

Pressure reducing valve

Operating manual

Series
DMV 755
DMV 765



Version BA-2016.02.11 EN
Print-No. 300 536
TR MA DE Rev001

ASV Stübbe GmbH & Co. KG
Hollwieser Straße 5
32602 Vlotho
Germany
Phone: +49 (0) 5733-799-0
Fax: +49 (0) 5733-799-5000
E-mail: contact@asv-stuebbe.de
Internet: www.asv-stuebbe.com



We reserve the right to make
technical changes.
Read carefully before use.
Save for future use.

1 About this document

This manual

- is part of the fitting
- applies to all series referred to
- describes safe and proper operation during all operating phases

1.1 Target groups

Operating company

- Responsibilities:
 - Keep this manual available at the place of operation, also for future use.
 - Ensure that employees read and observe this manual and other applicable documents, especially the safety instructions and warnings.
 - Observe any additional country-specific rules and regulations that relate to the system.

Qualified personnel, fitter

- Mechanics qualification:
 - Qualified employees with additional training for fitting the respective pipework.
- Electrical qualification:
 - Qualified electrician
- Responsibility:
 - Read, observe and follow this manual and the other applicable documents, especially all safety instructions and warnings.

1.2 Other applicable documents

To download: Resistance guide Chemical resistance of the materials used	
http://www.asv-stuebbe.de/pdf_resistance/300051.pdf	
	To download: Data sheet DMV755 Technical data, operating conditions
http://www.asv-stuebbe.de/pdf_datasheets/300542.pdf	
To download: Data sheet DMV765 Technical data, operating conditions	
http://www.asv-stuebbe.de/pdf_datasheets/300554.pdf	
	To download: CE declaration of conformity Conformity with standards
http://www.asv-stuebbe.de/pdf_DOC/300168.pdf	

Tab. 1 Other application documents, purpose and where found

1.3 Warnings and symbols

Symbol	Meaning
	<ul style="list-style-type: none"> • Immediate acute risk • Death, serious bodily harm
	<ul style="list-style-type: none"> • Potentially acute risk • Death, serious bodily harm
	<ul style="list-style-type: none"> • Potentially hazardous situation • Minor injury
	<ul style="list-style-type: none"> • Potentially hazardous situation • Material damage
	<p>Safety warning sign</p> <ul style="list-style-type: none"> ▶ Take note of all information highlighted by the safety warning sign and follow the instructions to avoid injury or death.
	Instruction
1. , 2. , ...	Multiple-step instructions
✓	Precondition
→	Cross reference
	Information, notes

Tab. 2 Warnings and symbols

2 General safety instructions

 The manufacturer accepts no liability for damages caused by disregarding any of the documentation.

2.1 Intended use

- Exclusively use the fitting as pressure-reducing valve in pipes for appropriate media (→ Resistance list).
- Adhere to the operating limits (→ 9.2.2 Pressure and temperature limits, Page 14).
- Observe setting range (→ 9.2.1 Setting range, Page 14).
- Use fitting for solids-free media.

2.2 General safety instructions

 Read and observe the following regulations before carrying out any work.

2.2.1 Obligations of the operating company

Safety-conscious operation

- Only operate the fitting if it is in perfect technical condition and only use it as intended, staying aware of safety and risks, and in adherence to the instructions in this manual.
- Ensure that the following safety aspects are observed and monitored:
 - Intended use
 - Statutory or other safety and accident-prevention regulations
 - Safety regulations governing the handling of hazardous substances
 - Applicable standards and guidelines in the country where the pump is operated
- Make personal protective equipment available.

Qualified personnel

- Make sure all personnel tasked with work on the fitting have read and understood this manual and all other applicable documents, especially the safety, maintenance and repair information, before they start any work.
- Organize responsibilities, areas of competence and the supervision of personnel.
- The following work should be carried out by specialist technicians only:
 - Installation, repair and maintenance work
 - Work on the electrical system
- Make sure that trainee personnel only work on the fitting under supervision of specialist technicians.

2.2.2 Obligations of personnel

- Observe the instructions on the fitting and keep them legible, e.g. nameplate, identification marking for fluid connections.
- Only carry out work on the fitting if the following requirements are met:
 - System is empty
 - System has been flushed
 - System is depressurized
 - System has cooled down
 - System is secured against being switched back on again

2.3 Specific hazards

2.3.1 Hazardous media

- When handling hazardous media (e.g. hot, flammable, explosive, toxic, hazardous to health or the environment), observe the safety regulations for the handling of hazardous substances.
- Use personal protective equipment when carrying out any work on the fitting.
- Collect leaking pumped liquid and residues in a safe manner and dispose of in accordance with environmental regulations.

3 Layout and Function

3.1 Marking

3.1.1 Nameplate

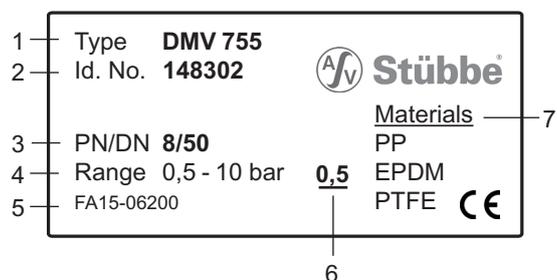


Fig. 1 Nameplate (example)

- 1 Type
- 2 ID number
- 3 Nominal pressure [bar] / Nominal diameter [mm]
- 4 Pressure range
- 5 Serial number – production date
- 6 Pressure presetting
- 7 Materials

3.2 Layout

The fitting is a pressure relief valve controlled by medium. It closes at a defined inlet pressure and is used to reduce primary pressures to operating pressures and for regulated, constant operating pressures.

As a result, the system parts downstream of the fitting are safely protected against excess pressure.

- Optional installation position
- Fastening via threaded inserts (metal inserts) in the valve body

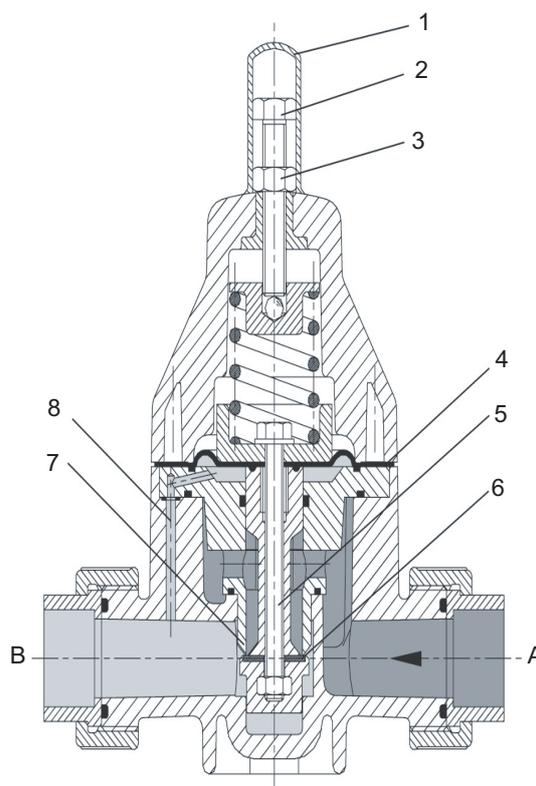


Fig. 2 Layout DMV 755

3.3 Direction of flow

 The direction of flow can be identified by the arrow on the fitting.

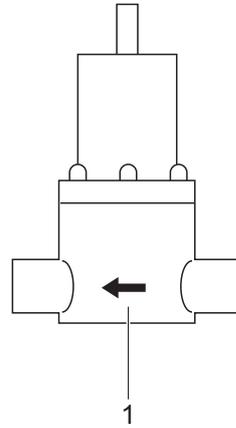


Fig. 4 Fitting with directional arrow (example)

1 Directional arrow

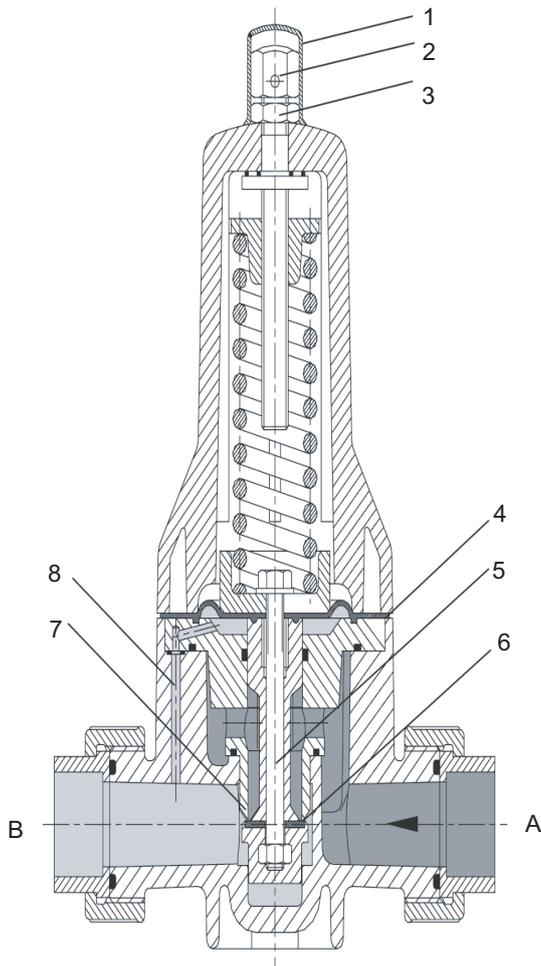


Fig. 3 Layout DMV 765

- A Primary side
- B Secondary side
- 1 Protection cap
- 2 Adjustment screw
- 3 Counter nut
- 4 Piston
- 5 Membrane
- 6 Flat sealing ring
- 7 Valve seat
- 8 Control bore hole

4 Transport, Storage and Disposal

4.1 Unpacking and inspection on delivery

1. Unpack the fitting when received and inspect it for transport damage.
2. Report any transport damage to the manufacturer immediately.
3. Ensure that the information on the nameplate agrees with the order/design data.
4. For immediate installation, dispose of packaging material according to local regulations.
 - For later installation, leave the fitting in the original packaging.

4.2 Transportation

1. If possible, transport fitting (including drive) in original packaging.
2. To transport, lift the fitting by hand, weight specifications (→ Data sheet)

4.3 Storage

NOTE

Material damage due to inappropriate storage!

- ▶ Store the fitting properly.
-
- ▶ Make sure the storage room meets the following conditions:
 - Dry
 - Frost-free
 - Vibration-free
 - Not in direct sunlight
 - Storage temperature +10 °C to +60 °C

4.4 Disposal

-  Plastic parts can be contaminated by poisonous or radioactive media to such an extent that cleaning will not be sufficient.

WARNING

Risk of poisoning and environmental damage from medium.

- ▶ Use personal protective equipment when carrying out any work on the fitting.
 - ▶ Before disposing of the fitting:
 - Collect escaping medium and dispose separately according to local regulations.
 - Neutralize residues of medium in the fitting.
 - ▶ Remove plastic parts and dispose of them in accordance with local regulations.
-
- ▶ Dispose of fitting in accordance with local regulations.

5 Installation and connection

5.1 Preparing for installation

5.1.1 Check operating conditions

1. Ensure the design of the fitting is consistent with the purpose intended:
 - Materials used (→ nameplate).
 - Medium (→ order and design data).
2. Ensure the required operating conditions are met:
 - Resistance of body and seal material to the medium (→ resistance lists).
 - Media temperature (→ 9.2.2 Pressure and temperature limits, Page 14).
 - Working pressure (→ 9.2.2 Pressure and temperature limits, Page 14).
 - Setting range (→ 9.2.1 Setting range, Page 14).
3. Consult with the manufacturer regarding any other use of the device.

5.2 Planning pipelines

5.2.1 Designing pipelines

WARNING

Risk of poisoning and environmental damage from medium.

Leaks due to impermissible pipework forces.

- ▶ Ensure that the fitting is not subject to any pulling or thrusting forces or bending moments.

1. Plan pipes safely:
 - No pulling or thrusting forces
 - No bending moments
 - Adjust for changes in length due to temperature changes (compensators, expansion shanks)
 - Optional installation position
2. Dimensions (→ Data sheet).

5.3 Installing fitting in pipe

WARNING

Risk of poisoning and environmental damage from medium.

Leak due to faulty installation.

- ▶ Installation work on the pipes should only be performed by technicians who have been specially trained for the pipework in question.

NOTE

Material damage due to contamination of the fitting!

- ▶ Make sure no contamination reaches the fitting.
- ▶ Flush the pipe with a neutral medium.

 The fitting is installed according to the connection type of the pipes.

 For connection with solvent welding/fusion spigot ends: Use suitable solvent welding/fusion socket ends.

 Observe direction of flow (→ 3.3 Direction of flow, Page 6).

5.3.1 Fixed connection with solvent welding/fusion spigot ends

1. Prepare pipe ends according to connection type.
2. Adhesively apply or weld fitting with solvent welding/fusion socket ends.

5.3.2 Connection with flange

1. Prepare pipe ends according to connection type.
2. Depending on the connection type, insert flat gasket or O-ring.
3. Radially push the fitting between the flange ends.
4. Bolt fitting and flange with flange screws, nuts and washers.
While doing so, observe tightening torques: (→ 9.2.3 Tightening torques, Page 14).

5.3.3 Connection with union nut and insert

1. Prepare pipe ends according to connection type.
2. Unscrew union nuts and slide over free pipe ends.
 - Check mounting direction.
3. Connect inserts with pipe ends.
4. Position fitting between the pipe ends.
5. Hand-tighten the union nut.

5.4 Performing the hydrostatic test

 Pressure test using neutral medium, e.g. water.

1. Pressurize the fitting, ensuring:
 - Test pressure < permissible system pressure
 - Test pressure < 1.5 PN
 - Test pressure < PN + 5 bar
2. Check the fitting for leaks.

6 Operation

6.1 Set pressure

 Presetting from factory: 0.5 bar (→ 3.1.1 Nameplate, Page 5). Other presetting possible upon consultation with manufacturer.

Set the pressure reducing valve under the same conditions encountered later during operation!

Recommendation for the setting: Installation of a diaphragm guard before the pressure reducing valve.

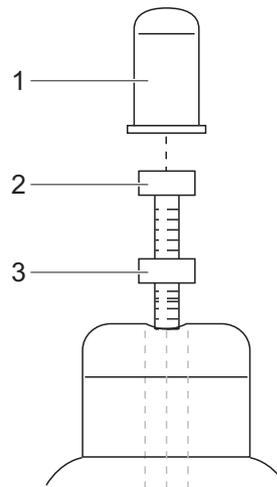


Fig. 5 Set pressure (schematic representation)

- 1 Protection cap
- 2 Adjustment screw
- 3 Counter nut

1. Remove protection cap (1) at adjustment screw (2) from the valve.
2. Undo locknut (3).
3. Turn adjustment screw (2) counter-clockwise until the pressure spring is perceptibly completely relieved of tension.

Valve is open.

4. Start up system.
5. Turn adjustment screw (2) clockwise until desired system pressure is reached.
6. Fix the adjustment screw (2) using a ring wrench, then tighten the locknut (3).

 Adjustment screw can be sealed to prevent unauthorized adjustment, if necessary.

7. Plug on protection cap (1), if present.

6.2 Commissioning

- ✓ Fitting correctly installed and connected

WARNING

Risk of injury and poisoning due to medium spraying out.

- ▶ Use personal protective equipment when carrying out any work on the fitting.
-
- ▶ After the initial stresses due to pressure and operating temperature, check if the fitting is sealed.

7 Maintenance

WARNING

Risk of injury and poisoning due to hazardous media liquids!

- ▶ Use personal protective equipment when carrying out any work on the fitting.

7.1 Servicing

1. Visual and function check (every three months):
 - Normal operating conditions unchanged
 - No leaks
 - No unusual operating noises or vibrations
 - Tightening torques of casing screws
(→ 9.2.3 Tightening torques, Page 14).
2. Clean fitting with a moist cloth if necessary.

7.2 Maintenance

WARNING

Risk of injury and poisoning due to hazardous or hot media.

- ▶ Use personal protective equipment when carrying out any work on the fitting.
- ▶ Safely collect the media and dispose of it in accordance with environmental regulations.

WARNING

Risk of injury during disassembly!

- ▶ Wear protective gloves, components can be very sharp-edged due to wear or damage.
- ▶ Remove components with springs (e.g. pneumatic drive) carefully, since spring tension can cause components to be ejected.

7.2.1 Removing fitting

1. Ensure that:
 - System is empty
 - System has been flushed
 - System is depressurized
 - System has cooled down
 - System is secured against being switched back on again
2. Remove fitting from the pipe.
3. Decontaminate fitting if required.
 - Dead space in the fitting may still contain medium.

7.2.2 Renew diaphragms and seals

 Exploded drawing: (→ 9.1.2 Drawings, Page 13).

1. Remove protective cap (18).
2. Undo locknut (16/2.3).
3. DMV 755: Unscrew hexagon screw (15) until pressure spring (8) is relieved of tension.
DMV765: Turn hexagon nut (2.4) counter-clockwise until the stop.
– Attention: Spring must be free of tension.
4. Remove protective cap (25).
5. Unscrew housing screws (19/20) and nuts (21) and remove with washers (22).
6. Remove upper part (2) upward.
7. Remove pressure plate (4), if present, steel ball (9), pressure spring (8) and spring plate (4).
8. Remove diaphragm (5).
9. Check housing (1) in interior (seal seat) for damage.
– If case of damage, replace housing (1).
10. Insert diaphragm (5).
– Position screw holes above each other.
11. Set spring plate (4) with pressure plate (6), if present, steel ball (9) and pressure spring (8) centered onto diaphragm (5).
12. Set upper part (2) onto fitting.
13. Tighten housing screws (19/20) with washers (22) and nuts (21) on fitting (→ 9.2.3 Tightening torques, Page 14).
14. Put on protective caps (25).
15. DMV755: Screw in hexagon screw (15) until spring resistance can be felt.
16. Performing the hydrostatic test (→ 5.4 Performing the hydrostatic test, Page 9).
17. Set pressure (→ 6.1 Set pressure, Page 9).
18. Tighten locknut (16/2.3).
19. Put on protective cap (18).

7.3 Replacement parts and return

1. For ordering spare parts or returns
(→ <http://www.asv-stuebbe.com/service/downloads>).



2. Have the following information ready to hand when ordering spare parts (→ nameplate).
 - Fitting type
 - ID number
 - Nominal pressure and diameter
 - Body and seal material

8 Troubleshooting

WARNING

Risk of injury and poisoning due to hazardous or hot media.

- ▶ Use personal protective equipment when carrying out any work on the fitting.
- ▶ Safely collect the media and dispose of it in accordance with environmental regulations.

Consult with the manufacturer regarding faults which are not identified in the following table, or which cannot be traced to the indicated causes.

Error	Possible cause	Corrective action
Fitting leaky at diaphragm	Insufficient contact pressure (diaphragm fastening)	▶ Retighten screws (19, 20)
	O-ring leaky	▶ Renew O-ring (13) (→ 7.2.2 Renew diaphragms and seals, Page 11).
Pressure rises above permissible value	Diaphragms leaky	▶ Renew diaphragms (→ 7.2.2 Renew diaphragms and seals, Page 11).
	Valve seat leaking	▶ Renew flat sealing ring (29) (→ 7.2.2 Renew diaphragms and seals, Page 11).
	O-ring leaky	▶ Renew O-rings (10, 11, 13, 27) (→ 7.2.2 Renew diaphragms and seals, Page 11).
	Control bore hole in housing and/or separating disc soiled	▶ Disassemble and clean fitting (→ 7.2.2 Renew diaphragms and seals, Page 11).
	Piston jams	▶ Disassemble and clean fitting (→ 7.2.2 Renew diaphragms and seals, Page 11).
Valve does not open	Fitting installed in backwards	▶ Install fitting in correction direction (→ 3.3 Direction of flow, Page 6).
Medium leaks out at adjustment screw	Diaphragms defective	▶ Renew diaphragms (→ 7.2.2 Renew diaphragms and seals, Page 11).

Tab. 3 Troubleshooting

9 Appendix

9.1 Replacement parts

9.1.1 Part numbers and designations

Item	Designation
1	Housing, complete
2	Upper part
2.1	spring nut
2.2	Adjustment screw
2.3	Hexagon nut
2.4	Cap nut
2.5	Axial bearing washer
2.6	Axial needle bearing
2.7	Clamping sleeve
2.8	Hexagon nut
3	Separating disc ¹⁾
4	Spring plate
5	Diaphragm ¹⁾
6	Pressure plate
7	Washer
8	Pressure spring
9	Steel ball
10	O-ring ¹⁾
11	O-ring ¹⁾
12	Piston ¹⁾
13	O-ring ¹⁾
14	Hexagon nut
15	hexagon bolt
16	Counter nut
17	O-ring ¹⁾
18	Protection cap
19	Housing screw (hexagon screw)
20	Housing screw (hexagon screw)
21	Hexagon nut
22	Washer
22.5	Washer
23	Union end
24	Union nut
25	Protection cap

Item	Designation
26	Protection cap
27	O-ring ¹⁾
28	Piston guidance ¹⁾
29	Flat sealing ring ¹⁾
31	Plug

Tab. 4 Part designations

1) Spare part

9.1.2 Drawings

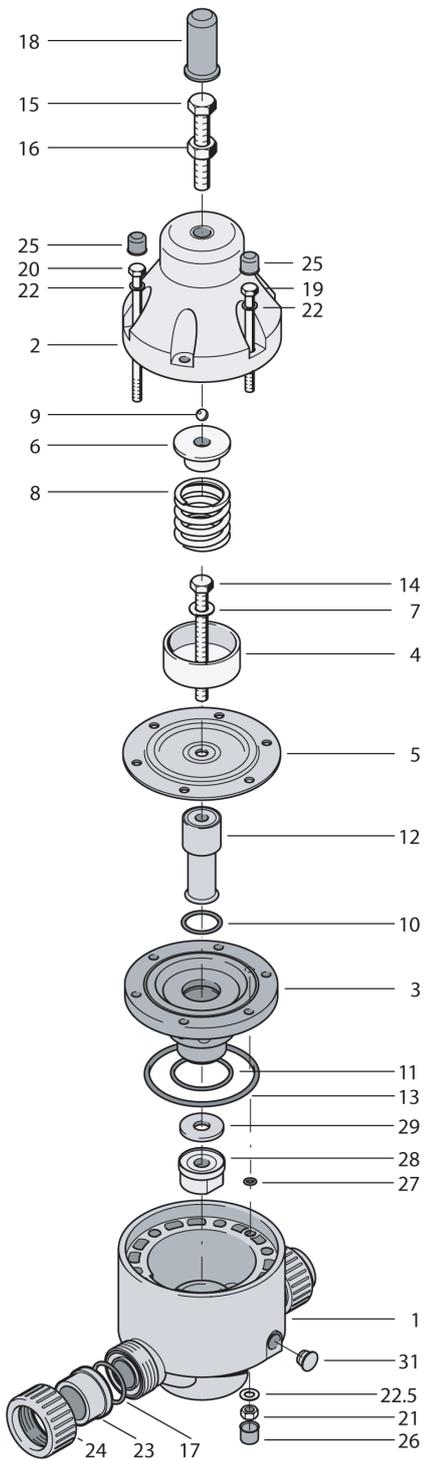


Fig. 6 Drawing DMV 755

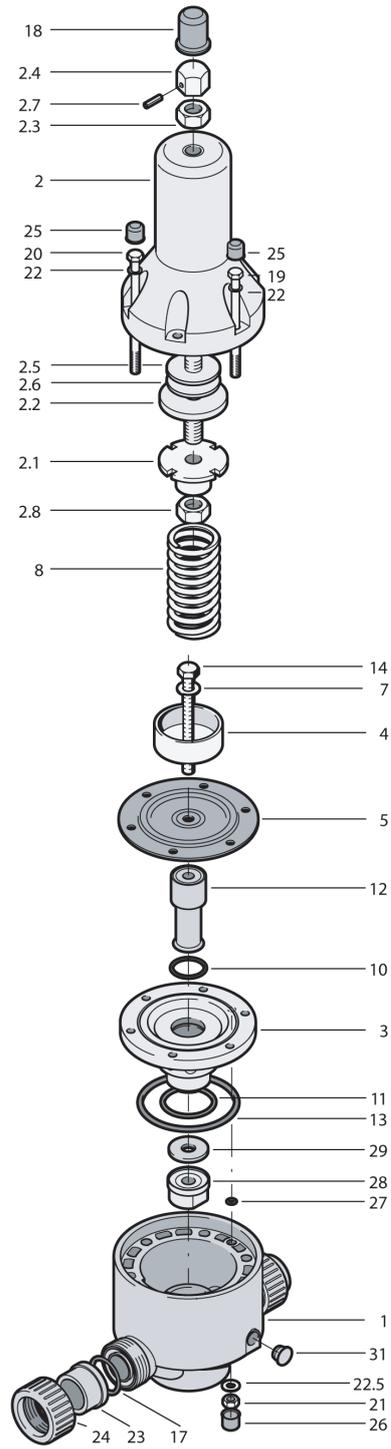


Fig. 7 Drawing DMV 765

9.2 Technical specifications

 Technical data (→ Data sheet).

9.2.1 Setting range

DMV 755: 1–9 bar

DMV 765: 0.5–9 bar

9.2.2 Pressure and temperature limits

 Other media (→ resistance lists).

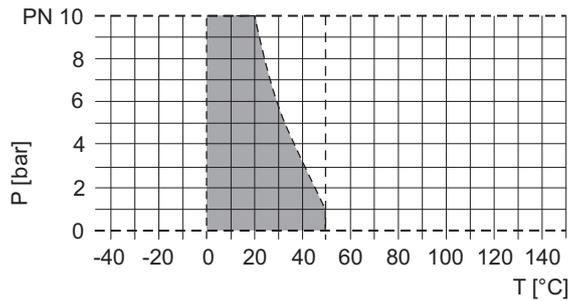


Fig. 8 Pressure and temperature limits PVC-U

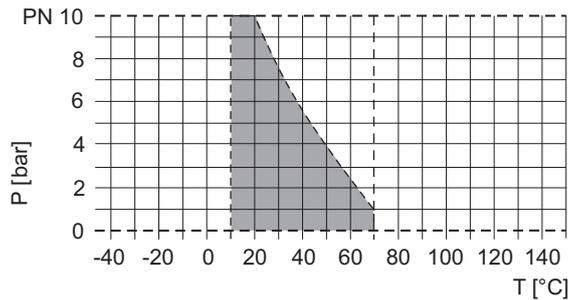


Fig. 9 Pressure and temperature limits PP

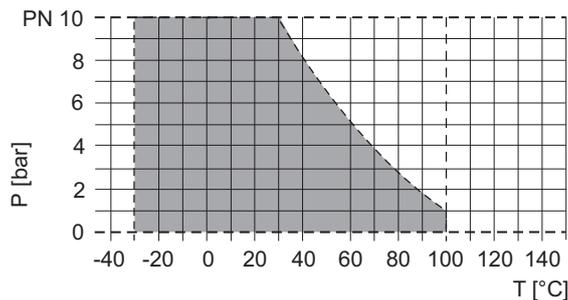


Fig. 10 Pressure and temperature limits PVDF

9.2.3 Tightening torques

Description	Tightening torque [Nm] for sizes						
	16	20	25	32	40	50	63
Flange PP/steel	–	10	15	15	20	25	35
Flange GFR	5	7	10	15	20	25	32
Housing screws ¹⁾ (hex screws, hex nuts)	4.5	4.5	6	6	8	8	8

Tab. 5 Tightening torques

1) greased

9.3 Installation examples

9.3.1 Secondary pressure – system dynamically flowing

If the stop valve is closed, the working pressure p_A rises by the amount of the closing pressure p_S .

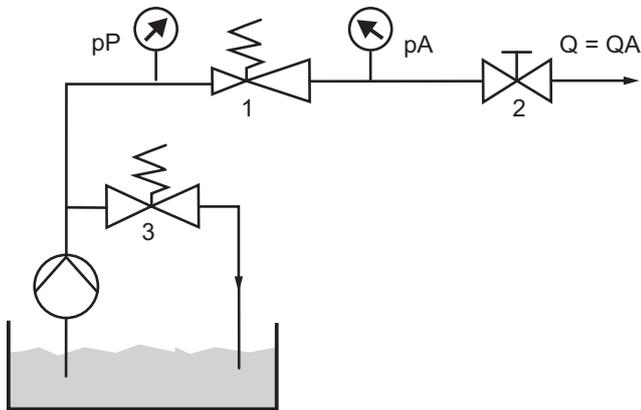


Fig. 11 Example 1: Secondary pressure – system dynamically flowing

9.3.2 Secondary pressure – system closed

If the stop valve is opened, the working pressure p_A drops by the amount of the opening pressure $p_{\ddot{O}}$.

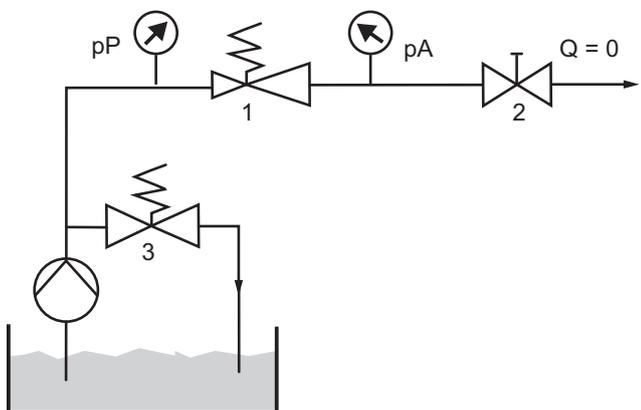


Fig. 12 Example 2: Secondary pressure – system closed

- p_P Pump pressure
- p_A Working pressure
- 1 Pressure reducing valve
- 2 Shut-off valve
- 3 Pressure relief valve

9.3.3 Operating behavior

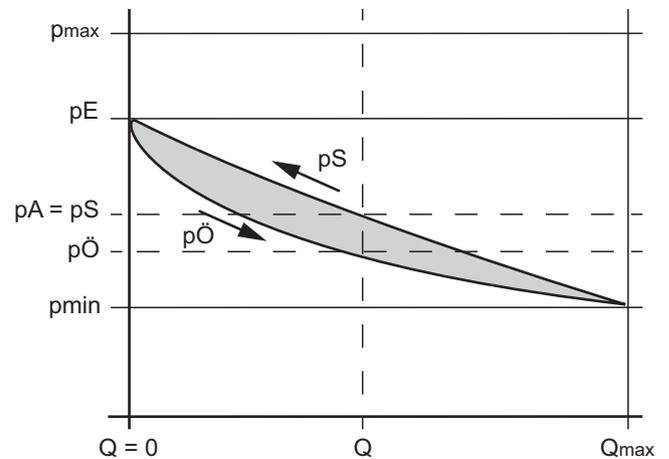


Fig. 13 Operating behavior

- p_E Set pressure
- p_A Working pressure
- $p_{\ddot{O}}$ Opening pressure
- p_S closing pressure
- $p_{\ddot{O}}-p_S$ Hysteresis
- p_A-p_E Flow-dependent pressure reduction
- Q Flow

