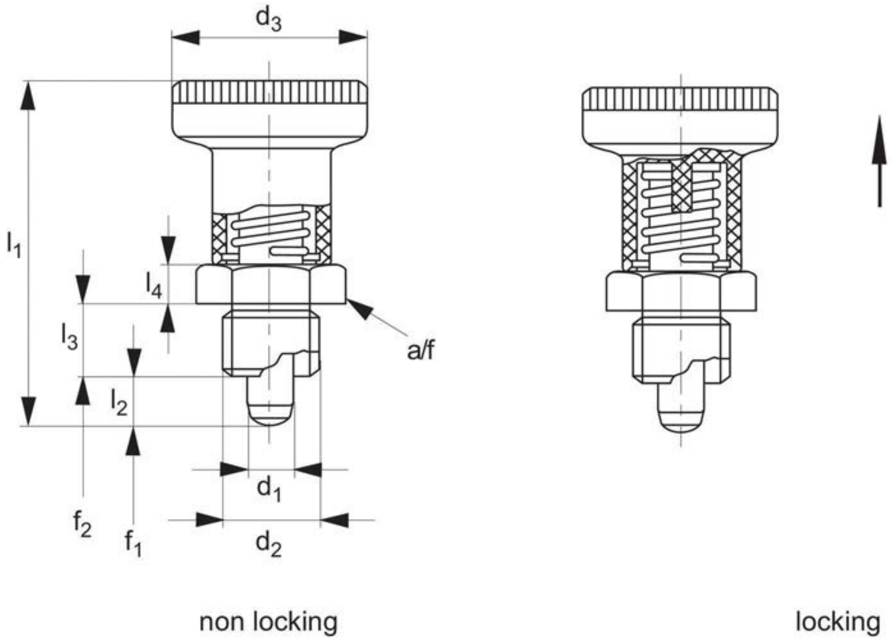
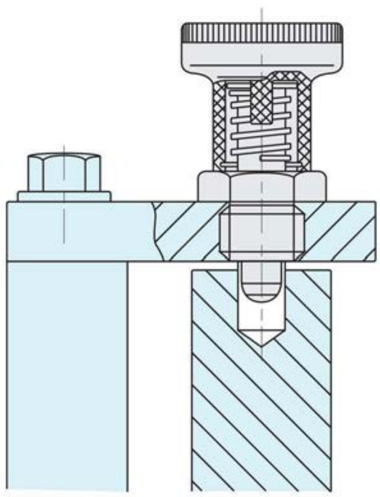
Index Plungers - Pull Grip

for thin walled parts

32730



Order No. Steel	Order No. Stainless	Type	d_1 -0,02 -0,04	d_2	d_3	l_1 ≈	l_2 min.	l_3 -0,15	l_4	a/f	Spring load* f_1 N≈	Spring load* f_2 N≈	g
32730.W0226	32730.W0246	Non Locking	6	M12x1,5	25	45	6	10	5	17	7	19	35,0
32730.W0228	32730.W0248	Non Locking	8	M16x1,5	31	54	8	12	6	19	14	24	62,0
32730.W0236	32730.W0256	Locking	6	M12x1,5	25	45	6	10	5	17	7	19	35,0
32730.W0238	32730.W0258	Locking	8	M16x1,5	31	54	8	12	6	19	14	24	61,0
32700.W0116	32700.W0516	Lock Nut	-	M12x1,5	-	-	-	-	-	-	-	-	7,4
32700.W0118	32700.W0518	Lock Nut	-	M16x1,5	-	-	-	-	-	-	-	-	18,0



Material

Free Cutting Steel type-
Body: free cutting steel, blackened.
Pin: steel, hardened.
Grip: thermoplastic PA6, black.
Stainless steel type -
Body: stainless steel 1.4305 (AISI 303).
Pin: stainless steel 1.4305 (AISI 303), nickel plated.
Grip: thermoplastic PA6, black.

Technical Notes

"Locking" type- enable pin to be held in retracted/non-projecting position; pull back grip, turn 90° to engage 'locking' on a notched catch.
"Non Locking" type- pin simply springs back when grip released.
Short bodied index plungers for compact applications. Hexagon collar improves leverage for secure installation.
Temperature resistance from -30° to +80°C.

Tips

Distance collars no. 32750 can be used to adapt screw length.
Spring loads * = statistical average.

A wide selection of solutions

Applications

- Locating and positioning.
- Indexing.
- Securing.
- Positive locking.
- Rapid adjustment of all kinds of tables, platforms and fixtures.
- Machine and fixture design.
- OEM products.
- Sports equipment.
- Medical aides (wheelchairs etc.).
- Aerospace.
- Machine cabinets.

Materials


Steel with plastic grip

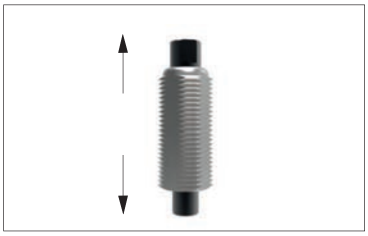

Stainless with plastic grip


Stainless body and grip

Locking or non locking


Locking (park)


Non locking (spring back)


Push pull

Handling and actuation methods


Standard grip


Lever grip


T-handle


Pull ring


Threaded for bespoke handle

Mounting options


Fine threaded (standard)


Coarse thread


Flange mount


Thin wall mount


Weldable

Additional technical notes

- Unless otherwise stated, grips on index plungers are not removeable.
- Many of the pins on index plungers are toleranced to either the pin or the hole. Please refer to the specific product table.
- Index plungers are not recommended for shear load applications.

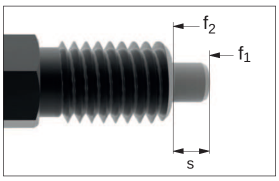
	Pin Tol.	Hole Tol.
1	h_9	+0,03 +0,08
2	-0,02 -0,04	H_7

Spring loads

s Stroke, or movement of plunger's pin.

f_1 The force required in Newtons (N) to over come the static strength of the spring and achieve initial movement of the plunger's pin.

f_2 The force required in Newtons (N) to fully compress the spring until the pin is fully depressed against the plunger's body.



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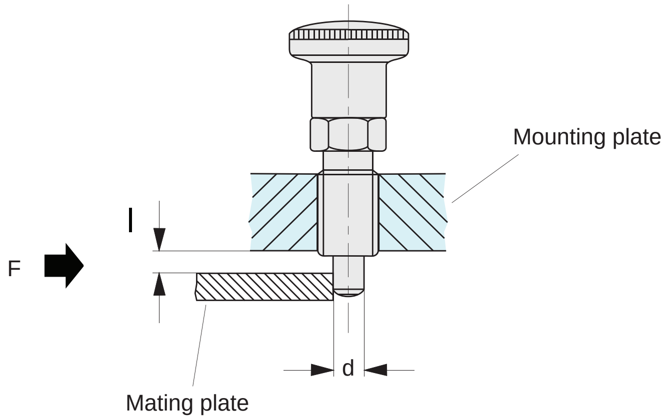
Computing the strength of index plungers

for shear loads / flexure loads of the plunger pin

Flexure loads

As soon as a gap **l** exists between the mounting plate in which the index plunger is installed, and the mating or base plate, the load must be considered to be as per a flexure load, with rod clamped at one side.

With this approach, the calculation is made against the bending of the index plunger.



Formulas for computation

Resistance torque	Flexural stress	Flexural strength
$W = \frac{\pi \times d^3}{32}$	$M_b = \sigma_b \times W$	$F = \frac{M_b}{l} = \frac{\sigma_b \times \pi \times d^3}{l \times 32}$

Material characteristics

The yield or substitute yield limit (Re / Rp 0,2) shown in the table opposite has been determine in tension tests involving tension specimen in accordance with DIN 50125-B6-30.

These tests constitute the basis for the load bearing details given.

Material Description	Material no.	Re in N/mm²(≈ per. flexural tension σ_b)
C45Pb	1.0504	560
X 10 CrNiS 18 9A	ISI 303	580

Calculation example, load values

Example:

Index plungers with a bolt diameter of 5 mm made of steel with a yield limit of Re = 560 N/mm², calculation against permanent deformation, the maximum permissible flexural strength is calculated as:

$$F_{per} = \frac{560\ N/mm^2 \times \pi \times (5mm)^3}{2mm \times 32} = 3430\ N$$

d Bolt diameter	max. flexural strength **F** in **N**, acc. to material and gap **l** differentiated C45Pb/1.0504 **l** = 2 mm	**l** = 3 mm	X 10 CrNiS 18 9/1.4305 **l** = 2 mm	**l** = 3 mm
3	740	490	760	510
4	1750	1170	1820	1210
5	3430	2290	3550	2370
65	930	3950	6140	4100
8	14070	9380	14570	9710
10	27480	18320	28470	18980
12	47490	31660	49190	32790
16	90070	102940	93290	119020

Safety information

On principle, the design also needs an adequate safety coefficient to be taken into account. The usual safety coefficients under static load 1.2 to 1.5; pulsating 1.8 to 2.4 and alternating 3 to 4.

Disclaimer:

You should carry out your own test series to verify whether a certain product is suitable for your specific applications.

Computing the strength of index plungers

for shear loads / flexure loads of the plunger pin

Shear loads

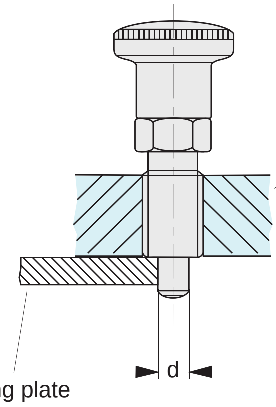
Providing only a very small gap exists between the mounting plate in which the index plunger is installed, and the mounting plate or base plate, the load can be calculated as a clean shear action.

As this is normally not the case, the “flexure” load should be used - see following page.

Approximately 80 % of the bolt’s tensile strength is assumed for the shear strength. This approach calculates against the tensile strength Rm, i.e. against the index pin shearing off.

To ensure the permanent and proper function of the index plunger, the yield limit Re must be considered in place of the tensile strength Rm.

Stop using the index plunger if the pin is damaged or deformed.



Formulas for computation

Bolt cross-section	Limit tension	Shear force
$S = \frac{d^2 \times \pi}{4}$	$\tau_a = 0,8 \times R_m$	$F = S \times \tau_a = \frac{d^2 \times \pi}{4} \times 0,8 \times R_m$

Material characteristics

The tensile strength shown in the table opposite (Rm) and the yield or substitute yield limit (Re / Rp 0,2) have been determine in tension tests involving tension specimen in accordance with DIN 50125- B6-30

These tests constitute the basis for the load bearing details given.

Material Description	Material no.	Re in N/mm^2	R_m in N/mm^2
C45Pb	1.0504	560	640
X 10 CrNiS 18 9A	ISI 303	580	740

Calculation example, load values

Example:

Index plungers with a bolt diameter of 6 mm made of Stainless Steel with a yield limit of Re = 580 N/mm², calculation against permanent deformation, the maximum permissible shear stress is calculated as:

$$F_{per} = \frac{(6\ mm)^2 \times \pi}{4} \times 0.8 \times 580\ N/mm^2 = 13120\ N$$

d Bolt diametre	max. force F in N, acc. to material and strength value differs: C45Pb/1.05045 at Re	C45Pb/1.05045 at Rm	X 10 CrNiS 18 9/1.4305 at Re	X 10 CrNiS 18 9/1.4305 at Rm
3	3160	3610	3270	4180
4	5620	6430	5830	7430
58	790	10050	9110	11620
6	12660	14470	13120	16730
8	22510	25730	23320	29750
10	35180	40210	36440	46490
12	50660	57900	52470	66950
16	90070	102940	93290	119020

Safety information

On principle, the design also needs an adequate safety coefficient to be taken into account. The usual safety coefficients under static load 1.2 to 1,5; pulsating 1.8 to 2.4 and alternating 3 to 4.

Disclaimer:

You should carry out your own test series to verify whether a certain product is suitable for your specific applications.