A KSB Company

Diaphragm Valve

SISTO-C

Sterile Process Engineering
PN 16
DN 6 - 200

Type Series Booklet

Legal information/Copyright

Type Series Booklet SISTO-C

Contents

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

- Pharmaceutical industry
- Process engineering
- Food industry / beverage industry
- Chemical industry
- Homogenisation
- 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][2)]	16
Min. permissible temperature [°C][3)]	≥ -20
Max. permissible temperature [°C][3)]	≤ +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][2)]	16
Min. permissible temperature [°C][3)]	≥ -20
Max. permissible temperature [°C][3)]	≤ +160
Control fluid	Compressed air (min. 5.5 bar)[4)] (max. 7.0 bar)

Valve body materials

Table 3: Overview of precision (investment) cast materials available

Material	Material number	Temperature limit
X2CrNiMo18-14-3	1.4435/316L	-20 °C to +160 °C

Table 4: Overview of forged materials available

Material	Material number	Temperature limit
X2CrNiMo18-14-3[5)]	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
NiMo16Cr16Ti	2.4610	-20 °C to +160 °C

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1 Smaller and larger nominal sizes available on request
2 Versions for higher operating pressures are available on request.
3 The temperatures indicated are for orientation only; they are not valid for all operating conditions.
4 Control pressure below 5.5 bar available on request.
5 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[6] 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[7]
- 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.520: diaphragm valve with stainless steel handwheel
- 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 ≥ 80 °C to 120 °C (max.) 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 5: Overview of diaphragm qualities

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

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6 Forged body only
7 For further designs refer to the "Sterile Processes" catalogue, reference No. 8652.10.

Surface finish

Table 6: Surface finish of wetted internal body surfaces[8)]

Ground				Electropolished[9)]			
Ra [µm][10)]	Ra [µin]	ASME BPE code	Hygiene class DIN 11866	Ra [µm][10)]	Ra [µin]	ASME BPE code	Hygiene class DIN 11866
6,3	250	SF0	-	-	-	-	-
3,2	125	-	-	-	-	-	-
1,6	60	-	-	-	-	-	-
0,8	30	SF3	H3	0,8	30	-	HE3
0,6	25	SF2	-	0,6	25	SF6	-
0,5	20	SF1	-	0,5	20	SF5	-
0,4	15	-	H4	0,4	15	SF4	HE4
-	-	-	-	0,25	10	-	HE5

Manually operated valve

Table 7: Overview of materials of manually operated valve

MD	Type	Bonnet	Handwheel
30 - 115	HV.510	Stainless steel 1.4409	PA66GF30
30 - 202	HV.520	Stainless steel 1.4409	Stainless steel 1.4409
280[11)]	HV	-	-

Drive

Table 8: 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	LAP	-	-

SISTO-LAP piston actuator

- Actuator type LAP-SF
  - Air-to-open
  - Spring-to-close
- Actuator type LAP-OF
  - Spring-to-open
  - Air-to-close
- Actuator type LAP-AZ
  - Air-to-open
  - Air-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
- Plain-text 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 chemicals Regulation (EC) No. 1907/2006 (REACH), see https://sisto-aseptic.com/infopage/.

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8 Surface finish to ASME BPE SF 2.2
9 Precision (investment) castings available in Ra 0.8, Ra 0.6 and Ra 0.5, electropolished
10 Exact values in accordance with ASME BPE: 0.76 µm/ 0.64 µm/ 0.51 µm/ 0.38 µm
11 Design as per customer specifications

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 9: Information/documents

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

Additional documents / declaration of conformity

Additional documents / declaration of conformity are available via the QR code.

Clickable QR code

Available software / web site

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 portal comprises the digital data of the SISTO products. (Click the QR code.)

Pressure/temperature ratings

Table 10: Permissible operating pressure [bar][12)]

PN	Material	[C°]							
	Designation	-20 to +50	+100	+110	+120	+130	+140	+150	+160
16	EPDM	16,0	16,0	16,0	16,0	16,0	16,0	-	-
	TFM/EPDM, bonded	16,0	16,0	16,0	16,0	16,0	16,0	-	-
	TFM/EPDM, 2-piece	16,0	16,0	16,0	16,0	16,0	16,0	14,0	12,0

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12 Other pressure/temperature ratings are available on request.

Purchase order information

Ordering key for SISTO-C

Type	Code
Valve body	A
Body material	B
Nominal size DN 1	C
Diaphragm diameter	D
Connection	E
Diaphragm material	F
Upper valve section	G
Surface finish	H
Nominal size DN 2	I
Accessories (optional)	J
Part number (optional)	K

A - Valve body	Code
SISTO-C	C
SISTO-CT	CT
SISTO-CY	CY
SISTO-CBAV	CBAV
SISTO-CBAVF	CBAVF
SISTO-CM	CMXXX

B - Body material	Code
1.4435/316L BN2, forged material	00
1.4435/316L, precision (investment) cast	0C
1.4435/316L, additively manufactured	0A
1.4539, forged material	10
2.4602/C-22, forged material	20
2.4602/C-22, additively manufactured	2A
2.4605/Alloy 59, forged material	30
2.4605/Alloy 59, additively manufactured	3A
Special material	99

C - Nominal size DN 1	Code
DN 6 - 1/4"	006
DN 8	008
DN 10 - 3/8"	010
DN 15 - 1/2"	015
DN 20 - 3/4"	020
DN 25 - 1"	025
DN 32	032
DN 40 - 1 1/2"	040
DN 50 - 2"	050
DN 65 - 2 1/2"	065
DN 80 - 3"	080
DN 100 - 4"	100
DN 125	125
DN 150 - 6"	150
DN 200 - 8"	200

D - Diaphragm diameter	Code
Diameter 30	MD30
Diameter 40	MD40
Diameter 65	MD65
Diameter 92	MD92
Diameter 115	MD115
Diameter 168	MD168
Diameter 202	MD202
Diameter 280	MD280

E - Connection	Code
DIN 11866 Series A (DIN 11850), butt weld ends	W1
DIN 11866 Series B (DIN EN ISO 1127/ISO 4200), butt weld ends	W2
DIN 11866 Series C (OD ASME BPE), butt weld ends	W3
DIN 32676-A (DIN), clamp connections	C1
DIN 32676-B (ISO), clamp connections	C2
DIN 32676-C (ASME BPE), clamp connections	C3
Special connection	99

F - Diaphragm material	Code
EPDM (FDA)	40
TFM/EPDM, 2-piece (FDA)	48
TFM/EPDM, bonded (FDA)	80
Special material	99

G - Upper valve section	Code
Manually operated valve HV.510 Plastic handwheel	M10
Manually operated valve HV.510 Stainless steel handwheel	M20
Pneumatic actuator LAP.520 Stainless steel, SF (spring-to-close)	C00
Pneumatic actuator LAP.520 Stainless steel, OF (spring-to-open)	N00
Pneumatic actuator LAP.520 Stainless steel, AZ (double-acting)	A00
Pneumatic actuator LAP.520 Stainless steel, 1x reinforced, SF (spring-to-close)	C10
Pneumatic actuator LAP.520 Stainless steel, 1x reinforced, OF (spring-to-open)	N10
Pneumatic actuator LAP.520 Stainless steel, 1x reinforced, AZ (double-acting)	A10
Pneumatic actuator LAP.520 Stainless steel, 2x reinforced, SF (spring-to-close)	C20
Upper valve section in special design	999

H - Surface finish		Code
Ra 6.3 µm	SF0	P63

H - Surface finish			Code
Ground	Ra 3.2 µm	-	P32
	Ra 1.6 µm	-	P16
	Ra 0.8 µm	SF3	P30
	Ra 0.6 µm	SF2	P25
	Ra 0.5 µm	SF1	P20
	Ra 0.4 µm	-	P15

H - Surface finish			Code
Electropolished	Ra 0.8 µm	-	E30
	Ra 0.6 µm	SF6	E25
	Ra 0.5 µm	SF5	E20
	Ra 0.4 µm	SF4	E15
	Ra 0.25 µm	-	E10
	Special surface	-	999

I - Nominal size DN 2 (see C)

J - Accessories (optional)	Code
4-digit	0000

K - Part number (optional)	Code
For describing articles that are not fully covered by the code	42123456

Ordering examples

A						B		C			D					E		F		G			H			I		
C						0	C	0	2	5	M	D	6	5		W	2	4	0	C	0	0	E	3	0			

A						B		C			D					E		F		G			H			I		
C	T					0	0	0	2	5	M	D	6	5		W	3	8	0	M	1	0	E	2	0	0	5	0

A						B		C			D					E		F		G			H			I		
C	B	A	V	F		2	0	0	5	0	M	D	1	1	5	W	3	4	8	C	1	0	E	2	5			

A						B		C			D					E		F		G			H			I				K								
C	M	2	1	0		0	0	0	5	0	M	D	1	1	5	W	1	4	8	C	1	0	E	2	5	0	2	5	-	4	2	1	2	3	4	5	6

Valve body (SH)

	A							B		C			D					E		H		
S	H	C						0	0	0	2	5	M	D	6	5		W	2	E	2	5

Diaphragm (SD)

	A	D						F	
S	D	C	M	D	6	5		4	0

Upper valve section (SB)

	A	D						G		
S	D	C	M	D	1	1	5	M	2	0

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Materials

Materials of SISTO-C manually operated valve

SISTO-C HV.510/.520 with handwheel

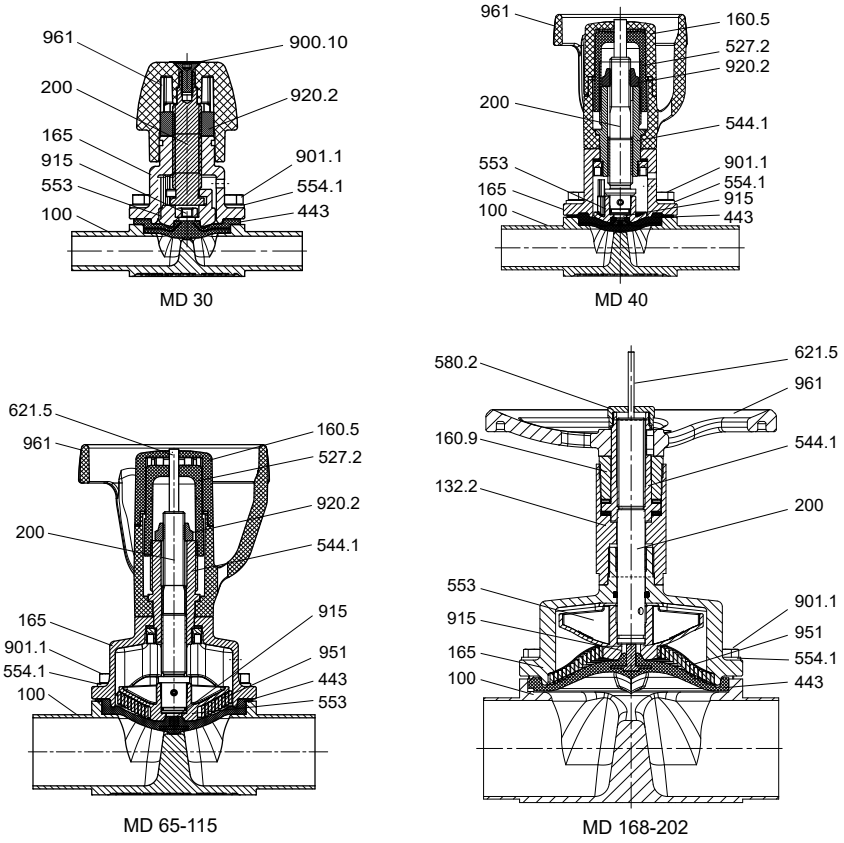

Fig. 2: SISTO-C HV.510/.520, MD 30 - 202

Table 11: Parts list

Part No.	Description	Material	Material number	Note
100	Body	X2CrNiMo18-14-3	1.4435/316L	Forged/precision (investment) cast
132.2	Intermediate piece	X2CrNiMo17-12-2	1.4404	-
160.5	Handwheel cover	PA66GF30	-	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[13)]	Diaphragm	SISTO-AseptiXX EPDM	-	FDA, CFR 21, Section 177.2600 EG 1935/2004
527.2	Locating sleeve	PA66GF30	-	30 % glass fibre, black
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	PA66GF30	-	MD 30 - 115; 30 % glass fibre, black
		GX2CrNiMo19-11-2	1.4409	MD 168 - 202

13 Recommended spare parts

Materials of piston actuators for SISTO-C

SISTO-C with LAP.520-SF

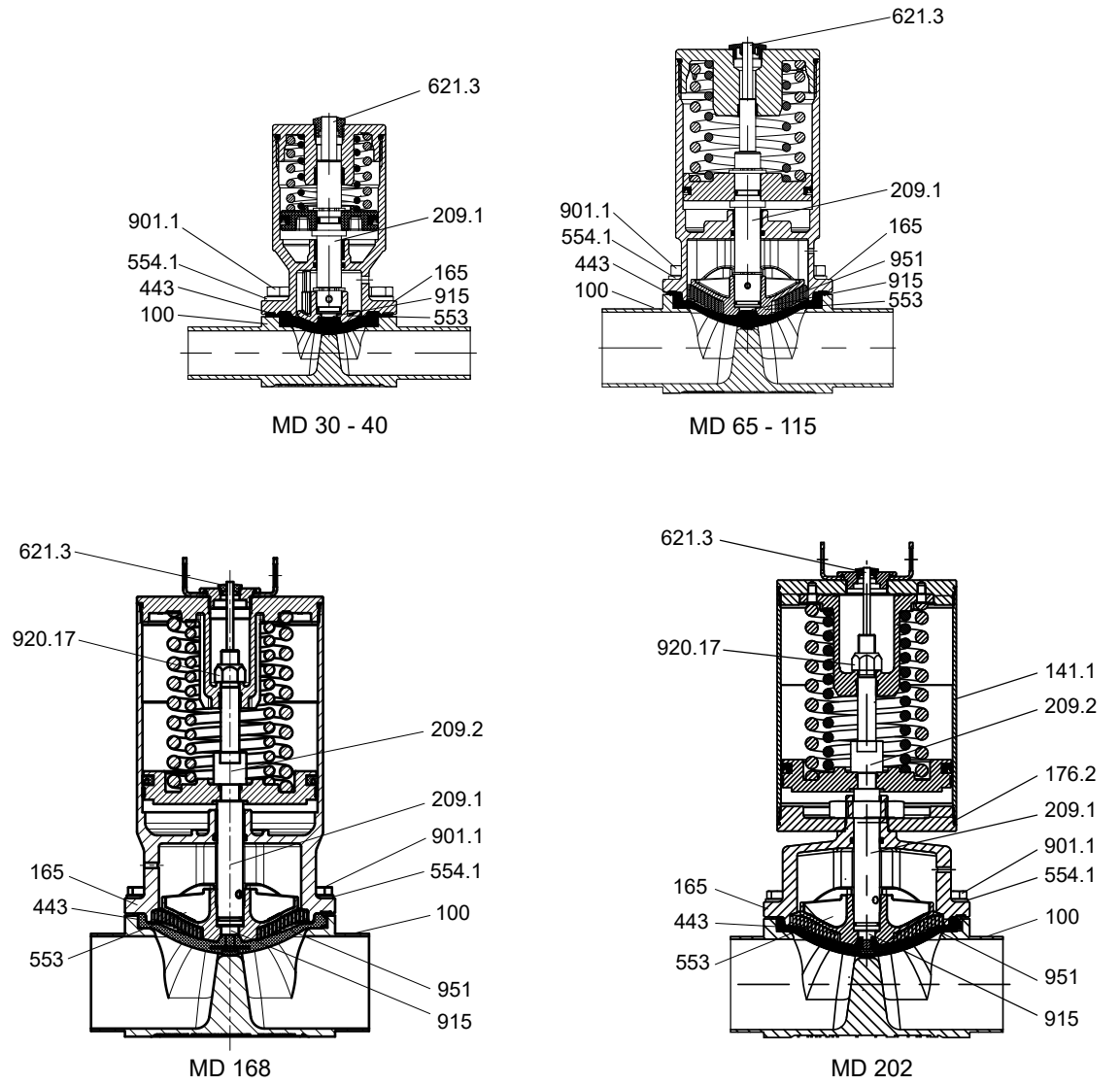

Fig. 3: SISTO-C LAP.520 (illustration of pneumatic piston actuator SF), MD 30 - 202

Table 12: Parts list

Part No.	Description	Material	Material number	Note
100	Body	X2CrNiMo18-14-3	1.4435/316L	Forged/precision (investment) cast
141.1	Cylinder	X6CrNiTi18-10	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[14)]	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

14 Recommended spare parts

Dimensions

Dimensions to ISO – precision (investment) cast body

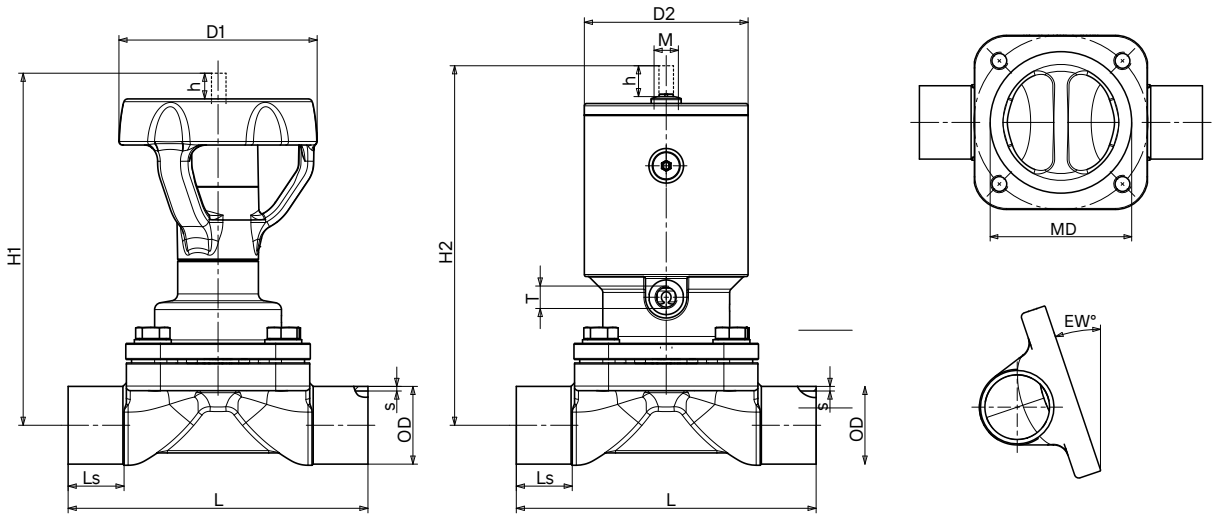

Fig. 4: Dimensions to ISO

Table 13: Dimensions to ISO (precision (investment) cast body)

DN[17]	Inch	MD	h [mm]	EW [°][18]	Manually operated valve[15]			Piston actuator[16]					Butt weld ends to DIN 11866-B (ISO 4200)			K_{vs} value [m³/h]
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	OD × s [mm]	
8	5/16	30	5	21,0	71	35	0,3	90	41	0,6	M 5	M 12 × 1	80	20,0	13,5 × 1,6	3,0
10	3/8	40	7	25,3	117	66	0,7	104	46	0,7			115	30,0	17,2 × 1,6	6,1
15	1/2			14,3	120			107							21,3 × 1,6	7,3
20	3/4	65	13	27,9	150	88	1,3	153	71	2,2	G 1/8		130	25,0	26,9 × 1,6	25,8
25	1			18,7	153		1,4	156		2,3					33,7 × 2,0	29,7
32	1 1/4	92	21	21,7	220	125	3,3	212	89	5,0		M 18 × 1	180	37,5	42,4 × 2,0	60,0
40	1 1/2			15,2	223		3,4	215		5,1					48,3 × 2,0	65,0
50	2	115	24	16,8	239		5,0	250	110	8,2			190	32,5	60,3 × 2,0	102,0

15 Variant HV.510 for MD 30 - MD 115
16 Variant LAP.520 for MD 30 - MD 115
17 Smaller and larger nominal sizes available on request
18 Maximum tolerance -3 °

Dimensions to OD ASME BPE – precision (investment) cast body

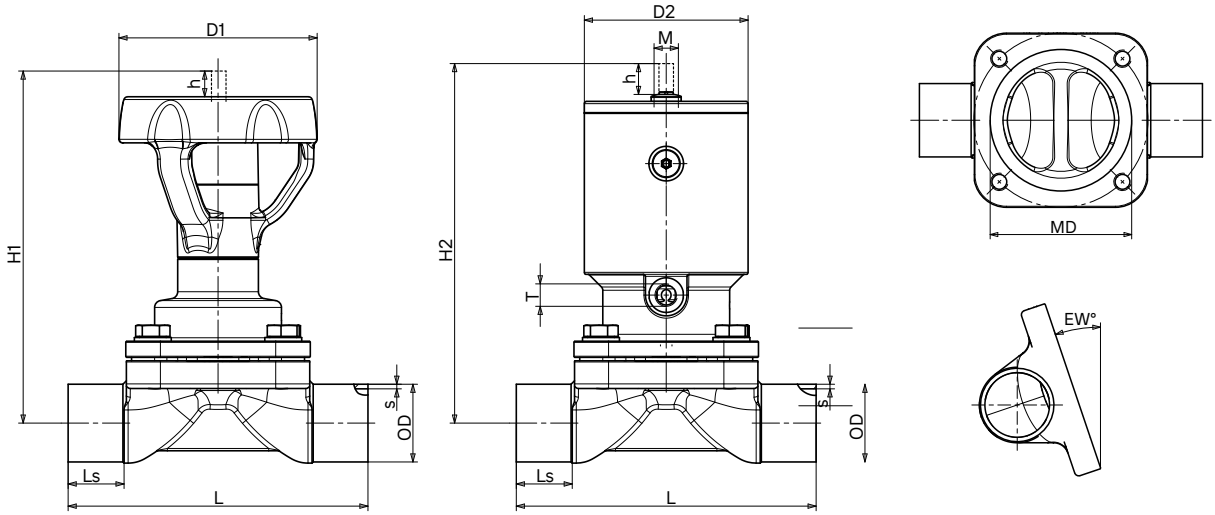

Fig. 5: Dimensions to OD ASME BPE

Table 14: Dimensions to OD ASME BPE (precision (investment) cast body)

DN[21]	Inch	MD	h [mm]	EW [°][22]	Manually operated valve[19]			Piston actuator[20]					Butt weld ends to DIN 11866-B (ISO 4200)			K_{VS} value [m³/h]
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	OD × s [mm]	
15	1/2	30	5	23,5	71	35	0,3	90	41	0,5	M 5	M 12 × 1	80	20,0	12,7 × 1,65	2,8
20	3/4	40	7	20,6	118	66	0,7	105	45	0,7			115	30,0	19,05 × 1,65	6,9
25	1	65	13	30,4	150	88	1,3	153	71	2,2	G 1/8		130	25,0	25,4 × 1,65	24,1
40	1 1/2			11,4	156		1,4	159	89	2,3					38,1 × 1,65	27,5
50	2	92	21	11,6	226	125	3,4	218		5,1		M 18 × 1	180	37,5	50,8 × 1,65	62,0
65	2 1/2	115	24	13,8	241		5,0	252	110	8,2			190	32,5	63,5 × 1,65	93,0

19 Variant HV.510 for MD 30 - MD 115
20 Variant LAP.520 for MD 30 - MD 115
21 Smaller and larger nominal sizes available on request
22 Maximum tolerance -3 °

Dimensions to DIN – forged body

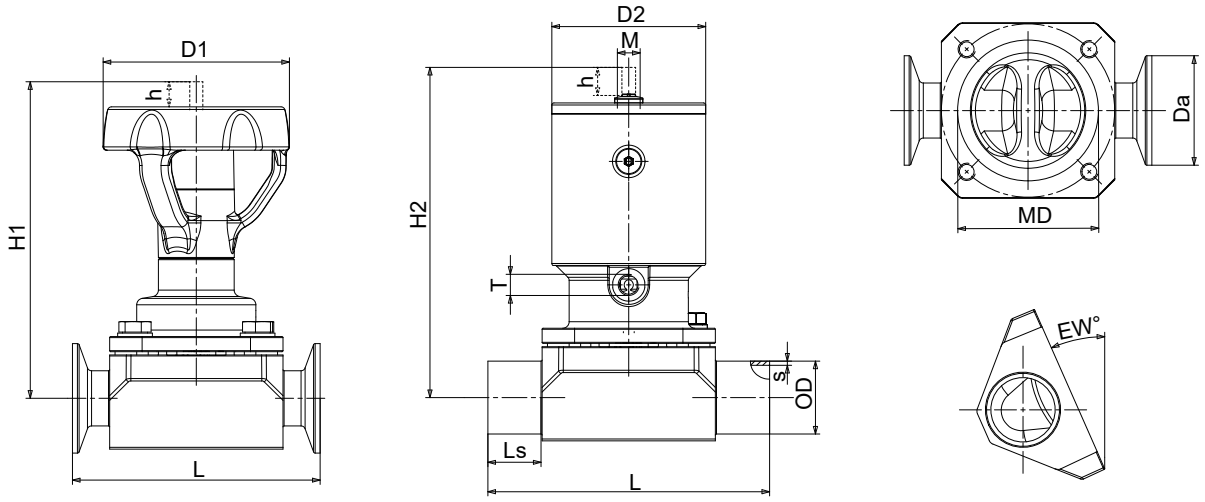

Fig. 6: Dimensions to DIN

Table 15: Dimensions to DIN (forged body)

DN [25]	Inch	MD	h [mm]	EW [°] [26]	Manually operated valve[23]			Piston actuator[24]					Butt weld ends to DIN 11866-A			Clamps to DIN 32676-A (DIN 11866-A)		K_{vs} value [m^3/h]
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	OD × s [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 12 × 1	80	20,0	8 × 1,0	63,5	25,0	1,1
8	5/16			34,6	68			87							10 × 1,0			1,8
10	3/8			24,0	69			88							13 × 1,5		34,0	2,1
15	1/2	40	7	21,7	116	66	0,9	103	46	0,9			115	30,0	19 × 1,5	88,9	34,0	5,0
20	3/4	65	13	34,6	146	88	2,0	149	71	2,9			130	25,0	23 × 1,5	101,6		11,8
25	1			24,1	148			151							29 × 1,5	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	35 × 1,5	139,7	50,5	34,0
40	1 1/2			24,7	216			208							41 × 1,5			42,5
50	2	115	24	21,7	231	125	7,1	242	110	10,3			190	32,5	53 × 1,5	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	70 × 2,0	-	-	137,0
80	3			21,0	336		22,8	405		30,0					85 × 2,0	-	-	156,0
100	4	202	55	20,0	377	250	37,7	501	210	59,3	G 1/8	M 18 × 1	305	37,5	104 × 2,0	-	-	245,0
125	5			8,8	392		49,7	516		71,3			356	63,0	129 × 2,0	-	-	230,0
150	6	280	80	17,6	512	400	97,0	-[27]					414	50,0	154 × 2,0	-	-	490,0
200	8			2,4	536		114,0	-[27]					521	103,5	204 × 2,0	-	-	500,0
Compact DN/MD combination																		
20	3/4	40	7	9,6	120	66	1,0	107	46	1,0	M 5	M 12 × 1	115	30,0	23 × 1,5	-	-	4,4
32	1 1/4	65	13	12,2	154	88	2,1	157	71	3,0			140	30,0	35 × 1,5	-	-	15,4
50	2	92	21	10,0	226	125	5,0	218	89	6,7			190	42,5	53 × 1,5	-	-	42,4
65	2 1/2	115	24	7,0	241	125	8,1	252	110	11,3	G 1/8	M 18 × 1	200	37,5	70 × 2,0	-	-	65,0
100	4	168	40	10,7	351	250	30,9	439	170	34,7			305	56,5	104 × 2,0	-	-	143,0

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 202
25 Smaller and larger nominal sizes available on request
26 Maximum tolerance -3 °
27 Design as per customer specifications

Dimensions to ISO – forged body

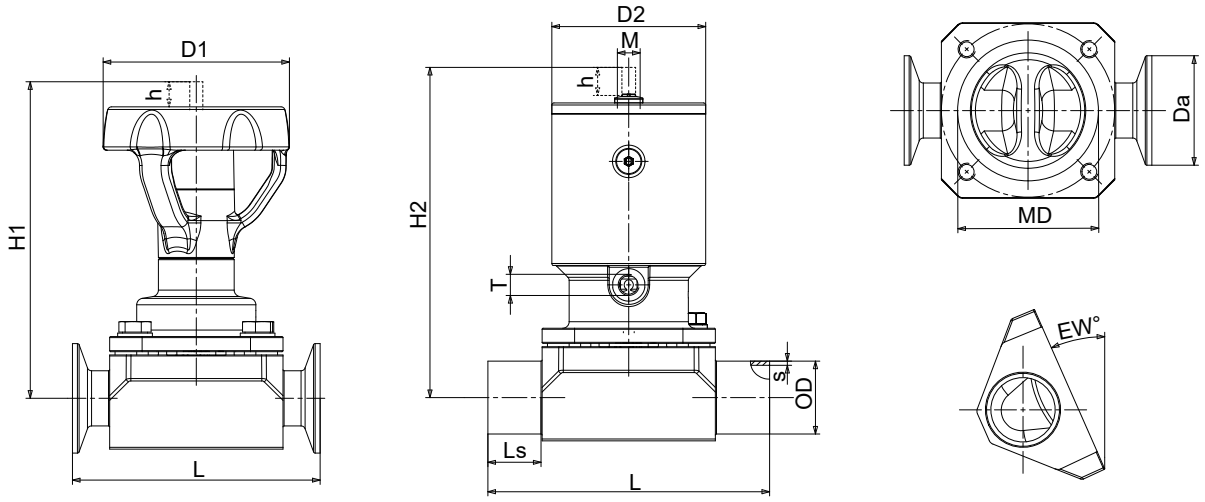

Fig. 7: Dimensions to ISO

Table 16: Dimensions to ISO (forged body)

DN [30]	Inch	MD	h [mm]	EW [°] [31]	Manually operated valve[28]			Piston actuator[29]					Butt weld ends to DIN 11866-B (ISO 4200)			Clamps to DIN 32676-B (ISO 4200)		K_{vs} value [m^3/h]
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	OD × s [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 12 × 1	80	20,0	10,2 × 1,6	63,5	25,0	1,5
8	5/16			23,0	69			88							13,5 × 1,6			2,2
10	3/8	40	7	27,7	115	66	0,9	102	46	0,9			115	30,0	17,2 × 1,6	88,9	25,0	4,5
15	1/2			15,7	117			104							21,3 × 1,6		50,5	5,2
20	3/4	65	13	27,1	148	88	2,0	151	71	2,9	G 1/8		130	25,0	26,9 × 1,6	101,6	50,5	14,7
25	1			17,7	150			153							33,7 × 2,0	114,3		17,5
32	1 1/4	92	21	24,4	216	125	4,6	208	89	6,3		M 18 × 1	180	37,5	42,4 × 2,0	139,7	64,0	43,0
40	1 1/2			17,1	219			211							48,3 × 2,0			45,5
50	2	115	24	15,6	234	125	7,1	245	110	10,3			190	32,5	60,3 × 2,0	158,8	77,5	69,0
65	2 1/2	168	40	27,0	330	250	23,8	399	170	30,7			254	31,0	76,1 × 2,0	-	-	149,0
80	3			19,6	336		22,8	405		30,0					88,9 × 2,3	-	-	161,0
100	4	202	55	15,3	382	250	37,7	506	210	59,3			305	37,5	114,3 × 2,3	-	-	255,0
125	5			5,4	392		47,7	516		69,3			356	63,0	139,7 × 2,6	-	-	258,0
150	6	280	80	13,7	518	400	92,0	-[32]					414	50,0	168,3 × 2,6	-	-	500,0
200	8			1,3	543		111,0	-[32]					521	103,5	219,1 × 2,6	-	-	510,0
Compact DN/MD combination																		
10	3/8	30	5	7,7	72	35	0,4	91	41	0,6	M 5	M 12 × 1	80	20,0	17,2 × 1,6	-	-	2,2
20	3/4	40	7	2,8	120	66	1,0	107	46	1,0			115	30,0	26,9 × 1,6	-	-	4,7
32	1 1/4	65	13	4,2	154	88	2,6	157	71	3,5	G 1/8		140	30,0	42,4 × 2,0	-	-	17,5
50	2	92	21	4,9	226	125	6,5	218	89	8,2		M 18 × 1	190	42,5	60,3 × 2,0	-	-	45,7
65	2 1/2	115	24	2,7	241	125	7,6	252	110	10,8			200	37,5	76,1 × 2,0	-	-	67,0
100	4	168	40	6,3	351	250	29,8	420	170	36,7			305	56,5	114,3 × 2,3	-	-	157,0

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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 202
30 Smaller and larger nominal sizes available on request
31 Maximum tolerance -3 °
32 Design as per customer specifications

Dimensions to OD ASME BPE – forged body

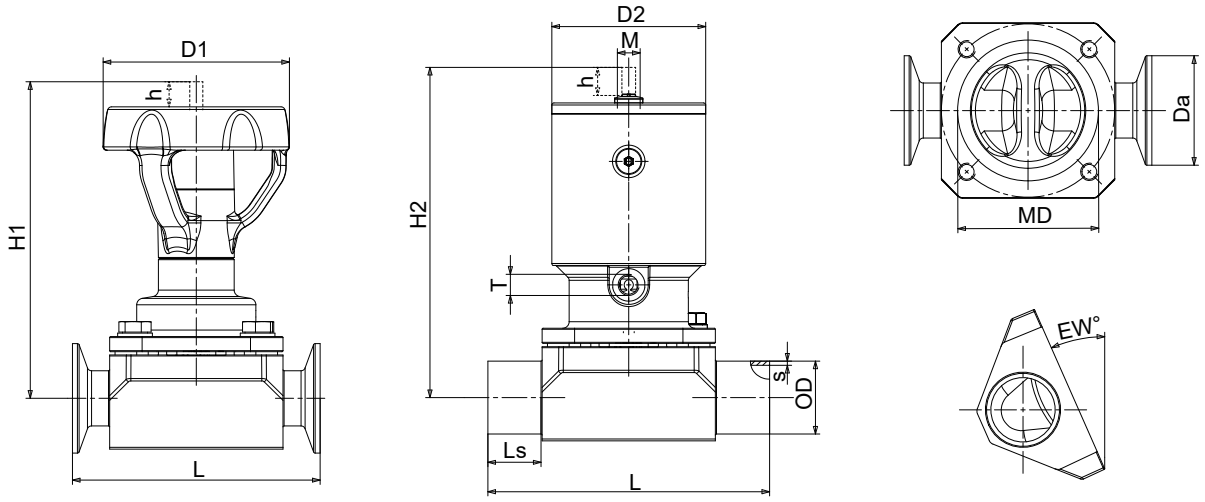


Fig. 8: Dimensions to OD ASME BPE

Table 17: Dimensions to OD ASME BPE (forged body)

DN [35]	Inch	MD	h [mm]	EW [°] [36]	Manually operated valve [33]			Piston actuator [34]					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]	OD × s [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 12 × 1	80	20,0	6,35 × 0,89	63,5	25,0	0,6
10	3/8			35,5	68			87							9,53 × 0,89			1,7
15	1/2			26,0	69			88							12,7 × 1,65			2,1
15	1/2	40	7	37,3	115	66	0,9	102	46	0,9			115	30,0	12,7 × 1,65	88,9	25,0	2,6
20	3/4			22,2	116			103							19,05 × 1,65	101,6	25,0	4,9
25	1	65	13	31,8	146	88	2,0	149	71	2,9	G 1/8	M 18 × 1	130	25,0	25,4 × 1,65	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	38,1 × 1,65	139,7	50,5	39,0
50	2	115	24	23,5	231	125	7,1	242	110	10,3			190	32,5	50,8 × 1,65	158,8	64,0	62,0
65	2 1/2			12,3	236		6,4	247		9,6					63,5 × 1,65	193,8	77,5	71,0
80	3	168	40	26,7	330	250	22,8	399	170	29,7			254	31,0	76,2 × 1,65	222,3	91,0	151,0
100	4	202	55	20,9	377	250	37,7	501	210	59,3			305	37,5	101,6 × 2,11	292,1	119,0	237,0
150	6	280	80	18,8	512	400	93,4	- [37]					414	50,0	152,4 × 2,77	-	-	490,0
Compact DN/MD combination																		
50	2	92	21	12,0	226	125	6,5	218	89	8,2	G 1/8	M 18 × 1	190	42,5	50,8 × 1,65	-	-	42,4
80	3	115	24	2,1	242	125	7,6	252	110	10,8			200	37,5	76,2 × 1,65	-	-	67,0
100	4	168	40	11,9	351	250	30,9	414	170	35,0			305	56,5	101,6 × 2,11	-	-	143,0

33 Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202
34 Variant LAP.520 for MD 30 - MD 202
35 Smaller and larger nominal sizes available on request
36 Maximum tolerance -3 °
37 Design as per customer specifications

Dimensions to SMS – forged body

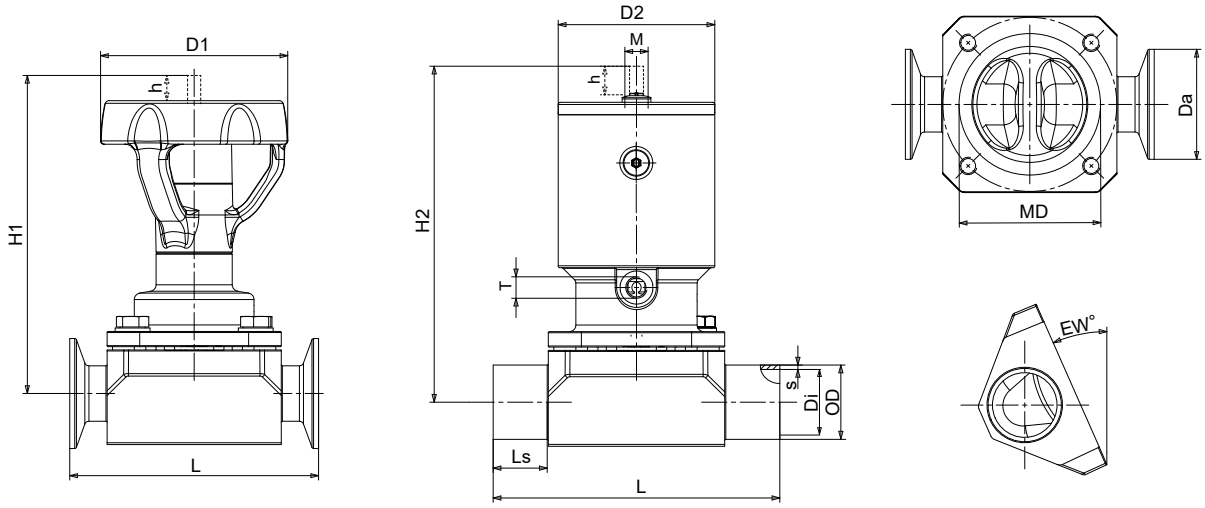


Fig. 9: Dimensions to SMS

Table 18: Dimensions and weights to SMS (forged body)

DN[40]	Inch	MD	h [mm]	EW [°] [41]	Manually operated valve[38]			Piston actuator[39]					Butt weld ends to SMS 3008			Clamps to DIN 32676 (SMS 3008)			K_{vs} value [m³/h]
					H1 [mm]	D1 [mm]	[kg]	H2 [mm]	D2 [mm]	[kg]	T	M	L [mm]	Ls [mm]	OD × s [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 12 × 1	80	20,0	12 × 1,0	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	18 × 1,0	88,9	25,0	16,0	5,0
25	1	65	13	31,1	146	88	2,0	149	71	2,9	G 1/8		130	25,0	25 × 1,2	114,3	50,5	22,6	13,8
40	1 1/2	92	21	26,9	216	125	4,6	208	89	6,3		M 18 × 1	180	37,5	38 × 1,2	139,7	50,5	35,6	39,0
50	2	115	24	22,7	231		7,1	242	110	10,3			190	32,5	51 × 1,2	158,8	64,0	48,6	62,0
65	2 1/2			12,2	236		6,4	247		9,6					63,5 × 1,6	193,8	77,5	60,3	71,0
80	3	168	40	26,7	330	250	22,8	399	170	29,7			254	30,0	76,1 × 1,6	222,3	91,0	72,9	151,0
100	4	202	55	20,8	377		37,7	501	210	59,3			305	37,5	101,6 × 2,0	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 18 × 1	190	42,5	51,0 × 1,2	-	-	-	42,4
80	3	115	24	2,1	242	125	7,5	253	110	10,7			200	37,5	76,1 × 1,6	-	-	-	67,0
100	4	168	40	11,8	345	250	28,1	414	170	35,0			305	56,5	101,6 × 2,0	-	-	-	143,0

38 Variant HV.510 for MD 30-MD 115, variant HV.520 for MD 168-MD 202
39 Variant LAP.520 for MD 30 - MD 202
40 Smaller and larger nominal sizes available on request
41 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 19: 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	157	71
		80	16	11	16	8	15	7,5	178	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
		125[42)]	13	6,5	12	6	10	5	276	136
		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[43)]	SF	-	-	-	-	-	-	-	-	-

Table 20: 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	130	58
65	OF	63	11	5,5	7	3,5	7	3,5	157	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

42 Available from 09/2026
43 Design as per customer specifications

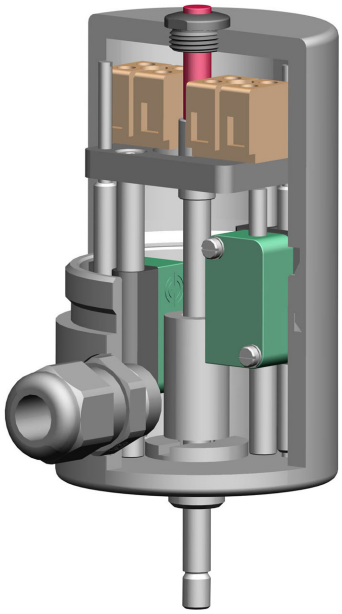
Diaphragm size			EPDM [bar]		TFM, bonded [bar]		TFM, 2-piece [bar]		Dimensions [mm]	
MD	Function	Piston	One side	Both sides	One side	Both sides	One side	Both sides	H2 max.	D2
115	OF	125[42)]	16	8	15	7,5	13	6,5	276	136
168	OF	160	12	6	-	-	8	4	420	170
202	OF	200	14	7	-	-	10	5	518	210
280[43)]	OF	-	-	-	-	-	-	-	-	-

Table 21: 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	130	58
65	AZ	63	13	6,5	10	5	12	6	157	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
		125[42)]	16	9	16	8,5	14	7	276	136
168	AZ	160	14	7	-	-	10	5	420	170
202	AZ	200	16	8	-	-	12	6	518	210
280[43)]	AZ	-	-	-	-	-	-	-	-	-

Accessories

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



Example: SK.500

- 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

Table 22: Technical data of SK.500/SK.510

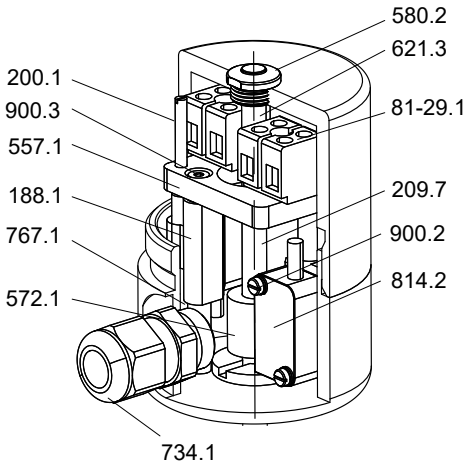
Characteristic	Type	
	SK.500	SK.510
Stroke [mm]	5-26	5-60
Housing material	1.4404	1.4404
Electrical connection	Terminal strip and cable entry (optional: connector)	
Setting the proximity sensors	Threaded stem (optional: from outside the housing)	
Travel stop	Optional	
Enclosure	IP64	

Table 23: Technical data of limit switches

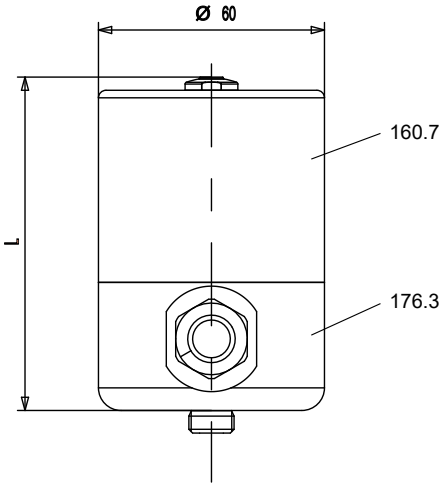
Characteristic	NCB2-V3-N0 (inductive) 2-wire system	NBB2-V3-E2 (inductive) 3-wire system	ABV161651 (mechanical)[44)]
Manufacturer	Pepperl & Fuchs	Pepperl & Fuchs	Matsushita (with modified switching flag)
Type	NAMUR normally closed contact	PNP normally open contact	Changeover contact
Voltage	8 V	10.....30V	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	-	-

44 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 24: 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 25: 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

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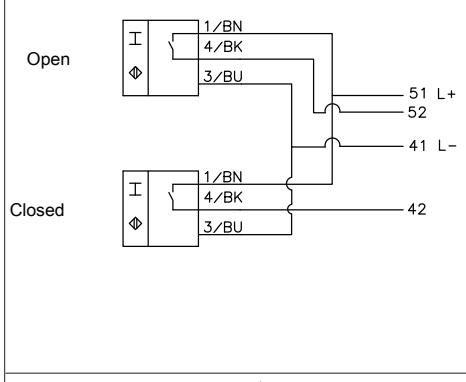
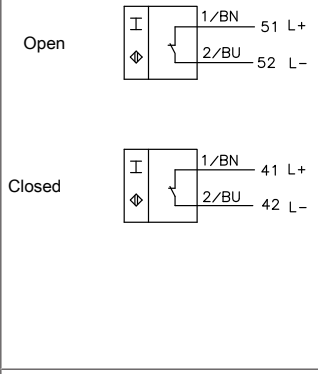
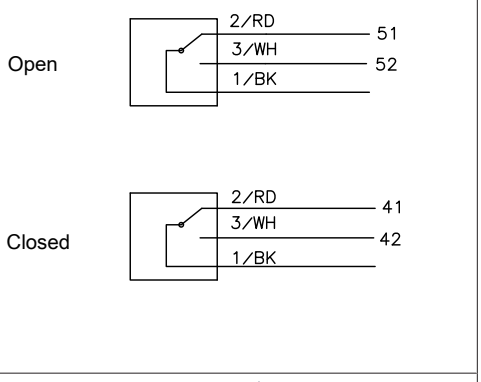
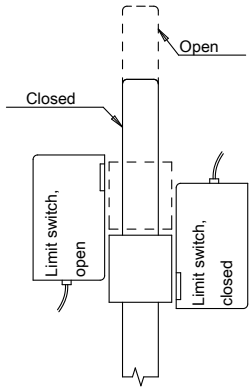
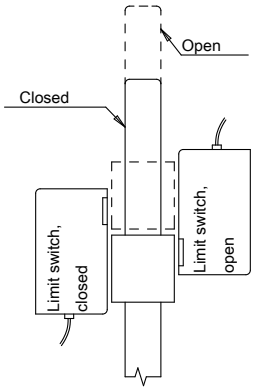
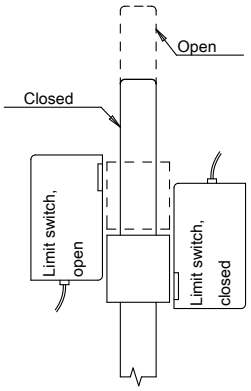
Terminal diagram for SK.500/SK.510

Table 26: Terminal diagram for SK.500/SK.510

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

Functional principle of SK.500/SK.510

Table 27: Functional principle of SK.500/SK.510

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

Switching logic

Table 28: 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 29: Limit 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 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).

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 SF, OF and AZ

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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