

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 and beverage industry
- Pharmaceutical industry
- Process engineering
- Water treatment
- Sugar industry

Fluids handled

- Aggressive fluids
- Inorganic fluids
- Steam
- Distillate
- Gas
- Fluids posing a health hazard
- Toxic fluids
- High-temperature 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

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

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 medium | Compressed air (min. 5.5 bar) (max. 7.0 bar) |

Valve body materials

Overview of available materials

| Material | Material number | Temperature limit |
|-------------------------------|-----------------|-------------------|
| X2CrNiMo18-14-3 ³⁾ | 1.4435/316L | -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 |

Design details

Design

- Soft-seated straightway shut-off valve in Y-pattern or T-pattern; manually or pneumatically actuated
- 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
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- Marked in accordance with ASME BPE

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

Variants

- Handwheel made of stainless steel 1.4404/1.4409
- Tank valves or multi-port valves⁴⁾
- Pneumatic actuators
- Limit switches
- Positioners
- Adjustable travel stop
- High-temperature design for temperatures $\geq 80^{\circ}\text{C}$ at actuator cylinder

Diaphragm materials

Overview of diaphragm qualities

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

Surface finish

Surface finish of wetted internal body surfaces

| Internal body surfaces | | | | |
|------------------------|----------|---------------|-------------------------|-------------------|
| Ra [µm] ⁵⁾ | 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 | Electropolished |
| 0,6 | 25 | SF6 | - | |
| 0,5 | 20 | SF5 | - | |
| 0,4 | 15 | SF4 | HE4 | |
| 0,25 | 10 | - | HE5 | |

Bonnet

Overview of bonnet materials

| MD ⁶⁾ | 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 ⁷⁾ | HV | - | - |

Actuator

Overview of actuator materials

| MD ⁶⁾ | Type | Bonnet | Actuator |
|-------------------|---------|------------------------|---------------------------------|
| 30 - 202 | LAP.520 | Stainless steel 1.4409 | Stainless steel 1.4301 / 1.4409 |
| 168 - 202 | LAP.530 | Stainless steel 1.4409 | Aluminium, hard anodised |
| 280 ⁷⁾ | 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 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.

4) For further designs refer to the "Sterile Processes" catalogue, reference No. 8652.10. More variants on request.
 5) Exact values in accordance with ASME BPE: 0.76 / 0.64 / 0.51 / 0.38 µm
 6) MD = diaphragm diameter
 7) Design as per customer specifications

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

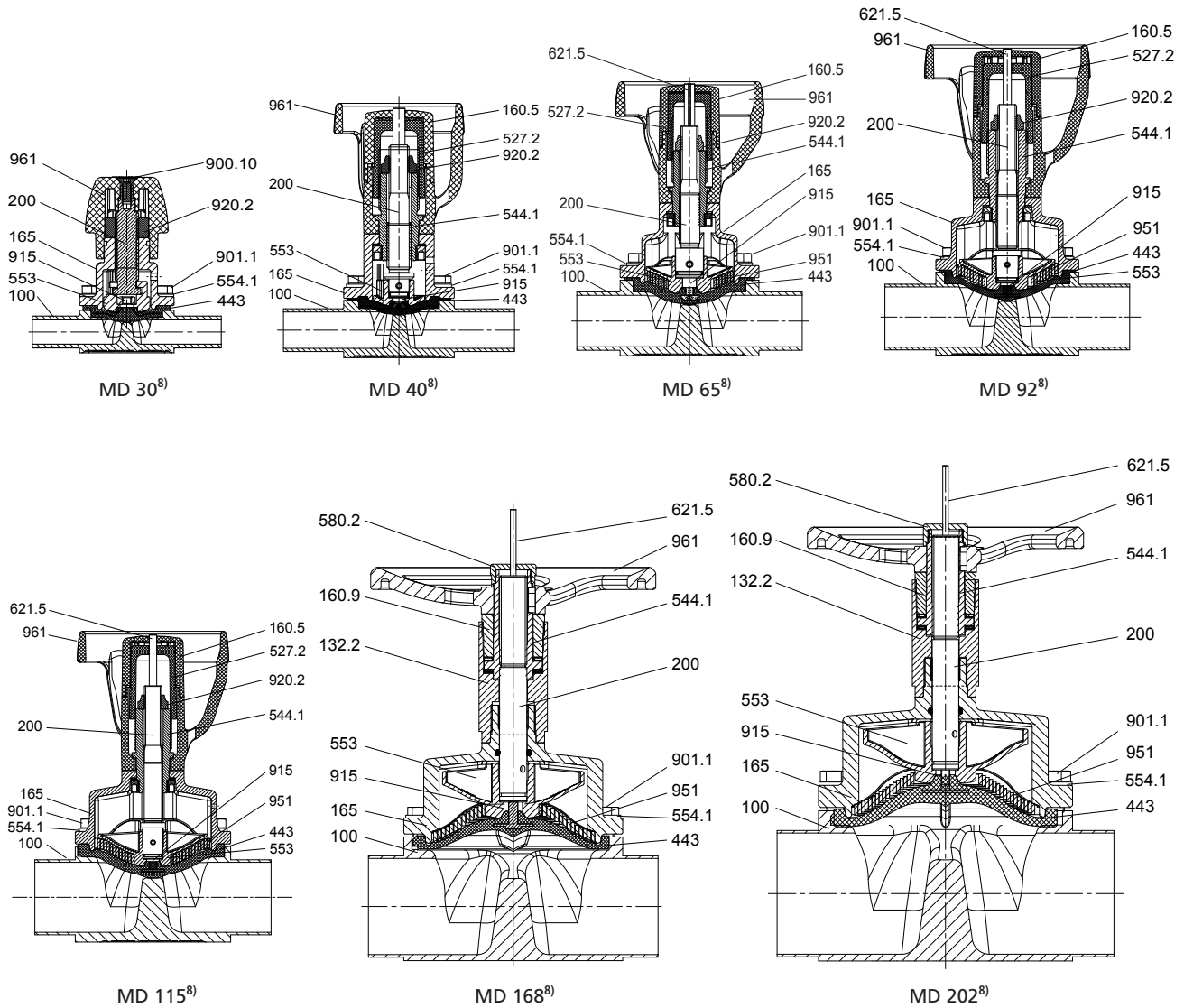
Information/documents

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

Materials

Materials of SISTO-C manually operated valve

SISTO-C HV.510/.520 mit Handrad



Parts list

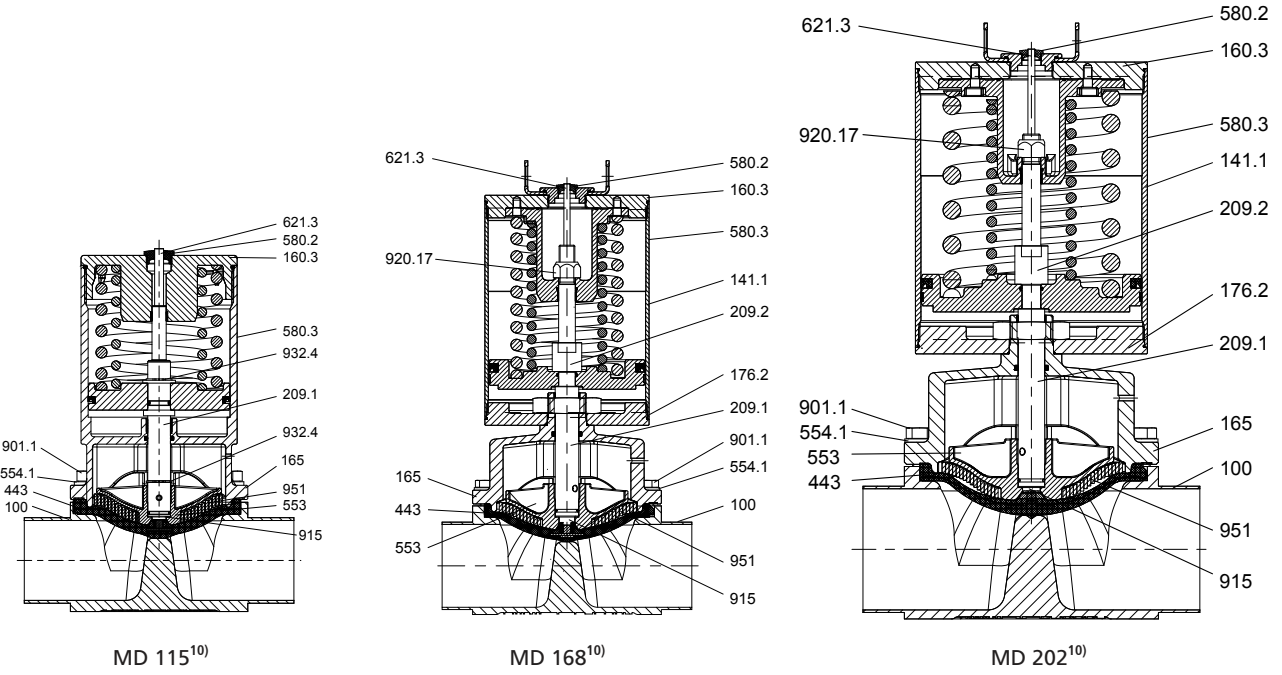
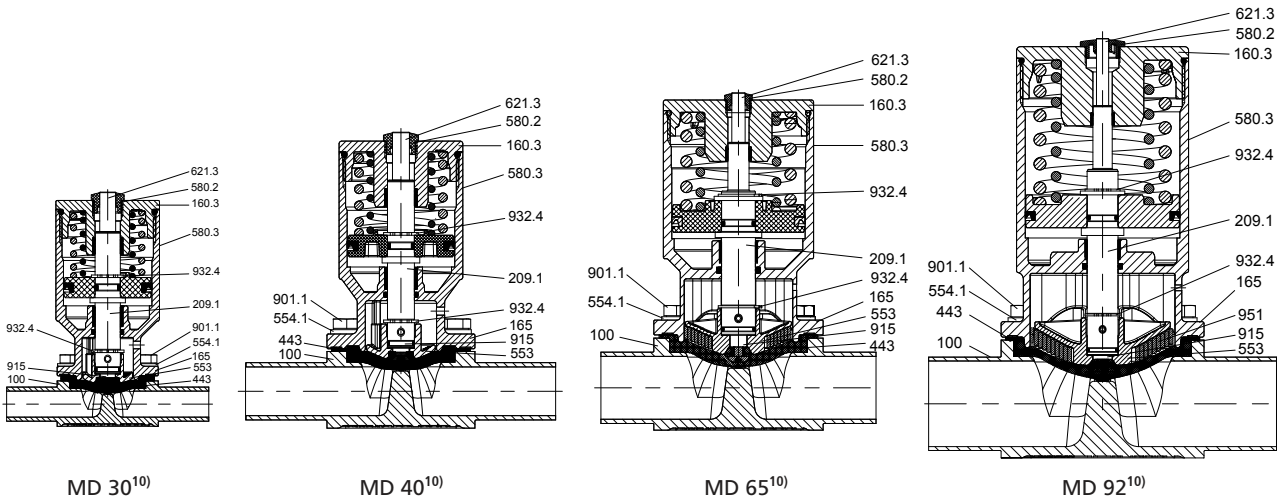
| Part No. | Description | Material | Material number | Note |
|-------------------|--------------------|--------------------------------|-----------------|---|
| 100 | Body | X2CrNiMo18-14-3 | 1.4435/316L | Forged |
| 132.2 | Intermediate piece | X2CrNiMo17-12-2 | 1.4404 | - |
| 160.5 | Handwheel cover | 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 ⁹⁾ | Diaphragm | EPDM | - | FDA, CFR 21, Section 177.2600 EC 1935/2004 |
| 527.2 | Locating sleeve | PA66-GF30 | - | - |
| 544.1 | Threaded bush | SoMs59 | - | - |
| 553 | Thrust insert | GX2CrNiMo19-11-2 | 1.4409 | - |
| 554.1 | Washer | A2 | - | - |
| 580.2 | Cap | X2CrNiMo17-12-2 | 1.4404 | - |
| 621.5 | Position indicator | PA6 | - | - |

8) MD = diaphragm diameter
9) Recommended spare parts

| Part No. | Description | Material | Material number | Note |
|----------|-------------------|------------------|-----------------|--------------------------------------|
| 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 | - | MD 30 - 115; 30 % glass fibre, black |
| | | GX2CrNiMo19-11-2 | 1.4409 | MD 168 - 202 |

Materials of SISTO-C with actuator

SISTO-C mit LAP.520/.530SF



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 MD168-202 Aluminium, hard anodised |
| 160.3 | Cover | X2CrNiMo17-12-2 | 1.4404 | Variant MD168-202 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 ¹¹⁾ | Diaphragm | EPDM | - | FDA, CFR 21, Section 177.2600 EC 1935/2004 |
| 553 | Thrust insert | GX2CrNiMo19-11-2 | 1.4409 | - |

10) MD = diaphragm diameter
11) Recommended spare parts

| Part No. | Description | Material | Material number | Note |
|----------|--------------------|-------------|-----------------|------------|
| 554.1 | Washer | A2 | - | - |
| 580.2 | Cap | PA | - | - |
| 580.3 | Cap | PA | - | - |
| 621.3 | Position indicator | PA | - | - |
| 901.1 | Hexagon head bolt | A2-70 | - | DIN 933 |
| 915 | Floating nut | A2 | - | - |
| 920.17 | Nut | A2 | - | - |
| 932.4 | Circlip | A2 | - | - |
| 951 | Support spiral | X5CrNi18-10 | 1.4301 | From MD 65 |

Dimensions

Dimensions to DIN

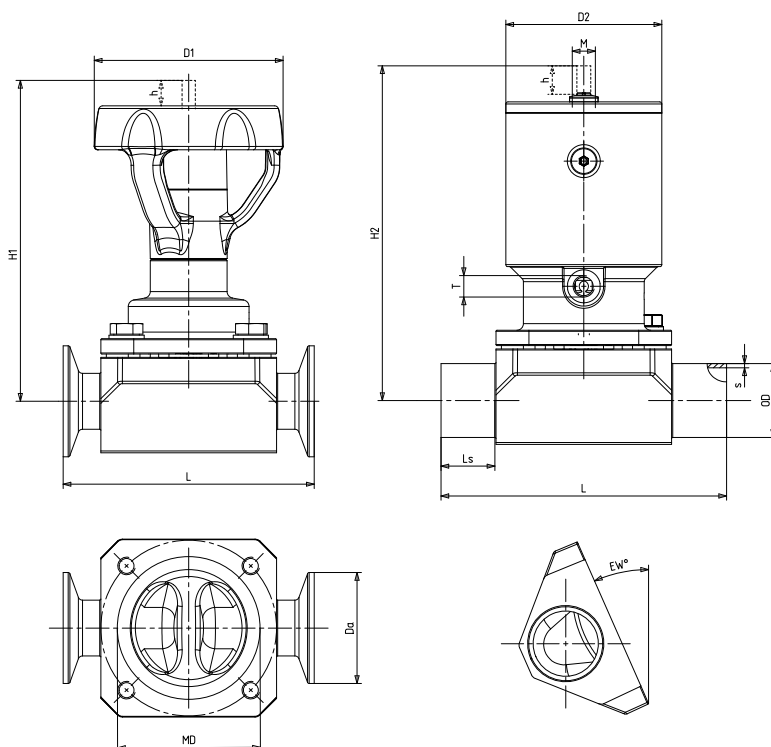


Fig. 1: Dimensions to DIN

Dimensions and weights to DIN

| DN | Inch | MD ⁽¹²⁾ | h | EW ⁽¹³⁾ | Manually operated valve | | | Actuator | | | | Butt weld ends ⁽¹⁴⁾ to DIN 11866-A | | | Clamps ⁽¹⁴⁾ to DIN 32676-A (DIN 11866-A) | | K _{vs} value | | | | | | | |
|-----|-------|--------------------|----|--------------------|-------------------------|---------|----------------------|-------------------|---------|----------------------|--------|---|--------|---------|---|--------|-----------------------|-------------------|-------------------|-----------|---------|--------|---------|-------|
| | | | | | H1 [mm] | D1 [mm] | [kg] ⁽¹⁵⁾ | H2 [mm] | D2 [mm] | [kg] ⁽¹⁶⁾ | T | M | L [mm] | Ls [mm] | OD×s [mm] | L [mm] | | Da [mm] | m ³ /h | | | | | |
| 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 | 30 | 5 | 34,6 | 68 | 35 | 0,4 | 87 | 41 | 0,6 | M 5 | M 12×1 | 80 | 20,0 | 10×1,0 | 63,5 | 25,0 | 1,8 | | | | | | |
| 10 | 3/8 | | | 24,0 | 69 | | | 88 | | | | | | | 13×1,5 | 63,5 | 34,0 | 2,1 | | | | | | |
| 15 | 1/2 | | | 40 | 7 | | | 21,7 | | | | | | | 116 | 66 | 0,9 | 103 | 46 | 0,9 | G 1/8 | M 18×1 | 115 | 30,0 |
| 20 | 3/4 | 65 | 13 | 34,6 | 146 | 88 | 2,0 | 149 | 71 | 2,9 | 130 | 25,0 | 23×1,5 | 101,6 | 34,0 | 11,8 | | | | | | | | |
| 25 | 1 | 115 | 24 | 24,1 | 148 | 125 | 7,1 | 151 | 89 | 6,3 | M 18×1 | M 18×1 | 180 | 37,5 | 29×1,5 | 114,3 | 50,5 | 16,5 | | | | | | |
| 32 | 1 1/4 | | | 92 | 21 | | | 31,3 | | | | | | | 215 | 207 | 208 | 35×1,5 | 139,7 | 50,5 | 34,0 | | | |
| 40 | 1 1/2 | 280 | 80 | 24,7 | 216 | 400 | 97,0 | 210 | 34,9 | 26,7/33,9 | M 18×1 | M 18×1 | 180 | 37,5 | 41×1,5 | 139,7 | 50,5 | 42,5 | | | | | | |
| 50 | 2 | | | 115 | 24 | | | 21,7 | | | | | | | 231 | 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 | 421 | 167 | 27,7/34,9 | 254 | 31,0 | 70×2,0 | - |
| 80 | 3 | 202 | 55 | 21,0 | 336 | 250 | 37,7 | 430 | 89 | 6,3 | M 18×1 | M 18×1 | 180 | 37,5 | 85×2,0 | - | - | 156,0 | | | | | | |
| 100 | 4 | | | 202 | 55 | | | 20,0 | | | | | | | 377 | 250 | 37,7 | 501 | 210 | 48,5/59,3 | 305 | 37,5 | 104×2,0 | - |
| 125 | 4 1/2 | 280 | 80 | 8,8 | 392 | 400 | 97,0 | - ⁽¹⁷⁾ | 34,9 | 26,7/33,9 | M 18×1 | M 18×1 | 180 | 37,5 | - | - | - | 230,0 | | | | | | |
| 150 | 5 | | | 280 | 80 | | | 17,9 | | | | | | | 512 | 400 | 97,0 | - ⁽¹⁷⁾ | 414 | 50,0 | 154×2,0 | - | - | 490,0 |
| 200 | 6 | | | 280 | 80 | | | 4,1 | | | | | | | 536 | 400 | 114,0 | - ⁽¹⁷⁾ | 521 | 103,5 | 204×2,0 | - | - | 500,0 |

8644.1/25-EN

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

Dimensions to ISO

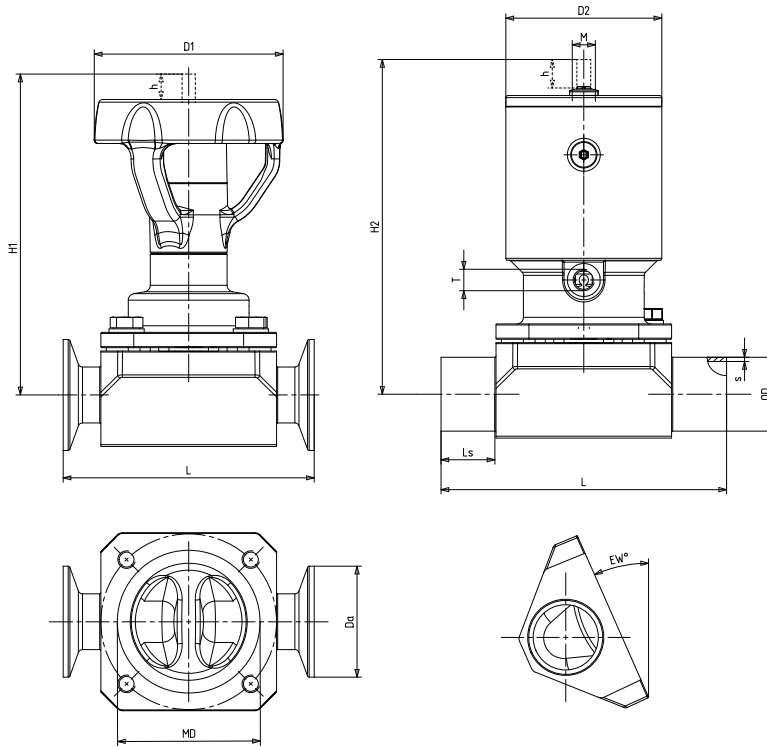


Fig. 2: Dimensions to ISO

Dimensions and weights to ISO

| DN | Inch | MD ⁽¹⁸⁾ | h | EW ⁽¹⁹⁾ [mm] | Manually operated valve | | | Actuator | | | | Butt weld ends ²⁰⁾ to DIN 11866-B (ISO 4200) | | | Clamps ²⁰⁾ to DIN 32676-A (ISO 4200) | | K _{vs} value | |
|-----|-------|--------------------|----|-------------------------|-------------------------|---------|----------------------|------------------|---------|----------------------|-------|---|--------|---------|---|--------|-----------------------|---------|
| | | | | | H1 [mm] | D1 [mm] | [kg] ⁽²¹⁾ | H2 [mm] | D2 [mm] | [kg] ⁽²²⁾ | T | M | L [mm] | Ls [mm] | OD×s [mm] | L [mm] | | Da [mm] |
| 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 | 63,5 | 25,0 | 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 | 88,9 | 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 | 50,5 | 17,5 |
| 32 | 1 1/4 | 92 | 21 | 24,4 | 216 | 125 | 4,6 | 208 | 89 | 6,3 | | M 18×1 | 180 | 37,5 | 42.2×2,0 | 139,7 | 64,0 | 43,0 |
| 40 | 1 1/2 | | | 17,1 | 219 | | | 211 | | | | | | | 48.3×2,0 | 139,7 | 64,0 | 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 | 424 | 167 | 27,7/ 34,9 | | | 254 | 31,0 | 76.1×2,0 | - | - | 149,0 |
| 80 | 3 | | | 19,6 | 336 | | 22,8 | 430 | | 26,7/ 33,9 | | | | | 88.9×2,3 | - | - | 161,0 |
| 100 | 4 | 202 | 55 | 15,3 | 382 | 250 | 37,7 | 506 | 210 | 48,5/ 59,3 | | | 305 | 37,5 | 114.3×2,3 | - | - | 255,0 |
| 125 | 4 1/2 | | | 5,4 | 392 | | 47,7 | - ²³⁾ | | | | | 356 | 63,0 | 139.7×2,6 | - | - | 258,0 |
| 150 | 5 | 280 | 80 | 13,5 | 518 | 400 | 92,0 | - ²³⁾ | | | | | 414 | 50,0 | 168.3×2,6 | - | - | 500,0 |
| 200 | 6 | | | 0,9 | 543 | | 111,0 | - ²³⁾ | | | | | 521 | 103,5 | 219.1×2,6 | - | - | 510,0 |

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

Dimensions to OD

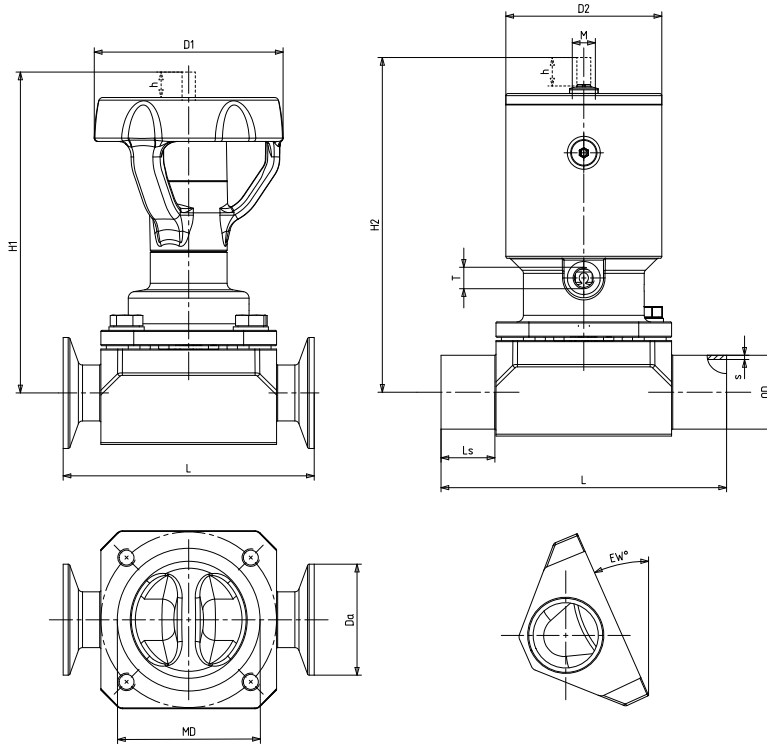


Fig. 3: Dimensions to OD

Dimensions and weights to OD

| DN | Inch | MD ²⁴⁾ | h | EW ²⁵⁾ | Manually operated valve | | | Actuator | | | | Butt weld ends ²⁶⁾ to OD ASME BPE | | | Clamps ²⁶⁾ to DIN 32676-A (OD ASME BPE) | | K _{vs} value | | | | | | | | | | | | |
|-----|-------|-------------------|----|-------------------|-------------------------|---------|---------------------|------------------|---------|---------------------|-----|--|--------|---------|--|--------|-----------------------|---------|-------------------|------|-----------|-----------|-------|------|-------|------------|-------|------|------|
| | | | | | H1 [mm] | D1 [mm] | [kg] ²⁷⁾ | H2 [mm] | D2 [mm] | [kg] ²⁸⁾ | T | M | L [mm] | Ls [mm] | ODxS [mm] | L [mm] | | Da [mm] | m ³ /h | | | | | | | | | | |
| 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 | | | 87 | | | | | | | 9.53x0,89 | 63,5 | 25,0 | 1,7 | | | | | | | | | | | |
| 15 | 1/2 | | | | 26,0 | | | 88 | | | | | | | 12.70x1,65 | 63,5 | 25,0 | 2,1 | | | | | | | | | | | |
| 15 | 1/2 | 40 | 7 | 37,3 | 115 | 66 | 0,9 | 102 | 46 | 0,9 | | | G 1/8 | M 18x1 | 115 | 30,0 | 12.70x1,65 | 88,9 | 25,0 | 2,6 | | | | | | | | | |
| 20 | 3/4 | | | | | | | | | | | | | | 22,2 | 103 | 19.05x1,65 | 101,6 | 25,0 | 4,9 | | | | | | | | | |
| 25 | 1 | 65 | 13 | 31,8 | 146 | 88 | 2,0 | 149 | 71 | 2,9 | | | G 1/8 | M 18x1 | 130 | 25,0 | 25.40x1,65 | 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 | 38.10x1,65 | 139,7 | 50,5 | 39,0 |
| 50 | 2 | | | | | | | | | | | | | | 115 | 24 | 23,5 | 231 | 125 | 7,1 | 242 | 110 | 10,3 | 190 | 32,5 | 50.80x1,65 | 158,8 | 64,0 | 62,0 |
| 65 | 2 1/2 | 168 | 40 | 26,7 | 330 | 250 | 22,8 | 247 | 167 | 9,6 | | | G 1/8 | M 18x1 | 254 | 31,0 | 63.50x1,65 | 193,8 | 77,5 | 71,0 | | | | | | | | | |
| 80 | 3 | | | | | | | | | | | | | | 20,9 | 377 | 250 | 37,7 | 501 | 210 | 48,5/59,3 | 26,7/33,9 | 222,3 | 91,0 | 151,0 | | | | |
| 100 | 4 | | | | | | | | | | 202 | 55 | | | 20,9 | 377 | 250 | 37,7 | 501 | 210 | 48,5/59,3 | 26,7/33,9 | 222,3 | 91,0 | 151,0 | | | | |
| 150 | 5 | 280 | 80 | 18,8 | 512 | 400 | 93,4 | - ²⁹⁾ | | | | | 414 | 50,0 | 152.4x2,77 | - | - | 490,0 | | | | | | | | | | | |

8644. 1/25-EN

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

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 |

Actuator selection by operating pressure

Operating pressure³⁰⁾ in bar in acc. with DIN EN 12266-2 and actuator dimensions

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 ³¹⁾ | Function | Piston [mm] | One side | Both sides | One side | Both sides | One side | Both sides | H2 max. | D2 |
| 30 | SF | 35 | 10 | 5 | 7 | 3,5 | - | - | 88 | 41 |
| | | 40 | 14 | 7 | 12 | 6 | 12 | 6 | 95 | 46 |
| | | 50 | 16 | 8 | 16 | 8 | 16 | 8 | 119 | 60 |
| 40 | SF | 40 | 10 | 5 | 7 | 3,5 | - | - | 104 | 46 |
| | | 50 | 14 | 7 | 12 | 6 | 12 | 6 | 136 | 58 |
| | | 63 | 16 | 8 | 16 | 8 | 16 | 8 | 168 | 77 |
| 65 | SF | 63 | 10 | 5 | 7 | 3,5 | 8 | 4 | 153 | 71 |
| | | 80 | 14 | 7 | 12 | 6 | 12 | 6 | 197 | 89 |
| | | 100 | 16 | 8 | 16 | 8 | 16 | 8 | 244 | 116 |
| 92 | SF | 80 | 10 | 5 | 7 | 3,5 | 8 | 4 | 211 | 89 |
| | | 100 | 14 | 7 | 12 | 6 | 12 | 6 | 243 | 110 |
| | | 160 | 16 | 8 | 16 | 8 | 16 | 8 | 371 | 167 |
| 115 | SF | 100 | 10 | 5 | 7 | 3,5 | 8 | 4 | 247 | 110 |
| | | 160 | 14 | 7 | 12 | 6 | 12 | 6 | 379 | 167 |
| 168 | SF | 160 | 10 | 5 | - | - | 8 | 4 | 430 | 167 |
| | | 200 | 14 | 7 | - | - | 12 | 6 | 460 | 210 |
| 202 | SF | 200 | 10 | 5 | - | - | 8 | 4 | 506 | 210 |
| | | D200 | 14 | 7 | - | - | 12 | 6 | 677 | 210 |
| 280 ³²⁾ | SF | - | - | - | - | - | - | - | - | - |

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 ³¹⁾ | Function | Piston [mm] | One side | Both sides | One side | Both sides | One side | Both sides | H2 max. | D2 |
| 30 | OF | 35 | 9 | 4,5 | 7 | 3,5 | 8 | 4 | 88 | 41 |
| 40 | OF | 40 | 9 | 4,5 | 7 | 3,5 | 8 | 4 | 104 | 46 |
| 65 | OF | 63 | 9 | 4,5 | 7 | 3,5 | 8 | 4 | 153 | 71 |
| 92 | OF | 80 | 9 | 4,5 | 7 | 3,5 | 8 | 4 | 211 | 89 |
| 115 | OF | 100 | 9 | 4,5 | 7 | 3,5 | 8 | 4 | 247 | 110 |
| 168 | OF | 160 | 9 | 4,5 | - | - | 8 | 4 | 430 | 167 |
| 202 | OF | 200 | 9 | 4,5 | - | - | 8 | 4 | 506 | 210 |
| 280 ³²⁾ | OF | - | - | - | - | - | - | - | - | - |

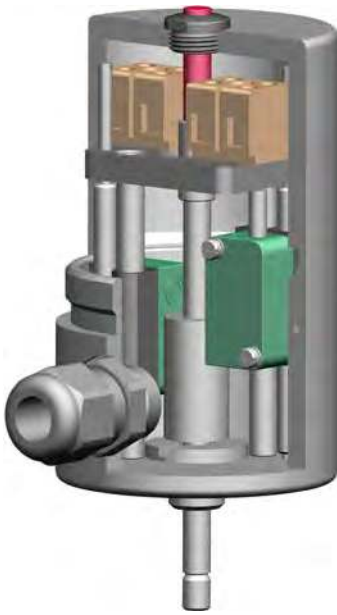
30) Higher operating pressures are possible with specific combinations.
31) MD = diaphragm diameter
32) Design as per customer specifications

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 ³¹⁾ | Function | Piston [mm] | One side | Both sides | One side | Both sides | One side | Both sides | H2 max. | D2 |
| 30 | AZ | 35 | 12 | 6 | 8 | 4 | 12 | 6 | 88 | 41 |
| 40 | AZ | 40 | 12 | 6 | 8 | 4 | 12 | 6 | 104 | 46 |
| 65 | AZ | 63 | 12 | 6 | 8 | 4 | 12 | 6 | 153 | 71 |
| 92 | AZ | 80 | 12 | 6 | 8 | 4 | 12 | 6 | 211 | 89 |
| 115 | AZ | 100 | 12 | 6 | 8 | 4 | 12 | 6 | 247 | 110 |
| 168 | AZ | 160 | 12 | 6 | - | - | 12 | 6 | 430 | 167 |
| 202 | AZ | 200 | 12 | 6 | - | - | 12 | 6 | 506 | 210 |
| 280 ³²⁾ | 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

Technical data of SK.500/SK.510

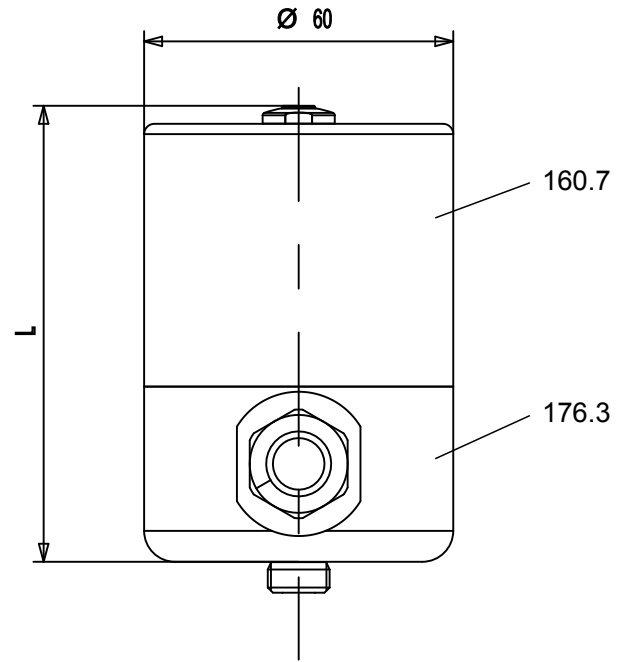
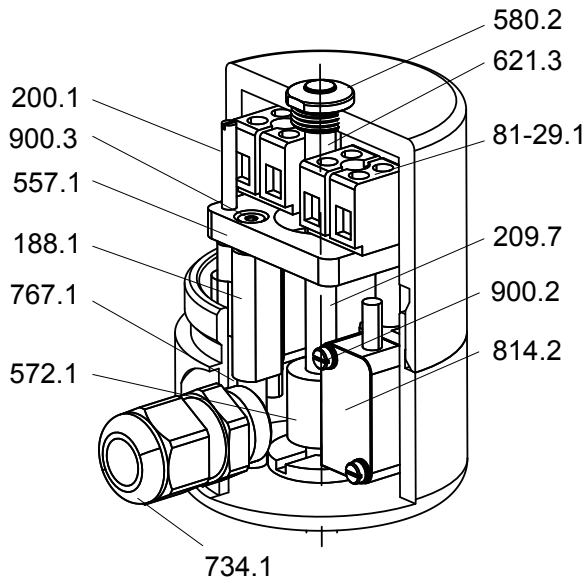
| Characteristic | Type | |
|-------------------------------|--|--------|
| | SK.500 | SK.510 |
| Stroke [mm] | 5-26 | 5-60 |
| Housing material | 1.4404 | 1.4404 |
| Electrical connection | Terminal strip and cable entry (optional: connector) | |
| Setting the proximity sensors | Threaded stem (optional: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

Technical data of limit switches

| Characteristic | NCB2-V3-N0 (inductive) 2-wire system | NBB2-V3-E2 (inductive) 3-wire system | ABV161651 (mechanical) ³³⁾ |
|-------------------|---|---|---|
| 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 | - | - |

33) 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)

Parts list

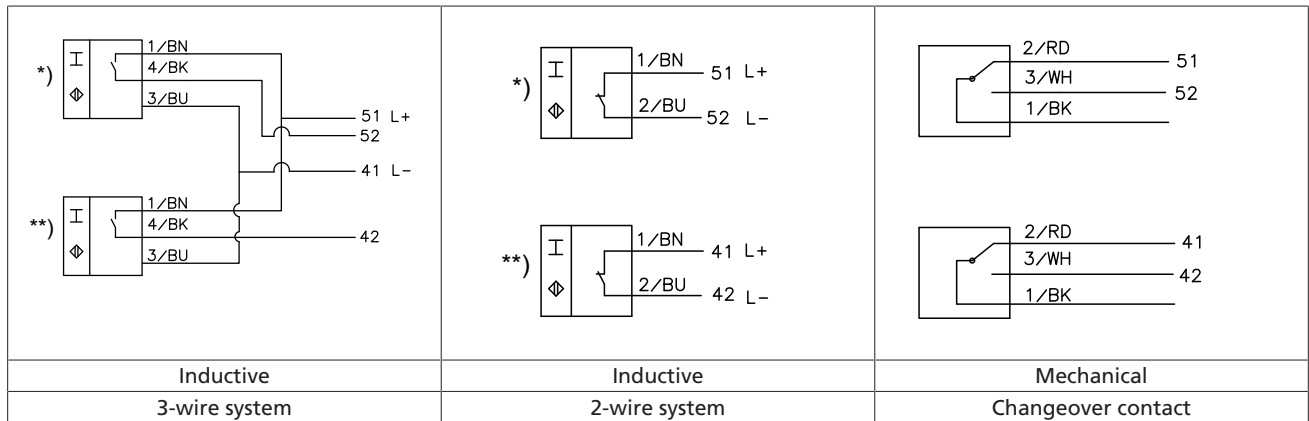
| Part No. | Description | Material | Material number | Note |
|----------|--------------------|-----------------|-----------------|---------|
| 81-29.1 | Terminal | Plastic | - | - |
| 160.7 | Cover | X2CrNiMo17-12-2 | 1.4404 | - |
| 176.3 | Bottom | X2CrNiMo17-12-2 | 1.4404 | - |
| 188.1 | Holder | 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 | Bolt/screw | A2 | - | - |
| 900.3 | Bolt/screw | A2 | - | - |

Dimensions table of SK.500/SK.510

| Model | Diaphragm diameter [MD] | Length (L) [mm] | Stroke [mm] |
|--------|-------------------------|-----------------|-------------|
| SK.500 | MD 30-115 | 101 | 5-26 |
| SK.510 | MD 168-202 | 152 | 5-60 |

Terminal diagram for SK.500/SK.510

Terminal diagram for SK.500/SK.510



Symbols key

| Symbol | Description |
|--------|-------------|
| *) | Open |
| **) | Closed |

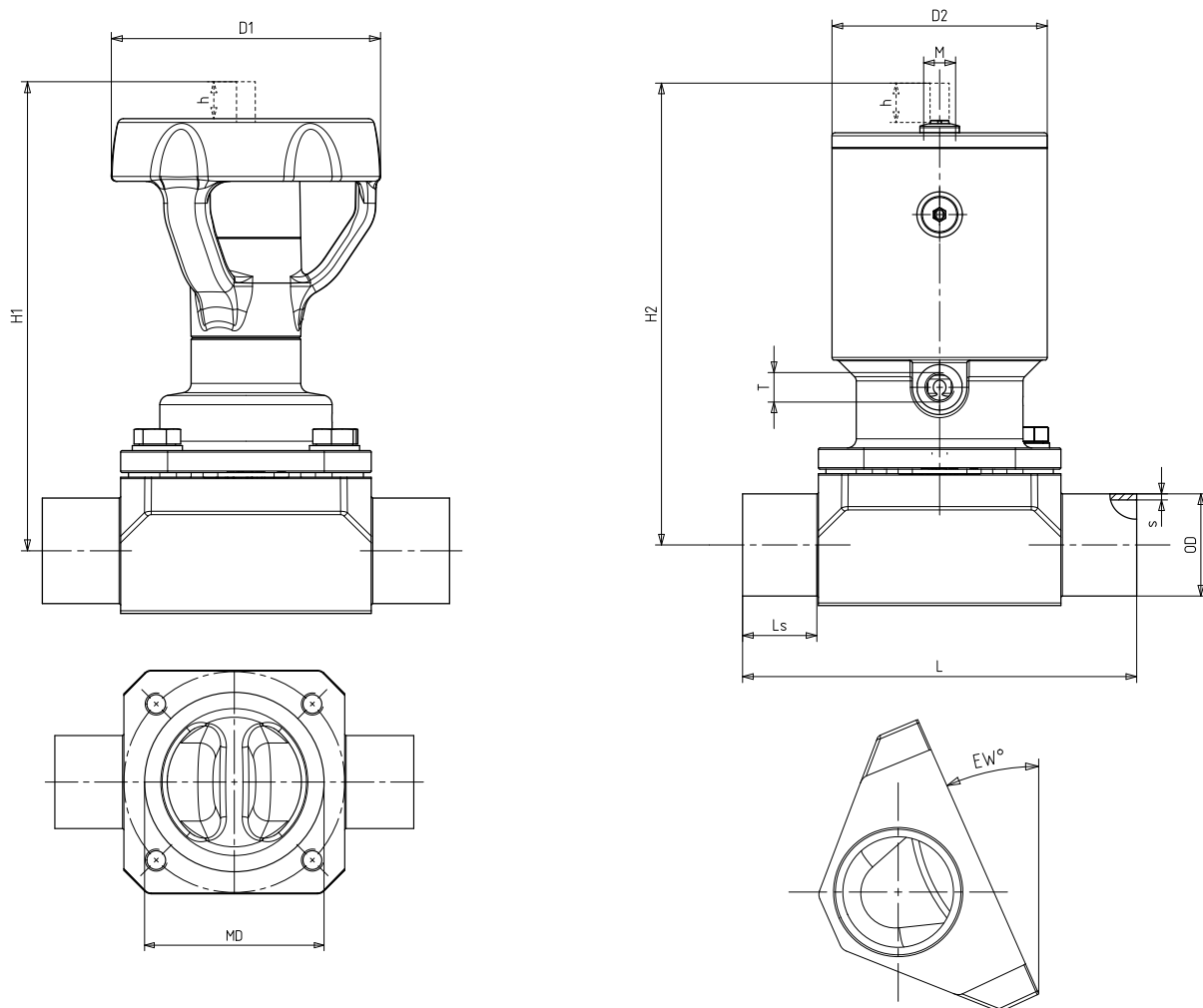


SISTO Armaturen S.A.
18, rue Martin Maas • L-6468 Echternach
Tel.: +352 325085-1 • Fax: +352 328956
E-Mail: sisto@ksb.com
www.sisto.lu

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SISTO-C - Non-standard

Dimensions and Kvs-Values



Dimensions to DIN [mm]

| DN | NPS | MD | h | EW° | Manually operated valve | | | Actuator | | | | Butt weld ends to DIN 11866 Series A | | | K _{vs} -Value m ³ /h |
|-----|------|-----|----|------|-------------------------|-----|------|----------|-----|-----------|----|--------------------------------------|------|--------|---|
| | | | | | H1 | D1 | [kg] | H2 | D2 | [kg] | T | L | Ls | ODxs | |
| 20 | ¾" | 40 | 7 | 9,6 | 120 | 66 | 1,0 | 107 | 46 | 1,0 | M5 | 115 | 30 | 23x1,5 | 4,4 |
| 32 | 1 ¼" | 65 | 13 | 12,2 | 154 | 88 | 2,6 | 157 | 71 | 3,5 | G¾ | 140 | 30 | 35x1,5 | 15,4 |
| 50 | 2" | 92 | 21 | 10 | 226 | 125 | 6,5 | 218 | 89 | 8,2 | G¾ | 190 | 42,5 | 53x1,5 | 42,4 |
| 65 | 2 ½" | 115 | 24 | 11 | 241 | 125 | 8,0 | 252 | 110 | 11,2 | G¾ | 200 | 37,5 | 70x2 | 65 |
| 100 | 4" | 168 | 40 | 10,2 | 351 | 250 | 30,9 | 445 | 167 | 34,8/42,0 | G¾ | 305 | 56,5 | 104x2 | 143 |

Dimensions to ISO [mm]

| DN | NPS | MD | h | EW° | Manually operated valve | | | Actuator | | | | Butt weld ends to DIN 11866-B (ISO 4200) | | | K _{vs} -Value m ³ /h |
|-----|------|-----|----|------|-------------------------|-----|------|----------|-----|-----------|----|--|------|-----------|---|
| | | | | | H1 | D1 | [kg] | H2 | D2 | [kg] | T | L | Ls | ODxs | |
| 10 | ¾" | 30 | 5 | 7,7 | 72 | 35 | 0,4 | 91 | 41 | 0,6 | M5 | 80 | 20 | 17,2x1,6 | 2,2 |
| 20 | ¾" | 40 | 7 | 2,8 | 120 | 66 | 1 | 107 | 46 | 1 | M5 | 115 | 30 | 26,9x1,6 | 4,7 |
| 32 | 1 ¼" | 65 | 13 | 4,2 | 154 | 88 | 2,6 | 157 | 71 | 3,5 | G¾ | 140 | 30 | 42,4x2 | 17,5 |
| 50 | 2" | 92 | 21 | 4,9 | 226 | 125 | 6,5 | 218 | 89 | 8,2 | G¾ | 190 | 42,5 | 60,3x2 | 45,7 |
| 65 | 2 ½" | 115 | 24 | 7,1 | 241 | 125 | 7,6 | 252 | 110 | 10,8 | G¾ | 200 | 37,5 | 76,1x2 | 67 |
| 100 | 4" | 168 | 40 | 6,25 | 351 | 250 | 29,8 | 445 | 167 | 34,8/42,0 | G¾ | 305 | 56,5 | 114,3x2,3 | 157 |

Dimensions to OD [mm]

| DN | NPS | MD | h | EW° | Manually operated valve | | | Actuator | | | | Butt weld ends to OD ASME BPE | | | K _{vs} -Value m ³ /h |
|-----|-----|-----|----|------|-------------------------|-----|------|----------|-----|-----------|----|-------------------------------|------|------------|---|
| | | | | | H1 | D1 | [kg] | H2 | D2 | [kg] | T | L | Ls | ODxs | |
| 50 | 2" | 92 | 21 | 12 | 226 | 125 | 6,5 | 218 | 89 | 8,2 | G¾ | 190 | 42,5 | 50,8x1,65 | 42,4 |
| 80 | 3" | 115 | 24 | 6,4 | 241 | 125 | 7,6 | 252 | 110 | 10,8 | G¾ | 200 | 37,5 | 76,2x1,65 | 67 |
| 100 | 4" | 168 | 40 | 11,2 | 351 | 250 | 30,9 | 445 | 167 | 34,8/42,0 | G¾ | 305 | 56,5 | 101,6x2,11 | 143 |