Einbau- und Bedienungsanleitung
Installation and operating instructions
Instructions de montage et de service

7511- 8010

Baureihe / Series / Série
DR 7511 + DR 7513
DR 7521 + DR 7541

Pressure reducer

Contents:

1. General description

The pressure reducer is a self-activated controller device with no auxiliary energy requirement to adjust the lower (outlet) pressure p2 to the setpoint value. As the pressure rises after the valve, the valve closes in proportion to the change in pressure. The setpoint value is adjusted by pre-stressing the adjustment spring, using a hand-wheel. On installation of the valve, the actuator system is connected directly by a control duct to the pressure tap point or to a condensation vessel placed at the measurement point in the pipe after the valve. This vessel ensures a constant level of condensation, and protects the operating diaphragm of the actuator system from excessively high temperatures.

RTK valves, including pressure reducers, are designed and marked in accordance with the relevant standards.

The following details are marked:
- Nominal width DN (mm)
- Nominal pressure PN (bar)
- Housing material
- Flow direction arrow
- Casting date
- CE mark according to the Pressure Equipment Directive 97/23/EC (> DN 25)

Subject to compliance with all specifications given in this manual, the user can be assured of the problem-free operation of the device, if correctly installed and maintained. RTK will not accept any responsibility for the incorrect installation or start-up of its valves. The operating conditions for valves must be in accordance with those specified in the data sheet. The valves must be installed and operated in accordance with local rules and specifications for industrial valves and installations. Failure to comply with such provisions may lead to hazards to the environment, health or satisfactory plant operation. If in doubt, please contact RTK directly.

2. Maintenance staff requirements

The installation and servicing staff must be appropriately qualified, or provided with suitable training to ensure correct compliance with the instructions in this manual. Where hazards are associated with specific valve components, e.g. the manual adjustment mechanism, owing to the high temperatures present, appropriate countermeasures must be implemented.

Caution! : Before starting to install or operate valves, please read document 0000-7004, “Hazard warnings ...”

3. Transport and storage

The temperature range for transport and storage is from –20 °C to +65 °C. The valves must be properly secured during transportation. Never fit hoisting devices on valve connection openings. Valves should be stored in a clean location, protected from the elements.

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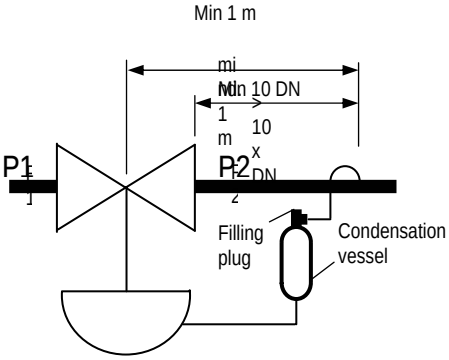
4. Installation

The following requirements must be noted when installing the pressure reducer:

- Installation area:
  The installation area must be easily accessible. There must be sufficient space for servicing procedures and for opening the drive system.
- Before starting the installation procedure:
  Remove any protective flaps, where applicable, and check the valves for any damage that may have occurred during transport or storage.
- Cleaning the pipes:
  To ensure the control valve is tightly sealed, carefully flush the pipes before installation, to prevent any damage to the valve seat or cone from impurities, e.g. rust, scale or weld spatter. It is advisable to fit a dirt trap before the pressure reducer in order to protect the device from soiling.
- Flow direction:
  The flow direction must be as indicated by the arrow on the valve housing.
- Installation location:
  The pressure reducer must be installed in a **horizontal** pipe with the actuator system **down** (except in the case of liquids and gases with temperatures of < +80 °C).

  Caution! : Strict compliance with installation location requirements is essential to ensure the satisfactory operation of the pressure reducer.

- Stress on valve structures:
  The valve, when fitted in the pipe, must never be exposed to bending moments, stress or vibration.
- Pipe routing:
  It is important to ensure correct pipe dimensioning before and after the pressure reducer (normal flow speeds). For cleaning and servicing purposes, it is advisable to place hand-operated stopcocks before the dirt trap and after the pressure reducer. It is also helpful to have a diversion pipe fitted with a hand-operated stopcock, so that the pressure reducer can be removed without shutting down the plant (emergency operation). If a diversion pipe is provided, it must rejoin the main pipe after the pressure tap point.
  In the case of media containing condensation (e.g. steam), the pipe must be laid with a slight gradient on both sides.
- Control duct connection:
  The pressure tap connection (p2) is via a control duct at a point with an undisturbed flow zone after the control valve (min. 10 DN), either in the middle to the side, or at the top of the pipe. The distance between the valve centre and the pressure tap should be at least 1 m, to protect the actuator diaphragm from overheating. In some plant systems, it is also possible to place the pressure tap directly in a device.
  No cross-section reducing devices may be fitted in the control duct (8 x 1 mm), in order to prevent excessive pressure differential values.



Liquids > +130 °C + steam:
For liquids at temperatures higher than +130 °C, a condensation vessel (available as an accessory) **must** be fitted in the control duct. The installation location for the condensation vessel is as shown in the diagram. It should always be placed at the highest point of the pipe. If the pipe is routed vertically upwards before or after the pressure reducer, an automatic water extraction system must

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be provided. Before start-up, fill the actuation chamber and condensation vessel (liquid head) with a clean, neutral medium* until the medium runs over the filling plug (ensuring as little air as possible is trapped in the liquid).

* Use water in the case of water and steam as operating medium, otherwise according to the operating medium.

5. Start-up

Start-up may take place only when all the points in section 2 "Installation" have been checked off.

Start up the pressure line (p1) with max. flow, continuously increasing the flow by slowly turning the hand-operated stopcock (to avoid condensation shocks).
There should be no sudden changes in temperature or pressure. Check that all connections are tightly sealed.

Caution! : Medium discharge can cause injuries.

Avoid pressure pulses; quick-action stop valves are permissible only as an emergency cut-off arrangement. It is advisable to protect the system by installing a safety valve after the pressure reducer, to ensure that the maximum permissible operating pressure (see Table) is not exceeded.

Actuator type	Max. permissible operating pressure [bar]
A	3 bar
B	6 bar
C	15 bar

It is advisable to place pressure gauges before and after the pressure reducer in order to monitor the pressures in the plant. The pressure gauge on the lower pressure side must never be placed before the pressure tapping point.

Before delivery, the pressure reducer has been set to a pressure that corresponds approximately to the setpoint value specified in the purchase order. Fine-tuning in operational conditions should be carried out as follows:

- Adjusting the setpoint value:
  According to the readings on the pressure gauge after the valve, turn the hand-wheel to set the required minimum pressure. Turn the wheel to the right to increase the pressure, and to the left to reduce the pressure. The setpoint value range is shown on the identification plate.

6. Servicing

When correctly used, this pressure reducer is maintenance-free.

For any repair work required, ensure compliance with the following instructions:

- All repair work must be carried out by qualified personnel, using the correct tools and original spare parts.
- Before removing the valve from the plant, always ensure that the relevant part of the plant has been shut down.
- Reduce the pressure and temperature to safe levels.
- Maintenance staff must wear suitable protective clothing for the working conditions.
- Any valves removed from the pipe must be fitted with a new seal (valve/pipe).
- Tighten the screws in the valve cover with the valve open.
- After reinstalling the valve in the pipe, check that it is operating properly before re-starting the system.

7. Faults

- If the controller shows a tendency to vibrate, it is advisable to install a needle valve in the control duct.
- If the downstream pressure increases with zero flow, the valve is not closing with a tight seal. The reason may be damage to the actuation diaphragm; otherwise, the problem may lie with the seal itself (soiling or damage to the seat/cone area). The valve must be dismantled in order to repair a fault of this kind, which will require re-machining of the seat or cone, preferably by us.
- If the pressure after the pressure reducer does not reach the required level in spite of sufficient inlet pressure, the device has not been set correctly (see "Start-up"), the valve is too small, or the spring may have been damaged.

8. Spare parts

When ordering spare parts, always specify the factory number (e.g. WE 255012) and model ID (e.g. DR 7511), as per the details on the identification plate.

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