Linear actuator Mini

General

Linear actuators from Framo are based on the economic **mini**mum principle:

By using powerful coaxial motors the requested stroke force can be achieved with a minimum use of space. The Mini is therefore especially usefull for operation with minimum space requirements.

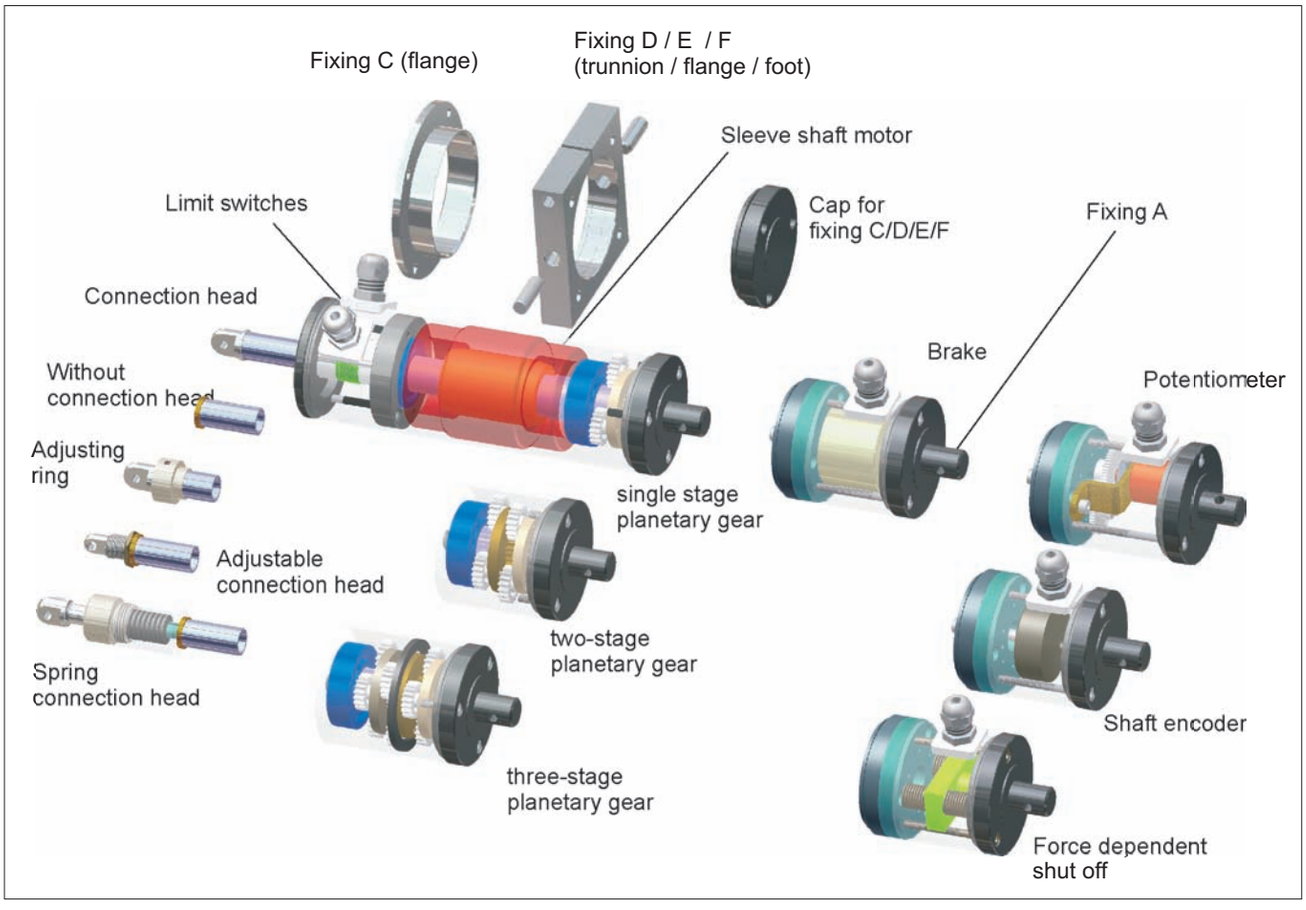
A wide range of options allows for the individual adaptation on almost every application from the food industry to the building envelopes.

There are many customized adaptions possible.

Contact us for further information!

Further options:

- Wide selection of AC- and DC-motors available
- Custom stroke lengths
- Water jet protected (IP65)
- Lubricating nipple in connection head
- Customized adaptations



Application examples

Automotive

The tool infeed on a rim production machine is done by a Mini2.

Building envelope design

The Mini 01, for instance, is used for climatisation of buildings with large glass surfaces.

Benefits at a glance

Economically

- Low costs of operation
- Easy installation and start-up
- Low maintenance
- Long life cycle
- Integrated options
- 5 sizes for every task

Reliability of operation

- Life time lubrication
- Reliable under extreme conditions like heat, dust, moisture
- Force dependend shut off
- Integrated safety switch
- Thermally protected motor

Design freedom

- Various types of mounting and connection heads
- Manifold options in modular design
- Reliable integration in existing control procedures
- High power density
- Water jet protected (IP65)
- Protection against corrosion by stainless-steel
- Reproducible positioning accuracy
- Large variety of three phase, alternating and direct current motors
- Customizations possible
- Special stroke lengths available on request

Crane construction

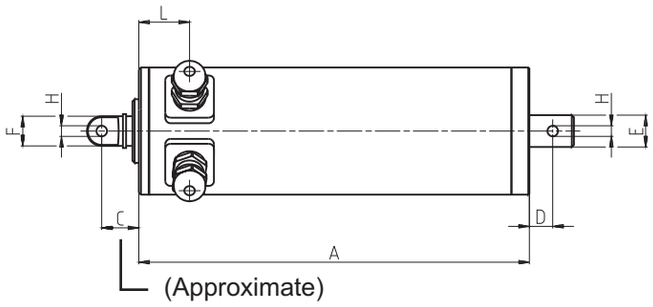
In this application a Mini 0 unlocks the wind-release of a crane.

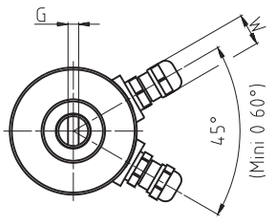
Material handling

A Mini 2 swivels the retainer for destacking glass sheets.

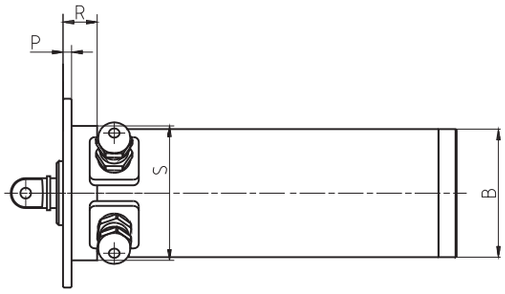
Dimensions (for DC on request) **/ fixing versions**

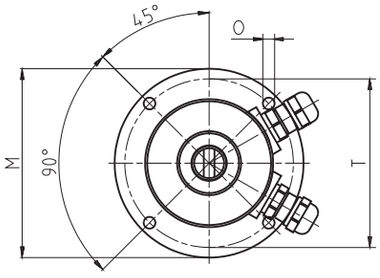
Version A





Version C

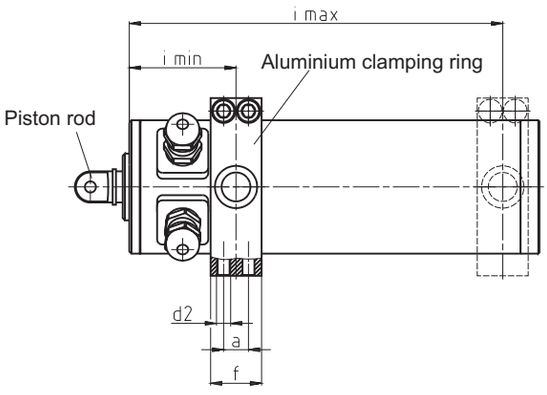


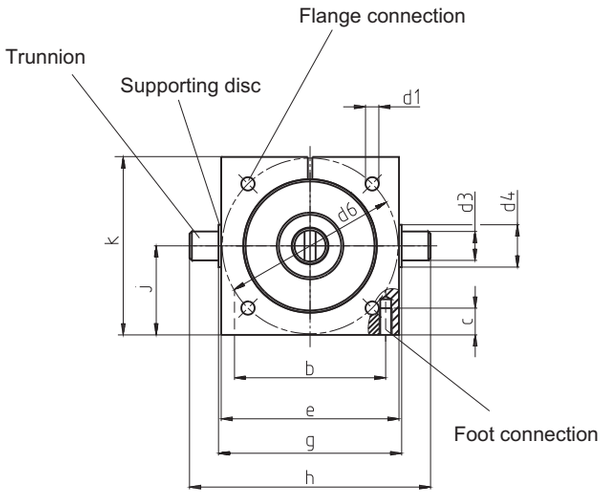


Type	Basic stroke*	A* 1-stage	2-stage	3-stage	B	C	D	E	F	G	H H9	L	M	O	P	R	S	T	W
Mini 0	100	186	198	210	Ø60	21 ±0,5	10	Ø15	Ø14	5	Ø5	24	89	Ø5,5	4	16	Ø63	Ø79	PG9
Mini 01	100	210	227	242	Ø80	21,5 ±0,7	12	Ø20	Ø16	8	Ø8	28	110	Ø6,5	5	30	Ø82	Ø100	PG9
Mini 1	150	279	299	319	Ø95	25,5 ±0,7	16	Ø20	Ø20	8	Ø8	28	130	Ø8,5	6	30	Ø100	Ø115	PG11
Mini 2	175	300	324	348	Ø115	37,5 ±1	22	40x14	Ø28	14	Ø14	29	165	Ø10,5	10	30	Ø122	Ø145	PG11
Mini 3	175	373	408	443	Ø128	53 ±1,3	35	50x25	Ø40	20	Ø20	39	185	Ø13	12	35	Ø134	Ø161	PG11

* Measurement A is based on the basic stroke. For longer strokes measurement A varies according to the extension of the stroke length.
All measurements in mm.

Version D: Trunnion
Version E: Flange mounting
Version F: Foot mounting





	i min.	i max.	e	k	Trunnion h	j	d3 h7	d4	g	Flange d1	d6	Base d2	a	b	c	f
Mini 0	48	68 + Hub	78	80	108,4	40	8	14	82,4	6	79	M6	0	69	12	16
Mini 01	54	88 + Hub	100	110	130,4	50	10	16	102,4	7	100	M8	0	87	16	20
Mini 1	59	104 + Hub	128	130	163	65	15	21	133	9,5	115	M12	0	104	24	30
Mini 2	66	90 + Hub	148	150	197	75	25	35	154	11,5	145	M12	21	127	24	43
Mini 3	85	154 + Hub	178	180	236	90	35	45	185	13,5	161	M20	0	149	40	60

All measurements in mm.

Performance table (for DC on request)

Size	Speed n1 [min^{-1}]	Motor power P1 [kW]	Duty cycle %	Planetary gear stages	Trapezoidal-thread [mm]	Stroke speed [mm/s]	Maximum stroke force [N] at stroke length [mm] 100	150	175	200	250 / 300	350 / 400	450 / 500	550 / 600	700 / 750	800
Mini 0	1200	0,030	15	1:1	10x6 So	120	110	110		110	110					
110V / 230V AC 24 V DC	1200	0,030	15	1:1	10x3 Sd	60	155	155		155	155					
	1200	0,030	15	1:1	10x2 Sd	40	175	175		175	175					
	1200	0,030	15	1-st.	10x6 So	30	450	450		450	450					
	1200	0,030	15	1-st.	10x3 Sd	15	600	600		600	600					
	1200	0,030	15	1-st.	10x2 Sd	10	600	600		600	600					
	1200	0,030	15	2-st.	10x6 So	8	1000	1000		1000	600					
	1200	0,015	30-40	2-st.	10x3 Sd	4	1000	1000		1000	600					
	1200	0,015	30-40	2-st.	10x2 Sd	2,7	1000	1000		1000	600					
	1200	0,015	50-60	3-st.	10x6 So	2	1000	1000		1000	600					
	1200	0,015	50-60	3-st.	10x3 Sd	1	1000	1000		1000	600					
	1200	0,015	50-60	3-st.	10x2 Sd	0,7	1000	1000		1000	600					
Mini 01	1300	0,05	15	1:1	10x6 So	130	200	200		200	200	200	200			
3x 230V / 400V AC 110V / 230V AC	1300	0,05	15	1:1	10x3 Sd	65	280	280		280	280	280	220			
	1300	0,05	15	1:1	10x2 Sd	43	310	310		310	310	310	310			
	1300	0,05	15	1-st.	10x6 So	30	700	700		700	540	320	220			
	1300	0,05	15	1-st.	10x3 Sd	15	1000	1000		1000	540	320	220			
	1300	0,05	15	1-st.	10x2 Sd	10	1000	1000		1000	1000	660	440			
	1300	0,032	40	2-st.	10x6 So	7	1500	1500		1000	540	320	220			
	1300	0,032	40	2-st.	10x3 Sd	3	1500	1500		1000	540	320	220			
	1300	0,022	50-60	2-st.	10x2 Sd	2	1500	1500		1500	1000	660	440			
	1300	0,022	50-60	3-st.	10x6 So	1,5	1600	1600		1000	540	320	220			
	1300	0,022	50-60	3-st.	10x3 Sd	1	1600	1600		1000	540	320	220			
	1300	0,022	50-60	3-st.	10x2 Sd	0,5	1600	1600		1600	1000	660	440			
Mini 1	1360	0,18	15	1:1	12x6 So	136		600		600	600	600	600	440		
3x 230V / 400V AC 110V / 230V AC	1360	0,18	15	1:1	12x3 Sd	68		850		850	850	850	620	440		
	1360	0,18	15	1:1	12x2 Sd	45		900		900	900	900	900	780		
	1360	0,18	15	1-st.	12x6 So	32		2200		2200	1560	940	620	440		
	1360	0,18	15	1-st.	12x4 Ss	21		2500		2500	2500	1640	1080	780		
	1360	0,18	15	1-st.	12x3 Sd	16		2510		2510	1560	940	620	440		
	1360	0,18	15	1-st.	12x2 Sd	10,5		3300		3300	2740	1640	1080	780		
	1360	0,11	40	2-st.	12x6 So	7		3500		3000	1560	940	620	440		
	1360	0,11	40	2-st.	12x4 Ss	5		3500		3500	2740	1640	1080	780		
	1360	0,11	40	2-st.	12x2 Sd	2,5		3500		3500	2740	1640	1080	780		
	1360	0,06	50-60	3-st.	12x4 Ss	1		3500		3500	2740	1640	1080	780		
	1360	0,06	50-60	3-st.	12x2 Sd	0,5		3500		3500	2740	1640	1080	780		
Mini 2	1360	0,5	15	1:1	18x8 So	181			1200		1200	1200	1200	1200	1200	1200
3x 230V / 400V AC 110V / 230V AC	1360	0,5	15	1:1	18x4 Ss	91			1600		1600	1600	1600	1600	1600	1540
	1360	0,5	15	1:1	18x3 Sd	68			1650		1650	1650	1650	1650	1650	1650
	1360	0,5	15	1-st.	18x8 So	49			3800		3800	3800	3680	2640	1980	1540
	1360	0,5	15	1-st.	18x4 Ss	24,5			5000		5000	5000	3680	2640	1980	1540
	1360	0,5	15	1-st.	18x3 Sd	18			5300		5300	5300	5300	3780	2840	2220
	1360	0,5	15	2-st.	18x8 So	13			10000		9080	5500	3680	2640	1980	1540
	1360	0,3	40	2-st.	18x4 Ss	6			10000		9080	5500	3680	2640	1980	1540
	1360	0,3	40	2-st.	18x3 Sd	5			10000		10000	7900	5280	3780	2840	2220
	1360	0,15	50-60	3-st.	18x4 Ss	2			14000		9080	5500	3680	2640	1980	1540
	1360	0,15	50-60	3-st.	18x3 Sd	1,5			14000		12000	7900	5280	3780	2840	2220
Mini 3	1400	1,5	15	1:1	28x5 Ss	117			2650		2650	2650	2650	2650	2650	2650
3x 230V / 400V AC	1400	1,5	15	1:1	28x3 Sd	70			3500		3500	3500	3500	3500	3500	3500
	1400	1,5	15	1-st.	28x8 Ss	47			8100		8100	8100	8100	8100	5560	3660
	1400	1,5	15	1-st.	28x5 Sd	29			8900		8900	8900	8900	8900	8900	7740
	1400	1,5	15	1-st.	28x3 Sd	17,5			9900		9900	9900	9900	9900	9900	9900
	1400	1,5	15	2-st.	28x8 Ss	12			20000		20000	19400	13120	9440	5560	3660
	1400	1,5	15	2-st.	28x5 Sd	7,3			20000		20000	20000	20000	20000	11780	7740
	1400	0,75	40	2-st.	28x3 Sd	4,4			20000		20000	20000	20000	20000	18100	11900
	1400	0,5	50-60	3-st.	28x8 Ss	2,9			26000		26000	19400	13120	9440	5560	3660
	1400	0,5	50-60	3-st.	28x5 Sd	1,8			26000		26000	26000	20000	20000	11780	7740
	1400	0,5	50-60	3-st.	28x3 Sd	1,1			26000		26000	26000	26000	20000	18100	11900

Starting at stroke speed of 20mm/sec. a brake is requested.

Duty ratio applies to 10 minutes duty time.

For tensile loading applies the maximum stroke force of the particular stroke speed.

Actuators with single phase motors reach only 60% of the force and motor power of those with 3-phase motors and 15 % stated duty cycle.

The force and motor power stated at 40% and 60% won't change if the actuator is operated at 15% duty cycle.

General information

- Maximum allowable ambient temperature -20 up to +60°C.
- For minus degrees a motor standby heating is required.
- A re-lubrication nipple is recommended for vertical applications.
- The piston rod is not torsion protected.

Ordersample

Type	-	Version	-	stroke force	-	stroke speed	-	stroke length
Mini 2	-	D/A	-	3000	-	10,5	-	175

So = No self-locking

Ss = Static self-locking

Sd = Dynamic self-locking

1-stage = up to 4,3:1

2-stage = from 4,3:1 up to 18,9:1

3-stage = from 18,9:1 up to 82,3:1;