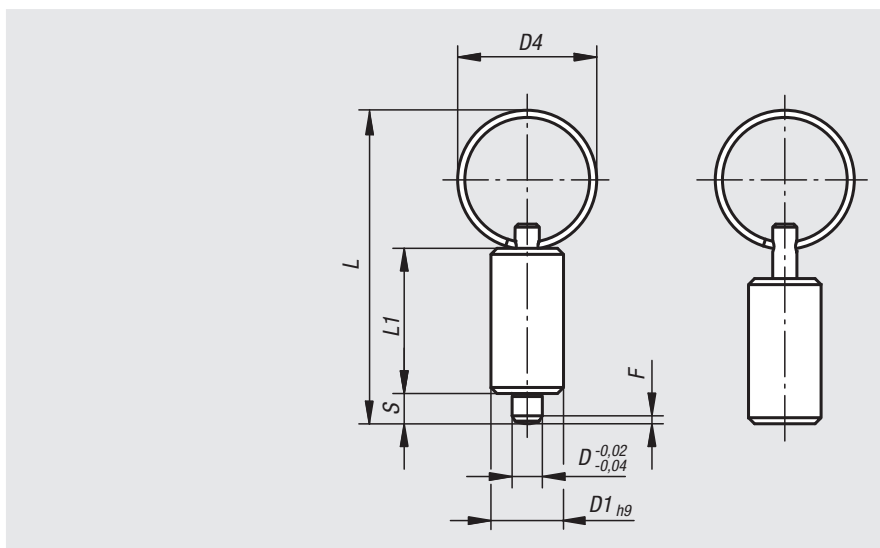
Note:

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

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.

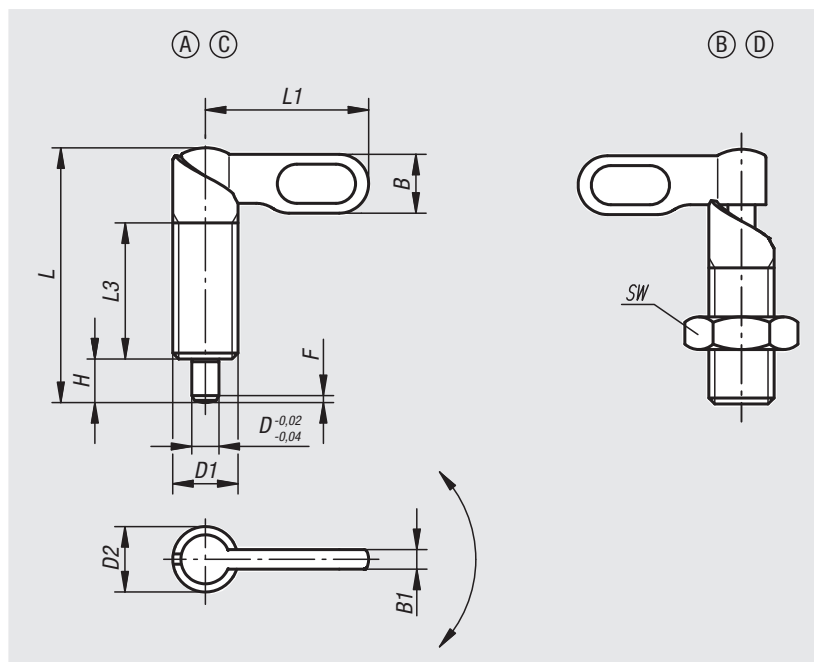
Drawing reference:

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

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.

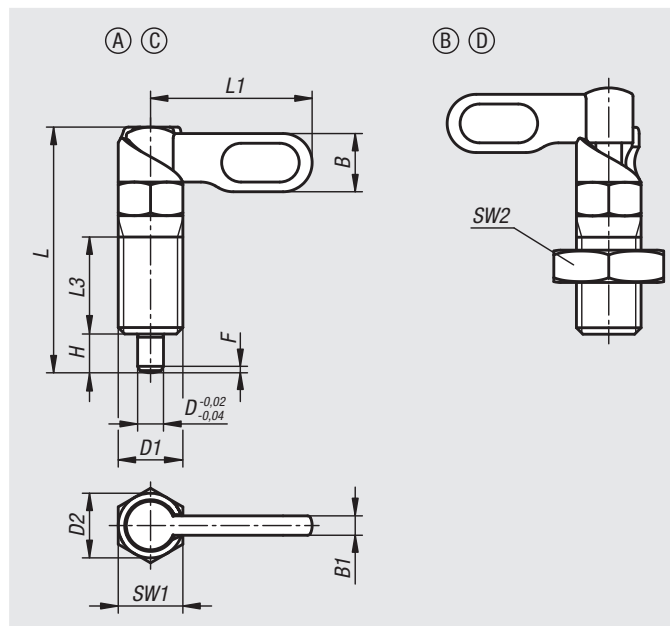
Drawing reference:

Form A: grip uncoated without nut

Form C: grip powder-coated without nut

Form B: grip uncoated with nut

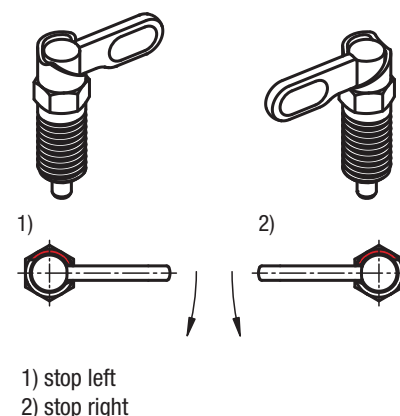
Form D: grip powder-coated with nut



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

Cam action indexing plunger

with stop



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

Cam-action indexing plungers stainless steel

**Material:**

Stainless steel 1.4305.

Version:

Bright.

Indexing pin ground, not hardened.

Sample order:

nlm 03099-1040616

Note:

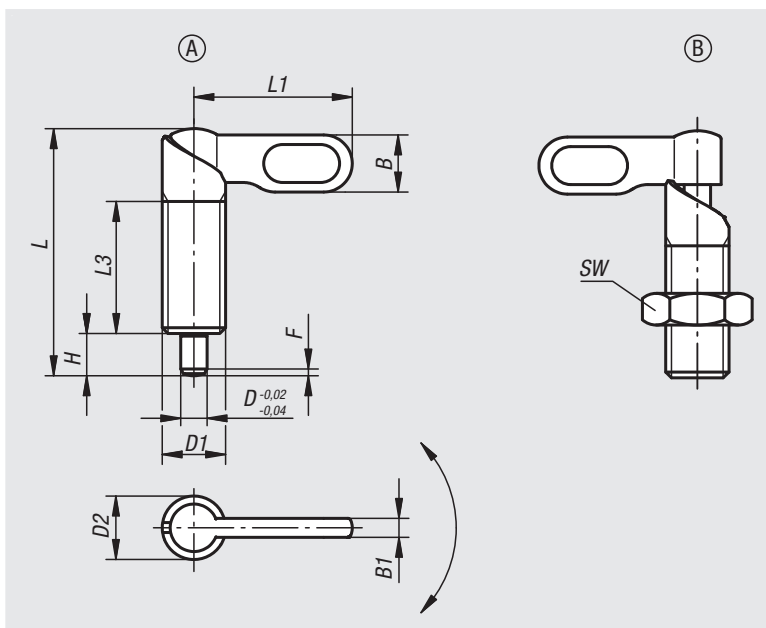
Cam-action indexing plungers are used when the indexing pin should not project all the time. Turning the handle through 180° retracts the pin.

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

Cam action indexing plunger

stainless steel, with stop



Material:

Stainless steel 1.4305.

Version:

Bright.

Indexing pin ground, not hardened.

Sample order:

nln 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.

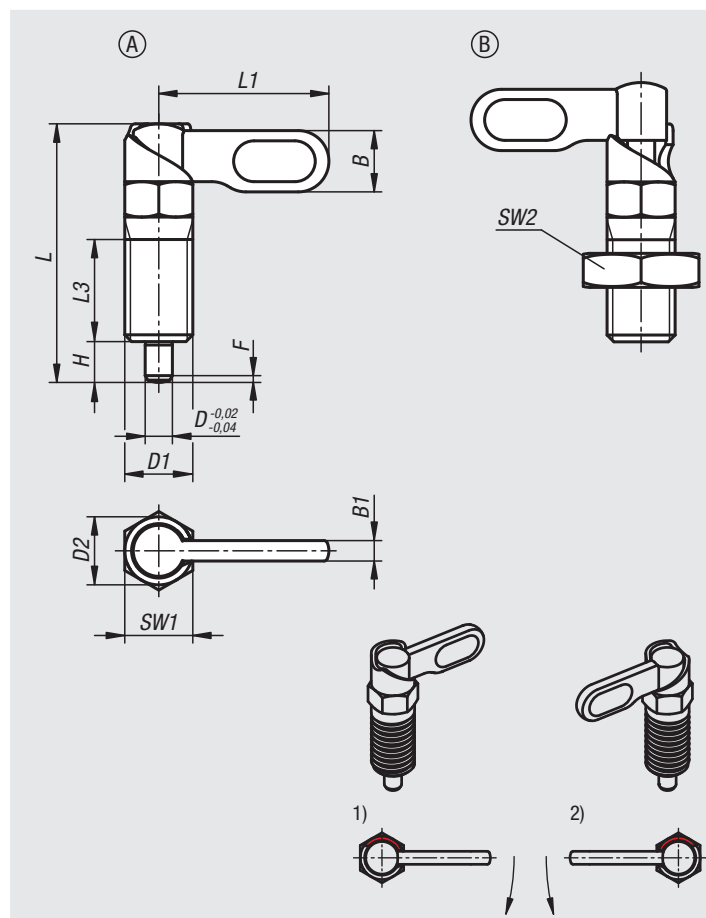
Drawing reference:

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

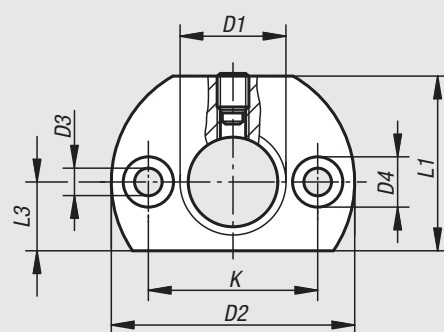


Material:
Steel.

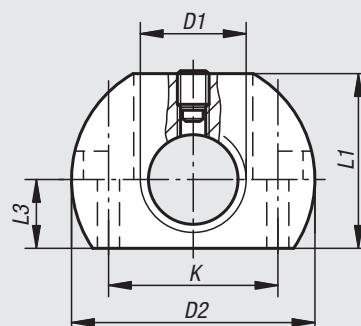
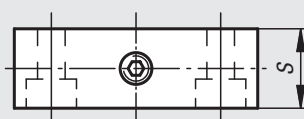
Version:
Black oxidised.

Sample order:
nlm 03099-116

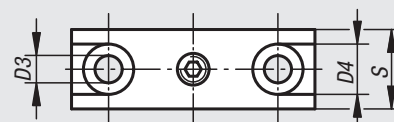
Note:
These mounting brackets are assembly aids for cam-action indexing plungers and extend their application field. They can also be used with other indexing plungers or other elements that have a suitable thread. Fastened using cap screws.



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.

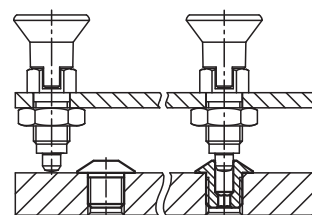
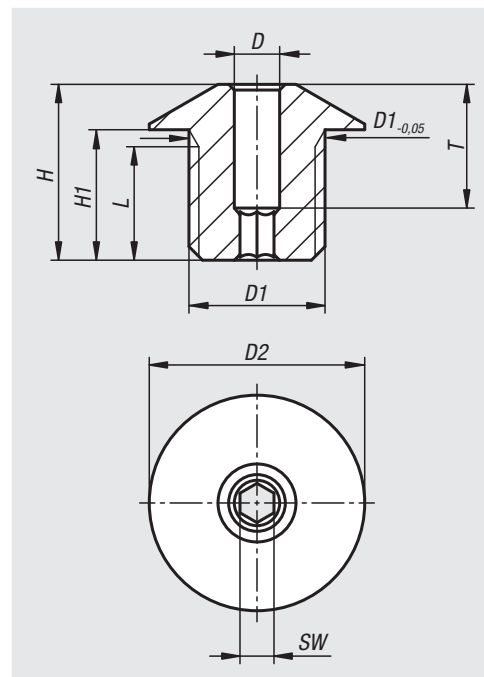
Sample order:

nIm 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

Mounting brackets

aluminium


Material:

Aluminium 3.2163.

Version:

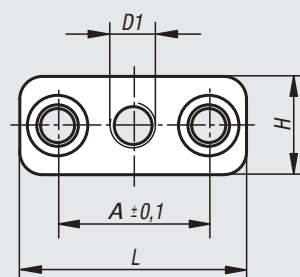
black.

Sample order:

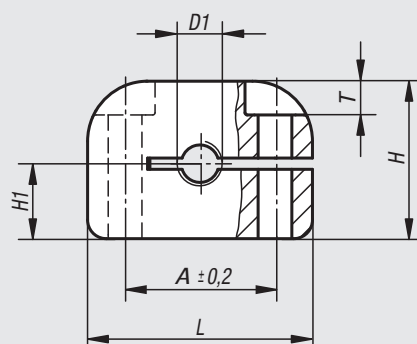
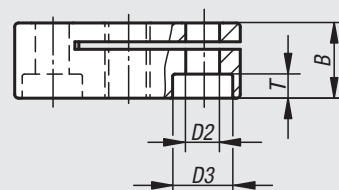
nIm 03099-308

Note:

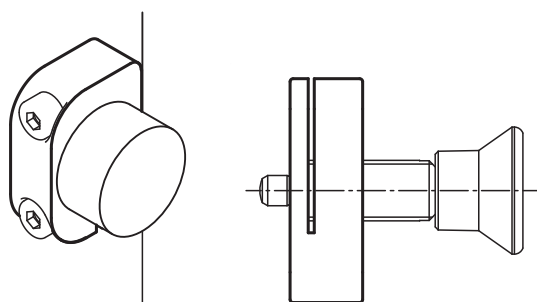
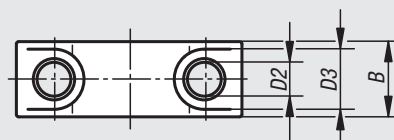
These mounting brackets are an assembly aid for cam-action and other indexing plungers and expand the application field. They can also be used with other elements that have a suitable thread. Fastened using DIN 912 / ISO 4762 cap screws.



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:

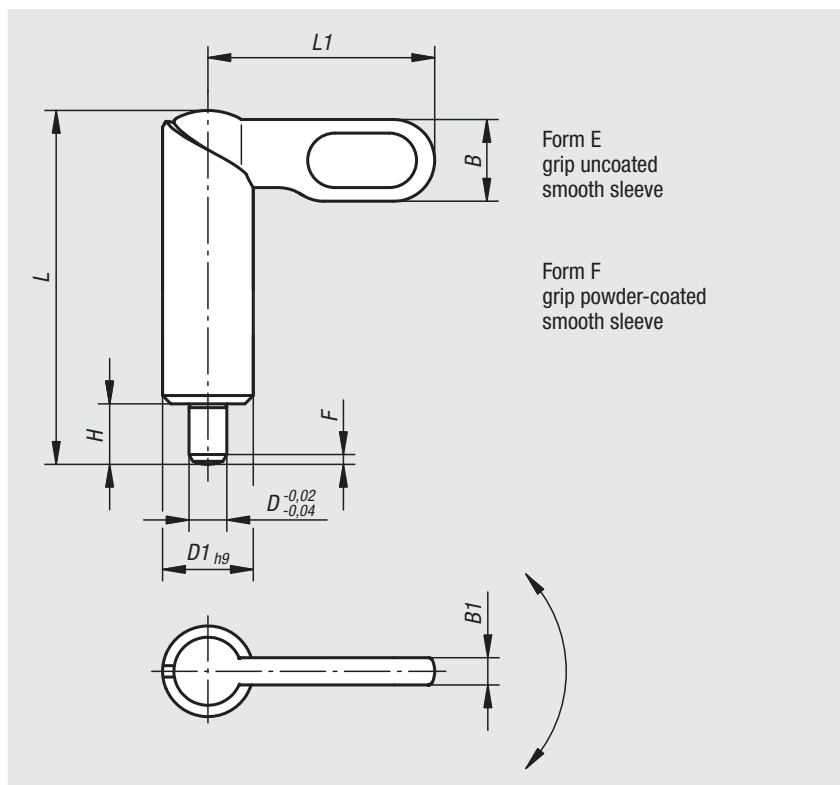
nln 03099-091220

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.

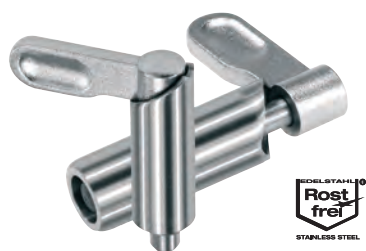
A notch ensures that the handle remains in this position.

To weld the plungers we recommend inert gas shielded welding with TIG welding equipment.



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:

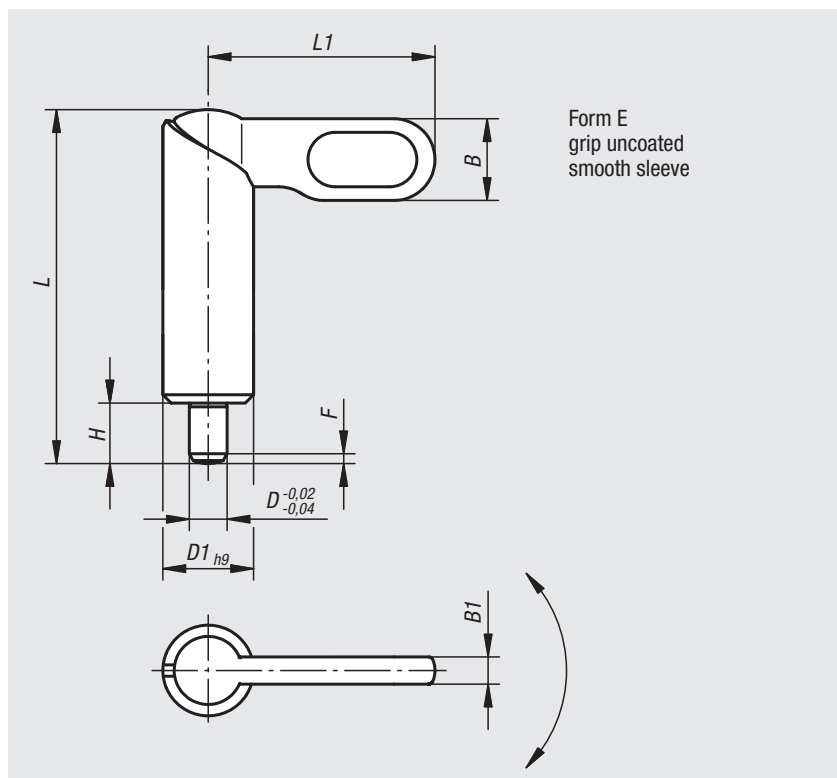
n1m 03099-1081220

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.



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

Barrel slide bolts


Material:

Housing die-cast zinc.
Grip, underlay and slot tabs thermoplastic PA.
Bolt stainless steel.

Version:

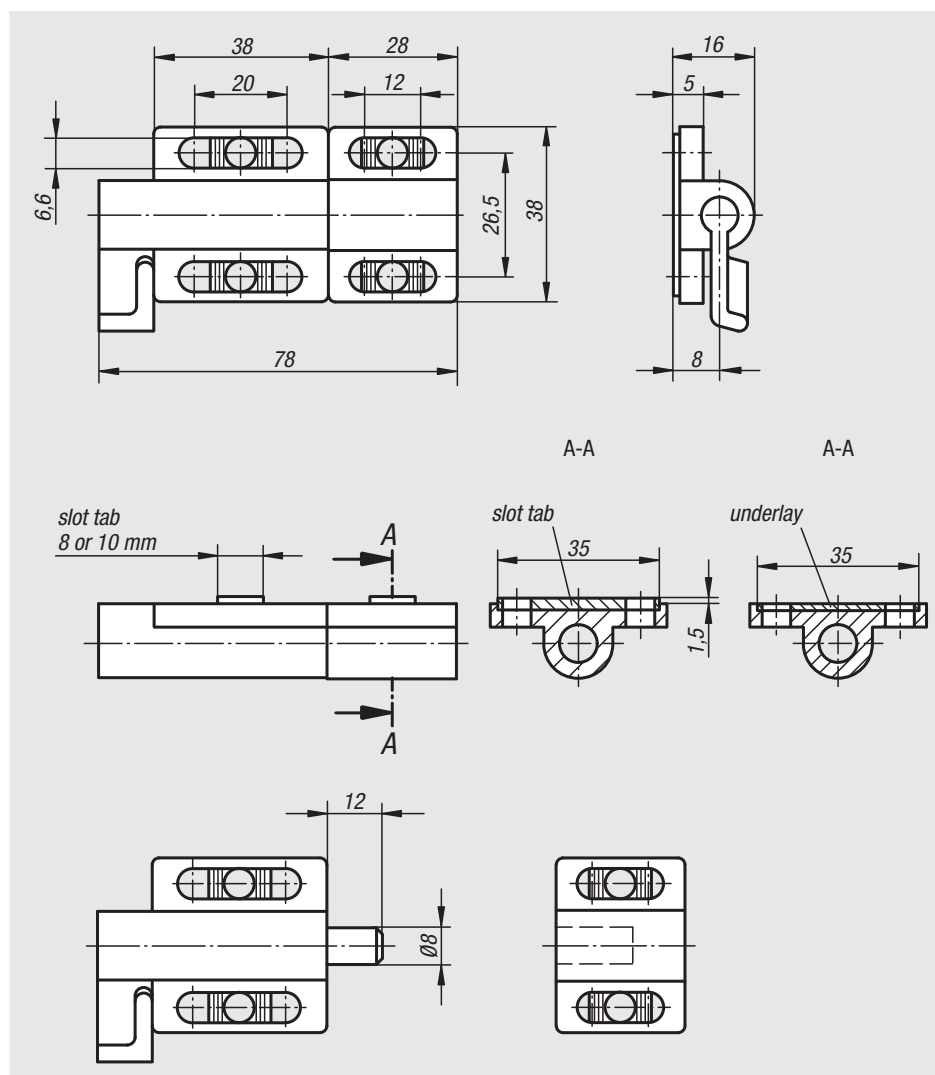
Housing painted silver.
Grip, underlay and slot tabs black.
Bolt bright.

Sample order:

nln 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.

03102-38038028

Spring force
initial pressure
F1 approx. N

5

Spring force
final pressure
F2 approx. N

15

Barrel locks with return spring, steel or brass

bevel up or down



Material:

Steel or brass.

Version:

Steel zinc-plated.

Brass chromed.

Sample order:

nIm 03102-05-056500

Note:

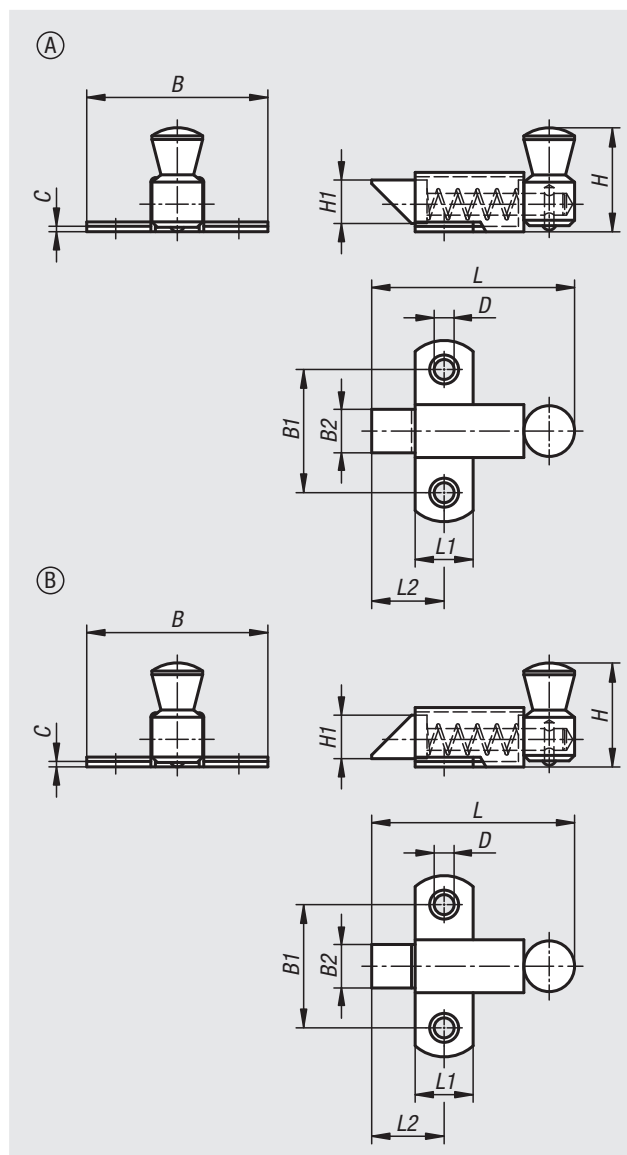
Barrel locks with return spring can be easily screwed onto doors, hatches and hoods. These locks are available in two different variants: bevelled upward or bevelled downward. The bevelled surface allows the application to be closed or opened without actuating the grip. The integrated return spring always 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

Catch plates, steel or brass

for barrel locks with return spring


Material:

Steel or brass.

Version:

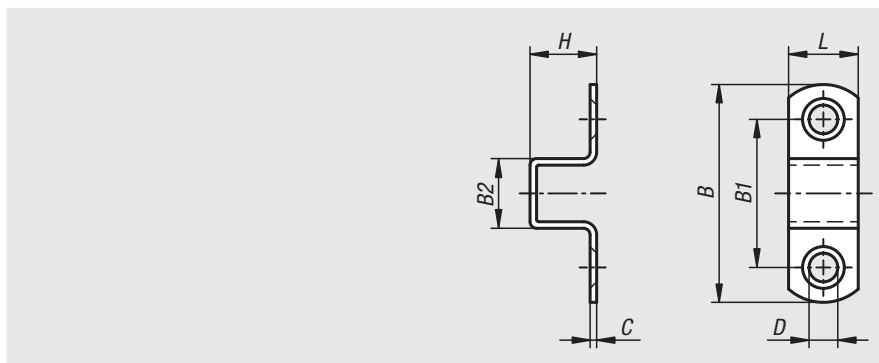
Steel zinc-plated.
Brass chromed.

Sample order:

nIm 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:

nIm 03102-10-04036

Note:

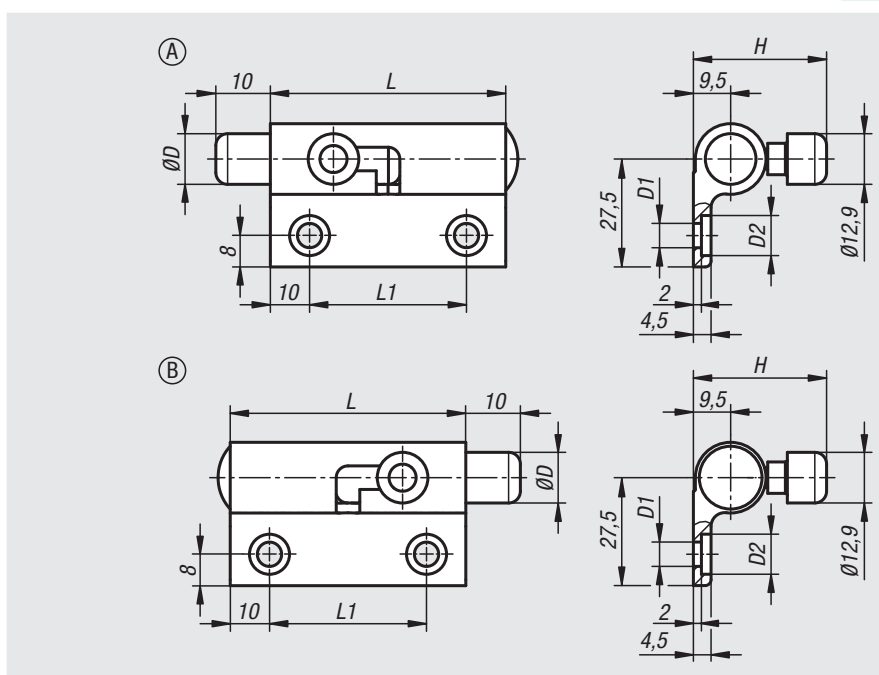
Barrel locks with return spring can be easily screwed onto doors, hatches and hoods. These locks are available in two different variants for left-opening and right-opening doors. The barrel can be latched in the open position. The integrated return spring always brings the grip back to its original position.

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:

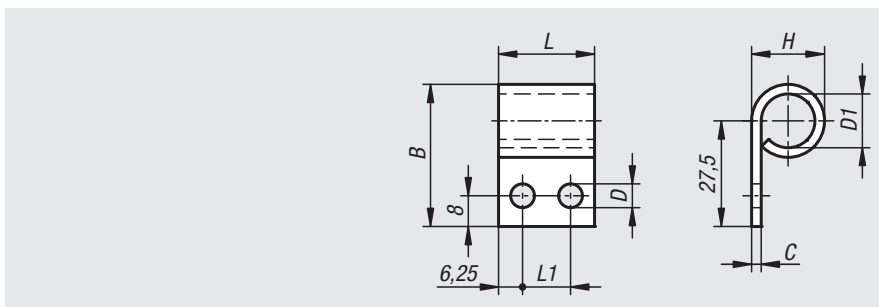
Aluminium.

Sample order:

nlm 03102-11-2537

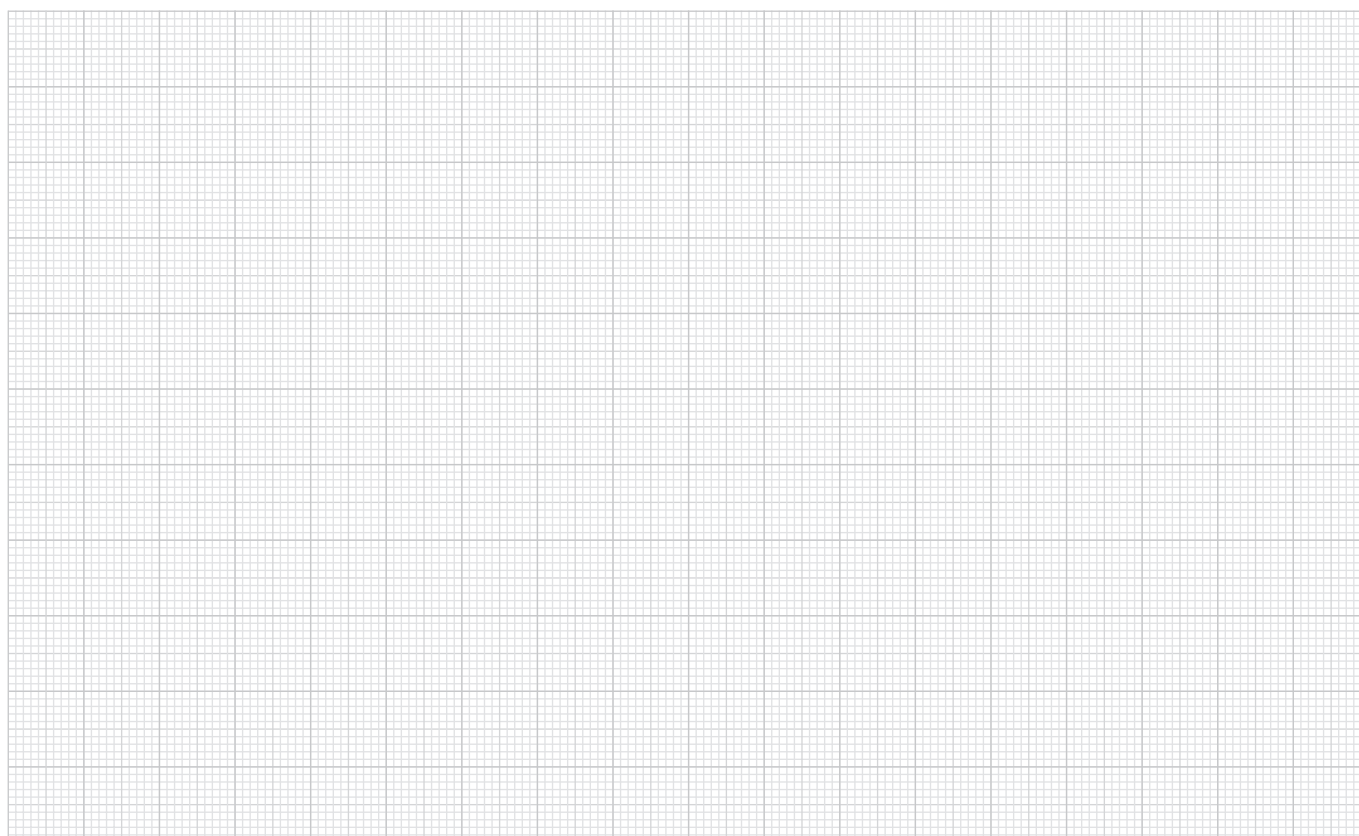
Note:

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



Barrel locks with return spring stainless steel

bevel up or down



Material:

Stainless steel

Sample order:

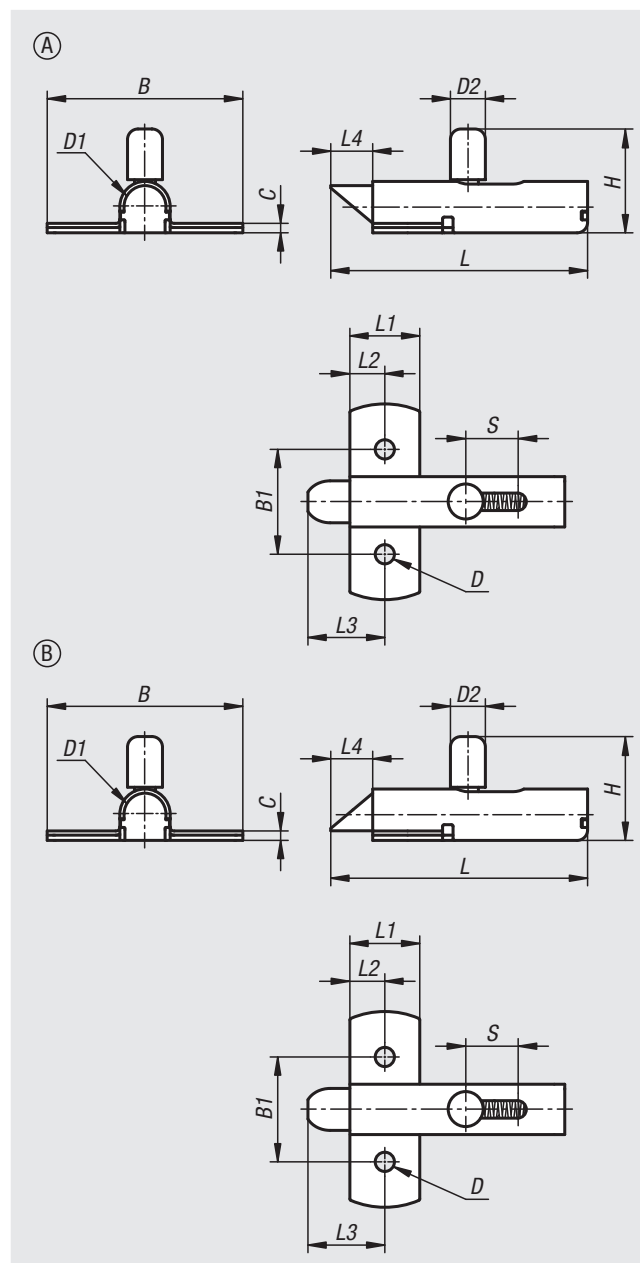
nln 03102-15-07356

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

Locating pins removable

Form A and C



Material:

Tool steel.

Version:

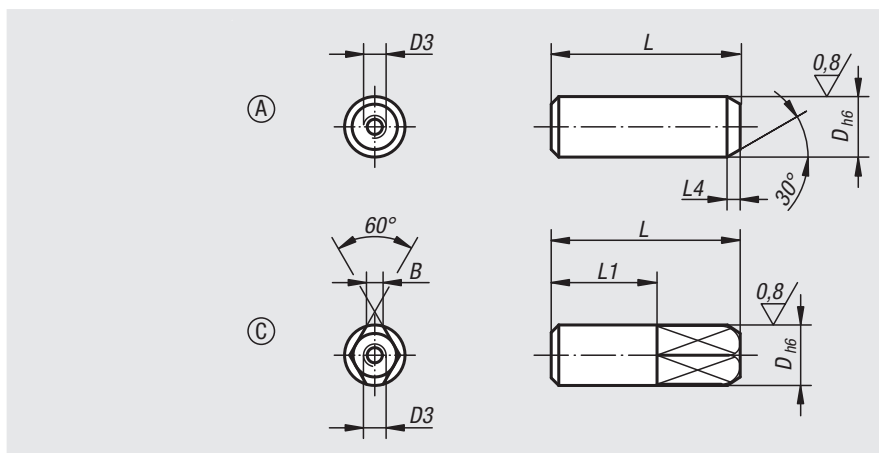
Hardened and ground (HRC 56 +2).

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

Locating pins removable

Form B and D



Material:

Tool steel.

Version:

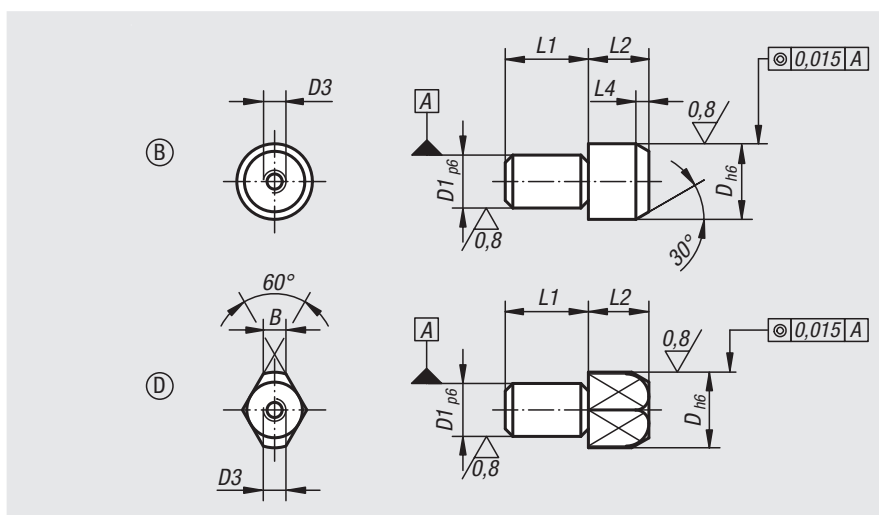
Hardened and ground (HRC 55-60).

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

Locating pins

with ball-end Form A


Material:

Tool steel or 1.4305 stainless steel.

Version:

Steel hardened and ground.

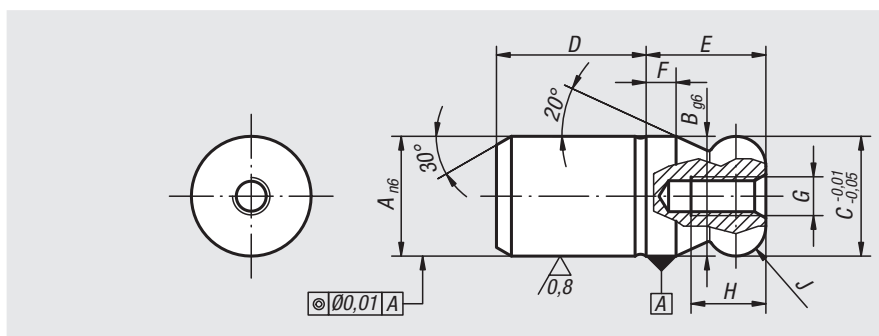
Stainless steel ground and kolsterised.

Sample order:

nln 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

Locating pins

with flattened ball-end Form C


Material:

Tool steel or 1.4305 stainless steel.

Version:

Steel hardened and ground.

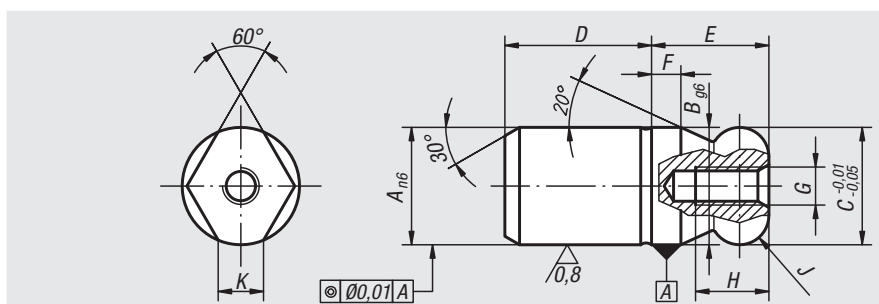
Stainless steel ground and kolsterised.

Sample order:

nln 03107-162

Note:

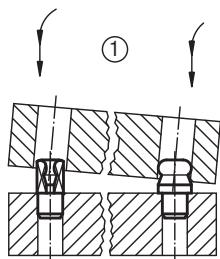
Ball end locating pins are specially designed to ease the locating process. The tendency to jam, caused by the locating hole not being at right angles to the pin or by the pushing force not being parallel to the pin axis, is minimized by the ball-end form. (See the illustration 1 by 03108 Form B)



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

Locating pins

with ball-end Form B



Material:

Tool steel or 1.4305 stainless steel.

Version:

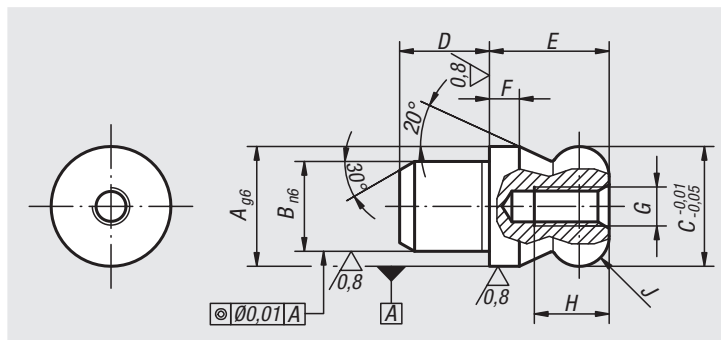
Steel hardened and ground.
Stainless steel ground and kolsterised.

Sample order:

nIm 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

Locating pins

with flattened ball-end Form D



Material:

Tool steel or 1.4305 stainless steel.

Version:

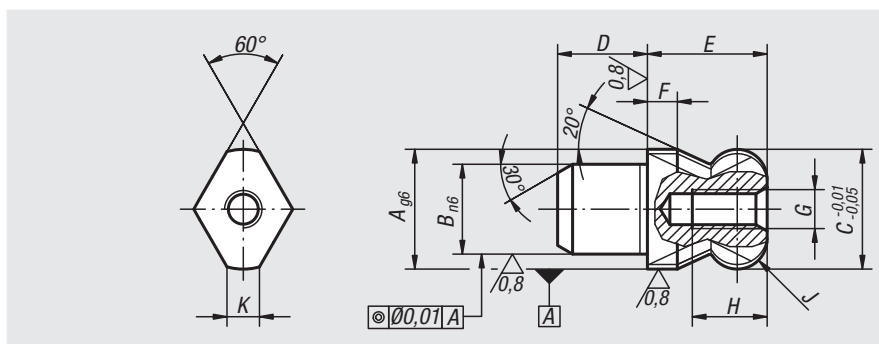
Steel hardened and ground.
Stainless steel ground and kolsterised.

Sample order:

nIm 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

Centring pins

for central hole

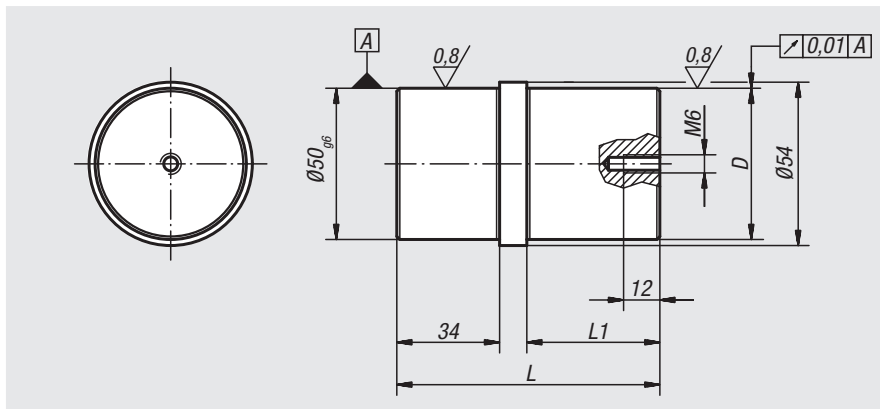


Material:
Steel.

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

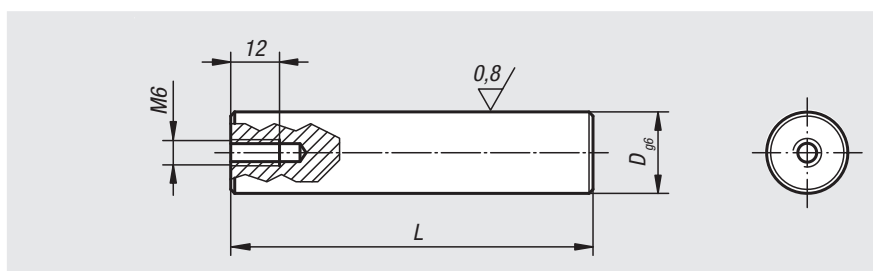


Material:
Steel.

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.

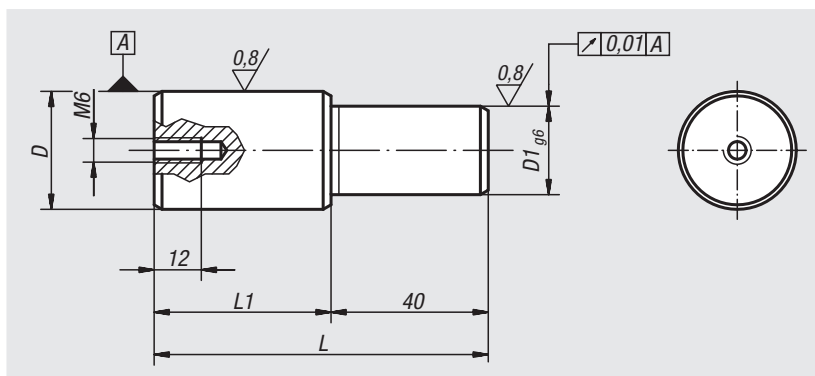
Toleranced diameter ground.

Sample order:

nln 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

Positioning pins cylindrical

ground

**Material:**

Tool steel.

Version:

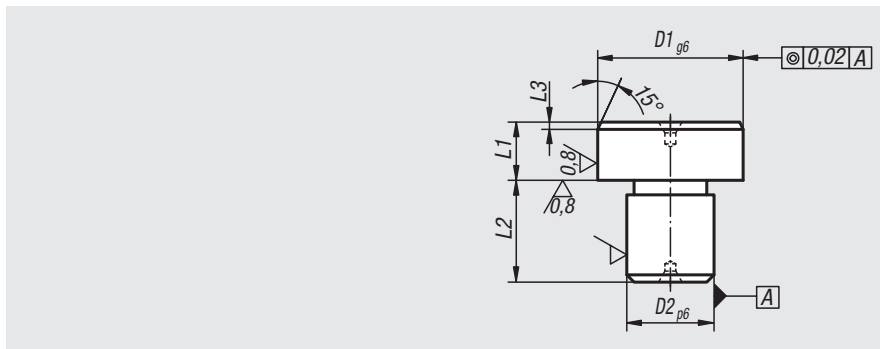
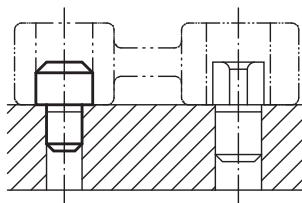
Hardened and ground.

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:

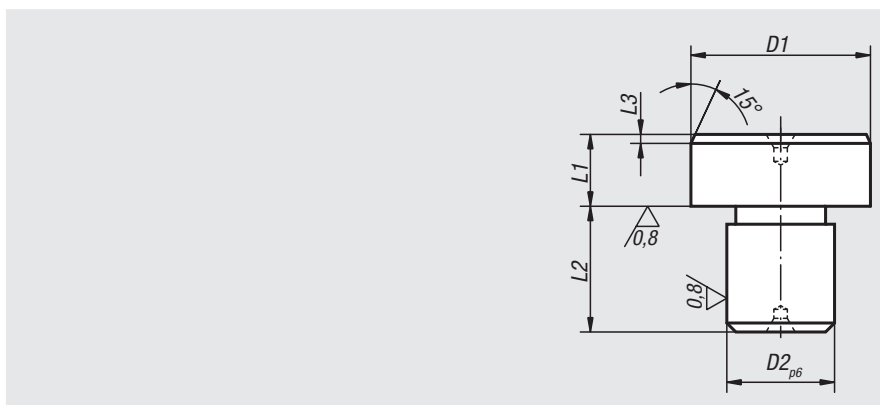
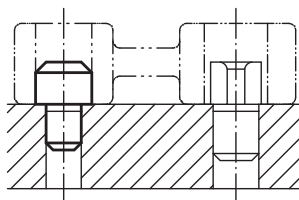
Hardened.

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

Positioning pins free-milled

ground

**Material:**

Tool steel.

Version:

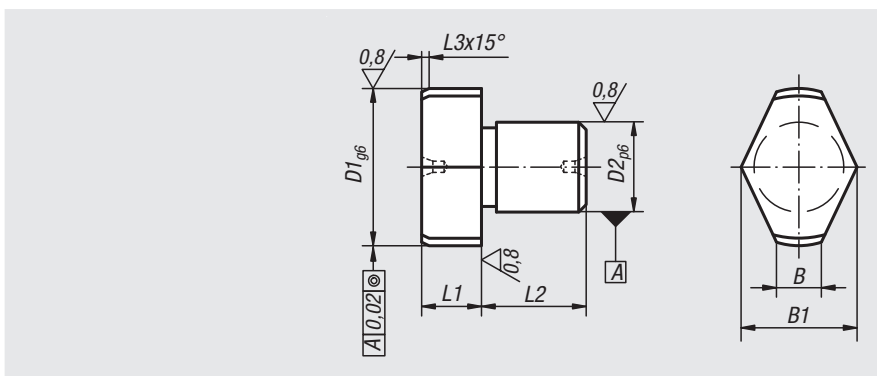
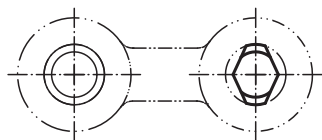
Hardened and ground.

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

Positioning pins free-milled

not ground

**Material:**

Tool steel.

Version:

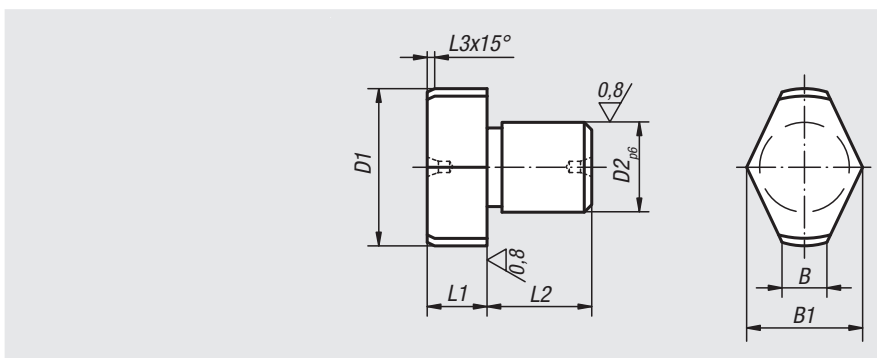
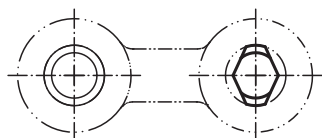
Hardened.

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

Locating pins expanding



Material:
Carbon steel.

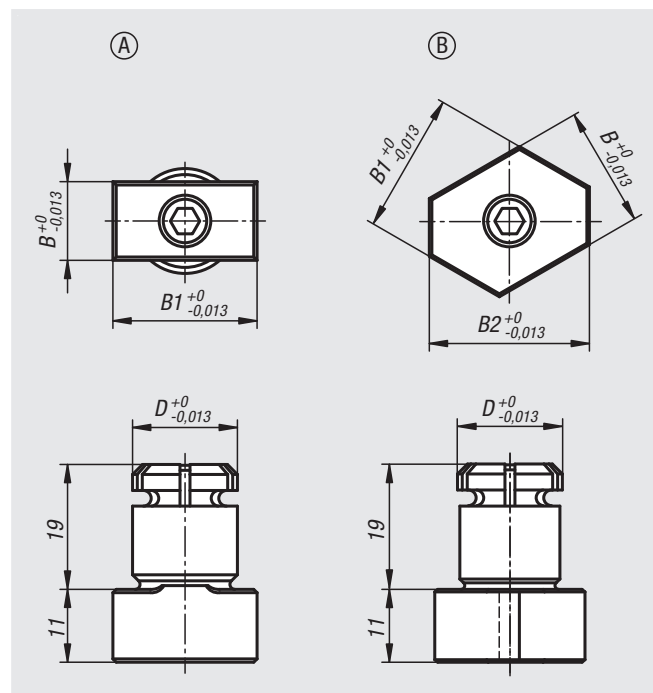
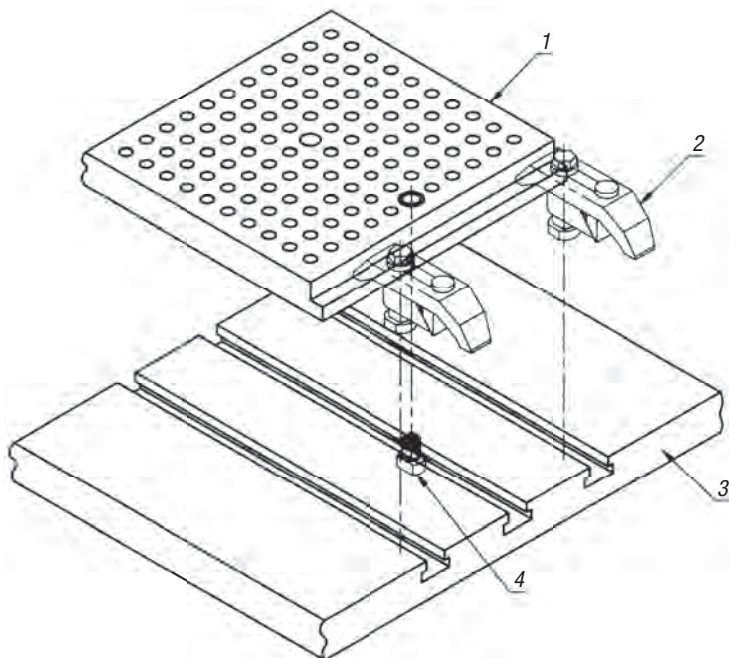
Version:
Tempered and black oxidised.
Locating diameter and guide faces ground.

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



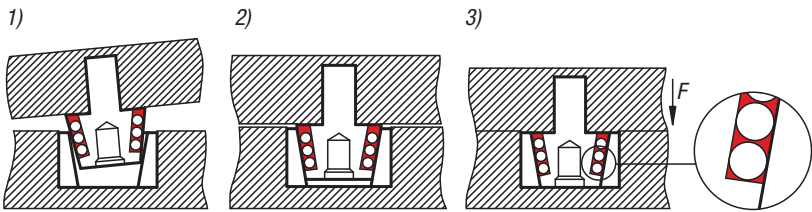
Order No.	Form	D	B	B1	B2	Recommended $\emptyset$
03151-1610	A	16	10	20	-	16,01 $\pm 0,01$
03151-1612	A	16	12	22	-	16,01 $\pm 0,01$
03151-1614	B	16	14	16	18	16,01 $\pm 0,01$
03151-2024	B	20	24	28	32	20,01 $\pm 0,01$

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	

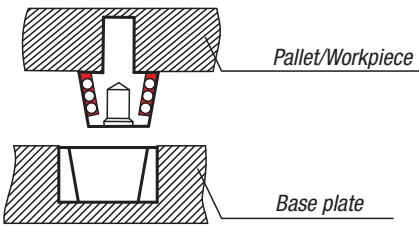
01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

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.

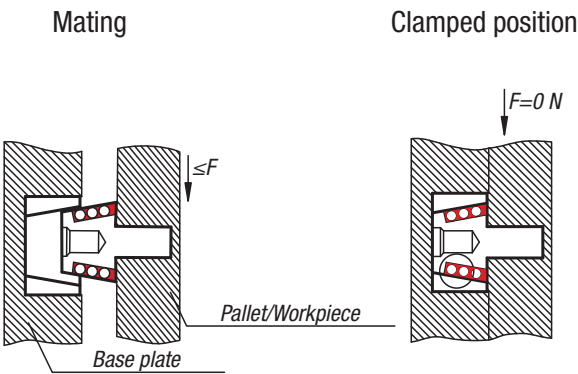
- The maximum working temperature is +80 °C
- Generally, the bush is pressed into the baseplate and the cone is pressed into a pallet or the workpiece
- The maximum centre offset between bush and cone should not exceed 3 mm when mating



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	



Positioning cones, steel

for centring units



Material:

Cone, steel.

Balls, ball bearing steel.

Version:

Cone hardened and ground.

Balls embedded in rubber which is vulcanised on the cones.

Sample order:

nlm 03152-10-3

Note:

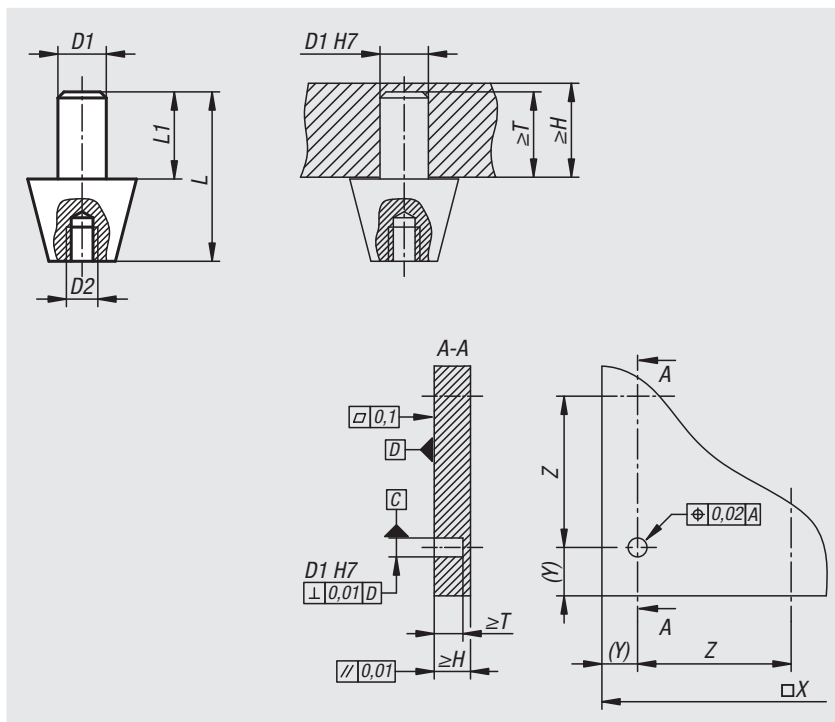
In conjunction with the position bushings, the position cones form a centring unit for the high-precision positioning of two components. The system achieves a repeat accuracy of <0.003 mm. The bonded rubber does not become brittle and is insensitive to contamination or swarf. Small embedded swarf splinters 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:

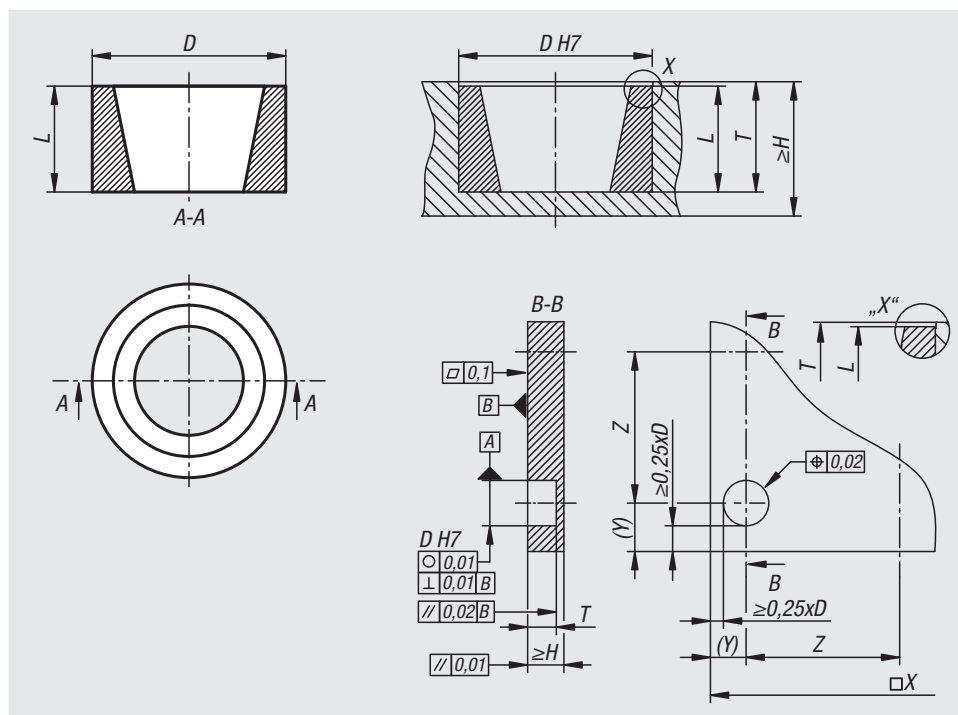
nIm 03152-11-3

Note:

These positioning bushes match positioning cones.

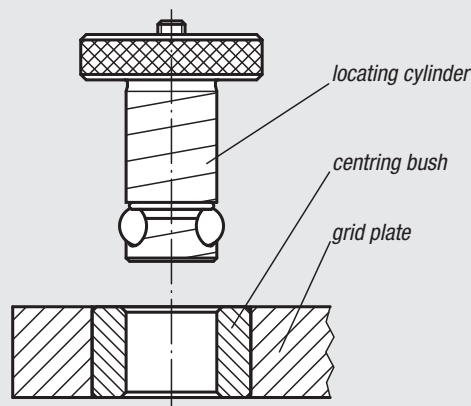
Temperature range:

+80 °C.

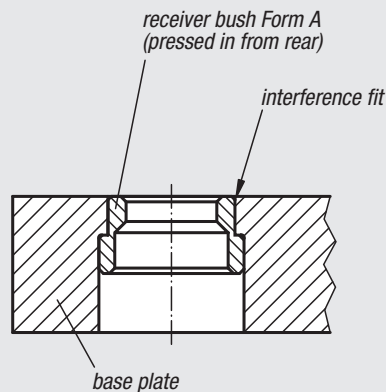


Order No.	Size	D	H min.	L max.	T	for Art. No.
03152-11-1	1	16	12,5	8,5	9-0,1	03152-10-1
03152-11-3	3	32	25	17,5	18-0,1	03152-10-3

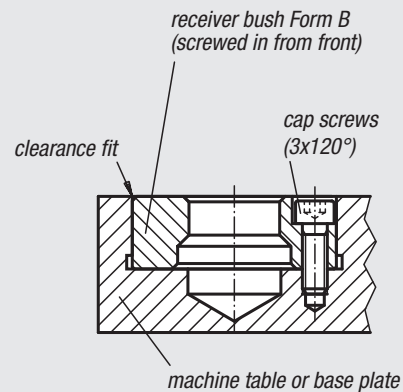
Locating and clamping system, mechanical



recommended installation



alternative installation



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 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.

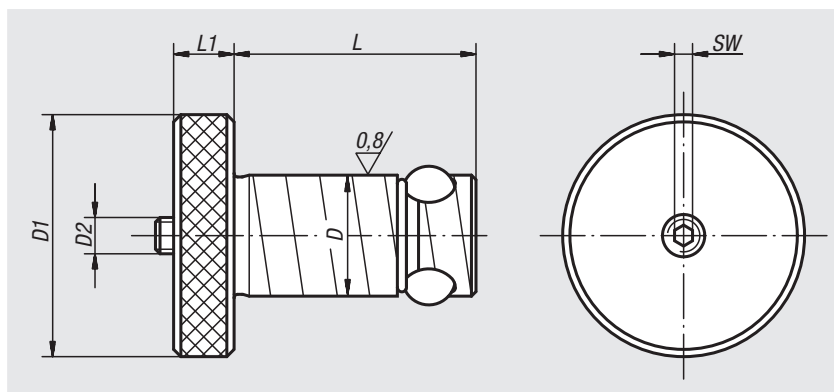
Sample order:

nIm 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.

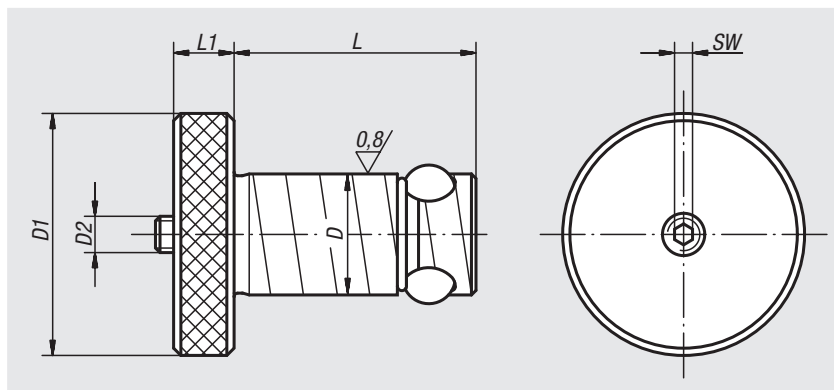
With this easy to use system machine set-up times are up to twelve times shorter than when conventional methods are used.



Order No.	Grid plate thickness $\pm 0,05$	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

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:

nIm 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.

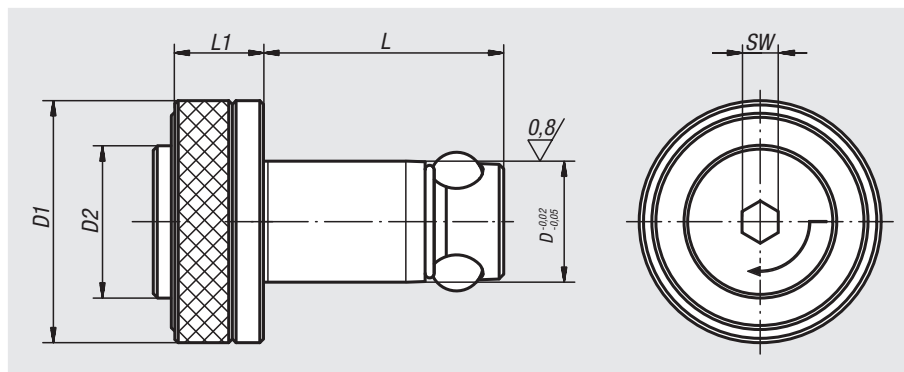
With this easy to use system machine set-up times are up to twelve times shorter than when conventional methods are used.



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:

nln 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 $\pm 0,05$	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

Centring bushes


Material:

Ball bearing steel

Version:

Hardened, black oxidised.

Sample order:

n1m 03154-113020

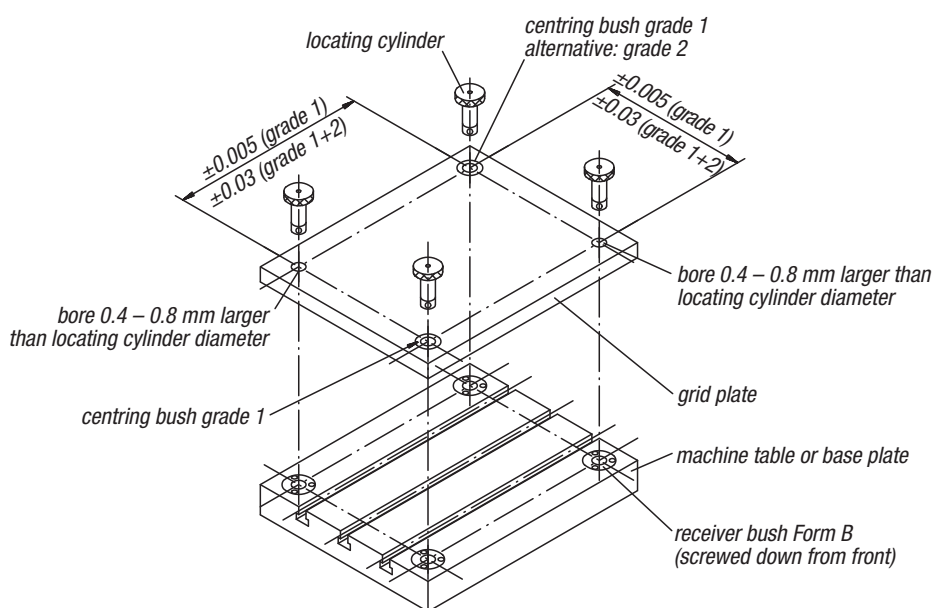
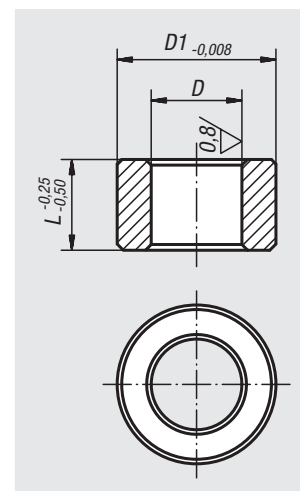
Note:

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

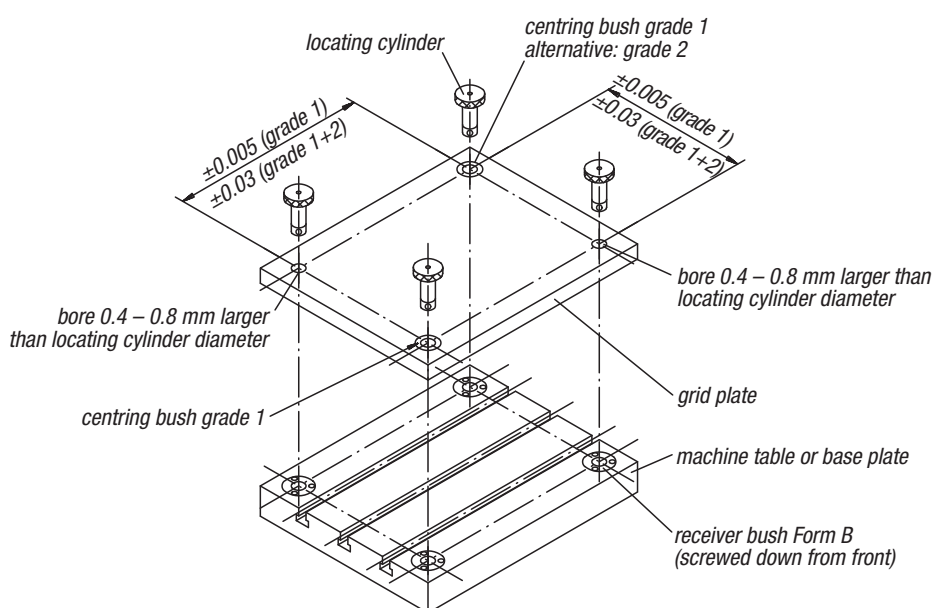
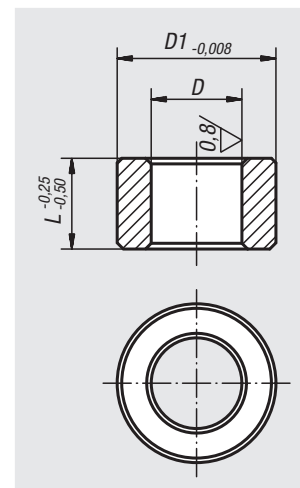
Note:

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

Locating bushes

Form A (pressed in from rear)

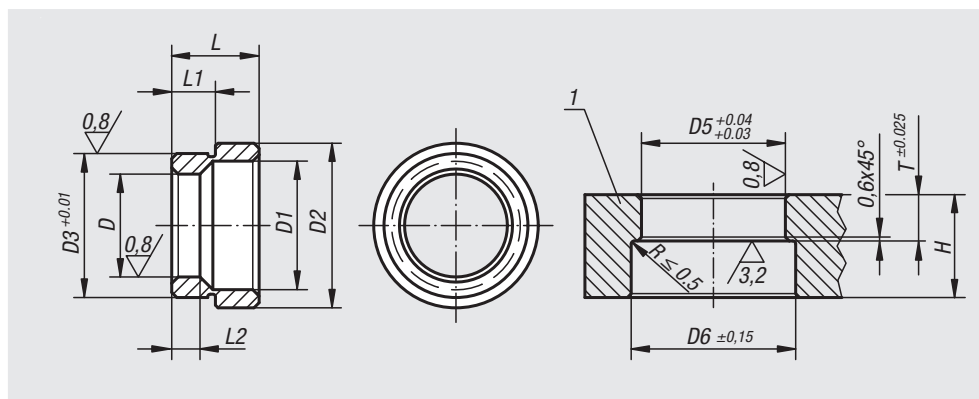


Material:
Carbon steel.

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)

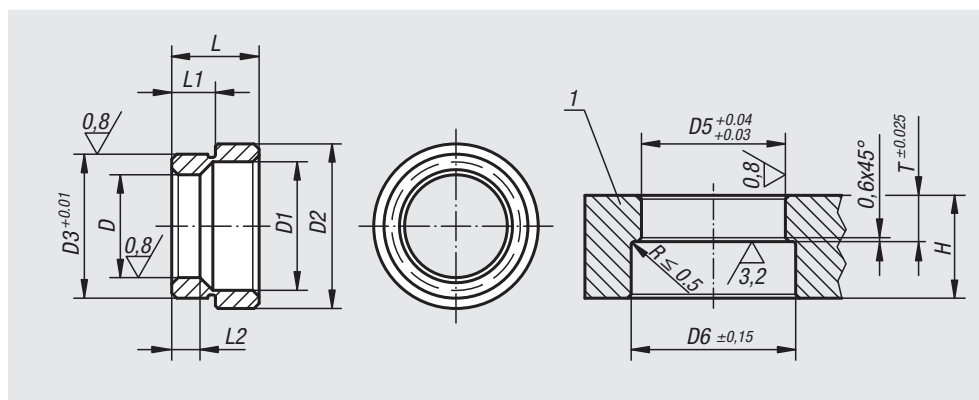


Material:
Stainless steel 1.4548.

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

Locating bushes

Form B (screwed down from front)



Material:

Carbon steel.

Version:

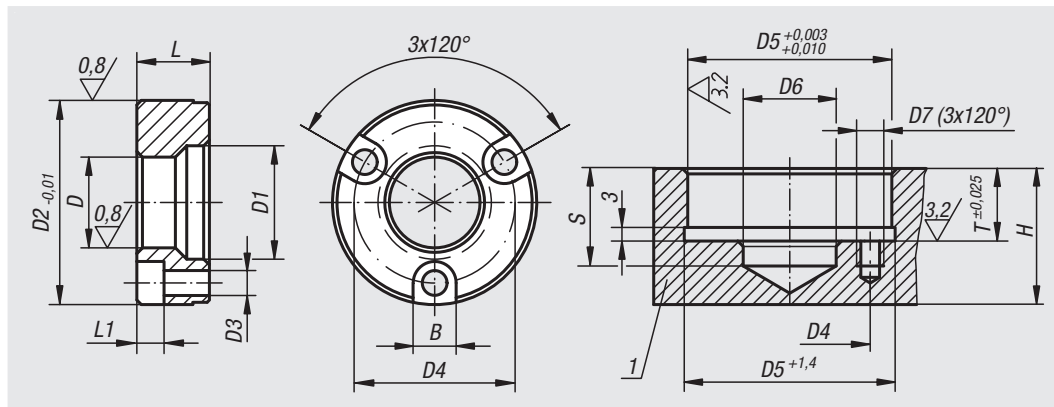
Tempered and black oxidised.

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:

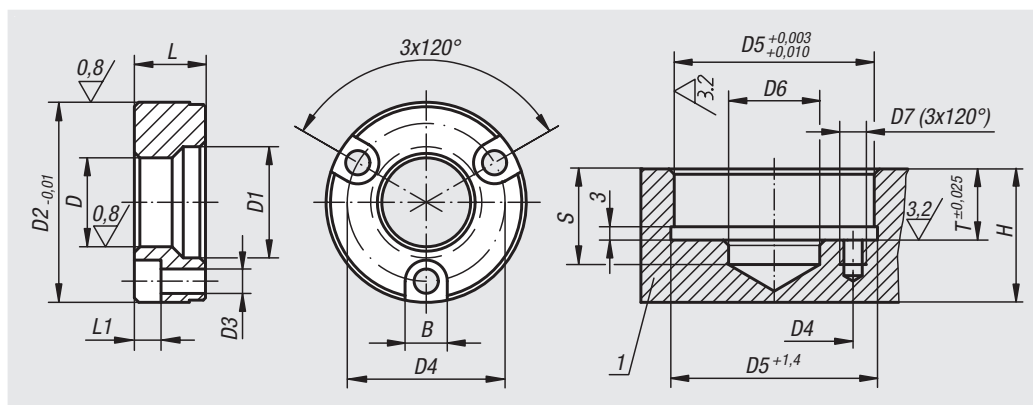
Hardened to min. 40 HRC, bright.

Sample order:

nlm 03156-02-13

Note:

Fastening screws included.

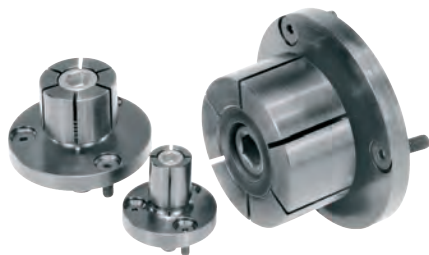


Drawing reference:

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

Mandrel collets


Material:

Mandrel mild steel.

Taper-head screw low-carbon steel

Version:

Mandrel black oxidised.

Taper-head screw case-hardened.

Sample order:

nIm 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:

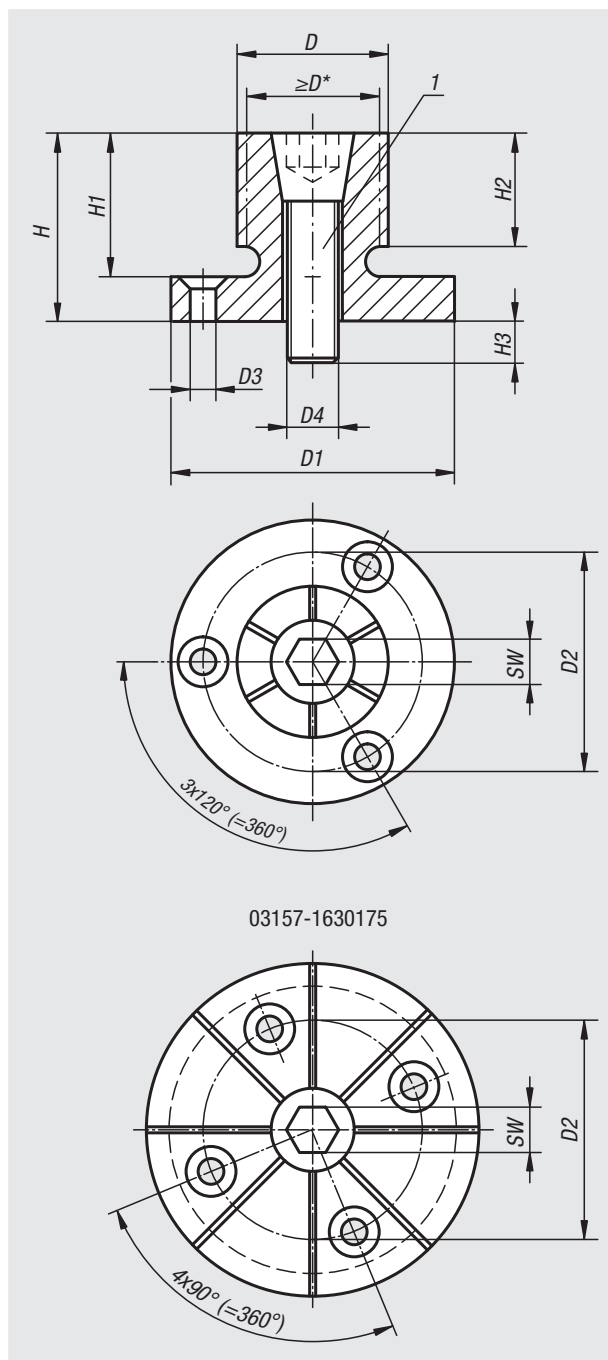
Expand the mandrel approx. 0.1 mm over the relaxed diameter.

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



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.

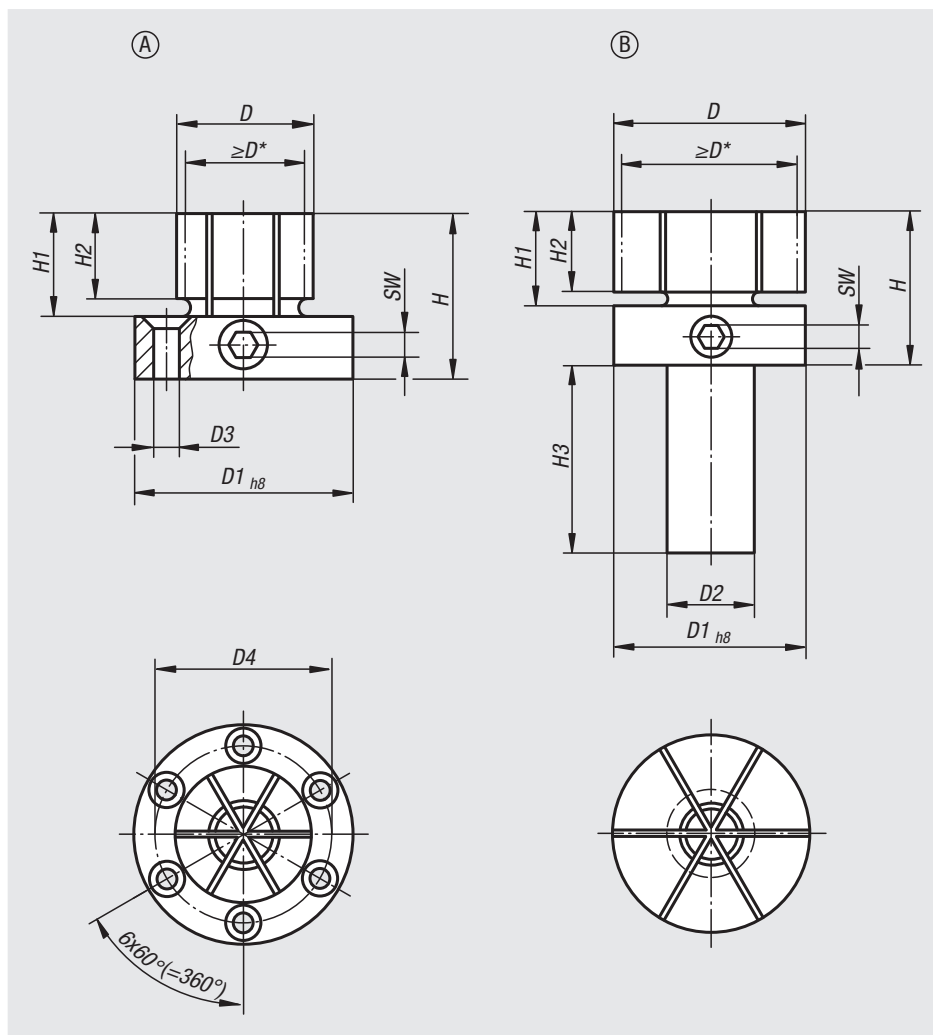
Drawing reference:

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

Mandrel collet

for small bores



Material:

Stainless steel 1.4305.

Version:

Bright.

Sample order:

nln 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.

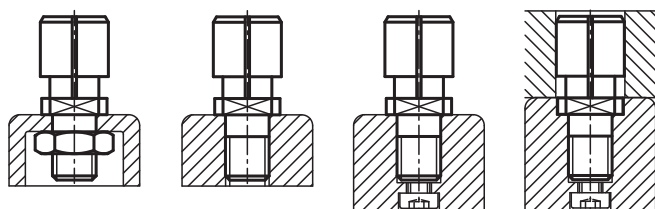
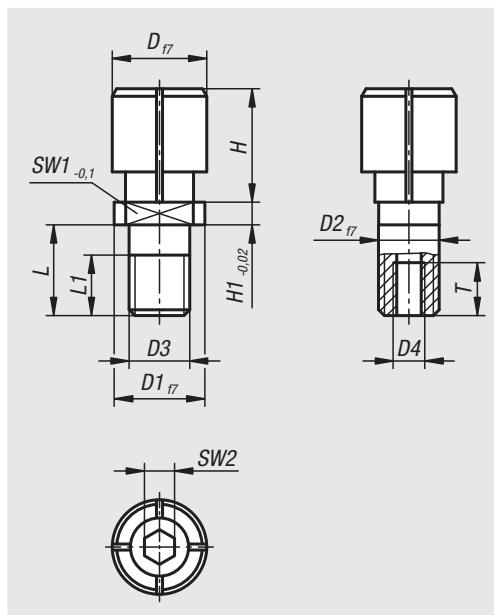
- applicable for holes from Ø5 to Ø12.5 mm
- compact design, small installation space
- simple handling
- mounting in any position
- different installation types possible
- surface pressure protects the workpiece surface
- individually adaptable to the diameter

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:

nIm 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.

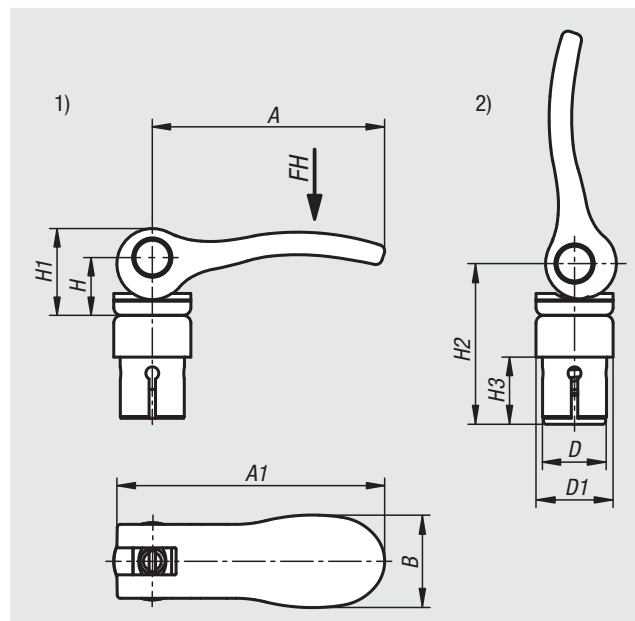
Functional principle:

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

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:

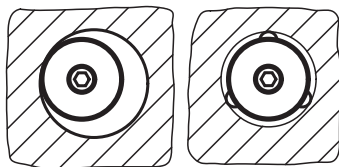
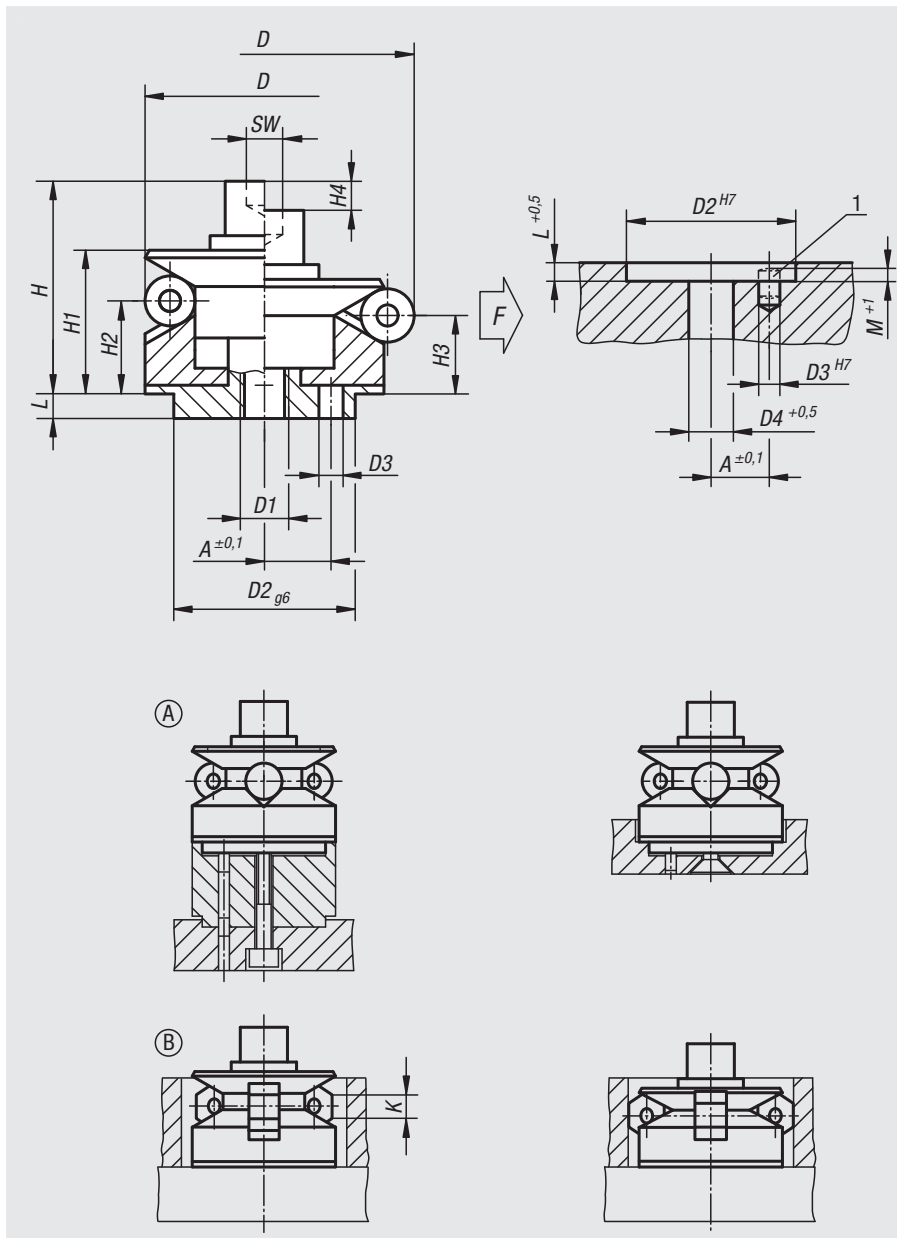
With balls for holes where light marking is acceptable.

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

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:

nIm 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:

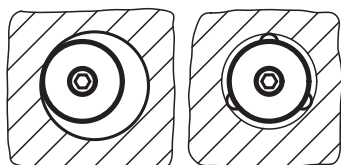
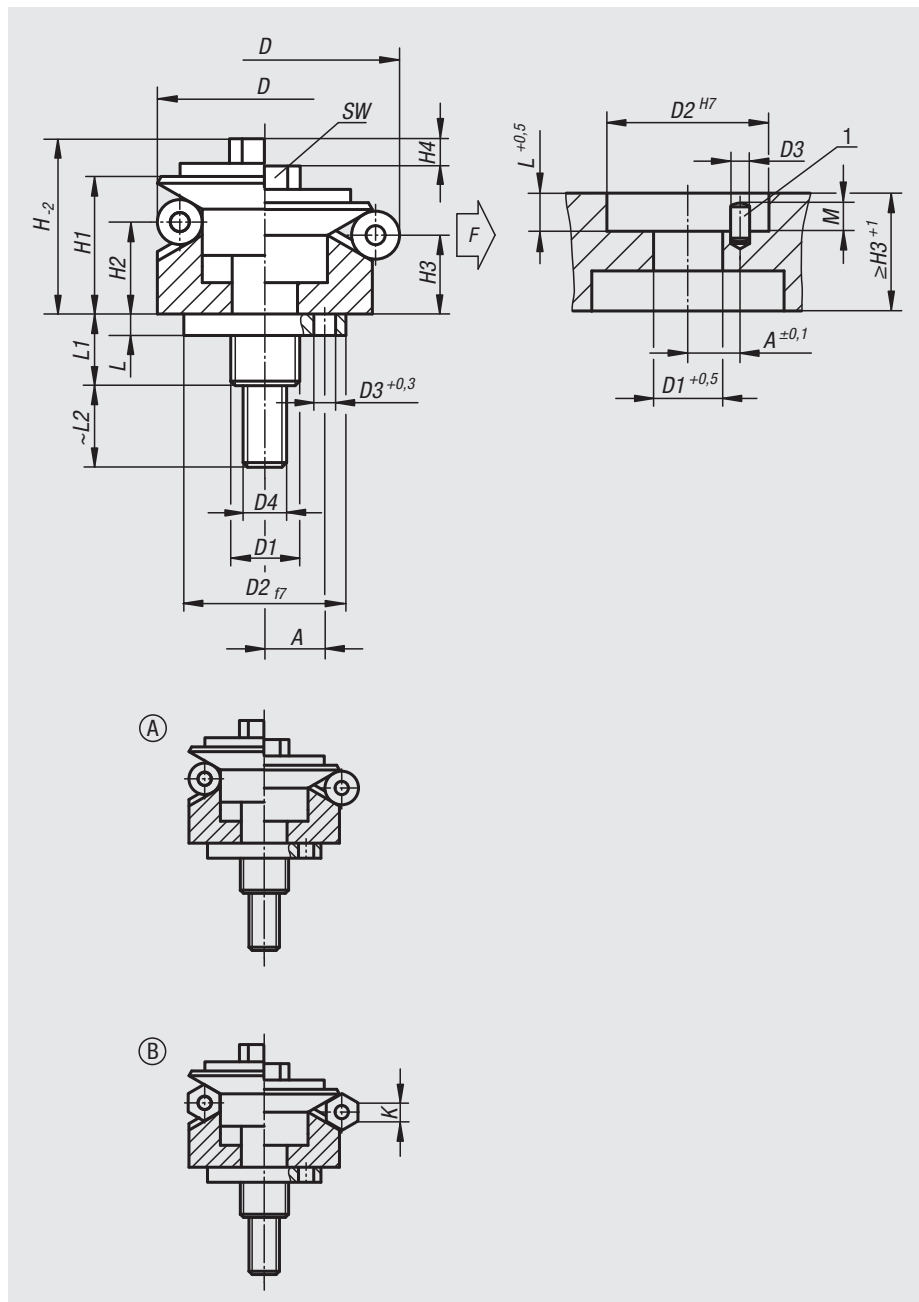
With balls for holes where light marking is acceptable.

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

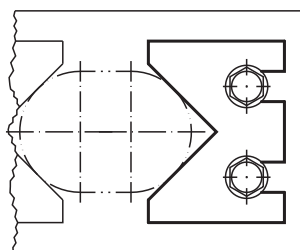
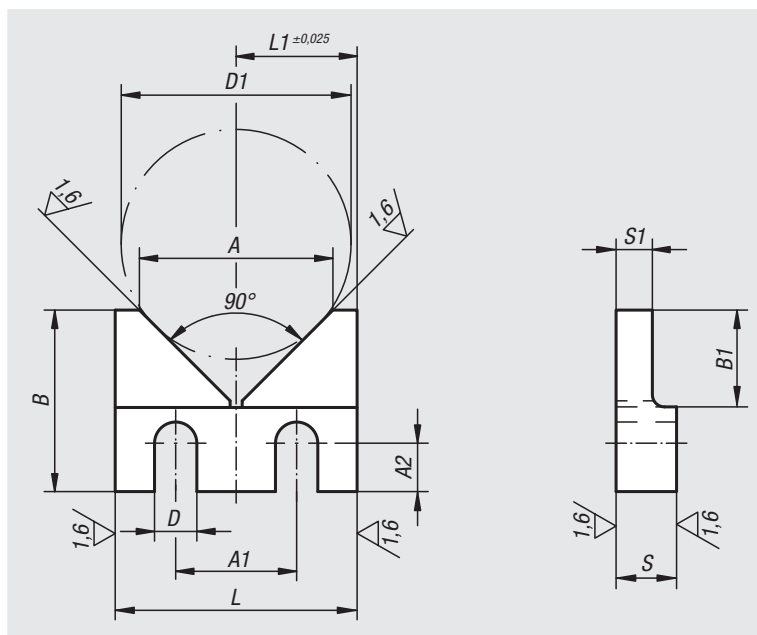
Centring V



Material:
Carbon steel 1.1181.

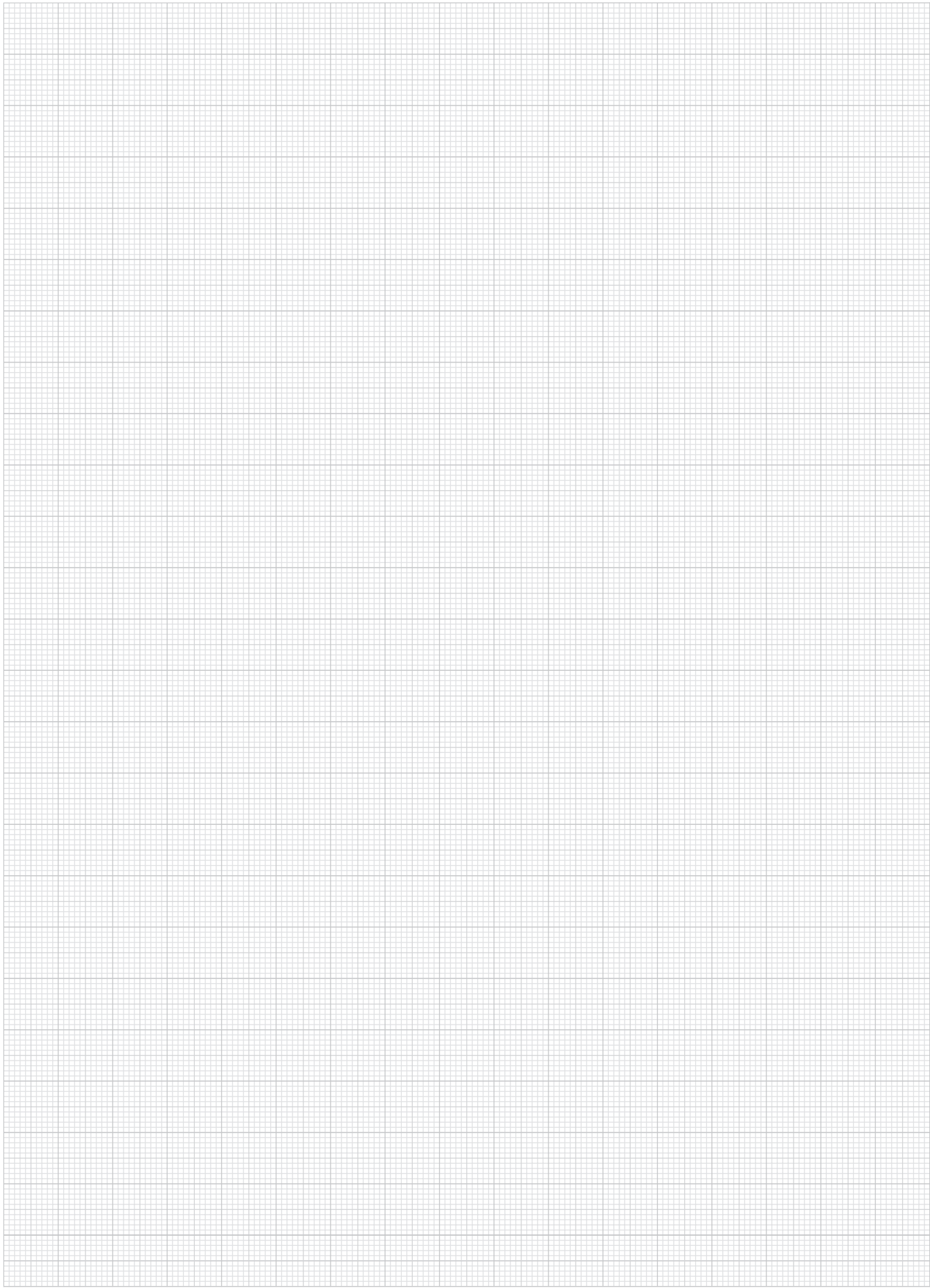
Version:
Black oxidised.

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



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Locating cylinders

pneumatic

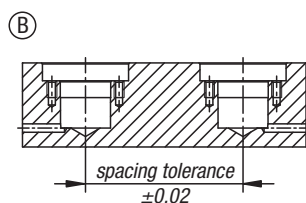
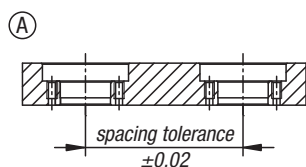
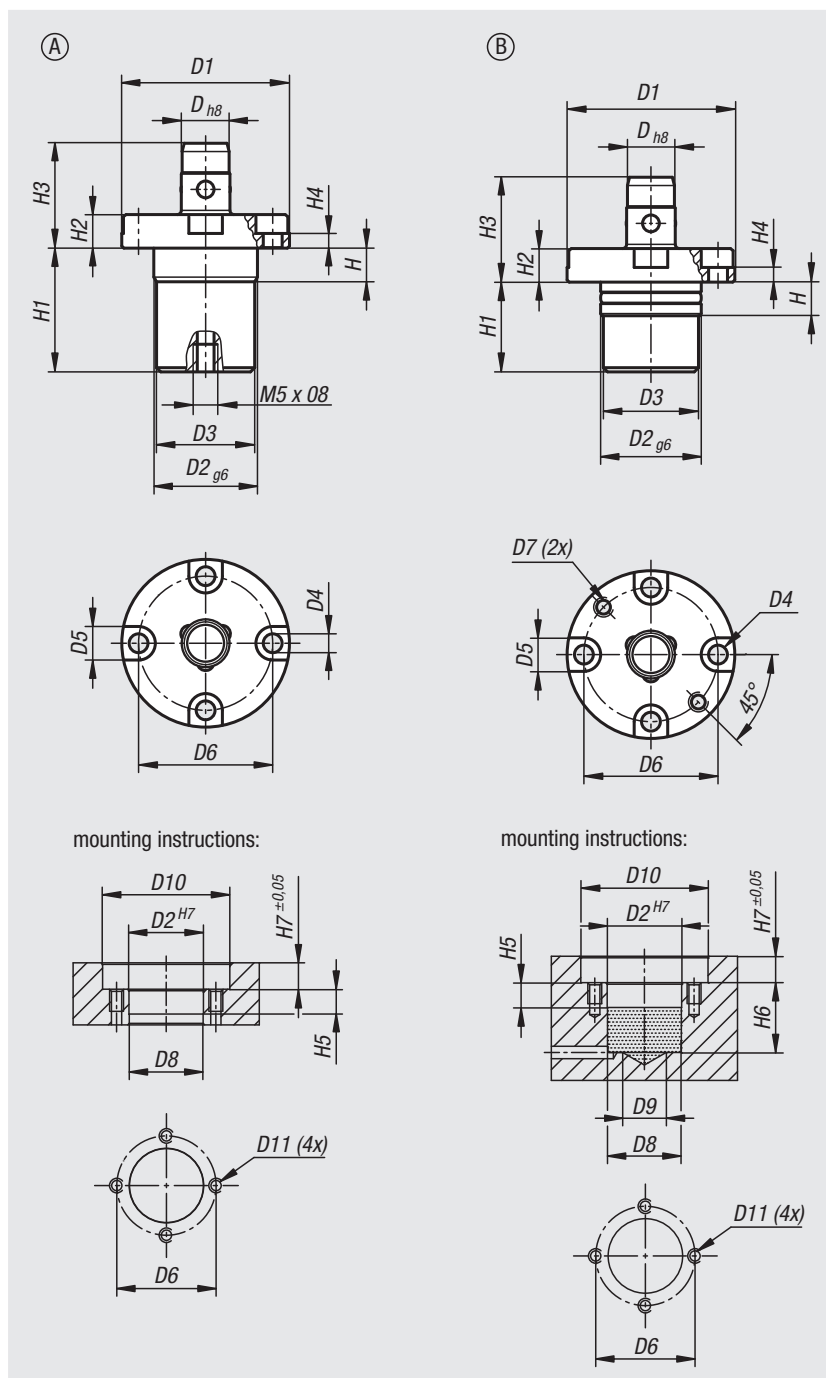


Material:
Carbon steel.

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:

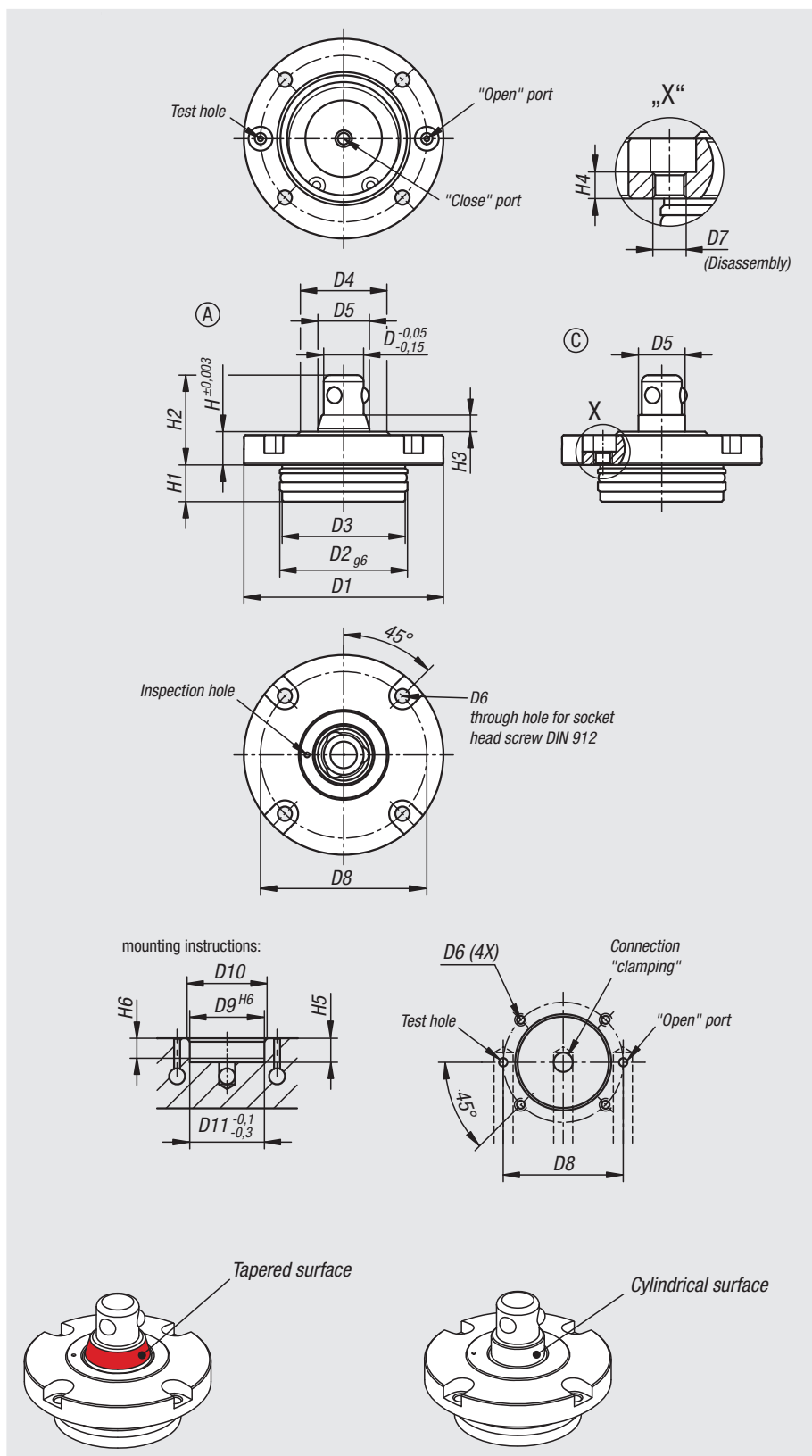
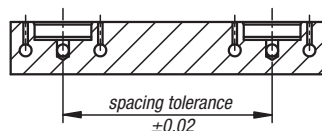
n1m 03161-02-11670

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

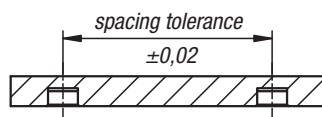
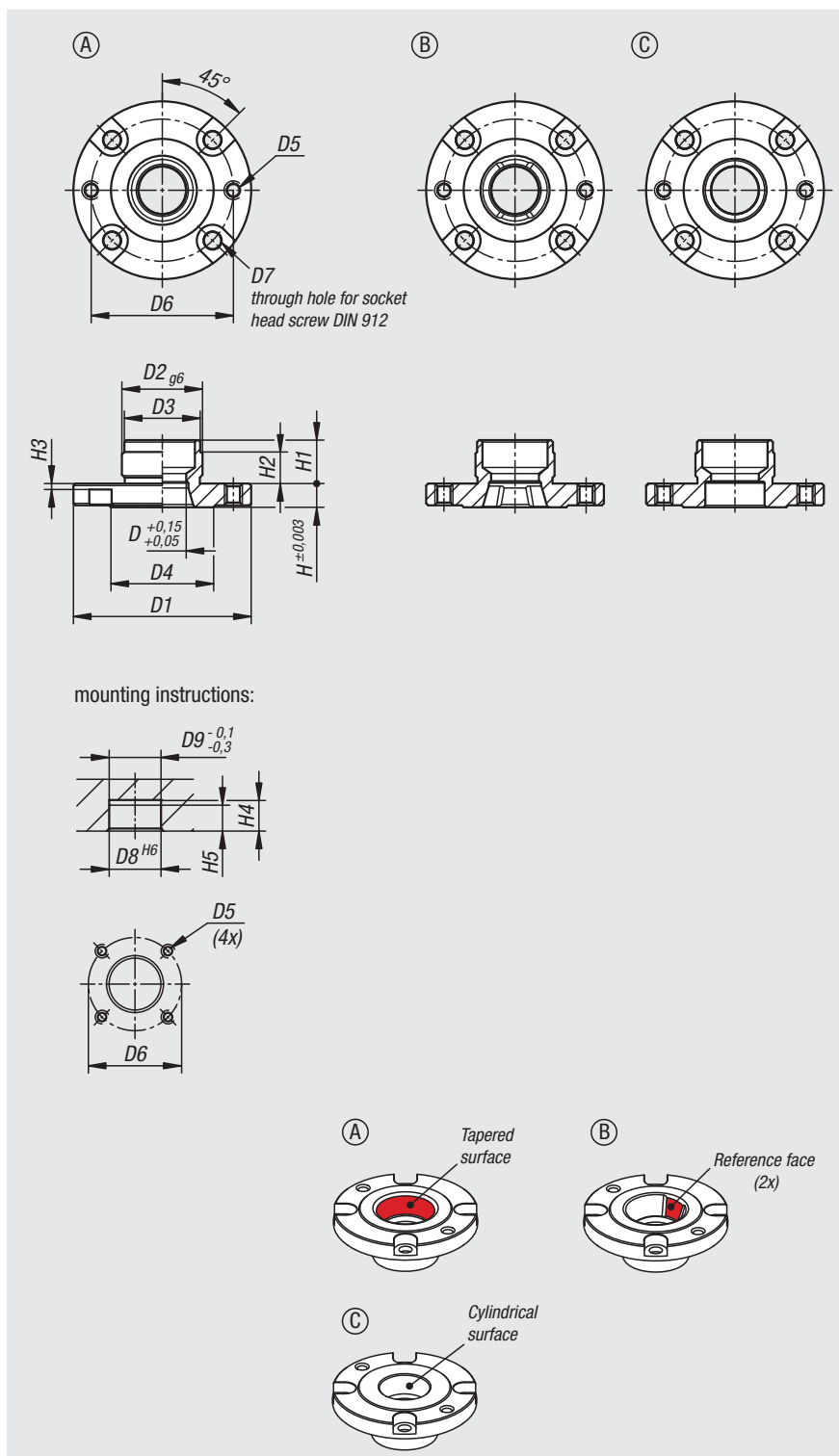
Note:

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.



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

Locating bushes

for pneumatic locating cylinder



Material:

Carbon steel.

Version:

nickel-plated.

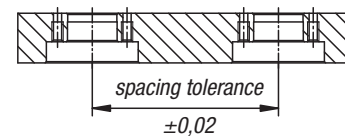
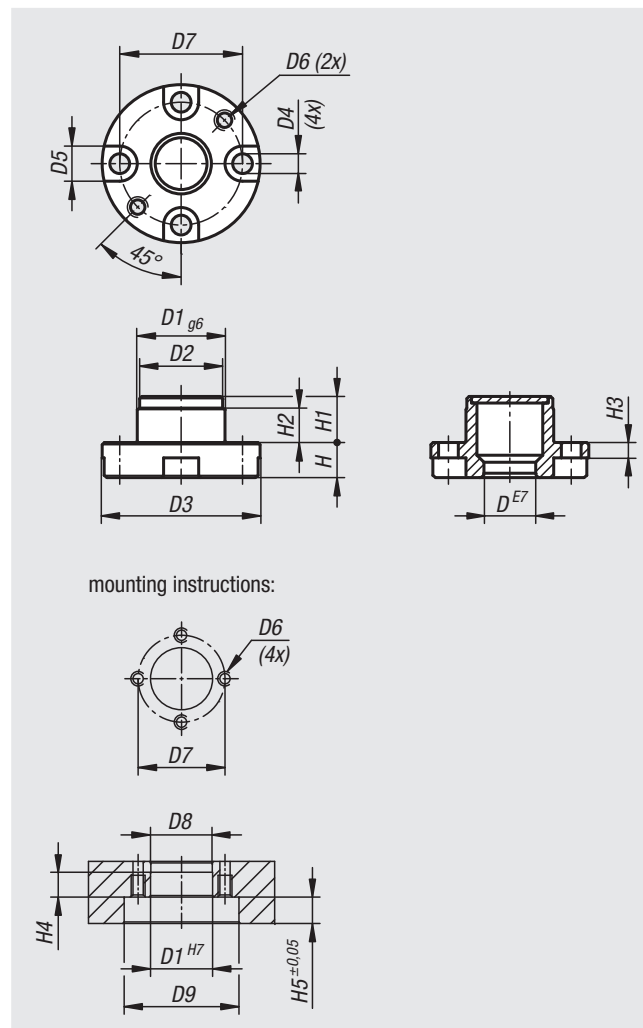
Sample order:

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.



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

Machinable collets, square


Material:

Body EN AC-51400.

Wedges high-carbon steel.

Version:

Body natural colour anodised.

Wedges black oxidised.

Sample order:

nIm 03163-32040

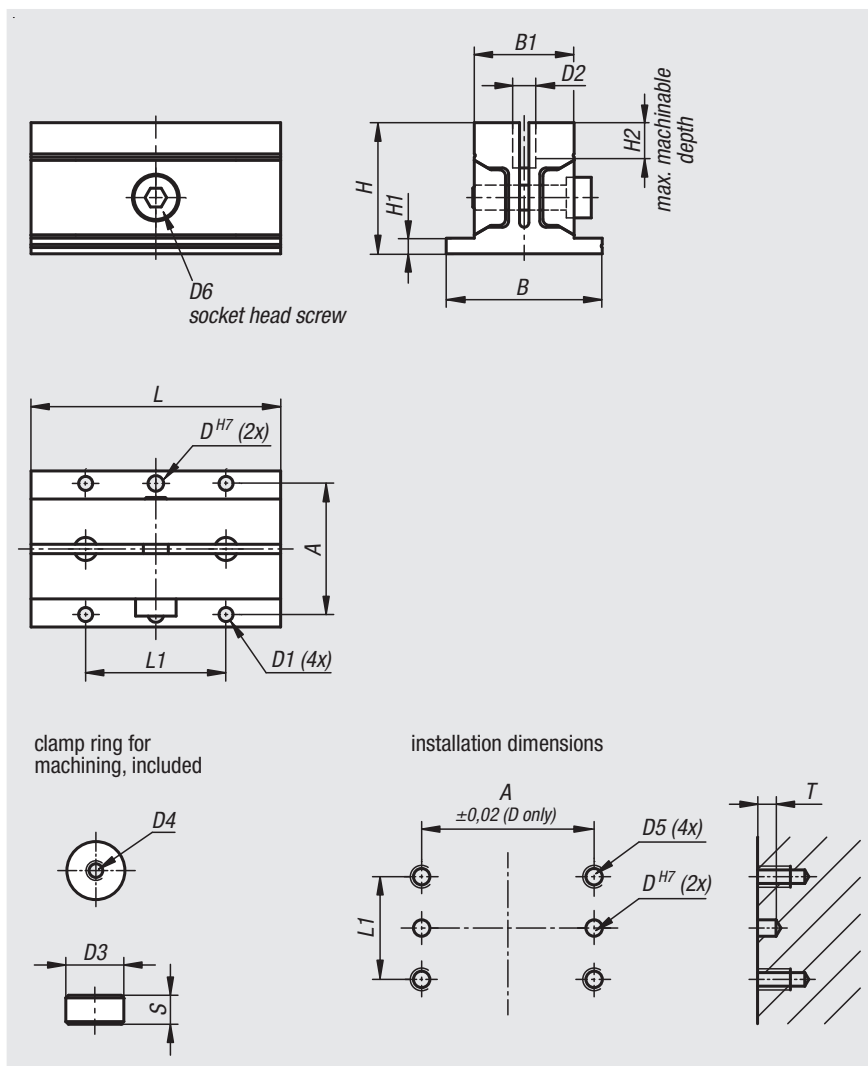
Note:

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.



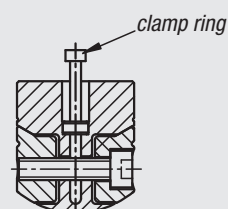
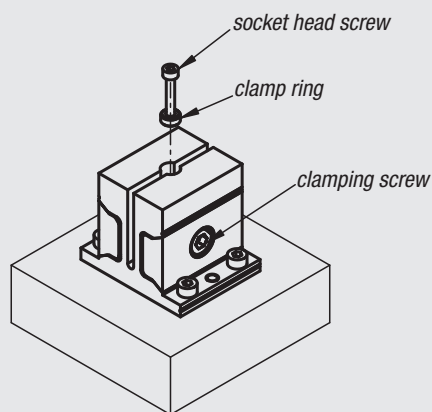
Order No.	A	B	B1	D	D1	D2	D3	D4	D5	D6	H	H1	H2	L	L1	S	T	Clamping force N	Tightening torque Nm
03163-32040	42	50	32	5	4,5	7,4	7	M3x0,5	M4x0,7	M6	42	5	10	40	25	3,5	5	2500	7,5
03163-32080	42	50	32	5	4,5	7,7	7	M3x0,5	M4x0,7	M8	42	5	10	80	45	3,5	5	2500	14
03163-50050	62	72	50	6	5,5	11,4	11	M3x0,5	M5x0,8	M10	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)

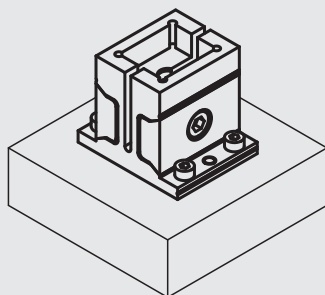


Note:

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.

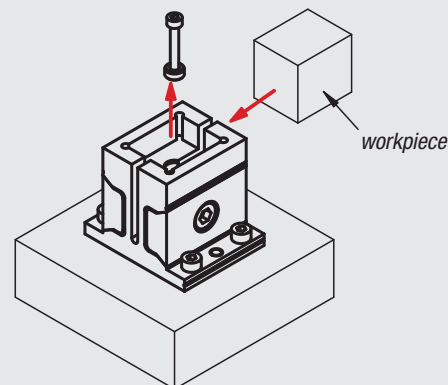


Note:

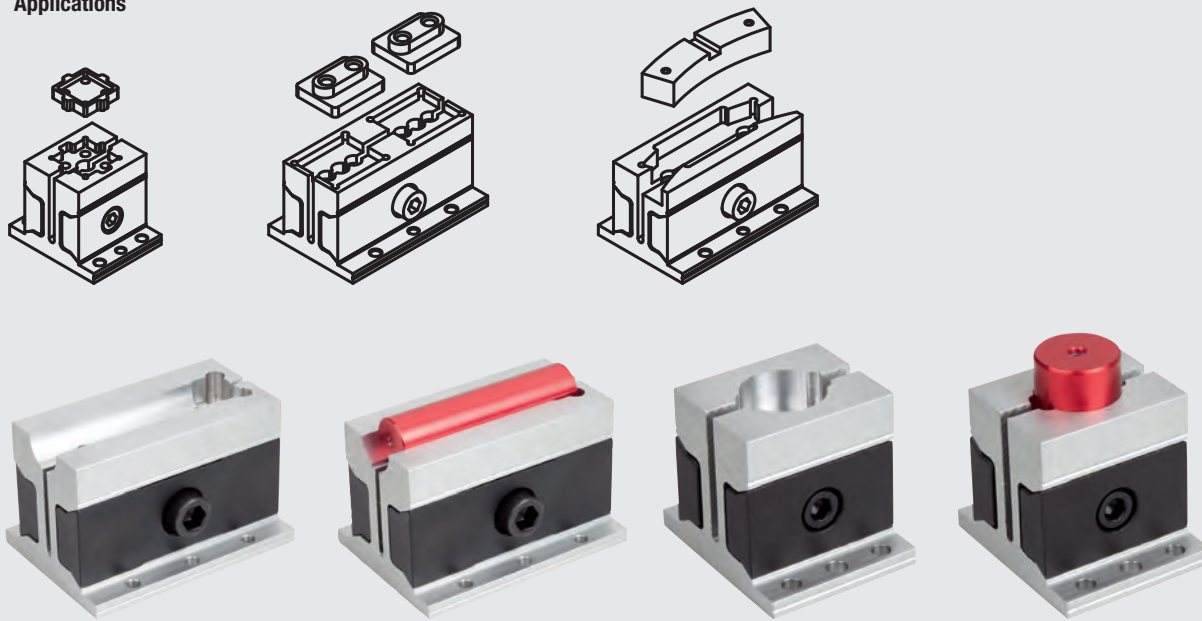
The contour should not be deeper than the max. permitted depth.

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



Centring clamps

round



Material:
Carbon steel.

Version:
Hardened (33–39 HRC) and black oxidised.

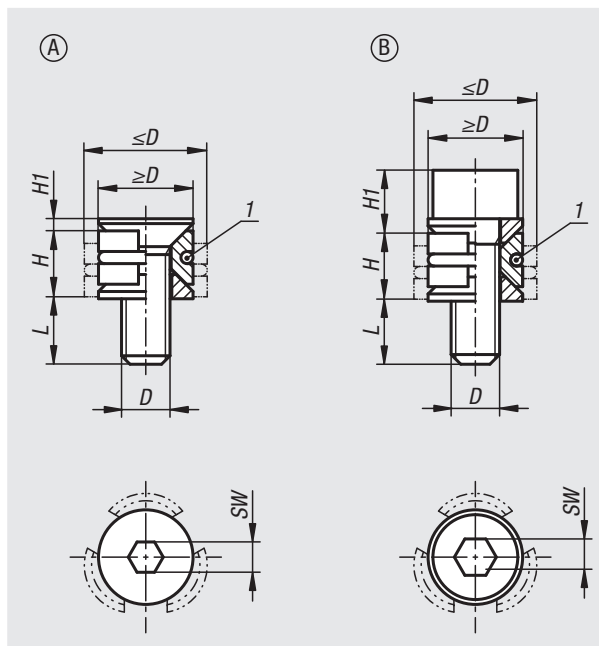
Sample order:
nlm 03164-10804

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 $\geq D$.
Dimension L refers to the length at $\leq D$

1) O-ring



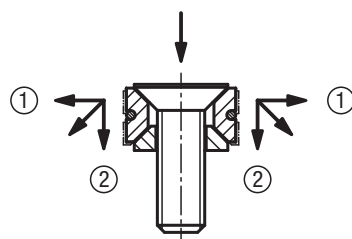
Order No.	Form	D	D min.	D max.	H	H1	L	SW	Clamping force max. kN	Tightening torque Nm
03164-10804	A	M4x12	8	10,3	5,5	0,9	7,3	2,5	0,9	2,1
03164-11005	A	M5X15	10	12,3	6,4	1,1	9,1	3	1,5	4,3
03164-11206	A	M6X18	12	16,3	8,6	1,3	11,2	4	2,1	7,3
03164-11608	A	M8X25	16	22	11,5	1,6	16,2	5	4	18
03164-20804	B	M4x12	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

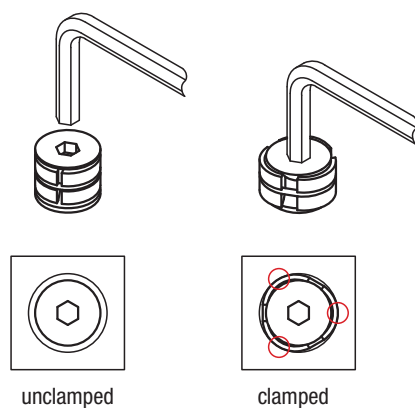
Technical information:

- These clamps grip the inside diameter of a workpiece.
- The wedge shape enables high clamping forces on the workpiece.

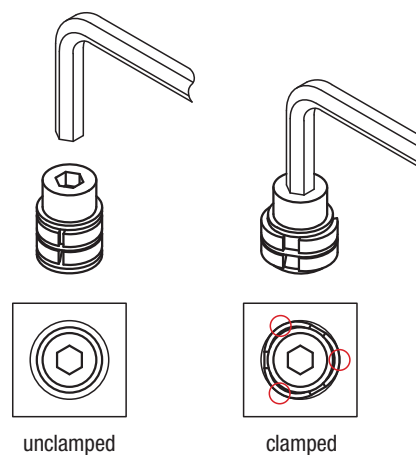


- (Jaws exert positive down force)
- ① Horizontal thrust against workpiece
 - ② Vertical thrust prevents the workpiece lifting

Form A:

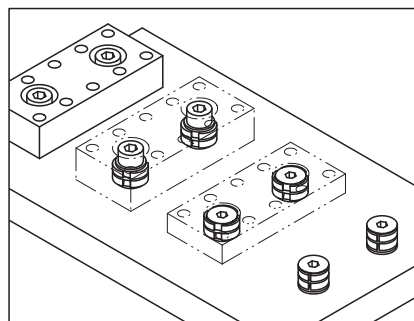


Form B:

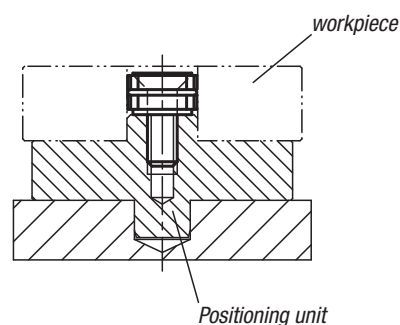


Note:

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.



Centring clamps


Material:

Body steel.
Bushes carbon steel.

Version:

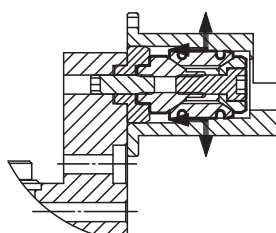
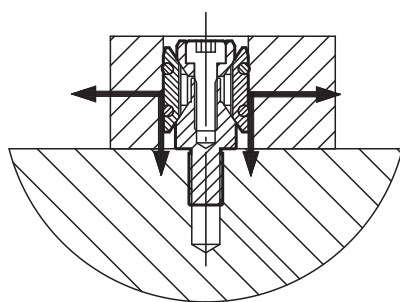
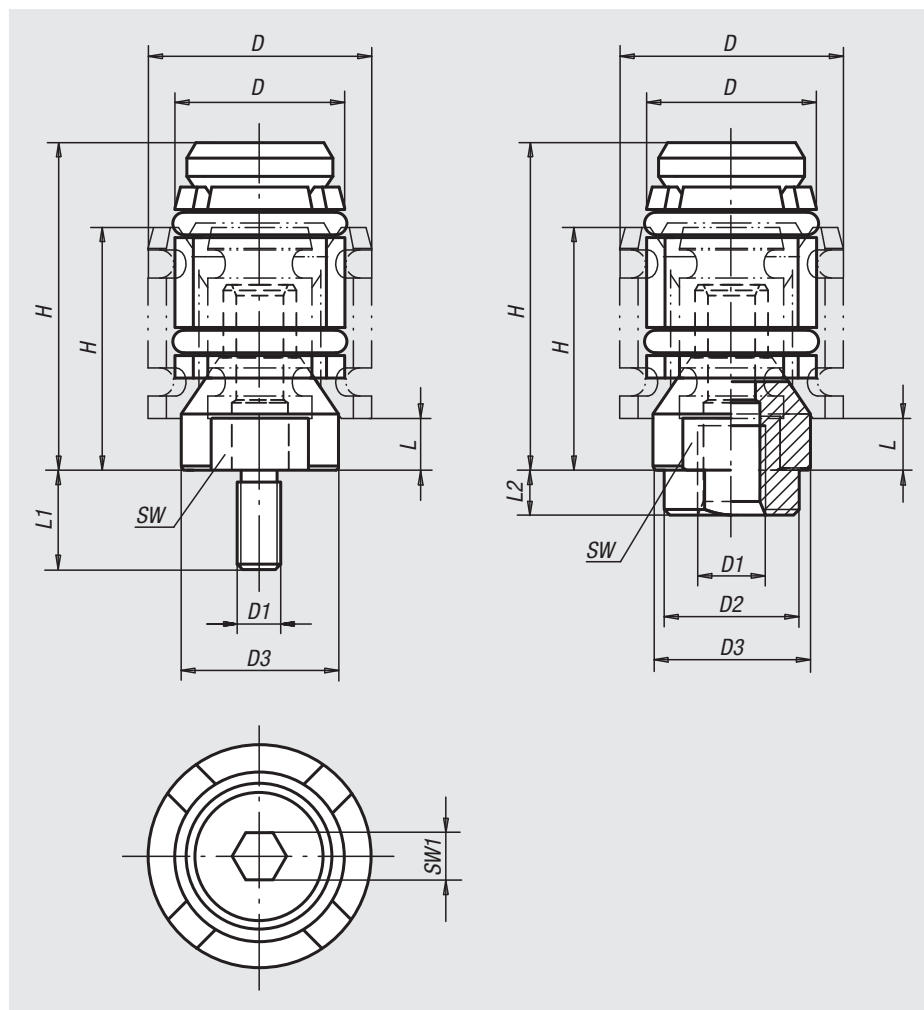
Black oxidised.

Sample order:

nln 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:

nIm 03167-065

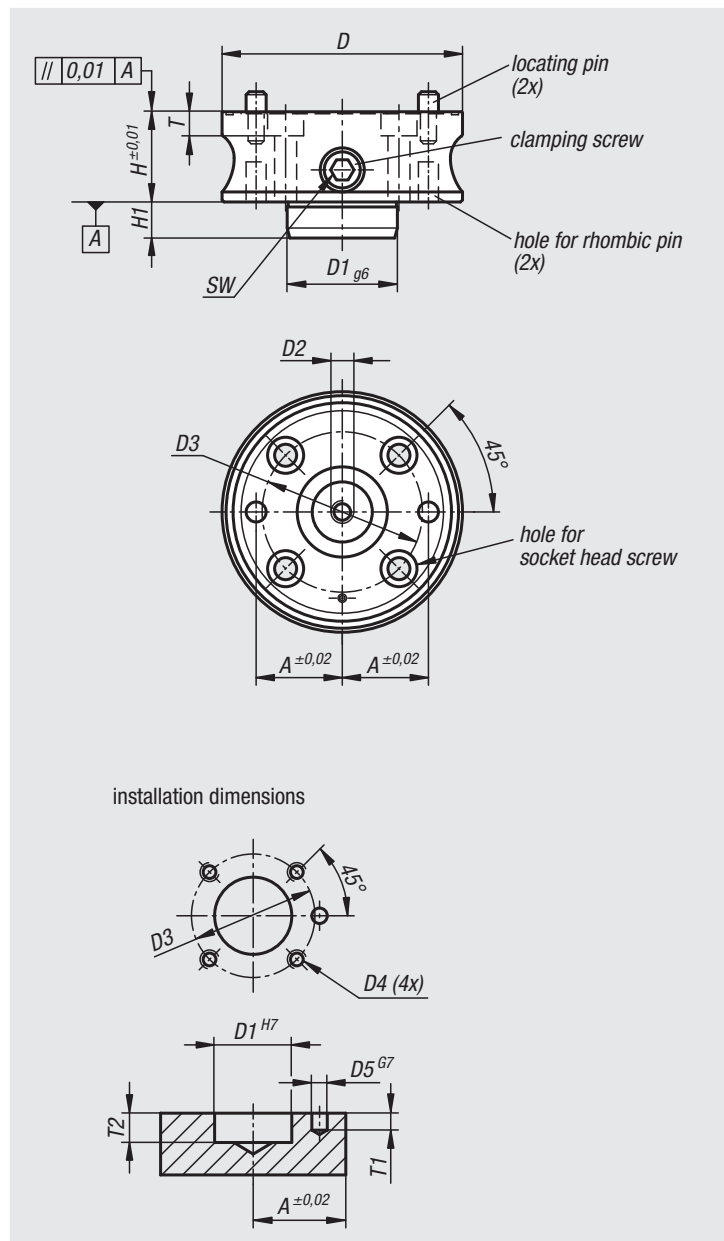
Note:

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.

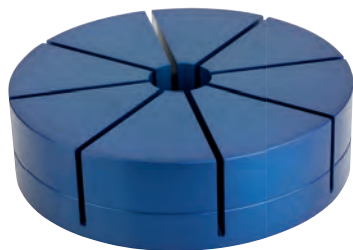
The collet is positioned on the adaptor with 2 dowel pins.



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

Collet

for external clamping


Material:

High-strength aluminium alloy

Version:

blue anodised.

Sample order:

nIm 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.

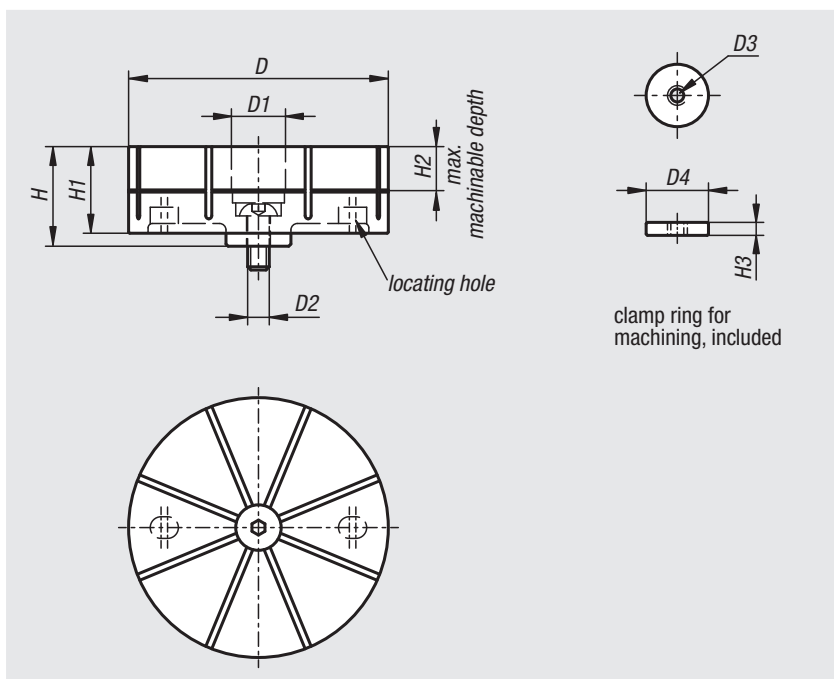
The collet mechanism enables a secure clamping of the workpiece.

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

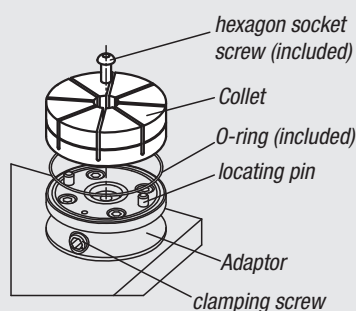
for external clamping

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 underside of the collet. Secure the collet using a buttonhead hex socket screw.

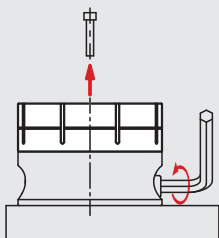
Note:

Before mounting the collet, ensure the cam cylinder is fully loosened by turning the tightening screw clockwise until it stops.



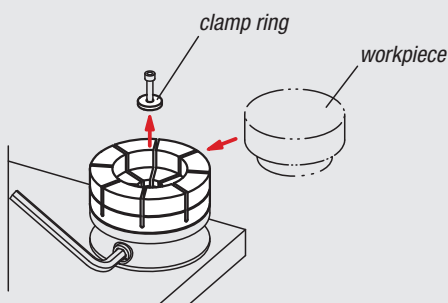
2.2

Tighten the cam cylinder to clamp the clamp ring (recommended torque: 15Nm).
Remove the screw from the clamp ring before machining.



3. Mounting workpiece:

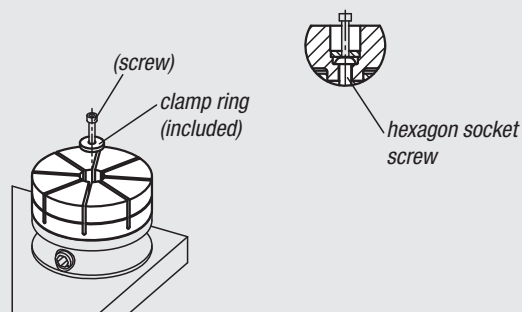
- Loosen the cam cylinder and remove the clamp ring.
- Place the workpiece in the contour and re-tighten the cam cylinder.



2. Machining collet:

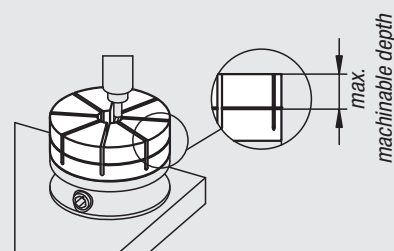
2.1

Place the clamp ring in the centre of the collet.
(Use a screw as an insertion aid)



2.3

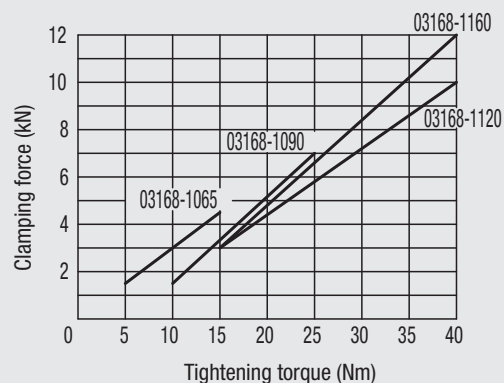
Machine the contour of the part that is to be held into the collet.



Note:

Do not machine the contour deeper than the permitted depth.

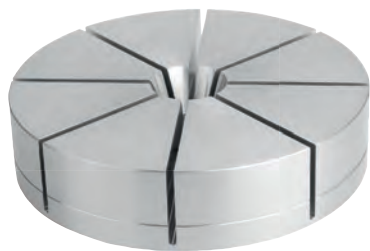
Performance curve



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:

nIm 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.

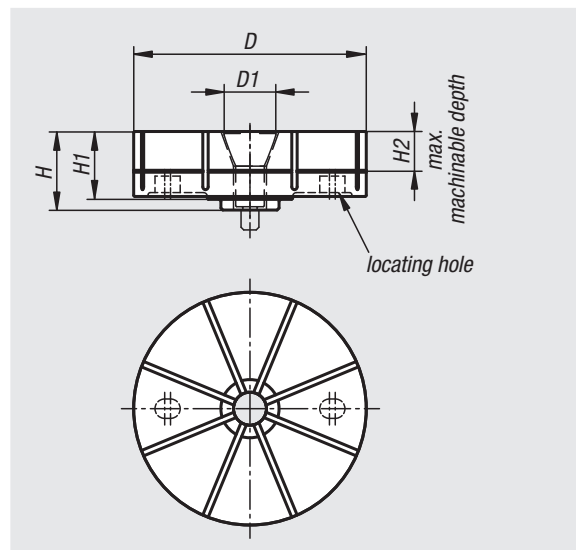
Clamping travel per collet segment (8x) max. 0.15 mm.

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

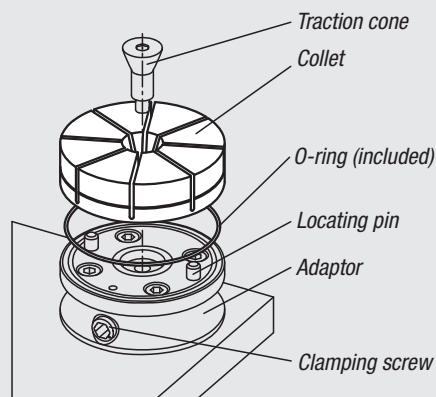
for internal clamping

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 underside of the collet.
- Secure the collet using a tapered screw.

Note:

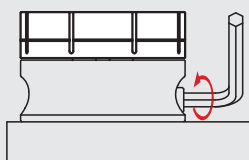
Before mounting the collet, ensure the cam cylinder is fully loosened by turning the tightening screw clockwise until it stops.



2. Machining collet:

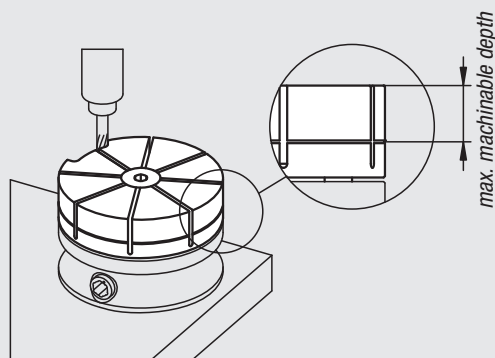
2.1

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.



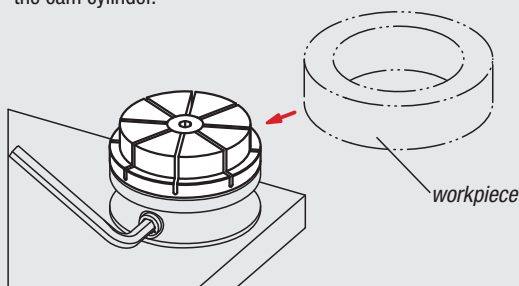
2.2

Machine the contour of the part that is to be held into the collet.

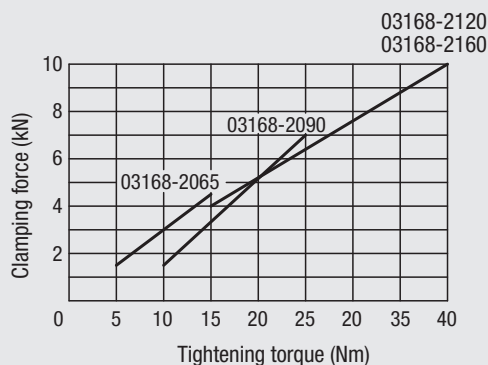


3. Mounting workpiece:

- Loosen the cam cylinder and remove the clamp ring.
- Place the workpiece in the contour and re-tighten the cam cylinder.

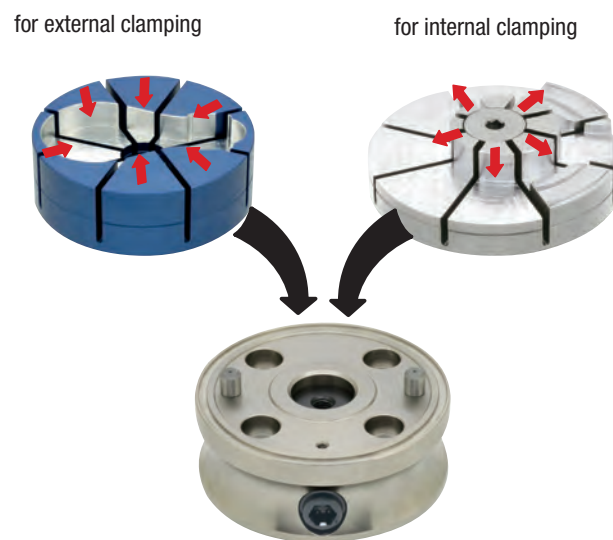


Performance curve

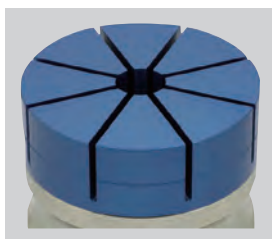


To avoid damaging the collet do not tighten the clamp without a workpiece or clamp ring.
Observe the maximum tightening torque in the table.

Technical information for collets



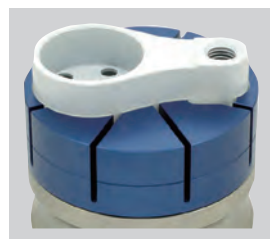
for external clamping



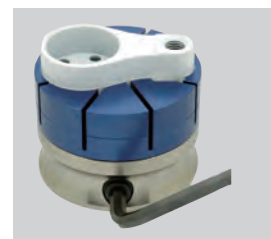
1. Prepare collet



2. Machine collet



3. Position workpiece

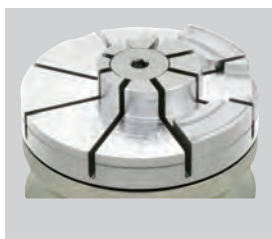


4. Tighten cam cylinder

for internal clamping



1. Prepare collet



2. Machine collet



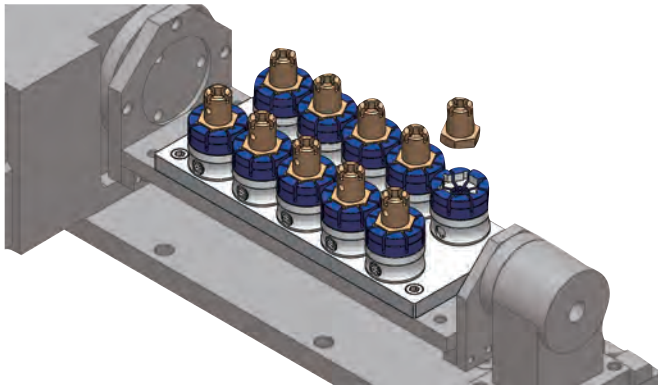
3. Position workpiece



4. Tighten cam cylinder

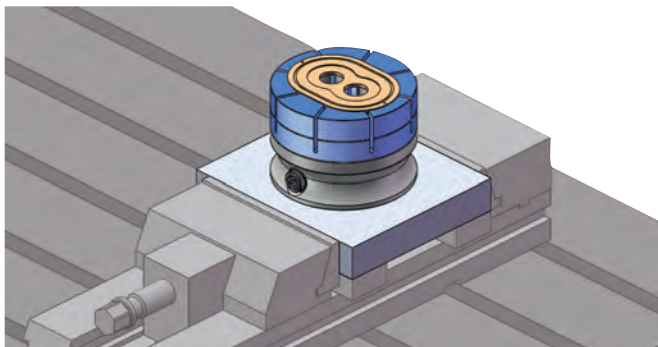
Technical information for collets

Series clamping



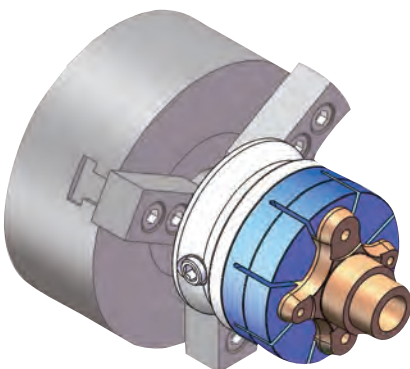
Small OD allows clamping in series with a limited space.

Fixture for individual parts



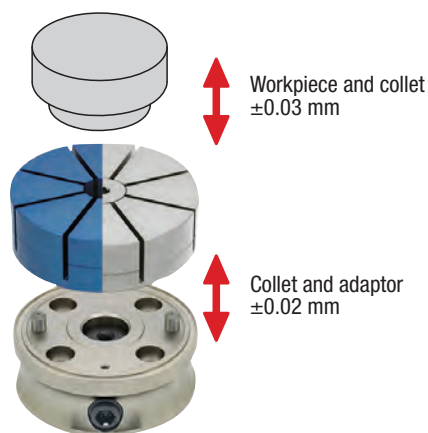
Clamp in a vice by mounting on a plate.

Fixture for lathe chuck

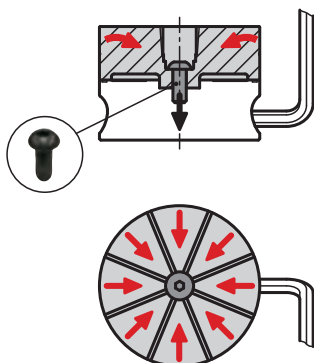


Can hold complex forms which are impossible for a 3 jaw chuck.

Technical information for collets



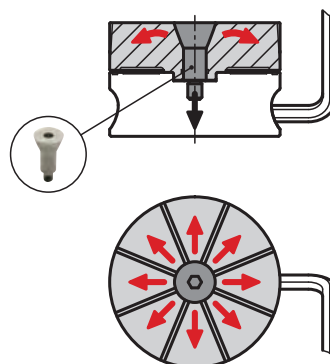
Force effect:



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.



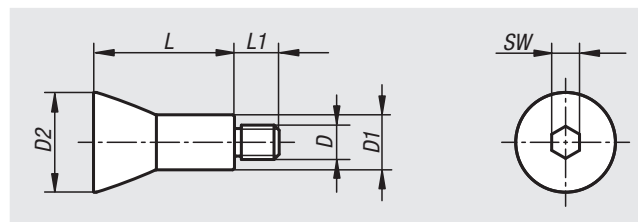
Collet segment travel: 0.3mm in diameter

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:

nIm 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

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.

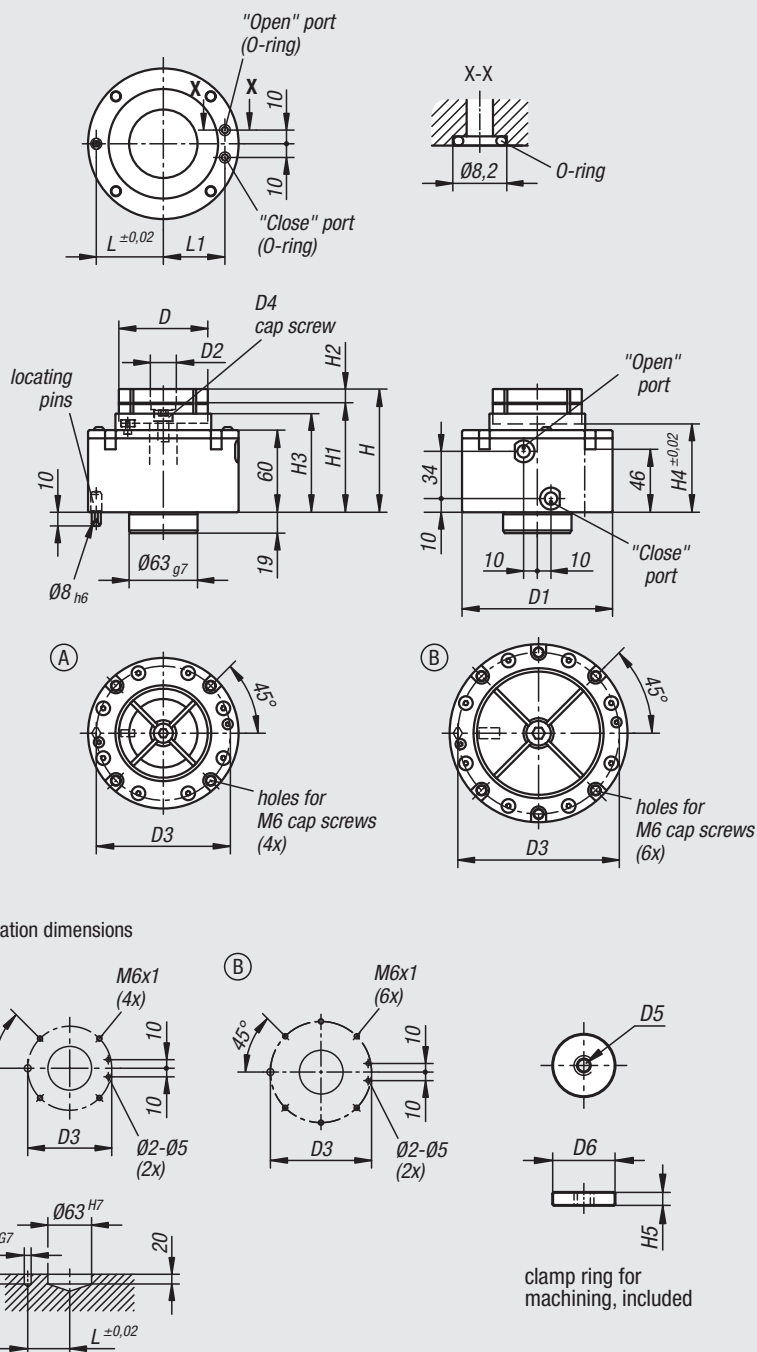
Accessories:

Clamping ring for machining the contour.

O-ring.

Locating pin.

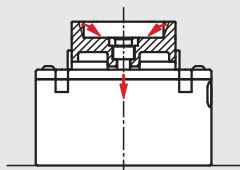
Clamping screw for collet.



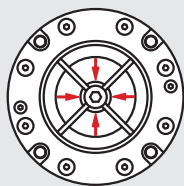
Order No.	Form	D	D1	D2	D3	D4	D5	D6	H	H1	H2	H3	H4	H5	L	L1	Operating pressure MPa	Clamping force N
03178-10-1065090	A	65	110	19	98	M8	M4	18	90	80	10	72	65	4	49	45	0,5	4000
03178-10-1090100	B	90	130	23	118	M10	M5	22	100	85	15	74	66	6	59	55	0,5	6000

Machinable collets

pneumatic

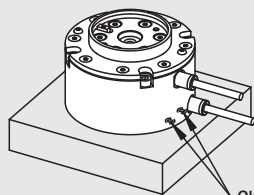


Applying compressed air draws the cylinder down.
The 4 clamping segments move inwards and clamp the workpiece.



Using the side ports:

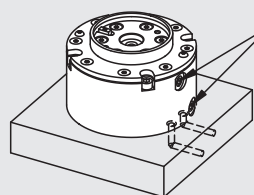
- Seal the lower ports with the O-rings provided.
- Check that no air escaping from here.



Check that the lower ports are sealed.

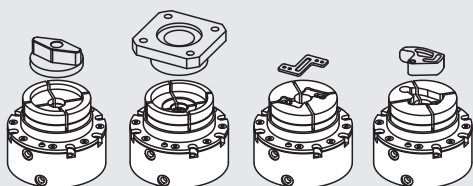
Using the lower ports:

- Fit the O-rings provided into the lower ports.
- The side ports must be closed.



Seal the air connections and check them for tightness.

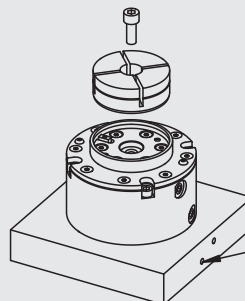
Different workpiece shapes can be machined into the collets.



Mounting the collet:

When mounting the collet, make sure that air is connected to the "open" connection.

The cylinder and fastening screw are loose.

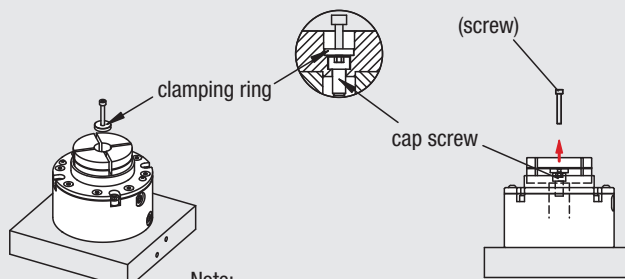


Note:
Connect air to the "open" port

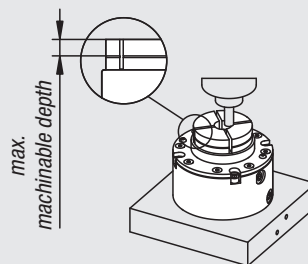
Machine the collet:

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.



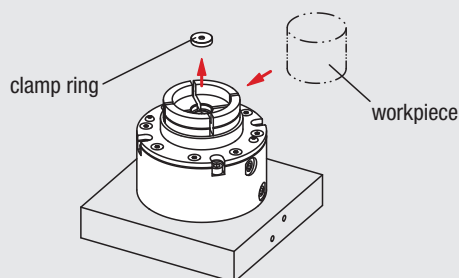
Clamp the collet over the "close" port.

Machine the collet to suit to the workpiece shape.

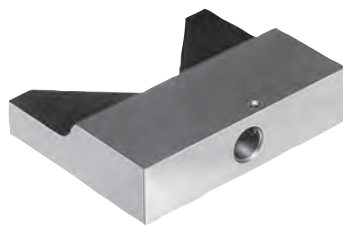
Clamp the workpiece:

After machining the collet, remove the clamping ring.

Insert the workpiece and apply air to the "close" port to clamp it.



Centring V-plate

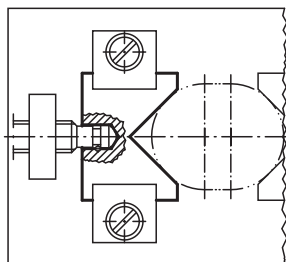
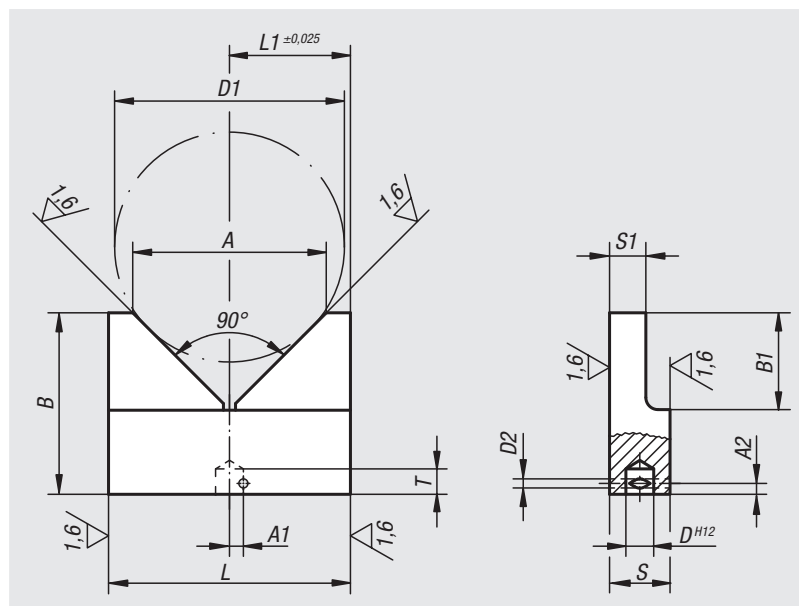


Material:
Carbon steel 1.1181.

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

Indexing plungers - Precision

with tapered pin


Material:

Steel.

Grip ball thermoplastic.

Version:

Hardened and ground.

Grip ball black grey.

Sample order:

nIm 03182-020

Note:

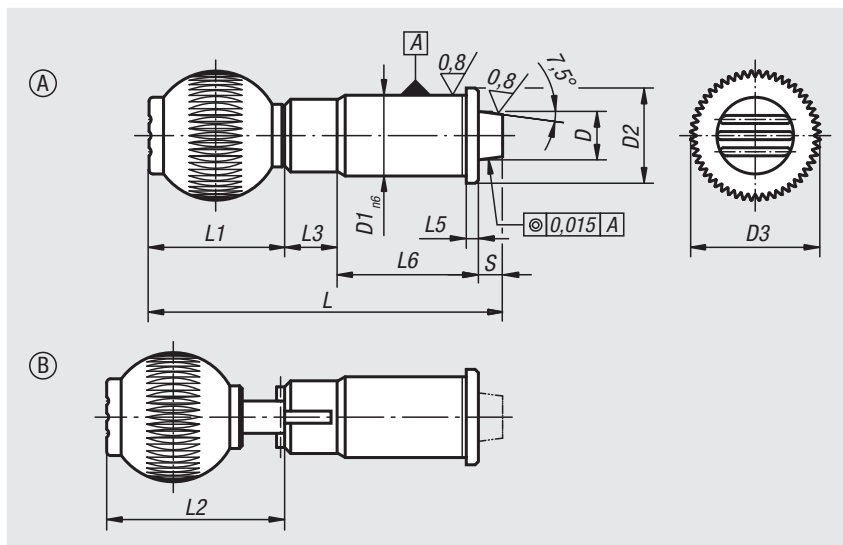
The indexing plungers with bushes are a perfect combination for rapid positioning and fixating. The precise design of both the indexing plunger and the bush guarantees high repeat accuracy when assembling two elements.

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:

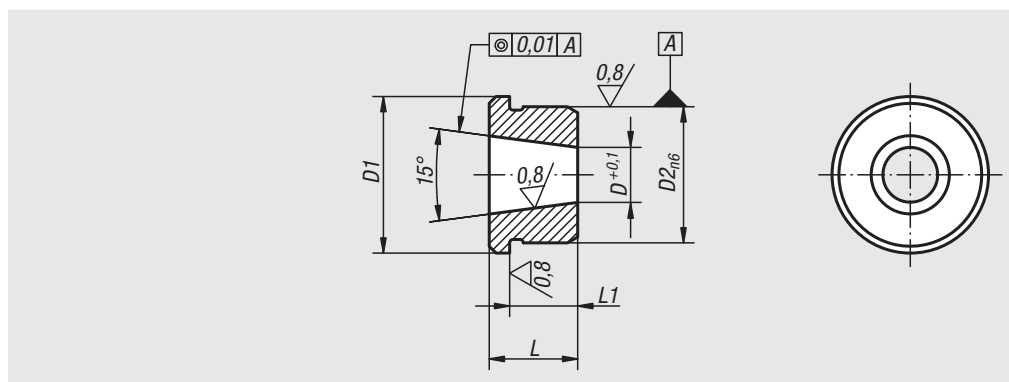
Hardened and ground.

Sample order:

nIm 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

Indexing plungers - Precision

with cylindrical pin

Material:

Steel.
Grip ball thermoplastic.

Version:

Hardened and ground.
Grip ball black grey.

Sample order:

nIm 03186-020

Note:

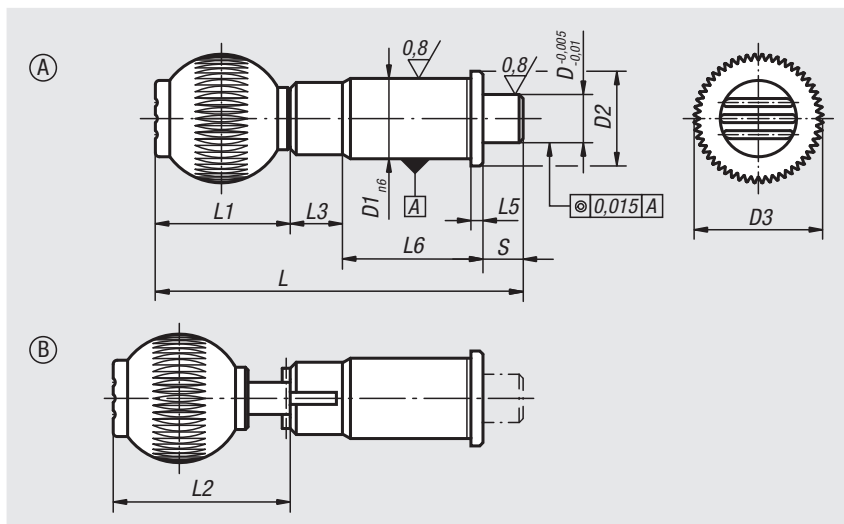
The indexing plungers with bushes are a perfect combination for rapid positioning and fixing. The precise design of both the indexing plungers and the bush guarantees high repeating accuracy when assembling two elements.

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:

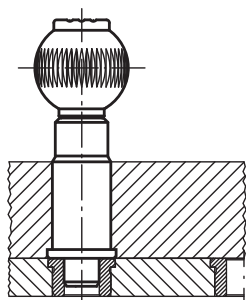
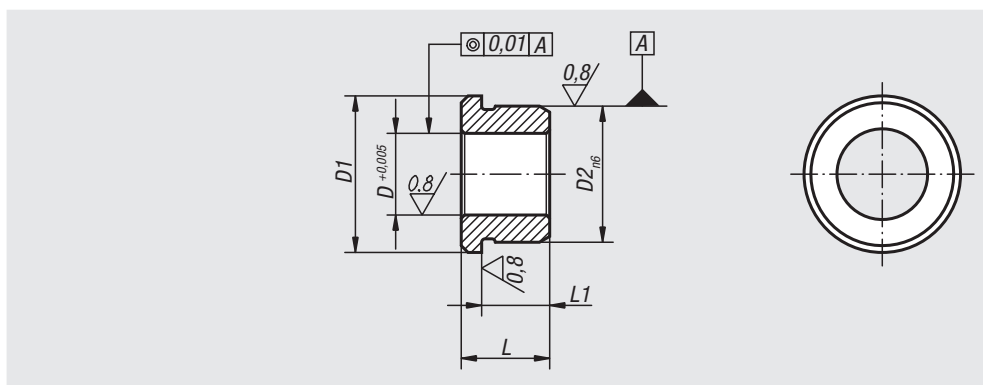
Hardened and ground.

Sample order:

nIm 03188-20

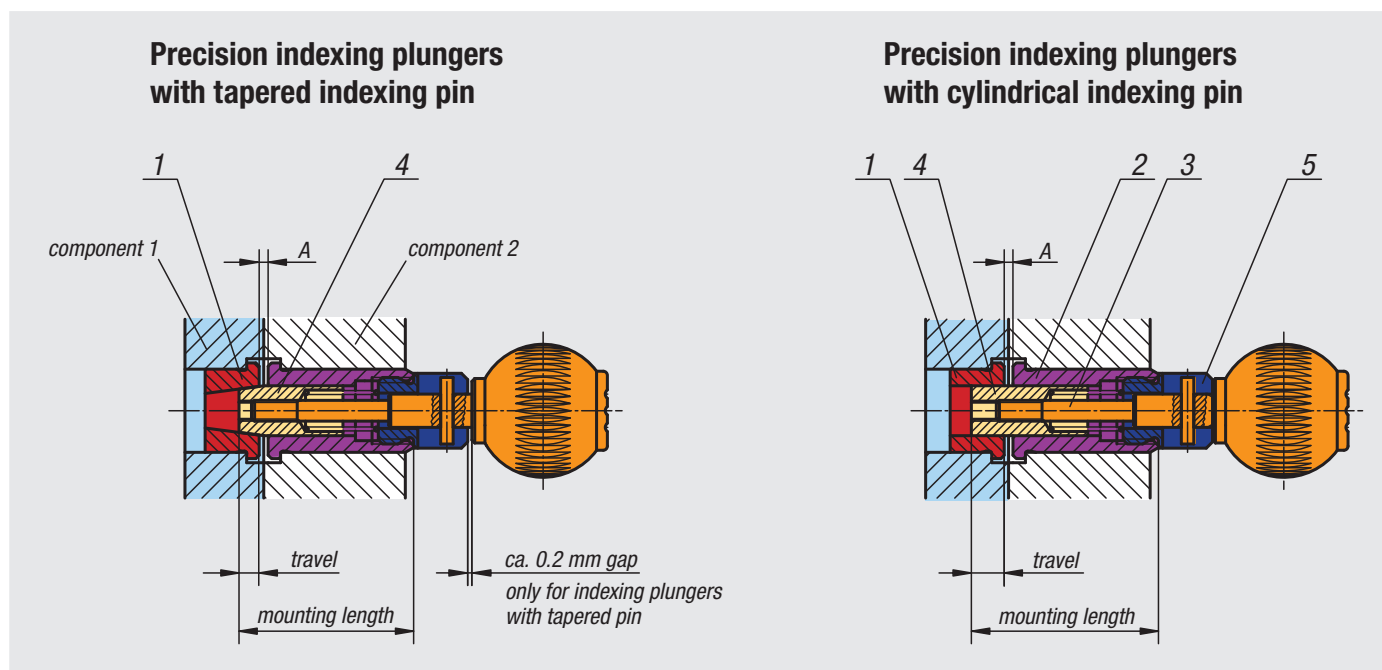
Note:

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



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.



Indexing plunger

with five lobe grip



Material:

Thermoplastic.
Indexing pin and screw steel 5.8.

Version:

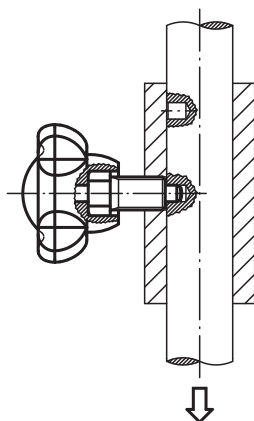
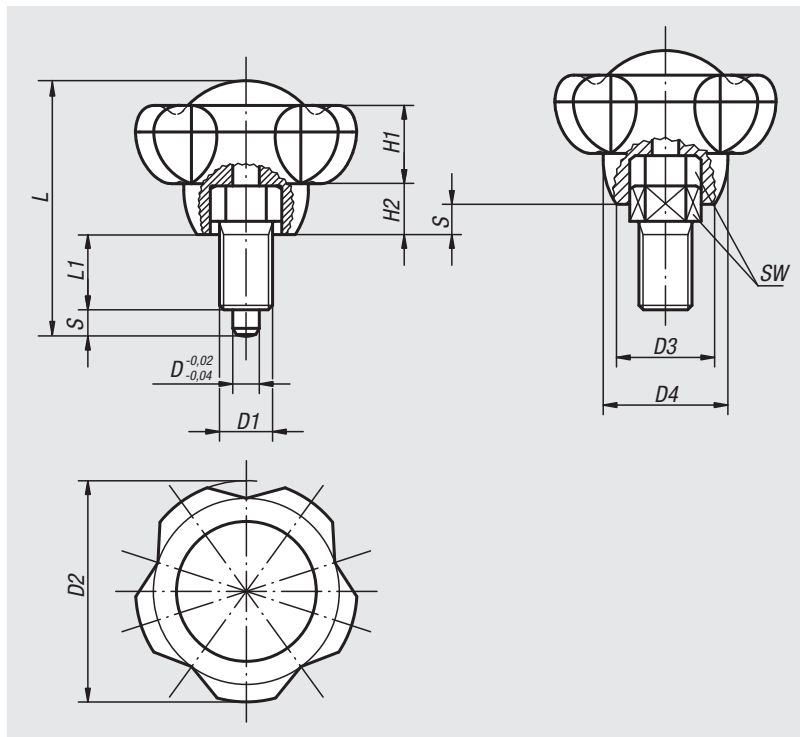
Lower grip black-grey.
Indexing pin and screw black oxidised.
Indexing pin hardened and ground.

Sample order:

nln 03190-11056 (cap colour traffic red)

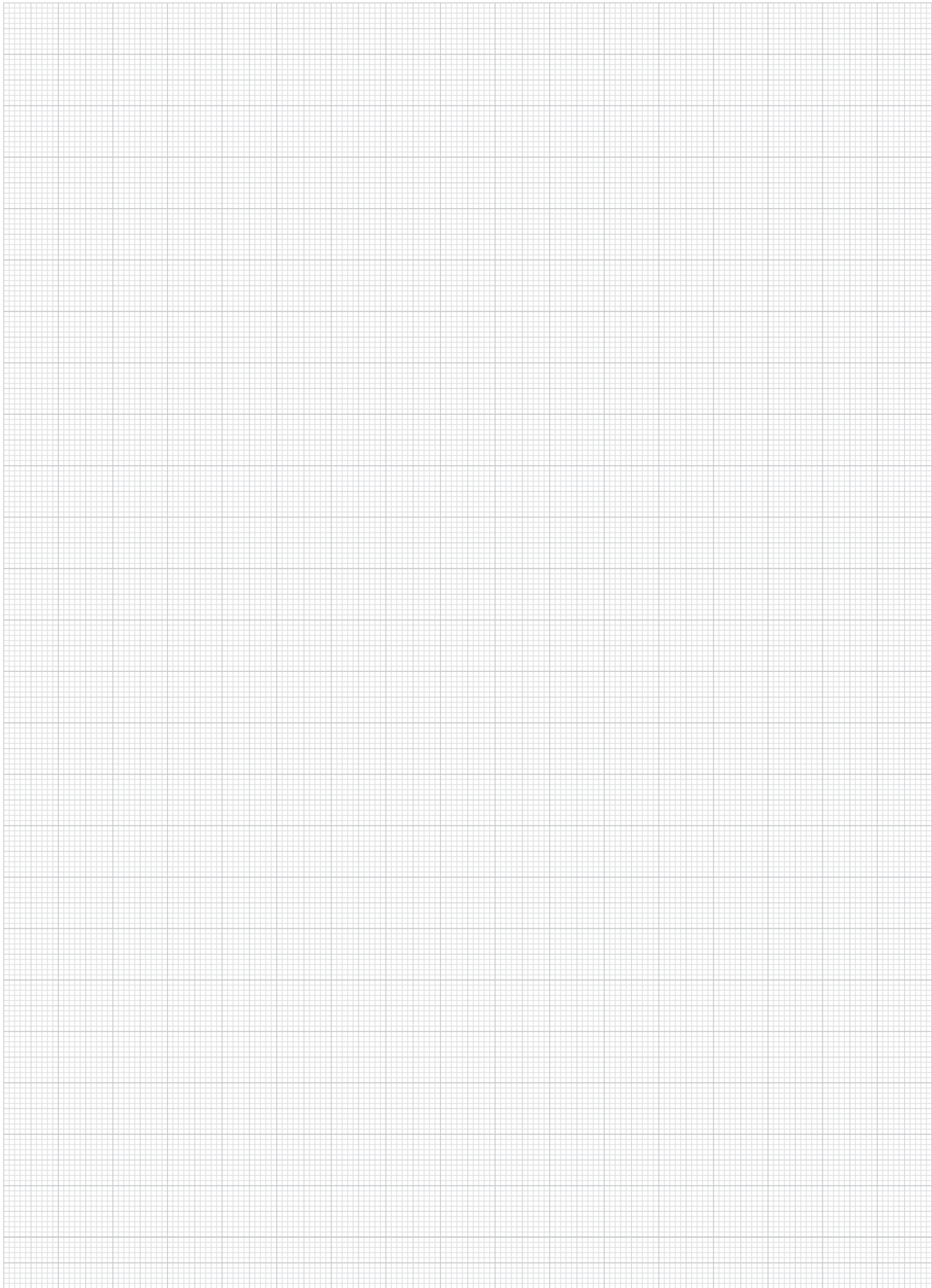
Note:

Δ Add the desired cap colour here.
No colour code is required for black grey caps.



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



01000

02000

03000

04000

05000

06000

07000

08000

09000

10000

12000

14000

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:

nIm 03190-10-108040

Advantages:

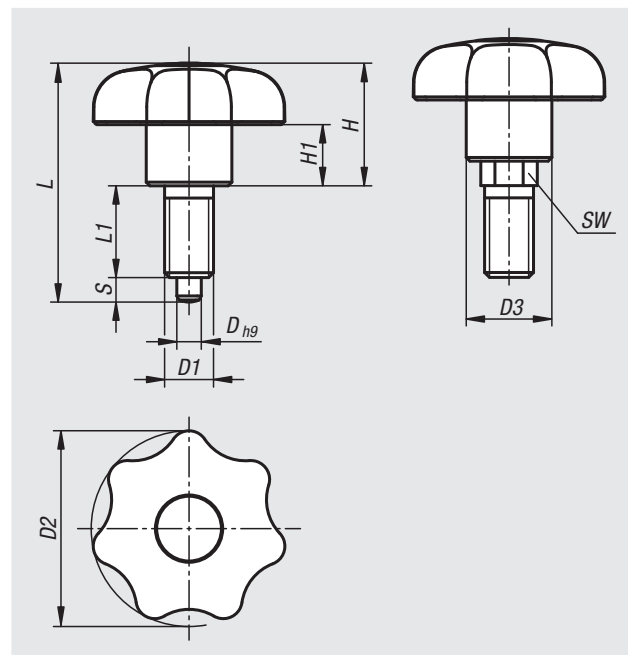
Indexing and clamping with one product.
Ergonomic operation via star grip.

On request:

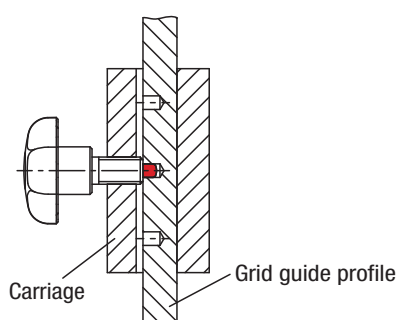
Special versions.

Accessories:

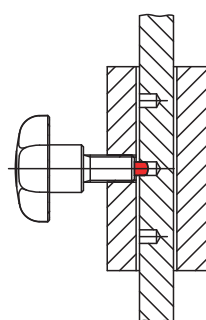
Hexagon nuts thin DIN 439



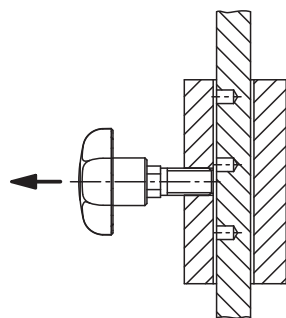
Indexing and clamping grip



- 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:

nIm 03191-108040

Advantages:

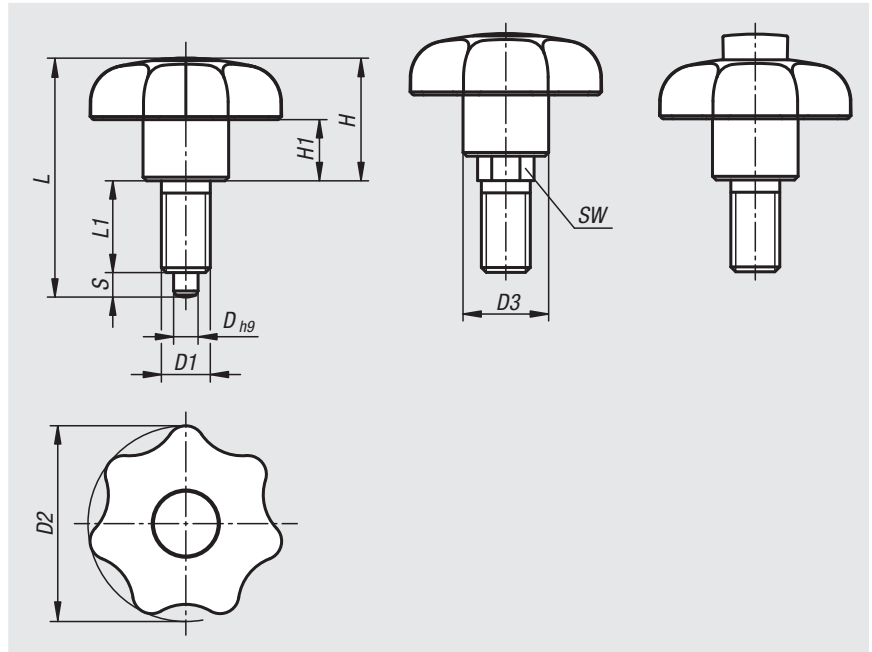
Optical indication of the engagement function.
Indexing and clamping with one product.
Ergonomic operation via star grip.

On request:

Special versions.

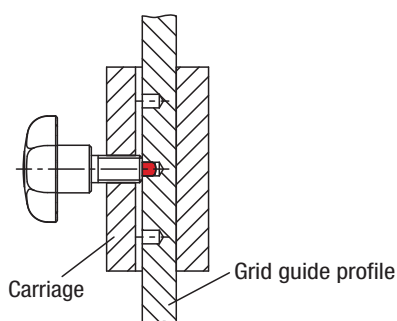
Accessories:

Hexagon nuts thin DIN 439

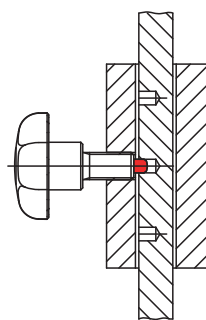


Indexing and clamping grip

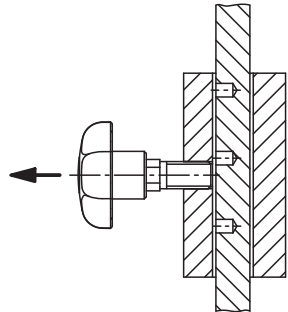
with optical locked indicator



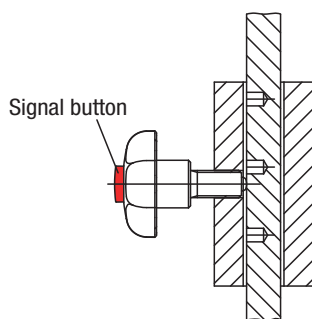
- Indexing pin engaged
- Grid guide profile clamped
- Locking slide system locked and clamped play-free with threaded sleeve



- 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:

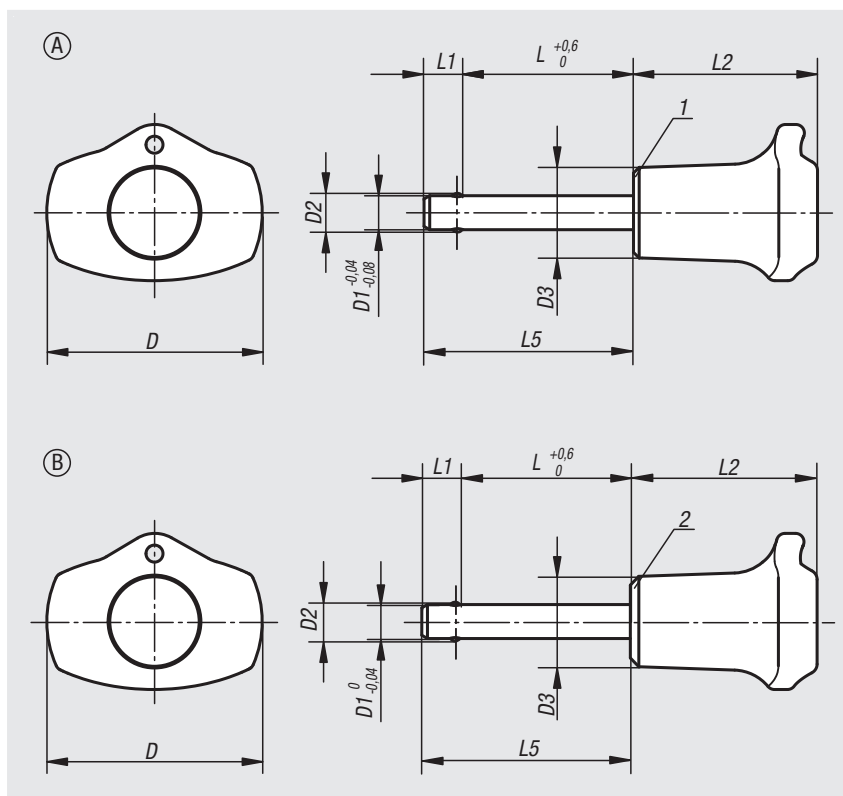
Pin h9, plastic collar, low axial pull-out force

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

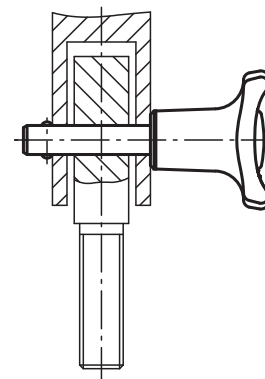


Accessories:

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

stainless steel



Material:

Metal parts stainless steel.

Version:

Bright.

Sample order:

nIm 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 · 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.

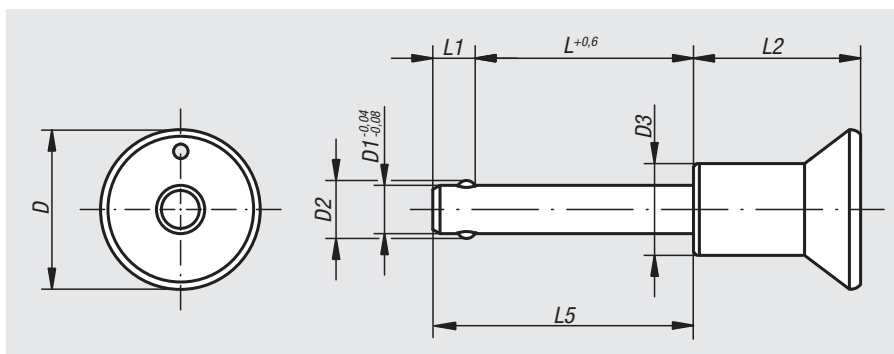
Accessories:

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	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	43,3/48,3/53,3/58,3/63,3/68,3/73,3/78,3/83,3/88,3/93,3	16	153

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) = $S \cdot \tau \cdot aB$ max.

The values given for the shear force are the theoretical breaking load.

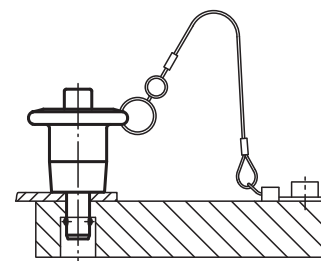
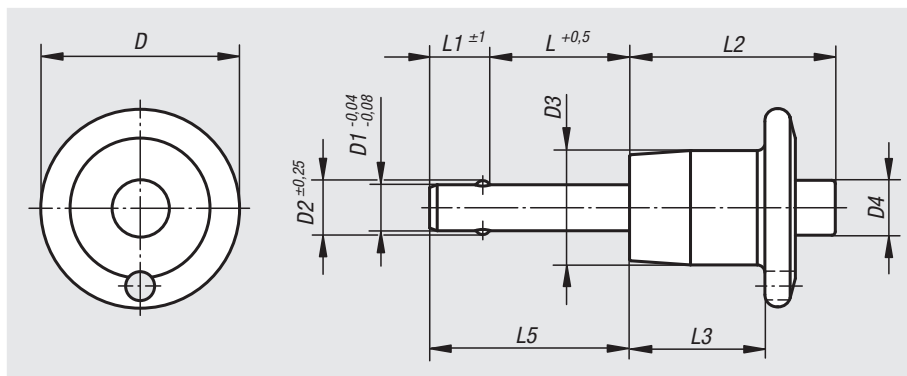
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

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:

nIm 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.

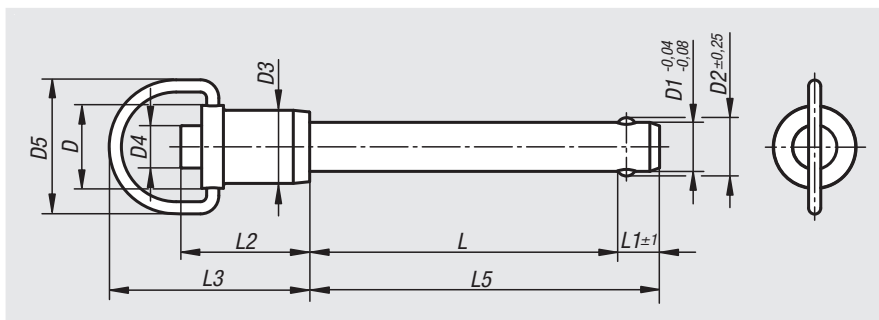
The hardened, high-tensile stainless steel pin permits extreme loads with low wear. Thanks to the high corrosion and acid resistance, they are mainly used in the foodstuff industry, in the chemical and petrochemical industry and as constructional elements in the aerospace industry.

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

Locking pins


Material:

Grip thermoplastic.
Steel parts stainless steel.

Version:

Grip black.
Stainless steel bright.

Sample order:

nIm 03195-2508020
(include length L, e.g. 020 for L = 20 mm)

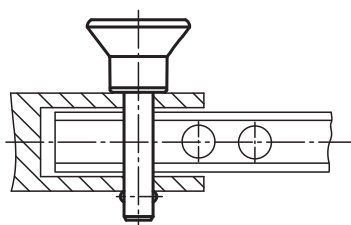
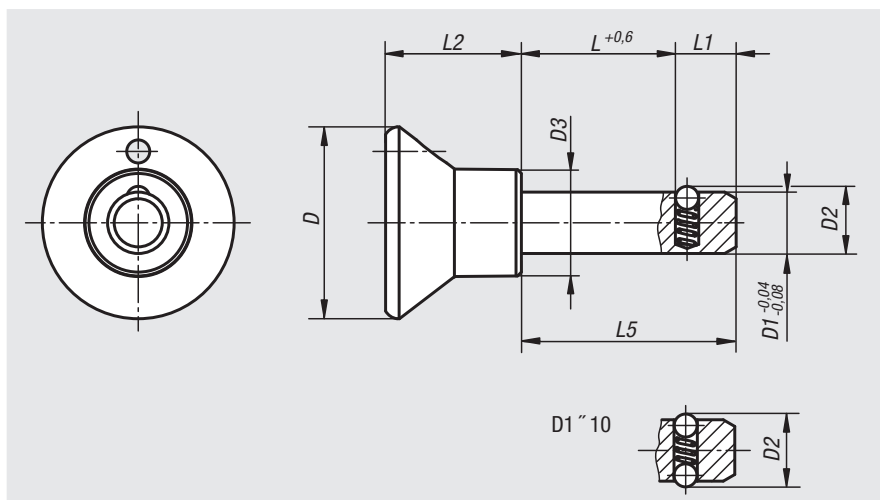
Note:

Locking pins are used for quick and easy fixating
and joining of parts and workpieces.

Shearing force double-shear (F) = $S \cdot \tau$ 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:

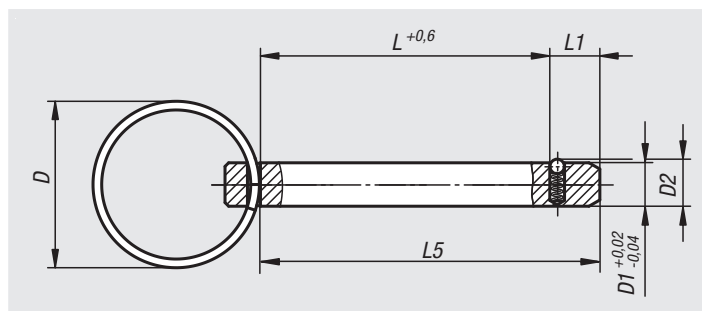
nIm 03195-102306015

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

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:

nIm 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.

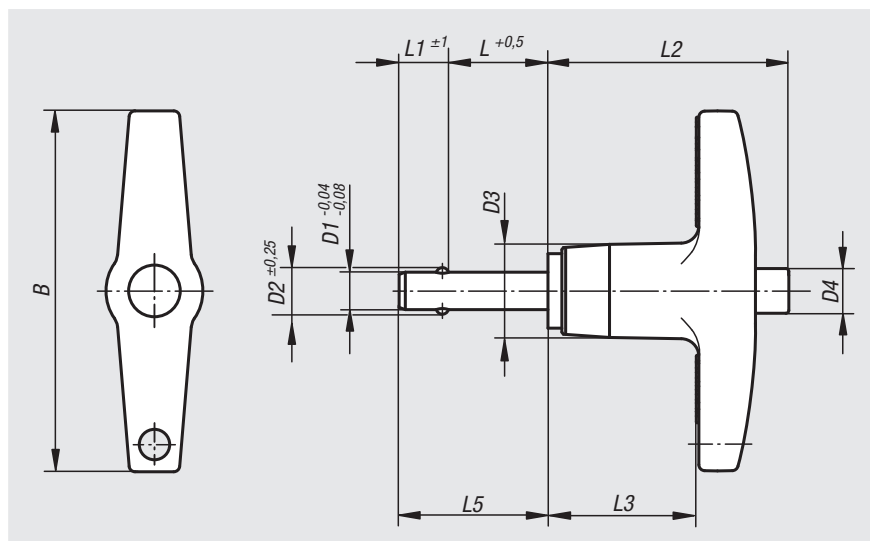
The hardened, high-tensile stainless steel pin permits extreme loads with low wear.

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.

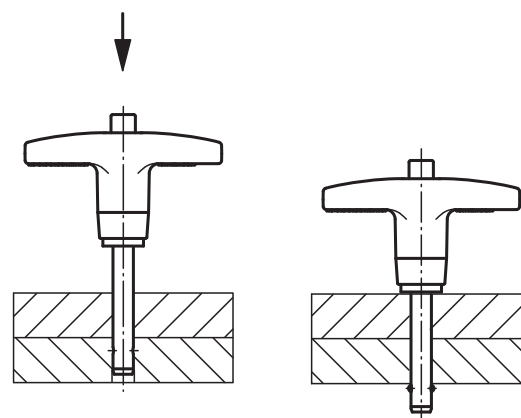
The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

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:

nIm 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.

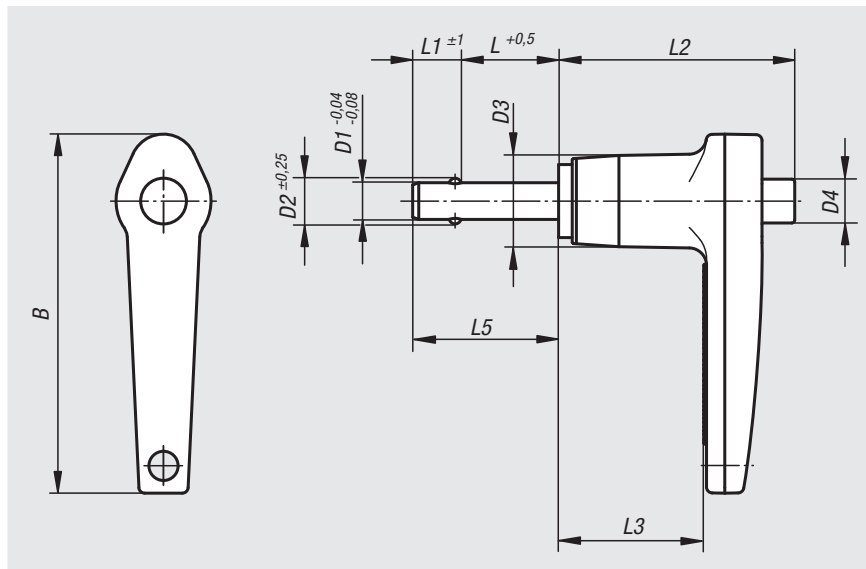
Shear force double shear (F) = S · τ aB max.

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.

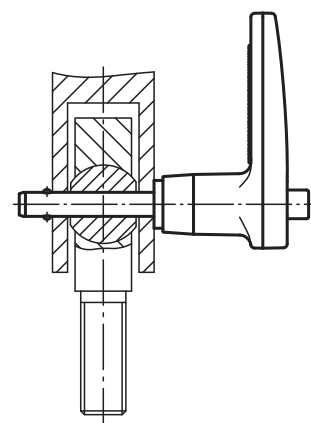
The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

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

Bushing for ball lock pins


Material:

Stainless steel 1.4305.

Version:

Bright.

Sample order:

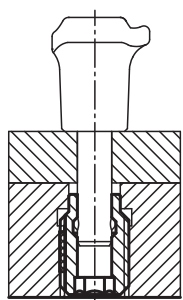
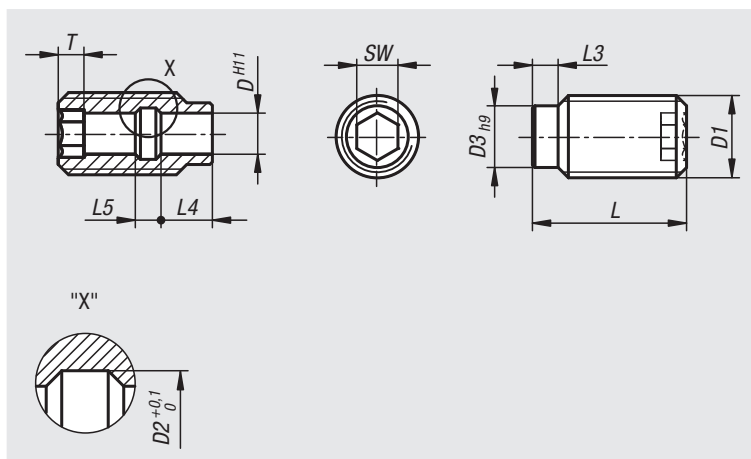
nlm 03197-11224

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:

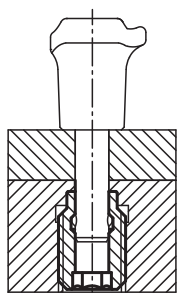
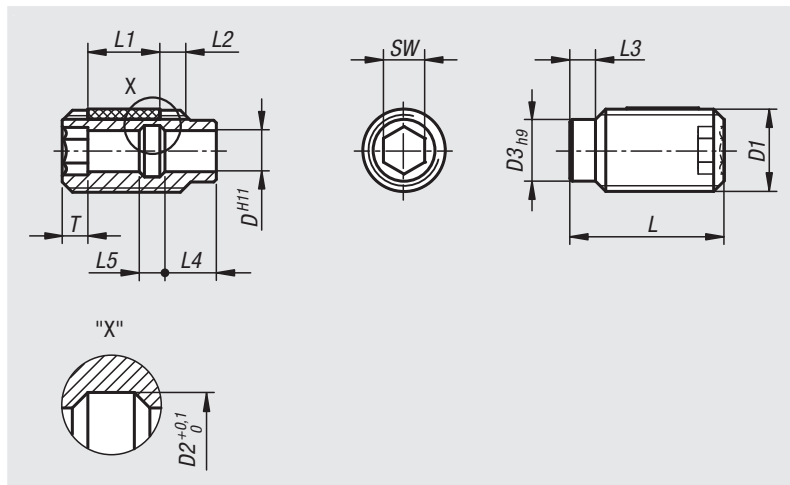
These bushes are ideal for easy and quick positioning of ball lock pins and locking pins.

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

Locating bushes with collar, stainless steel

for ball lock pins



Material:

Stainless steel 1.4305.

Version:

Bright.

Sample order:

nIm 03197-05-10512

Note:

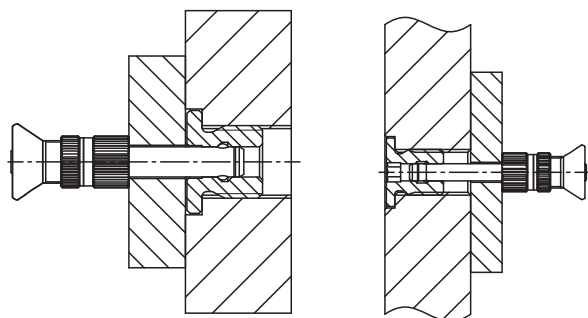
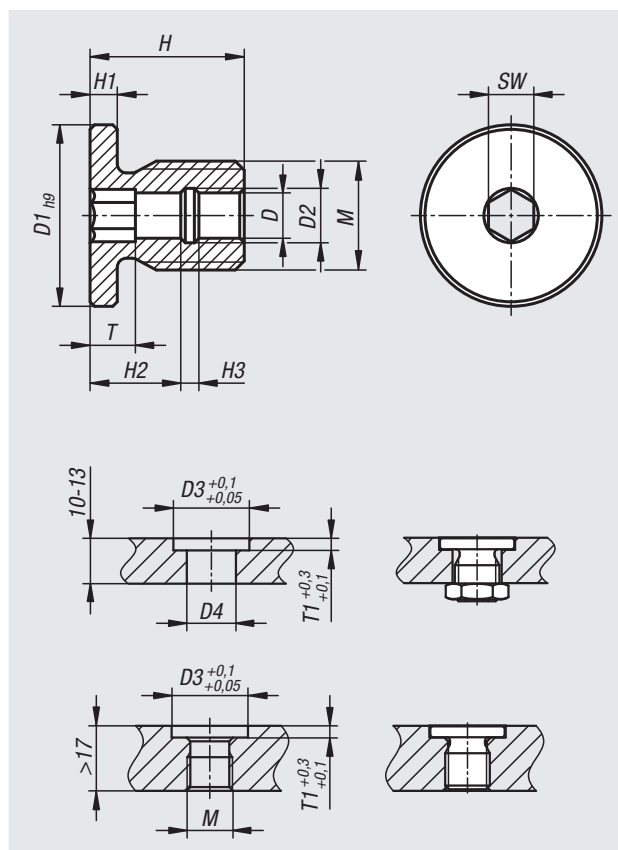
Locating bushes for ball lock pins are ideal for easy and quick positioning of ball lock pins and locking pins.

The collar serves as a stop at one end.

With hex socket to help screw in.

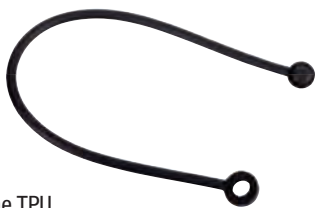
Advantages:

- 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

Safety cable



Material:
Thermoplastic urethane TPU.

Sample order:
nlm 03198-04190

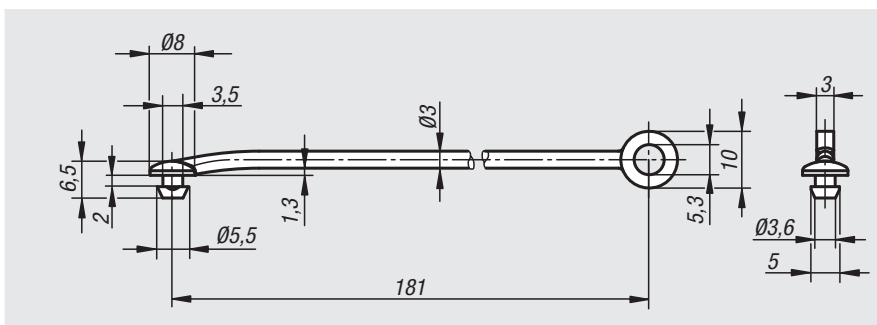
Note:
The safety cable is distinguished by its high elongation and good rebound resilience.

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 $\varnothing 3.8_{-0,1}$. 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

Safety spiral cable

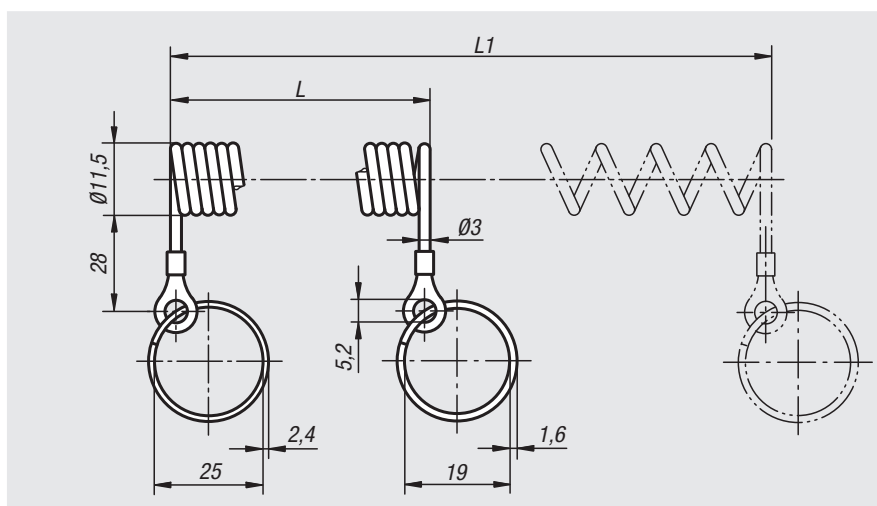


Material:
Spiral cable PUR.
Eye copper or stainless steel.
Key ring steel or stainless steel.

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


Material:

Stainless steel 1.4310.

Version:

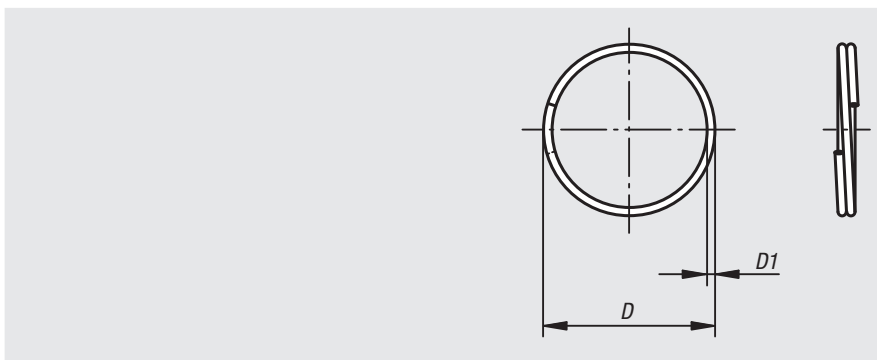
Bright.

Sample order:

nIm 03199-23

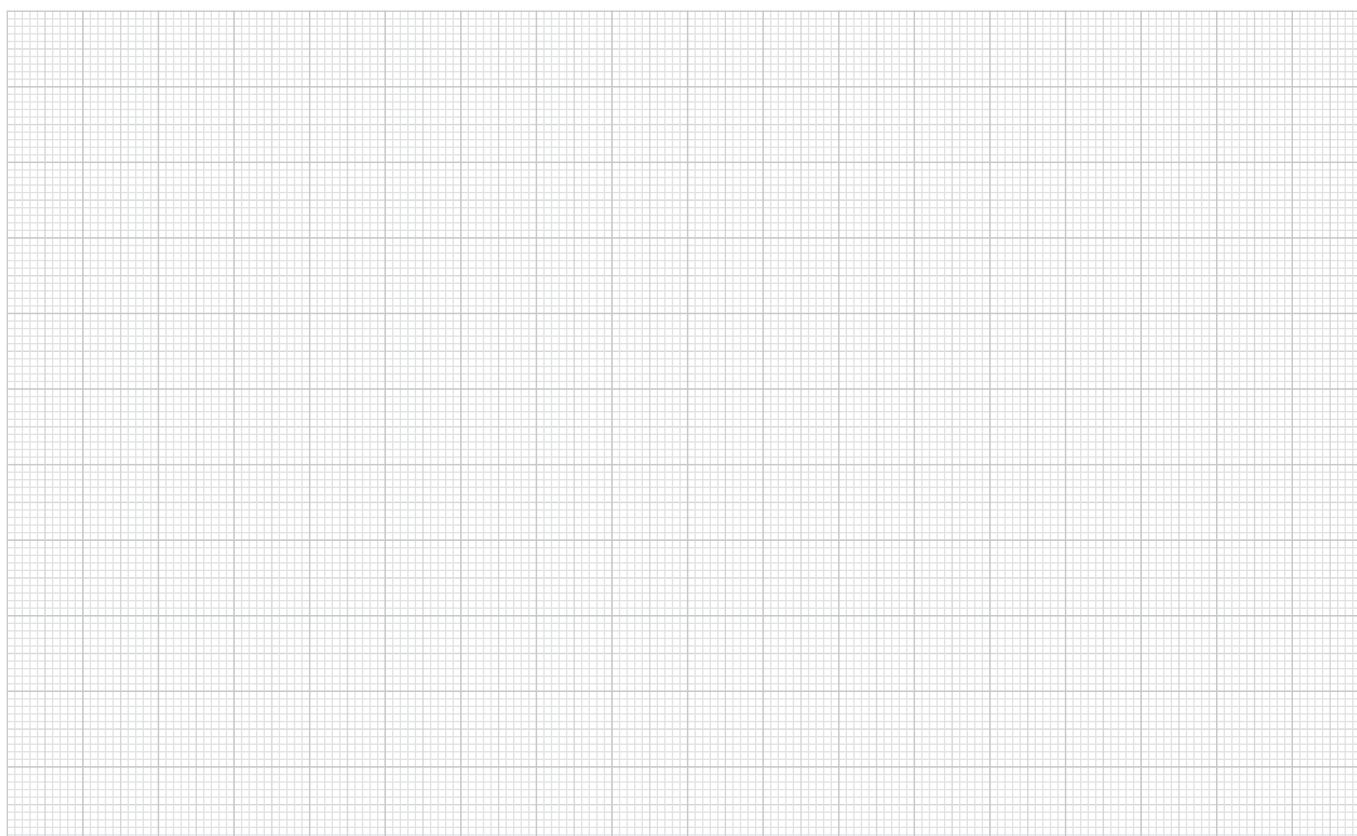
Note:

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.

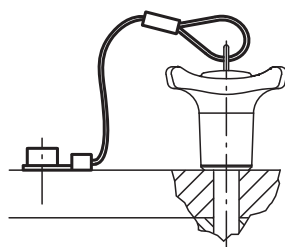
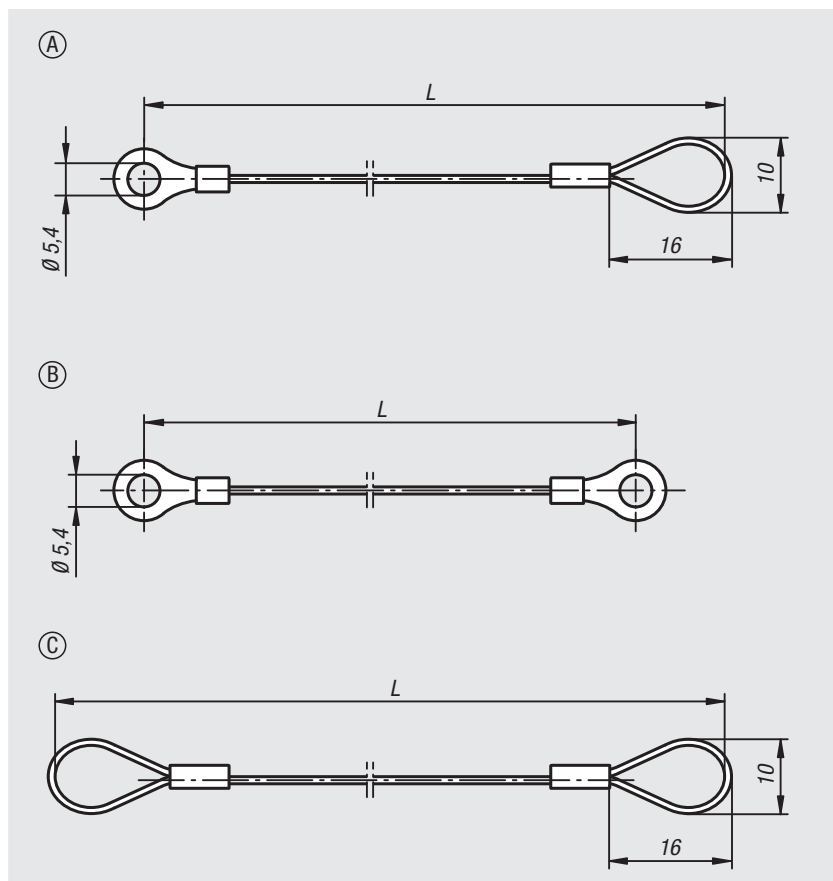
Sample order:

nIm 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.

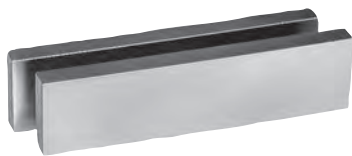
Application temperature: +80 °C.



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

Parallel blocks pair

DIN 6346

**Material:**

Steel.

Version:

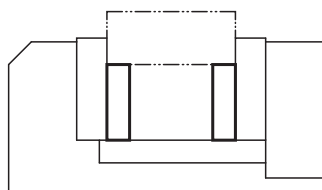
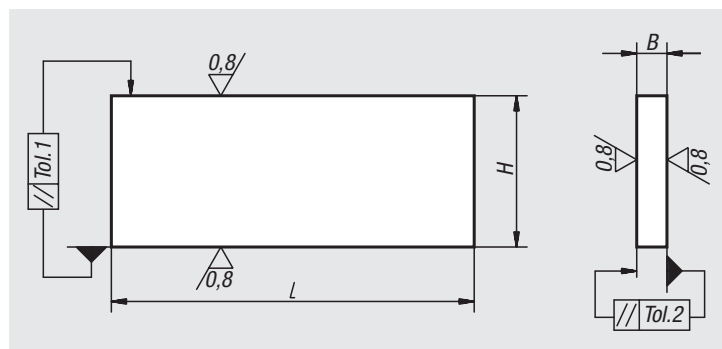
Hardened and ground, precision grade 1, paired tolerance IT 5, nominal dimensional tolerance DIN ISO 2768-mK

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

Parallel block sets

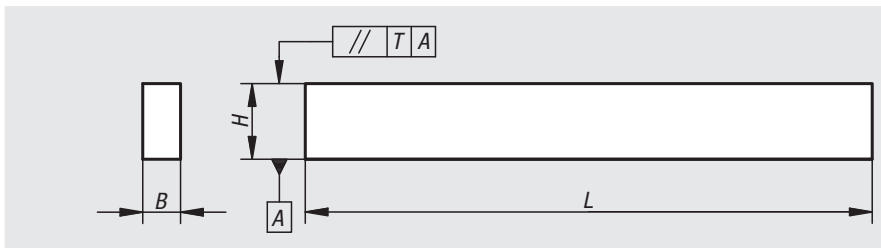


Material:
Steel.

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

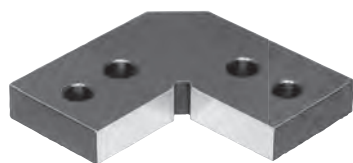
Note:
The parallel block set is supplied in a
wooden box with removable lid.



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	$\pm 0,004$

03220

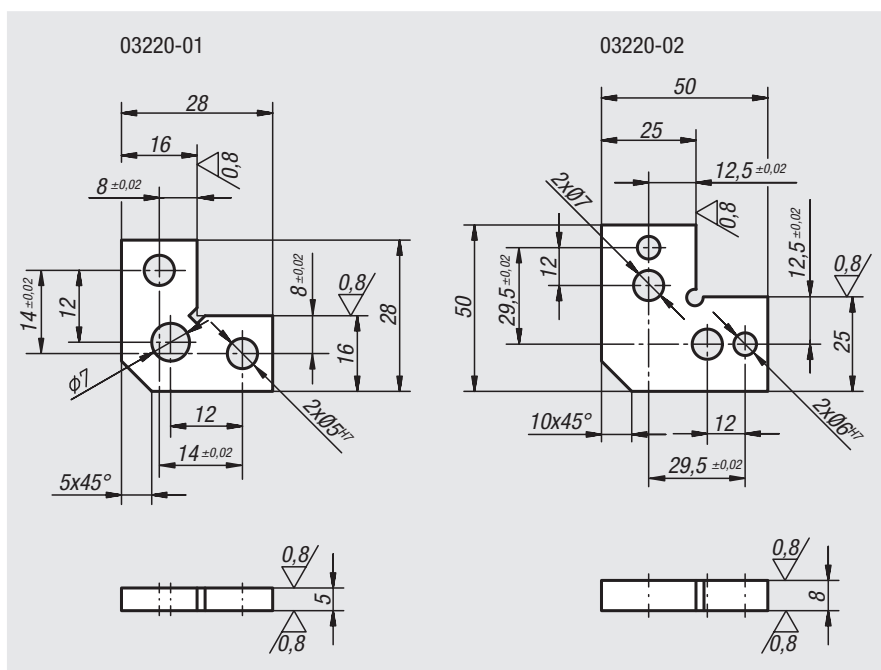
Positioning brackets



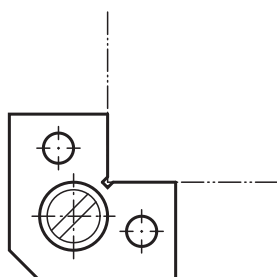
Material:
Carbon steel 1.7225

Version:
nitrided.

Sample order:
nlm 03220-02



Order No.	Dimensions
03220-01	see drawing
03220-02	see drawing



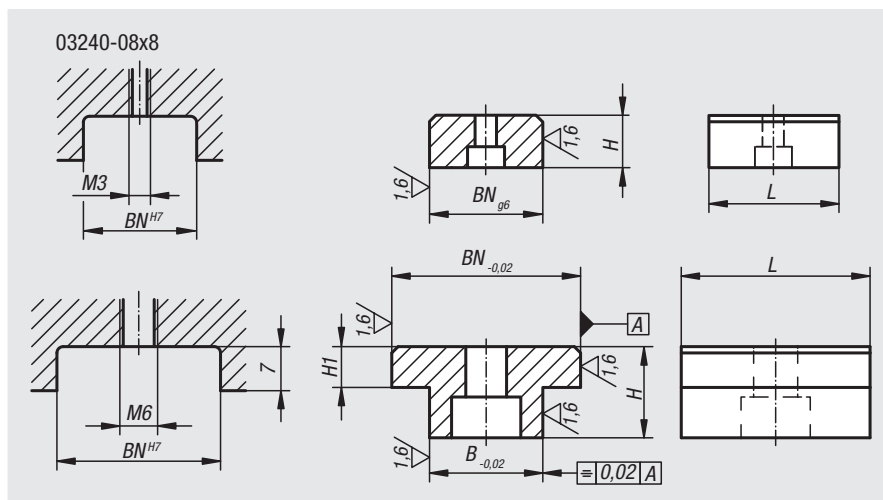
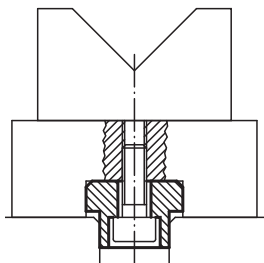
T-slot keys



Material:
Carbon steel 1.1191

Version:
Black oxidised.

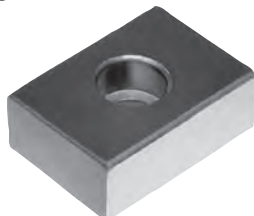
Sample order:
nlm 03240-08X8 (include dimension B1)



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



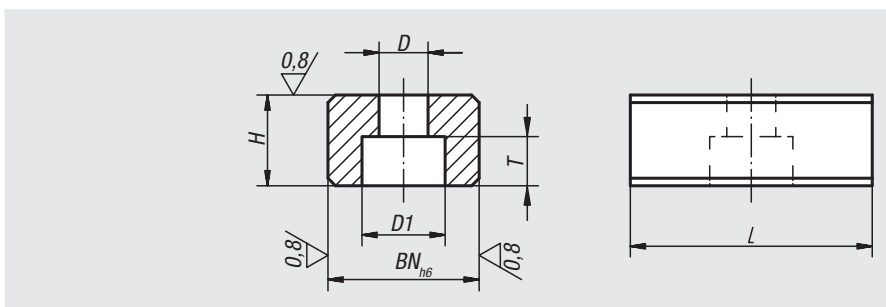
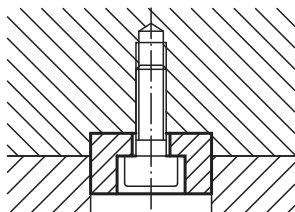
Material:
Steel.

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:

nIm 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:

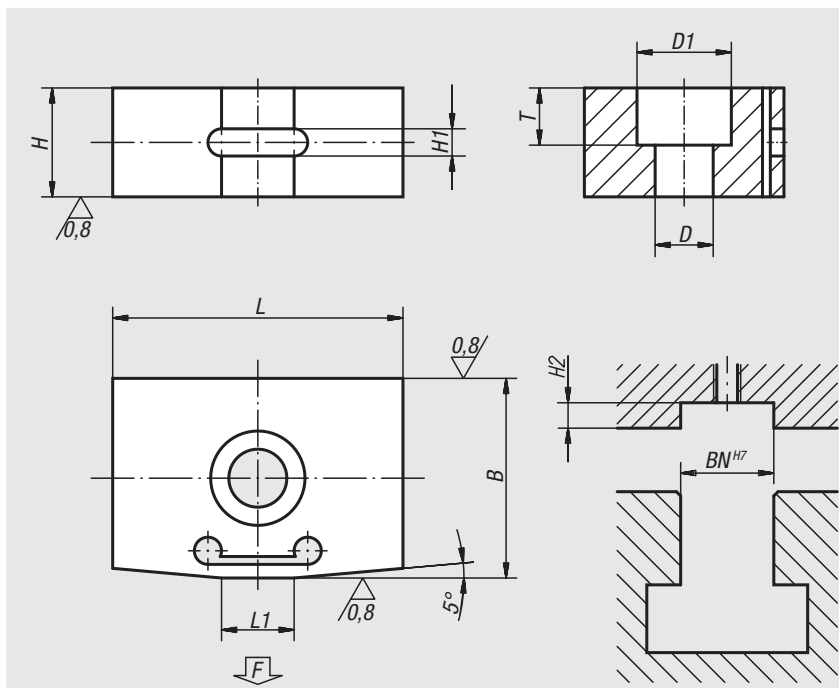
Independent compensation of two different slot dimensions

Spring surface 1:

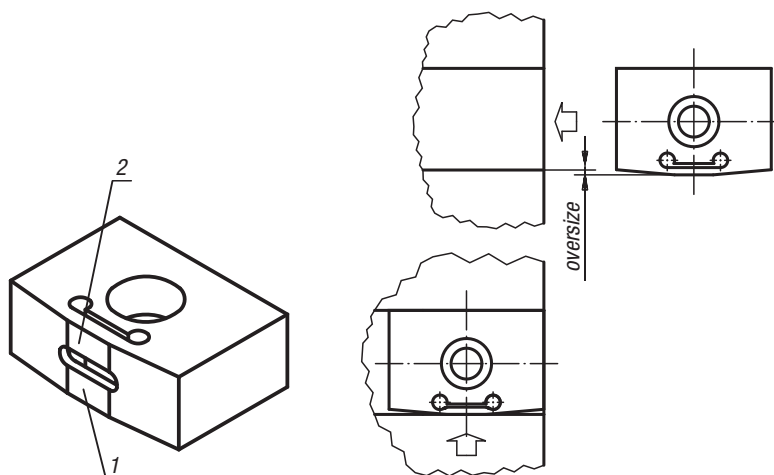
Adjusted to the guide slot of the add-on part (fixture/chucking tool).

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

Slot keys loose

DIN 6323

**Material:**

Hardened steel 1.0401

Version:

Case-hardened, black oxidised and ground.

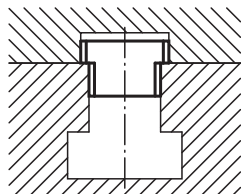
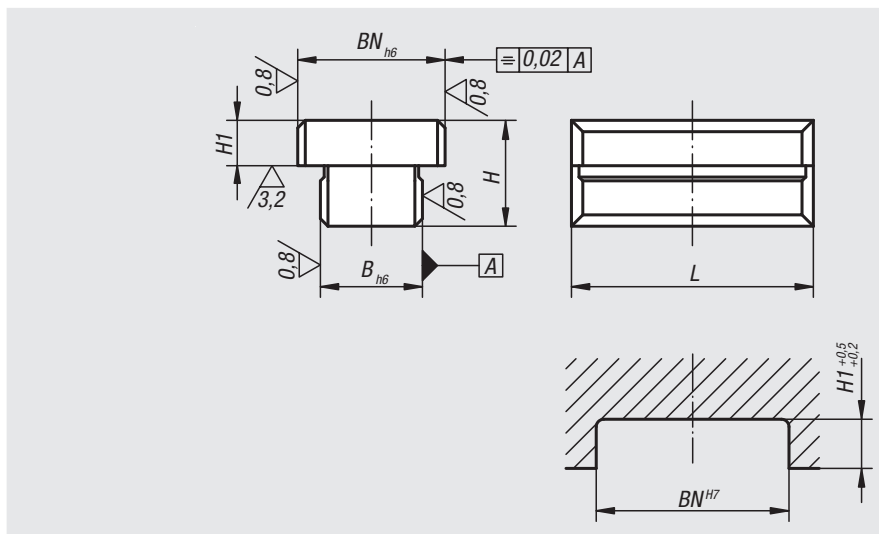
Sample order:

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.

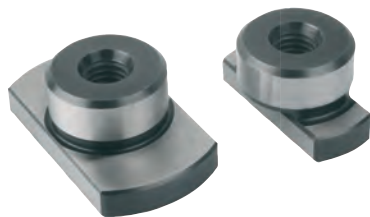


Order No.	BN=Slot width	B	H	H1	L
03260-10	12	10	12	3,6	20
03260-12	20	12	14	5,5	32
03260-14	20	14	14	5,5	32
03260-16	20	16	14	5,5	32
03260-18	20	18	14	5,5	32

03270

Slot keys

with locating pin

**Material:**

Steel.

Version:

Case-hardened, black oxidised and ground.

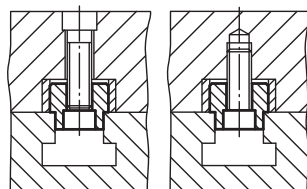
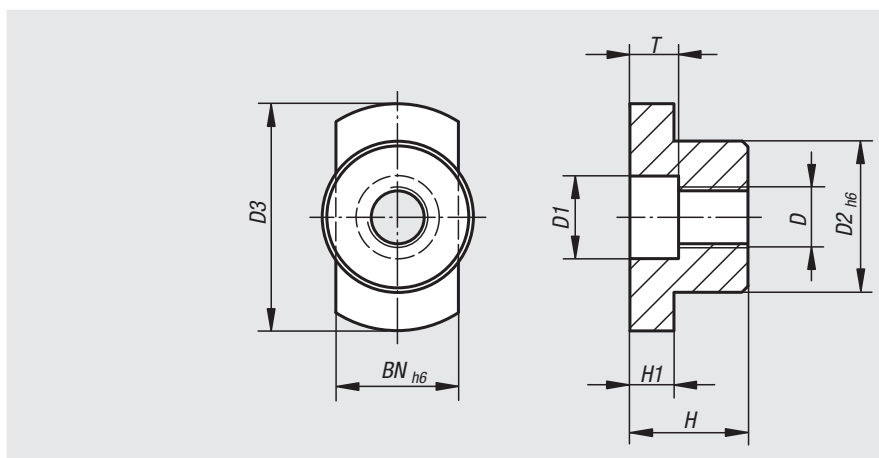
Sample order:

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:**

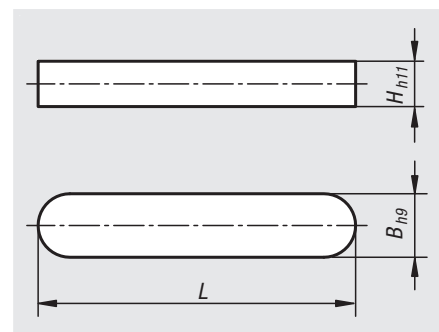
Steel 1.1192 or stainless steel 1.4571.

Version:

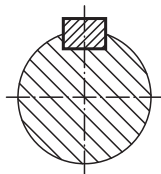
Bright.

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:

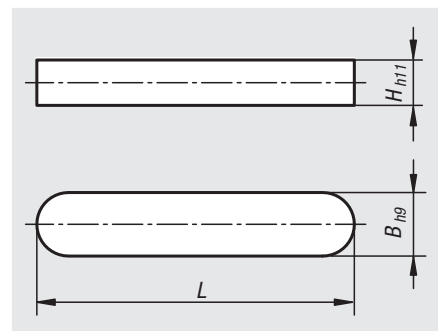
nlm 03288-01-03X8 (include length L)

Note:

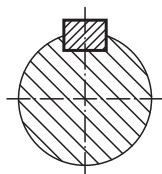
Parallel keys are used for the implementation of shaft-hub connections. These are positive connections which are used to transmit torque.

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.

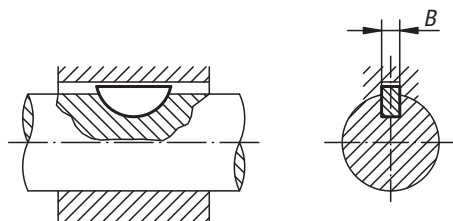
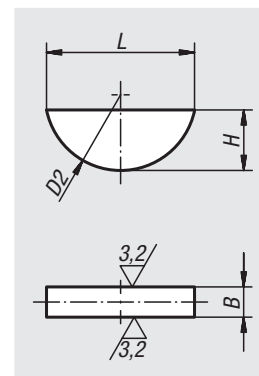
Sample order:

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

Carrier keys

DIN 2079

**Material:**

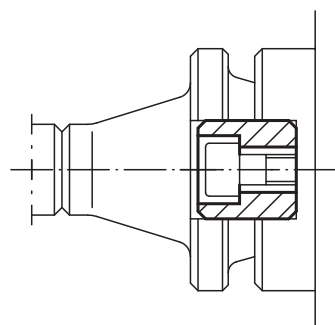
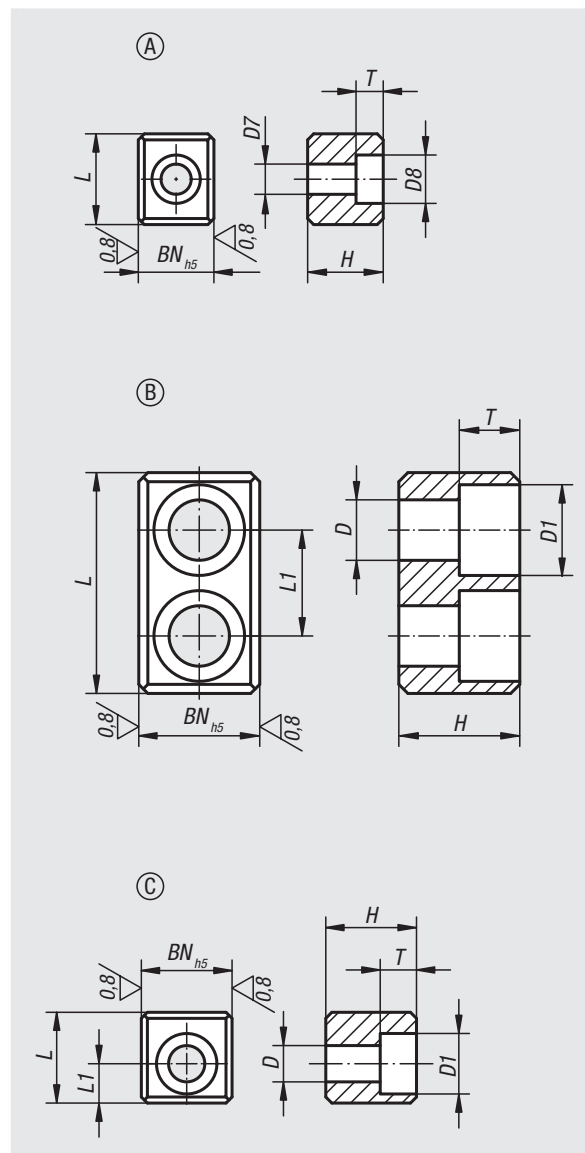
Steel.

Version:

Case-hardened, black oxidised and ground.

Sample order:

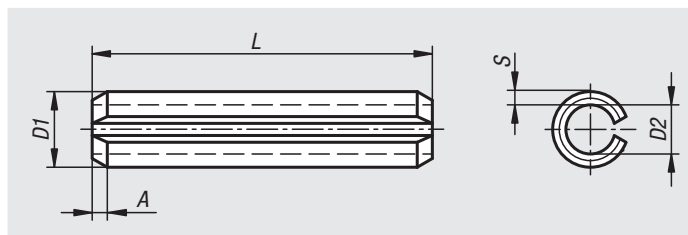
nlm 03290-04



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

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

Cylindrical pins

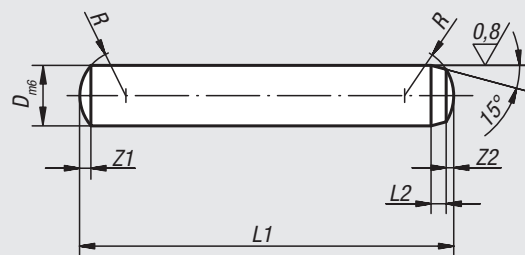
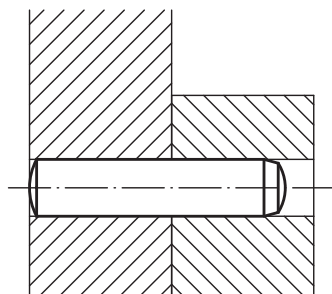
DIN 6325

**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:

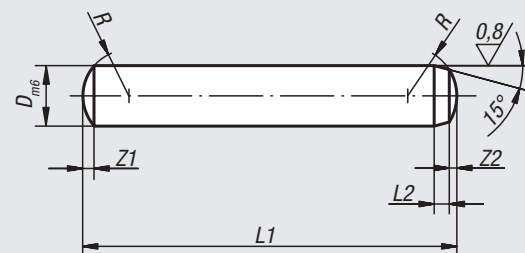
The dimensions of the dowel pin comply with DIN 6325.

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

Cylindrical pins with internal thread

DIN EN ISO 8735

**Material:**

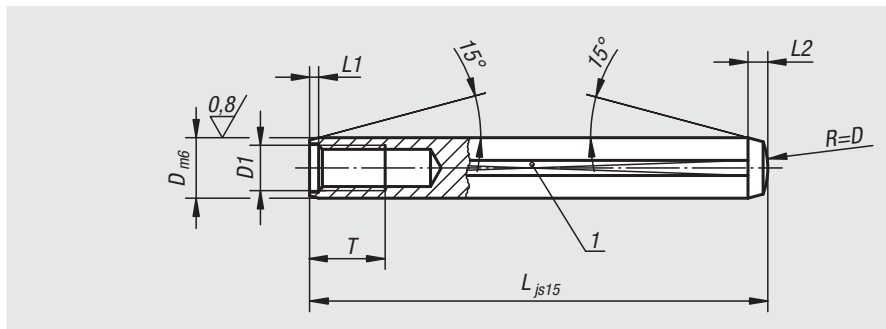
Tool steel 1.2067

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:

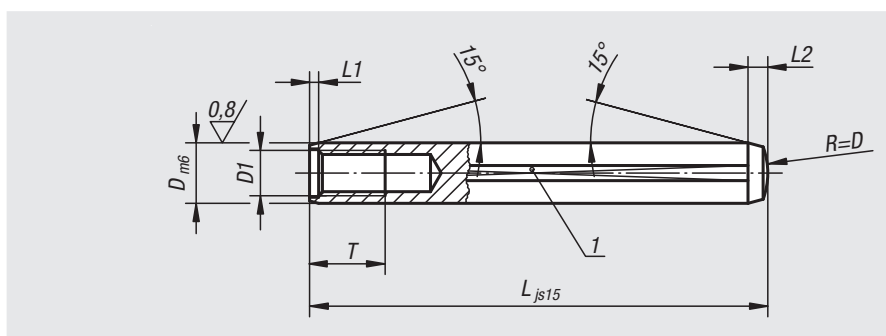
nlm 03325-01-06X28 (include length L)

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:

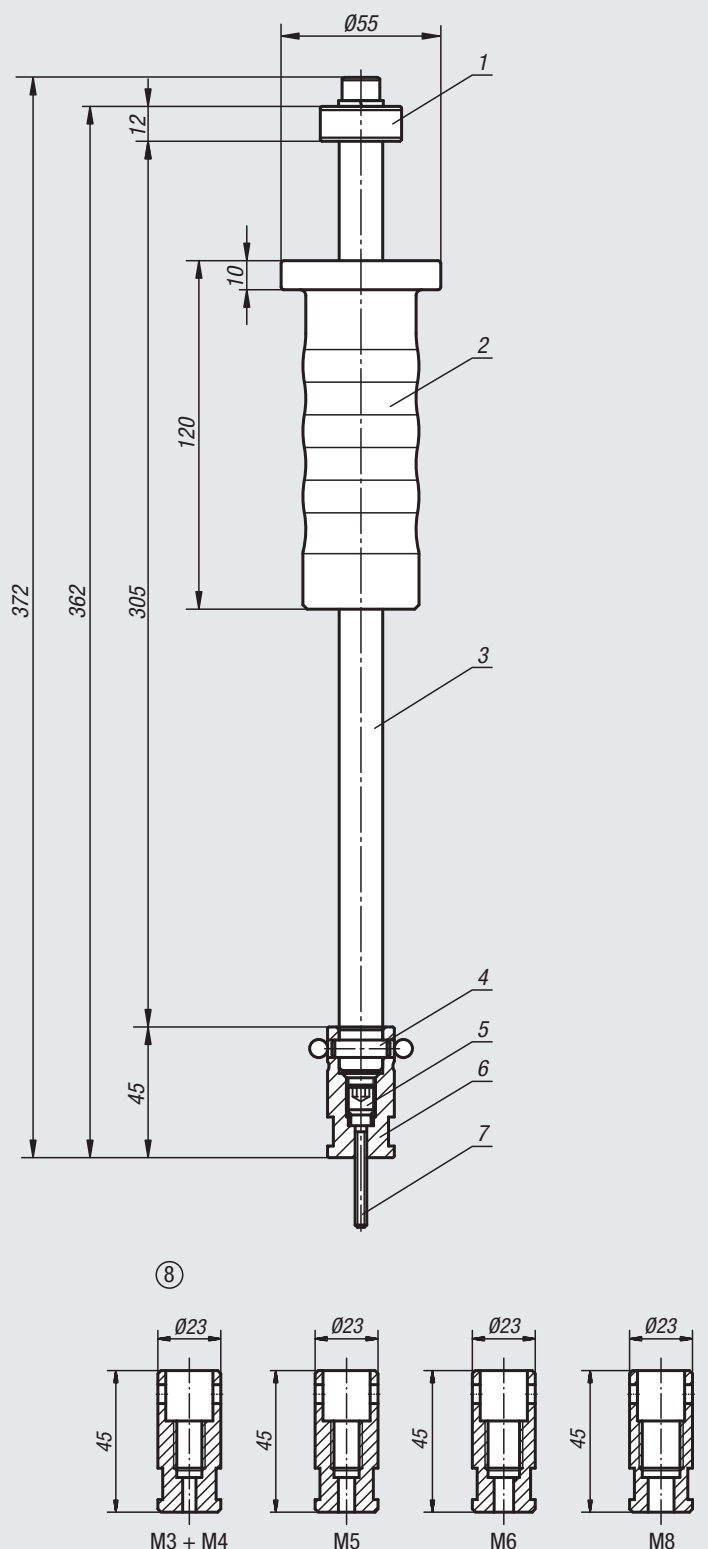
nlm 03328-40

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



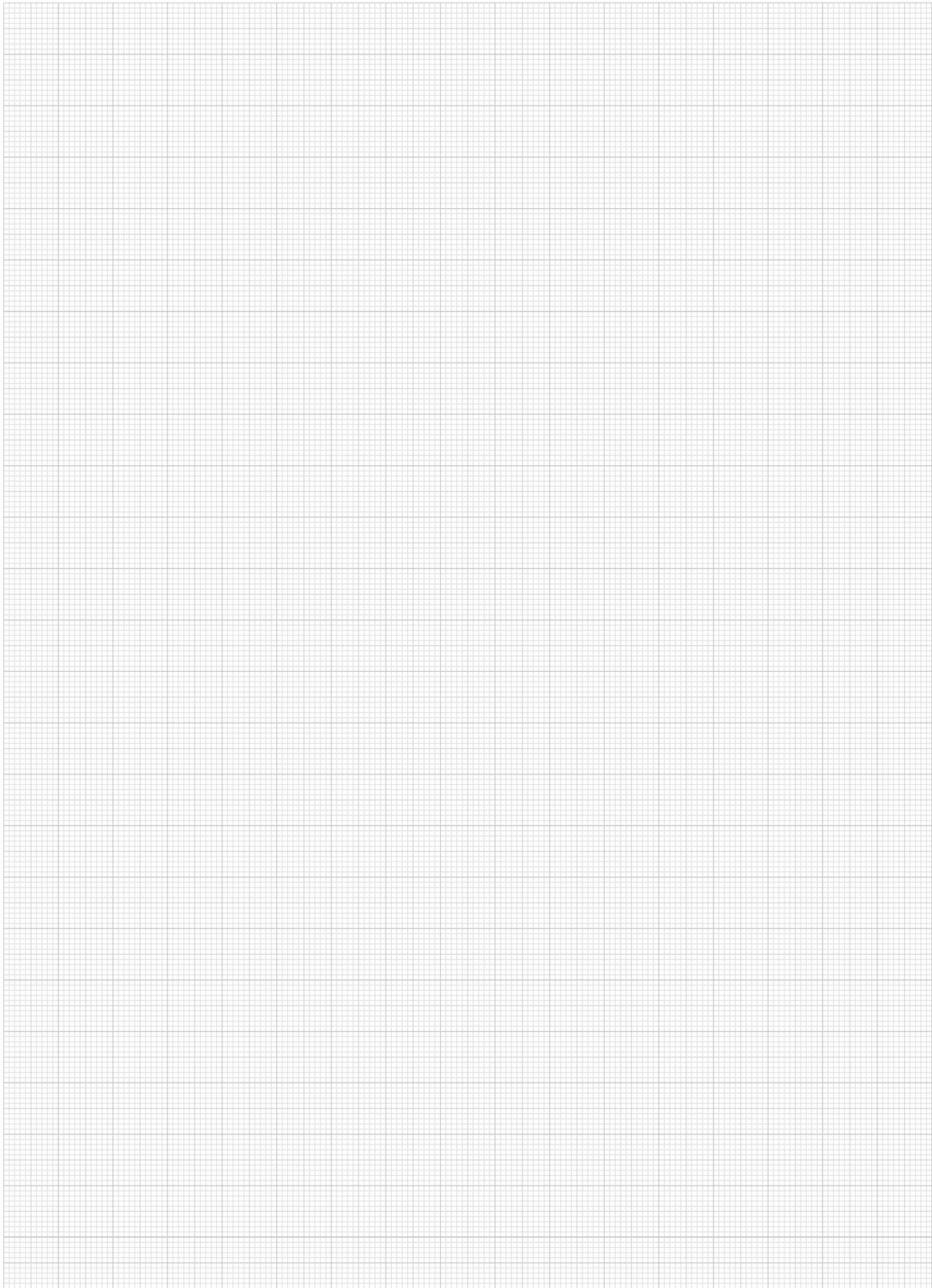
Order No.

Dimensions

03328-40

see drawing

Notes



01000

02000

03000

04000

05000

06000

07000

08000

09000

10000

12000

14000

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

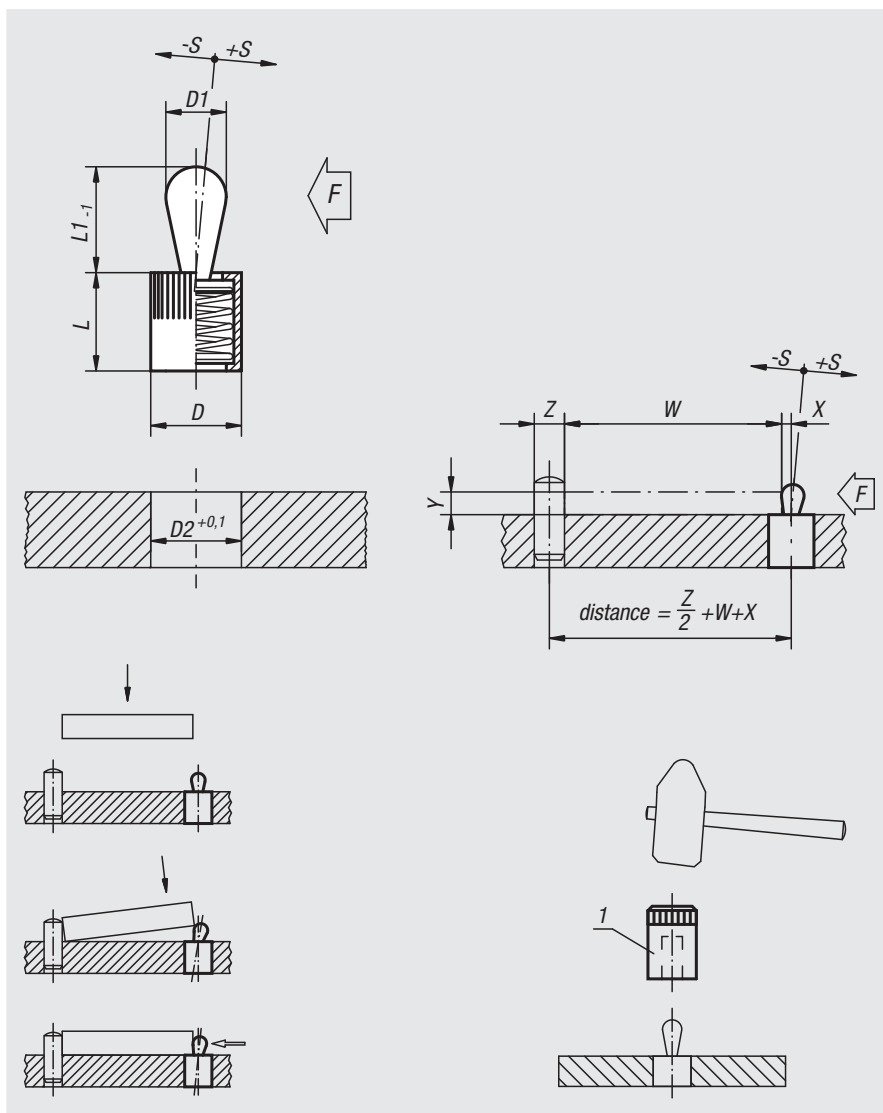
Note:

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 available.

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



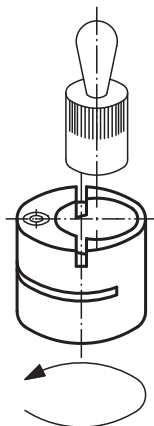
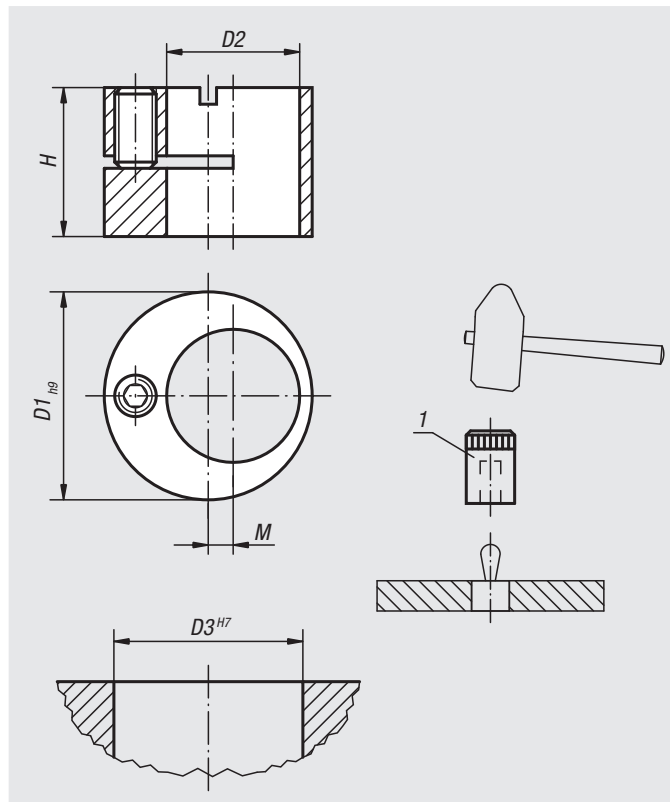
Material:
Steel.

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.

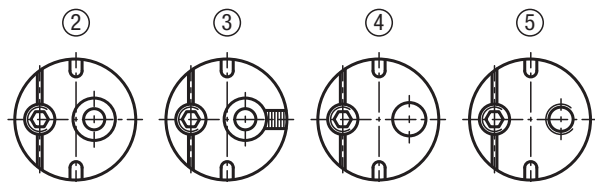
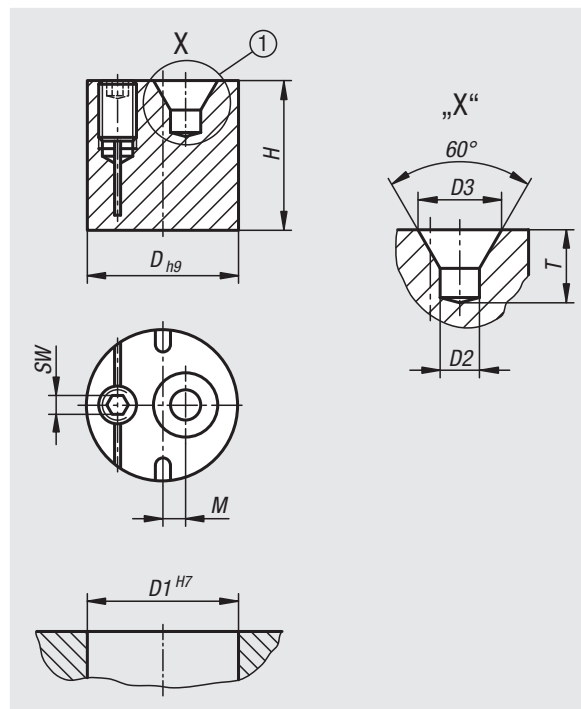
Application:

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



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

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:

nln 03332-31058

Note:

The thrust pin can be made to suit the required circumstances and screwed into the tapped hole in the locating washer.

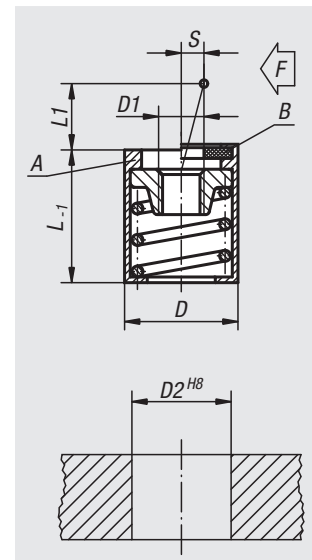
The required lateral thrust (F) can be achieved through the stroke (S) and length (L1).

Form B has a seal to keep swarf and dirt out.

Drawing reference:

Form A: without seal

Form B: with seal



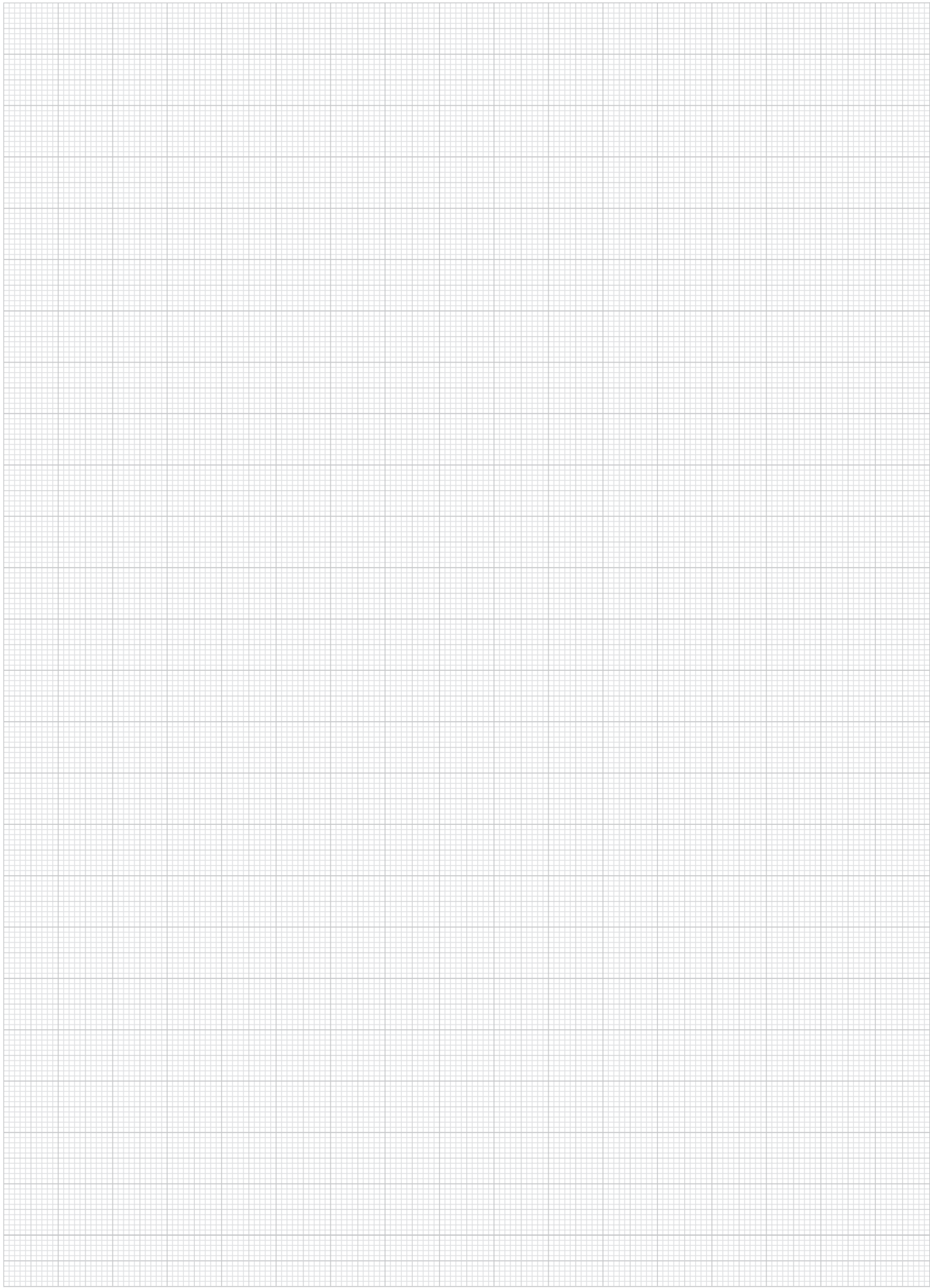
Lateral spring plungers without thrust pin, Form A, without seal

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



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Lateral spring plungers

with threaded sleeve



Material:

Steel.

Version:

Thrust pin steel, hardened and electro zinc-plated.
Sleeve blue electro zinc-plated.

Sample order:

nIm 03334-1020X12

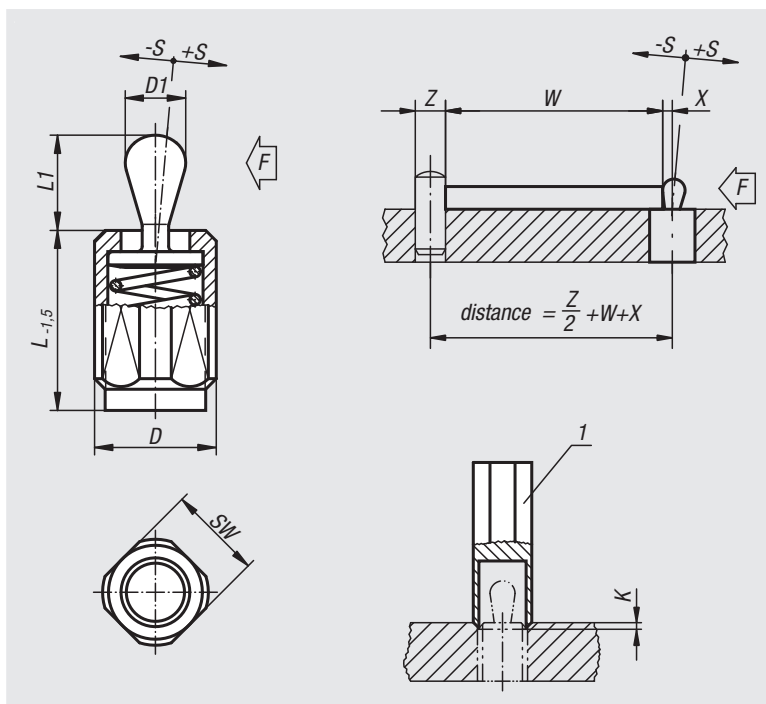
Note:

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

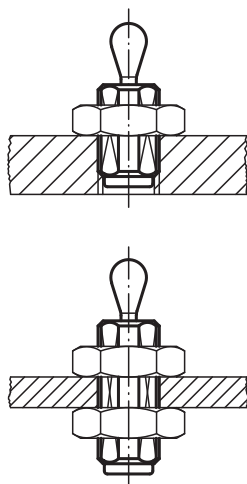


Lateral spring plungers without seal

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.

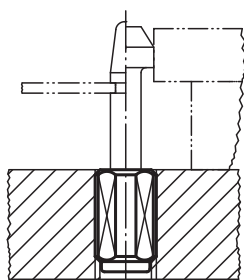
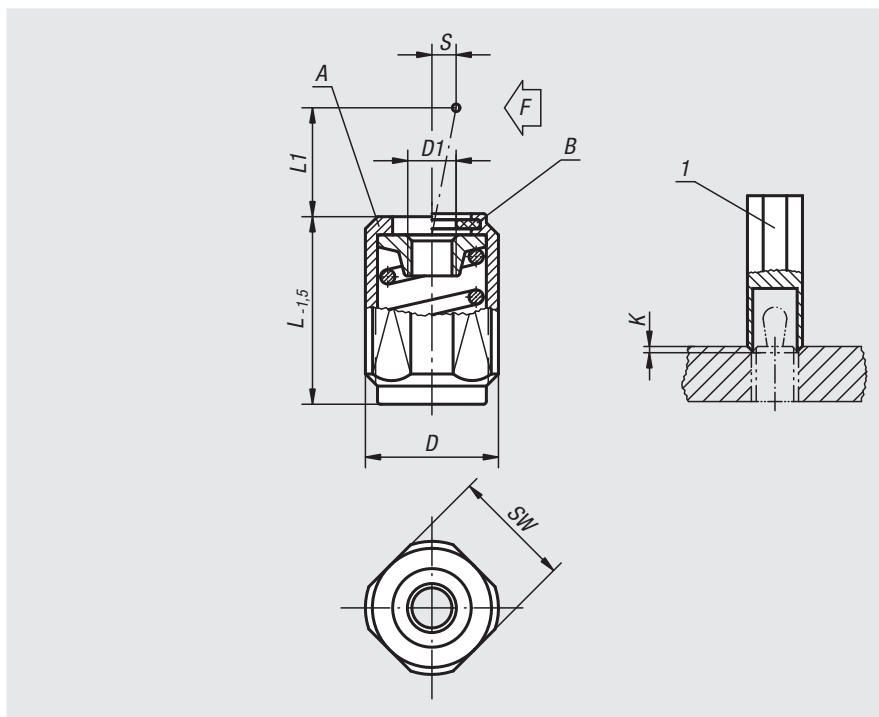
Version:
Sleeve blue electro zinc-plated.
Washer, hardened and burnished.

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.

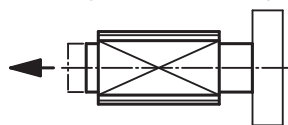
Sample order:
nlm 03338-1202004

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.

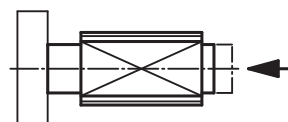
Assembly:
LOCTITE threadlocker 97990-243.... is recommended for gluing the threaded sleeve in position.

Application:

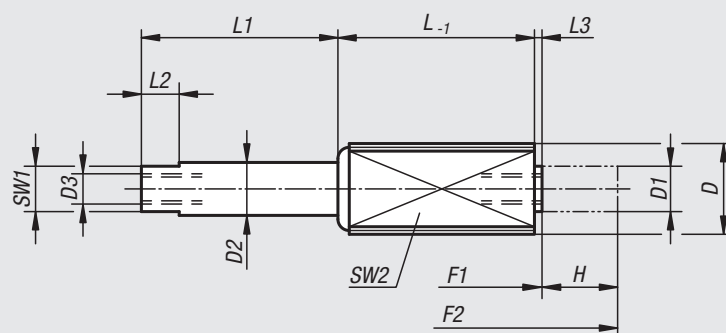
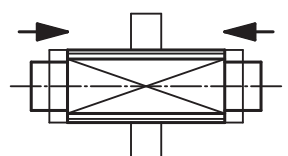
As **push plunger**:
The spring force pushes the object.



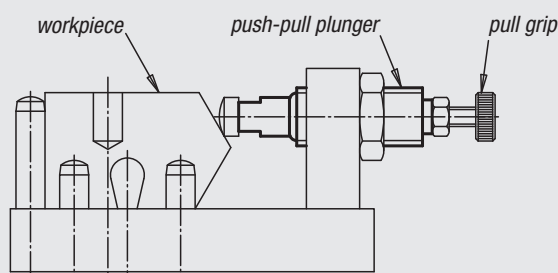
As **pull plunger**:
The spring force pulls the object.



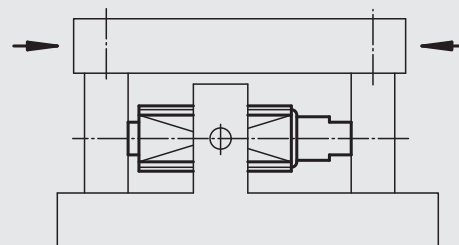
As **push-pull plunger**:
In this case the internal pin has a fixed position. The threaded sleeve acts as carrier. The spring force pushes or pulls the object in both directions.



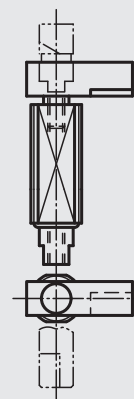
push-pull plunger



push-pull plunger as carrier



pull plunger as lock



Order No.	D	D1	D2	D3	H	L	L1	L2	L3	SW1	SW2	Spring force square initial pressure F1 approx. N	Spring force square 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

Push-Pull spring plungers

with rotation lock



Material:

Steel.

Version:

Threaded sleeve trivalent blue passivated.

Screw case hardened and black oxidised.

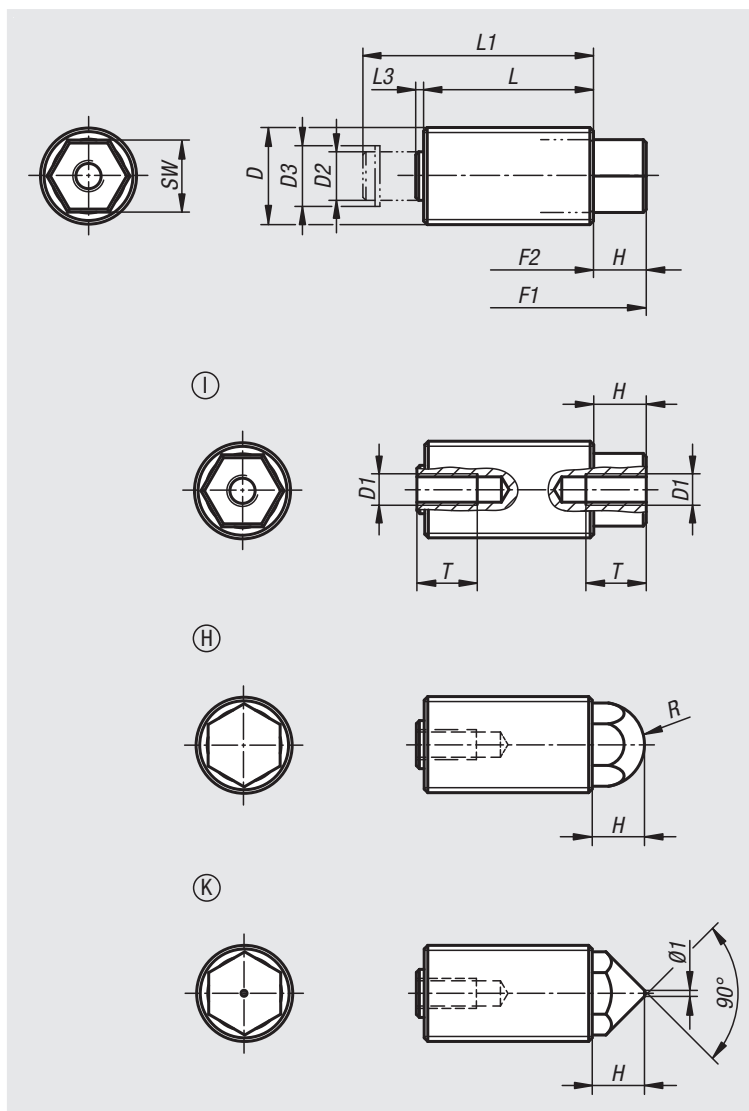
Spring strength - standard or intensified.

Sample order:

nln 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:

nIm 03340-410

Note:

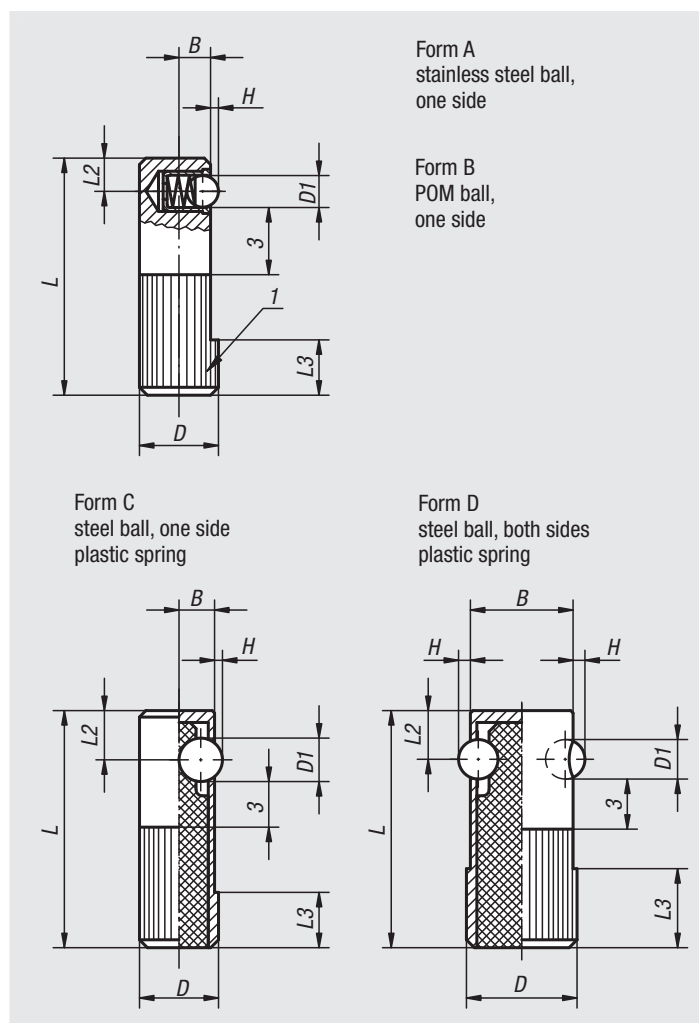
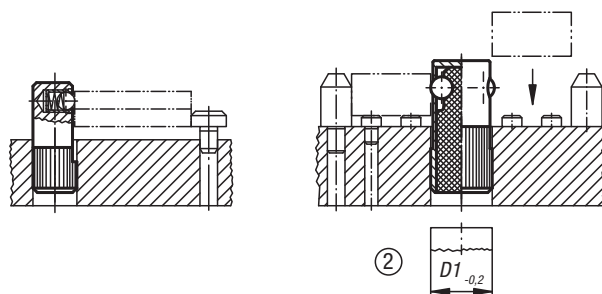
The lateral spring plunger must be pressed into the hole to at least depth L3. These plungers are for positioning and holding small parts in fixtures. If mechanical machining of the workpiece is to be carried out, other clamps may be necessary. When the fixture is not in use it should be ensured that plastic springs are not under stress.

Spring force refers to a mean value.

Drawing reference:

1) knurl

2) light holding



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:

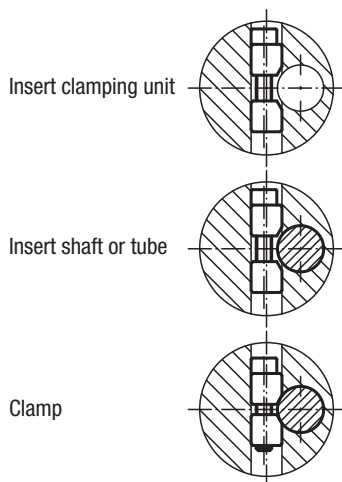
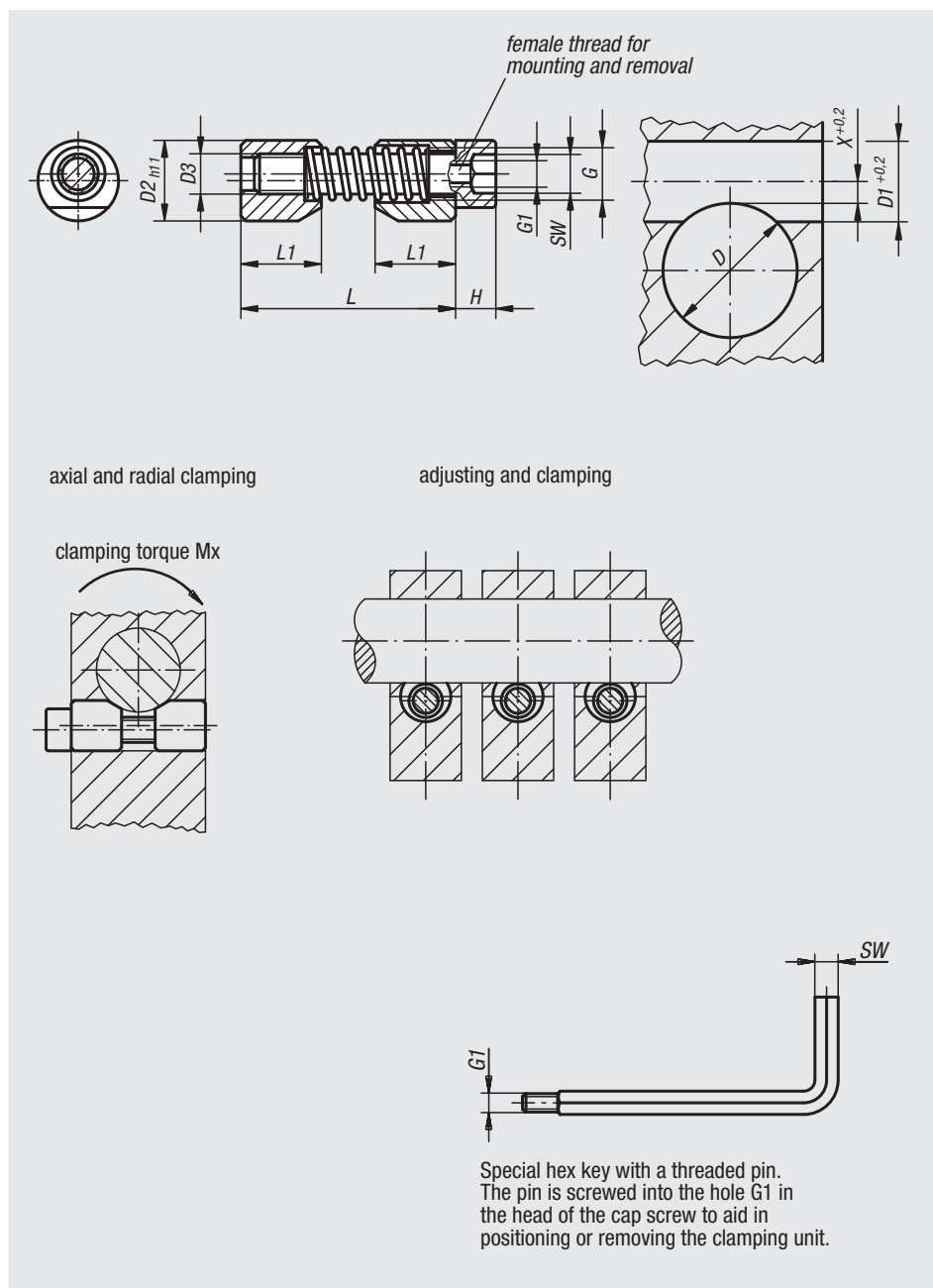
nln 03350-04

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.



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:

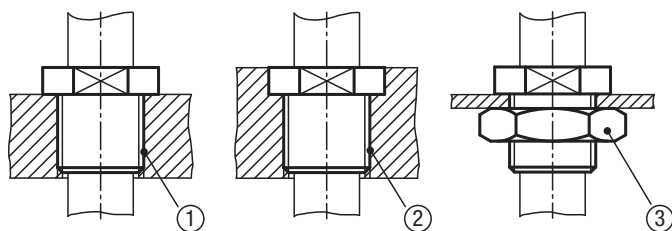
The threaded clamping bushes are used to clamp shafts, rods, tubes, etc. without damaging the surface.

Advantages:

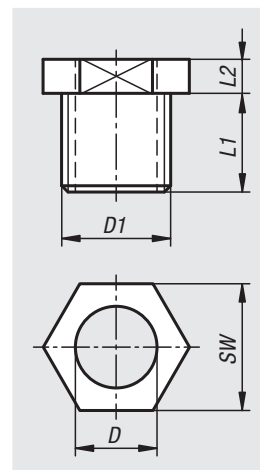
- Compact design
- Versatile use
- Arbitrary mounting position
- Easy handling
- Quick clamping and precise positioning
- Clamping without surface damage
- Clamping in thin plates
- Reusable

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:

nIm 03400-06025

Note:

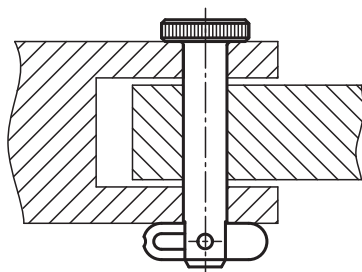
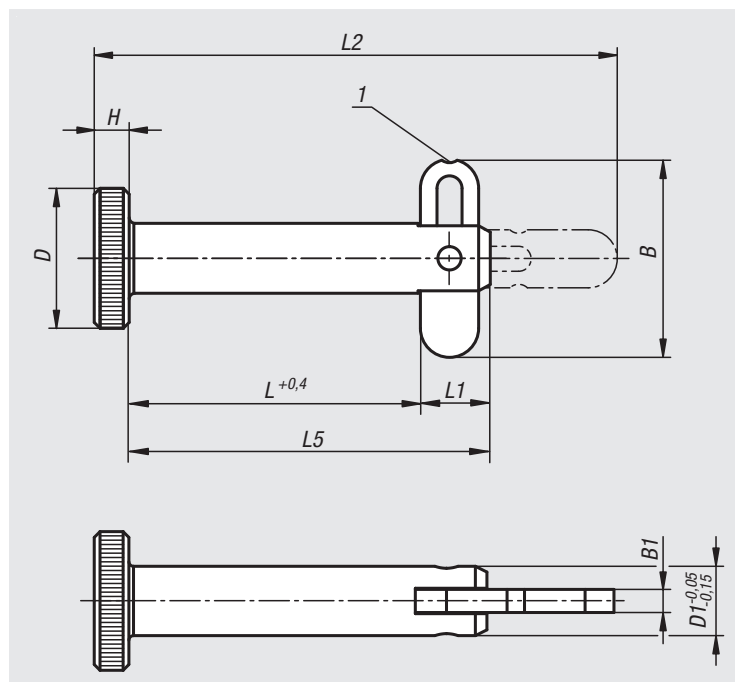
Locking pins with folding latch are not only used for fast and easy fixing but also for permanent joining of movable parts and workpieces.

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:

nIm 03410-1206016

Note:

Locking pins are used for quick and easy fixating and joining of parts and workpieces.

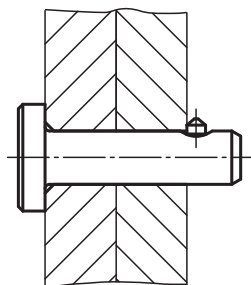
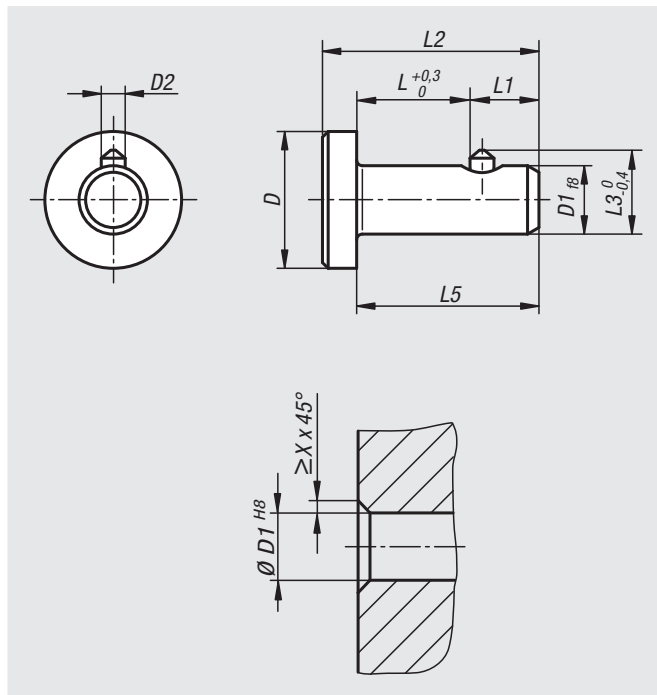
Shearing force double-shear (F) = $S \cdot \tau$ aB max.

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

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:

nIm 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:

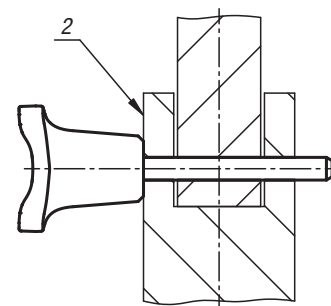
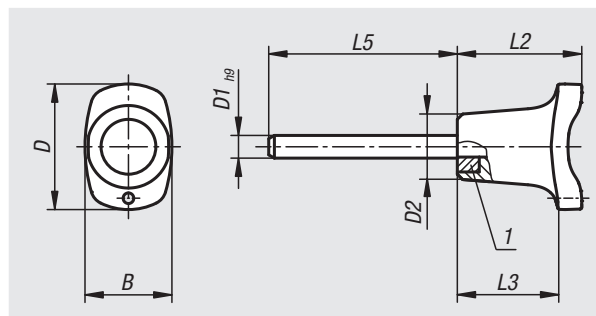
Other pin lengths.

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.

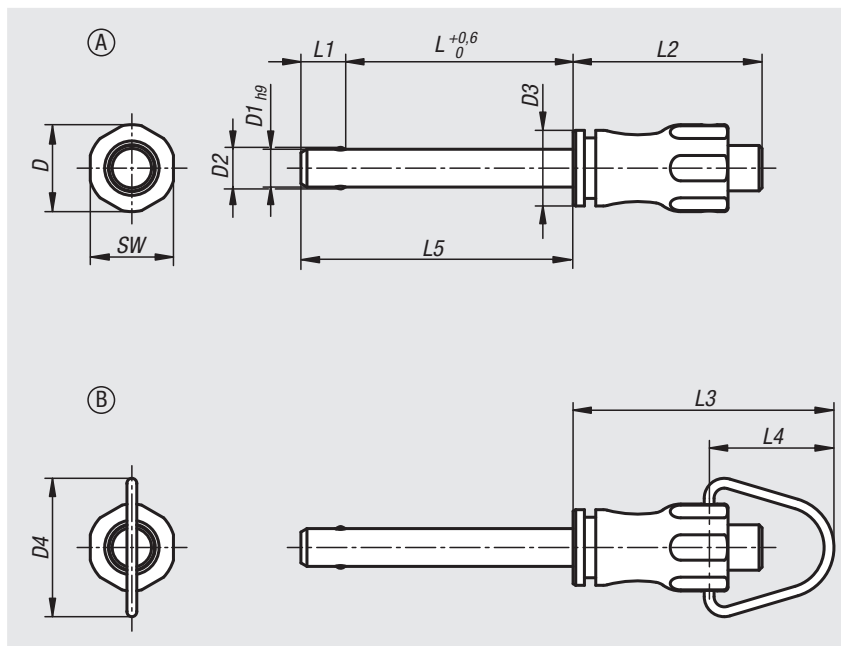
Shear force double shear (F) = S · τ aB max.

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.

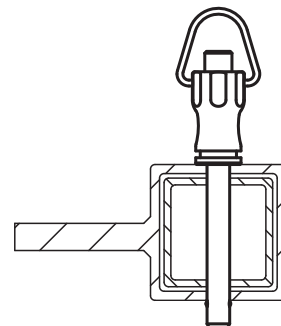
The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

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:

nIm 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.

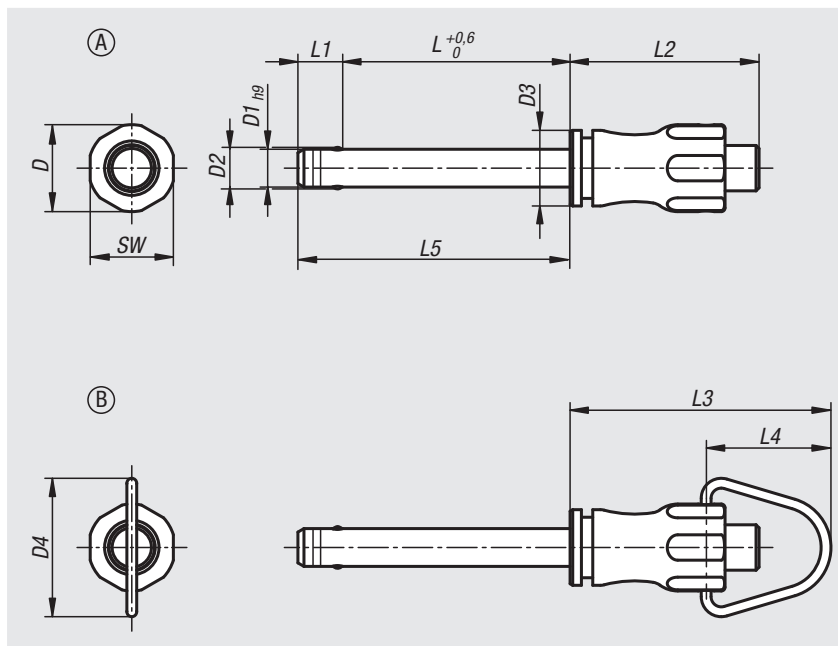
Shear force double shear (F) = S · τ aB max.

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:

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

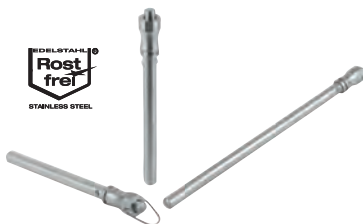
Order No. Form A	D	D1	D2	D3	L	L1	L2	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-011205***	11,5	5	5,5	10	10/15/20/25/30	5,9	25	15,9/20,9/25,9/30,9/35,9	11	5	24
03415-011206***	11,5	6	6,85	10	10/15/20/25/30/35/40/45/50	6,8	25	16,8/21,8/26,8/31,8/36,8/41,8/46,8/51,8/56,8	11	6	35
03415-011508***	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

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:

nIm 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.

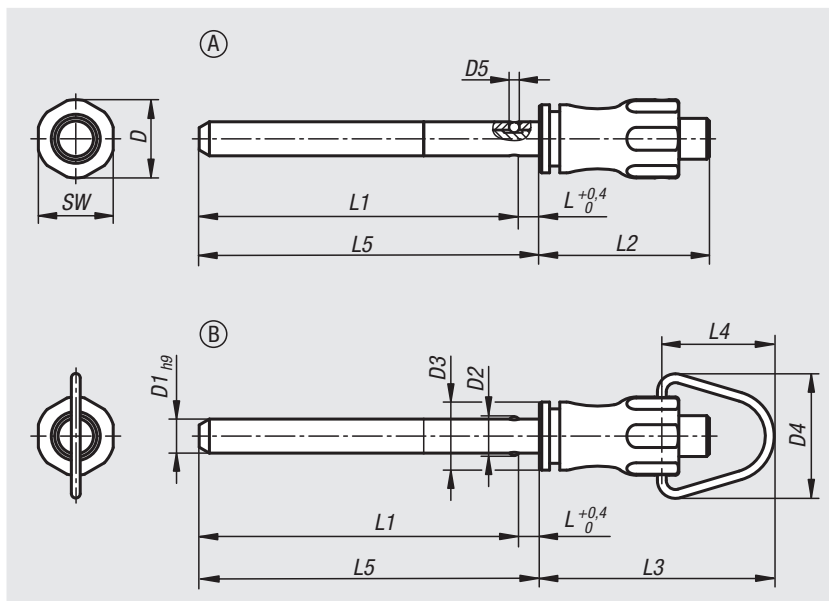
Shear force double shear (F) = S · τ aB max.

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:

Locating bushes for ball lock pins with head-end lock 03425.

Ball lock pins stainless steel, with head-end lock, Form A

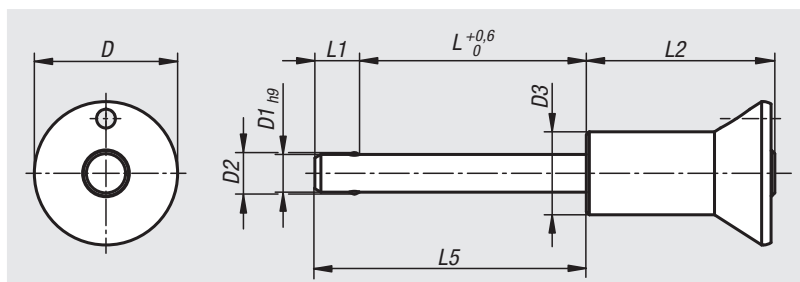
Order No.	Form	D	D1	D2	D3	D5	L	L1	L2	L5	SW	Receiving hole H11	Shearing force double shear max.kN
03415-10-001205***	A	11,5	5	5,5	10	1,5	3	47/97/147	25	50/100/150	11	5	10
03415-10-001206***	A	11,5	6	6,85	10	2	3	47/97/147	25	50/100/150	11	6	14
03415-10-001508***	A	15,5	8	9,5	13,5	3	3,5	96,5/146,5/196,5	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

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 steel 1.4125.

Compression spring stainless steel 1.4310.

Version:

Bright.

Sample order:

nIm 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.

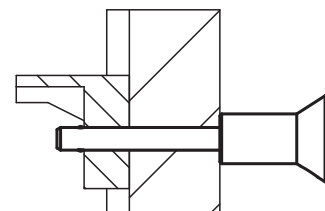
Accessories:

Bushing for ball lock pins 03197

Safety spiral cable 03199

Retaining cable with loop 03199

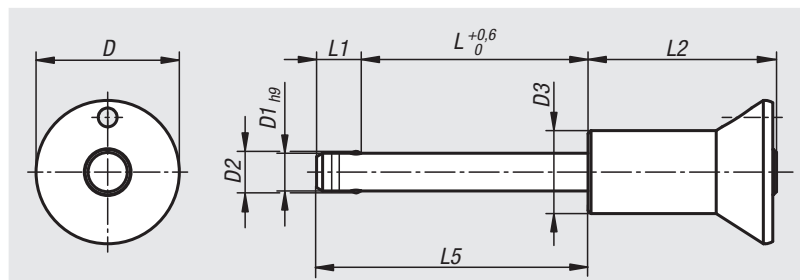
Key ring 03199



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

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 steel 1.4125.

Compression spring stainless steel 1.4310.

Version:

Bright.

Sample order:

nIm 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) = $S \cdot \tau$ 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.

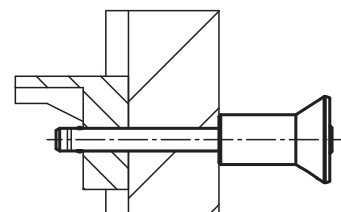
Accessories:

Bushing for ball lock pins 03197

Safety spiral cable 03199

Retaining cable with loop 03199

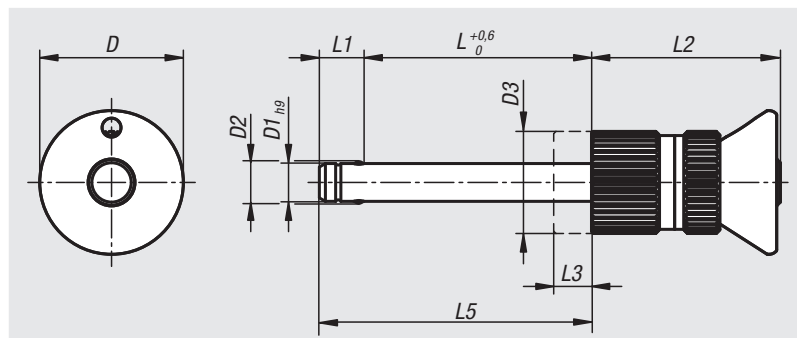
Key ring 03199



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	28,9/33,9/38,9/43,9/48,9/53,9/58,9/63,9	10	100
03418-13512***	35	12	14,5	22	25/30/35/40/45/50/60/70/80	9,9	39,5	34,9/39,9/44,9/49,9/54,9/59,9/64,9/69,9/74,9/79,9/84,9	12	144
03418-13516***	35	16	19	22	30/35/40/45/50/60/70/80	13,1	39,5	43,1/48,1/53,1/58,1/63,1/68,1/73,1/78,1/83,1/88,1	16	257

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:

nIm 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.

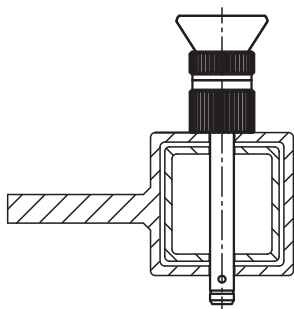
Shear force double shear (F) = S · τ aB max.

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.



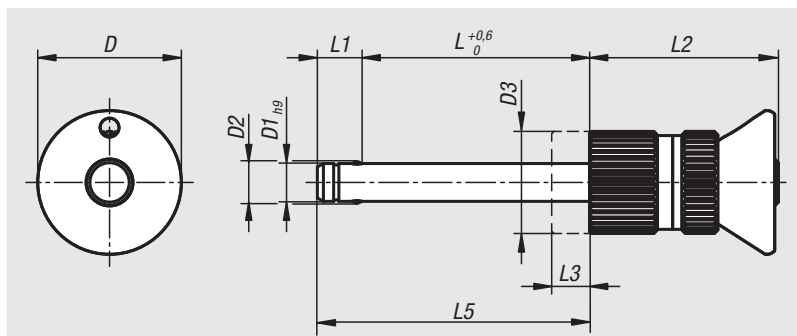
Ball lock pins with mushroom grip

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

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:

nIm 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) = $S \cdot \tau$ 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.

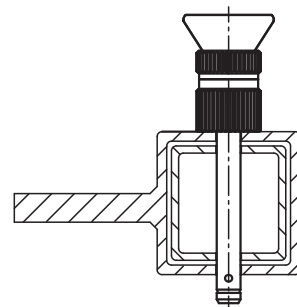
Each user must determine individually whether the ball lock pin is suitable for the respective application.

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 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.



Ball lock pins with mushroom grip

stainless steel, with high shear strength, adjustable



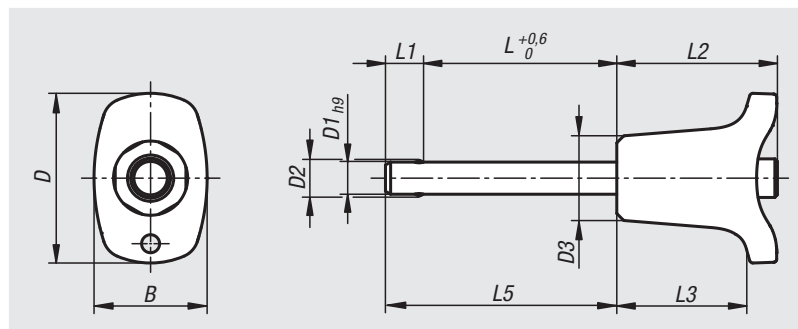
Order No.	D	D1	D2	D3	L	L1	L2	L3	L5	Receiving hole H11	Shearing force double shear max.kN
03418-10-11905010	19	5	5,5	13,5	2-10	5,9	25	8	7,9-15,9	5	24
03418-10-11905015	19	5	5,5	13,5	7-15	5,9	25	8	12,9-20,9	5	24
03418-10-11905020	19	5	5,5	13,5	12-20	5,9	25	8	17,9-25,9	5	24
03418-10-11905025	19	5	5,5	13,5	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

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.)

Accessories:

Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199

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.

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:

nIm 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.

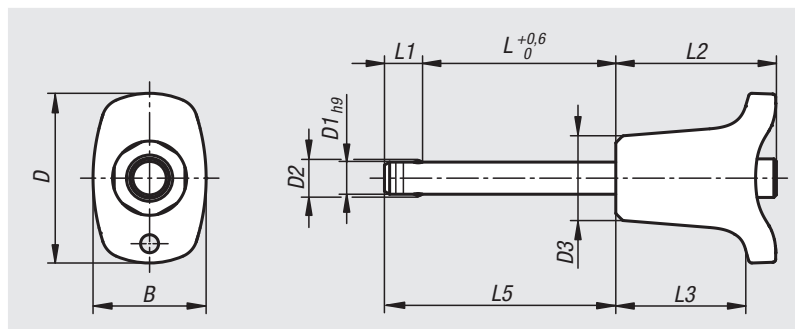
The values given for the shear force are the theoretical breaking load.

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.

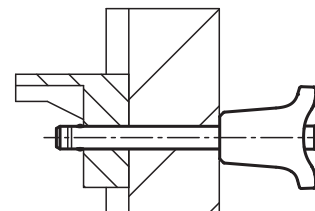


Advantages:

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

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:

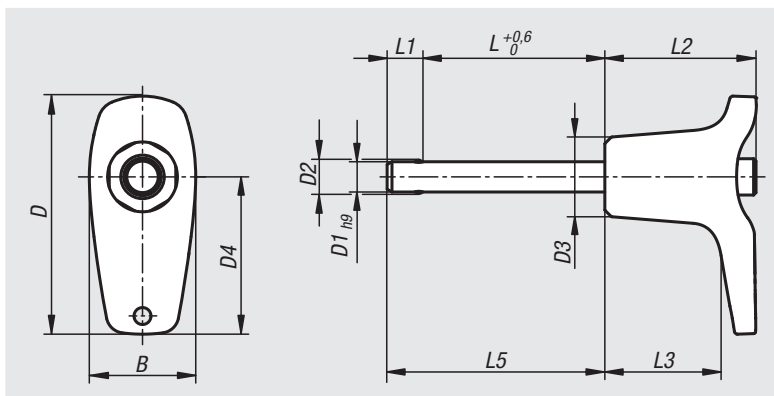
Ball lock pins are used for easy fastening or joining of components or workpieces.
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely. If required, the ball lock pins 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

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:

nIm 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.

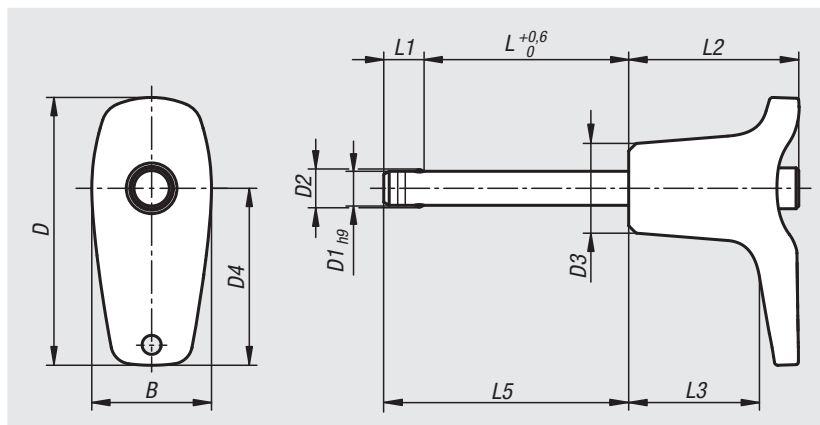
The values given for the shear force are the theoretical breaking load.

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.

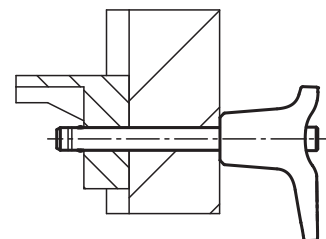


Advantages:

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

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:

nIm 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.

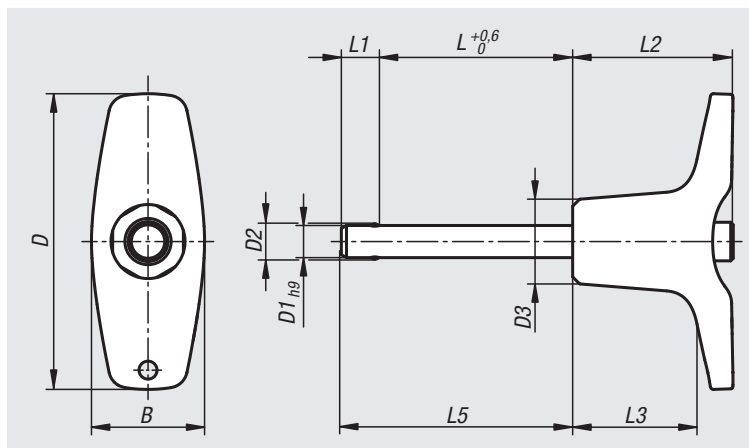
The two balls are disengaged by pressing the push button and the pin can be slipped into holes in the workpieces. When the push button is released, the balls lock the connection securely. If required, the ball lock pins can be fitted with a retaining cable.

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

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.

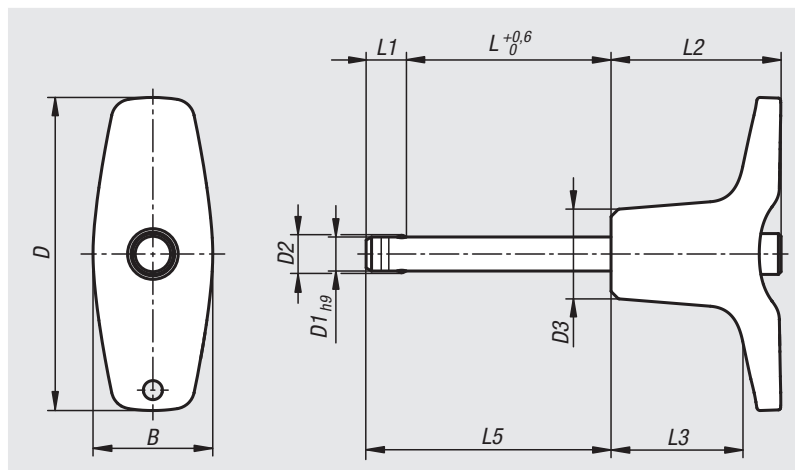
The values given for the shear force are the theoretical breaking load.

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.

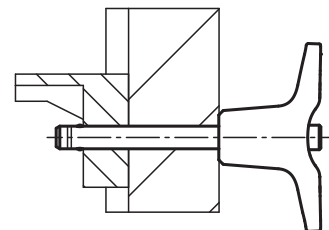


Advantages:

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

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:

nln 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) = $S \cdot \tau$ 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:

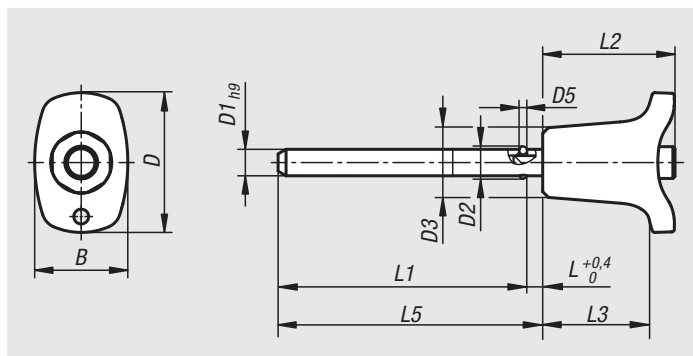
Wide connections possible.
The pin length does not need to be coordinated with the component width.

On request:

Other pin lengths.

Accessories:

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

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:

nln 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:

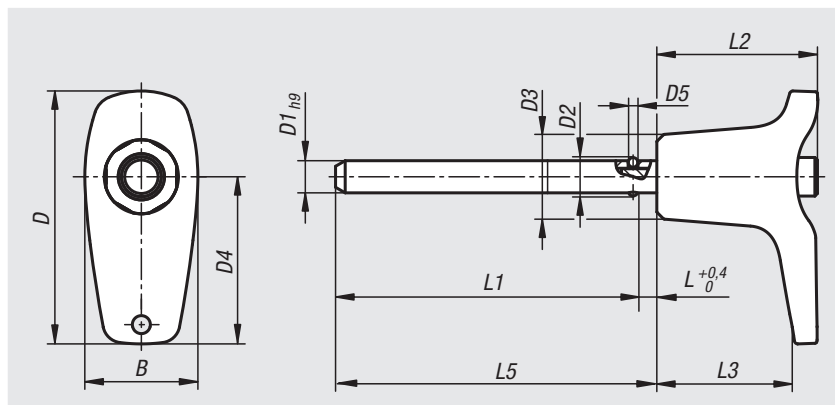
Wide connections possible.
The pin length does not need to be coordinated with the component width.

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

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:

nIm 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:

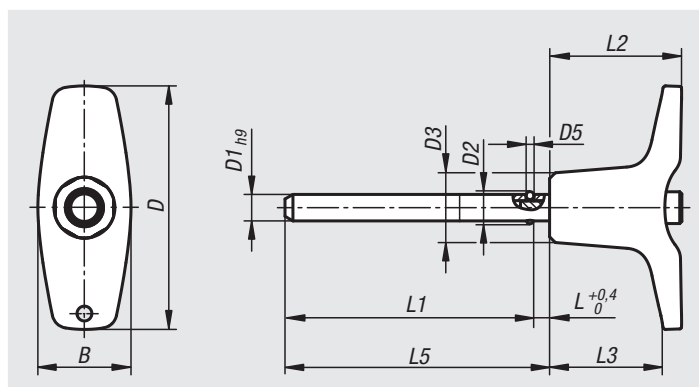
Wide connections possible.
The pin length does not need to be coordinated with the component width.

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

A large grid of graph paper for taking notes. The grid is composed of small squares, with larger squares forming a 10x10 pattern. The grid is intended for technical drawing or note-taking.

01000
02000
03000
04000
05000
06000
07000
08000
09000
10000
12000

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.

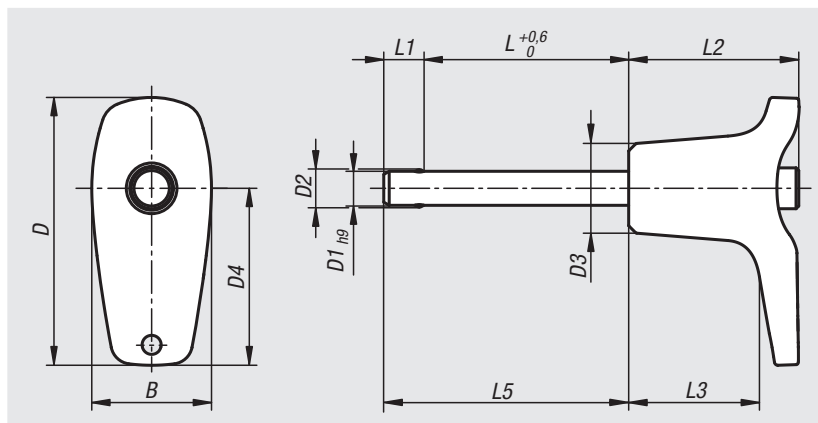
Accessories:

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:

nln 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.

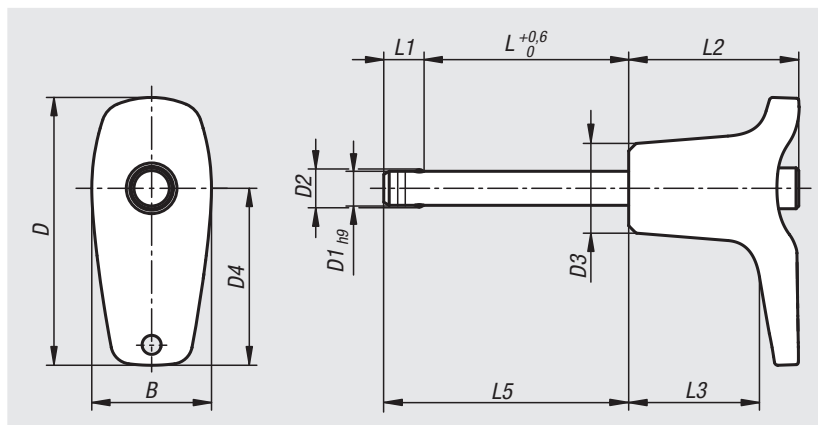
The load values have been calculated in accordance with DIN 50141. Each user must determine individually whether the ball lock pin is suitable for the respective application.

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.

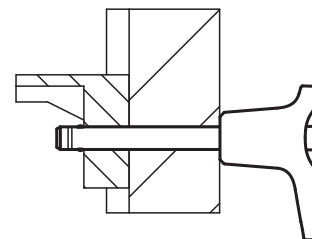
Advantages:

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	28,9/33,9/38,9/43,9/48,9/53,9/58,9/63,9	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	34,9/39,9/44,9/49,9/54,9/59,9/64,9/69,9/74,9/79,9/84,9	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	43,1/48,1/53,1/58,1/63,1/68,1/73,1/78,1/83,1/88,1/93,1	16	257

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.

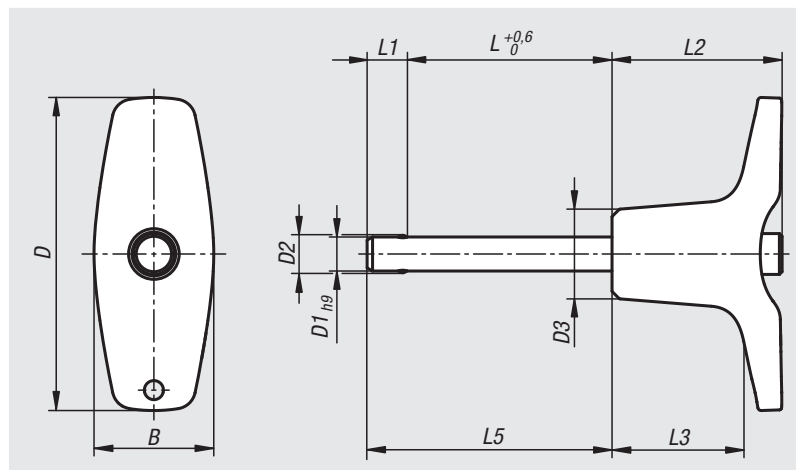
These are non-binding reference values without consideration of safety factors and exclude any liability. The values given are for information purposes only and do not constitute a legally binding assurance of properties.

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	28,9/33,9/38,9/43,9/48,9/53,9/58,9/63,9	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	34,9/39,9/44,9/49,9/54,9/59,9/64,9/69,9/74,9/79,9/84,9	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	43,1/48,1/53,1/58,1/63,1/68,1/73,1/78,1/83,1/88,1	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:

nIm 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.

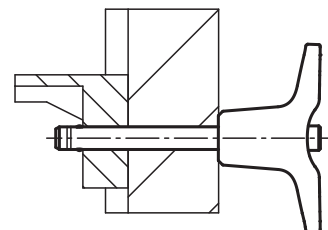
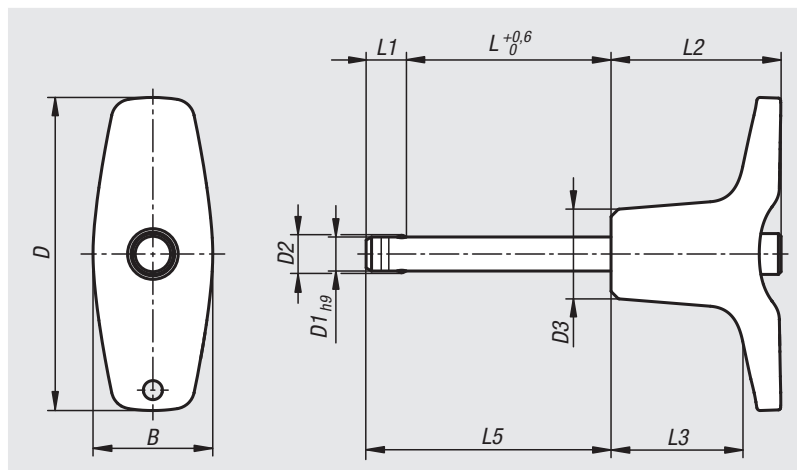
Ball lock pins with high shear strength are identified by a groove marking on the pin.

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:

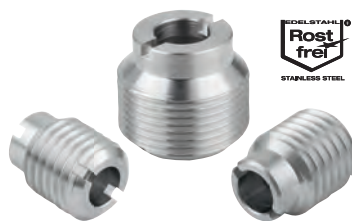
Bushing for ball lock pins 03197
Safety spiral cable 03199
Retaining cable with loop 03199
Key ring 03199



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	28,9/33,9/38,9/43,9/48,9/53,9/58,9/63,9	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	34,9/39,9/44,9/49,9/54,9/59,9/64,9/69,9/74,9/79,9/84,9	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	43,1/48,1/53,1/58,1/63,1/68,1/73,1/78,1/83,1/88,1	16	257

Locating bushes stainless steel

for ball lock pins


Material:

Stainless steel 1.4305.

Version:

Bright.

Sample order:

nln 03425-10512

Note:

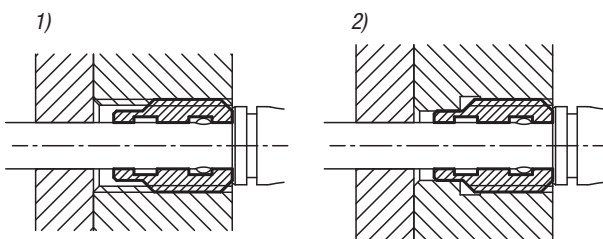
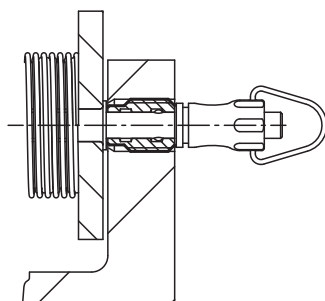
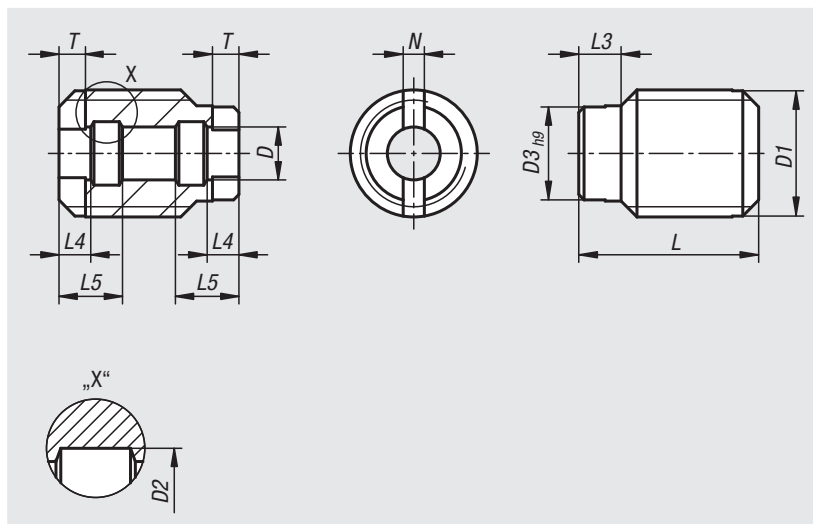
The locating bushes are ideal for easy and quick positioning of ball lock pins with head-end lock.

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



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