LinClamp/HLGClamp

LinClamp S

HLGClamp

LinClamp SK

LinClamp SA

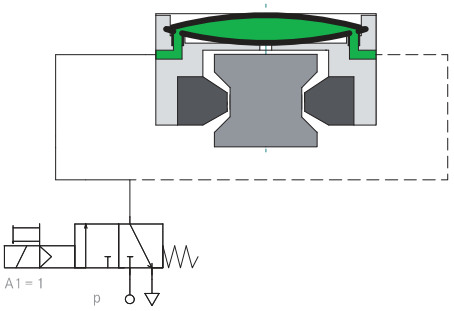
LinClamp A

Advantages

1. Suitable for almost all sizes and manufacturers of linear guide systems as well as for surfaces (LinClamp A)
2. Compact design, suitable for high and low carriages, simple installation
3. Compatible to other rail clamping systems
4. Pneumatic clamping or braking of the highest forces
5. Optimum safety clamping, failure of pneumatics results in clamping
6. Low system costs in comparison to hydraulics and electronic solutions
7. Special linings for clamping without loss of holding power for linear guides with grease lubrication.

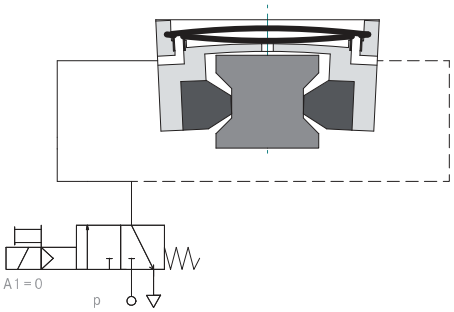
OPERATING PRINCIPLE OF THE LINCLAMP

Function of the LinClamp S/SK



Standard LinClamp rail clamping mechanism Opening with spring actuator

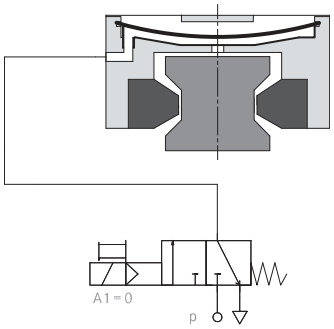
LinClamp S/SK released Compressed air is applied to the chamber between the two spring steel diaphragms. This deforms the spring steel sheets elastically and shortens them in the horizontal direction. The clamp body is deformed in such a way that it contacts at the top with the spring steel sheets and expands at the bottom around the brake shoes. This lifts the brake shoes from the rail and it can be moved freely.



Standard LinClamp rail clamping mechanism Clamping with spring actuator

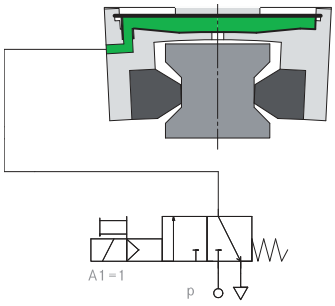
LinClamp S/SK clamped The chamber between the two spring steel diaphragms is vented. The spring steel sheets spring back to their normal position and expand the upper part of the clamping body. However, this expansion at the top simultaneously leads to a narrowing at the bottom. This narrowing causes the brake shoes to press against the rail and to clamp it.

Function of the LinClamp SA



Standard LinClamp rail clamping mechanism Opening with spring actuator

LinClamp SA released Venting causes the sheet to spring back and splays out the clamping body below the slide way. The base plate, which has previously been reformed elastically, now springs back to its starting position. It is thereby narrower above the cross web and wider beneath it. The brake shoes lift off from the rail. Operating pressure 4 to 6 Bar.



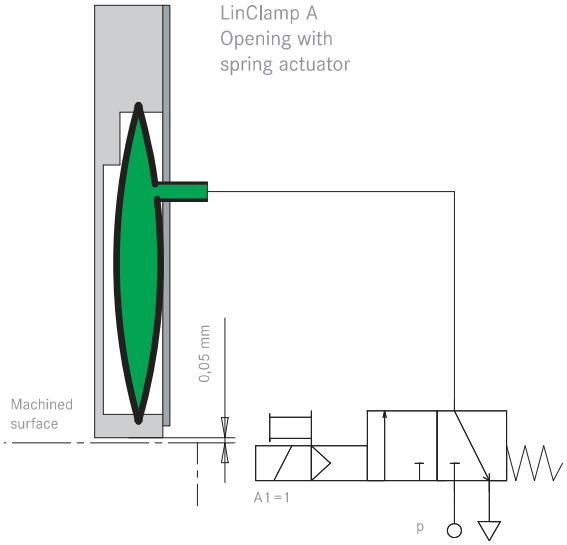
Standard LinClamp rail clamping mechanism Clamping with spring actuator

LinClamp SA clamped To activate the clamping mechanism, the chamber below the spring steel sheet is filled with compressed air. The prestressed spring steel sheet is thereby pressed upwards and simultaneously stretched. Simultaneously, the lower part of the clamping body is narrower over the cross web as pivot point. This presses the brake shoes against the rail.

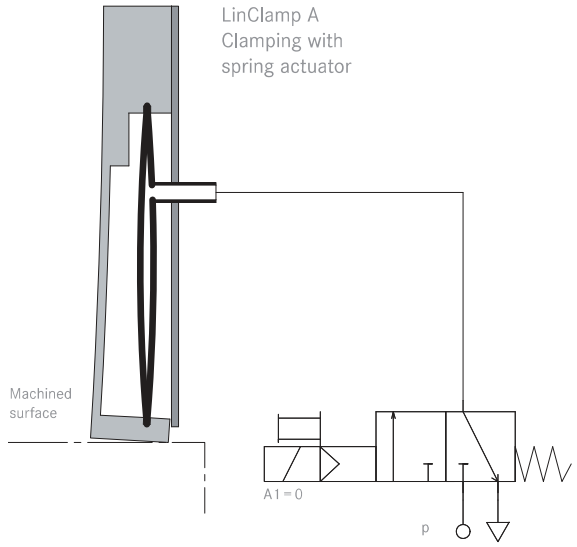
Compressed air

Operating principle of the LinClamp

Function of the LinClamp A



LinClamp A released Compressed air is applied to the chamber between the two spring steel diaphragms. This elastically deforms the spring steel sheets and the entire system contracts. This contraction causes the clamping jaw to lift from the base frame - the carriage can now be moved freely. The gap between the clamping jaws and the frame at an operating pressure of 4 Bar is 0.05 mm. The distance between the carriages and the frame remains constant due to the high accuracy of the precision rails; the gap of 0.05 mm is therefore not a problem.



LinClamp A clamped The chamber between the two spring steel diaphragms is vented. The energy stored in the spring steel sheets causes the clamping element to expand towards the machine frame. When the clamping jaws touch the machine frame, a large part of the energy is still within the spring actuator - the carriage is clamped.

Compressed air

RESEARCH RESULTS

Research results for pneumatically operated brake systems

Within the scope of a research project carried out by the VDW/VDMA (German Machinery Plant Manufacturer's Association), measurements were carried out at the Institut für Fertigungstechnik und Werkzeugmaschinen (IWF) at Hanover University, Germany over the course of two years to determine the braking distance of LinClamp brake systems using sintered metal in comparison to alternative products.

Comparative test of the braking distance

Test configuration
Institut für Fertigungstechnik und Werkzeugmaschinen (IWF) at Hanover University, Project "Fast braking" of the VDW/VDMA

Test object
LinClamp S 55

Rated values
6 kN holding force per element
Guide rails INA, air pressure min. 5.5 Bar

Measurements carried out
The measurements were made to determine the braking distance in comparison to alternative products

Parameter
60 and 120 m/min at 550 kg to 1550 kg
in 200-kg steps, 50 horizontal measurements,
air pressure 5.5 Bar

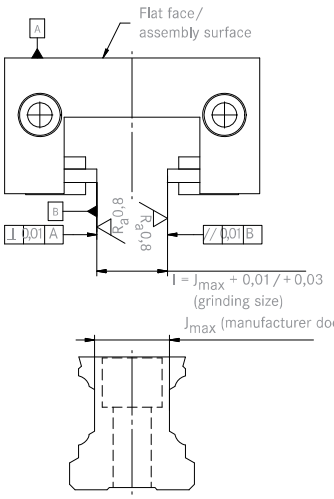
Results

Test object	60 m/min, 1150 kg	60 m/min, 1350 kg	60 m/min, 1550 kg	120 m/min, 550 kg	120 m/min, 750 kg
Unit	[mm]	[mm]	[mm]	[mm]	[mm]
LinClamp S 55	62,7	65,2	69,9	121,8	144,5
Clamping alternative 1	66,9	81,2	89,3	151,4	179,9
Clamping alternative 2	87,9	96,2	101,9	145,8	173,4

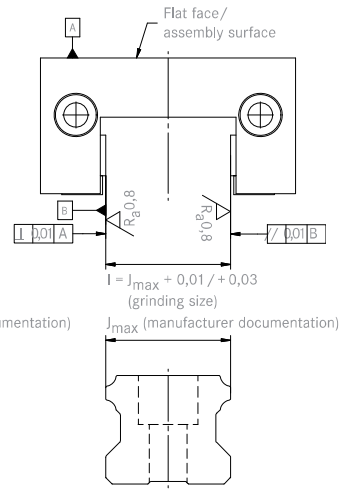
Features of LinClamp

Gap width between brake and clamping faces and linear guide rails

Example: Clamping in the middle area of a linear guide rail



Example: Clamping in the upper area of a linear guide rail



The inner dimension I between the faces of each LinClamp is polished to an exact value. This is always 0.01 mm to 0.03 mm larger than the maximum size J_{max} from the manufacturer documentation of the respective linear guide rail (refer to the diagram). The greatest possible holding force is at J_{max}. In unfavourable cases, there are resulting losses of holding force of up to 30% (refer to the table).

Air gap bellows/linear guide rail (mm)	Loss in holding force (%)
0,01	5
0,03	10
0,05	20
0,07	30

Clamping

Braking

All S, SK, and SA type LinClamps can be used both as brake and clamping elements.
Use as brake: Sintered metal brake lining.
Use as clamp: Clamp linings made of tool steel.

Mounting of the carriages

high

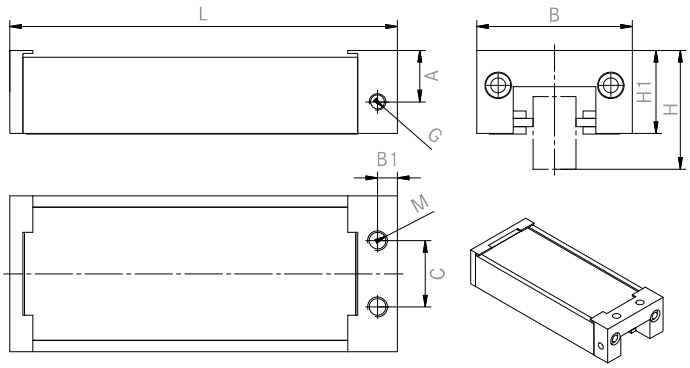
low

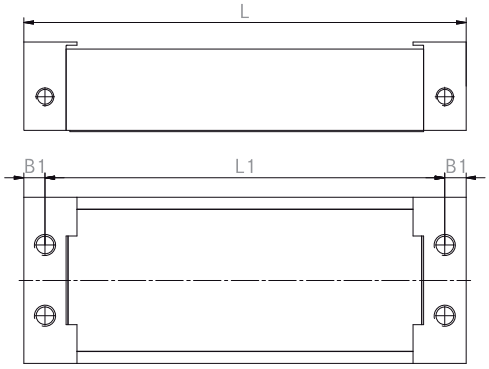
Comparison of higher/lower runner block LinClamp S:
In accordance to the configuration of the linear guide used, you can select between a high or a low fixing element.

TECHNICAL DATA

Technical data of the LinClamp S

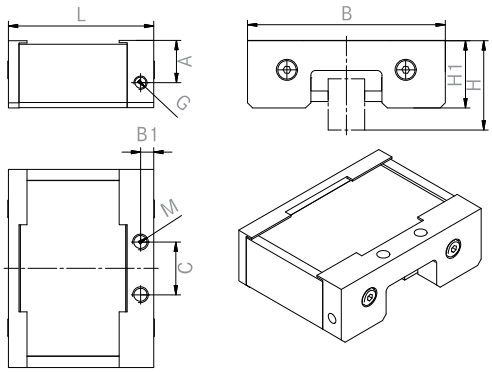
	2 fixing holes	4 fixing holes			Low carriage			High carriage									
Rail size	L	L	L1	B	H	H1	A	H	H1	A	B1	C	G	M	Holding force at 6 Bar	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			[N]	[N]	[kg]
20	97,5	105,5	93,2	43	30	19,5	13,5	-	-	-	6,0	15	M5	M5	900	540	0,32
25	117,5	125,5	113,0	47	36	25,0	15,5	40	29,0	19,5	6,0	20	M5	M6	1200	780	0,50
30	126,5	141,5	121,0	59	42	29,5	17,0	45	32,5	20,0	10,0	24	M5	M8	1800	1100	0,90
35	156,5	171,5	151,2	69	48	35,0	22,5	55	42,0	29,5	10,0	24	G1/8	M8	2800	1800	1,26
45	176,5	191,5	171,2	80	60	42,0	26,5	70	52,0	36,5	10,0	26	G1/8	M10	4000	2400	2,30
55	202,5	221,5	196,2	98	70	49,0	28,0	80	59,0	38,0	12,5	30	G1/8	M12	6000	3600	3,90
65	259,5	281,5	251,2	120	90	64,0	38,0	100	74,0	48,0	15,0	40	G1/8	M12	10000	6000	5,00

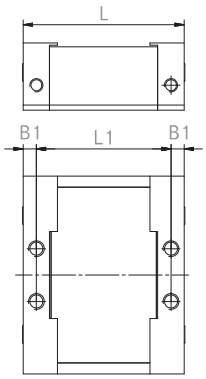




Technical data of the LinClamp SK

	2 fixing holes	4 fixing holes			Low carriage			High carriage									
Rail size	L	L	L1	B	H	H1	A	H	H1	A	B1	C	G	M	Holding force at 6 Bar	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			[N]	[N]	[kg]
15	55,5	61,5	51,5	45	24	18,0	14,0	-	-	14,0	5,00	15	M5	M4	450	300	0,50
20	55,5	61,5	51,5	54	30	22,0	16,0	-	-	16,0	5,00	20	M5	M6	650	430	0,60
25	55,5	61,5	51,5	75	36	25,5	16,0	40	29,5	16,0	5,00	20	M5	M6	800	530	0,70
30	67,0	76,5	59,0	82	42	30,0	21,0	45	33	21,0	8,75	22	M5	M8	1150	750	0,90
35	67,0	76,5	59,0	96	48	35,0	21,2	55	42	21,2	8,75	24	G1/8	M8	1250	820	1,27
45	80,0	92,0	72,0	116	60	45,0	27,5	70	55	27,5	10,00	26	G1/8	M10	1500	950	2,00
55	100,0	112,0	92,0	136	70	49,0	30,5	80	59	30,5	10,00	30	G1/8	M10	2100	1300	2,80

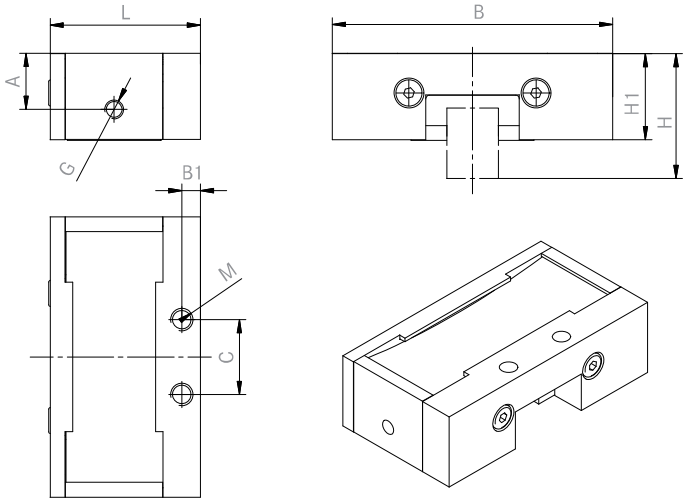




Technical data

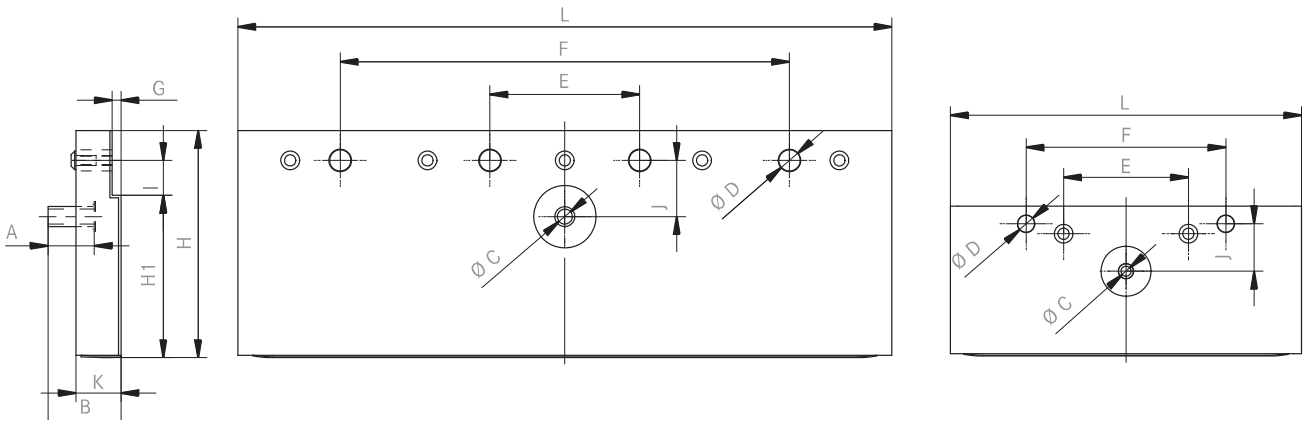
Technical data of the LinClamp SA

	2 fixing holes		Low carriage			High carriage									
Rail size	L	B	H	H1	A	H	H1	A	B1	C	G	M	Holding force at 6 Bar	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[N]	[N]	[kg]
20	40	75	30	23	15	-	-	15	5,00	20	M5	M6	650	390	0,53
25	40	75	36	23	15	40	27	15	5,00	20	M5	M6	800	480	0,53
35	67	96	48	35	20	55	42	20	8,75	24	G1/8	M8	1250	750	1,14



Technical data of the LinClamp A

Rail size	L	B	H	H1	A	C	D	E	F	G	I	J	K	Holding force at 4 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[kg]
25	140	28,15	60	36	17	4	6,8	50	80	3,5	17	19	18	1100	0,53
35	212	29,45	81	55	19	8	6,8	50	150	3,5	14	22	18	2200	1,15



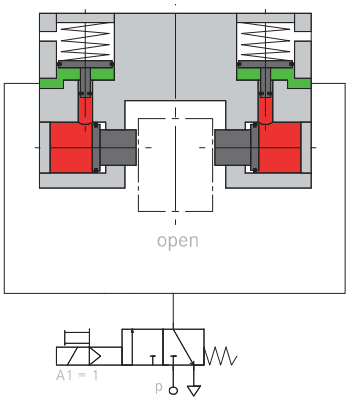
OPERATING PRINCIPLE OF THE HLGCLAMP

The main components of the HLGClamp are the housing, master and slave piston, hydraulic oil with power pack function and pressure springs for energy storage.

Advantages of HLGClamp

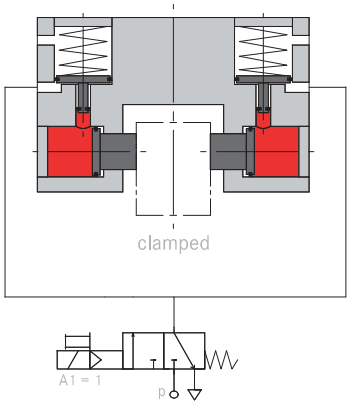
- One-piece, solid housing
- Functional principle applicable for most sizes and manufactures of linear guiding systems
- Compatible with other clamping solutions
- Active and passive clamping and clamping with booster function in one system
- High clamping forces with compact construction
- Low system costs by use of fewer production and standard parts

HLGClamp open



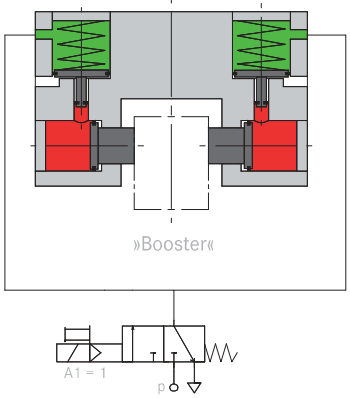
»Open« condition When applying compressed air the master piston compresses the spring. The slave pistons will be retracted, the HLGClamp is open.

HLGClamp clamped



»Clamped« condition Decreasing pressure will release the energy retained in the springs and transmit this energy to the the master pistons. Hereby the slave pistons will be moved toward the linear guidance rail, the HLGClamp is closed.
The power applied by the pressure springs will be magnified in the ratio of master to slave piston.

HLGClamp mit »Booster«

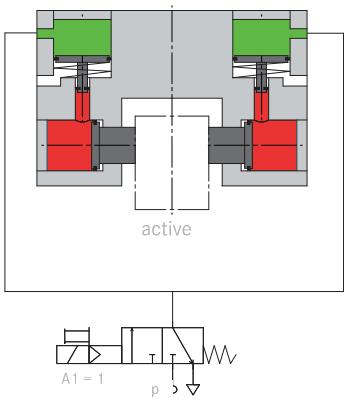


»Booster« condition The master pistons will be actuated with compressed air. Thereby the slave pistons will be moved toward the linear guiding rail, the HLGClamp is closed.
The power applied by the pressure springs will be magnified in the ratio of master to slave piston.
This function will increase the clamping force (booster).

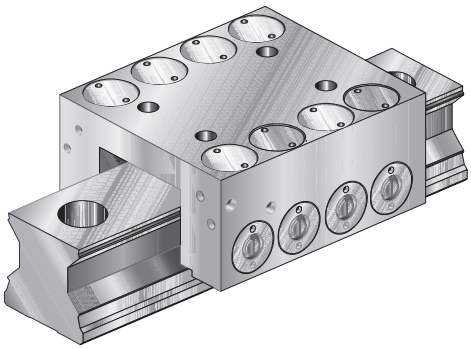
Compressed air

Operating principle of the HLGClamp

HLGClamp active



»Active« condition The master pistons are retracted by spring. The clamping is effected by compressed air.

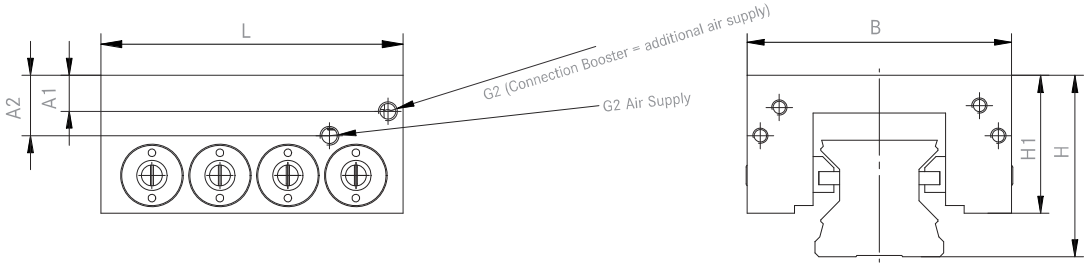


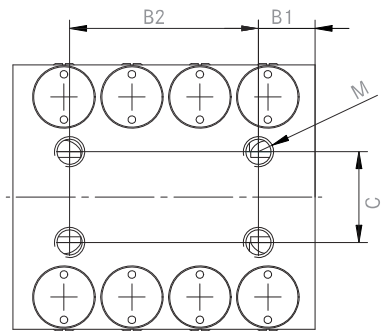
Technical Data

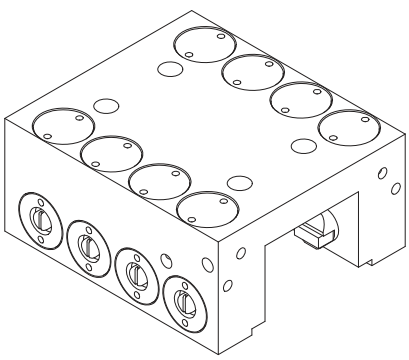
Technical Data HLGClamp

			Low carriage				High carriage										Clamping force		
Rail Size	L	B	H	H1	A1	A2	H	H1	A1	A2	B1	B2	C	G1	G2	M	at 6 Bar	Booster at 6 Bar	Mass
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]				[N]	[N]	[kg]
25	75	46,8	36	27	4,5	10	40	31	8,5	14	20,8	33,4	20	M5	M5	M6	1400*	2500*	2,20
35	80	69,8	48	36,5	5,5	13,9	55	43,5	12,5	20,9	15	50	24	M5	M5	M8	2800*	5200*	2,78
Special design for shaft guiding Ø20	30	80	85	70	15	31,5	-	-	-	-	6	18	18	M5	M5	M6	650	1200	0,96

* Preliminary Data







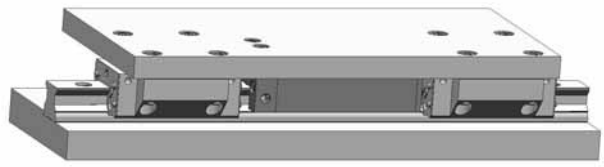
RECOMMENDATIONS/INSTALLATION/WARRANTY

General

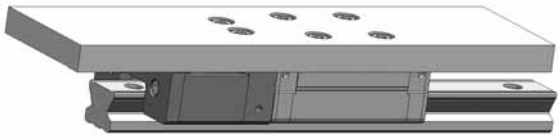
- To be able to transmit the indicated holding forces, the connection to the carriage(s) of the linear guide system used should be as rigid as possible.
- The mounting surface of the LinClamp is always at the same height as the mounting surfaces of the carriages (low or high) used in the linear guide due to the use of high or low fixing elements. Special heights of LinClamp as well as models adapted to lower rail sizes can be delivered on request.
- The mounting surface for fixing the LinClamp must be perfectly machined geometrically and must be flat.
- Check the air supply, line lengths and feeds and both check and test the valve selection.
- Braking element (brake linings) that are greased achieve approx. 60% of the holding forces.
- Clamping elements (steel linings) that are greased achieve 100% of the holding forces.
- If the combination of tolerances is unfavourable then there is a potential loss of holding force of up to 30% (due to the system).

Installation and assembly

- Air Pressure is applied to the LinClamp and it is opened (Type S, SK) or it is pushed over the rail without air pressure (Type SA) and then attached to the mounting surface via the fixing screws. The screws are only tightened by hand at first.
- The air pressure is now reduced to 0 Bar (Type S, SK) or increased to the required pressure (Type SA), thereby activating the clamping mechanism. This procedure centres the LinClamp relative to the rail.
- After the LinClamp has been centred in the intended position, the fixing screws are tightened in several steps up to the defined tightening torque.
- After assembly, a check is made whether the LinClamp can be freely moved over the rail when open. Only in this way is perfect function ensured.



View: LinClamp S in mounting position (suggestion)



View: LinClamp SK in mounting position (suggestion)

Request form

Please send by fax to +49 6182 773-35

Company name:

Address:

Country/Zip/Location:

Contact:

Area/Department:

Telephone: DID:

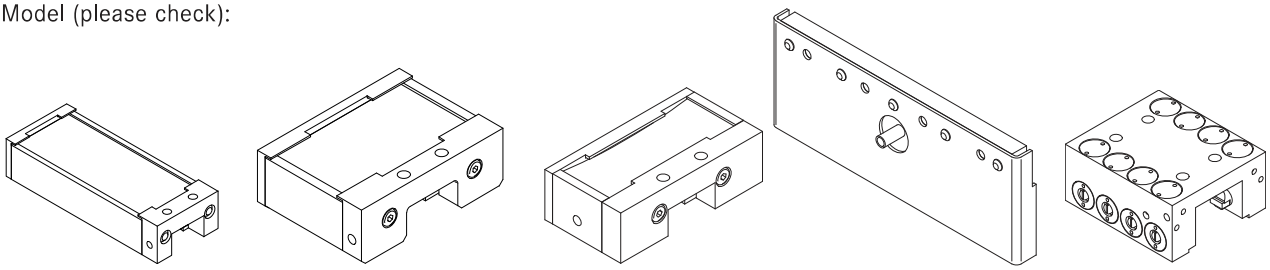
Fax: Direct:

E-Mail:

Internet:

LinClamp systems can be adjusted for various applications. The following criteria decide on the configuration of the system. Please enter the information as completely and detailed as possible.

Model (please check):



☐ LinClamp S ☐ LinClamp SK ☐ LinClamp SA ☐ LinClamp A ☐ HLGClamp

Type designation according to the table: _____

Holding force: _____ N Air pressure: _____ Bar

☐ System should clamp with air
☐ System should open with air

☐ Horizontal operation
☐ Vertical operation
☐ Vertical operation (with free fall)

Use as:
☐ brake system
☐ emergency brake
☐ mechanical fall arrester
☐ clamping system
☐ process terminal

Clamping cycles _____ per _____

Surface operating conditions:
☐ dry ☐ oiled ☐ greased

Exact designation of the oil/grease: _____

Exact designation of linear guidance:

Manufacturer: _____

Type/Size: _____

Carriage type high/low: _____

Required quantity: _____

Date of delivery: _____

☐ Please call back

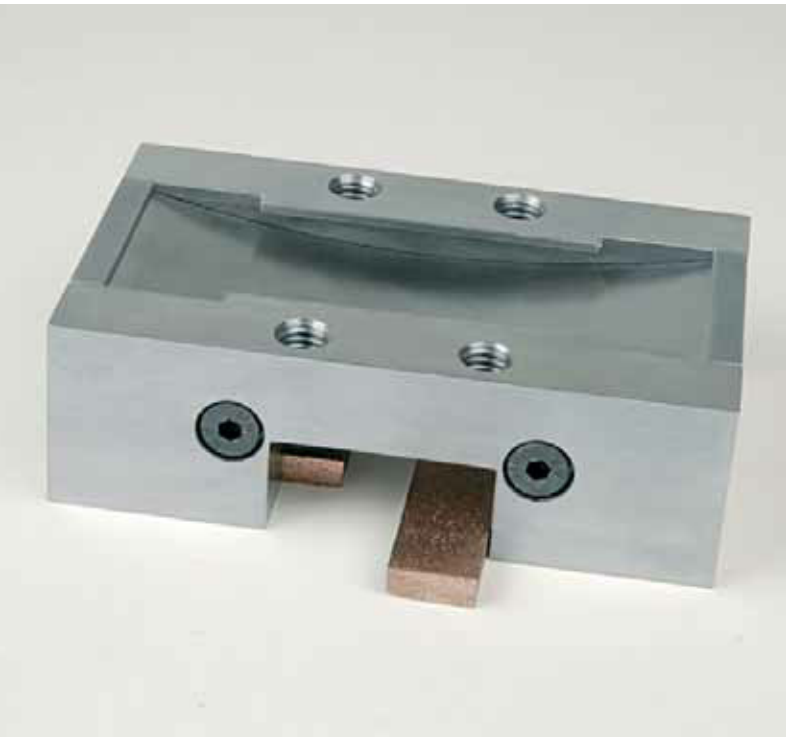
☐ Please visit

Other: _____

You can also download this form at:
www.hema-schutz.de.

HEMA

Clamping systems



LinClamp/HLGClamp