

Diaphragm Valves

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

SISTO-16



Main applications

- Chemical industry
- Industry/process engineering
- Air-conditioning systems
- Power stations
- Seawater desalination/reverse osmosis
- Mining
- Process engineering
- Hot-water heating systems

Fluids handled

- Waste water without faeces
- Aggressive fluids
- Inorganic fluids
- Service water
- Steam
- River water, lake water and groundwater
- Gas
- Fluids posing a health hazard
- Toxic fluids
- High-temperature hot water
- Highly aggressive fluids
- Condensate
- Corrosive fluids
- Fuels

- Cooling water
- Volatile fluids
- Solvents
- Seawater
- Fluids containing mineral oils
- Organic fluids
- Cleaning agents
- Brine
- Drinking water
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size ¹⁾	DN 15 - 200
Max. permissible pressure [bar]	16
Min. permissible temperature [°C] ²⁾	≥ -10
Max. permissible temperature [°C] ²⁾	≤ +160

SISTO-LAD diaphragm actuator

- Max. permissible control medium temperature: 80 °C
- Permissible control pressure: 4 - 6 bar

SISTO-LAP piston actuator

- Max. permissible control medium temperature: 80 °C

Permissible control pressure

Piston diameter	Actuator flange DIN ISO 5210 / DIN 3358	Permissible control pressure P _{ctr. perm.}
[mm]		[bar]
80 - 250	F10	5,5 - 10
250	F14	5,5 - 10
300	F10	5,5 - 7
300	F14	5,5 - 10
D250 ³⁾	F14	5,5 - 10
D300 ³⁾	F14	5,5 - 7

i Pneumatic actuators from SISTO are suitable for the control medium air and all non-aggressive gases. The control medium must be free from any solid particles and condensed water (important in the event of frost!).

1) From DN 100 and operating pressures > 10 bar using a gearbox is recommended.
 2) The temperatures indicated are for orientation only; they are not valid for all operating conditions.
 3) Double piston

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJL-250	5.1301	-10 °C to +160 °C

Design details

Design

- Soft-seated shut-off valve in straight-way pattern
- Rising handwheel
- Shut-off and sealing to atmosphere by spiral-supported, completely enclosed diaphragm
- Position indicator with integrated stem protection
- Manufactured and tested to EN 13397
- Marked in accordance with DIN EN 19 (ISO 5209)
- 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.
- 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).
- TA-Luft-compliant design to VDI 2440

Variants

- Actuator (electric or pneumatic)
- Limit switches
- Locking device
- Body lined with IIR (butyl), temperature limit: +120 °C
- Body lined with NRH (hard rubber), temperature limit: +100 °C
- Body coated with ECTFE (Halar), temperature limit: +90 °C
- Body coated with PA (Rilsan), temperature limit: +90 °C⁴⁾
- Chain wheel
- Leakage detection hole and additional stem seal
- Diaphragm made of CSM, temperature limit: +100 °C
- Diaphragm made of EPDM, temperature limit: +140 °C
- Diaphragm made of EPDM/W270, temperature limit: +90 °C
- Diaphragm made of EPDM-V (vacuum), temperature limit: +140 °C
- Diaphragm made of FKM, temperature limit: +120 °C⁵⁾
- Diaphragm made of IIR, temperature limit: +120 °C
- Diaphragm made of NBR, temperature limit: +90 °C

- Two-piece diaphragm made of TFM/EPDM, temperature limit: +160 °C
- Lead-sealable cap (prevents unauthorised actuation)
- Stem extension
- Certification to customer specification

Actuators

SISTO-LAD diaphragm actuator

- Sliding stem sealed by O-rings
- Mechanical travel stops in the actuator for closed position and open position
- Manual override available as standard for spring-to-close design

Actuator function

- Actuator type LAD-AZ
 - Air-to-open
 - Air-to-close
- Actuator type LAD-OF
 - Spring-to-open
 - Air-to-close
- Actuator type LAD-SF
 - Air-to-open
 - Spring-to-close

SISTO-LAP piston actuator

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

Actuator function

- Actuator type LAP-AZ
 - Air-to-open
 - Air-to-close
- Actuator type LAP-OF
 - Spring-to-open
 - Air-to-close
- Actuator type LAP-SF
 - Air-to-open
 - Spring-to-close

Electric actuator

- Multi-turn actuator
- Linear actuator

Product benefits

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

4) Temperatures of +90 °C persisting for periods of up to one hour resultant from one-off incorrect system operation will not impair the valve's function.
5) From DN 20

The diaphragm provides absolutely tight shut-off as well as hermetic sealing to atmosphere and of all operating elements.

- **Maximum service life and pressure limit**
Maximised diaphragm life and pressure limit thanks to completely enclosed, spiral-supported diaphragm.
- **Excellent functional reliability**
Increased functional reliability of the diaphragm thanks to balanced diaphragm suspension.
- **Excellent resistance to corrosion and abrasion**
High-quality linings offer reliability and a long service life.
- **Smooth actuation**
The thrust bearing minimises the closing torques.
- **Optimised long-term operation**
The stem protection integrated in the position indicator prevents ingress of contaminants.
- **Fluid purity**
Valve hydraulics without dead volume ensure optimum conditions for high-purity fluids and protection against deposits.
- **Quick identification of valve position**
The valve's position can be easily identified via a clear visual indicator, also visible from a distance.
- **Reliable operation**
The stem and all internal operating elements are **not** in contact with the fluid.

Related documents

Information/documents

Document	Reference number
Operating manual	0570.821
Type series booklet SISTO-LAD (diaphragm actuator)	9211.1
Type series booklet SISTO-LAP (piston actuator)	9210.1

Purchase order specifications

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

Valve

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

Actuator

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

Flow coefficients

Flow coefficients for unlined valves

DN	Kvs value [m ³ /h]	DN	Kvs value [m ³ /h]
15	4,0	65	141,0
20	11,5	80	195,0
25	14,0	100	304,0
32	35,0	125	298,0
40	43,0	150	601,0
50	72,0	200	478,0

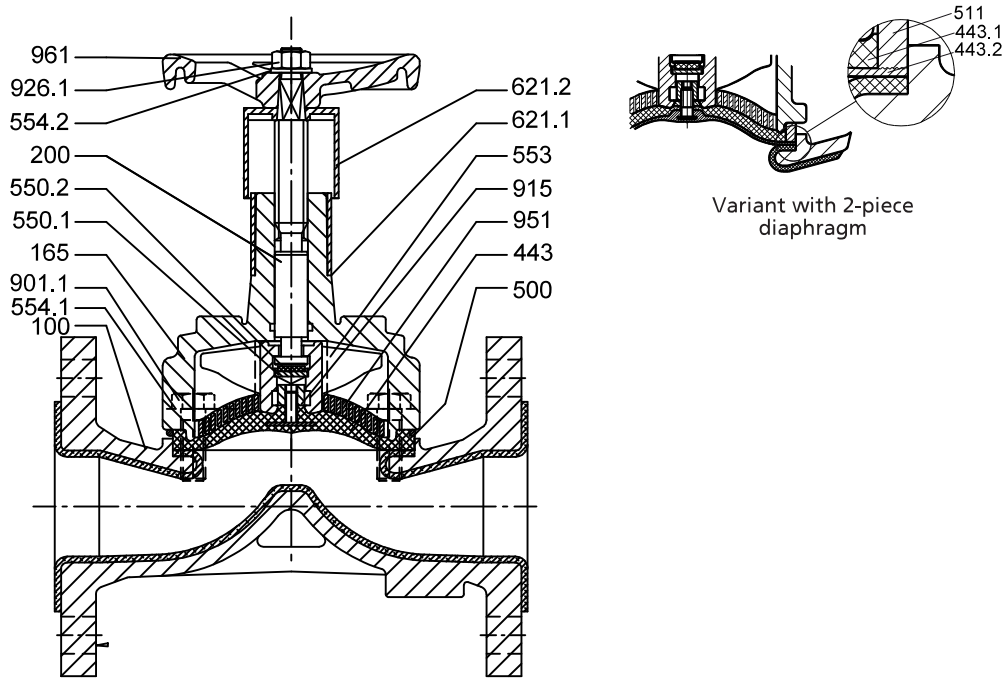
Pressure/temperature ratings

Permissible operating pressure [bar]

PN	Material		[°C]	
	Designation	Number	-10 to +140	+160
16	EN-GJL-250	5.1301	16	12

Materials

Materials of SISTO-16 manually operated valve



SISTO-16 manually operated valve

Parts list

Part No.	Description	Material	Material number	Note
100	Body	EN-GJL-250	5.1301	Standard DN 15, DN 200 = 5.3103 (EN-GJS-400-18U-LT) DN 15 with PFA lining = 1.0619
165	Bonnet	EN-GJL-250	5.1301	Standard DN 15 = 1.0619
200	Stem	X14CrMoS17	1.4104	-
443 ⁶⁾	Diaphragm	EPDM	-	Standard
443.1 ⁶⁾	Backing diaphragm	EPDM	-	-
443.2 ⁶⁾	Diaphragm	TFM	-	-
500	Ring	St 37 / A2E	-	-
511	Backing ring	St 37 / A2E	-	-
550.1	Bearing disc	11SMnPb30	1.0718	For DN 32-200
550.2	PTFE disc	PTFE/graphite	-	For DN 32-200
553	Compressor	EN-GJS-400-15	5.3106	DN 15-25 = GD-ZnAl4Cu1
554.1	Washer	A2	-	For bodies with PA or ECTFE coating
554.2	Washer	A2	-	-
621.1	Position indicator, lower part	ASA Luran	-	-
621.2	Position indicator, upper part	ASA Luran	-	-
901.1	Hexagon head bolt	A2-70	-	-
915	Floating nut	11SMnPb30	1.0718	-
926.1	Prevailing torque nut	A2-70	-	-
951	Support spiral	St 2K BK	-	From diaphragm diameter 65
961	Handwheel	EN-GJL-200	5.1300	DN 15 = polycarbonate (PC)

6) Recommended spare parts