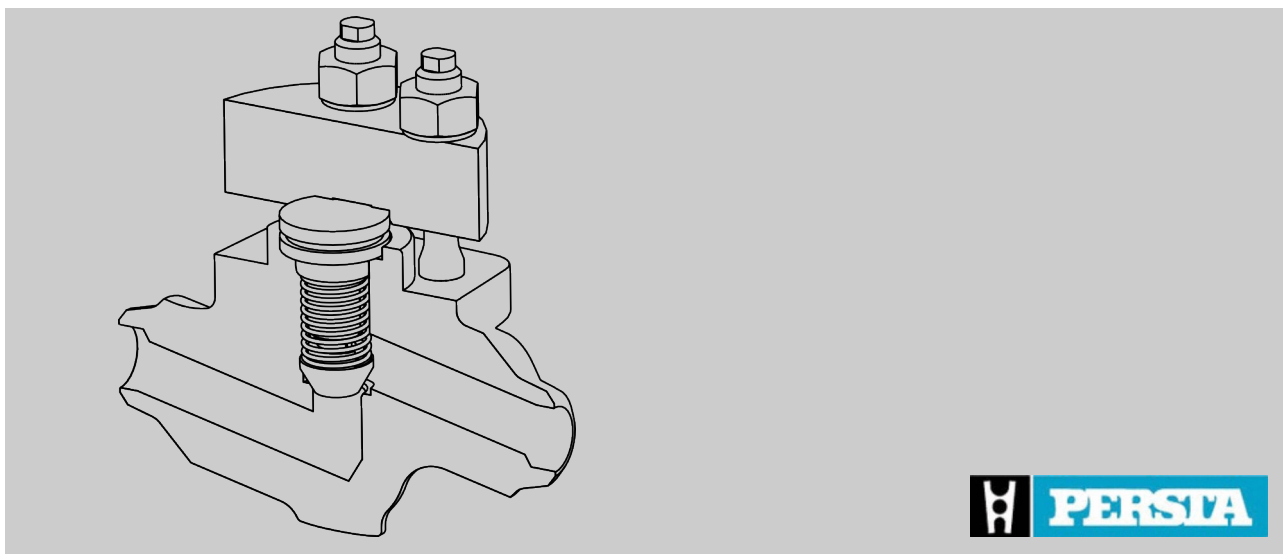


Operating instructions

High pressure lift check valve



Read the instructions prior to performing any task!

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Translation of the original operating instructions
Dok.-Nr. 6406.DE.STD.03.2013, 2, en_GB

Information about the operating manual

This manual enables safe and efficient handling of the high pressure valve.

The manual is a component of the high pressure valve and must be kept in the vicinity of the high pressure valve where it is available to personnel at all times.

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

In addition, the local occupational safety regulations and general safety regulations must be complied with for the high pressure valve's area of use.

The illustrations in this manual 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 of the series 240 MT of the high pressure lift check valve:

Designation	Series	Nominal diameter (DN) [mm]	Pressure rate	Class*
High pressure lift check valve	240 MT	10–65	PN 630	≤3200

* Assignment number in the pipe construction

Other applicable documents

- Ignition hazard assessment GA004
- Risk analysis according to Pressure Equipment Directive
- Risk analysis as per the Machinery Directive
- Technical data sheet
- Bolt tightening torques according to the website: www.persta.com
- And other documents included in the delivery

**Customer Service - Stahl-Arma-
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Revision overview

Revision number	Change/Supplemented information	Date
1	Updates to chapter <i>"Intended use"</i> .	05/05/2021

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1 Overview

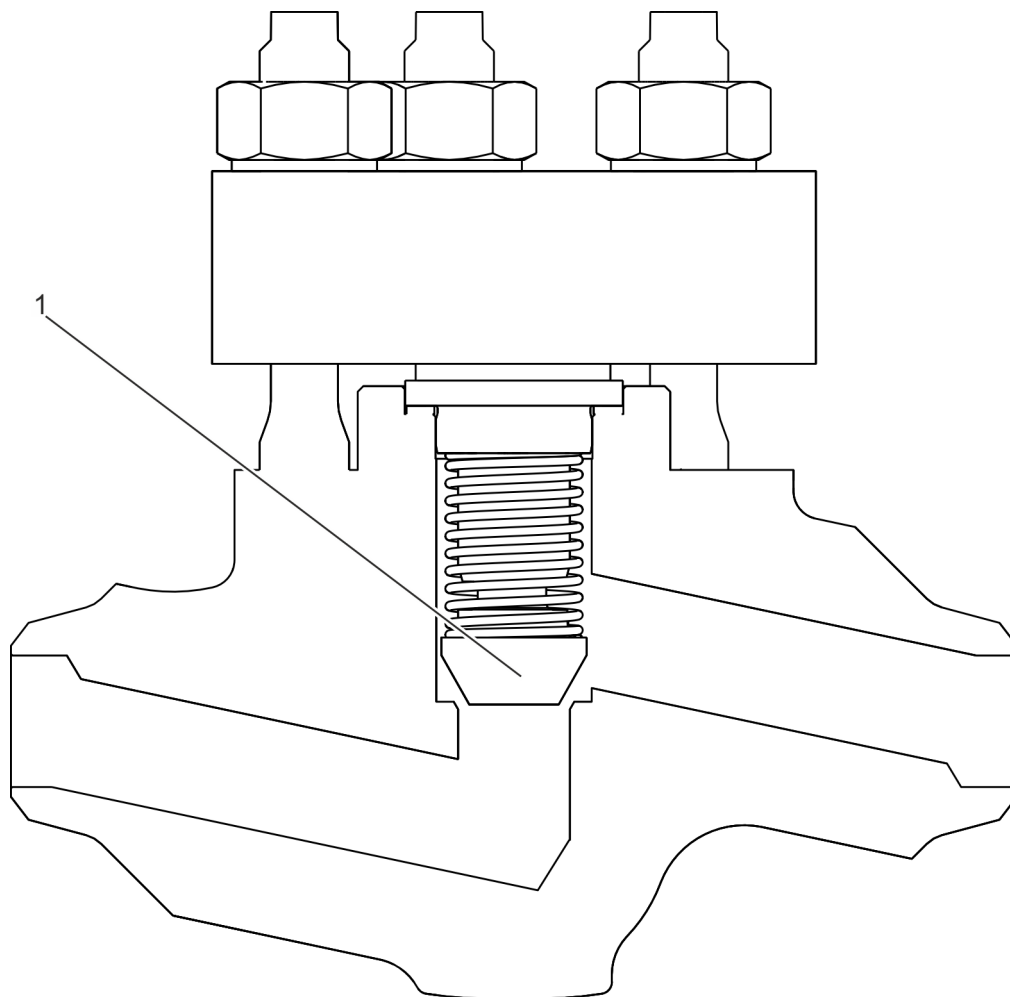


Fig. 1: High pressure lift check valve 240 MT

Brief description - high pressure lift check valve

The valve designated as a high pressure lift check valve is designed for installation in pipes.

By using the high pressure lift check valve the flow of a medium is allowed in only one direction within the pipe.

In the other direction, the check valve disc (Fig. 1/1) within the valve is pressed into its seat by the medium flowing back and a pre-tensioned spring and a return flow is thereby prevented.

Tools

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

Forklift

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

Hoist

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

Sling gear

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

2 Safety

2.1 Symbols in this manual

Safety instructions

Safety instructions are indicated by symbols in this manual. The safety instructions are introduced by signal words that indicate 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.


**ENVIRONMENT!**

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 into the specific instruction, so that the flow of reading is not interrupted during performance of the task. The signal words described above are used.

Example:

1.  Loosen 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 indicate special hazards:

Warning signs	Type of danger
	Warning – danger zone.





Tips and recommendations



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

Additional symbols

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

Symbol	Explanation
	Step-by-step instructions
	Results of actions
	References to sections of these operating instructions and other applicable documents
	Lists without a defined 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.
- Installation in horizontal pipes.
- Installation in vertical pipes.
- Operation of the valve with liquid or gaseous media, without particular corrosive, chemical or abrasive impact.
- Temperature change speeds of maximum 6 K/min (6°C/min).
- Maximum number of 1000 load cycles between a depressurized state and the maximum permissible pressure PS.
- Any number of load cycles at pressure fluctuations of up to 10 % of the maximum permissible pressure PS.
- 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.
- Operation of the valve only within the limits specified on the rating plate (☞ *“Rating plate” on page 12*).
- No temperature increases were considered. In case of use in the hot vapour area, temperature increases must be considered according to the regulations of the operating company.
- The test pressure for a recurring test must not exceed the maximum permitted pressure PS multiplied by 1.3.
- The valve may only be operated if internal pressure loading is predominantly dormant. Additional loads (e.g. stationary thermal stress, unsteady pressure and temperature loads in case of alternating loads or pipe loads) were not considered.
- If the valve is operated in the creep range, the valve is designed for a maximum operating time of 100,000 H. The valve must be replaced afterwards.

Intended use includes compliance with all the information contained in this manual.

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.

- Do not use the valve to regulate the mass flow.
- Connect the pipes so that they are free of tension.
- Pay attention to the correct installation position of the valve.
- Do not exceed the number of permitted load cycles (☞ Chapter 2.2 “Intended use” on page 11).
- Do not use valves as an anchor point.
- Never operate valves at temperatures near or below the freezing point of the pipeline medium.

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

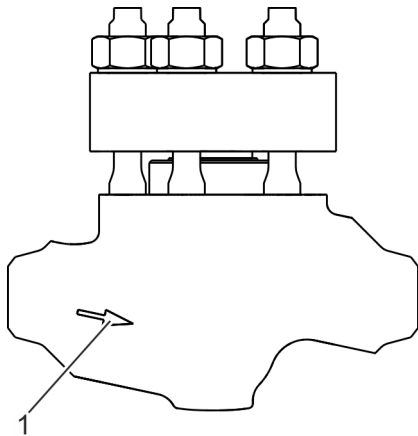
Flow direction arrow


Fig. 2: Flow direction arrow

The flow direction is marked with an arrow on the valve (☞ “Flow direction arrow” on page 13/1).

Pipeline medium flowing in the arrow direction opens the lift check valve and flows through the valve.

Customer-specific markings

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

2.4 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.

2.4.1 Basic dangers at the workplace

Hazardous areas

DANGER!

Life-threatening danger due to failure to comply with the rules of behaviour specified for hazardous areas!

Depending on the version the valve can be used in hazardous areas. There is life-threatening danger if the rules of behaviour are not complied with within these areas.

- Ensure that tasks on the valve can be executed 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.

2.4.2 Mechanical hazards

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.
- Use approved and functional sling gear.
- Safeguard valves and components from falling over.

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.

2.4.3 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.

2.4.4 Hazards due to hazardous substances and operating materials

Pumping medium

**WARNING!****Danger of injury due to pumping medium under pressure!**

In operating status, as well as in decommissioned status, depending on the version of the valve, injuries can occur due to medium escaping under high pressure.

- 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 for this clarified and eliminated. 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.

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.

Anticorrosive



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.

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 result in material damage and malfunctions of the valve.

- 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.

2.5 Behaviour in the event of an emergency

1. ➤ Shut off the pipe sections affected.
2. ➤ Comply with the plant regulations.

2.6 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 of the valve is therefore subject to the legal occupational health and safety obligations.

In addition to the safety instructions in this manual, the local occupational health and safety, accident prevention and environmental protection regulations that apply to the valve's area of application must be observed.

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 obtain information about the applicable occupational health and safety regulations and, in a hazard assessment, identify the additional hazards that may exist at the installation site of the valve due to the specific working conditions. The operating company must integrate this information into operating instructions for the operation of the valve.
- The operating company must ensure that the operating instructions it has drawn up comply with the currently applicable legislation throughout the operating period of the valve and, if necessary, adapt the operating instructions.
- The operating company must clearly define 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 provide equipment that ensures the safe transition of the valve into a depressurized state.
- The operating company must provide equipment that can completely drain the pipe sections in which the valve is installed as well as the valve itself.
- The operating company must ensure that all personnel who are to handle the valve have read and understood this manual. 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.

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 impermissibly high pressure or an impermissibly high temperature.

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.

Industrial mechanic (high pressure valves)

Based on their specialised training, skills, experience and knowledge of the applicable standards and provisions, the industrial mechanic is able to carry out the work assigned to them on installations and valves in the high pressure area and to independently identify potential hazards and avoid them.

They have been instructed by the operator on how to handle the plant and receive regular training.

The industrial mechanic is capable of maintaining and repairing installations and valves in the high pressure area independently.

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.

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 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.

2.9 Spare parts

Incorrect spare parts



WARNING!

Risk of injury if the wrong spare parts are used!

Using the wrong or defective spare parts may pose a hazard for personnel, or result in damage, malfunctions or even total failure.

- Only use genuine 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).

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 4.4 “Storage of spare parts” on page 31 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.

2.10 Environmental protection



ENVIRONMENT!

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:

- Residue of the pipeline medium
- Pickling medium
- Anticorrosive

3 Functional description

3.1 Mode of operation of the high-pressure lift check valve

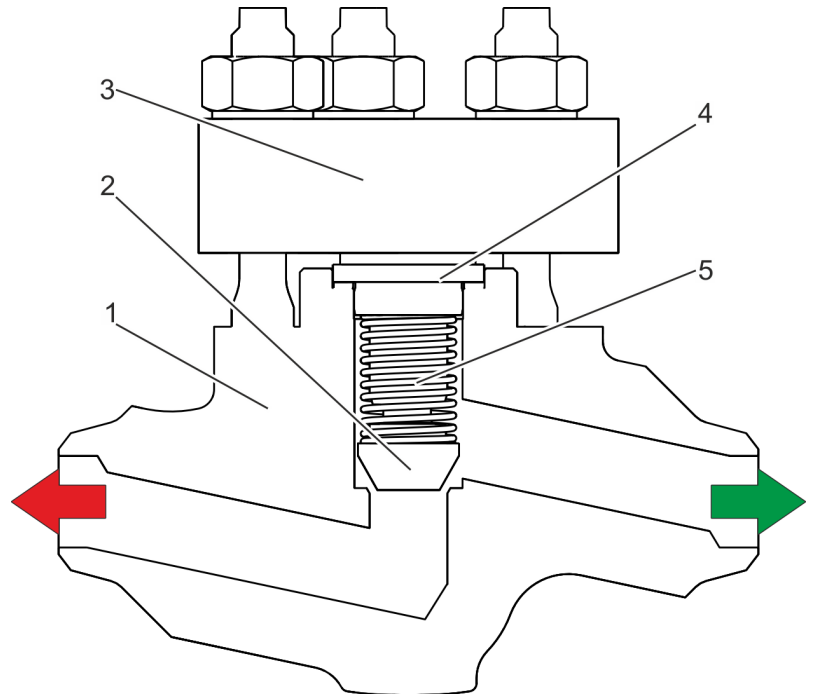






Fig. 3: Sectional view - high pressure lift check valve

-  Flow direction
-  Return flow direction blocked

In the body (Fig. 3/1) a check valve disc (Fig. 3/2) separates the inlet from the outlet side of the valve.

As soon as medium enters into the valve in the flow direction () , and there is sufficient high pressure, it pushes the check valve disc upward and medium flows through the body.

If the flow direction of the pumping medium reverses () , the check valve disc closes the valve.

3.2 Seal to the outside

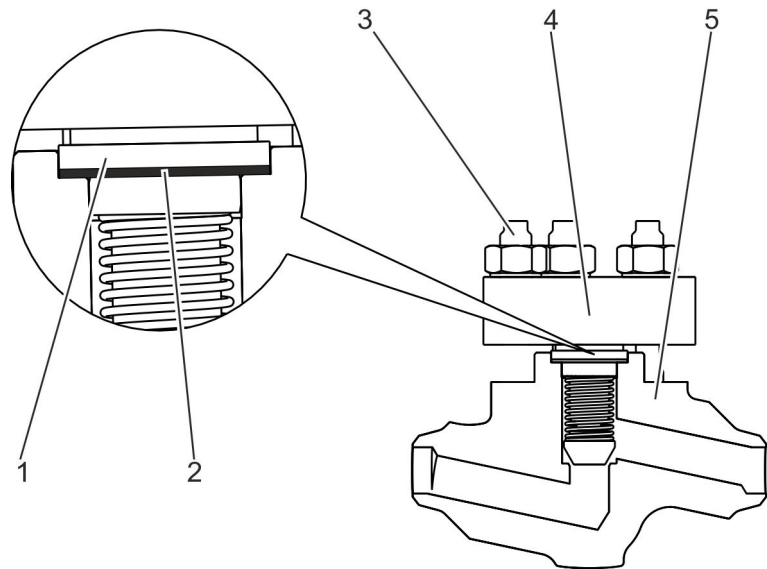


Fig. 4: Seal to the outside

The body (Fig. 4/5) is sealed against the environment via the gasket ring (Fig. 4/2).

The required sealing force is generated by the tension of the stud bolts (Fig. 4/3) in the body.

This force is transmitted via the check valve cover (Fig. 4/4) to the guide bushing (Fig. 4/1) and the underlying gasket ring (Fig. 4/2).

3.3 Shut-off element

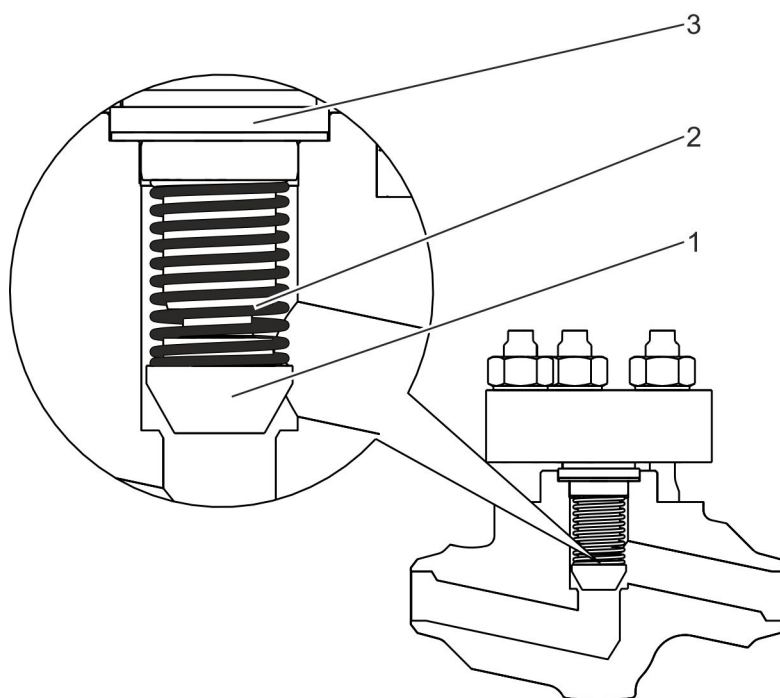


Fig. 5: Shut-off element

The entire shut-off element consists of

- the check valve disc (Fig. 5/1),
- the compression spring (Fig. 5/2) and
- the guide bushing (Fig. 5/3).

At the top end the disc is guided through the guide bush.

The pre-tension of the pressure spring results in the situation that the disc in normal status (no medium in the pipe or insufficient pressure of the medium) is pressed into the seat and the inlet side of the valve is separated from the outlet side of the valve.

3.4 Connections

Connection in the pipe

Depending on the version the high pressure lift check valve can be mounted in the pipe, as

- Butt-weld valve,
- Flanged valve,
- Socket weld,
- Special connection valve

4 Transport and storage

4.1 Safety notices for transport and storage

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.
- 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 of the valve

Store valves under the following conditions:

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



It may be the case that storage instructions are affixed to the packages that extend beyond the requirements cited here. Comply with these instructions accordingly.

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 notices for installation

Faulty installation

**WARNING!****Danger due to incorrectly installed valve!**

Faulty installation can result in injuries due to malfunction of the valve.

- Pay attention to the flow direction for valves.
- For butt-weld valves
 - Fasten the welding counterpole on the body, if possible in the vicinity of the welding point,
 - Execute the welding and the subsequent heat treatment in compliance with the valid welding regulations,
 - Partially execute the 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 design parameters and material.
2. ▶ Remove any protective caps and preservation agent from the valve.
3. ▶ Pay attention to the flow direction (☞ *"Flow direction arrow" on page 13*).
4. ▶ Ensure 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 (☞ *"Transporting individual valves" on page 30*) 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 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 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.

5.4.1 Pickling the valve



It is possible to pickle the valve in many 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. ▶ Properly pickle the valve.
2. ▶ Completely remove the pickling medium through rinsing.
3. ▶ Ensure that the pickling medium is completely flushed out of the dead spaces in the valve.

5.4.2 Painting the valve



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

Use suitable (compatible) painting systems.

5.4.3 Executing the system pressure test and leak test

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

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

5.4.4 Applying thermal insulation

**System-specific equipment**

Depending on the system, it may be necessary to equip the pipe or the valve with thermal insulation.

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

→ If necessary have the thermal insulation fitted by the operating company.

6 Commissioning

6.1 Safety notices 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.

Pumping medium

**WARNING!****Danger of injury due to pumping medium under pressure!**

In operating status, as well as in decommissioned status, depending on the version of the valve, injuries can occur due to medium escaping under high pressure.

- 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 for this clarified and eliminated. 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.

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.

Faulty alignment of the valve



NOTICE!

Malfunction of the valve due to failure to comply with the flow direction!

Faulty alignment can result in malfunctions of the overall system.

- Install the valve in accordance with the flow direction arrow (↻ “Flow direction arrow” on page 13) and the flow direction in the pipe.

6.2 Prior to commissioning

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

➔ Ensure that the overall system is released for operation.

6.3 Executing the commissioning process

- Personnel: ■ Pipeline engineer
 ■ Industrial mechanic (high pressure valves)
- Protective equipment: ■ Industrial hard hat
 ■ Safety goggles
 ■ Protective work clothing
 ■ Protective gloves
 ■ Safety footwear

Prerequisite:

- The overall system must be released for operation.

1. ➔



WARNING!

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

In compliance with the system-specific heating-up/cooling speed, fill the pipe or open the shut-off pipe section.

2. ➔ Examine the check valve cover for leaks.

3. ➔ Check the pipe connection flanges for leaks.

4. ➔ If necessary, recheck tightening torques in accordance with the manufacturer's/system planner's specifications.

7 Maintenance

7.1 Safety instructions for maintenance

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.

Pumping medium


WARNING!
Danger of injury due to pumping medium under pressure!

In operating status, as well as in decommissioned status, depending on the version of the valve, injuries can occur due to medium escaping under high pressure.

- 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 for this clarified and eliminated. 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.

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.

Spring elements



WARNING!

Danger of injury due to spring elements within the valve!

When opening the valve, danger of injury exists due to components being 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.

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.
- 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.

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.

7.2 Maintenance schedule

Maintenance tasks are described in the sections below that are required for optimal and trouble-free valve operation.

If regular inspections indicate increased wear, the required maintenance intervals must be shortened appropriately in accordance with the actual indications of wear. For questions concerning maintenance tasks and intervals, contact Stahl-Armaturen PERSTA GmbH customer service (contact details p. 3).

Interval	Maintenance work	Personnel
Depending on activation frequency, operating and ambient conditions/specified by the operating company	Check the valve visually for leaks (↪ <i>Chapter 7.3.1 “Visually checking the valve” on page 47</i>)	Trained person (operator)
Depending on duration of use, operating and ambient conditions	Replacing the gasket ring (↪ <i>Chapter 7.3.2 “Replacing the gasket ring” on page 48</i>)	Industrial mechanic (high pressure valves)

7.3 Maintenance tasks

7.3.1 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 cover for leaks.
2. ➤ Check the pipe connection flanges for leaks.

7.3.2 Replacing the gasket ring

- | | |
|-----------------------|---|
| Personnel: | <ul style="list-style-type: none"> ■ Industrial mechanic (high pressure valves) ■ Trained person (hoist) |
| Protective equipment: | <ul style="list-style-type: none"> ■ Industrial hard hat ■ Safety goggles ■ Protective work clothing ■ Protective gloves ■ Safety footwear |
| Special tool: | <ul style="list-style-type: none"> ■ Hoist ■ Sling gear |

Prerequisites:

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

1. ➤ Unscrew the nuts on the check valve cover (Fig. 6/1–5).
2. ➤ Remove nuts.



WARNING!
Danger of injury due to de-tensioning of pressure springs!

3. ➤ Depending on the version of the valve, together with a second person, carefully take off return valve cover upward and off of the stud bolts.

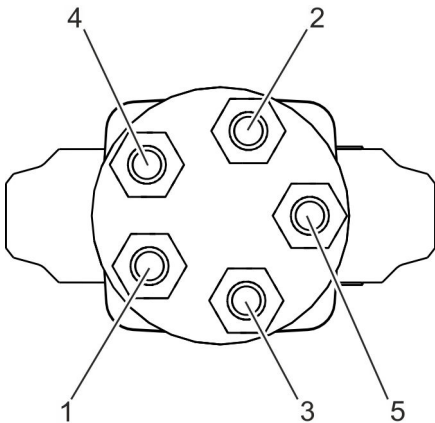


Fig. 6: Unscrew nuts (number of nuts/stud bolts can vary)

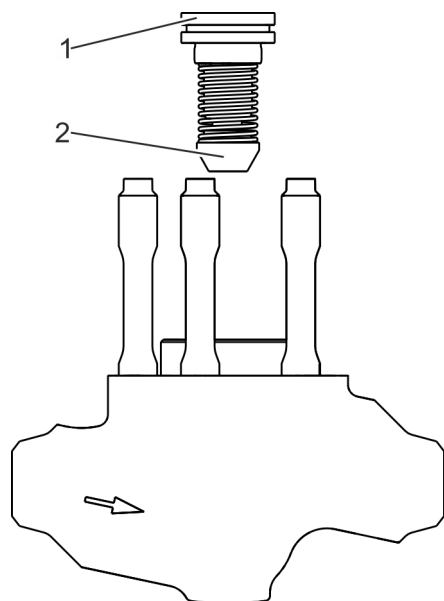


Fig. 7: Removing the shut-off element

4. ➤ Remove the guide bushing (Fig. 7/1) with inserted check valve disc (Fig. 7/2) upward and out of the body.
5. ➤ Check components for damage, replace if necessary.

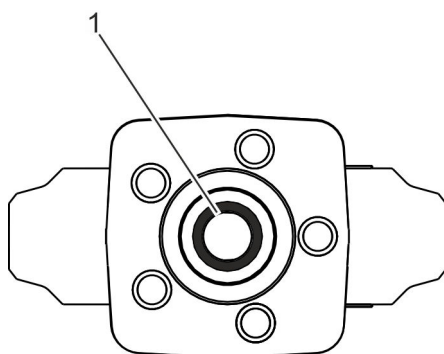


Fig. 8: Removing the gasket ring

6. ➤ Carefully remove the gasket ring (Fig. 8/1) from the body.
7. ➤ Carefully remove the residues of the gasket ring.
8. ➤



NOTICE!

Material damage due to the mechanical processing of support surfaces!

Ensure that all support surfaces are metallic bare and undamaged.

9. ➤ Insert new gasket ring in the body.

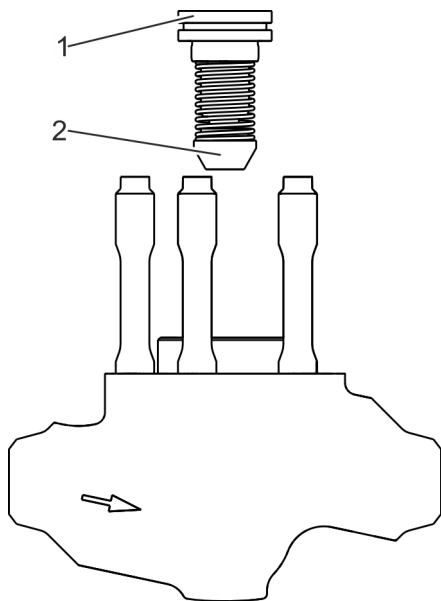


Fig. 9: Inserting the disc

- 10.** Insert the guide bushing (Fig. 9/1) with inserted pressure spring and check valve disc (Fig. 9/2) into the body.

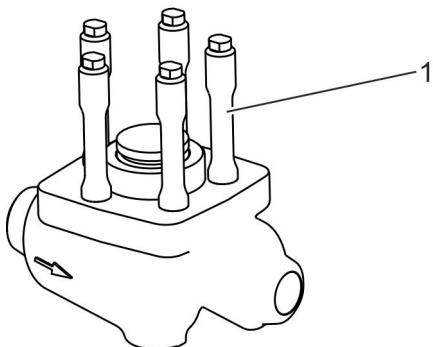
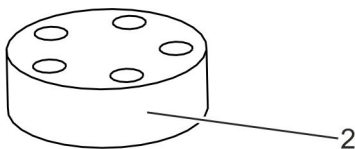
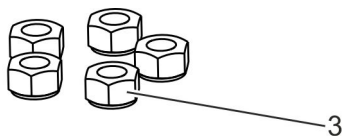


Fig. 10: Attaching the check valve cover

- 11.** With a second person, fit the check valve cover (Fig. 10/2) onto the stud bolts (Fig. 10/1) of the body.
- 12.** Loosely screw the nuts (Fig. 10/3) onto the stud bolts (Fig. 10/1).

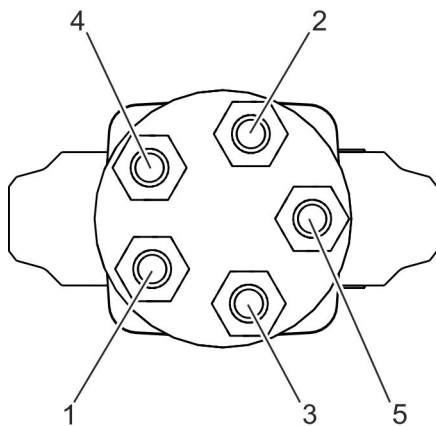


Fig. 11: Tightening nuts in a cross pattern (number of nuts/stud bolts can vary)

13. ▶



WARNING!
Danger due to the wrong screw tightening torque!

Tighten the nuts (Fig. 11/3) with the prescribed tightening torque in a cross pattern (Fig. 11/1–5).

14. ▶

Perform commissioning work (↪ Chapter 6.3 “Executing the commissioning process” on page 41).

8 Faults and fault correction

8.1 Safety notices for fault correction

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 injury and significant material damage.

- 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 system:
 - 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 protective devices 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.

Pumping medium



WARNING!

Danger of injury due to pumping medium under pressure!

In operating status, as well as in decommissioned status, depending on the version of the valve, injuries can occur due to medium escaping under high pressure.

- 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 for this clarified and eliminated. 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.

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.

8.2 Fault table

Fault description	Cause	Remedy	Personnel
Leakage of the check valve cover	Sealing gasket is defective	Replacing the gasket ring (☞ <i>Chapter 7.3.2 "Replacing the gasket ring" on page 48</i>).	Industrial mechanic (high pressure valves)
Leakage of the shut-off device	Solids in the medium that have damaged the seat	Grind the seat, if necessary have damaged parts replaced.	Industrial mechanic (high pressure valves)
	Deformation of the seat surface through thermal tensions	Grind the seat, if necessary have damaged parts replaced. Determine the cause of the deformation and have it eliminated.	Industrial mechanic (high pressure valves)
	Erosion or corrosion, e.g. due to the wrong selection of nominal valve width or valve material	Have the design of the valve checked.	Industrial mechanic (high pressure valves)

Fault table

9 Dismantling, disposal

9.1 Safety notice for dismantling and disposal

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.
- 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.

Pumping medium



WARNING!

Danger of injury due to pumping medium under pressure!

In operating status, as well as in decommissioned status, depending on the version of the valve, injuries can occur due to medium escaping under high pressure.

- 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 for this clarified and eliminated. 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.

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.

9.2 Dismantling

- Personnel:
- Industrial mechanic (high pressure valves)
 - Forklift truck driver
 - Trained person (operator)
 - Trained person (hoist)
 - Disposal contractor

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

- Special tool:
- Hoist
 - Sling gear

Prerequisites:

- The pipe section in question is shut-off.
- Valve is in the depressurised status.
- Valve is emptied.

1. ➤ Hold the valve in position with a suitable hoist (☞ *“Transporting individual valves” on page 30*).
2. ➤ Disconnect pipe 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 safeguarded against falling over.
5. ➤ Properly clean assemblies and components and take them apart.

In this process comply with local occupational health and safety regulations.

9.3 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.



ENVIRONMENT!

Hazards for the environment due to improper disposal!

Hazards for the environment can occur due to improper disposal.

- Have electrical scrap and electronic components, 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 compatible disposal.

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