BRAUER®

TOOLING COMPONENTS

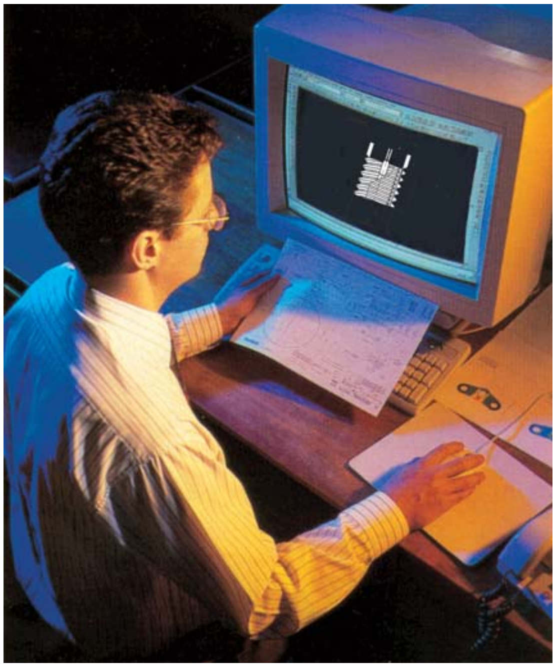
www.brauer.co.uk

Since 1926, Brauer has been providing industry with the finest engineered products, expert technical support, on time deliveries and unparalleled customer service. Our brands are now recognised world-wide as products of the highest quality, and the breadth of our product portfolio provides our demanding customers with a tooling solution for a wide variety of problems.

Our team of highly talented engineers is backed by the latest computer aided design facilities including three dimensional feature based parametric solid modelling. Manufacturing is carried out in our modern, well equipped factory accredited with ISO 9001 certification and situated in Milton Keynes, some 40 miles north of London.

At Brauer, we continue to be motivated by working with our customers in providing innovative solutions for their particular tooling requirements. These working partnerships, built by many years of unparalleled customer service, will ensure that Brauer branded tooling, and automation products, will remain at the forefront of their markets.

To view the complete tooling portfolio manufactured by the Brauer companies, please consult our Web Site at www.Brauer.co.uk.



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TOOLING COMPONENTS

MACHINE CLAMPS

MACHINE AND JIG COMPONENTS

TOOLING COMPONENTS

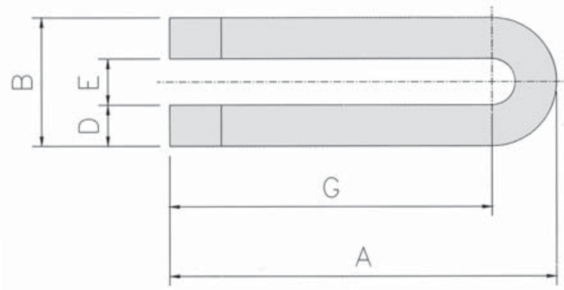
MACHINE AND JIG DEVICES (CONTINUED)

DOWEL PINS

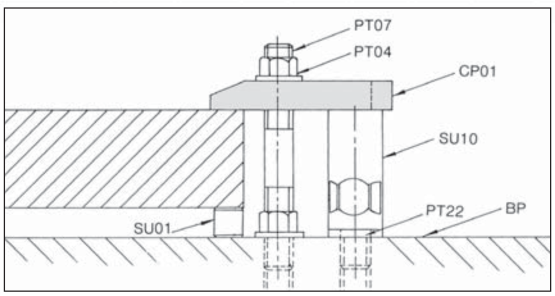
Machine Clamps

CP01 U-CLAMP

- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC32-38.
  Surface finish: Manganese Phosphating treatment.
- Features: Easy to assemble and/or disassemble because no need.



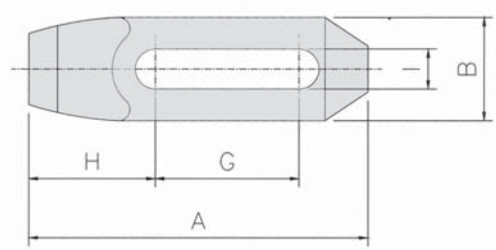
MODEL NO.	A	B	C	D	E	F	G	kg
CP010112	100	38	22	12	13	6	81	1.2
CP010212	125	38	25	12	13	6	106	1.5
CP010316	150	50	30	16	17	8	125	2.4
CP010420	200	60	35	19	21	10	170	4.5

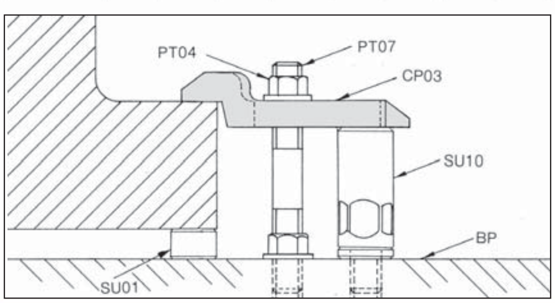


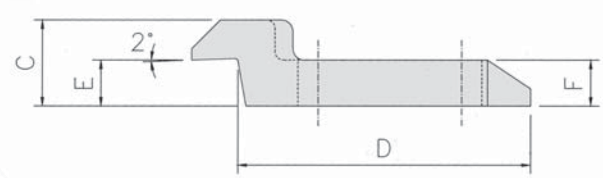
CP03 GOOSE NECK

- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC32-38.
  Surface finish: Manganese Phosphating treatment.
- Features: When fix the workpiece, this is an ideal part for lowering the height of the nut so as to minimize the interference spacing of tools.

MODEL NO.	A	B	C	D	E	F	G	H	I	kg
CP030112	120	36	30	102	16	17	50	45	13	0.6
CP030216	150	48	48	130	25	25	55	60	17	1.4
CP030320	175	60	60	150	30	30	65	70	21	1.8





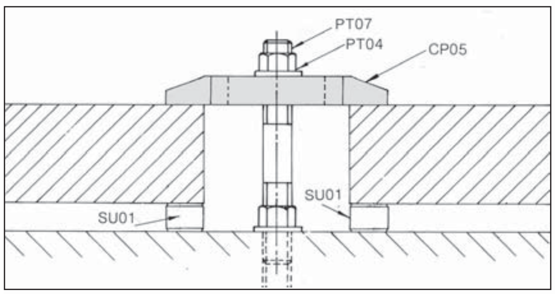


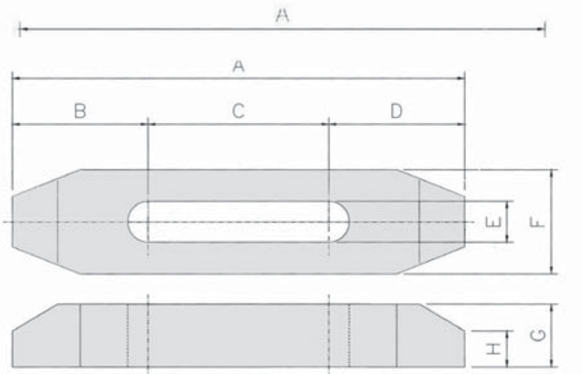
TOOLING COMPONENTS

CP05 PLANE-CLAMP

- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC32-38.
  Surface finish: Manganese Phosphating treatment.
- Application: Use for pressing plane surface.

MODEL NO.	A	B	C	D	E	F	G	H	kg
CP050112	65	20	25	20	13	32	19	13	0.20
CP050212	100	30	40	30	13	32	19	13	0.35
CP050316	80	28	24	28	17	38	22	13	0.22
CP050416	125	42	41	42	17	38	22	13	0.54
CP050520	100	34	32	34	21	38	22	13	0.40
CP050620	125	42.5	40	42.5	21	38	25	15	0.65

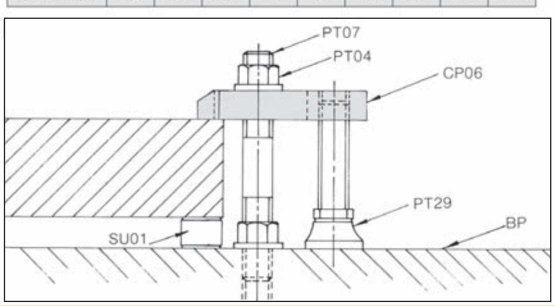


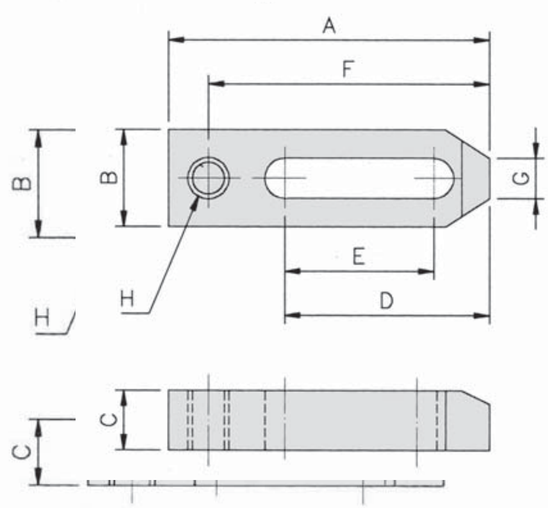


CP06 TAPPED END CLAMP STRAP

- Material/Finish:
  Material: S45C(JIS) / Ck45(DIN), heat treated to HRC32-38.
  Surface finish: Manganese Phosphating treatment.
- Application: Use with PT29 (toggle pad) for single orientation.

MODEL NO.	A	B	C	D	E	F	G	H	kg
CP060112	65	32	19	32	14	52	13	M12	0.20
CP060212	80	32	19	48	25	69	13	M12	0.24
CP060312	100	32	19	60	40	89	13	M12	0.35
CP060416	80	38	19	40	17	65	17	M16	0.32
CP060516	100	38	25	55	30	85	17	M16	0.54
CP060616	125	38	25	70	45	110	17	M16	0.67
CP060720	150	50	25	82	50	134	21	M20	1.10
CP060820	200	50	32	112	80	184	21	M20	1.45

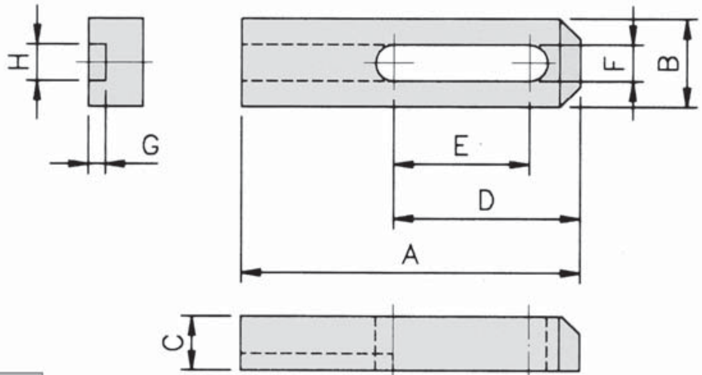




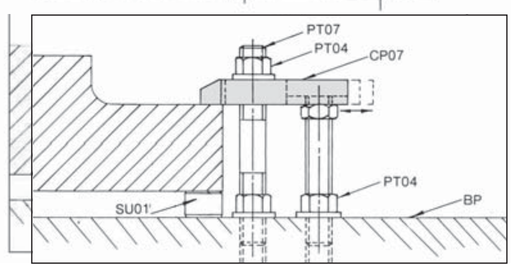
TOOLING COMPONENTS

CP07 SLOTTED END CLAMP STRAP

- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC32-38.
  Surface finish: Manganese Phosphating treatment.
- Application: Use the slot for fixing the orientation.

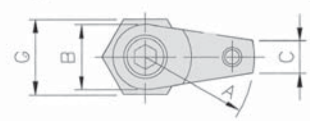


MODEL NO.	A	B	C	D	E	F	G	H	kg
CP070112	65	32	22	32	14	13	7	10	0.18
CP070212	80	32	22	48	25	13	7	10	0.20
CP070312	100	32	22	60	40	13	7	10	0.30
CP070416	80	38	22	40	17	17	8	12	0.28
CP070516	100	38	25	55	30	17	8	12	0.50
CP070616	125	38	25	70	45	17	8	12	0.56
CP070720	150	50	25	82	50	21	9	13	1.10
CP070820	200	50	32	112	80	21	9	13	1.40

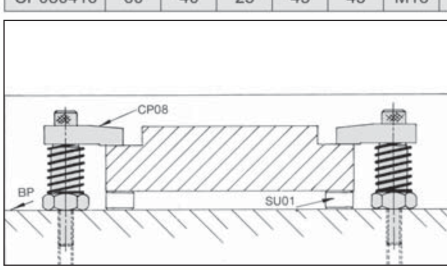


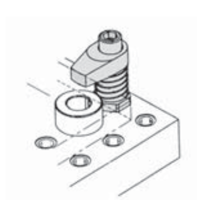
CP08 SWING CLAMP

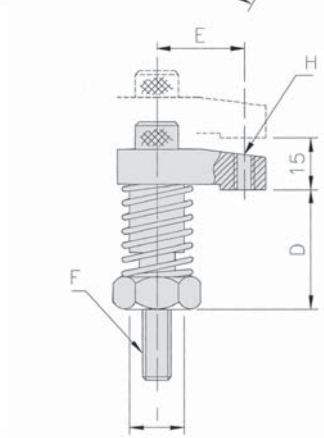
- Material/Finish:
  Material: SCM440(JIS) / 42CrMo4(DIN), heat treated to HRC38-42.
  Surface finish: Manganese Phosphating treatment.
- Application: Mount on base plate or clamping cube to clamp workpiece.
- Features: Easy for loading / unloading workpiece.
  No interference will happen during loading / unloading the workpiece because the pressure plate is available for rotating.



MODEL NO.	A	B	C	D	E	F	G	H	I	kg
CP080112	30	28	16	40	-	M12	29	-	21	0.49
CP080212	50	32	20	45	40	M12	36	M12	26	0.61
CP080316	50	32	20	45	40	M16	36	M12	26	0.61
CP080416	60	40	25	45	45	M16	41	M16	32	0.70

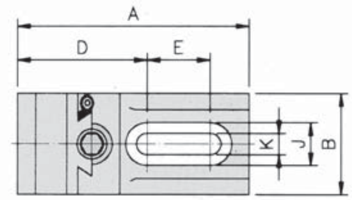




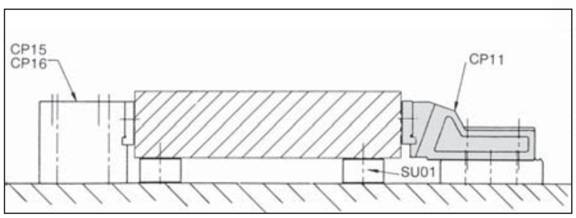


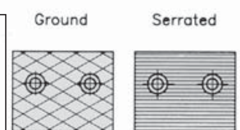
CP11 FREE JAW VISE

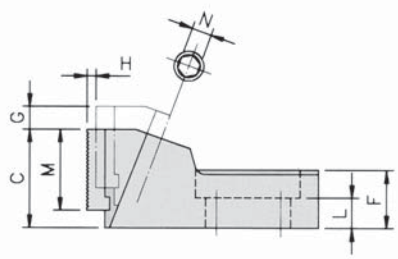
- Material/Finish:
  Material: FCD 45(JIS), heat treated(normalized).
- Application: Use with CP15 or CP16.
- Features: No limitation for the range of clamping.
  Most suitable for large workpiece.
  Available on either serrated or ground jaw.



MODEL NO.	A	B	C	D	E	F	G	H	J	K	L	M	N	Type	kg
CP110112	133	60	58	68	50	32	16	6	22	14	18	42	10	Serrated	2.0
CP110216	187	85	80	92	70	45	24	9	30	18	25	60	14		5.5
CP110312	133	60	58	68	50	32	16	6	22	14	18	42	10	Ground	2.0
CP110416	187	85	80	92	70	45	24	9	30	18	25	60	14		5.5

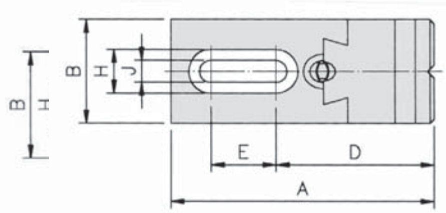




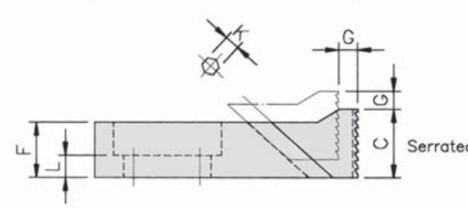


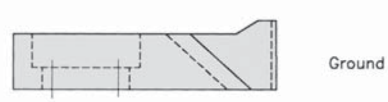
CP12 ADJUSTABLE SIDE CLAMP

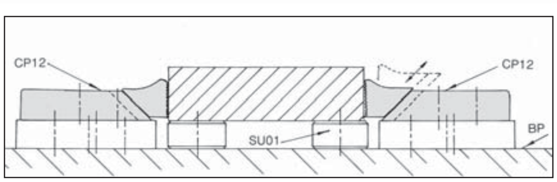
- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC38. Jaw Surface treated with high frequency quenching.
  Surface finish: Manganese Phosphating treatment.
- Application: Suitable for clamping both rouge casting or machined casting surface.
  Available on either serrated or ground jaw.



MODEL NO.	A	B	C	D	E	F	G	H	J	K	L	Type	kg
CP120108	72	25	20	45	16	16	7	14	8.5	4	7	Serrated	0.16
CP120212	105	35	30	65	26	22	12	20	13.5	6	9		0.45
CP120316	138	40	40	90	30	30	14	26	17.0	8	13		0.95
CP120408	72	25	20	45	16	16	7	14	8.5	4	7	Ground	0.16
CP120512	105	35	30	65	26	22	12	20	13.5	6	9		0.45
CP120616	138	40	40	90	30	30	14	26	17.0	8	13		0.95

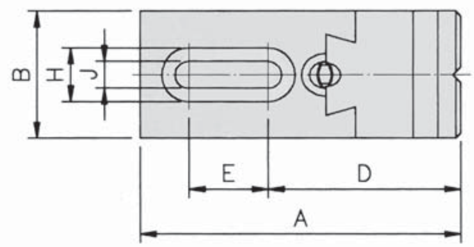


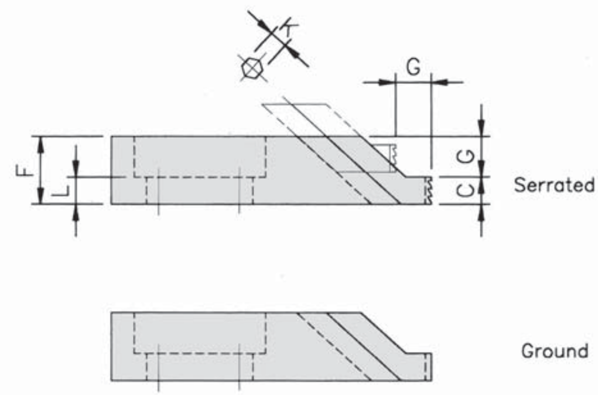




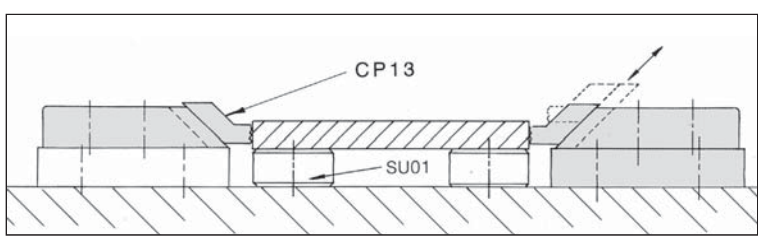
CP13 ADJUSTABLE SIDE CLAMP

- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC 42. Jaw Surface treated with high frequency quenching.
  Surface finish: Manganese Phosphating treatment.
- Application: Suitable for clamping rouge or machined workpiece which thin wall thickness.
  Available on either serrated or ground jaw.





MODEL NO.	A	B	C	D	E	F	G	H	J	K	L	Type	kg
CP130108	72	25	8	45	16	16	7	14	8.5	4	7	Serrated	0.15
CP130212	105	35	10	65	26	22	12	20	13.5	6	9	Serrated	0.40
CP130316	138	40	14	90	30	30	14	26	17.0	8	13	Serrated	0.85
CP130408	72	25	8	45	16	16	7	14	8.5	4	7	Ground	0.15
CP130512	105	35	10	65	26	22	12	20	13.5	6	9	Ground	0.40
CP130616	138	40	14	90	30	30	14	26	17.0	8	13	Ground	0.85



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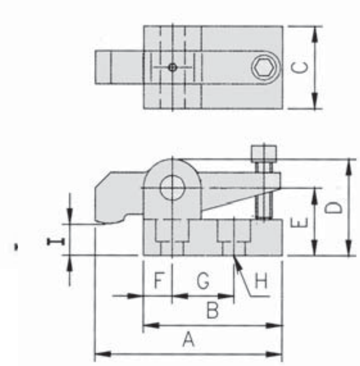
CP14 PIVOTING SIDE CLAMP

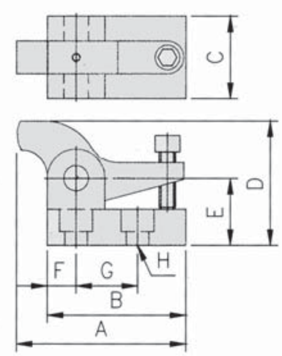
- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC 32-38.
  Surface finish: Manganese Phosphating treatment.
- Application: Mount onto base plate or clamp cube.
  Suitable for clamping rough surface workpiece.

CP14A



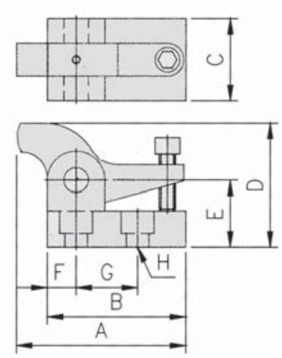
MODEL NO.	A	B	C	D	E	F	G	H	I	kg
CP140112	85	60	45	50	37	12.5	24	ϕ13	5-15	0.85
CP140216	125	90	68	65	47	18	36	ϕ18	5-15	2.3

CP14B



MODEL NO.	A	B	C	D	E	F	G	H	kg
CP140312	75	60	45	65	37	12.5	24	ϕ13	0.85
CP140416	110	90	68	88	47	18	36	ϕ18	2.20

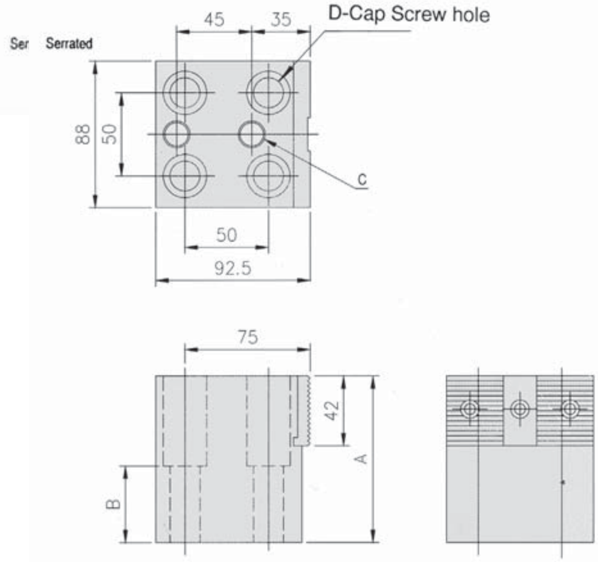
CP14C



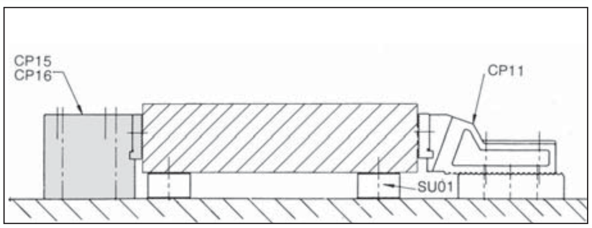
MODEL NO.	A	B	C	D	E	F	G	H	kg
CP140512	75	60	45	60	37	12.5	24	ϕ13	0.80
CP140616	115	90	68	83	47	18	36	ϕ18	2.10

CP15 BLOCK STOP

- Material/Finish:
  Material: body ==>S45C(JIS) / CK45(DIN), heat treated to HRC 32.
  jaw==>YK30(JIS) / C105W1(DIN), heat treated to HRC 58.
  Surface finish: Manganese Phosphating treatment.
- Application: Use with CP11 for clamping rough surface.
- Features: with serrated jaw.

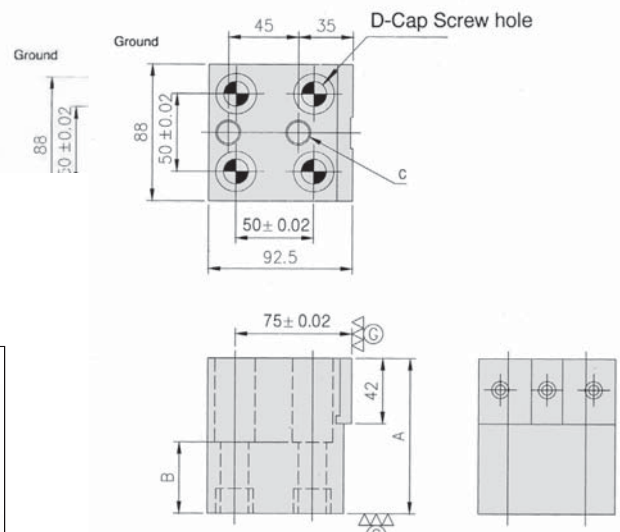


MODEL NO.	A	B	C	D	kg
CP150112	65	43	M12	ϕ14	4.0
CP150212	80	43	M12	ϕ14	4.5
CP150316	65	38	M16	ϕ18	3.9
CP150416	80	38	M16	ϕ18	4.4

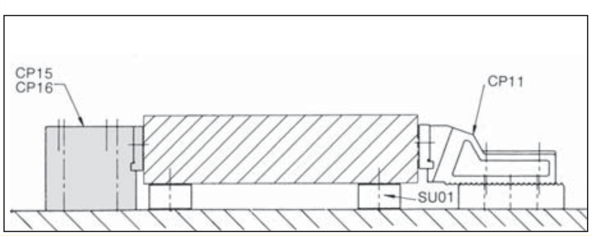


CP16 BLOCK STOP

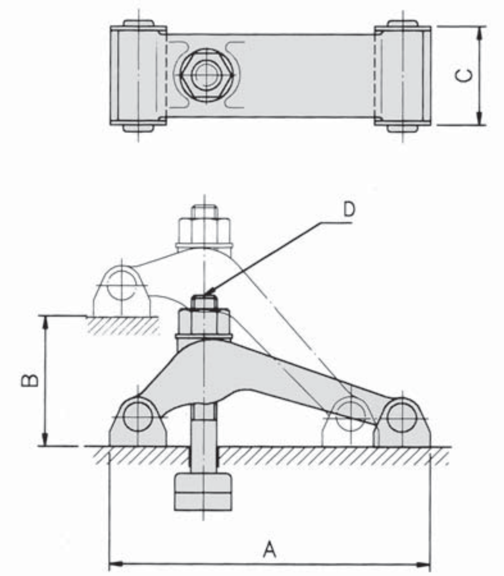
- Material/Finish:
  Material: body ==>S45C(JIS) / CK45(DIN), heat treated to HRC 32.
  jaw==>YK30(JIS) / C105W1(DIN), heat treated to HRC 58.
  Surface finish: Manganese Phosphating treatment.
- Application: Use with CP11 for clamping rough surface.
- Features: with ground jaw.



MODEL NO.	A	B	C	D (F7)	kg
CP160112	65	43	M12	ϕ12	4.0
CP160212	80	43	M12	ϕ12	4.5
CP160316	65	38	M16	ϕ16	3.9
CP160416	80	38	M16	ϕ16	4.4

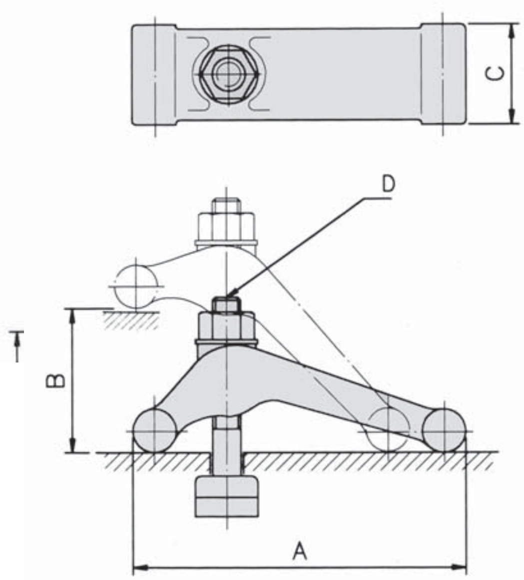


CP19 SWIVEL NEW CLAMP



MODEL NO.	A	B	C	D	kg
CP19-NC50	125	75	42	M12-125	0.38
CP19-NC60	150	85	49	M16-150	0.60
CP19-NC80	194	105	55	M20-175	1.20

CP20 SWIVEL NEW CLAMP



MODEL NO.	A	B	C	D	kg
CP20-NC5	125	75	42	M12-125	0.37
CP20-NC6	150	85	49	M16-150	0.58
CP20-NC8	194	105	55	M20-175	1.15

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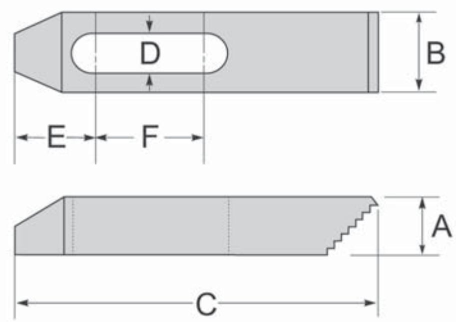
CP25 STEP CLAMP

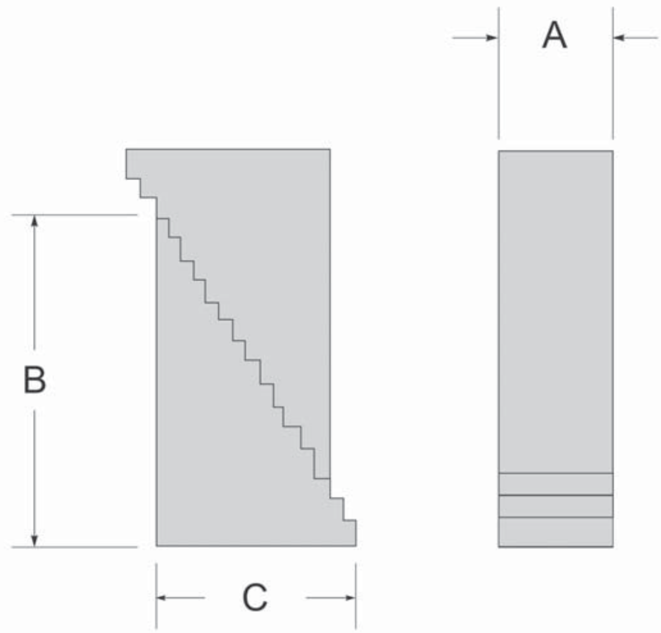
- Material/Finish:
  Material: S45C, heat treated to HRC 32~38.
  Surface finish: Manganese Phosphating treatment.
- Application: Used with SU25.



MODEL NO.	A	B	C	D	E	F	G	kg
CP251063	13	25	63		18	19		0.12
CP2510100	16	25	100	11	27	37	M10	0.23
CP2510150	19	32	150		30	50		0.47
CP251263	13	25	63		20	14		0.12
CP2512100	19	32	100	13	29	34	M12	0.38
CP2512150	22	32	150		32	50		0.68
CP251463	13	25	63		20	14		0.12
CP2514100	19	32	100	15	29	34	M14	0.38
CP2514150	22	32	150		32	50		0.68
CP251663	16	32	63		22	12		0.17
CP2516100	19	38	100	17	31	26	M16	0.42
CP2516150	22	38	150		40	47		0.72
CP251863	16	32	63		22	12		0.17
CP2518100	19	38	100	20	31	26	M18	0.42
CP2518150	22	38	150		40	47		0.72
CP2520100	19	38	100		33	27		0.38
CP2520150	25	38	150	22	43	44	M20	0.76
CP2520200	25	50	200		55	65		1.52
CP2524150	32	50	150		43	38		1.29
CP2524200	32	50	200	26	53	57	M24	2.00
CP2524250	38	50	250		60	64		2.95

SU25 STEP BLOCK

- Material/Finish:
  Material: S45C.
  Surface finish: Manganese Phosphating treatment.
- Application: used with CP25.



MODEL NO.	Supporting Height	A	B	C	Endurable weight	kg
SU252530	19-49	25	30	17	13.210	0.11
SU252545	28-68		45	27	21.000	0.26
SU252597	58-150		97	57	46.200	1.02
SU253259	38-90	32	59	35	41.650	0.71
SU253297	58-150		97	57	69.400	1.53
SU2532139	82-210		139	81	99.000	2.77
SU253859	36-90	38	59	35	55.500	0.92
SU253897	58-150		97	57	92.600	2.00
SU2538139	82-210		139	81	132.500	3.73

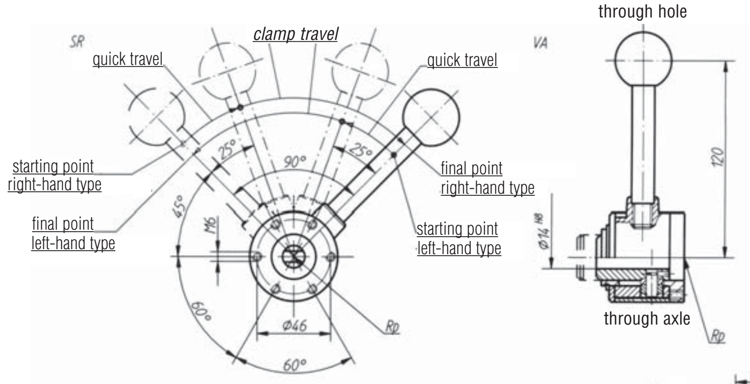
TOOLING COMPONENTS

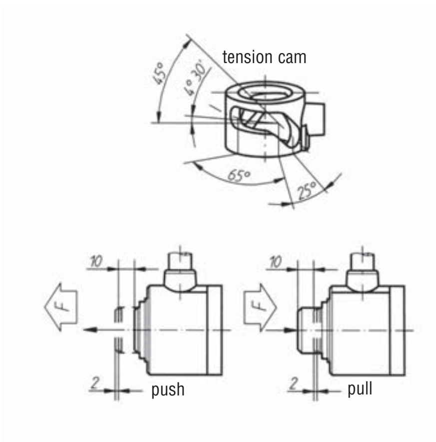
"Actima" clamping device

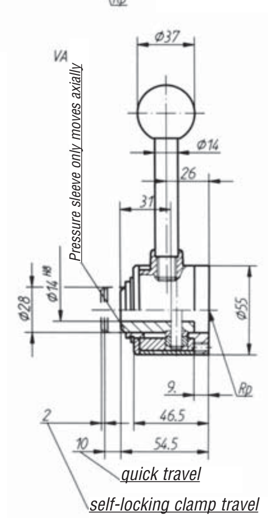
Material:
Steel, ball knob in duroplastic FS 31

Surface finish:
Clamping device and accessories black oxide finish. Red plastic ball knob.

Note:
The travel path is 10mm. Within the short clamp travel of 2mm self locking occurs in any position. Thus workpieces with tolerances of up to 1.5mm can be safely clamped. The actima clamping device can be fitted in any horizontal or vertical position. Optional standard accessories extend its range of application. All surfaces of the cam system subjected to heavy loads are case hardened (pressure sleeve and accessories only if specified). The maximum permissible clamping force is about 4905 N (500 kp).







"actima" clamping device with through axle

Order No.	Execution	Approx. weight kg
1001	r.h. / push	0,865
1002	r.h. / pull	0,865
1003	l.h. / push	0,865
1004	l.h. / pull	0,865

"actima" clamping device with through hole

Order No.	Execution	Approx. weight kg
1005	r.h. / push	0,865
1006	r.h. / pull	0,865
1007	l.h. / push	0,865
1008	l.h. / pull	0,865

"actima" accessories

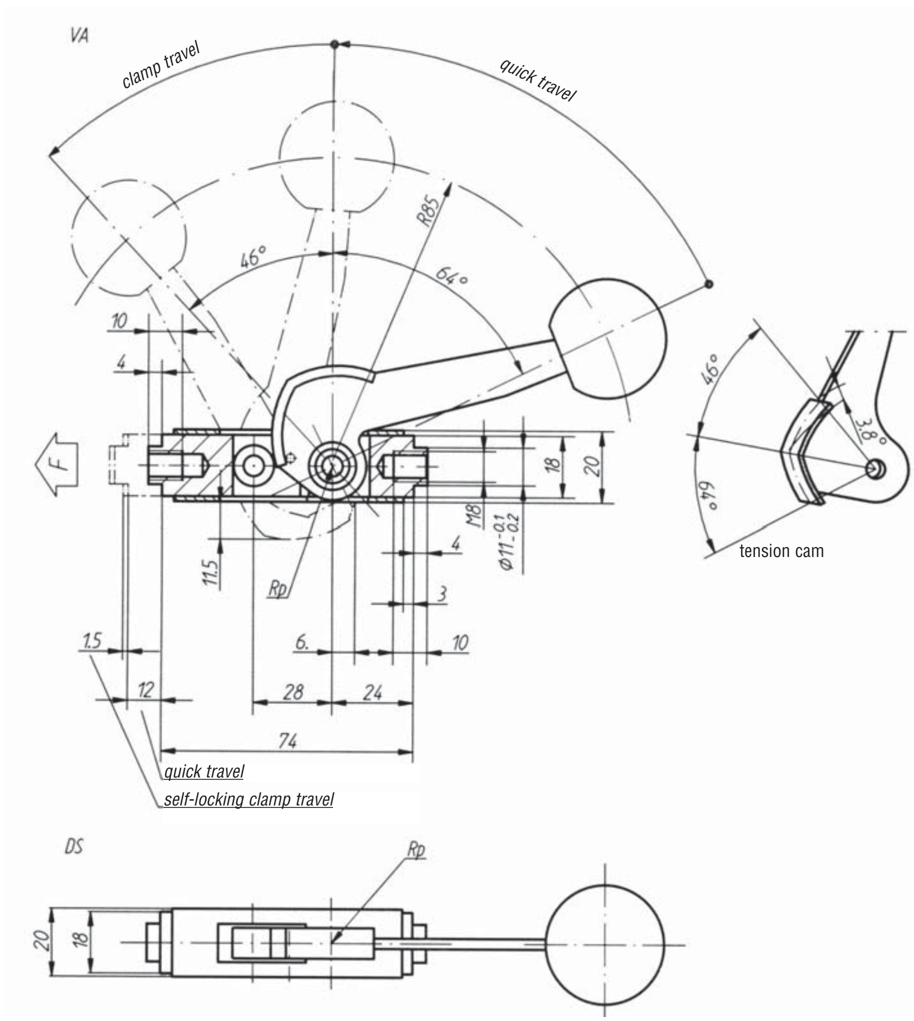
Order No.	Type	Approx. weight kg
1009	disk	0,275
1010	taper	0,085
1011	vee-block	0,080

“Arness” clamping device

Material:
Steel, ball knob in duroplastic FS 31

Surface finish:
Housing silver-grey hammertone finish. all other parts including accessories black oxide finish. Red duroplastic ball knob.

Note:
The travel path is 12mm. Within the short clamp travel of 1.5mm self locking occurs in any position. Thus workpieces with tolerances of up to 1mm can be safely clamped. The “arness” clamping device can be fitted in any horizontal or vertical position. For individual adaptation several standard parts have been developed and are available as special accessories. The pressure button and all surfaces of the cam system subjected to heavy loads are case hardened. The maximum permissible clamping force is about 4905 N (500 kp).



“arness” clamping device

Order No.	Approx. weight kg
0901	0,250

“arness” accessories

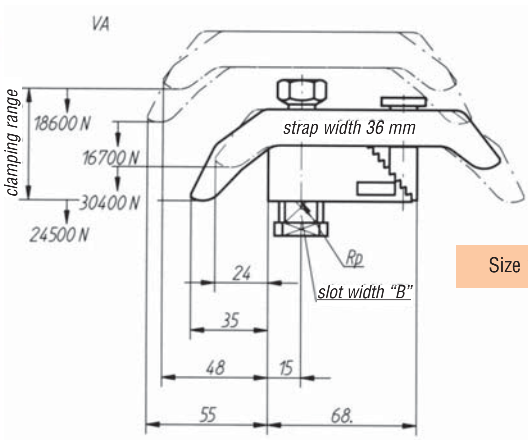
Order No.	Type	Approx. weight kg
0902	pressure button	0,010
0903	tension yoke	0,250
0904	fork	0,120

Quick-acting Clamps

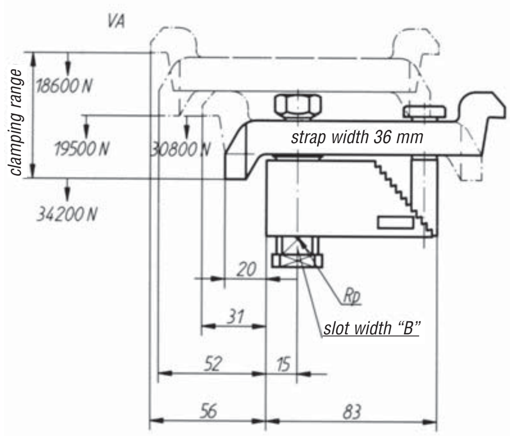
Material:
Base: spheroidal cast iron.
Strap: quenched and tempered steel.
Bolt: quenched and tempered steel.

Surface finish:
Phosphated.

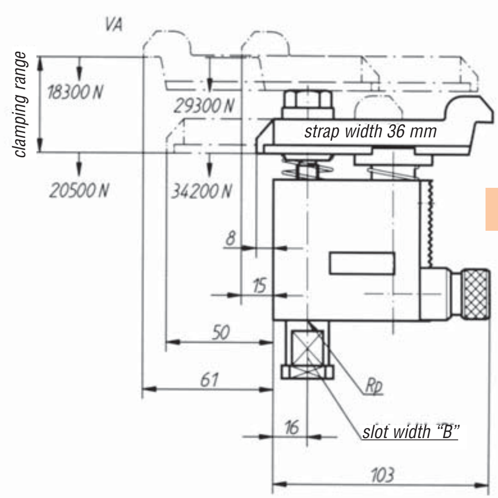
Note:
Quick-acting clamps are universal, flexible clamping devices which are preassembled from individual components and supplied as complete units. There are **no loose parts** which have to be put together for each clamping operation. Thanks to their compact design these clamps can be located very close to the workpiece, so that the full surface area of the machine table can be used.



Size 1



Size 2



Size 3

Specifications for quick-acting clamps

Order No. Phosphated	Size	Clamping range	Slot width B* to DIN 650	Approx. weight kg
121**	1	0-35	available for all sizes B 12, 14, 16,	1
122**	2	25-85		2
123**	3	80-137		3
124**	4	125-224		4
125**	5	160-300		5

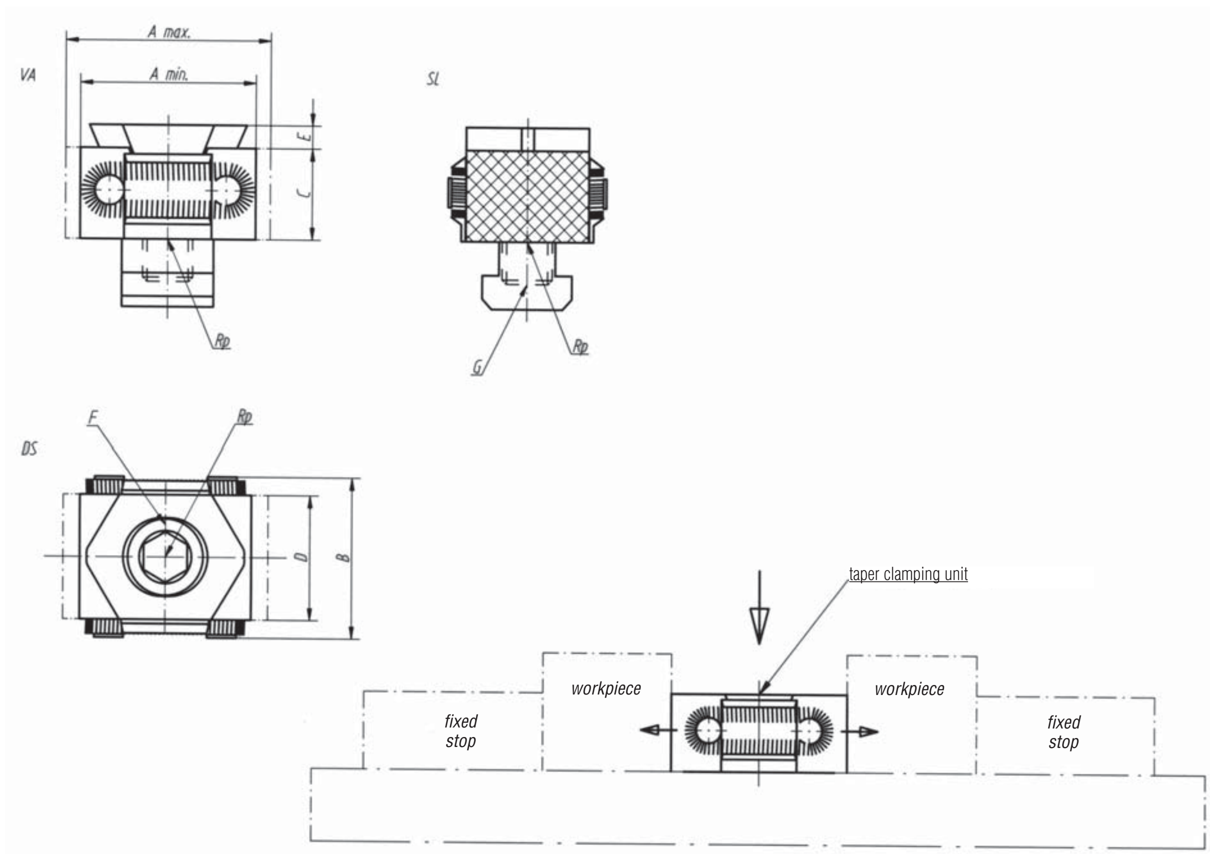
*Additional slot widths on request
*Please add the desired slot width after the order number.

Sample order: quick-acting clamp 21416

Taper Clamping Units Form A

Material, finish:
Body: tool steel, hardened.
Clamping segments: tool steel hardened (HRc 49-51) and black oxide finished.
Taper surface ground..

Note:
The taper clamping units are of compact design, especially suitable for horizontal and vertical multiple chucking. The hardened and ground taper surfaces ensure high clamping forces. Optionally, the appropriate taper clamping units can be mounted in a M.T.P. hole or T-slot. Inserting the socket head screw DIN 912 moves the two clamping segments outwards and presses the workpieces against a fixed stop. The clamping jaws of version 4525-08 are not corrugated.



Specifications for taper clamping units Form A

Order No.	A min.	A max.	B	C	D	E	F socket head screws DIN 912	G	Tension load approx. daN		Approx. weight kg
4525-08	27	31	29	15	21	2,5	M8 x 025	for threaded hole	1500	25	0,068
4525-0810	27	31	29	15	21	2,5	M8 x 025	for T-slot 10	1500	25	0,080
4525-12	42	49	41	22	30	4	M12 x 040	for threaded hole	3000	85	0,216
4525-1214	42	49	41	22	30	4	M12 x 030	for T-slot 14	3000	85	0,251
4525-16	57	66	56	29	42	5	M16 x 060	for threaded hole	5000	210	0,536
4525-1618	57	66	56	29	42	5	M16 x 050	for T-slot 18	5000	210	0,605

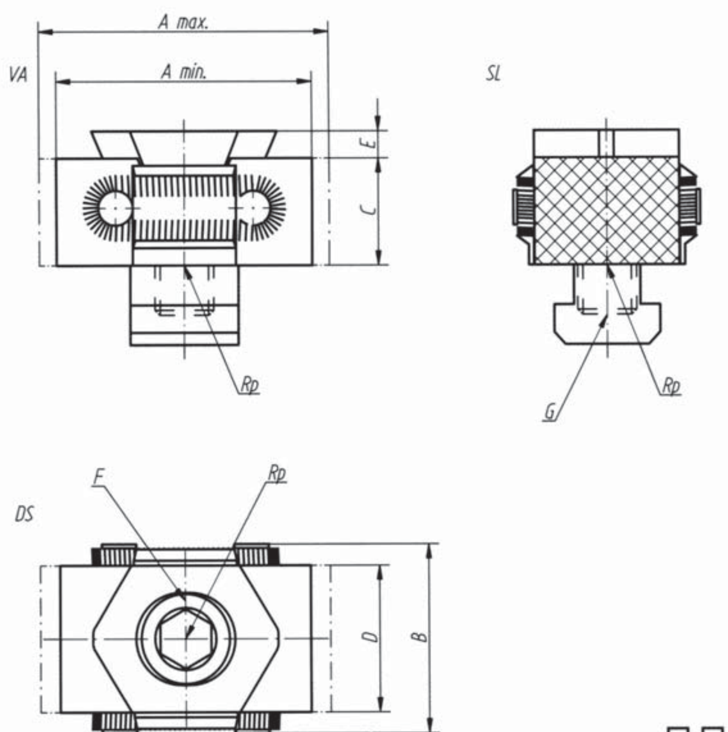
Sample order: taper clamping unit Form A 4525-1618

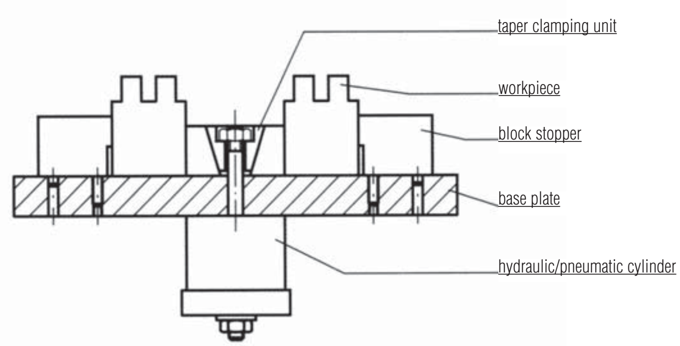
Taper Clamping Units Form A + L

with extra length for made to order forms

Material, finish:
Body: tool steel, hardened.
Clamping segments: tool steel (HRc 30), black oxide finished.
Taper surface ground.
Clamping segments with worked-in shape or other hardness values available on request.

Note:
The special feature of the taper clamping units “Form A + L” lies in the added length per clamping jaw of 3mm for versions 4526-08 and 3mm for versions 4526-12. This extra length allows form adjusted to the workpiece geometry to be worked in (see illustration). The clamping jaws of version 4526-08 are not corrugated.





Specifications for taper clamping units Form A+L

Order No.	A min.	A max.	B	C	D	E	F socket head screws DIN 912	G	Tension load approx. daN		Approx. weight kg
4526-08	33	37	29	15	21	2,5	M8 x 025	for threaded hole	1500	25	0,084
4526-0810	33	37	29	15	21	2,5	M8 x 025	for T-slot 10	1500	25	0,096
4526-12	52	59	41	22	30	4	M12 x 040	for threaded hole	3000	85	0,276
4526-1214	52	59	41	22	30	4	M12 x 030	for T-slot 14	3000	85	0,303

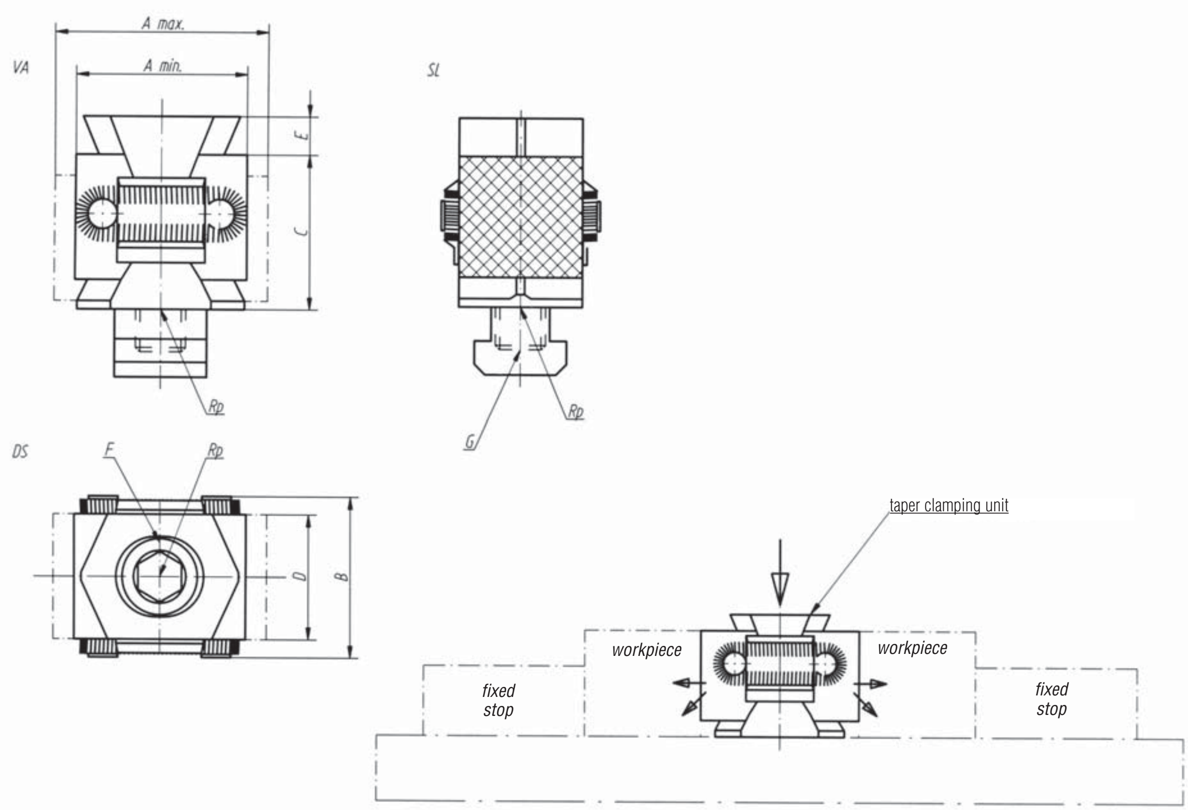
Sample order: taper clamping unit Form A+L 4525-12

BRAUER®

Taper Clamping Units Form B

Material, finish:
Body: tool steel, hardened.
Clamping segments: tool steel (HRc 49-51) and black oxide finished.
Taper surface ground.

Note:
The taper clamping units are of compact design, especially suitable for horizontal and vertical multiple chucking. The hardened and ground taper surfaces ensure high clamping forces. Optionally, the appropriate taper clamping unit can be mounted in an M.T.P. hole or T-slot. Inserting the socket head screw DIN 912 moves the two clamping segments outwards and presses the workpieces against a fixed stop. The double taper produces the so-called “downward” effect in this version.



Specifications for taper clamping units Form B

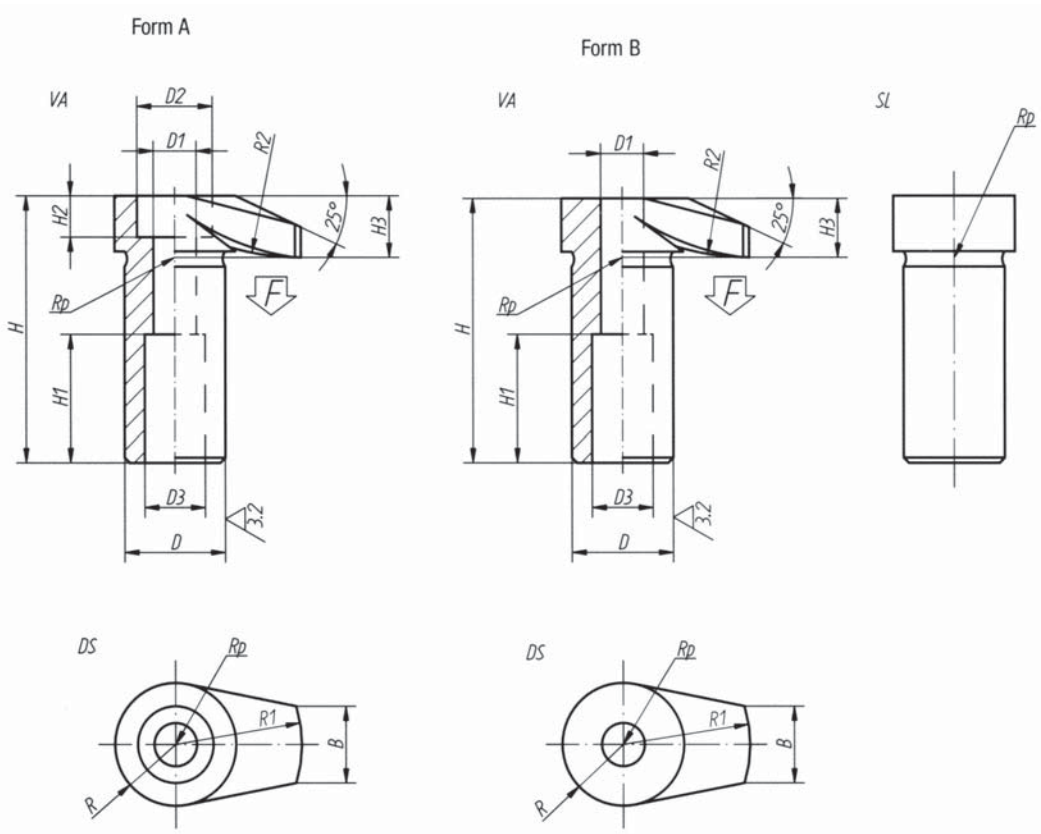
Order No.	A min.	A max.	B	C	D	E	F socket head screws DIN 912	G	Tension load approx. daN		Approx. weight kg
4527-12	42	49	41	36	30	5	M12 x 060	for threaded hole	4000	25	0,314
4527-1214	42	49	41	36	30	5	M12 x 050	for T-slot 14	4000	25	0,353
4527-16	57	67	56	50	42	5	M16 x 080	for threaded hole	6000	210	0,843
4527-1618	57	67	56	50	42	5	M16 x 070	for T-slot 18	6000	210	0,912

Sample order: taper clamping unit Form B 4527-1214

Hook Clamps

Material:
Heat treated steel, heat-treated.

Surface finish:
Black oxide finish.



Specifications for hook clamps

Order No. Form A	Order No. Form B	$D_{-0,10}^{-0,02}$	D_1	D_2	D_3	H Form A	H Form B	H_1	H_2	H_3 Form A	H_3 Form B	B	R	R_1	R_2	$P_{max.}$ daN	Approx. weight kg Form A	Approx. weight kg Form B
4370-06	**4370-106**	16	6,5	11	10	42	41,5	20	6	10	9,5	11	9	20	30	482	0,052	0,060
4370-08	**4370-108**	20	8,5	15	12	52	51,5	25	8	12	11,5	15	12	25	50	877	0,111	0,119
4370-10	**4370-110**	25	10,5	18	14	66	65,5	32	10	16	15,5	17	14	32	60	1390	0,230	0,238
4370-12	**4370-112**	32	12,5	20	17	83	82,5	40	12	20	19,5	20	18	40	80	2020	0,472	0,492

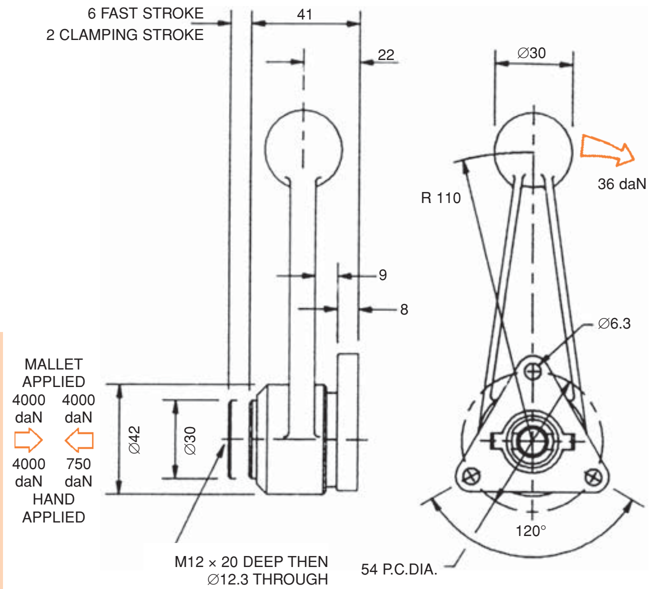
Sample order: hook clamp Form A 4370-10

BRAUER®

MAGNA FORCE HEAVY-DUTY CAM CLAMPS

CAM RAM CLAMPS

MODELS **CR4000** **(CLOCKWISE)**
CR4000A **(ANTI-CLOCKWISE)**

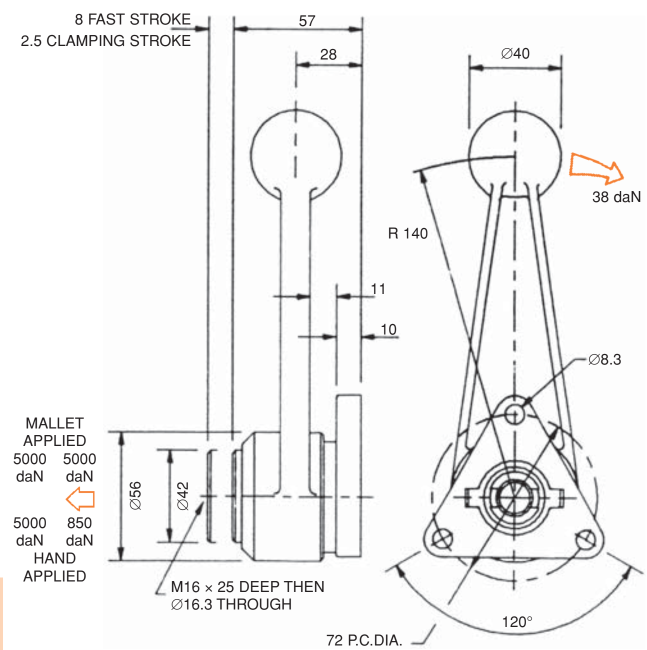


Operating clamping force:
750 daN (hand applied),
4000 daN (mallet applied)

Weight:
0.55 Kg

CAM RAM CLAMPS

MODELS **CR5000** **(CLOCKWISE)**
CR5000A **(ANTI-CLOCKWISE)**



Operating clamping force:
850 daN (hand applied),
5000 daN (mallet applied)

Weight:
1.3 Kg

TECHNICAL INFORMATION

Clamp No.	Applied Handle Force (Hand Push)	Clamping Force	Clamping Force using Mallet Blows	Daylight Travel	Clamping Travel
CR4000	36 daN	750 daN	4000 daN	6.0mm	2.0mm
CR4000A	36 daN	750 daN	4000 daN	6.0mm	2.0mm
CR5000	38 daN	850 daN	5000 daN	8.0mm	2.5mm
CR5000A	38 daN	850 daN	5000 daN	8.0mm	2.5mm

MAGNA FORCE HEAVY-DUTY CAM CLAMPS

CAM SWING CLAMPS

MODELS **CS300** (CLOCKWISE)
CS300A (ANTI-CLOCKWISE)

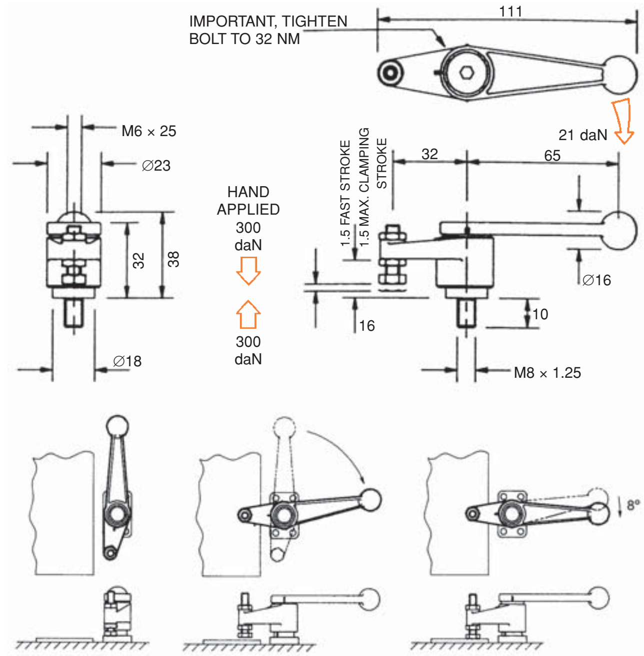
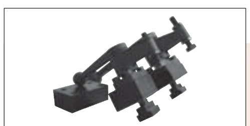


Fig. 1 Fig. 2 Fig. 3

Operating clamping force:
300 daN (hand applied).
Weight:
0.20 Kg
Supplied complete with:
MB0625 Set screw & nuts.

CAM SWING CLAMPS

MODELS **CS800** (CLOCKWISE)
CS800A (ANTI-CLOCKWISE)



For Cam Swing Height Block Assemblies see page 116

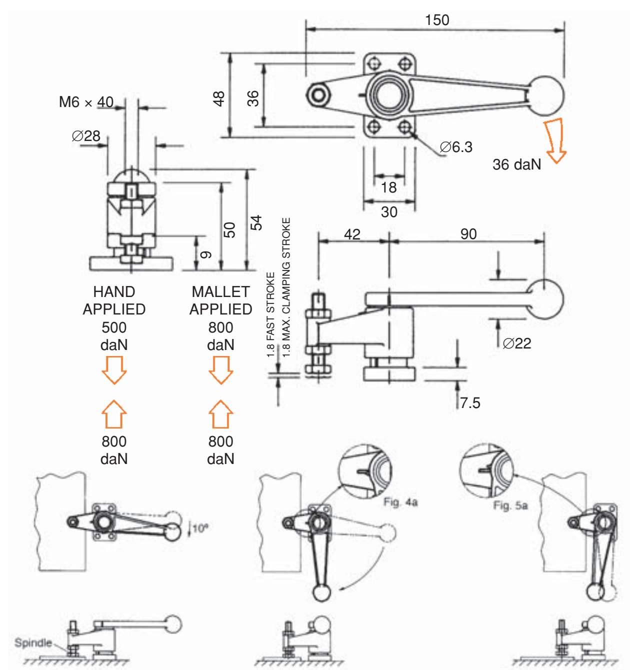


Fig. 3a Fig. 4 Fig. 5 Over-stroked Cam

Operating clamping force:
500 daN (hand applied),
800 daN (mallet applied).
Weight:
0.40 Kg
Supplied complete with:
MB0840 Set screw & nuts.

TECHNICAL INFORMATION

Clamp No.	Applied Handle Force (Hand Push)	Clamping Force	Clamping Force using Mallet Blows	Daylight Travel	Clamping Travel
CS300	21 daN	300 daN	N/A	1.5mm	1.5mm
CS300A	21 daN	300 daN	N/A	1.5mm	1.5mm
CS800	36 daN	500 daN	800 daN	1.8mm	1.8mm
CS800A	36 daN	500 daN	800 daN	1.8mm	1.8mm

MAGNA FORCE HEAVY-DUTY CAM CLAMPS

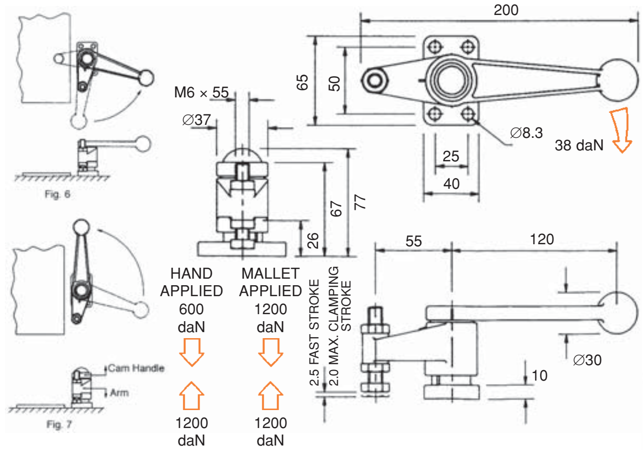
CAM SWING CLAMPS

MODELS **CS1200** **(CLOCKWISE)**
CS1200A **(ANTI-CLOCKWISE)**

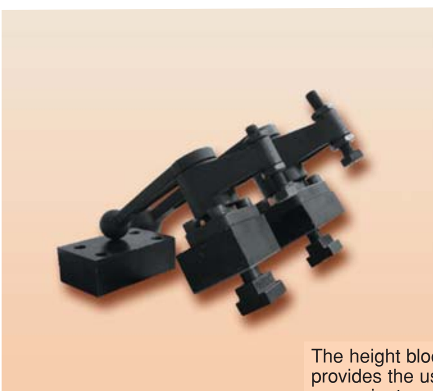
Operating clamping force:
600 daN (hand applied),
1200 daN (mallet applied).

Weight:
0.90 Kg

Supplied complete with:
MB1055 Set screw & nuts.

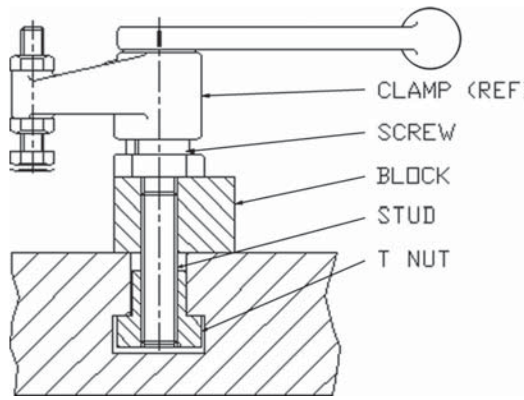


CAM SWING HEIGHT BLOCK ASSEMBLIES



The height block assembly provides the user with a convenient method of setting the height of the Cam Swing Clamp when in operation. The act of locking the clamp onto the work piece also locks the block into position along the Tee Slot.

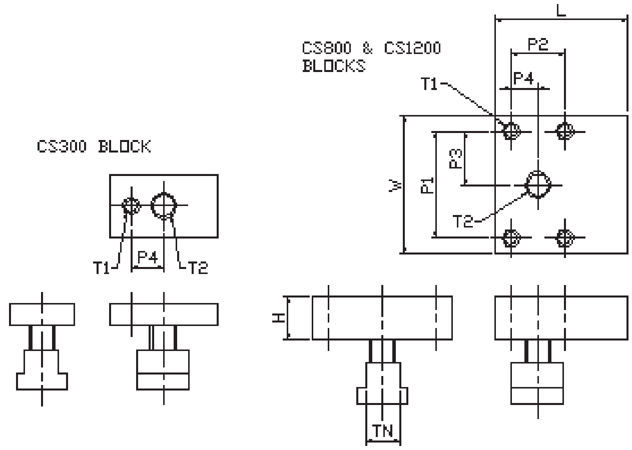
Note:
Clamp ordered separately



Example Part Code:

CSB1200-20-TN12

- 'T' slot width (standard options are 12, 14, 16, 18 for all blocks)
- Block height (see table for standard heights)
- To suit clamp (CS & CSA 300, 800, 1200)
- Cam Swing Block



To Suit Clamp	H	W	L	TN	P1	P2	P3	P4	T1	T2	Screw ×4
CS300	10, 20, 30, 40, 50	30	50	12, 14, 16, 18	N/A	N/A	N/A	15	M8×1.25	M12×1.25	N/A
CS800	12, 25, 40, 50	48	40	12, 14, 16, 18	36	18	18	9	M6×1.0	M12×1.25	M6×18
CS1200	20, 40, 60, 76	65	62	12, 14, 16, 18	50	25	25	12.5	M8×1.25	M12×1.25	M8×25

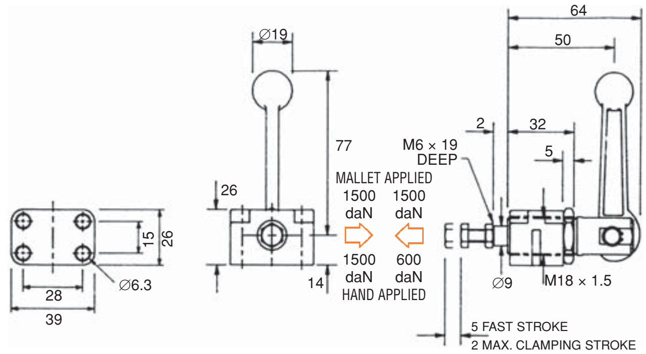
MAGNA FORCE HEAVY-DUTY CAM

CAM PUSH CLAMPS
MODELS **CP1500**

Operating clamping force:
1500 daN (mallet applied),
600 daN (hand applied).

Weight:
0.27 Kg

Supplied complete with:
MB063 Set screw & nuts.

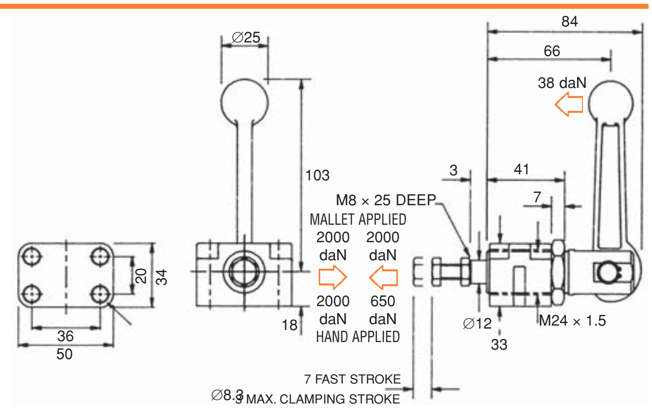


CAM PUSH CLAMPS
MODELS **CP2000**

Operating clamping force:
2000 daN (mallet applied),
650 daN (hand applied).

Weight:
0.60 Kg

Supplied complete with:
MB0840 Set screw & nuts.
CMB24 Mounting base & locknuts.



TECHNICAL INFORMATION

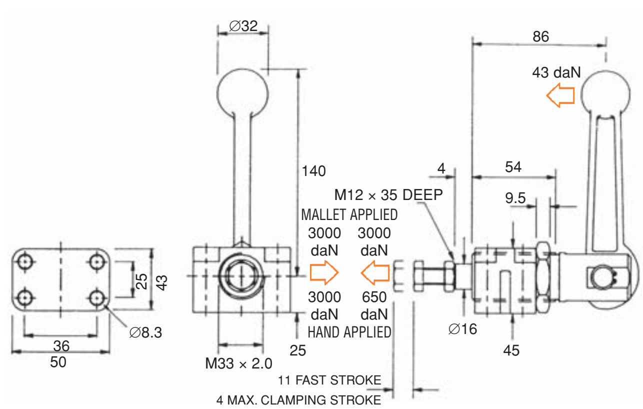
Clamp No.	Applied Handle Force (Hand Push)	Clamping Force	Clamping Force using Mallet Blows	Daylight Travel	Clamping Travel
CS1200	38 daN	600 daN	1200 daN	2.5mm	2.0mm
CS1200A	38 daN	600 daN	1200 daN	2.5mm	2.0mm
CP1500	36 daN	600 daN	1500 daN	5.2mm	2.2mm
CP2000	38 daN	650 daN	2000 daN	7.0mm	3.0mm

CAM PUSH CLAMPS
MODELS **CP3000**

Operating clamping force:
3000 daN (mallet applied),
650 daN (hand applied).

Weight:
1.50 Kg

Supplied complete with:
MB0840 Set screw & nuts.
CMB33 Mounting base & locknuts.

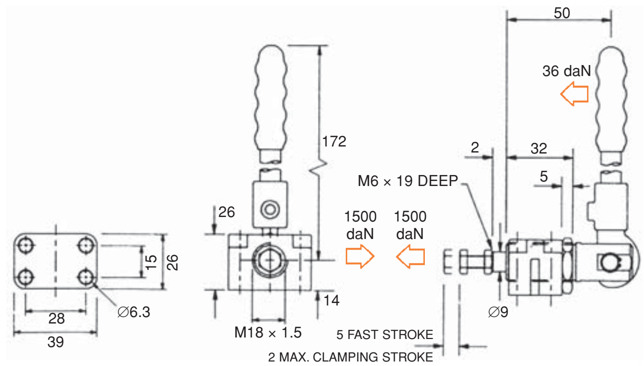


TOOLING COMPONENTS

MAGNA FORCE HEAVY-DUTY CAM CLAMPS

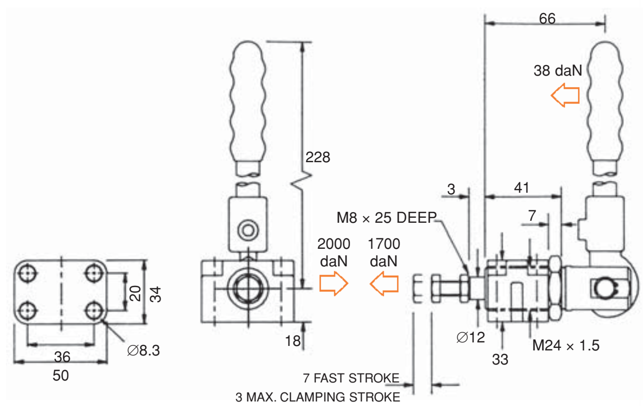
CAM PUSH CLAMPS
MODELS **CP1500L**

Operating clamping force:
1500 daN
Weight:
0.35 Kg
Supplied complete with:
MB0840 Set screw & nuts.
CMB18 Mounting base & locknuts.



CAM PUSH CLAMPS
MODELS **CP2000L**

Operating clamping force:
1700 daN
Weight:
0.75 Kg
Supplied complete with:
MB0840 Set screw & nuts.
CMB24 Mounting base & locknuts.
Nominal holding force:
2000 daN

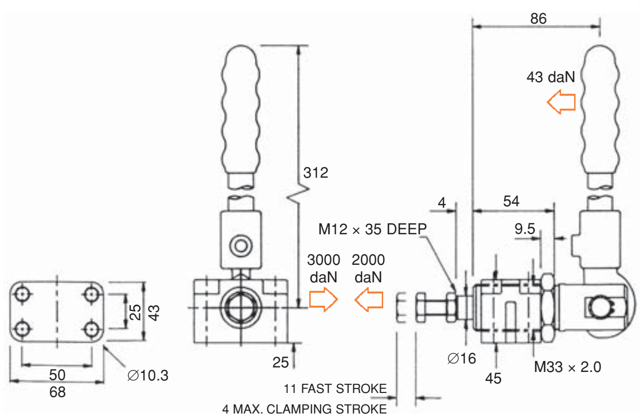


TECHNICAL INFORMATION

Clamp No.	Applied Handle Force (Hand Push)	Clamping Force	Clamping Force using Mallet Blows	Daylight Travel	Clamping Travel
CP3000	43 daN	650 daN	3000 daN	11.0mm	4.0mm
CP1500L	36 daN	1500 daN	N/A	5.2mm	2.2mm
CP2000L	38 daN	1700 daN	N/A	7.0mm	3.0mm

CAM PUSH CLAMPS
MODELS **CP3000L**

Operating clamping force:
2000 daN
Weight:
2.00 Kg
Supplied complete with:
MB1250 Set screw & nuts.
CMB33 Mounting base & locknuts.
Nominal holding force:
3000 daN

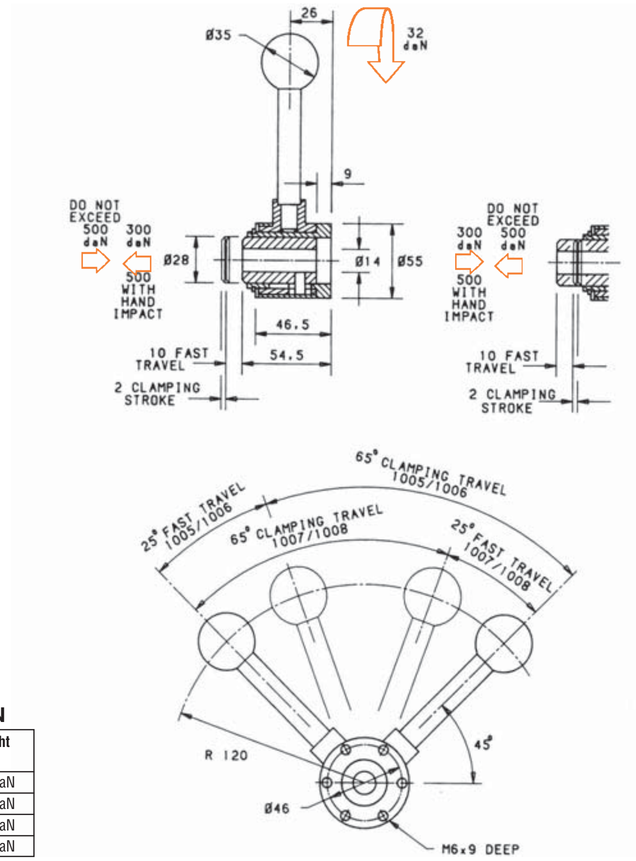


TECHNICAL INFORMATION

Clamp No.	Applied Handle Force (Hand Push)	Clamping Force	Clamping Force using Mallet Blows	Daylight Travel	Clamping Travel
CP3000L	43 daN	2000 daN	N/A	11.0mm	4.0mm

CAM PUSH/CAM PULL CLAMPS

CAM PUSH/CAM PULL CLAMPS



Cam operated.
Right hand push.
Rear mounted.

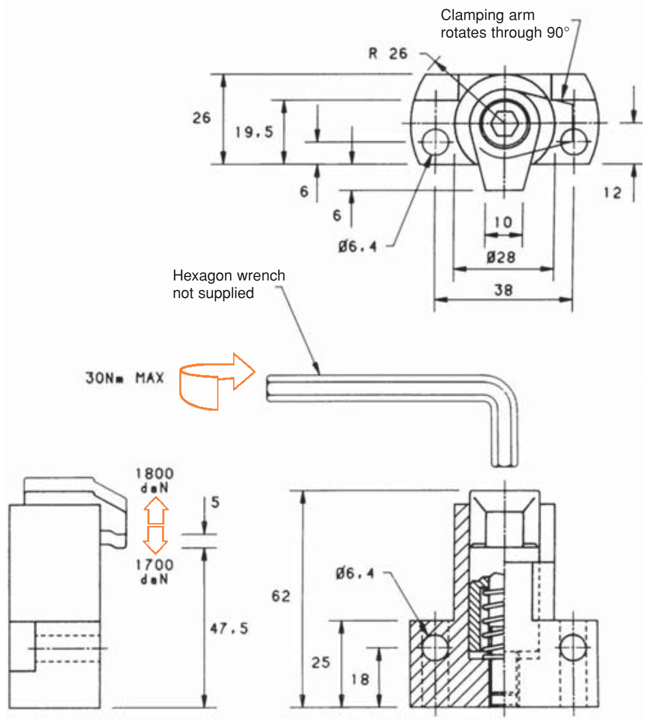
TECHNICAL INFORMATION

Clamp No.	Nominal Holding Force	Weight Kg
CP1005	500 daN	0.80 daN
CP1006	500 daN	0.80 daN
CP1007	500 daN	0.80 daN
CP1008	500 daN	0.80 daN

TOOLING COMPONENTS

SWING CLAMP ASSEMBLIES

SWING CLAMP ASSEMBLIES
MODEL **1016-08**

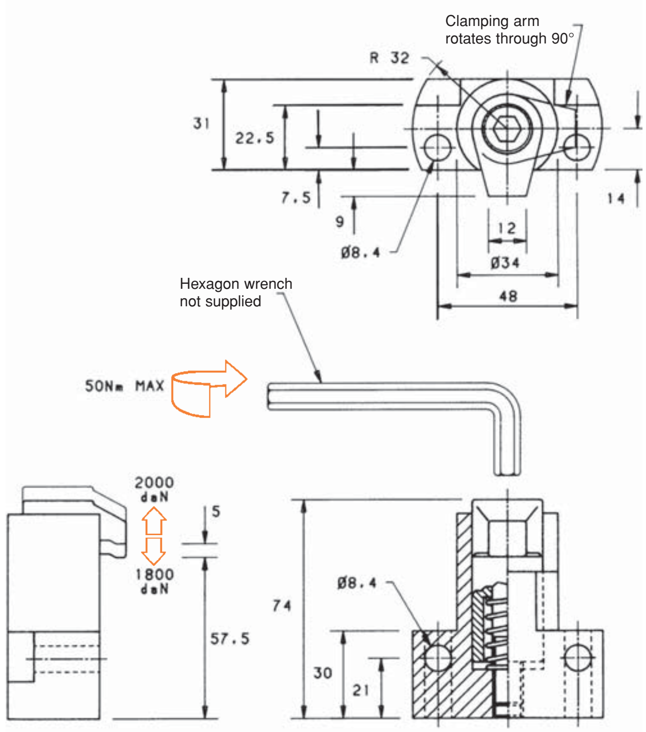


Base or Front Mounted.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
1800 daN

Weight:
0.33 Kg

SWING CLAMP ASSEMBLIES
MODEL **1016-10**



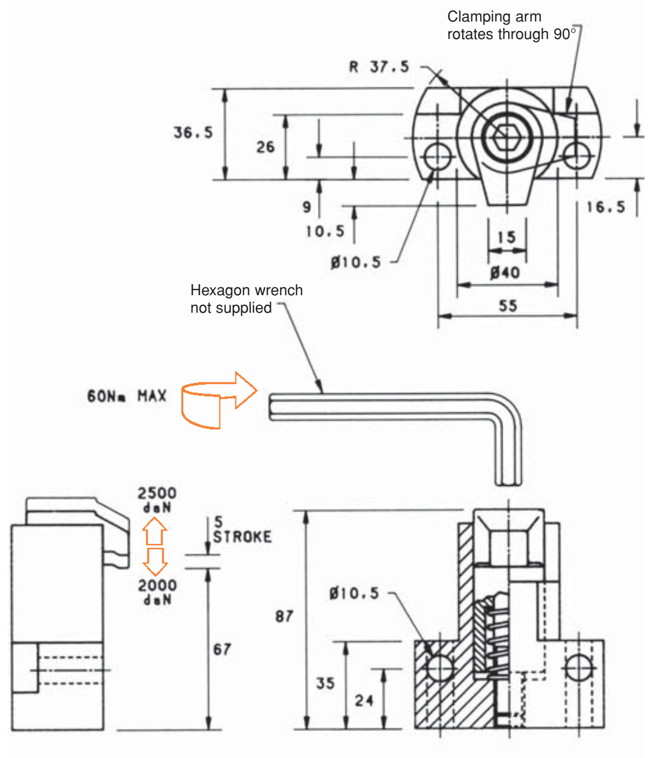
Base or Front Mounted.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
2000 daN

Weight:
0.56 Kg

SWING CLAMP ASSEMBLIES

SWING CLAMP ASSEMBLIES
MODEL **1016-12**

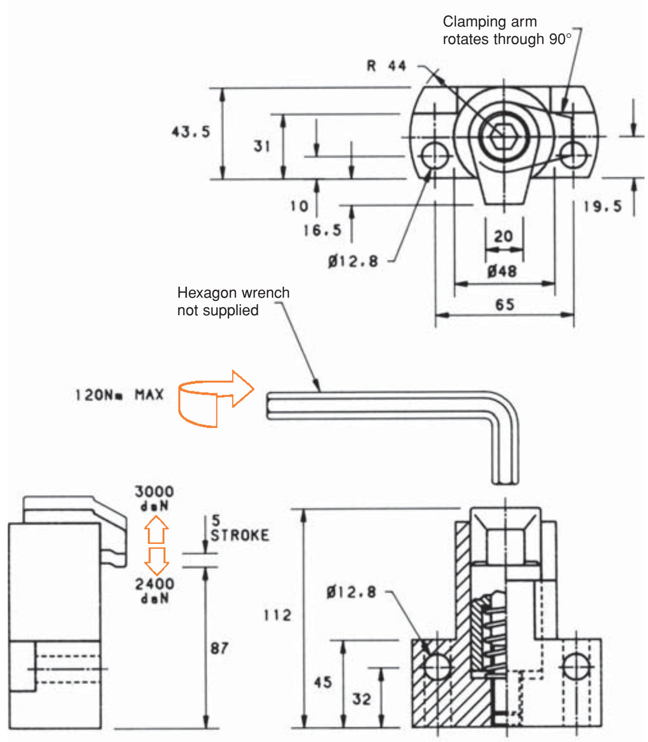


Base or Front Mounted.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
2500 daN

Weight:
0.81 Kg

SWING CLAMP ASSEMBLIES
MODEL **1016-16**



Base or Front Mounted.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
3000 daN

Weight:
1.60 Kg

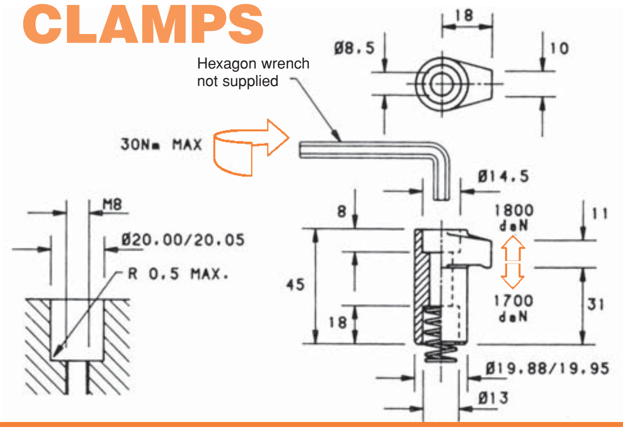
HEAVY-DUTY SWING CLAMPS

SWING CLAMPS
MODEL **1015-08**

Hole mounted by customer.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
1800 daN

Weight:
0.08 Kg

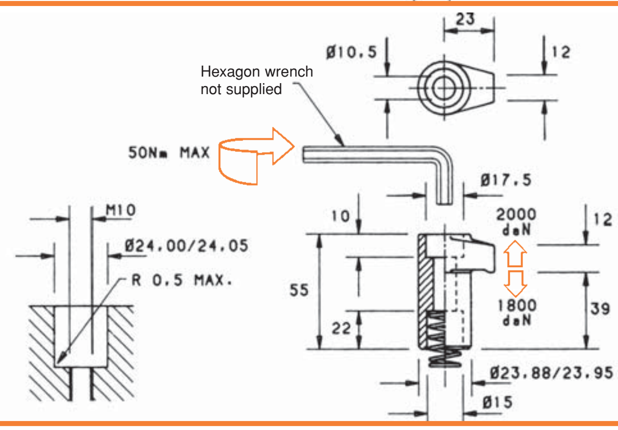


SWING CLAMPS
MODEL **1015-10**

Hole mounted by customer.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
2000 daN

Weight:
0.15 Kg

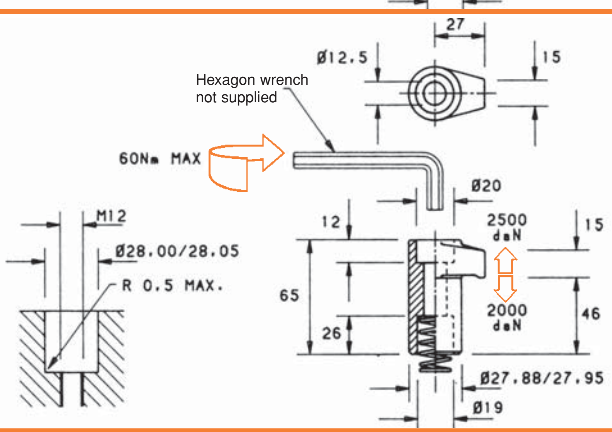


SWING CLAMPS
MODEL **1015-12**

Hole mounted by customer.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
2500 daN

Weight:
0.23 Kg

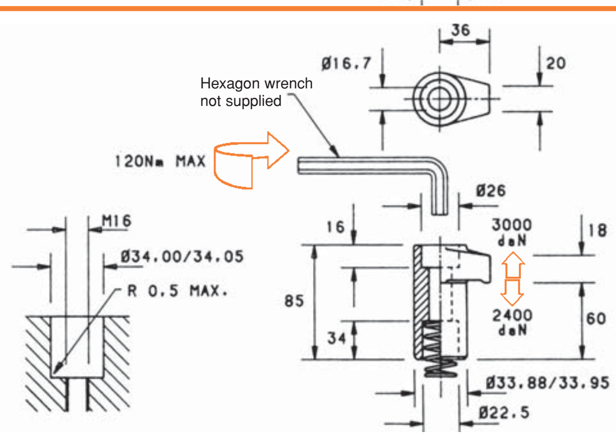


SWING CLAMPS
MODEL **1015-16**

Hole mounted by customer.
Manually turned.
Tightened & released by hexagonal key.
Spring return.

Nominal Holding Force:
3000 daN

Weight:
0.44 Kg



Quick-Lock Pins

Brauer introduces . . . Quick Lock Pins

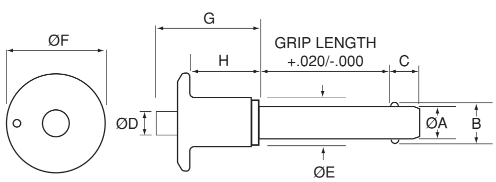
Quick Turnaround . . . easy to order

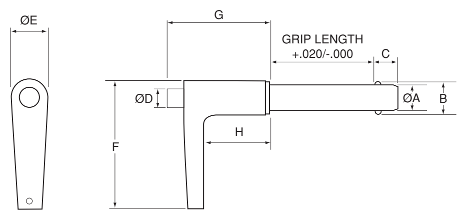
The Brauer Quick-Lock pins are manufactured in a wide range of sizes to meet any application. There is no longer any need to wait long lead times for special sizes or features. The unique manufacturing process allows for quick turnaround without sacrificing quality.

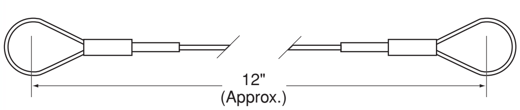
Additionally, Brauer makes it even easier to specify our Quick-Lock Pins by making drawing available in Solid Model drawings.

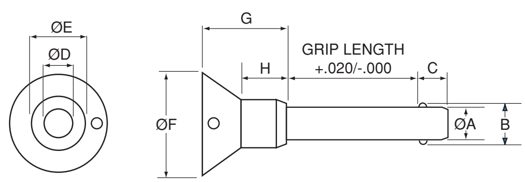
- Metric sizes from 5mm to 25mm O.D. in 10mm to 100mm grip lengths.
- Standard sizes from 3⁄16" to 1" O.D. in ½" to 6" grip lengths.
- Stainless steel 17-4 PH and carbon steel.
- Available in 5 handle styles:
  “T”, “L”, Button, Recessed Button and Ring
- 3D solid models available in Solid Works® (.SLDPRT) and .STEP file formats.
- Fast turnaround on special configurations.

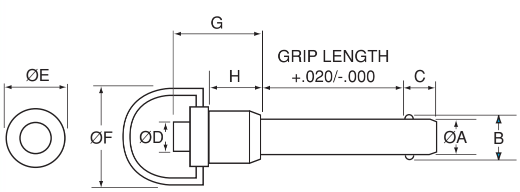
Ask about special sizes

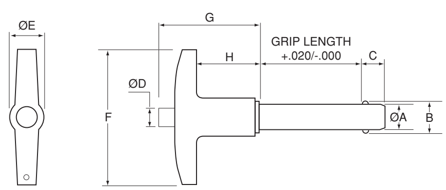


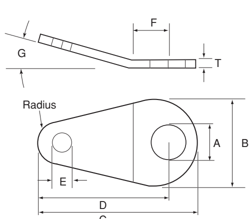


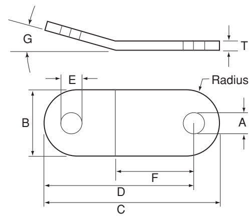












Machine and Jig Components

TOOLING COMPONENTS

CALL US AT: 00 44 (0)1908 374022 OR FAX US AT: 00 44 (0)1908 641628

BRAUER®

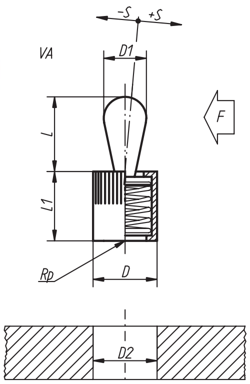
Lateral Spring Plungers

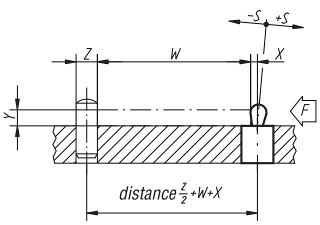
Material:
Sleeve in aluminium, spring in steel, pressure pin in steel or plastic

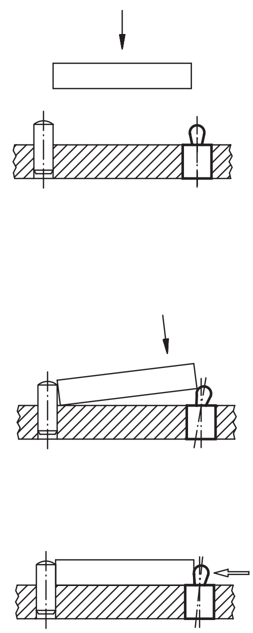
Surface finish:
Pressure pin (steel) surface hardened and galvanised, sleeve natural finish

Note:
Lateral Spring Plungers aid in the positioning and clamping, holding and fastening of tools and parts during:
engraving, labelling, drilling, galling, threading, honing, grinding, welding, soldering, hard-facing, assembling, etc.

Assembly tools available on request.







Lateral Spring Plungers without seal, pressure pin and spring in steel

Order No.	D	D1	L	L1	D2 +0,1	± S	F approx. 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	Approx. weight g
03330-21036	6	3	4	7	6	0,5	20	0,8	1,0	–	–	–	–	1
03330-21056	10	5	6,7	11	10	0,8	50	–	1,5	1,7	–	–	–	2
03330-21066	10	6	10,7	11	10	1,0	75	–	–	–	1,7	1,9	–	2
03330-21086	12	8	13,9	13	12	1,3	100	–	–	–	–	2,5	2,7	8
03330-21106	16	10	16,7	17	16	1,6	200	–	–	–	–	–	3,1	16

Lateral Spring Plungers with seal, pressure pin and spring in steel

Order No.	D	D1	L	L1	D2 +0,1	± S	F approx. 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	Approx. weight g
03330-22036	6	3	4	7	6	0,5	20	0,8	1,0	–	–	–	–	1
03330-22056	10	5	6	11,5	10	0,8	50	–	1,5	1,7	–	–	–	2
03330-22066	10	6	10	11,5	10	1,0	75	–	–	–	1,7	1,9	–	2
03330-22086	12	8	13	14	12	1,3	100	–	–	–	–	2,5	2,7	8
03330-22106	16	10	16	18	16	1,6	200	–	–	–	–	–	3,1	16

Lateral Spring Plungers without seal, pressure pin in plastic, spring in steel

Order No.	D	D1	L	L1	D2 +0,1	± S	F approx. 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	Approx. weight g
03330-71034	6	3	4	7	6	0,5	10	0,8	1,0	–	–	–	–	1
03330-71054	10	5	6,7	11	10	0,8	20	–	1,5	1,7	–	–	–	2
03330-71064	10	6	10,7	11	10	1,0	40	–	–	–	1,7	1,9	–	2
03330-71084	12	8	13,9	13	12	1,3	50	–	–	–	–	2,5	2,7	6
03330-71104	16	10	16,7	17	16	1,6	100	–	–	–	–	–	3,1	13

Lateral Spring Plungers with seal, pressure pin in plastic, spring in steel

Order No.	D	D1	L	L1	D2 +0,1	± S	F approx. 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	Approx. weight g
03330-72034	6	3	4	7	6	0,5	10	0,8	1,0	–	–	–	–	1
03330-72054	10	5	6	11,5	10	0,8	20	–	1,5	1,7	–	–	–	2
03330-72064	10	6	10	11,5	10	1,0	40	–	–	–	1,7	1,9	–	2
03330-72084	12	8	13	14	12	1,3	50	–	–	–	–	2,5	2,7	6
03330-72104	16	10	16	18	16	1,6	100	–	–	–	–	–	3,1	13

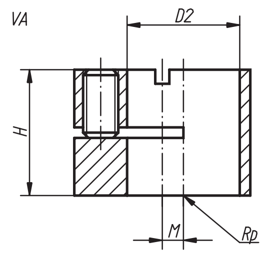
Sample order: Lateral Spring Plunger 03330-72064

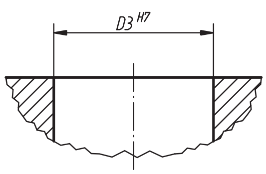
Eccentric Bushes for lateral spring plungers

Material:
Steel

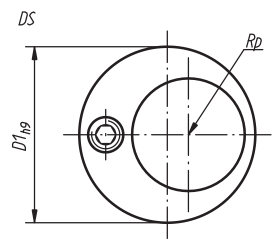
Surface finish:
Black oxide finish

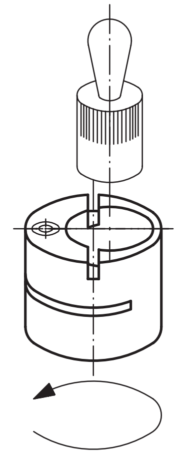
Note:
Eccentric Bushes enable Lateral Spring Plungers to be positioned exactly to the workpiece.





assembly hole





Eccentric Bushes for lateral spring plungers

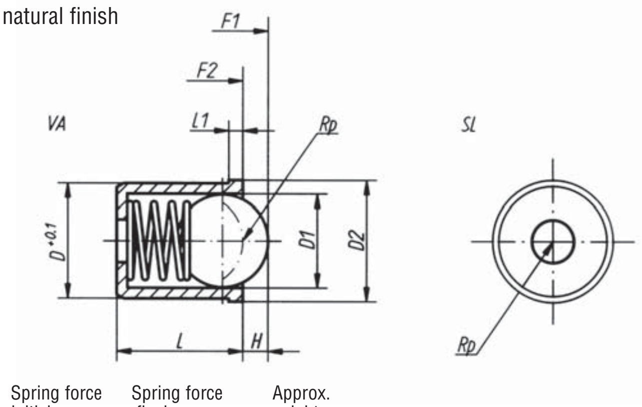
Order No.	D1$_{h9}$	D2	D3^{H7}	H	M	Approx. weight g	Fits Lateral Spring Plungers with D =
03330-120	12	6	12	9,9	2	6	6
03330-160	16	10	16	11,9	2	10	10
03330-180	18	12	18	13,9	2	12	12
03330-250	25	16	25	17,9	3	36	16

Sample order: Eccentric Bush 03330-180

Spring Plungers smooth surface plastic

Material:
Sleeve in black thermoplastic,
ball and spring in stainless steel

Surface finish:
Ball hardened, natural finish



Spring Plungers smooth surface plastic

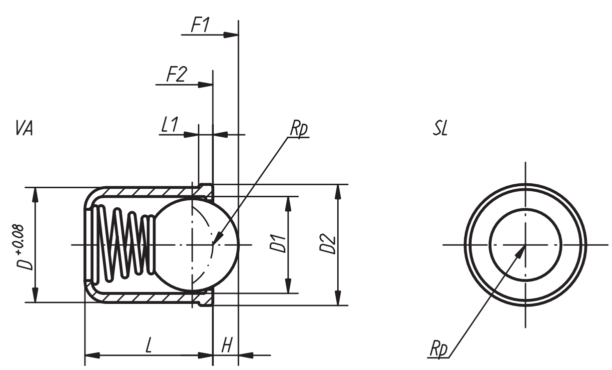
Order No.	$D^{+0,1}$	D1	D2	L	L1	H	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g
16 04010	4	3	4,6	5	1	0,7	3	7	0,17
16 05010	5	4	5,6	6	1	1	4	7	0,35
16 06010	6	5	6,5	7	1	1,5	6	12	0,66
16 08010	8	6,5	8,5	9	1	1,8	6	12	1,46

Sample order: Spring Plunger 16 05010

Spring Plungers smooth surface, steel parts in stainless steel

Material:
Stainless steel (also ball and spring)

Surface finish:
natural finish



Spring Plungers smooth surface, steel parts in stainless steel

Order No.	$D^{+0,08}$	D1	D2	L	L1	H	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g
03070-04	4	3	4,6	5	1	0,8	3	7	0,3
03070-05	5	4	5,6	6	1	1	4	7	0,6
03070-06	6	5	6,5	7	1	1,5	6	12	1
03070-08	8	6,5	8,5	9	1	1,8	6	12	2

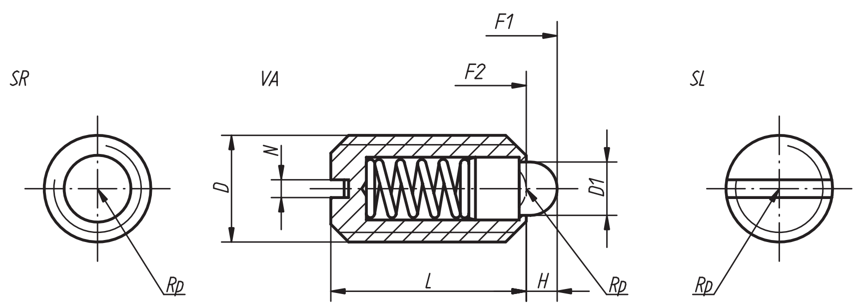
Sample order: Spring Plunger 03070-05

Spring Plungers with recess and pressure pin

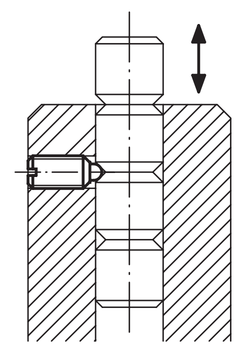
Material:
Sleeve in steel quality class 5.8, pressure pin in steel, spring in spring steel Kl. D

Surface finish:
Black oxide finish, pressure pin hardened

Note:
The following functional values of
sizes M4 - M12 are tested optoelectronically:
■ Spring force F1 and F2
■ Spring travel H
■ Thread D



column locking



Spring Plungers with recess and pressure pin

Order No.	D	D1	L	H	N	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g
16 04005	M 4	1,8	9	1,5	0,6	6	20	0,39
16 05005	M 5	2,4	12	2	0,8	6	20	1
16 06005	M 6	2,7	14	2	1	7	20	1,7
16 08005	M 8	4	16	2	1,2	15	30	4
16 10005	M 10	4,5	19	2,5	1,6	20	35	7
16 12005	M 12	6	22	3,5	2	30	55	13
16 16005	M 16	8,5	24	4,5	2,5	45	100	24
16 20005	M 20	10	30	6,5	2,5	60	120	46,3

Sample order: Spring Plunger 16 10005

BRAUER®

Spring Plungers with hexagon socket and pressure pin

Material:
Steel version:
sleeve in steel quality class 5.8, pressure pin in steel or plastic,
spring in spring steel Kl. D

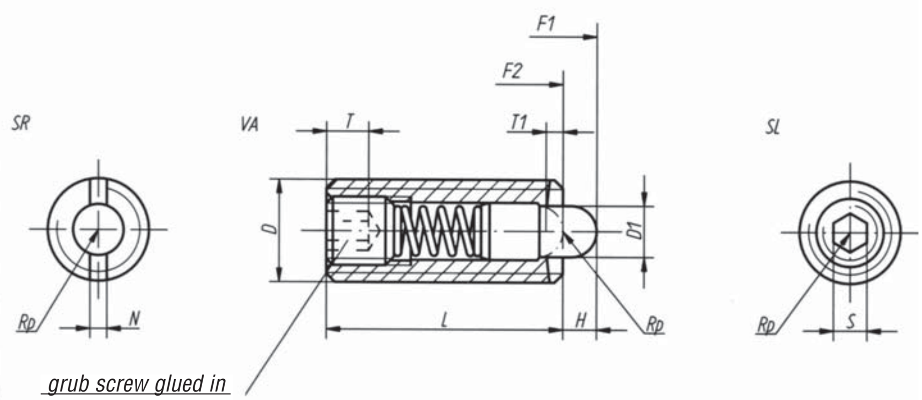
Stainless steel version:
sleeve 1.4305, pressure pin 1.4034, spring 1.4310

Stainless steel version with strong spring force:
sleeve 1.4305, pressure pin 1.4034, spring 1.4568

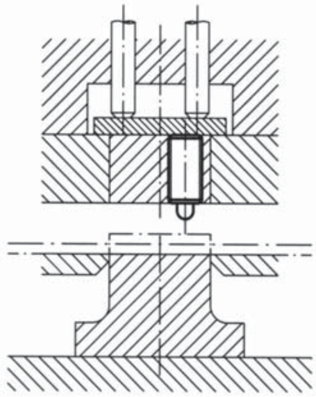
pressure and function tested

Surface finish:
Black oxide finish, pressure pin in hardened steel or hardened stainless steel, stainless steel natural finish

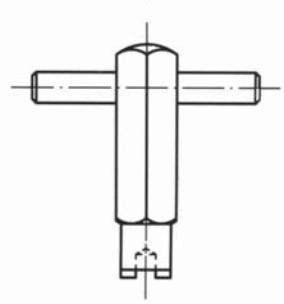
Note:
The following functional values of sizes M3 - M12 are tested optoelectronically:
- Spring force F1 and F2
- Spring travel H
- Thread D



Spring Plunger
cutaway view



assembly key



TOOLING COMPONENTS

Spring Plungers with hexagon socket and pressure pin

Spring Plungers with hexagon socket and pressure pin

Order No. pressure pin in hardened steel	Order No. pressure pin in plastic	Order No. stainless steel	Order No. stainless steel pressure pin in plastic	D	D1	L	H	T	T1	N	S	Spring force version pressure pin in steel and plastic initial press. F1 approx. N	Spring force version pressure pin in steel and plastic final press. F2 approx. N	Spring force version stainless steel initial press. F1 approx. N	Spring force version stainless steel final press. F2 approx. N	Approx. weight g	Assembly key Order No.	Assembly key Approx. weight g
16 03001	–	–	–	M 3	1	10	1,5	1,5	1	0,4	0,7	0,5	3	–	–	0,35	**16 03000**	11
16 04001	**16 04002**	**16 04011**	**16 04012**	M 4	1,5	15	1,5	2	0,6	0,6	1,3	5	16	5	16	0,8	**16 04000**	14
16 05001	**16 05002**	**16 05011**	**16 05012**	M 5	2,4	18	2,3	2	0,8	0,8	1,5	6	20	5	17	1,3	**16 05000**	14
16 06001	**16 06002**	**16 06011**	**16 06012**	M 6	2,7	20	2,5	2,5	1	1	2	7	20	6	17	2,5	**16 06000**	14
16 08001	**16 08002**	**16 08011**	**16 08012**	M 8	3,5	22	3	3	1,4	1,2	2,5	9	35	7	29	6	**16 08000**	33
16 10001	**16 10002**	**16 10011**	**16 10012**	M 10	4	22	3	3,5	1,4	1,6	3	9	35	8	31	9	**16 10000**	50
16 12001	**16 12002**	**16 12011**	**16 12012**	M 12	6	28	4	5	2	2	4	10	55	10	47	16	**16 12000**	70
16 16001	**16 16002**	**16 16011**	**16 16012**	M 16	7,5	32	5	6	2,5	2,5	5	45	100	45	100	35	**16 16000**	100
16 20001	–	–	–	M 20	10	40	7	8	3	2,5	6	60	120	–	–	66,3	–	–
16 24001	–	–	–	M 24	12	52	10	10	3	2,5	8	80	160	–	–	122,2	–	–

Spring Plungers with hexagon socket and pressure pin, light spring force

Order No. pressure pin in hardened steel light spring force	Order No. pressure pin in plastic light spring force	D	D1	L	H	T	T1	N	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g	Assembly key Order No.	Assembly key Approx. weight g
16 04003	**16 04004**	M 4	1,5	15	1,5	2	0,6	0,6	1,3	2	7	0,8	**16 04000**	14
16 05003	**16 05004**	M 5	2,4	18	2,3	2	0,8	0,8	1,5	3	9	1,3	**16 05000**	14
16 06003	**16 06004**	M 6	2,7	20	2,5	2,5	1	1	2	3	9	2,5	**16 06000**	14
16 08003	**16 08004**	M 8	3,5	22	3	3	1,4	1,2	2,5	4	16	6	**16 08000**	33
16 10003	**16 10004**	M 10	4	22	3	3,5	1,4	1,6	3	4	16	9	**16 10000**	50
16 12003	**16 12004**	M 12	6	28	4	5	2	2	4	5	27	16	**16 12000**	70
16 16003	**16 16004**	M 16	7,5	32	5	6	2,5	2,5	5	20	45	35	**16 16000**	100

Spring Plungers with hexagon socket and pressure pin, strong spring force

Order No. pressure pin in hardened steel strong spring force	D	D1	L	H	T	T1	N	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g	Assembly key Order No.	Assembly key Approx. weight g
16 05021	M 5	2,4	18	2,3	2	0,8	0,8	1,5	11	29	1,3	**16 05000**	14
16 06021	M 6	2,7	20	2,5	2,5	1	1	2	14	37	2,5	**16 06000**	14
16 08021	M 8	3,5	22	3	3	1,4	1,2	2,5	22	70	6	**16 08000**	33
16 10021	M 10	4	22	3	3,5	1,4	1,6	3	19	70	9	**16 10000**	50
16 12021	M 12	6	28	4	5	2	2	4	25	85	16	**16 12000**	70
16 16021	M 16	7,5	32	5	6	2,5	2,5	5	60	150	35	**16 16000**	100
16 20021	M 20	10	40	7	8	3	2,5	6	75	190	66,3	–	–
16 24021	M 24	12	52	10	10	3	2,5	8	95	240	122,2	–	–

Sample order: Spring Plunger 16 16002
Sample order: Assembly Key 16 12000

Spring Plungers with hexagon socket and ball

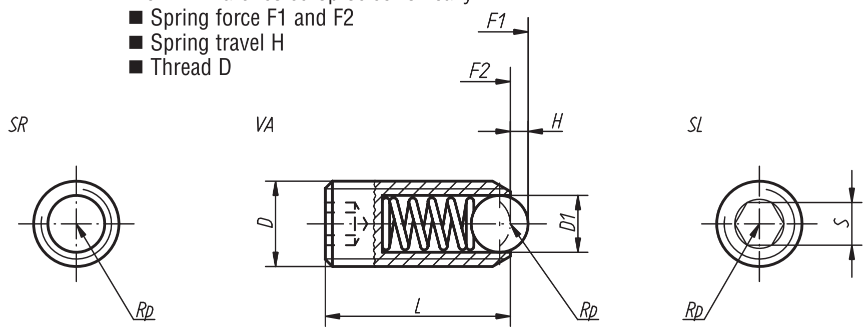
Material:
Steel version:
sleeve in steel quality class 5.8, ball in steel,
spring in spring steel Kl. D

Stainless steel version: sleeve 1.4305, ball 1.4034,
spring 1.4310

Stainless steel version with strong spring force: sleeve 1.4305,
ball 1.4034, spring 1.4568

Surface finish:
Black oxide finish, ball hardened natural finish, stainless steel version natural finish

Note:
The following functional values of sizes
M6 - M12 are tested optoelectronically:
- Spring force F1 and F2
- Spring travel H
- Thread D



Spring Plungers with hexagon socket and ball

Order No. steel	Order No. stainless steel	D	D1	L	H	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g
K5120 0106	K5120 0506	M 6	3,5	15	1	3	9	13	2
K5120 0108	K5120 0508	M 8	4,5	18	1,5	4	15	30	4
K5120 0110	K5120 0510	M 10	6	23	2	5	20	35	8
K5120 0112	K5120 0512	M 12	8	26	2,5	6	30	55	12
K5120 0116	K5120 0516	M 16	10	33	3,5	8	65	125	31
K5120 0120	K5120 0520	M 20	12	43	4,5	10	80	160	64
K5120 0124	K5120 0524	M 24	15	48	5,5	12	90	180	100

Spring Plungers with hexagon socket and ball, strong spring force

Order No. steel strong spring force	Order No. stainless steel strong spring force	D	D1	L	H	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g
K5120 2106	K5120 2506	M 6	3,5	15	1	3	28	40	2
K5120 2108	K5120 2508	M 8	4,5	18	1,5	4	47	73	4
K5120 2110	K5120 2510	M 10	6	23	2	5	66	100	8
K5120 2112	K5120 2512	M 12	8	26	2,5	6	66	120	12
K5120 2116	K5120 2516	M 16	10	33	3,5	8	90	180	31
K5120 2120	K5120 2520	M 20	12	43	4,5	10	115	240	64
K5120 2124	K5120 2524	M 24	15	48	5,5	12	130	270	100

Sample order: Spring Plunger K5120 2110

Spring Plungers with recess and ball

Material:
Steel version:
sleeve in steel quality class 5.8, ball in steel, spring in spring steel Kl. D

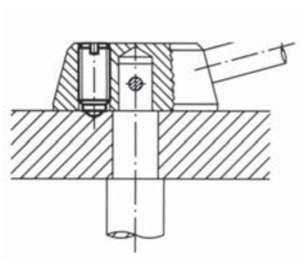
Stainless steel version:
sleeve 1.4305, ball 1.4034, spring 1.4310

Stainless steel version with strong spring force:
sleeve 1.4305, ball 1.4034, spring 1.4568

pressure and function tested

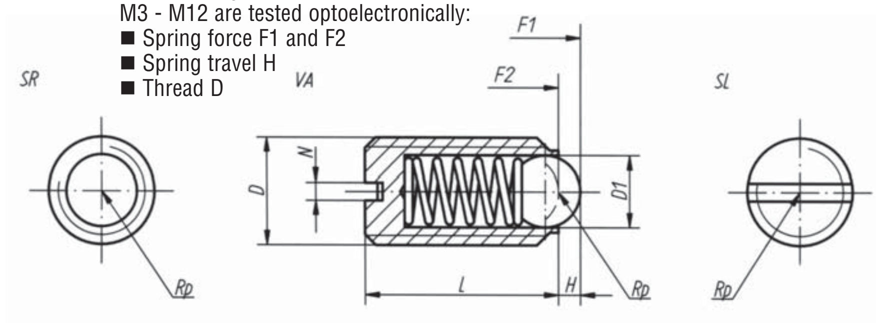
Surface finish:
Black oxide finish, ball hardened natural finish, stainless steel version natural finish

column locking



Note:
The following functional values of sizes M3 - M12 are tested optoelectronically:

- Spring force F1 and F2
- Spring travel H
- Thread D



Spring Plungers with recess and ball

Order No. steel	Order No. stainless steel	D	D1	L	H	N	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g
16 03008	**16 03009**	M 3	1,5	7	0,5	0,4	1,5	3	0,2
16 04008	**16 04009**	M 4	2,5	9	0,8	0,6	4	10	0,6
16 05008	**16 05009**	M 5	3	12	0,9	0,8	6	11	0,9
16 06008	**16 06009**	M 6	3,5	14	1	1	9	13	1,5
16 08008	**16 08009**	M 8	5	16	1,5	1,2	15	30	3,5
16 10008	**16 10009**	M 10	6	19	2	1,6	20	35	7
16 12008	**16 12009**	M 12	8	22	2,5	2	30	55	10
16 16008	**16 16009**	M 16	10	24	3,5	2,5	65	125	24
16 20008	**16 20009**	M 20	12	30	4,5	2,5	80	160	44,3

Spring Plungers with recess and ball, strong spring force

Order No. steel strong spring force	Order No. stainless steel strong spring force	D	D1	L	H	N	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Approx. weight g
16 05028	**16 05029**	M 5	3	12	0,9	0,8	19	30	0,9
16 06028	**16 06029**	M 6	3,5	14	1	1	28	40	1,5
16 08028	**16 08029**	M 8	5	16	1,5	1,2	47	73	3,5
16 10028	**16 10029**	M 10	6	19	2	1,6	66	100	7
16 12028	**16 12029**	M 12	8	22	2,5	2	66	120	10
16 16028	**16 16029**	M 16	10	24	3,5	2,5	90	180	24
16 20028	**16 20029**	M 20	12	30	4,5	2,5	115	240	44,3

Sample order: Spring Plunger 16 16009

TOOLING COMPONENTS

Spring Plungers with LONG-LOK thread lock

The following advantages are yours:

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 resilient nylon insert is squeezed like a wedge between the thread of the Spring Plunger and the fastening component. By means of the nylon locking system, the thread backlash is shifted to one side, which in turn causes surface pressure at the thread flanks. The resulting loosening torque is higher than that achieved with most conventional, mechanical methods.

3. Secure in Every Position

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

4. Save 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 tightening torque. After third or fourth use, the value reached last remains nearly constant for about 20 times.

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.

BRAUER®

Spring Plungers with hexagon socket and ball

LONG-LOK secured

Material:
Steel version:
sleeve in steel quality class 5.8, ball in steel, spring in spring steel Kl. D

Stainless steel version:
sleeve 1.4305, ball 1.4034, spring 1.4310,

Stainless steel version with strong spring force:
sleeve 1.4305, ball 1.4034, spring 1.4568

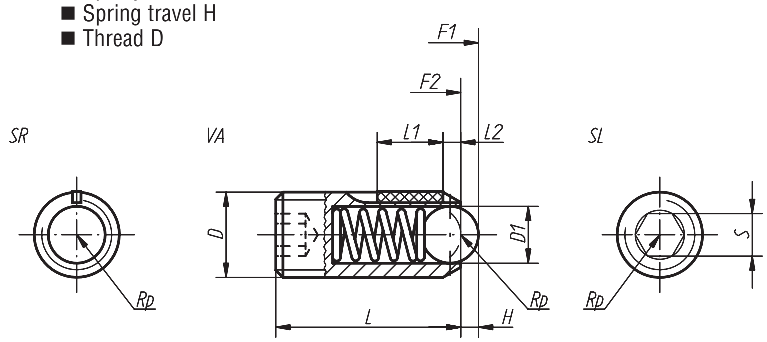
pressure and function tested

Surface finish:
Black oxide finish, ball hardened natural finish, stainless steel version natural finish

LONG-LOK thread lock in nylon

Note:
The following functional values of sizes M6 - M12 are tested optoelectronically:

- Spring force F1 and F2
- Spring travel H
- Thread D



Spring Plungers with hexagon socket and ball, LONG-LOK secured

Order No. steel	Order No. stainless steel	D	D1	L	L1 ±0,5	L2	H	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Tightening torque M_{EIN} approx. Nm	Loosening torque M_{Aus} approx. Nm	Approx. weight g
K5160 0106	K5160 0506	M 6	3,5	15	7	approx. two thread dials	1	3	9	13	0,25	0,45	2
K5160 0108	K5160 0508	M 8	4,5	18	8		1,5	4	15	30	0,4	0,6	4
K5160 0110	K5160 0510	M 10	6	23	9		2	5	20	35	0,7	0,8	8
K5160 0112	K5160 0512	M 12	8	26	10		2,5	6	30	55	1	1,2	12
K5160 0116	K5160 0516	M 16	10	33	14		3,5	8	65	125	4,2	4,3	31

Spring Plungers with hexagon socket and ball, strong spring force, LONG-LOK secured

Order No. steel strong spring force	Order No. stainless steel strong spring force	D	D1	L	L1 ±0,5	L2	H	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Tightening torque M_{EIN} approx. Nm	Loosening torque M_{Aus} approx. Nm	Approx. weight g
K5160 2106	K5160 2506	M 6	3,5	15	7	approx. two thread dials	1	3	28	40	0,25	0,45	2
K5160 2108	K5160 2508	M 8	4,5	18	8		1,5	4	47	73	0,4	0,6	4
K5160 2110	K5160 2510	M 10	6	23	9		2	5	66	100	0,7	0,8	8
K5160 2112	K5160 2512	M 12	8	26	10		2,5	6	66	120	1	1,2	12
K5160 2116	K5160 2516	M 16	10	33	14		3,5	8	90	180	4,2	4,3	31

Sample order: Spring Plunger LONG-LOK secured K5160 0108

BRAUER®

Spring Plungers with hexagon socket and pressure pin

LONG-LOK secured

pressure and function tested

Material:
Steel version:
sleeve in steel quality class 5.8, pressure pin in steel or plastic, spring in spring steel Kl. D

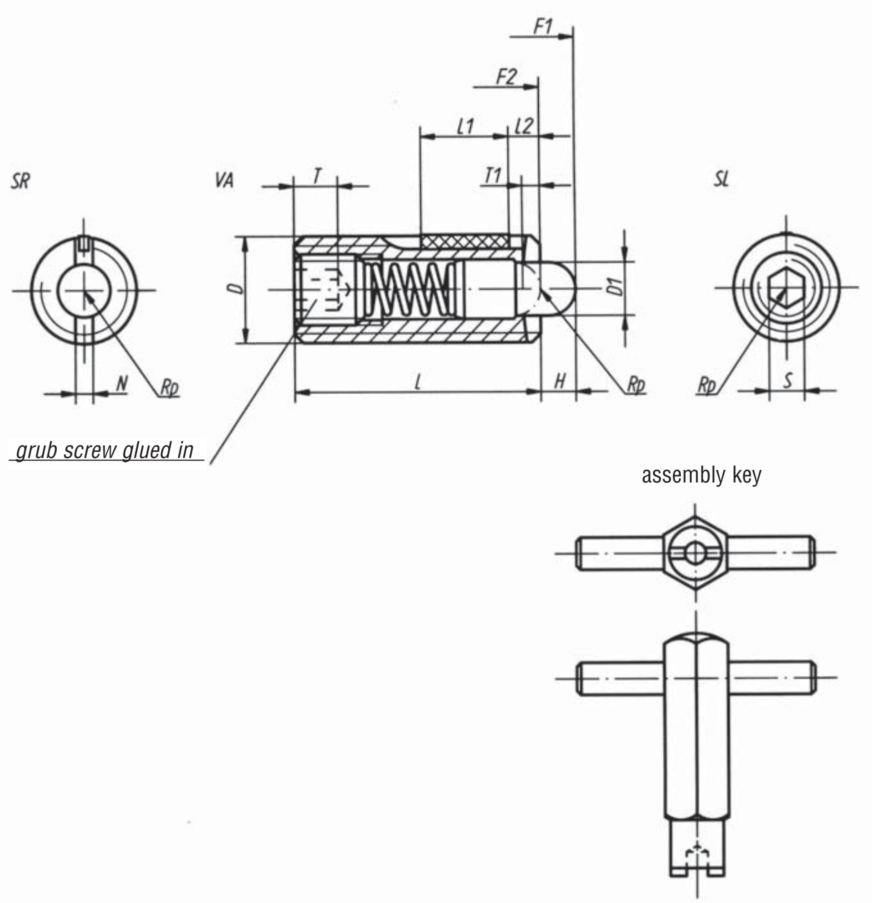
Stainless steel version:
sleeve 1.4305, pressure pin 1.4034,
spring 1.4310

Stainless steel version with strong spring force:
sleeve 1.4305, pressure pin 1.4034,
spring 1.4568

LONG-LOK thread lock in nylon

Surface finish:
Black oxide finish, pressure pin in hardened steel or hardened stainless steel, stainless steel version natural finish

Note:
The following functional values of sizes M5 - M12 are tested optoelectronically:
- Spring force F1 and F2
- Spring travel H
- Thread D



TOOLING COMPONENTS

Spring Plungers with hexagon socket and pressure pin

Spring Plungers with hexagon socket and pressure pin, LONG-LOK secured

Order No. pressure pin in hardened steel	Order No. pressure pin in plastic	Order No. stainless steel	Order No. stainless steel pressure pin in plastic	D	D1	L	L1 ±0,5	L2	H	T	T1	N	S	Spring force version pressure pin in steel and plastic: initial press. F1 approx. N	Spring force version pressure pin in steel and plastic: final press. F2 approx. N	Spring force version stainless steel: initial press. F1 approx. N	Spring force version stainless steel: final press. F2 approx. N	Tightening torque $M_{...}$ approx. Nm	Loosening torque $M_{...}$ approx. Nm	Approx. weight g	Assembly key Order No.	Assembly key Approx. weight g
16 05051	16 05052	16 050061	16 05062	M 5	2,4	18	7	approx. two thread dials	2,3	2	0,8	0,8	1,5	6	20	5	17	0,1	0,25	1,3	16 05000	14
16 06051	16 06052	16 060061	16 06062	M 6	2,7	20	7		2,5	2,5	1	1	2	7	20	6	17	0,25	0,45	2,5	16 06000	14
16 08051	16 08052	16 080061	16 08062	M 8	3,5	22	8		3	3	1,4	1,2	2,5	9	35	7	29	0,4	0,6	6	16 08000	33
16 10051	16 10052	16 100061	16 10062	M 10	4	22	9		3	3,5	1,4	1,6	3	9	35	8	31	0,7	0,8	9	16 10000	50
16 12051	16 12052	16 120061	16 12062	M 12	6	28	10		4	5	2	2	4	10	55	10	47	1	1,2	16	16 12000	70
16 16051	16 16052	16 160061	16 16062	M 16	7,5	32	14		5	6	2,5	2,5	5	45	100	45	100	4,2	4,3	35	16 16000	100

Spring Plungers with hexagon socket and pressure pin, light spring force, LONG-LOK secured

Order No. pressure pin in hardened steel light spring force	Order No. pressure pin in plastic light spring force	D	D1	L	L1 ±0,5	L2	H	T	T1	N	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Tightening torque $M_{...}$ approx. Nm	Loosening torque $M_{...}$ approx. Nm	Approx. weight g	Assembly key Order No.	Assembly key Approx. weight g
16 05053	16 05054	M 5	2,4	18	7	approx. two thread dials	2,3	2	0,8	0,8	1,5	3	9	0,1	0,25	1,3	16 05000	14
16 06053	16 06054	M 6	2,7	20	7		2,5	2,5	1	1	2	3	9	0,25	0,45	2,5	16 06000	14
16 08053	16 08054	M 8	3,5	22	8		3	3	1,4	1,2	2,5	4	16	0,4	0,6	6	16 08000	33
16 10053	16 10054	M 10	4	22	9		3	3,5	1,4	1,6	3	4	16	0,7	0,8	9	16 10000	50
16 12053	16 12054	M 12	6	28	10		4	5	2	2	4	5	27	1	1,2	16	16 12000	70
16 16053	16 16054	M 16	7,5	32	14		5	6	2,5	2,5	5	20	45	4,2	4,3	35	16 16000	100

Spring Plungers with hexagon socket and pressure pin, strong spring force, LONG-LOK secured

Order No. pressure pin in hardened steel strong spring force	D	D1	L	L1 ±0,5	L2	H	T	T1	N	S	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Tightening torque $M_{...}$ approx. Nm	Loosening torque $M_{...}$ approx. Nm	Approx. weight g	Assembly key Order No.	Assembly key Approx. weight g
16 05071	M 5	2,4	18	7	approx. two thread dials	2,3	2	0,8	0,8	1,5	11	29	0,1	0,25	1,3	16 05000	14
16 06071	M 6	2,7	20	7		2,5	2,5	1	1	2	14	37	0,25	0,45	2,5	16 06000	14
16 08071	M 8	3,5	22	8		3	3	1,4	1,2	2,5	22	70	0,4	0,6	6	16 08000	33
16 10071	M 10	4	22	9		3	3,5	1,4	1,6	3	19	70	0,7	0,8	9	16 10000	50
16 12071	M 12	6	28	10		4	5	2	2	4	25	85	1	1,2	16	16 12000	70
16 16071	M 16	7,5	32	14		5	6	2,5	2,5	5	60	150	4,2	4,3	35	16 16000	100

Sample order: Spring Plunger LONG-LOK secured 16 12051
Sample order: Assembly Key 16 12000

BRAUER®

Spring Plungers with recess and ball

LONG-LOK secured

Material:
Steel version:
sleeve in steel quality class 5.8, ball in steel, spring in spring steel Kl. D

Stainless steel version:
sleeve 1.4305, ball 1.4034, spring 1.4310

Stainless steel version with strong spring force:
sleeve 1.4305, ball 1.4034, spring 1.4568

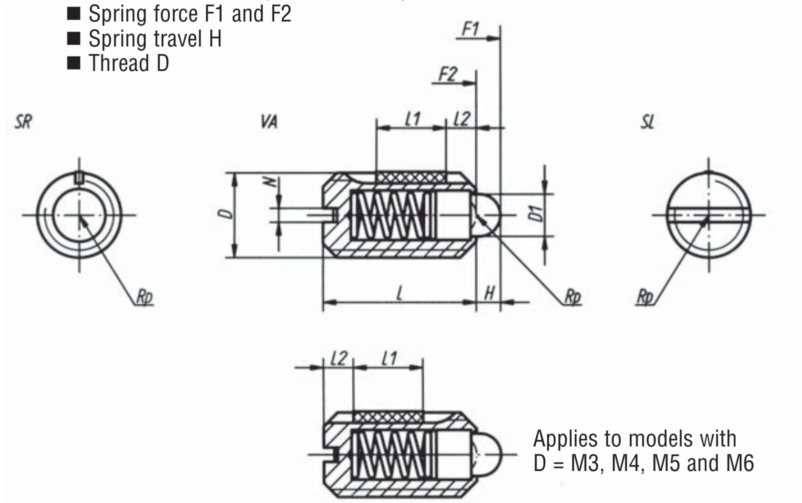
LONG-LOK thread lock in nylon

pressure and function tested

Surface finish:
Black oxide finish, ball hardened natural finish, stainless steel version natural finish

Note:
The following functional values of sizes M3 - M12 are tested optoelectronically:

- Spring force F1 and F2
- Spring travel H
- Thread D



Applies to models with D = M3, M4, M5 and M6

Spring Plungers with recess and ball, LONG-LOK secured

Order No. steel	Order No. stainless steel	D	D1	L	L1 ±0,5	L2	H	N	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Tightening torque M_{EIN} approx. Nm	Loosening torque M_{Aus} approx. Nm	Approx. weight g
16 03058	**16 03059**	M 3	1,5	7	4	approx. two thread dials	0,5	0,4	1,5	3	0,1	0,25	0,2
16 04058	**16 04059**	M 4	2,5	9	5		0,8	0,6	4	10	0,1	0,25	0,6
16 05058	**16 05059**	M 5	3	12	6		0,9	0,8	6	11	0,1	0,25	0,9
16 06058	**16 06059**	M 6	3,5	14	7		1	1	9	13	0,25	0,45	1,5
16 08058	**16 08059**	M 8	5	16	8		1,5	1,2	15	30	0,4	0,6	3,5
16 10058	**16 10059**	M 10	6	19	9		2	1,6	20	35	0,7	0,8	7
16 12058	**16 12059**	M 12	8	22	10		2,5	2	30	55	1	1,2	10
16 16058	**16 16059**	M 16	10	24	14		3,5	2,5	65	125	4,2	4,3	24

Spring Plungers with recess and ball, strong spring force, LONG-LOK secured

Order No. steel strong spring force	Order No. stainless steel strong spring force	D	D1	L	L1 ±0,5	L2	H	N	Spring force initial press. F1 approx. N	Spring force final press. F2 approx. N	Tightening torque M_{EIN} approx. Nm	Loosening torque M_{Aus} approx. Nm	Approx. weight g
16 05078	**16 05079**	M 5	3	12	6	approx. two thread dials	0,9	0,8	19	30	0,1	0,25	0,9
16 06078	**16 06079**	M 6	3,5	14	7		1	1	28	40	0,25	0,45	1,5
16 08078	**16 08079**	M 8	5	16	8		1,5	1,2	47	73	0,4	0,6	3,5
16 10078	**16 10079**	M 10	6	19	9		2	1,6	66	100	0,7	0,8	7
16 12078	**16 12079**	M 12	8	22	10		2,5	2	66	120	1	1,2	10
16 16078	**16 16079**	M 16	10	24	14		3,5	2,5	90	180	4,2	4,3	24

Sample order: Spring Plunger LONG-LOK secured 16 12058

TOOLING COMPONENTS

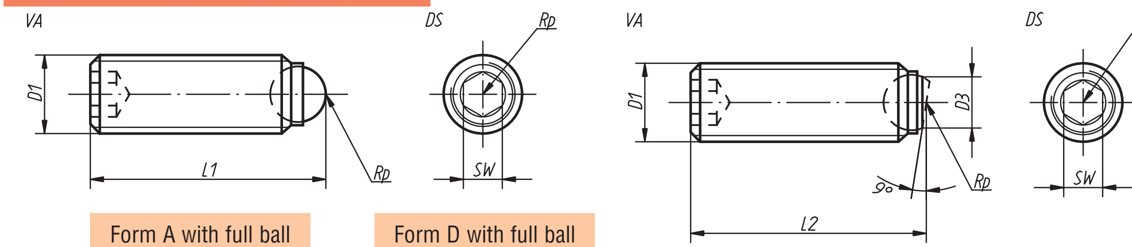
Ball Pressure Screws without head

Material:
Screw in tempered steel, ball in ball-bearing steel or delrin

Surface finish:
Black screw quality class 12.9, ball hardened natural finish, delrin ball in white

Note:
Form A with full ball is used when a clean, polished pressure surface is required. Surfaces which are not plane and parallel can be firmly clamped or supported with Form B with flattened ball because the movable ball can adapt itself up to 9°.

Models marked with * are also available in stainless steel on request.



Form A with full ball in steel

Form D with full ball in delrin

Form B with flattened ball in steel

Form BV with flattened ball in steel, with torsion protection

Form F with serrated, flattened ball in steel

Form FV with serrated, flattened ball in steel, with torsion protection

Ball Pressure Screws without head

Order No. Form A	Order No. Form B	Order No. Form D	Order No. Form F	Order No. Form BV	Order No. Form FV	D3	D1	L1	L2	Ball Ø	SW	Load capacity max. kN Form B and F (static load only)	Load capacity max. kN Form BV and FV	Approx. weight kg
07110-1046	–	07110-3046	–	–	–	–	M 4	6	–	2,5	2	–	(static load only)	0,004
07110-10410	–	07110-30410	–	–	–	–	M 4	10	–	2,5	2	–	–	0,007
07110-10416	–	07110-30416	–	–	–	–	M 4	16	–	2,5	2	–	–	0,001
07110-1058*	–	07110-3058	–	–	–	–	M 5	8	–	3	2,5	–	–	0,001
07110-10512*	–	07110-30512	–	–	–	–	M 5	12	–	3	2,5	–	–	0,001
07110-10520*	–	07110-30520	–	–	–	–	M 5	20	–	3	2,5	–	–	0,002
07110-10610*	07110-20610*	07110-30610	–	–	–	3,2	M 6	10,8	10	4	3	9	–	0,002
07110-10616*	07110-20616*	07110-30616	–	–	–	3,2	M 6	16,8	16	4	3	9	–	0,002
07110-10625*	07110-20625*	07110-30625	–	–	–	3,2	M 6	25,8	25	4	3	15	–	0,004
07110-10810*	07110-20810*	07110-30810	–	–	–	4,5	M 8	11,2	10	5,5	4	15	–	0,003
07110-10812*	07110-20812*	07110-30812	–	–	–	4,5	M 8	13,2	12	5,5	4	15	–	0,003
07110-10820*	07110-20820*	07110-30820	–	07110-50820	–	4,5	M 8	21,2	20	5,5	4	15	–	0,006
07110-10830*	07110-20830*	07110-30830	–	07110-50830	–	4,5	M 8	31,2	30	5,5	4	20	9	0,009
07110-11012*	07110-21012*	07110-31012	07110-41012	–	–	6	M 10	13,7	12	7	5	20	9	0,005
07110-11016*	07110-21016*	07110-31016	07110-41016	–	–	6	M 10	17,7	16	7	5	20	–	0,007
07110-11025*	07110-21025*	07110-31025	07110-41025	07110-51025	07110-61025	6	M 10	26,7	25	7	5	20	–	0,011
07110-11035*	07110-21035*	07110-31035	07110-41035	07110-51035	07110-61035	6	M 10	36,7	35	7	5	30	12	0,016
07110-11216*	07110-21216*	07110-31216	07110-41216	–	–	7,2	M 12	18	16	8,5	6	30	12	0,010
07110-11220*	07110-21220*	07110-31220	07110-41220	–	–	7,2	M 12	22	20	8,5	6	30	–	0,012
07110-11230*	07110-21230*	07110-31230	07110-41230	07110-51230	07110-61230	7,2	M 12	32	30	8,5	6	30	–	0,020
07110-11240*	07110-21240*	07110-31240	07110-41240	07110-51240	07110-61240	7,2	M 12	42	40	8,5	6	60	18	0,028
07110-11620*	07110-21620*	–	07110-41620	–	–	10,7	M 16	23,3	20	12	8	60	18	0,022
07110-11625*	07110-21625*	–	07110-41625	–	–	10,7	M 16	28,3	25	12	8	60	–	0,028
07110-11635*	07110-21635*	–	07110-41635	07110-51635	07110-61635	10,7	M 16	38,3	35	12	8	60	–	0,041
07110-11650*	07110-21650*	–	07110-41650	07110-51650	07110-61650	10,7	M 16	53,3	50	12	8	90	36	0,048
07110-12030	07110-22030	–	–	–	–	13,5	M 20	34,2	30	15	10	90	36	0,054
07110-12040	07110-22040	–	–	–	–	13,5	M 20	44,2	40	15	10	90	–	0,074
07110-12060	07110-22060	–	–	–	–	13,5	M 20	64,2	60	15	10	90	–	0,120
07110-12435	07110-22435	–	–	–	–	15,8	M 24	39,7	35	18	12	120	–	0,090
07110-12450	07110-22450	–	–	–	–	15,8	M 24	54,7	50	18	12	120	–	0,130
07110-12480	07110-22480	–	–	–	–	15,8	M 24	84,7	80	18	12	120	–	0,235

Sample order: Ball Pressure Screw without head 07110-21620

TOOLING COMPONENTS

Toggle Locators swivel angle 20°

Material:
Body in steel, ball in rust and acid resistant steel, Form M with hard metal insert

Surface finish:
Body black oxide finish, ball natural finish

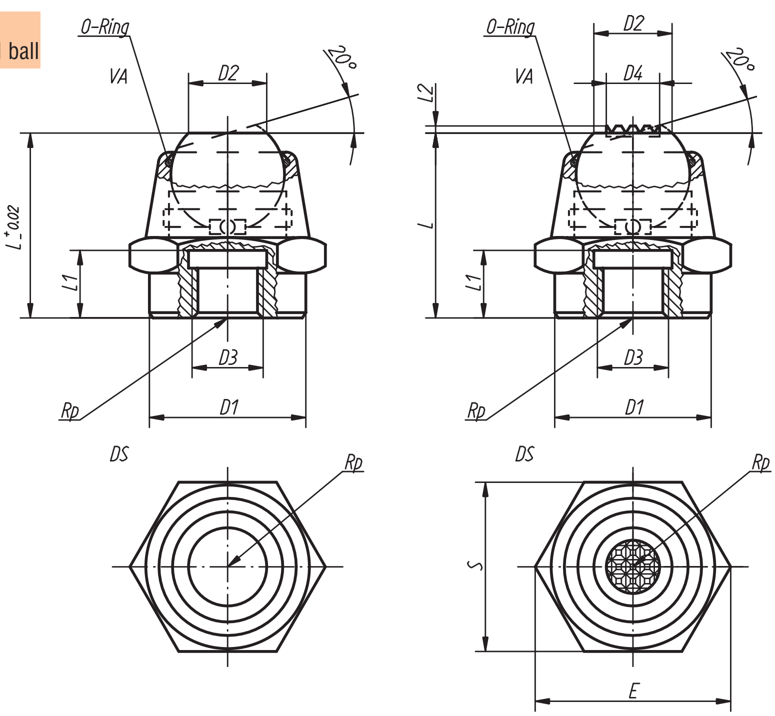
Note:
Toggle Locators are used to support and clamp unmachined and machined workpieces. In addition, they serve as stops, supports and thrust pads in fixture and tool shops. Patent applied for.

Balls are protected against torsion.

Benefits:
- The Toggle Locator can be swivelled by 20°.
- High load forces can be absorbed.
- The built-in O-ring keeps dirt and foreign particles out, which in turn guarantees reliable operation.

Form C
plain, flattened ball

Form M
flattened ball, serration in hard metal



Grub screws or threaded studs can be screwed and glued into thread D3.
This is an easy way of obtaining a toggle locator with external thread.

Toggle Locators swivel angle 20°

Order No. Form C	Order No. Form M	D1	D2	D3	D4	L	L1	L2	E	S	Ball Ø	Load capacity max. kN (statical load only)	Approx. weight kg Form C	Approx. weight kg Form M
02001-106	**02001-906**	16	7	M 6	5	17,5	6	0,4	19,6	17	10	14	0,020	0,021
02001-108	**02001-908**	22	11	M 8	7,5	26	9	0,8	27,7	24	16	34	0,065	0,066
02001-110	**02001-910**	22	11	M 10	7,5	26	9	0,8	27,7	24	16	34	0,058	0,064
02001-112	**02001-912**	22	11	M 12	7,5	26	9	0,8	27,7	24	16	34	0,061	0,063
02001-116	**02001-916**	34	18	M 16	13	40	15	0,6	41,6	36	25	90	0,224	0,227
02001-120	**02001-920**	34	18	M 20	13	40	15	0,6	41,6	36	25	90	0,215	0,218

Sample order: Toggle Locator Form C 02001-108

Toggle Locators with O-ring

Material:
Body in tempered steel, ball in tool steel,
Form K in delrin

Surface finish:
Body heat-treated, ball hardened, black oxide finish, delrin ball in white

Note:
Toggle Locators are used to support and clamp unmachined and machined workpieces. In addition, they serve as stops, supports and thrust pads in fixture and tool shops.

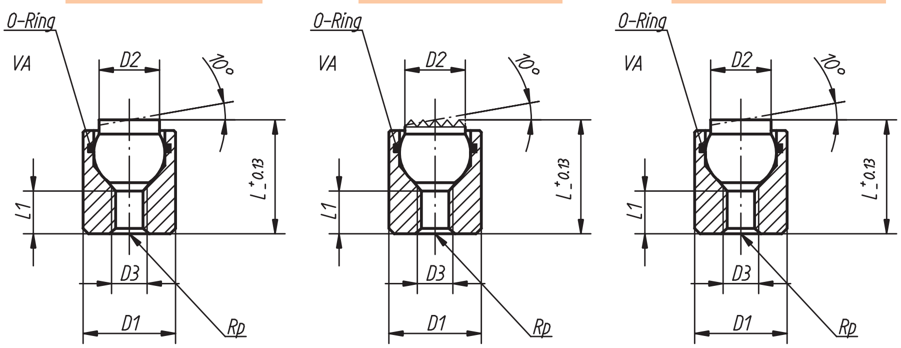
Balls are protected against torsion.

Benefits:
- The built-in O-ring keeps the ball in its place and prevents dirt and foreign particles from entering.
- This assures smooth and steady movements.

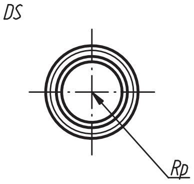
Form C
plain, flattened
steel ball

Form F
serrated, flattened
steel ball

Form K
plain, flattened
delrin ball



DS



Toggle Locators with O-ring

Order No. Form C	D1	D2	D3	L	L1	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg
02002-104 x 012	10	6	M 4	12	4,5	7	12	0,006
02002-104 x 025	10	6	M 4	25	12	7	12	0,013
02002-105 x 016	13	8,5	M 5	16	5	10	20	0,015
02002-105 x 025	13	8,5	M 5	25	12	10	20	0,023

Order No. Form F	D1	D2	D3	L	L1	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg
02002-304 x 012	10	6	M 4	12	4,5	7	12	0,006
02002-304 x 025	10	6	M 4	25	12	7	12	0,013
02002-305 x 016	13	8,5	M 5	16	5	10	20	0,014
02002-305 x 025	13	8,5	M 5	25	12	10	20	0,022

Order No. Form K	D1	D2	D3	L	L1	Ball-Ø	Load capacity max. kN (static load only)	Approx. weight kg
02002-704 x 012	10	6	M 4	12	4,5	7	12	0,005
02002-704 x 025	10	6	M 4	25	12	7	12	0,012
02002-705 x 016	13	8,5	M 5	16	5	10	20	0,011
02002-705 x 025	13	8,5	M 5	25	12	10	20	0,019

Sample order: Toggle Locator Form K 02002-704 x 012

Toggle Locators with O-ring and exchangeable inserts

Material, surface finish:
Body in tempered steel, hardened and black oxide finish; ball in rust and acid resistant steel, hardened and natural finish

Insert:
Form C in tool steel, hardened and black oxide finish, Form F in tool steel, hardened and black oxide finish, Form M in tool steel with hard metal serration, black oxide finish,
Form K in white delrin

Note:
Toggle Locators are used to support and clamp unmachined and machined workpieces. In addition, they serve as stops, supports and thrust pads in fixture and tool shops. The ball can be removed from the housing by applying light pressure to the socket head screw.

Balls are protected against torsion.

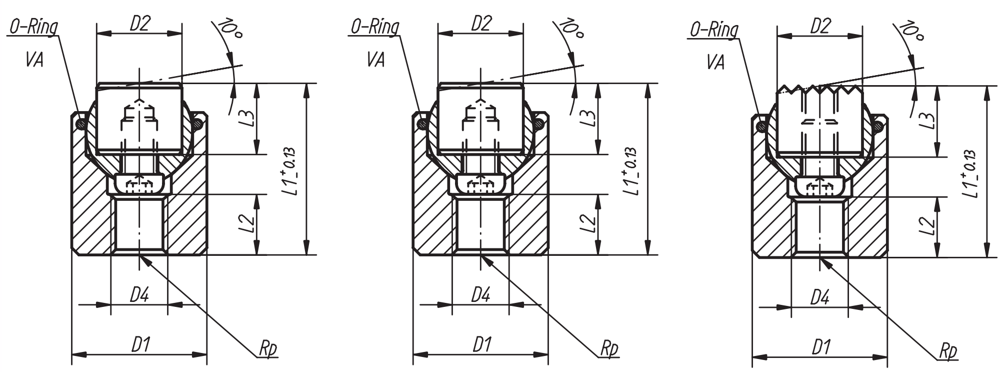
Benefits:
- Highly cost-effective as inserts can be exchanged.
- The built-in O-ring keeps the ball in its place and prevents dirt and foreign particles from entering.
- This assures smooth and steady movements.

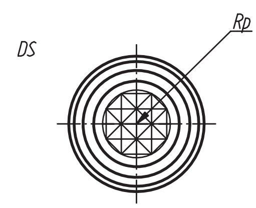
Form C
plain, flattened steel insert

Form K
plain, flattened delrin insert

Form M
gripper flattened,
serration in hard metal

Form F
serrated, flattened
gripper





Toggle Locators with O-ring and exchangeable inserts

Order No. Form C	D1	D2	D4	L1	L2	L3	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	Order No. steel insert Form C
02003-117 x 022	17	10	M 6	22	7	10	13	28	0,031	**07113-10108**
02003-119 x 024	19	12	M 8	24	8	10	15	39	0,043	**07113-12108**
02003-124 x 028	24	16	M 10	28	8	10	20	58	0,081	**07113-16108**
02003-130 x 030	30	20	M 12	30	9	10	23	95	0,139	**07113-20108**
02003-136 x 036	36	25	M 12	36	11	10	28	136	0,251	**07113-25108**

Order No. Form K	D1	D2	D4	L1	L2	L3	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	Order No. delrin insert Form K
02003-717 x 022	17	10	M 6	22	7	10	13	28	0,027	**07113-10109**
02003-719 x 024	19	12	M 8	24	8	10	15	39	0,036	**07113-12109**
02003-724 x 028	24	16	M 10	28	8	10	20	58	0,069	**07113-16109**
02003-730 x 030	30	20	M 12	30	9	10	23	95	0,121	**07113-20109**
02003-736 x 036	36	25	M 12	36	11	10	28	136	0,221	**07113-25109**

Order No. Form F	D1	D2	D4	L1	L2	L3	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	Order No. gripper Form F
02003-317 x 022	17	10	M 6	22	7	10	13	28	0,031	**07113-1010**
02003-319 x 024	19	12	M 8	24	8	10	15	39	0,045	**07113-1210**
02003-324 x 028	24	16	M 10	28	8	10	20	58	0,082	**07113-1610**
02003-330 x 030	30	20	M 12	30	9	10	23	95	0,141	**07113-2010**
02003-336 x 036	36	25	M 12	36	11	10	28	136	0,249	**07113-2510**

Order No. Form M	D1	D2	D3	D4	L1	L2	L3	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	Order No. gripper Form M
02003-917 x 022	17	10	7,9	M 6	22	7	10	13	28	0,031	**07113-10107**
02003-919 x 024	19	12	9,5	M 8	24	8	10	15	39	0,045	**07113-12107**
02003-924 x 028	24	16	12,7	M 10	28	8	10	20	58	0,082	**07113-16107**
02003-930 x 030	30	20	15,9	M 12	30	9	10	23	95	0,141	**07113-20107**
02003-936 x 036	36	25	19	M 12	36	11	10	28	136	0,249	**07113-25107**

Sample order: Toggle Locator Form K 02003-736 x 036

TOOLING COMPONENTS

Adjustable Toggle Locators with O-ring

Material:
Body in tempered steel, ball in tool steel, Form K in delrin

Surface finish:
Body heat-treated, ball hardened, black oxide finish, delrin ball in white

Note:
Toggle Locators are used to support and clamp unmachined and machined workpieces. In addition, they serve as stops, supports and thrust pads in fixture and tool shops.

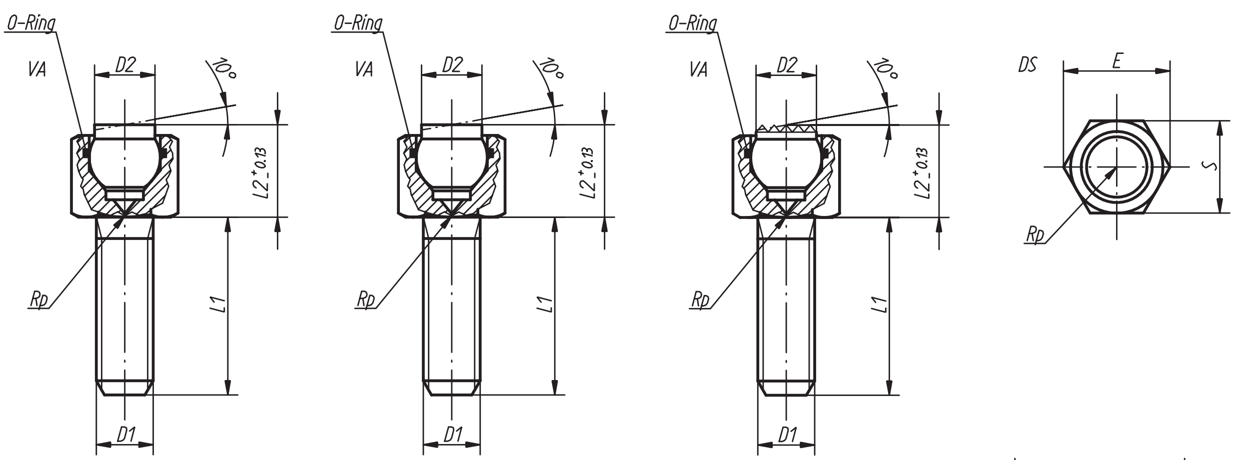
Balls are protected against torsion.

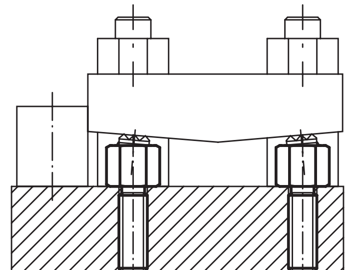
Benefits:
- The built-in O-ring keeps the ball in its place and prevents dirt and foreign particles from entering.
- This assures smooth and steady movements.

Form C
plain, flattened
steel ball

Form K
plain, flattened
delrin ball

Form F
serrated, flattened
steel ball





Adjustable Toggle Locators with O-ring

Order No. Form C	D1	D2	L1	L2	E	S	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg
02006-106 x 012	M 6	6	12	9,5	11,5	10	7	9	0,007
02006-106 x 025	M 6	6	25	9,5	11,5	10	7	9	0,010
02006-106 x 040	M 6	6	40	9,5	11,5	10	7	9	0,012
02006-108 x 012	M 8	8,5	12	13	15	13	10	15	0,016
02006-108 x 025	M 8	8,5	25	13	15	13	10	15	0,021
02006-108 x 040	M 8	8,5	40	13	15	13	10	15	0,026

Order No. Form F	D1	D2	L1	L2	E	S	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg
02006-306 x 012	M 6	6	12	9,5	11,5	10	7	9	0,007
02006-306 x 025	M 6	6	25	9,5	11,5	10	7	9	0,010
02006-306 x 040	M 6	6	40	9,5	11,5	10	7	9	0,012
02006-308 x 012	M 8	8,5	12	13	15	13	10	15	0,016
02006-308 x 025	M 8	8,5	25	13	15	13	10	15	0,021
02006-308 x 040	M 8	8,5	40	13	15	13	10	15	0,025

Order No. Form K	D1	D2	L1	L2	E	S	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg
02006-706 x 012	M 6	6	12	9,5	11,5	10	7	9	0,006
02006-706 x 025	M 6	6	25	9,5	11,5	10	7	9	0,009
02006-706 x 040	M 6	6	40	9,5	11,5	10	7	9	0,011
02006-708 x 012	M 8	8,5	12	13	15	13	10	15	0,012
02006-708 x 025	M 8	8,5	25	13	15	13	10	15	0,017
02006-708 x 040	M 8	8,5	40	13	15	13	10	15	0,022

Sample order: Adjustable Toggle Locator Form K 02006-706 x 040

Adjustable Toggle Locators with O-ring and exchangeable inserts

Material, surface finish:
Body in tempered steel, heat-treated and black oxide finish; ball in rust and acid resistant steel, hardened and natural finish

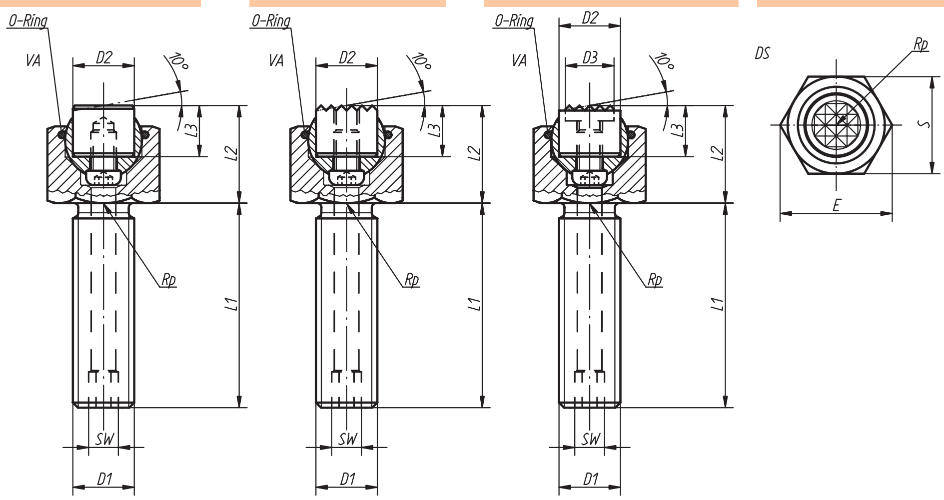
Insert:
Form C in tool steel, hardened and black oxide finish; Form F in tool steel, hardened and black oxide finish; Form M in tool steel with hard metal serration, black oxide finish; Form K in white delrin

Note:
Toggle Locators are used to support and clamp unmachined and machined workpieces. In addition, they serve as stops, supports and thrust pads in fixture and tool shops. The ball can be removed from the housing by applying light pressure to the socket head screw.

Balls are protected against torsion.

Benefits:
- HIghly cost-effective as inserts can be exchanged.
- The built-in O-ring keeps the ball in its place and prevents dirt and foreign particles from entering.
- This assures smooth and steady movements.

Form C plain, flattened steel insert	Form F serrated, flattened gripper	Form M gripper flattened, serration in hard metal	Form K plain, flattened delrin insert



Adjustable Toggle Locators with O-ring and exchangeable insert

Order No. Form C	D1	D2	L1	L2	L3	SW	Ball Ø	E	S	Approx. weight kg	Load capacity max. kN (static load only)	Order No. steel insert Form C
02007-110 x 015	M 10	10	15	17	10	3	13	19,6	17	0,032	19	**07113-10108**
02007-110 x 030	M 10	10	30	17	10	3	13	19,6	17	0,039	19	**07113-10108**
02007-110 x 050	M 10	10	50	17	10	3	13	19,6	17	0,047	19	**07113-10108**
02007-112 x 020	M 12	12	20	19	10	5	15	21,9	19	0,048	30	**07113-12108**
02007-112 x 040	M 12	12	40	19	10	5	15	21,9	19	0,059	30	**07113-12108**
02007-112 x 060	M 12	12	60	19	10	5	15	21,9	19	0,071	30	**07113-12108**
02007-116 x 025	M 16	16	25	23	10	6	20	27,7	24	0,100	50	**07113-16108**
02007-116 x 050	M 16	16	50	23	10	6	20	27,7	24	0,127	50	**07113-16108**
02007-116 x 080	M 16	16	80	23	10	6	20	27,7	24	0,159	50	**07113-16108**
02007-120 x 030	M 20	20	30	24	10	8	23	34,6	30	0,171	85	**07113-20108**
02007-120 x 060	M 20	20	60	24	10	8	23	34,6	30	0,220	85	**07113-20108**
02007-120 x 100	M 20	20	100	24	10	8	23	34,6	30	0,289	85	**07113-20108**
02007-124 x 040	M 24	25	40	30	10	10	28	41,6	36	0,321	121	**07113-25108**
02007-124 x 100	M 24	25	100	30	10	10	28	41,6	36	0,468	121	**07113-25108**

Sample order: Adjustable Toggle Locator Form C 02007-124 x 100

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Adjustable Toggle Locators with O-ring and exchangeable insert

Order No. Form K	D1	D2	L1	L2	L3	SW	Ball-Ø	E	S	Load capacity max. kN (static load only)	Approx. weight kg	Order No. delrin insert Form K
02007-710 x 015	M 10	10	15	17	10	3	13	19,6	17	19	0,027	**07113-10109**
02007-710 x 030	M 10	10	30	17	10	3	13	19,6	17	19	0,034	**07113-10109**
02007-710 x 050	M 10	10	50	17	10	3	13	19,6	17	19	0,043	**07113-10109**
02007-712 x 020	M 12	12	20	19	10	5	15	21,9	19	30	0,041	**07113-12109**
02007-712 x 040	M 12	12	40	19	10	5	15	21,9	19	30	0,052	**07113-12109**
02007-712 x 060	M 12	12	60	19	10	5	15	21,9	19	30	0,064	**07113-12109**
02007-716 x 025	M 16	16	25	23	10	6	20	27,7	24	50	0,088	**07113-16109**
02007-716 x 050	M 16	16	50	23	10	6	20	27,7	24	50	0,115	**07113-16109**
02007-716 x 080	M 16	16	80	23	10	6	20	27,7	24	50	0,147	**07113-16109**
02007-720 x 030	M 20	20	30	24	10	8	23	34,6	30	85	0,152	**07113-20109**
02007-720 x 060	M 20	20	60	24	10	8	23	34,6	30	85	0,202	**07113-20109**
02007-720 x 100	M 20	20	100	24	10	8	23	34,6	30	85	0,270	**07113-20109**
02007-724 x 040	M 24	25	40	30	10	10	28	41,6	36	121	0,291	**07113-25109**
02007-724 x 100	M 24	25	100	30	10	10	28	41,6	36	121	0,438	**07113-25109**

Order No. Form F	D1	D2	L1	L2	L3	SW	Ball Ø	E	S	Load capacity max. kN (static load only)	Approx. weight kg	Order No. gripper Form F
02007-310 x 015	M 10	10	15	17	10	3	13	19,6	17	19	0,031	**07113-1010**
02007-310 x 030	M 10	10	30	17	10	3	13	19,6	17	19	0,038	**07113-1010**
02007-310 x 050	M 10	10	50	17	10	3	13	19,6	17	19	0,047	**07113-1010**
02007-312 x 020	M 12	12	20	19	10	5	15	21,9	19	30	0,050	**07113-1210**
02007-312 x 040	M 12	12	40	19	10	5	15	21,9	19	30	0,061	**07113-1210**
02007-312 x 060	M 12	12	60	19	10	5	15	21,9	19	30	0,073	**07113-1210**
02007-316 x 025	M 16	16	25	23	10	6	20	27,7	24	50	0,100	**07113-1610**
02007-316 x 050	M 16	16	50	23	10	6	20	27,7	24	50	0,127	**07113-1610**
02007-316 x 080	M 16	16	80	23	10	6	20	27,7	24	50	0,159	**07113-1610**
02007-320 x 030	M 20	20	30	24	10	8	23	34,6	30	85	0,173	**07113-2010**
02007-320 x 060	M 20	20	60	24	10	8	23	34,6	30	85	0,222	**07113-2010**
02007-320 x 100	M 20	20	100	24	10	8	23	34,6	30	85	0,290	**07113-2010**
02007-324 x 040	M 24	25	40	30	10	10	28	41,6	36	121	0,319	**07113-2510**
02007-324 x 100	M 24	25	100	30	10	10	28	41,6	36	121	0,466	**07113-2510**

Order No. Form M	D1	D2	D3	L1	L2	L3	SW	Ball Ø	E	S	Load capacity max. kN (static load only)	Approx. weight kg	Order No. gripper Form M
02007-910 x 015	M 10	10	7,9	15	17	10	3	13	19,6	17	19	0,031	**07113-10107**
02007-910 x 030	M 10	10	7,9	30	17	10	3	13	19,6	17	19	0,038	**07113-10107**
02007-910 x 050	M 10	10	7,9	50	17	10	3	13	19,6	17	19	0,047	**07113-10107**
02007-912 x 020	M 12	12	9,5	20	19	10	5	15	21,9	19	30	0,050	**07113-12107**
02007-912 x 040	M 12	12	9,5	40	19	10	5	15	21,9	19	30	0,061	**07113-12107**
02007-912 x 060	M 12	12	9,5	60	19	10	5	15	21,9	19	30	0,073	**07113-12107**
02007-916 x 025	M 16	16	12,7	25	23	10	6	20	27,7	24	50	0,100	**07113-16107**
02007-916 x 050	M 16	16	12,7	50	23	10	6	20	27,7	24	50	0,127	**07113-16107**
02007-916 x 080	M 16	16	12,7	80	23	10	6	20	27,7	24	50	0,159	**07113-16107**
02007-920 x 030	M 20	20	15,9	30	24	10	8	23	34,6	30	85	0,173	**07113-20107**
02007-920 x 060	M 20	20	15,9	60	24	10	8	23	34,6	30	85	0,222	**07113-20107**
02007-920 x 100	M 20	20	15,9	100	24	10	8	23	34,6	30	85	0,290	**07113-20107**
02007-924 x 040	M 24	25	19	40	30	10	10	28	41,6	36	121	0,319	**07113-25107**
02007-924 x 100	M 24	25	19	100	30	10	10	28	41,6	36	121	0,466	**07113-25107**

Sample order: Adjustable Toggle Locator Form M 02007-910 x 050

Adjustable Toggle Locators with O-ring and hexagon socket

Material:
Body in tempered steel, ball in tool steel, Form K in delrin

Surface finish:
Body heat-treated; ball hardened, black oxide finish; delrin ball in white

Note:
Toggle Locators are used to support and clamp unmachined and machined workpieces. In addition, they serve as stops, supports and thrust pads in fixture and tool shops.

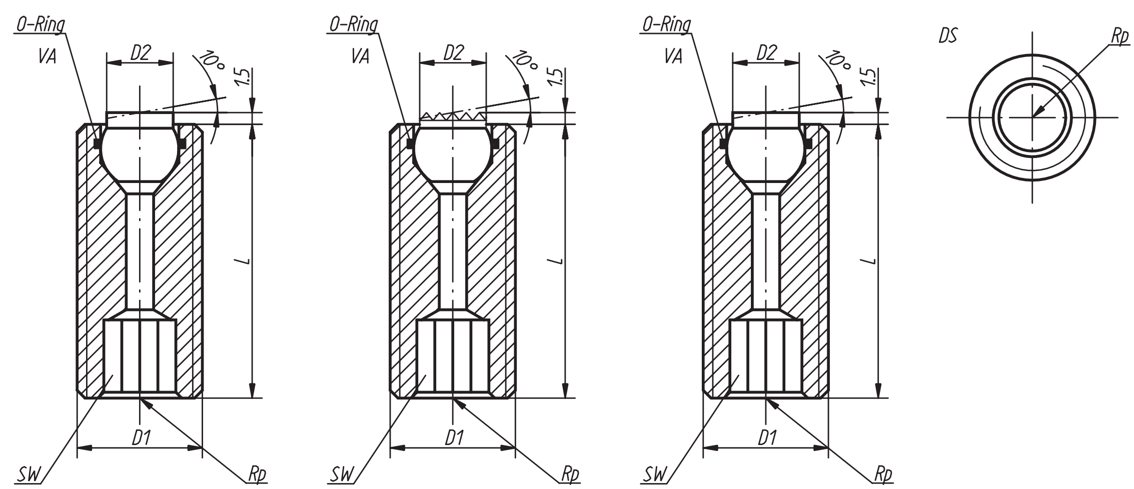
Balls are protected against torsion.

Benefits:
- The built-in O-ring keeps the ball in its place and prevents dirt and foreign particles from entering.
- This assures smooth and steady movements.
- The hexagon socket allows easy locating and positioning in through holes.

Form C plain, flattened steel ball

Form F serrated, flattened steel ball

Form K plain, flattened delrin ball



Adjustable Toggle Locators with O-ring and hexagon socket

Order No. Form C	D1	D2	L	SW	Load capacity max. kN (static load only)	Ball Ø	Approx. weight kg
02008-112 x 025	M 12	6	25	6	15	7	0,015
02008-112 x 035	M 12	6	35	6	15	7	0,022
02008-112 x 050	M 12	6	50	6	15	7	0,032
02008-116 x 025	M 16	8,5	25	8	23	10	0,028
02008-116 x 035	M 16	8,5	35	8	23	10	0,039
02008-116 x 050	M 16	8,5	50	8	23	10	0,058

Order No. Form F	D1	D2	L	SW	Load capacity max. kN (static load only)	Ball Ø	Approx. weight kg
02008-312 x 025	M 12	6	25	6	15	7	0,015
02008-312 x 035	M 12	6	35	6	15	7	0,022
02008-312 x 050	M 12	6	50	6	15	7	0,032
02008-316 x 025	M 16	8,5	25	8	23	10	0,027
02008-316 x 035	M 16	8,5	35	8	23	10	0,039
02008-316 x 050	M 16	8,5	50	8	23	10	0,057

Order No. Form K	D1	D2	L	SW	Load capacity max. kN (static load only)	Ball Ø	Approx. weight kg
02008-712 x 025	M 12	6	25	6	15	7	0,013
02008-712 x 035	M 12	6	35	6	15	7	0,021
02008-712 x 050	M 12	6	50	6	15	7	0,031
02008-716 x 025	M 16	8,5	25	8	23	10	0,024
02008-716 x 035	M 16	8,5	35	8	23	10	0,035
02008-716 x 050	M 16	8,5	50	8	23	10	0,054

Sample order: Adjustable Toggle Locator Form K 02008-712 x 050

Adjustable Toggle Locators with O-ring, exchangeable inserts and hexagon socket

Material, surface finish:
Body in tempered steel, heat-treated and black oxide finish; ball in rust and acid resistant steel, hardened and natural finish

Insert:
Form C in tool steel, hardened and black oxide finish, Form F in tool steel, hardened and black oxide finish, Form M in tool steel with hard metal serration, black oxide finish,
Form K in white delrin

Note:
Toggle Locators are used to support and clamp unmachined and machined workpieces. In addition, they serve as stops, supports and thrust pads in fixture and tool shops. The ball can be removed from the housing by applying light pressure to the socket head screw.

Balls are protected against torsion.

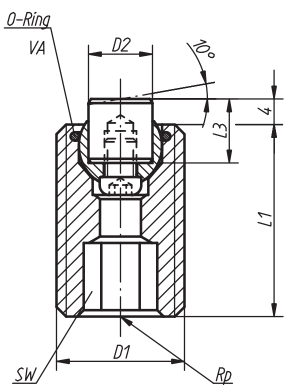
Benefits:
- Highly cost-effective as inserts can be exchanged.
- The built-in O-ring keeps the ball in its place and prevents dirt and foreign particles from entering.
- This assures smooth and steady movements.

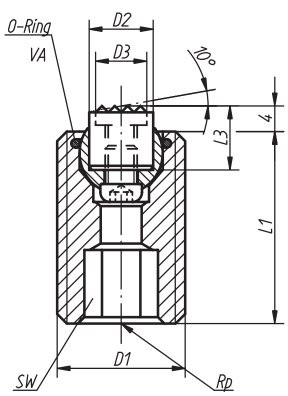
Form C plain, flattened steel insert

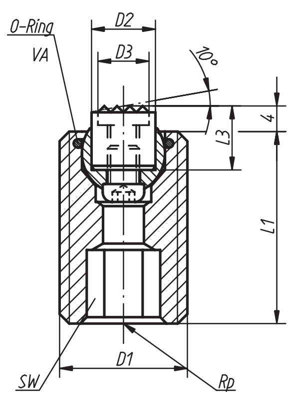
Form K plain, flattened delrin insert

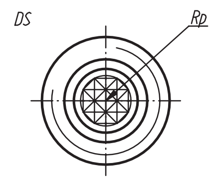
Form M gripper flattened, with serration in hard metal

Form F serrated, flattened gripper









Adjustable Toggle Locators with O-ring, exchangeable inserts and hexagon socket

Order No. Form C	D1	D2	L1	L3	SW	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	**Order No. steel insert Form C**
02009-120 x 030	M 20	10	30	10	8	13	37	0,049	**07113-10108**
02009-120 x 050	M 20	10	50	10	8	13	37	0,084	**07113-10108**
02009-120 x 070	M 20	10	70	10	8	13	37	0,122	**07113-10108**
02009-124 x 040	M 24	12	40	10	10	15	55	0,101	**07113-12108**
02009-124 x 080	M 24	12	80	10	10	15	55	0,200	**07113-12108**

Order No. Form F	D1	D2	L1	L3	SW	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	**Order No. gripper Form F**
02009-320 x 030	M 20	10	30	10	8	13	37	0,049	**07113-1010**
02009-320 x 050	M 20	10	50	10	8	13	37	0,084	**07113-1010**
02009-320 x 070	M 20	10	70	10	8	13	37	0,121	**07113-1010**
02009-324 x 040	M 24	12	40	10	10	15	55	0,103	**07113-1210**
02009-324 x 080	M 24	12	80	10	10	15	55	0,201	**07113-1210**

Order No. Form K	D1	D2	L1	L3	SW	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	**Order No. delrin insert Form K**
02009-720 x 030	M 20	10	30	10	8	13	37	0,045	**07113-10109**
02009-720 x 050	M 20	10	50	10	8	13	37	0,080	**07113-10109**
02009-720 x 070	M 20	10	70	10	8	13	37	0,117	**07113-10109**
02009-724 x 040	M 24	12	40	10	10	15	55	0,094	**07113-12109**
02009-724 x 080	M 24	12	80	10	10	15	55	0,193	**07113-12109**

Order No. Form M	D1	D2	D3	L1	L3	SW	Ball Ø	Load capacity max. kN (static load only)	Approx. weight kg	**Order No. gripper Form M**
02009-920 x 030	M 20	10	7,9	30	10	8	13	37	0,049	**07113-10107**
02009-920 x 050	M 20	10	7,9	50	10	8	13	37	0,084	**07113-10107**
02009-920 x 070	M 20	10	7,9	70	10	8	13	37	0,121	**07113-10107**
02009-924 x 040	M 24	12	9,5	40	10	10	15	55	0,103	**07113-12107**
02009-924 x 080	M 24	12	9,5	80	10	10	15	55	0,201	**07113-12107**

Sample order: Adjustable Toggle Locator Form K 02009-720 x 070

Round Grippers and Inserts

Material, surface finish:
Form C in tool steel, hardened and black oxide finish,
Form F in tool steel, hardened and black oxide finish,
Form M in tool steel with hard metal serration, black oxide finish,
Form K in white delrin

Note:
Grippers and Inserts are ideal for use in clamping arms, gripping systems, clamping fixtures, clamping jaws and toggle locators.
Grippers transfer very high torque values and above average holding forces. This is also true when they are applied to hard materials and surface irregularities.

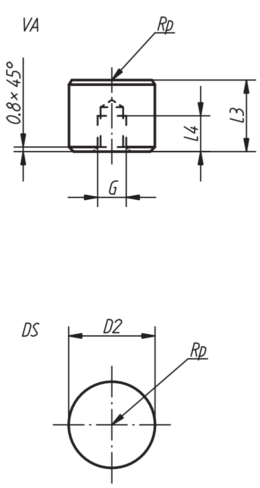
Grippers and Inserts can be fitted in the following Toggle Locators:

Order No.
02003-117 x 022 up to 02003-936 x 036

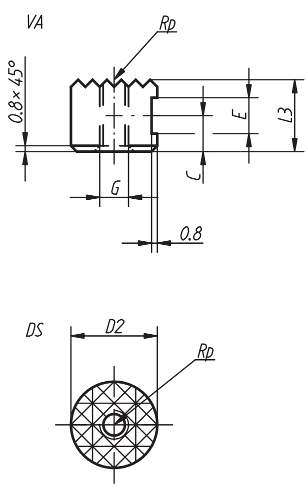
Order No.
02007-110 x 015 up to 02007-924 x 100

Order No.
02009-120 x 030 up to 02009-924 x 080

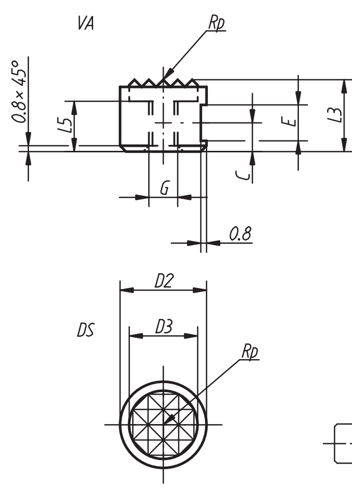
Form C plain, flattened steel insert

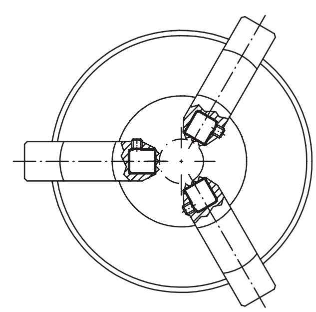


Form F serrated, flattened gripper



Form M flattened gripper, serration in hard metal





Form K plain, flattened delrin insert

Round Inserts

Order No. Form C	Order No. Form K	D2 -0,13	L3 ± 0,013 *(-0,13)	L4	G	Approx. weight g Form C	Approx. weight g Form K
07113-10108	**07113-10109**	10	10	5	M 5	5,5	1
07113-12108	**07113-12109**	12	10	5	M 5	8,5	1,5
07113-16108	**07113-16109**	16	10	5	M 6	14,5	2,5
07113-20108	**07113-20109**	20	10	5	M 6	23	4,5
07113-25108	**07113-25109**	25	10	5	M 6	37	7

* Applies to Form K

Round Grippers

Order No. Form F	Order No. Form M	D2 -0,13	D3	L3 -0,13	L5	C	E	G	Approx. weight g
07113-1010	**07113-10107**	10	7,9	10	6	4,5	4,75	M 5	5
07113-1210	**07113-12107**	12	9,5	10	6	4,5	4,75	M 5	10
07113-1212	**07113-12127**	12	9,5	12	7	6	4,75	M 5	12
07113-1610	**07113-16107**	16	12,7	10	6	4,5	4,75	M 6	15
07113-2010	**07113-20107**	20	15,9	10	6	4,5	4,75	M 6	25
07113-2510	**07113-25107**	25	19	10	6	4,5	4,75	M 6	35

Sample order: Round Gripper 07113-2510

TOOLING COMPONENTS

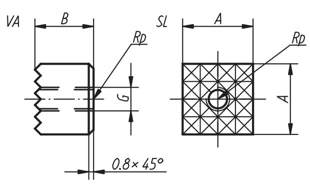
Square Grippers

Material:
Hardened tool steel or hard metal

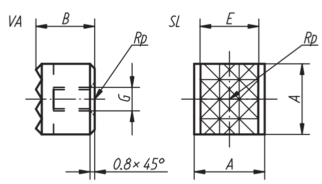
Surface finish:
Black oxide finish

Note:
Grippers and Inserts are ideal for use in clamping arms, gripping systems, clamping fixtures, clamping jaws and toggle locators.
Grippers transfer very high torque values and above average holding forces. This is also true when they are applied to hard materials and surface irregularities.
Grippers guarantee above average clamping forces at high cutting forces.

Form A
tool steel



Form B serration in
hard metal



Square Grippers

Order No. Form A	Order No. Form B	A -0,15	B	E	G	Approx. weight g
07115-1005	–	10	10	–	M 5	5
07115-1205	**07115-12057**	12	10	10,3	M 5	10
07115-2005	–	20	10	–	M 5	25
07115-2506	–	25	10	–	M 6	45

Sample order: Square Gripper 07115-2506

Hexagonal Grippers

Material:
Hardened tool steel or hard metal

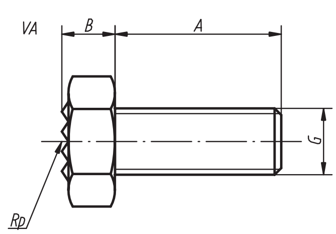
Surface finish:
Black oxide finish

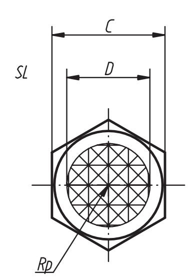
Note:
The serrated hard metal tips are soldered in.

Hexagonal Grippers

Order No.	A	B	C	D	G	Approx. weight kg
07114-1006	25	5	10	7,9	M 6	0,005
07114-1308	25	6,4	13	9,5	M 8	0,015
07114-1710	25	8,3	17	12,7	M 10	0,025
07114-17102	40	8,3	17	12,7	M 10	0,035
07114-1912	25	8,7	19	15,9	M 12	0,040
07114-19122	40	8,7	19	15,9	M 12	0,050
07114-2416	35	11	24	19	M 16	0,085
07114-24162	50	11	24	19	M 16	0,105
07114-3020	40	13,7	30	25,4	M 20	0,165
07114-30202	60	13,7	30	25,4	M 20	0,205

Sample order: Hexagonal Gripper 07114-1710





TOOLING COMPONENTS

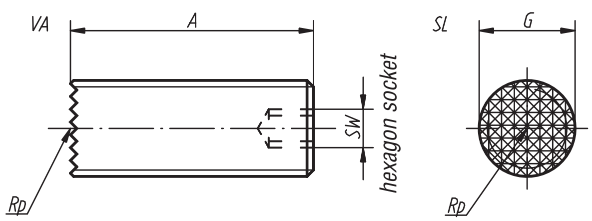
Adjustable Grippers

Material:
Hardened tool steel or hard metal

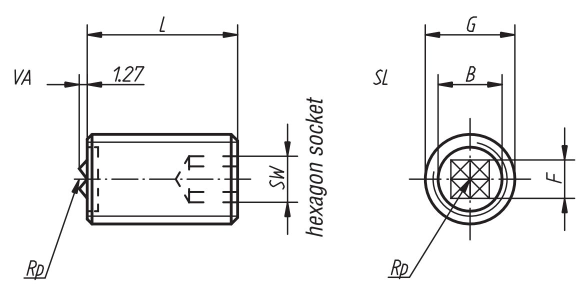
Surface finish:
Black oxide finish

Note:
The continuous external thread of the Adjustable Grippers allows exact adjusting to the clamping job. The hard metal tips are soldered in.

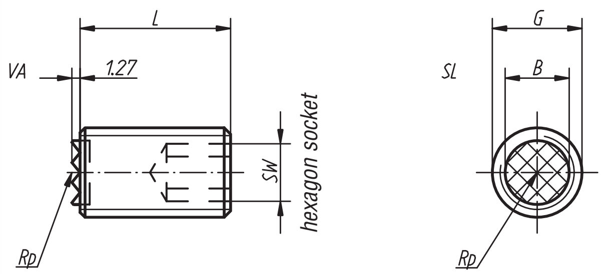
Form A
tool steel



Form C 4-point-serration
in hard metal



Form B
serration in hard metal



Adjustable Grippers

Order No. Form A	Order No. Form B	Order No. Form C	A	L	B	G	F	SW Form A	SW Form B+C
07117-4010	**07117-2510**	**–**	40	25	6,4	M 10	–	3	5
–	**07117-5010**	**–**	–	50	6,4	M 10	–	3	5
07117-4012	**07117-2512**	**07117-25124**	40	25	7,9	M 12	6,5	5	6
–	**07117-5012**	**07117-50124**	–	50	7,9	M 12	6,5	5	6
07117-4016	**07117-2516**	**07117-25164**	40	25	11,2	M 16	8	6	8
–	**07117-5016**	**07117-50164**	–	50	11,2	M 16	8	6	8
07117-4020	**07117-2520**	**07117-25204**	40	25	12,7	M 20	8	8	10
–	**07117-5020**	**07117-50204**	–	50	12,7	M 20	8	8	10

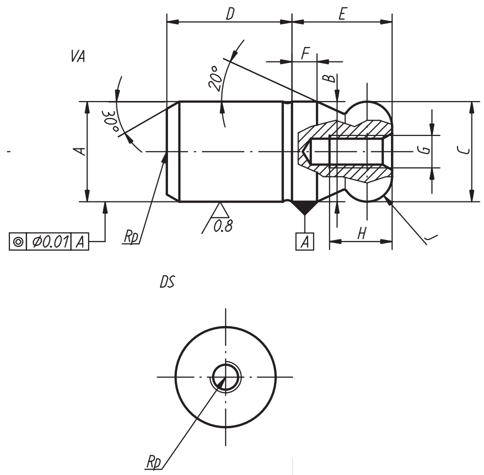
Sample order: Adjustable Gripper Form B 07117-5012

Straight Bolts with ball end Form A

Material:
Tool steel

Surface finish:
Hardened and ground

Note:
Straight Bolts with ball end facilitate mounting operations as they are specifically designed for this process. The tendency to jam parts, also known as “drawer effect”, is caused by forces not effective in the bolt axis or by parts being mounted at a slanted angle. This tendency is minimised by the ball end and the ball incline (see also mounting illustration).



Straight Bolts with ball end Form A

Order No.	A_{n6}	B_{g6}	$C_{-0,05}^{-0,01}$	D	E	F	G	H	J	Approx. weight kg
03107-08	8	8	8	10	8	2	M 3	6	R 2	0,006
03107-10	10	10	10	13	10	2,5	M 3	6	R 2,5	0,012
03107-12	12	12	12	15	12	3	M 4	8	R 3	0,021
03107-16	16	16	16	20	16	4	M 5	10	R 4	0,051
03107-20	20	20	20	25	20	5	M 5	10	R 5	0,101
03107-25	25	25	25	25	25	6	M 5	10	R 6	0,176
03107-30	30	30	30	30	30	8	M 6	12	R 8	0,307
03107-40	40	40	40	40	40	10	M 6	12	R 10	0,729
03107-50	50	50	50	50	50	12	M 6	12	R 12	1,422

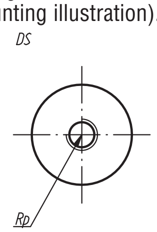
Sample order: Straight Bolt with ball end 03107-12

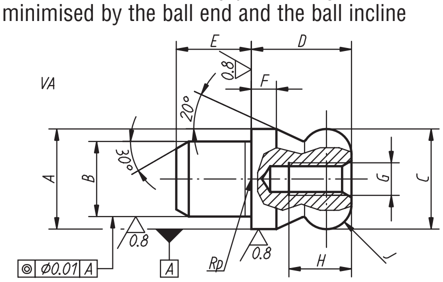
Straight Bolts with ball end Form B

Material:
Tool steel

Surface finish:
Hardened and ground

Note:
Straight Bolts with ball end facilitate mounting operations as they are specifically designed for this process. The tendency to jam parts, also known as “drawer effect”, is caused by forces not effective in the bolt axis or by parts being mounted at a slanted angle. This tendency is minimised by the ball end and the ball incline (see also mounting illustration).



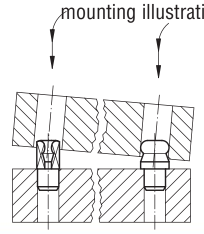


Straight Bolts with ball end Form B

Order No.	A_{g6}	B_{n6}	$C_{-0,05}^{-0,01}$	D	E	F	G	H	J	Approx. weight kg
03108-10	10	7	10	10	7	2,5	M 3	6	R 2,5	0,007
03108-12	12	8	12	12	8	3	M 4	8	R 3	0,011
03108-16	16	12	16	16	12	4	M 5	10	R 4	0,030
03108-20	20	14	20	20	14	5	M 5	10	R 5	0,057
03108-22	22	16	22	22	16	5,5	M 5	10	R 5,5	0,079
03108-25	25	18	25	25	18	6	M 5	10	R 6	0,116

Sample order: Straight Bolt with ball end 03108-20

mounting illustration



TOOLING COMPONENTS

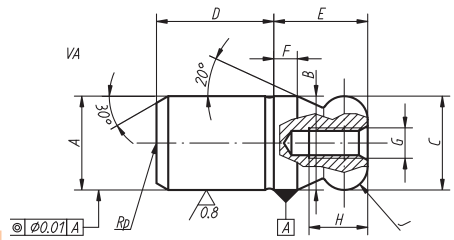
BRAUER®

Straight Bolts with flattened ball end Form C

Material:
Tool steel

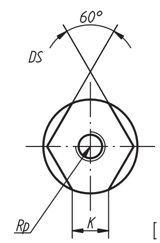
Surface finish:
Hardened and ground

Note:
Straight Bolts with ball end facilitate mounting operations as they are specifically designed for this process. The tendency to jam parts, also known as “drawer effect”, is caused by forces not effective in the bolt axis or by parts being mounted at a slanted angle. This tendency is minimised by the ball end and the ball incline.



Straight Bolts with flattened ball end Form C

Order No.	A_{n6}	B_{g6}	$C^{-0,01}_{-0,05}$	D	E	F	G	H	J	K	Approx. weight kg
03107-082	8	8	8	10	8	2	M 3	6	R 2	1,9	0,005
03107-102	10	10	10	13	10	2,5	M 3	6	R 2,5	2,5	0,011
03107-122	12	12	12	15	12	3	M 4	8	R 3	2,5	0,017
03107-162	16	16	16	20	16	4	M 5	10	R 4	4,3	0,044
03107-202	20	20	20	25	20	5	M 5	10	R 5	5	0,088
03107-252	25	25	25	25	25	6	M 5	10	R 6	5,6	0,149
03107-302	30	30	30	30	30	8	M 6	12	R 8	8,8	0,270
03107-402	40	40	40	40	40	10	M 6	12	R 10	12,8	0,657
03107-502	50	50	50	50	50	12	M 6	12	R 12	16,7	1,243



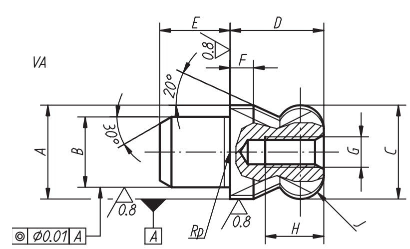
Sample order: Straight Bolt with flattened ball end 03107-162

Straight Bolts with flattened ball end Form D

Material:
Tool steel

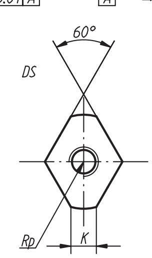
Surface finish:
Hardened and ground

Note:
Straight Bolts with ball end facilitate mounting operations as they are specifically designed for this process. The tendency to jam parts, also known as “drawer effect”, is caused by forces not effective in the bolt axis or by parts being mounted at a slanted angle. This tendency is minimised by the ball end and the ball incline.



Straight Bolts with flattened ball end Form D

Order No.	A_{n6}	B_{g6}	$C^{-0,01}_{-0,05}$	D	E	F	G	H	J	K	Approx. weight kg
03108-102	10	7	10	10	7	2,5	M 3	6	R 2,5	2,5	0,005
03108-122	12	8	12	12	8	3	M 4	8	R 3	2,5	0,008
03108-162	16	12	16	16	12	4	M 5	10	R 4	4,3	0,023
03108-202	20	14	20	20	14	5	M 5	10	R 5	5	0,045
03108-222	22	16	22	22	16	5,5	M 5	10	R 5,5	5	0,062
03108-252	25	18	25	25	18	6	M 5	10	R 6	5,6	0,091



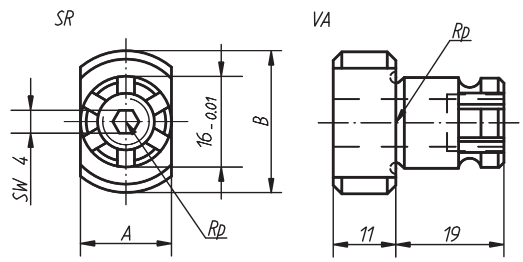
Sample order: Straight Bolt with flattened ball end 03108-162

Locating Bolts spread type

Material:
Tempered steel

Surface finish:
Heat-treated and black oxide finish,
locating diameter and guide surfaces ground

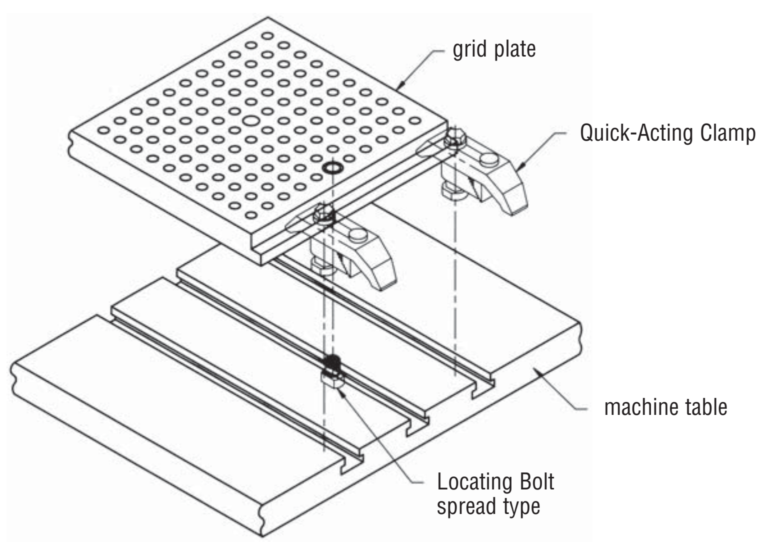
Note:
With the aid of spread type Locating Bolts, grid plates can, for example, be positioned on machine tables with T-slots (see illustration). The plates to be positioned must have two holes matching the spread type shaft. The continuous hexagonal socket in the spread type screw allows operation from two sides.



Locating Bolts spread type

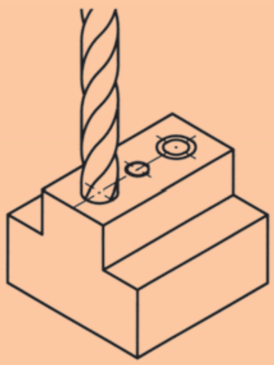
Order No.	A $_{-0.01}$	B	Approx. weight kg
03151-12016	12	25	0,040
03151-14016	14	25	0,050
03151-16016	16	25	0,050
03151-18016	18	29	0,050
03151-20016	20	29	0,060
03151-22016	22	29	0,060

Sample order: Locating Bolt spread type 03151-16016

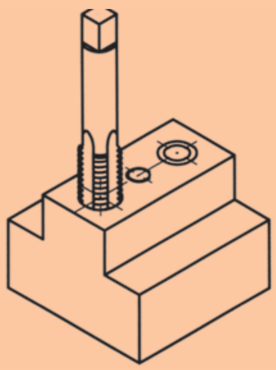


Operating Instructions for Threaded Inserts

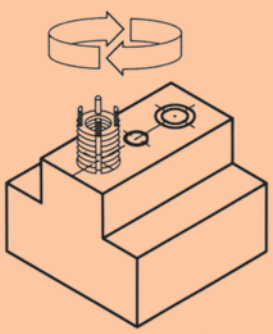
Installation Instructions



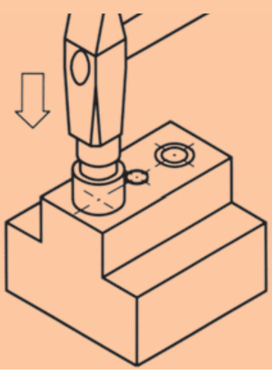
1.*
Rebore the old thread and countersink it (82°–100°)



2.*
Tap planned thread with a standard screw tap



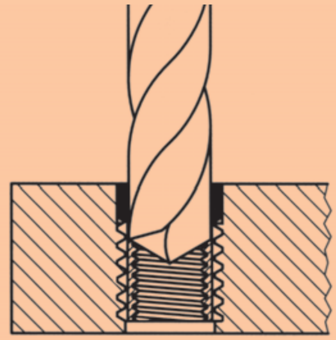
3.
Screw in the insert to just below the surface (0.3–0.7 mm)



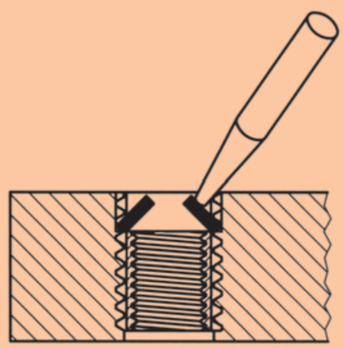
4.
Drive in the locking pins by striking the assembly tool lightly with a hammer

* For steps 1 and 2 see table under installation of threaded inserts

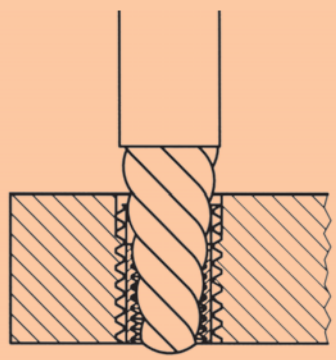
Removal Instructions



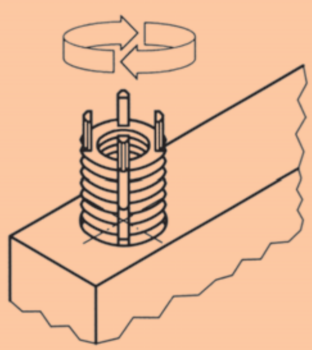
1.*
Rebore the material between the locking pins and the internal thread to the specified depth



2.
Bend the locking pins inwards and break them off



3.
Remove the old insert with a screw extractor



4.
Install a new threaded insert in the original threaded hole

* For step 1 see table under removal of threaded inserts

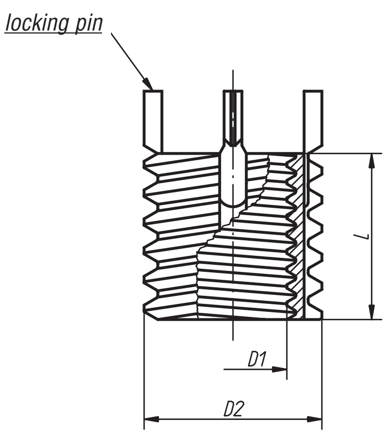
Threaded Inserts

Material:
Threaded insert in hardened steel or stainless steel

Surface finish:
Phosphated

Note:
Threaded Inserts allow threaded holes which have been damaged, torn out or jammed to be used again or repaired. This makes it possible to recover scrap and rejects of expensive products.
Threaded Inserts are suitable for use in various materials, including light metals and castings.
Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations: the medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads.
Other dimensions ± 0.25 mm.

Benefits of Threaded Inserts:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are needed besides the installation tool.

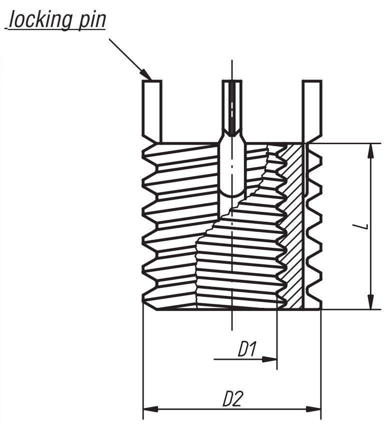


Threaded Inserts and Assembly Tools

		Threaded insert			Assembly tool	Installation				Removal	
Order No. steel	**Order No. stainless steel**	Internal thread D1	External thread D2	Length L	**Order No.**	Drill Ø	Countersunk Ø +0.25 0	Screw tap	Min. thread depth	Drill Ø	Drilling depth
07660-05	**07660-105**	M 5	M 8	8	**07660-805**	6,9	8,3	M 8	9,5	5,5	4
07660-06	**07660-106**	M 6	M 10 x 1,25	10	**07660-806**	8,8	10,3	M 10 x 1,25	11,5	7,5	4,8
07660-08	**07660-108**	M 8	M 12 x 1,25	12	**07660-808**	10,8	12,3	M 12 x 1,25	13,5	9,5	4,8
07660-08 x 1	**07660-108 x 1**	M 8 x 1	M 12 x 1,25	12	**07660-808**	10,8	12,3	M 12 x 1,25	13,5	9,5	4,8
07660-10	**07660-110**	M 10	M 14 x 1,5	14	**07660-810**	12,8	14,3	M 14 x 1,5	15,5	11,5	4,8
07660-10 x 125	**07660-110 x 125**	M 10 x 1,25	M 14 x 1,5	14	**07660-810**	12,8	14,3	M 14 x 1,5	15,5	11,5	4,8
07660-12	**07660-112**	M 12	M 16 x 1,5	16	**07660-812**	14,8	16,3	M 16 x 1,5	17,5	13,5	4,8
07660-12 x 125	**07660-112 x 125**	M 12 x 1,25	M 16 x 1,5	16	**07660-812**	14,8	16,3	M 16 x 1,5	17,5	13,5	4,8

Sample order: Threaded Insert 07660-12 / KIPP Assembly Tool 07660-812

Reinforced Threaded Inserts



Material:
Threaded insert in hardened steel or stainless steel

Surface finish:
Phosphated

Note:
Reinforced Threaded Inserts allow threaded holes which have been damaged, torn out or jammed to be used again or repaired. This makes it possible to recover scrap and rejects of expensive products.
Reinforced Threaded Inserts are suitable for use in various materials, including light metals and castings.
Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations: the medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads.
Other dimensions ± 0.25 mm.

Benefits of Reinforced Threaded Inserts:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are needed besides the installation tool.

Reinforced Threaded Inserts and Assembly Tools

		Threaded insert			Assembly tool	Installation				Removal	
Order No. steel	Order No. stainless steel	Internal thread D1	External thread D2	Length L	Order No.	Drill Ø	Countersun kØ +0.25 0	Screw tap	Min. thread depth	Drill Ø	Drilling depth
07661-04	07661-104	M 4	M 8	8	07661-804	6,9	8,3	M 8	9,5	5,5	4
07661-05	07661-105	M 5	M 10 x 1,25	10	07661-805	8,8	10,3	M 10 x 1,25	12,5	7,5	4,8
07661-06	07661-106	M 6	M 12 x 1,25	12	07661-806	10,8	12,3	M 12 x 1,25	14,5	9,5	4,8
07661-08	07661-108	M 8	M 14 x 1,5	14	07661-808	12,8	14,3	M 14 x 1,5	16,5	11,5	4,8
07661-08 x 1	07661-108 x 1	M 8 x 1	M 14 x 1,5	14	07661-808	12,8	14,3	M 14 x 1,5	16,5	11,5	4,8
07661-10	07661-110	M 10	M 16 x 1,5	16	07661-810	14,8	16,3	M 16 x 1,5	18,5	13,5	4,8
07661-10 x 125	07661-110 x 125	M 10 x 1,25	M 16 x 1,5	16	07661-810	14,8	16,3	M 16 x 1,5	18,5	13,5	4,8
07661-12	07661-112	M 12	M 18 x 1,5	18	07661-812	16,8	18,3	M 18 x 1,5	20,5	15,5	4,8
07661-12 x 125	07661-112 x 125	M 12 x 1,25	M 18 x 1,5	18	07661-812	16,8	18,3	M 18 x 1,5	20,5	15,5	4,8
07661-14	07661-114	M 14	M 20 x 1,5	20	07661-814	18,8	20,3	M 20 x 1,5	22,5	17,5	4,8
07661-14 x 15	07661-114 x 15	M 14 x 1,5	M 20 x 1,5	20	07661-814	18,8	20,3	M 20 x 1,5	22,5	17,5	4,8
07661-16	07661-116	M 16	M 22 x 1,5	22	07661-816	20,7	22,3	M 22 x 1,5	24,5	17,8	6,4
07661-16 x 15	07661-116 x 15	M 16 x 1,5	M 22 x 1,5	22	07661-816	20,7	22,3	M 22 x 1,5	24,5	17,8	6,4
07661-18 x 15	07661-118 x 15	M 18 x 1,5	M 24 x 1,5	24	07661-818	22,5	24,3	M 24 x 1,5	26,5	19,8	6,4
07661-20	07661-120	M 20	M 30 x 2	30	07661-820	28	30,3	M 30 x 2	34,5	25,8	6,4
07661-20 x 15	07661-120 x 15	M 20 x 1,5	M 30 x 2	30	07661-820	28	30,3	M 30 x 2	34,5	25,8	6,4
07661-22 x 15	07661-122 x 15	M 22 x 1,5	M 32 x 2	32	07661-822	30	32,3	M 32 x 2	36,5	27,8	6,4
07661-24	07661-124	M 24	M 33 x 2	33	07661-824	31	33,3	M 33 x 2	37,5	28,8	6,4
07661-24 x 2	07661-124 x 2	M 24 x 2	M 33 x 2	33	07661-824	31	33,3	M 33 x 2	37,5	28,8	6,4

Sample order: Reinforced Threaded Insert 07661-12 / KIPP Assembly Tool 07661-812

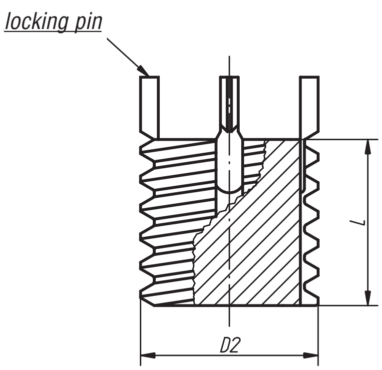
Solid Body Threaded Inserts

Material:
Threaded insert in hardened steel

Surface finish:
Phosphated

Note:
Solid Body Threaded Inserts allow threaded holes which have been damaged, torn out or jammed to be used again or repaired. This makes it possible to recover scrap and rejects of expensive products.
Solid Body Threaded Inserts are suitable for use in various materials, including light metals and castings.
Permissible deviations: the medium tolerance class applies to the threads listed, i.e. 6g for bolt threads.
Other dimensions ± 0.25 mm.

Benefits of Solid Body Threaded Inserts:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are needed besides the installation tool.



Solid Body Threaded Inserts and Assembly Tools

Order No.	Threaded inserts External thread D2	Length L	Assembly tool Order No.	Installation Drill Ø	Countersun kØ +0.25 0	Screw tap	Min. thread depth	Removal Drill Ø	Drilling depth
07662-08	M 8	8	**07662-808**	6,9	8,3	M 8	9,5	5,5	4
07662-10 x 125	M 10 x 1,25	10	**07662-810**	8,8	10,3	M 10 x 1,25	12,5	7,5	4,8
07662-12 x 125	M 12 x 1,25	12	**07662-812**	10,8	12,3	M 12 x 1,25	14,5	9,5	4,8
07662-14 x 15	M 14 x 1,5	14	**07662-814**	12,8	14,3	M 14 x 1,5	16,5	11,5	4,8
07662-16 x 15	M 16 x 1,5	16	**07662-816**	14,8	16,3	M 16 x 1,5	18,5	13,5	4,8
07662-18 x 15	M 18 x 1,5	18	**07662-818**	16,8	18,3	M 18 x 1,5	20,5	15,5	4,8
07662-20 x 15	M 20 x 1,5	20	**07662-820**	18,8	20,3	M 20 x 1,5	22,5	17,5	4,8
07662-22 x 15	M 22 x 1,5	22	**07662-822**	20,7	22,3	M 22 x 1,5	24,5	17,8	6,4
07662-24 x 15	M 24 x 1,5	24	**07662-824**	22,5	24,3	M 24 x 1,5	26,5	19,8	6,4
07662-30 x 2	M 30 x 2	30	**07662-830**	28	30,3	M 30 x 2	34,5	25,8	6,4
07662-32 x 2	M 32 x 2	32	**07662-832**	30	32,3	M 32 x 2	36,5	27,8	6,4
07662-33 x 2	M 33 x 2	33	**07662-833**	31	33,3	M 33 x 2	37,5	28,8	6,4

Sample order: Solid Body Threaded Insert 07662-10 x 125 / KIPP Assembly Tool 07662-810

Repair Kit

Material:
Threaded insert in hardened steel

Surface finish:
Phosphated

Note:
The Repair Kit allows threaded holes which have been damaged, torn out or jammed to be used again or repaired. This makes it possible to recover scrap and rejects of expensive products.
Threaded Inserts are suitable for use in various materials, including light metals and castings.
Inserts with internal threads larger than M6 are supplied with four locking pins instead of two.
Permissible deviations: the medium tolerance class applies to the threads listed, i.e. 6H for nut threads and 6g for bolt threads.
Other dimensions ± 0.25 mm.

Benefits of Threaded Inserts:
- Quick and easy installation.
- The insert is fixed with pins in order to prevent torsion due to twisting or vibrations.
- No other special tools are needed besides the installation tool.

Repair Kit

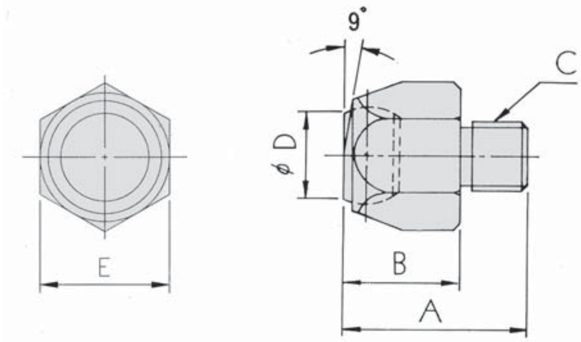
Order No.	Threaded inserts supplied		Length of inserts	Number of inserts	Number of fitting tools	Order No. threaded insert
	Internal threads	External threads				
	M 5	M 8	8	8	1	**07660-05**
	M 6	M 10 x 1,25	10	8	1	**07660-06**
	M 8	M 12 x 1,25	12	6	1	**07660-08**
07666-01	M 8 x 1	M 12 x 1,25	12	6		**07660-08 x 1**
	M 10	M 14 x 1,5	14	4	1	**07660-10**
	M 10 x 1,25	M 14 x 1,5	14	4		**07660-10 x 125**
	M 12	M 16 x 1,5	16	3	1	**07660-12**
	M 12 x 1,25	M 16 x 1,5	16	3		**07660-12 x 125**

Sample order: Repair Kit 07666-01

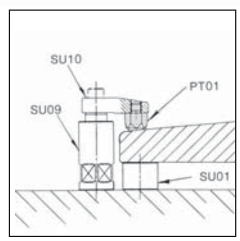
PT01-02 BALL END BOLT

- Material/Finish:
  Material: Bolt==>S45C(JIS) / CK45(DIN), heat treated to HRC35.
  Ball==>SUJ2(JIS) / 110Cr6(DIN) heat treated to HRC62
  Surface finish: Manganese Phosphating treatment.
- Application: use for supporting and clamping an inclined plate of the workpiece to prevent from deformation.
- Features: most ideal application when the supporting or clamping surface is in rough because of the serrated end.

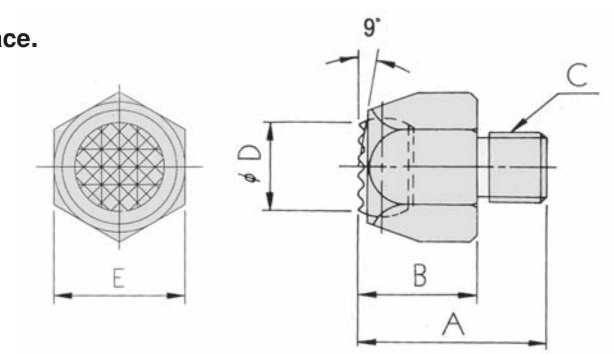
PT01



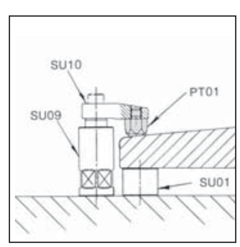
MODEL NO.	A	B	C	D	E	g
PT010108	25	12	M8	9	14	20
PT010210	30	16	M10	11	17	35
PT010312	35	22	M12	14	22	75
PT010416	42	26	M16	19	27	150



PT02 FEATURES: Good For Rough Surface.

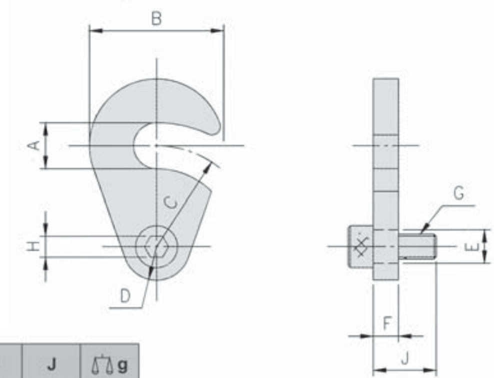


MODEL NO.	A	B	C	D	E	g
PT020108	25	12	M8	9	14	20
PT020210	30	16	M10	11	17	35
PT020312	35	22	M12	14	22	75
PT020416	42	26	M16	19	27	150



PT24 SWING "C" WASHER

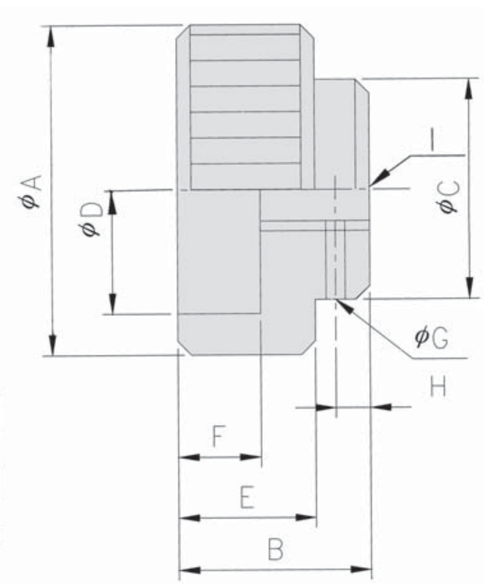
- Material/Finish:
  Material:4140(JIS)/CK45(DIN),heat treated to HRC 40
- Application:to pad the washer on the clamping surfase of the workpiece.
  Festures:easy to assemble/disassemble because on need to unfasten the nut completely.



MODEL NO.	A	B	C	D	E	F	G	H	J	g
PT240110	11	32	24	16	8	6	M6	5	15	50
PT240212	13.5	40	27	20	10	8	M8	6	20	90
PT240316	18	50	33	20	10	8	M8	6	20	130

PT33 KNURLED NUT

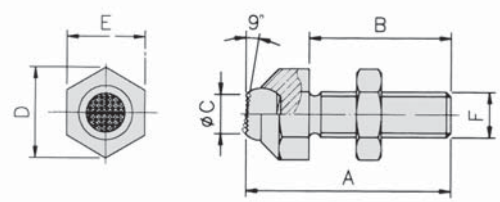
- Material/finish:
  Material: S45C(JIS) /CK45(DIN) heat treated to HRC32-38.
  Surface finish: Manganese Phosphating treatment.
- Application: assemble with bolt for clamping bolt feeding adjustment.



MODEL NO.	A	B	C	D	E	F	G	H	I	g
PT330108	30	17	20	24	11	7	M4	3	M8	50
PT330210	35	20	28	30	13	8	M4	4	M10	80
PT330312	40	24	32	34	15	10	M5	4	M12	120
PT330416	45	30	35	38	18	12	M6	5	M16	180

PT35 SELF-ALIGNING SCREWS

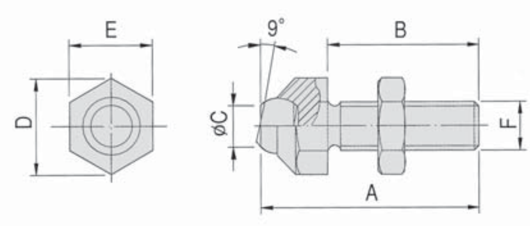
- Material:
  Body: S45C(JIS)
  Ball: SUJ2
- Hardness:
  Body: HRC35
  Ball: HRC62



MODEL NO.	A	B	C	D	E	F	kg
PT35-0108	36	25	5.5	15	14	M8	0.025
PT35-0210	45	30	8.6	19.6	17	M10	0.055
PT35-0312	50	35	8.6	19.6	17	M12	0.055
PT35-0416	60	40	10.5	27.7	24	M16	0.115

PT36 SELF-ALIGNING SCREWS

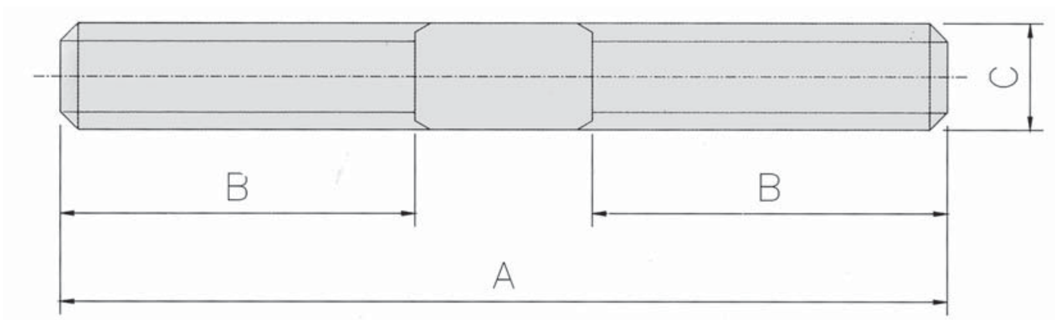
- Material:
  Body: S45C (JIS)
  Ball: SUJ2
- Hardness:
  body: HRC35
  Ball: HBC62



MODEL NO.	A	B	C	D	E	F	kg
PT36-0108	36	25	5.5	15	14	M8	0.025
PT36-0210	45	30	8.6	19.6	17	M10	0.055
PT36-0312	50	35	8.6	19.6	17	M12	0.070
PT36-0416	60	40	10.5	27.7	24	M16	0.115

PT07 NTUP

- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC 28-32
  Surface finish: Manganese Phosphating treatment.

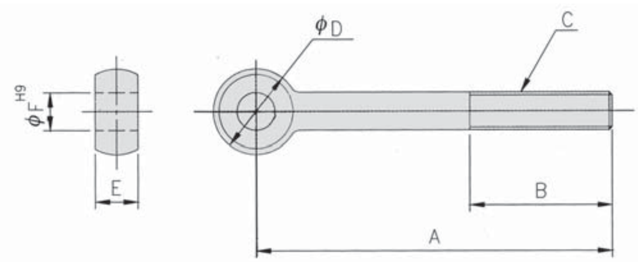


MODEL NO.	A	B	C	g
PT071050	50	22	M10 P=1.5	30
PT071075	75	30		42
PT0710100	100	32		55
PT0710125	125	32		70
PT0710150	150	32		90
PT0710175	175	40		108
PT0710200	200	40		123
PT071250	50	22	M12 P=1.75	40
PT071275	75	30		60
PT0712100	100	38		80
PT0712125	125	38		100
PT0712150	150	38		125
PT0712175	175	50		155
PT0712200	200	50		160
PT0712300	300	38		240
PT071450	50	22	M14 P=2.0	60
PT071475	75	30		90
PT0714100	100	38		120
PT0714125	125	38		150
PT0714150	150	50		180
PT0714175	175	50		210
PT0714200	200	50		240
PT071650	50	22	M16 P=2.0	78
PT071675	75	30		120
PT0716100	100	38		145
PT0716125	125	38		180

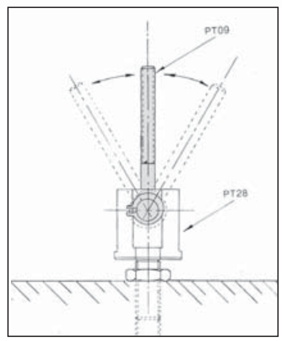
MODEL NO.	A	B	C	g
PT0716150	150	50	M16 P=2.0	230
PT0716175	175	50		276
PT0716200	200	50		290
PT0716250	250	65		350
PT0716300	300	65		450
PT0716400	400	65		580
PT0716500	500	65		700
PT071850	50	22	M18 P=2.5	100
PT071875	75	30		150
PT0718100	100	38		200
PT0718125	125	38		250
PT0718150	150	50		300
PT0718175	175	50		350
PT0718200	200	50		400
PT0718300	300	65		600
PT072050	50	22	M20 P=2.5	125
PT072075	75	30		170
PT0720100	100	38		230
PT0720125	125	38		280
PT0720150	150	50		360
PT0720175	175	50		437
PT0720200	200	50		450
PT0720250	250	65		550
PT0720300	300	65		700
PT0720400	400	65		880
PT0720500	500	65		1100

PT09 EYE BOLT

- Materia/finish:
  Material: S45C(JIS) / CK45(DIN),heat treated to HRC 28-32
- Application: use with PT28 to build up a clamping jig.
- Features: easy to assemble / disassemble.

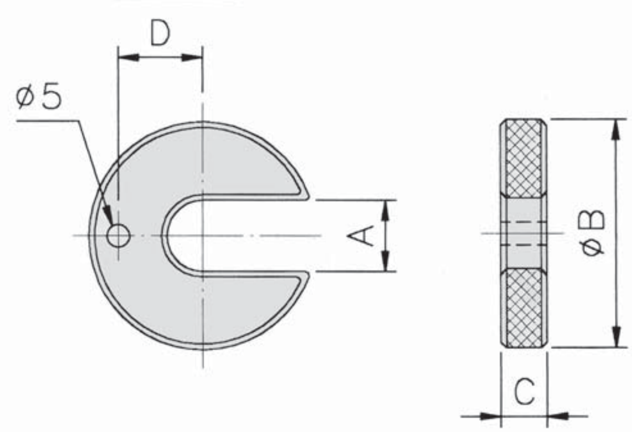


MODEL NO.	A	B	C	D	E	F	g
PT090110	75	40	M10	20	12	10	60
PT090210	100	40	M10	20	12	10	80
PT090312	75	50	M12	25	14	12	95
PT090412	100	60	M12	25	14	12	120
PT090516	125	60	M16	32	17	16	250
PT090616	150	75	M16	32	17	16	300
PT090720	125	60	M20	40	22	18	400
PT090820	150	75	M20	40	22	18	485



PT23 "C" WASHER

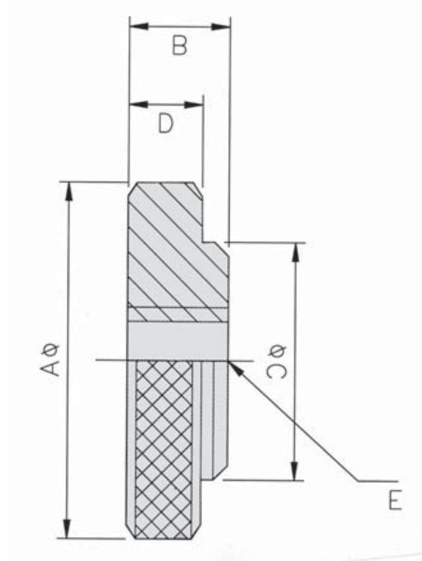
- Material/Finish:
  Material: 414(JIS) / CK45(DIN), heat treated to HRC42
  Surface finish: manganese Phosphatning treatment.
- Application: to pad the washer on the clamping surface of the workpiece.
- Features: easy to assemble / disassemble no need to unfasten the nut completely.



MODEL NO.	A	B	C	D	g
PT230110	11	40	8	15	65
PT230212	13	55	10	21	150
PT230316	17	65	10	25	200
PT230420	21	80	10	32	300

PT03 KNURLED NUT

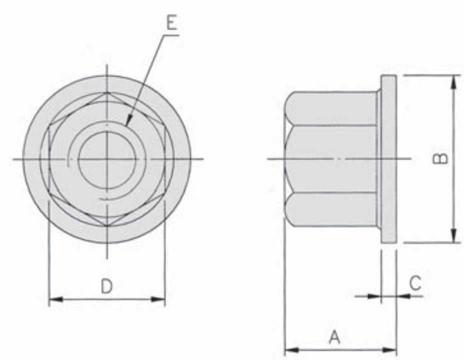
- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC 28-32.
  Surface finish: Manganese Phosphating treatment.
- Application: use for fixing the bolt to prevent from loosing.



MODEL NO.	A	B	C	D	E	g
PT030108	20	8	16	6	M8	28
PT030210	25	10	20	8	M10	35
PT030312	28	12	24	10	M12	40
PT030416	30	12	25	10	M16	45

PT04 FLANGE NUT

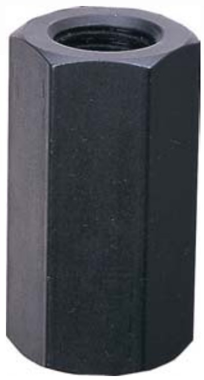
- Materia/finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC 28-32
  Surface finish: Manganese Phosphating treatment.

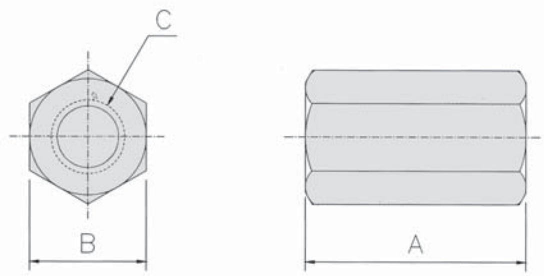


MODEL NO.	A	B	C	D	E	kg
PT040108	9	17	3	12	M8	0.011
PT040210	13	22	3	17	M10	0.033
PT040312	17	28	4	19	M12	0.050
PT040414	17	28	4	22	M14	0.081
PT040516	20	32	5	24	M16	0.081
PT040618	20	35	5	27	M18	0.083
PT040720	25	40	6	30	M20	0.150
PT040822	28	45	6	32	M22	0.170
PT040924	28	47	6	36	M24	0.360

PT05 EXTENSION NUT

- Material/Finish:
  Material: S45C(JIS) / CK45(DIN), heat treated to HRC 28-32.
  Surface finish: Manganese Phosphating treatment.
- Application: use for extending the length of the connecting bolt.



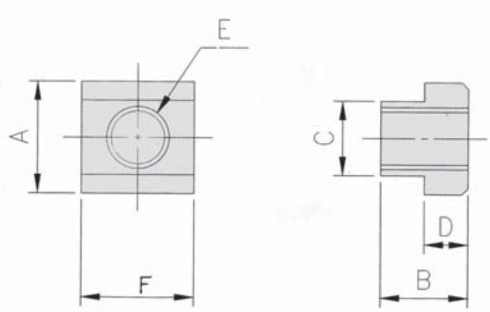


MODEL NO.	A	B	C	g (1)
PT051030	30	17	M10	30
PT051236	36	19	M12	46
PT051442	42	22	M14	65
PT051648	48	24	M16	110
PT051854	54	27	M18	150
PT052060	60	30	M20	220
PT052266	66	32	M22	350
PT052472	72	36	M24	350

PT06 T-SLOT NUT

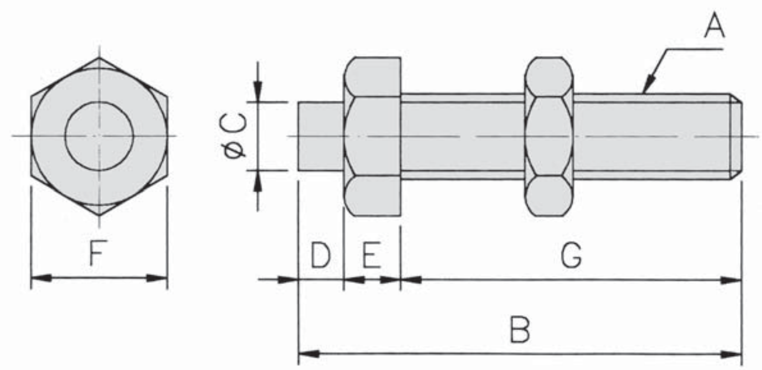
- Materia/finish:
  Material: S45C(JIS) / CK45(DIN),heat treated to HRC 32-38
  Surface finish: Manganese Phosphating treatment.

MODEL NO.	A	B	C	D	E	F	kg
PT061008	15.8	12.7	9.5	4.7	M8	22	0.020
PT061210	17.5	12.7	11.8	5.5	M10	22	0.022
PT061410	22.2	15.8	13.8	8.7	M10	28	0.050
PT061412	22.2	15.8	13.8	8.7	M12	28	0.048
PT061612	25.4	15.8	15.8	8.7	M12	28	0.060
PT061614	25.4	15.8	15.8	8.7	M14	28	0.057
PT061810	28.5	19.0	17.5	17.1	M10	30	0.090
PT061812	28.5	19.0	17.5	17.1	M12	30	0.090
PT061814	28.5	19.0	17.5	11.1	M14	30	0.090
PT061816	28.5	19.0	17.5	11.1	M16	30	0.085
PT062016	31.7	19.0	19.0	11.9	M16	30	0.098
PT062018	31.7	25.4	19.7	14.0	M18	38	0.110
PT062218	36.0	25.4	21.7	13.8	M18	38	0.178
PT062220	36.0	25.4	21.7	13.8	M20	38	0.190
PT062418	38.2	25.4	23.5	14.0	M18	38	0.184
PT062420	38.2	25.4	23.5	14.0	M20	38	0.250
PT062620	41.3	25.4	24.7	15.8	M20	44	0.250
PT062622	41.3	25.4	24.7	15.8	M22	44	0.240
PT062822	44.0	28.5	26.9	17.5	M22	50	0.330
PT062824	44.0	28.5	26.9	17.5	M24	50	0.312

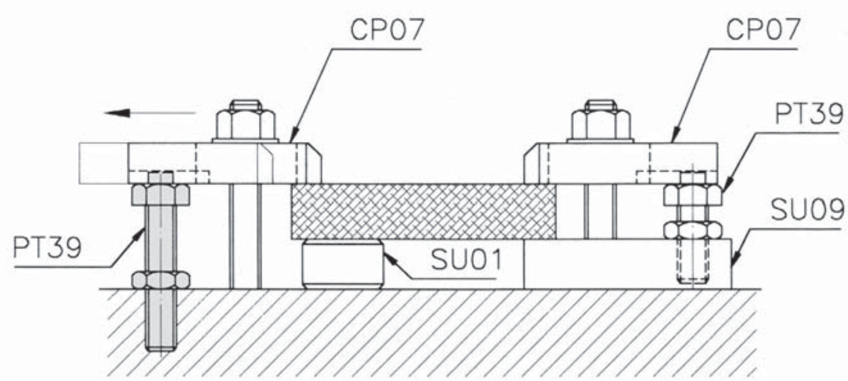


PT39 CLAMP RESET BOLT

- Material: S45C(JIS)
  Hardness: HRC35

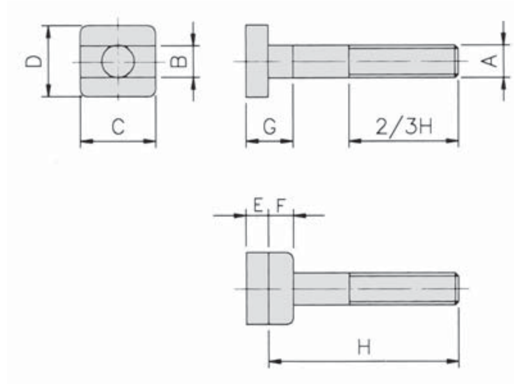


MODEL NO.	A	B	C	D	E	F	G	kg
PT39-0112	M12	75	9.5	6	9	19	60	0.09
PT39-0216	M16	80	11	7	10	24	63	0.17
PT39-0320	M20	100	12	8	12	30	80	0.35



PT40 T-SLOT BOLT

- Material/Finish:
  Material: S45C(JIS)Forging
  Surface Finish: Manganese Phosphating Treatment



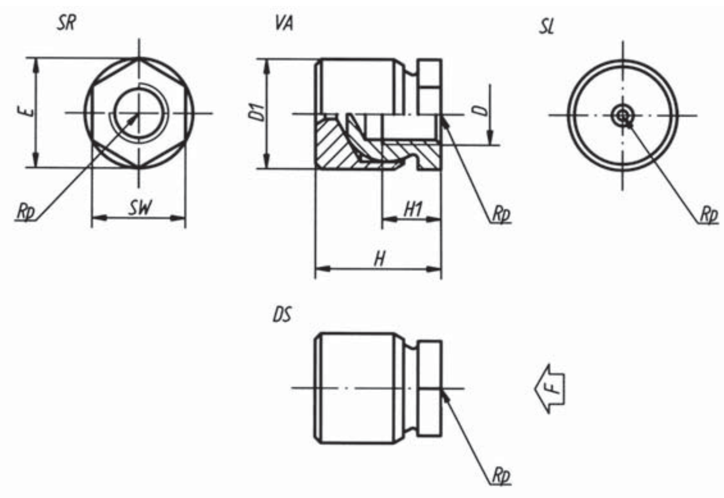
MODEL NO.	A	B	C	D	E	F	G	H
PT40-1250	M12	12	26	22	7	6	13	55
PT40-1275								75
PT40-12100								100
PT40-12125								125
PT40-12175								150
PT40-12150								175
PT40-12200								200
PT40-1650	M16	16	32	27	8	8	16	55
PT40-1675								75
PT40-16100								100
PT40-16125								125
PT40-16150								150
PT40-16175								175
PT40-16200								200
PT40-1875	M18	18	40	30	11	11	22	75
PT40-18100								100
PT40-18125								125
PT40-18150								150
PT40-18175								175
PT40-18200								200
PT40-2075	M20	20	40	30	11	11	22	75
PT40-20100								100
PT40-20125								125
PT40-20150								150
PT40-20175								175
PT40-20200								200
PT40-22100	M22	22	40	38	14	13	27	100
PT40-22125								125
PT40-22150								150
PT40-22175								175
PT40-22200								200
PT40-24100	M24	24	50	44	16	15	31	100
PT40-24125								125
PT40-24150								150
PT40-24175								175
PT40-24200								200

TOOLING COMPONENTS

Swivel Pads

Material:
Hexagonal part in case-hardened free-cutting steel 9 S Mn 28 K, pressure pad in free-cutting steel ETG 100

Surface finish:
Black oxide finish



Swivel Pads

Order No.	D	D1	H	H1	E	SW	F max. N	Approx. weight kg
02110-05	M 5	13	17	6,5	11,5	10	1620	0,012
02110-06	M 6	13	17	8,5	11,5	10	2330	0,011
02110-08	M 8	16	21	9	15	13	4150	0,023
02110-10	M 10	19	23	10	19,6	17	6480	0,035
02110-12	M 12	22	25	12	21,9	19	8320	0,052
02110-16	M 16	25	32	14	27,7	24	13940	0,074
02110-20	M 20	32	35	18	34,6	30	21000	0,138

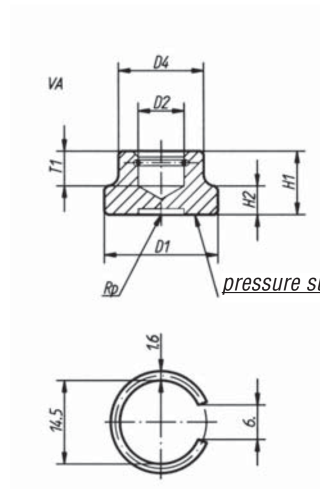
Sample order: Swivel Pad 02110-10

Thrust Pads to DIN 6311

Material:
Steel case-hardened, snap ring in spring steel

Surface finish:
Black oxide finish

Note:
When fitting the Thrust Pad, ensure that it is inclined as far as possible in the direction of the snap ring opening. The snap ring is supplied assembled.



Form S thrust pad with snap ring

* snap ring for thrust pad 07140-20

Thrust Pads to DIN 6311

Order No. Form S	D1	D2 H12	D4	H1	H2	T1	Corresponding snap ring	For grub screws with thrust journal DIN 6332	Approx. weight g
07140-06	12	4,6	10	7	2,5	4	5 DIN 9045	M 6	4,4
07140-08	16	6,1	12	9	4	5	6 DIN 9045	M 8	9
07140-10	20	8,1	15	11	5	6	8 DIN 9045	M 10	17
07140-12	25	8,1	18	13	6	7	8 DIN 9045	M 12	33
07140-16	32	12,1	22	15	7	7,5	12 DIN 9045	M 16	57
07140-20	40	15,6	28	16	9	8	see picture*	M 20	103

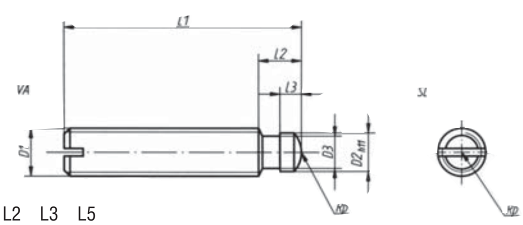
Sample order: Thrust Pad 07140-12

Grub Screws with thrust point to DIN 6332

Material:
Steel, grub screw case-hardened

Surface finish:
Black oxide finish

Note:
The thrust journal of the Grub Screws to DIN 6332 is designed for direct clamping as well as for use in conjunction with the Thrust Pad 07140.

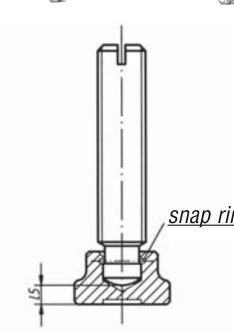


Grub Screws with thrust point to DIN 6332

Order No.	D1	L1													D2 h11	D3	L2	L3	L5
07120-06 x ***	M 6	30	35	40	–	50	–	–	–	–	–	–	–	–	4,5	4	6	2,5	2,2
07120-08 x ***	M 8	–	35	40	45	50	–	60	–	–	–	–	–	–	6	5,4	7,5	3	3
07120-10 x ***	M 10	–	–	–	–	50	55	60	65	–	80	–	–	–	8	7,2	9	4,5	3,6
07120-12 x ***	M 12	–	–	–	–	–	–	60	65	70	80	100	–	–	8	7,2	10	4,5	4,5
07120-16 x ***	M 16	–	–	–	–	–	–	–	65	70	80	100	125	–	12	11	12	5	5,3
07120-20 x ***	M 20	–	–	–	–	–	–	–	–	–	–	100	–	150	15,5	14,4	14	5,5	5,6

Sample order: Grub Screw with thrust point 07120-12 x 60 (Length L1)

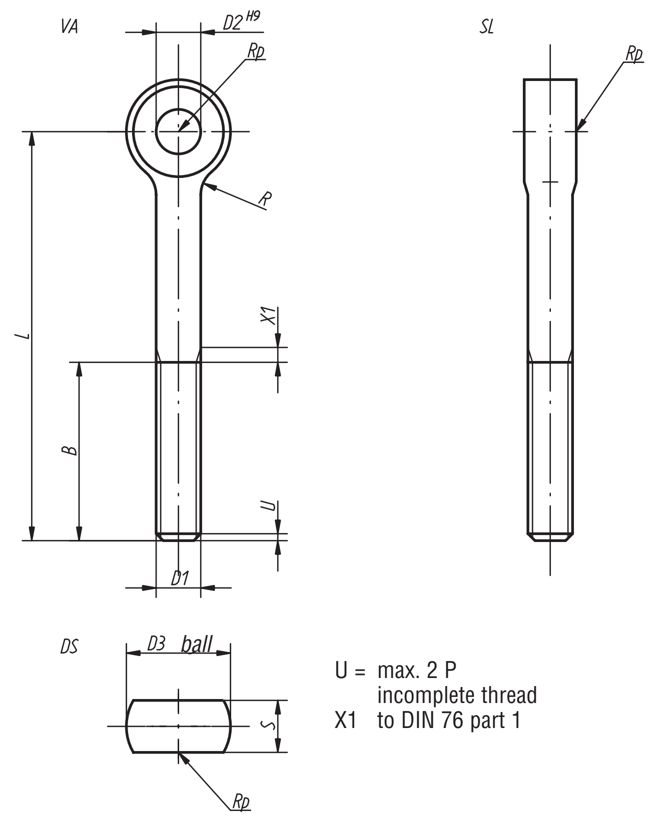
***Add the desired length L1 here, e.g. 060 for L1 = 60 mm



Eye Bolts to DIN 444 Form B

Material:
Steel, quality class 8.8

Surface finish:
Black oxide finish



U = max. 2 P incomplete thread

X1 to DIN 76 part 1

TOOLING COMPONENTS

Eye Bolts

Order No.	L	D1	D2 H9	D3	B	S	R	Approx. weight kg
07180-0550	50	M 5	5	12	16	6	2,5	0,011
07180-0575	75	M 5	5	12	16	6	2,5	0,015
07180-0650	50	M 6	6	14	18	7	4	0,016
07180-0675	75	M 6	6	14	18	7	4	0,021
07180-0850	50	M 8	8	18	22	9	4	0,030
07180-0875	75	M 8	8	18	22	9	4	0,040
07180-1075	75	M 10	10	20	26	12	4	0,055
07180-10100	100	M 10	10	20	26	12	4	0,070
07180-1275	75	M 12	12	25	30	14	6	0,085
07180-12100	100	M 12	12	25	30	14	6	0,100
07180-12120	120	M 12	12	25	30	14	6	0,124
07180-12130	130	M 12	12	25	36	14	6	0,135
07180-16130	130	M 16	16	32	44	17	6	0,244

Sample order: Eye Bolt 07180-12100

Locking Bolts

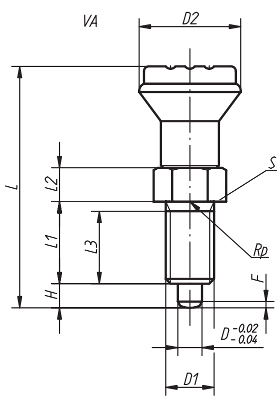
Material:
Steel version: quality class 5.8, stainless steel version: threaded sleeve X 10 CrNiS 18 9 = 1.4305, locking pin X 46 Cr 13 = 1.4034, mushroom knob in black thermoplastic

Surface finish:
Black oxide finish,locking pin hardened and ground, stainless steel version natural finish

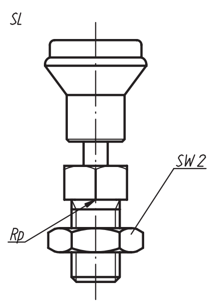
Note:
Locking Bolts are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the bolt has been manually disengaged. Form C or D is recommended for applications in which gradual disengagement of the locking bolt is desired, without any relocking of the locking pin.

Other threads and materials, surface finishes, special versions, etc. are available.

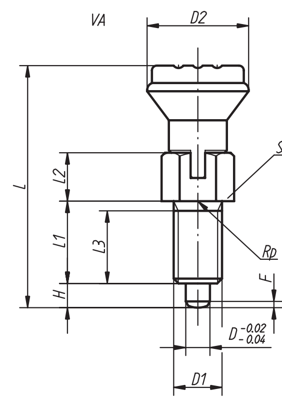
Form A
without locking slot
without locking nut



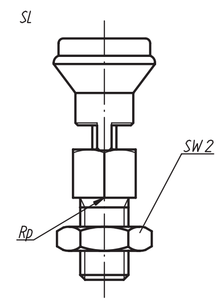
Form B
without locking slot
with locking nut



Form C
with locking slot without locking nut



Form D
with locking slot
with locking nut



Locking Bolts

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	Size	D	D1	D2	L	L1	L2 Form A+B	L2 Form C+D	L3	H	SW1	SW2	F x 30°	Spring force initial press. F1 ca.N	Spring force final press. F2 ca.N
45 105 A	**45 105 B**	**45 105 C**	**45 105 D**	1	5	M 10 x 1	21	50	17	7	10	15	5	13	17	1,3	5	12
45 206 A	**45 206 B**	**45 206 C**	**45 206 D**	2	6	M 12 x 1,5	25	59	20	8	11	17	6	14	19	1,8	6	14
45 308 A	**45 308 B**	**45 308 C**	**45 308 D**	3	8	M 16 x 1,5	33	77	26	10	13	23	8	19	24	2,3	15	35
45 410 A	**45 410 B**	**45 410 C**	**45 410 D**	4	10	M 20 x 1,5	33	83	28	12	15	25	10	22	30	2,8	20	40

Locking Bolts in stainless steel

Order No. Form A	Order No. Form B	Order No. Form C	Order No. Form D	Size	D	D1	D2	L	L1	L2 Form A+B	L2 Form C+D	L3	H	SW1	SW2	F x 30°	Spring force initial press. F1 ca.N	Spring force final press. F2 ca.N
45 105 AN	**45 105 BN**	**45 105 CN**	**45 105 DN**	1	5	M 10 x 1	21	50	17	7	10	15	5	13	17	1,3	5	12
45 206 AN	**45 206 BN**	**45 206 CN**	**45 206 DN**	2	6	M 12 x 1,5	25	59	20	8	11	17	6	14	19	1,8	6	14
45 308 AN	**45 308 BN**	**45 308 CN**	**45 308 DN**	3	8	M 16 x 1,5	33	77	26	10	13	23	8	19	24	2,3	15	35
45 410 AN	**45 410 BN**	**45 410 CN**	**45 410 DN**	4	10	M 20 x 1,5	33	83	28	12	15	25	10	22	30	2,8	20	40

Sample order: KIPP Locking Bolt 45 206 DN

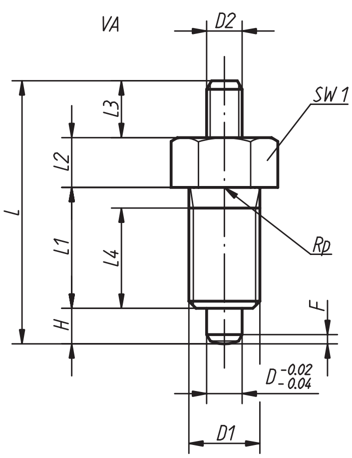
Locking Bolts

Material:
Steel version: quality class 5.8, stainless steel version: threaded sleeve X 10 CrNiS 18 9 = 1.4305, locking pin X46 Cr 13 = 1.4034

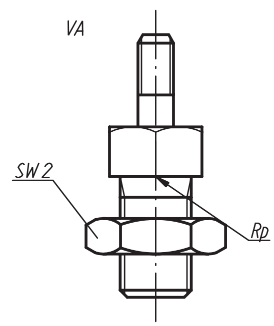
Surface finish:
Black oxide finish,locking pin hardened and ground, stainless steel version natural finish

Note:
Locking Bolts are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the bolt has been manually disengaged.
Special grips can be fitted on the projecting threaded pins. These pins are also suitable for actuation of the locking bolt, for example automatically (programme-controlled) with the aid of a pneumatic cylinder or actuation by remote control with bowden cables.

Other threads and materials, surface finishes, special versions, etc. are available.



Form E
with threaded pin
without locking nut



Form F
with threaded pin with
locking nut

Locking Bolts

Order No. Form E	Order No. Form F	Size	D	D1	D2	L	L1	L2	L3	L4	H	SW1	SW2	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N
45 105 E	**45 105 F**	1	5	M 10 x 1	M 5	37	17	7	8	15	5	13	17	1,3	5	12
45 206 E	**45 206 F**	2	6	M 12 x 1,5	M 6	43	20	8	9	17	6	14	19	1,8	6	14
45 308 E	**45 308 F**	3	8	M 16 x 1,5	M 8	56	26	10	12	23	8	19	24	2,3	15	35
45 410 E	**45 410 F**	4	10	M 20 x 1,5	M 10	62	28	12	12	25	10	22	30	2,8	20	40

Locking Bolts in stainless steel

STAINLESS STEEL OPTION

Order No. Form E	Order No. Form F	Size	D	D1	D2	L	L1	L2	L3	L4	H	SW1	SW2	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N
45 105 EN	**45 105 FN**	1	5	M 10 x 1	M 5	37	17	7	8	15	5	13	17	1,3	5	12
45 206 EN	**45 206 FN**	2	6	M 12 x 1,5	M 6	43	20	8	9	17	6	14	19	1,8	6	14
45 308 EN	**45 308 FN**	3	8	M 16 x 1,5	M 8	56	26	10	12	23	8	19	24	2,3	15	35
45 410 EN	**45 410 FN**	4	10	M 20 x 1,5	M 10	62	28	12	12	25	10	22	30	2,8	20	40

Sample order: Locking Bolt 45 308 FN

Locking Bolts without collar

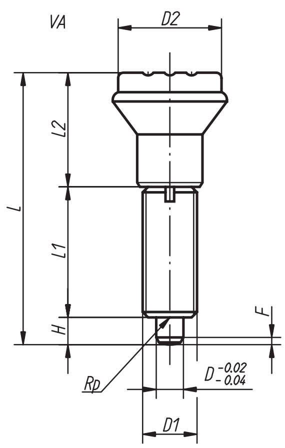
Material:
Steel version: quality class 5.8, stainless steel version: threaded sleeve X 10 CrNiS 18 9 = 1.4305, locking pin X 46 Cr 13 = 1.4034, mushroom knob in black thermoplastic

Surface finish:
Black oxide finish, locking pin hardened and ground, stainless steel version natural finish

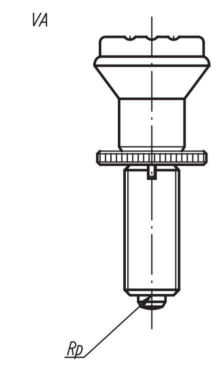
Note:
Locking Bolts are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the bolt has been manually disengaged. In order to screw in the locking bolts, a screw-in washer can be supplied. The washer is slid beneath the disengaged mushroom knob so that the follower pins engage in the slot.

Other threads and materials, surface finishes, special versions, etc. are available.

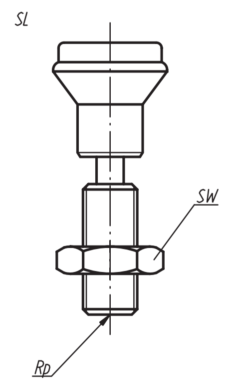
Form G without locking nut



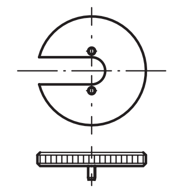
locking bolt with screw-in washer



Form H with locking nut



screw-in washer



Locking Bolts without collar

Order No. Form G	Order No. Form H	Size	D	D1	D2	L	L1	L2	H	SW	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N	Order No. screw-in washer
45 105 G	**45 105 H**	1	5	M 10 x 1	21	50	24	21	5	17	1,3	5	12	**45 105 Z**
45 206 G	**45 206 H**	2	6	M 12 x 1,5	25	59	28	25	6	19	1,8	6	14	**45 206 Z**
45 308 G	**45 308 H**	3	8	M 16 x 1,5	33	77	36	33	8	24	2,3	15	35	**45 308 Z**
45 410 G	**45 410 H**	4	10	M 20 x 1,5	33	83	40	33	10	30	2,8	20	40	**45 410 Z**

Locking Bolts without collar in stainless steel

STAINLESS STEEL OPTION

Order No. Form G	Order No. Form H	Size	D	D1	D2	L	L1	L2	H	SW	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N	Order No. screw-in washer
45 105 GN	**45 105 HN**	1	5	M 10 x 1	21	50	24	21	5	17	1,3	5	12	**45 105 Z**
45 206 GN	**45 206 HN**	2	6	M 12 x 1,5	25	59	28	25	6	19	1,8	6	14	**45 206 Z**
45 308 GN	**45 308 HN**	3	8	M 16 x 1,5	33	77	36	33	8	24	2,3	15	35	**45 308 Z**
45 410 GN	**45 410 HN**	4	10	M 20 x 1,5	33	83	40	33	10	30	2,8	20	40	**45 410 Z**

Sample order: Locking Bolt without collar 45206HN

Locking Bolts without collar

Material:
Steel version: quality class 5.8, stainless steel version: threaded sleeve X 10 CrNiS 18 9 = 1.4305, locking pin X 46 Cr 13 = 1.4034

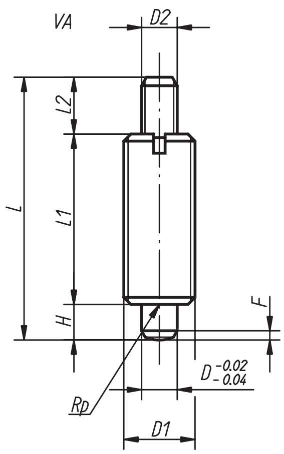
Surface finish:
Black oxide finish, locking pin hardened and ground, stainless steel version natural finish

Note:
Locking Bolts are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the bolt has been manually disengaged.
Special grips can be fitted on projecting threaded pins. These pins are also suitable for actuation, for example automatically (programme-controlled) with the aid of a pneumatic cylinder or actuation by remote control with bowden cables.

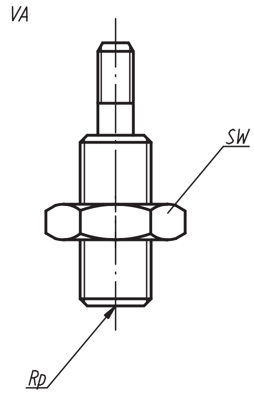
In order to screw in the locking bolts, a screw-in washer can be supplied. The washer is slid beneath the disengaged mushroom knob so that the follower pins engage in the slot.

Other threads and materials, surface finishes, special versions, etc. are available

Form J
with threaded pin
without locking nut



Form K with threaded pin
with locking nut



Locking Bolts without collar

Order No. Form J	Order No. Form K	Size	D	D1	D2	L	L1	L2	H	SW	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N	Order No. screw-in washer
45 105 J	**45 105 K**	1	5	M 10 x 1	M 5	37	24	8	5	17	1,3	5	12	**45 105 Z**
45 206 J	**45 206 K**	2	6	M 12 x 1,5	M 6	43	28	9	6	19	1,8	6	14	**45 206 Z**
45 308 J	**45 308 K**	3	8	M 16 x 1,5	M 8	56	36	12	8	24	2,3	15	35	**45 308 Z**
45 410 J	**45 410 K**	4	10	M 20 x 1,5	M 10	62	40	12	10	30	2,8	20	40	**45 410 Z**

Locking Bolts without collar in stainless steel

STAINLESS STEEL OPTION

Order No. Form J	Order No. Form K	Size	D	D1	D2	L	L1	L2	H	SW	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N	Order No. screw-in washer
45 105 JN	**45 105 KN**	1	5	M 10 x 1	M 5	37	24	8	5	17	1,3	5	12	**45 105 Z**
45 206 JN	**45 206 KN**	2	6	M 12 x 1,5	M 6	43	28	9	6	19	1,8	6	14	**45 206 Z**
45 308 JN	**45 308 KN**	3	8	M 16 x 1,5	M 8	56	36	12	8	24	2,3	15	35	**45 308 Z**
45 410 JN	**45 410 KN**	4	10	M 20 x 1,5	M 10	62	40	12	10	30	2,8	20	40	**45 410 Z**

Sample order: Locking Bolt without collar 45 105 KN

TOOLING COMPONENTS

Locking Bolts without collar

Material:
Steel version: sleeve C 15 Pb weldable, locking pin quality class 5.8, stainless steel version: sleeve X 5 Cr NiX 1810 = 1.4301 weldable, locking pin X 46 Cr 13 = 1.4034, mushroom knob in black thermoplastic

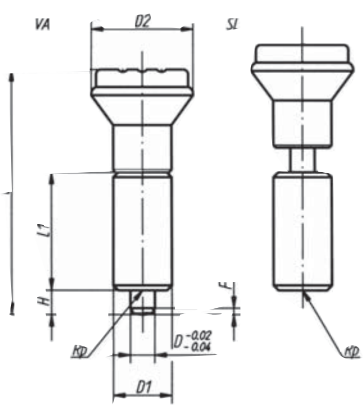
Surface finish:
Black oxide finish, locking pin hardened and ground, stainless steel version natural finish

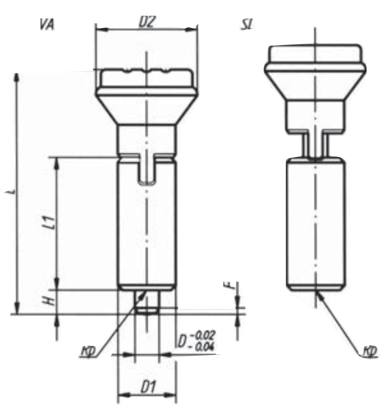
Note:
Locking Bolts are used to prevent any change in locking position due to lateral forces. A new locking position can only be set after the bolt has been manually disengaged. Form M is recommended for applications in which gradual disengagement of the locking bolt is desired, without any relocking of the pin.
Special grips can be fitted on the projecting threaded pins of Form N. These pins are also suitable for actuation, for example automa-tically (programme-controlled) with the aid of a pneumatic cylinder or actuation by remote control with bowden cables.

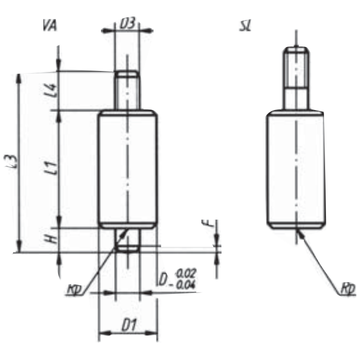
Other threads and materials, surface finishes, special versions, etc. are available.

In order to weld the locking bolts to another surface, we recommend inert gas-shielded welding with MIG welding equipment.

Form L without locking slot	Form M with locking slot	Form N with threaded pin







Locking Bolts without collar

Order No. Form L	Order No. Form M	Order No. Form N	Size	D	D1	D2	L	L1 Form L+N	L1 Form M	L3	L4	H	D3	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N
45 105 L	**45 105 M**	**45 105 N**	1	5	12	21	50	21	27	37	8	5	M 5	1,3	5	12
45 206 L	**45 206 M**	**45 206 N**	2	6	14	25	59	25	31	43	9	6	M 6	1,8	6	14
45 308 L	**45 308 M**	**45 308 N**	3	8	18	33	77	33	39	56	12	8	M 8	2,3	15	35
45 410 L	**45 410 M**	**45 410 N**	4	10	22	33	83	33	43	62	12	10	M 10	2,8	20	40

Locking Bolts without collar, stainless steel

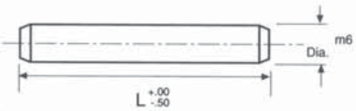
STAINLESS STEEL OPTION

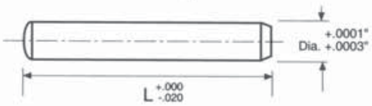
Order No. Form L	Order No. Form M	Order No. Form N	Size	D	D1	D2	L	L1 Form L+N	L1 Form M	L3	L4	H	D3	F x 30°	Spring force initial press. F1 ca. N	Spring force final press. F2 ca. N
45 105 LN	**45 105 MN**	**45 105 NN**	1	5	12	21	50	21	27	37	8	5	M 5	1,3	5	12
45 206 LN	**45 206 MN**	**45 206 NN**	2	6	14	25	59	25	31	43	9	6	M 6	1,8	6	14
45 308 LN	**45 308 MN**	**45 308 NN**	3	8	18	33	77	33	39	56	12	8	M 8	2,3	15	35
45 410 LN	**45 410 MN**	**45 410 NN**	4	10	22	33	83	33	43	62	12	10	M 10	2,8	20	40

Sample order: Locking Bolt without collar 45 206 LN

PARALLEL DOWEL PINS

Hardened and ground parallel dowel pins





Metric

Length L	Diameter 3	4	5	6	8	10	12	16	20
6	X								
10	X	X	X						
12	X	X	X	X					
14	X	X	X	X					
16	X	X	X	X					
18	X	X	X	X					
20	X	X	X	X	X	X			
24	X	X	X	X	X	X	X		
28	X	X	X	X	X	X	X		
32	X	X	X	X	X	X	X	X	
36	X	X	X	X	X	X	X	X	
40	X	X	X	X	X	X	X	X	X
45				X	X	X	X	X	
50			X	X	X	X	X	X	X
55					X	X	X	X	
60				X	X	X	X	X	X
70				X	X	X	X	X	X
80					X	X	X	X	X
90						X	X	X	X
100						X	X	X	X
120									X

ALL DIMENSIONS IN MM

Generally conforms to DIN 6325

Imperial

Length L	Diameter 1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4
1/4	X	X	X*							
3/8			X							
1/2	X	X	X	X	X		X			
5/8			X	X						
3/4	X	X	X	X	X	X	X			
1	X	X	X	X	X	X	X	X	X	X
1 1/4			X	X	X	X	X	X		X
1 1/2			X	X	X	X	X	X	X	X
1 3/4					X	X	X	X		
2				X	X	X	X	X	X	X
2 1/4					X	X	X	X		
2 1/2				X	X	X	X	X	X	X
3					X	X	X	X	X	X
3 1/2							X	X		
4							X	X	X	X
4 1/2								X		

ALL DIMENSIONS IN INCHES

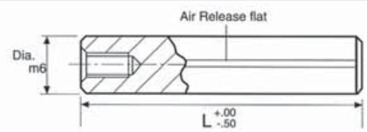
Specification conforms generally to BS1804 : Part 1, 1966 Grade One

NOTE: 1/16" and 3/32" diameter supplied in silver steel only in the unhardened condition.

* Supplied chamfered each end

EXTRACTABLE DOWEL PINS

Hardened and ground with air release flats



Metric

Length L	Diameter 6	8	10	12	16	20
16	X	X				
20	X	X	X			
24	X	X	X	X		
28	X	X	X	X		
32	X	X	X	X	X	
36	X	X	X	X	X	
40	X	X	X	X	X	X
45	X	X	X	X	X	X
50	X	X	X	X	X	X
60	X	X	X	X	X	X
70			X	X	X	X
80			X	X	X	X
90					X	X
100					X	X
THREAD	M4 x 0.7	M5 x 0.8	M6 x 1.0	M8 x 1.25	M10 X 1.5	M12 X 1.75

ALL DIMENSIONS IN MM

Generally conforms to DIN 7979

Hoist Rings

Fully certificated CE for the safety reassurance needed when lifting loads of any shape, type or weight

Centre Pull Style

- Full Swivel and Pivot Action
- Rated at 5:1 Strength Factor
- Material: Alloy Steel
- Finish: Black Oxide (Except Washer)
- Clevis, Bolt, Pins, Base, Washer and Bushing are magnetic particle inspected
- Washer: Zinc Plated with clear conversion coating
- Proof Tested to 200% of Rated Load Capacity
- All products are CE marked

Side Pull Style

- Convenient Part Handling
- Rated at 5:1 strength factor
- Bushing: Zinc plated silver passivate
- Material: Alloy Steel
- Finish: Black Oxide
- Clevis, Ring, Bushing and Cap Screw are magnetic particle inspected
- Clevis is x-rayed
- Proof Tested to 200% of Rated Load Capacity
- All products are CE marked

Available with Envirolox™ protective finish.

Side Pull 2000 Style

- Can be used for top lifts
- Full swivel and pivot action
- Rated at 5:1 strength factor
- Material:Alloy Steel
- Finish: Black Oxide
- Proof Tested to 200% of Rated Load Capacity
- All products are CE marked

SIDE PULL APPLICATION

TOP PULL APPLICATION

The Envirolox™ Protective Finish

The Envirolox™ Protective Finish is a *proprietary coating that helps to prevent rusting and other environmental hazards from affecting the Hoist Rings*. This coating is *environmentally friendly* and is proven to be *effective* in *extreme conditions.* Envirolox Protective Finish is available as a standard on Centre-Pull Style Hoist Rings. It is also available on the Side-Pull Style Hoist Rings upon special request. It is not recommended for the Swivel Eyebolt or the SP 2000 products.

- Available as standard on Centre-Pull Style Hoist Rings
- Prevents rusting
- Available upon request for Side-Pull Style
- Environmentally safe

Centre Pull Style

The Pivoting Lifting Ring is a low profile lifting device that pivots 180˚. It is one of the most economical lifting devices available and is ideal for applications that do not require a rotating action. This Lift Ring is easy to install and is available in five sizes. Load ratings range from 900Kg - 9,000Kg. The product is manufactured from alloy steel, heat treated and magnafluxed.

- Base: Precision machined alloy steel
- Ring: Alloy steel forging, heat treated, magnafluxed and certified
- Finish: Black oxide
- Rated at 6:1 strength factor
- All products are CE marked

Jergens

Centre Pull Style

The Swivel Eyebolt lifting product has a full swivel and pivoting action that allows for the flipping and turning of the part without unhooking. The patented tamper resistant design is ideal for permanent mounting on OEM applications or on moulds, dies and fixtures.

- Tamper resistant design
- Swivels 360˚, Pivots 180˚
- Eliminates bending (of eyebolt) problem
- Forged, oversized, one-piece lift ring
- Rated at 5:1 strength factor
- Load capacities to 2000Kg
- Economically priced
- Material: Alloy steel or 316 stainless steel
- Finish: Black oxide or passivated (SS)
- All products are CE marked

Vertical Clamps

With holding forces from 70 daN to 550 daN. Supplied complete with all hardware.

Heavy Duty Vertical Clamps

With holding forces from 300 daN to 2400 daN. Supplied complete with relevant hardware.

Vertical Cam Clamps

Cam action clamps ideal for clamping components of different thicknesses. With holding forces from 75 daN to 350 daN.

Pull Back Clamp

Wide opening clamp with flanged body ideal for fixtures or moulds.

Horizontal Clamps

With holding forces from 50 daN to 700 daN. Supplied complete with all hardware.

Positive Locking Clamps

Unique mechanical locking lever for positive safety locking in clamped and open position. Holding force 250 daN to 350 daN.

Push-Pull Clamps

Mounted directly into a threaded or plain hole in a fixture. Can also be mounted in a bracket. Holding force 50 daN to 400 daN.

Slimline Push-Pull Clamps

Nose mounting slimline version that locks at both extended and retracted ends of the stroke. Holding Force 350 daN to 750 daN.

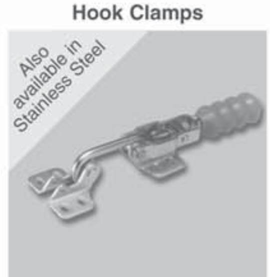
Heavy Duty Push-Pull Clamps

Exceptionally robust with cast and machined handles and bases. Holding forces form 600 daN to 5000 daN.

Long handle Push-Pull Clamps

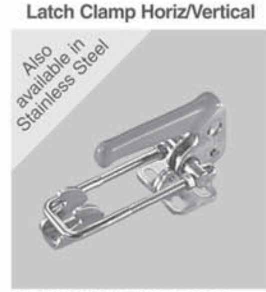
Long handled version of the heavy duty push-pull clamps. Holding forces from 600 daN to 5000 daN.

Hook Clamps



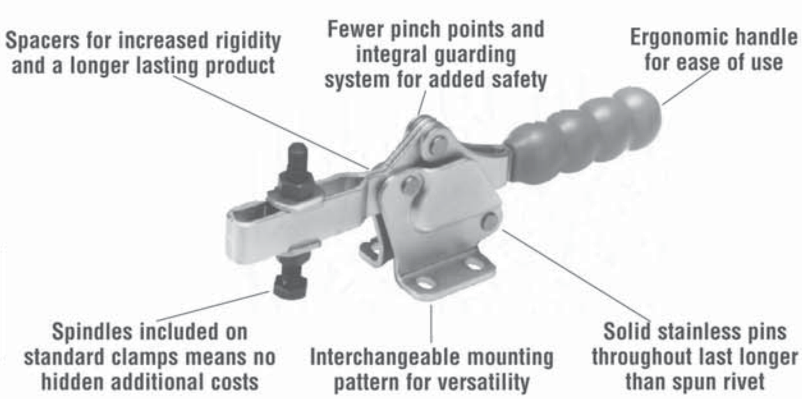
Ideal for applications such as closing and holding doors, lids, moulds etc. Complete with latch bracket as shown. Holding forces from 200 daN to 700 daN.

Latch Clamp Horiz/Vertical



Available in both horizontal and vertical configuration with latch bracket included. Holding force 200 daN to 4000 daN.

WHY BRAUER® QUALITY AND DURABILITY REMAINS UNRIVALLED



ISO 9001
Certificate No: FM13674

ALSO AVAILABLE FROM BRAUER®

CLAMPING PRODUCTS

PNEUMATIC WORKHOLDING

HOOK CLAMPS

LATCH CLAMPS

WHEELS AND CASTORS

ROTARY/LINEAR BEARINGS

DOWEL PINS

POWER CLAMPING

TURNKEY GAUGING
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04/04