

D.0025360002

Operating instructions (Translation)



Pressure relief valve DBD

88025360002-04

Englisch

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KRACHT

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1 General

1.1 About the documentation

These operating instructions describe the installation, operation and maintenance of the following device:

Pressure relief valve DBD

The device is manufactured in different versions. Information about the version concerned in the individual case can be found on the device's type plate.

These operating instructions are a component of the device and must be kept accessible for the personnel near the device at all times.

If you have any questions about these operating instructions, please contact the manufacturer.

1.2 Manufacturer's address

KRACHT GmbH
Gewerbestraße 20
DE 58791 Werdohl
phone: +49 2392 935-0
fax: +49 2392 935-209
email: info@kracht.eu
web: www.kracht.eu

1.3 Symbolism

 **DANGER**

Identification of an immediate hazard, which would result in death or severe bodily injury if not avoided.

 **WARNING**

Identification of a potential medium risk hazard, which would lead to death or severe bodily injury if not avoided.

 **CAUTION**

Identification of a low risk hazard, which could lead to minor or medium bodily injury if not avoided.

 **NOTICE**

Flagging of notices to prevent property damage.



Identification of basic safety instructions. Non-compliance can lead to hazards for people and the device.



Flagging of special user tips and other especially useful or important information.

2 Safety

2.1 Intended use

1. The device has been designed for operation with fluid.
2. The device may be operated in filled condition only.
The medium must be compatible with the materials used in the device. The chemical competence is necessary for this. Be careful with ethylene oxide or other cathalytic or exothermic or self-decomposing materials. Please consult the manufacturer in cases of doubt.
3. The device may be operated only in usual industrial atmospheres. If there are any aggressive substances in the air, always ask the manufacturer.
4. Operation of the device is only permissible when complying with the operating instructions and applicable documents.
Deviating operating conditions require the express approval of the manufacturer.
5. In case of any use of the device not according to specification, any warranty is voided.

2.2 Personnel qualification and training

The staff designated to assemble, operate and service the device must be properly qualified. This can be through training or specific instruction. Personnel must be familiar with the contents of this operating instructions.



Read the operating instructions thoroughly before use.

2.3 Basic safety instructions



1. Comply with existing regulations on accident prevention and safety at work along with any possible internal operator regulations.
2. Pay attention to the greatest possible cleanliness.
3. Wear suitable personal protection equipment.
4. Do not remove, make illegible or obliterate type plates or other references on the device.
5. Do not make any technical changes on the device.
6. Maintain and clean the device regularly.
7. Use spare parts approved by the manufacturer only.

2.4 Basic hazards

 **DANGER****Hazardous fluids!**

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

 **WARNING****Failure of load-carrying parts due to overload!**

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

 **WARNING****Failure of load-carrying parts due to overload!**

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Use only connections and lines approved for the expected pressure range.
2. Securely prevent exceeding the permissible pressure, e.g. by using pressure relief valves or rupture discs.
3. Design pipework so that no tensions, e.g. caused by changes in length due to fluctuations in temperature, are transmitted to the device.

 **WARNING****Failure of load-carrying parts due to overload!**

Danger of injury from flying parts.

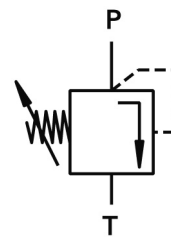
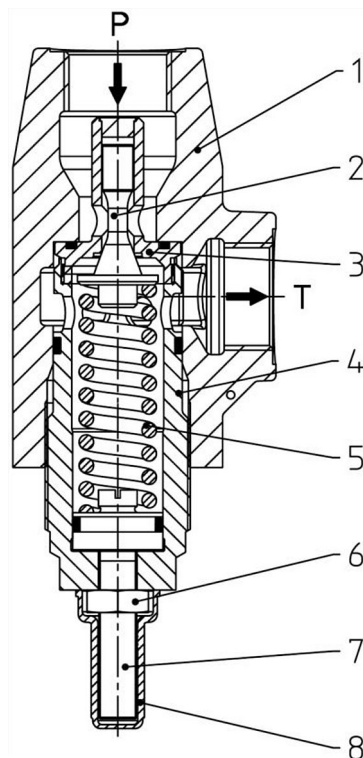
Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

3 Device description

3.1 Functional principle

Pressure relief valves of the DBD series are directly operated seat valves and are used to safeguard low-pressure hydraulic circuits.



Explanation

- 1 Housing
- 2 Valve cone
- 3 Valve seat
- 4 Threaded bush
- 5 Compression spring
- 6 Hexagonal nut
- 7 Adjustment screw
- 8 Protective cap

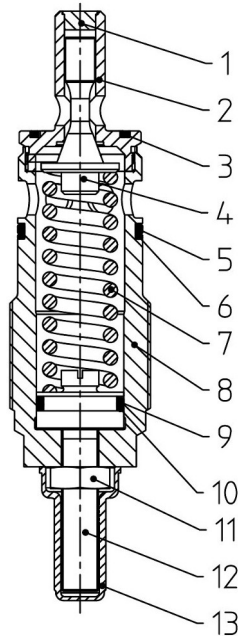
The valve cone is pressed by the compressed spring into the valve seat, which blocks Pressure connection (P) from Tank connection (T). When the response pressure is reached by adjusting with the setscrew, the valve cone releases the fluid flow to the tank connection.

The valve should preferably be mounted vertical, with the adjustment screw facing down.

The flow direction is marked with an arrow on the unit housing. It is always implemented from the pressure port (P) to the tank connector (T).

3.2 Basic design

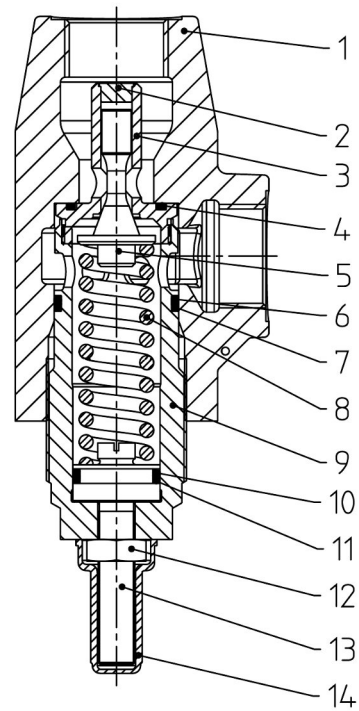
DBD .. E. A ...



Explanation

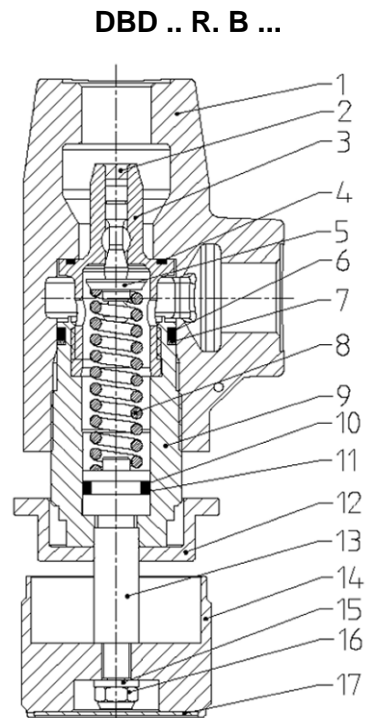
- 1. Damping plugs
- 2. Valve seat
- 3. O-Ring
- 4. Valve cone
- 5. O-Ring
- 6. Support ring
- 7. Compression spring
- 8. Threaded bush
- 9. O-Ring
- 10. Support ring
(only NG 20)
- 11. Hexagonal nut
- 12. Adjustment screw
- 13. Protective cap

DBD .. R. A ...



Explanation

- 1. Housing
- 2. Damping plugs
- 3. Valve seat
- 4. O-Ring
- 5. Valve cone
- 6. O-Ring
- 7. Support ring
- 8. Compression spring
- 9. Threaded bush
- 10. O-Ring
- 11. Support ring
(only NG 20)
- 12. Hexagonal nut
- 13. Adjustment screw
- 14. Protective cap



Explanation

- | | |
|-----------------------|----------------------|
| 1. Housing | 10. O-Ring |
| 2. Damping plugs | 11. Support ring |
| 3. Valve seat | (only NG 20) |
| 4. O-Ring | 12. Check nut |
| 5. Valve cone | 13. Adjustment screw |
| 6. O-Ring | 14. Twist grip |
| 7. Support ring | 15. Washer |
| 8. Compression spring | 16. Hexagonal nut |
| 9. Threaded bush | 17. Washer |

3.3 Type key

3.3.1 DBD 06; 08

| Ordering example DBD 06/08 | | | | | | | | | | | | | |
|----------------------------|--|-----------|--|----------|----------|--|----------|--|------------|--|-----------|--|------------|
| DBD | | 06 | | R | 1 | | A | | 200 | | S1 | | FKM |
| 1. | | 2. | | 3. | 4. | | 5. | | 6. | | 7. | | 8. |

| Explanation of type key DBD 06/08 | | | | |
|---------------------------------------|---|-----------------------|--|---------------------------------------|
| 1. | Product name | | | |
| 2. | Nominal size/Housing connection ⁽¹⁾ | | | |
| | 06 | G1/4 | | |
| | 08 | G3/8 | | |
| 3. | Fixing type | | | |
| | E | Screw-in valve | R | Pipeline installation |
| 4. | Design serial number/Design | | | |
| | 1 | Design serial number | Screw-in valve - E | |
| | | Design | Pipeline installation - R Housing material: EN-GJL-300 | |
| 5. | Actuation type | | | |
| | A | Can be preset | D | Can be preset, Console integration |
| | B | Twist grip | E | Twist grip, Console integration |
| 6. | Pressure stage | | | |
| | 400 | 80 - 400 bar | 125 | 20 - 125 bar |
| | 315 | 60 - 315 bar | 063 | 10 - 63 bar |
| | 200 | 35 - 200 bar | | |
| 7. | Code for special versions | | | |
| | S1 | without damping plugs | | |
| 8. | Seal | | | |
| | No specification | NBR | FKM | FKM |
| ⁽¹⁾ Pipe thread: ISO 228-1 | | | | |

3.3.2 DBD 10

| Ordering example DBD 10 | | | | | | | |
|-------------------------|----|----|----|----|-----|----|-----|
| DBD | 10 | R | 3 | B | 200 | S7 | FKM |
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |

| Explanation of type key DBD 10 | | | | |
|--------------------------------|------------------------------------|--------------------------------|---|---------------------------------------|
| 1. | Product name | | | |
| 2. | Nominal size | | | |
| | 10 | | | |
| 3. | Fixing type | | | |
| | E | Screw-in valve | D | Connection KP 1 |
| | R | Pipeline installation | | |
| 4. | Design serial number/Design | | | |
| | 1 | Design serial number | Screw-in valve - E | |
| | | Design | Connection KP 1 - D Tank connection ⁽¹⁾ : G1/2 Housing material: AlCuMg1 | |
| | 3 | Design | Housing connection ⁽¹⁾ : G1/2 Housing material: EN-GJS-400-18LT | |
| | 5 | Design | Housing connection ⁽¹⁾ : G3/4 Housing material: EN-GJL-300 | |
| 5. | Actuation type | | | |
| | A | Can be preset | D | Can be preset, Console integration |
| | B | Twist grip | E | Twist grip, Console integration |
| 6. | Pressure stage | | | |
| | 400 | 60 - 400 bar | 085 | 10 - 85 bar |
| | 300 | 10 - 300 bar | 040 | 10 - 40 bar |
| | 200 | 10 - 200 bar | 016 | 5 - 16 bar |
| | 150 | 10 - 150 bar | | |
| 7. | Code for special versions | | | |
| | S1 | Stroke limit on the valve cone | | |
| | S5 | for low viscosity media | | |
| | S7 | without damping plugs | | |
| 8. | Seal | | | |
| | No specification | NBR | FKM | FKM |

⁽¹⁾ Pipe thread: ISO 228-1

3.3.3 DBD 20

| Ordering example DBD 20 | | | | | | | |
|-------------------------|----|----|----|----|-----|----|-----|
| DBD | 20 | R | 2 | B | 315 | S3 | FKM |
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |

| Explanation of type key DBD 20 | | | | |
|--------------------------------|-----------------------------|--|--|---------------------------------------|
| 1. | Product name | | | |
| 2. | Nominal size | | | |
| | 20 | | | |
| 3. | Fixing type | | | |
| | E | Screw-in valve | R | Pipeline installation |
| 4. | Design serial number/Design | | | |
| | 2 | Design serial number | Screw-in valve - E | |
| | | Design | Pipeline installation - R Housing connection ⁽¹⁾ : G1 Housing material: EN-GJS-400-18LT | |
| 5. | Actuation type | | | |
| | A | Can be preset | D | Can be preset, Console integration |
| | B | Twist grip | E | Twist grip, Console integration |
| 6. | Pressure stage | | | |
| | 315 | 70 - 315 bar | 125 | 30 - 125 bar |
| | 200 | 50 - 200 bar | 063 | 10 - 63 bar |
| 7. | Code for special versions | | | |
| | S1 | Stroke limit on the valve cone | | |
| | S3 | Stroke limit on the valve cone (S1) without damping plugs | | |
| | S4 | for low viscosity media | | |
| | S8 | for low viscosity media (optimized characteristic at 80 to 150 bar) | | |
| 8. | Seal | | | |
| | No specification | NBR | FKM | FKM |

⁽¹⁾ Pipe thread: ISO 228-1

4 Technical data

4.1 General

| General information DBD | | |
|--|---------------|---|
| Design | | Seat valve, directly operated |
| Fixing type | | Screw-in valve / Pipeline installation Connection KP 1 (DBD 10) |
| Housing connection ⁽¹⁾ | | DBD 06 R 1 Whitworth pipe thread G1/4 |
| | | DBD 08 R 1 Whitworth pipe thread G3/8 |
| | | DBD 10 R 3 Whitworth pipe thread G1/2 |
| | | DBD 10 R 5 Whitworth pipe thread G3/4 |
| | | DBD 10 D 1 Tank connection: Whitworth pipe thread G1/2 |
| | | DBD 20 R 2 Whitworth pipe thread G1 |
| Type of damping | | Valve cone with damper |
| Mounting position | | preferably vertical, pressure set screw facing down |
| Max. flow capacity | $Q_{\max.}$ | See section 4.2 "Permissible pressure range" |
| Operating pressure | p | |
| Nominal pressure | p_N | |
| Pressure setting ranges | $p_{v \min.}$ | |
| | $p_{v \max.}$ | |
| Viscosity | v_{\min} | 10 mm ² /s |
| | v_{\max} | 600 mm ² /s |
| Fluid temperature | ϑ_m | See section 4.3 "Permissible temperature range" |
| Ambient temperature | ϑ_u | |
| Material | | See section 4.4 "Material data" |
| Oil cleanliness | | NAS 1638 Class 9 ISO 4406:1999 Code 20/18/15 |
| Permissible media | | Hydraulic fluids according to DIN 51524/25 Lubricating fluids without abrasive components. (Petrols, solvents, etc. are not permissible.) |
| ⁽¹⁾ Pipe thread: ISO 228-1 | | |

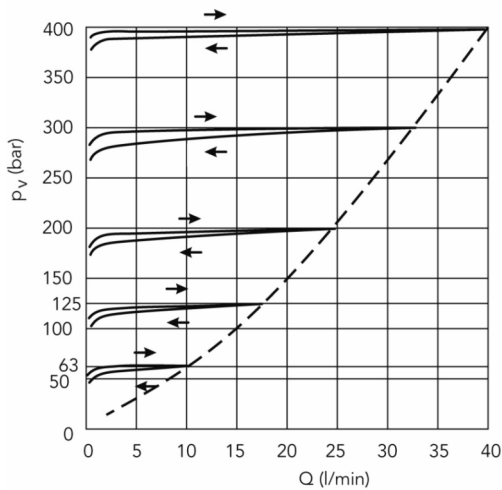
4.2 Permissible pressure range

4.2.1 Operating pressure

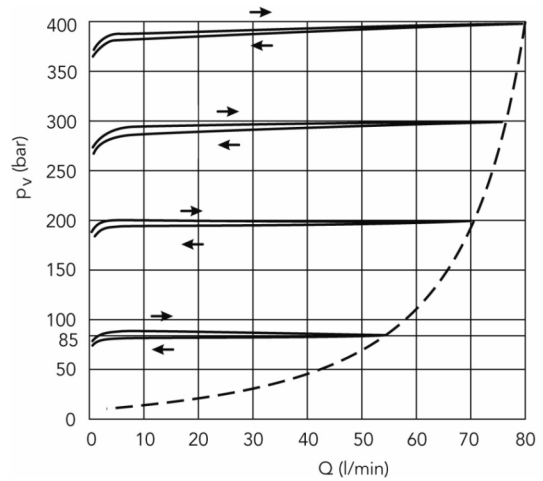
| Nominal size | Nominal pressure | Inlet pressure | | Outlet pressure |
|--------------|------------------|----------------------------|---------------------------|---------------------------|
| | p_N [bar] | $p_{e \text{ min.}}$ [bar] | $p_{e \text{ max}}$ [bar] | $p_{R \text{ max}}$ [bar] |
| 06 | 400 | 20 | 410 | 210 |
| 08 | | | | |
| 10 | | 15 | | |
| 20 | 315 | 20 | 325 | |

4.2.2 p_v - Q characteristic curves (at 34 mm²/s)

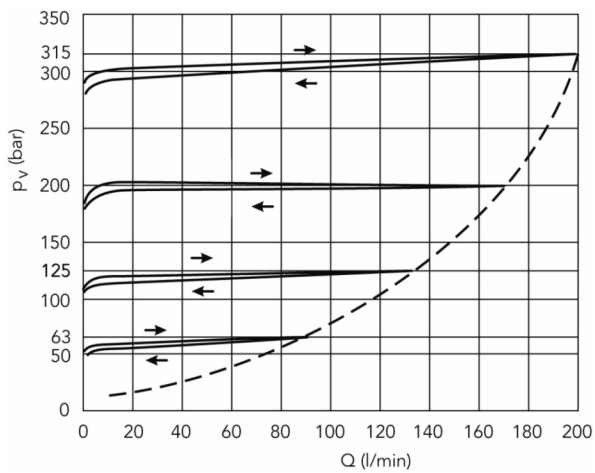
DBD 06/08



DBD 10



DBD 20



4.2.3 Layout pressure setting range - flow rate DBD 06; 08

| Pressure stage | Pressure setting ranges [bar] | | Flow [l/min] | |
|----------------|-------------------------------|----------------------|-------------------------|-------------------------|
| | $p_{v \text{ min.}}$ | $p_{v \text{ max.}}$ | $Q_{\text{max.}}$ | |
| | | | at $p_{v \text{ min.}}$ | at $p_{v \text{ max.}}$ |
| 400 | 80 | 400 | 15 | 40 |
| 315 | 60 | 315 | 10 | 30 |
| 200 | 35 | 200 | 8 | 25 |
| 125 | 20 | 125 | 5 | 15 |
| 063 | 10 | 63 | 5 | 10 |

4.2.4 Layout pressure setting range - flow rate DBD 10

| Pressure stage | Pressure setting ranges [bar] | | Flow [l/min] | |
|----------------|-------------------------------|----------------------|-------------------------|-------------------------|
| | $p_{v \text{ min.}}$ | $p_{v \text{ max.}}$ | $Q_{\text{max.}}$ | |
| | | | at $p_{v \text{ min.}}$ | at $p_{v \text{ max.}}$ |
| 400 | 60 | 400 | 55 | 80 |
| 300 | 10 | 300 | 15 | 75 |
| 200 | | 200 | | 70 |
| 150 | | 150 | 10 | 55 |
| 085 | | 85 | | 45 |
| 040 | | 40 | | 30 |
| 016 | 5 | 16 | 5 | 20 |

4.2.5 Layout pressure setting range - flow rate DBD 20

| Pressure stage | Pressure setting ranges [bar] | | Flow [l/min] | |
|----------------|-------------------------------|----------------------|-------------------------|-------------------------|
| | $p_{v \text{ min.}}$ | $p_{v \text{ max.}}$ | $Q_{\text{max.}}$ | |
| | | | at $p_{v \text{ min.}}$ | at $p_{v \text{ max.}}$ |
| 315 | 70 | 315 | 60 | 200 |
| 200 | 50 | 200 | 50 | 170 |
| 125 | 30 | 125 | 40 | 130 |
| 063 | 10 | 63 | | 90 |

4.3 Permissible temperature range

| Sealing material | Fluid temperature ϑ_m ⁽¹⁾ | |
|------------------|--|----------------------------------|
| | $\vartheta_{m \text{ min}}$ [°C] | $\vartheta_{m \text{ max}}$ [°C] |
| NBR | -20 | 80 |
| FKM | -15 | |

⁽¹⁾ Comply with media-specific properties.

| Sealing material | Ambient temperature ϑ_u | |
|------------------|-----------------------------------|----------------------------------|
| | $\vartheta_{u \text{ min}}$ [°C] | $\vartheta_{u \text{ max}}$ [°C] |
| NBR | -20 | 60 |
| FKM | -15 | |

4.4 Material data

| Nominal size | Fixing type | Material | | | |
|--------------|-------------|-----------------|-------------------|--------------------|-----------------|
| | | Housing | Seal | Compression spring | Other materials |
| 06 | E | Steel | NBR --- FKM | Spring steel | Steel |
| | R | EN-GJL-300 | | | |
| 08 | E | Steel | | | |
| | R | EN-GJL-300 | | | |
| 10 | E | Steel | | | |
| | R | EN-GJS-400-18LT | | | |
| | D | AlCuMg1 | | | |
| 20 | E | Steel | | | |
| | R | EN-GJS-400-18LT | | | |

4.5 Weight

| Nominal size | Fixing type | Weight [kg] | |
|--------------|-------------|----------------|------|
| | | Actuation type | |
| | | A; D | B; E |
| 06 | E | 0.3 | - |
| | R | 0.8 | |
| 08 | E | 0.3 | |
| | R | 0.8 | |
| 10 | E | 0.5 | 0.8 |
| | R | 1.4 | 1.7 |
| 20 | E | 1.0 | 1.3 |
| | R | 2.9 | 3.2 |

4.6 Dimensions

Dimensions of the device can be found in the relevant technical data sheets.

5 Transport and storage

5.1 General

- After receipt, check the device for transport damages.
- If transport damage is noticed, report this immediately to the manufacturer and the carrier. The device must then be replaced or repaired.
- Dispose of packing material and used parts in accordance with the local stipulations.

5.2 Storage

The device's function is tested in the plant with mineral hydraulic oil. Then all connections are closed. The remaining residual oil preserves the interior parts for up to 6 months.

Metallic exposed exterior parts are protected against corrosion by suitable conservation measures, also up to 6 months.

In case of storage, a dry, dust-free and low-vibration environment is to be ensured. The device is to be protected against influences from weather, moisture and strong fluctuations of temperature. The recommended storage conditions are to be adhered to.

Below the permissible ambient temperature ϑ_u elastomer seals lose their elasticity and mechanical loading capacity, since the glass transition temperature is fallen below. This procedure is reversible. A force action on the device is to be avoided in case of storage below the permissible ambient temperature ϑ_u .

When storing for a long period of time (> 6 months), treat all surfaces at risk of corrosion again with suitable preserving agents.

If high air humidity or aggressive atmospheres are expected, take additional corrosion-preventing measures.



Storage in corrosion protection bags (VCI) maximum of 6 months.



NOTICE

Corrosion/chemical impact

Improper storage can render the device useless.

1. Protect endangered surfaces by means of suitable conservation measures.
2. Comply with recommended storage conditions.

**Recommended storage conditions**

1. Storage temperature: 5 °C - 25 °C
2. Relative air humidity: < 70 %
3. Protect elastomer parts from light, especially direct sunlight.
4. Protect elastomer parts from oxygen and ozone.
5. Comply with maximum storage times of elastomeric parts:
 - 5 Years: AU (Polyurethane rubber)
 - 7 Years: NBR, HNBR, CR
 - 10 Years: EPM, EPDM, FEP/PTFE, FEPM, FKM, FFKM, VMQ, FVMQ

6 Installation

6.1 Safety instructions for installation

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Use only connections and lines approved for the expected pressure range.
2. Securely prevent exceeding the permissible pressure, e.g. by using pressure relief valves or rupture discs.
3. Design pipework so that no tensions, e.g. caused by changes in length due to fluctuations in temperature, are transmitted to the device.

6.2 Mechanical installation

6.2.1 Preparation

- Check the device for transport damage and dirt.
- Remove existing preservatives.
 - Use only those cleaning agents that are compatible with the materials used in the device.
 - Do not use cleaning wool.
- Compare the environmental and ambient conditions at the place of installation to the permissible conditions.
 - Expose the device only to small vibrations, see IEC 60034-14.
 - Secure sufficient access for maintenance and repair.

6.2.2 Screw-in valve

- Screw the screw-in valve into the designated housing with the specified torque.
 - Do not damage seals during assembly.

| Tightening torques [Nm] | | |
|-------------------------|----------------------|---------|
| Nominal size | Pressure stage [bar] | |
| | ≤ 200 | ≤ 400 |
| 6 | 50 ±5 | 80 ±5 |
| 8 | | |
| 10 | 100 ±5 | 150 ±10 |
| 20 | 150 ±10 | 300 ±15 |

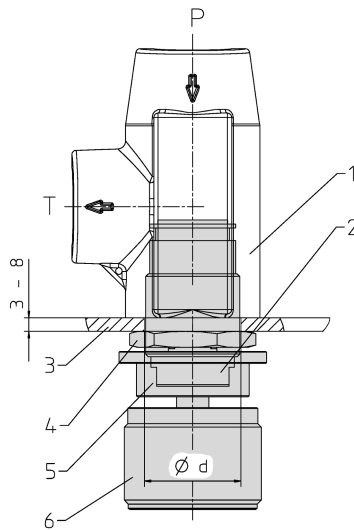


Select the material and dimensions of the planned housing to ensure sufficient safety for all conceivable operating conditions.

6.2.3 Pipeline installation

- Install the device preferably vertical with the pressure adjustment screw facing down.
- Take measures against accidental touching of hot surfaces (> 60 °C).

6.2.4 Console integration



Explanation

1. Housing
2. Screw-in valve
3. Desk panel
4. Hexagonal nut
5. Check nut DBD
6. Twist grip

| Installation hole | | |
|-------------------|-------------------------------|-------------|
| Nominal size | Thread size Screw-in valve | Ø d [mm] |
| 06 | M28x1.5 | 30 |
| 08 | | |
| 10 | M35x1.5 | 36 |
| 20 | M45x1.5 | 46 |



For installation, the screw-in valve can be unscrewed from the valve housing as a unit.

- Position the housing on the desk panel. [1, 3]
- Screw the screw-in valve into the designated housing with the specified torque. [1, 2]
 - Do not damage seals during assembly.

| Tightening torques [Nm] | | |
|-------------------------|----------------------|---------|
| Nominal size | Pressure stage [bar] | |
| | ≤ 200 | ≤ 400 |
| 6 | 50 ±5 | 80 ±5 |
| 8 | | |
| 10 | 100 ±5 | 150 ±10 |
| 20 | 150 ±10 | 300 ±15 |

- Hand-tighten hexagonal nut. [4]
- Take measures against accidental touching of hot surfaces (> 60 °C).

6.3 Connection lines

6.3.1 General



WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Use only connections and lines approved for the expected pressure range.
2. Securely prevent exceeding the permissible pressure, e.g. by using pressure relief valves or rupture discs.
3. Design pipework so that no tensions, e.g. caused by changes in length due to fluctuations in temperature, are transmitted to the device.



Additional connections

1. Provide measurement connections for pressure and temperature as close as possible to device.
2. If necessary, provide a facility to fill or empty the device and the line system.
3. If necessary, provide a facility to vent the device and the line system.

6.3.2 Mounting Connection lines



Position of the device connections: See [chapter 3 "Device description"](#)

- Clean all lines.
 - Do not use cleaning wool.
 - Pickle and flush welded pipes.
- Remove the protective plugs.
- Mount the lines.
 - Comply with the manufacturer's information.
 - Do not use any sealing materials such as hemp, Teflon tape or putty.

7 Operation start-up

7.1 Safety instructions for start-up

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

CAUTION

Hot surfaces!

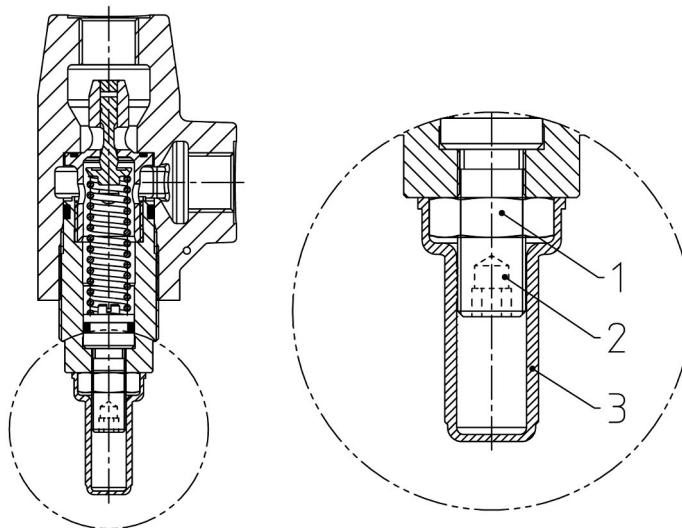
Burn injury to skin if touched.

1. Wear protective gloves at temperatures $\geq 48^{\circ}\text{C}$.

7.2 Pressure setting

The response pressure of the device is factory set to the mean value of each pressure stage. If applicable, the pressure setting must be adapted during commissioning.

Pressure setting for actuation type: A



1 Hexagonal nut

2 Adjustment screw

3 Protective cap

- Remove the protective cap
- Remove hexagon nut
- Set the response pressure using the adjusting screw
 - clockwise = Higher response pressure
 - counterclockwise = Lower response pressure
- Tighten hexagonal nut
- Put on the protective cap



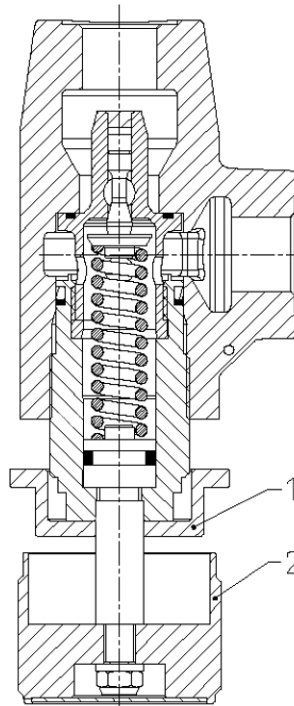
WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

Pressure setting for actuation type: B

1 Check nut

2 Twist grip

- Loosen the lock nut
- Set the response pressure with the adjusting screw
 - clockwise = Higher response pressure
 - counterclockwise = Lower response pressure
- Secure the twist grip with a lock nut

**WARNING****Failure of load-carrying parts due to overload!**

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

7.3 Further operation start-up

- Open existing shut-off elements upstream and downstream of the device.
- Vent the system at the highest possible point.
- Check the operating data such as:
 - Response pressure
 - System pressure (as close as possible to device)
 - Fluid temperature (as close as possible to device)
 - ...
- Document the operating data of the initial start-up for later comparison.
- Check the device for leaks.
- Check all threaded connections for leaks and retighten if necessary.



Existing venting and drain plugs must always be closed during operation according to specification.

8 Removal

8.1 Safety instructions for removal

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

CAUTION

Hot surfaces!

Burn injury to skin if touched.

1. At temperatures $\geq 48^{\circ}\text{C}$ the device must be allowed to cool down first.

8.2 General

- Depressurise and de-energize the system.
- Close existing shut-off elements upstream and downstream of the device.
- Open existing drain elements and loosen connection lines. Collect and dispose of discharging medium so that no hazard arises for persons or environment.
- Dismantle the device.
- Clean the device.
- Close the device connections and lines to prevent dirt penetration.

9 Maintenance

9.1 Safety instructions for maintenance

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

CAUTION

Hot surfaces!

Burn injury to skin if touched.

1. At temperatures $\geq 48^{\circ}\text{C}$ the device must be allowed to cool down first.

9.2 Maintenance work



Checking and documentation of the operating data

Regular checking and documentation of all operating data such as pressure, temperature, current consumption, degree of filter soiling, etc. contributes to early problem detection.

- Perform maintenance according to specification.
- Replace defective and worn components.
- If required, request spare parts lists and assembly drawings from the manufacturer.
- Document the type and scope of the maintenance work along with the operating data.
- Compare the operating data with the values of the first commissioning. Determine the cause in case of major non-compliances (> 10 %).
- Dispose of packing material and used parts in accordance with the local stipulations.



Barriers and instructions

All barriers and warning signs removed during this must be attached to their original position on completing maintenance and/or repairs.

9.3 Maintenance instructions

The following information provides recommendations on maintenance work and maintenance intervals for the device being used.

Depending on the actually occurring loads in operation, the type, scope and interval of the maintenance work can deviate from the recommendations. The equipment builder/operator shall write an obligatory maintenance plan.



Within the framework of preventive maintenance, it is appropriate to replace wear parts before reaching the wear limit.

With corresponding expertise and sufficient equipment, the replacement can be carried out by the equipment builder/operator. Please consult the manufacturer about this.



Warranty

In case of improper implementation, any warranty is voided.

| Maintenance recommendations Pressure relief valve | | | |
|--|---|------------------|-----------------------------|
| Interval | Maintenance work | Employees | Duration approx. [h] |
| Firstly: after max. 24 h | Inspection: Valve function | 1 | 1 |
| | Inspection: Response pressure | | |
| | Inspection: System pressure | | |
| | Inspection: Fluid temperature | | |
| | Inspection: Device temperature | | |
| | Inspection: Check potential equalisation for firm seating and functionality (if existing) | | |
| | Inspection: Condition of operating fluid | | |
| Daily | Audiometric monitoring: Unusual noise | 1 | 0.1 |
| | Cleaning: Remove dust deposits and dirt with a moist cloth | | |
| | Visual inspection: Leakages | | |
| 2000 Operating hours - - - Rotational direction monitoring of the motor, e.g. with a rotating field instrument. After 12 months | Inspection: Valve function | 1 | 1 |
| | Inspection: Response pressure | | |
| | Inspection: System pressure | | |
| | Inspection: Fluid temperature | | |
| | Inspection: Device temperature | | |
| | Inspection: Condition of operating fluid | | |
| As required | Replace: Seals | 1 | 1 |

10 Repairs

10.1 Safety instructions for repair

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

CAUTION

Hot surfaces!

Burn injury to skin if touched.

1. At temperatures $\geq 48^{\circ}\text{C}$ the device must be allowed to cool down first.

10.2 General

The repairs covers:

1. Troubleshooting
Determination of damage, pinpointing and localisation of the damage cause.
2. Elimination of damage
Elimination of the primary causes and replacement or repair of defective components. The repair is generally made by the manufacturer.

Repairs by manufacturer

- Before returning the device, fill in the *return notification* form. The form can be filled in online and is available as a pdf file download.



Device contains hazardous material

If the device was operated with dangerous liquids, it must be cleaned before the return. If this should not be possible, the safety data sheet of the hazardous material is to be provided beforehand.

Repair by equipment builder/operator

If corresponding expertise and sufficient equipment is available, the equipment builder/operator can also make the repairs. Please consult the manufacturer about this.

- If required, request spare parts lists and assembly drawings from the manufacturer.
- Use spare parts approved by the manufacturer only.
- Dispose of packing material and used parts in accordance with the local stipulations.



Warranty

In case of improper implementation, any warranty is voided.



Barriers and instructions

All barriers and warning signs removed during this must be attached to their original position on completing maintenance and/or repairs.

10.3 Detecting and eliminating failures

| Failure | | Potential causes | Possible measures |
|--|--|---|---|
| 1 | Increased noise <i>Mechanical vibrations</i> | Air in the spring chamber | Bleed system |
| 2 | Response pressure too high | Valve cone tight or jammed (Contaminated medium) | Clean the device |
| | | | Replace the device |
| | | | Provide filtration |
| 3 | Valve does not respond | Valve blocked | Adjust valve Comply with the adjustment range |
| 4 | Leakages <i>Seal failure</i> | Poor maintenance | Comply with maintenance plan Replace seals |
| | | Mechanical damage | Replace seals |
| | | Thermal overload | Check the operating datas Replace seals |
| | | Corrosion/chemical impact | Check the material compatibility Replace seals |
| Consult the manufacturer for all unidentifiable failures. | | | |