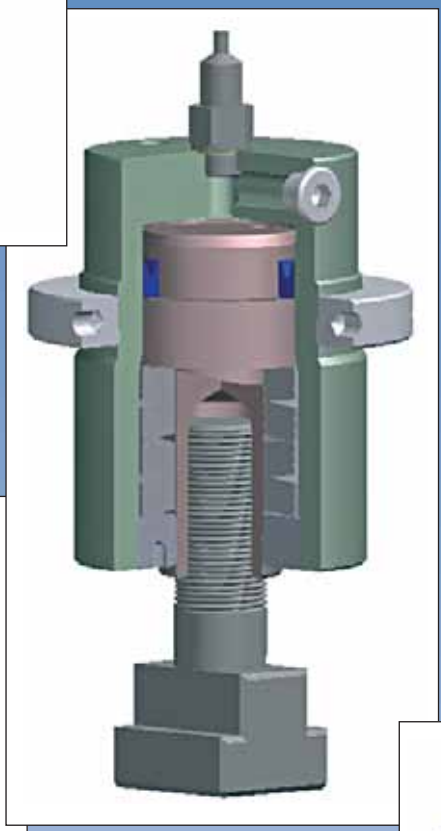
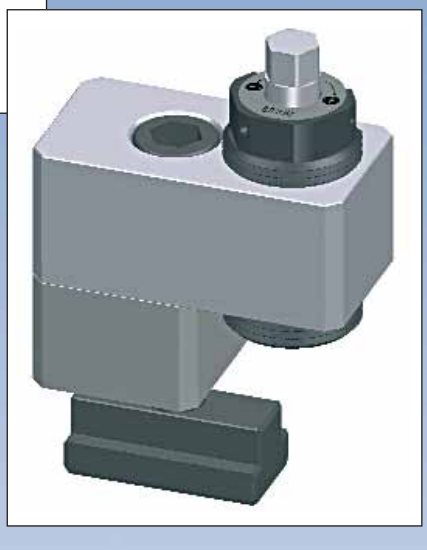
CLAMPING ELEMENTS





JAKOB Antriebstechnik

Clamping elements

Clamping elements

Mechanical clamping elements

Efficient manufacturing of parts in the metal-cutting and metal-forming industry is inconceivable today without quick clamping elements.

The requitements go nowadays far beyond the handling and operation capacity of conventional clamping elements, since higher clamping forces and more flexibility due to smaller lot sizes are demanded.
Quick clamping units are a must, to improve the quality, to gain rationalization and to humanize the work place.

The mechanical clamping elements of JAKOB meet these requirements perfectly, due to their different patented force amplifying systems. They are a true alternative as well to the conventional clamping elements as the expensive half or fully automatic clampimg systems.

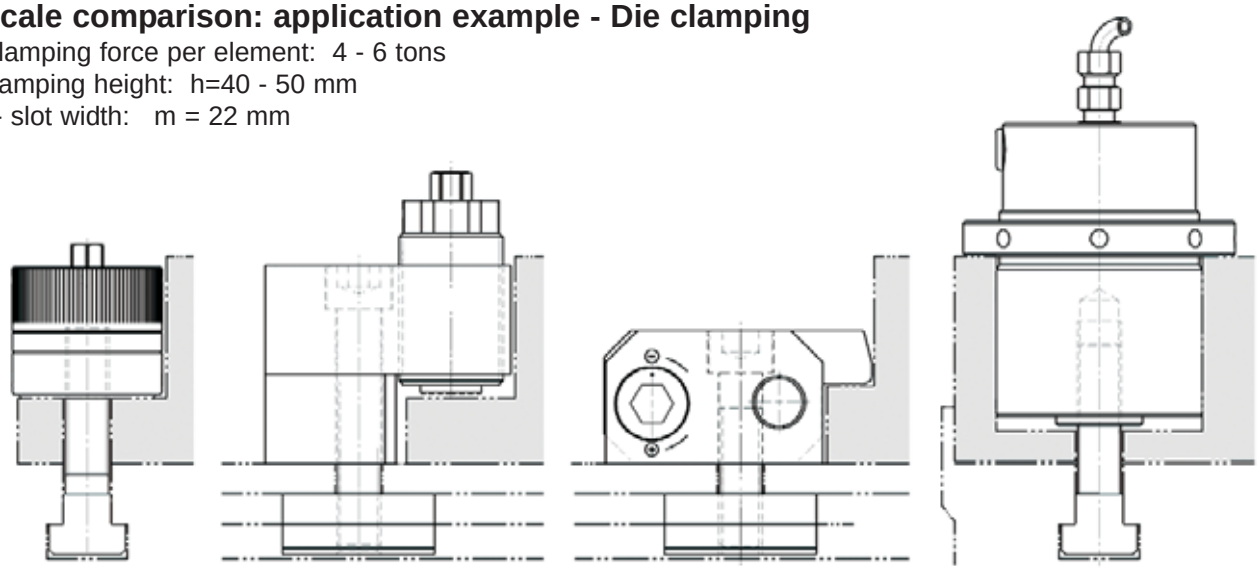
Whether as standard equipment or as retrofit for machine tools, presses, stamping machines etc. JAKOB clamping units hold tool and workpiece reliably in position.

Special characteristics

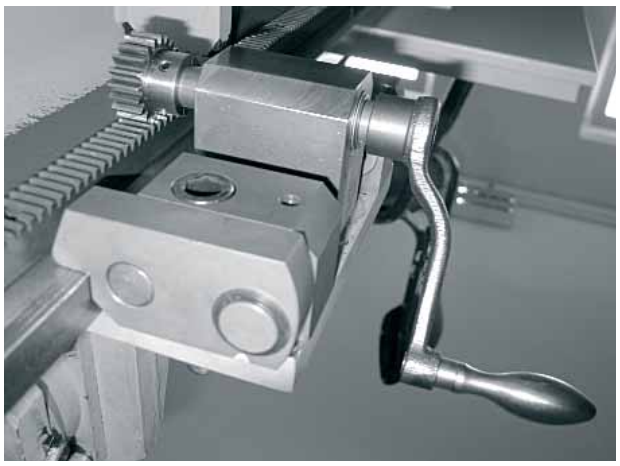
- + **high clamping forces / low tightening torques / large clamping strokes**
- + **high operational safety due to self-locking**
- + **improved technology for economical clamping**
- + **humanising of the workplace / reduced danger of accidents**
- + **simple manual operation / easy installation**
- + **clamping force check through defined tightening torques**
- + **versatile application through compact, flexible design**

Scale comparison: application example - Die clamping

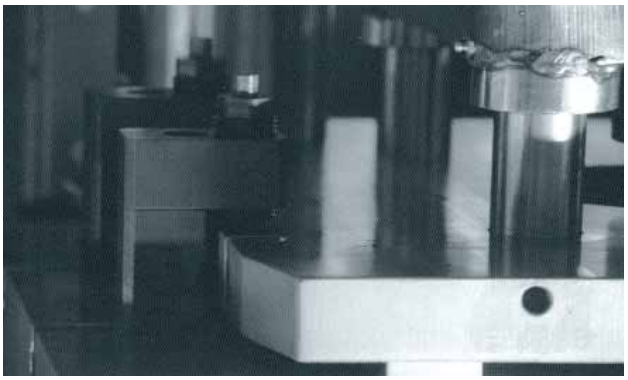
Clamping force per element: 4 - 6 tons
clamping height: h=40 - 50 mm
T- slot width: m = 22 mm



power-clamping nut	slide-in clamp unit	block-type-clamp	spring clamping cylinder
Type MCA 50-M 20	Type MES 60-60 - 22	Type EBS 40-50 - 22	Type ZSF 4000
Clamping force:50 kN	Clamping force: 60 kN	Clamping force: 40 kN	Clamping force: 40 kN
Holding force: 100 kN	Holding force: 120 kN	Holding force: 80 kN	Holding force: 40 kN

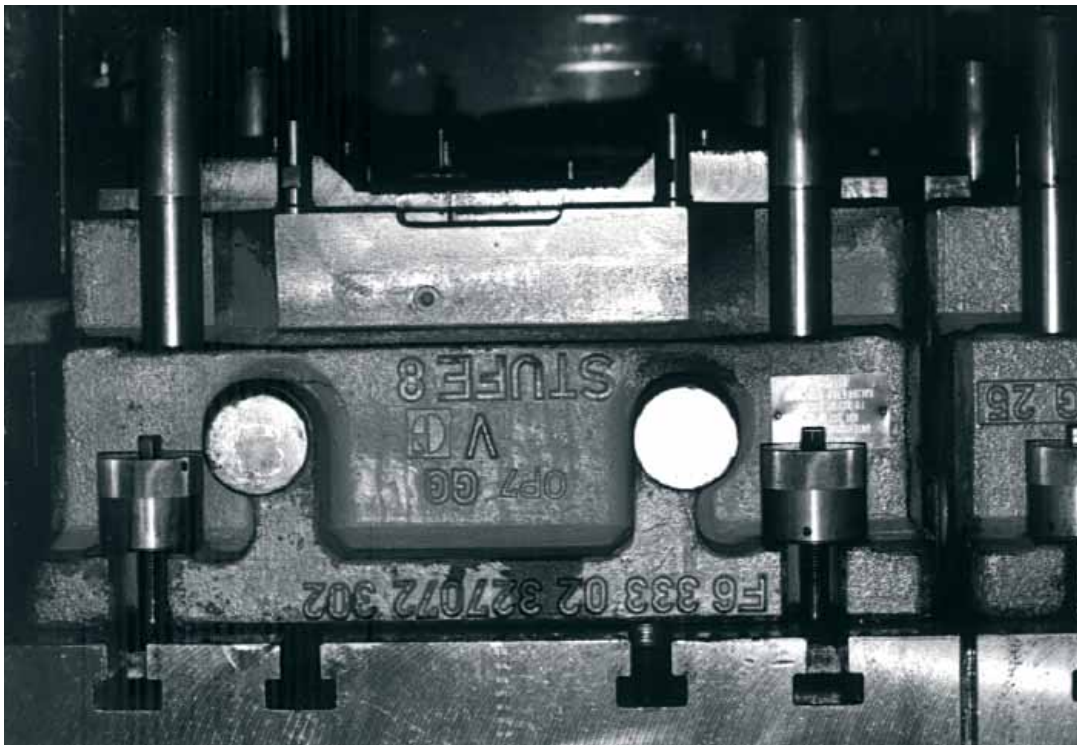


Eccentric block- type clamp type EBS for positioning of a bench sledge



Slide-in Clamp device MES for clamping the upper and lower die in a Spotting Press

Clamping nut MCA for clamping of chain wheels during milling



Clamping nut type MCA for tool clamping of a Multiple Plunger Press

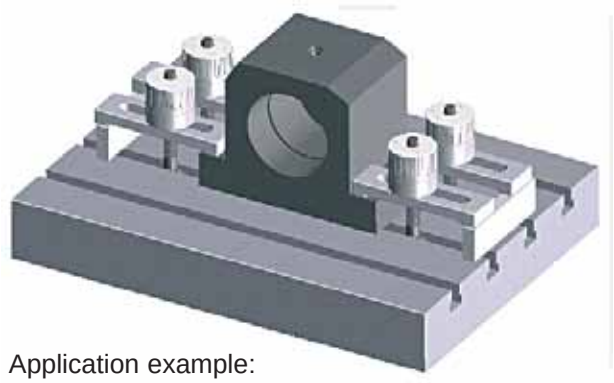
- high clamping forces through force magnification
- simple manual operation - low tightening torques
- high operation safety since self locking
- corrosion-resisting, sturdy, up to 400°C

The salient design feature of the mechanical power clamping nut MCA is an integral planetary gearbox for the multiplication of the manual tightening torque. With this, the user has a sturdy and flexible clamping element, which enables highest clamping forces with simple manual operating and maximum operating safety. The MCA power clamping nut can be used for various clamping tasks throughout the machine tool industry, particularly for die clamping in presses and punches. Additional versions with star knob and T-grip or for through bolts are available.

Function and handling:

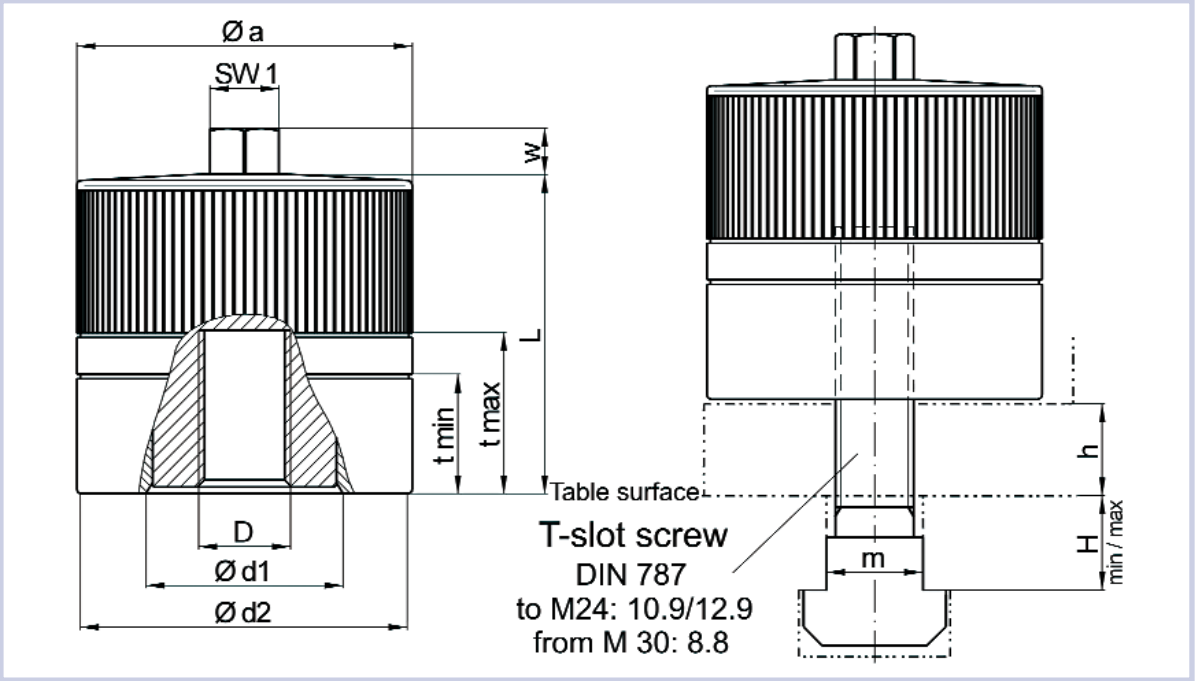
Only two easy manual operations are required to gain the very high clamping force of the MCA. First the nut has to be turned clockwise to bring all clamping surfaces in tight contact. The knurled housing makes prestressing possible if needed. Then the sun wheel is activated by turning the actuation hexagon SW1 clockwise, and the T-bolt is pulled into the nut, and force magnified by the planetary gearbox.

Dependent on the actuation torque and the strain deformation of the complete system a very high clamping force is generated. The system is self-locking in each and every position. Combined with a T-screw the MC nut can be used as a flexible T-slot slide-in clamping device. The clamping and operating forces are supported via an axial bearing and a pressure plate directly at the table or at the fixture. This clamping mechanism enables a theoretically unlimited clamping stroke, which, however, is limited in practice due to the screw-in depth (alternative see type MCA for trough bolts). The release is carried out in reverse order by turning the operating hexagon anti-clockwise. When laying out the actual screw-in depth of the thraeded bolt, the necessary stroke must be considered, i. e. the max. specified screw-in depth "t_{max}" must be reduced at least by the amount of the stroke. To visually check the actual screw-in depth of the T-bolt two (2) grooves have been provided on the housing circumference matching the dimensions t_{min} and t_{max} (see technical data). It must be ensured, that the screwed-in T-bolt is firm, i. e. it cannot turn with the MCA during application of actuation torque. The mechanical clamping nut MCA is maintenance free under normal conditions. The housing and the thread-nut are made from high-tensile, heat-treated steel with a corrosion resisting coating.



Application example:
workpiece-clamping on a machining centre table.

- **with bottomed thread**
- **thread protected - centered operation - kompact Design**



Technical data and dimensions: (mm) legth dimensions according to DIN ISO 2768 mH

MCA Size	nominal clamping force [kN]	thread D *	max. tightening torque [Nm]	max. static load [kN]	T - slot - DIN 650 " m "	T - slot - DIN 650 " H " min / max	weight approx. [kg]	Ø a	Ø d1	Ø d2	L	screw-in depth " t " min	screw-in depth " t " max	SW1	w
60	60	M 12	20	70	14	14 / 19									
		M 16	25	120	18	18 / 24	0,9	62	32	60	50	16	24	13	10
		M 20	30	120	22	22 / 29									
100	100	M 16	35	130	18	18 / 24									
		M 20	40	200	22	22 / 29	1,8	73	42	71	70	25	35	15	10
		M 24	45	200	28	28 / 36									
		M 30	50	200	36	36 / 46									
150	150	M 24	60	300	28	28 / 36	2,5								
		M 30	70	300	36	36 / 46	2,4								
		M 36	75	300	42	42 / 53	2,3	83	52	81	75	30	40	17	12
		M 42	80	300	48	48 / 59	2,2								
200	200	M 36	120	400	42	42 / 53	4,9								
		M 42	125	450	48	48 / 59	4,8								
		M 48	130	450	54	54 / 66	4,7	120	82	118	80	35	45	17	12
		M 56	140	500	-	-	4,5								
		M 64	150	500	-	-	4,3								

* Property class of the threaded bolt up to M24 minimum Q10.9; from M30 Q8.8
(further thread sizes i. e. inches on request)

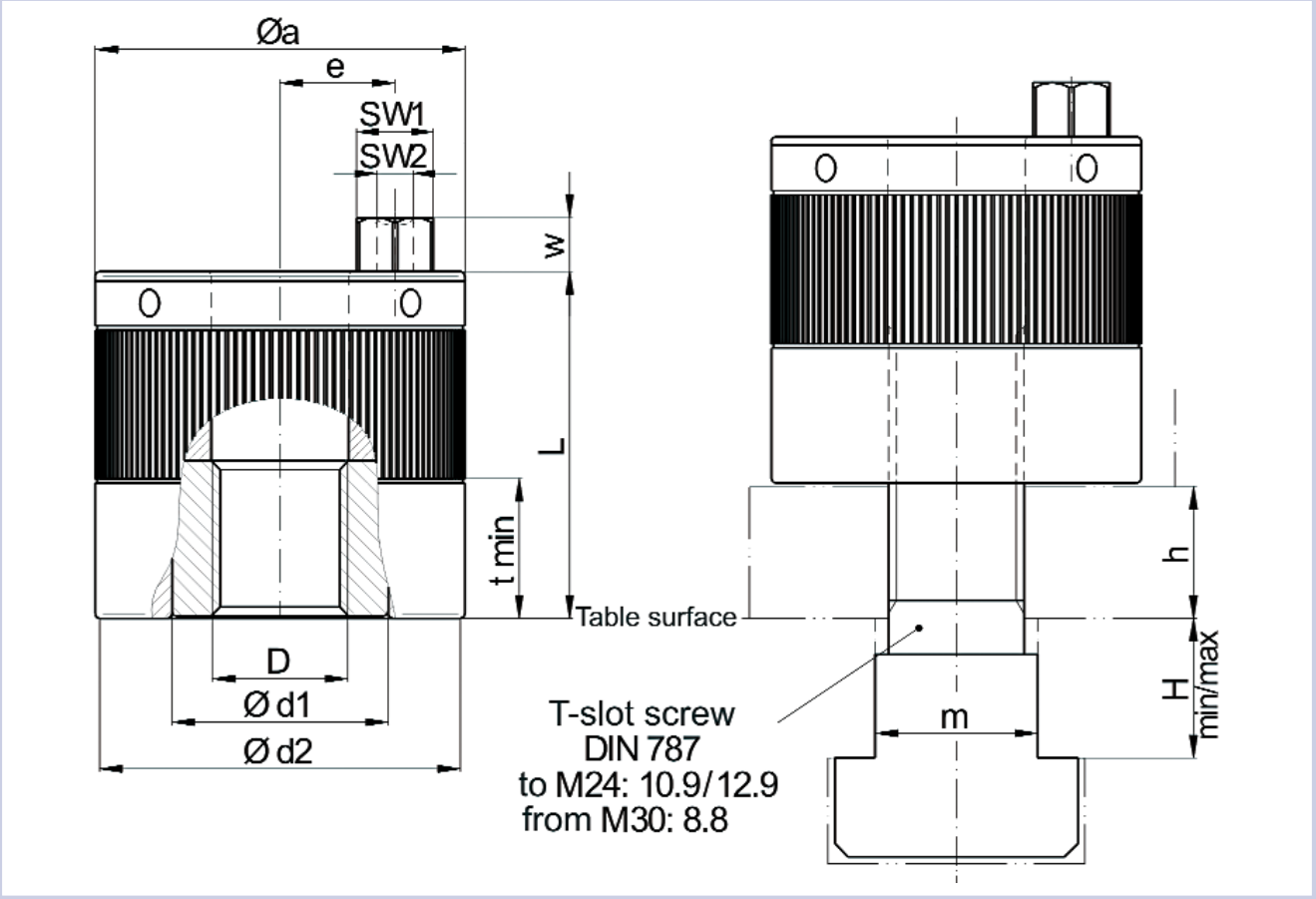
Ordering example: **Clamping nut** **MCA 100 - M 24**

incl. T-bolt **MCA 100 - 28 - 50 - 32**

Series and size (max. clamping force 100 kN)
T-slot dimension according to DIN 650 (dimension "m"=28 mm)
Clamping heigh ("h"= 50 mm)
Size of T-slot ("H"= 32 mm)

Power clamping nut — Series MDA

- with trough hole thread
- for variable clamping edges - unlimited clamping stroke



Technical data and dimensions: (mm) length dimensions according to DIN ISO 2768 mH

MDA Size	nominal clamping force [kN]	thread D *	max. tightening torque [Nm]	max. static load [kN]	T - slot - DIN 650 " m "	T - slot - DIN 650 " H " min / max	weight approx. [kg]	Øa	Ød1	Ød2	e	L	tmin	SW1 / SW2 outside / inside		w
100	100	M16	55	130	18	18/24	2,9	84	48	82	26,5	77	30	17	8	12
		M20	60	200	22	22/29	2,9									
		M24	65	200	28	28/36	2,8									
		M30	70	200	36	36/46	2,8									
150	150	M30	100	300	36	36/46	5,0	105	63	103	35	91,5	50	17	8	12
		M36	110	400	42	42/53	4,9									
		M42	115	450	48	48/59	4,8									
		M48	125	450	54	54/66	4,7									
200	200	M48	150	500	54	54/66	11,8	190	68	188	77	90	60	17	-	15
		M56	165	500	-	-	11,5									
		M64	180	500	-	-	11,2									

* Property class of threaded bolt up to M24 minimum Q10.9; from M30 Q8.8
(further thread sizes i. e. inches on request)

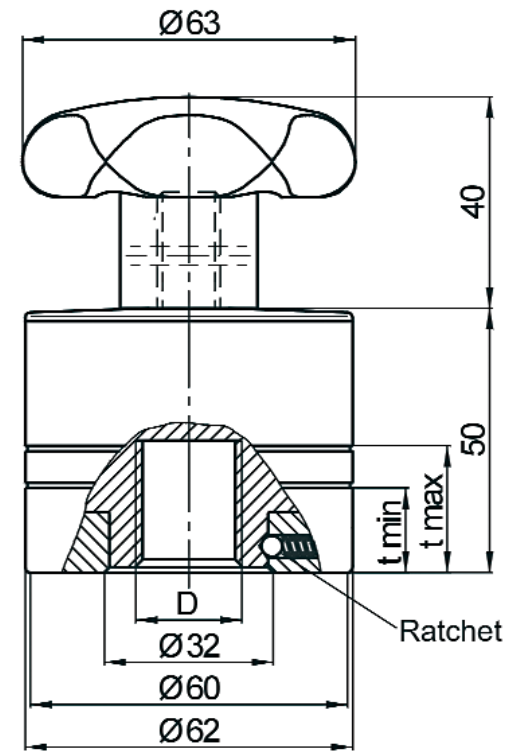
Ordering example: **Clamping nut** **MDA 100 - M 24**

incl. T- bolt **MDA 100 - 28 - 50 - 32**

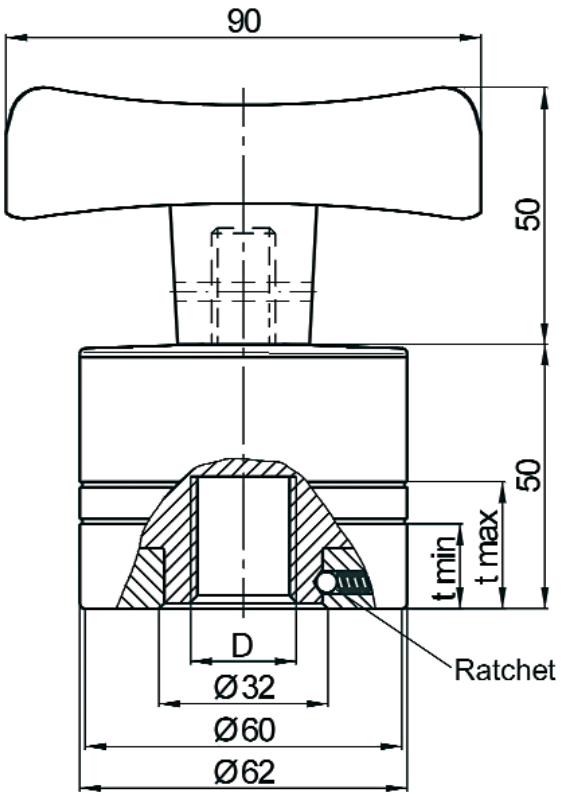
Series and size (max. clamping force 100 kN)
T-slot dimension according to DIN 650 (dimension "m"=28 mm)
Clamping heigh ("h"= 50 mm)
Size of T-slot ("H"= 32 mm)

Power clamping nut — Series MCA-S/MCA-T

- simple, manual operating with handle
- fast feed motion due to automatic change over



clamping nut MCA-S
with star grip



clamping nut MCA-T
with T-grip

Technical data and dimensions: (mm)

length dimensions according to DIN ISO 2768 mH

Series	nominal clamping force [kN]	thread	max. static load [kN]	screw in depth t min [mm]	screw in depth t max [mm]	weight approx. [kg]
MCA - S	40	M 10	50	16	24	1,0
		M 12	70			
MCA - T		M 16	120			
		M 20	120			

Notice:

Property class of threaded bolt should be at least Q10.9. Sizes of thread taller as M 16, should used a property class of Q 12.9, or the max. static load must be reduced.

special design
with bevel gear drive

Ordering example: **MCA-S - M10 / MCA-T - M16**

Eccentric block-type clamp Series EBS

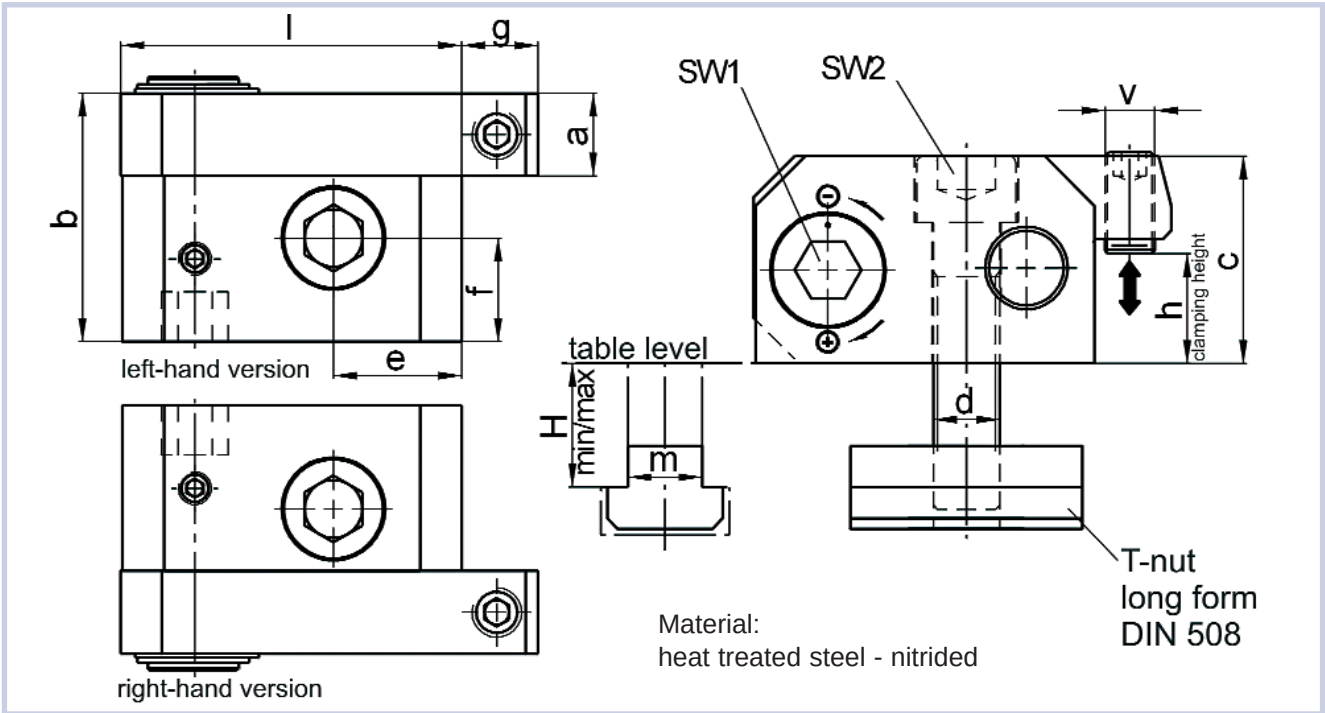
- flexible, sturdy and compact design
- simple handling - quick action clamp system
- high operating reliability by self-locking

With this mechanical eccentric block-type clamp “EBS” the user has a very compact and sturdy clamping element with high clamping forces and low tightening torques. To emphasize is the simple, manual operation (180° turn of the service hegagon), and the high operating reliability. The EBS - clamping element can be used for the manual tool clamping on presses and punches. Beyond this it can be used for plenty of clamping tasks in the entire field of mechanical engineering.

Technical data :

EBS Size	nominal clamping force [kN]	max. tightening torque ”SW1” [Nm]	max. static load [kN]	clamping range “h” [mm]	weight ca.[kg]	T-slot - DIN 650 m*	T-slot - DIN 650 H min/max
20	20	40	40	0 - 31	1,8	18	18/24
						22	22/29
40	40	75	80	0 - 51	3,6	22	22/29
						28	28/38

* further T-slot dimensions on request



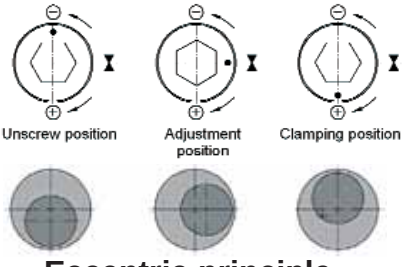
Dimensions: (mm) length dimensions according to DIN ISO 2768 mH

EBS Size	a	b	c	d (Q12.9)	e	f	g	h*	L	SW 1 SW 2	V**
20	20	60	50	M 16	31	25	19	0 - 31	82	14	M 12
40	25	75	70	M 20	36	32	23	0 - 51	100	17	M 16

* tolerance: max. ±0,2mm; greater clamping edge heights with distance plates are available on request.

** alternativ: bolt lever with setscrew and adjustment thread for variable clamping edge heigths

Mark at the service hexagon



Eccentric principle

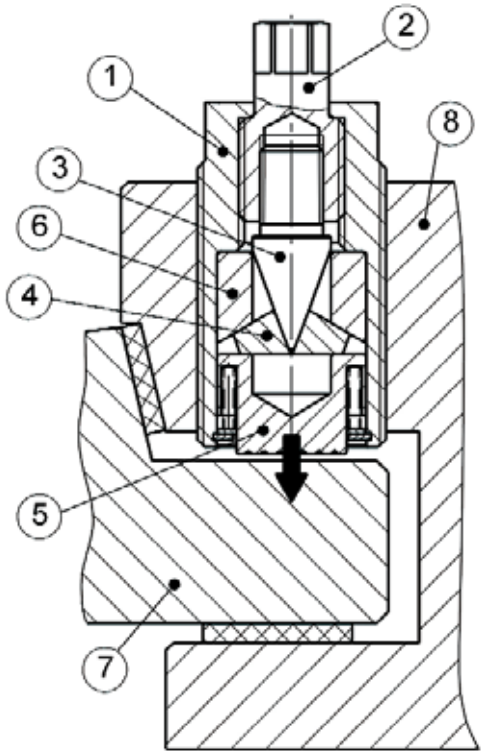
Ordering example:

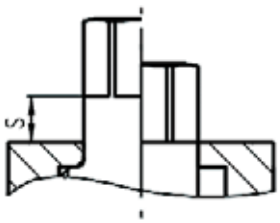
with T-Nut: **EBS 20 L - 30 - 22**

- Series
- Size
- Left hand version
- Clamping heigth “h” =30 mm
- T-Nut size “m” = 22 mm (DIN 650)

- wedge mechanism as force booster
- high clamping force 40 - 120 kN
- low tightening torque - simple manual operation

The clamping screws of series SC are equipped with a patented wedge clamping system as a force amplifier. This newly developed system enables highest clamping forces with low tightening torques, simple manual operation and high operating safety. The clamping screws series SC have various application possibilities, mainly in presses, punches and machine tools, as well as in jigs, fixtures and similar devices.





Release position — Fig. A1

max. clamping position — Fig. A2

Function

The wedge clamping system of the SC clamping screw is self-locking in each clamping position, due to its geometry, and offers a clamping stroke of up to 2,5 mm. This way, dependent on tightening torque, very high clamping forces up to the nominal clamping force can be achieved

Clamping Procedure

The infeed of the clamping screw down to a solid contact with the part to be clamped (7) is the first step, done by manually turning the housing (1) clockwise.
Only then the hexagon of the actuation spindle (2) should be turned clockwise, thus moving the forced-in key (3) in axial direction and pressing the slide gores (4) in radial direction. The latter motion results in the axial stroke of the thrust piece (5) against the part to be clamped (7). The clamping force is lead over the gore bedding (6) through the housing (1) into the yoke of the clamping devise (8).

After approximately two turns of the actuation hexagon the travel of the thrust piece will be blocked by an internal positive stop and the torque wrench will disengage although the required clamping force has not been generated; the clamping operation has to be repeated. The clamping travel “s” is indicated as optional clamping motion control. The maximal clamping position is reached when the lower cylindrical portion of the actuation hexagon is even with the top of the housing (Fig. A2).

Release

The release procedure is carried out in reverse order. By turning the operating hexagon to the left up to the fixed back stop (Fig. A1), the wedge slide moves back and the clamping mechanism is released.
Coil springs push the pressure piece and the wedges back into the starting position.

Note:

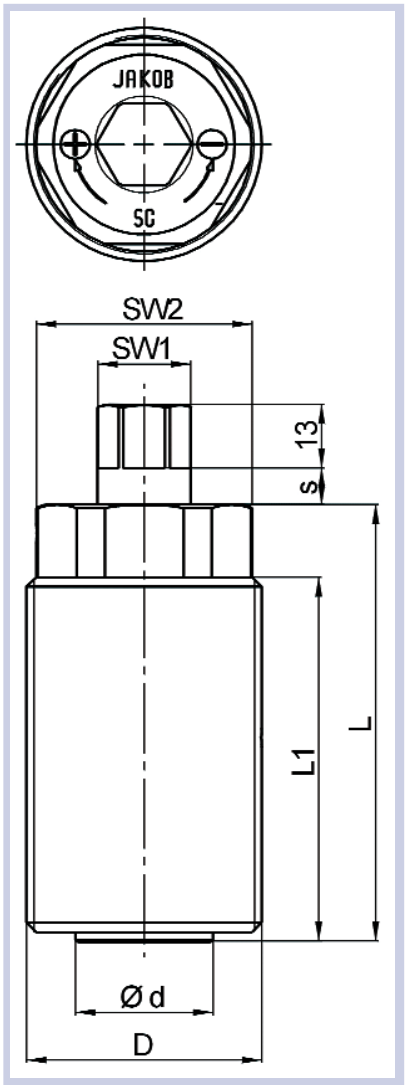
To reliable ensure the required clamping force on the one hand, and on the other hand to protect the drive or clamping mechanism against damages through excess tightening torque, we recommend the use of a torque wrench for applying the actuation torque.

With certain preconditions clamping is also acceptable with the usual ring or socket spanner.
The clamping screws are lubricated for life and maintenance free under normal operating conditions.

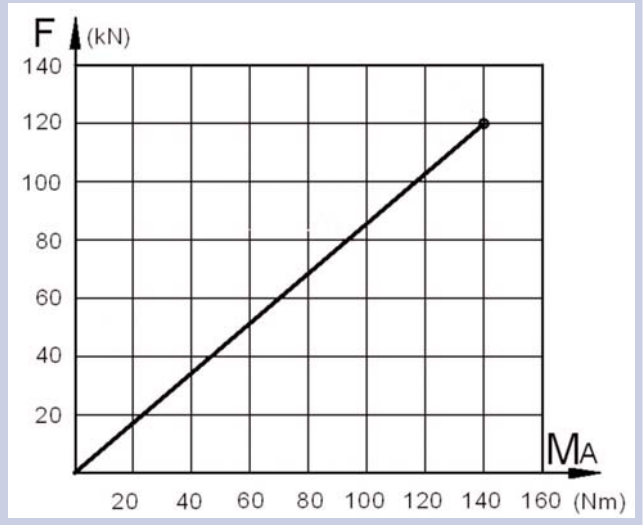
Technical data and Dimensions: (mm) length dimensions according to DIN ISO 2768 mH

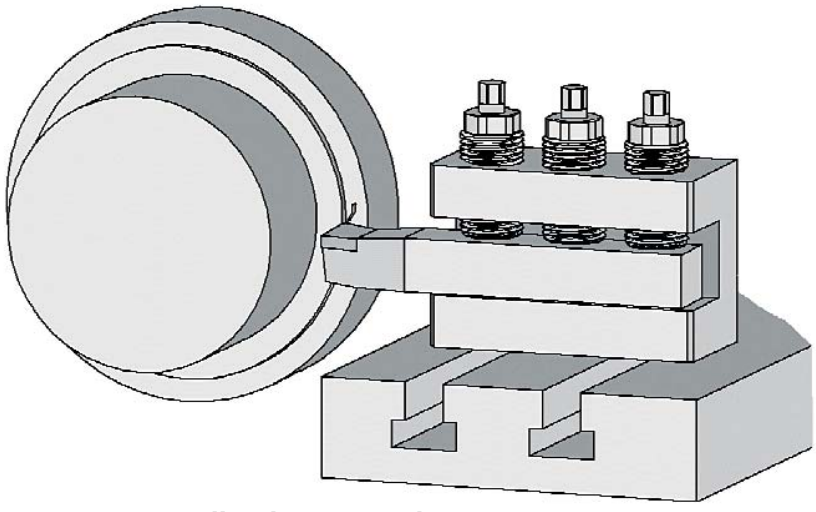
SC Size	nominal clamping force [kN]	max. tightening torque "SW1" [Nm]	max. clamping stroke [mm]	max. static load [kN]	operation path "s" [mm]	thread D *	Ø d [mm]	L1 [mm]	L [mm]	SW1 [mm]	SW2 [mm]
36	40	45	1,5	80	5	M 36x3	19	62	73	13	30
48	80	90	2,2	160	7,5	M 48x3	28	75	90	17	41
64	120	140	2,5	240	8,5	M 64x4	39	90	110	19	55
80	160	160	2,5	320	8,5	M 80x4	39	100	160	19	65
100	250	130	3	400	17	TR 100x6	60	205	230	17**	65

* Further sizes and threads (inch threads) on request.
** hexagon socket



Clamping force diagram: SC 64





Application example:
clamping screw SC

Ordering example: SC 48

Slide-in clamp — Series MES

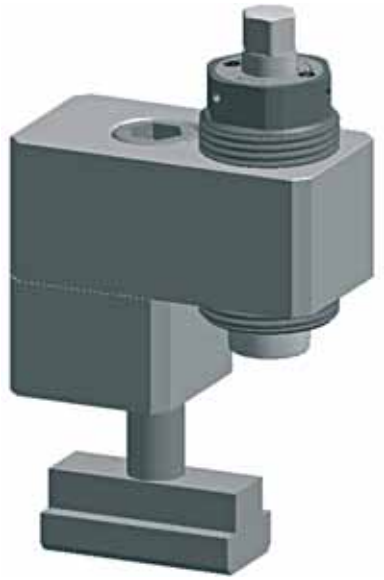
- versatile application - flexible, rotatable head piece
- simple, manuell operation - high clamping forces

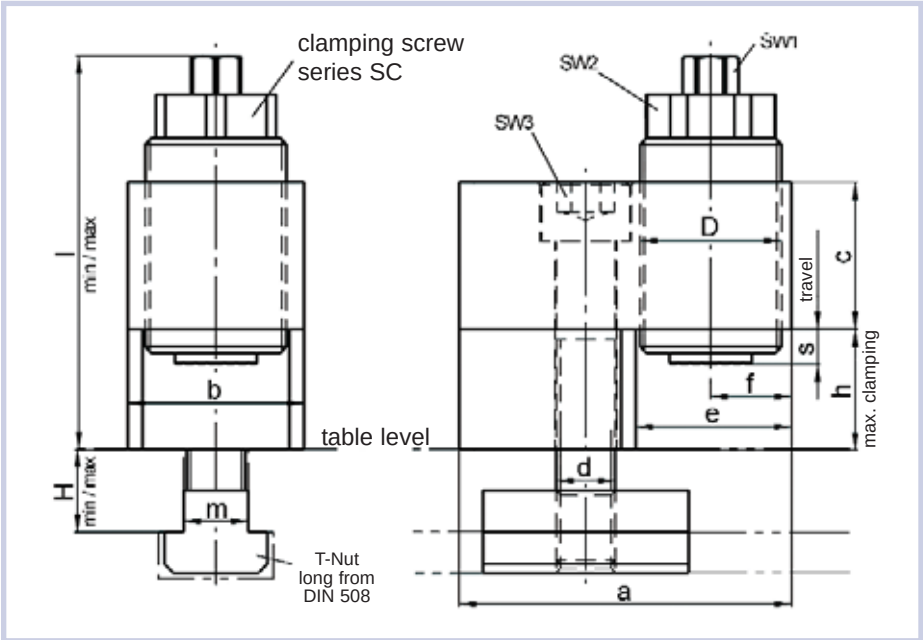
The mechanical slide-in clamp of series “MES” is a combination of a T-slot slide-in unit with a mechanical clamping screw of series “SC”. This flexible and sturdy clamping element represents a cost-effective alternativ to semi or fully automatic clamping systems, mainly for tool clamping on presses and punches. The MES unit is positioned by sliding it in the T-slot and swivelling of the bracket if necessary. The quick tightening of the socket head cap bolt completes this step. The infeed of the clamping screw until solid contact of all clamping surfaces is the next step. Only the hexagon of the actuation spindle should be turned clockwise to generate the clamping force. The bracket with clamping screw and distance plate can be screwed down without T-slot fixtures directly on supporting tables. The MES can be used as a limit stop too.

Technical data :

MES Size	nominal clamping force [kN]	max. tightening torque “SW1” [Nm]	max. clamping stroke [mm]	max. static load [kN]	max. adjusting path “s”	weight ca. [kg]	T-Nut “m”* DIN 650	H min/max
30	30	35	1,5	60	22	3	18	18/24
							22	22/29
60	60	80	2,2	120	25	5	22	22/29
							28	28/36
100	100	130	2,5	200	35	8	28	28/36
							36	36/46

* Further T-slot dimensions on request.





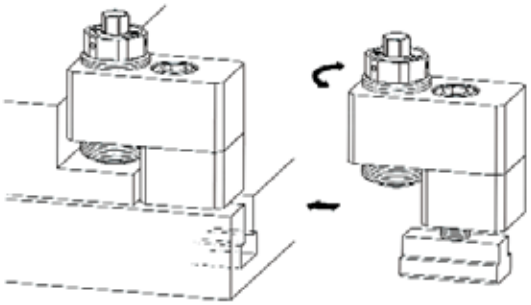
Dimensions: (mm)

MES Size	a	b	c	d (Q12.9)	thread D	e	f	h+1*	L min	L max	SW1	SW2	SW3
30	90	50	40	M 16	M 36 x 3	40	21	30	100	120	13	30	14
								50	120	142			
								70	140	162			
60	113	60	50	M 20	M 48 x 3	53	28	40	125	150	17	41	17
								60	145	170			
								80	165	190			
100	150	80	60	M 24	M 64 x 4	70	37	50	145	180	19	55	19
								80	175	210			

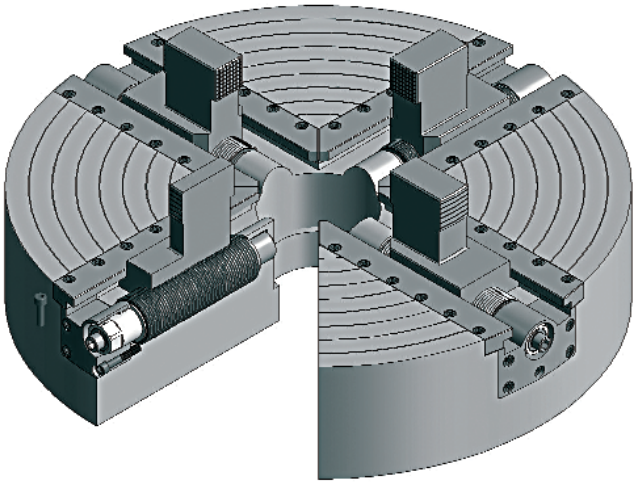
* Standard range for clamping height “h” ;
special clamping heights on request

Ordering example: MES 60 - 40 - 22

- Series
- Size (nominal force 60 kN)
- clamping height h (clamping range approx. 15 - 40mm)
- T-slot size according to DIN 650 (dimension “m” = 22mm)



For face plates and surface plates on vertical boring machines, turret lathes, centre lathes, facing lathes and roll turning lathes as well as grinding machines and specaial machines



The JAKOB power clamping screws have been developed for the most exacting demands and maximum workpiece weights with an optimum operational safety.

They are primarily suited for integration in jaw boxes or for direct installation in faceplates of lathes, grinding and special machines.

All components are made from hardened, heat-treated steel and produced with high precision which guarantees the user a clamping element of high sturdiness and reliability.

Essential features of performance

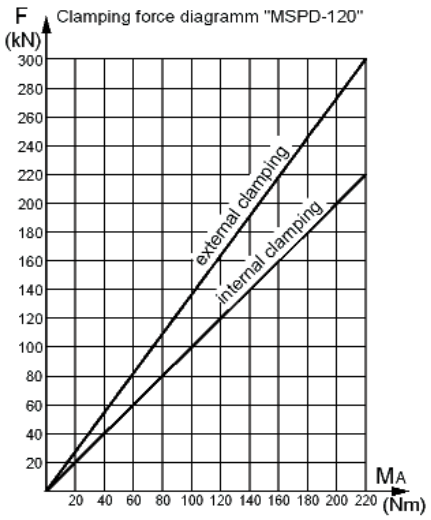
- **enormous clamping force, low actuation torque**
- **maximal reliability, high rigidity**
- **large clamping stroke, high alignment accuracy**
- **simple manual operation, minimized maintenence**

Note

Each clamping spindle is supplied with a clamping force diagram and a test report.

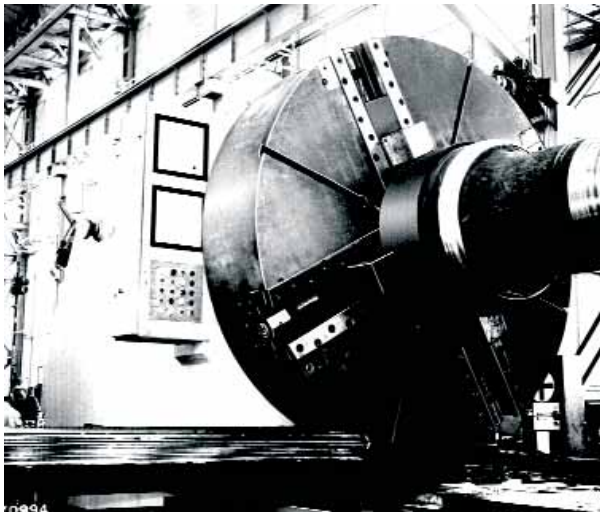
On request, the appropriate clamping force diagram can be supplied on an aluminium plate for fitting to the machine, as ready information to the operating personnel. Due to friction loss in the clamping jaws or linear guides, the table or diagram values for the actuation torque must be corrected. The appropriate factor must be determined, if necesaary, by the face plate or jaw box manufacturers either empirically or based on trials & tests.

An example of the characteristics of the type “MSPD 120” is shown:

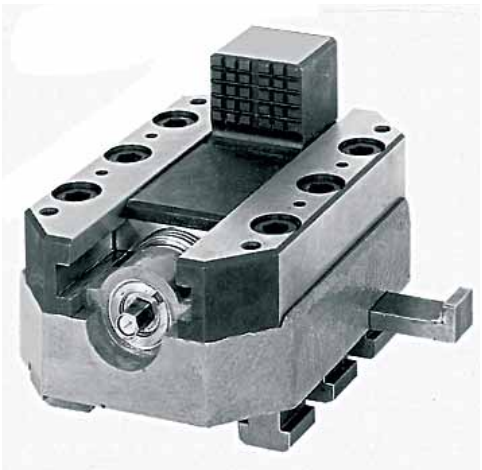


Application examples

Double acting type MSPD for a face plate of a big roll lathe.



Moveable jaw box with integrated power-clamping screw type MSP.

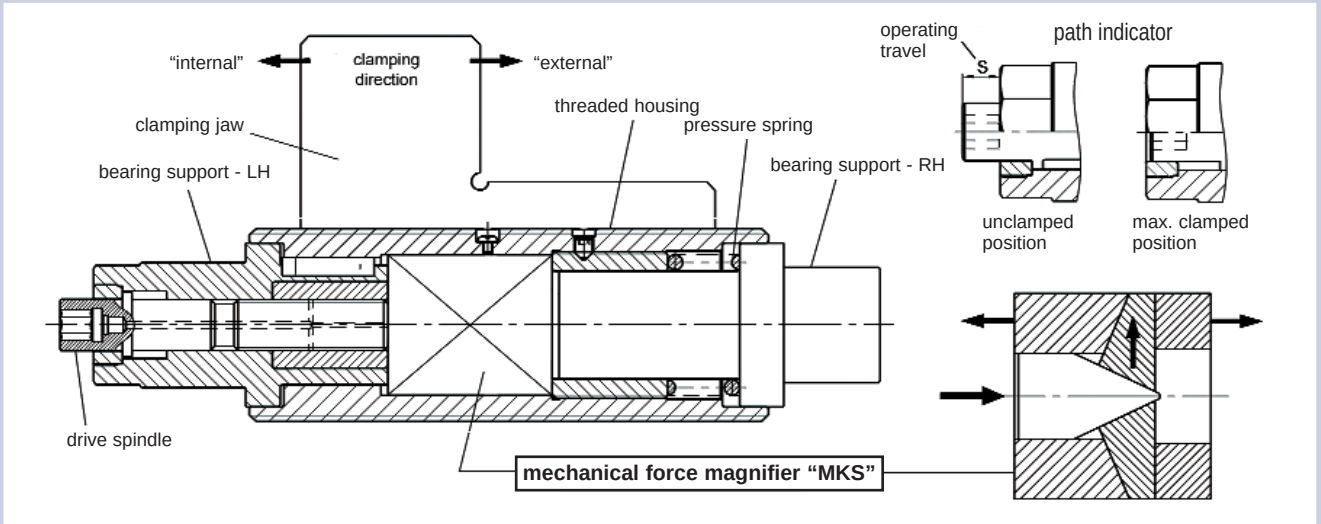


Design and function

The single acting Mechanical Power Clamping Screws of the series “MSP” have been developed for external clamping only, where as the double acting ones of the series “MSPD” for external (shafts, rollers) as well as internal clamping (pipes, bushes). These mechanical power clamping screws are equipped with a “forced in key” system type “MKS” as force magnifiers. The double acting version is equipped with an automatic change-over mechanism. This system generates high clamping forces with a simple operating procedure requiring low manual initiating torque or starting torque.

The state of the art “forced-in key” system is extremly robust and is self locking in every clamping stage. The high system stiffness achieved thus increases also the operational safety. No additional mechanical safety devices or supports are required for supporting the threaded power clamping screws.

Working over the “forced-in key” system an axial displacement of a pressure piece is made which presses the threaded power clamping screws with the jaw against the work piece and generates a clamping force proportional to the initiating torque. By changing the load direction from “external” to “internal” the clamping direction within the force magnifier automatically changes without the need to undertake an additional reversal of the clamping direction by hand. Correspondingly the clamping forces are passed on further depending on the direction of clamping into the left-bearing (LH) or support while externally clamping and in the right-bearing (RH) or support while internally clamping. The reversing motion of the force magnifer and threaded power clamping screw is compensated by a compression spring which functions at the same time also as a pull back spring during unclamping.



Operating

External clamping

The clamping jaw approaching the workpiece, is prealigned and pretensioned by turning the external hexagon SW1 with the aid of a ring or socket spanner in a clockwise direction. A torque wrench should be used for force clamping and fine adjusting. By turning the internal hexagon SW2 in clockwise direction, the drive spindle is activated and a clamping force is generated proportional to the starting torque until the torque wrench disengages upon reaching the preselected torque (see clamping force diagram). The clamping stroke can be controlled via an operating path indicator. The clamping procedure has to be repeated by slacking with SW2 and a possible pretensioning with SW1 if the preselected starting torque has not been attained until the end of the operating path. Avoid exceeding the maximum starting torque as it may cause damages.

Internal clamping

The clamping jaw approaches the workpiece, is prealigned and pretensioned by turning the external hexagon SW1 in an anti-clockwise direction with a ring or socket spanner. Effected is there by automatically the change-over to internal clamping. For this change-over the threaded housing of the power clamping screw with the jaw is maintained in a preloaded state and then subjected to an axial motion in the reverse direction, i.e. the external hexagon SW1 should be turned by approx. one turn additionally. The power clamping with internal hexagon SW2 is then done in a similar manner as the external clamping procedure.

Release

Release is effected in reverse order. By turning the hexagon SW2 in an anti-clockwise direction until the rear stop. The drive spindle is reversed and the clamping system unclamped.

The pressure spring pushes the threaded spindle with clamping jaw back, the force amplifier returns to its initial position.

Hydro-mechanical spring clamping systems Series ZSF/ZDF

- mechanical clamping - hydraulic releasing
- high operation safety, leakproof and robust
- economical clamping solution

General

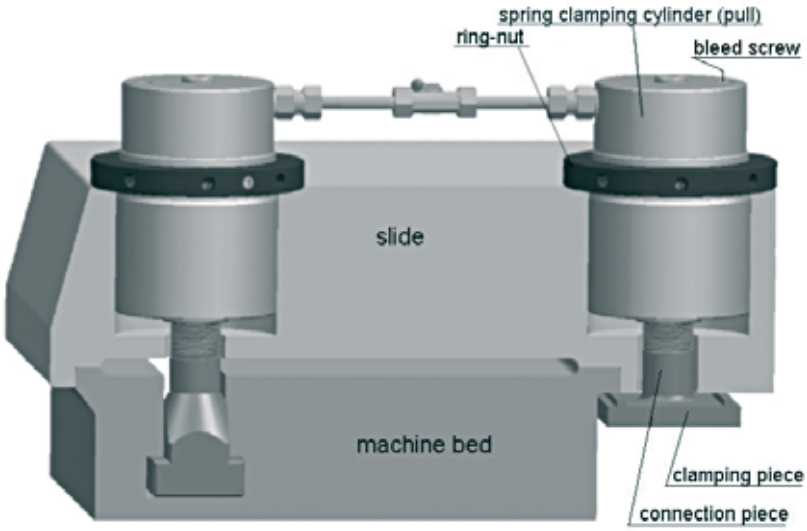
The pistonassembly (pulling or pushing version) is subjected alternatively to the cup spring force or hydraulic pressure. This means that the cup spring packet is compressed more with increasing pressure. The hydraulic pressure is required only for the release stroke of the elements whereby the pull stud/pressure piece is released.
This System ensures a very high factor of safety since the clamping force generated is independent from the oil pressure and from pressure loss due to leakage.

The full clamping force remains constant at all times. The short operating cycle times of the hydraulic power pack additionally save on costs and make it more economical. The spring clamping cylinders of the series ZSF and ZDF are robust and reliable elements which can be used in all applications where moveable machine parts (eg. fixtures, dies etc.) need to be clamped or locked into position. They are also used in workpiece and tool clamping operations.

Principal of Operation

The piston (push or pull) is subjected alternately to cup spring force or the hydraulic pressure. This means, that as the spring assembly is pressed together with increasing pressure, the spring force increases. At setting pressure, the appropriate nominal clamping force is achieved as reaction force of the cup spring assembly. For release (push or pull), a higher hydraulic pressure is required, which is proportional to the release stroke up to a maximum value.

The appropriate pressure values can be found in the tables. With spring clamping cylinders, a clamping bolt or pull stud is screwed into the threaded bore of the piston adjusted and secured (on request also supplied as one piece). The required hydraulic assembly should be equipped with a pressure limiting valve, a switching-magnetic valve, a pressure gauge and a pressure switch unit.

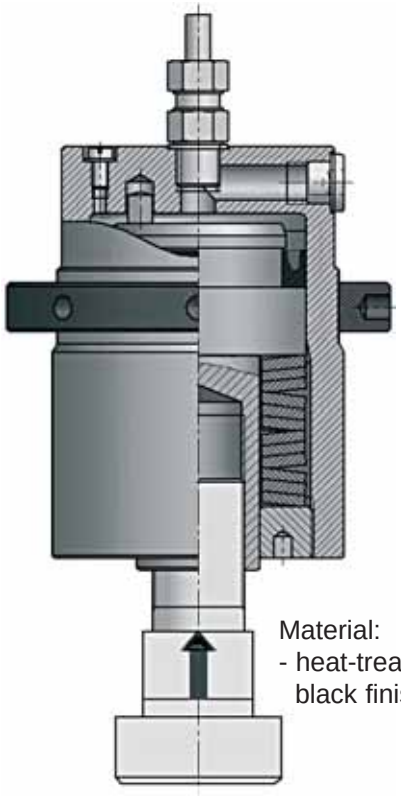


Fitting and adjustment

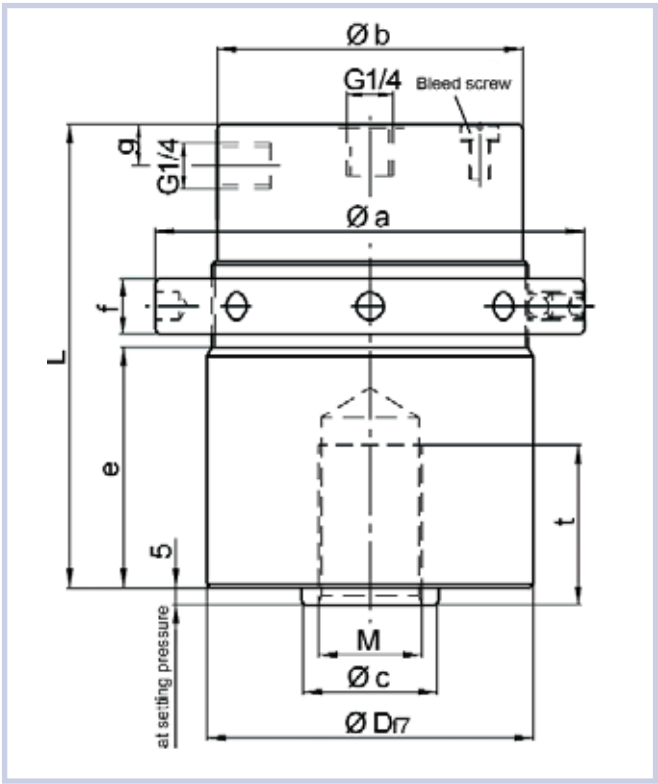
- slide cylinder into the locating hole provided (do not install), and make hydraulik connection
- bleed cylinder and pipe line at low pressure
- increase system pressure and hold; align the cylinder with the aid of ring nut (ZSF), with adjusting screw (ZDF-u) or spacer discs (ZDF-o) do the fine setting until the piston or clamping piece, backlashfree rests in place; secure pressure cylinder with cheese-head screw or secure the ring nut of the spring clamp cylinder
- drain system pressure; set release pressure for the required release stroke; check release stoke and adjust if necessary

Technical data:

ZSF Size	nominal clamping force [kN]	adjusting pressure [bar]	max.release stroke [mm]	release pressure at 0,5 mm stroke [bar]	release pressure at 1,0 mm stroke [bar]	release pressure at max. stroke [bar]	stroke volume at 1 mm stroke [cm3]	weight approx. [kg]
1.600	16	135	2,0	170	210	290	1,3	2,0
2.500	25	135	1,6	160	185	230	2,0	2,5
4.000	40	150	2,0	170	190	240	2,8	3,6
6.300	63	175	1,5	190	210	235	3,8	6,2
10.000	100	210	1,5	250	280	320	5,0	8,0
16.000	160	210	1,2	240	275	295	7,9	19
20.000	200	210	1,2	240	270	290	11,3	24
25.000	250	190	1,6	210	235	260	14,3	30
35.000	350	190	1,0	210	230	-	20,1	35



Material:
- heat-treated steel
  black finish



Dimensions: (mm) length dimensions according to DIN ISO 2768 mH

ZSF Size	Ø D_{f7}	"version-2" Ø D_{f7}	Ø a	Ø b	Ø c	e	f	g	L	M	t	adjusting thread - ring nut
1.600	60	55	85	55	20	45	14	12	101	M 14 x 1,5	24	M 58 x 1,5
2.500	70	65	95	65	25	50	14	13	111	M 18 x 1,5	30	M 68 x 1,5
4.000	80	75	110	75	30	60	16	12	125	M 22 x 1,5	36	M 78 x 1,5
6.300	95	85	125	89	40	70	16	12	135	M 30 x 1,5	48	M 92 x 1,5
10.000	105	95	140	100	40	80	16	18,5	150	M 30 x 1,5	50	M 102 x 1,5
16.000	142	-	180	137	50	80	32	22	170	M 38 x 1,5	50	M 140 x 2
20.000	150	-	190	143	57	100	40	22	200	M 45 x 1,5	60	M 148 x 3
25.000	170	-	220	163	70	100	40	22	230	M 45 x 1,5	60	M 168 x 3
35.000	200	-	250	192	80	105	45	47	240	M 52 x 1,5	70	M 198 x 3

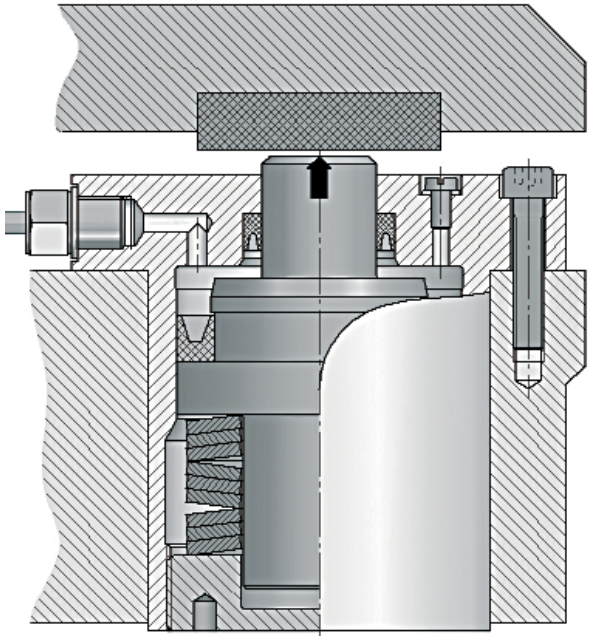
Note to version-2" The sizes 1.600 to 10.000 are available alternatively with smaller external diameter "D" cylinder housing according to column "-2" .

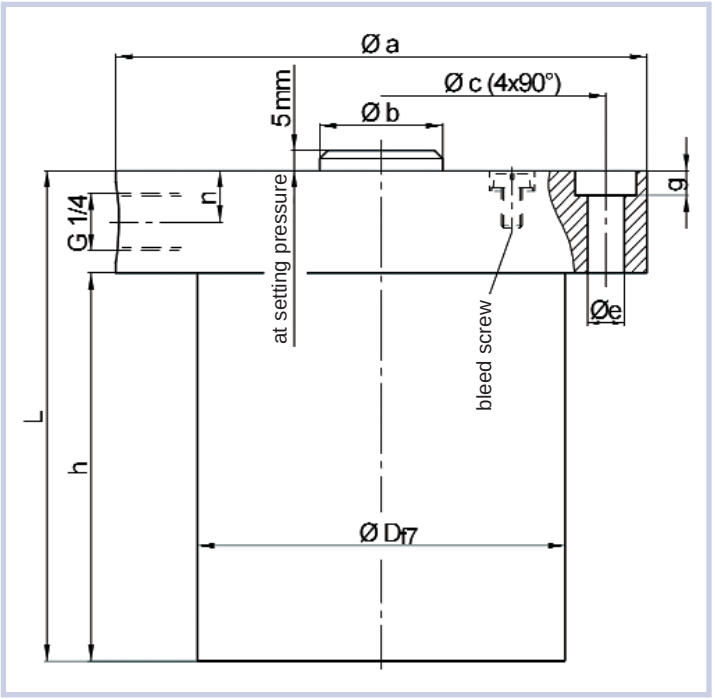
Ordering example: **ZSF 25.000 / ZSF 10.000 - 2**

Spring clamping cylinder (pushing) Series ZDF-o / ZDF-u

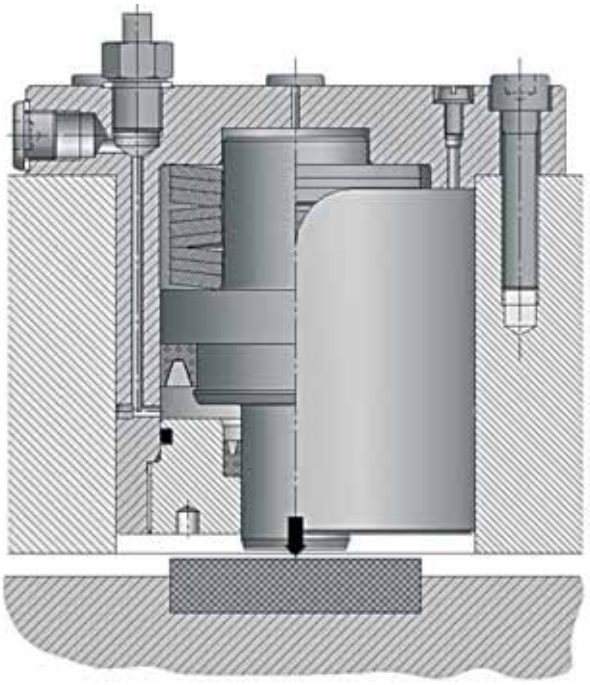
Spring clamping cylinders are generally offered in two versions: with different positions of the piston. For each version several sizes from 25 kN to 160 kN are available. As not all sizes are on stock, please contact us for special applications. According to the required operation parameters, we shall give you an appropriate offer with a dimensioned sketch.

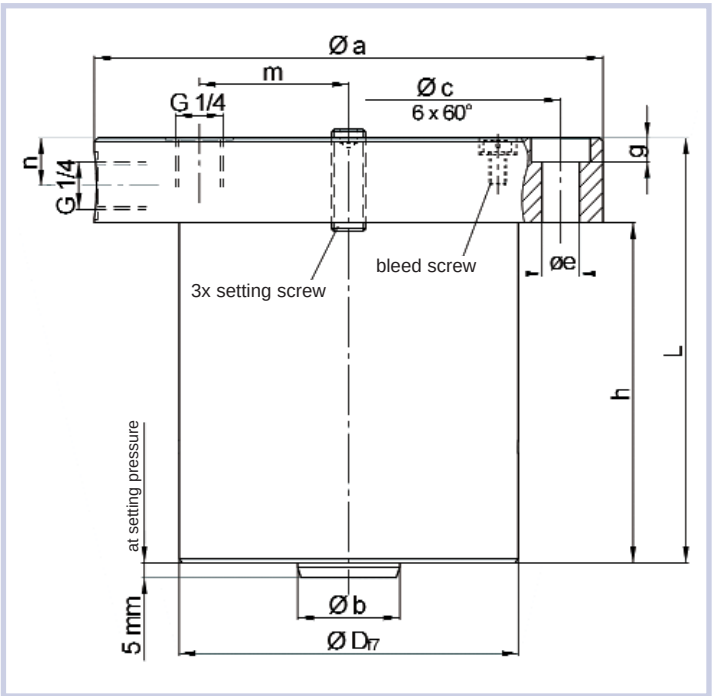
Spring clamping cylinder type ZDF-o





Spring clamping cylinder type ZDF-u





Ordering example: **ZDF- o 10.000** **/** **ZDF- u 6.300**