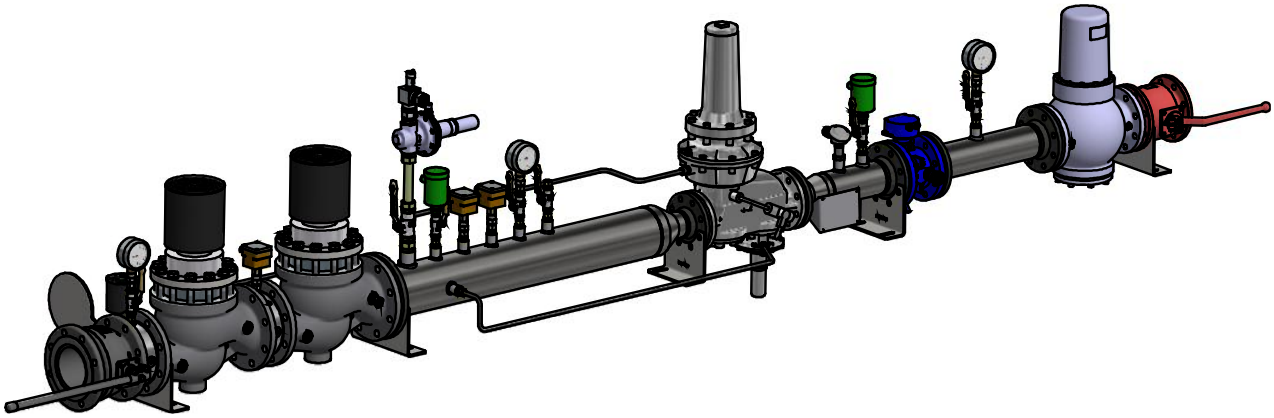
Operating and installation manual
Pressure control and shut-off systems



Pressure control and shut-off systems
"GVU" series, "OVU" series

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Read instructions carefully before use.
The operating and installation manual must always be available at the usage location of the system.

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1.0 Explanation of the symbols

DANGER!
Danger to life!

- This symbol, in conjunction with the signal word "Danger", indicates a dangerous situation that directly results in death or serious injury.

WARNING!
Serious injuries!

- This symbol, in conjunction with the signal word "Warning", indicates a dangerous situation that could result in death or serious injury.

CAUTION!
Minor to moderate injuries!

- This symbol, in conjunction with the signal word "caution", indicates a dangerous situation that may result in minor to moderate injury.

ATTENTION !
Property damage!

- This symbol, in conjunction with the signal word "Caution", indicates a situation that may result in property damage and environmental damage.

NOTE!

- Supplementary information on the operation of the product.

2.0 Safety

The manufacturer assumes no liability for damage in the following cases:

- Mounting or connection errors.
- Damage to the product due to mechanical influences and incorrect connection voltage.
- Modification of the product without the express permission of the manufacturer.
- Application outside the intended use.
- Welding work of any kind.
- Operating the product without safety devices.
- Installation of fittings, components and devices not included in the scope of delivery and not approved by the manufacturer.

2.1 General safety

- Accident prevention regulations must be observed.
- All work on the product must be carried out with suitable PPE only.
- If the product or its paintwork is visibly damaged, it must not be put into service.
- All work on the product must be carried out by qualified experts only.
- Before working, depressurise the pressure control and shut-off systems, disconnect them, check that there is no voltage and secure them against being switched on again.
  Furthermore, a closed and secure media supply must be ensured!
- Do not climb or mechanically load pressure control and shut-off systems / individual components.
- Non-permissibly high pressures (test pressures) lead to internal and external damage.
- Do not remove contact protection for moving parts during operation.
- Safely evacuate leaks of hazardous media (e.g. explosive, toxic, hot) in order to avoid danger to persons and the environment. Comply with legal provisions.
- During operation, there may be risks of noise and vibration, it should be avoided that persons stand in the immediate vicinity.
- The product must be protected against environmental and weather influences, e.g. harmful insects, mould, moisture, corrosion, icing, UV radiation, toxic/corrosive solutions/liquids.

2.2 Safety during operation in potentially explosive atmospheres (optional)

- In order to avoid critical static charging, plastic attachments, plastic-coated parts (e.g. painted pipe sections) and all other non-conductive materials must not be subjected to processes that cause very high levels of charging.
- All cleaning must be carried out manually using a damp cloth.
- Safe use is only guaranteed and permissible if the documentation of the individual components is complied with.
- Equipment category and possible use in potentially explosive areas according to Directive 2014/34/EU can be found on the nameplate of the pressure control and shut-off systems.
- The temperature of the medium must not exceed the maximum temperature of the specified temperature class.
- The temperature classes specified in the system must be observed for heated pressure control and shut-off systems.
- Pressure control and shut-off systems of these series must be grounded→, see point 10.5.
- Any change to the product requires consultation with the manufacturer.
  Unauthorized changes can result in ignition hazards.

2.3 Associated accompanying documentation

This operating and installation manual only applies in conjunction with the pressure control and shut-off system documentation and the documentation of the individual components.

3.0 Target group

This operating and installation manual contains the essential information and instructions for the safe operation of pressure control and shut-off systems. It is intended for qualified personnel in installation companies who are familiar with the applicable guidelines and safety precautions for the construction of pipe systems.

4.0 Scope of delivery

NOTE!

- It must be checked that the goods are complete and free of defects as soon as they are received. Damage to the product or the packaging must be reported to the shipping company immediately.

- Pressure control and shut-off system
- Operating and installation manual
- Acceptance test certificate 3.1 in accordance with EN 10204_*Pressure tests (B1)*
- Acceptance test certificate 3.1 in accordance with EN 10204_*Function tests (B2)*
- Pressure control and shut-off system documentation (separate provision in digital form)
  The contractor must send this to the system operator and make it available at the system's place of use.

5.0 Intended use

“GVU" and "OVU” series pressure control and shut-off systems are designed on a project-specific basis depending on the system conditions and are used, for example, for industrial thermal processes.

Depending on the application, they meet the requirements of the applicable guidelines or regulations.
These can be:

- Pressurised Equipment Directive 2014/68/EU
- ATEX Directive 2014/34/EU
- EMV Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Option: Machinery Directive 2006/42/EC “partly completed machinery”

The pressure control and shut-off systems manufactured by UNI-Geräte are subject to quality assurance in accordance with Module H of the Pressure Equipment Directive 2014/68/EU. *(If they fall within the scope of application)*

The individual components of the pressure control and shut-off systems are approved in accordance with Pressure Equipment Directive 2014/68/EU and/or Gas Appliance Regulation EU/2016/426 insofar as they fall within the scope of this Directive or Regulation.

For version for use in Ex zones: Equipment category and possible use in potentially explosive areas according to ATEX Directive 2014/34/EU can be found on the nameplate.
→ See also point 2.2.

Depending on the design (see nameplate), pressure control and shut-off systems are suitable for the specified medium.

Operational safety is only guaranteed if used in accordance with the intended purpose.
The application limits specified on the nameplate must be observed.

6.0 Technical data

The technical information can be found on the nameplate, the pressure control and shut-off system documentation and the documentation for the individual components.

7.0 Technical description

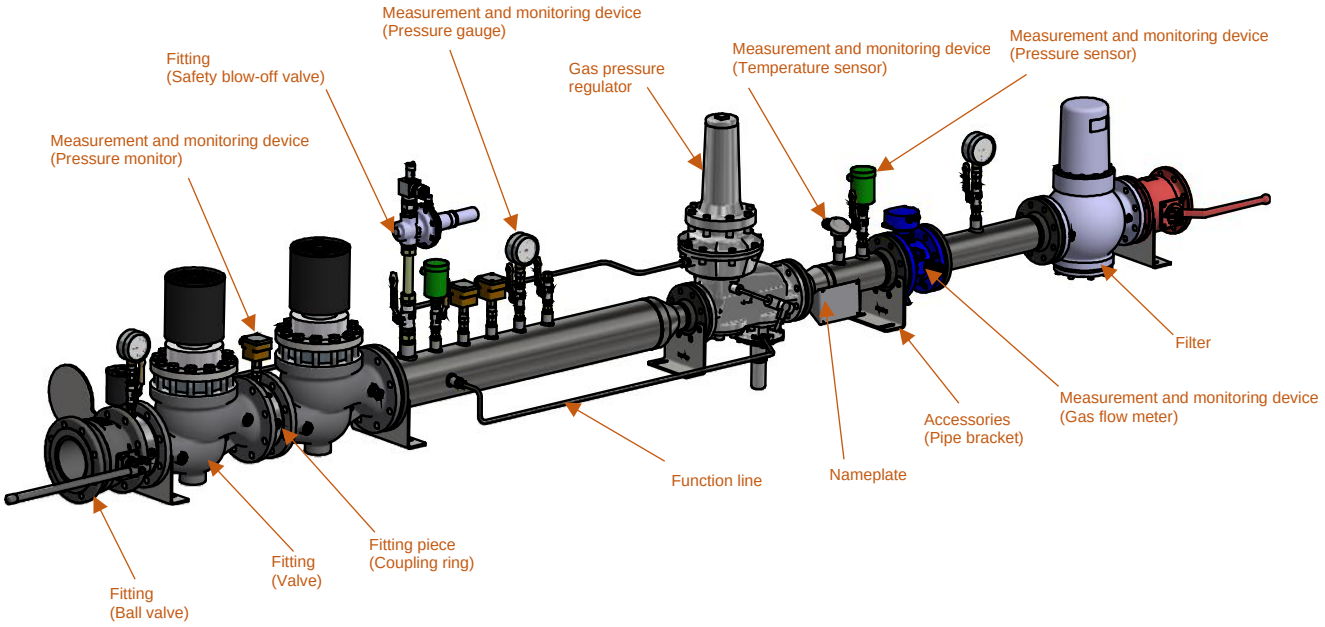
Pressure control and shut-off systems of the "GVU" and "OVU" series are system solutions for installation in piping systems.
According to the requirements of downstream consumers, they regulate the corresponding pressure. In addition, the pressure control and shut-off systems include devices for protection, filtering, as well as control and monitoring, among other things.

7.1 Function

A functional description of the respective project-related pressure control and shut-off system is derived from the pressure control and shut-off system documentation including the documentation of the installed individual components.

The following is an example of possible main components and their functions.

Additional system peripherals and accessories can be part of the system, depending on the system design.



Fittings
Fittings are installed in different variants depending on the design.
They can be operated manually, electrically or pneumatically.

The following fittings can be examples of components of a pressure control and shut-off system:
- Shut-off valves
- Safety valves
- Blow-off valves
- Control valves
- Check valves
- Pressure relief valves

Filter
Filters are used to protect downstream components from contamination.

NOTE!
- The necessary measures for filtering in the entire system are the responsibility of the plant operator.

Function lines
Functional lines can be used for supply, flushing, breathing, venting and emptying.

Fitting pieces
Fitting pieces serve as connections and provide connection options for various components and branches.

The following fitting pieces can be examples of components of a pressure control and shut-off system:
- Tube section with welding parts
- Coupling rings
- Adapter pieces
- Compensators

Measuring and monitoring devices
Measuring and monitoring devices serve as feedback for various parameters.
The values/signals are transmitted mechanically, electrically or pneumatically, depending on the measuring and monitoring device.

The following measuring and monitoring devices can, for example, be part of a pressure control and shut-off system:

- Pressure gauge
- Pressure monitor
- Pressure transmitter
- Pressure transducer
- Thermometers
- Temperature sensors
- Flow rate measurement
- Valve testing system
- Leakage gas indicator

Gas pressure regulator
Gas pressure regulators are used for pressure reduction and keep the outlet pressure constant - within the scope of their respective design - regardless of disturbance variables, such as inlet pressure or consumption changes.

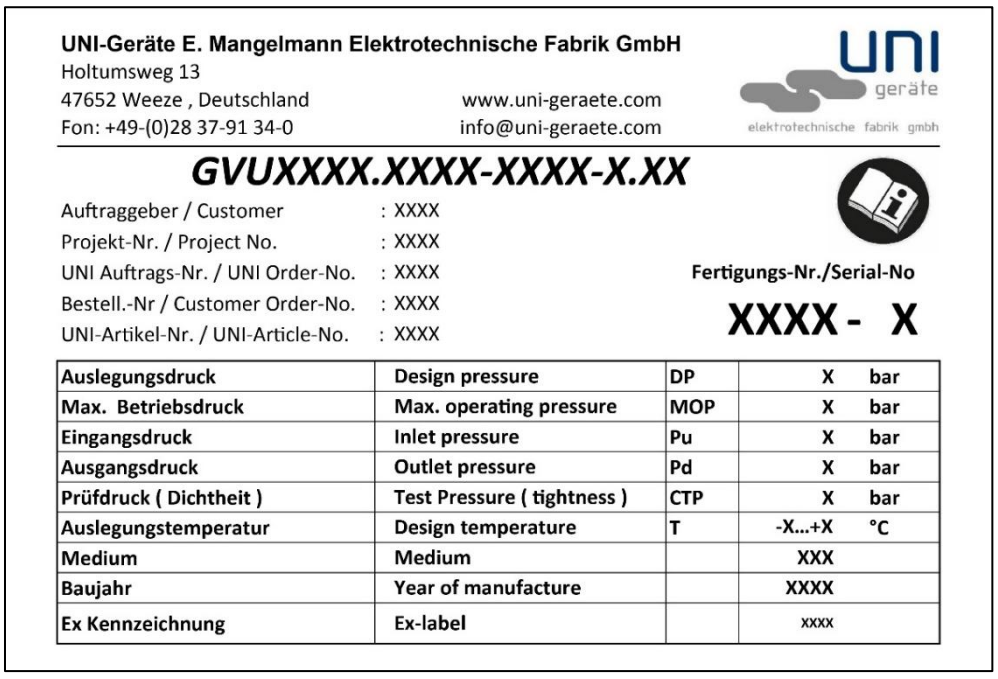
Accessories
The following accessories can, for example, be part of a pressure control and shut-off system:

- Measuring couplings
- Push-in washers
- Accumulator
- Junction boxes
- Fasteners
- Rack / pipe brackets
- …

7.2 Marking

The nameplate on the pressure control and shut-off system contains the following information:

Example:



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GVUXXXX.XXXX-XXXX-X.XX

Auftraggeber / Customer : XXXX
Projekt-Nr. / Project No. : XXXX
UNI Auftrags-Nr. / UNI Order-No. : XXXX
Bestell.-Nr / Customer Order-No. : XXXX
UNI-Artikel-Nr. / UNI-Article-No. : XXXX

Fertigungs-Nr./Serial-No
XXXX - X

Auslegungsdruck	**Design pressure**	**DP**	**X**	**bar**
Max. Betriebsdruck	**Max. operating pressure**	**MOP**	**X**	**bar**
Eingangsdruck	**Inlet pressure**	**Pu**	**X**	**bar**
Ausgangsdruck	**Outlet pressure**	**Pd**	**X**	**bar**
Prüfdruck (Dichtheit)	**Test Pressure (tightness)**	**CTP**	**X**	**bar**
Auslegungstemperatur	**Design temperature**	**T**	**-X...+X**	**°C**
Medium	**Medium**		**XXX**	
Baujahr	**Year of manufacture**		**XXXX**	
Ex Kennzeichnung	**Ex-label**		**xxxx**	

8.0 Transport

The transport & packaging instructions must be observed and adhered to.
The marked lifting points required for loading, unloading and transport must be used.

WARNING!
Risk of injury when unpacking!
There is a risk of injury due to the size and weight of the packaging.

- Remove the packaging with at least 2 persons.
- Intercept or support pressure control and shut-off systems.

DANGER!
Danger of crushing and collision during lifting and transport!
Due to the weight, there is an increased risk of injury during transport.

- Have trained personnel transport them.
- Transport in a pressure-free state.
- Use approved / tested lifting gear.
- Use lifting equipment with a minimum load capacity greater than the weight of the component to be lifted.
- Always maintain a safe distance from raised and moved components.
- Never step under suspended loads.
- Never place on attachments.

ATTENTION !
Damage to property caused by improper transport!
The pressure control and shut-off systems can be damaged during transport due to mechanical influences.

- Protect against shocks, blows or vibration during transport.
- Never use individual components and function lines for lifting.

ATTENTION !
Property damage due to incorrect ambient temperature!
If the ambient temperature is too high or too low, this can distort the pressure control and shut-off systems or damage the paint.

- Only transport at ambient temperatures according to the nameplate.

1. Install protective caps.
2. Secure pressure control and shut-off systems with lifting gear. If possible, transport in the delivered transport box or on a pallet with a soft surface.
3. Place on level ground.

9.0 Storage

Store under the following conditions:

- Ambient temperature: According to the nameplate,
- Dry and dirt-free.
- Protect from environmental and weather influences, e.g. harmful insects, mould, moisture, corrosion, icing, UV radiation, toxic/corrosive solutions/liquids.
- Unpressurised state
- Keep all openings closed until installation takes place.
- Do not damage the sealing surfaces.
- Storage only in installation position.
- Storage duration: max. 12 months

ATTENTION !
Property damage due to excessive storage!
Sealing elements can become brittle due to excessive storage.

- If pressure control and shut-off systems or individual components are stored for longer than one year, we recommend checking the seals and diaphragms before commissioning and replacing them if necessary.

NOTE!

- Recommended storage: In undamaged original packaging at a constant room temperature in locations that are dry, dust-free and protected from light. Damage to the original packaging must be avoided.

10.0 Installation

10.1 Installation instructions

DANGER!
Risk of crushing due to moving actuators!
There is a danger to life from crushing and shearing off limbs when interfering with the pressure control and shut-off system.

- Only connect and operate when installed.

- Visual inspection: Correspondence of drawing, part lists, technical data, nameplate, test certificate etc.
- During installation, make sure that the nameplate is visible, that all future maintenance and servicing work can be carried out and that operability is ensured.
- Observe the information signs.
- Check external conditions (transport damage, loose fasteners, etc.)
- Observe operating and installation manual / pressure control and shut-off system documentation.
- Protect the product against dirt and weathering influences→, see point 2.1.
- Tension-free installation in the intended pipeline system; provide support if necessary.
- Installation only in the specified flow direction.
- The required tightening torques for integration/installation in the pipeline system are determined by the flange/seal combination selected by the plant planner and the selected connecting elements (e.g. screws).

NOTE!

- The manufacturer must be contacted immediately in the event of deviations!

10.2 Assemble the product

1. Align the product.
2. Remove the protective caps.
3. Inspect the interior of the product and pipeline system and clean it of foreign particles if necessary.
4. Centre the seals between the connecting flanges. The connecting flanges must be aligned.
5. Tighten the flange screw connections. Observe the tightening torques.

10.3 Connection of function lines

1. Connect the function lines to the designated locations, according to the drawing legend.

NOTE!

- Breather connections must not be closed off!
- Respiratory and ventilation lines must not be folded together.
- Bypasses are prohibited.
- In the case of function lines with potential hazards, these must be routed outside hazardous areas, e.g. via the roof to the outside.
- The cross-section and direction of function lines must be dimensioned in such a way that they have no influence on the correct function of the system.

10.4 Connection of electrical components

DANGER!
Risk of crushing due to moving actuators!
There is a danger to life from crushing and shearing off limbs when interfering with the pressure control and shut-off systems.

- Only connect and operate when installed.

DANGER!
Danger of electric shock!
There is a danger of live conductors when working.

- Electrical connection only by qualified personnel.
- Before working, disconnect electrical interfaces / components, check that there is no voltage and secure them against being switched on again.

1. Connect the corresponding individual components of the pressure control and shut-off systems to the on-site interfaces as described in the respective manufacturer documentation.

10.5 Connection of equipotential bonding

Pressure control and shut-off systems are provided with internal equipotential bonding and have a central grounding connection (potential equalization rail or grounding lug) through which the potential equalisation is integrated into the system as a whole.

1. Integration of the equipotential bonding by qualified personnel with that of the entire system via a central grounding connection.

10.6 Connection of pneumatic components

WARNING!
Risk of injury due to leaking control medium!
Danger due to leaking control medium when working.

- Depressurise the pneumatic interfaces / components before carrying out any work, and safeguard them from being switched on again.

1. Connect the corresponding individual components of the pressure control and shut-off systems to the on-site interfaces as described in the respective manufacturer documentation.

11.0 Commissioning

11.1 Preparation for commissioning

Prior to initial commissioning, a leak test must be carried out in the installed condition.

DANGER!
Danger due to leaking pipeline system and lack of protective devices!
Operation of an incorrectly or improperly installed pipeline system can result in life-threatening injury from leaking media and pressure hazards.

- Make sure that all work is complete.
- Make sure all protective devices are installed and intact.
- Make sure that the pipeline system is free of dirt.

DANGER!
Danger due to impermissibly high pressure!
Pressurisation with impermissible (test) pressures can result in life-threatening injury from leaking media and pressure hazards.

- Ensure that all usage limits are adhered to.

1. Check for correct installation.
2. Check the on-site assembled components and fittings.
3. Check the function lines and pneumatic connections installed on-site.
4. Check electrical connections and equipotential bonding.
5. Check measures for explosion protection, if available, →see also point 2.2.

11.2 Leak test

Pressure control and shut-off systems are subjected to a factory leak test prior to delivery.
The pressure control and shut-off systems mounted at the installation site must undergo a leak test with test medium (nitrogen, air, inert gas) before commissioning in accordance with the specifications in the acceptance test certificate 3.1 according to EN 10204_*Pressure tests (B1)*.

DANGER!
Danger of electric shock!
When testing for leaks with liquid test equipment, there is a risk from live conductors.

- Only use test equipment on pressurised connections.
- Leak tests must be carried out by qualified experts only.

NOTE!
- Ensure adequate ventilation at the installation location.

1. Before applying pressure, the output-side shut-off valve, as well as all open connections and open function lines must be closed.
2. Pressurisation always in the direction of flow from the inlet to the outlet area of the pressure control and shut-off system. The test pressures are pressurised by introducing the test medium into the pressure control and shut-off system. For this purpose, flange, threaded connections or measuring couplings can be used.
3. The respective valve for pressurisation must be opened slowly and evenly.

ATTENTION!
Damage to the gas pressure regulator due to incorrect pressure application!
In order to avoid damage to the gas pressure regulator, the following note must be observed for pressure control and shut-off systems with a built-in gas pressure regulator:
- Pressure on the inlet side upstream of the gas pressure regulator [Pu] **must always be greater than or equal to** the pressure on the outlet side downstream of the gas pressure regulator [Pd].
  Pu controller ≥ Pd controller

4. After complete pressurisation, the pressure control and shut-off system is disconnected from the test medium source by closing the connection to the test medium source.

5. Testing process

The test is carried out with a suitable test device, e.g. foam-forming leak detection agent.
- Visual inspection at all relevant points.
- Check pressure drop on pressure gauges.

6. After a successful leak test:

- Pressure reduction of the test medium always in the direction of flow from the outlet (behind gas pressure regulator, if present) to the inlet area of the pressure control and shut-off system.
- If necessary, reactivate the safety shut-off valve (SSV).
- If necessary, carry out the flushing procedure.
- Dismantling the test medium source.
- Open all connections and function lines required for commissioning.

NOTE!
- Drain the test medium into a safe area.

DANGER!
Danger due to the formation of an explosive mixture!
When testing for leaks with air, there is a risk that an explosive mixture will be created when commissioning with operating medium.
- Perform flushing with inert gas.

11.3 Commissioning

After a leak test has been carried out, the system can be commissioned by qualified personnel only.

Pressure control and shut-off systems are preset at the factory.
The preset values can be found in the acceptance test certificate 3.1 according to EN 10204_*Function tests (B2)*.
All setting work within the operating limits must be carried out by qualified experts.

1. The operating medium must always be applied by slowly and evenly opening the inlet shut-off valve. Pressurisation always in the direction of flow from the inlet to the outlet area of the pressure control and shut-off system.

12.0 Decommissioning

1. Close the inlet-side shut-off valve.
2. Depressurise the pressure control and shut-off system and secure it against being switched on again. Pressure reduction of the operating medium always in the direction of flow from the outlet (behind gas pressure regulator, if present) to the inlet area of the pressure control and shut-off system.

NOTE!

- Drain the operating medium into a safe area.

The following work steps are required for maintenance/servicing and disassembly:

WARNING!
Risk of injury due to flow media!
There is a risk of injury in the event of contact with flow media or its residues.

- Prior to work, e.g. maintenance or dismantling of pressure control and shut-off systems, a flushing and decontamination procedure must be carried out when decommissioning.

1. Disconnect electrical interfaces / components, check that there is no voltage and secure them against being switched on again.
2. Depressurise the pneumatic interfaces / components and secure them against being switched on again.

13.0 Maintenance / servicing

DANGER!
Danger of electric shock!
There is a danger of live conductors when working.

- Before working, disconnect electrical interfaces / components, check that there is no voltage and secure them against being switched on again.

DANGER!
Danger to life due to improperly maintained pressure control and shut-off systems / individual components!
Too long intervals or maintenance by untrained personnel may cause
life-threatening injuries due to e.g. leaking media or malfunction.

- Observe the maintenance intervals according to the maintenance schedule.
- Only have maintenance carried out by qualified personnel trained by the manufacturer.

NOTE!

- Decommissioning must be completed.
- Flushing and decontamination process must have been performed.

NOTE!
- Maintenance training can be requested from UNI-Geräte.
- Only original spare parts authorized by the manufacturer may be used.

13.1 Maintenance intervals

Pressure control and shut-off systems must be visually inspected at regular intervals, and their function and internal/external tightness must be checked.

The maintenance recommendations and intervals in accordance with DVGW worksheet G 495 must be observed.

The intervals for regular inspections must be determined by the system operator in accordance with the operating conditions.

Device-specific design and special features of the maintenance of individual components can be found in the respective maintenance & spare parts instructions of the individual components and must be observed.

13.2 Maintenance by the plant operator

- **Visual inspection**

1. Check the pressure control and shut-off system / individual components for obvious damage, corrosion and contamination.

- **Leak test**

1. Check the pressure control and shut-off system for internal leaks.
2. Check the pressure control and shut-off system for external leaks.

- **Function check**

1. Perform a functional test on the pressure control and shut-off system.

- **Maintenance / cleaning work**

Device-specific design and special maintenance features can be found in the respective maintenance & spare parts instructions of the individual components and must be observed.
Cleaning work must be carried out as required.
Special requirements for cleaning in hazardous areas must be observed.
→ See also point 2.2.

DANGER!
Risk of explosion from using the wrong lubricants and sealing materials!
Flow media can undergo a chemical reaction with unsuitable lubricants or sealing materials and explode.
- For specific applications such as oxygen, use only approved lubricants and suitable sealing materials (BAM approval).

ATTENTION !
Damage to property due to dirty surfaces!
Dirty surfaces can cause parts of the pressure control and shut-off systems / individual components to be damaged.
- Place all parts on a clean subsurface.

CAUTION!
Risk of burns from hot/cold surfaces!
There is a risk of hot/cold surfaces during operation.
- When working, make sure that hot/cold surfaces are aligned with the ambient temperature.

NOTE!
- Perform a leak test after any maintenance work.

13.3 Maintenance by the manufacturer

If maintenance or servicing work is to be performed by the manufacturer, perform the following steps before delivery:

1. Clean the pressure control and shut-off system of substances harmful to health or the environment.
2. Complete the declaration of decontamination (available on the homepage) and attach it to the packaging of the pressure control and shut-off system.

14.0 Disassembly

DANGER!
Danger of electric shock!
There is a danger of live conductors when working.

- Before working, disconnect electrical interfaces / components, check that there is no voltage and secure them against being switched on again.

NOTE!

- Decommissioning must be completed.
- Flushing and decontamination process must have been performed.

DANGER!
Risk of crushing and collision during disassembly!
Due to the weight, there is an increased risk of injury during disassembly.

- When dismantling, intercept or support pressure control and shut-off systems / individual components.

CAUTION!
Risk of burns from hot/cold surfaces!
There is a risk of hot/cold surfaces during operation.

- When working, make sure that hot/cold surfaces are aligned with the ambient temperature.

1. Close interfaces to adjacent piping systems, e.g. by means of a plug-in washer, blind flange.
2. Disconnect electrical interfaces.
3. Separate pneumatic interfaces.
4. Disconnect function lines.
5. Dismantle from the pipeline system.
6. If necessary, disassemble the individual components in accordance with the respective manufacturer's documentation.

15.0 Troubleshooting

1. In the event of malfunctions, check the pressure control and shut-off system for correct installation.
2. If the pressure control and shut-off system has been installed correctly, use the troubleshooting plan.
3. If the problem persists, contact the manufacturer.

15.1 Troubleshooting plan

Faults	Troubleshooting	Possible cause of fault	Fault remedying instructions
Failure / malfunction Single component	Individual components	Application outside the limits of use / damage / faulty assembly	See the documentation for the individual components
Failure / malfunction Pressure control and shut-off systems	Pressure control and shut-off systems	Application outside the limits of use / damage / Faulty assembly	Compare operating data with information on the nameplate and pressure control and shut-off system documentation
No external leak tightness	Individual components	Screw connection loosened, Seals damaged	See the documentation for the individual components
	Fasteners		Tighten the screw connection according to the specified tightening torque or replace the seal.
	Pipeline		
No inner tightness	Individual components	Damage / malfunction of one single component	See the documentation for the individual components
No flow	Pipeline, individual components	Protective caps have not been removed	Remove the protective caps
	Individual components	Damage / malfunction of one single component	See the documentation for the individual components
	Pipeline	Blockage in pipeline system	Check pipeline system
Low flow	Single component (gas filter)	Soiled gas filter	See the documentation for the single component

16.0 Disposal

1. Disassemble the product and dispose of it in individual parts.

ATTENTION !
Environmental damage!
Residues of flow media or lubricants can cause environmental damage.

- Disposal only through specialized companies.

17.0 Warranty and information

Non-compliance with the operating and installation manual, the pressure control and shut-off system documentation, as well as non-compliance with the documentation of the individual components leads to risks to persons and the environment and to the forfeiture of warranty claims.
Changes of any kind are prohibited or require approval by the manufacturer.
The Contractor assumes no liability for the functionality of the pressure control and shut-off systems in the overall system or the end customer's overall system.
Information is contained in the relevant documentation or is available at the address on the cover page and back page.

PROMISING VALVOLUTIONS

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