HP Valves BV

Medium & high-pressure valves in accordance with ASME, EN, BS & API

Operation Instruction Manual

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1 Introduction

Once again, many thanks for showing your confidence in our products by selecting it for use in your plant.
The installation, operation and maintenance instructions in this manual are intended to be used for all valves we supply from our standard product range. They may also apply to non-standard products, as long as the special additional instructions are followed as well; these can be made available upon request or can be found on our website
www.hpvalves.com

2 Safety precautions

In terms of their hazard potential, in addition to being subject to these instructions, our products should also be handled in accordance with general safe handling instructions and on a par with pressure vessels. The handling and use of our valves and products should therefore only be entrusted to properly trained personnel.

Proper installation, operation and maintenance are essential to safe and reliable operation of all products supplied by HP Valves. The procedures described in this manual show effective methods for performing the aforementioned activities.
The installation, operation and maintenance of valves may involve working in proximity to fluids at extremely high pressures and/or high temperatures. To minimize the risk of personal injury or damage to the valve, or rendering it unsafe, it is important to follow the instructions described.
Prior to working with valves or related products, personnel should familiarise themselves with this manual and be fully aware of the hazards related to these procedures.

It is also important to note that "safety messages" are not exhaustive. Due to the broad application of the products supplied, HP Valves cannot possibly complete a full risk analysis related to the installation, operation and maintenance of its products.
The safety precautions listed here are for customer information only. HP Valves Oldenzaal BV waives any responsibility related to any omissions in the precautions and instructions for installation, operation and/or maintenance.
Should anyone decide to install, operate or maintain HP Valves products in a way which differs from the procedures described in this manual, they must make sure that this will not jeopardize personal safety, nor valve reliability.
Furthermore we would like to point out that all personnel handling our products should be trained professionals and instructed properly prior to performing the required activity.

If you are dissatisfied or have any questions regarding the tools or methods described, please contact HP Valves by e-mail or phone. Our contact details are shown on the cover page.

I Do not attempt to remove the cap (06) while the overpressure safety valve is pressurized.
II No alteration or modification should be made to any valve or related product, except as sanctioned and/or authorized in writing by HP Valves.
III Never install or attempt to use any valve that cannot be properly identified as to its material and/or pressure class.

3 General

The heating of liquids trapped within the valve body / bonnet chamber is a phenomenon that primarily occurs at gate valves.
If liquid remains in the main valve, after for instance pressure testing, or if condensate develops due to certain operating conditions, there is the risk of an impermissible pressure increase when the main valve is heated up by hot water or steam. The potential pressure increase depends both on the temperature and the extent to which the main valve is filled with trapped liquid and may reach impermissible pressures quickly.
The problem of trapped liquids heating up inside the main valve is particularly dangerous on gate valves equipped with a pressure seal bonnet, since the bonnet seal becomes tighter when subjected to rising pressure.
On gate valves with a bolted bonnet, an impermissible increase in pressure will most likely be relieved through leaks developing at the bonnet gasket.
Gate valves equipped with a pressure seal bonnet, need to be fitted with some kind of body safety device, if excessive heating of trapped liquids is potentially a problem. For instance a pressure relief valve can be used. The body pressure relief valve ensures that the body is protected against excessive loads and deformation under all operating conditions, thus avoiding incidents which may compromise safety.

The likelihood of trapped liquid heating up varies depending on the system and should be individually assessed for each gate valve by the purchaser.

Use the body overpressure relief valve only for the purpose of protecting the main valve, never to protect piping systems, etc.

4 Transport and Storage

Transport

When loading or unloading our products, ensure that they are handled with care and not subjected to sudden knocks. To ensure proper functioning of our products, visually inspect the valves.

If the products are to be shipped further after unloading, make sure that each individual product is properly secured against damage and properly packaged, taking into account the means of shipment.

Receipt

Unless specified otherwise, products are packed in wooden cases fitted with tarred paper on the inside and a layer of plywood between the layers of valves (if applicable). This kind of packing allows normal requirements for transport to be satisfied, guaranteeing effective resistance against humidity. All products have an adequate protection for storage in a closed environment up to a maximum period of 3 months. Standard protection (if not otherwise specified) includes treatment against rust by means of coating or phosphatising and caps in/on exposed openings, such as valve ends and cable/pneumatic entries. Damaged coating should be touched-up as soon as possible in order to prevent corrosion!
If protective caps are removed for inspection purposes, ensure these are refitted in order to maintain cleanliness. If caps are missing we suggest you tape over the openings.
If foreign debris has got into the product, remove it immediately. If using a cleaning agent for this purpose, ensure that the proper solvent is used, especially if the valve is installed in piping by means of welding. On receipt of our products, ensure the items can be properly identified and the following documents are available for verification:

- Packing list
- Operation Instruction Manual
- Material and pressure test certificates

Storage

On site, products delivered must be stored properly to protect them against mechanical damage, ingress of foreign objects, water and/or moisture and corrosion. Storage indoors at ambient temperature is preferred. Should it be unavoidable to store the products outdoors, make sure that products are supported off the ground or paving and are protected by a watertight enclosure.
The protective packaging we provide must be left in place during storage and should only be removed prior to installation or commissioning. Make sure stainless steel valves are stored separately from carbon- / alloy steel valves in order to prevent contamination.

Long-term storage

The following recommendations should be followed when preparing our products for long-term storage. These are necessary to maintain the valves and related products in a proper condition prior to installation and use. It is the purchaser's responsibility to take the necessary precautions for the protection of products in storage.

On receipt of the products at their destination, the wooden cases supplied should be examined thoroughly for signs of mishandling or damage during shipment, exposure to rain and/or ocean spray or ingress of foreign debris.
If the products are to be stored for more than 3 months, make sure that the storage facilities are in an enclosed, weatherproof building with a concrete floor provided with uniform heating, preferably at ambient temperature, or at least 6°C (43°F), maximum temperature variations and/or relative humidity should not exceed 50%.

Long-term storage outdoors is not permitted, unless otherwise explicitly agreed with HP Valves!

During long-term storage ensure to protect the products against mechanical damage, ingress of rain and/or foreign objects and/or corrosion. Likewise, during long-term storage, the protective packaging we provide must be left in place and only removed prior to installation or commissioning.

Furthermore, we recommend opening open the lid of the wooden cases slightly to allow air circulation; prevent condensation and corrosion (keep the cases covered to protect against ingress of water and foreign debris).
Our products are packed with protective caps on/in all openings; do not remove these protective caps unless required for inspection and installation. For storage longer than one year, you could consider removing the packing and applying an absorber, i.e. silica gel, in the correct quantity.

Periodic inspections should be performed on products in long-term storage. The frequency of these inspections should be determined on the basis of storage conditions available. All products should be inspected at least every 4-6 months. Inspect for dirt, moisture or any other type of contamination. If any of the former are found, the product should be thoroughly cleaned and dried.

When products are stored for a long period of time, it is recommended they are labelled as long-term storage items. When these products are ready for use, extra attention should be paid to the condition of the products. Prior to installing valves and/or related products, it is advisable to test these products hydrostatically.

If high-temperature coatings are applied to our products, superficial corrosion can be found on both interior and exterior surfaces after storage of over more than 6 months, due to the fact these coatings require heating to obtain full curing. This superficial corrosion does not affect the functionality of the valve.
To protect uncoated surfaces from corrosion, treat these surfaces with a rust-prevention agent, such as "Cortec VpIC377".

5 Valve Installation

Installation

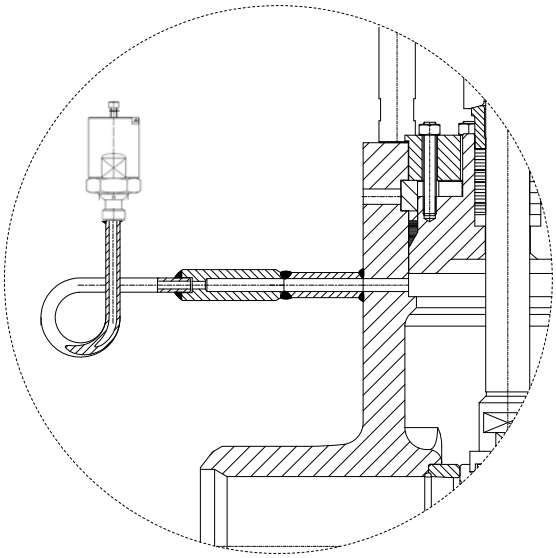
The purchaser, contractor or end-user has overall responsibility for the positioning, installation and operation of the products supplied in the plant.

Planning and installation errors can affect the proper operation of valves and related products, and may even constitute a major hazard potential (e.g. incorrect positioning of check valves or wrong direction of flow). So please take notice of the following safety precautions;

- **Before fitting the valve in position, remove the protective caps from the threaded ends. The valve must be free of all foreign matter. Cleanliness is the cardinal rule when fitting valves. If the pipe-ends require machining, foreign matter must be removed prior to installation of the valve.**
- **The operating limits of the valve must be at least the same as, or exceed the operating limits of the adjacent piping. Relevant pressure-temperature tables should be respected – these can be found in the O&M Manual section 10 of the main valve and on our corporate website** www.hpvalves.com

- Position

It is recommended to install overpressure safety valves with the blow-off path in the vertical position. This orientation provides enhanced protection against trapped dirt between the valve seat and obturator.



Welding

The contractor is responsible for welding the valves / “pigs tails” / piping onto the main valve / piping and for any heat treatment that may be necessary. All welding should be performed in compliance with applicable standards, by qualified welding personnel and with the equipment required to obtain operator safeguard and secure material integrity.

Valves must be welded when they are in their fully closed position. The pipe-ends must be properly aligned so as to prevent the valve / “pigs tail” / piping being subjected to unnecessary strain.
When welding valves / “pigs tails” / piping with socket weld (SW) ends, make sure that the valve is installed using

approximately 2.0 mm clearance between the bottom of the socket and the end of the inserted pipe; this allows for expansion of the pipe-end during welding.

When welding the safety valve assembly onto the pipe, the valve may remain in its fully assembled condition; the metal seated valves do not have to be disassembled before welding.
Prior to welding, make sure the valve is in its fully closed position to minimize the risk of any weld spattering reaching the seat facing.

It is prohibited to attach the welding cable (ground terminal) to the any part of the upper valve assembly. The ground terminal should be attached to an area on the valve body which is free of coating or, even better, on the adjacent pipe itself.

- Heat treatment

Heat treatment has to be performed in compliance with the applicable standards / guidelines. Heating should only be applied by inductive means or by resistance heating pads on the welding area to prevent damage occurring.

Threaded valves

When fitting threaded-end valves, it is important to ensure that both the valve- and pipe threads are clean and undamaged. During installation of threaded-end valves onto the “pigs tail”, make sure to install a new brass ring between the safety valve and the piping to ensure proper sealing. It is mandatory to hold on to the valve body (04) and prohibited to hold the valve in place using the upper valve assembly whilst screwing in and tightening, since this may cause damage to the valve.

Preservation

- Shot blasting

If, for any reason valves are shot-blasted, make sure to prevent ingress of blasting abrasive into the valve body; afterwards it is mandatory to clean the valves thoroughly. Before starting to shot blast, make sure the valves are in their fully closed positions and exposed openings are closed against ingress of blasting abrasive.

- Painting

Make sure valves are in their fully closed position. Moving parts and identification plates should not be painted and need to be protected. Before applying additional layers of paint, check the compatibility with the coating systems already applied.

- Insulation

Overpressure safety valves and adjacent piping / “pigs tails” should be free of insulation.

System cleaning

- Flushing

Before chemical treatment, ensure valves are in their fully closed position to prevent flow through this valve. Failure to do this could result in welding scale, debris or other foreign matter getting trapped between the valve plug and seat, causing damage to one or both faces.

- Cleaning / pickling

Applying the correct pickling process is the sole responsibility of the contractor. In case of doubt, HP Valves should be contacted. Before commencing the pickling process, the valves should be in their fully closed position to prevent flow of pickling medium in these valves. After pickling, the system should be thoroughly flushed.

Generally, it is recommended the system’s non-operational time is minimized after pickling. Depending on the pickling medium and process applied, a maximum of one day could be used as general recommendation.

6 Valve Operation

This pressure relief valve can only be used as an overpressure protection for the main valve.

During hydrotest:
please do not remove the block bolt (07).

During normal operation:
please remove the block bolt (07) in order to avoid overpressure in the main valve.

When a main valve is equipped with a special safety device, such as an over pressure safety valve or equalizing valve, these devices shall be kept in their (locked) open position during normal operation of the main valve.

The valve drawings shall be checked for actual valve configuration and additional instructions.

The pressure relief valve is operated automatically at the pre-set differential pressure. The spring-loaded disc will close when the pressure is reduced (relieved). The valve setting shall not be adjusted since this can cause damage to the main valve.

Damages and/or wear and tear to the pressure relief valve internals can cause leakage to this valve. Because of the valve specific design, materials and pre-set operating pressure, the valve shall be shimmed after repairing / recutting of sealing surfaces to compensate for removed material.

Seat and obturator

If the valves are reported to be leaking through the seat during start-up and/or commissioning, this is usually caused by debris and/or foreign particles. If leakage is identified, try to flush the vales by opening and closing them with sufficient flow. If seat leakage remains, stop operations immediately and disassemble the valve for inspection and to clean the internals. Failing to do so may lead to damaged valve internals. Check our disassembly & re-assembly instructions in section 7 for detailed instructions.

7 Maintenance

General

Before undertaking maintenance and/or (dis)assembly activities, please read the general safety precautions and relevant safety rules of the plant.

Our products must be serviced regularly to ensure trouble-free operation. Typical maintenance includes a visual inspection of the valve. Early detection of minor defects will prevent malfunctioning or major repairs in the future.

Before undertaking maintenance and/or (dis)assembly activities, make sure that the valve is free of pressure, sufficiently cooled and the system is free of hazardous media (steam, water or acid).

Cleaning

The frequency and extent of cleaning depends on the location of the valve and its service conditions. It is important that the valve is kept clean and free of foreign material. Do not allow water or dirt to accumulate in body cavities. Accumulation of any corrosive or extraneous material may interfere with removal of valve parts during disassembly. Excessive rust should not be allowed to build up on valves: if any is detected it is recommended this is removed and an anti-rust agent applied.

Disassembly & re-assembly

- Loosen the locknut (01) whilst holding the valve body (02) in place with an appropriate spanner.
- Unscrew the cap (06) form the valve body (02) and remove the shims (05), spring package (04), disc & disc pin (03). Make sure to store all parts in their correct orientation.
- Clean the valve internals and inspect the disc (03) and seat (02) for signs of damage / erosion.
- In case the seat (02) shows signs of damage, it should be reworked using a 60° countersink drill bit.
- After reworking the seat (02), the removed seat material should be shimmed in order to compensate the removed material and acquire the original pressure setting.
- Reinstall the shims (05), spring package (04), disc & disc pin (03) and place the cap (06) on the valve body (02) again.
- Lock the cap (06) in place by tightening the locknut (01) whilst holding the cap (06) in place with an appropriate spanner.
- Now check the valve for proper operation.

Spare parts

When, during inspection, it becomes apparent parts need to be replaced, it is mandatory to use genuine parts to guarantee proper fit and operation of our products after re-assembly.

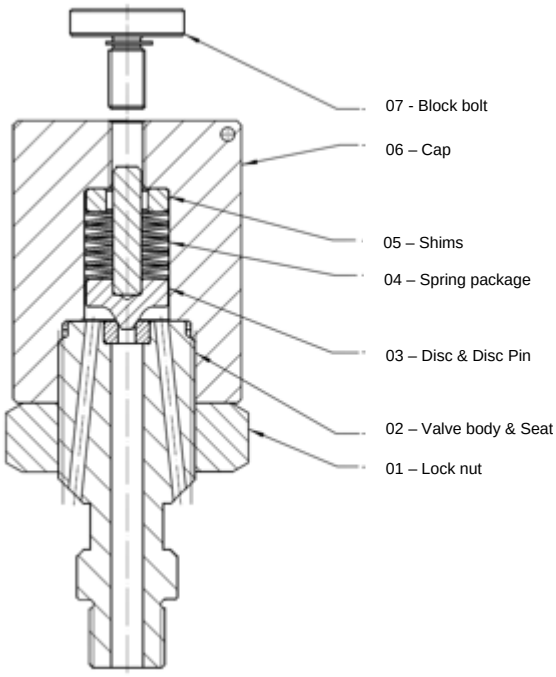
When ordering spare parts, please specify the following: Type of valve, year of manufacture, nominal diameter, body markings, pressure rating, drawing number and (when possible) the purchase order number under which the products were originally supplied.

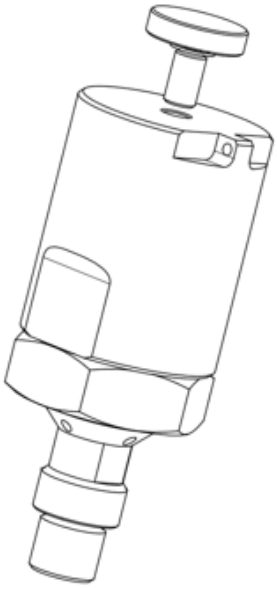
If you have any questions on this matter, please contact us at sales@hpvalves.com

8 Disposal

All our products are designed and manufactured for long-life service. However at the end of the product lifecycle, we would advise our products are recycled in a proper manner. Since the products are free of dangerous substances, such as asbestos, they can be disposed of without the need for special precautions.

9 Cross sectional drawing including parts list





Pos	Part description
01	Locknut M30x2
02	Valve body G3/8” and Seat
03	Disc & Disc Pin
04	Spring package
05	Shims
06	Cap
07	Block bolt