Diaphragm Valve

SISTO-16

PN 16
DN 15 - 300

Type Series Booklet

Legal information/Copyright

Type Series Booklet SISTO-16

Contents

Diaphragm Valves

Diaphragm Valves – No Dead Volume, Soft-seated, Glandless

SISTO-16

Main applications

- Mining
- General irrigation systems
- Chemical industry
- Homogenisation
- Industry/process engineering
- Industrial recirculation systems
- Waste water treatment plants
- Air-conditioning systems
- Condensate transport
- Fossil-fuelled power stations
- Power stations
- Cooling circuits
- Paint shops
- Seawater desalination/reverse osmosis
- Mining
- Paper industry / pulp industry
- Petrochemical industry
- Refinery
- Flue gas desulphurisation
- Shipbuilding
- Swimming pools
- Process engineering
- Heat recovery systems
- Hot-water heating systems
- Water treatment
- Water extraction

Fluids handled

- Waste water without faeces
- Aggressive fluids
- Inorganic fluids
- Brackish water
- Service water
- Steam
- Distillate
- Paints and varnishes
- River water, lake water and groundwater
- Gas
- Fluids posing a health hazard
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- Hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Fuels
- Cooling water
- Volatile fluids
- Solvents
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- Fluids containing mineral oils
- Oil
- Organic fluids
- Polymerising/crystallising fluids
- Cleaning agents
- Lubricants
- Brine
- Dipping paints
- Drinking water
- Wash water
- Other fluids on request.

Operating data

Table 1: Operating properties

Characteristic	Value
Nominal pressure	PN 16[1)]
Nominal size	DN 15 - 300
Max. permissible pressure [bar]	16[2)]
Min. permissible temperature [°C][3)]	≥ -10
Max. permissible temperature [°C][3)]	≤ +160

1 DN 250 - 300 = PN 10
2 DN 250 - 300 = 10 bar
3 The temperatures indicated are for orientation only; they are not valid for all operating conditions.

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Control pressure of piston actuators

Max. permissible temperature (actuator/control fluid): 80 °C

Table 2: Permissible control pressure

Type	Piston diameter [mm]	Top flange DIN ISO 5210 / DIN 3358	Permissible control pressure $P_{ctr.\ perm.}$ [bar]
SISTO-LAP	80 - 250	F10	5,5 - 10
	250	F14	5,5 - 10
	300	F10	5,5 - 7
	300	F14	5,5 - 10
	D250[4)]	F14	5,5 - 10
	D300[4)]	F14	5,5 - 7
SISTO-LAP.520/ DLAP.230	40 - 250	-	5,5 - 7

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.

Valve body materials

Table 3: Material overview (for available variants see the Variant overview (⇨ Page 6) table)

Material	Material number	ASTM[5)]	Temperature limit
EN-GJL-250 (GG25)	5.1301	A48 Class 35 (UNS F12401)	-10 °C to +160 °C
GX2CrNiMo19-11-2[6)]	1.4409	A351 Gr. CF3M (UNS J92800)	-10 °C to +160 °C
EN-GJS-400-18-LT (GGG40.3)	5.3103	A536 Gr. 60-40-18	-10 °C to +160 °C

Design details

Design

- Models with flanged ends or threaded socket ends
- Soft-seated weir-type shut-off valve in straight-way pattern
- Rising handwheel
- Shut-off and sealing to atmosphere by spiral-supported, completely enclosed diaphragm.
  DN 250 and above: spiral-supported design only
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- Version in compliance with TA-Luft (German Clean Air Act) to VDI 2440 for DN 15 - 200

Variants

- Actuator (electric or pneumatic)
- Limit switches
- Locking device
- Body lined with IIR (butyl), temperature limit: +120 °C
- Body lined with NRH (hard rubber), temperature limit: +100 °C
- Body coated with ECTFE (Halar), temperature limit: +90 °C
- Body coated with PA (Rilsan), temperature limit: +60 °C
- Chain wheel
- Leakage detection hole and additional stem seal for DN 15 - 200
- Diaphragm made of CSM, temperature limit: +80 °C
- Diaphragm made of EPDM, temperature limit: +140 °C
- Diaphragm made of SISTOMaXX (EPDM/W270), temperature limit: +90 °C
- Diaphragm made of EPDM-V (vacuum), temperature limit: +140 °C
- Diaphragm made of FKM, temperature limit: +120 °C
- Diaphragm made of IIR, temperature limit: +120 °C
- Diaphragm made of NBR, temperature limit: +90 °C
- TFM/EPDM diaphragm, 2-piece[7)], Temperature limit +160 °C
- Lead-sealable cap (prevents unauthorised actuation)
- Stem extension
- Positioner
- Certification to customer specification

4 Double drum
5 The ASTM materials are similar to the materials indicated.
6 Body with threaded socket ends
7 DN 250 - 300: max. operating pressure 6 bar

Variant overview

Table 4: Variant overview of SISTO-16 with flanged ends

DN	Material number		Lining			Coating	
	Body	Bonnet	None	IIR	NRH	PA (Rilsan)	ECTFE (Halar)
15	5.3103	1.0619	x	x	x	x	x
20 - 50	5.3103	5.1301	-	x	x	-	-
20 - 50	5.1301	5.1301	x	-	-	x	x
65 - 150	5.1301	5.1301	x	x	x	x	x
200 - 300	5.3103	5.1301	x	x	x	x	x

Table 5: Variant overview of SISTO-16 with threaded socket ends

DN	Material number		Lining			Coating	
	Body	Bonnet	None	IIR	NRH	PA (Rilsan)	ECTFE (Halar)
15 - 20	1.4409	1.0619	x	-	-	-	-
25 - 80	1.4409	5.1301	x	-	-	-	-

Actuators

Directly mounted piston actuator

- SISTO-DLAP.230 for DN 50 - 125
- SISTO-LAP.520 for DN 15 - 40
- Compact mounting without lantern
- Leakage detection hole
- Standard interface for accessories

Actuator function

- Actuator type DLAP.230/LAP.520 SF
  - Air-to-open
  - Spring-to-close
- Actuator type DLAP.230/LAP.520 OF
  - Spring-to-open
  - Air-to-close
- Actuator type DLAP.230/LAP.520 AZ
  - Air-to-open
  - Air-to-close

SISTO-LAP piston actuator

- Double-acting piston, piston rod extending from one end only, with or without spring
- Piston rod sealed by U-ring and scraper ring
- Piston with double cup seal and vulcanised metal disc
- Mechanical travel stops in the actuator for closed position and open position
- Flanges to DIN ISO 5210/DIN 3358
- Piston diameters 80 to 300 = F10
- Piston diameters 250 to 300 = F14
- Leakage detection hole from MD 65 with screw (can be plugged)

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

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

- **Reliable sealing to atmosphere and absolutely tight shut-off**

  The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.
- **Maximum service life and pressure limit**

  Maximised diaphragm life and pressure limit thanks to completely enclosed, spiral-supported diaphragm.
- **Excellent functional reliability**

  Increased functional reliability of the diaphragm thanks to balanced diaphragm suspension.
- **Excellent resistance to corrosion and abrasion**

  High-quality body materials and linings offer reliability and a long service life.
- **Smooth actuation**

  The thrust bearing minimises the closing torques.
- **Optimised long-term operation**

  The stem protection integrated in the position indicator prevents ingress of contaminants.
- **Fluid purity**

  Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.
- **Quick identification of valve position**

  The valve's position can be easily identified via a clear visual indicator, also visible from a distance.
- **Reliable operation**

  The stem and all internal operating elements are **not** in contact with the fluid.

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Product information

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

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see https://www.ksb.com/en-global/company/corporate-responsibility/reach.

Product information as per European Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

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

Valves 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).

Product information as per Regulation (EU) 1935/2004

Table 6: Overview

Label	Effective in:
	Europe[8)] Certificate regarding food contact materials as per Regulation (EU) 1935/2004

Related documents

Table 7: Information/documents

Document	Reference number
Operating manual	0570.821
Type series booklet SISTO-LAP (piston actuator)	9210.1
Type series booklet SISTO-SK-i	8676.5.

Available software

CAD portal, SISTO

This software uses the digital data of the SISTO products. (Click the QR code.)

Purchase order specifications

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

Valve

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Fluid handled
8. Pipe connection
9. Variants
10. Number of type series booklet
11. Certificate

Actuator

1. Type
2. Control pressure P_{ctr}
3. Accessories

8 This certification only applies to versions with threaded socket ends and EPDM diaphragm or 2-piece TFM/EPDM diaphragm.

Flow coefficients

Table 8: Flow coefficients for unlined valves with flanged ends

DN	MD [mm]	Kvs value [m³/h]
15	40	4
20	65	11,5
25	65	14
32	92	35
40	92	43
50	115	72
65	168	141
80	168	195
100	202	304
125	202	298
150	280	601
200	280	478
250	415	1166
300	415	1260

Table 9: Flow coefficients for lined valves with flanged ends

DN	MD [mm]	Kvs value [m³/h]
15	40	4
20	65	9,1
25	65	13
32	92	26,5
40	92	32,5
50	115	52,5
65	168	127
80	168	176
100	202	274
125	202	268
150	280	541
200	280	430
250	415	1142
300	415	1245

Table 10: Flow coefficients for unlined valves with threaded socket ends

DN	MD [mm]	Kvs value [m³/h]
15	40	7,6
20	40	7,4
25	65	28,3
32	65	29
40	65	28
50	92	66,5
65	115	114
80	168	234

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Pressure/temperature ratings

Table 11: Permissible operating pressure [bar]

PN	Material		[°C]							
	Designation	Number	-10 to +50	+100	+110	+120	+130	+140	+150	+160
16	EN-GJS-400-18-LT	5.3103	16,0	16,0	16,0	16,0	15,8	15,6	14,0	12,0
	EN-GJL-250	5.1301	16,0	16,0	16,0	16,0	15,4	14,9	14,0	12,0
	GP240GH	1.0619	16,0	14,8	14,6	14,4	14,3	14,1	14,0	12,0
	GX2CrNiMo19-11-2	1.4409	16,0	15,1	14,8	14,5	14,2	13,9	13,7	12,0
10[9)]	EN-GJS-400-18-LT	5.3103	10,0	10,0	10,0	10,0	9,9	9,8	9,0	8,0

If a combination of different pressure enclosure materials is used, the respectively lowest permissible operating pressure shall apply.

9 DN 250 - 300

Materials

Materials of SISTO-16 manually operated valve with flanged ends

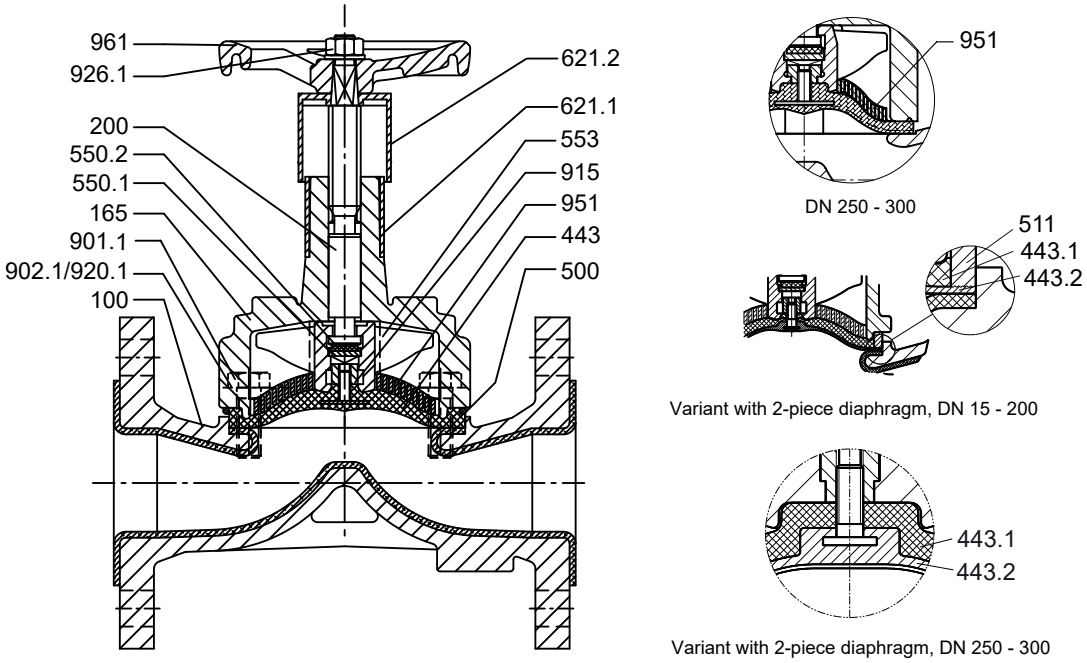

Fig. 1: SISTO-16 manually operated valve with flanged ends

Table 12: Parts list

Part No.	Description	MD	Material		Note
			Designation	Number	
100	Body	40	EN-GJS-400-18-LT	5.3103	
		65 - 115	EN-GJL-250	5.1301	NRH and IIR = 5.3103
		168 - 280	EN-GJL-250	5.1301	DN 200 = 5.3103
		415	EN-GJS-400-18-LT	5.3103	-
165	Bonnet	40	GP240GH	1.0619	-
		65 - 415	EN-GJL-250	5.1301	-
200	Stem	40 - 415	X14CrMoS17	1.4104	-
443[10)]	Diaphragm	40 - 415	EPDM	-	Standard
443.1[10)]	Backing diaphragm	40 - 415	EPDM	-	-
443.2[10)]	Diaphragm	40 - 415	TFM	-	-
500	Ring	40 - 280	Galvanised steel	-	-
511	Backing ring	40 - 280	Steel	-	-
550.1	Bearing disc	92 - 415	Steel	-	-
550.2	PTFE disc	40, 92 - 415	PTFE/graphite	-	-
553	Compressor	40	GP240GH	1.0619	-
		65	GD-ZnAl4Cu1	2.2141.05	-
		92 - 280	EN-GJS-400-15	5.3106	-
		415	EN-GJL-250	5.1301	-
621.1	Position indicator, lower part	40 - 415	ASA Luran	-	-
621.2	Position indicator, upper part	40 - 415	ASA Luran	-	-
901.1	Hexagon head bolt	40 - 280	A2	-	-
902.1	Stud	415	A2	-	-
915	Floating nut	40 - 415	Steel	-	-
920.1	Nut	415	A2	-	-
926.1	Prevailing torque nut	40 - 415	A2	-	-
951	Support spiral	65 - 415	Steel	-	-
961	Handwheel	40	Plastic	-	-

10 Recommended spare parts

Part No.	Description	MD	Material		Note
			Designation	Number	
961	Handwheel	65 - 415	EN-GJL-200	5.1300	-

Materials of SISTO-16 manually operated valve with threaded socket ends

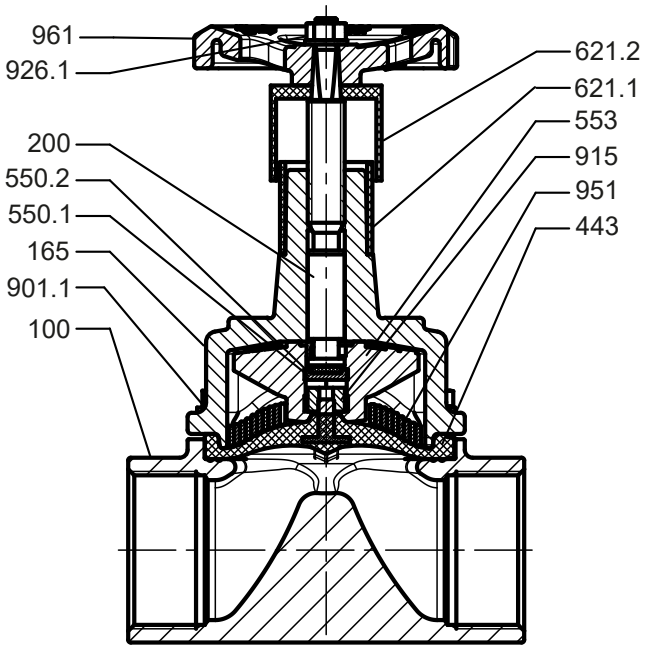

Fig. 2: SISTO-16 manually operated valve with threaded socket ends, DN 15 - 80

Table 13: Parts list

Part No.	Description	MD	Material		Note
			Designation	Number	
100	Body	40 - 168	GX2CrNiMo19-11-2	1.4409	-
165	Bonnet	40	GP240GH	1.0619	-
		65 - 168	EN-GJL-250	5.1301	-
200	Stem	40 - 168	X14CrMoS17	1.4104	-
443[11)]	Diaphragm	40 - 168	EPDM	-	Standard
550.1	Bearing disc	92 - 168	Steel	-	-
550.2	PTFE disc	40, 92 - 168	PTFE/graphite	-	-
553	Compressor	40	GP240GH	1.0619	-
		65	GD-ZnAl4Cu1	2.2141.05	-
		92 - 168	EN-GJS-400-15	5.3106	-
621.1	Position indicator, lower part	40 - 168	ASA Luran	-	-
621.2	Position indicator, upper part	40 - 168	ABS	-	-
901.1	Hexagon head bolt	40 - 168	A2	-	-
915	Floating nut	40 - 168	Steel	-	-
926.1	Prevailing torque nut	40 - 168	A2	-	-
951	Support spiral	65 - 168	Steel	-	-
961	Handwheel	40	Plastic	-	-
		65 - 168	EN-GJL-200	5.1300	-

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11 Recommended spare parts

Materials of directly mounted LAP.520 and DLAP.230 piston actuators

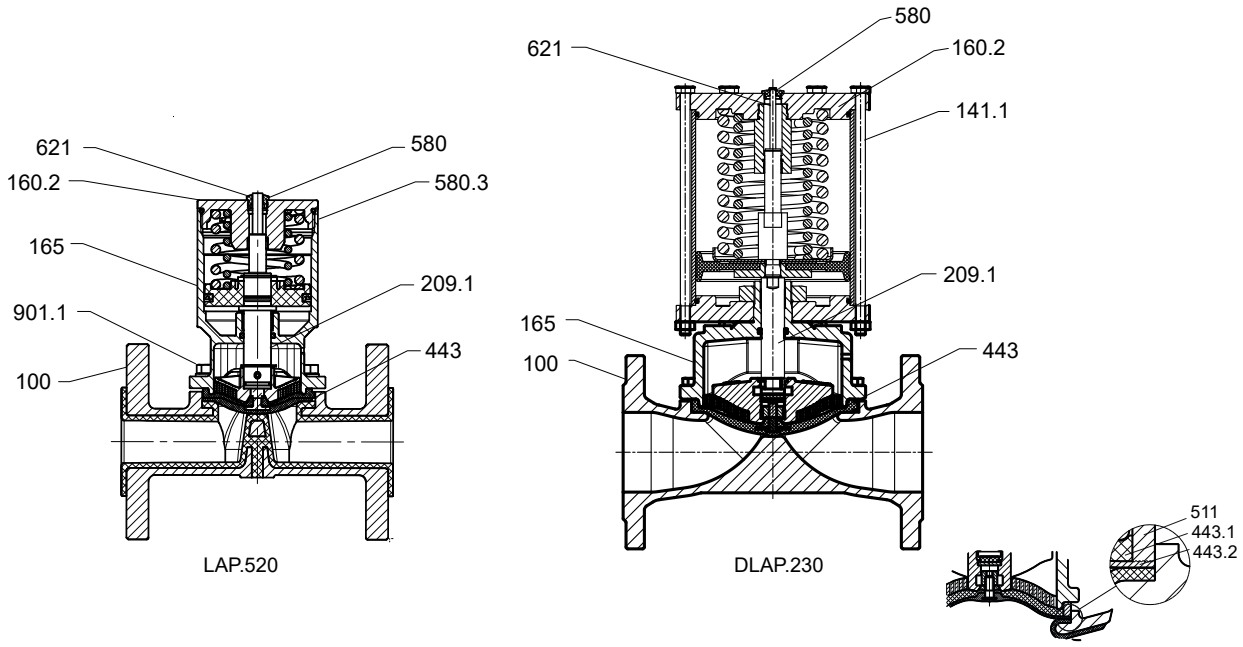

Fig. 3: Directly mounted LAP.520 and DLAP.230 piston actuators

Variant with 2-piece diaphragm, DN 15 - 125

Table 14: Parts list

Part No.	Description	MD	Material		Note
			Designation	Number	
100	Body	40 - 202	EN-GJL-250	5.1301	NRH and IIR = 5.3103
141.1	Cylinder	115-202	AlMgSi	3.3206	-
160.2	Top end cap	40 - 92	GX2CrNiMo19-11-2	1.4409	-
		115 - 202	AlCu4PbMgMn	3.1645	-
165	Bonnet	40 - 92	GX2CrNiMo19-11-2	1.4409	-
		115 - 202	EN-GJS-400-18-LT	5.3103	-
209.1	Piston rod	40 - 92	X8CrNiS18-9	1.4305	-
		115 - 202	X14CrMoS17	1.4104	-
443[12)]	Diaphragm	40 - 202	EPDM	-	Standard
443.1[12)]	Backing diaphragm	40 - 202	EPDM	-	-
443.2[12)]	Diaphragm	40 - 202	TFM	-	-
511	Backing ring	40 - 202	Steel	-	-
580	Cap	40 - 202	Plastic	-	M12 x 1/M18 x 1 interface
580.3	Cap	40 - 202	Plastic	-	M5 / G1/8 air supply connection
621	Position indicator	40 - 202	Plastic	-	-
901.1	Hexagon head bolt	40 - 202	A2	-	For PTFE lining with TFM diaphragm: material 8.8 A2E

12 Recommended spare parts

Materials of SISTO-LAP piston actuator

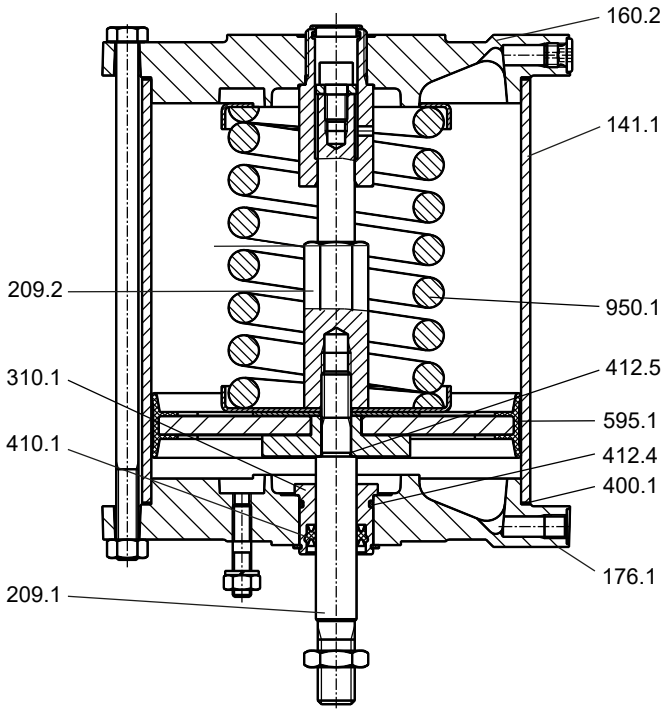

Fig. 4: SISTO-LAP-SF piston actuator

Table 15: Parts list

Part No.	Description	Material		Piston diameter [mm]
		Designation	Number	
141.1	Cylinder	AlMgSi	3.3206	80 - 300
160.2	Top end cap	AlCu4PbMgMn	3.1645	80 - 160
		AlSi7Mg0.3	3.2371	200 - 300
176.1	Bottom end cap	AlCu4PbMgMn	3.1645	80 - 160
		AlSi7Mg0.3	3.2371	200 - 300
209.1	Lower piston rod	X14CrMoS17	1.4104	80 - 300
209.2	Upper piston rod	X14CrMoS17	1.4104	80 - 300
310.1[13) 14)]	Plain bearing	Plastic – POM	-	80 - 300
400.1[13) 14)]	Gasket	Plastic – AFM 30	-	80 - 300
410.1[13) 14)]	Seal/wiper set	Plastic – L96-SFR/NBR	-	80 - 300
412.4[13) 14)]	O-ring	NBR	-	80 - 300
412.5[13) 14)]	O-ring	NBR	-	80 - 300
595.1[13) 14)]	Piston assembly	Steel/acrylonitrile butadiene rubber – St/NBR	-	80 - 300
950.1	Spring	Spring steel	-	80 - 300

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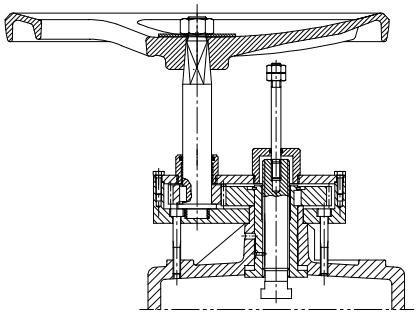
13 Recommended spare parts (= complete set of sealing elements)

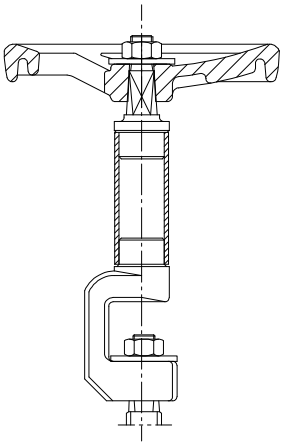
14 We recommend having these parts replaced in our factory.

Variants and accessories

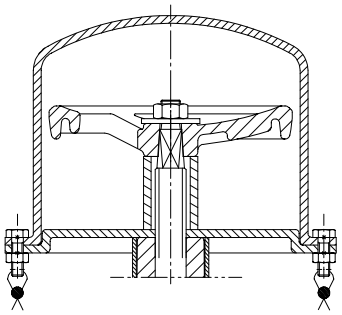
Variants and accessories of SISTO-16 manually operated valves



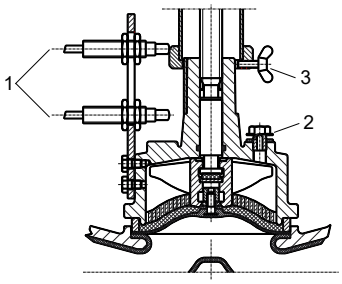
Gearbox



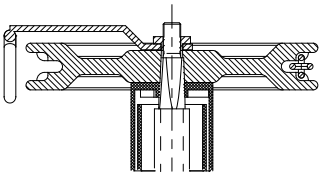
Stem extension



Lead-sealable cap

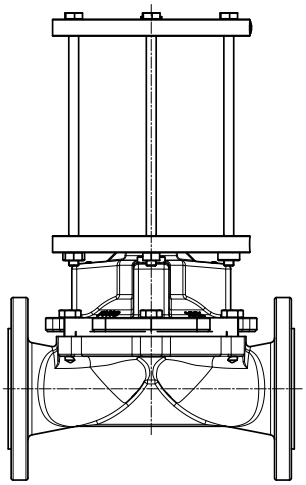


1 Inductive limit switches
2 Leakage detection hole
3 Locking device

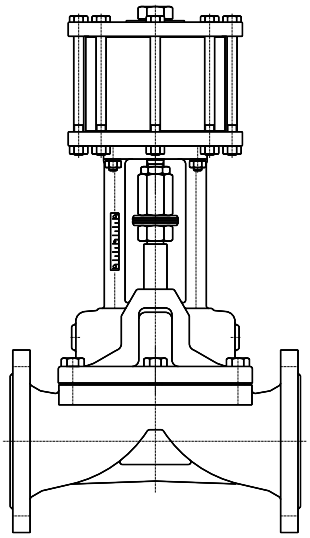


Chain wheel

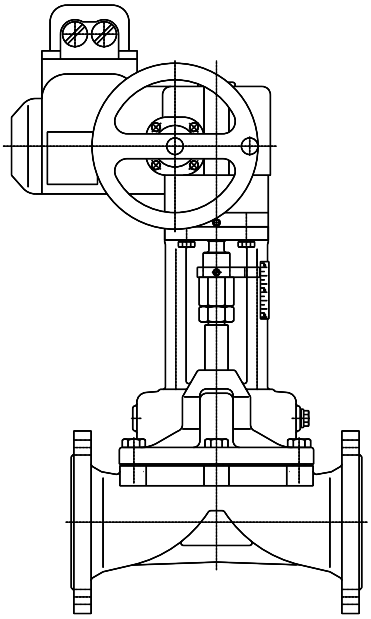
Variants of SISTO-16 with actuator



With directly mounted piston actuator

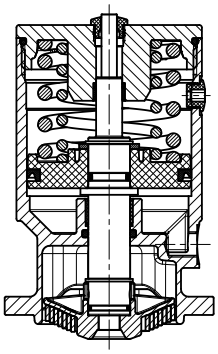


With pneumatic piston actuator

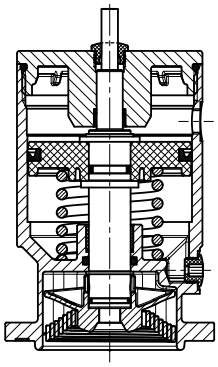


With electric actuator

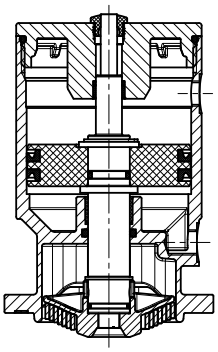
Variants and accessories of the directly mounted LAP.520 and DLAP.230 piston actuator



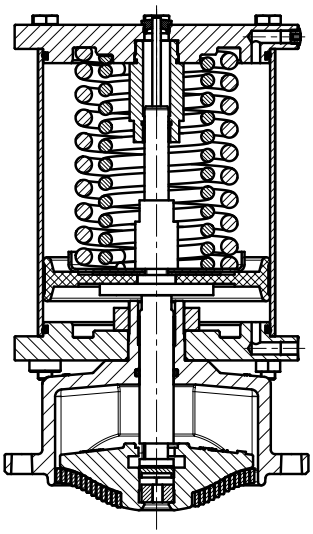
LAP.520-SF



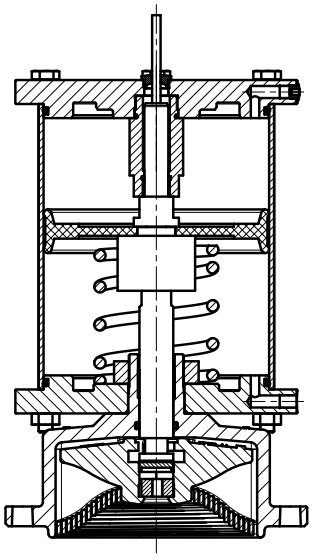
LAP.520-OF



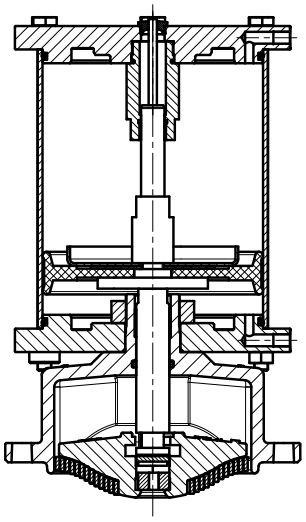
LAP.520-AZ



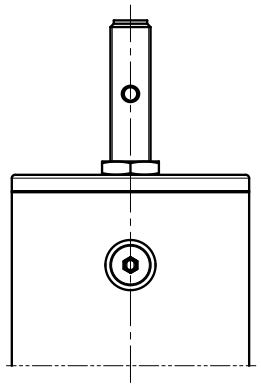
DLAP.230-SF



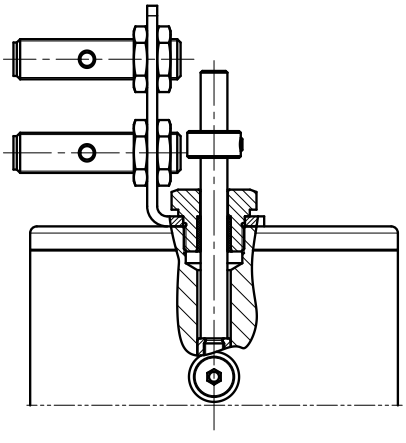
DLAP.230-OF



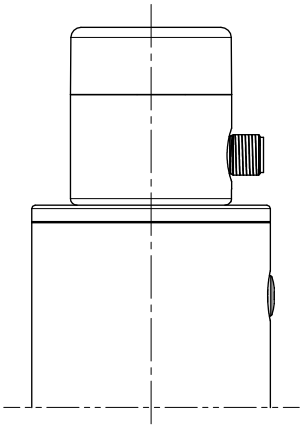
DLAP.230-AZ



Directly mounted proximity switch for open position



Inductive limit switches



Intelligent actual-position feedback unit
SK-i.310

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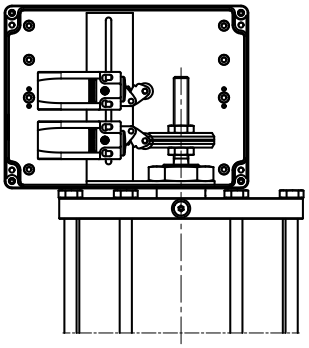
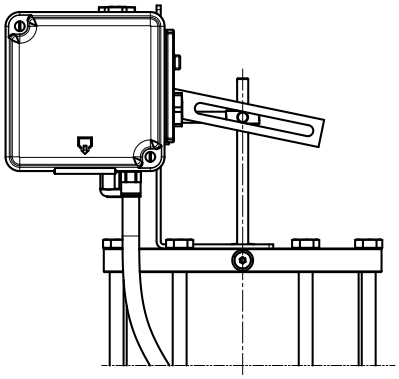
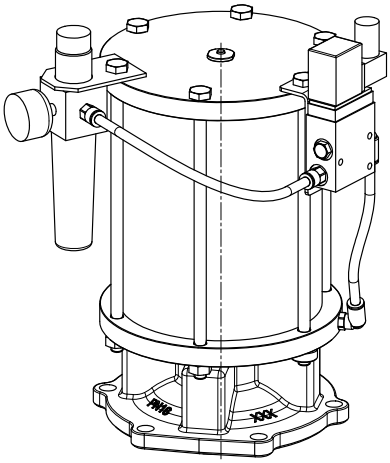


Mechanical limit switches

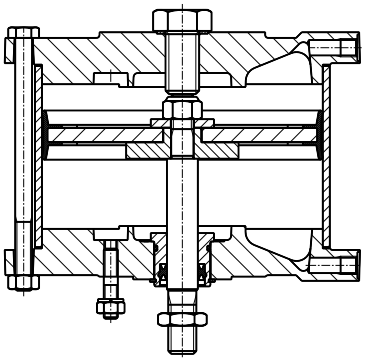


Positioner

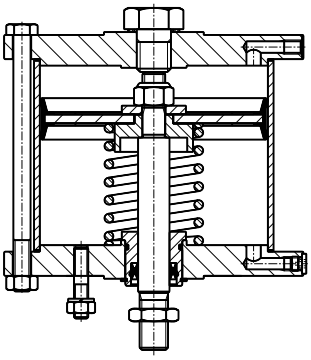


Solenoid valve and
filter/pressure reducer

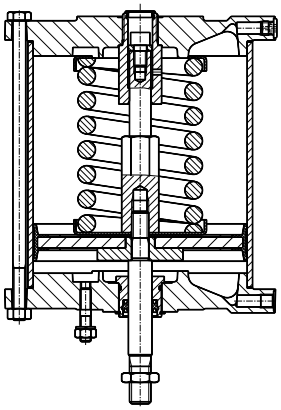
Variants and accessories of the SISTO-LAP piston actuator



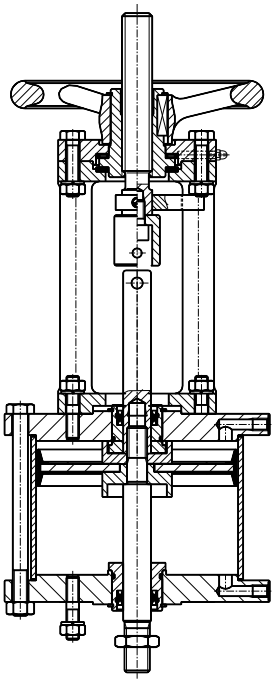
LAP-AZ type



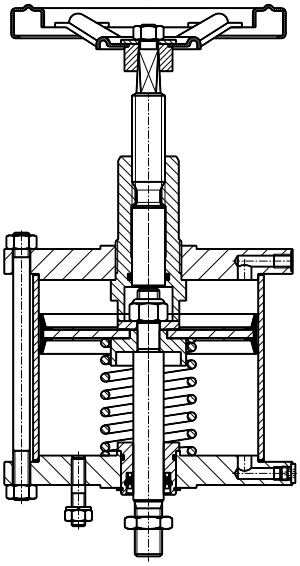
LAP-OF type



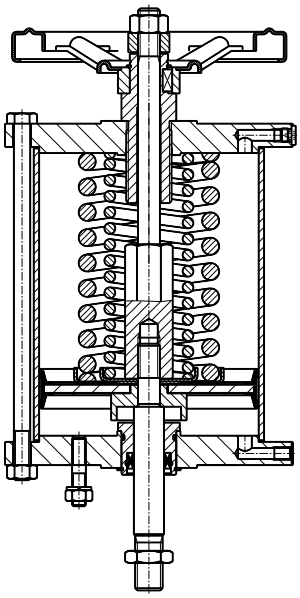
LAP-SF type



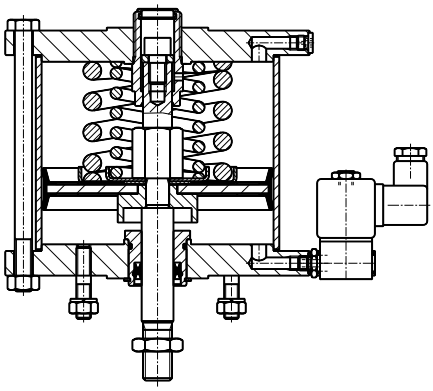
LAP-AZ type with emergency handwheel



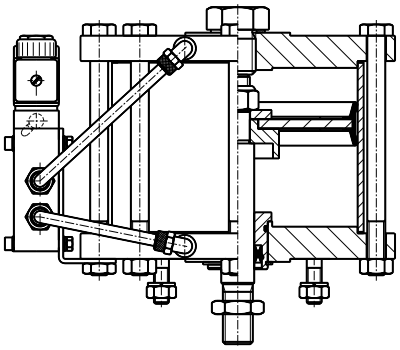
LAP-OF type with emergency handwheel



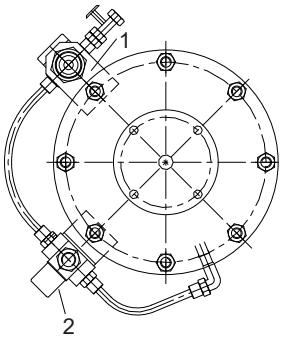
LAP-SF type with emergency handwheel



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

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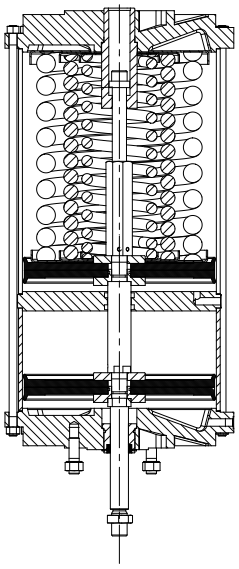
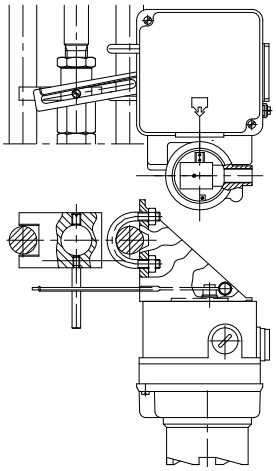
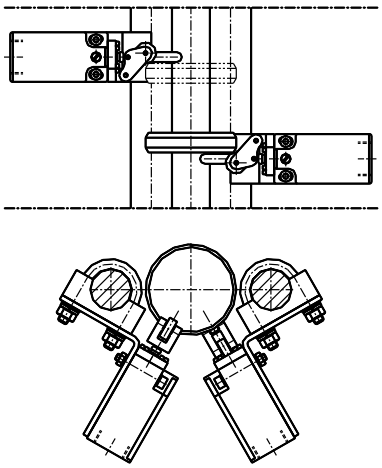


LAP-SF type with double piston

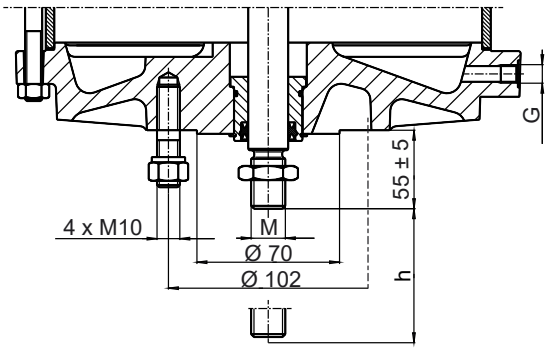


Configuration with positioner

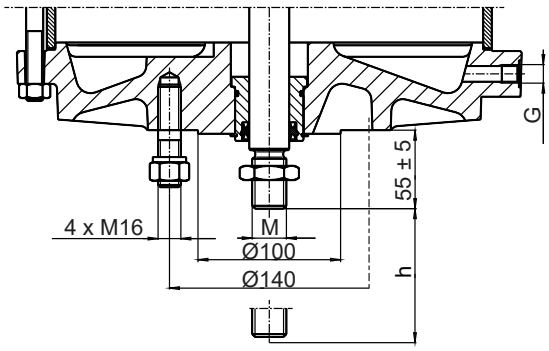


Configuration with mechanical limit switches

Interface



Flange connection F10



Flange connection F14

Table 16: Symbols key

Symbol	Description
G	G1/8 in. for piston diameters 80/125/160 G1/4 in. for piston diameters 200/250/300
M	M12 for piston diameters 80/125 M20 for piston diameters 160 to 300 M24 for piston diameters D300/F14 optional

Mating dimensions as per standard

Flange connection:	DIN ISO 5210 / DIN 3358
Pipe connection:	DIN ISO 228 G1/8 in. and G1/4 in.

Dimensions and weights

Dimensions and weights of SISTO-16 manually operated valve with flanged ends

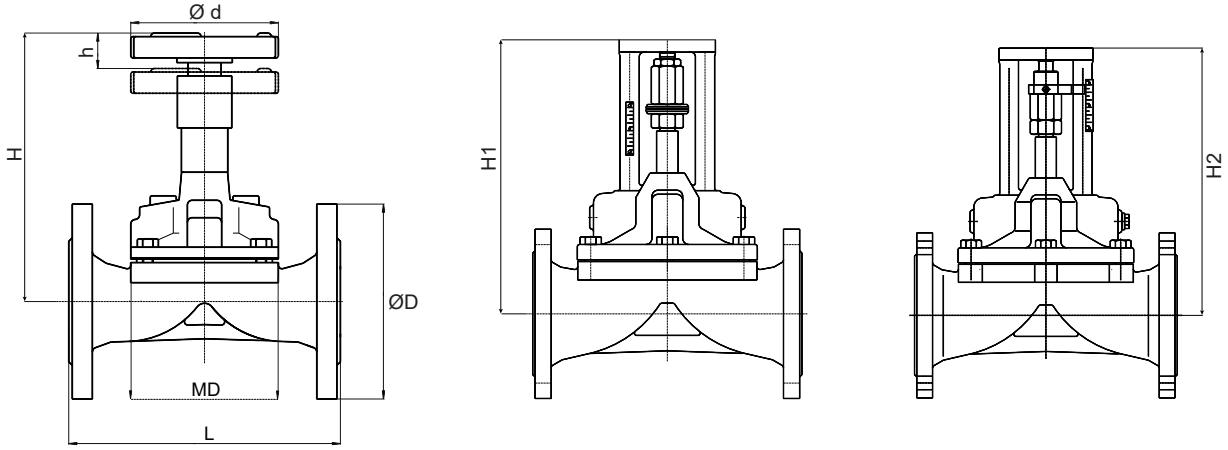


Fig. 5: SISTO-16 manually operated valve with flanged ends

Prepared for SISTO-LAP (from MD 65)

Prepared for electric actuator (from MD 65)

Table 17: Dimensions and weights

DN	MD [mm]	L [mm]	Ø D [mm]	h [mm]	Manually operated valve				Prepared for actuator		
					H[15] [mm]	Ø d [mm]	Handwheel turns approx.	[kg]	Centre-to-top height SISTO-LAP H1[15] [mm]	Centre-to-top height Electric actuator H2[15]	
										F07/F10 [mm]	F14 [mm]
15	40	130	95	7	104	60	3	2,5	On request	On request	-
20	65	150	105	13	152	100	4	3,9	220	220	-
25	65	160	115	13	150	100	4	4,5	220	220	-
32	92	180	140	22	196	100	7	7,1	245	245	-
40	92	200	150	22	200	100	7	7,5	245	245	-
50	115	230	165	30	241	125	8	11,0	265	285	-
65	168	290	185	45	322	200 (250)[16]	9	20,5	350	370	-
80	168	310	200	45	322	200 (250)[16]	9	23,0	350	370	-
100	202	350	220	60	388	250 (315)[16]	12	36,5	390	410	-
125	202	400	250	60	388	250 (315)[16]	12	44,0	390	410	-
150	280	480	285	80	512	400 (500)[16]	13	80,0	500	520	540
200[17]	280	600	340	80	512	400 (500)[16]	13	100,0	500	520	540
250[18]	415	730	400	115	645	400	20	190,0	600	-	640
300[18]	415	850	445	115	645	400	20	210,0	600	-	640

Mating dimensions as per standard

Face-to-face lengths:	EN 558 R1
Flanges:	DIN EN 1092-2
Flange facing:	DIN EN 1092-2, type B

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15 Add 5 mm to centre-to-top height for rubber-lined valves.

16 Optionally with a larger handwheel diameter for operating pressures > 10 bar, from DN 100, a gearbox can be used as an alternative.

17 Alternative: bolt hole pattern to DIN EN 1092-2 PN 10

18 Bolt hole pattern to DIN EN 1092-2 PN 10. Optional: gearbox for operating pressures > 5 bar.

Dimensions and weights of SISTO-16 manually operated valve with threaded socket ends

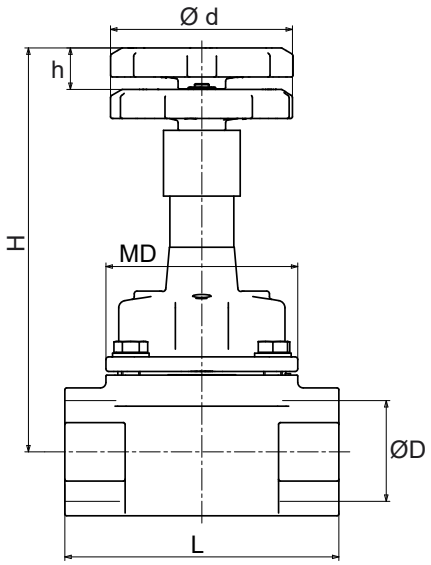

Fig. 6: SISTO-16 manually operated valve with threaded socket ends

Table 18: Dimensions and weights

DN	MD [mm]	Ø D [inch]	L [mm]	H [mm]	Ø d [mm]	h [mm]	[kg]
15	40	½	85	103	63	7	0,5
20	40	¾	95	106	63	7	0,6
25	65	1	105	151	100	13	2,5
32	65	1¼	120	156	100	13	2,5
40	65	1½	130	159	100	13	3,0
50	92	2	150	202	100	22	5,0
65	115	2½	185	248	125	30	8,0
80	168	3	220	333	200	45	16,5

Mating dimensions as per standard

Face-to-face lengths:	DIN EN 16722
Pipe threads:	DIN EN 10226-1 (ISO 7/1)

Dimensions and weights of SISTO-16 with directly mounted LAP.520 and DLAP.230 piston actuator

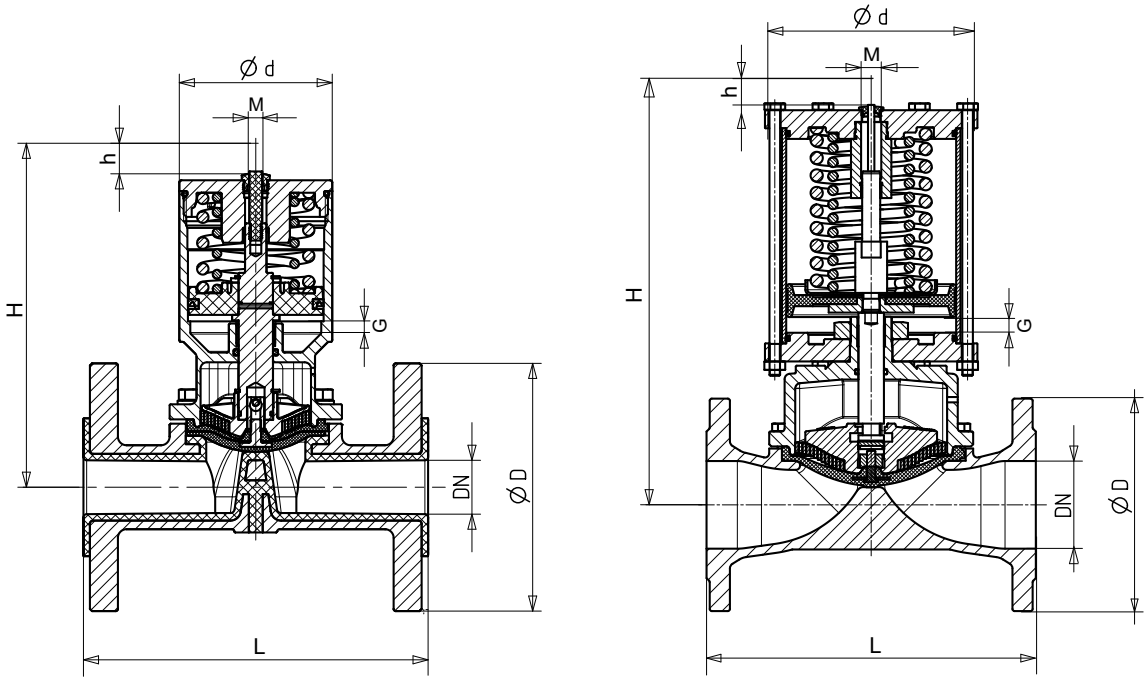

Fig. 7: Diaphragm valves with directly mounted piston actuators

SISTO-16 with LAP.520

SISTO-16 with DLAP.230

Table 19: Dimensions and weights

DN	MD [mm]	Type	Piston [mm]	L [mm]	Ø D [mm]	h [mm]	H [mm]	Ø d [mm]	[kg]
15	40	LAP.520	40	130	95	7	112	46	2,2
			50				136	58	2,7
20	65	LAP.520	63	150	105	13	156	71	4,1
			80				182	89	5,5
25	65	LAP.520	63	160	115	13	159	71	4,5
			80				185	89	6,0
32	92	LAP.520	80	180	140	21	214	89	8,5
			100				225	110	10,0
40	92	LAP.520	80	200	150	21	219	89	9,3
			100				230	110	10,8
50	115	LAP.520	100	230	165	24	252	110	14,0
		DLAP.230	125				364	165	18,5
			160				381	200	23,0
65	168	DLAP.230	160	290	185	40	423	200	33,0
			200				467	250	44,0
80	168	DLAP.230	160	310	200	40	423	200	35,5
			200				467	250	47,0
100	202	DLAP.230	200	350	220	55	517	250	56,0
125	202	DLAP.230	200	400	250	55	517	250	63,5

Table 20: Connections

	Piston 40 - 50 mm	Piston 63 mm	≥ Piston 80 mm
Control air	M5	G1/8 in	G1/8 in
Interface for accessories	M12x1	M12x1	M18x1

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Dimensions and weights of SISTO-LAP piston actuator

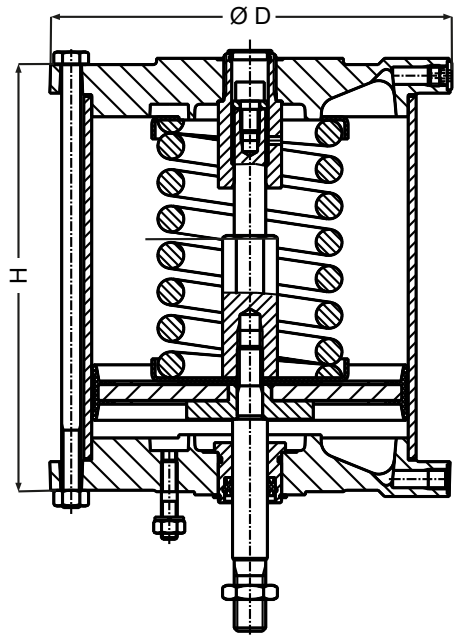

Fig. 8: SISTO-LAP

Table 21: Dimensions and weights for actuator function: **type LAP-AZ (air-to-open/air-to-close)**

Type	Stroke [mm]	Ø D [mm]	H [mm]	[kg]
LAP-AZ-80-F10	15	130	111	4
LAP-AZ-80-F10	30	130	131	5
LAP-AZ-125-F10	15	170	131	6
LAP-AZ-125-F10	30	170	131	7
LAP-AZ-125-F10	45	170	151	8
LAP-AZ-125-F10	60	170	151	9
LAP-AZ-160-F10	30	210	168	11
LAP-AZ-160-F10	45	210	168	11
LAP-AZ-160-F10	60	210	188	12
LAP-AZ-200-F10	30	255	170	17
LAP-AZ-200-F10	45	255	190	17
LAP-AZ-200-F10	60	255	210	18
LAP-AZ-200-F10	80	255	230	20
LAP-AZ-250-F10	60	305	240	25
LAP-AZ-250-F10	80	305	260	28
LAP-AZ-250-F14	60	305	260	28
LAP-AZ-250-F14	80	305	260	28
LAP-AZ-300-F10	60	355	254	32
LAP-AZ-300-F10	80	355	274	35
LAP-AZ-300-F14	60	355	254	32
LAP-AZ-300-F14	80	355	274	35
LAP-AZ-D250-F14	80	355	424	47
LAP-AZ-D300-F14	80	355	432	61

Table 22: Dimensions and weights for actuator function: **type LAP-OF (spring-to-open/air-to-close)**

Type	Stroke [mm]	Ø D [mm]	H [mm]	[kg]
LAP-OF-80.101-F10	15	130	151	5
LAP-OF-80.101-F10	30	130	151	6
LAP-OF-125.101-F10	15	170	151	7
LAP-OF-125.101-F10	30	170	151	8
LAP-OF-160.102-F10	30	210	188	12
LAP-OF-160.102-F10	45	210	208	13
LAP-OF-200.102-F10	30	255	210	19
LAP-OF-200.102-F10	45	255	210	19

Type	Stroke [mm]	Ø D [mm]	H [mm]	[kg]
LAP-OF-200.001-F10	45	255	310	22
LAP-OF-200.001-F10	60	255	330	23
LAP-OF-250.002-F10	60	305	380	32
LAP-OF-250.002-F10	80	305	400	35
LAP-OF-250.002-F14	60	305	400	32
LAP-OF-250.002-F14	80	305	400	35
LAP-OF-300.002-F10	60	355	414	51
LAP-OF-300.012-F14	80	355	434	53
LAP-OF-D250.012-F14	80	305	504	54
LAP-OF-D300.012-F14	80	355	572	74

Table 23: Dimensions and weights for actuator function: **type LAP-SF (air-to-open/spring-to-close)**

Type	Stroke [mm]	Ø D [mm]	H [mm]	[kg]
LAP-SF-80.001.5-F10	15	130	171	6
LAP-SF-80.001-F10	30	130	271	7
LAP-SF-125.002.5-F10	15	170	212	10
LAP-SF-125.002-F10	30	170	271	12
LAP-SF-160.012-F10	30	210	274	18
LAP-SF-160.012-F10	45	210	310	19
LAP-SF-200.003.5-F10	30	255	290	28
LAP-SF-200.003.7-F10	45	255	350	32
LAP-SF-200.003-F10	60	255	450	35
LAP-SF-200.003-F10	80	255	470	37
LAP-SF-250.004.7-F10	45	305	380	42
LAP-SF-250.004-F10	60	305	480	45
LAP-SF-250.004-F10	80	305	500	48
LAP-SF-250.004-F14	60	305	380	42
LAP-SF-250.004-F14	80	305	500	49
LAP-SF-300.034-F10	60	355	514	67
LAP-SF-300.034-F14	80	355	535	75
LAP-SF-D300.005-F14	80	355	732	99
LAP-SF-D300.034-F10	80	355	693	81
LAP-SF-D300.345-F14	80	355	732	122

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Technical data

Actuator sizes of directly mounted LAP.520 and DLAP.230 piston actuators

Selection table for maximum permissible operating pressure in bar for SISTO-16

Minimum required control pressure: 5.5 bar
Maximum permissible control pressure 7 bar

Operating pressure for pressure applied on one side in accordance with EN12266-1.
Information on operating pressures applied on both sides is available on request.

Combination of diaphragm seats (MD) and nominal sizes (DN) (⇨ Page 22)

Table 24: Operating pressure [bar] for actuator function: **type LAP-AZ (air-to-open/air-to-close)**

MD [mm]	Type	Piston [mm]	Elastomer diaphragm [bar]	TFM diaphragm [bar]
40	LAP.520	40	10	-
		50	16	16
65	LAP.520	63	10	5
		80	16	12
92	LAP.520	80	8	4
		100	14	8
115	LAP.520	100	10	5
	DLAP.230	125	14	8
		160	16	16
168	DLAP.230	160	9	6
		200	15	10
202	DLAP.230	200	10	7

Table 25: Operating pressure [bar] for actuator function: **type LAP-OF (spring-to-open/air-to-close)**

MD [mm]	Type	Piston [mm]	Elastomer diaphragm [bar]	TFM diaphragm [bar]
40	LAP.520	40	10	-
		50	16	16
65	LAP.520	63	10	5
		80	16	12
92	LAP.520	80	8	4
		100	14	8
115	LAP.520	100	8	3
	DLAP.230	125	14	8
		160	16	16
168	DLAP.230	160	9	6
		200	15	10
202	DLAP.230	200	10	7

Table 26: Operating pressure [bar] for actuator function: **type LAP-SF (air-to-open/spring-to-close)**

MD [mm]	Type	Piston [mm]	Elastomer diaphragm [bar]	TFM diaphragm [bar]
40	LAP.520	40	9	-
		50	16	13
65	LAP.520	63	9	4
		80	16	12
92	LAP.520	80	8	4
		100	13	8
115	LAP.520	100	8	3
	DLAP.230	125	12	6
		160	16	14
168	DLAP.230	160	7	4
		200	13	9
202	DLAP.230	200	8	5

Other selection options on request.

Actuator size of SISTO-LAP piston actuator

Selection table for maximum permissible operating pressure in bar for SISTO-16 valve with elastomer diaphragm

Minimum required control pressure: 5.5 bar
Maximum permissible pressure 10 bar

Operating pressure for pressure applied on one side in accordance with EN12266-1.
Information on operating pressures applied on both sides is available on request.

Table 27: Symbols key

Symbol	Description
↑	Select smaller actuator.
↓	Select larger actuator.

Table 28: Operating pressure [bar] for actuator function: **type LAP-AZ (air-to-open/air-to-close)**

Actuator size	Stroke [mm]	MD 65	MD 92	MD 115	MD 168	MD 202	MD 280
LAP-AZ-80-F10	15/30	16	9	5	↓	↓	↓
LAP-AZ-125-F10	15/30	↑	16	16	↓	↓	↓
LAP-AZ-125-F10	45/60	↑	↑	↑	5	↓	↓
LAP-AZ-160-F10	30	↑	↑	↑	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	10	6	↓
LAP-AZ-200-F10	30/45	↑	↑	↑	16	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↑	10	3
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	↑	16	7
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	↑	11
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	16
LAP-AZ-D300-F14[19)]	80	↑	↑	↑	↑	↑	↑

Table 29: Operating pressure [bar] for actuator function: **type LAP-OF (spring-to-open/air-to-close)**

Actuator size	Stroke [mm]	MD 65	MD 92	MD 115	MD 168	MD 202	MD 280
LAP-OF-80.101-F10	15/30	16	5	3	↓	↓	↓
LAP-OF-125.101-F10	15/30	↑	16	16	↓	↓	↓
LAP-OF-160.102-F10	30/45	↑	↑	↑	9	↓	↓
LAP-OF-200.102-F10	30/45	↑	↑	↑	15	↓	↓
LAP-OF-200.001-F10	45/60	↑	↑	↑	↑	9	↓
LAP-OF-250.002-F10/F14	60/80	↑	↑	↑	16	16	4
LAP-OF-300.002-F10[19)]	60	↑	↑	↑	↑	↑	↓
LAP-OF-300.012-F14	80	↑	↑	↑	↑	↑	10
LAP-OF-D250.012-F14	80	↑	↑	↑	↑	↑	14
LAP-OF-D300.012-F14[19)]	80	↑	↑	↑	↑	↑	16

Table 30: Operating pressure [bar] for actuator function: **type LAP-SF (air-to-open/spring-to-close)**

Actuator size	Stroke [mm]	MD 65	MD 92	MD 115	MD 168	MD 202	MD 280
LAP-SF-80.001.5-F10	15	13	↓	↓	↓	↓	↓
LAP-SF-80.001-F10	30	16	7	3	↓	↓	↓
LAP-SF-125.002.5-F10	15	↑	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	16	10	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	↑	15	4	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	16	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	↑	9	↓	↓
LAP-SF-200.003-F10	60/80	↑	↑	↑	↓	6	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	14	↓	↓
LAP-SF-250.004F10/F14	60/80	↑	↑	↑	↓	9	3
LAP-SF-300.034-F10	60	↑	↑	↑	16	15	↓
LAP-SF-300.034-F14	80	↑	↑	↑	↑	↑	5
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	16	10
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	16

Other selection options on request.

19 Max. control pressure: 7 bar

Actuator size of SISTO-LAP piston actuator

Selection table for maximum permissible operating pressure in bar for SISTO-16 valve with TFM diaphragm

Minimum required control pressure: 5.5 bar
Maximum permissible pressure 10 bar

Operating pressure for pressure applied on one side in accordance with EN12266-1.
Information on operating pressures applied on both sides is available on request.

Table 31: Symbols key

Symbol	Description
↑	Select smaller actuator.
↓	Select larger actuator.

Table 32: Operating pressure [bar] for actuator function: **type LAP-AZ (air-to-open/air-to-close)**

Actuator size	Stroke [mm]	MD 65	MD 92	MD 115	MD 168	MD 202	MD 280
LAP-AZ-80-F10	15/30	13	4	↓	↓	↓	↓
LAP-AZ-125-F10	15/30	16	16	8	↓	↓	↓
LAP-AZ-160-F10	30	↑	↑	16	↓	↓	↓
LAP-AZ-160-F10	45/60	↑	↑	↑	6	↓	↓
LAP-AZ-200-F10	30/45	↑	↑	↑	11	↓	↓
LAP-AZ-200-F10	60/80	↑	↑	↑	↓	7	↓
LAP-AZ-250-F10/F14	60/80	↑	↑	↑	16	13	↓
LAP-AZ-300-F10/F14	60/80	↑	↑	↑	↑	16	5
LAP-AZ-D250-F14	80	↑	↑	↑	↑	↑	10
LAP-AZ-D300-F14[20)]	80	↑	↑	↑	↑	↑	16

Table 33: Operating pressure [bar] for actuator function: **type LAP-OF (spring-to-open/air-to-close)**

Actuator size	Stroke [mm]	MD 65	MD 92	MD 115	MD 168	MD 202	MD 280
LAP-OF-80.101-F10	15/30	8	↓	↓	↓	↓	↓
LAP-OF-125.101-F10	15/30	16	↓	↓	↓	↓	↓
LAP-OF-160.102-F10	30/45	↑	16	14	↓	↓	↓
LAP-OF-200.102-F10	30/45	↑	↑	16	↓	↓	↓
LAP-OF-200.001-F10	45/60	↑	↑	↑	8	↓	↓
LAP-OF-250.002-F10/F14	60/80	↑	↑	↑	14	9	↓
LAP-OF-300.002-F10[20)]	60	↑	↑	↑	16	16	↓
LAP-OF-300.012-F14	80	↑	↑	↑	↑	↑	2
LAP-OF-D250.012-F14	80	↑	↑	↑	↑	↑	8
LAP-OF-D300.012-F14[20)]	80	↑	↑	↑	↑	↑	16

Table 34: Operating pressure [bar] for actuator function: **type LAP-SF (air-to-open/spring-to-close)**

Actuator size	Stroke [mm]	MD 65	MD 92	MD 115	MD 168	MD 202	MD 280
LAP-SF-80.001.5-F10	15	7	↓	↓	↓	↓	↓
LAP-SF-125.002.5-F10	15	16	↓	↓	↓	↓	↓
LAP-SF-125.002-F10	30	↑	12	4	↓	↓	↓
LAP-SF-160.012-F10	30/45	↑	16	8	↓	↓	↓
LAP-SF-200.003.5-F10	30	↑	↑	10	↓	↓	↓
LAP-SF-200.003.7-F10	45	↑	↑	16	5	↓	↓
LAP-SF-250.004.7-F10	45	↑	↑	↑	10	↓	↓
LAP-SF-250.004-F10	60	↑	↑	↑	↑	6	↓
LAP-SF-300.034-F10	60	↑	↑	↑	16	12	↓
LAP-SF-D300.034-F10[20)]	60	↑	↑	↑	↑	↑	↓
LAP-SF-D300.005-F14	80	↑	↑	↑	↑	16	4
LAP-SF-D300.345-F14	80	↑	↑	↑	↑	↑	10

Other selection options on request.

20 Max. control pressure: 7 bar

Glossary

ATEX 2014/34/EU

The acronym ATEX is the French abbreviation for explosive atmospheres: “Atmosphère explosible”. The ATEX product directive 2014/34/EU lays down rules to be met by equipment and protective systems intended for use in potentially explosive atmospheres in the European Union (EU).

DN

Nominal size; numeric designation of size of the components in a piping system

LAP-AZ

LAP-AZ = OPEN/CLOSE = double-acting piston actuator (air-to-open / air-to-close)

LAP-OF

LAP-OF = opening spring = pneumatic piston actuator, fail-open (spring-to-open / air-to-close)

LAP-SF

LAP-SF = closing spring = pneumatic piston actuator, fail-close (air-to-open / spring-to-close)

MD

Diaphragm diameter, numeric designation of the diaphragm size

Pressure Equipment Directive 2014/68/EU (PED)

The 2014/68/EU Directive sets out the requirements to be met by pressure equipment intended to be placed on the market in the European economic area.

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