

DE-STA-CO straight-line RAKO system clamps are used in applications requiring quick bridging of workpiece thicknesses and workpiece tolerances without conversion. These clamps are most suitable for clamping tasks between ribs and hollow spaces difficult to reach.

Their compact design and their different types of operation allow for application of the straight-line clamps in fixtures for mass production as well as for single part production.

### Mounting types

- Flange base
- Front flange
- Screw-in thread

### Type of operation

- Two hand operation
 

The hand lever (10) and the push rod (1) are separated. The hand lever is connected to the clamp's clamping mechanism. The push rod can be removed from the clamp
- One-hand operation
 

The hand lever (10), or the hand wheel (11) and the push rod (2) are linked. The push rod is retained within the clamp.

### Clamping operation

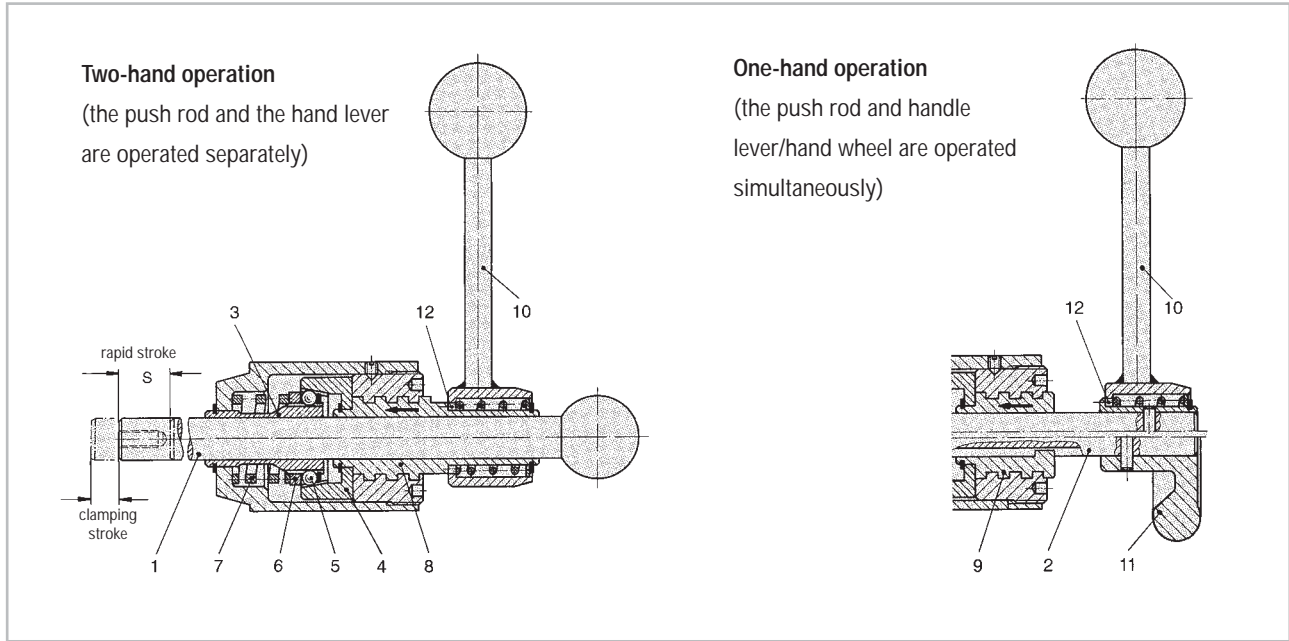
The push rod (1) or (2) which is guided within the clamp body is applied to the workpiece. By rotating the hand lever (10) or the hand wheel (11) clock-wise the clamping stroke  $S_1$  is induced and the push rod is tightly gripped by the slotted clamping sleeve (3).

### Operating principle

The hand lever's (10) clock-wise rotation causes the threaded sleeve (8) and the conical sleeve (4) to which it is connected to move in the direction of the arrow shown in the drawing. The conical sleeve produces a force-locking connection between the slotted clamping sleeve (3) and the push rod by means of the steel balls (5) located at the clamping sleeve's perimeter.

Thanks to this force-locking connection, the push rod rotates and effects the clamping stroke  $S_1$ . The push rod's rotation may be compensated by means of a swivel hold-down piece. The clamping strokes  $S_1$  specified in this catalogue were measured with no counterforce acting while measurements were taken. When clamping this clamp against a workpiece, the clamping stroke  $S_1$  is reduced by the force-locking connection between the push rod and the workpiece. The straight-action clamp is unlocked by turning the hand lever or the hand wheel counter-clockwise; this method is applied for both the one-hand and the two-hand operation types. This counter-clockwise rotation makes the conical sleeve (4) and the threaded sleeve (8) or (9) move backward. The pressure spring (7) pushes back the relieved steel balls (5) via the pressure ring (6).

## Straight line clamps, RAKO system



The force-locking connection between the slotted clamping sleeve and the push rod can be moved freely again. Straight-line clamps which are two-hand operated can also be applied for PULL actions when the push rod is inserted in the clamp's housing in the opposite direction. On the one hand operated clamp, the rotation inducing the clamping stroke  $S_1$  is directly transmitted from the push rod (2) or the hand wheel to the threaded sleeve (9) via a groovespring connection. The clamping and unlocking operations are executed in the same way as described before.

### Handling

In order to change the clamping or the unlocking position, pull the hand lever off its tothing (12) and set it in the desired position.

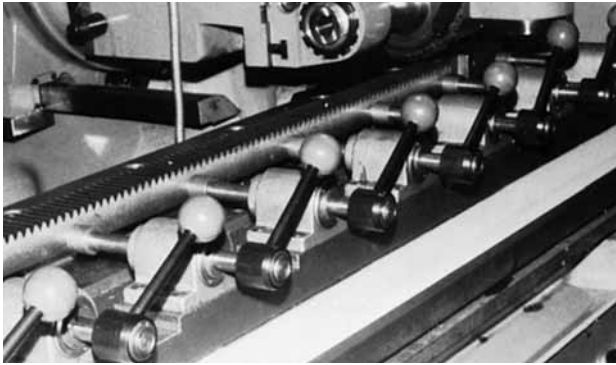
### Important

- The holding forces specified in the catalogue refer to the maximum load exerted on the clamp by counter-forces. For details concerning the clamping force  $F_S$  exerted on the workpiece by the clamp and depending on the operation force  $F_B$  (manual force), please see the chart on the next page. Straining point of the operation force: the hand levers' knob or the grooves in the hand wheel.

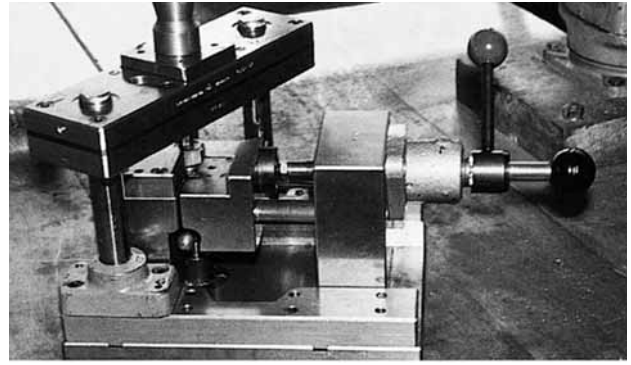
The clamping force is proportional to the operation force.

**The achieved clamping force must not exceed the maximum holding force.**

- As the straight-line clamps, with the exception of the F-160 model, are designed only for axial load, we recommend to use an additional radial support for the push rod in the event of lateral load.



model FO-161-60 on a milling machine



model FL-160 with push rod 16/100F on a punching fixture

## Different designs



**mounting type:** flange base  
**operating method:** one-hand operation with hand lever

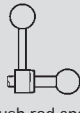


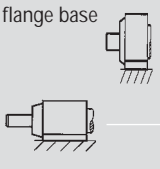
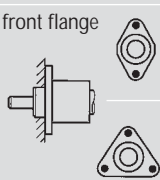



**mounting type:** front flange  
**operating method:** one-hand operation with hand wheel



**mounting type:** screw-in thread  
**operating method:** two-hand operation with push rod and hand lever

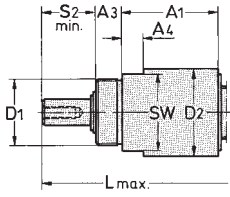
## Product list and technical data

Mounting type	Operating method			Model-no.	Max. holding force	Clamping force $F_s$ with an operating force $F_B$		Rapid stroke S <sup>2)</sup> 400 and 500 mm strokes available on request	Max. clamping stroke S1	Weight ~
	two-hand operation	one-hand operation	one-hand operation			$F_B$	$F_s$			
	 push rod and hand lever	 hand lever	 hand wheel	<sup>1)</sup> push rod order separately; see page 5.4	[N]	[N]	[N]	[mm]	[mm]	[kg]
flange base 	■		■	FO-082-40	1500	100	450	40	2,5	0,325
	■			FO-120 <sup>1)</sup>	3000		1900	100, 200, 300	3	0,540
		■		FO-121-45	3000		1900	45	3	0,665
			■	FO-122-45	3000		550	45	3	0,610
	■			FO-160 <sup>1)</sup>	9000		2500	100, 200, 300 <sup>2)</sup>	4	1,240
			■	FO-161-60	9000		2500	60	4	1,540
			■	FO-162-60	9000		850	60	4	1,430
	■			FO-220 <sup>1)</sup>	18000		3000	100, 200, 300	4	2,655
front flange 	■			FO-221-80	18000		3000	80	4	3,385
	■			FL-120 <sup>1)</sup>	3000		1900	100, 200, 300	3	0,485
		■		FL-121-45	3000		1900	45	3	0,610
			■	FL-122-45	3000		550	45	3	0,550
	■			FL-160 <sup>1)</sup>	9000		2500	100, 200, 300 <sup>2)</sup>	4	1,130
			■	FL-161-60	9000		2500	60	4	1,430
screw-in thread 			■	FL-162-60	9000		850	60	4	1,325
	■			G-082-40	1500		450	40	2,5	0,300
	■			G-120 <sup>1)</sup>	3000	1900	100, 200, 300	3	0,470	
		■		G-121-45	3000	1900	45	3	0,595	
			■	G-122-45	3000	550	45	3	0,535	

# Straight line clamps, RAKO system

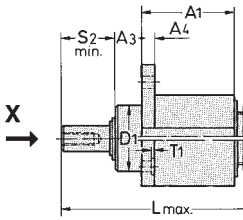
Two-hand operation (the push rod and the hand lever are operated separately)

## Screw-in thread

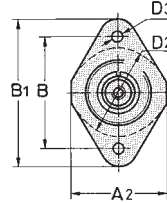


part no. G-120

## Front flange

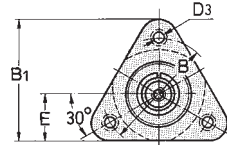


View „X”



part no. FL-120

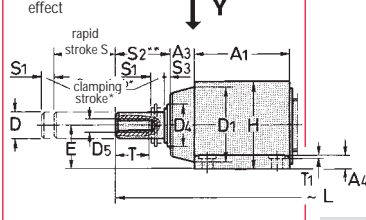
View „X”



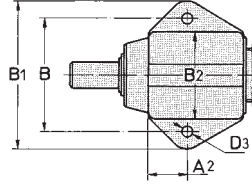
part no. FL-160

## Flange base

\*without counter-force effect

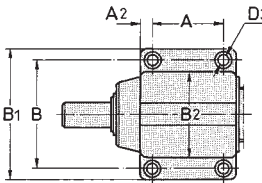


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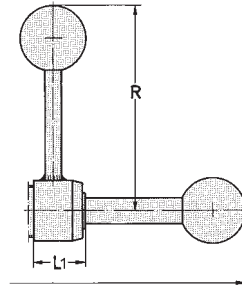


part no. FO-120

View „Y”



part no. FO-160  
FO-220



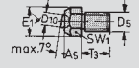
## Accessories (order separately)

### push rod



part no.	for rapid stroke S	weight ~ [kg]	for clamps
12/100	100	0,135	FO-120
12/200	200	0,280	FL-120
12/300	300	0,370	G-120
16/100F	100	0,400	FO-160
16/200F	200	0,500	FL-160
16/300F*	300	0,700	
22/100	100	1,000	
22/200	200	1,090	FO-220
22/300	300	1,390	

### swivel thrust pad



part no.	thread	weight ~ [kg]
K-612	M6	0,007
K-816	M8	0,015
K-1222	M12	0,035

\* 400 and 500 mm strokes available on request

### Important

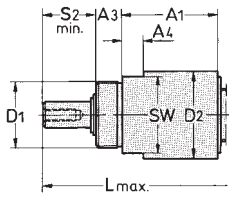
The straight-line clamps are designed **only for axial load**. In case of lateral load, we recommend an additional radial support of the push rod.

Mounting type	part no. without push rod	available rapid strokes S (order push rod separately)	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>8</sub>	B	B <sub>1</sub>	B <sub>2</sub>	D <sub>h8</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>
Flange base	FO-120	100, 200, 300	-	44	19	12	6,3	8,5	52	68	40	12	35	-	6,5	20
	FO-160	100, 200, 300	40	62	11	12	12	10	70	90	52	16	46	-	9	25
	FO-220	100, 200, 300	50	75	13	20	15	12	90	115	69	22	60	-	11	36
Front flange	FL-120	100, 200, 300	-	44	44	12	6	8,5	52	68	-	12	30 <sub>r7</sub>	40	6,5	20
	FL-160	100, 200, 300	-	60	-	14	14	10	68	73	-	16	40 <sub>r7</sub>	52	9	25
Screw-in thread	G-120	100, 200, 300	-	44	-	12	10	8,5	-	-	-	12	M30x1,5	40	-	20

Mounting type	part no. without push rod	D <sub>5</sub>	D <sub>9</sub>	D <sub>10</sub>	E	E <sub>1</sub>	H	~ L			L <sub>1</sub>	R	S <sub>2</sub>	S <sub>3</sub>	SW	SW <sub>1</sub>	T	T <sub>1</sub>	T <sub>3</sub>	
								L with rapid strokes:												
								100	200	300										
Flange base	FO-120	M6	30	6	20	12,5	42	228	328	428	24	95	2,5	2,5	-	11	12	-	10	
	FO-160	M8	35	8	30	14,8	58	280	380	480	33	130	3	3	-	13	15	1	14	
	FO-220	M12	45	9,5	35	19,5	71	295	395	495	35	197	3	3	-	17	25	1	18	
Front flange	FL-120	M6	30	6	-	12,5	-	228	328	428	24	95	2,5	2,5	-	11	12	-	10	
	FL-160	M8	35	8	28	14,8	-	280	380	480	33	130	3	3	-	13	15	1	14	
Screw-in thread	G-120	M6	30	6	-	12,5	-	228	328	428	24	95	2,5	2,5	35	11	12	-	12	

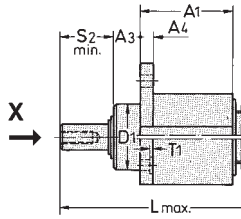
One-hand operation (the push rod and the hand lever are operated simultaneously)

### Screw-in thread

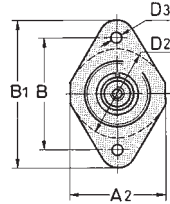


part no. G-121-45

### Front flange

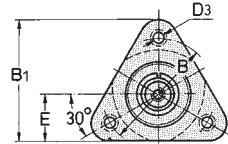


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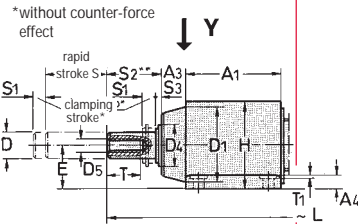
part no. FL-121-45

View „X“

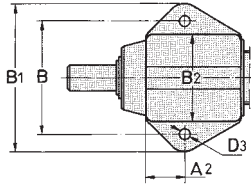


part no. FL-161-60

### Flange base

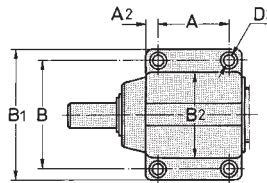


View „Y“

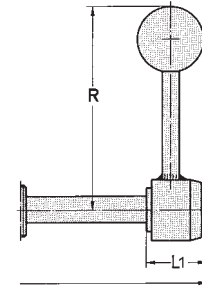


part no. FO-121-45

View „Y“



part no. FO-161-60  
FO-221-80

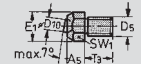


### Important

The straight-line clamps are designed **only for axial load**. In case of lateral load, we recommend an additional radial support of the push rod.

### Accessories (order separately)

swivel thrust pad



part no.	thread	weight - [kg]
K-612	M6	0,007
K-816	M8	0,015
K-1222	M12	0,035

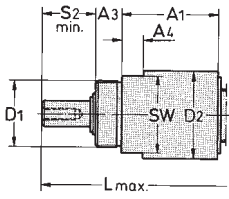
Mounting type	part no. with push rod	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	B	B <sub>1</sub>	B <sub>2</sub>	D <sub>h8</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>
Flange base	FO-121-45	-	44	19	12	6,3	8,5	52	68	40	12	35	-	6,5	20
	FO-161-60	40	62	11	12	12	10	70	90	52	16	46	-	9	25
	FO-221-80	50	75	13	20	15	12	90	115	69	22	60	-	11	36
Front flange	FL-121-45	-	44	44	12	6	8,5	52	68	-	12	30 <sub>H7</sub>	40	6,5	20
	FL-161-60	-	60	-	14	14	10	68	73	-	16	40 <sub>H7</sub>	52	9	25
Screw-in thread	G-121-45	-	44	-	12	10	8,5	-	-	-	12	M30x1,5	40	-	20

Mounting type	part no. with push rod	D <sub>5</sub>	D <sub>10</sub> Ø	E	E <sub>1</sub>	H	L	L <sub>1</sub>	R	S <sub>2</sub>	S <sub>3</sub>	SW	SW <sub>1</sub>	T	T <sub>1</sub>	T <sub>3</sub>
Flange base	FO-121-45	M6	6	20	12,5	42	153	27	95	15	2,5	-	11	12	-	10
	FO-161-60	M8	8	30	14,8	58	196	35	130	18	3	-	13	15	1	14
	FO-221-80	M12	9,5	35	19,5	71	245	40	197	20	3	-	17	25	1	18
Front flange	FL-121-45	M6	6	-	12,5	-	153	27	95	15	2,5	-	11	12	-	10
	FL-161-60	M8	8	28	14,8	-	196	35	130	18	3	-	13	15	1	14
Screw-in thread	G-121-45	M6	6	-	12,5	-	153	27	95	15	2,5	35	11	12	-	10

# Straight line clamps, RAKO system

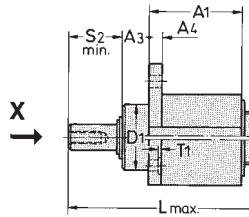
One-hand operation (the push rod and the hand wheel are operated simultaneously)

## Screw-in thread

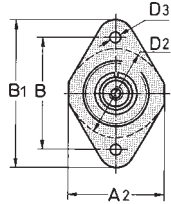


part no. G-082-40  
G-122-45

## Front flange

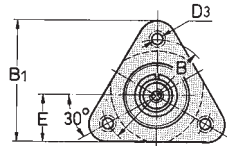


View „X“



part no. FL-122-45

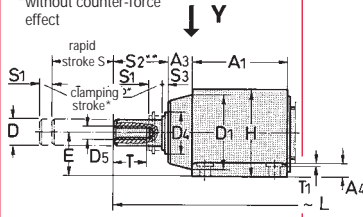
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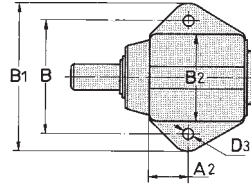
part no. FL-162-60

## Flange base

\*without counter-force effect



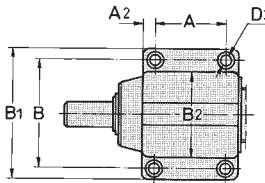
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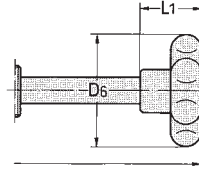
part no. FO-082-45

FO-082-45

View „Y“



part no. FO-162-60

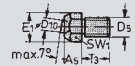


### Important

The straight-line clamps are designed **only for axial load**. In case of lateral load, we recommend an additional radial support of the push rod.

### Accessories (order separately)

#### swivel thrust pad



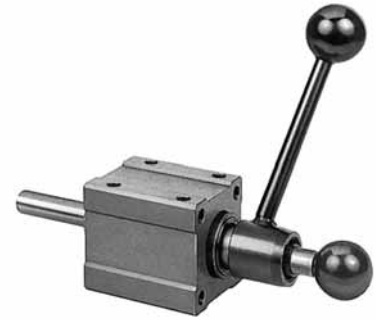
part no.	thread	weight ~ [kg]
K-508	M5	0,004
K-612	M6	0,007
K-816	M8	0,015
K-1222	M12	0,035

Mounting type	part no. with push rod	A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	B	B <sub>1</sub>	B <sub>2</sub>	D <sub>h8</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>
Flange base	FO-082-40	-	37	15,3	10	5	6	44	56	35	8	30	-	4,5	16
	FO-122-45	-	44	19	12	6,3	8,5	52	68	40	12	35	-	6,5	20
	FO-162-60	40	62	11	12	12	10	70	90	52	16	46	-	9	25
Front flange	FL-122-45	-	44	44	12	6	8,5	52	68	-	12	30 <sub>T7</sub>	40	6,5	20
	FL-162-60	-	60	-	14	14	10	68	73	-	16	40 <sub>T7</sub>	52	9	25
Screw-in thread	G-082-40	-	37	-	10	8	6	-	-	-	8	M24x1,5	35	-	16
	G-122-45	-	44	-	12	10	8,5	-	-	-	12	M30x1,5	40	-	20

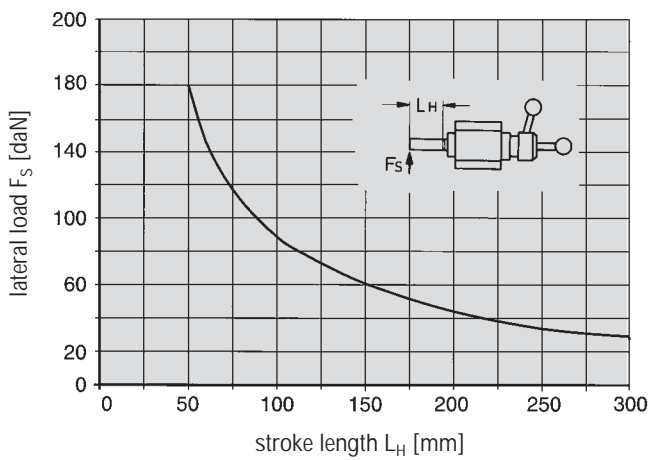
Mounting type	part no. with push rod	D <sub>5</sub>	D <sub>6</sub>	D <sub>10</sub> Ø	E	E <sub>1</sub>	H	L	L <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	SW	SW <sub>1</sub>	T	T <sub>1</sub>	T <sub>3</sub>
Flange base	FO-082-40	M5	40	5	18	9,2	36	128	26	9	2,5	-	8	8	-	8
	FO-122-45	M6	52	6	20	12,5	42	153	27	15	2,5	-	11	12	-	10
	FO-162-60	M8	75	8	30	14,8	58	196	35	18	3	-	13	15	1	14
Front flange	FL-122-45	M6	52	6	-	12,5	-	153	27	15	2,5	-	11	12	-	10
	FL-162-60	M8	75	8	28	14,8	-	196	35	18	3	-	13	15	1	14
Screw-in thread	G-082-40	M5	40	5	-	9,2	-	128	26	9	2,5	30	8	12	-	8
	G-122-45	M6	52	6	-	12,5	-	153	27	15	2,5	35	11	12	-	10

## Technical features

- high holding force of 1800 daN
- high lateral load capacity
- exact push rod guide
- wiper ring avoiding contamination of clamping mechanism
- block layout provides for variable mounting
- low weight due to the aluminium housing
- 50mm horizontal and vertical modular dimension of the hole pattern

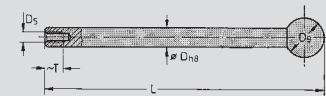


## Admissible lateral load $F_S$ depending on the stroke length $L_H$



## Accessories (order separately)

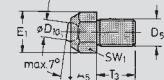
### push rod



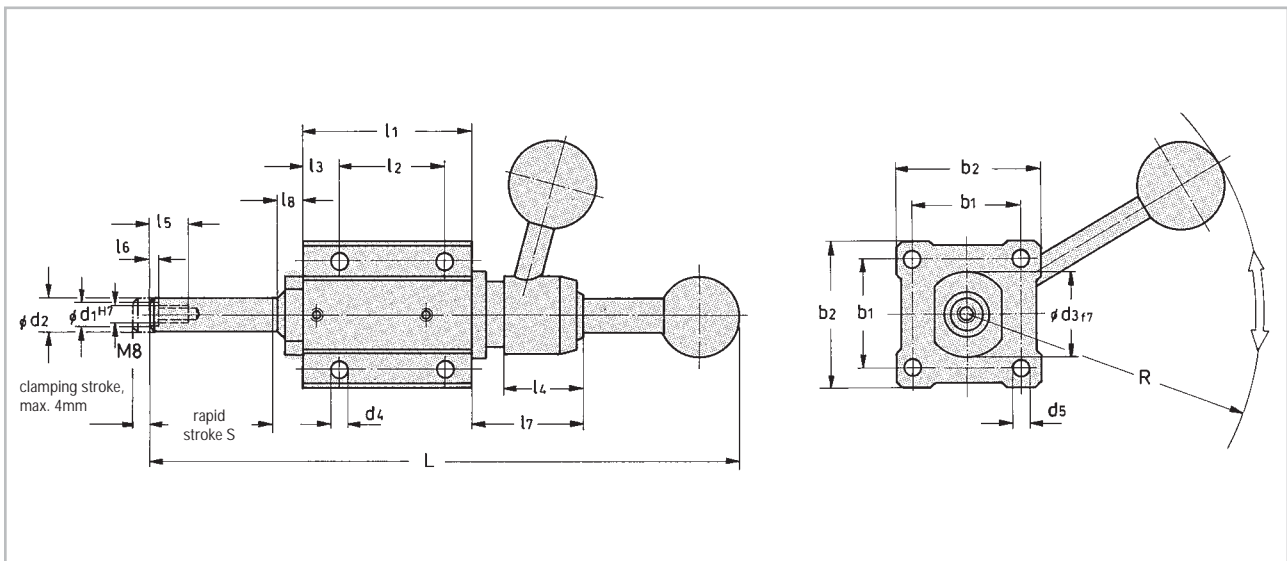
part no.	for rapid strokes S	Dh8	D5	D9	L	T	weight ~[kg]
16/100F	100	16	M8	35	280	15	0,4
16/200F	200	16	M8	35	380	15	0,5
16/300F*	300	16	M8	35	480	15	0,7

\*Hub 400 und 500 mm auf Anfrage

### swivel thrust pad



part no.	A5	D5	D10	E1	T3	SW1	weight ~[kg]
K-816	10	M8	8	14,8	14	13	0,035



model no. without push rod	max. holding force [daN]	$F_S^*$ [daN]	b1	b2	-L for rapid strokes			l1	l2	l3	l4	l5	l6	l7	l8	d1 <sup>H7</sup>	d2 <sub>h8</sub>	d3	d4	d5	R	weight ~ [kg]
					100	200	300															
F-160	1800	500	50	68	280	380	480	80	50	18	35	20	2	50	12	10	16	40	8,3	8,5	165	1,5

\* $F_S$  = clamping force at an operating force of 10 daN