

Operating and assembly instructions

Pressure regulating valves

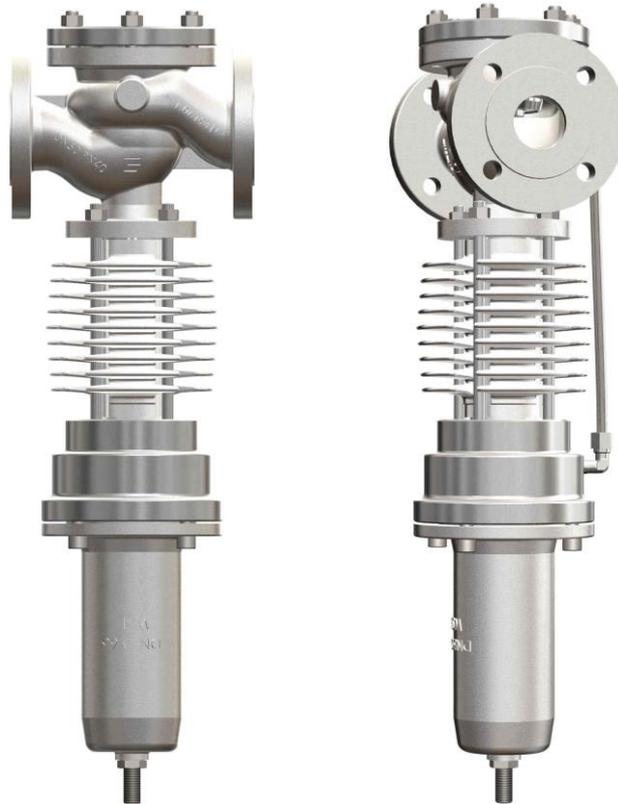


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1.0 General information about the operating instructions

These operating instructions are used as instructions to install and maintain the valves safely. In case of difficulties that cannot be solved with the help of the operating instructions, contact the supplier or manufacturer.

These operating instructions are binding for transport, storage, assembly, commissioning, operation, maintenance and repair. The instructions and warnings must be observed and adhered to.

Handling and all other work must be carried out by competent personnel or all activities must be supervised and checked.

The determination of the area of responsibility, the area of responsibility and the monitoring of the personnel is incumbent on the operator.

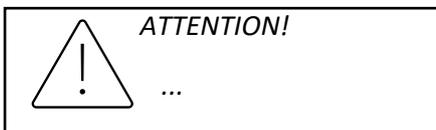
In the event of decommissioning, maintenance or repair, the current regional safety requirements must also be taken into account and observed.

The manufacturer reserves the right to make technical changes and improvements at any time.

These operating instructions comply with the requirements of EU directives.

2.0 Hazard statements

2.1 Meaning of symbols



Warning of a general danger.



Danger in case of non-observance of the operating instructions!
Read and follow operating instructions before assembly, operation, maintenance or disassembly.

2.2 Explanation of safety-relevant information

In these operating and assembly instructions, particular attention is drawn to hazards, risks and safety-relevant information by means of a highlighted presentation.

Notices marked with a symbol listed above and "ATTENTION!" describe behavioral measures, the non-observance of which can lead to serious injury or danger to life for users or third parties or to material damage to the plant or the environment. They must be followed unconditionally, or compliance must be monitored.

However, observance of the other transport, assembly, operation and maintenance instructions as well as technical data (in the operating instructions, the product documentation and on the device itself) is equally essential in order to avoid disturbances that can directly or indirectly cause personal injury or property damage.

3.0 Storage and transport



ATTENTION!

- Protect against external violence (such as shock, impact, vibration, etc.).
- Valve superstructures such as control housings, bonnets and optionally handwheels must not be misused to absorb external forces such as climbing aids, connection points for hoisting gear, etc.
- Suitable means of transport and lifting must be used.
- Weight see catalogue sheet.

- From -20°C to +65°C.
- The coating is a basic coat of paint intended to protect against corrosion during transport and storage. Color protection must not be damaged.

4.0 Description

4.1 Scope

Pressure regulating valves are used for "control of liquid, gaseous and vaporous media in process engineering as well as in plant engineering".



ATTENTION!

- Areas of application, application limits and possibilities of use can be found in the catalogue sheet.
- The pressure regulating valve is suitable for the control of fluids of group II according to pressure equipment correct line 2014/68/EU.
- Certain media require or exclude special materials.
- The valves are designed for normal operating conditions. If the conditions go beyond these requirements, such as aggressive or abrasive media, the operator must specify the higher requirements when ordering.
- Valves made of grey cast iron are not approved for use in systems according to TRD 110.

The specifications comply with the Pressure Equipment Directive 2014/68/EU.

Compliance is the responsibility of the plant designer.

Special markings of the valves must be observed.

The materials of the standard versions can be found in the catalogue sheet.

If you have any questions, please consult the supplier or manufacturer.

4.2 Operation

The pressure regulating valve is a pressure-controlled proportional controller for pressure control of liquid, gaseous and vaporous media of fluid group II in accordance with the Pressure Equipment Directive 2014/68/EU. Auxiliary power is not required.

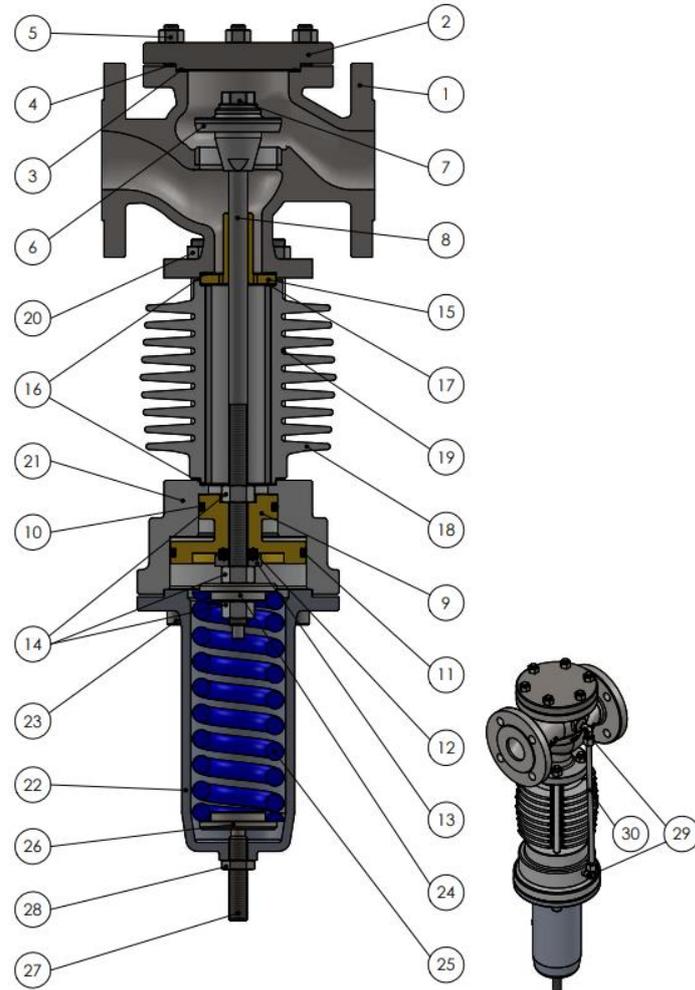
In the depressurized state, the valve is fully open. The medium passes from the inlet to the outlet through the housing. The medium passes from the housing of the valve by a pulse line to the control housing of the valve.

The pressure is converted into a force acting in the closing direction of the cone by the control piston. The force of the preloaded spring acts in the opening direction of the cone. This force is counteracted by the pressure that is passed through the pulse line into the interspace and counteracts it on the upper surface of the control piston.

If both forces are equal, there is equilibrium and the reduced pressure set by the adjustment plate is compensated.

If the reduced pressure changes, the cone is adjusted "up" or "closed" in the respective direction.

4.3 Diagram



4.3.1 Parts List

Materials with designations and figure numbers can be found in the data sheet.

1	Valve body
2	Valve cover
3	Gasket
4	Double end stud bolt
5	Hexagon nut
6	Cone
7	Locking screw
8	Cone rod
9	Control piston
10	O-ring
11	O-ring
12	Gasket
13	Gasket ring
14	Hexagon nut
15	Guide sleeve

16	Gasket
17	Gasket
18	Cooling cylinder
19	Bolt
20	Hexagon nut
21	Control housing
22	Bonnet
23	Socket head screw
24	Spring
25	Spring plate
26	Adjusting screw
27	Locking nut
28	Elbow
29	Pulse line

4.4 Technical specification – Notes

Such as

- **Dimensions**
- **Pressure-temperature assignments, etc.** can be found in the data sheet

Nominal diameter: DN15 – DN100

Pressure levels: PN16, PN25, PN40, PN63, PN100, ANSI/ASME #150, ANSI/ASME #300, ANSI/ASME #600

Low pressure: according to low pressure table min. 0.5 bar, max. 16 bar

Temperature – valve: according to pressure-temperature table see data sheet

Materials:

Body	Internal parts
1.4408	1.4301, 1.4404, 1.4571, Rg7
EN-JS-1030 (PN16) / 1.0619+N (PN40)	1.0576, 1.4057, 1.4571, Ms58, Rg7,

Gasket (O-ring): EPDM, NBR, FKM

Temperature range: EPDM -50 to +140°C
NBR -25 to +120°C
FKM -40 to +200°C

4.5 Marking



Address of the manufacturer: see point 11.0 Guarantee / Warranty

In accordance with the pressure equipment directive diagram 6, Annex II, valves without a safety function may only be CE marked from DN32 onwards.

5.0 Assembly

5.1 General assembly information

In addition to the generally applicable assembly guidelines, the following points must be observed:



ATTENTION!

- Remove flange covers, if any.
- The interior of the valve and the pipe must be free of foreign particles.
- Observe the installation position with regard to air flow, see marking → on the valve.
- Route the pipelines in such a way that harmful shear, bending and torsional forces are kept away.
- Protect valves from contamination during construction work.
- Connection flanges must match.
- Connection screws for piping flanges are preferably to be mounted from the counter flanges (6kt nuts from the valve side).
- Valve structures such as control housings, bonnets and optional handwheels must not be used to absorb external forces such as climbing aids, connection points for hoisting gear, etc. be misused.
- Suitable means of transport and lifting must be used for assembly work.
Weight see data sheet
- Since dangerous medium (hot condensate, steam, etc.) can escape from the vent (screw plugs) on the drive in the event of a defective drive diaphragm, this connection should be provided with a pipeline for safe discharge.

- Planners/construction companies or operators are responsible for the positioning and installation of the products.
- The valves are designed for use in weather-protected systems.
- For use in free-standing areas or in particularly unfavourable environmental conditions, such as corrosion-promoting conditions (seawater, chemical vapours, etc.), special designs or protective measures are recommended.
- The system must be flushed before installing the pressure regulating valve to remove any contaminants that could damage the cone/seating area or clog control holes.
- Center seals between the flanges.
- The hood thread must remain paint-free.

5.2 Installation information on the installation site

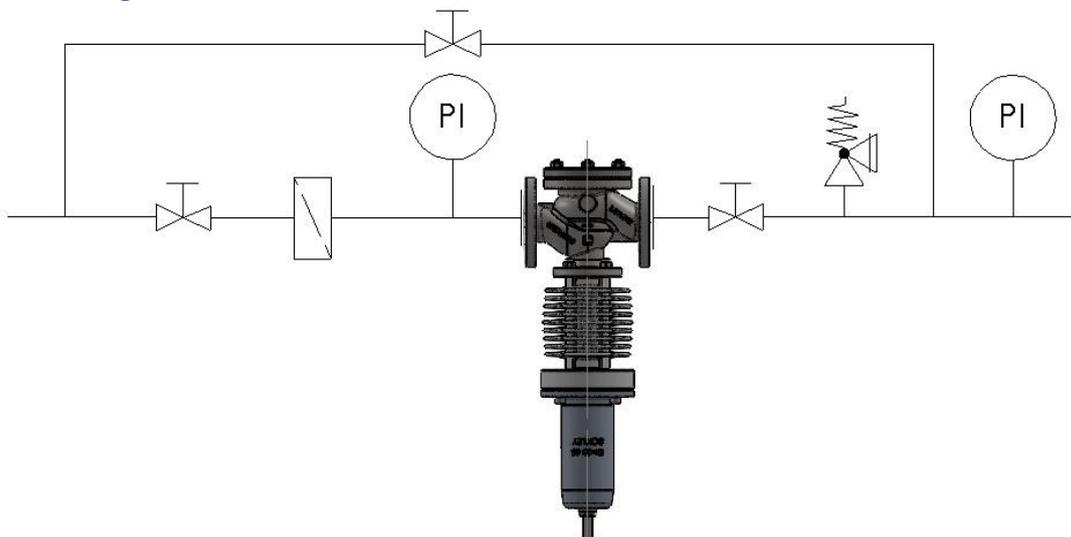
The installation site should be easily accessible and have sufficient space for maintenance. Manual shut-off valves shall be provided upstream and downstream of the pressure regulating valve to enable maintenance and repair work on the pressure regulating valve without emptying the system. The arrangement of a bypass line allows uninterrupted operation by means of manual control.

Pressure gauges must be provided to check inlet and low pressure. Point 5.3 shows in an example of a pressure reducing station the common arrangement of all the before mentioned valves, whereby the pressure reduction should be as close as possible to the consumer.

The pipes upstream and downstream of the pressure regulating valve must be selected in their nominal diameter according to the maximum permissible flow velocities (liquids max. 5 m/s; Saturated steam and gases max. 40 m/s; Superheated steam max. 60 m/s). In the case of compressible media (e. g. steam, air, etc.), an extension must be arranged behind the valve, otherwise the required mass flow will not be achieved due to the increase in volume associated with the expansion.

When insulating the pipelines, it is essential to ensure that the area of the spring and control line is not insulated.

5.3 Plant diagram



5.4 Strainers



ATTENTION!

A strainer should be installed in front of the pressure regulating valve. This should be cleaned at regular intervals.

5.5 Safety valve



ATTENTION!

The system area behind the pressure regulating valve (low pressure side) must be protected against inadmissible overpressure. The design of the safety valve required for this must consider the resulting mass flow at maximum possible inlet pressure and fully open pressure regulating valve. The safety valve must be able to dissipate this mass flow at the response pressure. The response pressure depends on the part of the system with the lowest pressure resistance, whereby there must be a sufficiently large distance between the set reduced pressure and the response pressure.

If it cannot be ruled out that a bypass valve performs more than the pressure regulating valve or is opened at the same time, this additional flow rate must be taken into account when designing the safety valve.

6.0 Commissioning



ATTENTION!

- *Before commissioning, the information on material, pressure, temperature and direction of flow must be checked.*
 - *In principle, the regional safety instructions must be observed.*
 - *Residues in pipes and valves (such as dirt, welding beads, etc.) lead to leaks or damage.*
 - *When operating at high (> 50 °C) or low (< 0 °C) media temperatures, there is a risk of injury if the valve is touched.*
- If necessary, attach warnings or insulation.*
- Before each commissioning of a new plant or recommissioning of a plant after repairs or conversions, it must be ensured:*
- *The proper completion of all work.*
 - *The correct functional position of the valve.*
 - *Guards are fitted.*

The commissioning then takes place as follows:

- Open the shut-off valve behind the pressure regulating valve.
- Now carefully open the shut-off valve in front of the pressure regulating valve (medium must flow).
- It is not necessary to adjust the valve because it is factory set to the contractually specified values. Should there nevertheless be deviations in the pressure, adjustment by the user is possible. Here the manufacturer should be contacted.
- The pressure regulating valve is ready for use.



ATTENTION!

High flow noises may occur during operation.

7.0 Care and maintenance

The maintenance and maintenance intervals are to be determined by the operator according to the conditions of use. However, a visual inspection should take place after one year at the latest and the valve should be completely checked after two years. Here, the manufacturer recommends replacing all seals and o-rings of the valve for material fatigue in order to prevent leaks.

When dismantling the valve, the gaskets must always be replaced.

For the reordering of the seals, please always enter the details of the type plate in order to ensure an assignment of the valve.

8.0 Cause and remedy in the event of operational disruptions

In the event of malfunctions or operating behaviour, it must be checked whether the assembly work has been carried out and completed in accordance with these instructions.



ATTENTION!

When troubleshooting, safety regulations must be followed.

In the event of malfunctions that cannot be remedied based on the following table see section "9.0 Troubleshooting Plan", the supplier or manufacturer must be contacted.

9.0 Troubleshooting Plan



ATTENTION!

- **Observe points 10.0 and 11.0 before assembly and repair work!**
- **Please note points 5.0 and 6.0 before recommissioning!**

Disturbance	Possible causes	Remedy
No flow	Flange covers have not been removed.	Remove flange covers.
Too low flow	Contaminated strainer.	Clean / replace.
	Blockage in the piping system.	Check piping system.
	Valve or Kvs value selected incorrectly.	Insert valve with a larger Kvs value.
Reduced pressure increases sharply when consumers are switched off	Seat / cone leaking because heavily soiled.	Replace valve or, if necessary, seat / cone.
	Control line clogged.	Cleaning the control cable.
	O-ring is defect.	Replace o-ring.
Flange breakage	Transport damage.	Replacing the pressure regulating valve.
	Flanges tightened on one side.	Replacing the pressure regulating valve.
	Transmitting inadmissible forces such as bending or torsional forces.	Tension-free installation.
Reduced pressure does not occur in the full load range	Valve designed too small.	Redesign valve.
	Valve set incorrectly.	Readjust valve.
Valve does not regulate	Control line clogged.	Cleaning the control cable.
	O-ring is defective.	Replace o-ring.
Low pressure oscillates	Ratio of form to low pressure too large.	Reduction through two stages: pressure regulating valve connected in series.
Medium leaks out of the hood (leaking at the spindle)	O-ring defective.	Replace o-ring.
Low pressure cannot be changed	Pressure gauge defective.	Replacing pressure gauges.
	Thread on the pressure screw damaged.	Replacing the pressure screw.
Valve spindle moves only jerkily	Valve cone has eaten slightly due to solid dirt particles.	Clean internal parts, replace cones, guide bushings and o-rings
When the valve is closed, the leak rate is too high	Sealing surfaces on the seat / cone washed out or worn.	Replace valve or, if necessary, seat / cone.
	Sealing edge on seat damaged or worn.	Replace valve or, if necessary, seat / cone.
	Seat / cone leaking because heavily soiled	Clean valve inner parts, mount any strainers, replace valve or, if necessary, seat / cone.
Reduced pressure rises inadmissibly high	Safety valve not available in the reduced pressure system.	Install safety valve.
	Safety valve too small / incorrectly dimensioned.	Redesign the safety valve and replace it if necessary.

10.0 Dismantling the valve



ATTENTION!

In particular, the following points should be noted:

- *Unpressurized piping system*
- *Cooled medium*
- *Emptied plant*
- *In case of corrosive, flammable, aggressive or toxic media, ventilate the piping system*
- *Please wear the necessary personal protective equipment (PPE)*

11.0 Guarantee / Warranty

The scope and period of warranty is specified in the edition of the "General Terms and Conditions of Schley Armaturen GmbH" valid at the time of delivery or deviating from this in the purchase contract itself.

We warrant freedom from defects in accordance with the current state of the art and the confirmed intended use.

No warranty claims can be asserted for damages caused by improper handling or non-observance of the operating and assembly instructions, the data sheet and the relevant regulations.

Justified complaints will be eliminated by rework by us or by specialist companies commissioned by us.

Claims beyond the warranty are excluded. There is no entitlement to a replacement delivery.

Maintenance work, installation of third-party parts, changes in design and natural wear and tear are excluded from the warranty.

Any transport damage must not be reported to us, but immediately to your responsible goods handling, the railway or the freight forwarder, otherwise claims for compensation against these companies will be lost.



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