Hygienic valves

FLOWVENT double seal valve

Operating instruction (Translation from the original language)

430BAL014079EN_7

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1 General Information

1.1 Information on the Document

The present Operating Instructions are part of the user information for the product. The Operating Instructions contain all the information you need to transport, install, commission, operate and carry out maintenance for the product.

1.1.1 Binding Character of These Operating Instructions

These Operating Instructions contain the manufacturer's instructions to the operator of the product and to all persons who work on or use the product regarding the procedures to follow.

Carefully read these Operating Instructions before starting any work on or using the product. Your personal safety and the safety of the product can only be ensured if you act as described in the Operating Instructions.

Store the Operating Instructions in such a way that they are accessible to the operator and the operating staff during the entire life cycle of the product. When the location is changed or the product is sold make sure you also provide the Operating Instructions.

1.1.2 Notes on the Illustrations

The illustrations in these Operating Instructions show the product in a simplified form. The actual design of the product can differ from the illustration. For detailed views and dimensions of the product please refer to the design documents.

1.1.3 Symbols and Highlighting

In these Operating Instructions, important information is highlighted by symbols or special formatting. The following examples illustrate the most important types of highlighting.

Danger

Warning: Fatal Injuries

Failure to observe the warning can result in serious damage to health, or even death.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Warning: Explosions

Failure to observe the warning can result in severe explosions.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Warning!

Warning: Serious Injuries

Failure to observe the warning can result in serious damage to health.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Caution!

Warning: Injuries

Failure to observe the warning can result in minor or moderate damage to health.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Notice

Warning: Damage to Property

Failure to observe the warning can result in serious damage to the component or in the vicinity of the component.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Carry out the following steps: = Start of a set of instructions.

1. First step in a sequence of operations.
2. Second step in a sequence of operations.

   → Result of the previous operation.

→ The operation is complete, the goal has been achieved.

Hint!

Further useful information.

1.2 Manufacturer address

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1.3 Contact

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2 Safety

2.1 Intended use

The GEA FLOWVENT double-seal valve is used for the mixproof separation of cleaning media at flow path intersections in pipe systems.

The medium should preferably flow in the opening direction of the valve disc to avoid pipe hammers when the valve is opened or closed.

Do not install the valve in spring-opening, as this will open when there is a current or air failure and leads to product mixing.

In a closed pipe system, hydraulic pressure build-up may occur when the valve switches and result in seal damage.

Hint!

The manufacturer will not accept any liability for damage resulting from any use of the valve which is not in accordance with the designated use of the valve. The risk is borne solely by the operating company.

2.1.1 Requirements for operation

The prerequisite for reliable and safe operation of the component is proper transportation and storage as well as professional installation and assembly. Operating the unit within the limits of its designated use also involves adhering to the operating, inspection and maintenance instructions.

2.1.2 ATEX directive

In areas with an explosive atmosphere, only valves suitable for use in such areas may be used.

Refer to and observe the additional operating instructions “ATEX version valves”. For details regarding the marking of valves for potentially hazardous areas also refer to the additional operating instructions “ATEX version valves”.

If these valves are used in areas with a potentially explosive atmosphere, you must absolutely comply with directive 2014/34/EC with respect to all ignition hazards.

2.1.3 Improper operating conditions

The operational safety of the component can not be guaranteed under improper operating conditions. Therefore avoid improper operating conditions.

The operation of the component is not permitted if:

- Persons or objects are in the danger zone.
- Safety devices are not working or were removed.
- Malfunctions have been detected on the component.
- Damage to the component has been detected.
- Maintenance intervals have been exceeded.

2.2 Operator’s Duty of Care

The operating company of the component has a special responsibility for the proper and safe handling of the component within their company. Only use the component when it is in perfect operating condition in order to prevent danger to persons and property.

This operating manual contains information that you and your employees need for safe operation over the life of the component. Be sure to read these Operating Instructions carefully and ensure that the measures described here are observed.

The operator's duty of care includes planning the necessary safety measures and monitoring that these measures are observed. The following principles apply:

- Only qualified personnel may work on the component.
- The operating company must authorize personnel to carry out the relevant tasks.
- Order and cleanliness must be maintained at the work stations and in the entire area surrounding the component.
- Personnel must wear suitable work clothing and personal protective equipment. As the operating company must ensure that work clothing and personal protective equipment are used.
- Inform personnel regarding any properties of the product which might pose a health risk and the preventative measures to be taken.
- Have a qualified first-aid representative on call during the operation. This person must be able to initiate any necessary first-aid measures in case of an emergency.
- Clearly define procedures, competences and responsibilities for those working in the area of the component. Everybody must know what to do in case of an emergency. Instruct the staff in this respect at regular intervals.
- The signs on the component must always be complete and easy to read. Check, clean and replace the signs as necessary at regular intervals.
- Observe the Technical Data specified and the limits of use!

Hint!

Carry out regular checks. This way you can ensure that these measures are actually observed.

2.3 Subsequent changes

No technical modifications should ever be made to this component. Otherwise you will have to undergo a new conformity process in accordance with the EC Machinery Directive on your own.

In general, only genuine spare parts supplied by GEA Process & Equipment Technologies (Suzhou) Co., Ltd. should be fitted. This ensures that the component is always operating properly and efficiently.

2.4 General safety instructions and dangers

The component is safe to operate. It was built according to state-of-the-art science and technology.

Nevertheless, dangers can arise from the component, if:

- the component is not used as intended
- the component is used improperly
- the component is operated under impermissible conditions

2.4.1 Principles for safe operation

Dangerous situations during operation can be avoided by safety-conscious and proactive behaviour of the staff.

To ensure safe operation of the valve the following principles apply:

- The Operating Instructions must be kept ready to hand at the valve's place of use. They must be complete and in clearly legible form.
- Only use the valve for its intended use.
- The valve must be functional and in good working order. Check the condition of the valve before starting work and at regular intervals.
- Wear tight-fitting work clothing for all work on the valve.
- Ensure that nobody can get hurt on the parts of the valve.
- Immediately report any faults or noticeable changes on the valve to the person responsible.
- Never touch the pipes and the valve when these components are hot! Avoid opening the valve unless the process plants have been emptied and depressurised.
- Observe the accident prevention regulations and all local regulations.

2.4.2 Environmental Protection

Harm to the environment can be avoided by safety-conscious and proactive behaviour of the staff.

For environmental protection the following principles apply:

- Substances harmful to the environment must not be discharged into the ground or the sewage system.
- Always observe the pertinent regulations relating to waste avoidance, disposal and utilization.
- Substances harmful to the environment must be collected and stored in suitable containers. Clearly mark the containers.
- Dispose of lubricants as hazardous waste.

2.4.3 Electrical Equipment

For all work on electrical equipment, the following principles apply:

- Access to electrical equipment should only be allowed to qualified electricians. Always keep unattended switch cabinets locked.
- Modifications of the control system can affect the safe and reliable operation. Modifications are only permitted with the express permission of the manufacturer.
- After completion of all work, check that the protective devices are fully functional.

2.5 Supplementary Regulations

In addition to the instructions in this documentation the following also has to be observed:

- pertinent accident prevention regulations,
- generally accepted safety rules,
- national regulations applicable in the country of use,
- work and safety instructions applicable in the facility,
- installation and operating regulations for use in potentially explosive areas.

2.6 Qualification of personnel

This section provides information on how the personnel working on the component must be trained.

Operating and maintenance personnel must

- have the necessary qualification to carry out their tasks,
- be instructed with regard to possible dangers,
- know and observe the safety instructions given in the documentation.

Only allow qualified electricians to carry out work on the electrical equipment or have a qualified electrician supervise the work.

Only allow specially trained personnel to carry out work on an explosion-protected system. When working on explosion-protected equipment observe the standards DIN EN 60079-14 for gases and DIN EN 50281-1-2 for dusts.

The following minimum qualifications are required:

- Training as a specialist for working independently on the component.
- Adequate instruction to work on the component under the supervision and guidance of a trained specialist

Each employee must meet the following requirements to work on the component:

- Personal suitability for the respective task.
- Sufficient professional qualification for the respective task.
- Received instruction about the functionality of the component.
- Received instruction about operating sequences on the component.
- Familiar with the safety devices and their function.

- Familiar with these Operating Instructions, especially with the safety instructions and the information which is relevant for the task on hand.
- Familiar with the basic regulations with regard to occupational health and safety and accident prevention.

When working with the component, a distinction is made between the following user groups:

User groups	
Staff	**Qualifications**
Operating personnel	Adequate instruction and sound knowledge in the following areas: • Functionality of the component • Operating sequences on the pump • What to do in case of an emergency • Lines of authority and responsibilities with respect to the task
Maintenance personnel	Appropriate training and a sound knowledge of the structure and functionality of the component. Sound knowledge in the following areas: • Mechanical equipment • Electrical equipment • Pneumatic system Authorization with regard to safety engineering standards to carry out the following tasks: • Setting devices into operation • Earthing of devices • Marking of devices The relevant certificates of qualification must be submitted before work can be carried out on ATEX certified machines.

2.7 Safety equipment

2.7.1 Signs

Dangerous points on the valve are indicated by warning signs, prohibition signs and mandatory signs.

The signs and notes on the valve must always be legible. Any illegible signs must be replaced immediately.

Signs on the valve	
Sign	**Meaning**
	General hazard warning
	Warning crushing
	Warning spring tension. Do not open the actuator.

2.8 Residual dangers

Dangerous situations can be avoided by safety-conscious and proactive behaviour of the personnel and by wearing personal protective equipment.

Residual dangers on the valve and measures		
Danger	**Cause**	**Measure**
Danger to life	Inadvertent switch-on of the valve	Effectively disconnect all components, effectively prevent switch-on.
	Electric power	Observe the following safety rules: 1. Isolate from the power supply. 2. Take appropriate measures to prevent switch on. 3. Test absence of voltage. 4. Earthing and short-circuiting. 5. Cover or safeguard any adjacent live parts.
	Spring tension in the actuator	Danger to life caused by the pressurised spring in the actuator. Do not open the actuator; instead, return it to GEA Process & Equipment Technologies (Suzhou) Co., Ltd for proper disposal.

Residual dangers on the valve and measures		
Danger	**Cause**	**Measure**
Risk of injury	Danger presented by moving or sharp-edged parts	The operator must exercise caution and prudence. For all work: • Wear suitable work clothing. • Never operate the machine if the cover panels are not correctly fitted. • Never open the cover panels during the operation. • Never reach into openings. As a precautionary measure, wear personal protective equipment in the vicinity of the valve: • Protective gloves • Safety shoes
Environmental damage	Operating materials with properties which are harmful to the environment	For all work: • Collect lubricants in suitable collecting vessels. • Dispose of lubricants in accordance with the pertinent regulations.

2.9 Danger zones

Please observe the following notes:

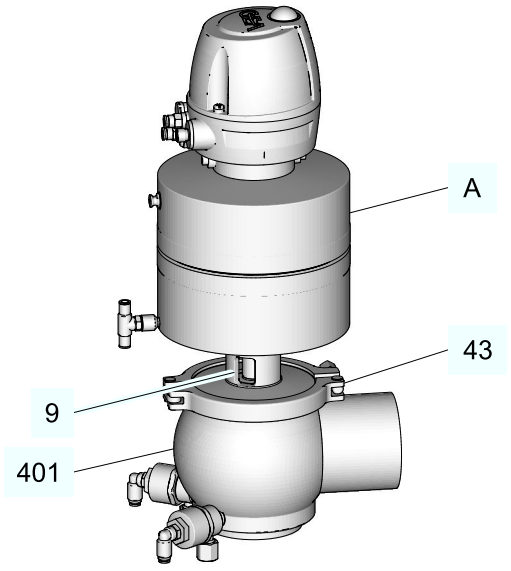


Fig.1

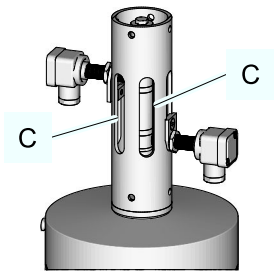


Fig.2

- In the event of malfunctions, shut down the valve (disconnect from the power and air supply) and secure it against being used.
- Never reach into the lantern (9) or the valve housing (401) when the valve is switching. Fingers can be crushed or cut off.
- On a spring-closing valve there is danger of injury when the clamp connection (43) is opened, as the released spring pretension will suddenly lift the actuator. Therefore, release the spring tension before detaching the clamp connection (43) by supplying the actuator (A) with compressed air.
- Before starting any maintenance, servicing or repair work, disconnect the valve from the power supply and secure it against inadvertently being switched back on again.
- Only allow a qualified electrician to carry out any work on the electrical power supply.
- Check the electrical equipment of the valve at regular intervals. Immediately remedy loose connections and molten cables.
- If work on live parts cannot be avoided, call in a second person, who can operate the main switch in case of an emergency.
- The housing sockets have very sharp edges. When transporting and installing the valve be sure to wear suitable protective gloves.
- On versions with proximity switch holder do not put your fingers in the slots (C).

3 Description

3.1 Design

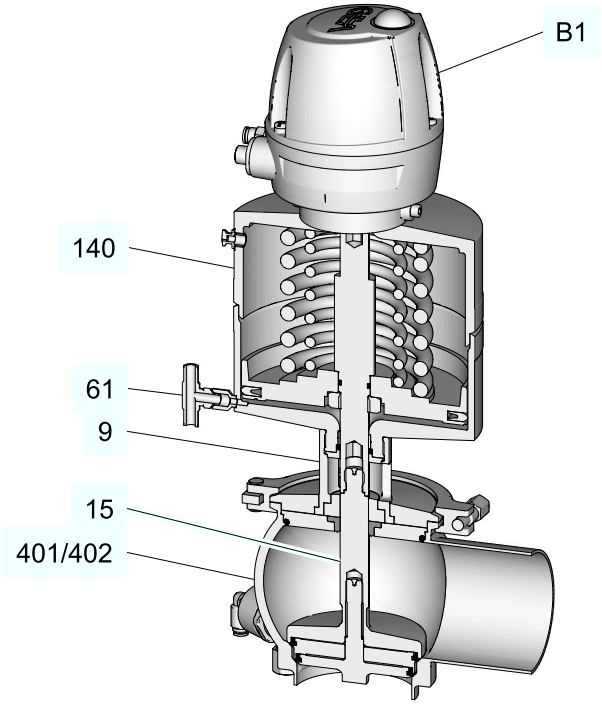


Fig.3: Double seal valve SV/DS

Design	
No.	**Designation**
B1	Control top FLOWVENT-CT
9	Lantern
15	Valve disk
61	Air connection/ locking screw
140	Actuator
401/402	Valve housing

Hint!

See spare parts drawings for housing configuration.

3.2 Function

The FLOWVENT Double Seal Valve, in which two seals with the leakage chamber between them are located in a valve disk, is used for the mixing-safe separation of products at pipe intersections. When the valve is closed (non-actuated position), there are always two seals between the separate pipelines.

3.2.1 Spring-to-close actuator (Z)

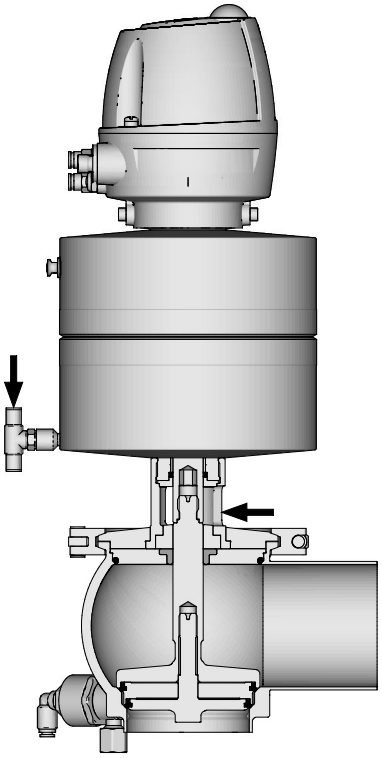


Fig.4: Double seal valve - spring-to-close actuator

Valve is closed in the non-actuated position.

Identification:

- Double disk is at the bottom in the lantern

Identification with FLOWVENT CT control top once the installation (SET-UP) has been completed:

- Permanent light (1) green: valve in non-actuated position
- Permanent light (1) yellow: valve in end position (actuated position)

4 Transport and storage

4.1 Storage conditions

The valves, valve inserts or spare parts should be stored in a dry place, free of vibrations and dust, and protected from light. To avoid damage, leave the components in their original packaging if possible.

If, during transport or storage, the valve is going to be exposed to temperatures ≤ 0°C, it must be dried beforehand and suitable measures must be taken to protect it from damage.

Hint!

We recommend that the valve should be stored at a temperature of ≥ 5 °C for a period of 24 hours prior to any handling (disassembling the housings / activation of actuators) so that any ice crystals formed by condensation water can melt.

4.2 Transport

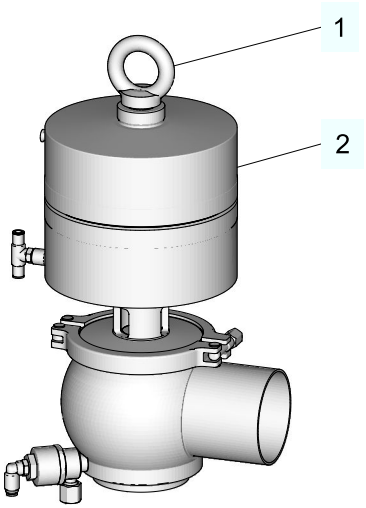


Fig.5

For transport, the following principles apply:

- When transporting the valve be sure to unscrew the control top and the switch bar from the actuator (2) and use the screwed-in eye bolt (1), material no. 221-104.98, to lift the valve.
- Only use suitable hoist and slings for transporting the package units/valves.
- Observe the pictograms on the package.
- Handle valves with care to avoid damage caused by impact or careless loading and unloading. The outside synthetic materials are susceptible to breaking.
- Control tops must be protected from animal and vegetable fats.
- Only allow qualified staff to transport the valve.
- Movable parts must be properly secured.

- Only use approved, fully functional load lifting devices and lifting accessories which are suitable for the intended purpose. Observe the maximum load-bearing capacities.
- Secure the valve against slipping. Take the weight of the valve into account and the position of the point of gravity.
- Under no circumstances should anyone stand under a suspended load.
- Take care when transporting the valve. Do not grip sensitive parts of the unit to lift or push the unit or to support yourself. Avoid jerky movements when putting down the unit.

4.2.1 Scope of supply

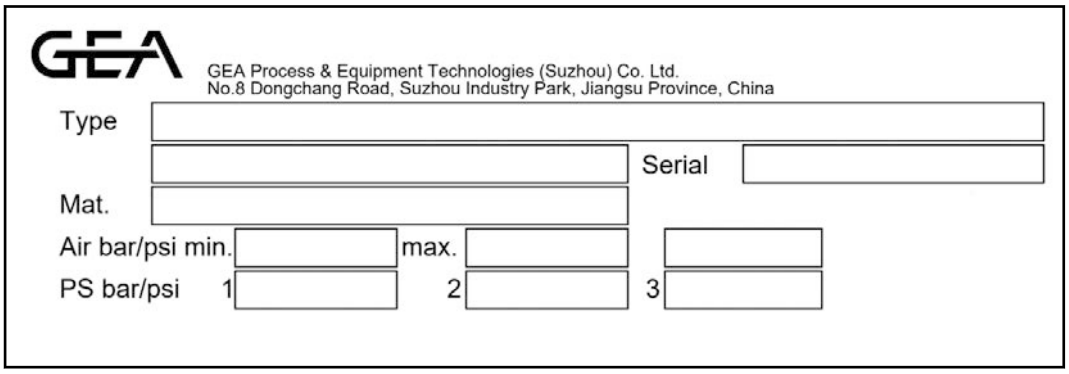
After taking delivery of the component, check if

- the details on the type plate correspond to the data in the order and delivery documents,
- the equipment is complete and all components are in good order.

5 Technical data

5.1 Type plate

The type plate clearly identifies the valve.



The type plate provides the following key data:

Key data of the valve	
Type	Valve type
Serial	Serial number
Material	1.4404(AISI316L) / EPDM
Control air pressure bar/psi	min. 5.0 / 72.5; max. 8.0 / 116
Product pressure bar/psi	6 / 87

5.2 Technical data

Refer to the following tables for the key technical data of the valve:

Technical data: Valve	
Designation	**Description**
Size	DN 25 to DN 100 1" to 4" OD
Material of product contact parts	Stainless steel 316L / EPDM
Fitting position	Vertical

Technical data: Ambient temperatures	
Designation	**Description**
- Valve	0 to 45 °C (32 ... 113 °F), standard < 0 °C (32 °F): Use control air with low dew point. Protect valve rods against freezing. < −15 °C: no solenoid valves in the control top < +50 °C: no solenoid valves in the control top
- Initiator	-20 to +80 °C (-4 ... +176 °F)
- Control top FLOWVENT Control Top	-20 to +55 °C (-4 ... +122 °F)
Product temperature and operating temperature	dependent on the seal material, see Section 5.3, Page 21

Technical data: Compressed air supply	
Designation	**Description**
Air hose	
- metric	Material PE-LD Outer-Ø 6 mm +/- 0.1 mm Inside Ø 4 mm
- Inch	Material PA outer-Ø 6.35 mm +/1 0.1 mm Inside Ø 4.3 mm
Product pressure	5 bar (72 psi) deviations on request
Control air pressure	min. 5.0 (72 psi); max. 8.0 (116 psi) Air support: spring side in accordance with main control air pressure selected
Control air	acc. to ISO 8573-1
- Solid particle content:	Quality class 6 Particle size max. 5 µm Particle density max. 5 mg/m^3
- Water content:	Quality class 4 max. dew point +3 °C If the unit is used at higher altitudes or at low ambient temperatures, the dew point must be adapted accordingly.
- Oil content:	Quality class 3, preferably oil free, max. 1 mg oil to 1 m^3 air

5.3 Resistance and permitted operating temperature of the sealing materials

The resistance and permitted operating temperature of the sealing materials depend on the type and temperature of the medium conveyed. The exposure time can adversely affect the service life of the seals. The sealing materials comply with the regulations of FDA 21 CFR 177.2600 or FDA 21 CFR 177.1550.

The maximum operating temperature is defined by the sealing type and its mechanical load.

GEA Process & Equipment Technologies (Suzhou) Co., Ltd recommends that users should carry out the resistance test themselves to check the suitability of the selected elastomer for their application.

Resistances of the seal materials can only be determined by the user since they depend on the operating conditions, for instance:

- Time during which the seals are in contact with the media
- Process temperature
- Flow speed
- Concentration of detergent
- Ambient conditions

On request, GEA Process & Equipment Technologies (Suzhou) Co., Ltd will provide support and additional information for special applications.

Resistances in the following table:

- + = good resistance
- o = reduced resistance
- – = no resistance

Table of sealing resistance / permitted operating temperature

Medium	Maximum operating temperatures	Sealing materials	
		EPDM	FKM
Alkalis up to 3%	up to 80 °C (176°F)	+	o
Alkalis up to 5%	up to 40 °C (104°F)	+	o
Alkalis up to 5%	up to 80 °C (176°F)	+	–
Alkalis more than 5%		o	–
Inorganic acids up to 3%	up to 80 °C (176°F)	+	+
Inorganic acids up to 5%	up to 80 °C (176°F)	o	+
Inorganic acids up to 5%	up to 100 °C (212°F)	–	+
Water	up to 100 °C (176°F)	+	+
Steam	up to 135 °C (275°F)	+	o
Steam, approx. 30 min	up to 150 °C (302°F)	+	o
Fuels/hydrocarbons		–	+
Product with a fat content of max. 35%		+	+
Product with a fat content of more than 35%		–	+
Oils		–	+

Sealing materials	General temperature resistance*
EPDM	-40 … +135 °C * (-40 … 275 °F)
FKM	-10 … +200 °C * (+14 … +392 °F)
* The general resistance of the material does not correspond to the maximum operating temperature	

5.4 Pipe ends - General table of measurements

Dimensions for tubes in DN				
Metric DN	**Outside diameter**	**Wall thickness**	**Inside diameter**	**Outside diameter acc. to DIN 11850**
15	19	1.5	16	x
20	23	1.5	20	x
25	29	1.5	26	x
40	41	1.5	38	x
50	53	1.5	50	x
65	70	2.0	66	x
80	85	2.0	81	x
100	104	2.0	100	x
125	129	2.0	125	x
150	154	2.0	150	x

Dimensions for tubes in inch OD				
Inch OD	**Outside diameter**	**Wall thickness**	**Inside diameter**	**Outside diameter acc. to BS 4825**
0.5"	12.7	1.65	9.4	x
0.75"	19.05	1.65	15.75	x
1"	25.4	1.65	22.1	x
1.5"	38.1	1.65	34.8	x
2"	50.8	1.65	47.5	x
2.5"	63.5	1.65	60.2	x
3"	76.2	1.65	72.9	x
4"	101.6	2.11	97.38	x
6"	152.4	2.77	146.86	x

5.5 Lubricants

Lubricants	
Lubricant designation	**Material no.**
Rivolta F.L.G. MD-2 (1000 g)	413-071
Rivolta F.L.G. MD-2 (100 g)	413-136

6 Assembly and installation

6.1 Safety instructions

Hazardous situations during installation can be avoided by safety-conscious and proactive behaviour of the personnel.

For installation, the following principles apply:

- Only qualified personnel are allowed to set-up, install and commission the component.
- Ensure that adequate working and traffic areas are available at the place of installation.
- Observe the maximum load-bearing capacity of the installation surface.
- Observe the transport instructions and markings on the part(s) to be transported.
- Remove any nails protruding from transport crates immediately after opening the crate.
- Under no circumstances should anyone stand under a suspended load.
- Safety devices of the component may not work effectively during installation.
- Reliably secure sections of the plant which have already been connected against inadvertently being switched on.

6.2 Notes on installation

The installation position of the valve is upright. Care must be taken to ensure that the valve housing and the pipe system can drain properly.

To prevent damage, make sure that

- the valve is installed in the pipe system free of tension and
- no foreign materials (e.g. tools, bolts, lubricants) are left in the system.

6.3 Control head

If external valves are connected in a control top with several solenoid valves, make sure that the control air pressure in the main actuator does not fall below the operating pressure.

6.4 Valve with Detachable Pipe Connection Elements

This section describes the procedure to fit the valve.

⚠ Caution!

Liquids in pipes

Danger of injury due to liquid spraying out

► Therefore, before releasing any pipe connections or clamp connections: drain the pipe and, if necessary, clean or rinse it.
► Separate the pipe section in which the valve is to be fitted from the rest of the piping system to prevent product entering again.

Carry out the following steps:

1. Fit valves with detachable pipe connection elements – using suitable connection fittings – directly into the pipe system.

→ Valve is installed.

6.5 Valve with welded ends

This section describes the welding procedure for the valve housing.

⚠ Warning!

Spring tension in the valve

Danger of injury when opening the clamp connections on the actuator or on the housing as the released spring pretension will suddenly lift the actuator.

► Therefore, release the spring tension before detaching the clamp connections by supplying the actuator with compressed air at max. 8 bar.

Notice

Seals are wearing parts

Old seals will cause malfunction of the valve

► When fitting the valve be sure to fit new housing O-rings.

Carry out the following steps:

1. Release the spring tension.
2. Remove the valve insert, see chapter Section 10.6, Page 39.
3. Weld in the housing free of tension, in addition:
4. Fit the housing into place and tack it.
5. To avoid welding distortions, always seal the housing before welding.
6. Flush the housing with forming gas from the inside to push the oxygen out of the system.
7. Weld the housing into the pipe system; use welding filler if necessary. When technically possible, use the WIG-orbital welding process with pulse configuration, according to guidelines EHEDG documentation. 35.
8. Passivate the seam after welding.
9. Assemble the valve and vent the actuator.
10. Fit the seals.

    → The valve disk is lowered.

→ Install the valve with welded ends.

Hint!

Welding method: We recommend using the automatic orbital welding method. All welding work should only be performed by certified welders or machine operators (orbital welders).

Housing-O-rings: When assembling the valve always replace the housing O-rings to ensure that the valve is tight.

6.6 Pneumatic connections

6.6.1 Air requirement

Actuator type	Air requirement (dm^3_n/stroke) for overall stroke*
A12	0.15
B21	0.23
C21 C36	0.37
D21-Z D33-Z D51-Z D73 D107	0.61
E51 E73 E107	0.96

* 1 dm^3 n /stroke = 1 ln /stroke ≈ 61 $inch^3$/stroke

6.6.2 Establishing Hose Connections

To ensure reliable operation, the compressed air hoses must be cut exactly square.

Tools required:

- A hose cutter

Carry out the following steps:

1. Shut off the compressed air supply.
2. Use the hose cutter to cut the pneumatic hoses square.
3. Push the air hose into the air connector on the control top.
4. Re-open the compressed air supply.

→ Establish a hose connection.

6.6.3 Hose installation FLOWVENT double seal valve

With FLOWVENT-CT connection

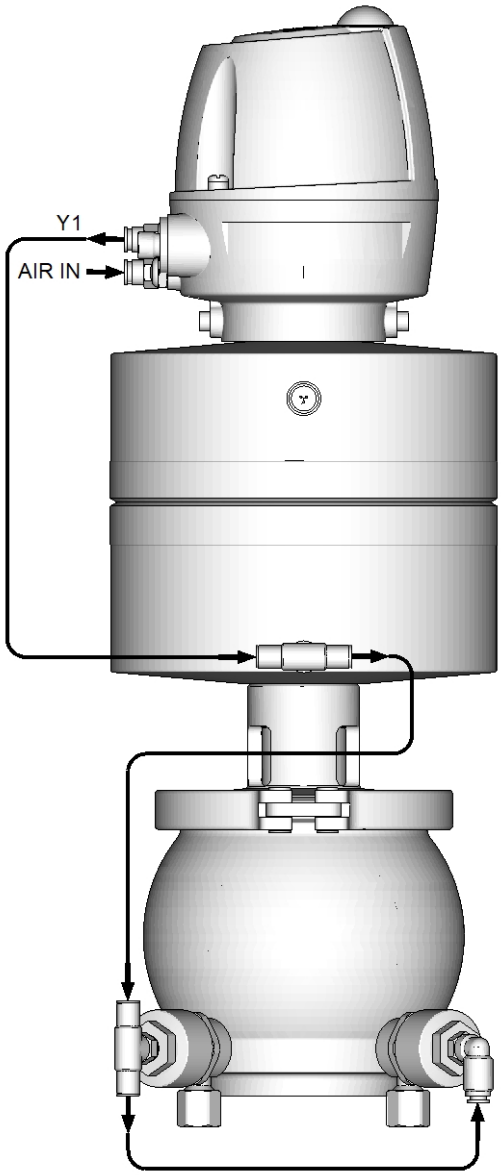


Fig.6

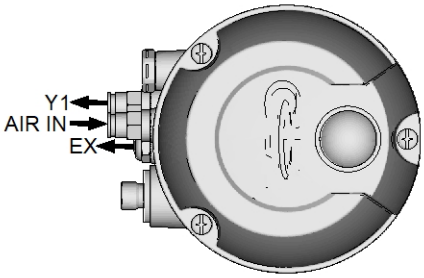


Fig.7

Item	Designation
Y1	Air connection for main stroke connection on actuator
AIR IN	Central air supply with integrated filter optional: supply air throttle
EX	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle The Ex connection may not be closed!

Hint!

For an optimal fit at the air connection, it is necessary to cut the pneumatic hoses at a right angle with the hose cutter.

6.7 Electrical connections

6.7.1 Electrical connection for FLOWVENT-CT control top

Danger

Live parts

Electrical shock can result in serious personal injury or death.

► Only allow properly qualified staff to carry out work on the electrical equipment.
► Prior to establishing electrical connections check the maximum permissible operating voltage.

Carry out the following steps:

1. Connect in accordance with the wiring diagram and the instructions in the corresponding operating instructions for the FLOWVENT-CT control top.

→ Done

6.7.2 Connection and setting when using proximity switches

Lower valve position

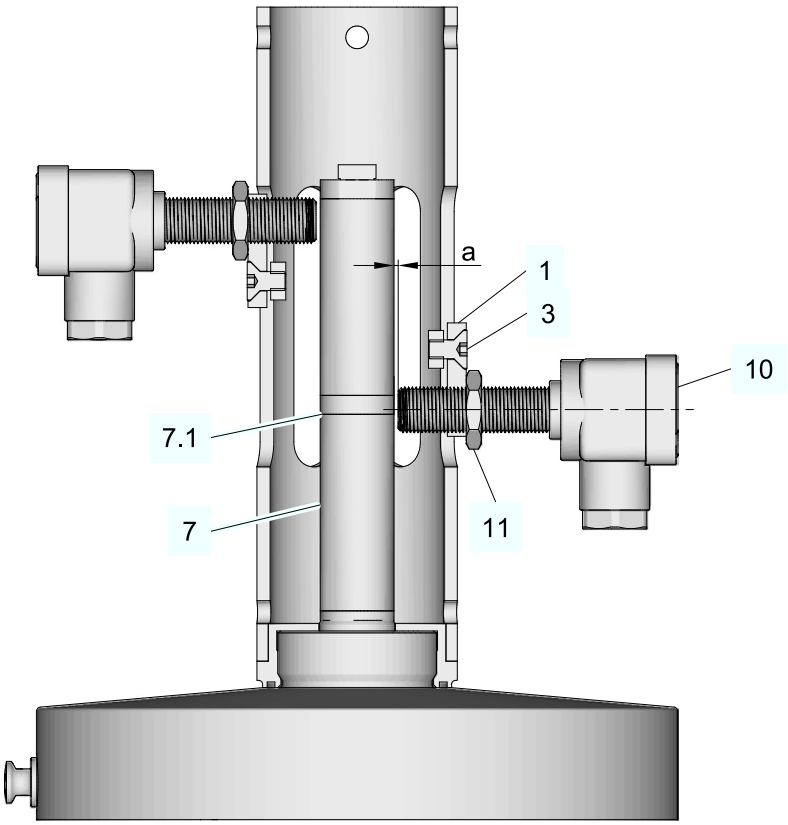


Fig.8

Tools required:

- Hexagon socket 3mm
- Jaw wrench SW17

Carry out the following steps:

1. Bring the valve to the lower end position

   → Spring-closing valve (NC)
   Depressurise the actuator.

2. Release the lock nut (11).
3. Set distance (a) between the initiator (10) and the switch bar head (7) to 0.5 to 1.5 mm by screwing in the slider (1).
4. Position the centre axis of the initiator (10) over the switching edge (7.1). To do this, unscrew the countersunk screw (3), move the slider (1) and then retighten the countersunk screw (3).
5. Charge and vent the actuator to check the feedback of the lower end position.

→ Done

Upper valve position

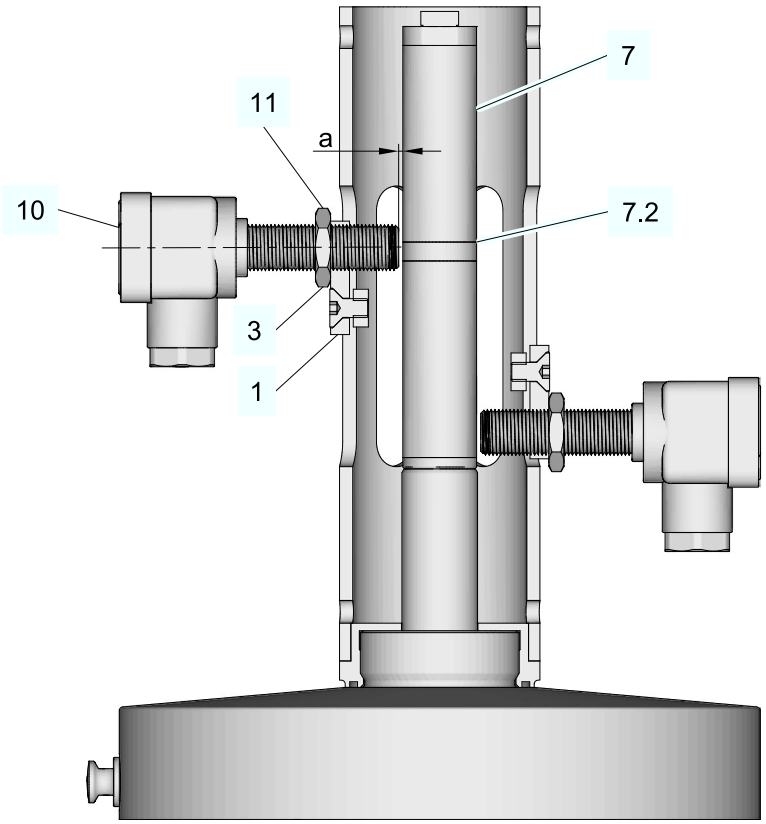


Fig.9

Carry out the following steps:

1. Bring the valve to the upper end position

   → Spring-closing valve (NC)

   Pressurize the actuator with compressed air, max. 8 bar.

2. Release the lock nut (11).
3. Set distance (a) between the initiator (10) and the switch bar (7) to 0.5 to 1.5 mm by screwing in the slider (1).
4. Position the centre axis of the proximity switch (10) under the switching edge (7.2). To do this, unscrew the countersunk screw (3), move the slider (1) and then retighten the countersunk screw (3).
5. Charge and vent the actuator to check the feedback of the upper end position.

→ Done

7 Start-up

7.1 Safety instructions

Initial commissioning

For initial commissioning, the following principles apply:

- Take protective measures against dangerous contact voltages in accordance with pertinent regulations.
- The valve must be completely assembled and correctly adjusted. All screw connections must be securely tightened. All electrical cables must be installed correctly.
- Reliably secure machine parts which have already been connected against inadvertently being switched on.
- Relubricate all lubricating points.
- Make sure lubricants are used properly.
- After conversion of the valve, residual risks must be reassessed.

Setting into Operation

For commissioning, the following principles apply:

- Only allow properly qualified staff to set the valve into operation.
- Establish all connections correctly.
- The safety devices for the valve must be complete, fully functional and in perfect condition. Check the function before starting any work.
- When the valve is switched on, the danger zones must be free.
- Remove any liquids that have escaped without leaving residues.

7.2 Notes on commissioning

Before starting commissioning observe the following:

- Make sure that there are no foreign materials in the system.
- Actuate the valve once by applying compressed air.
- Clean the pipe system prior to the first product run.
- During commissioning, regularly check all sealing points for leaks. Replace defective seals.

8 Operation and control

8.1 Safety instructions

Dangerous situations during operation can be avoided by safety-conscious and proactive behaviour of the personnel.

For operation, the following principles apply:

- Monitor the component during operation.
- Safety devices must not be changed, removed or taken out of service. Check all safety devices at regular intervals.
- All guards and hoods must be fitted as intended.
- The installation location of the component must always be properly ventilated.
- Structural changes to the component are not permitted. Report any changes to the component immediately to the person in charge.
- Always keep danger zones clear. Do not leave any objects in the danger zone. Only allow persons to enter the danger zone when the machine is de-energized.
- Regularly check that all emergency stop devices are working correctly.

9 Cleaning

9.1 Cleaning

All parts in contact with product must be cleaned at regular intervals. Always observe the safety data sheets issued by the cleaning agent manufacturers. Only use cleaning agents which do not cause damage to the seals and the inner parts of the valve. When the pipe is cleaned, the cleaning medium also flows through and cleans the valve housings.

With respect to the cleaning method and parameters like detergents, temperatures, times, and intervals, the component manufacturer can merely make recommendations but cannot provide any generally applicable details. Method and parameters should be determined and defined by the operator in accordance with the relevant process and product.

The cleaning effect must be checked regularly by the operator!

9.1.1 Cleaning Process Examples

Typical Cleaning Parameters in Dairy Operations

Example of a two-phase cleaning process:

- Sodium hydroxide solution and sodium hydroxide based combination products in concentrations from 0.5% to 2.5% at 75 °C (167 °F) to 80 °C (176 °F).
- Phosphoric or nitric acid, and combination products based thereon in the concentrations of 0.3 to 1.5% at approx. 65 °C (149 °F).

Example of a cleaning operation in one cleaning step:

- Formic acid and formic acid-based combination products at up to 85 °C (185 °F).

Typical Cleaning Parameters in Breweries

- Sodium hydroxide solution and sodium hydroxide based combination products in concentrations of 1% to 4% at about 85 °C (185 °F).
- Phosphoric or nitric acid, and combination products based thereon in the concentrations of 0.3 to 1.5% at 20 °C (68 °F).

9.1.2 Cleaning effect

The cleaning effect depends on the following factors:

- Temperature
- Time
- Mechanics
- Chemicals
- Degree of soiling

These factors can be combined in such a way as to make an optimal cleaning result probable. Depending on the cleaning method (medium, concentration, temperature and contact times), the seals are affected to different degrees. This can impair the function and the service life.

9.2 Passivation

Before commissioning a plant, passivation is commonly carried out for long pipes and tanks.

Valve blocks are usually excepted from this. Passivation is typically performed using nitric acid (HNO_3) at approx. 80 °C (176 °F) at a concentration of 3 % and a contact time of 6 to 8 hours.

10 Servicing

FLOWVENT valves

- Spring-closing valve / spring-opening valve
- Nominal width DN 25 to DN 100 / 1" to 4" OD
- With control top FLOWVENT Control Top

10.1 Safety instructions

Maintenance and repair

Before carrying out maintenance and repair work on the component's electrical equipment, perform the following steps in accordance with the "5 safety rules":

- Isolate from the power supply
- Take appropriate measures to prevent switch on
- Test absence of voltage
- Earthing and short-circuiting
- Cover or safeguard any adjacent live parts.

For maintenance and repair, the following principles apply:

- Observe the intervals specified in the maintenance schedule.
- Only qualified personnel may carry out maintenance or repair work on the component.
- The component must be switched off and secured against being switched back on before maintenance or repair work. Work may only be started once any residual energy has been discharged.
- Block access for unauthorized persons. Put up notice signs which draw attention to the maintenance or repair work going on.
- Do not climb on the component. Use suitable access aids and working platforms.
- Wear suitable protective clothing.
- Only use suitable and undamaged tools to carry out maintenance work.
- When replacing parts only use approved, fully functional load lifting devices and lifting accessories which are suitable for the intended purpose.
- Before setting the unit back into operation, refit all safety devices as originally provided in the factory. Then check that all safety devices are working correctly.
- Make sure lubricants are used properly.
- Check pipes are firmly secured, also check for leaks and damage.
- Check that all emergency stop devices are working correctly.

Disassembly

For disassembly, the following principles apply:

- Only qualified personnel are allowed to dismantle the component.
- The component must be switched off and secured against being switched back on before it is dismantled. Work may only be started once any residual energy has been discharged.
- Disconnect all power and utility lines.
- Markings, e.g. on lines, must not be removed.
- Do not climb on the component. Use suitable access aids and working platforms.
- Mark the lines (if unmarked) prior to disassembly to ensure they are not confused when re-assembling.
- Protect open line ends with blind plugs against ingress of dirt.
- Pack sensitive parts separately.
- For longer periods of standstill, observe the storage conditions, see Section 4.1, Page 17.

10.2 Inspections

Between the maintenance periods, the valves must be checked for leakage and proper function.

10.2.1 Product contact seals

Carry out the following steps:

1. Regularly check:
   - Stem seal between upper housing and lantern
   - Y-rings in the valve disks
   - O-rings between the valve housings

→ Done

10.2.2 Pneumatic connections

Carry out the following steps:

1. Check the operating pressure at the pressure reducing and filter station.
2. Regularly clean the air filter in the filter station.
3. Check that the air hoses sit firmly in the air connections.
4. Check the lines for kinks and leaks.
5. Check the solenoid valves for proper function.

→ Done

10.2.3 Electrical connections

Carry out the following steps:

1. Check that the union nut on the cable gland is tight

2. Check that the cable connections are firmly secured.
3. Check the solenoid valves for proper function.
4. Check that the proximity switch connections are clean.

→ Done

Hint!

The electrical cable must be long enough to allow the control top to be removed via the switch bar.

10.2.4 Signs on the valve

Carry out the following steps:

1. Check the signs on the valve.
2. Replace damaged or missing stickers with new ones.

→ Done

10.3 Maintenance intervals

To ensure the highest operational reliability, all wearing parts should be replaced at longer intervals.

The actual maintenance intervals can only be determined by the user since they depend on the operating conditions, for instance:

- daily period of use,
- switching frequency,
- type and temperature of the product,
- type and temperature of the cleaning solution,
- ambient conditions.

Maintenance Intervals	
Applications	**Maintenance intervals (guideline values)**
Media at temperatures of 60 °C to 130 °C (140 °F to 266 °F)	approx. every 3 months
Media at temperatures of < 60 °C (< 140 °F)	approx. every 12 months

10.4 List of tools

Tool	Material no.	FLOWVENT mixproof valve - nominal widths					
		DN 25	DN 40	DN 50	DN 65	DN 80	DN 100
Belt wrench	408-142	X	X	X	X	X	X
Adjustable sickle spanner, 1/2" square adapter, with nose 45-90 mm	408-441	X	X	X	X	X	X
Torque wrench, 1/4", switchable, 2.5 - 25 Nm	408-424	X	X	X	X	X	X
Torque wrench, insertion shaft size 2 (14x18mm), plug-in, 20 - 120 Nm	408-426	X	X	X	X	X	X
Ratchet adapter, insertion shaft size 2 (14x18mm) with ejector, 1/2”	408-427	X	X	X	X	X	X
Insertion tool, insertion shaft size 2 (14x18mm), 3/4”	408-436	X	X	X	X	X	X
Tool O-ring installation, for the flushing valves	--	X	X	X	X	X	X
Sickle spanner, with nose 45-90 mm	408-442	X	X	X	X	X	X
Jaw insertion tool, insertion shaft size 2 (14x18mm), SW 17	408-446				X	X	X
Jaw insertion tool, insertion shaft size 2 (14x18mm), SW 21	408-445			X			
Jaw insertion tool, insertion shaft size 2 (14x18mm), SW 32	408-465	X	X	X	X	X	X
Jaw wrench, AF 13/ 17	408-036	X	X	X	2x	2x	2x
Jaw wrench, AF 21/ 23	408-046			X	X	X	X
Jaw wrench, AF 30/ 32	408-041	X	X	X	X	X	X
Jaw wrench, AF 36/ 41	408-042	X	X	X	X	X	X
Calliper,	--	X	X	X	X	X	X
Pick-Set	221-007248	X	X	X	X	X	X
Bruch	--	X	X	X	X	X	X
Cross handle 1/2", 295 mm	408-438	X	X	X	X	X	X
Rivolta, F.L.G. MD-2, can	413-071	X	X	X	X	X	X
Rivolta, F.L.G. MD-2, tube	413-136	X	X	X	X	X	X
Hose cutter	407-065	X	X	X	X	X	X
Screwdriver insert 1/2", hexagon socket SW 10	408-439	X	X	X	X	X	X
Pin punch, with handle, 6 mm	--	X	X	X	X	X	X
Socket wrench bit 3/8", SW 13	408-161	X					
Socket wrench bit 3/8", SW 17	408-444		X	X	X	X	X
Socket wrench bit 1/4", SW 13	408-425	X	X	X	X	X	X
Adapter, 3/8", 1/2"	--	X	X				
Adapter, 1/4", 3/8"	408-443			X	X	X	X

10.5 Prior to removal

Requirement:

- Make sure that during maintenance and servicing work no process is in operation in the area concerned.

Carry out the following steps:

1. Drain all pipe system elements that lead to the valve and, if necessary, clean or rinse them.
2. Shut off the control air supply.
3. Disconnect the power supply.

→ Done

10.6 Disassembly

10.6.1 Removing the control top

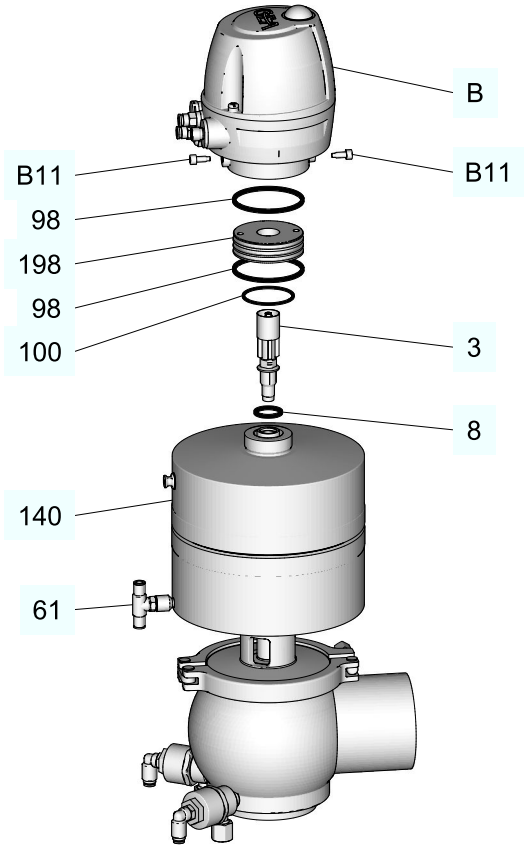


Fig.10

Requirement:

- No solenoid valve must be actuated electrically or manually.
- The pneumatic and electrical connections on the plant side can remain on the control top.

Notice

The switch bar is sensitive and must be protected from impact stress.

Damage to switch bar.

► Protect the switch bar against impact stress

Tools required:

- Allen key 4 mm
- Jaw wrench SW13/17 (408-036)
- Adjustable face wrench with a 5 mm journal
- Pickset

Carry out the following steps:

1. Remove the hose from Y1 to the elbow-type threaded plug-type connector (61).
2. Release two lock screws (B11) on the adapter of the control top (B).

   Screws can remain in the adapter and only need to be unscrewed to a level where the control top can be removed.
3. Pull the control top (B) upwards.
4. Unscrew the switch bar (3) from the piston stem of the actuator (140).
5. Release the installation base (198) from the actuator (140). Remove the O-rings (98,100) from the installation base.

   → The installation base does not need to be dismantled. This is only necessary when replacing the seals.
6. Remove the O-ring (8) from the piston rod (3) on the actuator.

→ Control top is removed.

10.6.2 Disconnecting the valve insert from the housing

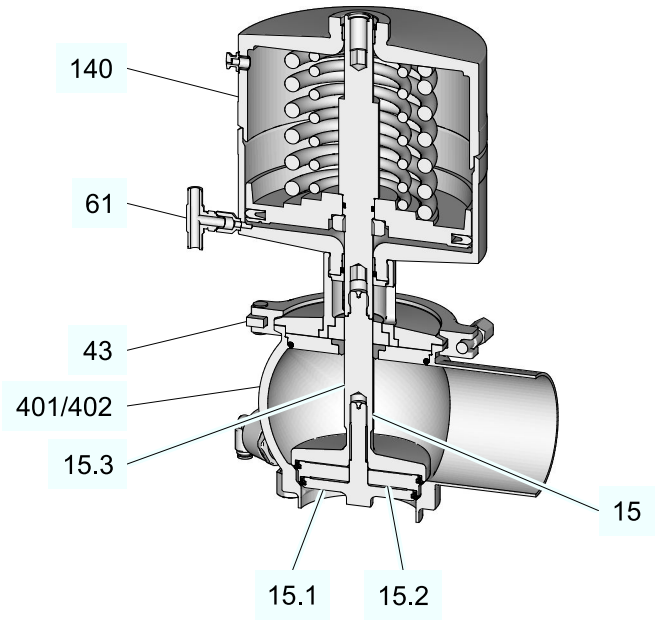


Fig.11

⚠ Warning!

Danger of injury through sudden release of spring force

When the hinged clamp (43) between the lantern and housing of the non-actuated valve (spring-to-close version) is loosened, there is a danger of injury since the released spring pretension will suddenly lift the actuator.

► For this reason, always release the spring tension before loosening the hinged clamp - by venting or aerating the actuator (140), depending on the actuator type.

Tools required:

- Jaw wrench SW13 (408-034)

Carry out the following steps:

1. Vent the actuator with elbow-type threaded plug-type connector (61).

   → The valve disk (15) is raised.

2. Remove the hinged clamp (43) between the housing (401/402) and locking ring (4).
3. Aerate the actuator with elbow-type threaded plug-type connector (61).

   → Valve disk (15) is lowered, valve insert is lifted out of the housing (401/402).

4. Disconnect the air hose on the flushing valves.
5. Pull the valve insert out of the housing (401/402).

   ! Do not set the valve insert down on the valve disk assembly (15.1, 15.2 and 15.3). The valve disk assembly (15.1 and 15.2) can become damaged. Therefore lay down the valve insert.

6. Lay the valve insert down.

→ The valve insert has been disconnected from the housing.

10.6.3 Dismantling the valve insert

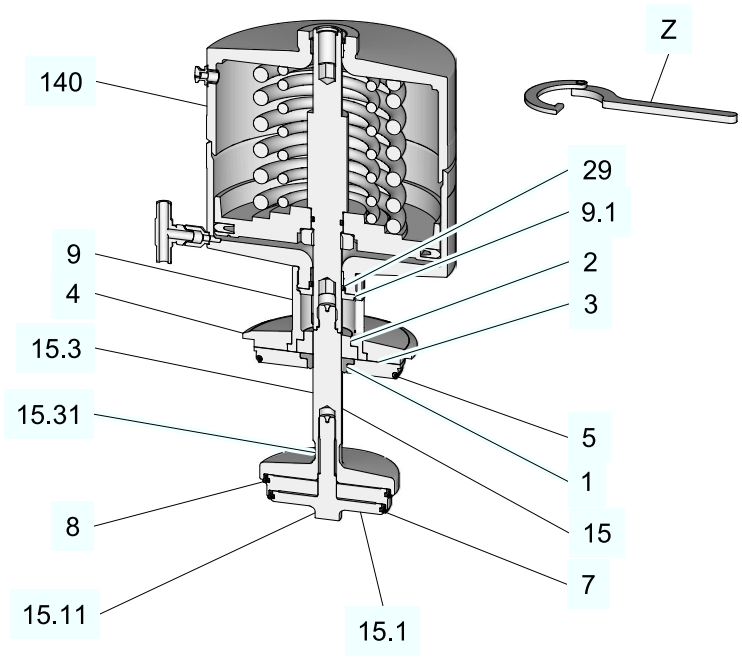


Fig.12

Warning!

Danger of injury through sudden release of spring force

When the hinged clamp (43) between the lantern and housing of the non-actuated valve (spring-to-close version) is loosened, there is a danger of injury since the released spring pretension will suddenly lift the actuator.

► For this reason, always release the spring tension before loosening the hinged clamp - by venting or aerating the actuator (140), depending on the actuator type.

Tools required:

- Screwdriver insert 1/2", hexagon socket SW10, (408-439)
- Cross handle 1/2" (408-438)
- Pickset
- Jaw wrench SW21/23 (408-046)
- Jaw wrench SW13/17 (408-036)
- Strap wrench (408 -142)
- Sickle spanner with nose (408-442)

Carry out the following steps:

1. Loosen the valve disk assembly (15.1 and 15.3) using the jaw wrench at the wrench surface (15.31) and screw out of the actuator (140). To do this, fix the piston rod using the hexagon socket wrench.
2. Remove the seal disk (3) from the valve disk (15).
3. Remove the O-ring (5) and seal ring (1) from the seal disk (3).

4. Affix the upper valve disc (15.3) to the wrench flat surface (15.31) with a jaw wrench. Use the socket wrench to unscrew the lower valve disk (15.1) from the valve disk (15.3) on the wrench flat (15.11).
5. Dismantle the Y-ring (7) and (8) from the valve disk (15.1).

   → All seals that come into contact with the product are now accessible.
6. Secure actuator (140) with a strap wrench. Release the lantern (9) with a sickle spanner (Z) and unscrew from the actuator (140).
7. Remove the bearing (2), disk (9.1) and locking ring (4).
8. Remove the O-rings (29).

→ Valve insert has been dismantled.

10.6.4 Removing the flushing valve

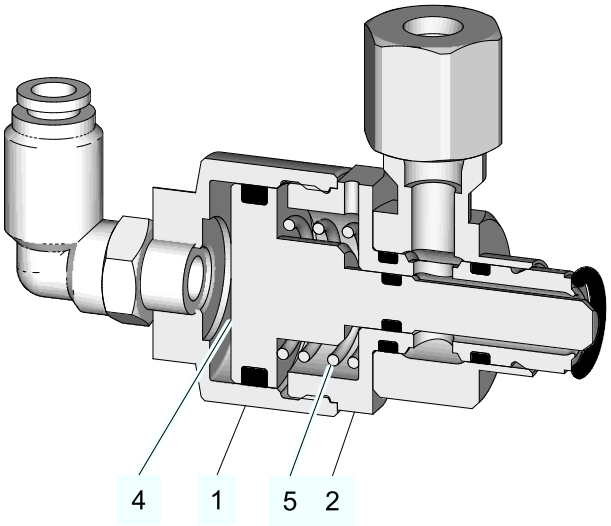


Fig.13

Tools required:

- Jaw wrench SW17 (408-036)
- Jaw wrench SW32
- Pickset
- Pin punch 6 mm

Carry out the following steps:

1. Depressurise the valve.
2. Take off the air hose.
3. Remove the hose on the cleaning connection (2).
4. Unscrew the rinsing valve from the housing.
5. Dismantle the O-ring.
6. Unscrew the cylinder (1) from housing (2).
7. Take the spring (5) from cylinder (1).

8. Pull the piston (4) from the housing (1).
9. Dismantle the O-ring.

→ The flushing valve has been removed.

10.7 Installation

10.7.1 Tightening torques

Tighten the corresponding valve components to the tightening torques specified in the table.

Required tightening torques				
		[Nm]	**[lbft]**	
Mounting base		20	14.75	Screw the installation base to the actuator.
		15	11.06	Screw the installation base to the actuator using the insertion tool.
Switch bar		2	1.47	Screw the switch bar into the piston rod of the actuator.
Locking screws control top		3	2.21	Turn the control top into the required position and tighten the inner hey screws to affix.
Cap		1	0.73	Fit the hood and tighten the screws.
Clamp connection	M8	15	11.06	Fit the hinged clamp between the housing and locking ring.
Valve disk	M12	25	18.43	Screw valve disk (15.2) into valve disk (15.3) and tighten.
	M14	45	33	Screw the valve disk into the actuator and tighten.
Lantern	M42 x 1.5	60	43.8	Push the lantern onto the actuator and tighten.

10.7.2 Fitting the flushing valve

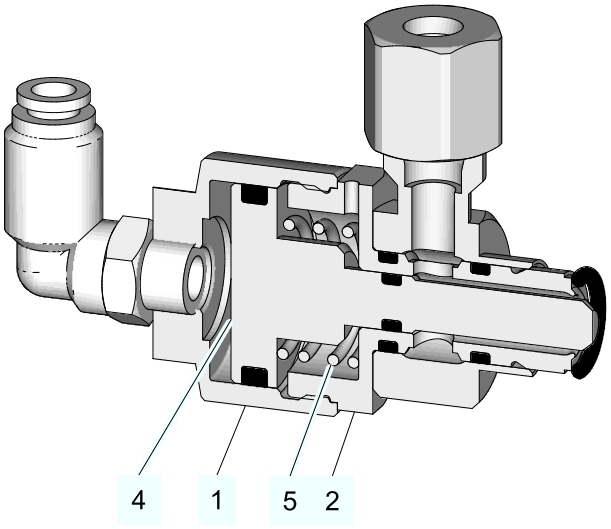


Fig.14

Tools required:

- Jaw wrench SW30/32 (408-041)
- Jaw wrench SW21/23 (408-046)
- Jaw wrench SW13/17 (408-036)
- Tool O-ring installation flushing valves

Carry out the following steps:

1. Fit the O-ring to the piston (4) and cylinder (1).
2. Push the outlet onto the housing (2)
3. Push the piston (4) into the cylinder (1).
4. Push the spring (5) into cylinder (1).
5. Screw the cylinder (1) onto the housing (2).
6. Screw the air hose into the housing (2) at surface (2).
7. Install the air hose.
8. Vent the flushing valve for the functional test.
9. Press the O-ring into the installation tool. Insert the O-ring into the valve housing with the installation (401/402).
10. Screw the flushing valve (401/402) insert into the valve housing.
11. Screw the cleaning hose into the valve housing (401/402).
12. Install the air hose.

→ The flushing valve is now installed.

10.7.3 Assembly of the valve insert

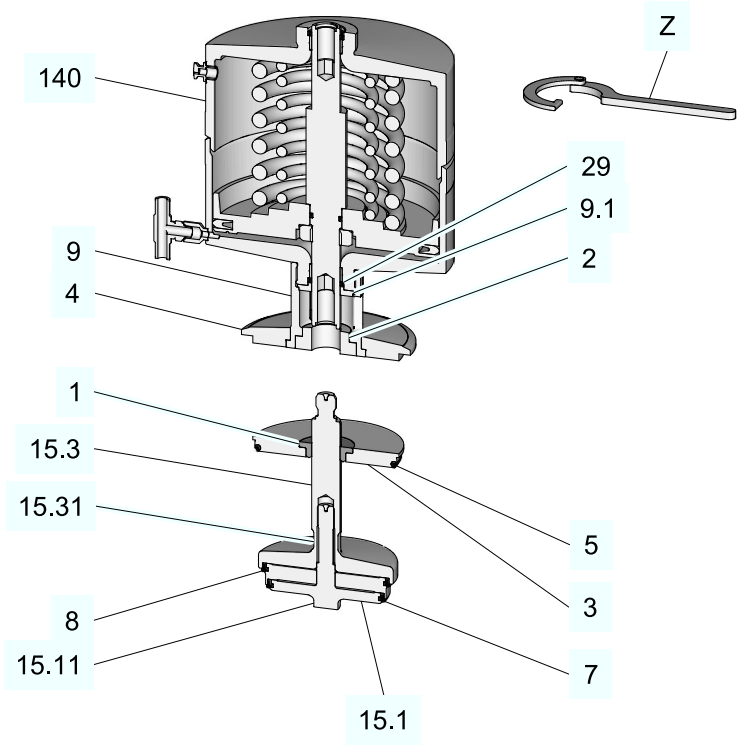


Fig.15

Warning!

Danger of injury due to sharp-edged parts

Danger of injury during assembly.

► Do not put your hand into the valve housing.
► Screw the valve disk at the wrench surface 15.21 as far as possible into the actuator.

Hint!

All threads must be greased before assembly!

Tools required:

- Strap wrench (408 -142)
- Sickle spanner adjustable 1/2" with a nose (408 -441)
- Torque ratchet insertion shaft size 2 (14x18mm), 1/2" (408-427)
- Torque wrench insertion shaft size 2 (14x18mm), 20 - 120 Nm (408-426)
- Torque wrench, 1/4", 2,5 - 25 Nm (408-424)
- Torque wrench insertion shaft size 2 (14x18mm), 20 - 120 Nm (408-426)
- Adapter 1/4"-3/8" (408-443)
- Socket for wrench, 3/8, SW17 (408 -444)
- Jaw wrench SW21/23 (408-046)
- Jaw insertion tool insertion shaft size 2 (14x18mm) SW32 (408-465)

- Jaw insertion tool insertion shaft size 2 (14x18mm) SW21 (408-445)
- Torque wrench insertion shaft size 2 (14x18mm), 20 - 120 Nm (408-426)
- Screwdriver insert 1/2" hexagon socket SW 10, (408-439)
- Cross handle 1/2" (408-438)

Carry out the following steps:

1. Mount the O-ring (29) on the top and bottom of the actuator.
2. Push the disk (9.1), locking ring (4) with lantern (9) onto the actuator from below. Tighten the lantern (9) using the sickle spanner. If necessary, fix the actuator using belt wrench while tightening.

   ! Observe torques, see table “Tightening torques” Page 44.
3. Press the bearing (2) into the lantern (9).

Assemble valve disk assembly (15.1, 15.2 and 15.3)

4. Fit the Y-ring (7) and (8) onto the valve disk (15.1) and (15.2).

   ! Ensure the Y-ring sits correctly.

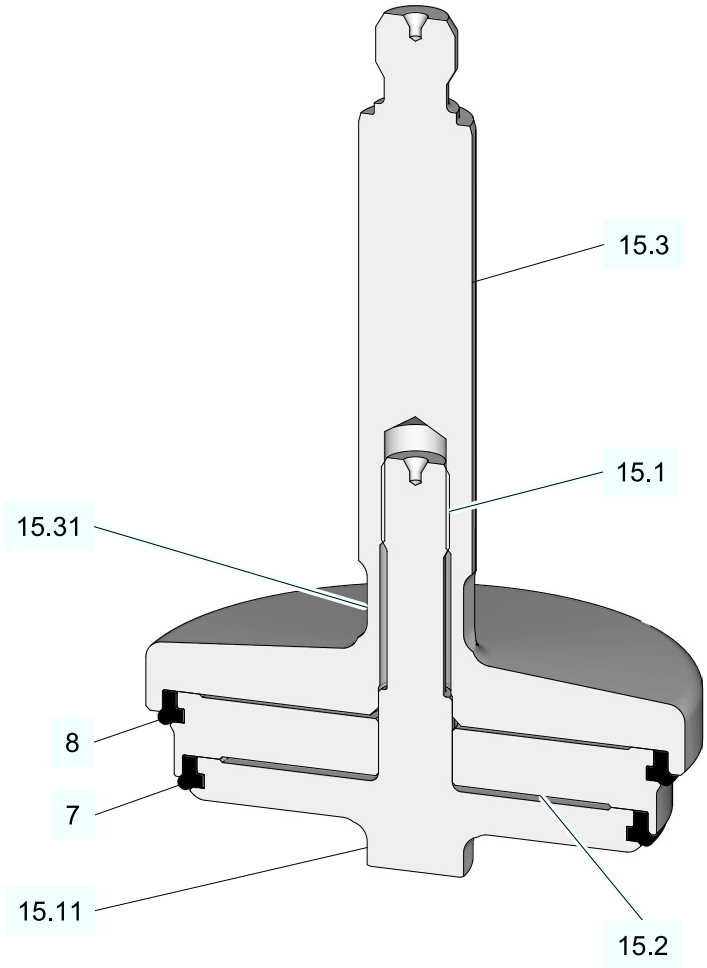


Fig.16

5. Screw the valve disk (15.1) with valve disk (15.2) into valve disk (15.3). Affix valve disk (15.3) to the wrench surface (15.31) using the jaw wrench, and tighten the valve disk (15.1) to the wrench surface (15.11) using a socket wrench.

   In contrast for nominal width DN25/40 because there is no wrench surface on valve disk (15.3). Here, only tighten valve disk (15.1) to the wrench surface (15.11) using the socket wrench.

   ! Observe torques, see table “Tightening torques” Page 44.

6. Fit the O-ring (5) and seal ring (1) to the seal disk (3).
7. Push the seal disk (3) onto valve disk assembly.
8. Screw valve disk assembly into actuator (140) and tighten using jaw wrench at wrench surface (15.21). Fix piston rod in actuator using hexagon socket key AF 10 to counter-lock

   ! Observe torques, see table “Tightening torques” Page 44.

→ Valve insert has been fitted.

10.7.4 Installing the valve insert in the housing

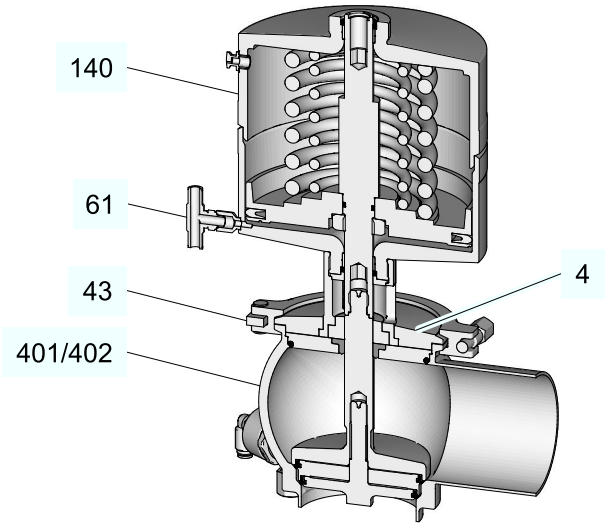


Fig.17

Tools required:

- Torque wrench, 1/4", 2,5 - 25 Nm (408-424)
- Socket for wrench, 1/4" SW13 (408-425)

Carry out the following steps:

1. Insert the valve insert into the housing (401/402).
2. Attach the air hose to the actuator (140) with an elbow-type threaded plug-type connector (61).
3. Vent the actuator (140) with elbow-type threaded plug-type connector (61).

   → Valve disk is lifted, valve insert lowered in the housing (401/ 402).

4. Fit the hinged clamp (43) between the housing (409/410) and locking ring (4).

! Observe torques, see table “Tightening torques” Page 44.

5. Aerate the actuator with elbow-type threaded plug-type connector (61).

→ The valve insert has been installed in the housing.

10.7.5 Fitting the control top

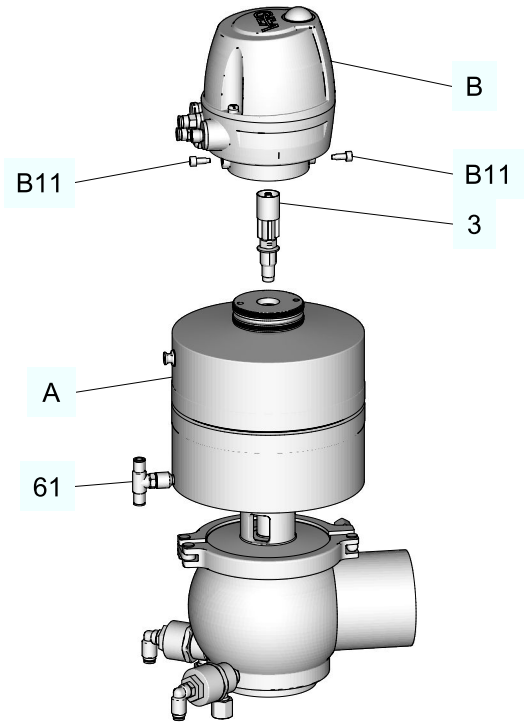


Fig.18

Requirement:

- No solenoid valve must be actuated electrically or manually.
- The pneumatic and electrical connections on the plant side can remain on the control top.

Notice

The switch bar is sensitive and must be protected from impact stress.

Damage to switch bar.

► Protect the switch bar against impact stress

Tools required:

- Torque wrench insertion shaft size 1 (9x12mm), 2.5-25 Nm (408-450)
- Insertion tool, insertion shaft size 1 (9x12mm), 1/2" (408-451)
- Adapter 1/2" - 3/4" (408-453)
- Adjustable face wrench, 3/4" square adapter 5 mm journal (408-448)
- Torque wrench insertion shaft size 1 (9x12mm), 2 - 10 Nm
- Jaw insertion tool, insertion shaft size 1 (9x12mm) SW13

- Torque screw wrench, Bit D 6.3; 1 - 5 Nm (408-449)
- Blade shaft E 6.3; size 4, hex 89 mm (408-463)
- Blade shaft E 6.3; PH2 Philips 89 mm (408-459)

Carry out the following steps:

1. Apply a thin layer of grease to the O-rings (54.31) and threads.
2. Screw the installation base to the actuator using an adjustable face wrench.

   ! Observe torques, see table “Tightening torques” Page 44.

   ! When adjusting an insertion tool, take the correction factor into account when setting the tightening torque.
3. Screw the switch bar (3) into the piston stem of the actuator.

   ! Observe torques, see table “Tightening torques” Page 44.
4. Fit the control top (B) over the switch bar (3) on the installation base (198) and push on up to the stopper.

   ! Apply a thin layer of grease for optimum installation of the O-rings.
5. Turn the control top to the correct position. Tighten both locking screws (B11).

   ! Observe torques, see table “Torques” Page 44.
6. Connect the air connection (Y1) on the control top via connection Y1 on the valve actuator using air hose (L).

   → In case of FLOWVENT valves and control tops with lift strokes, connect the air connections Y2 and Y3 to the connections Y2 and Y3 of the valve actuator.

   → In case of valves with air support Y2, connect with connection Y2 of the valve actuator.
7. Fit the hood (7) and tighten the screws.

   ! Observe torques, see table “Tightening torques” Page 44.

→ Control top is fitted.

10.7.6 Reconnect the cleaning hose

Prerequisite

- The cleaning hose is made of plastics. When screwing the cleaning hose on, it can become easily constricted in the area of the sealing disc and the cleaning hose can become detached. Therefore, during assembly of the cleaning hose, insert sleeves must be used.

Cleaning hose preparation

Carry out the following steps:

1. Cut off the cleaning with the hose cutter at a right angle.
2. Place insertion sleeves up to the edge of the hose.
3. Grease the threads and cone of the fitting, as well as the sealing disc and the threads of the union nut.

Hint!

GEA Refrigeration recommends Rivolta F.L.G. MD-2 and PARALIQ GTE 703. These lubricants are approved for foodstuff and are resistant to beer froth. They have the NSF-H1 (USDA H1) registration. PARALIQ GTE 703 can be ordered under mat. no. 413-064, and Rivolta F.L.G. MD-2 can be ordered under mat. no. 413-071 from GEA Refrigeration.

Fitting the cleaning hose

1. Slide the union nut (2) and sealing disc (1) over the cleaning hose disc.

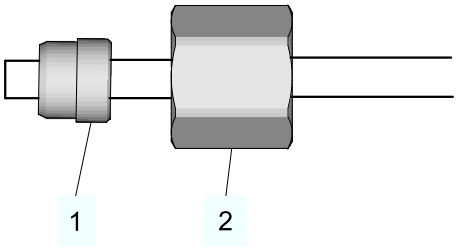


Fig.19

Assembling the cleaning hose

Carry out the following steps:

1. Screw on the union nut hand tight. When the cleaning hose stops, press it against the inner cone.
2. Turn the union nut about another 1 1/2 turns. Do not turn the cleaning hose with the union nut. The stop-edge limits the motion, requiring a greater turning strength.

   ! A marked line on the cleaning hose should aid in making sure that the cleaning hose does not turn.

Checking

Carry out the following steps:

1. Loosen the union nut.
2. Make sure that there is a visible connection (3) in the space before the 1. Make sure the disc fits.

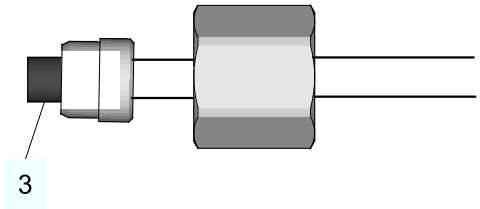


Fig.20

→ It will not hurt if the disc on the end of the cleaning hose turns.

Re-assembly

Carry out the following steps:

1. After removing the union nut replace it without using aggressive force. Make sure that the nozzle is also tight.

→ Done

10.7.7 Checking the function

Checking valve strokes and adjusting feedback

Carry out the following steps:

1. Actuate the valve with compressed air.
2. Check the stroke of the valve in accordance with the table “Valve stroke”.
3. When strokes are correct, adjustment and checking of the feedback can take place.

   Please take the operating instructions for the respective control top into account for adjustment of the feedbacks.

→ Stroke has been checked.

Strokes depending on size

Valve stroke	
Valve size	**Valve stroke [mm]**
Metric	
25	14
40	28
50	28
65	28
80	28
100	28
Inch OD	
1"	10
1.5"	25
2"	25.5
2.5"	22
3"	20
4"	25.5

10.8 Maintenance

10.8.1 Cleaning the valve

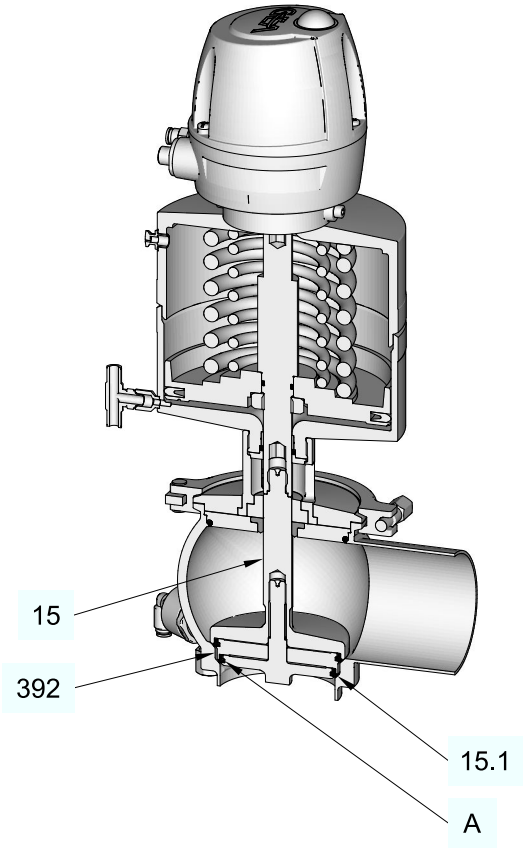


Fig.21

Notice

The stem of the valve disk (15), the housing seat (392), the valve seat (15.1) and the Y-ring groove (A) are precision parts.

Damage to these parts can result in malfunction.

► Handle the valve with care!

Notice

Damage to the valve

Damage to these parts can result in malfunction.

► Observe the safety information sheets issued by the detergent manufacturers!

► Only use detergents which are non-abrasive and not aggressive towards stainless steel.

► Use only detergents which do not damage the materials of the control top (PA).

Carry out the following steps:

1. Disassemble the valve, see Section 10.6, Page 39.
2. Carefully clean the individual parts.

→ Done

10.8.2 Replacing seals

Hint!

Replace defective seals, but always fit new housing O-rings to ensure the tightness of the valve. Always use genuine spare parts.

Hint!

Used seals must not be used again, since the proper function of the seal can then no longer be ensured.

10.8.3 Lubricating seals and threads

Caution!

Damage to seals and threads

Damage to seals and threads can result in malfunction.

► Ensure that an adequate film of lubricant is applied to those seals that do not come into contact with the product. No grease residues must be visible once the valve has been assembled completely.

► Observe the safety data sheets issued by the lubricant manufacturer.

Carry out the following steps:

1. Lightly grease the valve disc thread.
2. Apply a very thin coat of grease to the O-rings at the top and bottom of the actuator piston rod.

   ! Do not grease the Y-ring

→ Done

Hint!

GEA Process & Equipment Technologies (Suzhou) Co., Ltd. revommends Rivolta F.L.G. MD-2 and PARALIQ GTE 703. These lubricants are approved for foodstuff and are resistant to beer froth. They have the NSF-H1 (USDA H1) registration. They do not affect the taste or the consistency of the products and are compatible with the seals in contact with product.

Rivolta F.L.G. MD-2 can be ordered from GEA Process & Equipment Technologies (Suzhou) Co., Ltd.. Using other types of grease can result in malfunctions or in premature seal failure. The warranty will also become null and void.

On request, GEA Process & Equipment Technologies (Suzhou) Co., Ltd will provide a manufacturer declaration for these products.

A thin film of grease is required on the seals to ensure the proper function of the fittings. It reduces friction and extends the service life of the seals. This is absolutely harmless from a health and hygienic point of view.

Running dry must be avoided!

11 Alarms

11.1 Malfunctions and remedies

In the event of malfunctions immediately deactivate the valve and secure it against inadvertent reactivation. Malfunctions may only be remedied by qualified staff, who must observe the safety precautions.

Fault	Cause	Remedy
Valve does not work	Fault in the controller	Check the system configuration
	No compressed air or compressed air too low	Check compressed air supply and check air hoses for free passage and air tightness
	Fault in the electrical system	Check actuation / external controller and routing of electrical lines
	Solenoid valve defective	Replace the solenoid valve
	Valve works against a hydraulically closed pipe	Open the pipe
Valve does not close	Dirt/foreign material between valve seat and valve disk	Clean valve housing and valve seat
Valve closes too slowly	O-rings in the actuator and control top are dry (friction losses)	Grease O-rings
Leakage from the flushing valve	Y-ring defective	Replace Y-ring

12 Decommissioning

12.1 Safety instructions

For shutting down, the following principles apply:

- Switch off the compressed air.
- Switch off the component with the main switch.
- Padlock the main switch (if fitted) in the off position to prevent it from being switched back on. The key to the padlock must be deposited with the person responsible until the machine is restarted.
- For longer periods of standstill, observe the storage conditions, see Chapter 4, Page 17.

12.2 Disposal

12.2.1 General notes

Dispose of the component in an environmentally safe manner. Observe the statutory waste disposal regulations applicable at the place of installation.

The component consists of the following materials:

- Metals
- Synthetic materials
- Electronic parts
- Lubricants containing oil and grease

Separate the different materials and dispose of them correctly sorted. Also observe the instructions regarding disposal in the operating instructions for the individual components.

12.2.2 Valve actuator disposal

⚠ Danger

The spring forces in the actuator can be as high as 11 kN.

The pre-stressed spring can cause serious personal injury or death.

► Never open the actuator.
► GEA Process & Equipment Technologies (Suzhou) Co., Ltd accepts unopened actuators and disposes them free of charge.

Carry out the following steps:

1. Remove the actuator.
2. Pack actuator safely and send to GEA Process & Equipment Technologies (Suzhou) Co., Ltd.

→ Done

13 Spare parts list - GEA FLOWVENT Double seal valve SV/DS

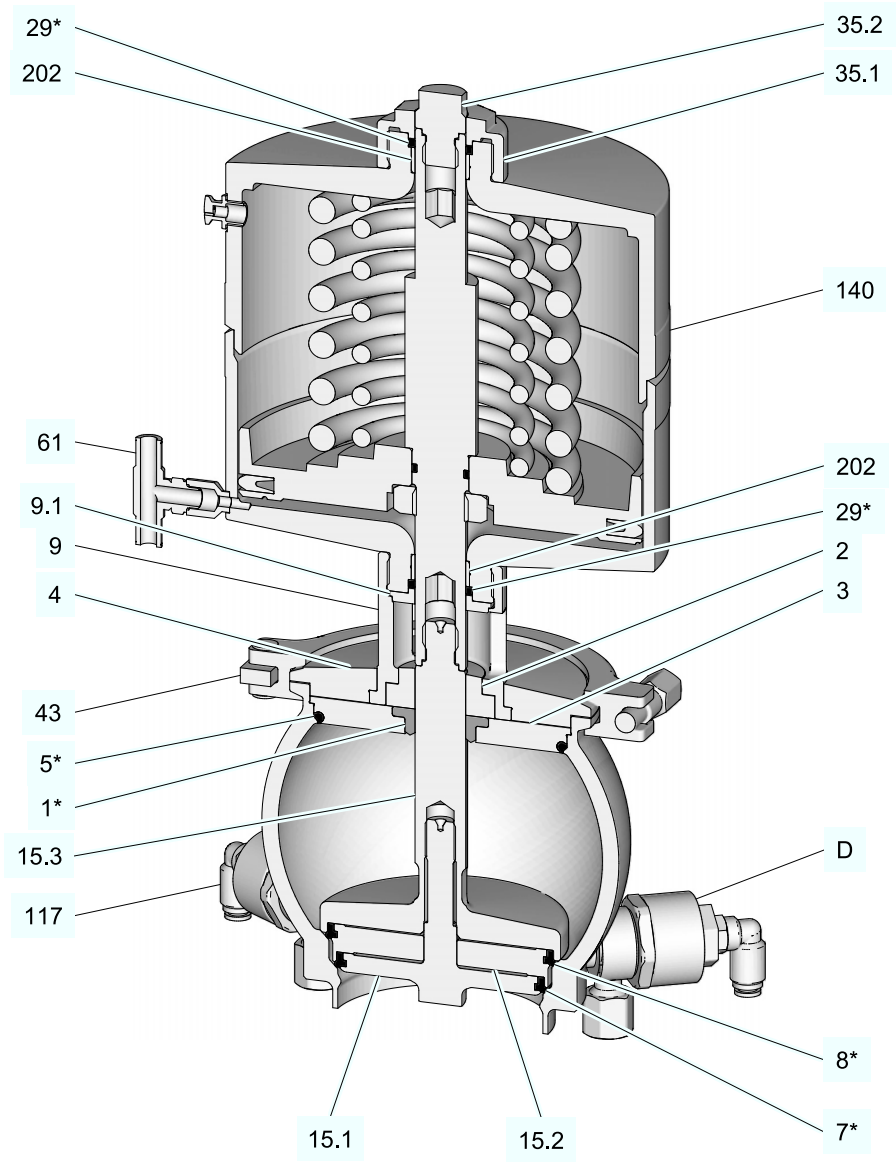


Fig.22

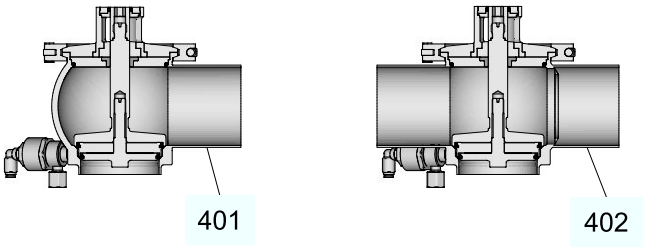


Fig.23

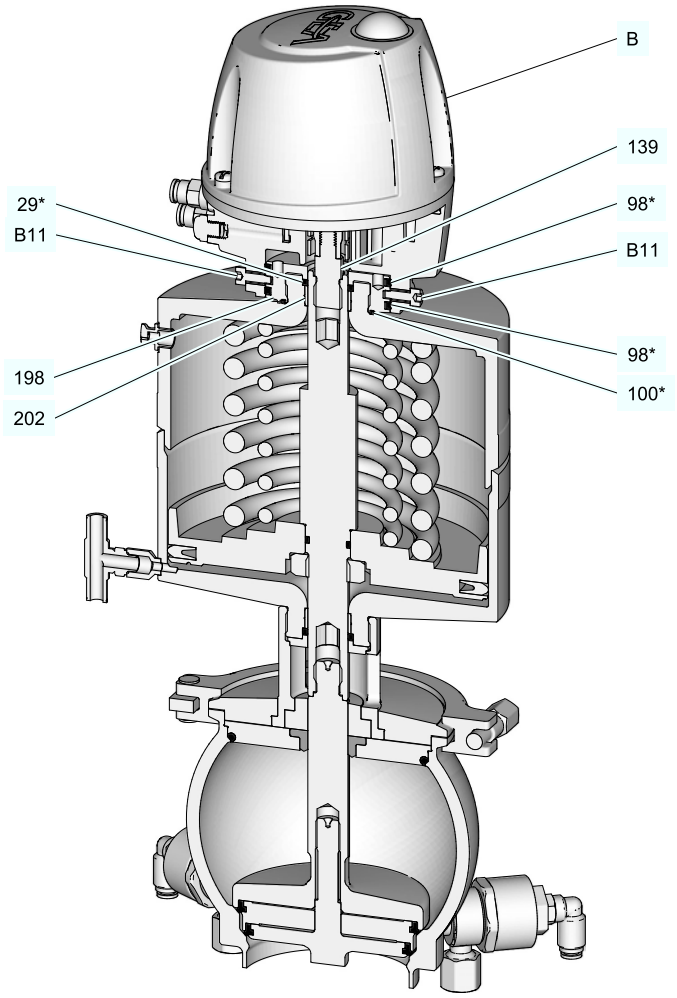


Fig.24

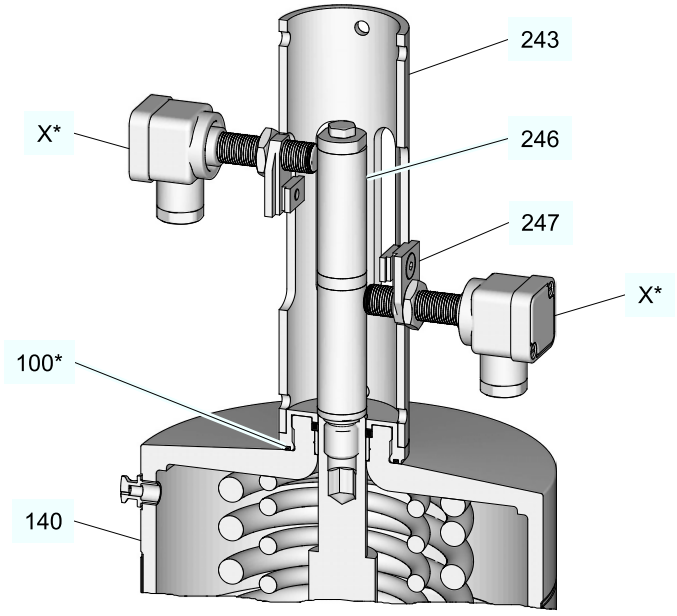


Fig.25: X* = no more than 2 proximity switches M12 can be fitted

Item	Designation	Material	DN 25	DN 40	DN 50	DN 65	DN 80	DN 100
Seal set SV/DS cpl. 1)		EPDM	821-000093	821-000094	821-000095	821-000096	821-000097	821-000098
		FKM	821-000099	821-000100	821-000101	821-000102	821-000103	821-000104
1*	Seal ring	EPDM	924-350	924-350	924-350	924-350	924-350	924-351
		FKM	924-353	924-353	924-353	924-353	924-353	924-361
2	Bearing SV	PTFE/carbon	935-140	935-140	935-140	935-140	935-140	935-153
3	Seal disk SV/SO	316L	821-144.01	821-144.02	821-144.03	821-144.04	821-144.05	821-144.07
4	Locking ring SV/SO	304	821-115.01	821-115.02	821-115.03	821-115.04	821-115.05	821-115.06
5*	O-ring	EPDM	930-057	930-1005	930-1006	930-543	930-1007	930-1008
		FKM	930-1009	930-1010	930-1011	930-1012	930-1013	930-1014
7*	Y-ring SV	EPDM	821-117.03	821-117.05	821-117.07	821-117.01	821-117.09	821-117.11
		FKM	821-117.13	821-117.15	821-117.17	821-117.19	821-117.21	821-117.23
8*	Y-ring	EPDM	821-117.04	821-117.06	821-117.08	821-117.02	821-117.10	821-117.12
		FKM	821-117.14	821-117.16	821-117.18	821-117.20	821-117.22	821-117.24
9	Lantern SV/SO	1.4308	821-116.01	821-116.01	821-116.01	821-116.01	821-116.01	821-116.03
9.1	Disk SV	304	821-143.01	821-143.01	821-143.01	821-143.01	821-143.01	821-143.01
15.1	Valve disk SV/DS-B	316L	821-112.01	821-112.02	821-112.03	821-112.04	821-112.05	821-112.06
15.2	Valve disk SV/DS-M	316L	821-113.01	821-113.02	821-113.03	821-113.04	821-113.05	821-113.06
15.3	Valve disk SV/DS-T	316L	821-114.01	821-114.02	821-114.03	821-114.04	821-114.05	821-114.07
29*	O-ring	NBR	930-026	930-026	930-026	930-026	930-026	930-026
35.1	Actuator cover	PA12	821-121.01	821-121.01	821-121.01	821-121.01	821-121.01	821-121.01
35.2	Locking screw	PP	821-122.01	821-122.01	821-122.01	821-122.01	821-122.01	821-122.01
43	Hinged clamp SV	--	821-145.01	821-145.02	821-145.03	821-145.04	821-145.05	821-145.06
61	T-screw-in connector G1/8"-6.35	Brass, nickel-plated	933-959	933-959	933-959	933-959	933-959	933-959
	T-screw-in connector G1/8"-6	Brass, nickel-plated	933-991	933-991	933-991	933-991	933-991	933-991
98*	O-ring	NBR	930-073	930-073	930-073	930-073	930-073	930-073
100*	O-ring	NBR	930-095	930-095	930-095	930-095	930-095	930-095
117	Screw-in angled connector G1/8"-6/4	Brass, nickel-plated	933-475	933-475	933-475	933-475	933-475	933-475
139	Switch bar FLOWVENT-CT	--	221-589.104	221-589.104	221-589.104	221-589.104	221-589.104	221-589.104
198	Mounting base	304	822-100.11	822-100.11	822-100.11	822-100.11	822-100.11	822-100.11
202	Plain bearing	IGLIDUR-X	704-044	704-044	704-044	704-044	704-044	704-044
Proximity switch holder FLOWVENT cpl.		--	822-100.33	822-100.33	822-100.33	822-100.33	822-100.33	822-100.33
243	Mounting for proximity switch FLOWVENT	1.4301	822-100.30	822-100.30	822-100.30	822-100.30	822-100.30	822-100.30
246	Switch bar FLOWVENT cpl.	--	822-100.35	822-100.35	822-100.35	822-100.35	822-100.35	822-100.35
247	Proximity switch holder NI-E/DT	--	221-105.26	221-105.26	221-105.26	221-105.26	221-105.26	221-105.26
401	Housing SV/DS 1	316L	821-105.01	821-105.02	821-105.03	821-105.04	821-105.05	821-105.06
402	Housing SV/DS 2	316L	821-106.01	821-106.02	821-106.03	821-106.04	821-106.05	821-106.06
B	Control top FLOWVENT-CT		see spare parts list for control top FLOWVENT-CT 221ELI014158					
B11	Hex head screw	1.4301	901-365	901-365	901-365	901-365	901-365	901-365
D	Flushing valve SV/DS		see parts list for flushing valve SV/DS 221ELI013697					
Double seal valve (control air pressure/product pressure)								
140	Standard actuator NC 6bar/5bar		821-118.01	821-118.01	821-118.04	821-118.06	821-118.07	821-118.11
1) The seal set includes items 1, 5, 7, 8 and 29.								

Item	Designation	Material	1" OD	1.5" OD	2" OD	2.5" OD	3" OD	4" OD
Seal set SV/DS cpl. 1)		EPDM	821-000093	821-000094	821-000095	821-000096	821-000097	821-000098
		FKM	821-000099	821-000100	821-000101	821-000102	821-000103	821-000104
1*	Seal ring	EPDM	924-350	924-350	924-350	924-350	924-350	924-351
		FKM	924-353	924-353	924-353	924-353	924-353	924-361
2	Bearing SV	PTFE/carbon	935-140	935-140	935-140	935-140	935-140	935-153
3	Seal disk	316L	821-144.01	821-144.02	821-144.03	821-144.04	821-144.05	821-144.07
4	Locking ring SV/SO	304	821-115.01	821-115.02	821-115.03	821-115.04	821-115.05	821-115.06
5*	O-ring	EPDM	930-057	930-1005	930-1006	930-543	930-1007	930-1008
		FKM	930-1009	930-1010	930-1011	930-1012	930-1013	930-1014
7*	Y-Ring SV D26	EPDM	821-117.03	821-117.05	821-117.07	821-117.01	821-117.09	821-117.11
		FKM	821-117.13	821-117.15	821-117.17	821-117.19	821-117.21	821-117.23
8*	Y-Ring SV D33	EPDM	821-117.04	821-117.06	821-117.08	821-117.02	821-117.10	821-117.12
		FKM	821-117.14	821-117.16	821-117.18	821-117.20	821-117.22	821-117.24
9	Lantern SV/SO	1.4308	821-116.01	821-116.01	821-116.01	821-116.01	821-116.01	821-116.03
9.1	Disk SV	304	821-143.01	821-143.01	821-143.01	821-143.01	821-143.01	821-143.01
15.1	Valve disk SV/DS-B	316L	821-112.01	821-112.02	821-112.03	821-112.04	821-112.05	821-112.06
15.2	Valve disk SV/DS-M	316L	821-113.01	821-113.02	821-113.03	821-113.04	821-113.05	821-113.06
15.3	Valve disk SV/DS-T	316L	821-114.01	821-114.02	821-114.03	821-114.04	821-114.05	821-114.07
29*	O-ring	NBR	930-026	930-026	930-026	930-026	930-026	930-026
35.1	Actuator cover	PA12	821-121.01	821-121.01	821-121.01	821-121.01	821-121.01	821-121.01
35.2	Locking screw	PP	821-122.01	821-122.01	821-122.01	821-122.01	821-122.01	821-122.01
43	Hinged clamp SV	--	821-145.01	821-145.02	821-145.03	821-145.04	821-145.05	821-145.06
61	T-screw-in connector G1/8"-6.35	Brass, nickel-plated	933-959	933-959	933-959	933-959	933-959	933-959
	T-screw-in connector G1/8"-6	Brass, nickel-plated	933-991	933-991	933-991	933-991	933-991	933-991
98*	O-ring	NBR	930-073	930-073	930-073	930-073	930-073	930-073
100*	O-ring	NBR	930-095	930-095	930-095	930-095	930-095	930-095
117	Screw-in angled connector G1/8"-6/4	Brass, nickel-plated	933-475	933-475	933-475	933-475	933-475	933-475
139	Switch bar FLOWVENT-CT	--	221-589.104	221-589.104	221-589.104	221-589.104	221-589.104	221-589.104
198	Mounting base	304	822-100.11	822-100.11	822-100.11	822-100.11	822-100.11	822-100.11
202	Plain bearing	IGLIDUR-X	704-044	704-044	704-044	704-044	704-044	704-044
Proximity switch holder FLOWVENT cpl.		--	822-100.33	822-100.33	822-100.33	822-100.33	822-100.33	822-100.33
243	Mounting for proximity switch FLOWVENT	1.4301	822-100.30	822-100.30	822-100.30	822-100.30	822-100.30	822-100.30
246	Switch bar FLOWVENT cpl.	--	822-100.35	822-100.35	822-100.35	822-100.35	822-100.35	822-100.35
247	Proximity switch holder NI-E/DT	--	221-105.26	221-105.26	221-105.26	221-105.26	221-105.26	221-105.26
401	Housing SV/DS 1	316L	821-105.07	821-105.08	821-105.09	821-105.10	821-105.11	821-105.12
402	Housing SV/DS 2	316L	821-106.07	821-106.08	821-106.09	821-106.10	821-106.11	821-106.12
B	Control top FLOWVENT-CT		see spare parts list for control top FLOWVENT-CT 221ELI014158					
B11	Hex head screw	1.4301	901-365	901-365	901-365	901-365	901-365	901-365
D	Flushing valve SV/DS		see parts list for flushing valve SV/DS 221ELI013697					
Double seal valve (control air pressure/product pressure)								
140	Standard actuator NC 6bar/5bar		821-118.01	821-118.01	821-118.04	821-118.06	821-118.07	821-118.11
1) The seal set includes items 1, 5, 7, 8 and 29.								

14 Spare parts list - GEA FLOWVENT Flushing valve SV/DS

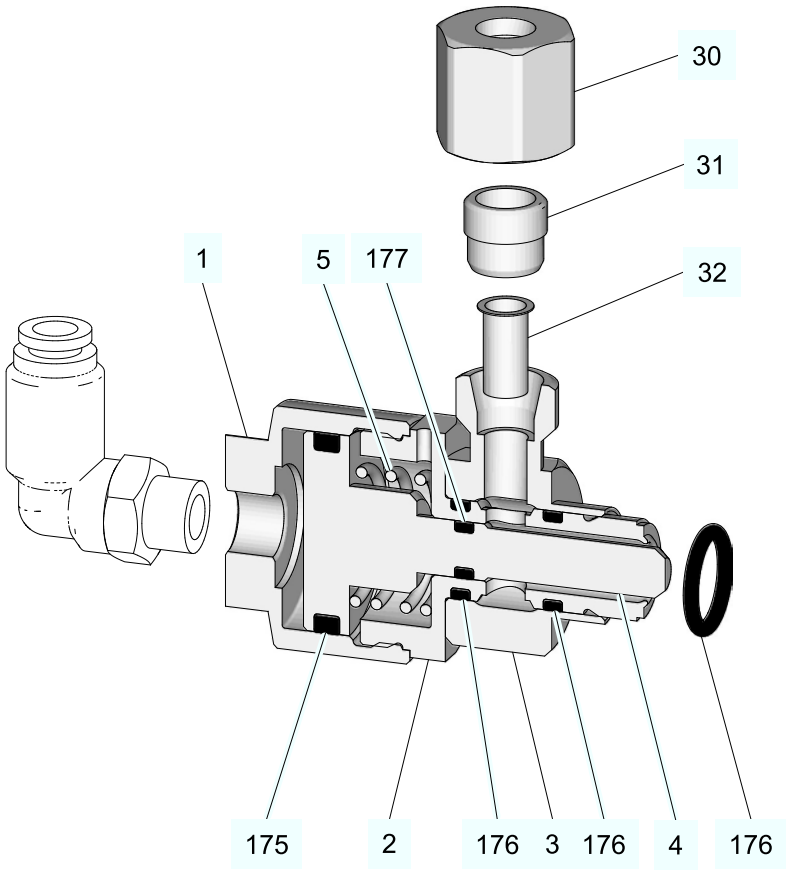


Fig.26

Item	Designation	Material	DN 25 1" OD	DN 40 1.5" OD	DN 50 2" OD	DN 65 2.5" OD	DN 80 3" OD	DN 100 4" OD
Flushing valve C-S complete		EPDM	221-464.28	221-464.28	221-464.28	221-464.28	221-464.28	221-464.28
		FKM	221-464.31	221-464.31	221-464.31	221-464.31	221-464.31	221-464.31
1	Cylinder SPV-C	1.4305	221-464.10	221-464.10	221-464.10	221-464.10	221-464.10	221-464.10
2	Housing SPV-C	1.4305	221-464.08	221-464.08	221-464.08	221-464.08	221-464.08	221-464.08
3	Outlet SPV-C	1.4301	221-464.05	221-464.05	221-464.05	221-464.05	221-464.05	221-464.05
4	Piston SPV-C	PEEK	221-464.19	221-464.19	221-464.19	221-464.19	221-464.19	221-464.19
5	Compression spring	1.4310	931-225	931-225	931-225	931-225	931-225	931-225
30	Cap nut	1.4571	933-456	933-456	933-456	933-456	933-456	933-456
31	Cutting ring	1.4571	933-455	933-455	933-455	933-455	933-455	933-455
32	Support sleeve	1.4571	933-382	933-382	933-382	933-382	933-382	933-382
175	O-ring	NBR	930-029	930-029	930-029	930-029	930-029	930-029
176	O-ring	EPDM	930-542	930-542	930-542	930-542	930-542	930-542
		FKM	930-1016	930-1016	930-1016	930-1016	930-1016	930-1016
177	O-ring	EPDM	930-541	930-541	930-541	930-541	930-541	930-541
		FKM	930-1015	930-1015	930-1015	930-1015	930-1015	930-1015

15 Spare parts list - Proximity switch holder FLOWVENT

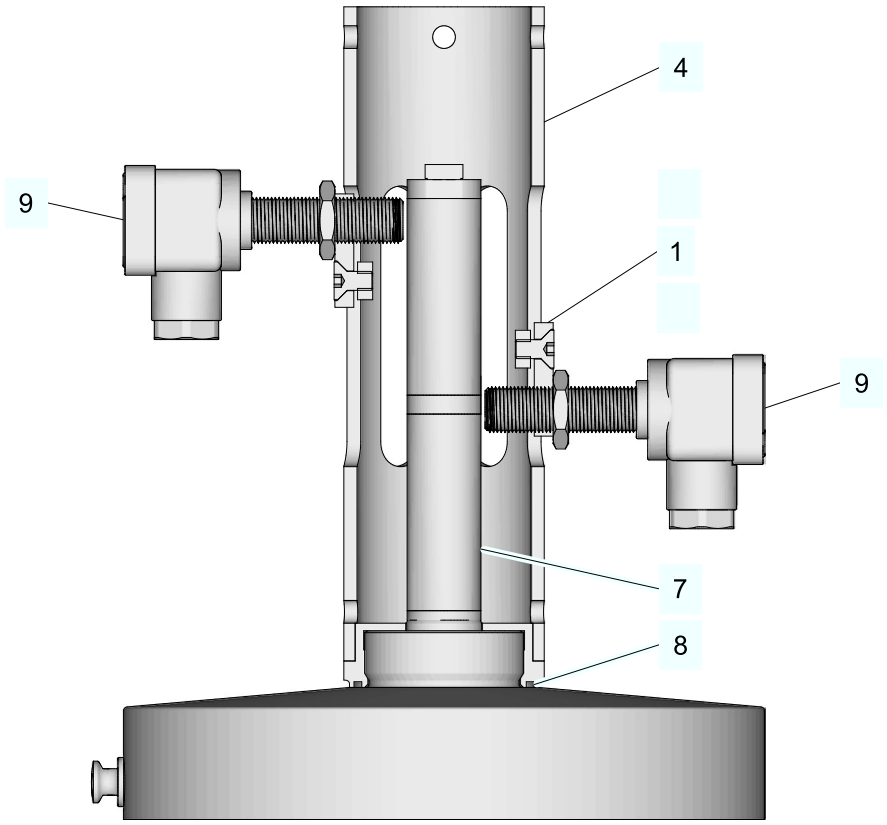


Fig.27

Item	Designation	Material	Material no.
Proximity switch holder FLOWVENT cpl.		--	822-100.33
1	Proximity switch holder Ni-E/DT	1.4301	221-105.26
4	Mounting for proximity switch FLOWVENT	1.4301	822-100.30
7	Switch bar FLOWVENT cpl.	1.4305+PA	822-100.35
8	O-ring	NBR	930-095
9	Proximity switch KR/3DR S/M12x1/40/10-30V DC	--	505-088
	Proximity switch KR/2DR M12x1/30/ATEX	--	505-109

16 Dimension sheet - FLOWVENT Double seal valve SV/DS

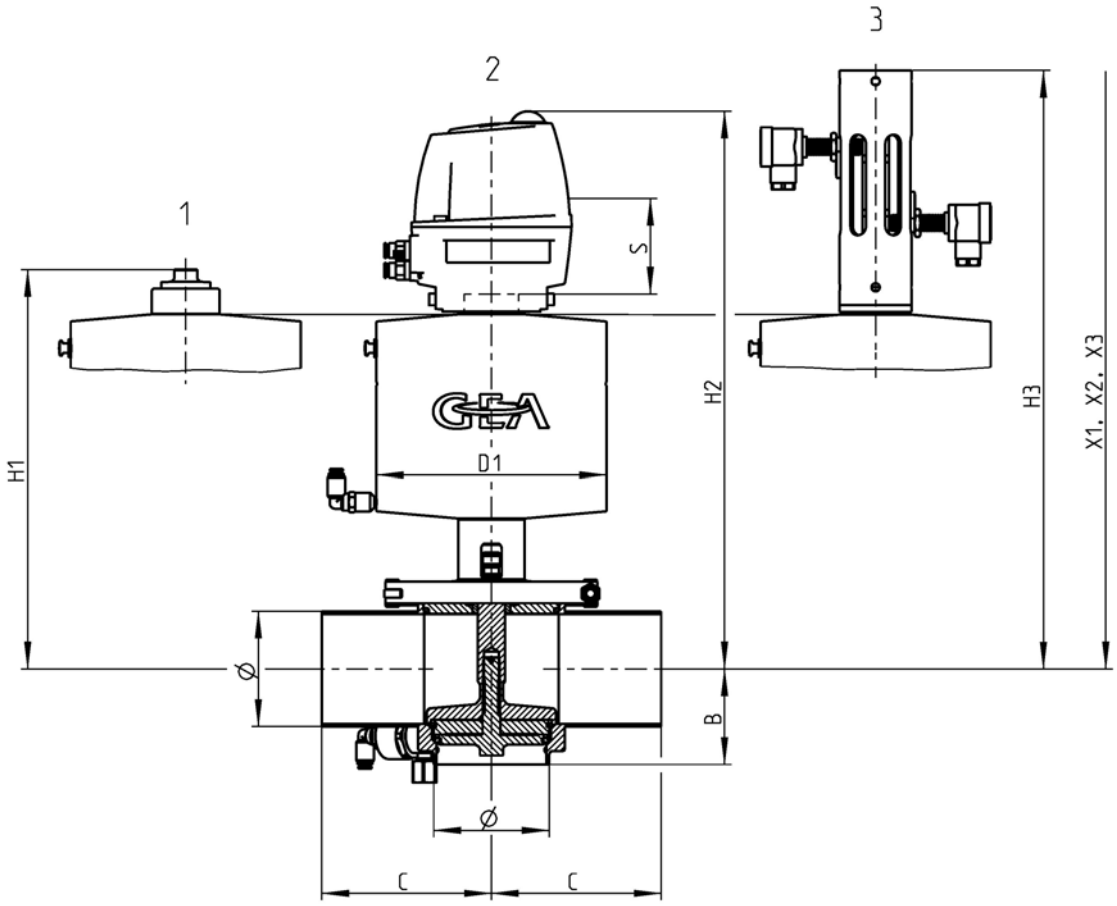


Fig.28: 1 = no feedback ; 2 = with feedback FLOWVENT CT ; 3 = with NI-holder FLOWVENT

Nominal width	Pipe	Housing		Actuator	Size						Valve		Flushing valve hose (PTFE)
	Ø [mm]	B [mm]	C [mm]	D 1 [mm]	H 1 [mm]	H 2 [mm]	H 3 [mm]	Removing X1 [mm]	Removing X 2 [mm]	Removing X 3 [mm]	Stroke S [mm]	Weight [kg]	Ø [mm]
DN 25	29 x 1.50	41	90	89	245	350	378	328	434	461	14	6	8/6
DN 40	41 × 1.50	47	90	89	237	356	384	318	438	465	28	6	8/6
DN 50	53 × 1.50	53	90	135	243	362	390	336	456	483	28	9	8/6
DN 65	70 × 2.00	63	125	170	287	406	434	399	519	546	28	15	8/ 6
DN 80	85 × 2.00	71	125	170	294	414	441	422	541	569	28	16	8/6
DN 100	104 × 2.00	80	125	210	354	473	501	500	620	647	28	24	8/6
OD 1"	25.4 x 1.65	39	90	89	247	348	376	330	432	459	10	6	8/6
OD 1.5"	38.1 × 1.65	45.5	90	89	238	355	382	320	436	464	25	6	8/6
OD 2"	50.8 × 1.65	52	90	135	244	361	389	338	455	482	25.5	9	8/6
OD 2.5"	63.5 × 1.65	60	125	170	290	403	431	402	516	543	22	15	8/6
OD 3"	76.2 × 1.65	66.5	125	170	298	410	437	426	537	565	20	16	8/6
OD 4"	101.6 × 2.11	79	125	210	355	472	500	502	619	646	25.5	24	8/6

17 Appendix

17.1 Lists

17.1.1 Abbreviations and terms

Abbreviation	Explanation
BS	British Standard
bar	Unit of measurement of pressure [bar] All pressure data expressed in [bar/psi] is assumed to be gauge pressure [barg/psig] unless explicitly specified otherwise.
approx.	approximately
°C	Unit of measurement of temperature [degree Celsius]
DI	Divert valve
dm^3_n	Unit of measurement of volume [cubic decimetre] standard volume (standard litres)
DN	DIN nominal width
DIN	German standard issued by DIN (Deutsches Institut für Normung e.V., German Institute for Standardization)
EN	European Standard
EPDM	Material designation Brief designation according to DIN/ISO 1629: Ethylene-propylene-diene- rubber
°F	Unit of measurement of temperature [degree Fahrenheit]
FVCT	FLOWVENT Control Top
FKM	Material designation, short designation according to DIN/ISO 1629: Fluorine rubber
h	Unit of measurement of time [hour]
HNBR	Material designation, short designation according to DIN/ISO 1629: Hydrated nitrile butadiene rubber
IP	Protection class
ISO	International Standard of the International Organization for Standardization
kg	Unit of measurement of weight [kilogram]
kN	Unit of measurement of force [kilonewton]
Kv value	Flow coefficient [m³/s] 1 KV = 0.86 x Cv
l	Unit of measurement of volume [litre]
max.	maximum

Abbreviation	Explanation
mm	Unit of measurement of length [millimetre]
µm	Unit of measurement of length [micrometre]
M	Metric
Nm	Unit of measurement of work [newton metre] SPECIFICATION FOR THE TORQUE: 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
PA	Polyamide
PE-LD	Low-density polyethylene
PPE	Polytetrafluoroethylene
psi	Anglo-American unit of measurement for pressure [pound-force per square inch] All pressure data expressed in [bar/psi] is assumed to be gauge pressure [barg/psig] unless explicitly specified otherwise.
PTFE	Polytetrafluoroethylene
SET-UP	Self-learning installation During commissioning and maintenance, the SET-UP procedure carries out all the necessary settings for the generation of messages.
SV	Seat valve
AF	Indicates the size of spanners [width across flats]
V AC	Volt alternating current
V DC	Volt direct current
W	Unit of measurement of power [Watt]
TIG	Welding method Tungsten inert gas welding
Inch	Unit of measurement of length in the Anglo-American language area
Inch OD	Tube measurement according to British Standard (BS), outside diameter
Inch IPS	American pipe measurement, iron pipe size

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