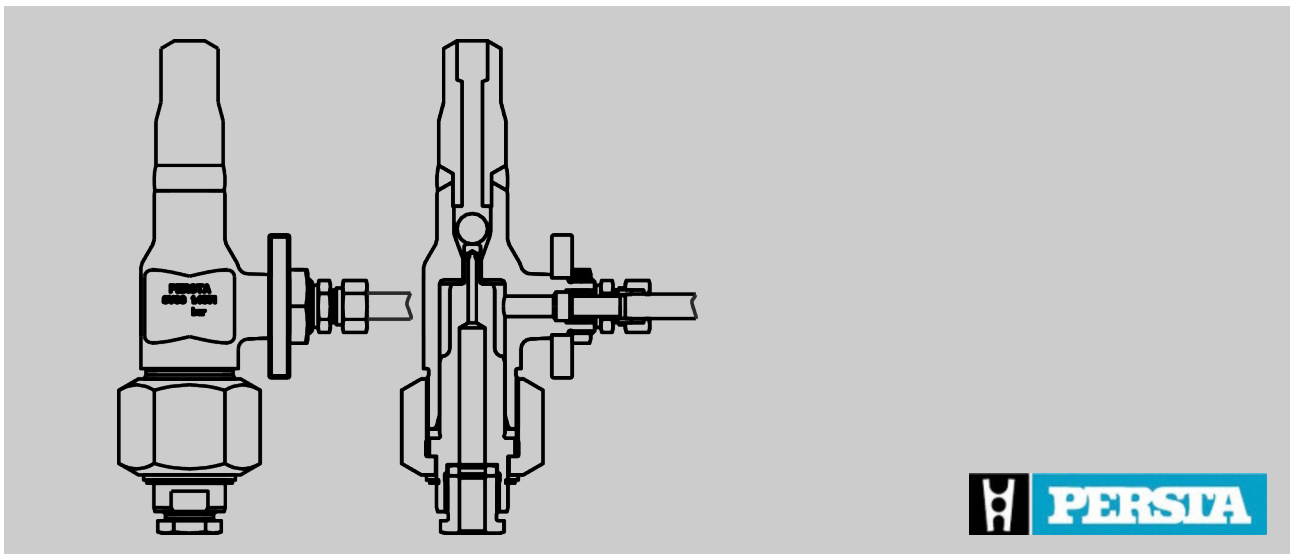


# Operating instructions

Over pressure safety device  
SV 98



Read the instructions prior to performing any task!

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Translation of the original operating instructions

6410.DE.STD.11.2016, 3, en\_GB

**Information about the operating instructions**

This manual enables the safe and efficient handling of the over pressure safety device.

The manual is an integral part of the over pressure safety device and must be kept in the vicinity of the over pressure safety device so that it is available to the personnel at all times.

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

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

The illustrations in this manual are provided as examples only and may deviate from the actual version.

**Other applicable documents**

- GA04 ignition hazard assessment
- MRL risk assessment
- PED hazard analysis
- Technical data sheet
- Bolt 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/Supplemented information	Date
1	Updates to chapter " <i>Intended use</i> ".	05/05/2021



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## 1 Overview

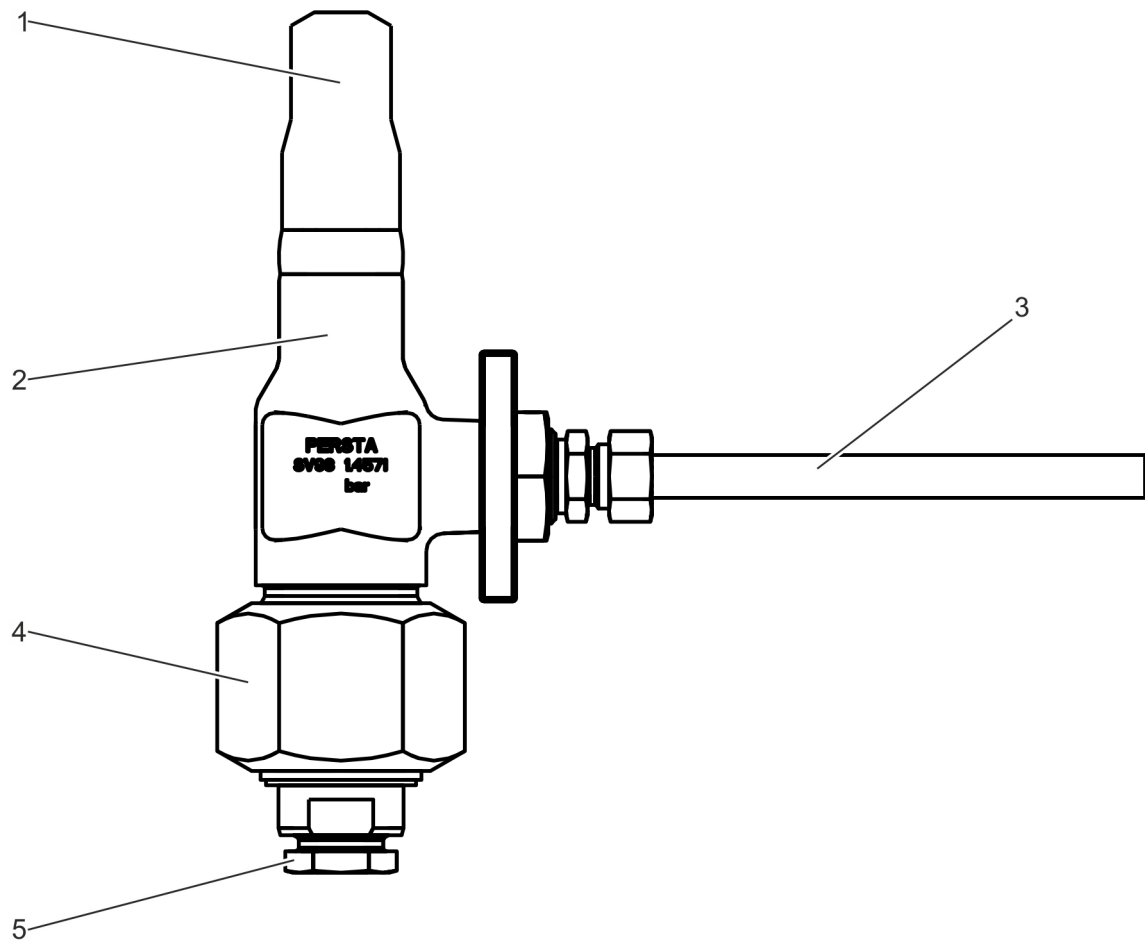


Fig. 1: General view

- |   |                      |   |  |
|---|----------------------|---|--|
| 1 | Connecting nozzle    | 4 | Union nut  |
| 2 | Body                 | 5 | Blow-out nozzle (integrated in a pressure screw) |
| 3 | Steam-releasing pipe |   |  |

### Brief description of the over pressure safety device

The over pressure safety device is a safety system for the operation of gate valves.

The excess pressure that develops in the gate valve in certain circumstances is released into the atmosphere with the assistance of the over pressure safety device.

When the over pressure safety device is triggered, a bursting disc breaks inside the body and the open over pressure safety device releases the excess pressure in the gate valve into the atmosphere.

After the bursting disc has broken, it can be replaced with an intact bursting disc during operation and at normal pressure ratios in the gate valve.

Using an over pressure safety device protects the gate valve from overloads.

### Tools

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

#### **High temperature grease**

High temperature resistant grease for the treatment of threaded fittings during the bursting disc replacement.

#### **Spanner size 27**

Spanner with a spanner width of 27 mm.

#### **Spanner size 30**

Spanner with a spanner width of 30 mm.

#### **Spanner size 50**

Spanner with a spanner width of 50 mm.

#### **Spanner size 60**

Spanner with a spanner width of 60 mm.



## 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 trapped 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 – hot surface.
	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 these 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 defined sequence

## 2.2 Intended use

Over pressure safety devices of the specified series are designed to be used as safety systems on gate valves under the following conditions:

- Operation of the over pressure safety device with liquid media or steam, without particularly corrosive, chemical, or abrasive impact.
- Operation of the over pressure safety device without additional external impact, such as pipe forces, vibrations, wind loads, earthquakes, corrosive environments, fire, traffic loads, decomposition pressures of unstable fluids.
- Operation of the over pressure safety device only within the limits specified on the rating plate (☞ *“Rating plate” on page 14*).
- Operation of the over pressure safety device with the safety systems provided by the operating company:
  - Safety system around the blow-out nozzle (☞ *“Safety system around the blow-out nozzle” on page 13*) and
  - Safety system around the outlet area of the steam-releasing pipe (☞ *“Safety system around the steam-releasing pipe” on page 13*) and
- Any number of load cycles at pressure fluctuations of up to 10 % of the maximum permissible pressure PS.
- Maximum number of 1000 load cycles between a depressurised state and the maximum permissible pressure PS.
- Operation of the over pressure safety device after its suitability has been determined by the operating company or the manufacturer of the plant for the relevant purpose.
- 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.
- 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.

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 over pressure safety device can result in dangerous situations arising.

- Only operate the over pressure safety device with an intact bursting disc during production.
- Do not operate the over pressure safety device with gaseous media in the pipes (other than steam).
- Connect the pipes so that they are free of tension.
- Do not insulate the over pressure safety device and the siphon (☞ “Siphon” on page 12).
- Pay attention to the correct installation position of the over pressure safety device (☞ Chapter 5.3 “Fitting the over pressure safety device” on page 36).
- Do not use the over pressure safety device as an anchor point.

## 2.3 Safety systems included in the scope of delivery

### Siphon

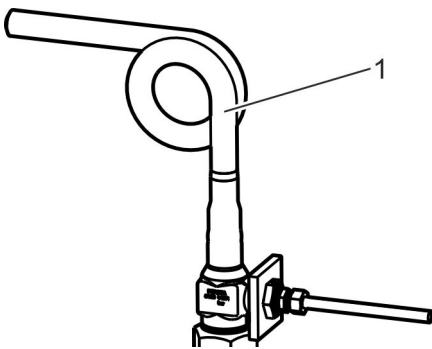


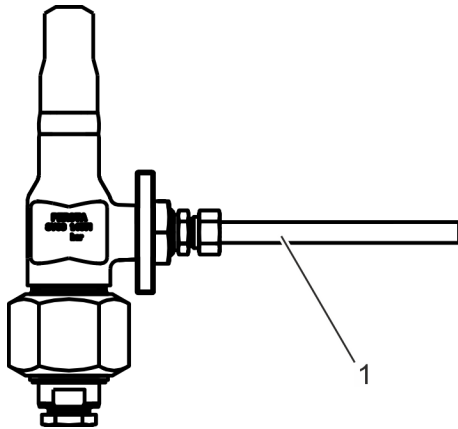
Fig. 2: Siphon (shown as an example only)

A siphon must be installed between the connection on the gate valve and the over pressure safety device (Fig. 2/1).

The siphon is part of the scope of delivery and is usually already welded to the connecting nozzle of the over pressure safety device.



*Information concerning the design of the siphon for its subsequent adjustment by the operating company can be obtained from Stahl-Armaturen PERSTA GmbH (see page 3 for the contact details).*

**Steam-releasing pipe**


To release steam from the over pressure safety device, a pipe is included in the scope of delivery that is fitted to the screw connection (Fig. 3/1) of the over pressure safety device.

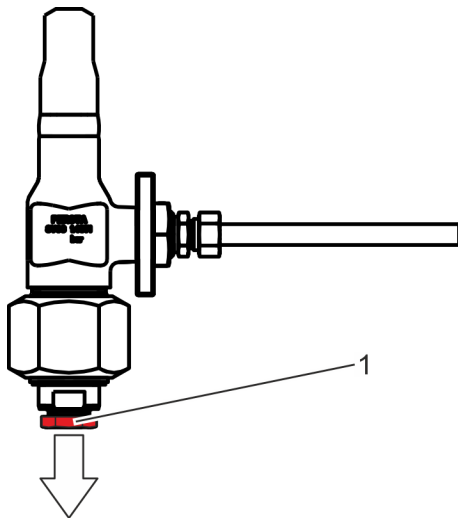


*The operating company must adjust the steam-releasing pipe according to the local circumstances.*

Fig. 3: Steam-releasing pipe

## 2.4 Safety systems provided by the operating company

The following safety systems are to be provided by the operating company:

**Safety system around the blow-out nozzle**


A safety system must be installed around the blow-out nozzle to prevent the personnel from coming into contact with the (hot or cold) pipeline medium that is discharged when the over pressure safety device is triggered.



*Triggering the over pressure safety device can only be detected by the pipeline medium being discharged from the blow-out nozzle.*



*As an option, triggering the over pressure safety device can be detected electronically (☞ “Optional: fibre-optic sensor” on page 28).*

Fig. 4: Blow-out nozzle without safety system

**Safety system around the steam-releasing pipe**

The steam-releasing pipe must be permanently open at the end and persons must be protected from inadvertently coming into contact with pipeline medium that is discharged (☞ “Obligations of the operating company” on page 18).

## 2.5 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 over pressure safety device. Depending on the version, the following information is on the rating plate:

- Manufacturer
- Confirmation number
- Type identification
- Material number
- Design triggering pressure
- Design temperature
- Flow direction
- CE marking

### **Rating plate of the bursting disc used**

The rating plate of the bursting disc used is on the over pressure safety device.

Depending on the version, the following information is on the rating plate:

- Type designation
- Bursting pressures
- Nominal diameter

### **Customer-specific markings**

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

## 2.6 Residual risks

The over pressure safety device has been developed and manufactured according to the state of the art and in compliance with the currently applicable safety standards. Nevertheless, residual risks remain that require caution. The residual risks and the resulting conduct and measures required are listed below.

### 2.6.1 Basic dangers at the workplace

#### Potentially explosive atmospheres



#### **DANGER!**

**Life-threatening danger due to a failure to comply with the rules of conduct specified for potentially explosive atmospheres!**

Depending on the version, the over pressure safety device can be used in potentially explosive atmospheres. There is life-threatening danger if the rules of conduct are not complied with within these areas.

- Ensure that tasks on the over pressure safety device can be carried out at the installation site.

#### Presence in the danger zone



#### **WARNING!**

**Risk of injury due to the over pressure safety device being triggered!**

With pressurised gate valves, there is always a risk that the over pressure safety device will be triggered and hot or cold pipeline medium will escape under high pressure.

- Only operate the over pressure safety device with safety systems around the blow-out nozzle and steam-releasing pipe.
- Only carry out work on the over pressure safety device while the gate valve is open.
- Wear protective equipment: safety goggles, protective gloves, protective work clothing, hearing protection.

## Incorrectly set triggering pressure



### **WARNING!**

#### **Danger of injury due to the use of a bursting disc that is not permitted!**

There is a risk of severe injuries if the over pressure safety device is operated with a bursting disc designed solely for pressure-testing the gate valve.

- After pressure-testing the gate valve with the over pressure safety device already installed, insert a bursting disc with the triggering pressure for normal operation.

## 2.6.2 Thermal dangers

### Thermal dangers



### **WARNING!**

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

Depending on the application of the over pressure safety device or of the pipe, injuries can occur due to the high or low temperature of the components.

- Prior to performing work on these components, allow them to cool down or warm up to the ambient temperature.

### Escaping hot medium



### **WARNING!**

#### **Risk of injury when replacing the bursting disc!**

While replacing the bursting disc, pipeline medium escapes from the steam-releasing pipe as well as from the blow-out nozzle. There is a risk of scalding.

- Make sure that the escaping pipeline medium is collected by the safety systems at the steam-releasing pipe and blow-out nozzle.
- When replacing the bursting disc, wear the following protective equipment: safety goggles, protective gloves, protective work clothing.



### 2.6.3 Hazards due to hazardous substances and operating materials

#### Pipeline medium

**WARNING!****Risk of impairing health due to the pipeline medium!**

Coming into contact with the pipeline medium can adversely affect your health.

- Handle the pipeline medium 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.
- Collect any pipeline medium that has run out without delay and dispose of it in an environmentally responsible manner.

#### Corrosion protection agent

**WARNING!****Risk of impairing health 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.

## Damage to sealing surfaces and slide faces



### NOTICE!

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

The metallic processing of sealing surfaces, slide faces and components can cause damage and result in the over pressure safety device malfunctioning.

- Sealing surfaces and slide faces of gaskets must not be
  - scratched with a scraper,
  - brushed with wire brushes.
- Sealing surfaces and slide faces must be
  - sanded using a fine emery cloth,
  - machined with suitable grinding tools or
  - scraped off with plastic or wooden tools.

## 2.7 Behaviour in the event of an emergency

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

## 2.8 Responsibility of the operating company

### Operating company

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

### Obligations of the operating company

The over pressure safety device is used commercially. The operating company of the over pressure safety device is therefore subject to the statutory occupational health and safety obligations.

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

In this regard, the following applies in particular:

- The operating company is responsible for the installation and operation of the over pressure safety device on the gate valve.
- The operating company must ensure that the 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 assessment, identify the additional hazards that exist at the installation site of the over pressure safety device due to the specific working conditions. The operating company must convert this information into operating instructions for the operation of the over pressure safety device.
- The operating company must ensure that the operating instructions drawn up by it are in accordance with the current state of legislation throughout the service life of the over pressure safety device and, if necessary, amend the operating instructions.
- The operating company must clearly specify and assign the responsibilities for installation, operation, fault correction, maintenance and cleaning.
- The operating company must ensure that all the personnel who will be handling the over pressure safety device 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 operator must install additional safety systems that prevent contact with the medium located in the pipe system. Of particular importance in this regard is:
  - The installation of a collecting system for the pipeline medium that escapes under pressure below and in the area of the blow-out nozzle.
  - The installation of a collecting system for the pipeline medium that escapes below and in the area of the steam-releasing pipe.
- The operating company must install a siphon between the gate valve and the connecting nozzle of the over pressure safety device to protect the over pressure safety device from the hot pipeline medium.
- The operating company must secure the over pressure safety device.

The operating company is also responsible for keeping the over pressure safety device in a proper working condition at all times. Consequently, the following applies:

- The operating company must ensure that the maintenance intervals described in this manual are complied with.

## 2.9 Personnel requirements

**WARNING!****Risk of injury due to inadequate qualification of the personnel!**

If unqualified personnel work on the over pressure safety device or remain in the danger zone of the over pressure safety device, there is a risk that severe injuries and substantial damage to property may be caused.

- Only permit personnel to perform tasks for which they are qualified.
- Keep unqualified personnel away from the danger zones.

The qualifications of personnel for the various areas of activity are set out below in this manual:

**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.

**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 (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 who can be expected to perform their work reliably can be accepted as personnel. Persons whose ability to react is impaired, for example through drugs, alcohol or medication, are not acceptable.

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

### Unauthorised persons



#### **WARNING!**

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

Unauthorised persons who do not satisfy the requirements described here are unable to appreciate the hazards in the work area. Consequently, there is a risk of unauthorised persons sustaining severe or fatal injuries.

- Unauthorised personnel must be kept away from the danger and working areas.
- If in doubt, speak to these persons and instruct them to leave the danger zone and work area.
- Interrupt work for as long as unauthorised persons remain in the danger zone and work area.

### Training

The operating company must train the personnel at regular intervals. For improved tracking, a training log must be maintained with at least the following information:

- Date of training session
- Name of the person trained
- Contents of training session
- Name of trainer
- Signatures of the trainee and the trainer

## 2.10 Personal protective equipment

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

During the various tasks performed on and with the over pressure safety device, personnel must wear the 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:



### 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.

## 2.11 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, do not hesitate to contact our customer service department (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 over pressure safety device.

**Storing spare parts**

**Storage of spare parts**

Please see  Chapter 4.3 "Storage of spare parts" on page 32 for information on storing spare parts.

**Ordering spare parts**

Order spare parts from Stahl-Armaturen PERSTA GmbH, specifying:

- Year of manufacture
- Type identification
- Design triggering pressure
- Material
- Confirmation number
- Consignment number (if possible)

. See page 3 for contact details.

## 2.12 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.

Environmental protection

### Substances used

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

- Residue of the pipeline medium
- Anticorrosive



### 3 Functional description

#### 3.1 Mode of operation of the over pressure safety device

General view and sectional view

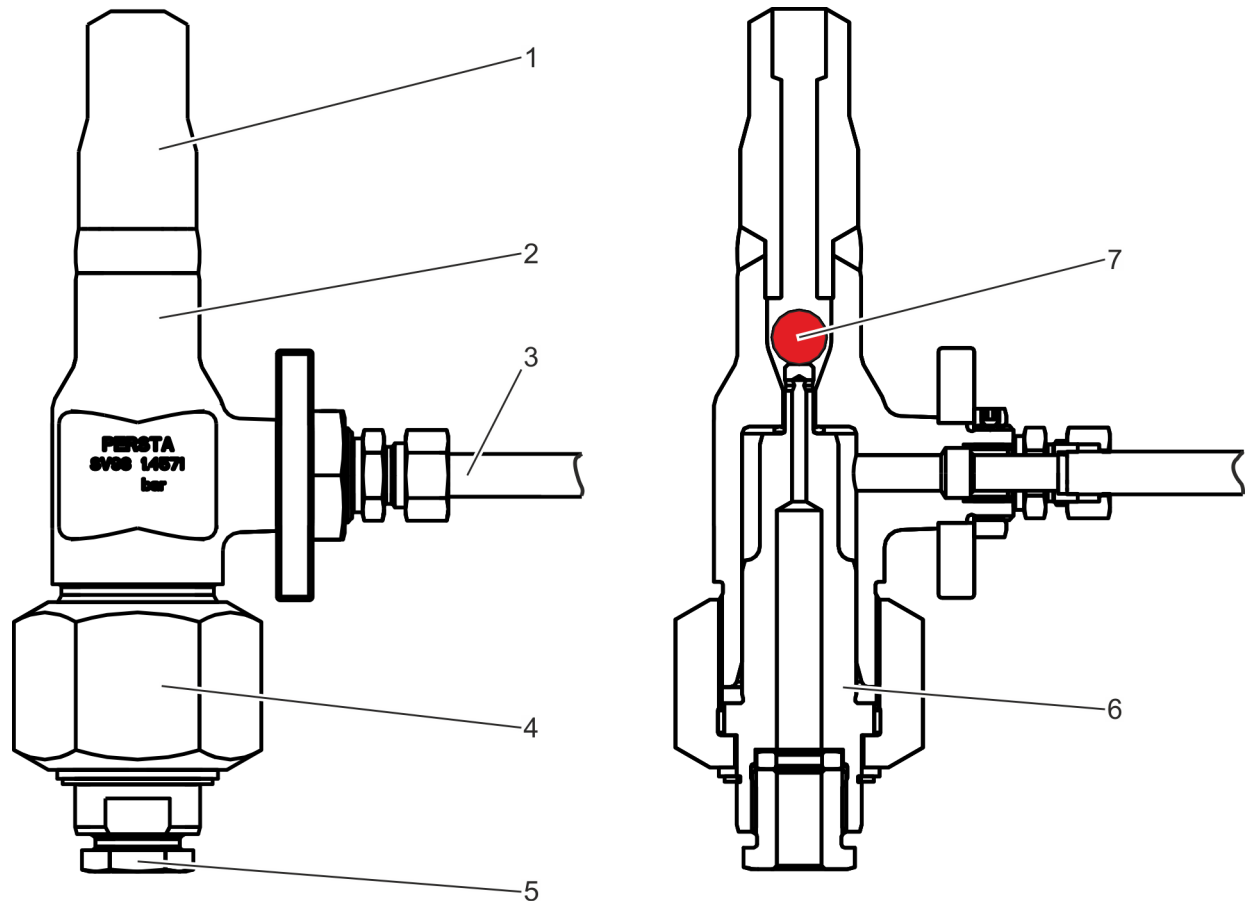
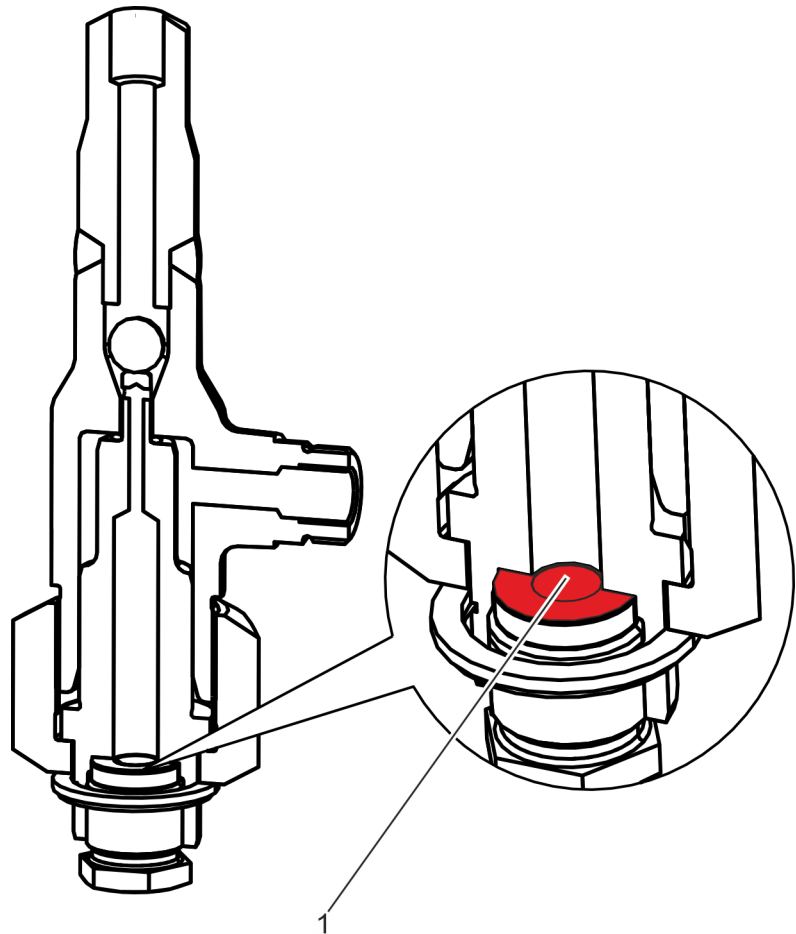


Fig. 5: General view (left) and sectional view (right)

- 1 Connecting nozzle
- 2 Body
- 3 Steam-releasing pipe
- 4 Union nut

- 5 Blow-out nozzle (integrated in a pressure screw)
- 6 Valve body
- 7 Ball

### Normal state: over pressure safety device has not been triggered



*Fig. 6: normal state with the bursting disc intact*

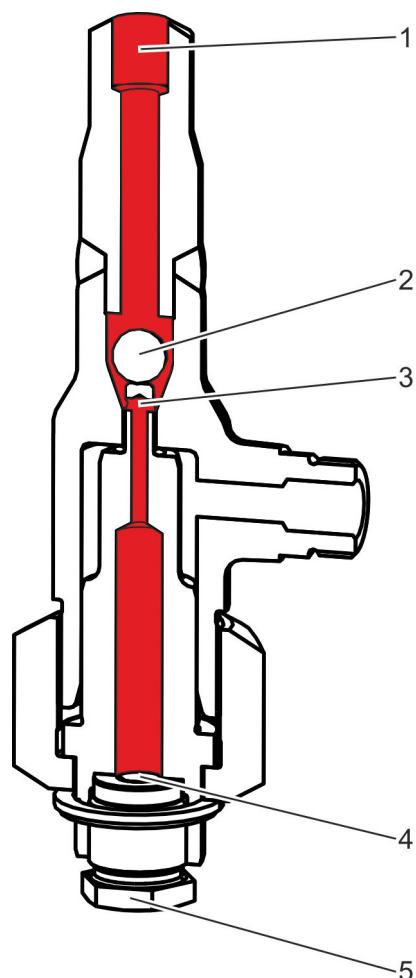
There is a bursting disc (Fig. 6/1) inside the body (Fig. 5/2) between the valve body (Fig. 5/6) and the pressure screw (Fig. 5/5).

The bursting disc (Fig. 6/1) seals the body of the over pressure safety device from the atmosphere.

Depending on the particular application, the bursting disc (Fig. 6/1) may have a convex shape.

In the normal state, the body of the over pressure safety device is under pressure up to the bursting disc.

### Triggering the over pressure safety device



*Fig. 7: Increasing pressure before the bursting disc breaks*

If the pressure (Fig. 7/1) in the over pressure safety device increases to a critical level, this results in the bursting disc breaking (Fig. 7/4).

When the bursting disc breaks, the pressure (Fig. 7/3) is released into the atmosphere through the blow-out nozzle (Fig. 7/5) that is open at the bottom.



*The triggering of the over pressure safety device can only be detected by the pipeline medium being discharged from the blow-out nozzle.*

### Replacing the bursting disc during operation

The over pressure safety device can be replaced while the plant is in operation.

After unscrewing the union nut (Fig. 5/4) and the position of the valve body (Fig. 5/6) has accordingly changed, the ball (Fig. 5/7) inside the body closes the flow passage between the connection nozzle and blow-out nozzle to prevent the pressurised medium from escaping through the open blow-out nozzle.

After the flow passage has been blocked, the broken bursting disc can be removed and replaced with a new disc.



*Before replacing the bursting disc, the gate valve must be completely open.*

### 3.2 Bursting discs

#### Standard version

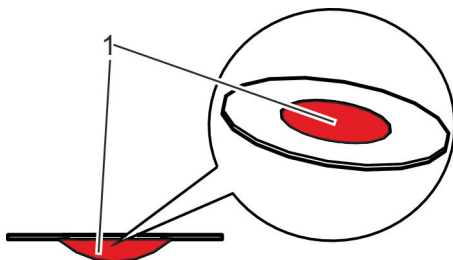


Fig. 8: Bursting disc

The bursting disc has a convex element in its centre (Fig. 8/1). If the design pressure is exceeded, the element breaks and the excess pressure can be released into the atmosphere.

#### Optional: fibre-optic sensor

The over pressure safety device can optionally be equipped with a fibre-optic sensor.

The fibre-optic sensor signals the triggering of the over pressure safety device via a digital switching output.

The triggering of the over pressure safety device can be displayed centrally, without personnel having to be physically present to check for escaping pipeline medium at the blow-out nozzle (☞ *“Triggering the over pressure safety device” on page 27*).

### 3.3 Connections

#### Connection to the gate valve

The over pressure safety device is installed as a butt-weld valve on the gate valve.

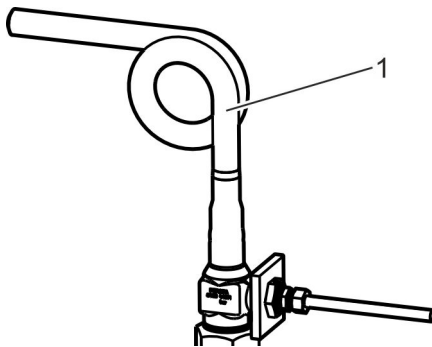
**Siphon**


Fig. 9: Siphon (shown as an example only)

A siphon must be installed between the connection on the gate valve and the over pressure safety device (Fig. 9/1).

The siphon is already fitted ex-works to the connecting nozzle of the over pressure safety device.

The siphon

- reduces pressure surges in the medium when it enters the over pressure safety device and
- lowers the temperature of the medium before it enters the over pressure safety device.

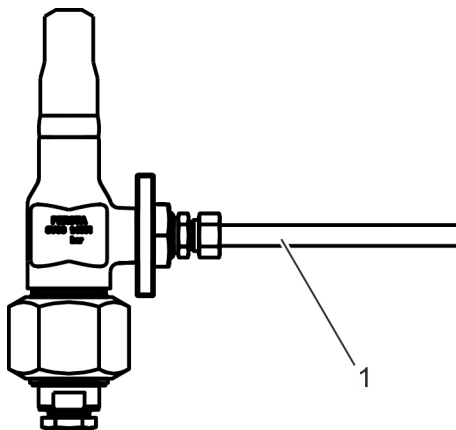
**Steam-releasing pipe**


Fig. 10: Steam-releasing pipe

To release steam from the over pressure safety device, a pipe (Fig. 10/1, included in the scope of delivery) must be fitted to the screw connection that has been provided.

The end of the pipe must remain open permanently.

The operating company must screen the end of the pipe with a safety system to prevent people from inadvertently coming into contact with the escaping medium (☞ *“Obligations of the operating company” on page 18*).



## 4 Transport and storage

### 4.1 Safety notices for transport and storage

#### Corrosion protection agent

**WARNING!****Risk of impairing health 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.

#### Improper transport

**NOTICE!****Damage caused by improper transport!**

The over pressure safety device can fall or tip over if transported improperly. This can cause considerable damage.

- When unloading the over pressure safety device on delivery, as well as during in-house transportation, proceed carefully and pay attention to the symbols and instructions on the packaging.
- Protect the over pressure safety device from impacts.
- Do not throw the over pressure safety device.
- Only remove the packaging just before installation.

### 4.2 Storing the over pressure safety device

#### Storage requirements

Comply with the following requirements when storing the over pressure safety device:

- Store the over pressure safety device in a closed state (delivery state).
- 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 state of the protective caps attached in the factory. If necessary, replace the protective caps.
- When storing for longer than 3 months, check the general condition of all the parts and the packaging on a regular basis. Touch up or reapply preservation agent as required.



*There may be storage instructions affixed to the packaged items that extend beyond the requirements set out in this manual. Comply with the terms of those instructions.*

### 4.3 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

#### Faulty installation

**WARNING!****Danger due to incorrectly installed over pressure safety device!**

A faulty installation can result in injuries due to a malfunction of the over pressure safety device.

- Only carry out an installation after the affected pipe section has been shut off.
- For butt-weld valves
  - Fasten the welding counterpole on the body, if possible in the vicinity of the welding point.
  - Perform welding and subsequent heat treatment in compliance with the applicable welding regulations
  - Partially carry out the thermal treatment.
- Do not insulate the over pressure safety device.
- Pay attention to the correct installation position: Align the blow-out nozzle vertically downwards.

#### Missing safety systems

**WARNING!****Risk of injury due to missing safety systems!**

There is a risk of serious injury if the operating company fails to install any safety systems.

- Install a safety system around the blow-out nozzle.
- Install a safety system around the outlet of the steam-releasing pipe.
- Install the siphon.

## 5.2 Before the installation

### Incorrectly set triggering pressure



#### WARNING!

#### Danger of injury due to the use of a bursting disc that is not permitted!

There is a risk of severe injuries if the over pressure safety device is operated with a bursting disc designed solely for pressure-testing the gate valve.

- After pressure-testing the gate valve with the over pressure safety device already installed, insert a bursting disc with the triggering pressure for normal operation.

### Pressure test of the gate valve to be protected



*The installation of the over pressure safety device can be carried out at the following times:*

- *Installation of the over pressure safety device **before** pressure-testing the gate valve to be protected:*

*If the over pressure safety device is installed before pressure-testing the gate valve, the burst disc approved for operation will not be triggered and the test pressure cannot be transferred to the gate valve.*

*For this pressure test, a burst disc must be used that is only triggered above the test pressure.*

*This bursting disc to be used for the pressure test must be ordered when ordering the over pressure safety device from Stahl-Armaturen PERSTA GmbH.*

*Procedure: ↪ Chapter 5.5 “Installation of the over pressure safety device of the gate valve to be protected” on page 39*

- *Installation of over pressure safety device **after** pressure-testing the gate valve to be protected:*

*If the over pressure safety device is installed after pressure-testing the gate valve, the burst disc approved for operation can remain installed in the over pressure safety device.*

*Installation of the over pressure safety device **after** pressure-testing the gate valve to be protected is described below:*

## Prerequisites



### **Nozzle on the gate valve**

*For the installation of the over pressure safety device, the gate valve must have a nozzle on the body that is to be protected.*

*The nozzle may*

- *already be present when the gate valve is delivered or*
- *be properly welded to the body by an expert in consultation with Stahl-Armaturen PERSTA GmbH.*



### **Siphon**

*The bursting disc must be protected from the hot medium to prevent it from ageing prematurely.*

*A looped pipe (siphon) must be inserted between the nozzle on the gate valve and the connecting nozzle of the over pressure safety device.*

*The siphon is welded to the connecting nozzle of the over pressure safety device in the factory.*

*A condensate barrier forms in the siphon that minimises the transmission of heat to the bursting disc.*

## Preparing for the installation

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

- 1.** ➤ Shut off the pipe section affected.
- 2.** ➤ Check the design parameters and material.
- 3.** ➤ Remove any protective caps and preservation agents from the over pressure safety device.
- 4.** ➤ Open the nozzle on the body of the gate valve, which is delivered sealed ex-works.
- 5.** ➤ Prepare the nozzle on the gate valve for welding on to the over pressure safety device.

6. ➤



**CAUTION!**

**Risk of excess heat being transferred to the siphon through the gate valve!**

Dimensioning the siphon, make sure that the distance between the body of the gate valve and the siphon is sufficient.

7. ➤

Weld the siphon to the nozzle on the gate valve.

## 5.3 Fitting the over pressure safety device

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

1. ➤ Check butt-welding ends for damage and cleanliness.
2. ➤ Centre the siphon and connecting nozzle.

Pay attention to the correct installation position

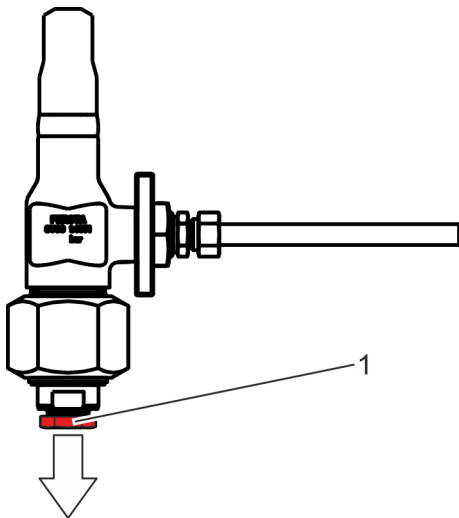


Fig. 11: Aligning the over pressure safety device

3. ➤



**WARNING!**

**Do not incorrectly align the blow-out opening!**

Make sure that the blow-out opening (Fig. 11/1) points vertically downwards.

4. ➤

Weld the siphon to the connecting nozzle on the gate valve.

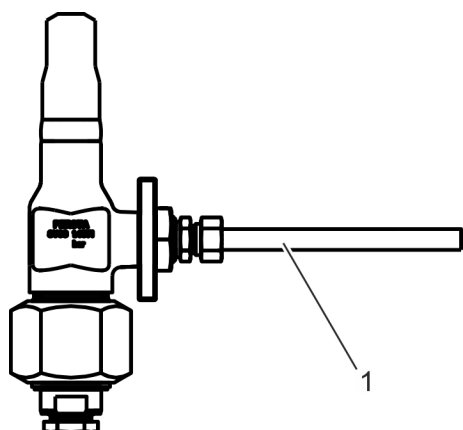


Fig. 12: Aligning the steam-releasing pipe

5. →



**WARNING!**  
Do not incorrectly align the steam-releasing pipe!

Align the steam-releasing pipe (Fig. 12/1) in such a way that the escaping medium will not, at any stage, injure persons or damage property.

6. → If necessary, extend the steam-releasing pipe.

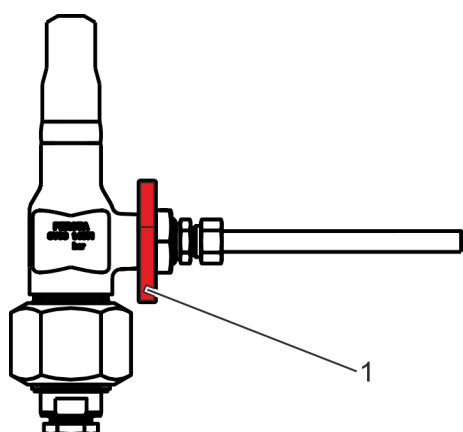


Fig. 13: Securing the over pressure safety device

7. →



**CAUTION!**  
Risk of breaking during operation by reactive forces when blowing out!

Take appropriate measures to secure the over pressure safety device on the retaining plate (Fig. 13/1).

8. → Ensure that the pipes are properly sealed.

## 5.4 Fitting the safety systems

### Fitting safety systems to the steam-releasing pipe and around the blow-out nozzle

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

1. → Fit safety systems to collect and drain the medium that escapes from the steam-releasing pipe (Fig. 14/1).

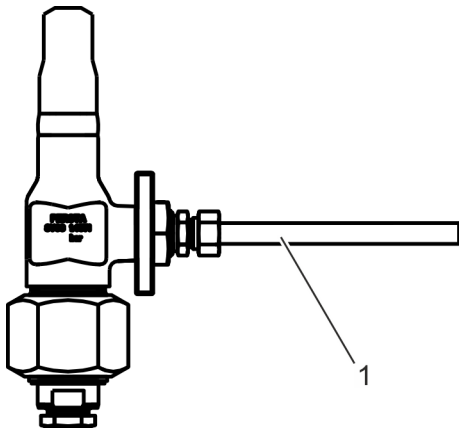


Fig. 14: Steam-releasing pipe

2. → Fit safety systems to collect and drain the medium that escapes from the blow-out nozzle (Fig. 15/1).

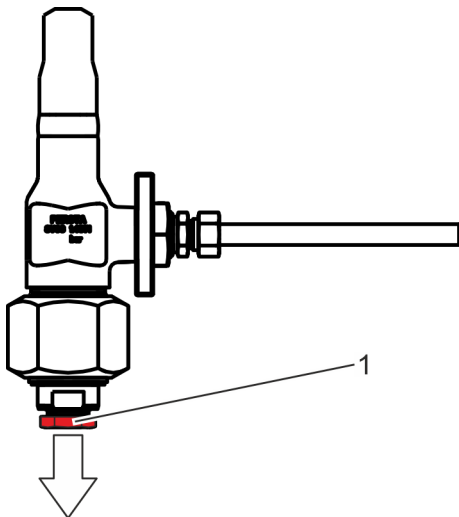


Fig. 15: Blow-out nozzle

## 5.5 Installation of the over pressure safety device of the gate valve to be protected

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

1. ➤ Prepare for the installation (☞ *“Preparing for the installation” on page 35*).
2. ➤ Fit the over pressure safety device (☞ *Chapter 5.3 “Fitting the over pressure safety device” on page 36*).
3. ➤ Fit the safety systems (☞ *Chapter 5.4 “Fitting the safety systems” on page 38*).
4. ➤ Insert the burst disc to be used for the pressure test (☞ *Chapter 7.2 “Replacing the bursting disc” on page 44*).
5. ➤ Perform a pressure test of the gate valve to be protected (for procedure, see operating instructions for the gate valve).

6. ➤



**WARNING!**

**Over pressure safety device has not been triggered!**

Insert the burst disc to be used for normal operation (☞ *Chapter 7.2 “Replacing the bursting disc” on page 44*).

Installation of the over pressure safety device of the gate valve to be protected



## 6 Initial start-up

### Incorrectly set triggering pressure

**WARNING!****Danger of injury due to the use of a bursting disc that is not permitted!**

There is a risk of severe injuries if the over pressure safety device is operated with a bursting disc designed solely for pressure-testing the gate valve.

- After pressure-testing the gate valve with the over pressure safety device already installed, insert a bursting disc with the triggering pressure for normal operation.

The over pressure safety device is ready for use, once it has been successfully installed and the bursting disc has been fitted.

For information on replacing the bursting disc, see [Chapter 7.2](#) “Replacing the bursting disc” on page 44.



## 7 Operation

### 7.1 Safety instructions for operation

#### Escaping hot medium

**WARNING!****Risk of injury when replacing the bursting disc!**

While replacing the bursting disc, pipeline medium escapes from the steam-releasing pipe as well as from the blow-out nozzle. There is a risk of scalding.

- Make sure that the escaping pipeline medium is collected by the safety systems at the steam-releasing pipe and blow-out nozzle.
- When replacing the bursting disc, wear the following protective equipment: safety goggles, protective gloves, protective work clothing.

#### Pipeline medium

**WARNING!****Risk of impairing health due to the pipeline medium!**

Coming into contact with the pipeline medium can adversely affect your health.

- Handle the pipeline medium 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.
- Collect any pipeline medium that has run out without delay and dispose of it in an environmentally responsible manner.

## 7.2 Replacing the bursting disc

- |                       |   |
|-----------------------|---|
| Personnel:            | ■ Industrial mechanic (high pressure valves)  |
| Protective equipment: | ■ Protective work clothing<br>■ Safety goggles<br>■ Protective gloves<br>■ Safety footwear                    |
| Special tool:         | ■ Spanner size 50<br>■ Spanner size 60<br>■ Spanner size 30<br>■ Spanner size 27<br>■ High temperature grease |

1. ▶



**WARNING!**  
**Risk of scalding!**



**WARNING!**  
**Risk of frostbite!**

Avoid coming into contact with the medium escaping from the blow-out nozzle and steam-releasing pipe.

2. ▶ Make sure that the gate valve can be opened.
3. ▶ Open the gate valve completely.

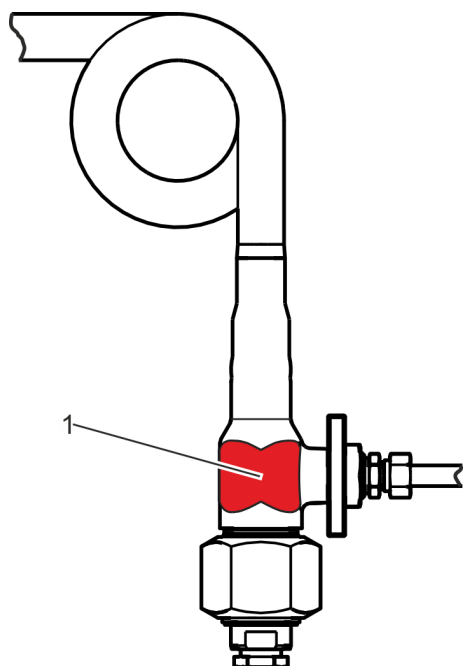


Fig. 16: Holding the punched surface in position

4. →



**CAUTION!**  
Do not overstress the welding seams and pipes!

Use a size 50 spanner in the area of the punched surface (Fig. 16/1) to hold the body in position.

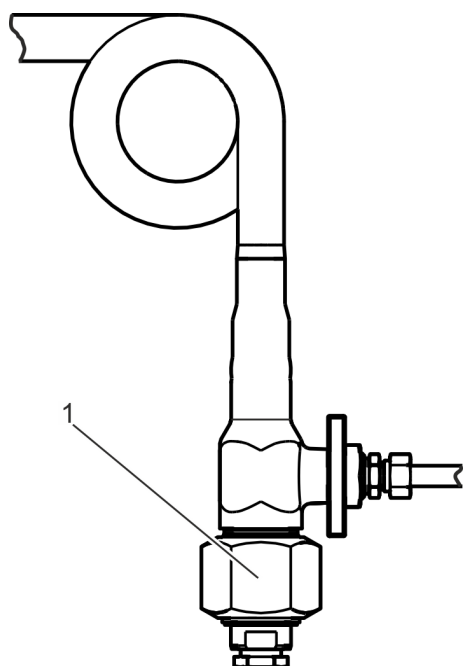


Fig. 17: Unscrewing the union nut

5. →



*While unscrewing the union nut, medium will escape from the steam-releasing pipe and blow-out nozzle.*

Unscrew the union nut (Fig. 17/1) by approx. 5 turns in an anticlockwise direction using a size 60 spanner.

⇒ The ball shuts off the seat in the body.

6. → Wait until the medium has stopped escaping from the blow-out nozzle and steam-releasing pipe.

7. → Improve the seating of the ball by lightly tapping against the body.

8. → Unscrew the union nut (Fig. 17/1) completely.

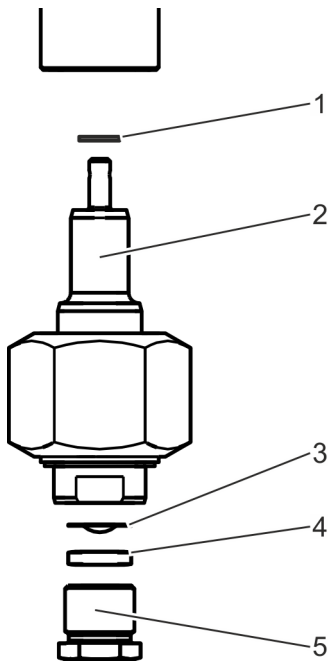


Fig. 18: Disassembling the unit

9. ▶ Remove the unit consisting of
- a gasket (Fig. 18/1),
  - a valve body (Fig. 18/2),
  - a bursting disc (Fig. 18/3),
  - a pressure ring (Fig. 18/4) and
  - a pressure screw (Fig. 18/5)
- from the body.

10. ▶



**WARNING!**  
Risk of scalding!



**WARNING!**  
Risk of frostbite!

Allow the removed unit to cool down or warm up to the ambient temperature.

11. ▶ Hold the spanner flats (Fig. 19/2) at the bottom of the valve body (Fig. 19/1) in position using a size 30 spanner.

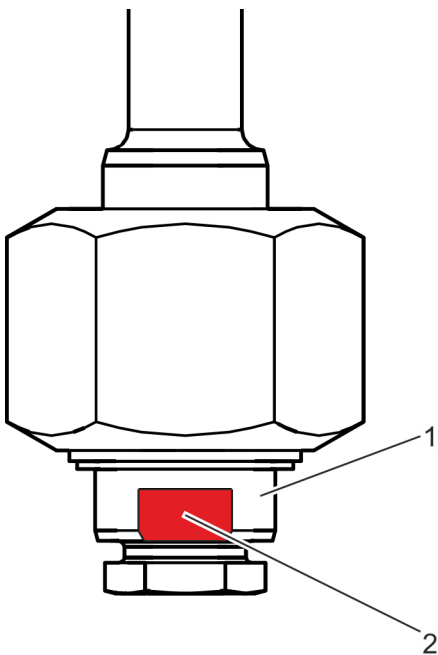


Fig. 19: Holding the valve body in position

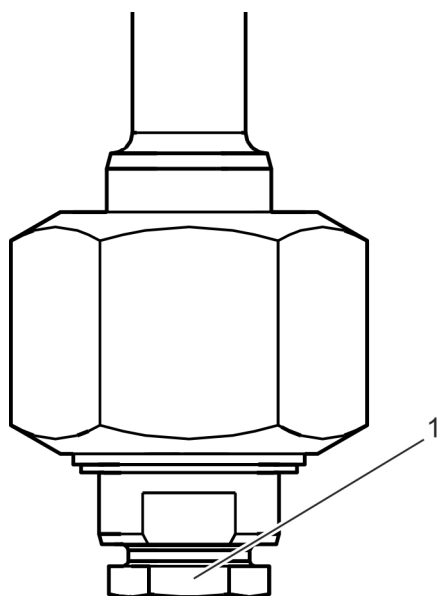


Fig. 20: Unscrewing the pressure screw.

- 12.** ➤ Unscrew the pressure screw (Fig. 20/1) using a size 27 spanner in an anticlockwise direction.

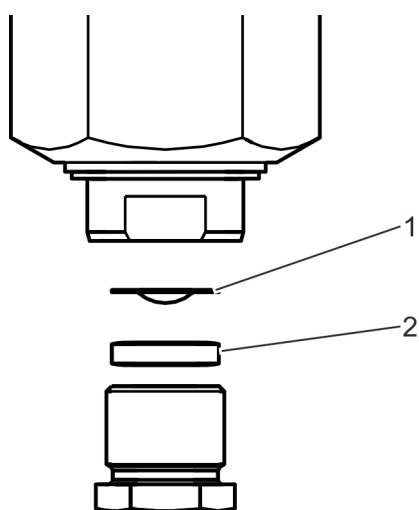


Fig. 21: Replacing the bursting disc (an intact bursting disc is shown)

- 13.** ➤ Remove the pressure ring (Fig. 21/2) and the defective bursting disc (Fig. 21/1).
- 14.** ➤ Clean all the threaded fittings and treat them with high temperature grease (e.g. graphite grease or copper grease).
- 15.** ➤



**CAUTION!**  
Do not select the wrong bursting disc!



**NOTICE!**  
Risk of irreparable damage to the new bursting disc!

Check the nominal burst pressure on the edge of the disk and compare this with the design data as well as the delivery documentation from the manufacturer.

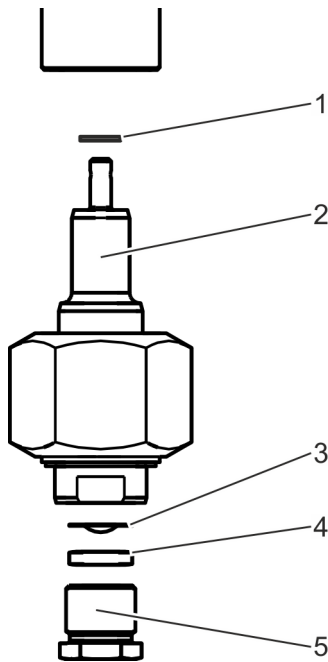


Fig. 22: Inserting a new bursting disc

16.▶



**CAUTION!**  
Do not orient the bursting disc in the wrong direction!

Screw the new bursting disc (Fig. 22/3) with the convex curvature pointing in the blow-out direction together with the pressure ring (Fig. 22/4) and the pressure screw (Fig. 22/5) to the valve body (Fig. 22/2), with a tightening torque of 80 Nm.

17.▶

Insert the assembled unit with a new gasket (Fig. 22/1) into the body.

18.▶



**CAUTION!**  
Risk of the bursting disc breaking due to incorrect assembly or wrong materials!

Avoid coming into contact with any medium that may escape.

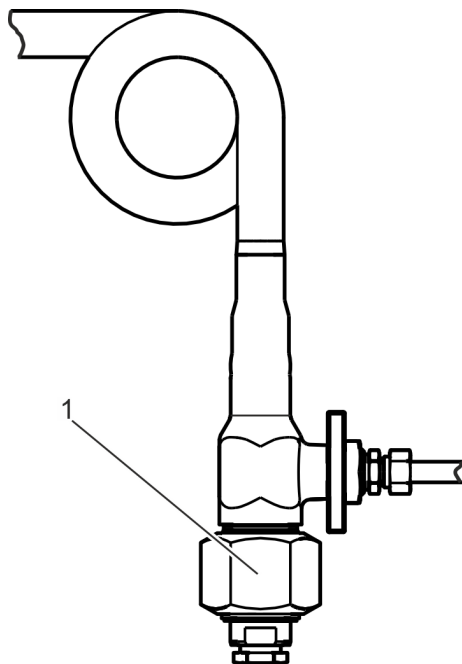


Fig. 23: Tightening the union nut

19.▶



**WARNING!**  
Risk of scalding!



**WARNING!**  
Risk of frostbite!

Fit the union nut (Fig. 23/1), turning it clockwise and without tightening it fully.

⇒ The ball is lifted from the seat and the connection between gate valve and bursting disc / steam-releasing pipe is restored.



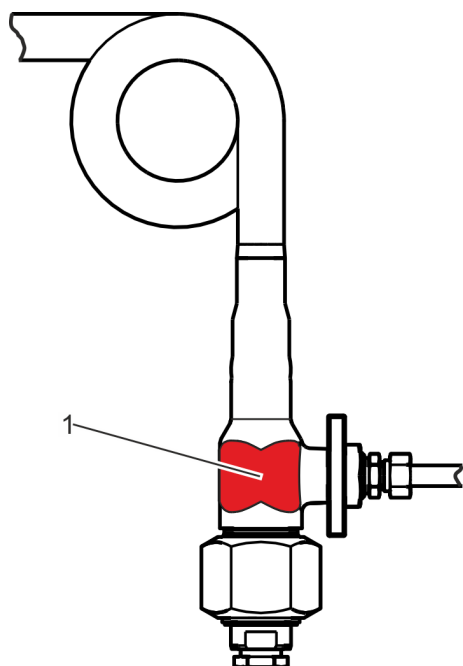


Fig. 24: Holding the punched surface in position

### Visually displaying the replacement of the bursting disc

20.



#### CAUTION!

**Do not overstress the welding seams and pipes!**

Use a size 50 spanner in the area of the punched surface (Fig. 24/1) to hold the body in position.

21.

Tighten the union nut (Fig. 23/1) using a size 60 spanner and applying a tightening torque of 100 Nm.

⇒ As soon as the gasket (Fig. 22/1) creates a seal between the body and valve body, the medium no longer escapes.

Personnel: ■ Pipeline engineer

1. ➤ Remove the rating plate of the broken bursting disc from the over pressure safety device.

2. ➤ Fasten the rating plate of the new bursting disc to the over pressure safety device so that it cannot be lost (e.g. with a lead wire seal).

⇒ The traceability of the primary material of the replacement bursting disc is guaranteed.

## Completing the replacement of the bursting disc

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

1. ▶



**WARNING!**  
**Risk of scalding!**



**WARNING!**  
**Risk of frostbite!**

Make sure that the medium has stopped escaping from the steam-releasing pipe.

2. ▶ Make sure that the replacement of the bursting disc is visually displayed.
3. ▶ Make sure that the gate valve can be closed again.
4. ▶ Close the gate valve.
5. ▶ If the bursting disc breaks again within a short period of operation, check the mode of operation of the gate valve and, if necessary, have this changed.

## 8 Maintenance

### Maintenance schedule

Interval	Maintenance work	Personnel
To be determined by the operating company	Checking the over pressure safety device for leaks. If necessary (on the onset of signs of fatigue or after consultation with the manufacturer), replace the over pressure safety device.	Pipeline engineer



## 9 Faults and fault correction

### 9.1 Safety notices for fault correction

#### 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.

- 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 or low temperatures!**

Depending on the application of the over pressure safety device or of the pipe, injuries can occur due to the high or low temperature of the components.

- When working on components, wear the following protective equipment: protective gloves, safety goggles.

### Pipeline medium



#### **WARNING!**

#### **Risk of impairing health due to the pipeline medium!**

Coming into contact with the pipeline medium can adversely affect your health.

- Handle the pipeline medium 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.
- Collect any pipeline medium that has run out without delay and dispose of it in an environmentally responsible manner.

### Conduct in the event of dangerous faults

In general, the following applies:

- 1.** ▶ In respect of faults that constitute an immediate danger to persons or property, immediately trigger the emergency stop function.
- 2.** ▶ Determine the cause of the fault.
- 3.** ▶ If correction of the fault requires work in the danger zone, secure the area of the plant in question and open the gate valve.
- 4.** ▶ Have the manufacturer correct faults that affect the safe operation of the over pressure safety device.

## 9.2 Fault table

Fault description	Cause	Remedy	Personnel
Medium escapes from the blow-out nozzle.	Bursting disc is broken.	Replace the bursting disc (☞ <i>Chapter 7.2 "Replacing the bursting disc" on page 44</i> ).	Industrial mechanic (high pressure valves)
Bursting disc breaks shortly after having been replaced.	Wrong type of bursting disc (incorrect triggering pressure) was selected.	Select a bursting disc with the correct triggering pressure (☞ <i>"Rating plate of the bursting disc used" on page 14</i> ). If you have any questions or if anything is unclear, contact the manufacturer (contact details on page 3).	Industrial mechanic (high pressure valves)
	Bursting disc is incorrectly oriented.	Insert the bursting disc correctly oriented (☞ <i>Chapter 7.2 "Replacing the bursting disc" on page 44</i> ).	Industrial mechanic (high pressure valves)
Medium escapes from the steam-releasing pipe while the bursting disc remains intact.	Union nut (Fig. 5/4) is too loose.	Tighten the union nut (Fig. 5/4) to a tightening torque of 100 Nm.	Industrial mechanic (high pressure valves)
	Gasket (Fig. 22/1) is damaged.	Take the gate valve and over pressure safety device out of operation. Have the damaged components replaced. Determine the cause of the deformation and have it eliminated.	Industrial mechanic (high pressure valves)

Fault table



## 10 Dismantling, disposal

### 10.1 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).

#### Pipeline medium

**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:
- Industrial mechanic (high pressure valves)
  - Trained person (operator)
  - Disposal contractor
- Protective equipment:
- Safety goggles
  - Protective work clothing
  - Protective gloves
  - Safety footwear

### Prerequisites:

- The relevant pipe section is shut-off.
  - The gate valve has been opened.
1. ▶ Have an additional person hold the over pressure safety device in position.
  2. ▶ Disconnect the pipe inlet and outlet side from the over pressure safety device.
  3. ▶ If necessary, remove the existing nozzles.
  4. ▶ Remove and set down the over pressure safety device.
  5. ▶ Properly clean the assemblies and components and take them apart.

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

## 10.3 Disposal

### Improper disposal



#### ENVIRONMENT!

#### Danger for the environment due to improper disposal!

Risks for the environment can arise 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 sound disposal.

If a return or disposal agreement has not been concluded, then recycle the disassembled components as follows:

- Scrap the metals.
- Send the plastic elements for recycling.
- Sort and dispose of all the other components according to the properties of their materials.



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