# OPERATING INSTRUCTIONS

Translation from the original language

# Hygienic valves

## GEA VARIVENT® Double seal valve, type C

GEA Tuchenhagen GmbH
Document number: 430BAL008331
Language: EN / Date: 2024-01

## COPYRIGHT



## LEGAL NOTICE

### Word marks

The designations VARIVENT® and T.VIS® are protected trademarks of GEA Tuchenhagen GmbH.

# TABLE OF CONTENTS

# 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

GEA Tuchenhagen GmbH
Am Industriepark 2-10
21514 Büchen

## 1.3 Contact

Tel.:+49 4155 49-0
Fax:+49 4155 49-2035

flowcomponents@gea.com
www.gea.com

Engineering for a better world.

**EU Declaration of conformity within the meaning of the EC machine directive 2006/42/EC**

Manufacturer: **GEA Tuchenhagen GmbH**
**Am Industriepark 2-10**
**21514 Büchen, Germany**

Hereby, we declare that the machine designated in the following

---

| | |
|---|---|
| Designation: | Valve with acutator |
| Type: | VARIVENT® / ECOVENT® |

---

by virtue of its design and construction and in the versions placed on the market by us, complies with the essential health and safety requirements of the following directive:

| | | |
|---|---|---|
| Relevant EC directives: | 2006/42/EC | EC Machinery Directive |
| Applicable harmonized standards, in particular: | EN ISO 12100: 2010 | |

---

Remarks:

- In the event of a modification to the machine that was not agreed with us, this declaration loses its validity
- Furthermore, we declare that the specific technical documentation for this machine has been drawn up in accordance with Annex VII, Part A, and undertake to forward this documentation by means of data medium upon justified request by the national authorities

---

Person authorised for compilation and handover of technical documentation:

**GEA Tuchenhagen GmbH**
**Am Industriepark 2-10**
**21514 Büchen, Germany**

---

Büchen, 18 July 2025

Sören de Boon
Senior Vice President
Business Unit Valves & Pumps

i.V. Stephan Dirks
Senior Director Product Engineering & Development
Business Line Hygienic Valves/ BU Valves & Pumps

Engineering for a better world.

**UK- Declaration of conformity by Supply of Machinery (Safety) Regulations 2008**

Manufacturer: **GEA Tuchenhagen GmbH**
**Am Industriepark 2-10**
**21514 Büchen, Germany**

Hereby, we declare that the machine designated in the following

| | |
|---|---|
| Designation: | Valve with actuator |
| Type: | VARIVENT® / ECOVENT® |

by virtue of its design and construction and in the versions placed on the market by us, complies with the essential health and safety requirements of the following directive:

| | |
|---|---|
| Relevant UK legislation: | Supply of Machinery (Safety) Regulations 2008 |
| Applicable harmonized standards, in particular: | EN ISO 12100: 2010 |

Remarks:

- In the event of a modification to the machine that was not agreed with us, this declaration loses its validity
- Furthermore, we declare that the specific technical documentation for this machine has been drawn up in accordance with Annex VII, Part A, and undertake to forward this documentation by means of data medium upon justified request by the national authorities

GEA Importer into UK

**GEA Mechanical Equipment UK Ltd.**
Westfalia House
Old Wolverton Road, Old Wolverton, Milton Keynes
MK12 5PY, United Kingdom

Person authorised for compilation and handover of technical documentation:

Mike Kiely
**GEA Mechanical Equipment UK Ltd.**
Westfalia House
Old Wolverton Road, Old Wolverton, Milton Keynes
MK12 5PY, United Kingdom

Büchen, 23 July 2025

Sören de Boon
Senior Vice President
Business Unit Valves & Pumps

i.V. Stephan Dirks
Senior Director Product Engineering & Development
Business Line Hygienic Valves/ BU Valves & Pumps

# 2 Safety

## 2.1 Intended use

The double-seal valve type C 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 disk to avoid pipe hammers when the valve is opened or closed.

If the valve is used in the opposite direction (valve closing), a damping cylinder can be used to avoid pressure drops.

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.

**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 Pressure equipment directive

The component is a piece of pressure equipment (without safety function) in the sense of the pressure equipment directive 2014/68/EU. Classified according to Annex II in category 1.

According to the scope of directive 2014/34/EC, article 1, paragraph 2, f, the exception of the directive applies, due to conformity with the machine directive 2006/42/EU.

The nominal diameters smaller than DN 25 are subject to article 4, paragraph 3 of the Pressure Equipment Directive which specifies sound engineering practice.

Nominal diameters ≥ IPS 4“; DN 125 valid for the fluid group II.

In the event of any deviations, GEA Tuchenhagen GmbH will supply a specific Declaration of Conformity.

### 2.1.3 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.

### 2.1.4 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 original spare parts supplied by GEA Tuchenhagen GmbH 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:<br>• Functionality of the component<br>• Operating sequences on the pump<br>• What to do in case of an emergency<br>• 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.<br>Sound knowledge in the following areas:<br>• Mechanical equipment<br>• Electrical equipment<br>• Pneumatic system<br>Authorization with regard to safety engineering standards to carry out the following tasks:<br>• Setting devices into operation<br>• Earthing of devices<br>• Marking of devices<br>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 Signage

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** |
|  Fig.1 | General hazard warning |
|  Fig.2 | Warning Crushing |
|  Fig.3 | Explosive atmosphere hazard warning |

## 2.8 Residual dangers

Dangerous situations can be avoided by safety-conscious and proactive behaviour of the staff 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:<br>1. Isolate from the power supply.<br>2. Take appropriate measures to prevent switch on.<br>3. Test absence of voltage.<br>4. Earthing and short-circuiting.<br>5. Cover or safeguard any adjacent live parts. |
| | Spring tension in the actuator | Danger to life caused by compression spring in the actuator. Do not open the actuator but return it to GEA Tuchenhagen for proper disposal. |

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

## 2.9 Danger zones

Please observe the following notes:

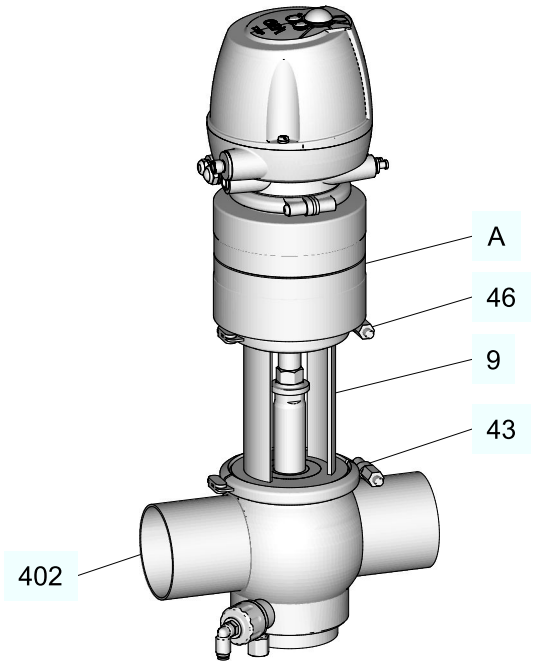


Fig.4

- 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 (402) 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, 46) is opened, as the released spring pretension will suddenly lift the actuator. Therefore, release the spring tension before detaching the clamp connection (43, 46) by supplying the actuator (A) with compressed air.
- Before starting any service, maintenance 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 assembling the valve be sure to wear suitable protective gloves.

# 3 Description

## 3.1 Design

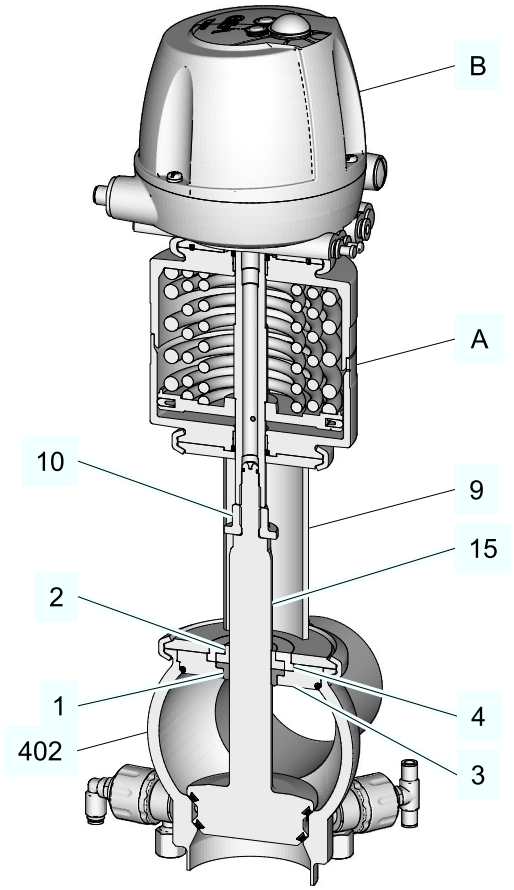


Fig.5

| Design | |
|---|---|
| **No.** | **Designation** |
| A | Actuator |
| B | T.VIS control top |
| 1 | Seal ring |
| 2 | Bearing |
| 3 | Seal disk |
| 4 | Bearing disc |
| 9 | Lantern |
| 10 | Spacer nut |
| 15 | Valve disc C |
| 402 | Valve housing |

## 3.2 Functional description

### 3.2.1 Actuator Function

The actuator is of the spring-closing type (Z). The valve is closed in the non-actuated position.

Identification on the T.VIS control top once the installation (SET-UP) has been completed:

- Green steady light (1): valve in non-actuated position
- Yellow steady light (1): valve in end position (actuated position)

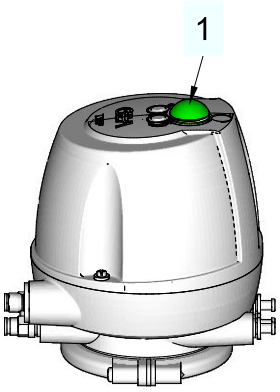


Fig.6

# 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

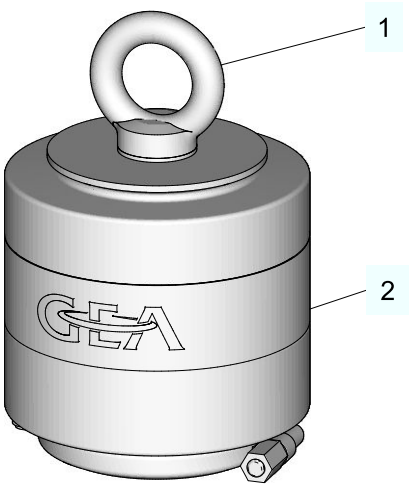


Fig.7

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 lifting gear 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 putting the unit down with a jerk.

### 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.

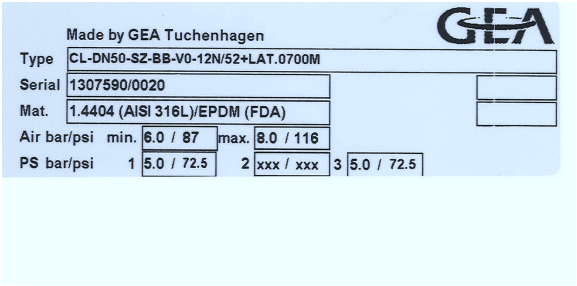


Fig.8

The type plate provides the following key data:

| Key data of the valve | |
|---|---|
| Type | Double seal valve C |
| Serial | Serial number |
| Material | 1.4404(AISI316L)/FKM (FDA) |
| Control air pressure bar/psi | min. 6.0 (87); max. 8.0 (116) |
| Product pressure bar/psi | 5.0 (72.5) |

## 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 150<br>1" to 6" OD |
| Material of product contact parts | Stainless steel 1.4404 |
| Fitting position | Vertical |

| Technical data: flushing valve SPV | | |
|---|---|---|
| **Designation** | **Description** | **Operating temperature** |
| SPV C | Piston material PVDF | < 80°C |
| SPV C-S | Piston material PEEK | > 80°C |

| Technical data: Ambient temperatures | |
|---|---|
| **Designation** | **Description** |
| Valve | 0 to 45°C, standard<br>< 0 °C: Use control air with low dew point. Protect valve rods against freezing. |
| Initiator | -20 to +80 °C (-4 ... +176 °F) |
| Control top T.VIS M-20, M-15, A-15, P-15 | -20 to +50 °C (-4 ... +122 °F) |
| Product temperature and operating temperature | depending on the sealing material |

| Technical data: compressed air supply, product pressure and CIP pressure | |
|---|---|
| **Designation** | **Description** |
| Air hose | |
| • Metric | Material PE-LD outside Ø 6 mm<br>Inside Ø 4 mm |
| • Inch | Material PA outside-Ø 6.35 mm<br>Inside Ø 4.3 mm |
| Control air | acc. to ISO 8573-1 |
| • Solid particle content: | Quality class 6<br>Particle size max. 5 µm<br>Particle density max. 5 mg/$m^3$ |
| • Water content: | Quality class 4<br>max. dew point +3 °C<br>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<br>preferably oil free<br>max. 1 mg oil in 1$m^3$ air |
| Control air pressure | 6 bar (87 psi), max. 8 bar (116 psi) configuration with standard drive<br>Alternative combinations of product pressure and control air pressure on request |

| Technical data: compressed air supply, product pressure and CIP pressure | |
|---|---|
| **Designation** | **Description** |
| Product pressure | 5 bar (72.5 psi) configuration with standard drive<br>max. 10 bar (116 psi) configuration with correspondingly designed actuator<br>> 10 bar (145.0 psi) for static applications and on request |
| CIP pressure | 2-5 bar (29-72.5 psi), a test may be necessary for higher CIP pressures |

## 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.

Due to the versatile conditions of use (e.g. usage duration, switching frequency, type and temperature of product and cleaning agents as well as usage environment), GEA Tuchenhagen recommends that the user carries out resistance tests.

Resistance:

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

| Table of sealing resistance / permitted operating temperature | | | | |
|---|---|---|---|---|
| **Medium** | **Maximum operating temperatures** | **Sealing material** | | |
| | | **EPDM** | **FKM** | **HNBR** |
| Alkalis up to 3% | up to 80 °C (176°F) | + | o | + |
| Alkalis up to 5% | up to 40 °C (104°F) | + | o | 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) | + | + | + |

| Table of sealing resistance / permitted operating temperature | | | | |
|---|---|---|---|---|
| **Medium** | **Maximum operating temperatures** | **Sealing material** | | |
| | | **EPDM** | **FKM** | **HNBR** |
| Inorganic acids up to 5% | up to 80 °C (176°F) | o | + | 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 | 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) |
| HNBR | -25...+140 °C (-13...+284 °F) |
| * The general resistance of the material does not correspond to the maximum operating temperature. | |

## 5.4 Pipe ends - General table of measurements

**Hint!**

**Not every valve is available in every size. Particulars of available sizes of valves see Chapter 5, Page 22.**

| Dimensions for Pipes in DN | | | | |
|---|---|---|---|---|
| **Metric DN** | **Outside diameter** | **Wall thickness** | **Inside diameter** | **Outside diameter acc. to DIN 11850** |
| 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 Pipes in Inch OD | | | | |
|---|---|---|---|---|
| **Inch OD** | **Outside diameter** | **Wall thickness** | **Inside diameter** | **Outside diameter acc. to BS 4825** |
| 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 Tool

| List of tools | |
|---|---|
| **Tool** | **Material no.** |
| Hose cutter | 407-065 |
| Belt wrench | 408-142 |
| V-ring insertion tool | 229-109.88 |
| Allen key, ends ground, a/f 3 | 408-121 |
| Open-ended wrench, ends ground, a/f 21-23 | 229-119.05 |
| Open-ended wrench a/f 13 | 408-034 |
| Open-ended wrench a/f 28 | 408-268 |
| Open-ended wrench, a/f 30-32 | 408-041 |

| List of tools | |
|---|---|
| **Tool** | **Material no.** |
| Eyebolt | 229-104.98 |
| Assembly tool | 221-105.99 |

## 5.6 Lubricants

| **Lubricants** | **Material no.** |
|---|---|
| Rivolta F.L.G. MD-2 | 413-071 |
| PARALIQ GTE 703 | 413-064 |

## 5.7 Weights

| **Size** | **Weight [kg]** |
|---|---|
| DN 25; 1" | 8 |
| DN 40; 1.5" | 10 |
| DN 50; 2" | 10.2 |
| DN 65; 2.5" | 15.4 |
| DN 80; 3" | 15.7 |
| DN 100; 4" | 23.3 |
| DN 125 | 49.1 |
| DN 150; 6" | 55.2 |

# 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 valve is normally installed in upright position. Care must be taken to ensure that the valve housing, the pipe system, and the leakage cavity can drain properly.

If the valve is installed in the horizontal position, pay attention that the vent hole in the actuator is aligned horizontally on one side.

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 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 hinged clamps: 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.

## 6.4 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 pressurizing 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.

**Notice**

**Welding distortions**

An open housing can warp during welding.

► To avoid welding distortions, always seal the housing before welding.

Carry out the following steps:

1. Release the spring tension.
2. Remove the valve insert, see chapter Section 10.5, Page 43.
3. Weld the housing, without sealing rings, into position, ensuring that the connection is free of stress.
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 depressurize 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.**

## 6.5 Pneumatic connections

### 6.5.1 Air Requirement

| Actuator type | Actuator Ø [mm] | Air requirement ($dm^3_n$/Stroke) $dm^3_n$ at 1.01325 bar at 0 °C as per DIN 1343 | Use |
|---|---|---|---|
| A... | 98 | 0.16 | DN 25 - DN 100<br>1" - 4" OD<br>2" - 4" IPS |
| B... | 109 | 0.26 | |
| C... | 135 | 0.42 | |
| D... | 170 | 0.70 | |
| E... | 210 | 1.10 | |
| R...[1] | 170 | 1.60 | |
| S...[1] | 210 | 2.00 | |
| T...[1] | 210 | 2.20 | |
| D...6 | 170 | 1.30 | DN 125 + DN 150<br>6" OD, 6" IPS |
| E...6 | 210 | 2.00 | |
| S...6 | 261 | 3.20 | |
| T...6[1] | 210 | 4.00 | |
| U...6[1] | 261 | 5.20 | |

[1] Actuators with booster cylinder for increasing the pneumatic actuating force when lower control air pressures are used

### 6.5.2 Establishing Hose Connections

To ensure reliable operation, the compressed air hoses must be cut exactly at a right angle.

Tools required:

- A hose cutter

Carry out the following steps:

1. Establish the hose connections in accordance with the hose connection diagram, see Section 6.5.3, Page 32.
2. Shut off the compressed air supply.
3. Use the hose cutter to cut the pneumatic hoses at a right angle.
4. Push the air hose into the air connector on the control top.
5. Re-open the compressed air supply.

→ Hose connection has been established.

### 6.5.3 Hose fitting valve C

With T.VIS connection

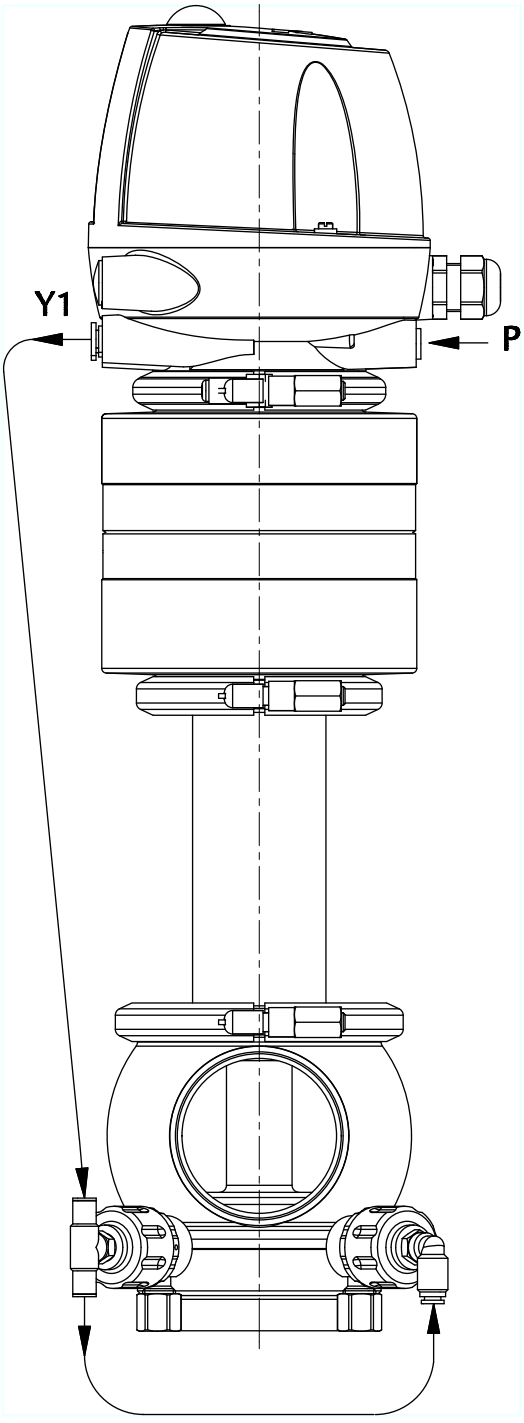


Fig.9

With 0 connection

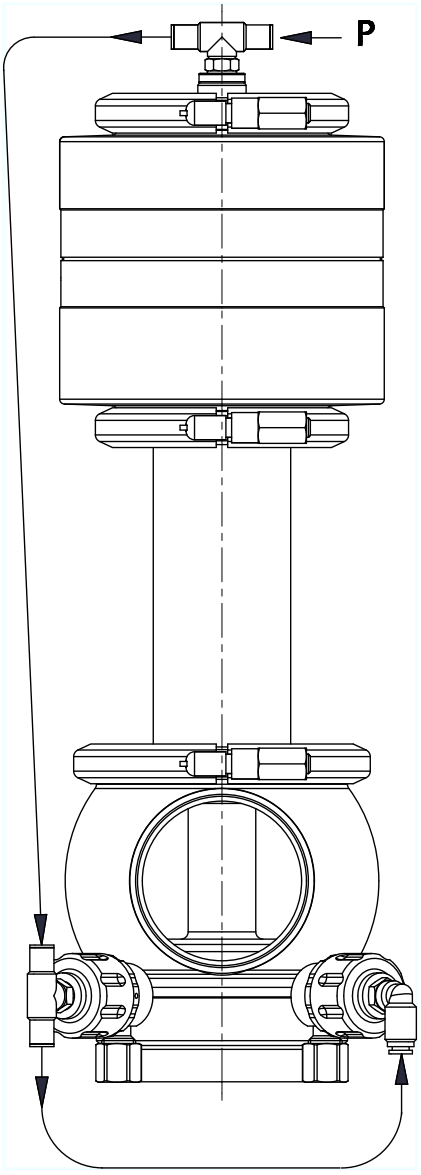


Fig.10

With T.VIS connection and actuator Z

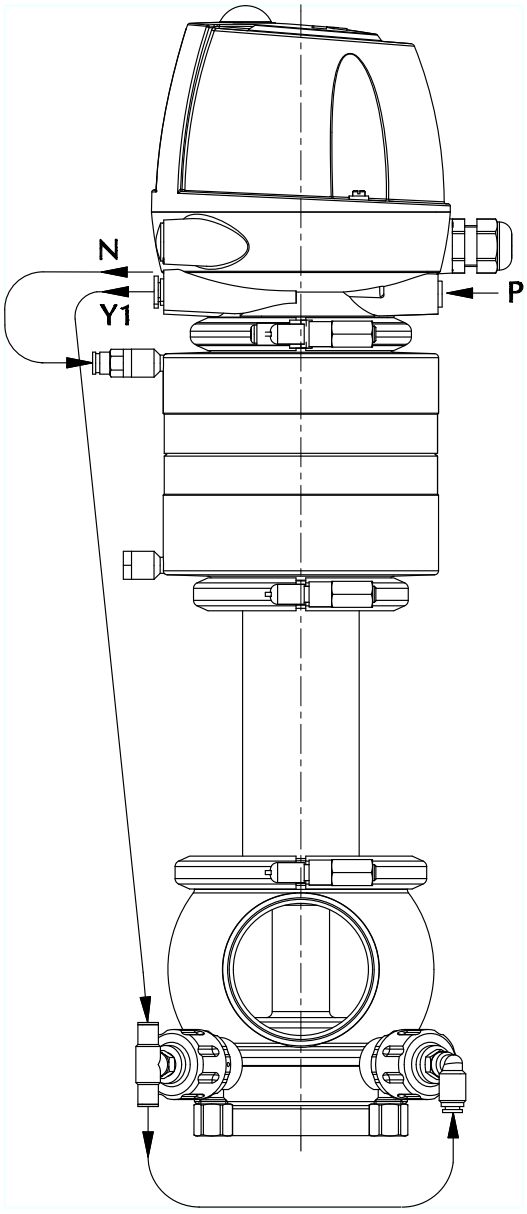


Fig.11

ATEX variant with actuator Z

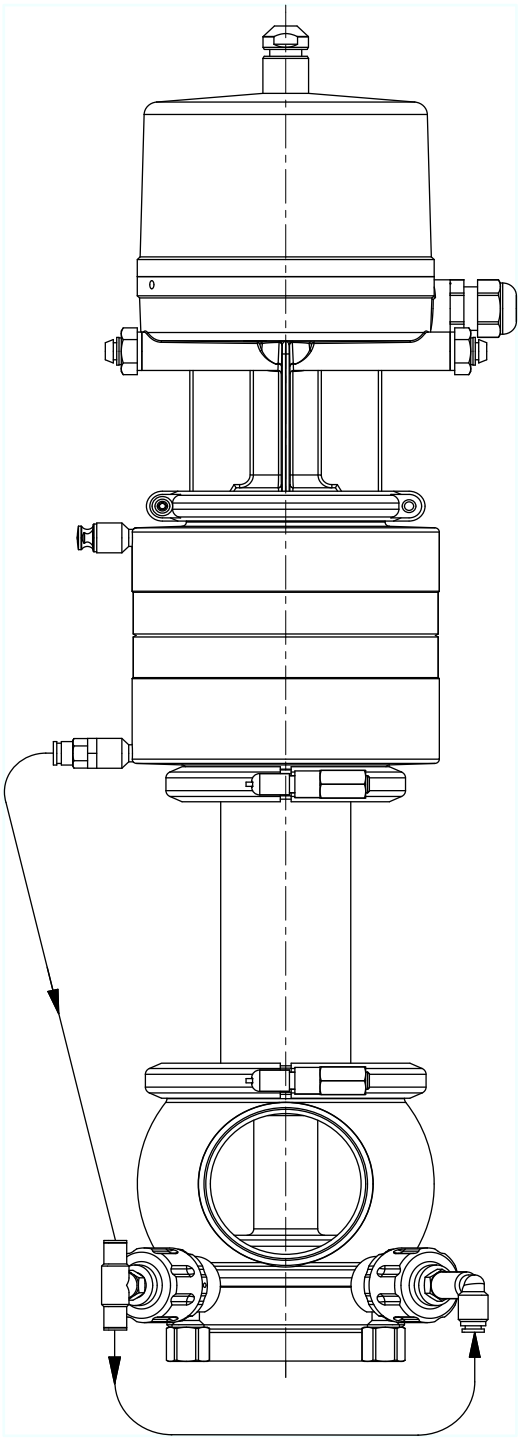

Fig.12

View without hood

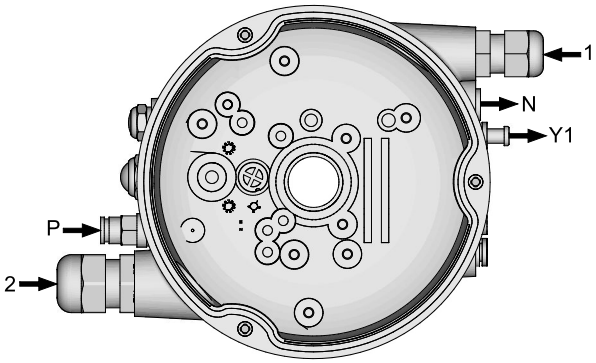


Fig.13

| Item | Designation |
|---|---|
| 1 | External initiator |
| 2 | Electrical connections |

**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.**

## 6.6 Electrical connection with T.VIS 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.

**Explosive gases or dusts**

An explosion can result in serious personal injury or death.

► Observe the installation and operating regulations for use in potentially explosive areas.

Carry out the following steps:

1. Connect in accordance with the connection diagram and the instructions in the corresponding operating instructions for control tops T.VIS M-15, A-15 or T.VIS P-15.

→ Done

**Hint!**

**The proximity switches are factory set. During transport and installation it can happen that the settings are changed, so that readjustment may be required (see the Operating Instructions for the control top).**

# 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.

### 9.1.3 Cleaning the leakage cavity

To clean the leakage cavity, two flush valves are fitted in the seat area of the double-seal valve C. Cleaning liquid is flushed into the leakage cavity through one of the flush valves. The cleaning medium is discharged via the second flush valve. This valve is also used for leakage detection in the event of seal damage. If valve C is only equipped with a flush valve, this is only for leakage detection and discharge. In this case, the leakage cavity cannot be cleaned separately.

The recommended admission pressure for the cleaning medium supply at the inlet valve to the leakage cavity is 2.5 bar ± 0.5 bar. Pressure build-up between the seals on the valve disc should always be avoided. Non-pressurised discharging at the outlet valve is therefore required. The duration of the flushing operation via the flush valve depends on the type of soiling and typically ranges between 10 and 90 seconds.

| **Flow rates for cleaning the leakage cavity** | | | | | | |
|---|---|---|---|---|---|---|
| Nominal width | DN25<br>1" | DN40, DN50<br>1.5", 2" | DN 65, DN80<br>2.5", 3" | DN100<br>4" | DN125 | DN150<br>6" |
| Kvs values (l/h) | 127 | 453 | 486 | 486 | 1490 | 1490 |

### 9.1.4 Rinsing operations

The table lists the values for the duration and number of rinsing operations.

| **Medium** | **Duration [s]** | **Number of rinsing operations** | |
|---|---|---|---|
| Beer | 1...2 | 2...3 | During every cleaning phase:<br>1. Prerinse<br>2. Hot caustic<br>3. Intermediate rinse<br>4. Acid<br>5. Rinsing |
| Yeast | 1...2 | 2...3 | |
| Fruit juices | 2...6 | 3 | |
| Milk | 2…5 | 3 | |
| Yoghurt | 3…5 | 3 | |

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 usually 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 Maintenance

## 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 20.

## 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
   - V-ring 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 Prior to disassembly

Prerequisite:

- Make sure that during maintenance and repair 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.
4. Take the valve out of the pipe section, with all housings and housing connections if possible.

→ Done

## 10.5 Disassembling the Valve

### 10.5.1 Ventilating the Actuator for Disassembly

The actuator can be ventilated for disassembly via the pilot valve or with the assembly tool.

Requirement:

- The pneumatic and electrical connections at the site can remain on the control top.

**Via pilot valve**

**Hint!**

**The pneumatic and electrical connections can remain on the connecting head.**

Carry out the following steps:

1. Remove the hood (B1) of the control top.

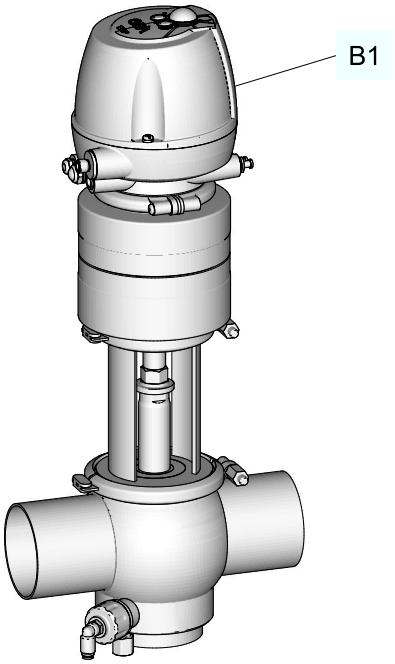


Fig.14

2. Turn the screw (S) of the handheld control element on the pilot valve, see Chapter "Commissioning, step 2 - Valve actuation" in the operating instructions for the control top T.VIS.

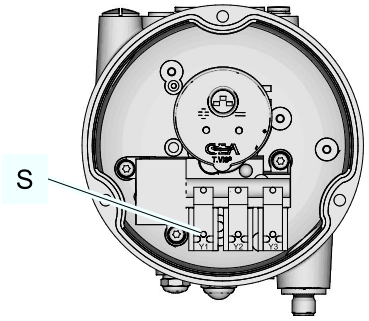


Fig.15

→ The valve is ventilated.

**With assembly tool**

**⚠ Caution!**

**The permanent magnet on the switch bar is fragile.**

Mechanical impact may break the permanent magnet.

► Protect the permanent magnet from mechanical impact.

**⚠ Caution!**

**Influence on electronic and mechanical components.**

Data carriers may be erased by the permanent magnet.

► Do not place any mechanical or electronic components next to the permanent magnet.

**⚠ Caution!**

**Data loss**

Data may be lost by welding work near the connecting head.

► Do not carry out any welding work near the connecting head.

Carry out the following steps:

1. Remove the clamps (R) between control top and actuator.

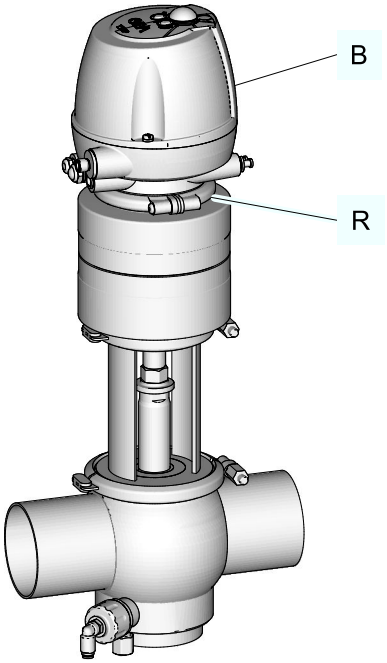


Fig.16

2. Pull off the control top (B) upwards.
3. Mount the assembly tool (M), part no. 221-105.99, onto the actuator (A) via the switch bar.

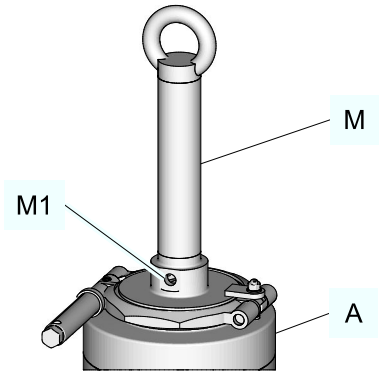


Fig.17

→ The valve can be ventilated at M1.

### 10.5.2 Removing the Valve Insert

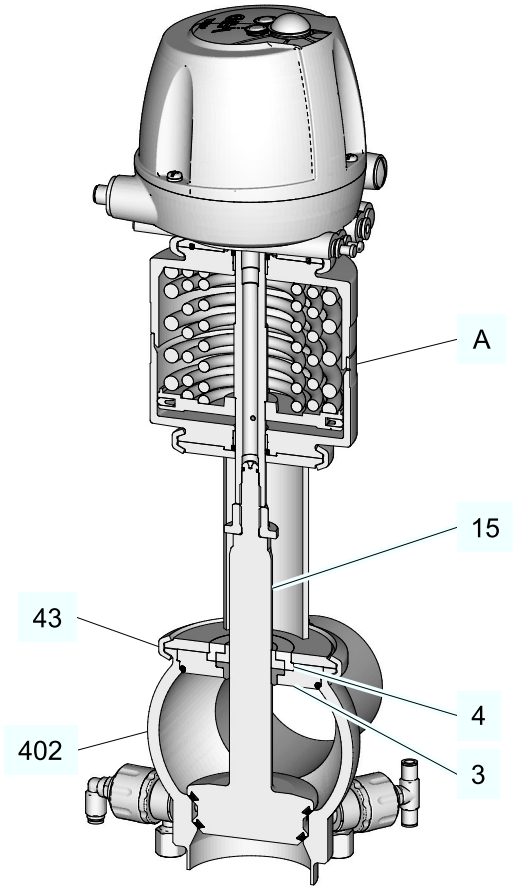


Fig.18

**Notice**

**The stem of the valve disc (15) is a sensitive component.**

Damage to these parts can result in malfunction.

► The bearing disc (4) and the sealing disc (3) must not hit the stem (15) of the valve disc when the valve insert is withdrawn.
► Do not place the valve insert down on the valve disc. Therefore lay down the valve insert.

**⚠ Warning!**

**Spring tension in the valve**

Danger of injury when detaching the clamp connection (43.1) as the released spring pretension will suddenly lift the actuator.

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

Carry out the following steps:

1. Ventilate the valve.

→ The valve disc (15) is raised.

2. Remove the clamp connection (43).
3. Vent the actuator.

4. Carefully pull out the valve along with actuator (A) from the housing (402).

→ Done

### 10.5.3 Separating the Valve from the Actuator

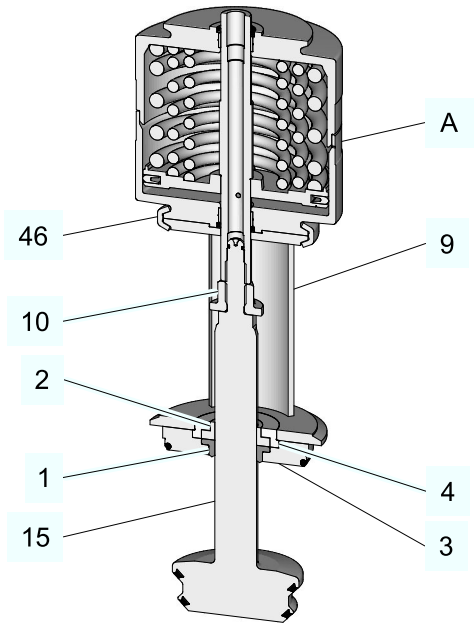


Fig.19

**Notice**

**The stem of the valve disc (15) is a sensitive component.**

Damage to these parts can result in malfunction.

► The bearing disc (4) and the sealing disc (3) must not hit the stem (15) of the valve disc when the valve insert is withdrawn.
► Do not place the valve insert down on the valve disc. Therefore lay down the valve insert.

Carry out the following steps:

1. Unscrew the switch bar.
2. Release but do not remove the clamp connection (46) between the actuator and the lantern.
3. Secure actuator (A) with a strap wrench.
4. Place an open-ended wrench on the spacer nut (10), use a strap wrench to turn the actuator (A) and release the valve disc (15).
5. Unscrew the valve disc (15) along with the bearing disc (4), the bearing (2), the gasket (1) and the sealing washer (3).
6. Unscrew the spacer nut (10) from the valve disc using 2 open-ended wrenches.
7. Pull off the bearing disc (4) with bearing (2) and sealing washer (3) with gasket (1) from the valve disc (15).

8. Remove the clamp connection (46) between the lantern and the actuator.
9. Remove the lantern (9).

→ Done

### 10.5.4 Removing the flush valve C

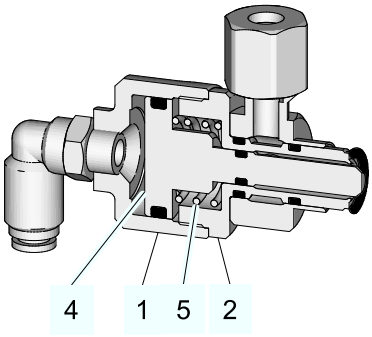


Fig.20

Carry out the following steps:

1. Depressurise the valve.
2. Take off the air hose.
3. Unscrew the air hose from the housing at surface (2).
4. Remove cylinder SPV-C (1) from housing SPV-C (2).
5. Take out spring (5) from cylinder SPV-C (1).
6. Pull piston SPV-C (4) out of cylinder SPV-C (1).

→ Done

## 10.6 Maintenance

### 10.6.1 Cleaning the Valve

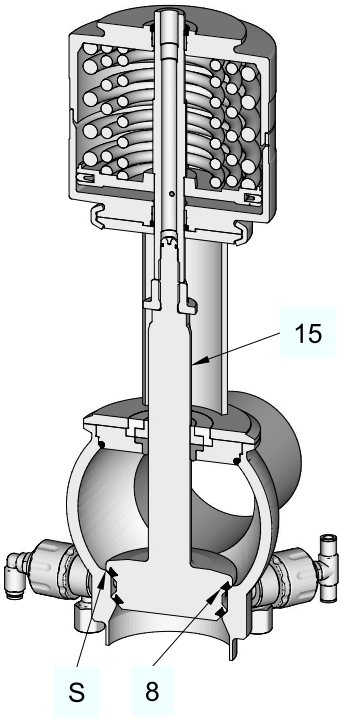


Fig.21

**Notice**

**The stem of the valve disc (15), the housing seat, the valve seat (S) and the V-ring groove (8) 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 cleaning mediums which do not damage the materials of the control top (PPE, PA).

Carry out the following steps:

1. Valve disassembly, see “Valve disassembly” (Section 10.5, Page 43)
2. Carefully clean the individual parts.

→ Done

### 10.6.2 Replacing Seals

**Hint!**

**Replace defective seals to ensure the tightness of the valve. Always use original spare parts.**

**Replacing the V-Ring**

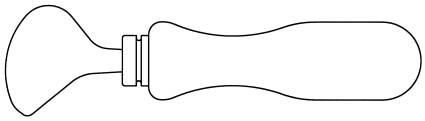

Fig.22: V-ring insertion tool

Prerequisite:

- Insert V-Ring without grease. To facilitate fitting, use water with a drop of washing-up liquid to remove the surface tension. In order that no rust is transferred, the washing-up liquid solution must be made up in a ceramic, plastic, or stainless steel container.

Tools required:

- V-ring insertion tool

**⚠ Caution!**

**Danger of injury!**

The scriber can slip off when the V-ring is removed

► Grip the valve disk in a vice with protected jaws.
► Unscrew the curved side of the scriber.

Carry out the following steps:

1. Put a scriber into the V-ring and take it out.

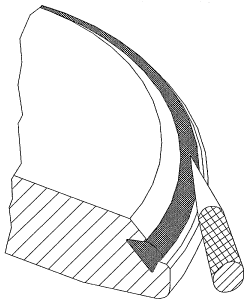

Fig.23

2. Before fitting, wet the V-ring on the side not in contact with product (rear side). Pay attention that water does not drip into the V-ring groove on the valve disk.
3. Put in the V-ring. Make sure the installation position of the V-ring is correct (see illustration).

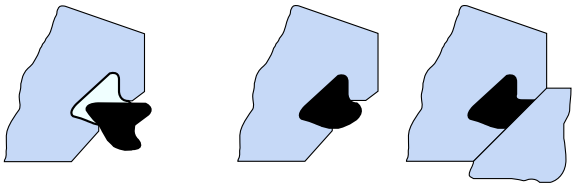

Fig.24

4. Use the insertion tool to press in the V-ring – evenly press in at several opposite points along the circumference.

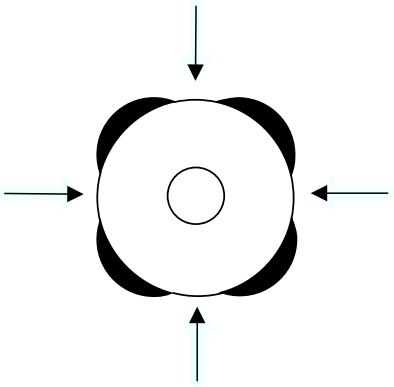

Fig.25

5. Insert the V-ring evenly.
6. Replace all the other seals identified in the spare parts lists.

→ Done

**Hint!**

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

### 10.6.3 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.
► For product contact seals only use suitable greases and oils.
► Observe the safety data sheets issued by the lubricant manufacturer!

Carry out the following steps:

1. Lightly grease the thread of the valve disc and all screws.
2. Grease the thread on the housing of the flush valve at the indicated positions (1, 2).

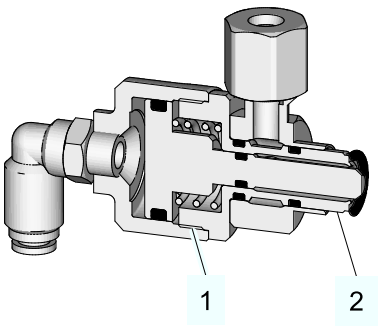


Fig.26

3. Grease all seals – including the O-rings at the top and bottom of the actuator piston rod – very thinly.

   **!** Do not grease the V-ring.

4.

→ Done

**Hint!**

**GEA Tuchenhagen 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. They do not affect the taste or the consistency of the products and are compatible with the seals in contact with product.**

**PARALIQ GTE 703 can be ordered from GEA Tuchenhagen under material no. 413-064, and Rivolta F.L.G. MD-2 can be ordered under material no. 413-071. Using other types of grease can result in malfunctions or in premature seal failure. The warranty will also become null and void.**

**A Manufacturer's Declaration for these products can be obtained from GEA Tuchenhagen if required.**

**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!**

## 10.7 Installation

Assemble the valve in reverse order of disassembly. Observe the notes and instructions given in the following sections when doing so.

### 10.7.1 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 Tuchenhagen 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 Tuchenhagen.**

### Fitting the cleaning hose

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

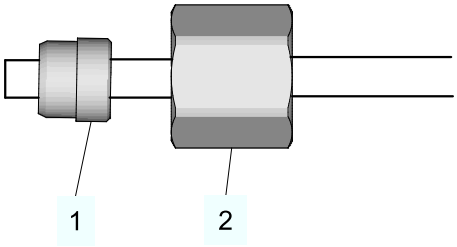


Fig.27

### 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.

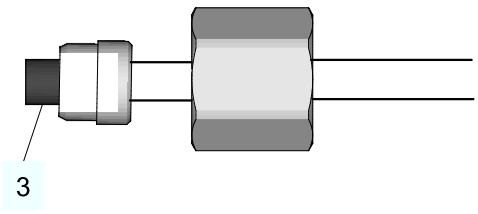


Fig.28

→ 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

### 10.7.2 Torques for the Clamps and Clamp Connections

Tighten the clamp connection and semi-rings on the valve to the torques specified in the table.

| **Torques** | | **[Nm]** | **[lbft]** |
|---|---|---|---|
| Clamps on the control top | | 1 | 0.7 |
| Clamp connection cast half rings | M6 | 9 | 6.6 |
| Clamp connection cast half rings | M8 | 22 | 16.2 |
| Cast clamps | M10 | 45 | 33 |

### 10.7.3 Checking the function

**Setting the valve stroke**

Carry out the following steps:

1. Actuate the valve with compressed air.
2. Check the stroke of the valve in accordance with (Page 54).

→ The stroke is set.

**Strokes Depending on Size**

| **Valve Stroke** | |
|---|---|
| **Valve size** | **Valve stroke [mm]** |
| Metric | |
| 25 | 22 |
| 40 | 22 |

| Valve Stroke | |
|---|---|
| **Valve size** | **Valve stroke [mm]** |
| 50 | 30 |
| 65 | 30 |
| 80 | 30 |
| 100 | 30 |
| 125 | 60 |
| 150 | 60 |
| Inch OD | |
| 1" | 18 |
| 1.5" | 22 |
| 2" | 30.5 |
| 2.5" | 31 |
| 3" | 29 |
| 4" | 30.5 |
| 6" | 60 |
| Inch IPS | |
| 2" | 30 |
| 3" | 30 |
| 4" | 30 |
| 6" | 60 |

# 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 instructions.

| Malfunction | Cause | Remedy |
|---|---|---|
| Valve does not work | Fault in the control system | 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 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 actuator and control top are dry (friction losses) | Grease O-rings |
| Leakage in the area of the valve housing | Housing O-rings defective | Valve disassembly - Housing Replace the O-Ring |
| Leakage in the lantern | Sealing ring defective | Replace the sealing ring |
| Leakage in the leakage cavity | V-rings defective | Replace the V-rings |

# 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 20.

## 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 24 kN.**

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

► Never open the actuator.
► GEA Tuchenhagen accepts unopened actuators and arranges for proper disposal free of charge.

Carry out the following steps:

1. Remove the actuator.
2. Pack the actuator safely and send it to GEA Tuchenhagen GmbH.

→ Done

# 13 Parts list - Double seal valve C

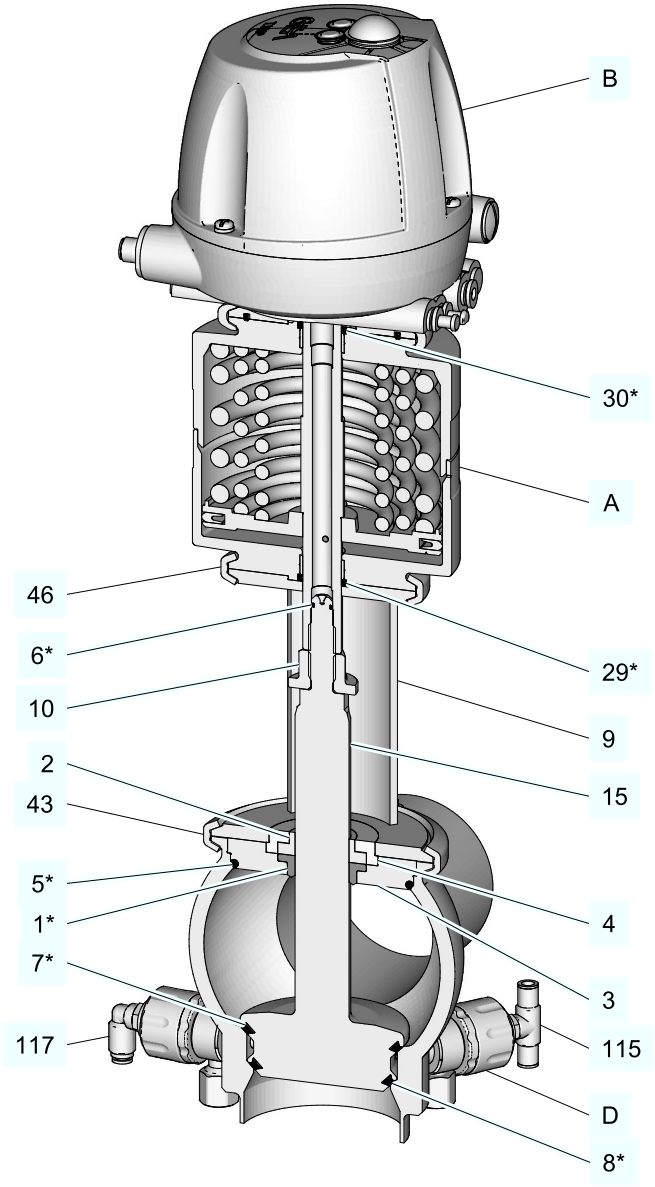


Fig.29

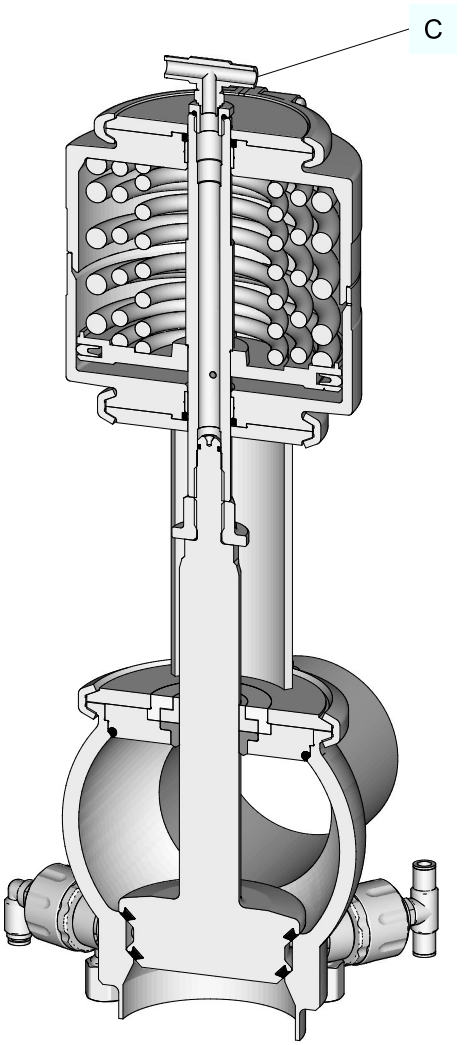


Fig.30

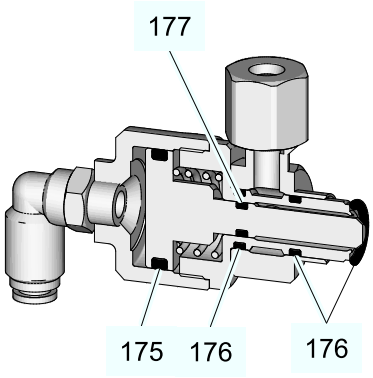


Fig.31: Flush valve SPV-C/SPV-C-S

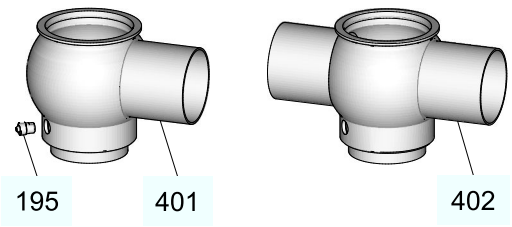


Fig.32: Housing combinations

| Item | Designation | Material | DN 25 | DN 40 | DN 50 | DN 65 |
|---|---|---|---|---|---|---|
| Seal set complete 1) | | EPDM | 221-528.44 | 221-511.74 | 221-511.74 | 221-511.75 |
| | | FKM | 221-528.45 | 221-519.53 | 221-519.53 | 221-519.54 |
| | | HNBR | 221-528.97 | 221-519.85 | 221-519.85 | 221-519.86 |
| 1* | Seal ring | EPDM | 924-084 | 924-084 | 924-084 | 924-085 |
| | | FKM | 924-082 | 924-082 | 924-082 | 924-083 |
| | | HNBR | 924-311 | 924-311 | 924-311 | 924-313 |
| 2 | Bearing | PTFE/carbon | 935-001 | 935-001 | 935-001 | 935-002 |
| | Bearing, 3A | SUSTA-PVDF | 935-098 | 935-098 | 935-098 | 935-099 |
| 3 | Seal disk | 1.4404 | 221-141.01 | 221-141.02 | 221-141.02 | 221-141.03 |
| 4 | Bearing disc | 1.4301 | 221-142.01 | 221-142.02 | 221-142.02 | 221-142.03 |
| 5* | O-ring | EPDM | 930-309 | 930-144 | 930-144 | 930-150 |
| | | FKM | 930-168 | 930-171 | 930-171 | 930-176 |
| | | HNBR | 930-632 | 930-633 | 930-633 | 930-634 |
| 6* | O-ring | NBR | 930-004 | 930-004 | 930-004 | 930-004 |
| **7* | V-ring | EPDM | 932-046 | 932-021 | 932-021 | 932-024 |
| | | FKM | 932-030 | 932-033 | 932-033 | 932-035 |
| | | HNBR | 932-087 | 932-088 | 932-088 | 932-090 |
| **8* | V-ring | EPDM | 932-017 | 932-019 | 932-019 | 932-023 |
| | | FKM | 932-029 | 932-032 | 932-032 | 932-034 |
| | | HNBR | 932-085 | 932-084 | 932-084 | 932-089 |
| 9 | Lantern | 1.4301 | 221-121.01 | 221-121.02 | 221-121.02 | 221-121.03 |
| 10 | Spacer nut | 1.4301 | 221-147.02 | 221-147.02 | 221-147.02 | 221-147.01 |
| 15 | Valve disc C | 1.4404 | 221-463.06 | 221-463.01 | 221-463.01 | 221-463.02 |
| 29* | O-ring | NBR | 930-026 | 930-026 | 930-026 | 930-026 |
| 30* | O-ring | NBR | 930-026 | 930-026 | 930-026 | 930-026 |
| 43 | Clamp join KL | 1.4401 | 221-507.02 | 221-507.04 | 221-507.04 | 221-507.09 |
| 46 | Clamp join KL | 1.4401 | 221-507.06 | 221-507.06 | 221-507.06 | 221-507.06 |
| 115 | T-screw fitting G1/8" (metric) | Brass, nickel-plated | 933-991 | 933-991 | 933-991 | 933-991 |
| | T-screw fitting G1/8" (inch) | Brass, nickel-plated | 933-959 | 933-959 | 933-959 | 933-959 |
| 117 | Angular screw fitting (metric) | Brass, nickel-plated | 933-475 | 933-475 | 933-475 | 933-475 |
| | Angular screw fitting (inch) | Brass, nickel-plated | 933-979 | 933-979 | 933-979 | 933-979 |
| 175* | O-ring | NBR | 930-029 | 930-029 | 930-029 | 930-029 |
| 176* | O-ring | EPDM | 930-677 | 930-677 | 930-677 | 930-677 |
| | | FKM | 930-684 | 930-684 | 930-684 | 930-684 |
| 177* | O-ring | EPDM | 930-678 | 930-678 | 930-678 | 930-678 |
| | | FKM | 930-1015 | 930-1015 | 930-1015 | 930-1015 |
| 195*** | Plug | PVDF | 221-464.07 | 221-464.07 | 221-464.07 | 221-464.07 |
| | Plug with O-ring | 1.4404+EPDM | 221-464.12 | 221-464.12 | 221-464.12 | 221-464.12 |
| 401 | Housing CL | 1.4404 | 221-461.13 | 221-461.10 | 221-461.15 | 221-461.09 |
| 402 | Housing CT | 1.4404 | 221-462.11 | 221-462.12 | 221-462.14 | 221-462.15 |

| Item | Designation | Material | DN 25 | DN 40 | DN 50 | DN 65 |
|---|---|---|---|---|---|---|
| A | Actuator VARIVENT® | | See parts list/dimensions sheet for VARIVENT® actuator | | | |
| B | Control top T.VIS® | | See parts list for control top T.VIS® | | | |
| C | Connection 0/C | | See parts list for connection 0/C | | | |
| D | Flush valve SPV-C (< 80°C)<br>Flush valve SPV-C-S (> 80°C) | | See parts list for flush valve SPV | | | |
| Grease RIVOLTA F.L.G. 100g tube not included with seal set.<br>** Do not grease item 7 and 8 | | | | | 413-136 | |
| 1) The seal set includes items 1, 5, 6, 7, 8, 29, 30, 175, 176 and 177<br>Items marked with an * are wearing parts<br>*** Pos. 195 optional, if only one flush valve is used<br>PVDF = Standard<br>1.4404+EPDM = if the valve is used at over 80°C | | | | | | |

| Item | Designation | Material | DN 80 | DN 100 | DN 125 | DN 150 |
|---|---|---|---|---|---|---|
| Seal set complete 1) | | EPDM | 221-511.75 | 221-511.76 | 221-511.77 | 221-511.78 |
| | | FKM | 221-519.54 | 221-519.55 | 221-519.56 | 221-519.57 |
| | | HNBR | 221-519.86 | 221-004179 | -- | -- |
| 1* | Seal ring | EPDM | 924-085 | 924-085 | 924-088 | 924-088 |
| | | FKM | 924-083 | 924-083 | 924-087 | 924-087 |
| | | HNBR | 924-313 | 924-313 | -- | -- |
| 2 | Bearing | PTFE/carbon | 935-002 | 935-002 | 935-003 | 935-003 |
| | Bearing, 3A | SUSTA-PVDF | 935-099 | 935-099 | 935-102 | 935-102 |
| 3 | Seal disk | 1.4404 | 221-141.03 | 221-141.04 | 221-141.07 | 221-141.05 |
| 4 | Bearing disc | 1.4301 | 221-142.03 | 221-142.03 | 221-142.04 | 221-142.04 |
| 5* | O-ring | EPDM | 930-150 | 930-156 | 930-372 | 930-260 |
| | | FKM | 930-176 | 930-178 | 930-409 | 930-259 |
| | | HNBR | 930-634 | 930-863 | -- | -- |
| 6* | O-ring | NBR | 930-004 | 930-004 | 930-007 | 930-007 |
| **7* | V-ring | EPDM | 932-024 | 932-028 | 932-060 | 932-042 |
| | | FKM | 932-035 | 932-039 | 932-062 | 932-041 |
| | | HNBR | 932-090 | 932-100 | -- | -- |
| **8* | V-ring | EPDM | 932-023 | 932-027 | 932-059 | 932-045 |
| | | FKM | 932-034 | 932-038 | 932-063 | 932-044 |
| | | HNBR | 932-089 | 932-099 | -- | -- |
| 9 | Lantern | 1.4301 | 221-121.03 | 221-121.04 | 221-121.06 | 221-121.22 |
| 10 | Spacer nut | 1.4301 | 221-147.02 | 221-147.02 | 221-147.02 | 221-147.01 |
| 15 | Valve disc C | 1.4404 | 221-463.03 | 221-463.04 | 221-463.07 | 221-463.08 |
| 29* | O-ring | NBR | 930-026 | 930-026 | 930-035 | 930-035 |
| 30* | O-ring | NBR | 930-026 | 930-026 | 930-026 | 930-026 |
| 43 | Clamp join KL | 1.4401 | 221-507.09 | 221-507.11 | 221-507.13 | 221-507.14 |
| 46 | Clamp join KL | 1.4401 | 221-507.06 | 221-507.06 | 221-507.11 | 221-507.11 |
| 115 | T-screw fitting G1/8" (metric) | Brass, nickel-plated | 933-991 | 933-991 | 933-991 | 933-991 |
| | T-screw fitting G1/8" (inch) | Brass, nickel-plated | 933-959 | 933-959 | 933-959 | 933-959 |
| 117 | Angular screw fitting (metric) | Brass, nickel-plated | 933-475 | 933-475 | 933-475 | 933-475 |
| | Angular screw fitting (inch) | Brass, nickel-plated | 933-979 | 933-979 | 933-979 | 933-979 |
| 175* | O-ring | NBR | 930-029 | 930-029 | 930-029 | 930-029 |
| 176* | O-ring | EPDM | 930-677 | 930-677 | 930-677 | 930-677 |
| | | FKM | 930-684 | 930-684 | 930-684 | 930-684 |
| 177* | O-ring | EPDM | 930-678 | 930-678 | 930-678 | 930-678 |
| | | FKM | 930-1015 | 930-1015 | 930-1015 | 930-1015 |
| 195*** | Plug | PVDF | 221-464.07 | 221-464.07 | 221-464.07 | 221-464.07 |
| | Plug with O-ring | 1.4404+EPDM | 221-464.12 | 221-464.12 | 221-464.12 | 221-464.12 |
| 401 | Housing CL | 1.4404 | 221-461.14 | 221-461.08 | 221-461.11 | 221-461.16 |
| 402 | Housing CT | 1.4404 | 221-462.08 | 221-462.09 | 221-462.13 | 221-462.16 |

| Item | Designation | Material | DN 80 | DN 100 | DN 125 | DN 150 |
|---|---|---|---|---|---|---|
| A | Actuator VARIVENT® | | See parts list/dimensions sheet for VARIVENT® actuator | | | |
| B | Control top T.VIS® | | See parts list for control top T.VIS® | | | |
| C | Connection 0/C | | See parts list for connection 0/C | | | |
| D | Flush valve SPV-C (< 80°C)<br>Flush valve SPV-C-S (> 80°C) | | See parts list for flush valve SPV | | | |
| Grease RIVOLTA F.L.G. 100g tube not included with seal set.<br>** Do not grease item 7 and 8 | | | | | 413-136 | |
| 1) The seal set includes items 1, 5, 6, 7, 8, 29, 30, 175, 176 and 177<br>Items marked with an * are wearing parts<br>*** Pos. 195 optional, if only one flush valve is used<br>PVDF = Standard<br>1.4404+EPDM = if the valve is used at over 80°C | | | | | | |

| Item | Designation | Material | 1" OD | 1.5" OD | 2" OD | 2.5" OD |
|---|---|---|---|---|---|---|
| Seal set complete 1) | | EPDM | 221-528.44 | 221-511.74 | 221-511.74 | 221-511.75 |
| | | FKM | 221-528.45 | 221-519.53 | 221-519.53 | 221-519.54 |
| | | HNBR | 221-528.97 | 221-519.85 | 221-519.85 | 221-519.86 |
| 1* | Seal ring | EPDM | 924-084 | 924-084 | 924-084 | 924-085 |
| | | FKM | 924-082 | 924-082 | 924-082 | 924-083 |
| | | HNBR | 924-311 | 924-311 | 924-311 | 924-313 |
| 2 | Bearing | PTFE/carbon | 935-001 | 935-001 | 935-001 | 935-002 |
| | Bearing, 3A | SUSTA-PVDF | 935-098 | 935-098 | 935-098 | 935-099 |
| 3 | Seal disk | 1.4404 | 221-141.01 | 221-141.02 | 221-141.02 | 221-141.03 |
| 4 | Bearing disc | 1.4301 | 221-142.01 | 221-142.02 | 221-142.02 | 221-142.03 |
| 5* | O-ring | EPDM | 930-309 | 930-144 | 930-144 | 930-150 |
| | | FKM | 930-168 | 930-171 | 930-171 | 930-176 |
| | | HNBR | 930-632 | 930-633 | 930-633 | 930-634 |
| 6* | O-ring | NBR | 930-004 | 930-004 | 930-004 | 930-004 |
| **7* | V-ring | EPDM | 932-046 | 932-021 | 932-021 | 932-024 |
| | | FKM | 932-030 | 932-033 | 932-033 | 932-035 |
| | | HNBR | 932-086 | 932-087 | 932-087 | 932-088 |
| **8* | V-ring | EPDM | 932-017 | 932-019 | 932-019 | 932-023 |
| | | FKM | 932-029 | 932-032 | 932-032 | 932-034 |
| | | HNBR | 932-085 | 932-084 | 932-084 | 932-089 |
| 9 | Lantern | 1.4301 | 221-121.01 | 221-121.07 | 221-121.07 | 221-121.08 |
| 10 | Spacer nut | 1.4301 | 221-147.02 | 221-147.02 | 221-147.02 | 221-147.01 |
| 15 | Valve disc C | 1.4404 | 221-463.06 | 221-463.01 | 221-463.01 | 221-463.02 |
| 29* | O-ring | NBR | 930-026 | 930-026 | 930-026 | 930-026 |
| 30* | O-ring | NBR | 930-026 | 930-026 | 930-026 | 930-026 |
| 43 | Clamp join KL | 1.4401 | 221-507.02 | 221-507.04 | 221-507.04 | 221-507.09 |
| 46 | Clamp join KL | 1.4401 | 221-507.06 | 221-507.06 | 221-507.06 | 221-507.06 |
| 115 | T-screw fitting G1/8" (metric) | Brass, nickel-plated | 933-991 | 933-991 | 933-991 | 933-991 |
| | T-screw fitting G1/8" (inch) | Brass, nickel-plated | 933-959 | 933-959 | 933-959 | 933-959 |
| 117 | Angular screw fitting (metric) | Brass, nickel-plated | 933-475 | 933-475 | 933-475 | 933-475 |
| | Angular screw fitting (inch) | Brass, nickel-plated | 933-979 | 933-979 | 933-979 | 933-979 |
| 175* | O-ring | NBR | 930-029 | 930-029 | 930-029 | 930-029 |
| 176* | O-ring | EPDM | 930-677 | 930-677 | 930-677 | 930-677 |
| | FKM | 930-684 | 930-684 | 930-684 | 930-684 | 930-684 |
| 177* | O-ring | EPDM | 930-678 | 930-678 | 930-678 | 930-678 |
| | | FKM | 930-1015 | 930-1015 | 930-1015 | 930-1015 |
| 195*** | Plug | PVDF | 221-464.07 | 221-464.07 | 221-464.07 | 221-464.07 |
| | Plug with O-ring | 1.4404+EPDM | 221-464.12 | 221-464.12 | 221-464.12 | 221-464.12 |
| 401 | Housing CL | 1.4404 | 221-461.12 | 221-461.06 | 221-461.01 | 221-461.02 |
| 402 | Housing CT | 1.4404 | 221-462.10 | 221-462.01 | 221-462.02 | 221-462.03 |

| Item | Designation | Material | 1" OD | 1.5" OD | 2" OD | 2.5" OD |
|---|---|---|---|---|---|---|
| A | Actuator VARIVENT® | | See parts list/dimensions sheet for VARIVENT® actuator | | | |
| B | Control top T.VIS® | | See parts list for control top T.VIS® | | | |
| C | Connection 0/C | | See parts list for connection 0/C | | | |
| D | Flush valve SPV-C (< 80°C)<br>Flush valve SPV-C-S (> 80°C) | | See parts list for flush valve SPV | | | |
| Grease RIVOLTA F.L.G. 100g tube not included with seal set.<br>** Do not grease item 7 and 8 | | | | | 413-136 | |
| 1) The seal set includes items 1, 5, 6, 7, 8, 29, 30, 175, 176 and 177<br>Items marked with an * are wearing parts<br>*** Pos. 195 optional, if only one flush valve is used<br>PVDF = Standard<br>1.4404+EPDM = if the valve is used at over 80°C | | | | | | |

| Item | Designation | Material | 3" OD | 4" OD | 6" OD |
|---|---|---|---|---|---|
| Seal set complete 1) | | EPDM | 221-511.75 | 221-511.76 | 221-511.78 |
| | | FKM | 221-519.54 | 221-519.55 | 221-519.57 |
| | | HNBR | 221-519.86 | 221-004179 | -- |
| 1* | Seal ring | EPDM | 924-085 | 924-085 | 924-088 |
| | | FKM | 924-083 | 924-083 | 924-087 |
| | | HNBR | 924-313 | 924-313 | -- |
| 2 | Bearing | PTFE/carbon | 935-002 | 935-002 | 935-001 |
| | Bearing, 3A | SUSTA-PVDF | 935-099 | 935-099 | 935-098 |
| 3 | Seal disk | 1.4404 | 221-141.03 | 221-141.04 | 221-141.02 |
| 4 | Bearing disc | 1.4301 | 221-142.03 | 221-142.03 | 221-142.02 |
| 5* | O-ring | EPDM | 930-150 | 930-156 | 930-260 |
| | | FKM | 930-176 | 930-178 | 930-259 |
| | | HNBR | 930-634 | 930-863 | -- |
| 6* | O-ring | NBR | 930-004 | 930-004 | 930-007 |
| **7* | V-ring | EPDM | 932-024 | 932-028 | 932-042 |
| | | FKM | 932-035 | 932-039 | 932-041 |
| | | HNBR | 932-090 | 932-100 | -- |
| **8* | V-ring | EPDM | 932-023 | 932-027 | 932-045 |
| | | FKM | 932-034 | 932-038 | 932-044 |
| | | HNBR | 932-089 | 932-099 | -- |
| 9 | Lantern | 1.4301 | 221-121.08 | 221-121.09 | 221-121.22 |
| 10 | Spacer nut | 1.4301 | 221-147.01 | 221-147.01 | 221-147.01 |
| 15 | Valve disc C | 1.4404 | 221-463.03 | 221-463.04 | 221-463.08 |
| 29* | O-ring | NBR | 930-026 | 930-026 | 930-035 |
| 30* | O-ring | NBR | 930-026 | 930-026 | 930-026 |
| 43 | Clamp join KL | 1.4401 | 221-507.09 | 221-507.11 | 221-507.11 |
| 46 | Clamp join KL | 1.4401 | 221-507.06 | 221-507.06 | 221-507.06 |
| 115 | T-screw fitting G1/8" (metric) | Brass, nickel-plated | 933-991 | 933-991 | 933-991 |
| | T-screw fitting G1/8" (inch) | Brass, nickel-plated | 933-959 | 933-959 | 933-959 |
| 117 | Angular screw fitting (metric) | Brass, nickel-plated | 933-475 | 933-475 | 933-475 |
| | Angular screw fitting (inch) | Brass, nickel-plated | 933-979 | 933-979 | 933-979 |
| 175* | O-ring | NBR | 930-029 | 930-029 | 930-029 |
| 176* | O-ring | EPDM | 930-677 | 930-677 | 930-677 |
| | FKM | 930-684 | 930-684 | 930-684 | 930-684 |
| 177* | O-ring | EPDM | 930-678 | 930-678 | 930-678 |
| | | FKM | 930-1015 | 930-1015 | 930-1015 |
| 195*** | Plug | PVDF | 221-464.07 | 221-464.07 | 221-464.07 |
| | Plug with O-ring | 1.4404+EPDM | 221-464.12 | 221-464.12 | 221-464.12 |
| 401 | Housing CL | 1.4404 | 221-461.03 | 221-461.04 | 221-461.05 |
| 402 | Housing CT | 1.4404 | 221-462.04 | 221-462.05 | 221-462.06 |
| A | Actuator VARIVENT® | | See parts list/dimensions sheet for VARIVENT® actuator | | |
| B | Control top T.VIS® | | See parts list for control top T.VIS® | | |
| C | Connection 0/C | | See parts list for connection 0/C | | |

| Item | Designation | Material | 3" OD | 4" OD | 6" OD |
|---|---|---|---|---|---|
| D | Flush valve SPV-C (< 80°C)<br>Flush valve SPV-C-S (> 80°C) | | See parts list for flush valve SPV | | |
| Grease RIVOLTA F.L.G. 100g tube not included with seal set.<br>** Do not grease item 7 and 8 | | | | 413-136 | |
| 1) The seal set includes items 1, 5, 6, 7, 8, 29, 30, 175, 176 and 177<br>Items marked with an * are wearing parts<br>*** Pos. 195 optional, if only one flush valve is used<br>PVDF = Standard<br>1.4404+EPDM = if the valve is used at over 80°C | | | | | |

| Sealing sets for double seal valve C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | **Qty.** | **Designation** | **Material** | **DN 25<br>1"** | **DN 40/50<br>1.5"/2"** | **DN 65/80<br>2.5"/3"** | **DN 100<br>4"** | **DN 125** | **DN 150<br>6"** |
| 1 | 1 | Seal ring | Ø | 22 | 22 | 28 | 28 | 35 | 35 |
| | | | EPDM | 924-084 | 924-084 | 924-085 | 924-085 | 924-088 | 924-088 |
| | | | FKM | 924-082 | 924-082 | 924-083 | 924-083 | 924-087 | 924-087 |
| | | | HNBR | 924-311 | 924-311 | 924-313 | 924-313 | -- | -- |
| 5 | 1 | O-ring | Ø | 42 x 3 | 60 x 3 | 85 x 4 | 113 x 4 | 138 x 4 | 158 x 5 |
| | | | EPDM | 930-309 | 930-144 | 930-150 | 930-156 | 930-372 | 930-260 |
| | | | FKM | 930-168 | 930-171 | 930-176 | 930-178 | 930-409 | 930-259 |
| | | | HNBR | 930-632 | 930-633 | 930-634 | 930-863 | -- | -- |
| 6 | 1 | O-ring | Ø | 8 x 1.6 | 8 x 1.6 | 8 x 1.6 | 8 x 1.6 | 9 x 3 | 9 x 3 |
| | | | NBR | 930-004 | 930-004 | 930-004 | 930-004 | 930-007 | 930-007 |
| **7 | 1 | V-ring | Ø | 35-5 | 52-6 | 76-6 | 104-6 | 128-6 | 148-6 |
| | | | EPDM | 932-046 | 932-021 | 932-024 | 932-028 | 932-060 | 932-042 |
| | | | FKM | 932-030 | 932-033 | 932-035 | 932-039 | 932-062 | 932-041 |
| | | | HNBR | 932-087 | 932-088 | 932-090 | 932-100 | -- | -- |
| **8 | 1 | V-ring | Ø | 28-5 | 44-6 | 68-6 | 96-6 | 120-6 | 140-6 |
| | | | EPDM | 932-017 | 932-019 | 932-023 | 932-027 | 932-059 | 932-045 |
| | | | FKM | 932-029 | 932-032 | 932-034 | 932-038 | 932-063 | 932-044 |
| | | | HNBR | 932-085 | 932-084 | 932-089 | 932-099 | -- | -- |
| 29 | 1 | O-ring | Ø | 20 x 3 | 20 x 3 | 20 x 3 | 20 x 3 | 25 x 3 | 25 x 3 |
| | | | NBR | 930-026 | 930-026 | 930-026 | 930-026 | 930-035 | 930-035 |
| 30 | 1 | O-ring | Ø | 20 x 3 | 20 x 3 | 20 x 3 | 20 x 3 | 20 x 3 | 20 x 3 |
| | | | NBR | 930-026 | 930-026 | 930-026 | 930-026 | 930-026 | 930-026 |
| 175 | 2 | O-ring | Ø | 22 x 3 | 22 x 3 | 22 x 3 | 22 x 3 | 22 x 3 | 22 x 3 |
| | | | NBR | 930-029 | 930-029 | 930-029 | 930-029 | 930-029 | 930-029 |
| 176 | 6 | O-ring | Ø | 11 x 2 | 11 x 2 | 11 x 2 | 11 x 2 | 11 x 2 | 11 x 2 |
| | | | EPDM | 930-677 | 930-677 | 930-677 | 930-677 | 930-677 | 930-677 |
| | | | FKM | 930-684 | 930-684 | 930-684 | 930-684 | 930-684 | 930-684 |
| 177 | 2 | O-ring | Ø | 5 x 2 | 5 x 2 | 5 x 2 | 5 x 2 | 5 x 2 | 5 x 2 |
| | | | EPDM | 930-678 | 930-678 | 930-678 | 930-678 | 930-678 | 930-678 |
| | | | FKM | 930-1015 | 930-1015 | 930-1015 | 930-1015 | 930-1015 | 930-1015 |
| Seal set complete | | | EPDM | 221-528.44 | 221-511.74 | 221-511.75 | 221-511.76 | 221-511.77 | 221-511.78 |
| | | | FKM | 221-528.45 | 221-519.53 | 221-519.54 | 221-519.55 | 221-519.56 | 221-519.57 |
| | | | HNBR | 221-528.97 | 221-519.85 | 221-519.86 | 221-004179 | -- | -- |
| Grease RIVOLTA F.L.G. 100g tube not included with seal set | | | | | | | | 413-136 | |
| ** Do not grease item 7 and 8 | | | | | | | | | |
| Advice on storage: storage in accordance with DIN 7716<br>Relative humidity approx. 65%, temperature 15-25°C and protected from light<br>When replacing seals, observe the instructions in the instruction manual!<br>**429-021** | | | | | | | | | |

# 14 Parts list - 0 connection (0/C)

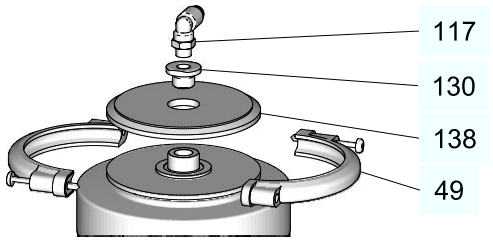


Fig.33: Connection type 0 for all VARIVENT valves except type C

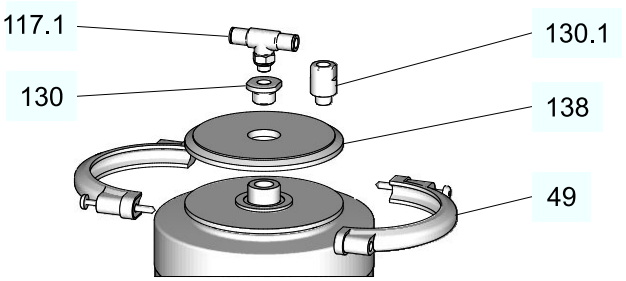


Fig.34: Connection type 0/C for VARIVENT double seal valve type C

| Item | Designation | Material | Connection 0/100 for DN25 - DN125 and 1" to 6" | |
|---|---|---|---|---|
| | | | Material no. | |
| | | | for metric connection | for inch connection |
| 49 | Clamp connection KU | -- | 221-507.08 | 221-507.08 |
| **Connection 0 cpl.** | | 1.4301 | 221-140.02 | 221-140.04 |
| 117* | Angular screw fitting 6-1/8” | Brass/nickel-plated | 933-475 | -- |
| | Angular screw fitting 6.35-1/8” | | -- | 933-979 |
| 130* | Reducing nipple with O-ring | 1.4305 | 933-992 | 933-992 |
| 138* | Actuator cover | 1.4301 | 221-469.01 | 221-469.01 |
| **Connection 0/C cpl.** | | 1.4301 | 221-140.10 | 221-140.11 |
| 117* | Angular screw fitting 6-1/8” | Brass/nickel-plated | 933-991 | -- |
| | Angular screw fitting 6.35-1/8” | | -- | 933-959 |
| 130* | Reducing nipple with O-ring | 1.4305 | 9233-992 | 933-992 |
| 130.1* | Reducing nipple | 1.4305 | -- | 933-962 |
| 138* | Actuator cover | 1.4301 | 221-469.01 | 221-469.01 |
| Parts marked with * are included in connection cpl | | | | |
| | | | | |

# 15 Parts list - Flush Valve SPV

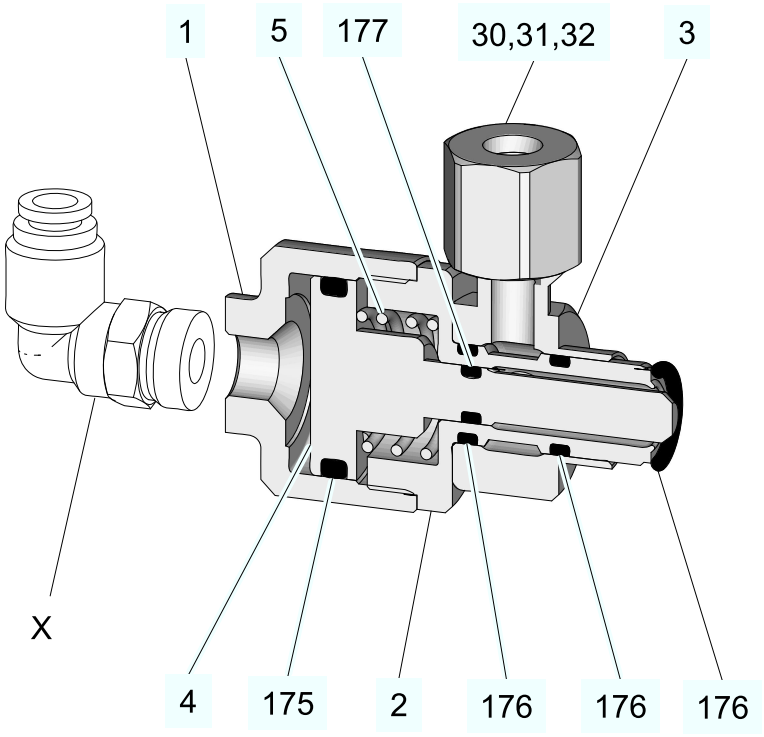


Fig.35: Types C and C-S

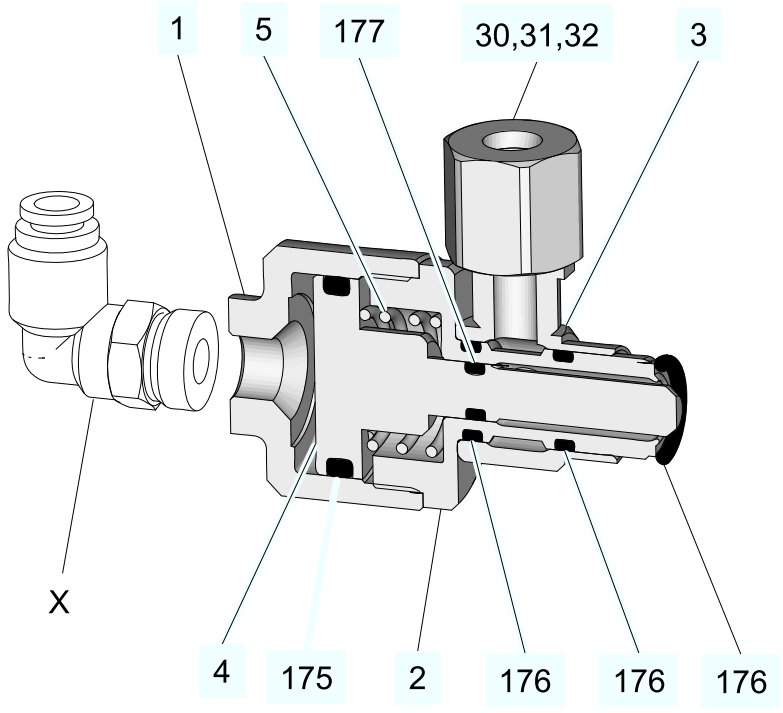


Fig.36: Type M

| Item | Designation | Material | Type C* | Type M* | Type C-S* |
|---|---|---|---|---|---|
| Rinsing valve, complete | | EPDM | 221-464.01 | 221-464.13 | 221-464.21 |
| | | FKM | 221-464.06 | 221-464.18 | 221-464.22 |
| 1 | Cylinder SPV | PVDF | 221-464.03 | 221-464.03 | -- |
| | | 1.4305 | -- | -- | 221-464.10 |
| 2 | Housing SPV | 1.4305 | 221-464.08 | 221-464.08 | 221-464.08 |
| 3 | Outlet SPV | 1.4301 | 221-464.05 | 221-464.09 | 221-464.05 |
| 4 | Piston SPV | PVDF | 221-464.04 | 221-464.04 | -- |
| | | PEEK | -- | -- | 221-464.19 |
| 5 | Compression spring | 1.4310 | 931-225 | 931-225 | 931-225 |
| 30 | Cap nut | 1.4571 | 933-456 | 933-456 | 933-456 |
| 31 | Cutting ring | 1.4571 | 933-455 | 933-455 | 933-455 |
| 32 | Support sleeve | 1.4571 | 933-382 | 933-382 | 933-382 |
| 175 | O-ring | NBR | 930-029 | 930-029 | 930-029 |
| 176 | O-ring | EPDM | 930-677 | 930-677 | 930-677 |
| | | FKM | 930-684 | 930-684 | 930-684 |
| 177 | O-ring | EPDM | 930-678 | 930-678 | 930-678 |
| | | FKM | 930-1015 | 930-1015 | 930-1015 |
| X* | Elbow screw-in plug connection, metric G1/8"-6/4 | Brass/nickel-plated | 933-475 | 933-475 | 933-475 |
| | Elbow screw-in plug connection, imperial G1/8"-6.35 | Brass/nickel-plated | 933-979 | 933-979 | 933-979 |
| | T-screw-in connection, metric G1/8"-6/4 | Brass/nickel-plated | 933-991 | 933-991 | 933-991 |
| | T-screw-in connection, imperial G1/8"-6.35 | Brass/nickel-plated | 933-959 | 933-959 | 933-959 |
| X* is not included in the complete assembly | | | | | |
| * Type C: Standard for C-valves<br>* Type M: for ECO-MATRIX<br>* Type C-S: For C valves with temperatures exceeding 80°C (with metal cylinder and piston made of PEEK) | | | | | |

# 16 Parts list - Hose connection diagram

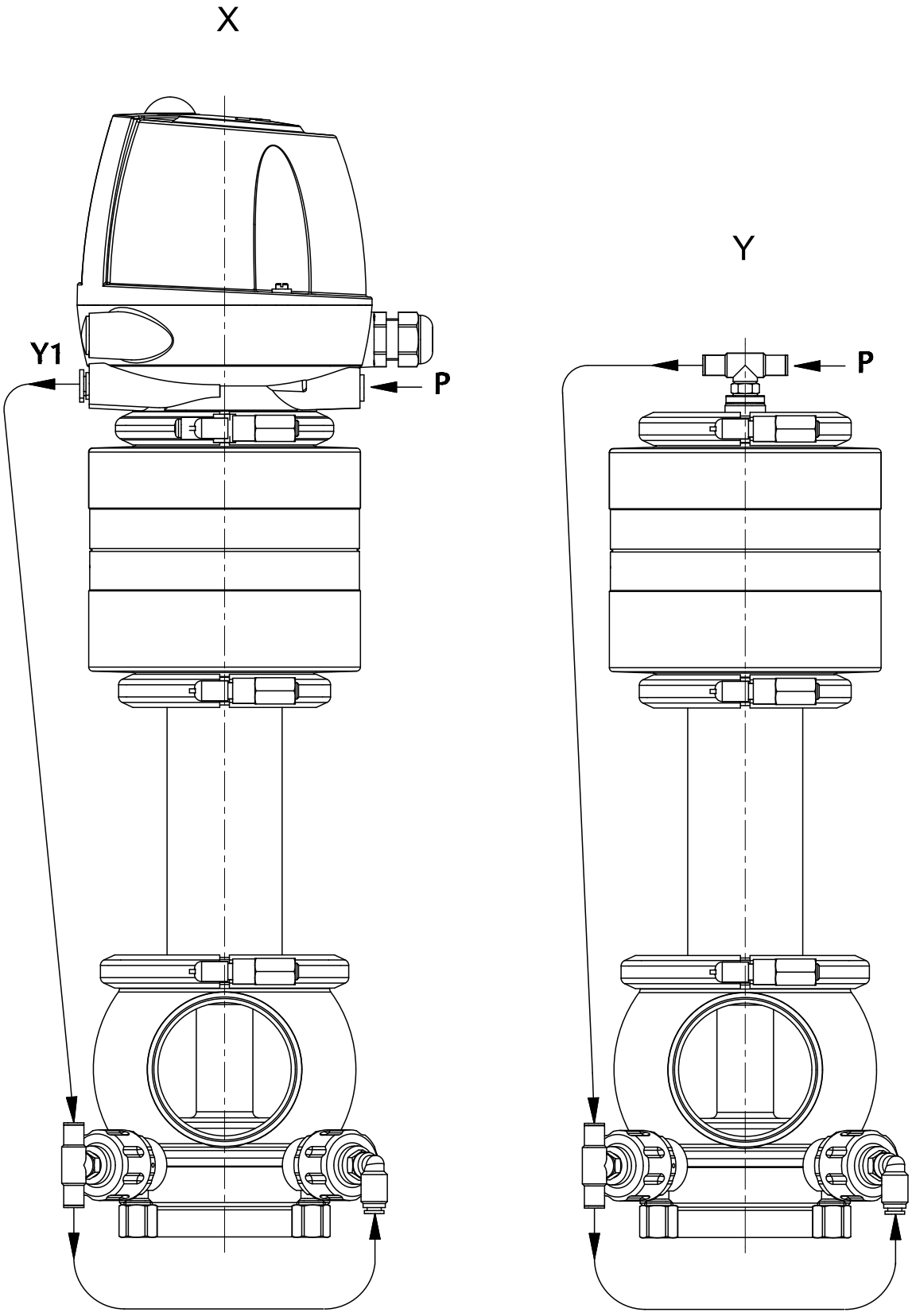


Fig.37: X = with T.VIS connection / Y = with 0 connection

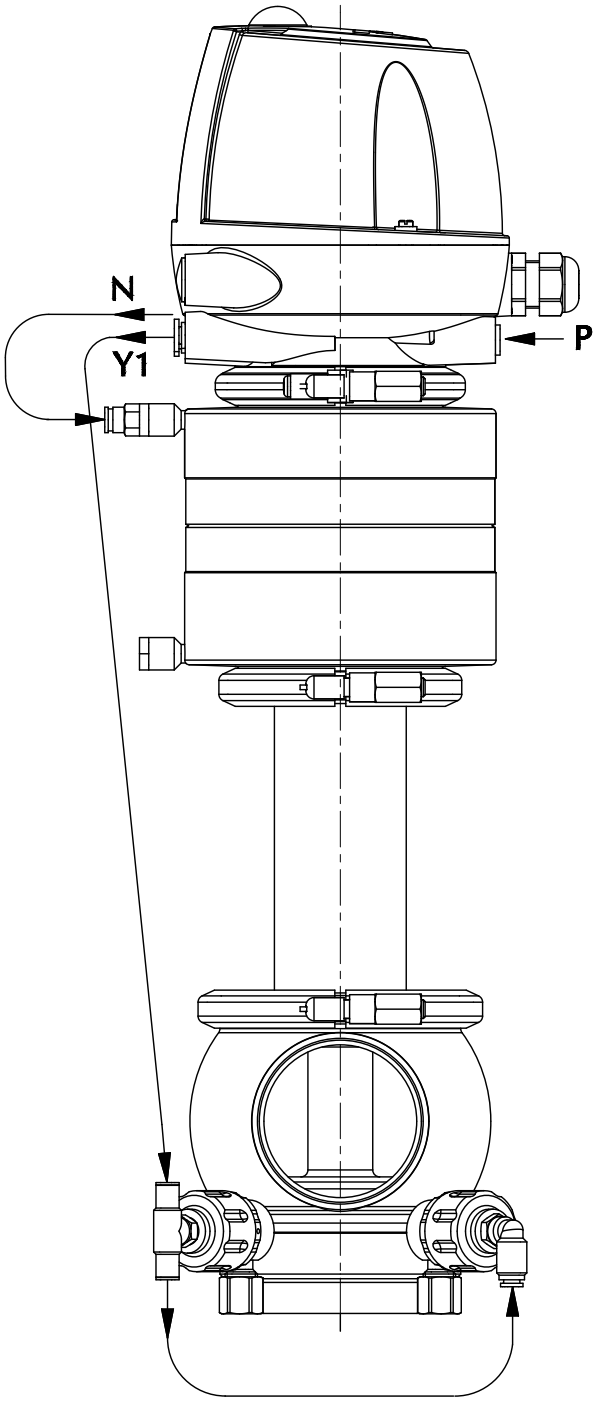


Fig.38: With T.VIS connection and actuator Z

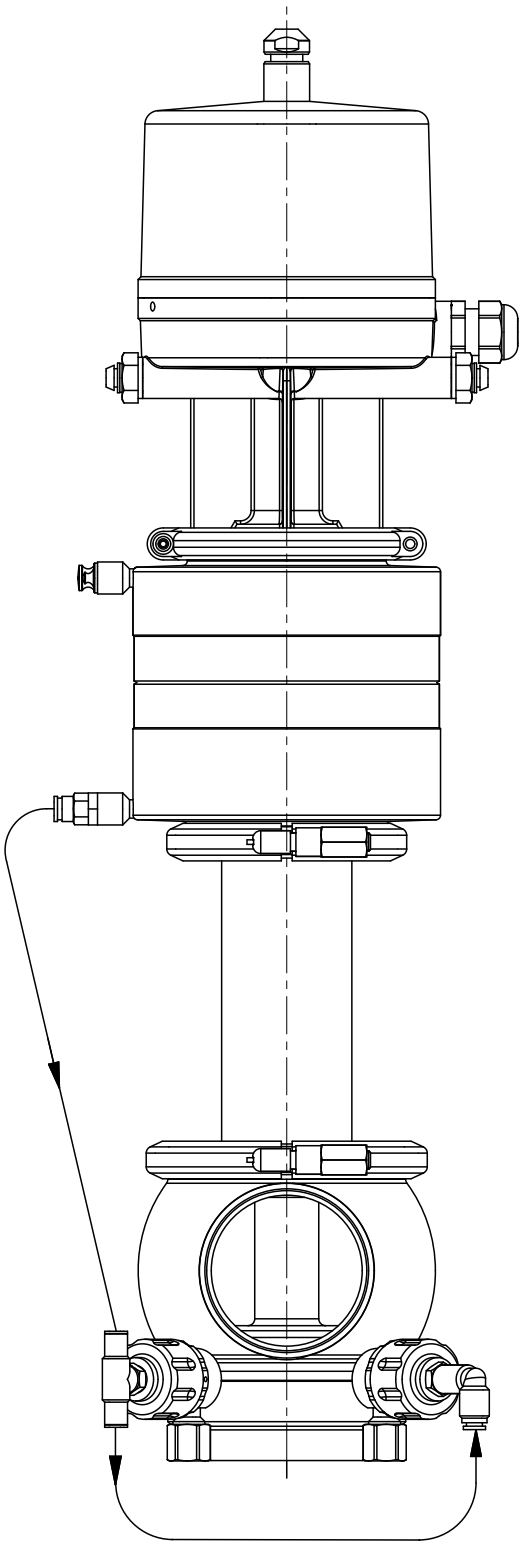

Fig.39: ATEX variant with actuator Z

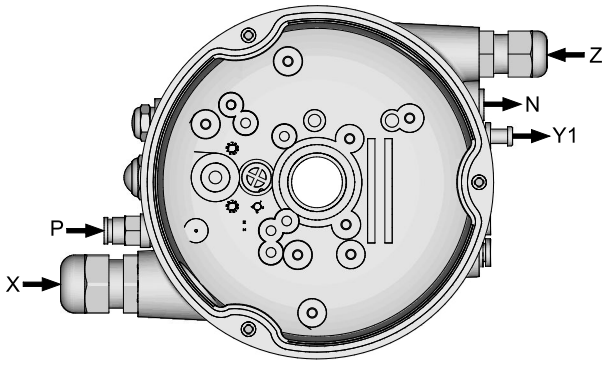


Fig.40: View without hood

X = Electrical connection / Z = External initiator

For assignment of N, Y1, and P refer to the control top operating instructions.

# 17 Dimension Sheet - VARIVENT® mixproof valve C

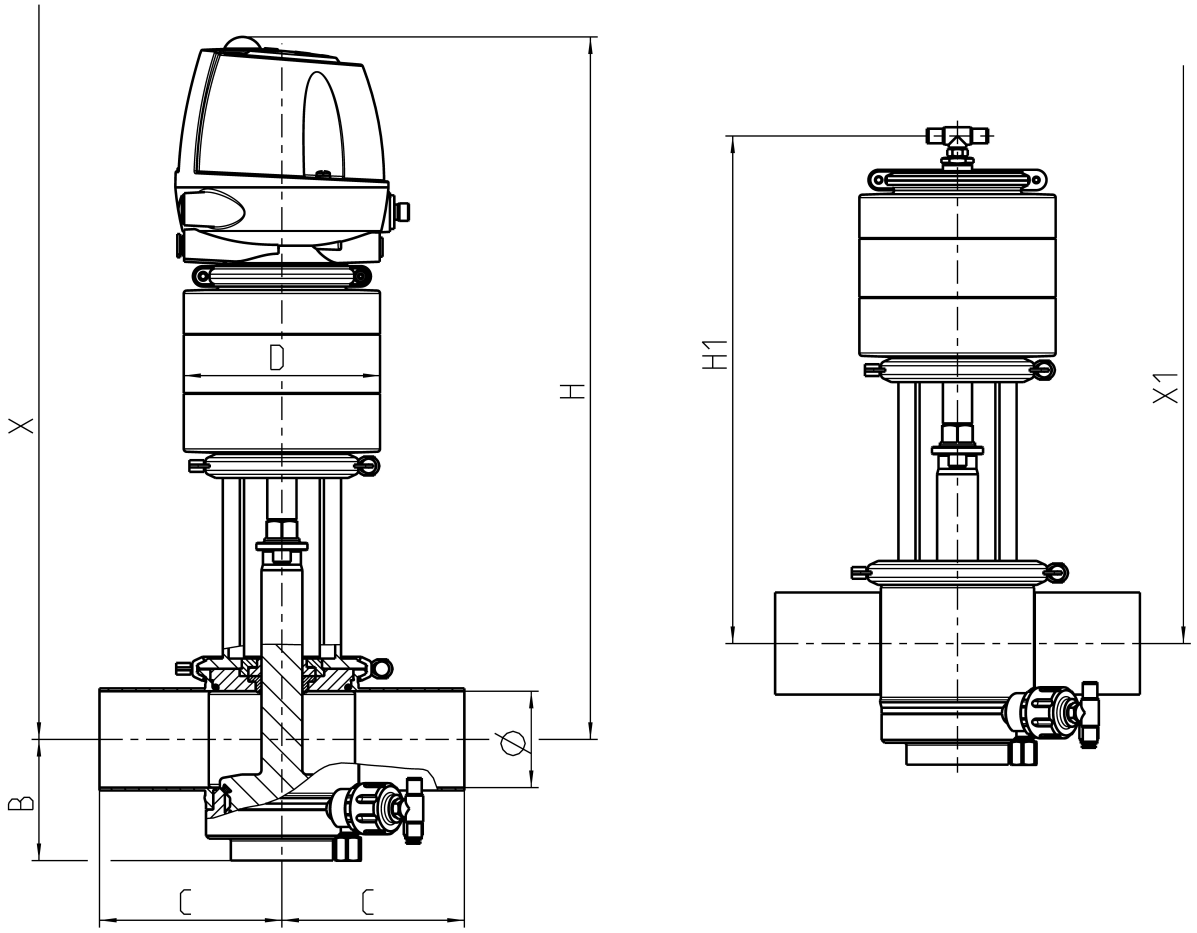


Fig.41

| Dimension | DN 25 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 | DN 125 | DN 150 |
|---|---|---|---|---|---|---|---|---|
| B | 58 | 64 | 70 | 83 | 90.5 | 100 | 113 | 125 |
| C | 90 | 90 | 90 | 125 | 125 | 125 | 150 | 150 |
| D | 99 | 110 | 110 | 135 | 135 | 170 | 260 | 260 |
| H | 423 | 464 | 470 | 481 | 489 | 528 | 684 | 708 |
| H1 | 354.5 | 383.5 | 377.5 | 413.5 | 425.5 | 432.5 | 590.5 | 614.5 |
| Installation dimension X | 651 | 657 | 663 | 674 | 682 | 721 | 877 | 901 |
| Installation dimension X1 | 403 | 441 | 450 | 511 | 538 | 564 | 747 | 771 |
| Dia. E | 26 | 38 | 50 | 66 | 81 | 100 | 125 | 150 |
| Stroke | 16 | 18 | 30 | 30 | 30 | 30 | 60 | 60 |

| Dimension | 1" OD | 1.5" OD | 2" OD | 2.5" OD | 3" OD | 4" OD | 6" OD |
|---|---|---|---|---|---|---|---|
| B | 56 | 62.5 | 69 | 80 | 86.5 | 99 | 123.5 |
| C | 90 | 90 | 90 | 125 | 125 | 125 | 150 |
| D | 99 | 110 | 110 | 135 | 135 | 170 | 260 |
| H | 421 | 466 | 472 | 485 | 492 | 530 | 706.5 |
| H1 | 354.5 | 354.5 | 378.5 | 417.5 | 425.5 | 432.5 | 613 |
| Installation dimension X | 649 | 659 | 665 | 678 | 685 | 723 | 899 |
| Installation dimension X1 | 403 | 721 | 448 | 509 | 530 | 562 | 769 |
| Dia. E | 22 | 20 | 47.5 | 60.2 | 72.9 | 97.4 | 146.9 |
| Stroke | 12 | 18 | 30.5 | 31 | 29 | 30 | 57 |

# 18 Appendix

## 18.1 Lists

### 18.1.1 Abbreviations and terms

| Abbreviation | Explanation |
|---|---|
| BS | British Standard |
| bar | Unit of measurement of pressure [bar]<br>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] |
| $dm^3_n$ | Unit of measurement of volume [cubic decimetre] Standard volume (standard litre) |
| 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<br>Short designation according to DIN/ISO 1629: Ethylene Propylene Diene Rubber |
| °F | Unit of measurement of temperature [degree Fahrenheit] |
| FKM | Material designation, short designation according to DIN/ISO 1629: Fluorine rubber |
| h | Unit of measurement of time [hour] |
| HNBR | Material designation<br>Short designation according to DIN/ISO 1629: Hydrogenated Acrylonitrile Butadiene Rubber |
| IP | Protection class |
| ISO | International standard issued by the International Organisation for Standardisation |
| 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 |
| mm | Unit of measurement of length [millimetre] |
| µm | Unit of measurement of length [micrometre] |

| Abbreviation | Explanation |
|---|---|
| M | Metric |
| Nm | Unit of measurement of work [newton metre]<br>Specification of torque 1 Nm = 0.737 lbft<br>Pound-Force (lb) + Feet (ft) |
| PA | Polyamide |
| PE-LD | Low-density polyethylene |
| PPE | Polytetrafluoroethylene |
| psi | America measurement for pressure [Pound-forse per square inch]<br>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<br>During commissioning and maintenance, the SET-UP procedure carries out all the necessary settings for the generation of messages. |
| AF | Specifications for the size of spanners width across flats |
| T.VIS | Tuchenhagen Valve Information System |
| V AC | Volt alternating current |
| V DC | Volt direct current |
| W | Unit of measurement of power [Watt] |
| TIG | Welding method<br>Tungsten inert gas welding |
| Inch | Unit of measurement of length in the Anglo-American language area |
| Inch OD | Pipe measurement according to British Standards (BS), Outside Diameter |
| Inch IPS | American pipe measure - Iron Pipe Size |

**GEA Tuchenhagen GmbH**
**Am Industriepark 2-10**
**21514 Büchen, Germany**

**Telephone +49 4155 49-0**