

Pneumatic Actuator

SISTO-LAP

Piston Actuator

Type Series Booklet



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Type Series Booklet SISTO-LAP

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Pneumatic Actuators

Piston Actuators

SISTO-LAP



SISTO-LAP product description

Pneumatic piston actuator designed for valves with a linear stem movement (globe, diaphragm and gate valves).

Suitable for building services, industrial plants, power stations, the food and beverages industries and the chemical industry.

The pneumatic actuators can also be used in potentially explosive atmospheres.

Operating data

- Max. permissible control medium temperature: 80 °C
- Permissible ambient temperature: -10 °C to +80 °C

Permissible control pressure

Piston diameter [mm]	Actuator flange DIN ISO 5210 / DIN 3358	Permissible control pressure $P_{ctrl. perm.}$ [bar]
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ¹⁾	F14	5,5 - 7
D300 ¹⁾	F14	5,5 - 7
500	F25	4-10
D500 ¹⁾	F25	4-7

i Pneumatic actuators from SISTO are suitable for compressed air of purity class 5:4:4 in accordance with ISO 8573-1. If there is a risk of frost, purity class 5:3:4 must be applied to prevent damage caused by icing.

Design details

Design

- Double-acting piston, piston rod extending from one end only, with or without spring
- Flanges to DIN ISO 5210/DIN 3358
- Piston diameters 80 to 300 = F10
- Piston diameters 250 to 300 = F14
- Piston diameter 500 = F25
- Piston with double cup seal and vulcanised metal disc
- Piston rod sealed by U-ring and scraper ring
- Mechanical travel stops in the actuator for closed position and open position
- Installation kit and mating dimensions see type series booklet of the valve type series

Actuator function

- Actuator type LAP-AZ
 - Air-to-open
 - Air-to-close
- Actuator type LAP-OF
 - Spring-to-open
 - Air-to-close
- Actuator type LAP-SF
 - Air-to-open
 - Spring-to-close

Accessories

- Exhaust regulator
- Throttling valve
- Piston rods protruding from both cylinder end caps (stroke limited in closing direction)
- Filter/pressure reducer
- Solenoid valves
- Emergency handwheel
- Limit switch(es)
- Silencer
- Positioners

Product benefits

- Actuators with optimised stroke variants ensure full valve travel with minimum air consumption
- Smooth, low-friction movement of the piston assembly with double cup seal or low-friction piston ring

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No 1907/2006 (REACH), see https://www.ksb.com/ksb-de/konzern/Unternehmerische_Verantwortung/reach/

¹ Double piston

Product information as per Directive 2014/34/EU (ATEX) for pneumatic actuators

Pneumatic actuators without electrical components do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 1 (zones 0+20), category 2 (zones 1+21) and category 3 (zones 2+22) to ATEX 2014/34/EU. Components such as electric actuators, position switches, block terminals, solenoid valves, etc. may in certain circumstances be covered by Article 1 of Directive 2014/34/EU. They must be subjected to a conformity assessment procedure and separate evidence of compliance must be provided (e.g. EC Declaration of Conformity or manufacturer's declaration).

Related documents

Information/documents

Document	Reference number
Installation instructions for partly completed machinery, SISTO-LAP	0570.823
Operating manual	0570.821

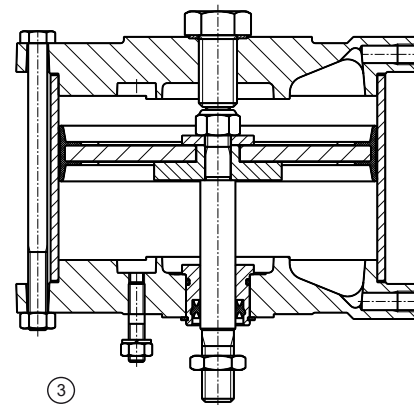
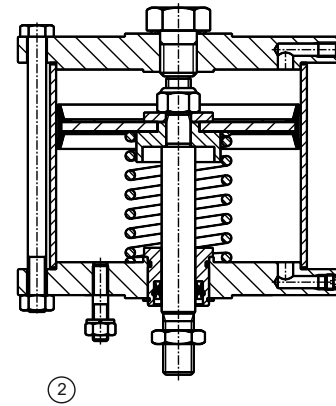
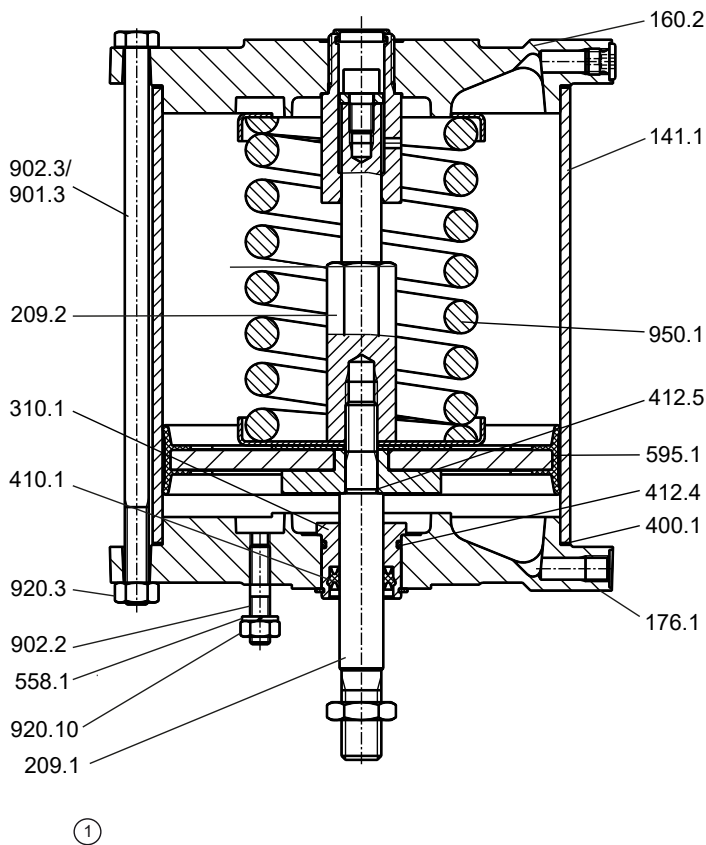
Purchase order information

Actuator

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Control pressure P_{ctr}
3. Accessories
4. Number of type series booklet
5. Valve travel
6. Break-to-open force
7. Break-to-close force
8. End-to-open force
9. End-to-close force

Materials of SISTO-LAP piston actuator



1	LAP-SF type	2	LAP-OF type	3	LAP-AZ type
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Parts list

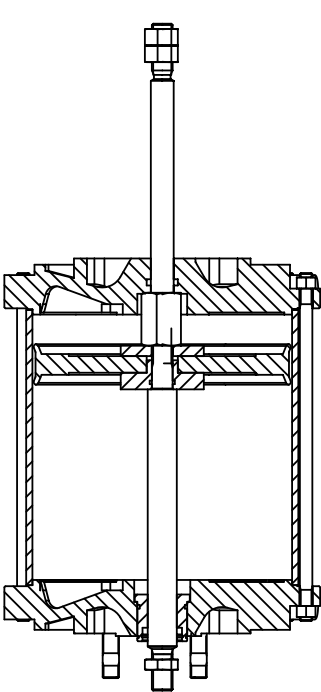
Part No.	Description	Material	Material number	Piston diameter [mm]
141.1	Cylinder	AlMgSi	3.3206	80 - 300
160.2	Top end cap	AlCu4PbMgMn AlSi7Mg0.3	3.1645 3.2371	80 - 160 200 - 300
176.1	Bottom end cap	AlCu4PbMgMn AlSi7Mg0.3	3.1645 3.2371	80 - 160 200 - 300
209.1	Lower piston rod	Stainless steel - X14CrMoS17	1.4104	80 - 300
209.2	Upper piston rod	Stainless steel - X14CrMoS17	1.4104	80 - 300
310.1 ^{2) 3)}	Plain bearing	Plastic - POM	-	80 - 300
400.1 ^{2) 3)}	Gasket	Plastic - AFM 30	-	80 - 300
410.1 ^{2) 3)}	Seal/wiper set	Plastic - L96-SFR/NBR	-	80 - 300
412.4 ^{2) 3)}	O-ring	NBR	-	-
412.5 ^{2) 3)}	O-ring	NBR	-	-
558.1	Lock washer	A2	-	-
595.1 ^{2) 3)}	Piston assembly	Steel/acrylonitrile butadiene rubber - St/NBR	-	80 - 300
901.3	Hexagon head bolt	8.8 A2E	-	-
902.2	Stud	8.8 A2E	-	-
902.3	Stud	A2-70	-	-
920.3	Nut	A2	-	-
920.10	Nut	A2	-	-
950.1	Spring	Spring steel	-	80 - 300

² Recommended spare parts (= complete set of sealing elements)

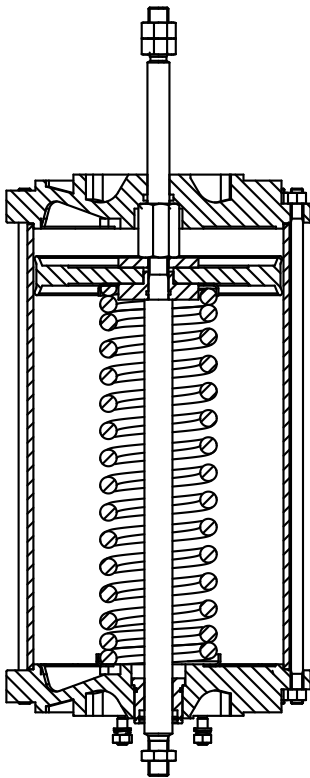
³ We recommend having these parts replaced in our factory.

Materials

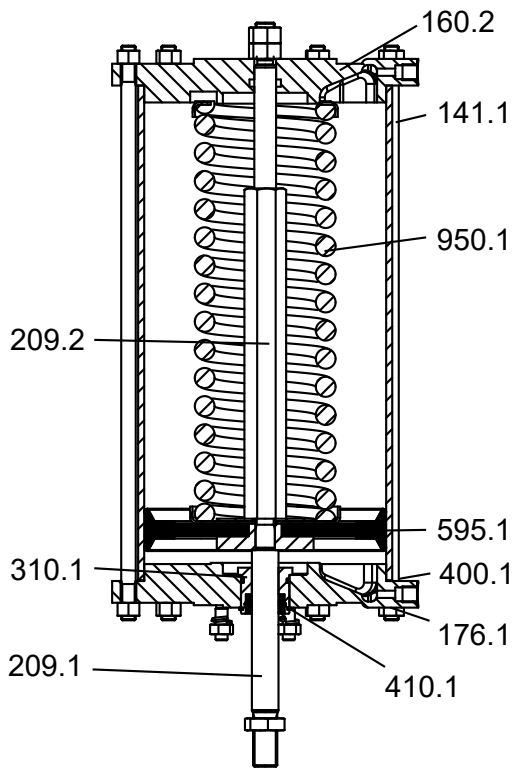
SISTO-LAP piston actuator
(with piston rods protruding from both cylinder end caps)



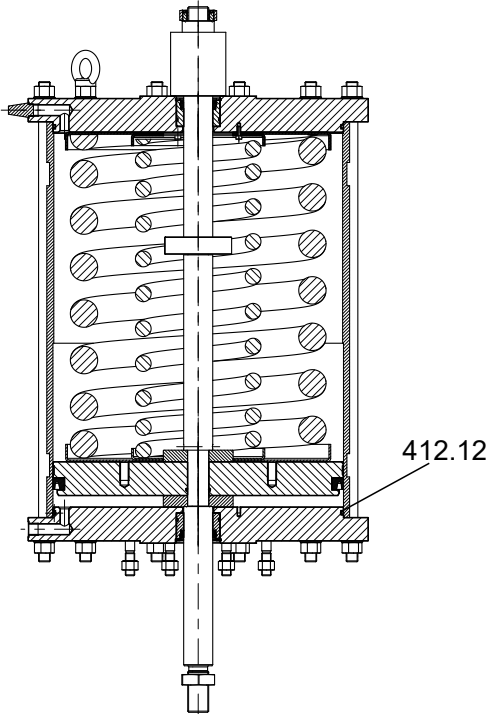
LAP-AZ...DK



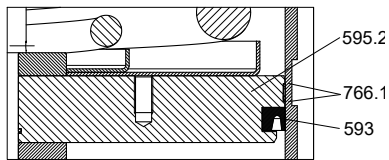
LAP-OF...DK



LAP-SF...DK



LAP-SF 500...DK



Piston 500

9210.1/9-EN

Parts list

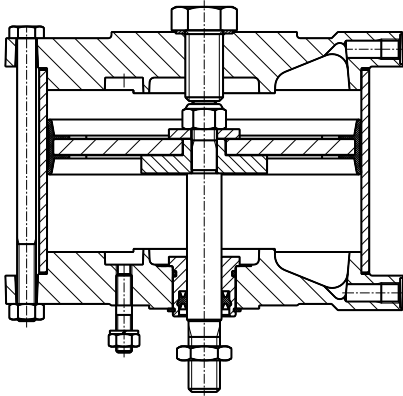
Part No.	Description	Material	Material numbers	Piston diameter [mm] DK
141.1	Cylinder	AlMgSi0.5F22 St E355	3.3206 1.0580	80 - 300 500
160.2	Top end cap	AlCuMgPb AlSiMg AW2017A	3.1645 3.2371	80 - 160 200 - 300 500
176.1	Bottom end cap	AlCuMgPb AlSiMg AW2017A	3.1645 3.2371	80 - 160 200 - 300 500
209.1	Lower piston rod	Stainless steel - X12CrMoS17	1.4104	80 - 500
209.2	Upper piston rod	Stainless steel - X12CrMoS17	1.4104	80 - 500
310.1 ^{4) 5)}	Plain bearing	Plastic - POM CWR710R	2.0540	80 - 300 500
400.1 ^{4) 5)}	Gasket	Plastic – AFM 30	-	80 - 300
410.1 ^{4) 5)}	Seal/wiper set	Plastic – L96-SFR/NBR	-	80 - 300
412.12	O-ring	NBR	-	500
593 ^{4) 5)}	Piston seal	Acrylonitrile butadiene rubber – NBR	-	500
595.1 ^{4) 5)}	Piston assembly	Steel/acrylonitrile butadiene rubber – St/NBR	-	80 - 300
595.2	Piston	Cast aluminium alloy – G-AlSi7Mg AW2017A	3.2371	500
766.1 ^{4) 5)}	Guide strap	PTFE	-	500
950.1	Spring	Spring steel	-	80 - 500

⁴ Recommended spare parts (= complete set of sealing elements)

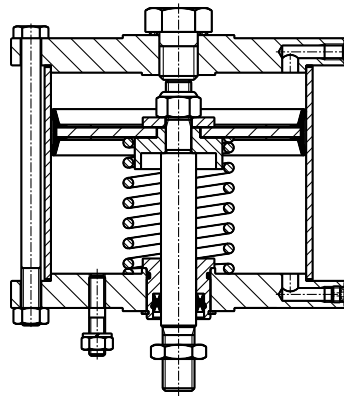
⁵ We recommend having these parts replaced in our factory.

Variants

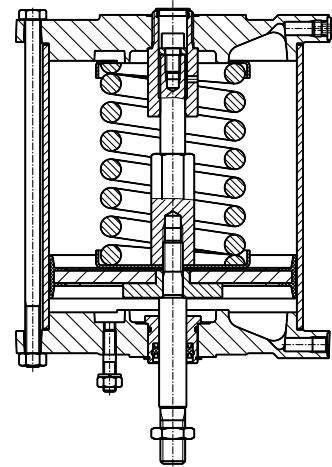
SISTO-LAP piston actuator and accessories



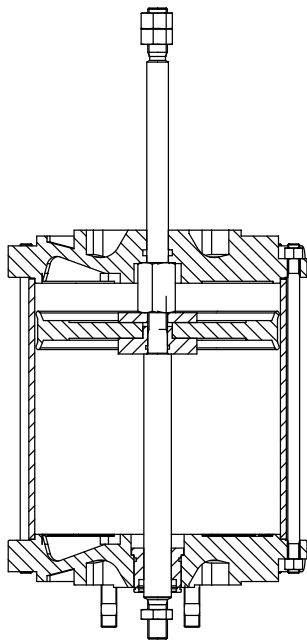
LAP-AZ type



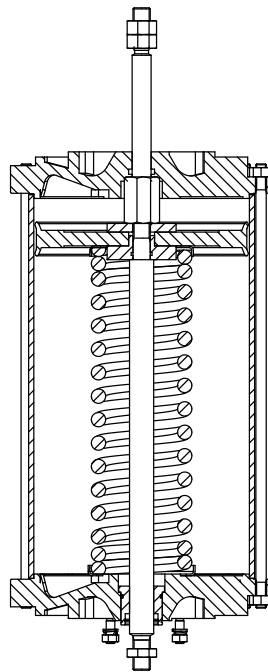
LAP-OF type



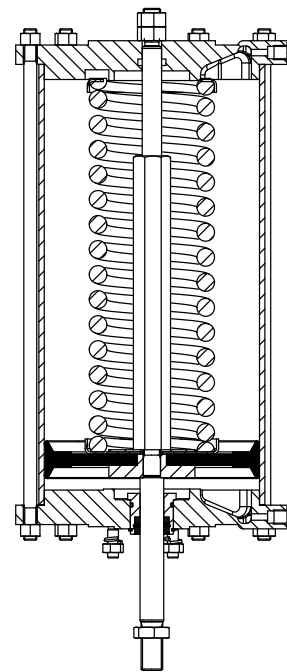
LAP-SF type



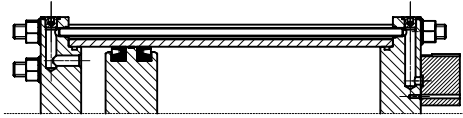
LAP-AZ...DK type



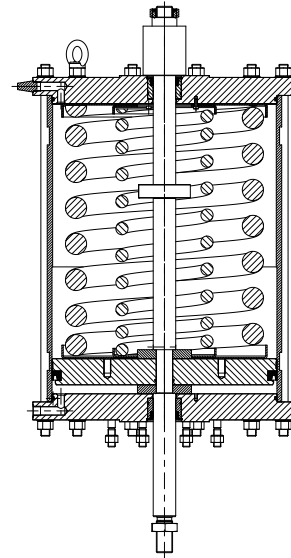
LAP-OF...DK type



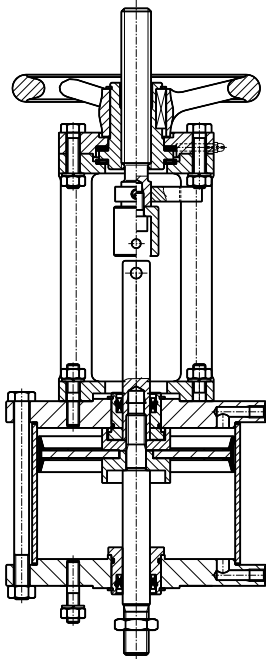
LAP-SF...DK type



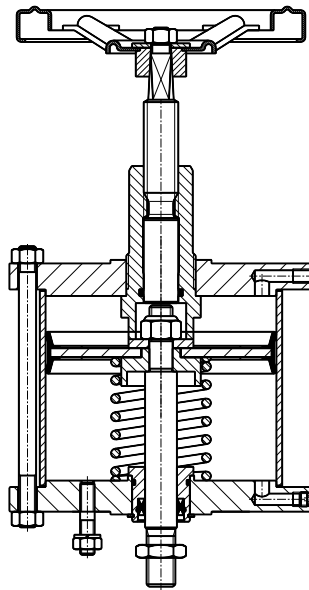
Internal air routing, example: LAP-AZ-500
(only available for LAP-500 design)



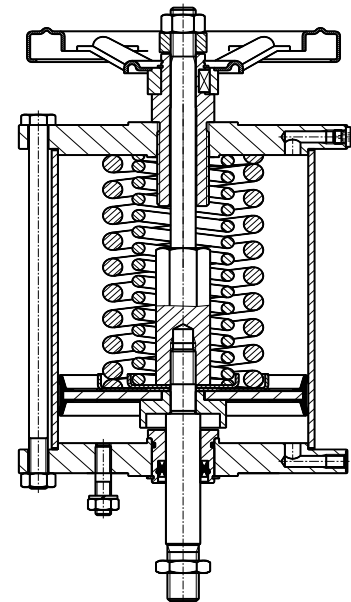
LAP-SF-500...DK type
(design with piston rods protruding from both cylinder end caps only)



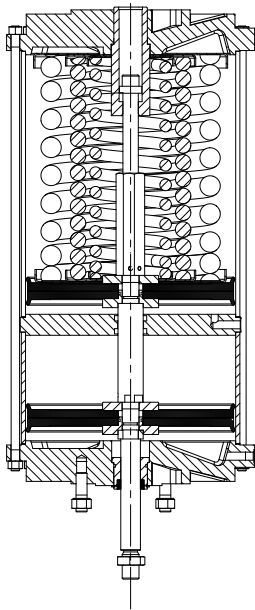
LAP-AZ type with emergency handwheel



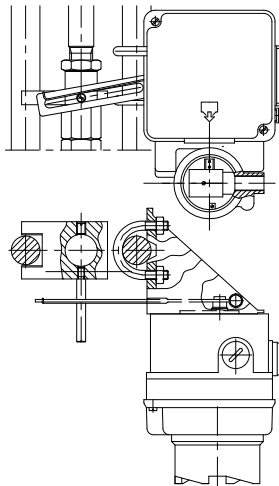
LAP-OF type with emergency handwheel



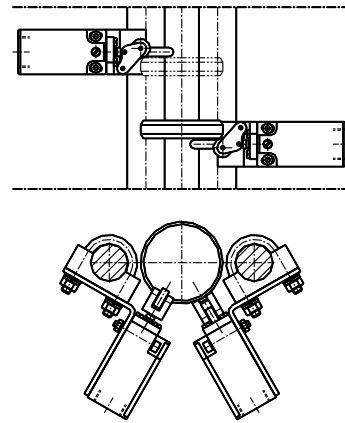
LAP-SF type with emergency handwheel



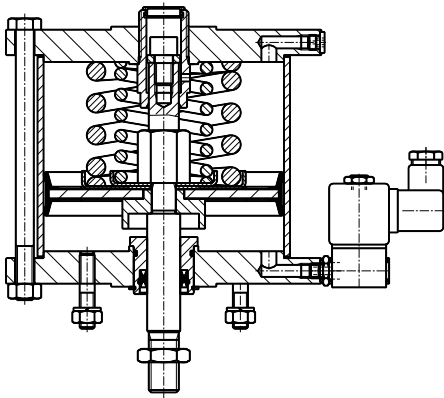
LAP-SF type with double piston



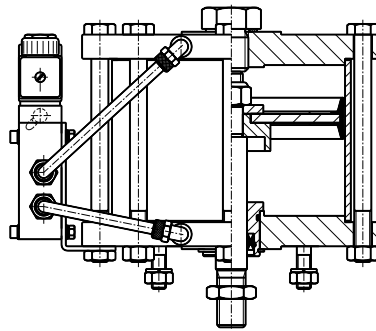
Configuration with positioner



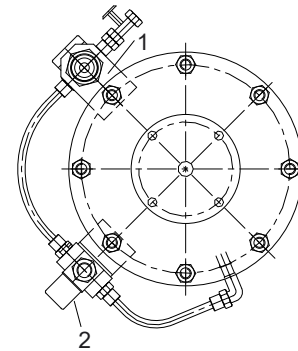
Configuration with limit switches



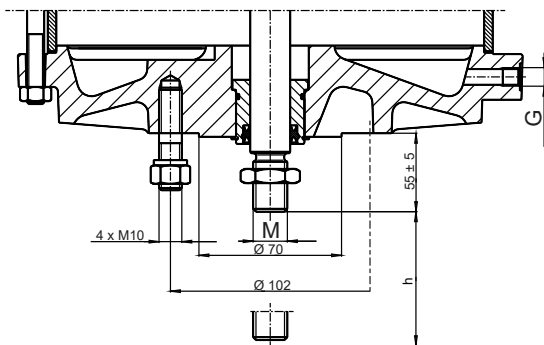
LAP-SF type with 3/2 directional control valve



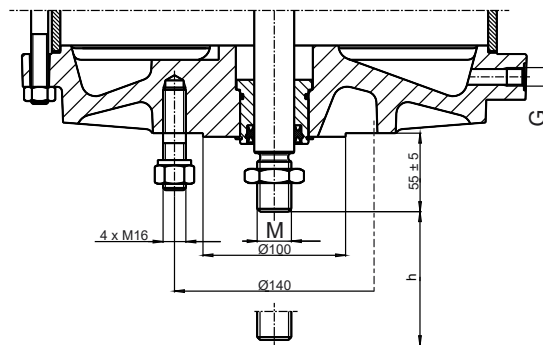
LAP-AZ type with 5/2 directional control valve



1) Filter/pressure reducer
2) Solenoid valve



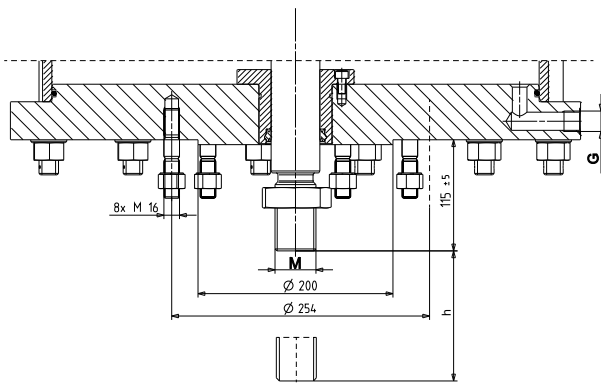
Flange connection F10⁶⁾



Flange connection F14⁶⁾

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⁶⁾ See "Symbols key" table



Flange connection F25⁶⁾

Symbols key

Symbol	Description
G	G1/8" for piston diameters 80/125/160 G1/4" for piston diameters 200/250/300 G 1/2" for piston diameter 500
M	M12 for piston diameters 80/125 M20 for piston diameters 160 to 300 M24 for piston diameter D 300/F14 optional M36x3 for piston diameter 500

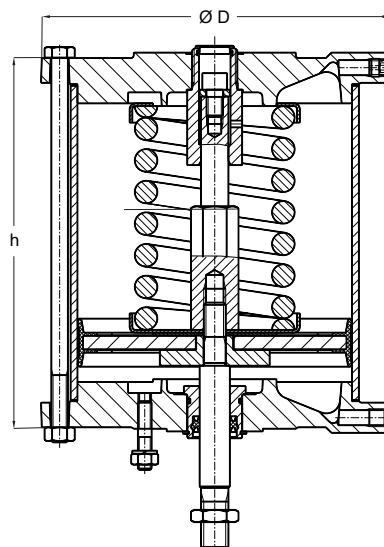
Mating dimensions as per standard

Flange connection: DIN ISO 5210 / DIN 3358

Pipe connection: DIN ISO 228

Dimensions and weights

SISTO-LAP piston actuator



SISTO-LAP

Dimensions and weights for actuator function: air-to-open/air-to-close (AZ) PST 5.5 bar

Type	Stroke [mm]	Ø D[mm]	h [mm]	[kg]	Opening force [N]	Closing force [N]
LAP-AZ-80-F10	15	130	111	4	2500	2500
LAP-AZ-80-F10	30	130	131	5	2500	2500
LAP-AZ-125-F10	15	170	131	6	6300	6300
LAP-AZ-125-F10	30	170	131	7	6300	6300
LAP-AZ-125-F10	45	170	151	8	6300	6300
LAP-AZ-125-F10	60	170	151	9	6300	6300
LAP-AZ-160-F10	30	210	168	11	10300	10300
LAP-AZ-160-F10	45	210	168	11	10300	10300
LAP-AZ-160-F10	60	210	188	12	10300	10300
LAP-AZ-160-F10	80	210	208	13	10300	10300
LAP-AZ-200-F10	30	255	170	17	16216	16216
LAP-AZ-200-F10	45	255	190	17	16216	16216
LAP-AZ-200-F10	60	255	210	18	16216	16216
LAP-AZ-200-F10	80	255	230	20	16216	16216
LAP-AZ-250-F10	60	305	240	25	16216	16216
LAP-AZ-250-F10	80	305	260	28	25300	25300
LAP-AZ-250-F14	60	305	260	28	25300	25300
LAP-AZ-250-F14	80	305	260	28	25300	25300
LAP-AZ-250-F14	100	305	280	34	25300	25300
LAP-AZ-300-F10	60	355	254	32	36600	36600
LAP-AZ-300-F10	80	355	274	35	36600	36600
LAP-AZ-300-F14	60	355	254	32	36600	36600
LAP-AZ-300-F14	80	355	274	35	36600	36600
LAP-AZ-300-F14	100	355	294	44	36600	36600
LAP-AZ-D250-F14	80	355	424	47	50600	50600
LAP-AZ-D300-F14	80	355	452	61	73200	73200
LAP-AZ-500-F25	60	585	275	133	101500	101500
LAP-AZ-500-F25	120	585	335	154	101500	101500
LAP-AZ-500-F25	180	585	395	175	101500	101500
LAP-AZ-500-F25	240	585	455	196	101500	101500
LAP-AZ-D500-F25	60	585	275	364	203000	203000
LAP-AZ-D500-F25	120	585	295	376	203000	203000
LAP-AZ-D500-F25	180	585	315	388	203000	203000
LAP-AZ-D500-F25	240	585	335	400	203000	203000

Dimensions and weights for actuator function: spring-to-open/air-to-close (OF) PST 5.5 bar

Type	Stroke [mm]	Ø D[mm]	h [mm]	[kg]	Opening force [N]	Closing force [N]
LAP-OF-80.101-F10	15	130	151	5	720	1700
LAP-OF-80.101-F10	30	130	151	6	720	1700
LAP-OF-125.101-F10	15	170	151	7	720	5500
LAP-OF-125.101-F10	30	170	151	8	720	5500
LAP-OF-125.102-F10	30	170	189	6	1150	5100
LAP-OF-160.001-F10	45	210	288	13	2360	7900
LAP-OF-160.102-F10	30	210	188	12	1150	9100
LAP-OF-160.102-F10	45	210	208	13	1150	9100
LAP-OF-160.102-F10	60	210	224	14	1150	9100
LAP-OF-200.001-F10	45	255	310	22	2360	13800
LAP-OF-200.001-F10	60	255	330	23	2360	13800
LAP-OF-200.001-F10	80	255	350	25	2360	13800
LAP-OF-200.102-F10	30	255	210	19	1150	15000
LAP-OF-200.102-F10	45	255	210	19	1150	15000
LAP-OF-250.001-F10	45	305	340	35	2360	22960
LAP-OF-250.001-F10	60	305	360	30	2360	22960
LAP-OF-250.002-F10	60	305	380	32	5630	19600
LAP-OF-250.002-F10	80	305	400	35	5630	19600
LAP-OF-250.002-F14	60	305	400	32	5630	19600
LAP-OF-250.002-F14	80	305	400	35	5630	19600
LAP-OF-300.002-F10	60	355	414	51	5630	30900
LAP-OF-300.002-F10	80	355	434	51	5630	30900
LAP-OF-300.002-F14	80	355	434	52	5630	30900
LAP-OF-300.012-F14	80	355	434	53	7960	28600
LAP-OF-D250.012-F14	80	305	504	54	7960	42600
LAP-OF-D250.012-F14	100	305	524	55	7960	42600
LAP-OF-D300.012-F14	80	355	572	74	7960	65260
LAP-OF-500.007-F25	60	585	641	281	78300	23200
LAP-OF-500.007-F25	120	585	701	293	82400	19100
LAP-OF-500.007-F25	180	585	761	305	86500	15000
LAP-OF-500.007-F25	240	585	821	317	90700	10800
LAP-OF-500.008-F25	60	585	641	316	56700	44800
LAP-OF-500.008-F25	120	585	701	328	64200	37300
LAP-OF-500.008-F25	180	585	761	340	71800	29700
LAP-OF-500.008-F25	240	585	821	352	79400	22100
LAP-OF-500.009-F25	60	585	641	356	41500	60000
LAP-OF-500.009-F25	120	585	701	368	50900	50600
LAP-OF-500.009-F25	180	585	761	380	60400	41100
LAP-OF-500.009-F25	240	585	821	392	69800	31700
LAP-OF-500.078-F25	60	585	641	349	33400	68100
LAP-OF-500.078-F25	120	585	701	361	45100	56400
LAP-OF-500.078-F25	180	585	761	373	56800	44700
LAP-OF-500.078-F25	240	585	821	385	68500	33000
LAP-OF-500.079-F25	60	585	641	389	18200	83300
LAP-OF-500.079-F25	120	585	701	401	31800	69700
LAP-OF-500.079-F25	180	585	761	413	45400	56100
LAP-OF-500.079-F25	240	585	821	425	58900	42600
LAP-OF-D500.007-F25	60	585	641	389	179900	23200
LAP-OF-D500.007-F25	120	585	701	409	184000	19100
LAP-OF-D500.007-F25	180	585	761	429	188100	15000
LAP-OF-D500.007-F25	240	585	821	449	192300	10800
LAP-OF-D500.008-F25	60	585	641	424	158300	44800
LAP-OF-D500.008-F25	120	585	701	444	165800	37300
LAP-OF-D500.008-F25	180	585	761	464	173400	29700
LAP-OF-D500.008-F25	240	585	821	484	181000	22100
LAP-OF-D500.009-F25	60	585	641	464	143100	60000
LAP-OF-D500.009-F25	120	585	701	484	152500	50600
LAP-OF-D500.009-F25	180	585	761	504	162000	41100

Type	Stroke [mm]	Ø D[mm]	h [mm]	[kg]	Opening force [N]	Closing force [N]
LAP-OF-D500.009-F25	240	585	821	524	171400	31700
LAP-OF-D500.078-F25	60	585	641	457	135000	68100
LAP-OF-D500.078-F25	120	585	701	477	146700	56400
LAP-OF-D500.078-F25	180	585	761	497	158400	44700
LAP-OF-D500.078-F25	240	585	821	517	170100	33000
LAP-OF-D500.079-F25	60	585	641	497	119800	83300
LAP-OF-D500.079-F25	120	585	701	517	133400	69700
LAP-OF-D500.079-F25	180	585	761	537	147000	56100
LAP-OF-D500.079-F25	240	585	821	557	160500	42600
LAP-OF-D500.089-F25	60	585	641	532	98200	104900
LAP-OF-D500.089-F25	120	585	701	552	115200	87900
LAP-OF-D500.089-F25	180	585	761	572	132200	70900
LAP-OF-D500.089-F25	240	585	821	592	149200	53900
LAP-OF-D500.789-F25	60	585	1104	565	74900	128200
LAP-OF-D500.789-F25	120	585	1164	585	96100	107000
LAP-OF-D500.789-F25	180	585	1224	605	117200	85900
LAP-OF-D500.789-F25	240	585	1284	625	138400	64700

Dimensions and weights for actuator function: air-to-open/spring-to-close (SF) PST 5.5 bar

Type	Stroke [mm]	Ø D[mm]	h [mm]	[kg]	Opening force [N]	Closing force [N]
LAP-SF-80.001.5-F10	15	130	171	6	1050	1600
LAP-SF-80.001-F10	30	130	271	7	820	1830
LAP-SF-125.002.5-F10	15	170	212	10	2640	3990
LAP-SF-125.002-F10	30	170	271	12	2270	4360
LAP-SF-160.012-F10	30	210	274	18	4680	6160
LAP-SF-160.012-F10	45	210	310	19	5280	5560
LAP-SF-200.003.5-F10	30	255	290	28	9190	7880
LAP-SF-200.003.7-F10	45	255	350	32	7320	9750
LAP-SF-200.003-F10	60	255	450	35	7810	9260
LAP-SF-200.003-F10	80	255	470	37	8920	8150
LAP-SF-250.004.7-F10	45	305	380	42	11810	14840
LAP-SF-250.004-F10	60	305	480	45	12540	14110
LAP-SF-250.004-F10	80	305	500	48	14230	12420
LAP-SF-250.004-F14	60	305	480	42	12540	14110
LAP-SF-250.004-F14	80	305	500	49	14230	12420
LAP-SF-300.034-F10	60	355	514	67	15380	23150
LAP-SF-300.034-F10	80	355	535	70	18180	20350
LAP-SF-300.034-F14	80	355	535	75	18180	20350
LAP-SF-D300.005-F14	80	355	742	99	44630	32430
LAP-SF-D300.034-F14	80	355	712	89	56710	20350
LAP-SF-D300.035-F14	100	355	832	127	43160	33900
LAP-SF-D300.345-F14	80	355	752	122	30180	46880
LAP-SF-500.007-F25	60	585	641	281	78300	23200
LAP-SF-500.007-F25	120	585	701	293	82400	19100
LAP-SF-500.007-F25	180	585	761	305	86500	15000
LAP-SF-500.007-F25	240	585	821	317	90700	10800
LAP-SF-500.008-F25	60	585	641	316	56700	44800
LAP-SF-500.008-F25	120	585	701	328	64200	37300
LAP-SF-500.008-F25	180	585	761	340	71800	29700
LAP-SF-500.008-F25	240	585	821	352	79400	22100
LAP-SF-500.009-F25	60	585	641	356	41500	60000
LAP-SF-500.009-F25	120	585	701	368	50900	50600
LAP-SF-500.009-F25	180	585	761	380	60400	41100
LAP-SF-500.009-F25	240	585	821	392	69800	31700
LAP-SF-500.078-F25	60	585	641	349	33400	68100
LAP-SF-500.078-F25	120	585	701	361	45100	56400
LAP-SF-500.078-F25	180	585	761	373	56800	44700
LAP-SF-500.078-F25	240	585	821	385	68500	33000
LAP-SF-500.079-F25	60	585	641	389	18200	83300
LAP-SF-500.079-F25	120	585	701	401	31800	69700

Type	Stroke [mm]	Ø D[mm]	h [mm]	[kg]	Opening force [N]	Closing force [N]
LAP-SF-500.079-F25	180	585	761	413	45400	56100
LAP-SF-500.079-F25	240	585	821	425	58900	42600
LAP-SF-D500.007-F25	60	585	641	389	179900	23200
LAP-SF-D500.007-F25	120	585	701	409	184000	19100
LAP-SF-D500.007-F25	180	585	761	429	188100	15000
LAP-SF-D500.007-F25	240	585	821	449	192300	10800
LAP-SF-D500.008-F25	60	585	641	424	158300	44800
LAP-SF-D500.008-F25	120	585	701	444	165800	37300
LAP-SF-D500.008-F25	180	585	761	464	173400	29700
LAP-SF-D500.008-F25	240	585	821	484	181000	22100
LAP-SF-D500.009-F25	60	585	641	464	143100	60000
LAP-SF-D500.009-F25	120	585	701	484	152500	50600
LAP-SF-D500.009-F25	180	585	761	504	162000	41100
LAP-SF-D500.009-F25	240	585	821	524	171400	31700
LAP-SF-D500.078-F25	60	585	641	457	135000	68100
LAP-SF-D500.078-F25	120	585	701	477	146700	56400
LAP-SF-D500.078-F25	180	585	761	497	158400	44700
LAP-SF-D500.078-F25	240	585	821	517	170100	33000
LAP-SF-D500.079-F25	60	585	641	497	119800	83300
LAP-SF-D500.079-F25	120	585	701	517	133400	69700
LAP-SF-D500.079-F25	180	585	761	537	147000	56100
LAP-SF-D500.079-F25	240	585	821	557	160500	42600
LAP-SF-D500.089-F25	60	585	641	532	98200	104900
LAP-SF-D500.089-F25	120	585	701	552	115200	87900
LAP-SF-D500.089-F25	180	585	761	572	132200	70900
LAP-SF-D500.089-F25	240	585	821	592	149200	53900
LAP-SF-D500.789-F25	60	585	1104	565	74900	128200
LAP-SF-D500.789-F25	120	585	1164	585	96100	107000
LAP-SF-D500.789-F25	180	585	1224	605	117200	85900
LAP-SF-D500.789-F25	240	585	1284	625	138400	64700



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A KSB Company • The KSB logo, consisting of the letters "KSB" in a bold, blue, sans-serif font, followed by a stylized blue square icon containing a white lowercase letter "b".