

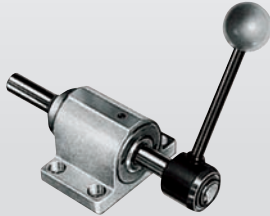
F0 Series

Type of Mounting:

- Foot mount

Type of Actuation:

- Hand wheel or hand lever (one-handed operation)
- Locking lever and Plunger (two-handed operation)



page **5.4**

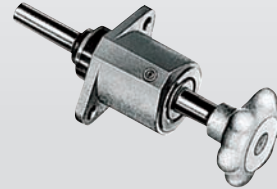
FL Series

Type of Mounting:

- Flange mount

Type of Actuation:

- Locking lever or hand wheel (one-handed operation)
- Locking lever and Plunger (two-handed operation)



page **5.4**

G Series

Type of Mounting:

- Through hole mount








Type of Actuation:

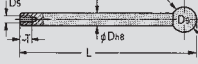
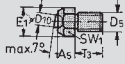
- Locking lever and Plunger (two-handed operation)
- Hand wheel or hand lever (one-handed operation)





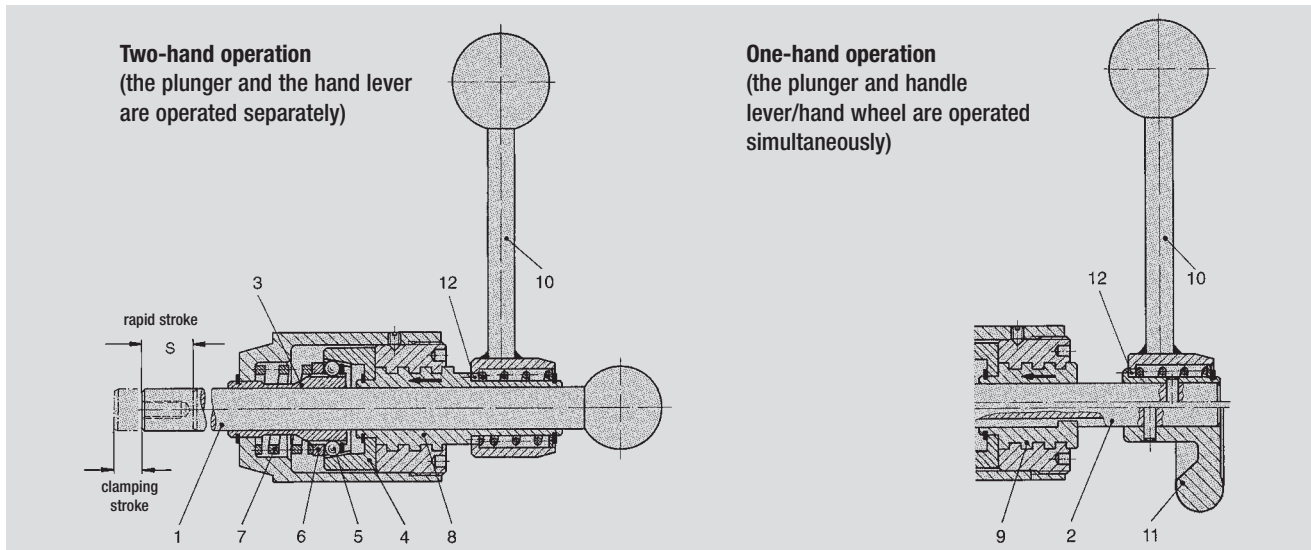
page **5.4**

Variable stroke straight-line action clamps

		Part No.	Holding Capacity max. [lbs]	Page
Flanged base   		F0-082/40	300	5.4
		F0-120/--	600	
		F0-121/45	600	
		F0-122/45	600	
		F0-160/--	2,000	
		F0-161/60	2,000	
		F0-162/60	2,000	
		F0-220/--	4,000	
		F0-221/80	4,000	
	Front flange   		FL-120/--	600
		FL-121/45	600	
		FL-122/45	600	
		FL-160/--	2,000	
		FL-161/60	2,000	
		FL-162/60	2,000	
Threaded mount 		G-082/40	300	
		G-120/--	600	
		G-121/45	600	
		G-122/45	600	

Accessories	Part no.		Page
Plunger 	12/100		5.5
	12/200		
	12/300		
	16/100		
	16/200		
	16/300		
	16/400		
	16/500		
	22/100		
	22/200		
	22/300		
Swivel thrust pad 	K508		5.8
	K612		
	K816		
	K1222		

	Part no.	Holding Capacity max. [lbs]	Page
	F-160	2,000	5.8
	FRL-12		5.9.
	FRL-16		
	FRL-20		
	FRF-12		
	FRF-16		
	FRF-2		



DE-STA-CO's variable stroke straight-line clamps are used in applications where workpiece thicknesses and workpiece tolerances vary. These clamps are suitable for clamping between ribs and hollow spaces difficult to reach.

Compact design and 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

- Foot base (FO Series)
- Flange mount (FL Series)
- Through hole mount (G Series)

Type of operation

- Two hand operation
The hand lever (10) and the plunger (1) are separate. The hand lever is connected to the clamping mechanism. The plunger can be removed from the clamp
- One-hand operation
The hand lever (10) or the hand wheel (11) and the plunger (2) are linked. The plunger is retained within the clamp.

Clamping operation

The plunger (1) or (2) which is guided within the clamp body contacts the workpiece. By rotating the hand lever (10) or the hand wheel (11) clock-wise the clamping stroke, S1 is engaged and the plunger 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 plunger by means of the ball bearings (5) located at the clamping sleeve's perimeter.

Due to the force-locking connection, the plunger rotates and produces the clamping stroke S1. The plunger's rotation may be compensated for by means of a swivel hold-down piece.

The clamping strokes S1 specified in this catalog were measured with no opposing forces present while measurements were taken. When clamping this product against a workpiece, the clamping stroke S1 is reduced by the force-locking connection between the plunger and the workpiece. The straight-action clamp is unlocked by turning the hand lever or the hand wheel counter-clockwise. This method is used 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 ball bearings (5) via the pressure ring (6).

The force-locking connection between the slotted clamping sleeve and the plunger can be moved freely again. Straight-line clamps which are two-hand operated can also be applied to pull actions when the plunger is inserted in the clamp's housing in the opposite direction. On the one hand operated clamp, the rotation inducing the clamping stroke S1 is directly transmitted from the plunger (2) or the hand wheel to the threaded sleeve (9) via a groovespring connection. The clamping and unclamping operations are executed in the same way as described before.

Handling

To change the position of the handle while in the clamped or the unclamped position, pull the hand lever off its spline (12) and set it in the desired position.

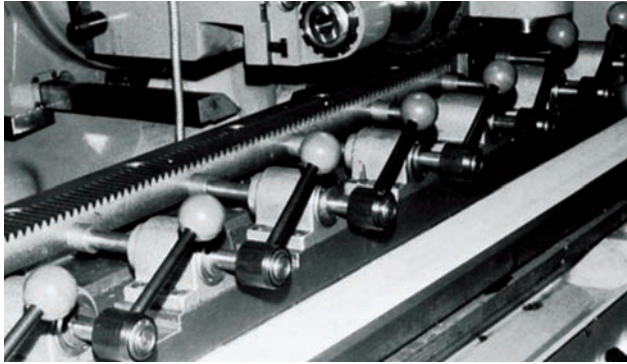
Important

- The holding forces specified in the catalog refer to the maximum load exerted on the clamp by counter-forces. For details concerning the clamping force FS exerted on the workpiece by the clamp and depending on the operation force FB (manual force), please see the chart on the next page.

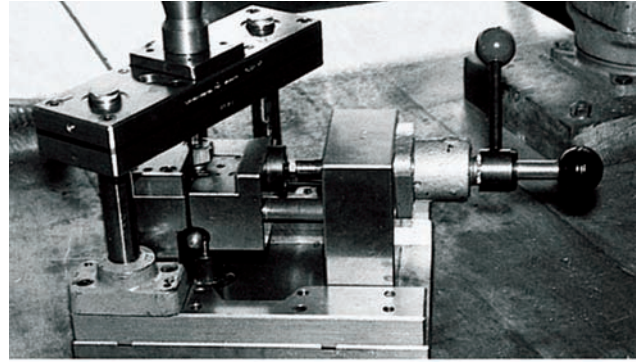
The clamping force is proportional to the operation force. **The achieved clamping force must not exceed the maximum holding force.**

- 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 plunger in the event of side load.

Variable stroke straight-line action clamps

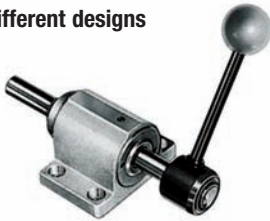


Model FO-161/60 on a milling machine



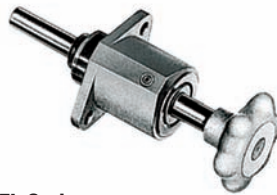
Model FL-160 with plunger 16/100 on a punching fixture

Different designs



FO Series

Mounting type: flange base foot mount
Operating method: one-hand or two-hand operation



FL Series

Mounting type: front flange mount
Operating method: one-hand or two-hand operation



G Series

Mounting type: through hole mount
Operating method: one-hand or two-hand operation

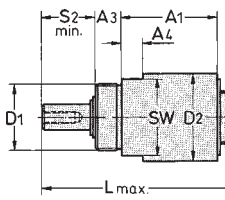
Product list and technical data

Mounting type	Operating method			Model-no.	Max. holding capacity	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 S_1	Weight –
	Two-hand operation	One-hand operation	One-hand operation			F_B	F_s			
	Plunger and hand lever	Hand lever	Hand wheel	¹⁾ Plunger order separately; see page 5.5	[lbs.]	[lbs.]	[lbs.]	[mm]	[mm]	[lbs]
Foot mount			■	FO-082/40	300		100	40	2,5	0.72
	■			FO-120/-- ¹⁾	600		400	100, 200, 300	3	1.19
		■		FO-121/45	600		400	45	3	1.47
			■	FO-122/45	600		100	45	3	1.34
	■			FO-160/-- ¹⁾	2,000		500	100, 200, 300	4	2.73
		■		FO-161/160	2,000		500	60	4	3.40
			■	FO-162/60	2,000		150	60	4	3.15
	■			FO-220/-- ¹⁾ ▲	4,000		600	100, 200, 300	4	5.85
Flange mount			■	FO-221/80 ▲	4,000		600	80	4	7.46
	■			FL-120/-- ¹⁾	600	20	400	100, 200, 300	3	1.07
		■		FL-121/45	600		400	45	3	1.34
			■	FL-122/45 ▲	600		100	45	3	1.21
	■			FL-160/-- ¹⁾	2,000		500	100, 200, 300	4	2.49
		■		FL-161/60	2,000		500	60	4	3.15
			■	FL-162/60 ▲	2,000		150	60	4	2.92
	■			G-082/40	300		100	40	2,5	0.66
Through hole mount	■			G-120/-- ¹⁾	600		400	100, 200, 300	3	1.01
		■		G-121/45	600		400	45	3	1.31
			■	G-122/45 ▲	600		100	45	3	1.18
	■									

▲ Available upon request

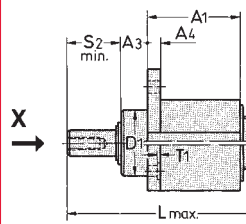
Two-hand operation (the plunger and the hand lever are operated separately)

Through hole mount

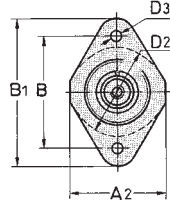


Part no. G-120/--

Flange mount

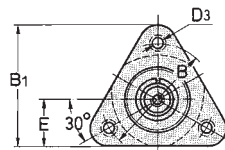


View "X"



Part no. FL-120/--

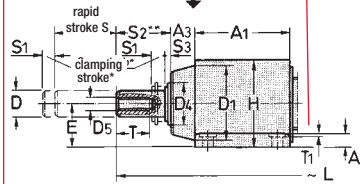
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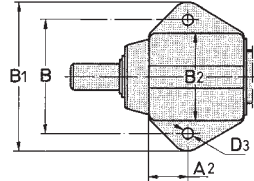
Part no. FL-160/--

Foot mount

*without counter-force effect

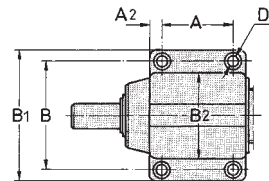


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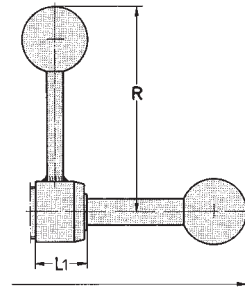


Part no. FO-120/--

View "Y"




Part no. FO-160/--
FO-220/--




Accessories (order separately)

Plunger



Part no.	For rapid stroke S	Weight ~ [lbs.]	For clamps
12/100	100	0.30	FO-120
12/200	200	0.62	FL-120
12/300	300	0.82	G-120
16/100	100	0.88	FO-160
16/200	200	1.10	FL-160
16/300*	300	1.54	
22/100	100	2.20	
22/200	200	2.40	FO-220
22/300	300	3.06	

Swivel thrust pad



Part no.	Thread	Weight ~ [lbs.]
K-612	M6	0.02
K-816	M8	0.03
K-1222	M12	0.08

*400 and 500 mm strokes available on request

Important

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

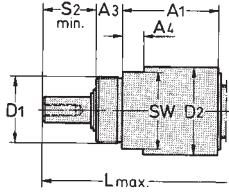
Mounting type	Part no. without plunger	Available rapid strokes S (order plunger separately)	A	A ₁	A ₂	A ₃	A ₄	A ₈	B	B ₁	B ₂	D _{h8}	D ₁	D ₂	D ₃	D ₄
			~	~	~	~	~	~	~	~	~	~	~	~	~	~
Foot mount	FO-120/--	100, 200, 300	-	44	19	12	6,3	8,5	52	68	40	12	35	-	6,5	20
	FO-160/--	100, 200, 300	40	62	11	12	12	10	70	90	52	16	46	-	9	25
	FO-220/--	100, 200, 300	50	75	13	20	15	12	90	115	69	22	60	-	11	36
Flange mount	FL-120--	100, 200, 300	-	44	44	12	6	8,5	52	68	-	12	30 ⁷	40	6,5	20
	FL-160--	100, 200, 300	-	60	-	14	14	10	68	73	-	16	40 ⁷	52	9	25
Through hole mount	G-120/--	100, 200, 300	-	44	-	12	10	8.5	-	-	-	12	M30x1,5	40	-	20

Mounting type	Part no. without plunger	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									
Foot mount	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	40	9,5	35	19,5	71	295	395	495	35	197	3	3	-	17	25	1	18
Flange mount	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
Through hole mount	G-120/--	M6	30	6	-	12,5	-	228	328	428	24	95	2,5	2,5	35	11	12	-	12

Variable stroke straight-line action clamps

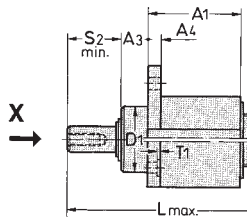
One-hand operation (the plunger and the hand wheel are operated simultaneously)

Through hole mount

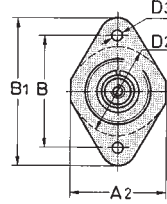


Part no. G-082/40
G-122/45

Flange mount

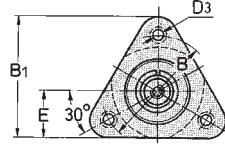


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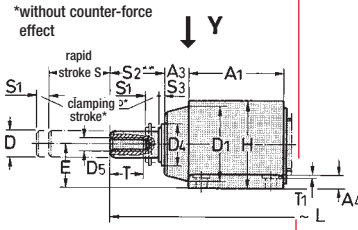
Part no. FL-122/45

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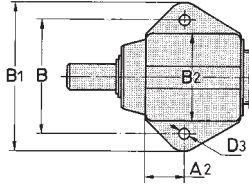


Part no. FL-162/60

Foot mount

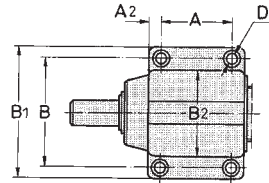


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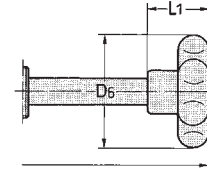


Part no. FO-082/45

View "Y"

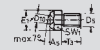


Part no. FO-162/60



Accessories (order separately)

Swivel thrust pad



Part no.	Thread	Weight ~ [lbs.]
K-508	M5	0.01
K-612	M6	0.02
K-816	M8	0.03
K-1222	M12	0.08

Important

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

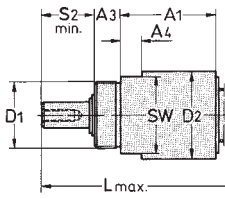
Mounting type	Part no. with plunger	A	A ₁	A ₂	A ₃	A ₄	A ₅	B	B ₁	B ₂	D _{h8}	D ₁	D ₂	D ₃	D ₄
Foot mount	FO-082/40	-	37	15,3	10	5	6	44	56	35	8	30	-	4,5	16
	FO-122/45	-	44	19	12	6,3	8,5	52	68	40	12	35	-	6,5	20
	FO-162/60	40	62	11	12	12	10	70	90	52	16	46	-	9	25
Flange mount	FL-122/45	-	44	44	12	6	85	52	68	-	12	30 ⁷	40	6,5	20
	FL-162/60	-	60	-	14	14	10	68	73	-	16	40 ⁷	52	9	25
Through hole mount	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 plunger	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
Foot mount	FO-082/40	M5	40	5	18	9,2	36	128	26	9	2,5	-	8	8	-	8
	FO-122-45	M6	75	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
Flange mount	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
Through hole mount	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

Variable stroke straight-line action clamps

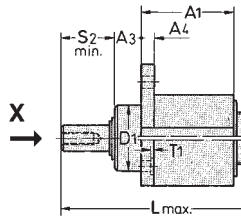
One-hand operation (the plunger and the hand lever are operated simultaneously)

Through hole mount

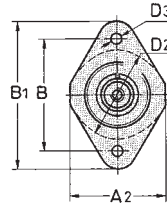


Part no. G-121/45

Flange mount

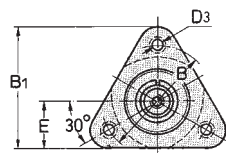


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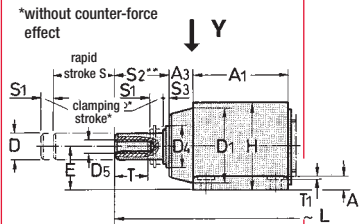
Part no. FL-121/45

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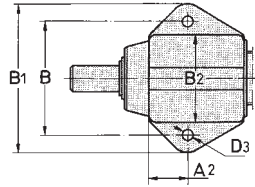


Part no. FL-161/60

Foot mount

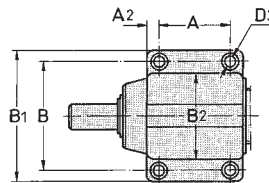


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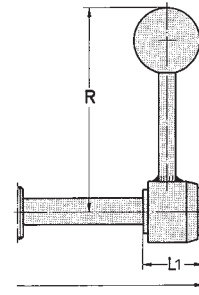


Part no. FO-121/45

View "Y"



Part no. FO-161/60
FO-221/80



Important

The straight-line clamps are designed only for axial load. In case of side load, we recommend an additional radial support of the plunger.

Accessories (order separately)

Swivel thrust pad



Part no.	Thread	Weight ~ [lbs.]
K-612	M6	0.02
K-816	M8	0.03
K-1222	M12	0.08

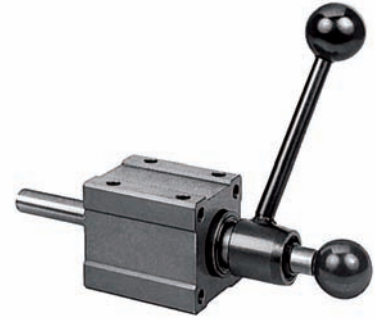
Mounting type	Part no. with plunger	A	A ₁	A ₂	A ₃	A ₄	A ₅	B	B ₁	B ₂	D _{h8}	D ₁	D ₂	D ₃	D ₄
	FO-121/45	-	44	19	12	6,3	8,5	52	68	40	12	35	-	6,5	20
	FO-161/60	40	62	11	12	12	10	70	90	52	16	46	-	9	25
	FO-221/80	50	75	13	20	15	12	90	115	69	22	60	-	11	36
	FL-121/45	-	44	44	12	6	8,5	52	68	-	12	30 ⁷	40	6,5	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 plunger	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-162/60	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

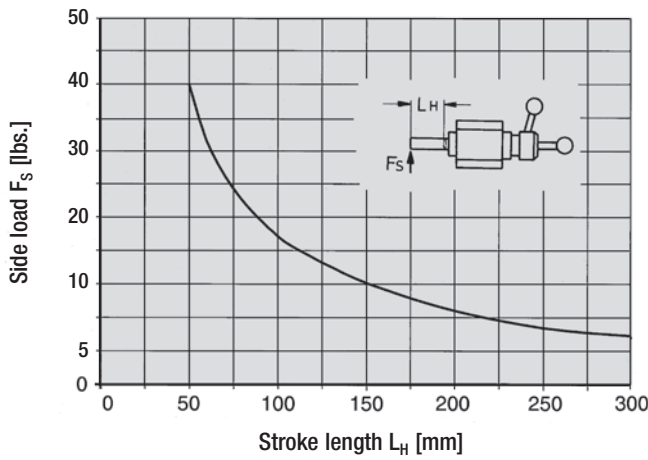
Variable stroke straight-line action clamps

Technical features

- High holding capacity of 2,000 lbs.
- High side load capacity
- Plunger guide
- Wiper ring avoiding contamination of clamping mechanism
- Block style base provides for variable mounting
- Low weight due to the aluminium housing
- 50 mm horizontal and vertical hole pattern



Allowable side load F_s depending on the stroke length L_H



Accessories (order separately)

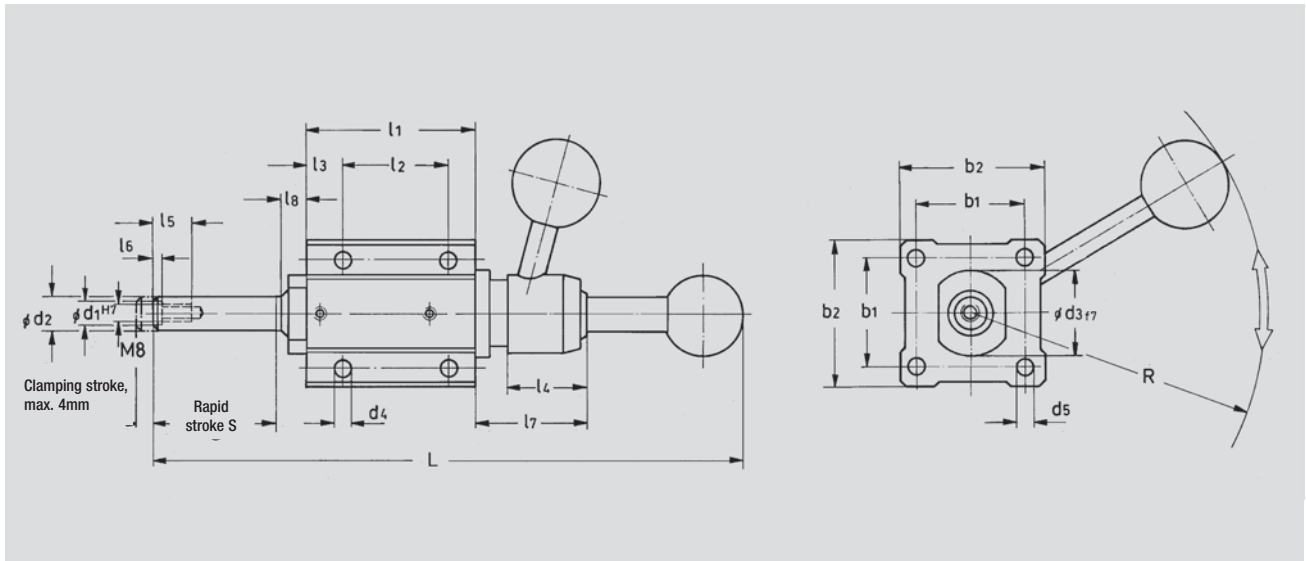
Plunger

Part no.	For rapid strokes S	D _{h8}	D5	D9	L	T	Weight ~[lbs.]
16/100	100	16	M8	35	280	15	0.90
16/200	200	16	M8	35	380	15	1.10
16/300*	300	16	M8	35	480	15	1.54

*400 and 500 mm strokes available upon request

Swivel thrust pad

Part no.	A5	D5	D10	E1	T3	SW1	Weight ~[lbs.]



Model no. without plunger	Max. holding capacity [lbs.]	F_s^* [lbs.]	b1	b2	~ L													R	Weight ~ [lbs.]			
					For rapid strokes:			l1	l2	l3	l4	l5	l6	l7	l8	d1 ^{H7}	d2 _{h8}			d3	d4	d5
					100	200	300															
F-160/--	2,000	100	50	68	250	350	451	80	50	18	35	20	2	50	12	10	16	40	8,3	8,5	165	3.30

* F_s = exerting force at an operating force of 20 lbs.

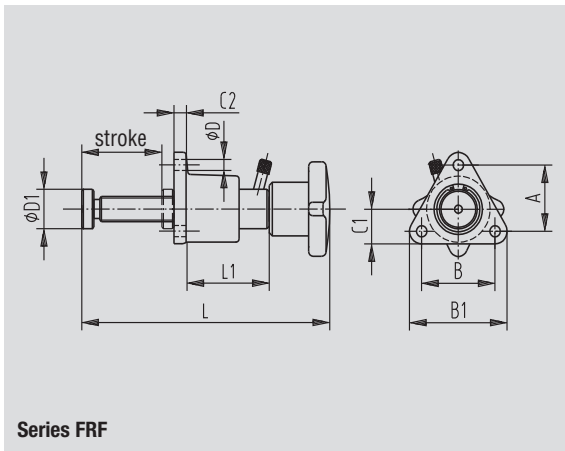


Models FRF-12, FRF-16, FRF-20, FRL-12, FRL-16

Application areas

These new quick-acting Ram Lock clamps are ideal for bridging of different workpiece thicknesses and can be front or base mounted. Each version offers high holding forces and is available in three different maximum stroke lengths. The clamp's unique design allows "fine" clamping force adjustments once the locking lever is activated.

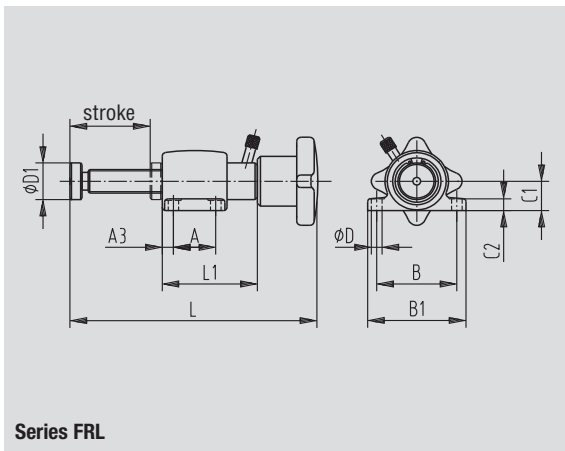
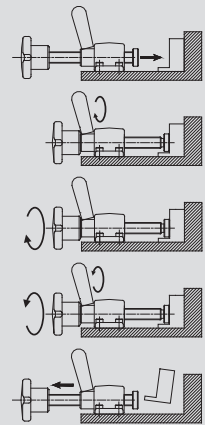
Model no.	Holding Capacity ↔ [lbs.]	Plunger Travel [lbs.]	
FRL-12	5,500	0-3 3/8	1.00
FRL-16	11,000	0-5 5/16	1.50
FRF-12	5,500	0-3 3/8	1.00
FRF-16	11,000	0-5 5/16	1.50



Series FRF

To operate:

1. Slide spindle bar forward to contact the workpiece.
2. Turn the locking lever clockwise to engage the locking mechanism.
3. Turn knob handle to "fine" to adjust the clamping force.
4. After operation is finished, turn the locking lever counter-clockwise to disengage locking mechanism.



Series FRL



Series FRF



Series FRL

Model no.	A	A3	B	B1	C1	C2	øDmm	øD1	L	L1
FRL-12	0.79	0.24	1.77	2.17	0.63	0.24	5.5	0.75	6.46	1.69
FRL-16	1.57	0.23	2.09	2.56	0.79	0.31	7.0	0.98	9.25	2.24
FRF-12	1.30	-	1.50	1.97	0.67	0.24	5.5	0.75	6.46	1.69
FRF-16	1.65	-	1.91	2.54	0.87	0.31	7.0	0.98	9.25	2.24

