

# Diaphragm Valve

## SISTO-C

Sterile Process Engineering  
PN 16  
DN 6 - 200

## Type Series Booklet



**SISTO**

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Type Series Booklet SISTO-C

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## Diaphragm Valves

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

## SISTO-C



**Fig. 1:** SISTO-C LAP.520 with SK-i.310 (left)  
SISTO-C HV (right)

### Main applications

- Chemical industry
- Homogenisation
- Food industry / beverage industry
- Pharmaceutical industry
- Process engineering
- Water treatment

### Fluids handled

- Aggressive fluids
- Inorganic fluids
- Steam
- Distillate
- Gas
- Fluids posing a health hazard
- Toxic fluids
- Hot water
- Corrosive fluids
- Valuable fluids
- Volatile fluids
- Solvents
- Oil
- Organic fluids

- Polymerising/crystallising fluids
- Radioactive fluids
- Cleaning agents

### Operating data

#### SISTO-C manually operated valve

**Table 1:** Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size <sup>1)</sup>	DN 6 - 200
Max. permissible pressure [bar]	16
Min. permissible temperature [°C] <sup>2)</sup>	≥ -20
Max. permissible temperature [°C] <sup>2)</sup>	≤ +160

#### SISTO-C LAP actuated valve

**Table 2:** Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size <sup>1)</sup>	DN 6 - 200
Max. permissible pressure [bar]	16
Min. permissible temperature [°C] <sup>2)</sup>	≥ -20
Max. permissible temperature [°C] <sup>2)</sup>	≤ +160
Control fluid	Compressed air <sup>3)</sup> (min. 5.5 bar) (max. 7.0 bar)

### Valve body materials

**Table 3:** Overview of available materials

Material	Material number	Temperature limit
X2CrNiMo18-14-3 <sup>4)</sup>	1.4435/316L	-20 °C to +160 °C
X1NiCrMoCuN25-20-7	1.4529	-20 °C to +160 °C
X1NiCrMoCu25-20-5	1.4539	-20 °C to +160 °C
NiCr21Mo14W	2.4602	-20 °C to +160 °C
NiCr23Mo16Al	2.4605	-20 °C to +160 °C
NiMo16Cr15W	2.4819	-20 °C to +160 °C
NiMo16Cr16Ti	2.4610	-20 °C to +160 °C

<sup>1)</sup> Smaller and larger nominal sizes available on request

<sup>2)</sup> The temperatures indicated are for orientation only; they are not valid for all operating conditions.

<sup>3)</sup> Control pressure below 5.5 bar available on request.

<sup>4)</sup> Forged material to ASME BPE: sulphur content 0.005 % to 0.015 %; chrome content 17 % to 18 %; BN2: Δ Fe < 0.5 %

## Design details

### Design

- Soft-seated weir-type shut-off valve in straight-way pattern, Y-pattern, T-pattern and multi-port pattern, either manually operated or with pneumatic piston actuator
- Shut-off and sealing to atmosphere by completely enclosed diaphragm; no dead volumes; suitable for sterilisation
- Suitable for CIP/SIP
- Self-drain angle marked on weld ends and in marking area.
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- Marked in accordance with ASME BPE

### Variants

- Tank valves or multi-port valves<sup>5)</sup>
- Pneumatic actuators
- Limit switches
- SISTO-SK-i actual-position feedback unit
- SISTO-SK-i actual-position feedback unit with integrated solenoid valve
- Positioners
- Adjustable travel stop
- HV.514/.524: diaphragm valve with handwheel, locking device and padlock
- HV.516/.526: diaphragm valve with handwheel and stem extension
- HV.518/.528: diaphragm valve with handwheel and inductive Open/Closed limit switch
- HV.519/.529/SISTO-CSPV: diaphragm valve with handwheel and pneumatic fail-safe action
- HV.523: Diaphragm valve with handwheel and travel stop for closed and open positions (MD168 and MD202)
- LAP.523: diaphragm valve with pneumatic piston actuator, high-temperature version for temperatures  $\geq 80^{\circ}\text{C}$  at the actuator cylinder
- LAP.525: diaphragm valve with pneumatic piston actuator, with full and partial opening (2-stage actuator)
- LAP.526: diaphragm valve with pneumatic piston actuator with overflow function
- LAP.527: diaphragm valve with actuator with lower control pressure

## Diaphragm materials

Table 4: Overview of diaphragm qualities

Diaphragm	Temperature limit [°C]
SISTO-AseptiXX EPDM	+140
SISTO-AseptiXX TFM/EPDM, bonded	
SISTO-AseptiXX TFM/EPDM, 2- piece	+160

## Surface finish

Table 5: Surface finish of wetted internal body surfaces

Internal body surfaces				
Ra [µm] <sup>6)</sup>	Ra [µin]	ASME BPE code	Hygiene class DIN 11866	Surface treat- ment
6,3	250	SF0	-	Ground
3,2	125	-	-	
1,6	60	-	-	
0,8	30	SF3	H3	
0,6	25	SF2	-	
0,5	20	SF1	-	
0,4	15	-	H4	

Internal body surfaces				
Ra [µm] <sup>6)</sup>	Ra [µin]	ASME BPE code	Hygiene class DIN 11866	Surface treat- ment
0,8	30	-	HE3	Electropolished
0,6	25	SF6	-	
0,5	20	SF5	-	
0,4	15	SF4	HE4	
0,25	10	-	HE5	

<sup>5)</sup> For further designs refer to the "Sterile Processes" catalogue, reference No. 8652.10. More variants on request.

<sup>6)</sup> Exact values in accordance with ASME BPE: 0.76 µm/ 0.64 µm/ 0.51 µm/ 0.38 µm

## Manually operated valve

**Table 6:** Overview of materials of manually operated valve

MD	Type	Bonnet	Handwheel
30 - 115	HV.510	Stainless steel 1.4409	PA66-GF30
30 - 202	HV.520	Stainless steel 1.4409	Stainless steel 1.4409
280 <sup>7)</sup>	HV	-	-

## Drive

**Table 7:** Overview of materials of pneumatic piston actuator

MD	Type	Bonnet	Piston actuator
30 - 202	LAP.520	Stainless steel 1.4409	Stainless steel 1.4409 / 1.4301
280 <sup>7)</sup>	LAP	-	-

## SISTO-LAP piston actuator

- 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

## Product benefits

- Reliable sealing ensured by one single sealing element (the diaphragm) which provides hermetic sealing to atmosphere and absolutely tight shut-off. The specially enclosed diaphragm ensures long service life and high operating reliability.
- Special design: All moving parts are separated from the fluid by the diaphragm.
- Compact valve design with integrated actuator requires minimal space.
- Actuator interface allows straightforward retrofitting of limit switches.
- Higher sterile requirements can be met with standard design by controlled discharge of exhaust air
- Pneumatic stainless steel actuators meet stringent requirements in sterile applications.
- High operating comfort thanks to visual position indicator, also with the limit switch enclosure mounted
- Low-friction piston seal minimises friction losses and ensures smooth movement of the pneumatic actuators.
- The valve hydraulics without dead volume offers optimum conditions for high-purity fluids.
- Optimised functional reliability of the diaphragm thanks to balanced diaphragm suspension
- Reliable processes ensured by limit switches in IP64 stainless steel enclosure for actuators

- Readily identifiable position: integral red position indicator on manually operated valves and pneumatic actuators
- The valves are self-draining and CIP/SIP-compatible, making them ideally suited for pharmaceutical applications
- Laser marking simplifies valve installation and identification of drain angle.

## 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).

## Related documents

**Table 8:** Information/documents

Document	Reference number
Sterile Processes catalogue	8652.10.
Operating manual	0570.822.
Type series booklet SISTO-SK-i	8676.5.

<sup>7</sup> Design as per customer specifications

**Available software/apps****SISTO angle measurement**

This software can be used to measure the drain angle.

<https://sisto-aseptic.com/files/app3/index.html>

**CAD portal, SISTO**

This software uses the digital data of the SISTO products.

<https://ksb.partcommunity.com/3d-cad-models/diaphragm-valves-ksb?info=ksb%2F1products%2F3-valves%2F5diaphragm&cwid=3461>



## Materials

### Materials of SISTO-C manually operated valve

SISTO-C HV.510/.520 with handwheel

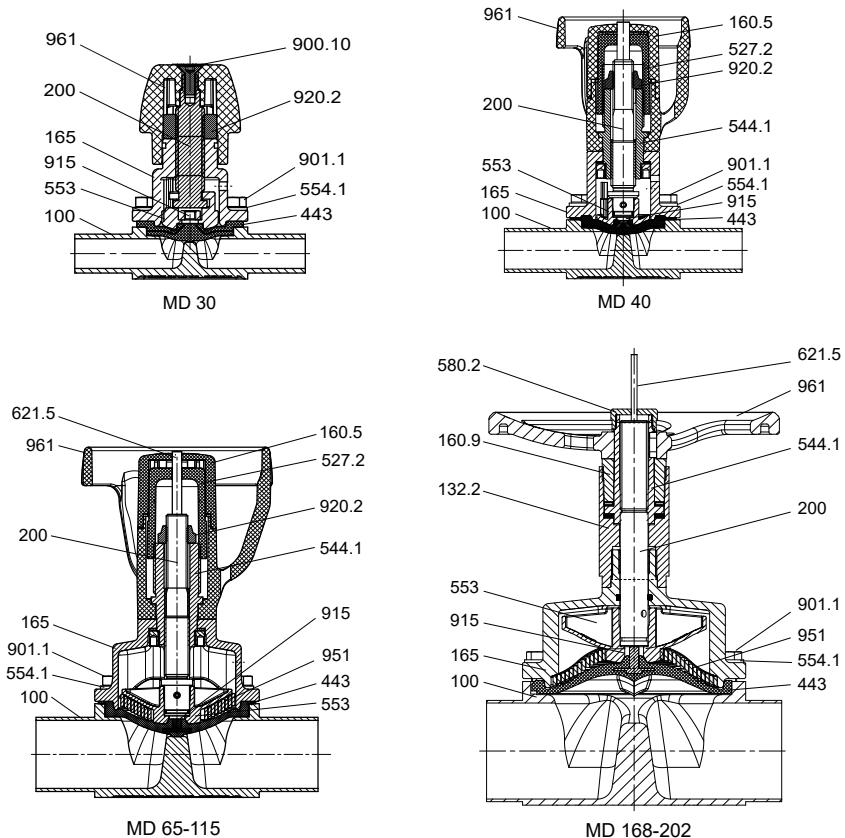


Fig. 2: SISTO-C HV.510/.520, MD 30 - 202

Table 9: Parts list

Part No.	Description	Material	Material number	Note
100	Body	X2CrNiMo18-14-3	1.4435/316L	Forged
132.2	Intermediate piece	X2CrNiMo17-12-2	1.4404	-
160.5	Handwheel cover	PA66-GF30	-	30 % glass fibre, black
160.9	Bearing cover	X2CrNiMo17-12-2	1.4404	-
165	Bonnet	GX2CrNiMo19-11-2	1.4409	-
200	Stem	X2CrNiMo17-12-2 X8CrNiS18-9	1.4404/1.4305	MD 30 = 1.4404 Kolsterised
443 <sup>8)</sup>	Diaphragm	SISTO-AseptiXX EPDM	-	FDA, CFR 21, Section 177.2600 EG 1935/2004
527.2	Locating sleeve	PA66-GF30	-	-
544.1	Threaded bush	SoMs59	-	-
553	Compressor	GX2CrNiMo19-11-2	1.4409	-
554.1	Washer	A2	-	-
580.2	Cap	X2CrNiMo17-12-2	1.4404	-
621.5	Position indicator	PA6	-	-
900.10	Bolt/screw	A2	-	-
901.1	Hexagon head bolt	A2-70	-	DIN 933
915	Floating nut	A2	-	-
920.2	Nut	A2	-	-
951	Support spiral	X5CrNi18-10	1.4301	-
961	Handwheel	PA66-GF30 GX2CrNiMo19-11-2	1.4409	MD 30 - 115; 30 % glass fibre, black MD 168 - 202

<sup>8</sup> Recommended spare parts

### Materials of piston actuators for SISTO-C

SISTO-C with LAP.520-SF

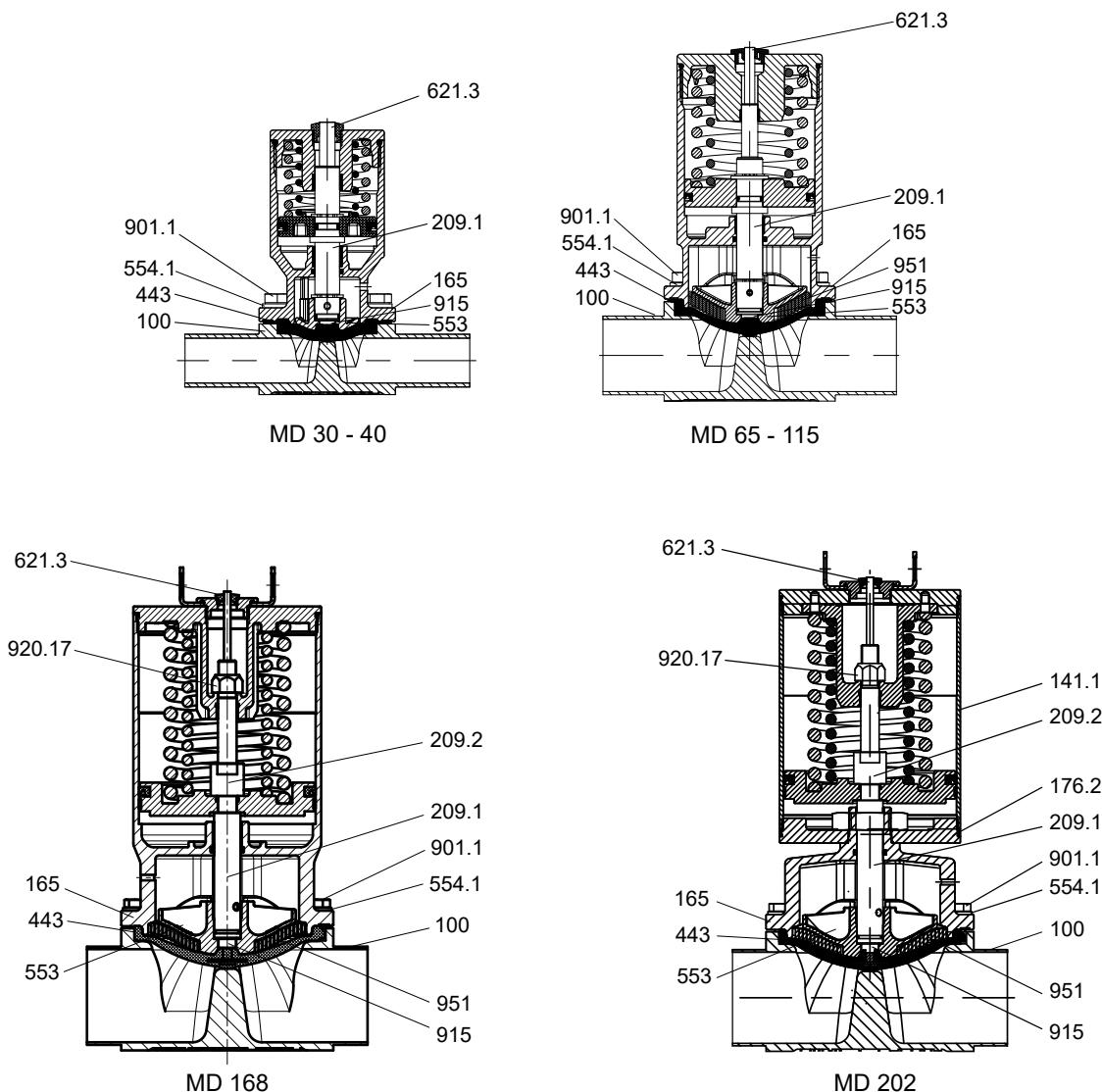


Fig. 3: SISTO-C LAP.520 (illustration of pneumatic piston actuator SF), MD 30-202

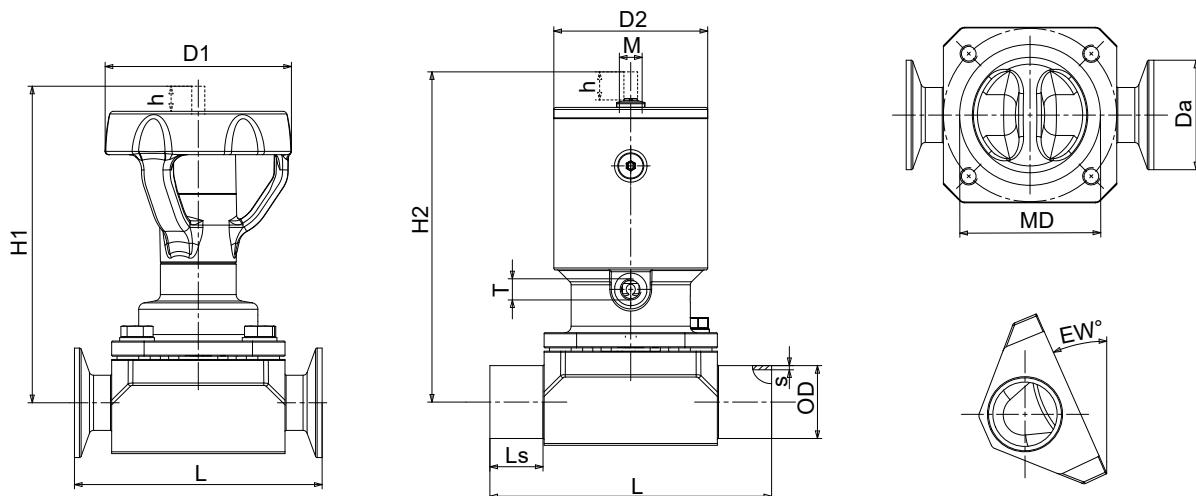
Table 10: Parts list

Part No.	Description	Material	Material number	Note
100	Body	X2CrNiMo18-14-3	1.4435/316L	Forged
141.1	Cylinder	X5CrNi18-10	1.4541	-
165	Bonnet	GX2CrNiMo19-11-2	1.4409	-
209.1	Lower piston rod	X8CrNiS18-9	1.4305	-
209.2	Upper piston rod	X8CrNiS18-9	1.4305	-
443 <sup>9)</sup>	Diaphragm	SISTO-AseptiXX EPDM	-	FDA, CFR 21, Section 177.2600 EG 1935/2004
553	Compressor	GX2CrNiMo19-11-2	1.4409	-
554.1	Washer	A2	-	-
621.3	Position indicator	PA	-	-
901.1	Hexagon head bolt	A2-70	-	DIN 933
915	Floating nut	A2	-	-
920.17	Nut	A2	-	-
951	Support spiral	X5CrNi18-10	1.4301	From MD 65

<sup>9</sup> Recommended spare parts

## Dimensions

### Dimensions to DIN



**Fig. 4:** Dimensions to DIN

**Table 11:** Dimensions and weights to DIN

DN <sup>12)</sup>	Inch	MD	h [mm]	EW <sup>13)</sup>	Manually operated valve <sup>10)</sup>			Piston actuator <sup>11)</sup>					Butt weld ends to DIN 11866-A				Clamps to DIN 32676-A (DIN 11866-A)			K <sub>vs</sub> value [m <sup>3</sup> /h]	
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	ODxs [mm]	L [mm]	Da [mm]				
<b>Standard DN/MD combination</b>																					
6	1/4	30	5	41,2	68	35	0,4	87	41	0,6			80	20,0	8x1,0	63,5	25,0	1,1			
8	5/16			34,6	68			87							10x1,0						1,8
10	3/8			24,0	69			88							13x1,5						34,0
15	1/2	40	7	21,7	116	66	0,9	103	46	0,9			115	30,0	19x1,5	88,9	34,0	5,0			
20	3/4	65	13	34,6	146	88	2,0	149	71	2,9			130	25,0	23x1,5	101,6					11,8
25	1			24,1	148			151							29x1,5	114,3	50,5	16,5			
32	1 1/4	92	21	31,3	215	125	4,6	207	89	6,3			180	37,5	35x1,5	139,7	50,5	34,0			
40	1 1/2			24,7	216			208							41x1,5						42,5
50	2	115	24	21,7	231	125	7,1	242	110	10,3			190	32,5	53x1,5	158,8	64,0	65,0			
65	2 1/2	168	40	31,0	327	250	23,8	396	170	30,7			254	31,0	70x2,0	-	-				137,0
80	3			21,0	336			22,8	405						85x2,0	-	-				156,0
100	4	202	55	20,0	377	250	37,7	501	210	48,5/ 59,3			305	37,5	104x2,0	-	-				245,0
125	5			8,8	392			49,7	- <sup>14)</sup>						356	63,0	129x2,0	-	-		230,0
150	6	280	80	17,9	512	400	97,0	- <sup>14)</sup>							414	50,0	154x2,0	-	-		490,0
200	8			4,1	536			114,0	- <sup>14)</sup>						521	103,5	204x2,0	-	-		500,0
<b>Compact DN/MD combination</b>																					
20	3/4	40	7	9,6	120	66	1,0	107	46	1,0			115	30,0	23x1,5	-	-				4,4
32	1 1/4	65	13	12,2	154	88	2,6	157	71	3,5			140	30,0	35x1,5	-	-				15,4
50	2	92	21	10,0	226	125	6,5	218	89	8,2			190	42,5	53x1,5	-	-				42,4
65	2 1/2	115	24	7,0	241	125	8,0	252	110	11,2			200	37,5	70x2,0	-	-				65,0
100	4	168	40	10,7	351	250	30,9	439	170	34,7			305	56,5	104x2,0	-	-				143,0

10 Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202

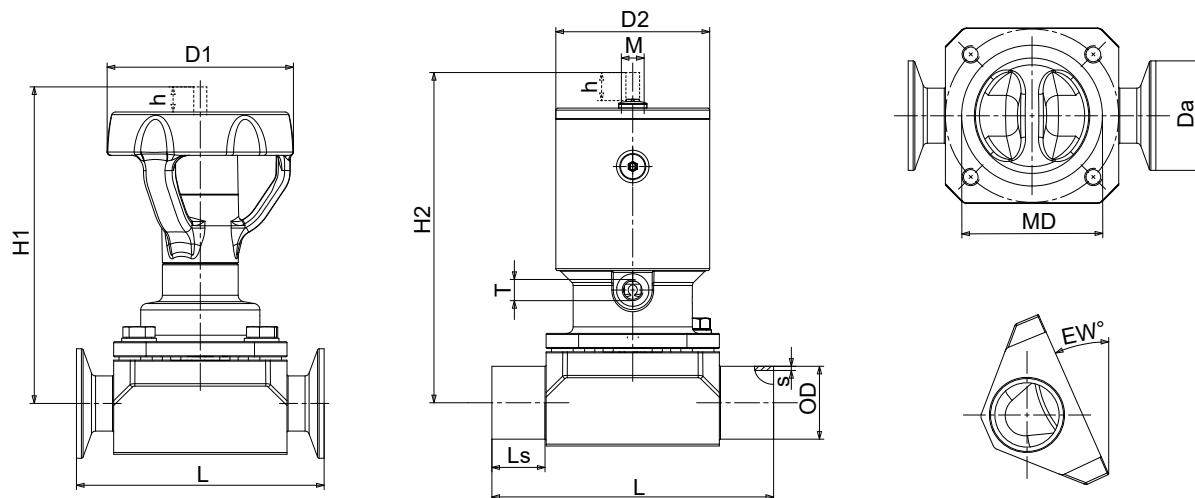
11 Variant LAP.520 for MD 30 - MD 202

12 Smaller and larger nominal sizes available on request

13 Maximum tolerance -3 °

14 Design as per customer specifications

### Dimensions to ISO



**Fig. 5:** Dimensions to ISO

**Table 12:** Dimensions and weights to ISO

DN <sup>15)</sup>	Inch	MD	h [mm]	EW <sup>18)</sup>	Manually operated valve <sup>15)</sup>			Piston actuator <sup>16)</sup>					Butt weld ends to DIN 11866-B (ISO 4200)				Clamps to DIN 32676-B (ISO 4200)			$K_{vs}$ value [m³/h]	
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	ODxs [mm]	L [mm]	Da [mm]				
<b>Standard DN/MD combination</b>																					
6	1/4	30	5	38,0	68	35	0,4	87	41	0,6			80	20,0	10,2x1,6	63,5	25,0	1,5			
8	5/16			23,0	69			88					115	30,0	13,5x1,6			2,2			
10	3/8	40	7	27,7	115	66	0,9	102	46	0,9			115	30,0	17,2x1,6	88,9	25,0	4,5			
15	1/2			15,7	117			104					130	25,0	21,3x1,6			50,5	5,2		
20	3/4	65	13	27,1	148	88	2,0	151	71	2,9			130	25,0	26,9x1,6	101,6	50,5	14,7			
25	1			17,7	150			153					180	37,5	33,7x2,0	114,3		17,5			
32	1 1/4	92	21	24,4	216	125	4,6	208	89	6,3			180	37,5	42,2x2,0	139,7	64,0	43,0			
40	1 1/2			17,1	219			211					190	32,5	48,3x2,0			45,5			
50	2	115	24	15,6	234	125	7,1	245	110	10,3			254	31,0	60,3x2,0	158,8	77,5	69,0			
65	2 1/2	168	40	27,0	330	250	23,8	399	170	30,7			190	42,5	76,1x2,0			149,0			
80	3			19,6	336			22,8	405				200	37,5	88,9x2,3			161,0			
100	4	202	55	15,3	382	250	37,7	506	210	48,5/ 59,3			305	37,5	114,3x2,3			255,0			
125	5			5,4	392			47,7					356	63,0	139,7x2,6			258,0			
150	6	280	80	13,7	518	400	92,0						414	50,0	168,3x2,6			500,0			
200	8			0,9	543			111,0					521	103,5	219,1x2,6			510,0			
<b>Compact DN/MD combination</b>																					
10	3/8	30	5	7,7	72	35	0,4	91	41	0,6			80	20,0	17,2x1,6			2,2			
20	3/4	40	7	2,8	120	66	1,0	107	46	1,0			115	30,0	26,9x1,6			4,7			
32	1 1/4	65	13	4,2	154	88	2,6	157	71	3,5			140	30,0	42,4x2,0			17,5			
50	2	92	21	4,9	226	125	6,5	218	89	8,2			190	42,5	60,3x2,0			45,7			
65	2 1/2	115	24	2,7	241	125	7,6	252	110	10,8			200	37,5	76,1x2,0			67,0			
100	4	168	40	6,3	351	250	29,8	420	170	36,7			305	56,5	114,3x2,3			157,0			

<sup>15</sup> Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202

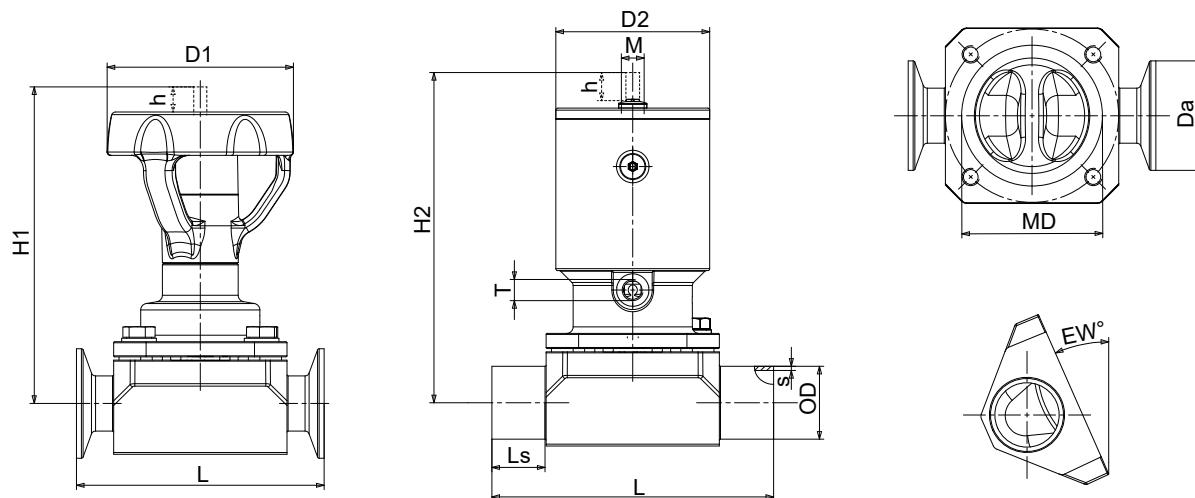
<sup>16</sup> Variant LAP.520 for MD 30 - MD 202

<sup>17</sup> Smaller and larger nominal sizes available on request

<sup>18</sup> Maximum tolerance -3 °

<sup>19</sup> Design as per customer specifications

### Dimensions to OD



**Fig. 6:** Dimensions to OD

**Table 13:** Dimensions and weights to OD

DN <sup>22)</sup>	Inch	MD	h [mm]	EW <sup>[23]</sup>	Manually operated valve <sup>20)</sup>			Piston actuator <sup>21)</sup>					Butt weld ends to OD ASME BPE				Clamps to DIN 32676-C (OD ASME BPE)		Value K <sub>v</sub> [m <sup>3</sup> /h]		
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	ODxs [mm]	L [mm]	Da [mm]				
<b>Standard DN/MD combination</b>																					
6	1/4	30	5	45,8	68	35	0,4	87	41	0,6	M 5	M 12x1	80	20,0	6,35x0,89	63,5	25,0	0,6	1,7		
10	3/8			35,5	68			87							9,53x0,89						
15	1/2			26,0	69			88							12,7x1,65						
15	1/2	40	7	37,3	115	66	0,9	102	46	0,9	G 1/8	M 18x1	115	30,0	12,7x1,65	88,9	25,0	2,6	2,1		
20	3/4			22,2	116			103							19,05x1,65	101,6	25,0	4,9			
25	1	65	13	31,8	146	88	2,0	149	71	2,9			130	25,0	25,4x1,65	114,3	50,5	13,8			
40	1 1/2	92	21	28,8	215	125	4,6	207	89	6,3			180	37,5	38,1x1,65	139,7	50,5	39,0			
50	2	115	24	23,5	231	125	7,1	242	110	10,3			190	32,5	50,8x1,65	158,8	64,0	62,0			
65	2 1/2			12,3	236			6,4	247						63,5x1,65	193,8	77,5	71,0			
80	3	168	40	26,7	330	250	22,8	399	170	29,7	G 1/8	M 18x1	254	31,0	76,2x1,65	222,3	91,0	151,0	237,0		
100	4	202	55	20,9	377	250	37,7	501	210	48,5/ 59,3			305	37,5	101,6x2,11	292,1	119,0				
150	6	280	80	18,8	512	400	93,4	- <sup>24)</sup>					414	50,0	152,4x2,77	-	-	490,0			
<b>Compact DN/MD combination</b>																					
50	2	92	21	12,0	226	125	6,5	218	89	8,2	G 1/8	M 18x1	190	42,5	50,8x1,65	-	-	42,4	67,0		
80	3	115	24	2,1	241	125	7,6	252	110	10,8			200	37,5	76,2x1,65	-	-				
100	4	168	40	11,9	351	250	30,9	414	170	35,0			305	56,5	101,6x2,11	-	-	143,0			

<sup>20</sup> Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202

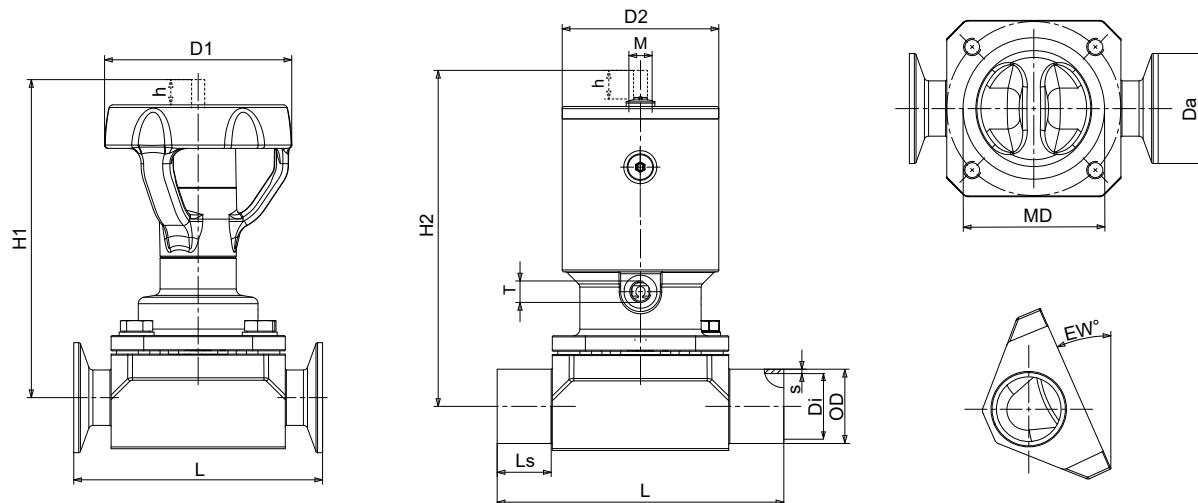
<sup>21</sup> Variant LAP.520 for MD 30 - MD 202

<sup>22</sup> Smaller and larger nominal sizes available on request

<sup>23</sup> Maximum tolerance -3 °

<sup>24</sup> Design as per customer specifications

**Dimensions to SMS**



**Fig. 7:** Dimensions to SMS

**Table 14:** Dimensions and weights to SMS

DN <sup>27)</sup>	Inch	MD	h [mm]	EW <sup>28)</sup>	Manually operated valve <sup>25)</sup>			Piston actuator <sup>26)</sup>					Butt weld ends to SMS 3008				Clamps to DIN 32676 (SMS 3008)				K <sub>vs</sub> value [m <sup>3</sup> /h]	
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	ODxs [mm]	L [mm]	Da [mm]	Di [mm]				
<b>Standard DN/MD combination</b>																						
10	3/8	30	5	24,0	69	35	0,4	88	41	0,6			80	20,0	12x1,0	63,5	25,0	10,0	2,1			
15	1/2	40	7	21,7	116	66	0,9	103	46	0,9	M 5		115	30,0	18x1,0	88,9	25,0	16,0	5,0			
25	1	65	13	31,1	146	88	2,0	149	71	2,9			130	25,0	25x1,2	114,3	50,5	22,6	13,8			
40	1 1/2	92	21	26,9	216	125	4,6	208	89	6,3			180	37,5	38x1,2	139,7	50,5	35,6	39,0			
50	2	115	24	22,7	231			7,1	242	110	10,3			190	32,5	51x1,2	158,8	64,0	48,6	62,0		
65	2 1/2			12,2	236			6,4	247		9,6					63,5x1,6	193,8	77,5	60,3	71,0		
80	3	168	40	26,7	330	250	22,8	399	170	29,7	G 1/8		254	30,0	76,1x1,6	222,3	91,0	72,9	151,0			
100	4	202	55	20,8	377			37,7	501	210	48,5/ 59,3	M 18x1		305	37,5	101,6x2,0	292,1	119,0	97,6	237,0		
<b>Compact DN/MD combination</b>																						
50	2	92	21	11,2	226	125	4,9	218	89	6,6	G 1/8		190	42,5	51,0x1,2	-	-	-	-	42,4		
80	3	115	24	2,1	242	125	7,5	253	110	10,7	M 18x1		200	37,5	76,1x1,6	-	-	-	-	67,0		
100	4	168	40	11,8	345	250	28,1	414	170	35,0	M 18x1		305	56,5	101,6x2,0	-	-	-	-	143,0		

<sup>25</sup> Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202

<sup>26</sup> Variant LAP.520 for MD 30 - MD 202

<sup>27</sup> Smaller and larger nominal sizes available on request

<sup>28</sup> Maximum tolerance -3 °

## Specifications

Butt weld ends:	DIN 11866 Series A (DIN 11850) DIN 11866 Series B (DIN EN ISO 1127/ISO 4200) DIN 11866 Series C (OD ASME BPE)
SMS 3008	
JIS-G 3447	
Clamps:	DIN 32676 ASME BPE SMS 3017 JIS-G 3447
Marking:	DIN EN 19 (ISO 5209) ASME BPE

## Piston actuator selection by operating pressure

### Operating pressure in bar in acc. with DIN EN 12266-1 and dimensions of pneumatic piston actuators

Table 15: Operating pressure [bar] for actuator function: (LAP.520-SF) air-to-open/spring-to-close

Diaphragm size			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD	Function	Piston	One side	Both sides	One side	Both sides	One side	Both sides	H2 max.	D2
30	SF	35	16	8	14	7	-	-	91	41
		40	16	12	16	10	14	7	95	46
		50	16	16	16	16	16	16	119	58
40	SF	40	11	5,5	10	5	-	-	106	46
		50	16	10	16	9	14	7	130	58
		63	16	16	16	16	16	16	134	71
65	SF	63	11	5,5	7	3,5	6	3	156	71
		80	16	11	16	8	15	7,5	182	89
		100	16	16	16	16	16	13	211	110
92	SF	80	10	5	9	4,5	6	3	217	89
		100	14	7	13	6,5	11	5,5	228	110
		100.222	16	9	16	8	13	6,5	232	110
		160	16	16	16	16	16	14	370	170
115	SF	100	10	5	8	4	6	3	249	110
		100.222	12	6	9	4,5	8	4	256	110
		160	16	12	16	10	16	8	387	170
168	SF	160	10	5	-	-	6	3	420	170
		200	14	7	-	-	10	5	475	210
202	SF	200	10	5	-	-	6	3	518	210
		D200	14	7	-	-	10	5	691	210
280 <sup>29)</sup>	SF	-	-	-	-	-	-	-	-	-

Table 16: Operating pressure [bar] for actuator function: (LAP.520-OF) spring-to-open/air-to-close

Diaphragm size			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD	Function	Piston	One side	Both sides	One side	Both sides	One side	Both sides	H2 max.	D2
30	OF	35	16	9	16	8	6	3	91	41
		40	16	13	16	12	16	8	95	46
40	OF	40	13	6,5	12	6	6	3	106	46
		50	16	11	16	11	16	10	123	58
65	OF	63	11	5,5	7	3,5	7	3,5	156	71
		80	16	11	16	10	16	8	178	89
92	OF	80	10	5	9	4,5	7	3,5	217	89
		100	16	8	16	8	12	6	228	110
115	OF	100	10	5	8	4	7	3,5	249	110

<sup>29)</sup> Design as per customer specifications

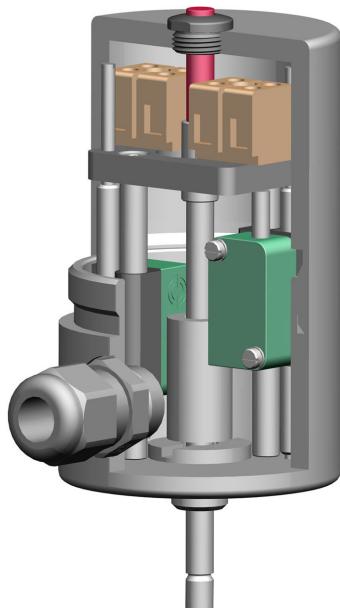
Diaphragm size			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD	Function	Piston	One side	Both sides	One side	Both sides	One side	Both sides	H2 max.	D2
168	OF	160	12	6	-	-	8	4	420	170
202	OF	200	14	7	-	-	10	5	518	210
280 <sup>29)</sup>	OF	-	-	-	-	-	-	-	-	-

Table 17: Operating pressure [bar] for actuator function: (LAP.520-AZ) air-to-open/air-to-close

Diaphragm size			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD	Function	Piston	One side	Both sides	One side	Both sides	One side	Both sides	H2 max.	D2
30	AZ	35	16	12	16	11	14	7	91	41
		40	16	16	16	16	16	12	95	46
40	AZ	40	16	8,5	16	8	14	7	106	46
		50	16	13	16	13	16	12	123	58
65	AZ	63	13	6,5	10	5	12	6	156	71
		80	16	13	16	12	16	9	178	89
92	AZ	80	13	6,5	12	6	10	5	217	89
		100	16	10	16	10	16	8	228	110
115	AZ	100	12	6	10	5	10	5	249	110
168	AZ	160	14	7	-	-	10	5	420	170
202	AZ	200	16	8	-	-	12	6	518	210
280 <sup>29)</sup>	AZ	-	-	-	-	-	-	-	-	-

## Accessories

### Electrical actual-position feedback unit SK.500/SK.510 for linear actuators, stroke: 5-60 mm



- Straightforward adjustment of limit switches by means of threaded stem
- No special tools required for retrofitting on SISTO-C
- ATEX-compliant model (sensor, block terminals and cable entry with ATEX certification)
- Block terminals easily accessible for connection
- Visual position indicator as standard
- Stainless steel housing as standard
- Reliable adjustment of limit switches even under vibration conditions

Example: SK.500

**Table 18:** Technical data of SK.500/SK.510

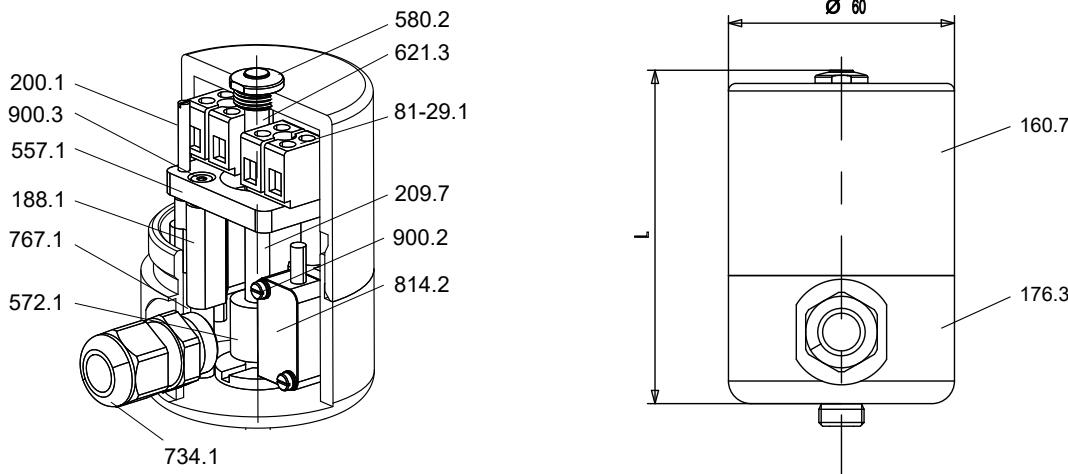
Characteristic	Type	
	SK.500	SK.510
Stroke [mm]	5-26	5-60
Housing material	1.4404	1.4404
Electrical connection	Terminal strip and cable entry (optional: connector)	
Setting the proximity sensors	Threaded stem (optional: from outside the housing)	
Travel stop	Optional	
Enclosure	IP64	

**Table 19:** Technical data of limit switches

Characteristic	NCB2-V3-N0 (inductive) 2-wire system	NBB2-V3-E2 (inductive) 3-wire system	ABV161651 (mechanical) <sup>30)</sup>
Manufacturer	Pepperl & Fuchs	Pepperl & Fuchs	Matsushita (with modified switching flag)
Type	NAMUR normally closed contact	PNP normally open contact	Changeover contact
Voltage	8 V	10.....30V	24 VDC / 250 VAC
Temperature range	-25 °C to +100 °C	-25 °C to +70 °C	-40 °C to +85 °C
Housing material	PBT	PBT	-
ATEX	SK.500/SK.510	-	-

<sup>30</sup> Can be used from diaphragm diameter 40 only

List of components of SK.500/SK.510



General assembly drawing of SK.500/SK.510

SK.500/SK.510 (MD 30 - 202)

Table 20: Parts list

Part No.	Description	Material	Material number	Note
81-29.1	Terminal	Plastic	-	-
160.7	Cover	X2CrNiMo17-12-2	1.4404	-
176.3	Bottom	X2CrNiMo17-12-2	1.4404	-
188.1	Holder	PA6	-	-
200.1	Stem	A2	-	-
209.7	Switching rod	X2CrNiMo17-12-2	1.4404	-
557.1	Guide disc	PA6	-	-
572.1	Contact piece	X14CrMoS17	1.4104	-
580.2	Cap	PA6	-	-
621.3	Position indicator	PA	-	-
734.1	Cable gland	Plastic	-	M16 x 1.5
767.1	Rod guide	A2	-	-
814.2	Limit switch	Plastic	-	-
900.2	Screw	A2	-	-
900.3	Screw	A2	-	-

Table 21: Dimensions table of SK.500/SK.510

Model	Diaphragm diameter	Length (L) [mm]	Stroke [mm]	Weight [kg]
SK.500	30 - 115	101	5 - 26	1,3
SK.510	168 - 202	152	5 - 60	1,8

### Terminal diagram for SK.500/SK.510

Table 22: Terminal diagram for SK.500/SK.510

Inductive 3-wire system	Inductive 2-wire system	Mechanical Changeover contact

### Functional principle of SK.500/SK.510

Table 23: Functional principle of SK.500/SK.510

Limit positions covered / damped	Intermediate positions covered / damped	Limit positions covered / damped

### Switching logic

Table 24: Intermediate positions covered / damped with 2-wire NC contact

Valve position	Limit switch – Open			Limit switch – Closed		
	Position	Status	Signal	Position	Status	Signal
Closed	Covered	Open	Logic 0	Not covered	Closed	Logic 1
Middle	Covered	Open	Logic 0	Covered	Open	Logic 0
Open	Not covered	Closed	Logic 1	Covered	Open	Logic 0

Table 25: Intermediate positions covered / damped with 3-wire NO contact

Valve position	Limit switch – Open			Limit switch – Closed		
	Position	Status	Signal	Position	Status	Signal
Closed	Not covered	Open	Logic 0	Covered	Closed	Logic 1
Middle	Not covered	Open	Logic 0	Not covered	Open	Logic 0
Open	Covered	Closed	Logic 1	Not covered	Open	Logic 0

## Glossary

### ATEX 2014/34/EU

The acronym ATEX is the French abbreviation for explosive atmospheres: "Atmosphère explosive". 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).

### EW

Drain angle = angle of body to pipe enabling the fluid to drain completely.

### HV

SISTO-C diaphragm valve with handwheel

### LAP

Pneumatic piston actuator, available in versions AZ, OF and SF

### 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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