

Diaphragm Valve

SISTO-C

Sterile Process Engineering
PN 16
DN 6-200

Type Series Booklet



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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



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 ¹⁾	DN 6 - 200
Max. permissible pressure [bar]	16
Min. permissible temperature [°C] ²⁾	≥ -20
Max. permissible temperature [°C] ²⁾	≤ +160

SISTO-C LAP actuated valve

Table 2: Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size ¹⁾	DN 6 - 200
Max. permissible pressure [bar]	16
Min. permissible temperature [°C] ²⁾	≥ -20
Max. permissible temperature [°C] ²⁾	≤ +160
Control fluid	Compressed air ³⁾ (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 ⁴⁾	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

¹ Smaller and larger nominal sizes available on request

² The temperatures indicated are for orientation only; they are not valid for all operating conditions.

³ Control pressure below 5.5 bar available on request.

⁴ 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 valves⁵⁾
- Pneumatic actuators
- Limit switches
- 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 locking device (MD168 and MD202)
- LAP.523: diaphragm valve with pneumatic piston actuator, high-temperature version for temperatures ≥ 80 °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
- Actual-position feedback unit

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] ⁶⁾	Ra [μin]	ASME BPE code	Hygiene class DIN 11866	Surface treatment
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	
0,8	30	-	HE3	

Internal body surfaces				
Ra [μm] ⁶⁾	Ra [μin]	ASME BPE code	Hygiene class DIN 11866	Surface treatment
0,6	25	SF6	-	Electropolished
0,5	20	SF5	-	
0,4	15	SF4	HE4	
0,25	10	-	HE5	

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

⁶ Exact values in accordance with ASME BPE: 0.76 / 0.64 / 0.51 / 0.38 μm

Manually operated valve

Table 6: Overview of materials of manually operated valve

MD ⁷⁾	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 ⁸⁾	HV	-	-

Drive

Table 7: Overview of materials of pneumatic piston actuator

MD ⁷⁾	Type	Bonnet	Piston actuator
30 - 202	LAP.520	Stainless steel 1.4409	Stainless steel 1.4409 / 1.4301
168 - 202	LAP.530	Stainless steel 1.4409	Aluminium, hard anodised
280 ⁸⁾	LAP	-	-

- 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.

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

Product information

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

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see <http://www.ksb.com/reach>.

Product information as per 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).

⁷ MD = diaphragm diameter

⁸ Design as per customer specifications

Related documents

Table 8: Information/documents

Document	Reference number
"Sterile Processes" catalogue	8652.10
Operating manual	0570.822
Type series booklet SISTO-SK-i LED	8676.5
CAD portal 	https://ksb.partcommunity.com/3d-cad-models/membranventile-ksb-se-co-kgaa?info=ksb%2F1products%2F3valves%2F5diaphragm&cwid=8817

Materials

Materials of SISTO-C manually operated valve

SISTO-C HV.510/.520 with handwheel

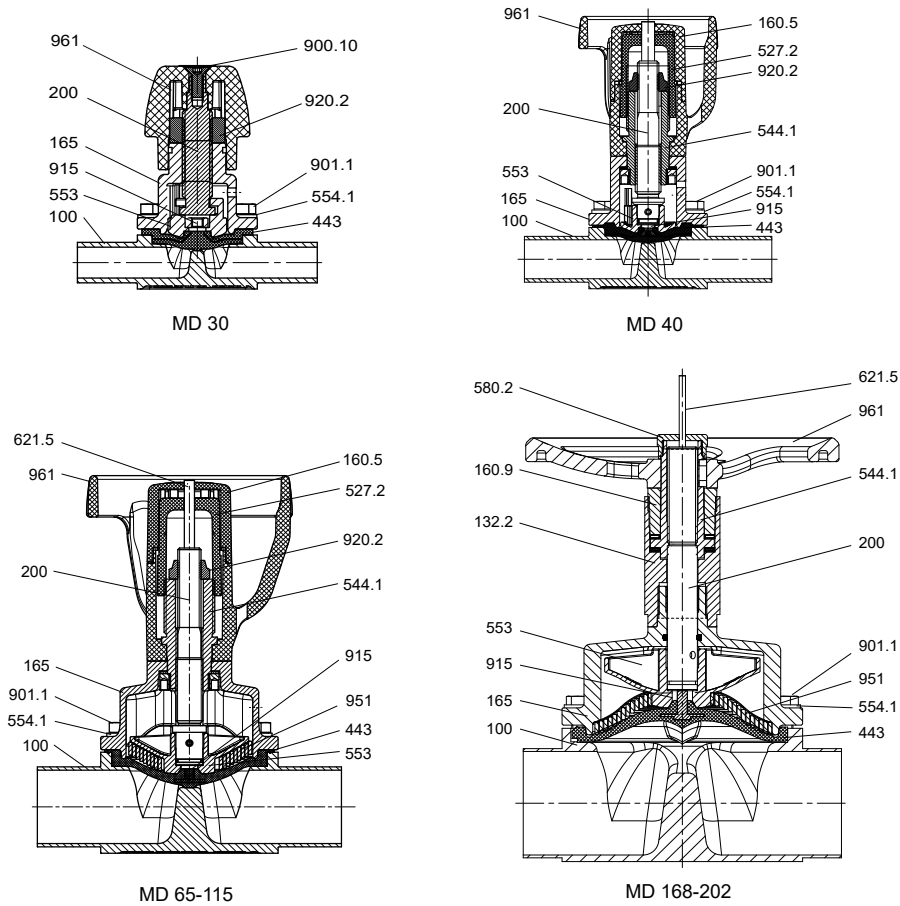


Fig. 1: SISTO-C HV.510/.520, MD 30 - 202⁹⁾

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 ¹⁰⁾	Diaphragm	SISTO-AseptiXX EPDM	-	FDA, CFR 21, Section 177.2600 EC 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	-	-

⁹⁾ MD = diaphragm diameter

¹⁰⁾ Recommended spare parts

Part No.	Description	Material	Material number	Note
920.2	Nut	A2	-	-
951	Support spiral	X5CrNi18-10	1.4301	-
961	Handwheel	PA66-GF30	-	MD 30 - 115; 30 % glass fibre, black
		GX2CrNiMo19-11-2	1.4409	MD 168-202

Materials of piston actuators for SISTO-C

SISTO-C with LAP.520/.530SF

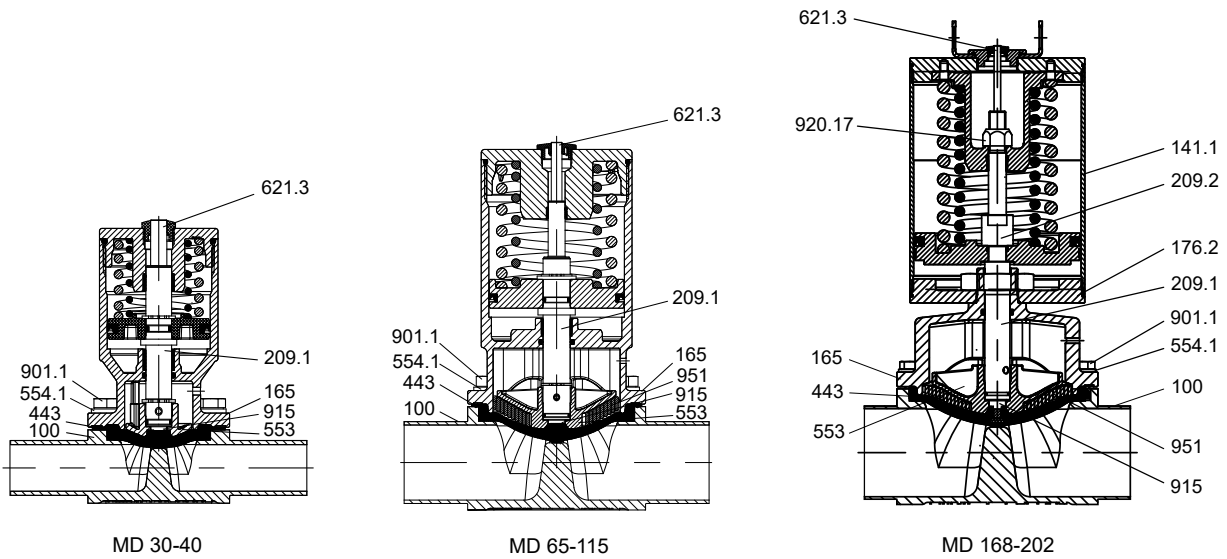


Fig. 2: SISTO-C LAP.520/.530 (illustration of pneumatic piston actuator SF), MD 30-202¹¹⁾

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 / X6CrNiTi18-10	1.4301/1.4541	Variant MD 168-202 Aluminium, hard anodised
165	Bonnet	GX2CrNiMo19-11-2	1.4409	-
176.2	Bottom	X2CrNiMo17-12-2	1.4404	-
209.1	Lower piston rod	X8CrNiS18-9	1.4305	-
209.2	Upper piston rod	X8CrNiS18-9	1.4305	-
443 ¹²⁾	Diaphragm	SISTO-AseptiXX EPDM	-	FDA, CFR 21, Section 177.2600 EC 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

¹¹ MD = diaphragm diameter

¹² Recommended spare parts

Dimensions

Dimensions to DIN

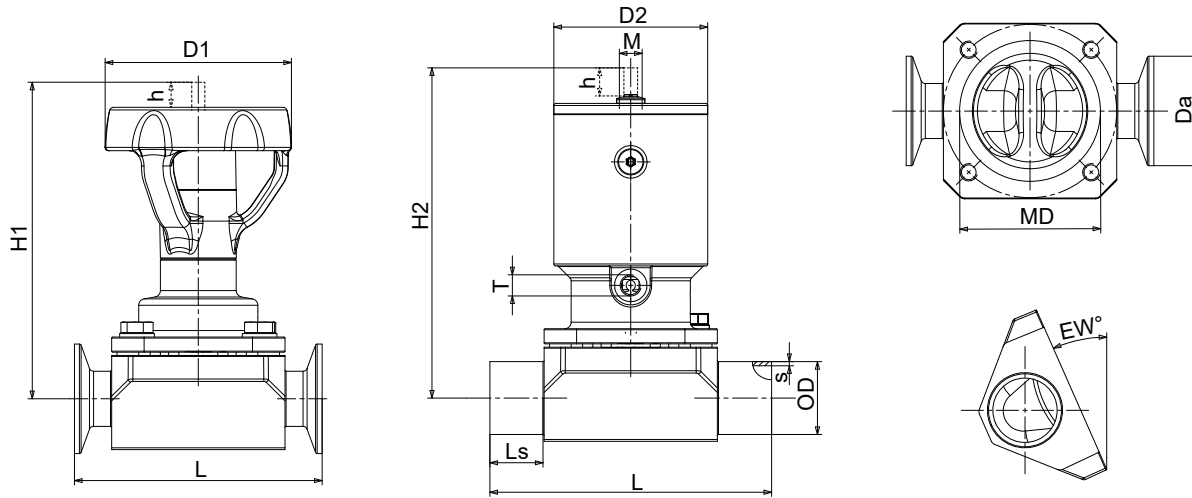


Fig. 3: Dimensions to DIN

Table 11: Dimensions and weights to DIN

DN ¹⁵⁾	Inch	MD ¹⁶⁾	h [mm]	EW [°]	Manually operated valve ¹³⁾			Piston actuator ¹⁴⁾			Butt weld ends to DIN 11866-A			Clamps to DIN 32676-A (DIN 11866-A)		K _{v3} value [m ³ /h]				
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	ODxs [mm]		L [mm]	Da [mm]		
Standard DN/MD combination																				
6	1/4	30	5	41,2	68	35	0,4	87	41	0,6	M 5	M 12x1	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	2,1
15	1/2	40	7	21,7	116	66	0,9	103	46	0,9	M 5	M 12x1	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	G 1/8	M 18x1	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	421	167	27,7/ 34,9	G 1/8	M 18x1	254	31,0	70x2,0	-	-	137,0		
80	3			21,0	336		22,8	430		26,7/ 33,9							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	- ¹⁷⁾					356	63,0	129x2,0	-	-	230,0		
150	6	280	80	17,9	512	400	97,0	- ¹⁷⁾					414	50,0	154x2,0	-	-	490,0		
200	8			4,1	536		114,0	- ¹⁷⁾					521	103,5	204x2,0	-	-	500,0		
Compact DN/MD combination																				
20	3/4	40	7	9,6	120	66	1,0	107	46	1,0	M 5	M 12x1	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	G 1/8	M 18x1	200	37,5	70x2,0	-	-	65,0		
100	4	168	40	10,7	351	250	30,9	445	167	34,8/ 42,0					305	56,5	104x2,0	-	-	143,0

8644. 1/27-EN

¹³ Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202
¹⁴ Variant LAP.520 for MD 30-MD 115, variant LAP.530/.520 for MD 168-MD 202
¹⁵ Smaller and larger nominal sizes available on request
¹⁶ MD = diaphragm diameter
¹⁷ Design as per customer specifications

Dimensions to ISO

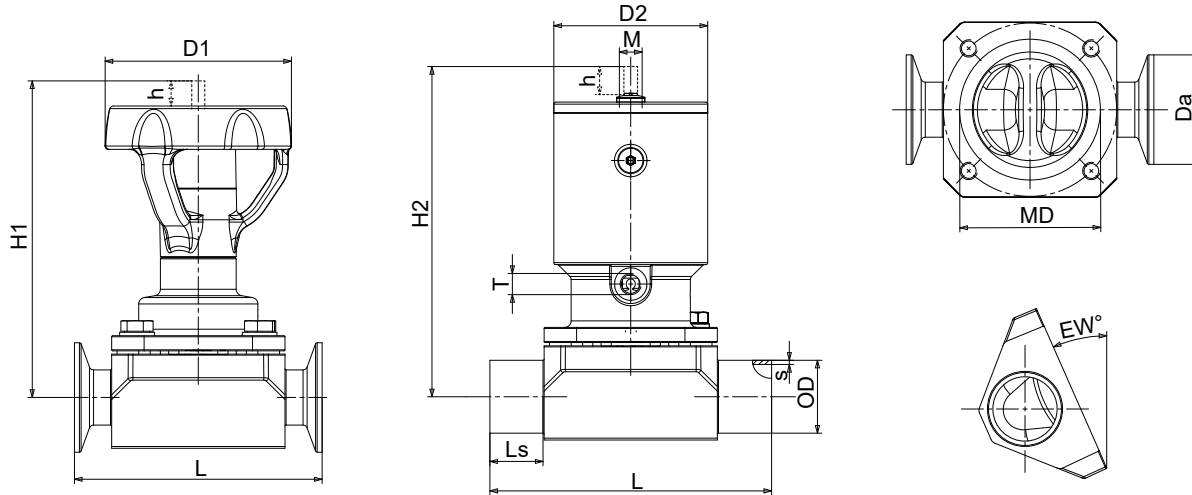


Fig. 4: Dimensions to ISO

Table 12: Dimensions and weights to ISO

DN ²⁰⁾	Inch	MD ²¹⁾	h [mm]	EW [°]	Manually operated valve ¹⁸⁾			Piston actuator ¹⁹⁾			Butt weld ends to DIN 11866-B (ISO 4200)			Clamps to DIN 32676-B (ISO 4200)		K _v value [m ³ /h]				
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	ODxS [mm]		L [mm]	Da [mm]		
Standard DN/MD combination																				
6	1/4	30	5	38,0	68	35	0,4	87	41	0,6	M 5	M 12x1	80	20,0	10,2x1,6	63,5	25,0	1,5		
8	5/16	40	7	23,0	69	66	0,9	88	46	0,9			115	30,0	13,5x1,6	88,9	25,0	4,5		
10	3/8		27,7	115	102			104					17,2x1,6	50,5	5,2					
15	1/2	65	13	15,7	117	88	2,0	151	71	2,9			130	25,0	21,3x1,6	101,6	50,5	14,7		
20	3/4		27,1	148	151			153					26,9x1,6	114,3	17,5					
25	1		17,7	150	153			153					33,7x2,0	114,3	17,5					
32	1 1/4	92	21	24,4	216	125	4,6	208	89	6,3			M 18x1	180	37,5	42,2x2,0	139,7	64,0	43,0	
40	1 1/2		17,1	219	211	48,3x2,0	45,5													
50	2	115	24	15,6	234	125	7,1	245	110	10,3			M 18x1	190	32,5	60,3x2,0	158,8	77,5	69,0	
65	2 1/2		168	40	27,0	330	250	23,8								424				167
80	3	202	55	19,6	336	250	37,7	430	210	48,5/59,3	G 1/8	M 18x1	305	37,5	88,9x2,3	-	-	161,0		
100	4			15,3	382			506							210				114,3x2,3	255,0
125	5			5,4	392			47,7							- ²²⁾				356	63,0
150	6	280	80	13,7	518	400	92,0	- ²²⁾	-	-	-	-	-	-	-	-	500,0			
200	8			0,9	543	111,0	- ²²⁾	521										103,5	219,1x2,6	-
Compact DN/MD combination																				
10	3/8	30	5	7,7	72	35	0,4	91	41	0,6	M 5	M 12x1	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	M 18x1	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	-	-
65	2 1/2	115	24	2,7	241	125	7,6	252	110	10,8	G 1/8	M 18x1	200	37,5	76,1x2,0	-	-	67,0		
100	4			168	40	6,3	351	250	29,8	445					167	34,8/42,0	305	56,5	114,3x2,3	-

18 Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202
 19 Variant LAP.520 for MD 30-MD 115, variant LAP.530/520 for MD 168-MD 202
 20 Smaller and larger nominal sizes available on request
 21 MD = diaphragm diameter
 22 Design as per customer specifications

Dimensions to OD

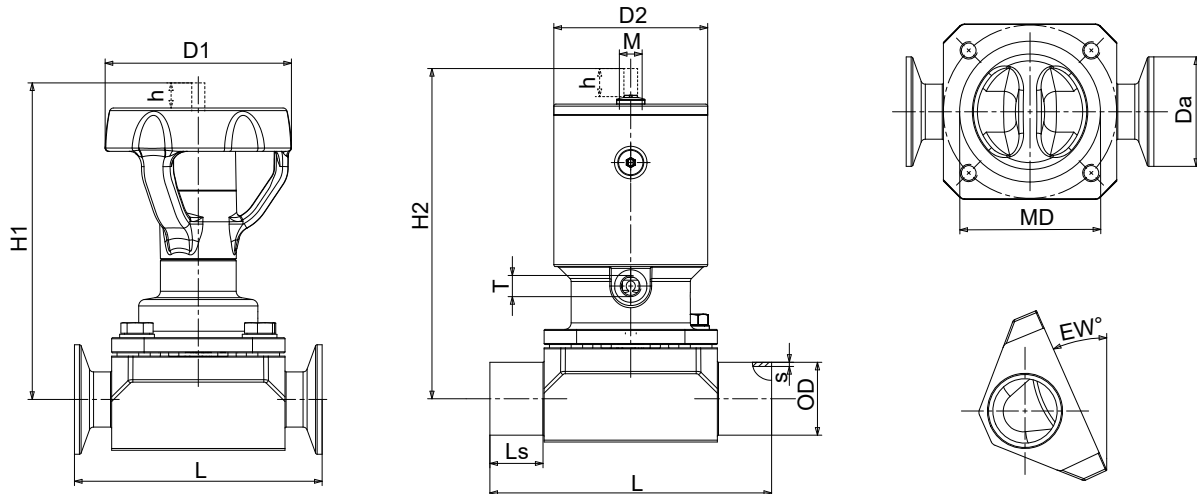


Fig. 5: Dimensions to OD

Table 13: Dimensions and weights to OD

DN ²⁵⁾	Inch	MD ²⁶⁾	h [mm]	EW [°]	Manually operated valve ²³⁾			Piston actuator ²⁴⁾				Butt weld ends to OD ASME BPE			Clamps to DIN 32676-C (OD ASME BPE)		K _{vs} value [m ³ /h]			
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	ODxs [mm]	L [mm]		Da [mm]		
Standard DN/MD combination																				
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		
10	3/8			35,5	68			87									9,53x0,89			1,7
15	1/2			26,0	69			88									12,7x1,65			2,1
15	1/2	40	7	37,3	115	66	0,9	102	46	0,9					115	30,0	12,7x1,65	88,9	25,0	2,6
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		9,6							63,5x1,65	193,8	77,5	71,0
80	3	168	40	26,7	330	250	22,8	424	167	26,7/ 33,9					254	31,0	76,2x1,65	222,3	91,0	151,0
100	4	202	55	20,9	377	250	37,7	501	210	48,5/ 59,3	G 1/6	M 18x1	305	37,5	101,6x2,11	292,1	119,0	237,0		
150	6	280	80	18,8	512	400	93,4	- ²⁷⁾					414	50,0	152,4x2,77	-	-	490,0		
Compact DN/MD combination																				
50	2	92	21	12,0	226	125	6,5	218	89	8,2	G 1/6	M 18x1	190	42,5	50,8x1,65	-	-	42,4		
80	3	115	24	2,1	241	125	7,6	252	110	10,8					200	37,5	76,2x1,65	-	-	67,0
100	4	168	40	11,9	351	250	30,9	445	167	34,8/ 42,0					305	56,5	101,6x2,11	-	-	143,0

8644.1/27-EN

²³ Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202
²⁴ Variant LAP.520 for MD 30-MD 115, variant LAP.530/520 for MD 168-MD 202
²⁵ Smaller and larger nominal sizes available on request
²⁶ MD = diaphragm diameter
²⁷ Design as per customer specifications

Dimensions to SMS

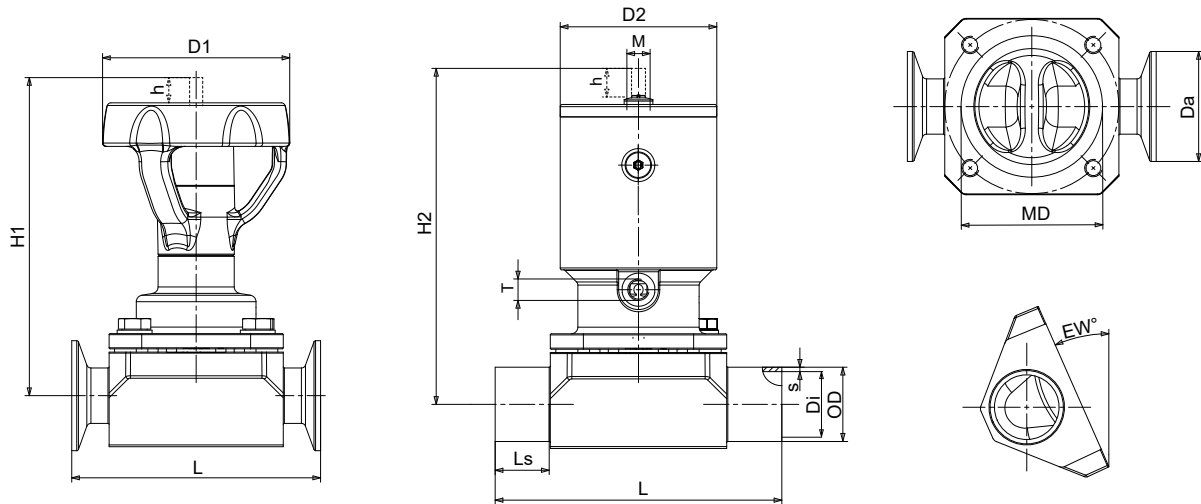


Fig. 6: Dimensions to SMS

Table 14: Dimensions and weights to SMS

DN ³⁰⁾	Inch	MD ³¹⁾	h [mm]	EW [°]	Manually operated valve ²⁸⁾			Piston actuator ²⁹⁾				Butt weld ends to SMS 3008			Clamps to DIN 32676 (SMS 3008)			K _{vs} value [m ³ /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]
Standard DN/MD combination																			
10	3/8	30	5	24,0	69	35	0,4	88	41	0,6	M 5	M 12x1	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			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	M 18x1	M 18x1	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	250	7,1	242	110	10,3	G 1/8	M 18x1	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	254			30,0	76,1x1,6	193,8	77,5	60,3	71,0	
80	3	168	40	26,7	330	250	22,8	424	167	26,7/ 33,9	G 1/8	M 18x1	305	37,5	101,6x2,0	222,3	91,0	72,9	151,0
100	4	202	55	20,8	377		37,7	501	210	48,5/ 59,3			292,1	119,0	97,6	237,0			
Compact DN/MD combination																			
50	2	92	21	11,2	226	125	4,9	218	89	6,6	G 1/8	M 18x1	190	42,5	51,0x1,2	-	-	-	42,4
80	3	115	24	2,1	242	125	7,5	253	110	10,7			200	37,5	76,1x1,6	-	-	-	67,0
100	4	168	40	11,8	345	250	28,1	439	167	32,0/ 39,2	305	56,5	101,6x2,0	-	-	-	143,0		

²⁸ Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202

²⁹ Variant LAP.520 for MD 30-MD 115, variant LAP.530/520 for MD 168-MD 202

³⁰ Smaller and larger nominal sizes available on request

³¹ MD = diaphragm diameter

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 12266-2 and dimensions of pneumatic piston actuators

Table 15: Operating pressure [bar] for actuator function: (LAP.520/530-SF) air-to-open/spring-to-close

Diaphragm size [mm]			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD ³²⁾	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	383	167
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	392	167
168	SF	160	10	5	-	-	6	3	445	167
		200	14	7	-	-	10	5	475	210
202	SF	200	10	5	-	-	6	3	518	210
		D200	14	7	-	-	10	5	691	210
280 ³³⁾	SF	-	-	-	-	-	-	-	-	-

Table 16: Operating pressure [bar] for actuator function: (LAP.520/530-OF) spring-to-open/air-to-close

Diaphragm size [mm]			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD ³²⁾	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

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³² MD = diaphragm diameter

³³ Design as per customer specifications

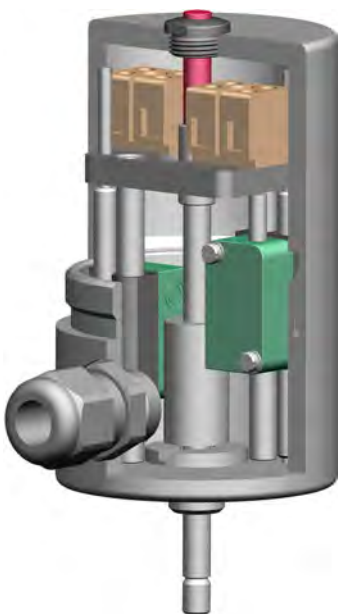
Diaphragm size [mm]			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD ³²⁾	Function	Piston	One side	Both sides	One side	Both sides	One side	Both sides	H2 max.	D2
168	OF	160	12	6	-	-	8	4	445	167
202	OF	200	14	7	-	-	10	5	518	210
280 ³³⁾	OF	-	-	-	-	-	-	-	-	-

Table 17: Operating pressure [bar] for actuator function: (LAP.520/530-AZ) air-to-open/air-to-close

Diaphragm size [mm]			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD ³²⁾	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	445	167
202	AZ	200	16	8	-	-	12	6	518	210
280 ³³⁾	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	

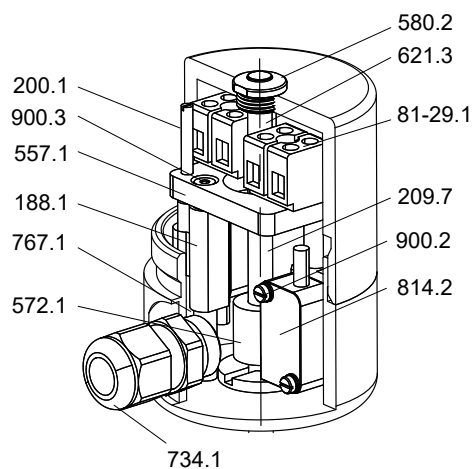
Table 19: Technical data of limit switches

Characteristic	NCB2-V3-N0 (inductive) 2-wire system	NBB2-V3-E2 (inductive) 3-wire system	ABV161651 (mechanical) ³⁴⁾
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	-	-

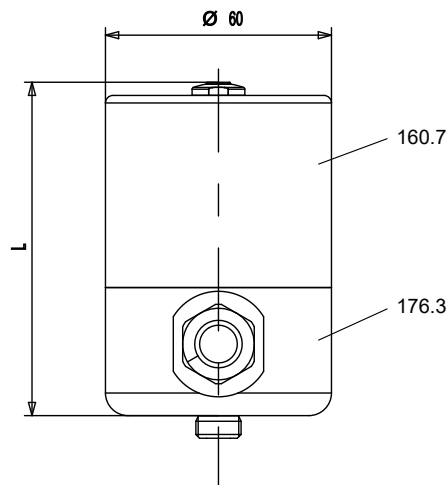
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³⁴⁾ Can be used from diaphragm diameter 40 only

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	-	M16x1.5
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 [MD]	Length (L) [mm]	Stroke [mm]	Weight [kg]
SK.500	MD 30-115	101	5-26	1,3
SK.510	MD 168-202	152	5-60	1,8

Terminal diagram for SK.500/SK.510

Table 22: Terminal diagram for SK.500/510

<p>Open</p> <p>Closed</p>	<p>Open</p> <p>Closed</p>	<p>Open</p> <p>Closed</p>
Inductive 3-wire system	Inductive 2-wire system	Mechanical Changeover contact

Functional principle of SK.500/510

Table 23: Functional principle of SK.500/510

Limit positions covered / damped	Intermediate positions covered / damped	Limit positions covered / damped
Inductive 3-wire system	Inductive 2-wire system	Mechanical Changeover contact

Switching logic

Table 24: Intermediate positions covered / damped

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

Table 25: Limit positions covered / damped

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

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