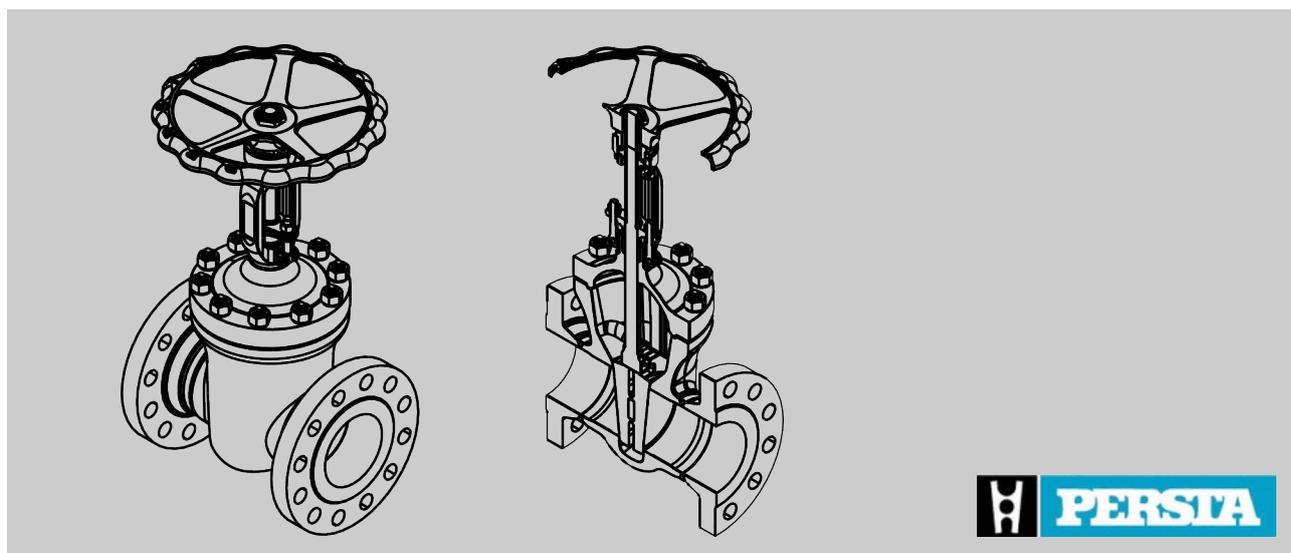


# Operating instructions

Gate valve

GJ, HJ and JJ



Read the instructions prior to performing any task!

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Translation of the original operating instructions

Dok.-Nr. 6415.DE.STD.12.2015, 1, en\_GB

### Information about the operating instructions

This manual enables safe and efficient handling of the gate valve. The manual is a component of the product and must be kept in the vicinity of the gate valve where it is available to personnel at all times.

Furthermore, the local occupational safety regulations and general safety requirements must be complied with for the area in which the valve is used.

The personnel must have carefully read and understood these instructions before performing any tasks. The basic prerequisite for safe work is compliance with all the specified safety and handling instructions.

The diagrams in these instructions are provided as examples only and may deviate from the actual version.



*Although the size and pressure ratings of the valve types vary, the information in these instructions applies generally to all valves, provided nothing to the contrary is specified.*

### Scope of the document

This manual applies to the following versions:

Designation	Series	Nominal diameter (DN) [mm]	Pressure stage	Class*
Small gate valve	808	10–40	PN 10–100	-
Small gate valve/ VALTRA	800 GJ / 808 GJ	15–50	PN 10–40	800
Gate valve	700 HJ / 700 JJ (GA)	50–150	PN 10–100 PD 10	600
Gate valve	700 HJ / 700 JJ (GA)	200–250	PN 10–40	-
Gate valve	700 HJ / 700 JJ	200–300	PN 63–100	600
Gate valve	400 JJ	350–700	PN 63–100	600
Gate valve/ VALTRA	700 JJ	300–1000	PN 10–25	-
Gate valve/ VALTRA	700 JJ	300–700	PN 40	-
Gate valve	700 JJ	50–300/250	PN 160 / PD 18	900

\* Assignment number in the pipe construction



## Other applicable documents

- Ignition hazard assessment GA004
- Provided connection diagram
- Risk assessment according to Pressure Equipment Directive
- Risk analysis according to Machinery Directive
- Actuator instructions
- Technical data sheet
- Screw tightening torques according to the website:  
[www.persta.com](http://www.persta.com)
- and other documents included in the delivery

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## Revision overview

Revision number	Change/supplement	Date

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# 1 Overview

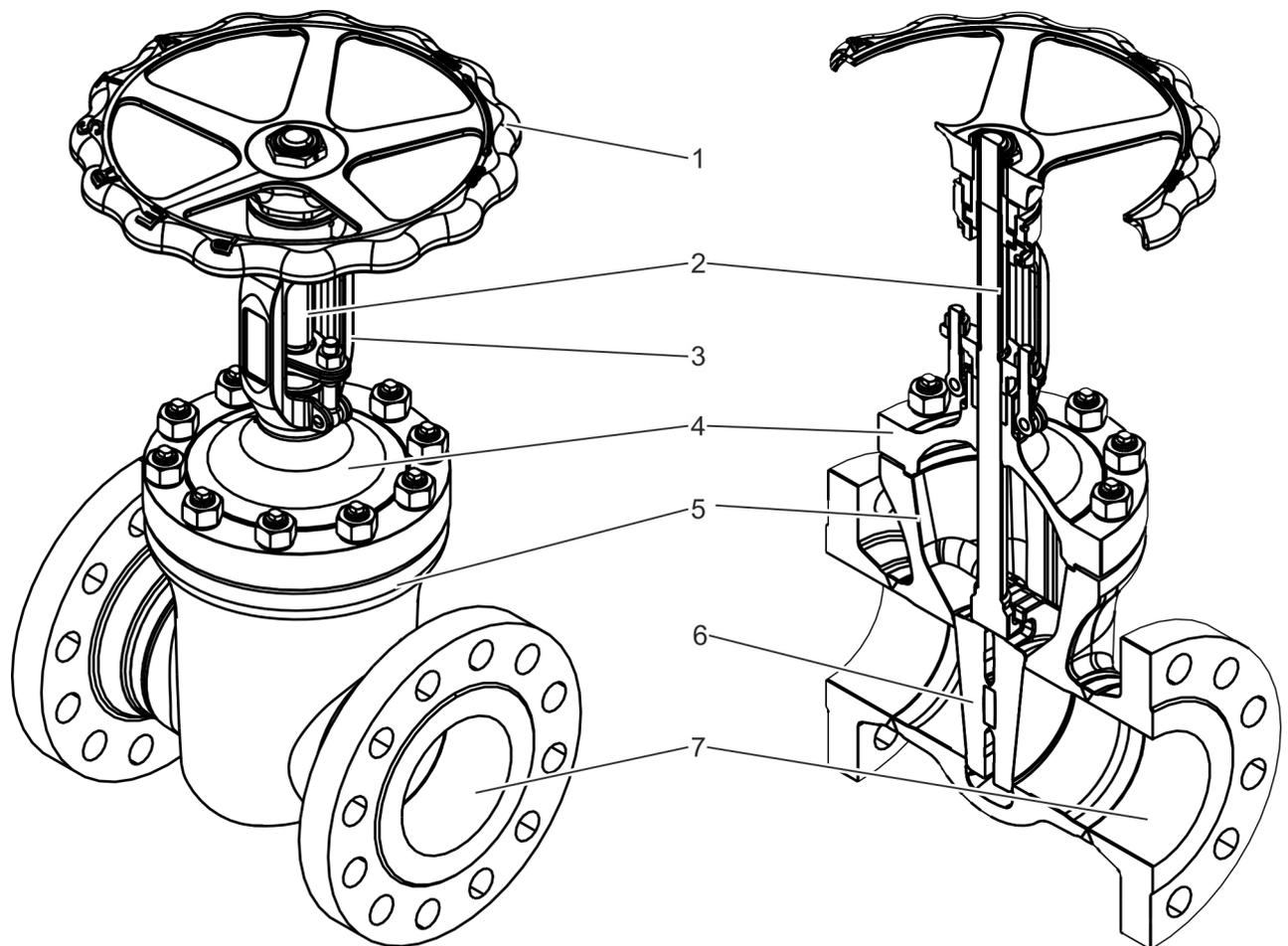


Fig. 1: Gate valve

- |   |                                      |   |   |
|---|--------------------------------------|---|---|
| 1 | Actuator (in the example: handwheel) | 5 | Body  |
| 2 | Stem                                 | 6 | Shut-off element (in the example: flexible discs) |
| 3 | Bonnet (fixed permanently to cover)  | 7 | Flow passage                                      |
| 4 | Cover                                |   |   |

## Brief description

The valves that are termed “gate valves” are installed in pipes. The body (Fig. 1/5) of the valve is flanged or welded in the pipework, depending on the version.

The shut-off element is moved up and down via the stem (Fig. 1/2).

When the shut-off element (Fig. 1/6) is moved down into the flow passage (Fig. 1/7), no medium can flow through the valve. When the valve is open, the medium flows through the entire body.

## Actuator variants

The stem is moved differently depending on the version:

- manually via handwheel
- electrically

- hydraulically
- pneumatically

See [↗ Chapter 3.3.2 'Actuator variants'](#) on page 34.

### Media

Depending on the version of the gate valve, it is suitable for use with water, steam, oil and other non-aggressive media.

### Tools

The following tools are required for the tasks described in the operating instructions:

#### **Forklift**

Forklift with sufficient load-bearing capacity for transport of valves.

#### **Hoist**

Hoist with sufficient load-bearing capacity for transporting valves and components.

#### **Packing extractor**

Tool for removing gland packing elements.

#### **Sling gear**

Functional and approved gear for attaching valves and components on the hoist.

## 2 Safety

### 2.1 Symbols in these instructions

#### Safety instructions

Safety instructions are indicated by symbols in these operating instructions. The safety instructions are introduced by signal words that express the scope of the hazard.

**DANGER!**

This combination of symbol and signal word indicates a hazardous situation that, if not avoided, will result in death or serious injury.

**WARNING!**

This combination of symbol and signal word indicates a potentially hazardous situation that, if not avoided, may result in death or serious injury.

**CAUTION!**

This combination of symbol and signal word indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

**NOTICE!**

This combination of symbol and signal word indicates a potentially hazardous situation that, if not avoided, may result in damage to property.

**ENVIRONMENTAL PROTECTION!**

This combination of symbol and signal word indicates potential hazards for the environment.

#### Safety instructions in specific instructions

Safety instructions may refer to specific, individual instructions. Such safety instructions are integrated in an instruction, so that the flow of reading is not interrupted when performing the action. The above-mentioned signal words are used.

Example:

1. ➤ Unscrew the bolt.

2. ➤



**CAUTION!**  
Risk of getting pinched by the cover!

Close the cover carefully.

3. ➤ Tighten the bolt.

## Special safety instructions

The following symbols are used in the safety instructions to alert the reader to special dangers:

Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

## Tips and recommendations



*This symbol indicates useful tips and recommendations, as well as information for efficient and trouble-free operation.*

## Additional symbols

The following symbols are used throughout these operation instructions to highlight specific instructions, results, lists, references and other elements:

Symbol	Explanation
➤	Step-by-step instructions
⇒	Results of an action
↪	References to sections of these operating instructions and other applicable documents
■	Lists without a specified sequence

## 2.2 Intended use

Valves of the specified series are designed for installation in pipes under the following conditions:

- Operation of the valve as an open/close valve.
- Operation of the valve with liquid or gaseous media, without particularly corrosive, chemical, or abrasive influences.
- Temperature change speeds from approx. 3–6 K/min (3–6 °C/min).
- Maximum number of 1000 load cycles between a depressurised state and the maximum permissible pressure  $p$ .
- Any number of load cycles at pressure fluctuations up to 10% of the maximum permissible pressure  $p$ .
- Generally used flow rates depending on the type of medium and the application for which the valve is used.
- Operation of the valve without additional external influences, such as pipe forces, vibrations, wind loads, earthquakes, corrosive environments, fires, traffic loads, decomposition pressures of unstable fluids.
- Only operate the valve within the limits specified on the type plate (☞ *'Rating plate' on page 13*).

When using the valve in potentially explosive areas, observe instructions contained in the ignition hazard assessment GA004 and implement the measures it stipulates.

The intended use includes compliance with all the information contained in these instructions.

Any use that deviates from the intended use or any other form of use constitutes misuse.

## Misuse



### WARNING!

#### Danger in the event of misuse!

Misuse of the valve can cause dangerous situations.

- Never use the valve in potentially explosive areas without complying with the instructions and measures contained in the ignition hazard assessment GA004.
- Do not use the valve to regulate the mass flow.
- Do not use any objects to increase the force applied when using the handwheel.
- Only activate the handwheel by hand.
- If the handwheel does not move smoothly, or if it cannot be activated, contact the manufacturer.
- Connect the pipes so that they are free of tension.
- Pay attention to the correct installation position of the valve.
- Do not use valves as an anchor point.
- Never run the electric actuators with excess torque.
- Do not exceed the number of permitted load cycles (☞ *Chapter 2.2 'Intended use' on page 11*).
- When operating a valve with:
  - an equalizing pipe
  - a bore in the disc or
  - a bore in the seat ring

as a safety device (☞ *Chapter 2.4 'Safety devices' on page 14*), only operate the valve in one direction (☞ *'Flow direction arrow' on page 13*).

## 2.3 Safety signs

The following symbols and instruction signs are in the work area. These symbols and instruction signs refer to the immediate vicinity in which they are affixed.



### WARNING!

#### Danger if signs are illegible!

Over time, stickers and signs can become fouled or can become illegible in some other manner, so that dangers are not recognised and necessary operating instructions cannot be complied with. This results in a danger of injury.

- Keep all safety, warning, and operating instructions that are affixed to the device in legible condition.
- Replace damaged signs or stickers immediately.

**Rating plate**

The rating plate is on the valve. Depending on the version, the following information is on the rating plate:

- Confirmation number
- Article number
- Year of manufacture
- Nominal diameter
- Nominal pressure/design data

**Flow direction arrow**

Depending on the version, the flow direction is marked with an arrow on the valve.

**Customer-specific markings**

Additional markings (e.g. max. temperature limits) are available on customer request.

## 2.4 Safety devices

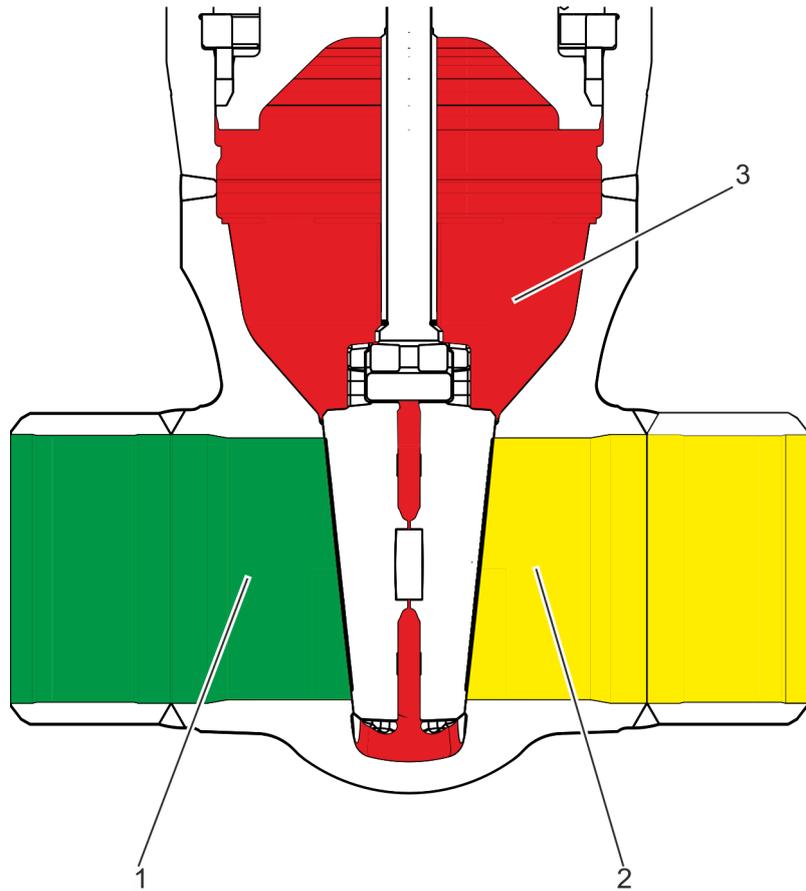


Fig. 2: Division into “chambers”

In the closed position, there are three “chambers” in the valve:

- 1st chamber: pressurized side (Fig. 2/1)
- 2nd chamber: non-pressurized side (Fig. 2/2)
- 3rd chamber: shut-off inner chamber (Fig. 2/3)



*Have the operating company safeguarded the 3rd chamber against overloading.*

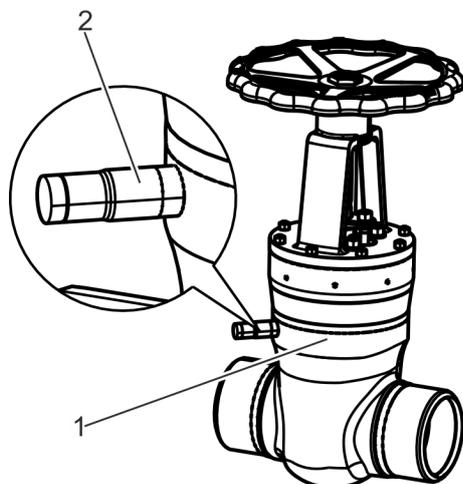
**Optional connection for external safety devices**


Fig. 3: Closed nozzle on the body

Depending on the application, the valve (Fig. 3/1) may need to be equipped with an external overpressure safety device by the operating company. In this regard, the valve can be delivered with a factory-sealed nozzle by the manufacturer (Fig. 3/2). The nozzle creates a connection from the outside to the 3rd Chamber (Fig. 2/3). External overpressure safety devices can be attached to the nozzle (Fig. 3/2).

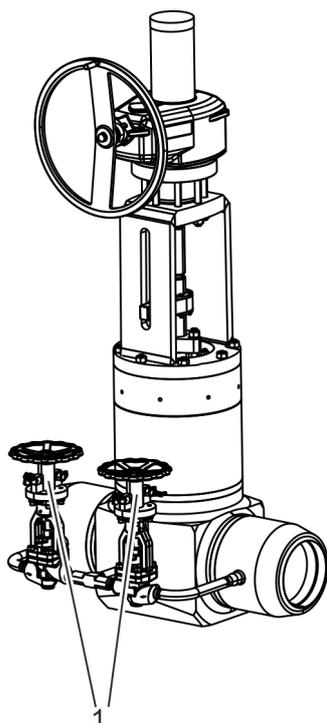
**External safety device: bypass with equalizing pipe**


Fig. 4: Bypass with equalizing pipe (shown here: DSK 25 50–600)

With a bypass, additional external valves (Fig. 4/1) can establish connections between chambers (Fig. 3) within a valve that are separated from each other.


**NOTICE!**
**Risk of damage to property due to closed bypass valves!**

The valve can be damaged if both bypass valves are closed.

- Ensure that at least one of the two bypass valves is open at all times.

## Equalizing pipe

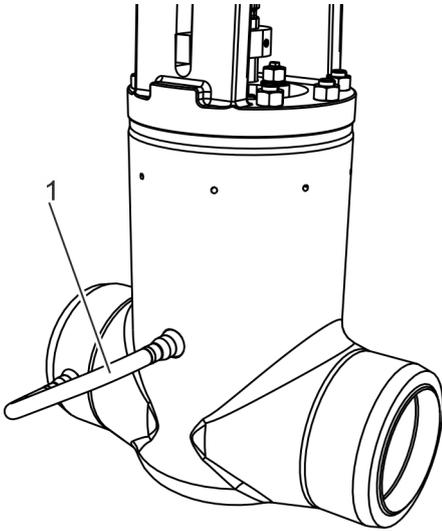


Fig. 5: Equalizing pipe

An equalizing pipe (Fig. 5/1) is used to create a connection between the 3rd chamber (Fig. 2/3) and the pressurised side (Fig. 2/1 (1st chamber)) of the valve.



### WARNING!

#### Risk of injury from alternating flow direction!

There is a risk of serious injury if the specified flow direction is not complied with when an equalizing pipe is used to protect the valve.

- Only operate the valve in the permitted flow direction (↪ 'Flow direction arrow' on page 13).

## Safety valve

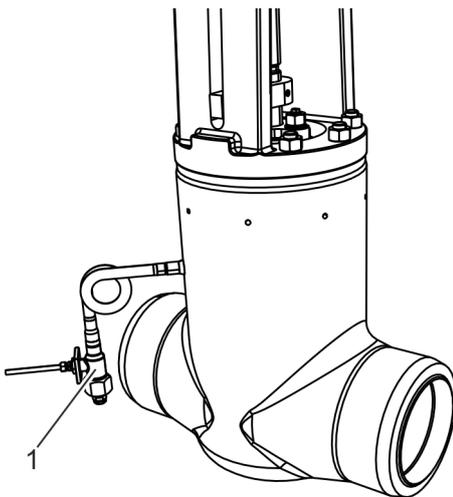


Fig. 6: Safety valve

A safety valve (Fig. 6/1) attached to the nozzle (Fig. 3/2) discharges critical pressures.

## Bore in the disc

An optional bore in the disc prevents pressure in the body from exceeding the operating pressure of the valve.



### WARNING!

#### Risk of injury from alternating flow direction!

There is a risk of serious injury if the specified flow direction is not complied with when a bore in the disc is used to protect the valve.

- Only operate the valve in the permitted flow direction (↪ 'Flow direction arrow' on page 13).

### Bore in the seat ring

An optional bore in the seat ring prevents pressure in the body from exceeding the operating pressure of the valve.



#### **WARNING!**

#### **Risk of injury from alternating flow direction!**

There is a risk of serious injury if the specified flow direction is not complied with when a bore in the seat ring is used to protect the valve.

- Only operate the valve in the permitted flow direction (↺ 'Flow direction arrow' on page 13).

### Torque switch on an electric actuator

On an electric actuator, torque switches are installed in addition to the limit switch. The torque switches protect the valve from excessive torque.

## 2.5 Residual risks

The valve has been developed and manufactured to the state-of-the-art and in accordance with generally accepted rules of safety. Nevertheless residual risks remain that require careful handling. The residual risks and the resulting behaviours and measures are listed below.

### 2.5.1 Basic dangers at the workplace

#### Potentially explosive atmospheres



#### **DANGER!**

#### **Risk of fatal injury due to failure to comply with the rules of conduct specified for potentially explosive atmospheres!**

Depending on the version, the valve can be used in potentially explosive atmospheres. There is a risk of fatal injury if the rules of conduct are not complied with within these areas.

- Ensure that the valve that is to be used in potentially explosive atmospheres has been approved for such an application.
- Never use the valve in potentially explosive areas without complying with the instructions and measures contained in the ignition hazard assessment GA004.
- Ensure that the tasks on the valve can be performed at the installation site.

## Trip hazard



### CAUTION!

#### Danger of injury due to tripping up!

There is a danger of fall injuries in the area of use of the valve.

- Install cable and connection lines in such a manner that there are no trip hazards.

## 2.5.2 Hazards due to electric current (in versions with electric actuator)

### Electric shock



### DANGER!

#### Risk of fatal injury from electric shock!

There is a risk of fatal injury when touching live components of the actuator. Switched-on electrical components can execute uncontrolled movements and can cause serious injuries.

- Prior to starting work, switch off the supply of electricity and definitively disconnect it.
- Only have an electrician perform tasks on electrical lines and components.

## 2.5.3 Hazards due to hydraulics (in versions with hydraulic actuator)

### Fluid under high pressure



### WARNING!

#### Danger of injury due to hydraulic energy!

Hydraulically-powered components of the valve, as well as the triggering of the overpressure valve can cause severe injuries.

- Only have specialised personnel perform tasks on the hydraulic system.
- Prior to starting the tasks on the hydraulic system ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Operate the valve in a frost-free environment to prevent the body from bursting.
- Wear personal protective equipment.

## 2.5.4 Hazards due to the pneumatic system (in versions with pneumatic actuator)

### Hazards associated with the pneumatic system

**WARNING!****Danger of injury due to pneumatic energy!**

Pneumatically-powered components of the valve, can cause severe injuries.

- Only have pneumatic specialists perform tasks on the pneumatic equipment.
- Prior to starting the tasks on the pneumatic equipment ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Wear personal protective equipment.

## 2.5.5 Mechanical hazards

### Danger of crushing on stems

**WARNING!****Danger of injury on moving parts!**

Danger of injury exists on moving parts (stems/anti-twist devices).

- When the valve is in operation do not grasp moving parts.
- Wear personal protective equipment.

### Heavy weight of the valve

**WARNING!****Danger of injury due to the heavy weight of the valve!**

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Don not lift valves via the handwheel.
- Do not lift valves via the actuator.
- If possible, lift valves via the bonnet.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

## 2.5.6 Thermal dangers

### Thermal dangers



#### **WARNING!**

#### **Danger of injury due to high/low temperatures!**

Depending on the insert of the valve or of the pipe, injuries can occur due to the high or low temperature of the components.

- When working on components or activating final control equipment, wear protective equipment: Protective gloves, protective goggles.
- Prior to performing tasks on these components, allow them to cool down/warm up to ambient temperature.
- Have the protective insulation provided by the operating company attached.

### Danger of freezing



#### **WARNING!**

#### **Danger of injury due to pipes shattering at freezing temperatures!**

As a result of pipes shattering at freezing temperatures, severe injuries can be caused by fluid under high pressure.

- Ensure that the valve is completely empty before it is taken out of service.
- Never operate valves at temperatures close to, or below the freezing point of the pumping medium.

## 2.5.7 Hazards due to hazardous substances and operating materials

### Pipeline medium



#### **WARNING!**

#### **Risk of injury due to pressurised pumped medium!**

Depending on the version of the valve, injuries can be caused by the medium escaping under pressure, irrespective of whether the system is in operation or not.

- Do not unscrew threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut-off.
- If threaded connections are loose have the cause of this clarified and rectified. If necessary have the manufacturer check the valve.

**WARNING!****Pumping medium is a health hazard!**

Contact with the pumping medium can have health implications.

- Handle pumping medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pumping medium without delay and dispose of it in an environmentally responsible manner.

**Lubricating grease****WARNING!****Operating materials are a health hazard!**

Contact with operating materials/lubricants can have health implications.

- Handle operating materials and lubricants in accordance with the instructions in the manufacturer's safety data sheet.
- Wear personal protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped operating materials/lubricants without delay and dispose of them in an environmentally responsible manner.

**Pickling medium****WARNING!****Pickling medium is a health hazard!**

Direct contact with the pickling medium used can have health implications.

- Handle pickling medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pickling medium without delay and dispose of it in an environmentally responsible manner.

## Gloss paint



### WARNING!

#### Gloss paint is a health hazard!

Direct contact with the gloss paint used can have health implications.

- Handle gloss paint in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles.

## Anticorrosive



### WARNING!

#### Health risk due to the corrosion protection agent!

Direct contact with the corrosion protection agent used can adversely affect your health.

- Handle the corrosion protection agent in accordance with the instructions in the manufacturer's safety data sheet.
- Wear the following protective equipment: protective gloves, safety footwear, safety goggles, protective work clothing.
- Soak up any spilled corrosion protection agent without delay and dispose of it in an environmentally responsible manner.

## 2.6 Behaviour in the event of an emergency

1. ➤ Shut off the pipe sections affected.
2. ➤ Comply with the in-house regulations.
3. ➤ Operating the valve in an emergency (☞ *Chapter 7.3 'Operating the valve in an emergency' on page 65*).

## 2.7 Personnel requirements


**WARNING!**
**Danger of injury due to inadequate personnel qualification!**

If unqualified personnel perform tasks on the machine or are present in the danger zone, dangers occur that can cause severe injury and significant material damage.

- Only have activities performed by personnel who are qualified to perform these activities.
- Keep unqualified personnel away from the danger zones.

In this manual the qualifications of personnel for the various activity areas are cited below:

**Disposal contractor**

A disposal contractor is a company qualified in accordance with local regulations to collect, transport, store, handle, recycle or dispose of waste and recyclables.

**Forklift truck driver**

The forklift truck driver has demonstrated to the operator their skills in driving industrial trucks controlled by a sitting or standing operator and has been assigned to do this by the operator in writing.

**Hydraulics Specialist**

The Hydraulics Specialist is trained for the special area of responsibility he is involved with and knows the relevant standards and regulations.

Based on his technical training and experience, the Hydraulics Specialist can perform work on hydraulic systems and can recognise and avoid potential hazards himself.

**Industrial mechanic (for valves within the normal pressure range)**

Based on his or her specialised training, skill, experience and knowledge of the applicable standards and requirements, the industrial mechanic must be able to carry out the assigned work on installations and valves in the normal pressure range and to independently identify potential hazards and avoid them.

The operating company must have instructed the industrial mechanic on how to handle the plant and provide regular training for him or her.

The industrial mechanic must be able to independently maintain and repair installations and valves in the normal pressure range.

### **Pipeline engineer**

Based on their specialised training, skills, experience and knowledge of the applicable standards and provisions, the pipeline engineer is able to carry out the work assigned to them and to independently identify potential hazards and avoid them.

The pipeline engineer is able to install valves safely and properly in the pipework.

### **Pneumatics Specialist**

The Pneumatics Specialist is trained for the special area of responsibility he is involved with and knows the relevant standards and regulations.

Based on his technical training and experience, the Pneumatics Specialist can perform work on pneumatic systems and can recognise and avoid potential hazards himself.

### **Qualified electrician**

The qualified electrician is able to execute tasks on electrical equipment and independently detect and avoid any possible dangers thanks to his training, expertise and experience, as well as knowledge of all applicable regulations.

The qualified electrician has been specially trained for the work environment in which he is active and is familiar with all relevant standards and regulations.

### **Trained person (hoist)**

The trained person (hoist) has been instructed, and can provide evidence of this, by the operator on how to handle the hoist and sling gear and the potential hazards associated with improper behaviour.

### **Trained person (operator)**

The trained person (operator) has been instructed, and can provide evidence of this, by the operating company on how to handle the plant and the potential hazards associated with improper behaviour. This knowledge will be refreshed in regular training provided by the operating company. The trained person (operator) is familiar with the content of this manual.

The trained person (operator) is familiar with the operating company's plant and the associated hazards. They are assigned with operating the plant by the operating company.

## **Basic requirements**

Only persons from whom it is expected that they reliably perform their work are approved as personnel. Persons whose capacity to react is impaired, for example, through drugs, alcohol, or medication are not approved as personnel.

Comply with the age-specific and job-specific regulations that apply at the site of implementation when selecting personnel.

## Unauthorised persons



### **WARNING!**

#### **Risk of fatal injury for unauthorised persons due to hazards in the danger zone and work area!**

Unauthorised persons who do not satisfy the requirements described here are not aware of the hazards in the work area. Consequently there is a danger of severe or fatal injuries for unauthorised persons.

- Keep unauthorised persons away from the danger zone and work area.
- If in doubt, speak to these persons and instruct them to leave the danger zone and work area.
- Interrupt tasks as long as unauthorised persons are present in the danger zone and work area.

## Instruction

The operating company must instruct personnel on a regular basis. For better tracking an instruction log must be maintained with at least the following content:

- Date of the instruction
- Name of the instructed person
- Content of the instruction
- Name of the instructor
- Signatures of the instructed person and of the instructor

## 2.8 Responsibility of the operating company

### Operating company

The operating company is the company that operates the valve for commercial or economic purposes itself or that provides it to a third party for use, and that, during operation, bears the legal product responsibility for protection of the user, personnel or third parties.

### Obligations of the operating company

The valve is used commercially. The operating company using the valve is therefore subject to the legal occupational health and safety obligations.

In addition to the safety instructions in these instructions, the applicable local occupational health and safety, accident prevention and environmental protection regulations must be complied with for the area in which the valve is used.

In this regard, the following applies in particular:

- The operating company is responsible for the installation and operation of the valve in the pipe.
- The operating company must ensure that any dangerous situations caused by the operating conditions are avoided by installing additional safety systems.

- The operating company must inform itself of the applicable occupational health and safety regulations and, in a hazard analysis, identify the additional hazards that may exist at the installation site of the valve due to the specific working conditions. The operating company must convert this information into operating instructions for the operation of the valve.
- The operating company must ensure that the operating instructions drawn up by it comply with the currently applicable legislation throughout the operating period of the valve and, if necessary, amend the operating instructions.
- The operating company must clearly regulate and assign the responsibilities for installation, operation, fault correction, maintenance and cleaning.
- After the installation, the operating company must ensure the proper pickling of the valve.
- The operating company must draw up an emergency stop concept for the overall system: specifying whether opening or closing of the valve is necessary in an emergency.
- The operating company must provide devices that ensure the safe transition of the valve into a depressurised state.
- The operating company must provide devices with which the pipe sections in which the valve is installed, as well as the valve itself, can be completely drained.
- The operating company must ensure that all personnel who are to handle the valve have read and understood these operating instructions. In addition, the operating company must train the personnel and inform them of the hazards at regular intervals.
- The operating company must provide the required protective equipment for the personnel and instruct the personnel that wearing the required protective equipment is compulsory.
- The operating company must install additional protective devices around the valve if contact with the valve can result in injuries due to the medium in the pipe system.

The operating company is also responsible for keeping the valve in proper working order at all times. Therefore, the following applies:

- The operating company must ensure that the maintenance intervals described in these instructions are complied with.
- When using the valve as a throttling valve, the operating company must ensure that the valve is checked for signs of wear on a regular basis.

In the case of valves with different pipe connections on the inlet and outlet ends, the operating company must ensure that when opening the valve the respective pipe connection is not exposed to unduly high pressure or an unduly high temperatures.

## 2.9 Personal protective equipment

Personal protective equipment is used to protect personnel from impairments to health and safety at work.

During the various tasks performed on and with the machine, personnel must wear personal protective equipment, to which special reference is made in the individual sections of this manual.

## Description of the personal protective equipment

The personal protective equipment is described below:



### **Chemical resistant safety gloves**

Chemical resistant safety gloves are intended to protect hands against aggressive chemicals.



### **Industrial hard hat**

Industrial hard hats protect the head from falling objects, swinging loads and impacts on stationary objects.



### **Protective gloves**

Protective gloves protect hands from friction, abrasion, puncture wounds, or deeper injuries, as well as from contact with hot surfaces.



### **Protective work clothing**

Protective work clothing is tight-fitting work clothing with low resistance to tearing, with tight sleeves, and without projecting parts.



### **Safety footwear**

Safety footwear protects the feet from crushing injuries, falling parts and slipping on a slippery substrate.



### **Safety goggles**

The protective goggles protect the eyes from flying parts and liquid splashes.

## 2.10 Spare parts

### Wrong spare parts



#### **WARNING!**

#### **Danger of injury if the wrong spare parts are used!**

Using the wrong or defective spare parts may result in dangers for personnel and damage, malfunction or total machine failure.

- Only use original spare parts from Stahl-Armaturen PERSTA GmbH or spare parts approved by Stahl-Armaturen PERSTA GmbH.
- If you have any questions or if anything is unclear, always contact our customer service organisation (contact details on page 3).



#### ***Spare parts recommendation in the scope of delivery***

*The spare parts recommendation is included in the scope of delivery of the valve.*

### Selecting spare parts



#### ***Spare parts recommendation in the scope of delivery***

*The spare parts recommendation is included in the scope of delivery of the valve.*

### Before installation



#### ***Storage of spare parts***

*Please see  Chapter 7.3 'Operating the valve in an emergency' on page 65 for information on storing spare parts.*

### Ordering spare parts

Order spare parts from Stahl-Armaturen PERSTA GmbH, with specification of

- valve type,
- Year of manufacture,
- Nominal diameter,
- Nominal pressure,
- Material,
- Article number,
- Confirmation number,
- Consignment number

(if possible). See page 3 for contact details.

## 2.11 Environmental protection



### **ENVIRONMENTAL PROTECTION!**

#### **Hazards for the environment due to improper handling of environmentally-harmful substances!**

If environmentally-harmful substances are handled incorrectly, particularly if they are disposed of incorrectly, significant environmental damage can occur.

- Always comply with the instructions cited below for handling and disposal of environmentally-harmful substances.
- Comply with the guidelines for disposal of environmentally hazardous substances issued by the operating company.
- If environmentally-harmful substances inadvertently get into the environment, immediately implement suitable measures. If in doubt, inform the responsible municipal authorities of the damage and ask about suitable measures that should be implemented.

### **Substances used**

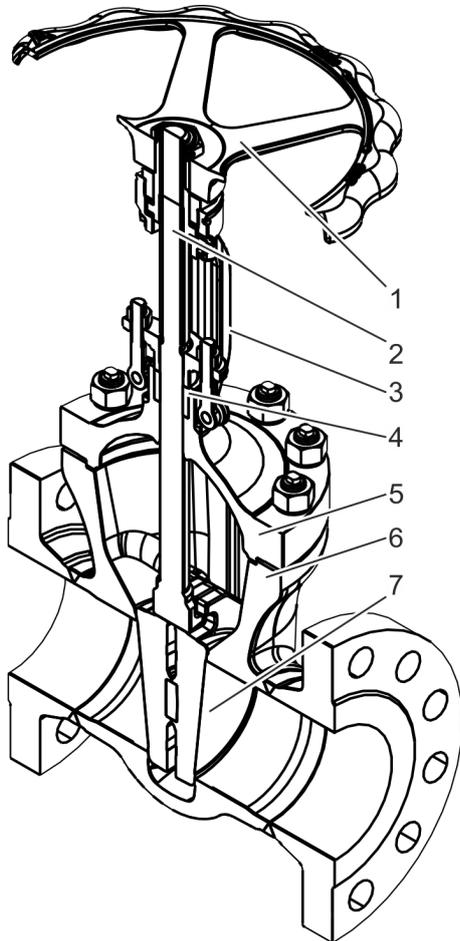
#### **The following environmentally harmful substances are used:**

- Lubricant for stem and bearing
- Residue of the pipeline medium
- Pickling medium
- Anticorrosive
- For hydraulic actuator: hydraulic fluid



### 3 Functional description

#### 3.1 Operating principle of the gate valve



- 1 Actuator (in the example: handwheel)
- 2 Stem
- 3 Bonnet
- 4 Gland packing
- 5 Pressure sealing bonnet
- 6 Body
- 7 Shut-off element (in the example: flexible discs)

In the closed state the shut-off element (Fig. 7/7) prevents the medium flowing through the valve.

The shut-off element is driven to the interior of the valve via the stem (Fig. 7/2). If the shut-off element is open, the medium flows through the entire cross section of the body.

High gate valves vary in the following components:

- Type of shut-off element
- Type of actuator
- Type of connection

Depending on the type, optional display elements can be attached to the gate valve (↪ *Chapter 3.3.3 'Display elements' on page 38*).

Fig. 7: Sectional view

## 3.2 External seal

### Gland packing

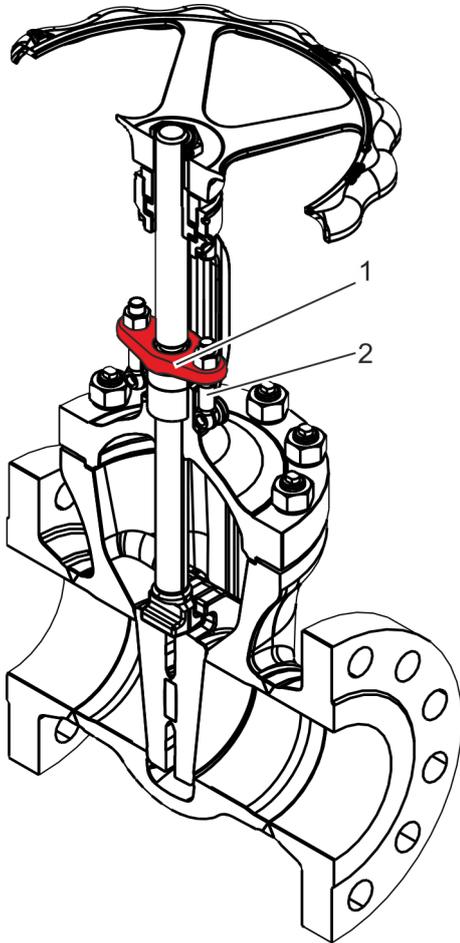


Fig. 8: Gland packing

The gland packing seals the stem off from the environment.

The gland follower flange (Fig. 8/1) is pressed onto the sealing elements using stud bolts (Fig. 8/2):

- Gland follower
- Chamber ring
- Packing ring

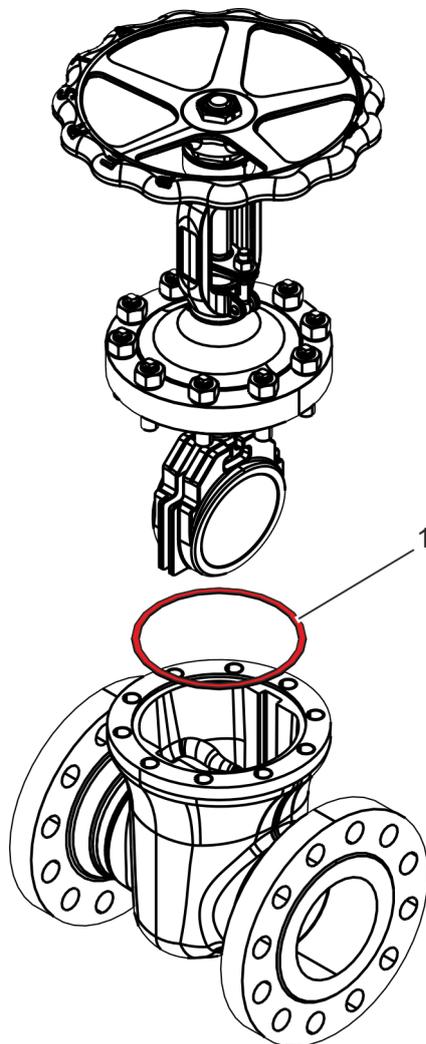
The resulting transverse deformation and the axial tensioning of the packing rings causes the stem to be sealed off from the medium.

If leaks occur, the gland packing can be replaced by employees of the operating company (☞ Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73).



#### **Live-loaded packing**

*Optionally a live-loaded packing can be used to ensure uniform contact pressure.*

**Cover gasket**


There is a sealing element (Fig. 9/1) between the body and the body cover to prevent the pipeline medium from escaping from the body. If leaks occur, the sealing element can be replaced by employees of the operating company (↪ *Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73*).

*Fig. 9: Cover gasket*

### 3.3 Versions of the gate valve

#### 3.3.1 Shut-off element

A shut-off element (Fig. 10/1–3) is fastened to the lower end of the stem, and is guided into the body via grooves or strips. In the closed position the shut-off element seals the flow passage in the body and prevents the medium from flowing through.

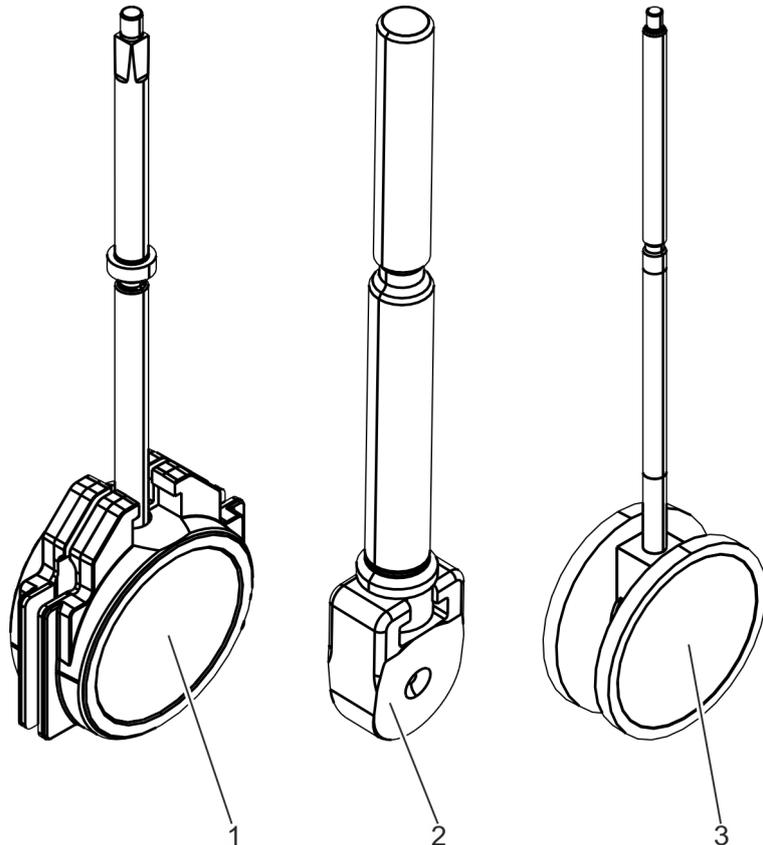


Fig. 10: Versions of the shut-off element

- 2-disc design (Fig. 10/1)
- Rigid shim (Fig. 10/2)
- Circular plates (Fig. 10/3)

#### 3.3.2 Actuator variants

The stem is moved differently depending on the version:

- manually via handwheel
- electrically
- hydraulically
- pneumatically



See the scope of delivery of the valve for additional information.

### Manual actuator (handwheel)

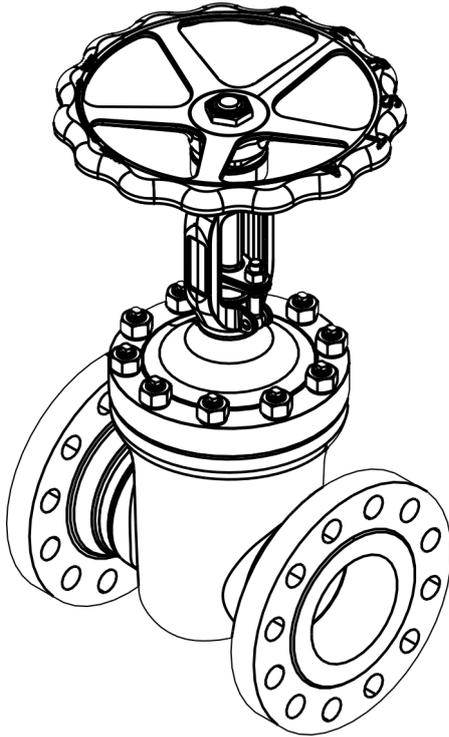


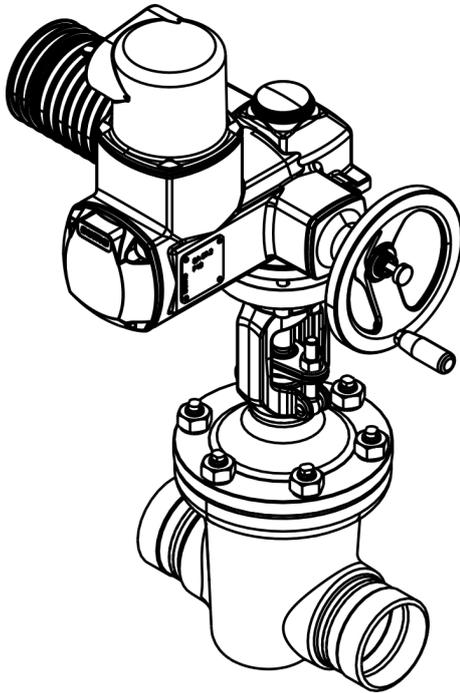
Fig. 11: Manual actuator

The stem is driven manually with the handwheel.

The handwheel can be attached in the following manner:

- direct attachment
- bevel gearbox with handwheel
- spur gear unit with handwheel
- remote actuator

### Electric actuator



With the optional electric actuator the stem is driven via an electric motor. The electric motor is connected to the valve above the bonnet.

The electric actuator is adjusted in the close and open direction via limit switches by the manufacturer.

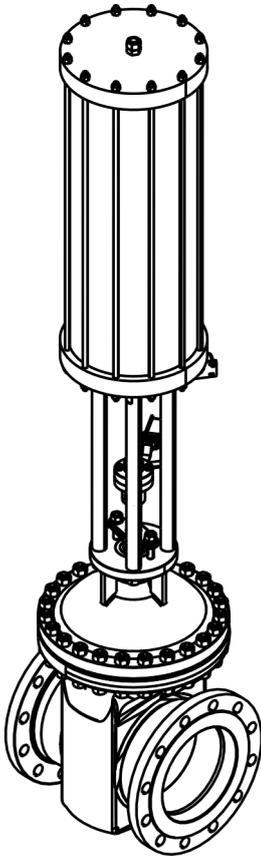
Downstream torque switches are installed for safety.

The electric actuator can be attached in the following manner:

- direct attachment of the electric actuator
- bevel gearbox with electric actuator
- spur gear unit with electric actuator
- remote actuator

Fig. 12: Electric actuator

### Hydraulic actuator



With the optional hydraulic actuator the stem is driven via a hydraulic piston actuator.

The hydraulic actuator is connected to the valve above the bonnet.

*Fig. 13: Hydraulic actuator*

### Pneumatic actuator

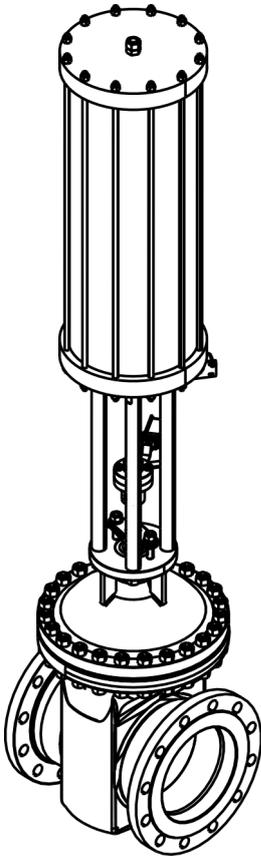


Fig. 14: Pneumatic actuator

With the optional pneumatic actuator the stem is driven via a pneumatic piston actuator.

The pneumatic actuator is connected to the valve above the bonnet.

### 3.3.3 Display elements

#### Position indicator (visualised)

An electrical position indicator (limit switch or inductive proximity switch) is optionally available for the valve. The display indicates whether the valve position is open or closed.

#### Position indicator (mechanical)

For series

- 400 JJ DN 350–700

the mechanical position indicator is standard equipment.

For other series, the mechanical position indicator is optionally available.

### 3.3.4 Connections

#### Connection in the pipe

Valves can be mounted in the pipe as

- Butt-weld valves
- Flanged valves
- Special connection valves

#### Electrical connections

A connection for the customer-provided power supply is provided on the electric actuator.



*Information on the connection is provided in the operating manual for the electric actuator.*

#### Hydraulic connections

Connections for the customer-provided hydraulic supply are provided on the flanges or on the control valves on the hydraulic piston actuator.



*Information on the connection is provided in the operating manual for the hydraulic actuator.*

#### Pneumatic connections

Connections for the customer-provided pneumatic supply are provided on the flanges or on the control valves on the pneumatic piston actuator.



*Information on the connection is provided in the operating manual for the pneumatic actuator.*

### Optional connection for external safety devices

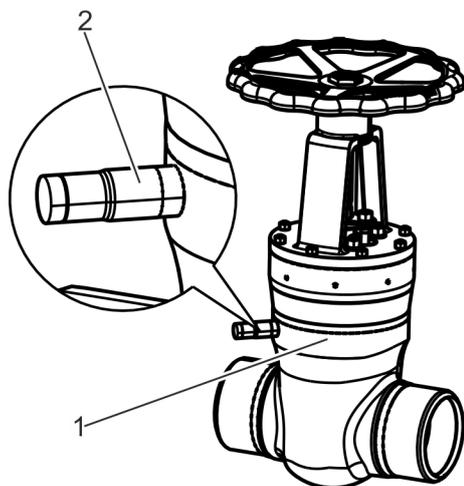


Fig. 15: Closed nozzle on the body

Depending on the application, the valve (Fig. 15/1) may need to be equipped with an external overpressure safety device by the operating company. In this regard, the valve can be delivered with a factory-sealed nozzle by the manufacturer (Fig. 15/2).

Further information on external safety devices: ↗ *Chapter 2.4 'Safety devices' on page 14*

## 4 Transport and storage

### 4.1 Safety notices for transport and storage

#### Heavy weight of the valve

**WARNING!****Risk of injury due to the heavy weight of the valve!**

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- If possible, lift valves via the bonnet.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

#### Suspended loads

**WARNING!****Danger of injury due to suspended loads!**

Suspended loads can cause dangerous situations that can result in severe injuries.

- Do not step under suspended loads.
- Wear protective equipment: Industrial hard hat, safety footwear.
- Transport loads as close to the ground as possible.
- Only use approved sling gear and hoists.
- Ensure that hoist and sling gear have sufficient load-bearing capacity.

#### Improper transport

**NOTICE!****Material damage due to improper transport!**

Valves can fall or tip over if transported improperly. This can cause considerable material damage.

- When unloading valves at delivery, as well as for inner-company transport, proceed carefully and pay attention to the symbols and instructions on the packaging.
- If present: Use the provided ring bolts and ring nuts.
- Protect valves from impacts.
- Do not throw valves.
- Only remove the packaging just before installation.

### 4.2 Transport of packages

Depending on the size, valves are delivered individually or on a pallet.

#### Transporting individual valves

Personnel:	■ Trained person (hoist)
Protective equipment:	■ Industrial hard hat
	■ Protective gloves
	■ Safety footwear
Special tool:	■ Sling gear
	■ Hoist

1. ▶



**DANGER!**  
**Unmarked attachment points!**

Fasten valve onto the hoist with suitable sling gear.

2. ▶

Slowly lift the valve and identify the position of the centre of gravity.

3. ▶

Transport the valve as close to the ground as possible.

4. ▶

After setting down the valve, safeguard it from falling over.

#### Transport on a pallet

Personnel:	■ Forklift truck driver
	■ Trained person (hoist)
Protective equipment:	■ Industrial hard hat
	■ Protective gloves
	■ Safety footwear
Special tool:	■ Sling gear
	■ Hoist
	■ Forklift

1. ▶

Ensure that the valve is fixed in place on the pallet.

2. ▶

Transport the pallet to the installation location.

3. ▶

Unload heavy valves from the pallet with a suitable hoist and further transport.

### 4.3 Storage of the valve

#### Storage requirements

Store a valve under the following conditions:

- Store valve in closed status (delivery status).
- Do not store outdoors.
- Store in a dry and dust-free environment.
- Do not expose it to any aggressive media.
- Protect from direct sunlight.
- Avoid mechanical vibrations.
- Storage temperature: 15–35 °C.
- Relative humidity: max. 60%.
- Check the condition of the protective caps attached at the factory. Replace protective caps if necessary.
- When storing valves for longer than 3 months, check the general condition of all parts and the packaging on a regular basis. Touch up or reapply preservation agent as required.



*There may be storage instructions affixed to the packed items that exceed the requirements set out in these instructions. Comply with the terms of those instructions.*

### 4.4 Storage of spare parts



#### **NOTICE!**

#### **Material damage due to reduced service life if stored incorrectly!**

Due to incorrect storage of soft-sealing spare parts, the service life may be reduced.

- Store soft-sealing elements, plastics or lubricants in a dry location at room temperature where they are protected against light.



## 5 Installation

### 5.1 Safety instructions for installation

**Electric current (in versions with electric actuator)**



**DANGER!**

**Risk of fatal injury due to electric current!**

There is a risk of fatal injury when touching live components of the actuator. Switched-on electrical components can perform uncontrolled movements and cause serious injuries.

- Prior to starting work, switch off the supply of electricity and disconnect it completely.
- Only have qualified electricians perform tasks on electrical lines and components.

**Liquid under high pressure (in versions with hydraulic actuator)**



**WARNING!**

**Risk of injury due to hydraulic energy!**

Hydraulically-powered components of the valve, as well as the triggering of the overpressure valve, can cause severe injuries.

- Only have hydraulic specialists perform tasks on the hydraulic system.
- Prior to starting the tasks on the hydraulic system, ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Operate the valve in a frost-free environment to prevent the body from bursting.
- Wear personal protective equipment.

**Hazards due to the pneumatic system (in versions with pneumatic actuator)**



**WARNING!**

**Risk of injury due to pneumatic energy!**

Pneumatically-powered components of the valve can cause severe injuries.

- Only have pneumatic specialists perform tasks on the pneumatic equipment.
- Prior to starting the tasks on the pneumatic equipment ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Wear personal protective equipment.

## Faulty installation



### WARNING!

#### Risk of injury due to incorrectly installed valve!

A faulty installation can cause injuries or result in the malfunction of the gate valve.

- Pay attention to the flow direction of valves.
- When operating a valve with:
  - an equalizing pipe
  - a bore in the disc or
  - Bore in the seat ring

as a safety device (☞ *Chapter 2.4 'Safety devices' on page 14*), only operate the valve in one direction (☞ *'Flow direction arrow' on page 13*).

- Pay attention to the correct installation position of the valve.
- In respect of valves with an actuator or transmission, ensure that the stem position is vertical.
- In special cases and if the stem position is not vertical:
  - Prop up the actuator on the valve head.
  - Ensure that the actuator can follow the position changes of the pipe.
- In respect of butt-weld valves:
  - Prior to welding on, open the valve completely
  - Fasten the welding counterpole on the body, if possible in the vicinity of the welding point
  - Perform the welding and the subsequent heat treatment in compliance with the applicable welding regulations
  - Perform partial thermal treatment.

## Wrong screw tightening torque



### WARNING!

#### Danger due to the wrong screw tightening torque!

The tightening torques of the threaded connections on the valve have been calculated and applied by the manufacturer. Hazards can occur due to unscrewing and subsequent tightening if the wrong tightening torques are used.

- Do not unscrew threaded connections on the valve.
- For maintenance tasks or when unscrewing threaded connections, contact
  - Stahl-Armaturen PERSTA GmbH customer service (contact details p. 3) to request the tightening torques, specifying the serial number, or
  - refer to the manufacturer's website (address on page 2).

## 5.2 Before the installation

- |                       |                            |
|-----------------------|----------------------------|
| Personnel:            | ■ Pipeline engineer        |
| Protective equipment: | ■ Protective work clothing |
|                       | ■ Protective gloves        |
|                       | ■ Industrial hard hat      |
|                       | ■ Safety footwear          |

1.  Check the design parameters and material.
2.  Pay attention to the installation position.
3.  Pay attention to the flow direction (  'Flow direction arrow' on page 13).
4.  For butt-weld valves: open the valve completely.
5.  Remove any protective caps and preserving agents from the valve.
6.  Make sure that there are no objects or materials in the interior of the valve.

## 5.3 Installing the valve

Personnel:	■ Pipeline engineer
	■ Trained person (hoist)
Protective equipment:	■ Protective work clothing
	■ Protective gloves
	■ Industrial hard hat
	■ Safety footwear
Special tool:	■ Sling gear
	■ Hoist

1. ▶ Prepare the respective pipe section for the installation.
2. ▶ Use a hoist to bring the valve into the installation position.
3. ▶ Ensure that the customer-provided pipes are free of tension.
4. ▶ Ensure that the customer-provided pipes are free of external forces and torques.
5. ▶ Check butt-welding ends and flange sealing surfaces for damage and cleanliness.
6. ▶ Centre the connection flange.
7. ▶ Use connection elements and sealing elements made of permissible materials.
8. ▶ Depending on the type of connection, weld in or flange on the valve in the correct flow direction and installation position.
9. ▶ Screw fasten all flange bores with connection elements using the permissible tightening torque.
10. ▶ Ensure the seal of the pipe and the valve.

## 5.4 Attaching additional safety devices



*Have the operating company ensure the installation of additional safety devices (↪ Chapter 2.4 'Safety devices' on page 14).*

*See the information in the documentation provided for the safety devices.*

## 5.5 For electric actuator: connecting the power supply

- Personnel: ■ Qualified electrician
- Protective equipment: ■ Protective work clothing  
■ Safety footwear

Requirement:

- Ensure that the customer-provided power supply is switched off and safeguarded against being switched on again.

1. ➤



***Terminal diagram and operating manual are located on the actuator.***

Connect the electric actuator of the valve to the customer-provided power supply in accordance with the provided terminal diagram.

2. ➤ Avoid mechanical stress of the cable by means of suitable cable routing.
3. ➤ Protect the cable against contact with hazardous substances and operating materials.
4. ➤ Route the cable in such a manner that there are no trip hazards.

## 5.6 For hydraulic actuator: connecting the hydraulic system

- Personnel: ■ Hydraulics Specialist
- Protective equipment: ■ Safety goggles  
■ Protective work clothing  
■ Safety footwear

1. ➤ Switch off the customer-provided hydraulic supply and safeguard it from being switched on again.
2. ➤ Connect the hydraulic actuator of the valve to the customer-provided hydraulic supply in accordance with the provided connection plan.
3. ➤ Avoid mechanical stress of the hydraulic line by means of suitable routing.
4. ➤ Protect the hydraulic line against contact with hazardous substances and operating materials.
5. ➤ Route lines in such a manner that there are no trip hazards.

## 5.7 For pneumatic actuator: connecting the pneumatic system

- Personnel: ■ Pneumatics Specialist
- Protective equipment: ■ Safety goggles  
■ Protective work clothing  
■ Safety footwear

1. ▶ Switch off the customer-provided pneumatic supply and safeguard it from being switched on again.
2. ▶ Connect the pneumatic actuator of the valve to the customer-provided pneumatic supply in accordance with the provided connection plan.
3. ▶ Avoid mechanical stress of the pneumatic line through suitable installation.
4. ▶ Protect the pneumatic line against contact with hazardous substances and operating materials.
5. ▶ Route lines in such a manner that there are no trip hazards.

## 5.8 After the installation

### Harmful substances



#### **WARNING!**

##### **Pickling medium is a health hazard!**

Direct contact with the pickling medium used can have health implications.

- Handle pickling medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pickling medium without delay and dispose of it in an environmentally responsible manner.



#### **WARNING!**

##### **Gloss paint is a health hazard!**

Direct contact with the gloss paint used can have health implications.

- Handle gloss paint in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles.


**WARNING!**
**Anticorrosive is a health hazard!**

Direct contact with the anticorrosive used can have health implications.

- Handle anticorrosive in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped anticorrosive without delay and dispose of it in an environmentally responsible manner.

### 5.8.1 Pickling the valve



*The valve can be pickled in several ways.*

*Ensure that the operating company's specialised personnel pickle the valve.*

- |                       |                                    |
|-----------------------|------------------------------------|
| Personnel:            | ■ Pipeline engineer                |
| Protective equipment: | ■ Safety goggles                   |
|                       | ■ Protective work clothing         |
|                       | ■ Chemical resistant safety gloves |
|                       | ■ Safety footwear                  |

- 1.** → Open the valve completely during the pickling process.
- 2.** → Pickle the valve correctly.
- 3.** → Close the valve half way after the pickling process.
- 4.** → Completely remove the pickling medium by flushing it out.
- 5.** → Ensure that the pickling medium is completely flushed out of the dead spaces in the valve.

### 5.8.2 Painting the valve



*Ensure that the operating company's specialised personnel paint the valve.*

*Use suitable (compatible) painting systems.*

## 5.8.3 Performing a system pressure test and leak test

### Alternating flow direction



#### **WARNING!**

#### **Risk of injury from alternating flow direction!**

When protecting the valve with:

- an equalizing pipe
- a bore in the disc or
- a bore in the seat ring

there is a risk of serious injury if the specified flow direction is not observed.

- Only operate the valve in the permitted flow direction (↺ 'Flow direction arrow' on page 13).

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Industrial hard hat  
■ Safety goggles  
■ Protective work clothing  
■ Protective gloves  
■ Safety footwear

1. ▶ Execute the tests in accordance with the local regulations.
2. ▶ Release the pipe after successful tests.
3. ▶ For longer idle periods after the hydrostatic pressure test, completely drain the valve.
4. ▶ For longer idle periods after the hydrostatic pressure test, replace the anticorrosive agent in consultation with the manufacturer.

## 5.8.4 Applying thermal insulation



#### **Plant-specific equipment**

*Depending on the plant, it may be necessary to equip the pipe and/or the valve with a thermal insulation.*

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Safety goggles  
 ■ Protective work clothing  
 ■ Protective gloves  
 ■ Safety footwear

1. ➔ If necessary, have the thermal insulation fitted by the operating company.
2. ➔ Ensure that all operating elements, as well as gland seal areas and overpressure safety devices remain permanently accessible and controllable.

The insulation must not exceed the upper edge of the body (Fig. 16, red arrow).

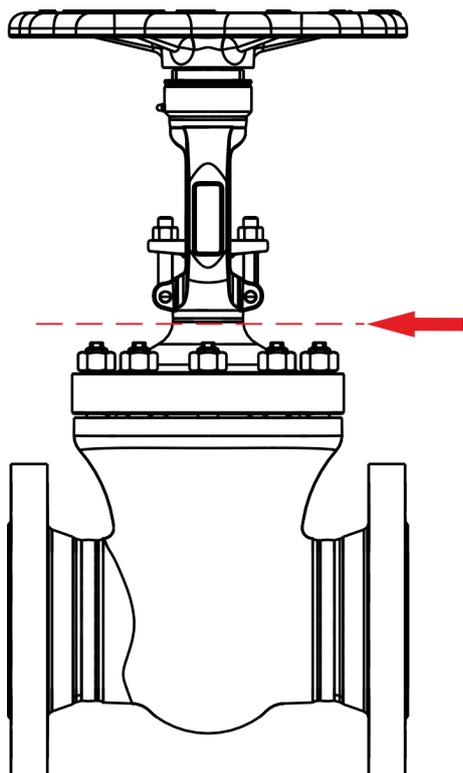


Fig. 16: Upper edge of the insulation



## 6 Commissioning

### 6.1 Safety instructions for commissioning

#### Danger of freezing

**WARNING!****Danger of injury due to pipes shattering at freezing temperatures!**

As a result of pipes shattering at freezing temperatures, severe injuries can be caused by fluid under high pressure.

- Ensure that the valve is completely empty before it is taken out of service.
- Never operate valves at temperatures close to, or below the freezing point of the pumping medium.

#### Faulty aeration and venting

**WARNING!****Danger of injury due to faulty aeration and venting!**

Faulty aeration and venting can result in severe injuries due to loss of stability of the valve.

- Do not aerate or vent the valve by loosening the gland seal.
- If provided, have the manufacturer attach venting devices.
- If provided, vent the valve via customer-provided devices.

#### Unscrewing pressurised threaded connections

**WARNING!****Danger of injury due to pressurised threaded connections!**

Depending on the version of the valve, both in an operating and decommissioned state, injuries can occur due to an escaping medium.

- Do not unscrew threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut-off.
- If threaded connections are loose have the cause of this clarified and rectified. If necessary have the manufacturer check the valve.

## Pipeline medium



### **WARNING!**

#### **Risk of injury due to pressurised pumped medium!**

Depending on the version of the valve, injuries can be caused by the medium escaping under pressure, irrespective of whether the system is in operation or not.

- Do not unscrew threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut-off.
- If threaded connections are loose have the cause of this clarified and rectified. If necessary have the manufacturer check the valve.



### **WARNING!**

#### **Pumping medium is a health hazard!**

Contact with the pumping medium can have health implications.

- Handle pumping medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pumping medium without delay and dispose of it in an environmentally responsible manner.

## Thermal dangers



### **WARNING!**

#### **Danger of injury due to high/low temperatures!**

Depending on the insert of the valve or of the pipe, injuries can occur due to the high or low temperature of the components.

- When working on components or activating final control equipment, wear protective equipment: Protective gloves, protective goggles.
- Prior to performing tasks on these components, allow them to cool down/warm up to ambient temperature.
- Have the protective insulation provided by the operating company attached.

### Danger of injury due to misuse



#### **WARNING!**

#### **Danger of injury due to force-increasing objects!**

By using force-increasing objects (rods/tubes) as levers for actuating the handwheel, injuries can occur due to damage of components in the force flux.

- Do not use any objects to increase the force applied when using the handwheel.
- Only activate the handwheel by hand.
- If the handwheel does not move smoothly, or if it cannot be activated, lubricate the stem thread and bearing (☞ *Chapter 8.3.3 'Lubricating moving parts (stem thread)' on page 78*). If necessary contact the manufacturer.

### Failure to comply with the heating-up times/cooling times



#### **WARNING!**

#### **Danger of injury due to failure to comply with the heating-up times/cooling times!**

Insufficient heating-up times/cooling times may lead to impermissible deformations of the valve and reduction of the total service life.

- Comply with the heating-up times/cooling times (max. 6 K/min (6 °C/min)).
- If in doubt consult with the manufacturer.

### Moving parts



#### **WARNING!**

#### **Danger of injury on moving parts!**

Danger of injury exists on moving parts (stems/anti-twist devices).

- When the valve is in operation do not grasp moving parts.
- Wear personal protective equipment.

## 6.2 Prior to commissioning

- Personnel: ■ Pipeline engineer
- Protective equipment: ■ Industrial hard hat  
■ Safety goggles  
■ Protective work clothing  
■ Protective gloves  
■ Safety footwear

Requirements:

- The entire plant must be released for operation.

### Valve with manual actuator

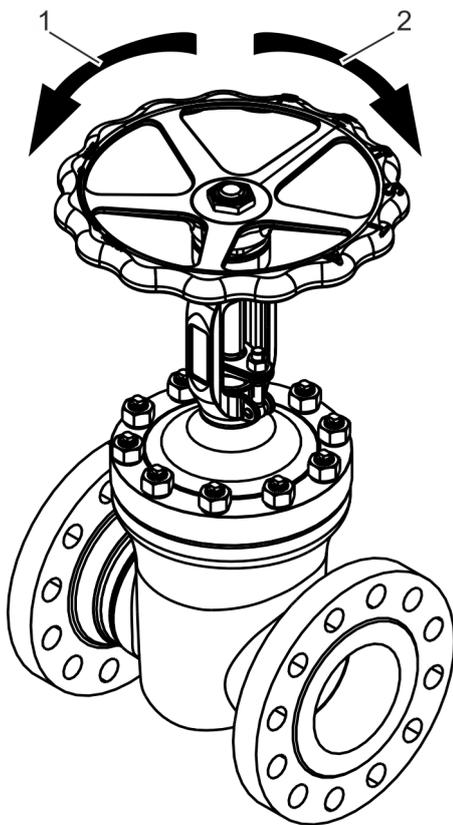


Fig. 17: Valve with handwheel

### Valve with electric, hydraulic or pneumatic actuator

1. Fully open the valve by turning the handwheel counterclockwise (Fig. 17/1).
2. Fully close the valve by turning the handwheel clockwise (Fig. 17/2).
3. Repeat steps 1–2 several times.

4. Open and close valve several times through the higher-level or local control system.

## 6.3 Carrying out the commissioning process

- |                       |   |
|-----------------------|---|
| Personnel:            | <ul style="list-style-type: none"> <li>■ Pipeline engineer</li> <li>■ Industrial mechanic (for valves within the normal pressure range)</li> </ul>  |
| Protective equipment: | <ul style="list-style-type: none"> <li>■ Industrial hard hat</li> <li>■ Safety goggles</li> <li>■ Protective work clothing</li> <li>■ Protective gloves</li> <li>■ Safety footwear</li> </ul> |

### Requirements:

- The entire plant must be released for operation.

1. ➤



### **WARNING!**

**Failure to comply with the heating/cooling times!**

Fill the pipe or open the shut-off pipe section in accordance with the plant-specific heating-up or cooling-down speed.

2. ➤ Check the gland seal for leaks.
3. ➤ If necessary, retighten the gland seal as specified by the manufacturer.
4. ➤ Check the pressure sealing bonnet for leaks.
5. ➤ Check the pipe connection flanges for leaks, if necessary retighten as specified by the system planner.



## 7 Operation

### 7.1 Safety instructions for operation

#### Thermal dangers


**WARNING!**
**Danger of injury due to high/low temperatures!**

Depending on the insert of the valve or of the pipe, injuries can occur due to the high or low temperature of the components.

- When working on components or activating final control equipment, wear protective equipment: Protective gloves, protective goggles.
- Prior to performing tasks on these components, allow them to cool down/warm up to ambient temperature.
- Have the protective insulation provided by the operating company attached.

#### Pipeline medium


**WARNING!**
**Risk of injury due to pressurised pumped medium!**

Depending on the version of the valve, injuries can be caused by the medium escaping under pressure, irrespective of whether the system is in operation or not.

- Do not unscrew threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut-off.
- If threaded connections are loose have the cause of this clarified and rectified. If necessary have the manufacturer check the valve.


**WARNING!**
**Pumping medium is a health hazard!**

Contact with the pumping medium can have health implications.

- Handle pumping medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pumping medium without delay and dispose of it in an environmentally responsible manner.

### Failure to comply with the heating-up times/cooling times



#### **WARNING!**

#### **Danger of injury due to failure to comply with the heating-up times/cooling times!**

Insufficient heating-up times/cooling times may lead to impermissible deformations of the valve and reduction of the total service life.

- Comply with the heating-up times/cooling times (max. 6 K/min (6 °C/min)).
- If in doubt consult with the manufacturer.

### Improper operation of the handwheel



#### **WARNING!**

#### **Danger of injury due to force-increasing objects!**

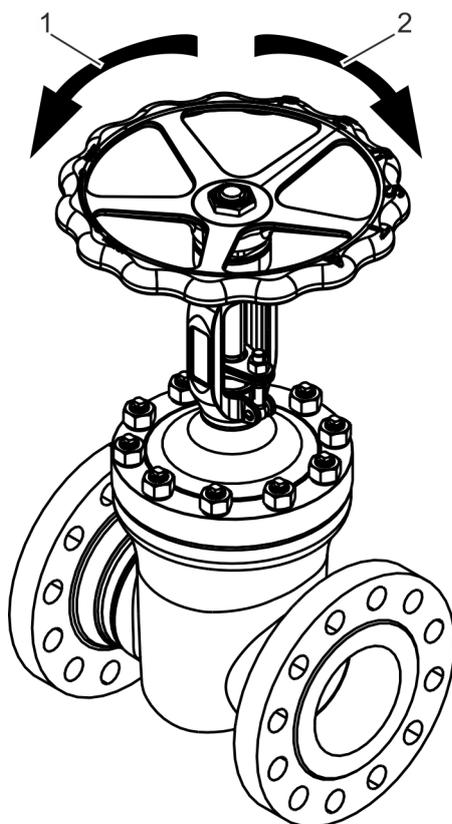
By using force-increasing objects (rods/tubes) as levers for actuating the handwheel, injuries can occur due to damage of components in the force flux.

- Do not use any objects to increase the force applied when using the handwheel.
- Only activate the handwheel by hand.
- If the handwheel does not move smoothly, or if it cannot be activated, lubricate the stem thread and bearing (☞ *Chapter 8.3.3 'Lubricating moving parts (stem thread)' on page 78*) and if necessary, contact the manufacturer.

## 7.2 Operating the valve

### 7.2.1 Valve with manual actuator (handwheel)

- |                       |   |
|-----------------------|---|
| Personnel:            | <ul style="list-style-type: none"> <li>■ Industrial mechanic (for valves within the normal pressure range)</li> <li>■ Trained person (operator)</li> </ul>                                    |
| Protective equipment: | <ul style="list-style-type: none"> <li>■ Industrial hard hat</li> <li>■ Safety goggles</li> <li>■ Protective work clothing</li> <li>■ Protective gloves</li> <li>■ Safety footwear</li> </ul> |



- Turn handwheel on the valve:
- Turning clockwise (Fig. 18/2): closes the valve.
  - Turning anticlockwise (Fig. 18/1): opens the valve.

Fig. 18: Turning the handwheel

### 7.2.2 Valve with electric actuator

The valve is operated by the higher-level control system or the local control system.



*See the scope of delivery of the valve for additional information.*

### 7.2.3 Valve with hydraulic or pneumatic actuator

The valve is operated by the higher-level control system or the local control system.



*See the scope of delivery of the valve for additional information.*

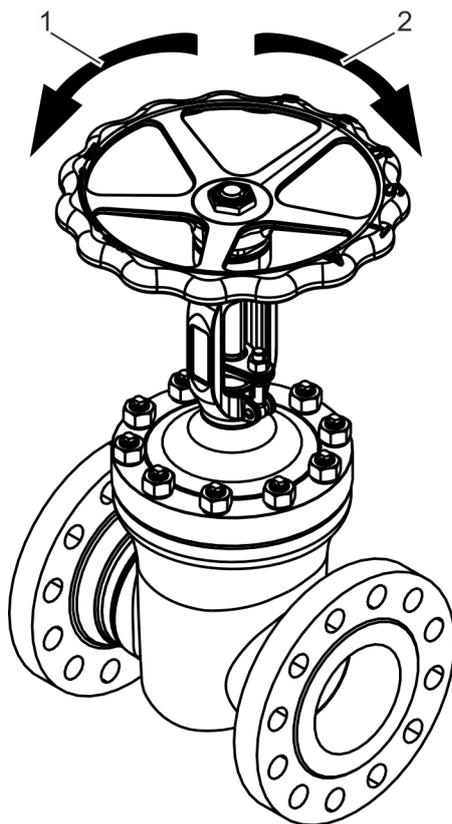
## 7.3 Operating the valve in an emergency

### 7.3.1 Valve with manual actuator (handwheel)



*Comply with the operating company's instructions concerning behaviour in the event of an emergency.*

- |                       |   |
|-----------------------|---|
| Personnel:            | <ul style="list-style-type: none"> <li>■ Industrial mechanic (for valves within the normal pressure range)</li> <li>■ Trained person (operator)</li> </ul>                                    |
| Protective equipment: | <ul style="list-style-type: none"> <li>■ Industrial hard hat</li> <li>■ Safety goggles</li> <li>■ Protective work clothing</li> <li>■ Protective gloves</li> <li>■ Safety footwear</li> </ul> |



→ Turn the handwheel.

- Turning anticlockwise (Fig. 19/1): opens the valve.
- Turning clockwise (Fig. 19/2): closes the valve.

*Fig. 19: Manual actuator: Operating the handwheel in an emergency*

## 7.3.2 Valve with electric actuator



### **Coupling/uncoupling the handwheel**

See the operating manual of the actuator for information on coupling and uncoupling the handwheel for operating the valve in an emergency.

- |                       |   |
|-----------------------|---|
| Personnel:            | <ul style="list-style-type: none"> <li>■ Industrial mechanic (for valves within the normal pressure range)</li> <li>■ Trained person (operator)</li> </ul>                                    |
| Protective equipment: | <ul style="list-style-type: none"> <li>■ Industrial hard hat</li> <li>■ Safety goggles</li> <li>■ Protective work clothing</li> <li>■ Protective gloves</li> <li>■ Safety footwear</li> </ul> |

#### Requirement:

- The electric actuator cannot be used.
1. ➤ Safeguard the affected system area.
  2. ➤ Couple the handwheel (Fig. 20/2).
  3. ➤ Turn the handwheel.
    - Turning anticlockwise (Fig. 20/1): opens the valve.
    - Turning clockwise (Fig. 20/3): closes the valve.

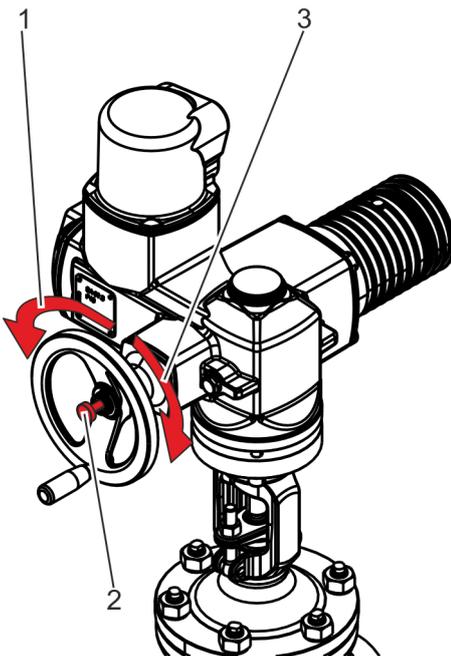


Fig. 20: Electric actuator: Operating the handwheel in an emergency

## 7.3.3 Valve with hydraulic or pneumatic actuator



See the operating manual of the actuator for information on operating the valve in an emergency.

## 8 Maintenance

### 8.1 Safety instructions for maintenance

#### Safeguard against restart

**DANGER!****Life-threatening danger due to unintended restart!**

The unauthorised switch-on of the energy supply during work poses a danger of severe or fatal injuries for persons in the danger zone.

- Prior to beginning work, switch off all energy supplies and safeguard them from being switched on again.
- Safeguard the system area.

#### Improperly executed maintenance tasks

**WARNING!****Danger of injury due to improperly executed maintenance tasks!**

Improper maintenance can cause severe injury or significant material damage.

- Before starting tasks:
  - ensure that there is adequate free space for installation,
  - ensure that the valve is depressurised,
  - ensure that the valve is cooled-down/warmed-up to ambient temperature,
  - Ensure that the upstream and downstream system for the valve are reliably sealed.
- Ensure order and cleanliness at the installation location! Loosely stacked components or components and tools that are lying about can cause accidents.
- Comply with the following before restarting the system:
  - Ensure that all maintenance tasks have been properly executed and concluded in accordance with the instructions in this manual.
  - Ensure that nobody is in the danger zone.
  - Ensure that all covers and protective devices are installed correctly and that they function properly.

### Pressurised components



#### **WARNING!**

#### **Danger of injury due to pressurised components!**

Tasks on pressurised components can result in serious injuries.

- Establish depressurised status before working on the valve.

### Heavy weight of the valve



#### **WARNING!**

#### **Danger of injury due to the heavy weight of the valve!**

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Don not lift valves via the handwheel.
- Do not lift valves via the actuator.
- If possible, lift valves via the bonnet.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

### Thermal dangers



#### **WARNING!**

#### **Danger of injury due to high/low temperatures!**

Depending on the insert of the valve or of the pipe, injuries can occur due to the high or low temperature of the components.

- When working on components or activating final control equipment, wear protective equipment: Protective gloves, protective goggles.
- Prior to performing tasks on these components, allow them to cool down/warm up to ambient temperature.
- Have the protective insulation provided by the operating company attached.

**Wrong screw tightening torque****WARNING!****Danger due to the wrong screw tightening torque!**

The tightening torques of the threaded connections on the valve have been calculated and applied by the manufacturer. Hazards can occur due to unscrewing and subsequent tightening if the wrong tightening torques are used.

- Do not unscrew threaded connections on the valve.
- For maintenance tasks or when unscrewing threaded connections, contact
  - Stahl-Armaturen PERSTA GmbH customer service (contact details p. 3) to request the tightening torques, specifying the serial number, or
  - refer to the manufacturer's website (address on page 2).

**Wrong spare parts****WARNING!****Danger of injury if the wrong spare parts are used!**

Using the wrong or defective spare parts may result in dangers for personnel and damage, malfunction or total machine failure.

- Only use original spare parts from Stahl-Armaturen PERSTA GmbH or spare parts approved by Stahl-Armaturen PERSTA GmbH.
- If you have any questions or if anything is unclear, always contact our customer service organisation (contact details on page 3).

***Spare parts recommendation in the scope of delivery***

*The spare parts recommendation is included in the scope of delivery of the valve.*

### Pipeline medium



#### **WARNING!**

##### **Risk of injury due to pressurised pumped medium!**

Depending on the version of the valve, injuries can be caused by the medium escaping under pressure, irrespective of whether the system is in operation or not.

- Do not unscrew threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut-off.
- If threaded connections are loose have the cause of this clarified and rectified. If necessary have the manufacturer check the valve.



#### **WARNING!**

##### **Pumping medium is a health hazard!**

Contact with the pumping medium can have health implications.

- Handle pumping medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pumping medium without delay and dispose of it in an environmentally responsible manner.

### Damage of sealing surfaces and slide faces



#### **NOTICE!**

##### **Damage of sealing surfaces and slide faces due to the metallic processing of sealing surfaces and slide faces!**

The metallic processing of sealing surfaces and slide faces and valve parts can cause material damage and valve malfunction.

- Sealing surfaces and slide faces of gaskets must not be
  - scratched with a scraper,
  - processed with wire brushes.
- Sealing surfaces and slide faces must be
  - pulled off with emery cloth,
  - processed with suitable abrasive tools or
  - scraped off with plastic tools/wooden tools.

**Environmental protection**

**ENVIRONMENTAL PROTECTION!**

Comply with the following instruction concerning environmental protection for maintenance tasks:

- On all lubrication points that are lubricated by hand, remove the escaping, used, or excess grease and dispose of it in accordance with the valid local regulations.
- Collect replaced oils in suitable containers and dispose of them in accordance with the applicable local statutory regulations.

**8.2 Maintenance schedule**

The maintenance tasks that are required for optimum and trouble-free valve operation are described in the sections below.

If regular inspections indicate increased wear, the required maintenance intervals must be reduced in accordance with the actual signs of wear. For questions concerning maintenance tasks and intervals, contact Stahl-Armaturen PERSTA GmbH customer service.

Interval	Maintenance work	Personnel
Depending on frequency of actuation, operating and ambient conditions/ specified by the operating company	Lubricate the stem and bearing (☞ <i>Chapter 8.3.3 'Lubricating moving parts (stem thread)' on page 78</i> )	Trained person (operator)
	Check the valve visually for leaks (☞ <i>Chapter 8.3.1 'Visually checking the valve' on page 72</i> )	Trained person (operator)
Every six months	Operate valve (open/close)	Trained person (operator)
Depending on duration of use, operating and ambient conditions	Replace the gland packing (☞ <i>Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73</i> )	Industrial mechanic (for valves within the normal pressure range)
	Replace the cover gasket (☞ <i>Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73</i> )	Industrial mechanic (for valves within the normal pressure range)

### 8.3 Maintenance tasks

#### 8.3.1 Visually checking the valve

Personnel: ■ Trained person (operator)

Protective equipment: ■ Industrial hard hat  
■ Safety goggles  
■ Protective work clothing  
■ Protective gloves  
■ Safety footwear

1. ▶ Check the gland seal for leaks.
2. ▶ Check the cover for leaks.
3. ▶ Examine the pipe connection flanges for leaks.
4. ▶ Check for abrasion in the stem thread.
5. ▶ Check for abrasion in the threaded bush.

### 8.3.2 Replacing the gland packing and cover gasket

Personnel: ■ Industrial mechanic (for valves within the normal pressure range)

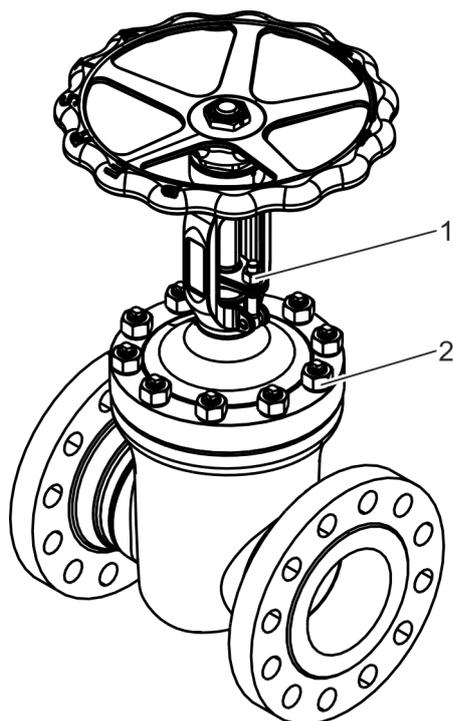
Protective equipment: ■ Industrial hard hat  
 ■ Safety goggles  
 ■ Protective work clothing  
 ■ Protective gloves  
 ■ Safety footwear

Special tool: ■ Packing extractor

Requirements:

- The valve must have cooled down/heated up to ambient temperature.
- A depressurised state must have been established.
- If an actuator is present it must be removed.
- The valve must be driven into the middle position, to empty the 3rd chamber and to unload the shut-off element (discs).

#### Removing the gland packing



1. ➔ Unscrew and remove the gland nuts (Fig. 21/1).

2. ➔

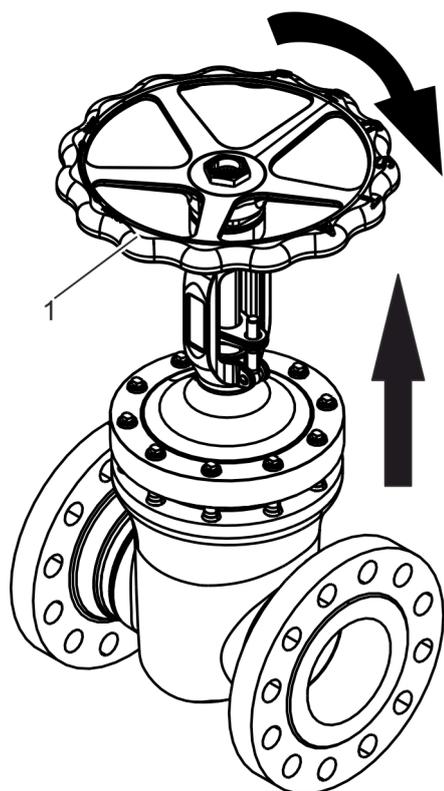


**WARNING!**  
 Risk of injury due to escaping medium!

Carefully push the gland follower flange upwards out of the seat.

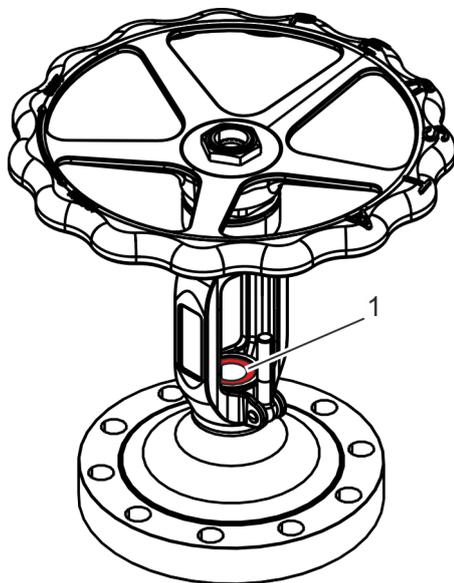
3. ➔ Undo the cover screws (Fig. 21/2).

Fig. 21: Undoing the threaded connections



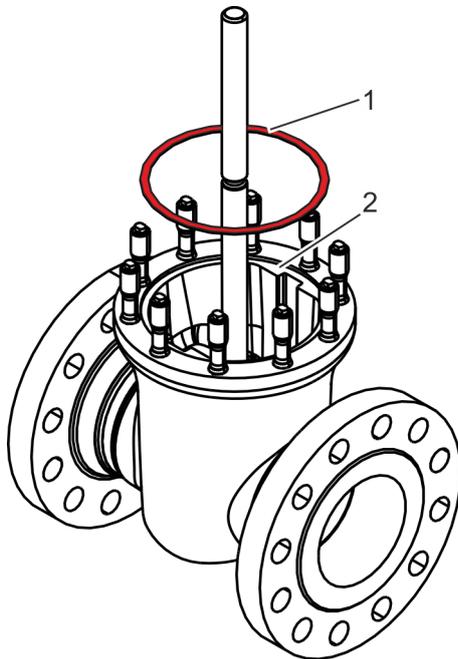
4. ➤ Turn the handwheel (Fig. 22/1) in the closing direction, until the threaded bush is screwed down from the stem thread.  
⇒ The bonnet lifts off of the body (Fig. 22).
5. ➤ Remove the cover, along with the gland follower flange, upwards from the stem.
6. ➤ Remove the gland follower flange from the eyebolts.

Fig. 22: Turning the handwheel



7. ➤ Use a packing extractor to remove the gland packing (Fig. 23/1).

Fig. 23: Removing the gland packing

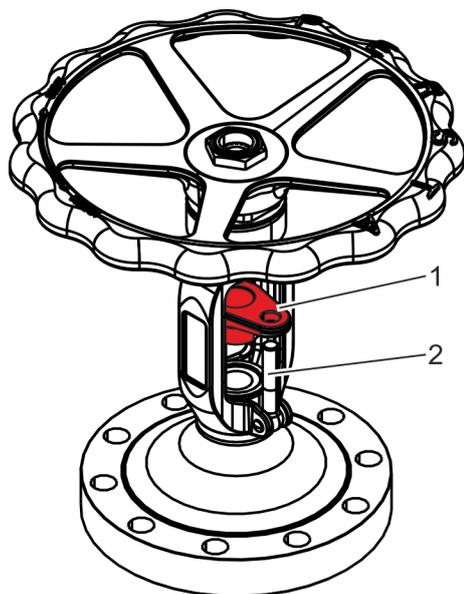
**Removing the cover gasket**


*Fig. 24: Replacing the gasket*

- 8.** ➤ Remove the gasket (Fig. 24/1) from the groove (Fig. 24/2) in the body.

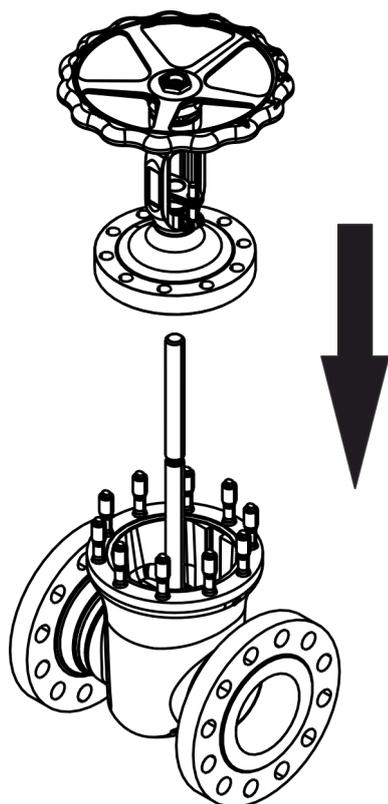
**Cleaning**

- 9.** ➤ Completely remove any residue from the cover gasket.
- 10.** ➤ Completely remove any residue from the gland packing.
- 11.** ➤ Carefully clean the gland contact parts.
- 12.** ➤ Insert the new gasket (Fig. 24/1) into the groove (Fig. 24/2) in the body.
- 13.** ➤ Insert new gland packing into the packing chamber.



- 14.** Attach the gland follower flange (Fig. 25/1) to the eyebolts (Fig. 25/2).

Fig. 25: Attaching the gland follower flange



- 15.** Attach the cover, along with the gland follower flange, onto the stem (Fig. 26).

Fig. 26: Attaching the cover and gland follower flange

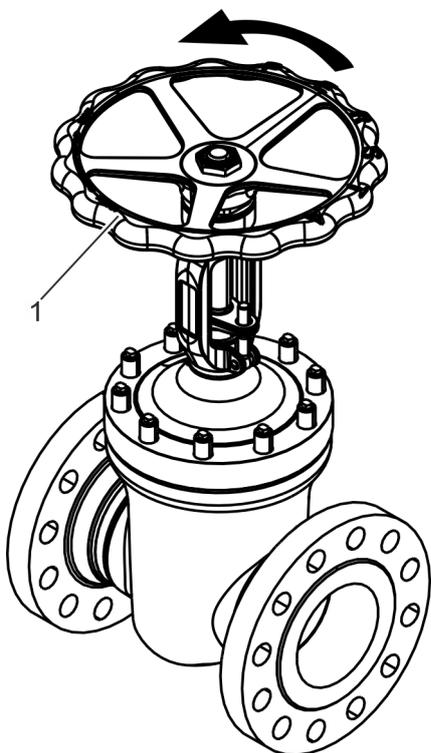


Fig. 27: Turning the handwheel

- 16. Turn the handwheel (Fig. 27/1) in the opening direction, until the threaded bush is screwed onto the stem thread.
- 17. Make sure that the cover is resting flat on the body.

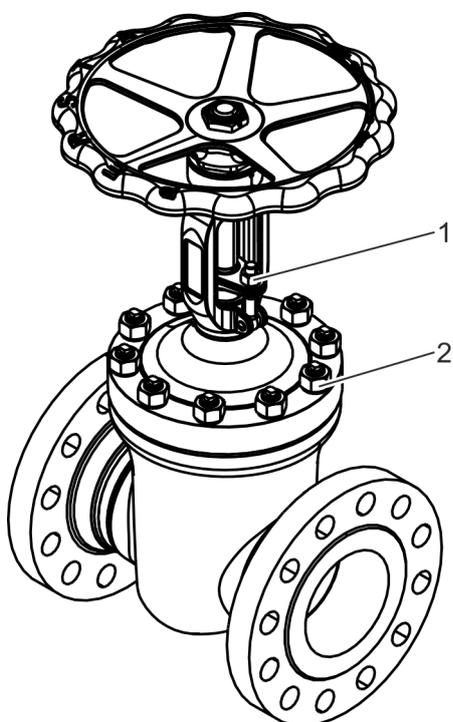


Fig. 28: Attaching threaded connections

- 18.  **WARNING!**  
Risk of injury due to incorrect tightening torques!
- 19. Attach the cover screws (Fig. 28/2) and tighten them in a cross pattern as specified by the manufacturer.
- 20. Attach the gland screws (Fig. 28/1) and tighten them as specified by the manufacturer.
- 20. If an actuator is present: mount the actuator as specified by the manufacturer and adjust the end positions.
- 21. Carry out the work for commissioning (☞ Chapter 6.3 'Carrying out the commissioning process' on page 59).

## 8.3.3 Lubricating moving parts (stem thread)

- Personnel: ■ Trained person (operator)
- Protective equipment: ■ Industrial hard hat  
 ■ Safety goggles  
 ■ Protective work clothing  
 ■ Protective gloves  
 ■ Safety footwear

### Prerequisites:

- The valve must be cooled/heated-up to ambient temperature.
- Depressurised status must have been established.

**1.** ▶ Protect the stuffing box area from the lubricant.

**2.** ▶



*Comply with the instructions in the manufacturer's documentation for the electric actuator.*

For an electric actuator: Couple the handwheel.

**3.** ▶



*Comply with the instructions in the manufacturer's documentation for the hydraulic/pneumatic actuator.*

For a hydraulic/pneumatic actuator: Operate the valve via the controller.

**4.** ▶ Open the valve completely.

**5.** ▶ Depending on the version:

- Grease the stem thread with a brush
- Grease stem thread and bearing via lubricating nipple

**6.** ▶ Completely close valve.

**7.** ▶ Repeat step 4–6 several times.

**8.** ▶



*Comply with the instructions in the manufacturer's documentation for the electric actuator.*

For electric actuator: Uncouple the handwheel.

## 9 Faults and troubleshooting

### 9.1 Safety instructions for fault correction

Electric current (in versions with electric actuator)



#### **DANGER!**

#### **Risk of fatal injury due to electric current!**

There is a risk of fatal injury when touching live components of the actuator. Switched-on electrical components can perform uncontrolled movements and cause serious injuries.

- Prior to starting work, switch off the supply of electricity and disconnect it completely.
- Only have qualified electricians perform tasks on electrical lines and components.

Safeguard against restart



#### **DANGER!**

#### **Life-threatening danger due to unintended restart!**

The unauthorised switch-on of the energy supply during work poses a danger of severe or fatal injuries for persons in the danger zone.

- Prior to beginning work, switch off all energy supplies and safeguard them from being switched on again.
- Safeguard the system area.

### Improperly executed fault correction tasks



#### **WARNING!**

#### **Danger of injury due to improper fault correction!**

Improperly executed fault correction tasks can cause severe injuries and significant damage to property.

- For faults that require intervention, only correct them after you have ensured that
  - the system area in question is secured
  - the valve is depressurised
  - the valve has cooled-down/warmed-up to ambient temperature.
- If in doubt, obtain the assistance of experienced persons or contact Stahl-Armaturen PERSTA GmbH Customer Service.
- Comply with the following before restarting the plant:
  - Ensure that all fault correction tasks have been properly executed and concluded in accordance with the instructions in this manual.
  - Ensure that nobody is in the danger zone.
  - Ensure that all covers and safety systems are installed correctly and that they function properly.

### Thermal dangers



#### **WARNING!**

#### **Danger of injury due to high/low temperatures!**

Depending on the insert of the valve or of the pipe, injuries can occur due to the high or low temperature of the components.

- When working on components or activating final control equipment, wear protective equipment: Protective gloves, protective goggles.
- Prior to performing tasks on these components, allow them to cool down/warm up to ambient temperature.
- Have the protective insulation provided by the operating company attached.

### Pipeline medium



#### **WARNING!**

#### **Risk of injury due to pressurised pumped medium!**

Depending on the version of the valve, injuries can be caused by the medium escaping under pressure, irrespective of whether the system is in operation or not.

- Do not unscrew threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut-off.
- If threaded connections are loose have the cause of this clarified and rectified. If necessary have the manufacturer check the valve.



#### **WARNING!**

#### **Pumping medium is a health hazard!**

Contact with the pumping medium can have health implications.

- Handle pumping medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pumping medium without delay and dispose of it in an environmentally responsible manner.

### Hazards due to the pneumatic system (in versions with pneumatic actuator)



#### **WARNING!**

#### **Risk of injury due to pneumatic energy!**

Pneumatically-powered components of the valve can cause severe injuries.

- Only have pneumatic specialists perform tasks on the pneumatic equipment.
- Prior to starting the tasks on the pneumatic equipment ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Wear personal protective equipment.

## Liquid under high pressure (in versions with hydraulic actuator)



### WARNING!

#### Risk of injury due to hydraulic energy!

Hydraulically-powered components of the valve, as well as the triggering of the overpressure valve, can cause severe injuries.

- Only have hydraulic specialists perform tasks on the hydraulic system.
- Prior to starting the tasks on the hydraulic system, ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Operate the valve in a frost-free environment to prevent the body from bursting.
- Wear personal protective equipment.

## Behaviour if there are dangerous faults

The following always applies:

1. ➤ For faults that pose an imminent danger to personnel or material assets, immediately trigger the emergency stop function.
2. ➤ Determine the fault cause.
3. ➤ If correction of the fault requires work in the danger zone, secure the system area in question, and depressurise the valve.
4. ➤ Have faults that affect the safe operation of the valve corrected by the manufacturer.

## 9.2 Fault table

Fault description	Cause	Remedy	Personnel
Leakage of the shut-off element	Solids in the medium that have damaged the seat	Grind the seat, if necessary have damaged components replaced.	Industrial mechanic (for valves within the normal pressure range)

Fault description	Cause	Remedy	Personnel
	Deformation of the seat surface due to an impermissibly high tension on the valve or due to thermal tension	Grind the seat, if necessary have damaged components replaced. Check actuator setting. Determine the cause of the deformation and have it rectified.	Industrial mechanic (for valves within the normal pressure range)
	Erosion or corrosion, e.g. due to improper selection of valve nominal diameter or valve material	Have the design of the valve checked.	Industrial mechanic (for valves within the normal pressure range)
End position of the actuator not reached	Incorrect actuator setting	Set the actuator correctly.	Industrial mechanic (for valves within the normal pressure range)
	Valve bearing, stem thread, lift stop or inner parts of the valve are defective	Replace the damaged parts.	Industrial mechanic (for valves within the normal pressure range)
	Gland seal has been overtightened	Tighten the gland seal correctly, if necessary replace the gland packing (☞ <i>Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73</i> ).	Industrial mechanic (for valves within the normal pressure range)
	Moving parts insufficiently lubricated	Lubricate the moving parts (☞ <i>Chapter 8.3.3 'Lubricating moving parts (stem thread)' on page 78</i> ).	Trained person (operator)
Leakage of the gland packing	Insufficient maintenance	Shut off the pipe section affected. Retighten the gland follow flange with the tightening torque specified by the manufacturer. If necessary pack or repack the gland seal (☞ <i>Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73</i> ).	Industrial mechanic (for valves within the normal pressure range)

Fault description	Cause	Remedy	Personnel
	Destruction of the gland seal due to the use of packing material without sufficient media or temperature resistance	Shut off the pipe section affected. Replace the gland seal with a suitable packing set ( ↪ Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73).	Industrial mechanic (for valves within the normal pressure range)
	Wear of the packing material	Shut off the pipe section affected. Replace the gland seal ( ↪ Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73).	Industrial mechanic (for valves within the normal pressure range)
Body cover leaking	Gasket is worn	Replace the gasket ( ↪ Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73).	Industrial mechanic (for valves within the normal pressure range)
Valve does not function	Electric actuator does not function	Check electric actuator as specified in the manufacturer's documentation.	Qualified electrician
	Hydraulic actuator does not function	Check hydraulic actuator as specified in the manufacturer's documentation.	Hydraulics Specialist
	Pneumatic actuator does not function	Check pneumatic actuator as specified in the manufacturer's documentation.	Pneumatics Specialist
Malfunction of the valve	End contacts are defective	Have the end contacts checked. Prior to readjustment consult with Stahl-Armaturen PERSTA GmbH customer service.	Qualified electrician
	Torque switch is defective	Have the torque switch checked. Prior to readjustment consult with Stahl-Armaturen PERSTA GmbH customer service.	Qualified electrician
Jerky lifting movement	Gland packing is too tight	Readjust gland packing, replace if necessary ( ↪ Chapter 8.3.2 'Replacing the gland packing and cover gasket' on page 73).	Industrial mechanic (for valves within the normal pressure range)

## 10 Dismantling, disposal

### 10.1 Safety instructions for dismantling

Electric current (in versions with electric actuator)

**DANGER!****Risk of fatal injury due to electric current!**

There is a risk of fatal injury when touching live components of the actuator. Switched-on electrical components can perform uncontrolled movements and cause serious injuries.

- Prior to starting work, switch off the supply of electricity and disconnect it completely.
- Only have qualified electricians perform tasks on electrical lines and components.

Improper dismantling

**WARNING!****Danger of injury due to improper dismantling!**

Stored residual energy, sharp-edged components, points and corners on or in the valve, or on the required tools can cause serious injury.

- Prior to starting work ensure that there is adequate free space.
- Handle open, sharp-edged components carefully.
- Ensure order and cleanliness at the workstation! Loosely stacked components or components and tools that are lying about can cause accidents.
- Dismantle components properly. Pay attention to the high dead weight of some of the components. If necessary use hoists.
- Secure the components so that they do not fall down or fall over.
- If anything is unclear obtain the assistance of Stahl-Armaturen contact PERSTA GmbH customer service (contact details p. 3).

### Heavy weight of the valve



#### **WARNING!**

#### **Danger of injury due to the heavy weight of the valve!**

The heavy weight of the valve, and of its components, can result in severe injuries.

- Transport valves with a suitable hoist or forklift.
- Don not lift valves via the handwheel.
- Do not lift valves via the actuator.
- If possible, lift valves via the bonnet.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

### Suspended loads



#### **WARNING!**

#### **Danger of injury due to suspended loads!**

Suspended loads can cause dangerous situations that can result in severe injuries.

- Do not step under suspended loads.
- Wear protective equipment: Industrial hard hat, safety footwear.
- Transport loads as close to the ground as possible.
- Only use approved sling gear and hoists.
- Ensure that hoist and sling gear have sufficient load-bearing capacity.

### Spring elements



#### **WARNING!**

#### **Danger of injury due to spring elements within the valve!**

When opening the valve, danger of injury exists due components released from tension.

- Uniformly detach the check valve cover from the stud bolts.
- Slowly take off the check valve cover.
- Wear protective equipment: Wear a hard hat, safety footwear, protective goggles.

### Liquid under high pressure (in versions with hydraulic actuator)



#### **WARNING!**

#### **Risk of injury due to hydraulic energy!**

Hydraulically-powered components of the valve, as well as the triggering of the overpressure valve, can cause severe injuries.

- Only have hydraulic specialists perform tasks on the hydraulic system.
- Prior to starting the tasks on the hydraulic system, ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Operate the valve in a frost-free environment to prevent the body from bursting.
- Wear personal protective equipment.

### Hazards due to the pneumatic system (in versions with pneumatic actuator)



#### **WARNING!**

#### **Risk of injury due to pneumatic energy!**

Pneumatically-powered components of the valve can cause severe injuries.

- Only have pneumatic specialists perform tasks on the pneumatic equipment.
- Prior to starting the tasks on the pneumatic equipment ensure that it is completely depressurised. Completely depressurise pressure accumulators.
- Wear personal protective equipment.

### Pipeline medium



#### **WARNING!**

#### **Risk of injury due to pressurised pumped medium!**

Depending on the version of the valve, injuries can be caused by the medium escaping under pressure, irrespective of whether the system is in operation or not.

- Do not unscrew threaded connections.
- If threaded connections are loose, inform the operating company and have the pipe section in question shut-off.
- If threaded connections are loose have the cause of this clarified and rectified. If necessary have the manufacturer check the valve.



### WARNING!

#### Pumping medium is a health hazard!

Contact with the pumping medium can have health implications.

- Handle pumping medium in accordance with the instructions in the manufacturer's safety data sheet.
- Wear protective equipment: Protective gloves, safety footwear, protective goggles, protective work clothing.
- Soak up escaped pumping medium without delay and dispose of it in an environmentally responsible manner.

## 10.2 Dismantling

- |                       |  |
|-----------------------|--|
| Personnel:            | <ul style="list-style-type: none"><li>■ Industrial mechanic (for valves within the normal pressure range)</li><li>■ Forklift truck driver</li><li>■ Trained person (operator)</li><li>■ Trained person (hoist)</li><li>■ Disposal contractor</li></ul> |
| Protective equipment: | <ul style="list-style-type: none"><li>■ Industrial hard hat</li><li>■ Safety goggles</li><li>■ Protective work clothing</li><li>■ Protective gloves</li><li>■ Safety footwear</li></ul>  |
| Special tool:         | <ul style="list-style-type: none"><li>■ Hoist</li><li>■ Sling gear</li></ul>   |
| Requirements:         | <ul style="list-style-type: none"><li>■ The relevant pipe section is shut off.</li><li>■ Valve is in depressurised state.</li><li>■ Valve has been drained.</li></ul>  |

- For electric actuator:
    - Power supply is switched off and physically disconnected.
  - For hydraulic or pneumatic actuator:
    - Ensure that the customer-provided hydraulic/pneumatic supply is switched off and safeguarded against being switched on again.
    - Hydraulic lines/pneumatic lines are in a depressurised state.
    - Hydraulic lines/pneumatic lines are removed from the actuator of the valve.
1. ➤ Hold the valve in position with a suitable hoist (☞ 'Transporting individual valves' on page 42).
  2. ➤ Disconnect pipes on inlet side and outlet side from the valve.
  3. ➤ If necessary, remove the existing supports.
  4. ➤ Use a suitable hoist to remove the valve from the pipe and set it down so that it is secured against falling over.
  5. ➤ Clean the assemblies and components as required, and take them apart.

In doing so, comply with local occupational health and safety regulations.

### 10.3 Disposal

If a return or disposal agreement has not been concluded, then recycle dismantled components:

- Scrap metals.
- Recycle plastic elements.
- Sort and dispose of all other components according to material condition.



#### **ENVIRONMENTAL PROTECTION!**

##### **Hazards for the environment due to improper disposal!**

Hazards for the environment can occur due to improper disposal.

- Have electrical scrap and electronic components, hydraulic oil, lubricants and other auxiliary materials recycled or disposed of by approved specialist companies.
- If in doubt, contact the local authorities or specialist disposal companies for information regarding the environmentally responsible disposal.



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