OPERATING INSTRUCTIONS

Translation from the original language

24/7 PMO VALVE NON-STOP PRODUCTION

Hygienic valves

GEA VARIVENT® 24/7 PMO Cheese Curd Valve 2.0, Type: M_C/2.0

GEA Tuchenhagen GmbH
Document number: 430BAL013215
Language: EN / Date: 2018-10

Product	VARIVENT® 24/7 PMO Cheese Curd Valve 2.0 Type: M_C/2.0
Document	Operating Instructions Edition 2018-10-04 430BAL013215EN_1
Manufacturer	GEA Tuchenhagen GmbH Am Industriepark 2-10 D-21514 Büchen Phone:+49 4155 49-0 Fax: +49 4155 49-2423 Mail: sales.geatuchenhagen@gea.com Web: http://www.tuchenhagen.com
Wordmarks	The designations VARIVENT®, 24/7 PMO Valve® 2.0 and T.VIS® are protected trademarks of GEA Tuchenhagen GmbH.

Table of Contents

Notes for the Reader

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

Binding Character of These Operating instructions

These Operating instructions contains the manufacturer's instructions for the owner of the valve and for all persons who work on or use the valve regarding the procedures to follow.

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

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

Notes on the Illustrations

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

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 cause serious damage to health, or even death.
➔ The arrow identifies a precautionary measure you have to take to avoid the hazard.

WARNING

Warning: Serious Injuries.
Failure to observe the warning note 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 note can result in minor or moderate damage to health.
➔ The arrow identifies a precautionary measure you have to take to avoid the hazard.

IMPORTANT NOTE

Warning: Damage to Property.
Non-observance of the warning note can cause serious damage to the valve or the vicinity of the valve.
➔ The arrow identifies a precautionary measure you have to take to avoid the hazard.

EXPLOSION HAZARD

Warning: Explosions.
Failure to observe the warning may result in a severe explosion.
➔ The arrow identifies a precautionary measure you have to take to avoid the hazard.

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

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.

NOTE
Further useful information.

Abbreviations and Terms

Abbreviation	Explanation
a/f	Indicates the size of spanners width across flats
approx.	approximately
BS	British Standard
bar	Unit of measurement of pressure [bar] All pressure ratings [bar/psi] stand for over pressure [bar_g/psi_g] if this is not explicitly described differently.
Cv value	flow coefficient [US gallons per minute] 1 Cv = 1,17 x Kv
°C	Unit of measurement of temperature [degree Celsius]
dm^3_n	Unit of measurement of volume [cubic decimetre] Volume (litre) at standard temperature and pressure
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 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 Short designation according to DIN/ISO 1629: Hydrogenated Acrylonitrile Butadiene Rubber
IP	Protection class
Inch	Unit of measurement of length [inch]
Inch OD	Pipe dimension acc. to British standard (BS), Outside Diameter
Inch IPS	US pipe dimension Iron Pipe Size
ISO	International standard issued by the International Organization for Standardi- zation
kg	Unit of measurement of weight [kilogram]

Abbreviation	Explanation
kN	Unit of measurement of force [kilonewton]
L	Unit of measurement of volume [litre]
max.	maximum
mm	Unit of measurement of length [millimetre]
µm	Unit of measurement of length [micrometre]
M	metric
Nm	Unit of measurement of work [newton metre] UNIT OF TORQUE 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
PA	Polyamide
PE-LD	Low-density polyethylene
psi	Anglo-American Unit of measurement of pressure [Pound-force per square inch] All pressure ratings [bar/psi] stand for over pressure [bar_g/psi_g] if this is not explicitly described differently.
SET-UP	Self-learning installation During commissioning and maintenance, the SET-UP procedure carries out all the necessary settings for the generation of messages.
TIG	Welding method Tungsten inert gas welding
T.VIS	Tuchenhagen Valve Information System
V AC	Volt alternating current
V DC	Volt direct current
W	Unit of measurement of power [Watt]

Safety

Safety Note

The valve is operationally reliable. It was built according to state-of-the art standards.

Nevertheless, the valve can pose dangers, especially if

- the valve is not used in accordance with its intended use,
- the valve is not used correctly,
- the valve is operated under impermissible operating conditions.

Operator's Duties

In your capacity as operator of the facility you bear a particular responsibility for the proper and safe handling of the valve in your facility. Only use the valve when it is in perfect condition to prevent danger to persons and property.

These Operating instructions contain the information you and your staff need for the safe and reliable operation during the entire service life of the valve. 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 allow qualified staff to work on the valve.
- The operator must authorize the staff to carry out the relevant tasks.
- Working areas and the entire environment of the valve must be neat and clean.
- The staff must wear suitable work clothing and personal protective equipment. As the operator of the facility make sure that work clothing and personal protective equipment are used.
- Instruct the staff with regard to any properties of the product which might pose a health risk and the preventative measures to be taken.
- Have a qualified first-aider on call during the operation, who can initiate the necessary first-aid measures in case of an emergency.
- Clearly define processes, lines of authority and responsibilities associated with the valve. Everybody must know what to do in case of an emergency. Instruct the staff in this respect at regular intervals.
- The signs relating to the valve must always be complete and legible. Check, clean and replace the signs as necessary at regular intervals.

NOTE

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

Qualification of Staff

This section contains information about the qualifications that staff working on the valve must have.

Operating and maintenance staff 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 staff to carry out any work on explosion-protected equipment. 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:

- Vocational training as a specialist who can work on the valve independently.
- Sufficient instruction to work on the valve under the supervision and direction of a qualified specialist.

Each member of staff must meet the following requirements to be allowed to work on the valve:

- Personal qualification for the relevant task.
- Sufficient professional qualification for the relevant task.
- Instructed with regard to the function of the valve.
- Instructed with regard to the operating sequences of the valve.
- 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.

For work to be carried out on the valve the following user groups are distinguished:

User groups

Staff	Qualifications
Operating staff	Adequate instruction and sound knowledge in the following areas: • Function of the valve • Valve operating sequences • What to do in case of an emergency • Lines of authority and responsibilities with respect to the task.
Maintenance staff	Adequate instruction as well as sound knowledge of the design and function of the valve. Sound knowledge in the following areas: • Mechanical equipment • Electrical equipment • Pneumatic system Authorization with regard to safety engineering standards to carry out the following tasks: • Setting devices into operation • Earthing of devices • Marking of devices The relevant certificates of qualification must be submitted before work can be carried out on ATEX certified machines.

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.

Instructions for the Safe Operation

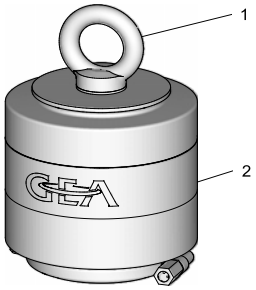
Dangerous situations during the operation can be avoided by safety-conscious and proactive behaviour of the staff.

General Principles

To ensure the 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.
- Observe the accident prevention regulations and all local regulations.

Installation



For installation, the following principles apply:

- Only properly qualified staff is allowed to install, assemble and set the valve into operation.
- 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. For transportation and installation of the valve, it is imperative to remove the control top and the switch bar from the actuator (2) and to use the screwed-in eye bolt (1), part no. 221-104.98 for lifting the valve, see “Removing the Control Top and the Switch Bar“ (Page 52).
- Remove any nails protruding from transport crates immediately after opening the crate.
- Under no circumstances should anyone stand under a suspended load.
- During assembly, the valve safety devices might not be working effectively.
- Reliably secure machine parts which have already been connected against inadvertently being switched on.

Commissioning/Setup Mode

For 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 setting into operation, 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.

Operation

For operation, the following principles apply.

- Monitor the valve during the 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 place of installation of the valve must be adequately ventilated at all times.
- Structural alterations of the valve are not permitted. Immediately report any changes on the valve to the person responsible.
- 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.
- Observe the safety information sheets issued by the detergent manufacturers! Only use detergents which are non-abrasive and not aggressive towards the used material.

Shutting Down

For shutting down, the following principles apply:

- Switch off the compressed air.
- Switch off the valve via 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 “Storage“ (Page 24).

Maintenance and Repair

Before starting any maintenance and repair work on the electrical devices of the valve, carry out 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 allow qualified staff to carry out maintenance or repair work on the valve.
- Before starting any maintenance or repair work, the valve must be switched off and secured against being switched back on. 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 valve. 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, see “Storage“ (Page 24).
- Before setting the valve 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.
- The housing sockets have very sharp edges. When transporting and assembling the valve be sure to wear suitable protective gloves.

Disassembly

For disassembly, the following principles apply:

- Only allow qualified staff to disassemble the valve.
- Before starting disassembly, the valve must be switched off and secured against being switched back on. 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 valve. 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 “Storage“ (Page 24).

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.

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.

Signage

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

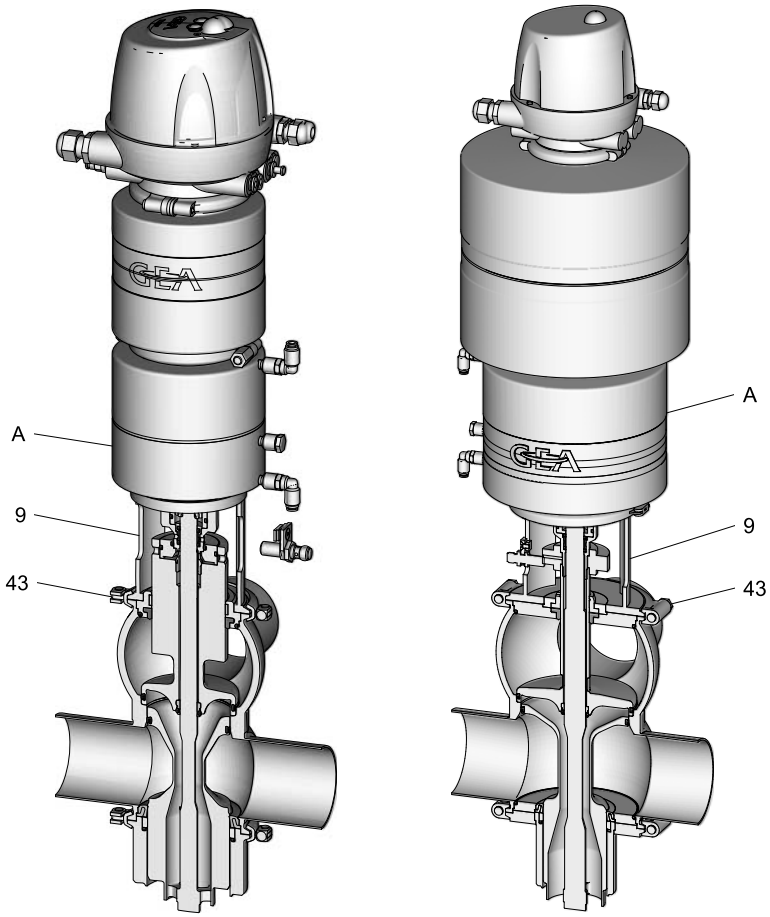
The signs and notes on the valve must always be legible. Any illegible signs must be replaced immediately.

Signs on the valve

Sign	Meaning
	General hazard warning
	Warning Crushing
	Explosive atmosphere hazard warning

Residual Risk

Hazard Areas



Please observe the following notes:

- 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 when the valve is switching. Fingers can be crushed or cut off.
- On a spring-closing valve there is danger of injury when the clamps (43) are opened as the released spring pretension will suddenly lift the actuator. Therefore, release the spring tension before detaching the clamps 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.
- When the valve is lifting, when the valve seat is cleaned or if a seal is defective, cleaning medium escapes from the leakage outlet. This leakage must be collected in a suitable container, e.g. a funnel or a drip pan, and removed in a controlled manner. Observe the instructions in the safety data sheets issued by the detergent manufacturers.
- The housing of the T.VIS control top is made of Noryl or PA. The operator must pay particular attention to the selection of a suitable cleaning agent.The operator must ensure that safety valve E2 is functional all the time.

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: 1 Isolate from the power supply. 2 Take appropriate measures to prevent switch on. 3 Test absence of voltage. 4 Earthing and short-circuiting. 5 Cover or safeguard any adjacent live parts.
	Spring tension in the actuator	Danger to life caused by compression spring in the actuator. Do not open the actuator but return it to GEA Tuchenhagen for proper disposal.
Danger of injury	Danger presented by moving or sharp-edged parts	The operator must exercise caution and prudence. For all work: • Wear suitable work clothing. • Never operate the machine if the cover panels are not correctly fitted. • Never open the cover panels during the operation. • Never reach into openings. As a precautionary measure, wear personal protective equipment in the vicinity of the valve: • Protective gloves • Safety shoes
Environmental damage	Operating materials with properties which are harmful to the environment	For all work: • Collect lubricants in suitable containers. • Dispose of lubricants in accordance with the pertinent regulations.

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

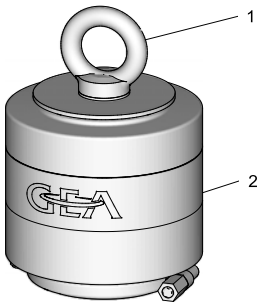
Transport and Storage

Scope of Supply

On receipt of the valve check whether

- 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.

Transport



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 damaged caused by impact or careless onloading and unloading. The outside synthetic materials are susceptible to breaking.
- The 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 valve to lift or push the valve or support yourself. Avoid putting the valve down with a jerk.

Storage

Valves, valve inserts or spare parts should be stored in a dry place, free of vibrations and dust. 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 and suitable measures be taken to protect it from damage.

NOTE

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.

Intended Purpose

Designated Use

The Mixproof Valve M-C/2.0 is used for mixproof shut-off of high quality, non-abrasive products at points of intersection in pipe systems.
It is resistant to pipe hammers.
Do not install the valve with actuator spring-to-open, because the valve may open in case of power / air failure and cause product intermixing.

NOTE
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 of such misuse lies entirely with the operator of the facility.

Requirements for the Operation

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

Pressure Equipment Directive

The mixproof valves M/2.0 are pressure equipment (without safety function) in the sense of the pressure equipment directive: Directive 97/23/EC. They are classified according to Annex II, article 3, section 3. In the event of any deviations, GEA Tuchenhagen GmbH will supply a special Declaration of Conformity.

Improper Operating Conditions

The operational reliability of the valve cannot be ensured under improper operating conditions. Therefore avoid improper operating conditions.

Operating the valves 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 valve.
- Damage has been detected on the valve.
- Maintenance intervals have been exceeded.

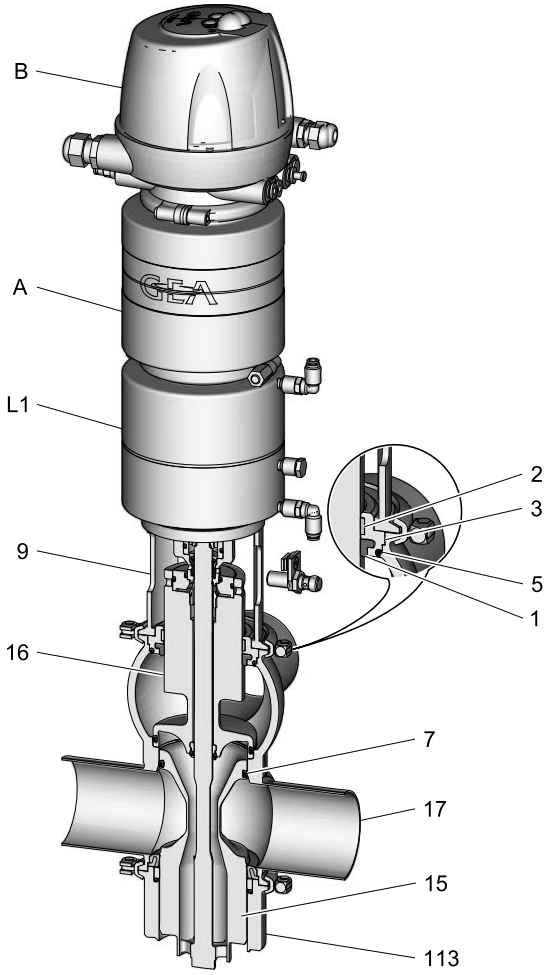
Conversion Work

You should never make any technical modifications to the valve. 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 the reliable and economical operation of the valve.

Design and Function

Design



No.	Designation	No.	Designation
A	actuator	9	lantern
B	control top T.VIS	15	valve disk
1	sealing ring	16	double valve disk
2	rod guide ring	L1	lifting actuator
3	sealing disk	17	valve housing
5	O-ring	113	Sterile lock MMU
7	V-ring RA		

Leakageproof Shut-off

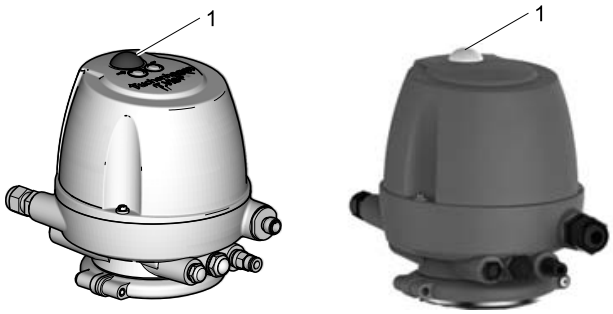
In mixproof valve M/2.0, the upper and the lower valve housing are each fitted with a valve seat.The chamber between the valve disks is connected to the open environment by an isolation outlet integrated into the lower valve spindle. Should seal damage occur, leaking fluid flows safely into the open. Defective seals can thus easily be detected. The penetration of leaking fluids from one pipe into the other is excluded under normal operating conditions.

Actuator Function

Actuator with spring closing function (Z). The valve is closed in the non-actuated position.

Distinguishing feature with control top T.VIS on completed installation (SET-UP):

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



Control top T.VIS A-15 and Control top T.VIS M-15

Installation

Notes on Installation

The standard installation position of the valve is upright and in no case more than 15 degrees to the vertical. However, care must be taken to ensure that the valve housing and the pipe system can drain properly.

To prevent damage, make sure that

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

Valve with Detachable Pipe Connection Elements

This section describes the procedure to fit the valve.

CAUTION

Liquids in pipes
Danger of injury due to liquid spraying out

➔ Therefore, before releasing any pipe connections or clamp joints: 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.

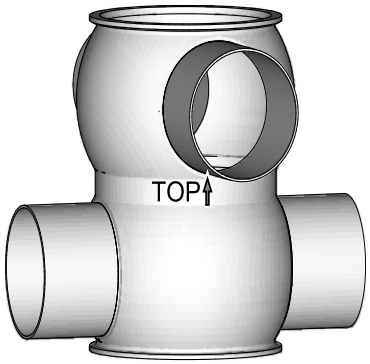
Carry out the following steps:

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

✓ Done

Valve with Welding Ends

This section describes the welding procedure for the valve.



Installation position of the valve housing

WARNING

Spring tension in the valve
Danger of injury when opening the clamps (43) as the released spring pretension will suddenly lift the actuator.
➔ Therefore, release the spring tension before detaching the clamps by pressurizing the actuator of a spring-closing valve with compressed air at max. 8 bar.

IMPORTANT NOTE

The installation position of the housing is not any!
In case of incorrect installation position, the valve is not working properly.
➔ Make sure that the housing has the correct orientation (TOP↑), see pict.

Carry out the following steps:

1. Release the spring tension.
2. Disassemble the valve, see chapter “Disassembling“ (Page 51).
3. Fit the housing without sealing rings.
4. Fit the housing into place and tack it.
5. Always close 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 stress-free into the pipe system; use welding filler if necessary. Use the TIG welding with pulse method.
8. Passivate the seam after welding.
9. Fit the seals.

10. Assemble the valve and depressurize the actuator.
    ➥ The valve disk is lowered.

✓ Done

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

Pneumatic Connections

Air requirement

Size	Type	Air requirement (dm^3_n/stroke) dm^3_n at 1.01325 bar at 0°C as per DIN 1343 for **Total stroke**	Air requirement (dm^3_n/stroke) dm^3_n at 1.01325 bar at 0°C as per DIN 1343. for Lifting **Stroke of valve disk (lower disk)**	Air requirement (dm^3_n/stroke) dm^3_n at 1.01325 bar at 0°C as per DIN 1343 for Lifting **Stroke of double disk (upper disk)**
4"	SN6Z/ELMN6	5.60	2.25	0.30
6"	EH6Z/ELMN6	4.45	2.25	0.30

Establishing the hose connection

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

Tools required:

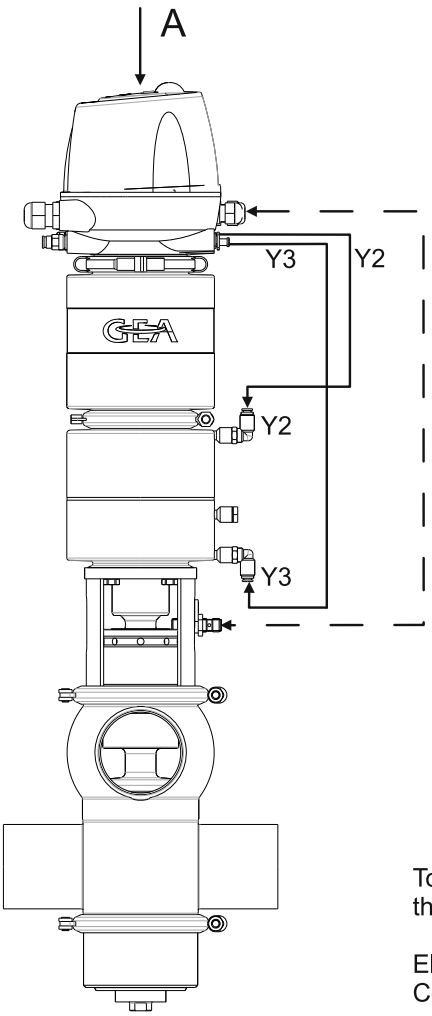
- A hose cutter.

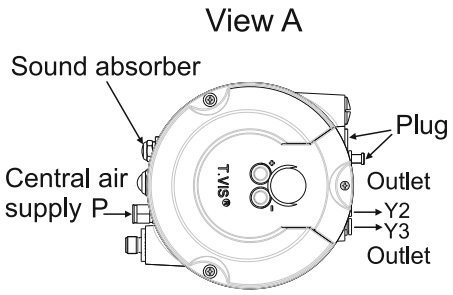
Carry out the following steps:

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

✓ Done

Hosing Diagram





To ensure optimum fit in the air connector,
the pneumatic hoses must be cut square with a hose cutter.

Electrical connection see operating instructions
Control module T.VIS A-8 or T.VIS M-1!

Electrical Connections and Commissioning

Connecting the valve

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.

EXPLOSION HAZARD

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:

➔ Connect in accordance with the connection diagram and the instructions in the corresponding operating instructions for the control top.

✓ Done

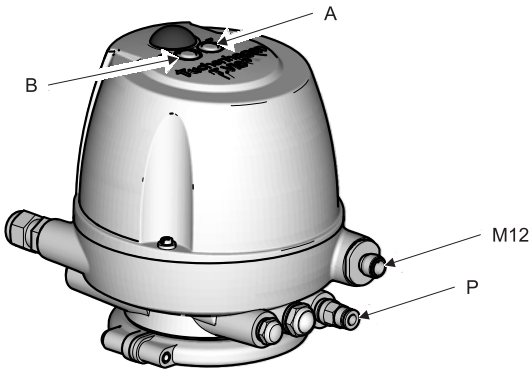
Adjusting the Position Detecting Devices

The control top and lantern sensors are adjusted at the factory. During transportation or installation these settings may alter and re-adjustment may be necessary (see operating instructions Control top T.VIS M-15 or T.VIS A-15).
The standard adjustment procedure for control tops T.VIS A-15, T.VIS M-15 as well as the lantern sensor are as follows:

WARNING

The following description is a summary of the basic adjustment steps and is not intended as a substitute for the official operating instructions. The operating instructions should always be consulted for comprehensive operation and safety instructions.

Adjusting Control top T.VIS A-15



Control top T.VIS A-15 with 2 buttons

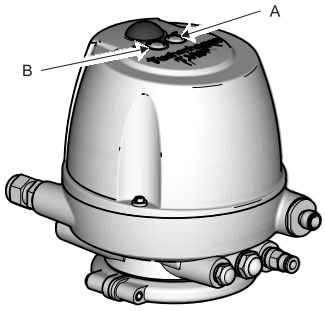
CAUTION

Danger if media are present in the valve when this is actuated!
They can escape or mix in the pipelines.
➔ Make sure that no media are inside the valve.

Carry out the following steps:

1. Connect the control air to the control top T.VIS A-15 (port P).
2. Power up the control top by connecting the supply to the M12 pin connector.

3. Within 30 seconds of power up, simultaneously press both black buttons (A, B) on the top of the control top for 3 to 7 seconds.



➥ The set-up will proceed automatically. This will take approx. 60 seconds. Do not press any buttons during the 60 second set up procedure irrespective of the colors or flashing of the LED.

➥ Once the LED is a steady green light, set-up is completed and the valve is ready to operate.

✓ Done

NOTE

Refer the chapter 'Remedy Faults' in the operating instructions of TVIS A-15 if the LED does not show a steady green light after two minutes.

Adjusting Control top T.VIS M-15

For the Start Position of the Valve Disk – Valve Non-actuated

Requirement

- Clockwise rotation of the setting screw (1) moves the sensor upwards, anti-clockwise rotation downwards.

Presetting

CAUTION

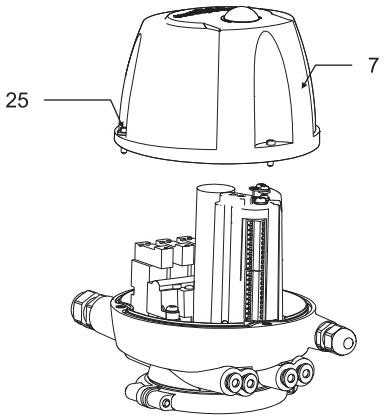
Danger if media are present in the valve when this is actuated!
They can escape or mix in the pipelines.
➔ Make sure that no media are inside the valve.

IMPORTANT NOTE

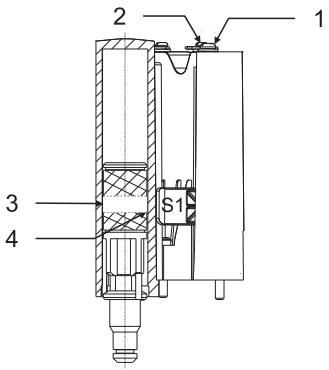
There is a risk of overwinding the setting screw (1)!
This would damage the setting screw.
➔ Therefore turn the setting screw (1) with a torque of 0.3 Nm max. up to the upper or down to the lower limit stop of the sensor.

Carry out the following steps:

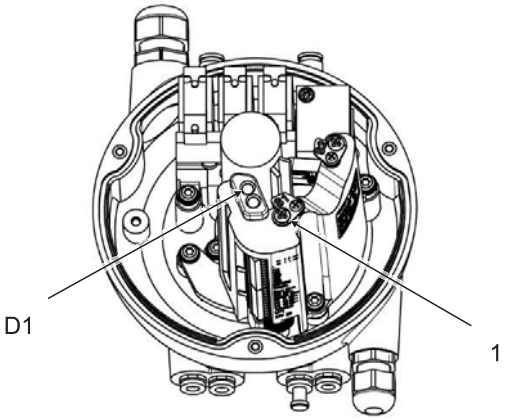
1. Undo cylinder screws (25) and remove the hood (7).



2. Slacken the locking screw (2).



3. Turn setting screw (1) of the sensor S1, until light emitting diode D1 at the interface top shines green.



4. Move sensor using the setting screw (1) in the direction of the lower switching edge (4) of the switching range (3) until the diode turnes off.

Setting the switch point

Carry out the following steps:

1. Setting the switchpoint in upward position, 1 clockwise rotation.
   ➥ Light emitting diode D1 at the interface top shines green.
2. Tighten the locking screw (2).

✓Done

For the Actuated Position of the Valve Disk – Valve Main Stroke Actuated

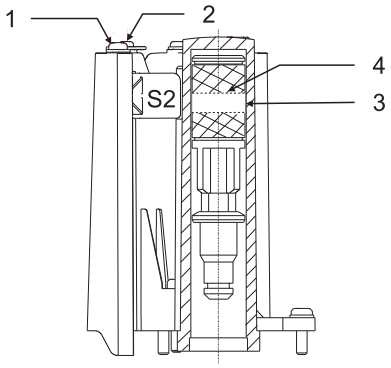
Requirement

- Move the valve disk to the upper position either by electrical or manual actuation of the solenoid valve Y1.

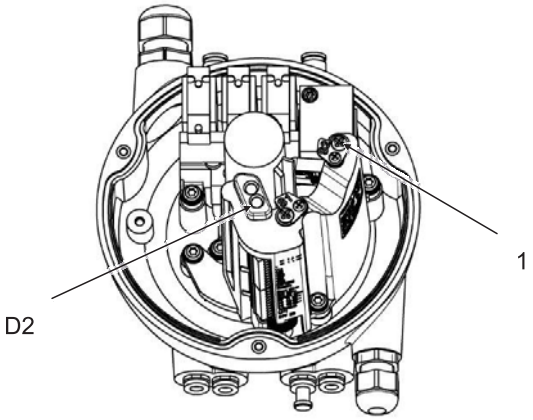
Presetting

Carry out the following steps:

1. Slacken the locking screw (2).



2. Turn setting screw (1) of the sensor S2, until light emitting D2 at the interface top shines yellow.



3. Move sensor using the setting screw (1) in the direction of the upper switching edge (4) of the switching range (3) until the diode turnes off.

Setting the switch point

Carry out the following steps:

1. Setting the switchpoint in downward position, 1 anti-clockwise rotation.
   ➥ Light emitting diode D2 at the interface top shines yellow.
2. Tighten the locking screw (2).
3. Deactivate solenoid valve Y1.
   ➥ Valve disk moves into the nonactuated position.
   ➥ LED B yellow turnes off and LED A green switches on.
4. If you are ready put on the hood.

✓ Done

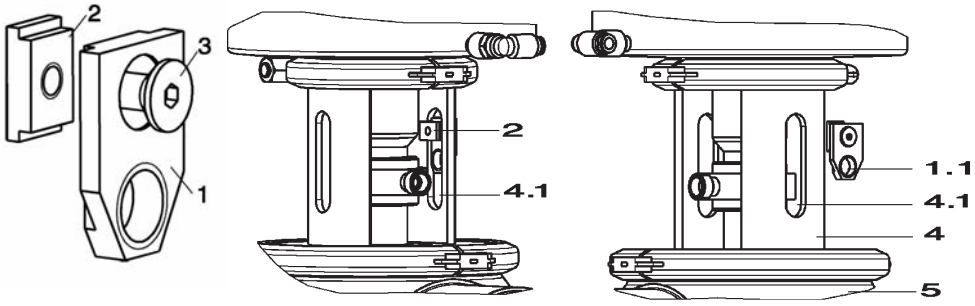
Adjusting the Proximity Switch in the Lantern on Double-Disks Without Balancer

This section only applies for double-disks without balancer on VARIVENT valves D, R, Y and B.

Fitting the proximity switch holder

Carry out the following steps:

1. Preassemble sliding piece (1), countersunk screw (3) and nut NI (2).

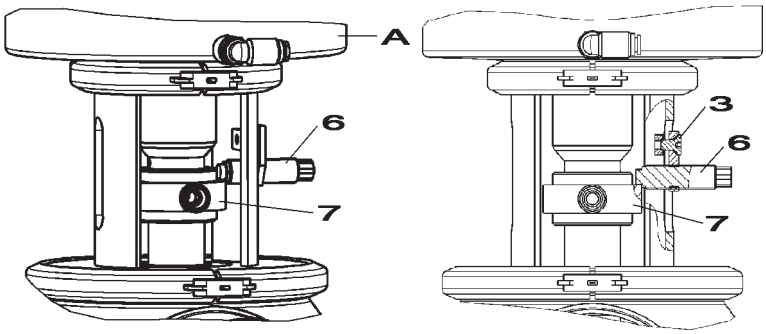


2. Insert the preassembled part in the slot (4.1) in the lantern (4) with the mounting hole (1.1) facing in the direction of the housing (5).
3. Turn the nut NI (2) in the slot (4.1) in the lantern through 90° and tighten with the countersunk screw (3).

Adjusting the proximity switch holder

Carry out the following steps:

1. Screw the adjusting screw (6) into the proximity switch holder down to the cleaning connection (7).

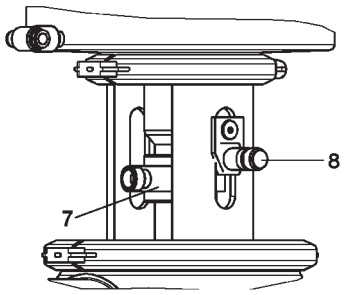


2. By slightly slackening the countersunk screw, position the proximity switch holder in the slot in the lantern so that the point of the adjusting screw (6) rests on the shoulder of the cleaning connection in the direction of the actuator (A).
3. Fix the proximity switch holder in position with the countersunk screw (3).

Fitting the proximity switch

Carry out the following steps:

1. Remove the adjusting screw.

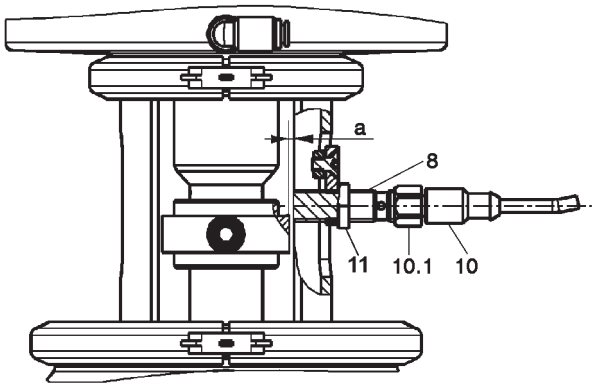


2. Screw proximity switch M12 (8) into the proximity switch holder until the cleaning connection (7) is reached.

Adjusting the proximity switch

Carry out the following steps:

1. Unscrew the proximity switch by one full turn (360°) to set the gap (a) in the range from 0.5 to 1.0 mm.



2. Tighten the lock nut (11).
3. Secure the connector (10), which has already been electrically connected to the control top, to the proximity switch using the cap nut M12 (10.1).

➥ The LED on the proximity switch must now be lit in operating mode.

Checking the function

Carry out the following steps:

➔ Check the feedback function by actuating solenoid valve Y3.

➥ The LED must go out.

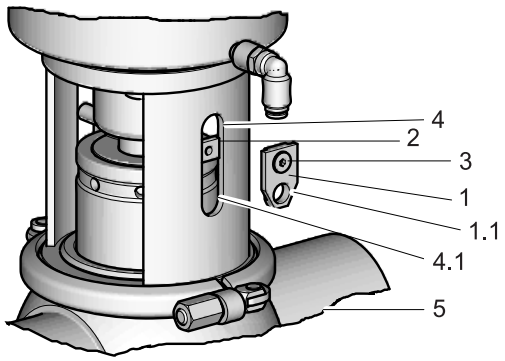
✓ The external proximity switch has been adjusted.

Adjusting of the external Sensor in the Lantern

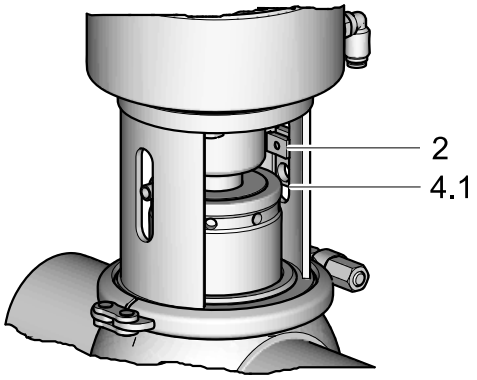
Fitting the proximity switch holder

Carry out the following steps:

1. Place the proximity switch nut (2) against the slot (4.1) from the inside of the lantern (4) and hold it in position with a finger.



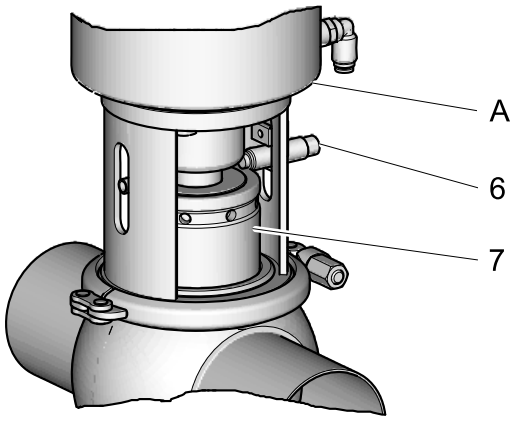
2. Fix the sliding piece (1) with the countersunk screw (3) in the orientation shown – with the mounting hole (1.1) facing in the direction of the housing (5).
3. Tighten the proximity switch nut (2) with the countersunk screw (3).



Adjusting the proximity switch holder

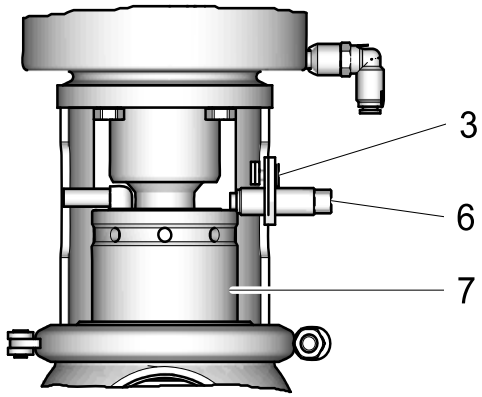
Carry out the following steps:

1. Screw the adjusting screw (6) into the proximity switch holder down to the upper edge of the balancer (7).



2. By slightly slackening the countersunk screw, position the proximity switch holder in the slot in the lantern so that the point of the adjusting screw (6) rests on the shoulder of the balancer in the direction of the actuator (A).

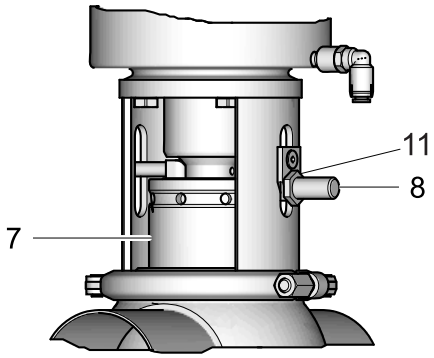
3. Fix the proximity switch holder in position with the countersunk screw (3).



Fitting the proximity switch

Carry out the following steps:

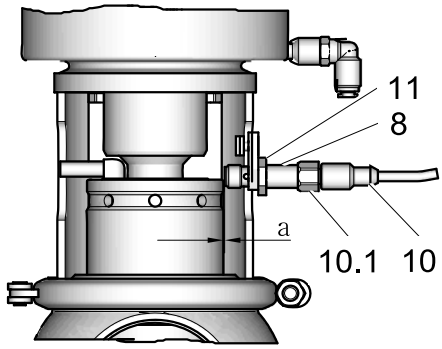
1. Remove the adjusting screw (6).
2. Screw the proximity switch M12 (8) into the proximity switch holder up to the balancer (7) together with counter nut (11).



Adjusting the proximity switch

Carry out the following steps:

1. Unscrew the proximity switch a full rotation (360°), to adjust distance (a) up 0.5 to 1.0 mm.



2. Tighten counternut (11).
3. Secure the connector (10), which has already been electrically connected to the control top, to the proximity switch using the cap nut M12 (10.1).

   ➥ The LED on the proximity switch must now be lit in operating mode.

Checking the function

Carry out the following steps:

➔ Check the feedback function by actuating solenoid valve Y3.

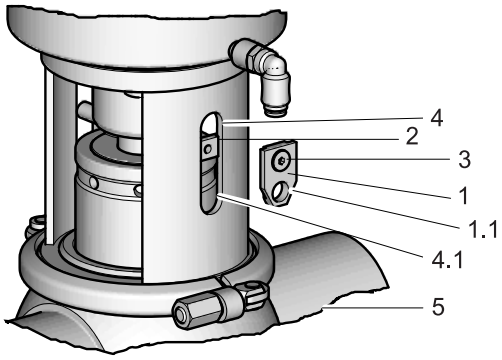
➥ The LED must go out.

✓ Done

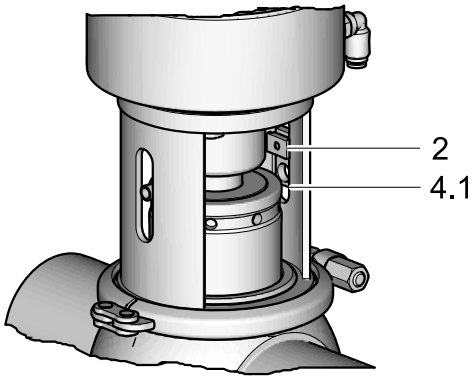
Fitting the proximity switch holder

Carry out the following steps:

1. Place the proximity switch nut (2) against the slot (4.1) from the inside of the lantern (4) and hold it in position with a finger.



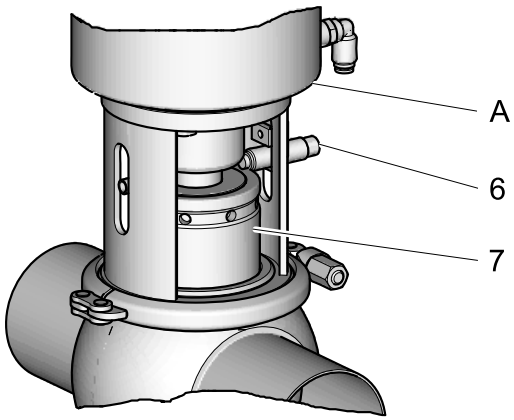
2. Fix the sliding piece (1) with the countersunk screw (3) in the orientation shown – with the mounting hole (1.1) facing in the direction of the housing (5).
3. Tighten the proximity switch nut (2) with the countersunk screw (3).



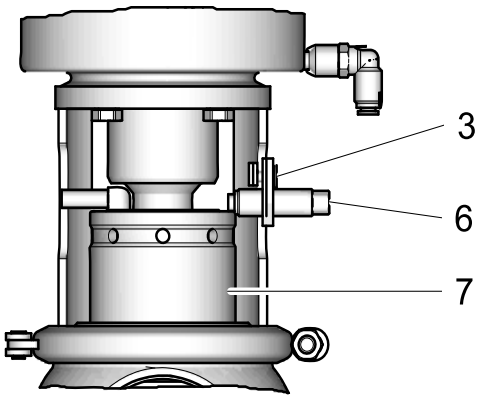
Adjusting the proximity switch holder

Carry out the following steps:

1. Screw the adjusting screw (6) into the proximity switch holder down to the upper edge of the balancer (7).



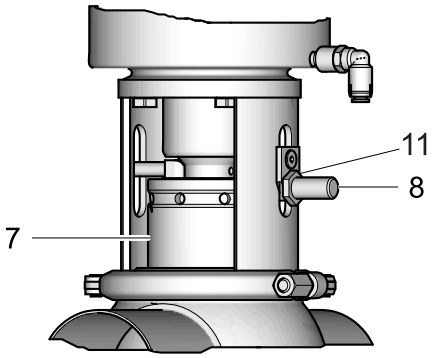
2. By slightly slackening the countersunk screw, position the proximity switch holder in the slot in the lantern so that the point of the adjusting screw (6) rests on the shoulder of the balancer in the direction of the actuator (A).
3. Fix the proximity switch holder in position with the countersunk screw (3).



Fitting the proximity switch

Carry out the following steps:

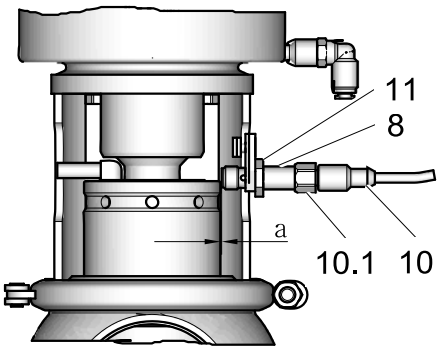
1. Remove the adjusting screw (6).
2. Screw the proximity switch M12 (8) into the proximity switch holder up to the balancer (7) together with counter nut (11).



Adjusting the proximity switch

Carry out the following steps:

1. Unscrew the proximity switch a full rotation (360°), to adjust distance (a) up 0.5 to 1.0 mm.



2. Tighten counternut (11).
3. Secure the connector (10), which has already been electrically connected to the control top, to the proximity switch using the cap nut M12 (10.1).

➥ The LED on the proximity switch must now be lit in operating mode.

Checking the function

Carry out the following steps:

➔ Check the feedback function by actuating solenoid valve Y3.

➥ The LED must go out.

✓ Done

NOTE

The purpose of the proximity switch is to monitor the position of the upper seat whilst the valve is in a closed position and during the lower seat-lift operation. During main valve activation (by activation of solenoid Y1) the signal from the proximity switch should not be monitored at the PLC. Sensor S2 may be used to confirm the valve has reached its fully activated position.

Test Procedures for Tuchenhagen PMO Valve Type M-C/2.O

Purpose

- The purpose of test procedure 1 is for the Regulatory Inspector to check and ensure that the detecting devices which detect and confirm the closed position of the upper and lower seats of the PMO valve respectively (as per PMO Item 15p.(B) - Point 1.b.(2)) are adjusted and functioning properly.
- The purpose of test procedure 2 is to allow the Regulatory Inspector to confirm the proper control system interlocking of the PMO Valve type M/2.O during an active circuit CIP operation.

Test Procedure Overview

The methodology behind the test procedure 1 is for the Regulatory inspector to manually implement the upper seat lift and the lower seat lift operations locally at the valve, thereby verifying that the position detecting devices used for upper and lower seat closed position detection DO change status.

Hardware Description

1. The T.VIS A-15 or T.VIS M-15 Control Top on the top of the valve will house 3 solenoid valves

a) Solenoid Y1 – Main Valve Activation

b) Solenoid Y2 – Lower Seat Lift Activation

c) Solenoid Y3 – Upper Seat Lift Activation

These valves can be activated externally by sending signals from the PLC.

2. The lower seat closed position is detected by path measurement system. The correct adjustment of this system to detect the closed position of the lower seat is given in detail on page 33 of the Operating instructions.

The sensitivity of the path measurement system is 0.1 mm.

3. The upper seat closed position is detected by the externally-mounted lantern proximity switch S3 as shown on page 35 of the Operating instructions. The correct adjustment of this switch to detect the closed position of the upper seat is given in detail on page 35 of the Operating instructions.

The sensitivity of this proximity switch is also 0.1 mm.

Test procedure 1

Step 1

The valve should be in the closed position. This can be seen by the GREEN LED on the top of the control top.

Step 2

Carry out the following steps:

➔ Activate the lower seat lift operation by activating solenoid Y2 from the PLC.
  ➔ When the seat moves downwards (approx. 6 mm), the GREEN LED on the top of the control top will turn off to indicate that the position detecting device no longer sees the lower seat in its closed position.
  ➔ If the GREEN LED does not turn off, the position detecting device is NOT adjusted correctly and the adjustment procedure described under “Adjusting the Position Detecting Devices“ (Page 34) of the Operating instructions should be repeated.

✓ Done

Step 3

Carry out the following steps:

➔ Activate the upper seat lift operation by activating solenoid Y3 from the PLC.
  ➔ When the seat moves upwards (approx. 2 mm), the YELLOW LED on the externally-mounted lantern proximity switch will turn off to indicate that the proximity switch S3 no longer sees the upper seat in its closed position.
  ➔ If the YELLOW LED does not turn off, the upper seat proximity switch S3 is NOT adjusted correctly and the adjustment procedure described under “Adjusting Control top T.VIS M-15“ (Page 36) of the Operating instructions should be repeated.

✓ Done

Test procedure 2

The **methology** behind test procedure 2 is to allow the Regulatory Inspector to manually force open the seat opposite to the valve housing which is part of an active CIP circuit to ensure that proper control system interlocking is in place. In this case, the CIP supply pump or the source of the CIP solution pressure should be deactivated.

CAUTION
Please note that great care should be taken with test procedure 2 as there is danger of CIP mixing with product if the proper control system interlocks are not in place. Ensure that product is NOT present in the valve housing opposite to the housing which is part of the active CIP circuit for the duration of this test!

Step 1

Ensure that the valve being tested is part of an active CIP circuit program and determine which housing (upper or lower) of the valve is part of that active CIP circuit.

Step 2

Carry out the following steps:

1. If the upper housing is part of the active CIP circuit
   Activate the lower seat lift by activating solenoid Y2 from the PLC
2. If the lower housing is part of the active CIP circuit
   Activate the upper seat lift by activating solenoid Y3 from the PLC

✓ Done

Step 3

If the control system is properly interlocked, the CIP supply pump or the source of the CIP solution pressure will be deactivated. If the CIP supply pump or the source of the CIP solution pressure does NOT deactivate, the system should be shut down immediately for an investigation of the control system interlocking software.

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.

Cleaning and Passivation

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 inner valve parts. During pipe cleaning, the cleaning fluid also flows through the valve housings and cleans them. 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 plant operator in accordance with the relevant process. The cleaning effect must be checked regularly by the plant operator!

Typical cleaning parameters in dairy operations

Example of a two-phase cleaning process:

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

Example of a cleaning operation in one cleaning step:

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

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.

Cleaning of the leakage outletsystem

On 24/7 PMO double seat valves, the leakage cavity is cleaned by lifting the upper and the lower valve disk during the corresponding pipe cleaning operation.
Here, too, we can only give recommendations with respect to the number and duration of lifting strokes, since the conditions in the process line such as product, temperatures, cleaning media, cleaning intervals etc. affect the duration and frequency of the cleaning operations required.

We recommend that the cleaning parameters for the system should be defined during the test phase in order to save cleaning medium. To optimize seat cleaning, spot checks on the valve are performed after cleaning to ascertain whether the valve seats and the sealing surfaces are clean.

All systems fitted for cleaning the valve should be used regularly to ensure best cleaning results and prevent damage to the valve.

The leakage cavity is cleaned by lifting the upper or the lower valve disk during the relevant pipe cleaning operation. This allows cleaning fluid to flow past the seals and into the leakage cavity via a metallic throttling gap, thus cleaning the sealing surfaces of the lifted valve disk and the leakage cavity. Lifting is typically a pulsed process; the maximum length of a lifting pulse should not exceed 10 seconds.

This type of leakage cavity cleaning is used for sensitive media, which also require the sealing surfaces to be cleaned in order to remove micro-organisms that may adhere to them. This kind of cleaning is also recommended for sticking and crystallizing media.

The PMO double seat valve is also fitted with a balancer cleaning device. This is used to clean the product-contact surfaces of the balancer. A shroud is fitted around the lower valve stem. When the lower valve disk is lifted, a gap opens between the lower balancer seal and the balancer. The cleaning medium flows through this gap and past the balancer, so that all surfaces on the lower stem area and the surface behind the shaft seal are cleaned.

Examples of cleaning by lifting

In the table values for the duration and number of liftings are listed.

Medium	Period (s)	Number of liftings	Remark
Milk	2...5	3	During each cleaning phase 1. Prewash 2. Hot caustic 3. Intermediate washing 4. Acid 5. Rinse
Yogurt	3...5	3	

Depending on the cleaning method (medium concentration, temperature and contact time), the seals are attacked differently. This can lead to impairments in function and durability.

Passivation

Before commissioning a plant, passivation is commonly carried out for long pipes and tanks. Valve blocks are usually excluded from this.
Passivation is typically performed using nitric acid (HNO_3) at approx. 80 °C (176 °F) at a concentration in the 3% range and a contact time of 6 to 8 hours.

Malfunctions

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 pressure too low	Check the compressed air supply 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 solenoid valve
	the valve is operating against the hydraulically closed pipe	open pipe
Double valve disk oscillates during lifting or does not open	Air pressure too low	Increase air pressure
	Product pressure too high	Reduce product pressure
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	Disassemble the valve, change the housing O-rings
Leakage at the leakage outlet (closed position)	Valve disk V-ring defective	Dismantle valve insert replace V-rings
Leakage in the lantern	Sealing ring defective	Replace the sealing ring

Maintenance

Inspections

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

Product Contact Seals

Carry out the following steps:

➔ Regularly check:
– Upper sealing ring
– Lower sealing ring
– V-ring in the valve disks. Deficiency visible at the leakage on the leakage outlet during the closed position of the valve.

✓ Done

Pneumatic Connections

Carry out the following steps:

1. Check the operating pressure at the pressure reducing and filter station.
2. Clean the air filter at regular intervals.
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

Electrical Connections

Carry out the following steps:

1. Check that the cap nut on the cable gland is tight.
2. Check that the cable connections are firmly secured.
3. Check the solenoid valves for proper function.

✓ Done

Maintenance Intervals

To ensure the highest operational reliability of the valves, 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	approx. every 3 months
Media at temperatures of < 60 °C	approx. every 12 months

Prior to dismantling the Valve

Requirement

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

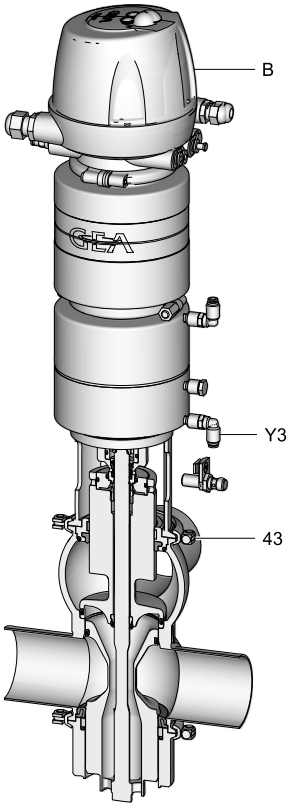
Carry out the following steps:

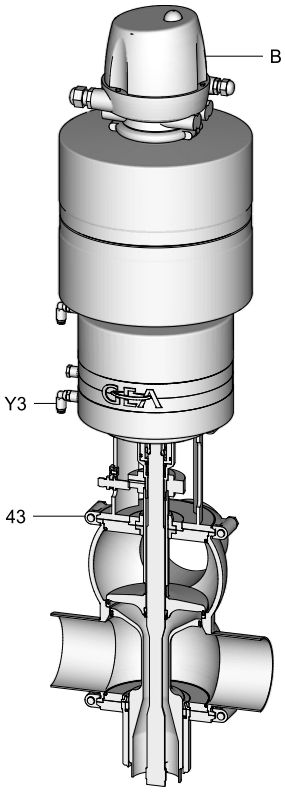
1. Drain all pipe system elements that lead to the valve and, if necessary, clean or rinse them.
2. Shut off the control air supply.
3. Disconnect the power supply.
4. For a better access take the valve, with housing and housing connections if possible, out of the pipe section.

✓ Done

Disassembling

Depressurizing the Actuator





WARNING

Spring tension in the valve

Danger of injury when opening the clamps (43) as the released spring pretension will suddenly lift the actuator.

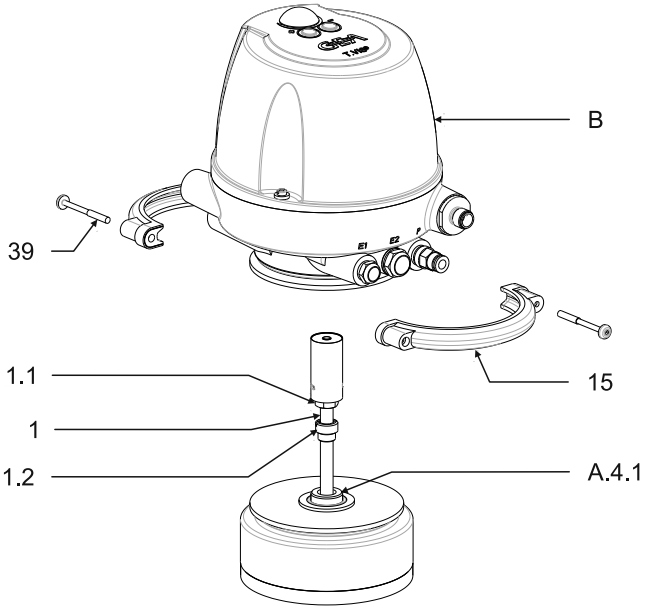
➔ Therefore, release the spring tension before detaching the clamps by pressurizing the actuator with compressed air at max. 8bar.

Carry out the following steps:

1. Remove the pneumatic hose at (Y3).
2. Connect an external pneumatic hose at (Y3).
3. Pressurize the lifting actuator via (Y3). For pressure see type plate.
   ↪ The valve disk is raised.
4. Take off the clamp (43) between the housing and the lantern.
5. Depressurize the actuator via (Y3).

✓ Done

Removing the Control Top and the Switch Bar



Requirement

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

IMPORTANT NOTE

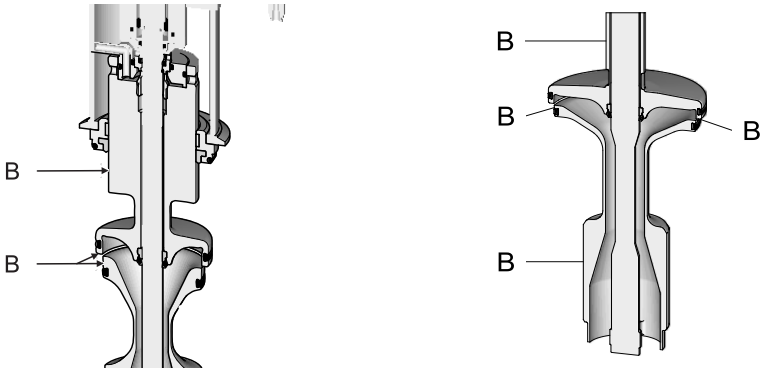
The permanent magnet on the switch bar (1) is fragile.
Damage to the permanent magnet.
➔ Protect the permanent magnet against impact stress.

Carry out the following steps:

1. Undo the screws (39).
2. Remove the semi-annular clamps (15) at the control top (B).
3. Remove the pneumatic connections at the lifting actuator.
4. Pull the control top (B) upwards to remove.
   ⮑ The feedback signal to the higher-level control system is interrupted.
   ⮑ The green LED goes out and the red LED lights up.
5. Unscrew the switch bar (1) by using an open spanner, size 13 at (1.1).
6. Pull out the switch bar (1) from the piston rod.
7. Only if you use the screwed-in eye bolt for transportation, see “Installation“ (Page 14):
   Unscrew the sliding piece (1.2) from the piston rod (A 4.1) of the actuator (A.4).

✓ Done

Separating the Valve from the Housing



IMPORTANT NOTE

The valve disks (B) are a sensitive components.
The sealing surfaces on the valve disks (B) may be damaged.

➔ Take care when removing the valve insert from the housing that the valve disks do not hit the valve housing.

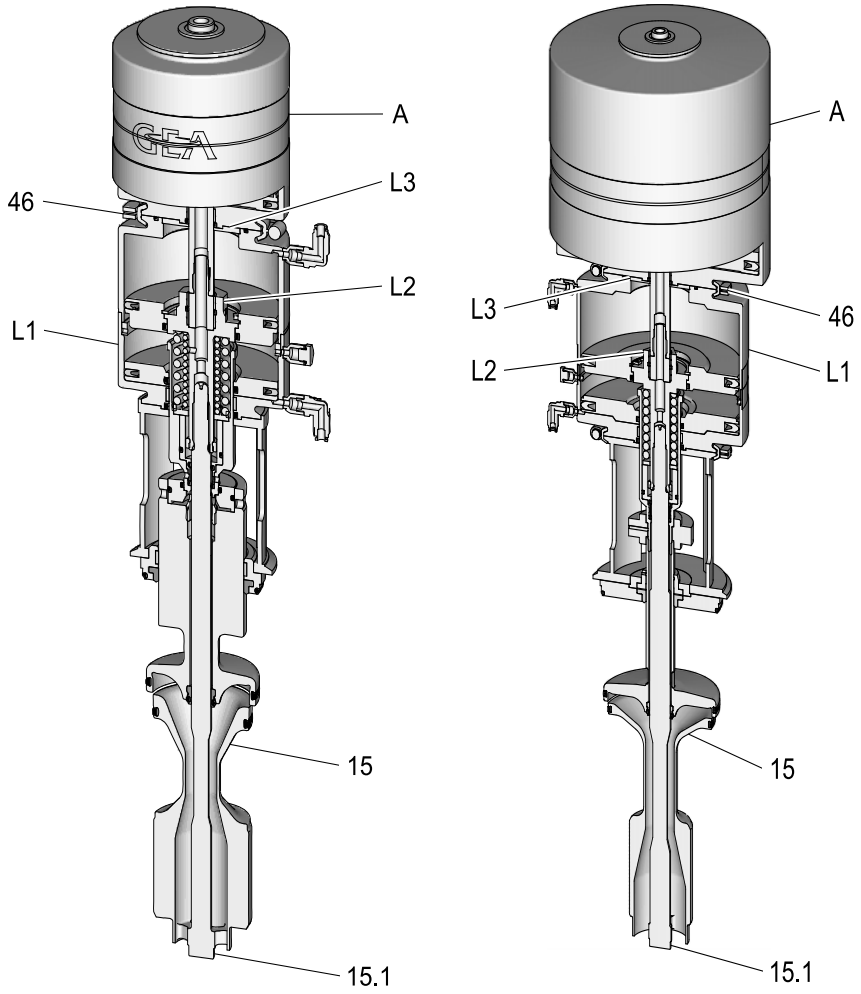
➔ Carefully draw out the valve insert.

Carry out the following steps:

➔ Pull the valve insert out of the housing.

✓ Done

Dismantling the Valve Disk

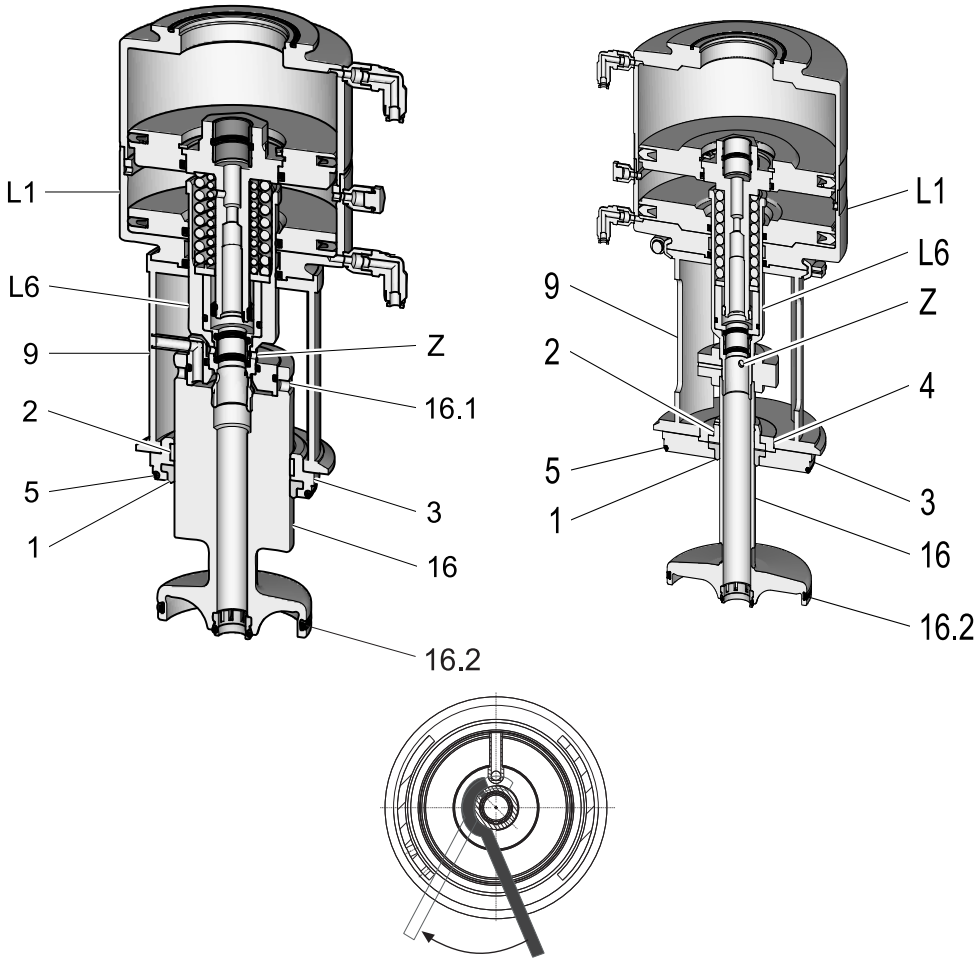


Carry out the following steps:

1. Remove clamp jointClamp joint (46).
2. Pull actuator (A) out of the lifting actuator (L1).
3. Remove locking flange (L3).
4. Hold carrier (L2) using a tubular hex. box spanner size 36, set the head face spanner at (15.1) and unscrew valve disk (15).

✓ Done

Dismantling the Double Valve Disk



IMPORTANT NOTE

The double valve disk and the sealing disk are sensitive components.
The sealing surfaces on the double valve disk and the sealing disk may be damaged.
➔ Take care when removing the double valve disk.

IMPORTANT NOTE

The deflection edges on the double valve disk are sensitive parts.
The edges on the double valve disk may be damaged.
➔ The deflection edge (16.2) must be handeld with care.

Carry out the following steps:

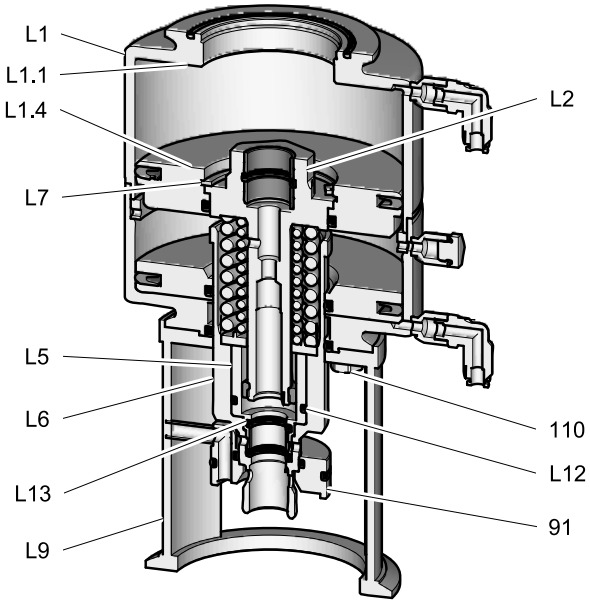
1. Place a hook spanner on the carrier sleeve (L6) at point (Z) and turn the sleeve in the direction of the lantern as far as it will go. Hold the carrier sleeve in this position with the hook spanner.

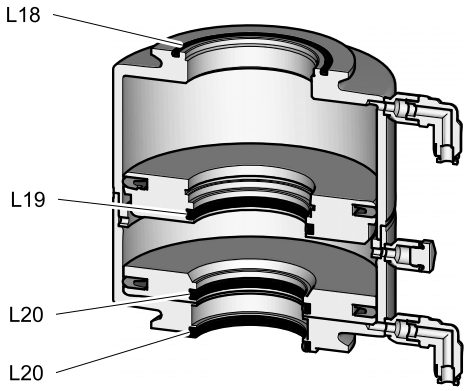
2. Insert pin punch into the bore (16.1) and unscrew double valve disk (16).
3. Withdraw sealing disk (3) with rod guide ring (2), O-ring (5), sealing ring (1) from the lantern (9).

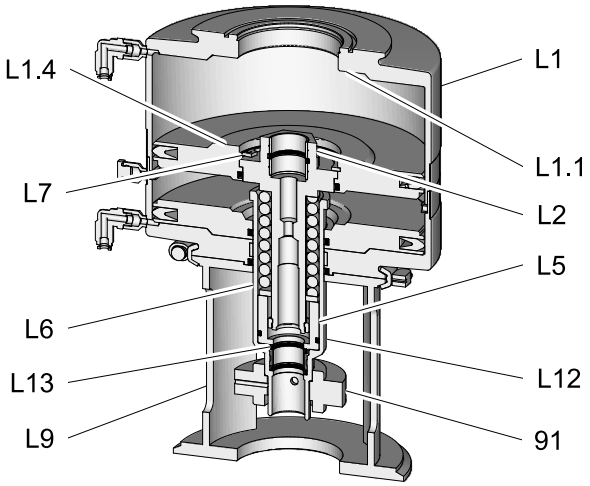
✓ Done

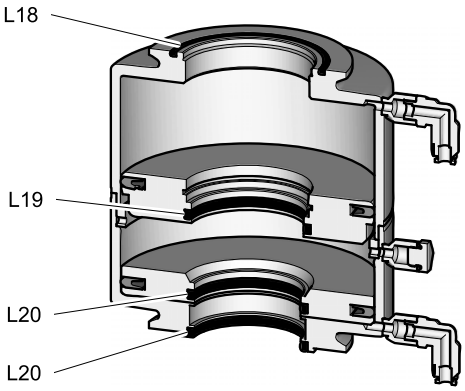
Dismantling the Lifting Actuator

It is not necessary, to change the O-rings in the lifting actuator at every service.









Carry out the following steps:

1. Pull-off CIP connection (91) from the carrier sleeve (L6).
2. Put lifting actuator (L1) down for further disassembly.
3. Push the piston (L1.4) with fitted carrier (L2) and carrier sleeve (L6) upwards against the lifting actuator flange (L1.1) and remove the circlip (L7) from the piston (L1.4) using nippers.
4. Push carrier (L2) complete and carrier sleeve (L6) out of the lifting actuator (L1).
5. Pull bushing (L5) out of the carrier sleeve (L6).
   ➥ The O-rings (L12, L13) are accessible.
6. Remove the 4 hex. screws (110).
7. Pull-off lantern (9) from lifting actuator (L1).
   ➥ O-rings (L18, L19, L20) are now accessible.

✓ Done

Maintenance

Cleaning the Valve

IMPORTANT NOTE

The shaft of the valve disk, the housing seat, the valve seat,
the V-ring groove and the lower edge of the double valve disk are precision parts.
Damage to these parts can result in malfunctions.
➔ Handle the valve with care!

IMPORTANT NOTE

Damage to the valve
Damage to the valve can result in a malfunction.
➔ Observe the safety information sheets issued by the detergent manufacturers!
➔ Only use detergents which are non-abrasive and not aggressive towards stainless steel.

Carry out the following steps:

1. Disassemble the valve, see “Disassembling“ (Page 51).
2. Carefully clean the individual parts.

✓ Done

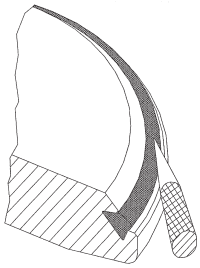
Removing V-Ring RA

CAUTION

The scriber can slip off when the V-ring RA is removed.
Danger of injury and damaging the valve disk!
➔ Grip the valve disk in a vice with protected jaws.

Carry out the following steps:

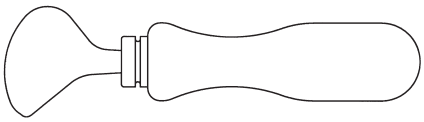
➔ Put a scriber into the V-ring RA and take it out.



✓

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

Inserting V-Ring RA



Insertion tool

Requirement

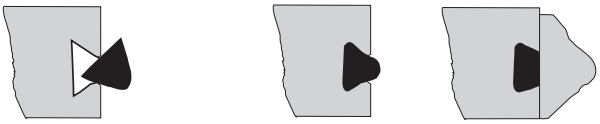
- Insert V-rings without grease.
- We recommend using water with household dish washing detergent (1 drop/1 l; 4 drops/US GAL) as an aid for the insertion of V-rings. In order that no rust is transferred, the washing-up liquid solution must be made up in a ceramic, plastic, or stainless steel container.

Tools required:

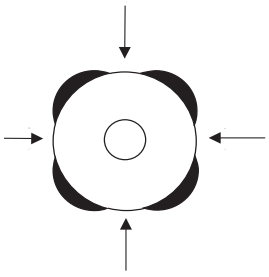
- Use the insertion tool to fit the V-ring RA (see illustration).

Carry out the following steps:

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



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



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

6. Check that the V-Ring is properly in position and that there are no dents.

✓ Done

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

Lubricating Seals and Threads

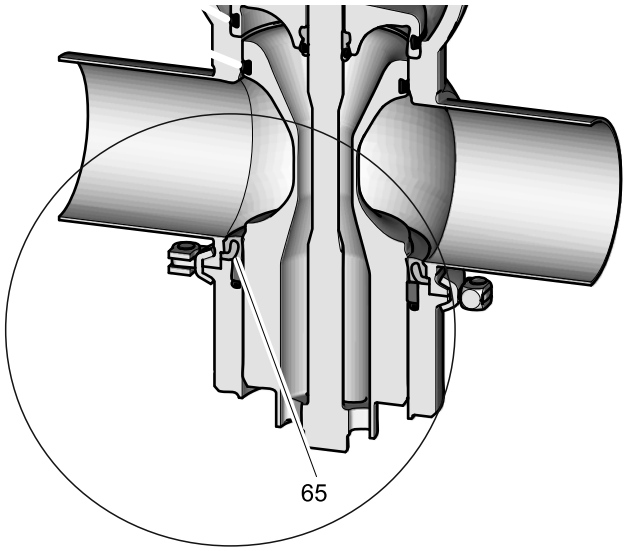
CAUTION

Damage to seals and threads
Damage to seals and threads can result in a malfunction.
➔ Ensure that an adequate film of lubricant is applied. No grease residues must be visible after fitting the complete valve.
➔ For product contact seals only use suitable greases and oils.
➔ Observe the safety information sheets issued by the lubricant manufacturer!

Carry out the following steps:

1. Grease the threads of the valve disk and those of all screws.
   ! Do not grease the thread of the adapter.
   ! Do not grease the thread of the piston rod.
2. Apply a very light film of grease to all seals – including the O-rings at the top and bottom of the piston rod for the actuator.
   ! Do not grease the V-rings.
3. Lubricate the balancer.

4. Lubricate the inner parts of the sealing ring (65).



✓ Done

NOTE

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 from GEA Tuchenhagen under part no. 413-064, and Rivolta F.L.G. MD-2 can be ordered under part 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.

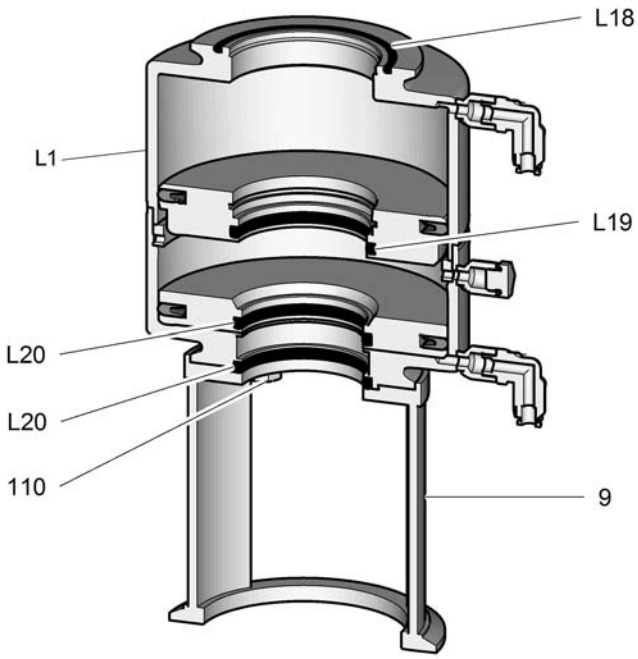
Running dry must be avoided!

Assembling

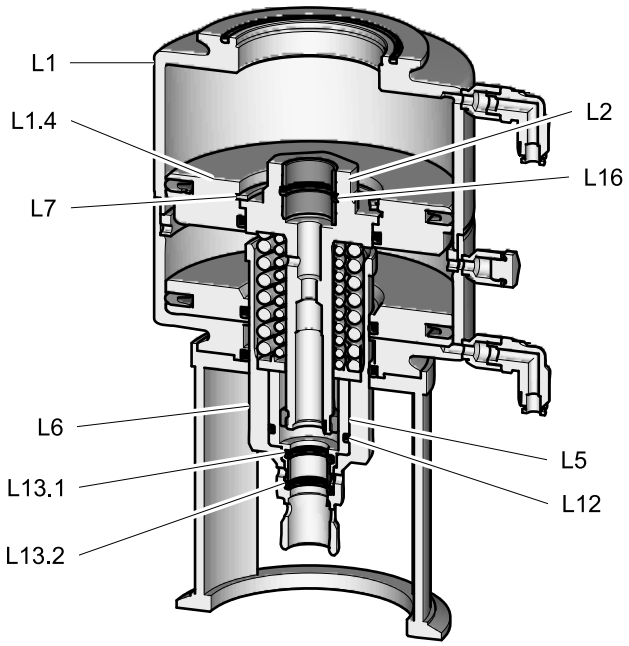
Assembling the Lifting Actuator

Carry out the following steps:

1. Equip the lifting actuator M/2.0 (L1) with O-rings (L18, L19, L20) and fix it at the lantern (9) with 4 hex. screws (110).



2. Place O-ring (13.2) into the carrier sleeve (L6) and provide bushing (L5) with O-rings (L12, L13.1) and place it also into the carrier sleeve (L6).
   ➔ Or with help of the mandrel, part no. 221-105.94 or 221-105.95
   Provide bushing (L5) with O-rings (L12, L13.1) and plug it on to the mandrel. Then place O-ring (L13.2) on the top and push everything into the carrier sleeve (L6). Remove mandrel.

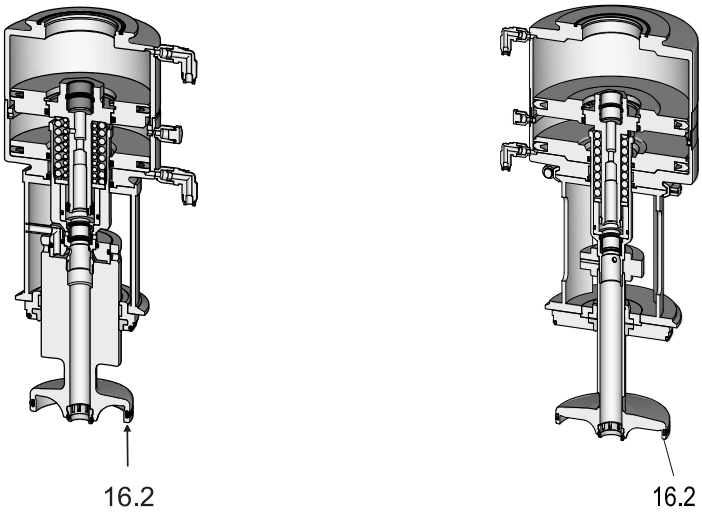


3. Push carrier (L2) complete with O-ring (L16) into the carrier sleeve (L6) and pre-stress with mandrel (part no. 221-105.76) and tubular hex. box spanner size 36.

4. Insert carrier sleeve (L5, L6) into the lifting actuator (L1) and fix with circlip (L7) at the piston (L1.4) and then relieve.

✓

Assembling the Valve

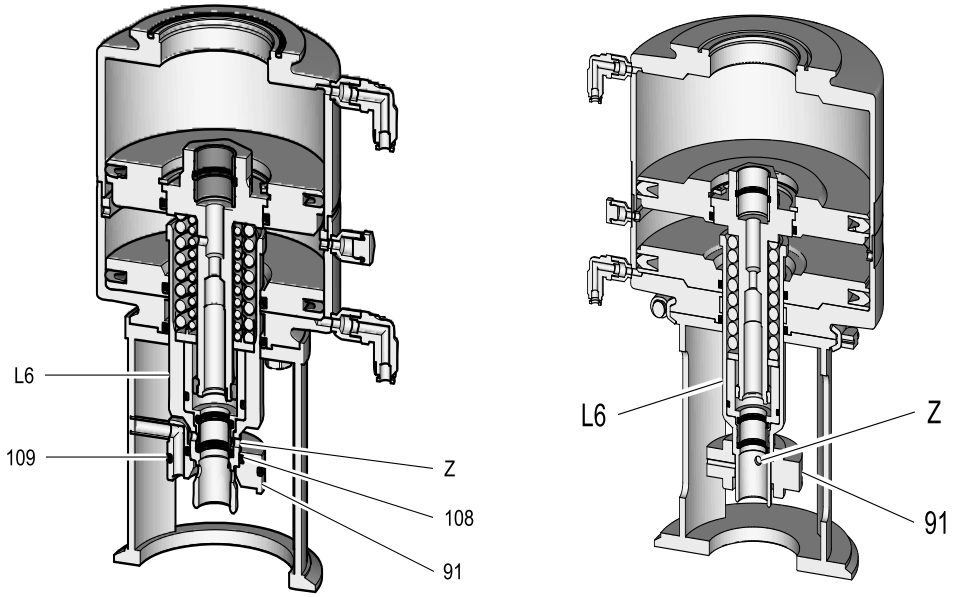


IMPORTANT NOTE

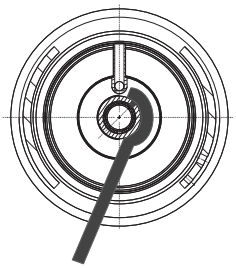
The deflection edges (16.2) on the double valve disk are sensitive parts.
The edges on the double valve disk may be damaged.
➔ The deflection edges must be handeld with care.

Carry out the following steps:

1. Push CIP connection (91) equipped with O-rings (108, 109) on to the carrier sleeve (L6).

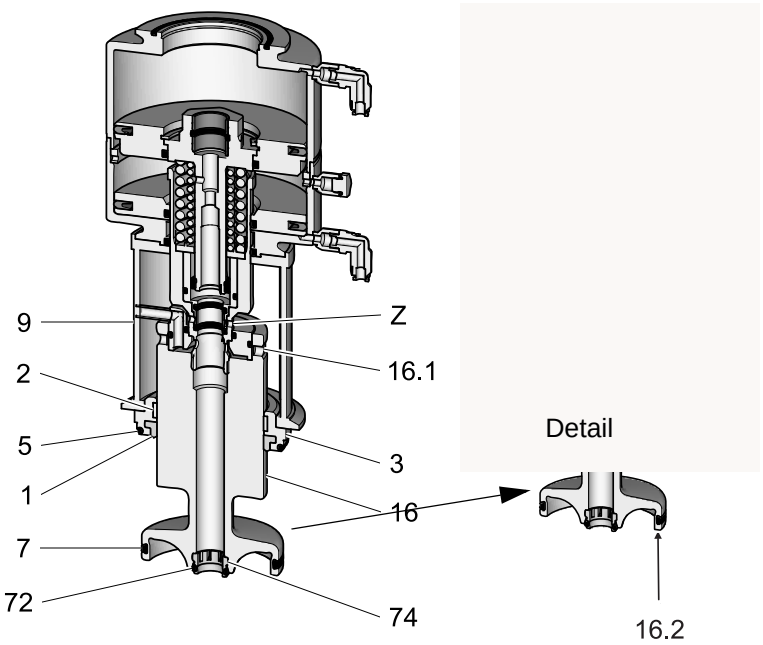


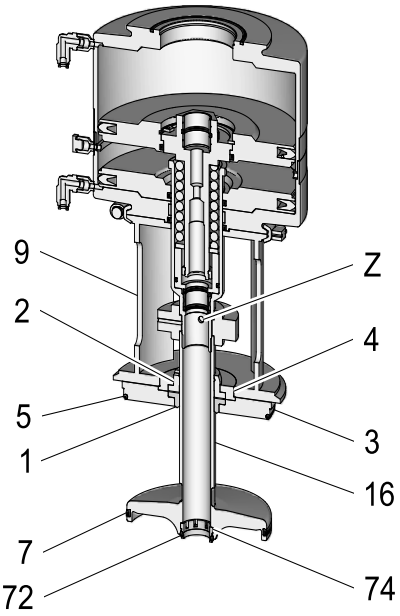
2. Hold carrier sleeve at (Z) using a hook spanner.



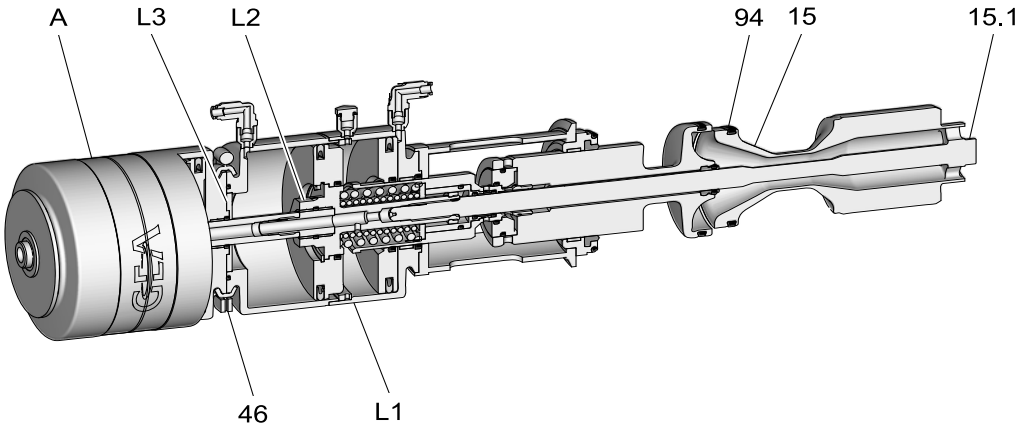
3. Tighten the double valve disk (16) complete with V-ring RA (7), snap sealing (74), O-ring (72), sealing disk (3), O-ring (5), sealing ring (1), rod guide ring (2) by applying a pin punch at (16.1).

➔ While screwing the double valve disk, press the sealing disk (3) against the lantern (9).





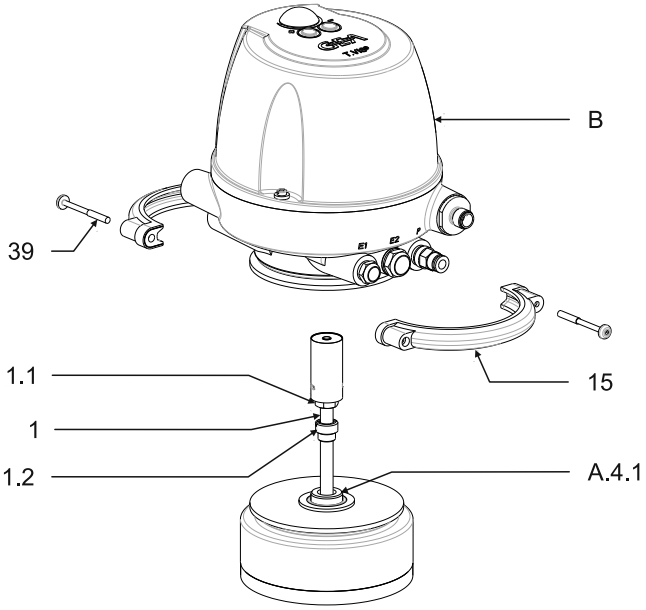
4. Hold carrier (L2) with tubular hex. box spanner size 36 and tighten valve disk (15) together with installed V-ring (94) with flexible head face spanner at (15.1).



5. Insert locking flange (L3) into the lifting actuator (L1).
6. Insert actuator (A) into the lifting actuator (L1) and fix with clamp joint (46).

✓ Done

Mounting the Switching Rod and the Control Top



IMPORTANT NOTE

The permanent magnet on the switch bar is fragile.
Damage to the permanent magnet.
➔ Protect the permanent magnet against impact stress.

Carry out the following steps:

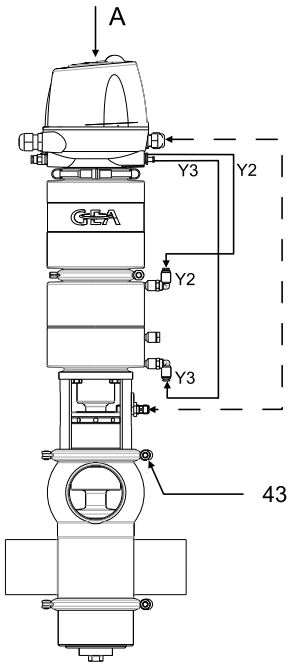
1. Screw the sliding piece (1.2) into the piston rod using a 12 mm slotted screw driver, tightening torque 2 Nm (1.4 lbft).
2. Insert the switch bar (1) through the sliding piece into the piston rod (A 4.1) and use an open spanner, size 13 to tighten at (1.1) with a torque of 22 Nm.
3. Fit the control top (B) over the switch bar (1) and on the actuator (A4).
4. Fix the clamps (15) by tightening the screws (39) to a torque of 1 Nm (0.7 lbft).
5. Align the pneumatic and electrical connections in accordance with the valve block configuration.

✓ Done

Insert the Valve into the Housing

Carry out the following steps:

1. Remove the pneumatic hose at Y3.
2. Connect an external pneumatic hose at Y3.
3. Pressurize the lifting actuator via (Y3). For pressure see type plate.
   ↪ The valve disk is raised.
4. Introduce valve insert carefully into the housing and fix with clamp joint (43).



✓ Done

Torques of the Semi-annular Clamps and Clamp Joints

Tighten the nuts of the clamp joints with following torques:

Torque		Nm	lbft
Semi-annular clamps at the control top		1	0.7
Clamp joints	M6	9	6.6
Clamp joints	M8	22	16.2
Clamp joints	M10	45	33

Checking the Function

Adjusting Stroke

Carry out the following steps:

1. Check the function of the proximity switches.
2. Check whether the valve stroke (c) is correct, see table “Valve strokes and lifting strokes“ (Page 70). Use a capiler gauge.

✓ Done

NOTE
It is not necessary to adjust the lifting strokes.

Valve Stroke

Valve strokes and lifting strokes

Valve size Inch OD	Valve stroke C mm	Lifting stroke Double valve disk mm	Lifting stroke Valve disk mm
4"	65	2.5	6
6"	65	2.5	6

Disposal

General Notes

Dispose of the machine at the end of its life cycle in an environmentally friendly manner. Observe the statutory waste disposal regulations applicable at the place of installation.

The valve is made 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.

Valve Actuator Disposal

DANGER

The spring forces in the actuator can be as much 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:

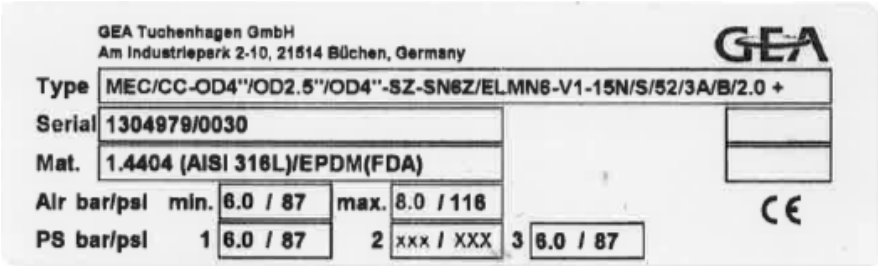
1. Remove the actuator.
2. Safely pack the actuator and send it to GEA Tuchenhagen GmbH.

✓

Technical Data

Type Plate

The type plate clearly identifies the valve.



Type plate of the valve

The type plate provides the following key data:

Key data of the valve

Type	Mixproof Valve M-C/2.0
Serial	Serial number
Material	1.4404 (AISI 316L)/EPDM (FDA)
Control air pressure	6 bar up to 8 bar (87 psi up to 116 psi)
Product pressure	6 bar (145 psi) max.

Technical Data

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

Technical data: Valve

Designation	Description
Size	4",6" OD
Material of product contact parts	Stainless steel 1.4404
Installation position	Upright and in no case more than 15 degrees to the vertical, so that the leakage cavity can drain properly

Technical data: Ambient temperatures

Designation	Description
- Valve	0 to 45 °C (32 to 113°F), standard < 0 °C(< 32°F): use control air with a low dew point. Protect valve stems against freezing.
- Proximity switch	-20 to +80 °C (-4...176°F)
- Control top type T.VIS A-15	-20 to +60 °C (-4...122°F)
Product temperature and operating temperature	Depending on the sealing material

Technical data: Compressed air supply

Designation	Description
Air hose	
- Metric	Material PE-LD Outside dia. 6 mm Inside dia. 4 mm
- Inch	Material PA Outside dia. 6.35 mm Inside dia. 4.3 mm
Product pressure	max. 6 bar (145 psi), standard
Control air pressure	6 bar up to 8 bar (87 psi up to 116 psi)
Control air	acc. to ISO 8573-1
- Solid particle content:	Quality class 6 Particle size max. 5µm Particle density max. 5 mg/m^3
- Water content:	Quality class 4 max. dew point +3 °C If the unit is used at higher altitudes or at low ambient temperatures, the dew point must be adapted accordingly.
- Oil content:	Quality class 3 preferably oil free max. 1 mg oil in 1m^3 air
Air requirement	“Air requirement“ (Page 31)

Resistance of Sealing Materials

The resistance of sealing materials depends 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.

Resistance:

- + = good resistance
- o = reduced service life
- – = not resistant

Table Resistance of Sealing Materials

Medium	Temperature	Sealing material (general operation temperature)		
		EPDM -40...+135°C -40...+275°F	FKM -10...+200 °C +14...+392°F	HNBR -25...+140 °C -13...+284°F
Caustics up to 3%	up to 80 °C (< 176°F)	+	o	+
Caustics up to 5%	up to 40 °C (< 104°F)	+	o	o
Caustics up to 5%	up to 80 °C (< 176°F)	+	–	–
Caustics at more than 5%		o	–	–
Inorganic acids up to 3%	up to 80 °C (< 176°F)	+	+	+
Inorganic acids up to 5%	up to 80 °C (< 176°F)	o	+	o
Inorganic acids up to 5%	up to 100 °C (< 212°F)	–	+	–
Water	up to 80 °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		–	+	+
* depending on the installation position				

Pipe Ends

Dimensions for pipes – Inch OD

Inch OD	Outside diameter	Wall thickness	Inside diameter	Outside diameter acc. DIN EN ISO 1127
1.5"	38.1	1.65	60.3	x
2"	50.8	1.65	47.6	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

Weights

Size	Weight (kg)
4" OD	80
6" OD	90

Tools

Tool list

Tools	Material no.
Hose cutter	407-065
Scriber	414-001
V-ring insertion tool	229-109.88
Open spanner, size 10x11	408-033
Open spanner, size 13x15	408-035
Open spanner, size 14x17	408-045
Open spanner, size 16x18	408-183
Open spanner, size 19x22	229-119.02
Open spanner, size 30x32	408-041
Screwdriver 12 mm	406-112
Screwdriver 2,3 mm	406-102
Allen key 3 mm	408-121
Phillips head screw driver size 2	406-125
Mandrel 4mm	403-209
Mandrel 6 mm	403-211
Mandrel	221-105.76 221-105.77
Mandrel used for installing the bushing into the drive sleeve	221-105.94 (1.5; 2"; 2.5"; 3") 221-105.95 (6")
Tubular hex. box spanner size 32x36	408-208
Hook spanner with pin for holding the drive sleeve Ø30/Ø4	408-202
Hook spanner with pin for holding the drive sleeve Ø34/Ø4	408-204
Screwed-in eye bolt T.VIS M14	221-104.98
Snap ring pliers for bores up to DN 100 Ø 60; DN 125/6"IPS Ø 72	9065838

Lubricants

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

1 Spare parts list - double seat valve M-C / 2.0

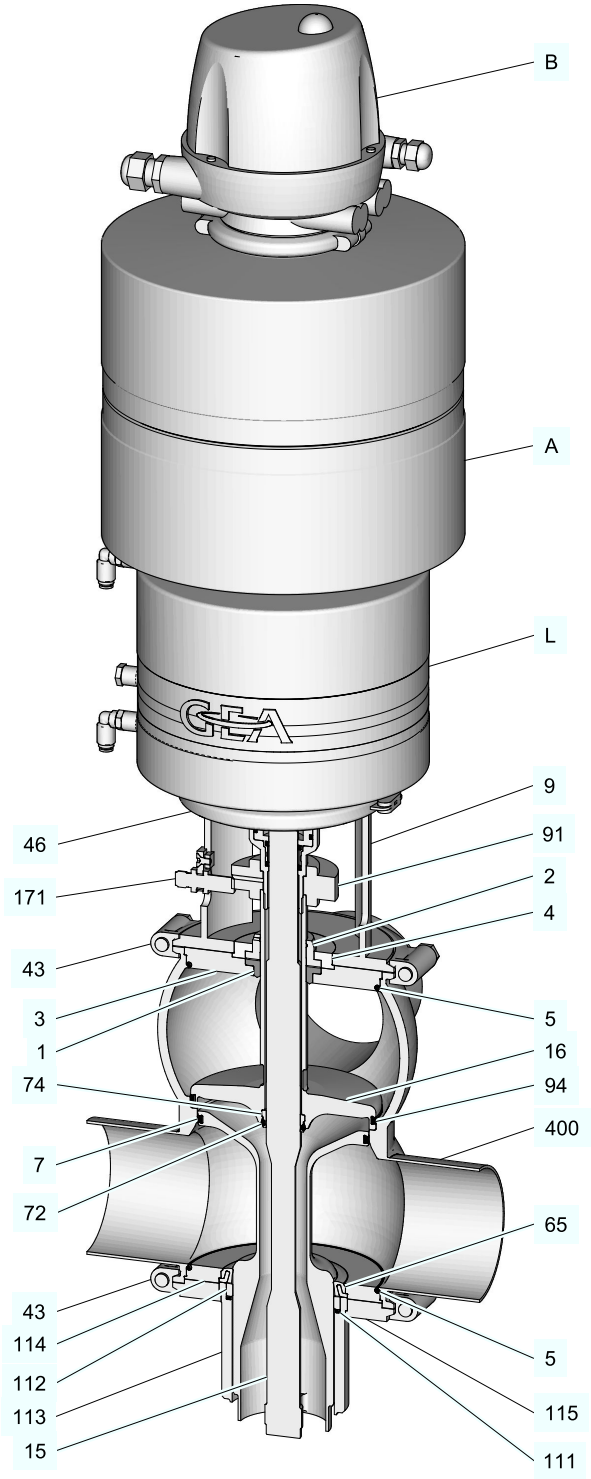
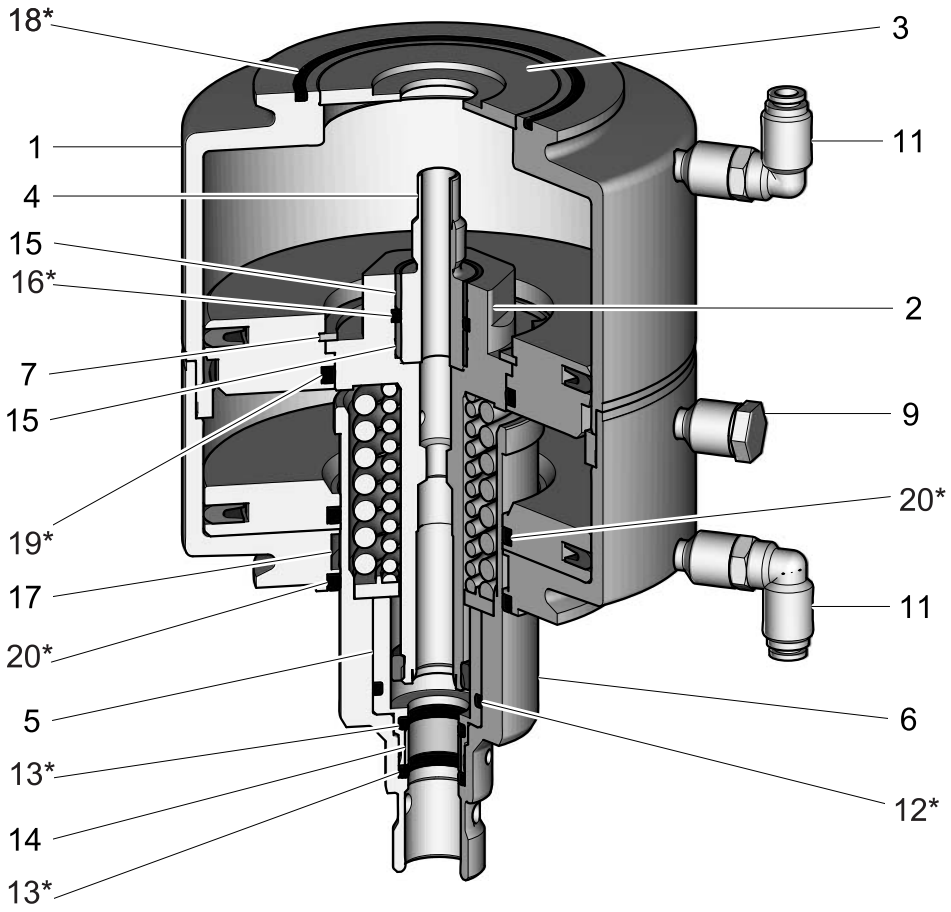


Fig.1

Item	Designation	Material	4" OD	6" OD	6"/Red- 4" OD
Set of seals		EPDM	221-006945	221-004553	221-004553
		FKM	221-006944	221-004554	221-004554
1	Sealing ring 35	EPDM	924-088	924-261	924-261
		FKM	924-087	924-320	924-320
2	Bearing N 35/3A	PEEK450G	935-102	935-116	935-116
3	Sealing disc N	1.4404	221-141.07	221-476.02	221-476.02
4	Bearing disk N	1.4305	221-142.04	--	--
5	O-ring	EPDM	930-372	930-260	930-260
		FKM	930-409	930-259	930-259
7	V-ring RA/I	EPDM	221-365.14	221-365.16	221-365.16
		FKM	221-365.15	221-365.17	221-365.17
9	Lantern DL-E	1.4301	221-575.06	221-651.15	221-651.15
15	Valve disc M-C/2.0	1.4404	221-722.25	221-722.26	221-722.26
16	Double disc M-C/2.0	1.4404	221-721.09	221-721.11	221-721.11
29	O-ring	NBR	930-035	930-035	930-035
30	O-ring	NBR	930-026	930-026	930-026
43	Clamp connection GU	--	221-507.13	221-507.14	221-507.14
46	Clamp connection KL	--	221-507.11	221-507.11	221-507.11
65	Sealing ring RA	EPDM	221-367.03	221-367.06	221-367.06
		FKM	221-367.08	221-367.11	221-367.11
72	O-ring	EPDM	930-612	930-612	930-612
		FKM	930-664	930-664	930-664
74	Snap seal D_C	PVDF	221-000524	221-000524	221-000524
91	Leak indicator L 35	1.4305	221-237.44	221-513.04	221-513.04
94	V-ring RA/I	EPDM	221-365.14	221-365.16	221-365.16
		FKM	221-365.15	221-365.17	221-365.17
110	Hex head screw	A2-70	901-089	901-089	901-089
111	O-ring	EPDM	930-148	930-925	930-925
112	Guide MU-0/06	MF6	221-696.08	221-696.11	221-696.11
113	Rinse feed MMU-C/2.0	1.4305	221-695.07	221-695.03	221-695.03
114	Sealing disc MMU-C	1.4404	221-673.03	--	
115	Lock ring MMU-C/2.0	1.4305	221-692.06	--	--
171	Proximity switch ST/NAMUR	--	221-105.28	221-105.28	221-105.28
400	Housing ME-C/2.0	1.4404	221-723.37	221-723.41	221-723.44
	Housing ME-C/2.0 Red/2,5"		221-723.39	--	221-723.46
	Housing ME-C/2.0 Red/3"		221-723.38	--	221-723.45
A	Actuator SN6Z		221-585.05	221-585.09	221-585.09
B	Control top T.VIS®	see spare parts list for T.VIS control top			
L	Lift drive M/2.0		221-609.49	221-609.49	221-609.49

Lifting Actuator M/2.0



Spare Parts List – OD Sizes 1.5" OD; 2" OD; 2.5" OD

Item	Designation	Material	1.5" OD	2" OD	2.5" OD
Lifting Actuator M/2.0 cpl.			BLMN35 221-609.46	BLMN48 221-609.47	CLMN56 221-609.45
1	Lifting actuator LFT-M/2.0	--	221-605.23	221-605.23	221-605.22
2	Carrier LFT-M/2.0	--	221-622.16	221-622.16	221-622.15
3	Locking flange LFT-R 200	EN AW-6083 T6	221-613.13	221-613.01	221-613.01
4	Adapter LFT-T 200	EN AW-6083 T6	221-614.01	221-614.01	221-614.01
5	Bushing LFT-M/2.0	1.4305	221-616.08	221-616.08	221-616.08
6	carrier sleeve LFT-M/2.0	1.4305	221-617.03	221-617.03	221-617.07
7	Snap ring	1.4122	917-179	917-179	917-179
9	Locking screw	1.4404	922-316	922-316	922-316
11	Angular union 6-1/8” Angular union 6,35-1/8”	Ms / nickled	933-475 933-979	933-475 933-979	933-475 933-979
12 *	O-ring	NBR	930-041	930-041	930-041
13 *	O-ring	EPDM	930-235	930-235	930-235

Spare Parts List – OD Sizes 1.5" OD; 2" OD; 2.5" OD (Cont.)

Item	Designation	Material	1.5" OD	2" OD	2.5" OD
14	Plain bearing	IGLIDUR G	704-043	704-043	704-043
15	Plain bearing	IGLIDUR G	704-041	704-041	704-041
16 *	O-ring	NBR	930-026	930-026	930-026
17	Plain bearing Guide ring	IGLIDUR G Turcite-B10	704-057	704-057	 935-015
18 *	O-ring	NBR	930-850	930-850	930-850
19 *	O-ring	NBR	930-848	930-848	930-848
20 *	O-ring	NBR	930-242	930-242	930-249

Spare Parts List – OD Sizes 3" OD; 4" OD; 6" OD

Item	Designation	Material	3" OD	4" OD	6" OD
Lifting Actuator M/2.0 cpl.			CLMN56 221-609.45	CLMN56 221-609.45	LFT-M/2.0 221-609.49
1	Lifting actuator LFT-M/2.0	--	221-605.22	221-605.22	221-605.25
2	Carrier LFT-M/2.0	--	221-622.15	221-622.15	221-622.17
3	Locking flange LFT-R 200	EN AW-6083 T6	221-613.01	221-613.01	221-613.02
4	Adapter LFT-T 200	EN AW-6083 T6	221-614.01	221-614.01	221-614.04
5	Bushing LFT-M/2.0	1.4305	221-616.08	221-616.08	221-616.09
6	carrier sleeve LFT-M/2.0	1.4305	221-617.07	221-617.07	221-004592
7	Snap ring	1.4122	917-179	917-179	917-154
9	Locking screw	1.4404	922-316	922-316	922-316
11	Angular union 6-1/8” Angular union 6,35-1/8”	Ms / nickled	933-475 933-979	933-475 933-979	933-475 933-979
12 *	O-ring	NBR	930-041	930-041	930-052
13 *	O-ring	EPDM	930-235	930-235	930-268
14	Plain bearing	IGLIDUR G	704-043	704-043	704-038
15	Plain bearing	IGLIDUR G	704-041	704-041	704-042
16 *	O-ring	NBR	930-026	930-026	930-035
17	Guide ring	Turcite-B10	935-015	935-015	935-015
18 *	O-ring	NBR	930-850	930-850	930-107
19 *	O-ring	NBR	930-848	930-848	930-849
20 *	O-ring	NBR	930-249	930-249	930-249
Items marked with * are wearing parts.					

1 Spare parts list - Switch bar T.VIS A-15

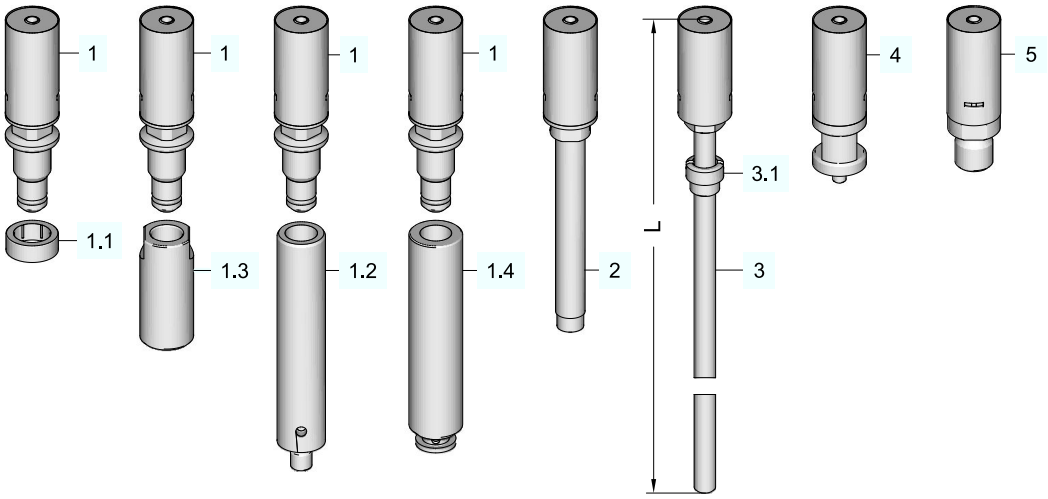


Fig.1

Item	Designation	Material	Material no.	Application
1	Switch rod	PA6/GK30	221-589.75	Standard for all valves with the exception of butterfly valves T-smart 7 and valves with lifting actuator R; T_R; L; M_O(06); MT/T_R(08); M/2.0
1.1	Ring T.VIS/ ECO	Noryl/GFN2	221-002396	In addition to item 1, only for ECOVENT valves and VESTA XL H_A/M valves
1.2	Switch rod	1.4301	224-000214	In addition to item 1, adapter only for T-smart 8000 butterfly valves
1.3	Switch bar incl. O-ring	1.4305	221-589.57	In addition to item 1, adapter only for valves type VESTA XL H_A
1.4	TME/T.VIS adapter	1.4305	221-573.06	In addition to item 1, only for butterfly valves ECOVENT-S
2	Switch bar BFV-7	1.4301/PA6	224-001696	For butterfly valves T-smart 7 and 9
3	Switch bar LFT-R	1.4301/PA6	see type	For valves with lifting actuator R; T_R; L; M_O(06); MT/ T_R(08); M/2.0
4	Switch bar A/P-15 ASG	1.4305/PA6	221-589.88	For all GEA ASEPTOMAG valves
5	Switch bar A/P-15 N_V	1.4305/PA6	221-589.90	only for VARIVENT long-stroke valves with drive ZEF/V and ZFD/V

Type		**125**	**200**	**205**	**166**	**256**
Use on standard actuators		See dimension sheet 221MBL010805DE				
Item	Designation	Material no.				
3	Switch bar LFT-R cpl. incl. sliding piece	221-618.20	221-618.21	221-618.22	221-618.23	221-618.24
L = Length		286	316	346	405	453
3.1	Sliding piece	221-619.04				

1 Spare parts list - Switch bar T.VIS M-15

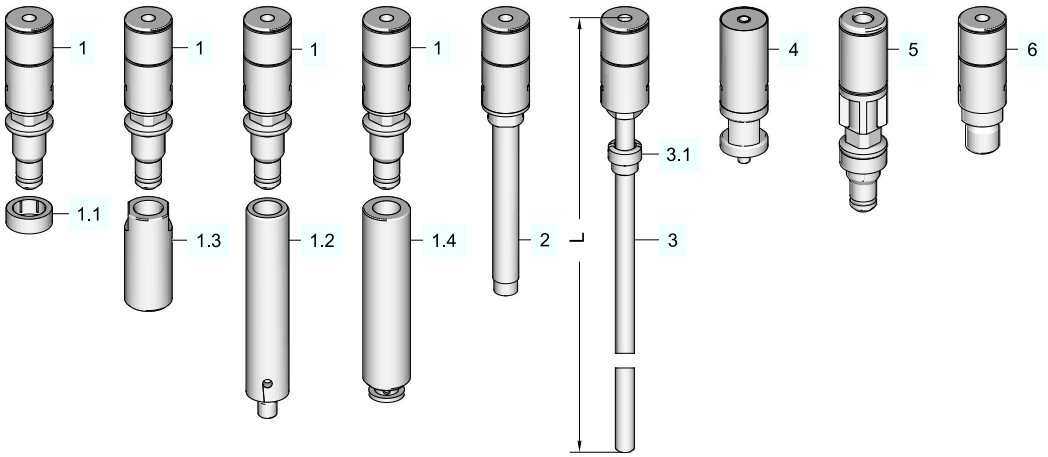


Fig.1

Item	Designation	Material	Material no.	Application
1	Switch rod	PA6/GK30	221-589.80	Standard for all valves with the exception of butterfly valves T-smart 7 and valves with lifting actuator R; T_R; L; M_O(06); MT/T_R(08); M/2.0
1.1	Ring T.VIS®/ECO	Noryl/GFN2	221-002396	In addition to item 1, only for ECOVENT valves and VESTA XL H_A/M valves
1.2	Switch rod	1.4301	224-000214	In addition to item 1, adapter only for T-smart 8000 butterfly valves
1.3	Switch bar incl. O-ring	1.4305	221-589.57	In addition to item 1, adapter only for valves XL H_A
1.4	TME/T.VIS adapter	1.4305	221-573.06	In addition to item 1, only for butterfly valves type ECOVENT-S
2	Switch bar BFV-7	1.4301/PA6	224-001697	For butterfly valves T-smart 7 and 9
3	Switch bar LFT-R	1.4301/PA6	see type	For valves with lifting actuator R; T_R; L; M_O(06); MT/T_R(08); M/2.0
4	Switch bar M-15 ASG	1.4305/PA6	221-589.87	For all GEA ASEPTOMAG valves
5	Switch bar M-15	PA6	221-589.79	for ECOVENT Valves N_ECO and W_ECO
6	Switch bar M-15 N_V	1.4305/PA6	221-589.89	only for VARIVENT long stroke valves with drive ZEF/V and ZFD/V

Type		**125**	**200**	**205**	**166**	**256**
Use on standard actuators		See dimension sheet 221MBL010829DE				
Item	Designation	Material no.				
3	Switch bar LFT-R cpl. incl. sliding piece	221-618.25	221-618.26	221-618.27	221-618.28	221-618.29
L = Length		286	316	346	405	453
3.1	Sliding piece	221-619.04				

1 Dimension sheet- double seat valve M-C/2.0

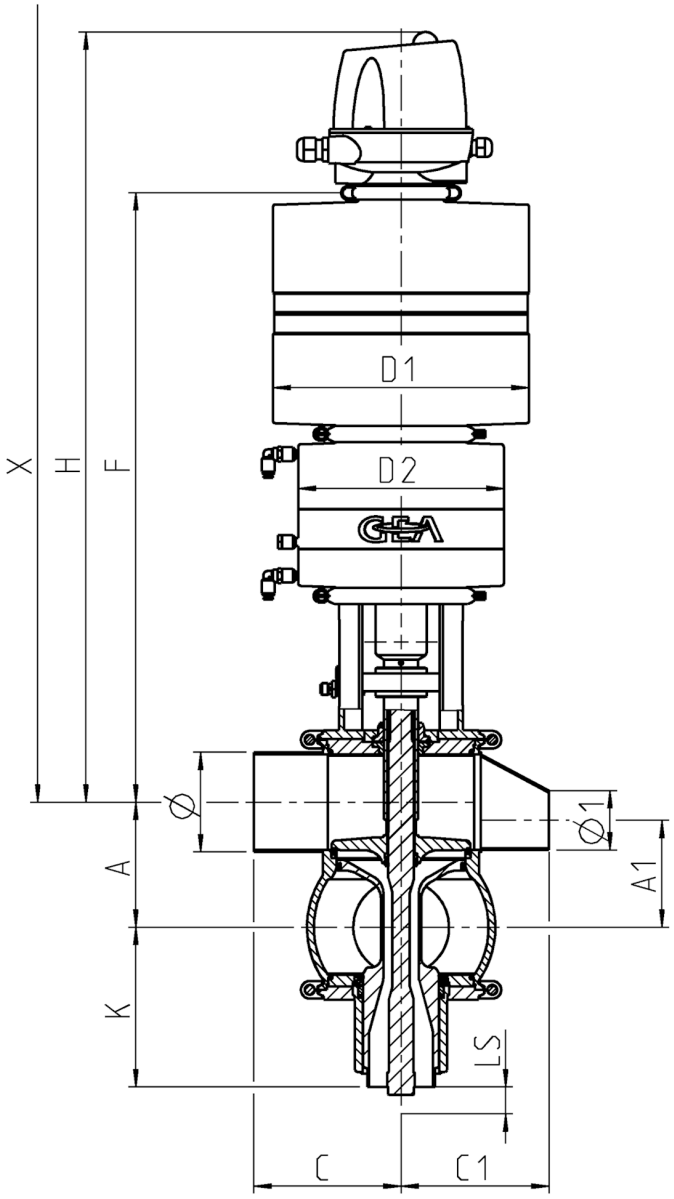


Fig.1

Dimension	4" valve with 2.5" CIP connection	4" valve with 3" CIP connection	4" valve with 4" CIP connection
	4" / 2.5" / 4" / 4" / 4" OD	4" / 3" / 4" / 4" / 4" OD	4" / 4" / 4" / 4" / 4" OD
A	127.5	127.5	127.5
A1	108.5	115	127.5
C	150	150	150
C1	150.5	150.0	150.0
Tube ID Ø	101.6 x 2.1	101.6 x 2.1	101.6 x 2.1
Ø1	63.5 x 1.6	76.2 x 1.6	101.6 x 2.1
D1	261	261	261
D2	210	210	210
F	622	622	622
H with T.VIS A-15	786.0	786.0	786.0
K	171	171	171
X	1150	1150	1150
Stroke	65	65	65
LS	6.0		
Control air pressure	6 bar (70 psi)		
Product pressure spring closing	6 bar		
Product pressure spring opening	6 bar		
Weight	80	80	80
Chunk size	45	45	45

Dimension	6" valve with 2.5" CIP connection	6" valve with 3" CIP connection	6" valve with 4" CIP connection	6" valve with 6" CIP connection
	6" / 2.5" / 6" / 6" / 6"	6" / 3" / 6" / 6" / 6"	6" / 4" / 6" / 6" / 6"	6" / 6" / 6" / 6" / 6"
A	177.0	177.0	177.0	177.0
A1	132.5	139.0	151.5	177.0
C	150	150	150	150
C1	303.0	282.0	234.0	150.0
Tube ID Ø	152.4 x 2.77	152.4 x 2.77	152.4 x 2.77	152.4 x 2.77
Ø1	63.5 x 1.6	76.2 x 1.6	101.6 x 2.1	152.4 x 2.77
D1	210	210	210	210
D2	210	210	210	210
F	644.5	644.5	644.5	644.5
H with T.VIS A-15	808.5	808.5	808.5	808.5
K	190	190	190	190
X	1217	1217	1217	1217
Stroke	65	65	65	65
LS	6.0			
Control air pressure	6 bar (70 psi)			
Product pressure spring closing	6 bar			
Product pressure spring opening	6 bar			
Weight	90	90	90	90
Chunk size	45	45	45	45

	6" valve with 4" connection and 2.5" CIP connection	**6" valve with 4" connection and 3" CIP connection**	**6" valve with 4" connection and 4" CIP connection**
	6" / 2.5" / 4" / 4" / 4" OD	**6" / 3" / 4" / 4" / 4" OD**	**6" / 4" / 4" / 4" / 4" OD**
A	177.0	177.0	177.0
A1	158.0	164.5	177.0
C	234	234	234
C1	303.0	282.0	234.0
Tube ID Ø	101.6 x 2.1	101.6 x 2.1	101.6 x 2.1
Ø1	63.5 x 1.6	76.2 x 1.6	101.6 x 2.1
D1	210	210	210
D2	210	210	210
F	644.5	644.5	644.5
H with T.VIS A-15	808.5	808.5	808.5
K	190	190	190
X	1217	1217	1217
Stroke	65	65	65
LS	6.0		
Control air pressure	6 bar (70 psi)		
Product pressure spring closing	6 bar		
Product pressure spring opening	6 bar		
Weight	90	90	90
Chunk size	45	45	45

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

Telephone +49 4155 49-0