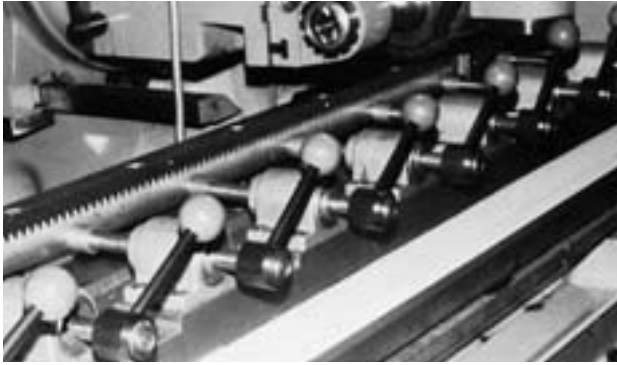
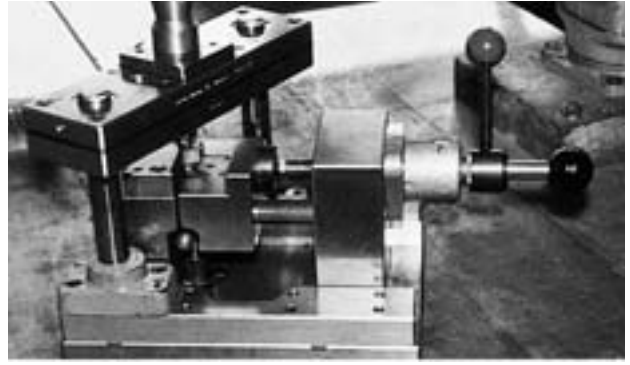


Straight line clamps, RAKO system



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

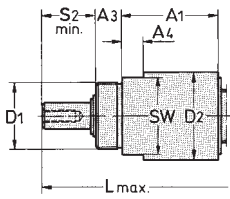
Product list and technical data

Mounting type	Operating method			Model-no.	Max. holding force	Clamping force F_s with an operating force F_B		Rapid stroke S ²⁾ 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			
				¹⁾ push rod order separately; see page 5.4	[N]	[N]	[N]	[mm]	[mm]	[kg]
flange base 			■	FO-082-40 ▲	1.500	100	450	40	2,5	0,325
	■			FO-120 ¹⁾ ▲	3.000		1.900	100, 200, 300	3	0,540
		■		FO-121-45 ▲	3.000		1.900	45	3	0,665
			■	FO-122-45 ▲	3.000		550	45	3	0,610
	■			FO-160 ¹⁾ ▲	9.000		2.500	100, 200, 300 ²⁾	4	1,240
		■		FO-161-60 ▲	9.000		2.500	60	4	1,540
			■	FO-162-60 ▲	9.000		850	60	4	1,430
	■			FO-220 ¹⁾ ▲	18.000		3.000	100, 200, 300	4	2,655
front flange 		■		FO-221-80 ▲	18.000		3.000	80	4	3,385
	■			FL-120 ¹⁾ ▲	3.000		1.900	100, 200, 300	3	0,485
		■		FL-121-45 ▲	3.000		1.900	45	3	0,610
			■	FL-122-45 ▲	3.000		550	45	3	0,550
	■			FL-160 ¹⁾ ▲	9.000		2.500	100, 200, 300 ²⁾	4	1,130
		■		FL-161-60 ▲	9.000		2.500	60	4	1,430
screw-in thread 			■	FL-162-60 ▲	9.000		850	60	4	1,325
	■			G-082-40 ▲	1.500		450	40	2,5	0,300
		■		G-120 ¹⁾ ▲	3.000	1.900	100, 200, 300	3	0,470	
			■	G-121-45 ▲	3.000	1.900	45	3	0,595	
		■	G-122-45 ▲	3.000	550	45	3	0,535		

▲ Available upon request

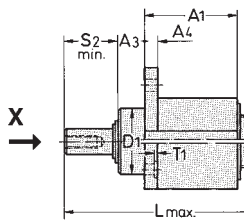
Two-hand operation (the push rod and the hand lever are operated separately)

Screw-in thread

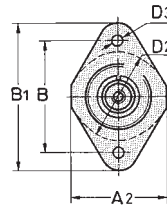


part no. **G-120**

Front flange

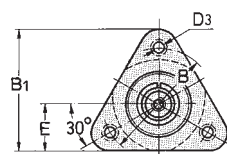


View „X”



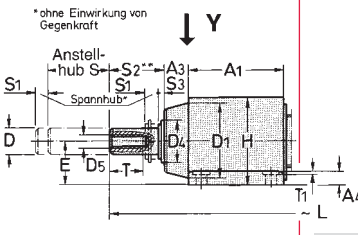
part no. **FL-120**

View „X”

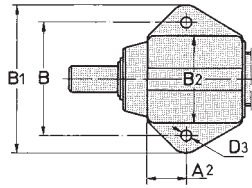


part no. **FL-160**

Flange base

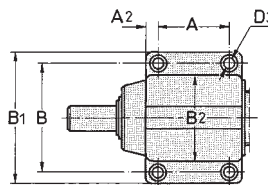


View „Y”

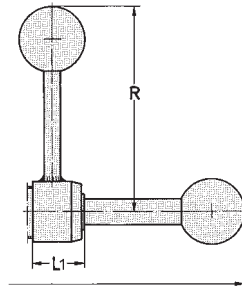


part no. **FO-120**

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	FL-160
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 ▲ Available upon 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.

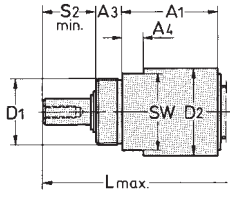
Mounting type	part no. without push rod	available rapid strokes S (order push rod separately)	A	A ₁	A ₂	A ₃	A ₄	A ₈	B	B ₁	B ₂	D _{h8}	D ₁	D ₂	D ₃	D ₄
Flange base	FO-120	100, 200, 300	-	44	19	12	6,3	8,5	52	68	40	12	35	-	6,5	20
	FO-160	100, 200, 300	40	62	11	12	12	10	70	90	52	16	46	-	9	25
	FO-220	100, 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 _{H7}	40	6,5	20
	FL-160	100, 200, 300	-	60	-	14	14	10	68	73	-	16	40 _{H7}	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 ₅	D ₉	D ₁₀	E	E ₁	H	~ L			L ₁	R	S ₂	S ₃	SW	SW ₁	T	T ₁	T ₃	
								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	

Straight line clamps, RAKO system

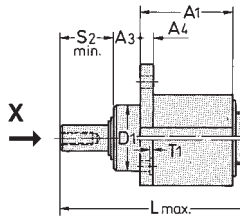
One-hand operation (the push rod and the hand lever are operated simultaneously)

Screw-in thread

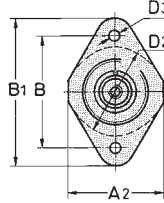


part no. **G-121-45**

Front flange

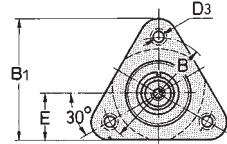


View „X”



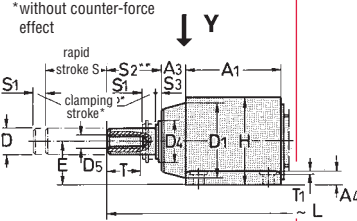
part no. **FL-121-45**

View „X”

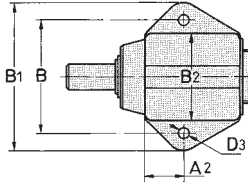


part no. **FL-161-60**

Flange base

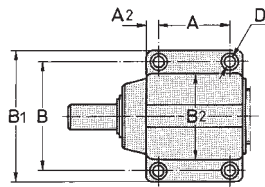


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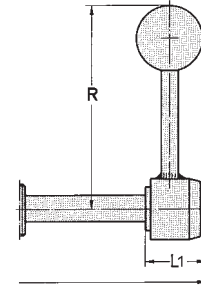


part no. **FO-121-45**

View „Y”



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

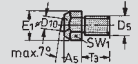


Important

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

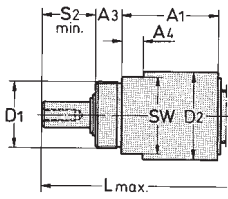
▲ Available upon request

Mounting type	part no. with push rod	A	A ₁	A ₂	A ₃	A ₄	A ₅	B	B ₁	B ₂	D _{h8}	D ₁	D ₂	D ₃	D ₄
	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
	FL-121-45	–	44	44	12	6	8,5	52	68	–	12	30 ₇	40	6,5	20
	FL-161-60	–	60	–	14	14	10	68	73	–	16	40 ₇	52	9	25
	G-121-45	–	44	–	12	10	8,5	–	–	–	12	M30x1,5	40	–	20

Mounting type	part no. with push rod	D ₅	D ₁₀ Ø	E	E ₁	H	L	L ₁	R	S ₂	S ₃	SW	SW ₁	T	T ₁	T ₃
	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
	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
	G-121-45	M6	6	–	12,5	–	153	27	95	15	2,5	35	11	12	–	10

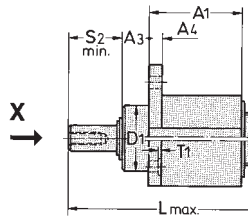
One-hand operation (the push rod and the hand wheel are operated simultaneously)

Screw-in thread

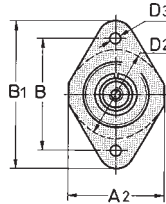


part no. **G-082-40**
G-122-45

Front flange

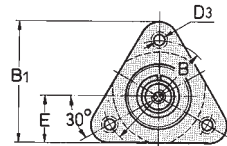


View „X”



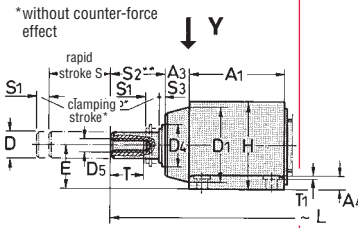
part no. **FL-122-45**

View „X”

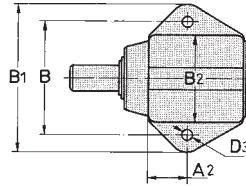


part no. **FL-162-60**

Flange base



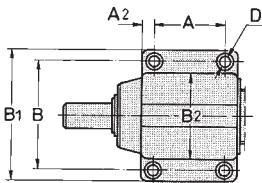
View „Y”



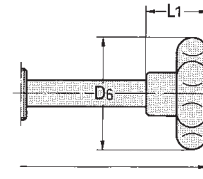
part no. **FO-082-45**

FO-082-45

View „Y”



part no. **FO-162-60**



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

▲ Available upon 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. with push rod	A	A ₁	A ₂	A ₃	A ₄	A ₅	B	B ₁	B ₂	D _{h8}	D ₁	D ₂	D ₃	D ₄
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 ₁₇	40	6,5	20
	FL-162-60	-	60	-	14	14	10	68	73	-	16	40 ₁₇	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 ₅	D ₆	D ₁₀ Ø	E	E ₁	H	L	L ₁	S ₂	S ₃	SW	SW ₁	T	T ₁	T ₃
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

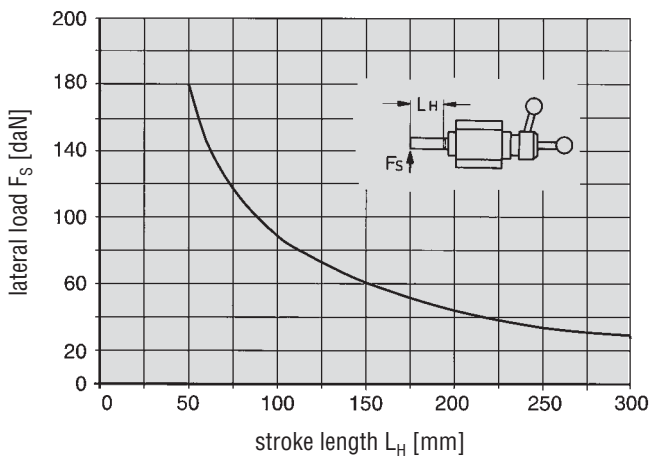
Straight line clamps, RAKO system



Technical features

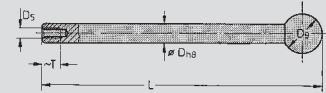
- high holding force of 1800 daN
- high lateral load capacity
- exact push rod guide
- wiper ring avoiding contamination of clamping mechanism
- block layout provides for variable mounting
- low weight due to the aluminium housing
- 50mm horizontal and vertical modular dimension of the hole pattern

Admissible lateral load F_s depending on the stroke length L_H



Accessories (order separately)

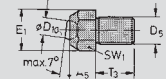
push rod



part no.	for rapid strokes S	D _{h8}	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

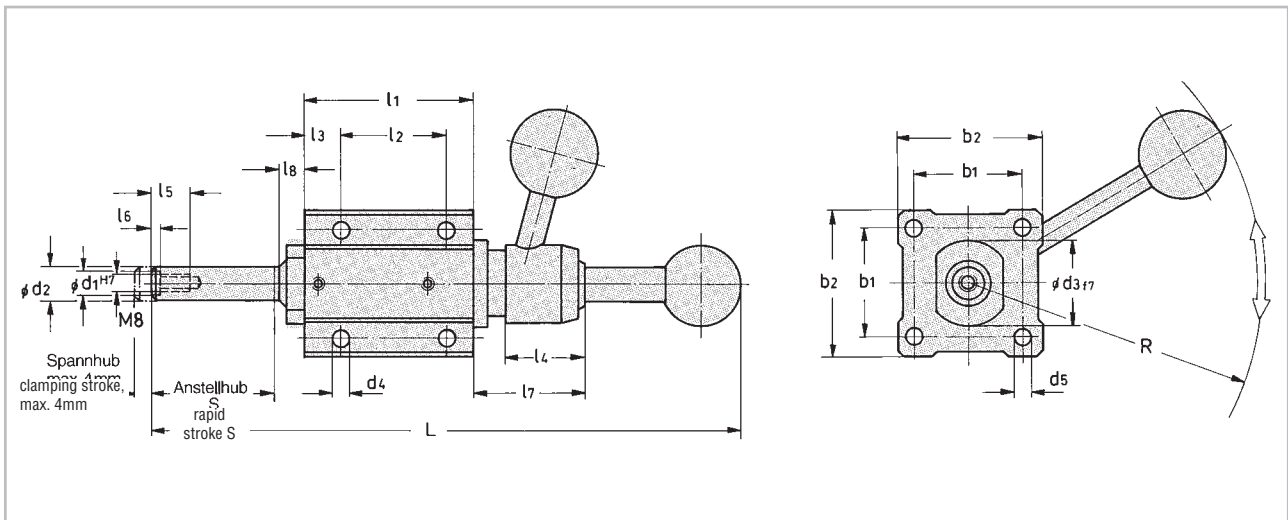
*400 and 500 mm strokes available on request ▲ Available upon request

swivel thrust pad



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

▲ Available upon request



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 ^{H7}	d2 _{h8}	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

▲ Available upon request

* F_s = clamping force at an operating force of 10 daN