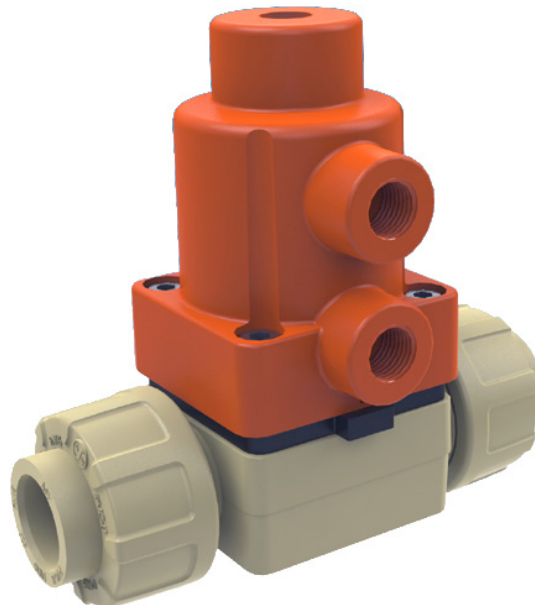


# Diaphragm valve

Operating manual

Series MV 308



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Subject to technical modifications.

Read carefully before use.  
Save for future use.

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# 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

<p><b>Resistance lists</b> Resistance of materials used to chemicals</p> <p><a href="http://www.asv-stuebbe.de/pdf_resistance/300051.pdf">www.asv-stuebbe.de/pdf_resistance/300051.pdf</a></p>	
	<p><b>Data sheet</b> Technical data and conditions of operation</p> <p><a href="http://www.asv-stuebbe.de/pdf_datasheets/300581.pdf">www.asv-stuebbe.de/pdf_datasheets/300581.pdf</a></p>
<p><b>CE declaration of conformity</b> Conformity with standards</p> <p><a href="http://www.asv-stuebbe.de/pdf_DOC/300168.pdf">http://www.asv-stuebbe.de/pdf_DOC/300168.pdf</a></p>	


Tab. 1 Other application documents, purpose and where found

## 1.3 Warnings and symbols

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

Tab. 2 Warnings and symbols


## 2 Safety instructions

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

### 2.1 Intended use

- Only use the fitting to shut off pipes for appropriate media (→ Resistance list).
- Adhere to the operating limits (→ Data sheet).

### 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 working

- Only operate the fitting if it is in perfect technical condition and only use it as intended, remaining aware of safety and risks, and adhering 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

- Ensure 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 personnel to be trained only work on the fitting under the supervision of specialist technicians.

#### 2.2.2 Obligations of personnel

- Observe the instructions on the fitting and keep them legible, e.g. name plate and 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
- Do not make any modifications to the device.

### 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 Name plate



Fig. 1 Name plate (example)

- 1 Type
- 2 ID number
- 3 Nominal pressure [bar] / Nominal diameter [mm]
- 4 Materials (valve body, diaphragm, other gaskets)
- 5 Date of manufacture - Series number

#### 3.2 Assembly

Compressed air operated diaphragm valve for shutting off pipelines or regulating systems.

- Optional flow direction
- Valve lift OPEN/CLOSE
- Optional installation position
- Valve functions
  - Normally closed (NC)
  - Normally open (NO)
  - Double acting (DA)

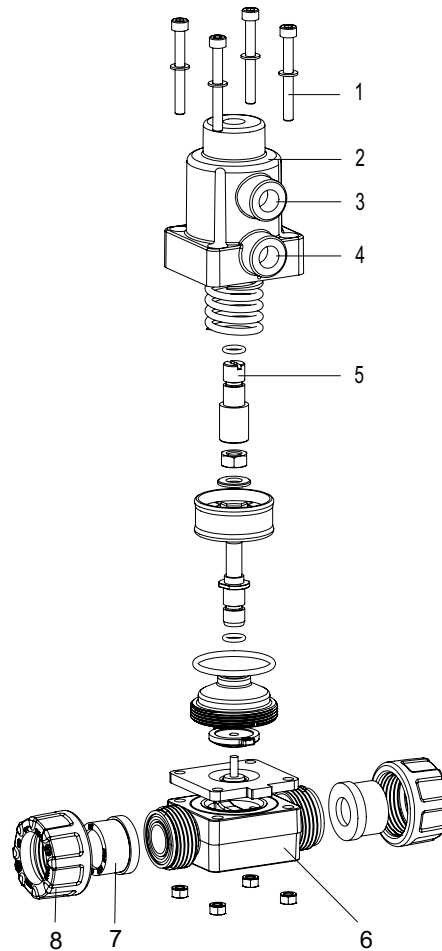


Fig. 2 Assembly

- 1 Housing screws (4 pieces)
- 2 Upper part
- 3 Compressed air connection A (G 1/4")
- 4 Compressed air connection B (G 1/4")
- 5 indicator pin
- 6 Valve body
- 7 Union end
- 8 Union nut

## 4 Transport, Storage and Disposal

### 4.1 Unpacking and inspection on delivery

1. Unpack the fitting when received and inspect it for transportation damage.
2. Report any transportation damage to the manufacturer immediately.
3. Ensure that the information on the name plate agrees with the order/design data.
4. With 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 the original packaging.
2. Lift fitting manually for transport. For 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 the 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 (→ Type plate).
  - 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 (→ Data sheet).
  - Operating pressure (→ Data sheet).
  - Setting range
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 flow direction
  - Optional installation position and direction
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.

#### 5.3.1 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.
  - Any position of the compressed air drive
5. Hand-tighten the union nut.

#### 5.3.2 Connection with internal thread fixed

1. Prepare pipe ends according to connection type.
2. Position fitting between the pipe ends.
  - Any position of the compressed air drive
3. Screw pipe ends with fitting.

### 5.4 Connecting the drive

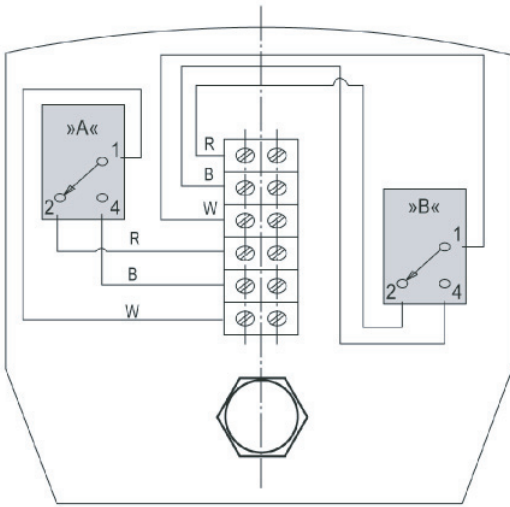


Fig. 3 Limit switch, type VCSP

A closed  
B open

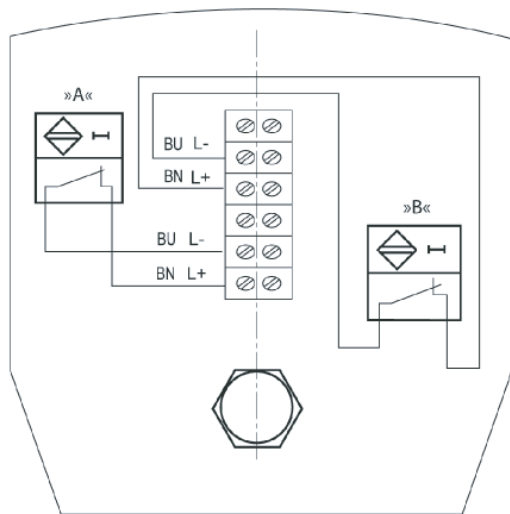


Fig. 4 Limit switch, type Nj2-V3-N

A closed  
B open

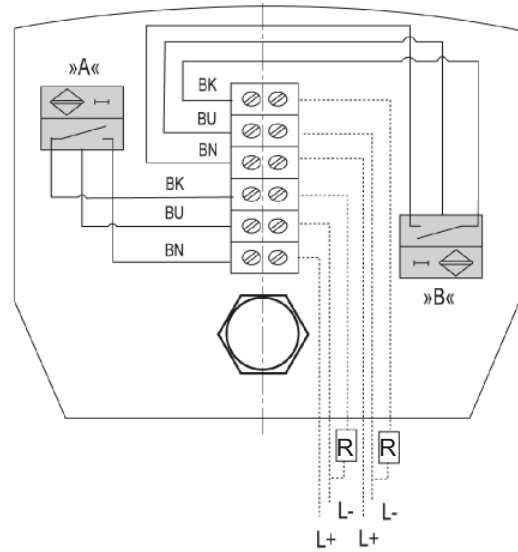


Fig. 5 Limit switch, type NBB2-V3-E2

R Load  
A closed  
B open

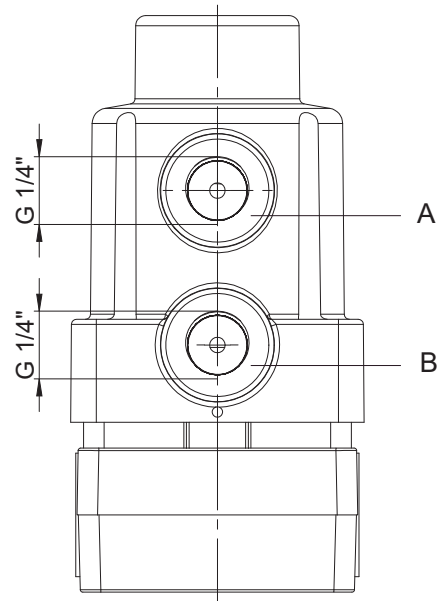



Fig. 6 compressed air

A closed  
B open



### 5.4.1 Installing limit switch

 Only necessary for fittings with limit switches.


#### DANGER

##### Risk of electrocution!

► All electrical work must be carried out by qualified electricians only.

1. Mount limit switch unit onto fitting.
2. Connect limit switch:
  - (→ [Figure Limit switch, type VCSP, Page 8](#)).
  - (→ [Figure Limit switch, type Nj2-V3-N, Page 8](#)).
  - (→ [Figure Limit switch, type NBB2-V3-E2, Page 8](#)).

### 5.4.2 Pneumatic connection

 Solenoid pilot valves are available for control of the compressed air drive:

- 3/2-way valve for single-acting drives
- 5/2-way valve for double-acting drives

#### CAUTION

##### Risk of injury from compressed air!

- All work on the compressed air system must be carried out by qualified technicians.
- Connect compressed air lines to the compressed air drive. (→ [Figure compressed air, Page 8](#)).


Function	Control pressure on	
	a	b
Normally closed (NC)	–	open
Normally open (NO)	close	–
Double acting (DA)	close	open

Tab. 3 Compressed air connection

### 5.4.3 Checking the function of the drive

- Open and close fitting using the pneumatic connection, the indicator pin signals the corresponding position
- lowered: Fitting is closed
  - protruding: Fitting is open

## 5.5 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 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.
1. Open and close fitting, the indicator pin signals the corresponding position
    - lowered: Fitting is closed
    - protruding: Fitting is open
  2. 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
2. Ensure that fitting functions properly (opening, closing)
3. Clean the fitting with a moist cloth if necessary.
4. Retighten housing screws (→ [9.2 Tightening torques, Page 13](#)).
5. Check diaphragm for wear and replace if necessary:

Diaphragm material	Max. number of operations*
EPDM	200,000
FPM:	200,000
PTFE (EPDM)	200,000

Tab. 4 Diaphragm maintenance interval

\*) applies to water, 20 °C (for chemicals, media that contains solids/abrasives shorten the maintenance intervals)

## 7.2 Maintenance

**⚠ DANGER**

**Risk of electrocution!**

- ▶ All electrical work must be carried out by qualified electricians only.

**⚠ 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 Fixing leaks in the port

 (→ 9.4 Parts, Page 14).

1. Removing fitting (→ 7.2.1 Removing fitting, Page 11).

 Before removing housing screws (1), note:

- For NC drives, apply compressed air pressure to connection B to bring the drive into the open position (→ Figure compressed air, Page 8).
- For NO and DA drives, this is not necessary.

2. Unscrew housing screws (1).
3. Unscrew diaphragm (18) and dispose of properly.
4. Ensure that pressure piece (13) is exposed in the guides.
5. Check state of sealing surfaces of the valve body (14) for damage.
6. Lightly lubricate new diaphragm with special grease on top of curvature and on thread. (Recommended special grease: Syntheso ProAA2)
7. Screw diaphragm into spindle (9) clockwise until resistance is felt.
8. Unscrew diaphragm until the diaphragm hole pattern matches the valve body (14) (max. 180°).
9. Tighten housing screws (1) crosswise with hexagon nuts (15).  
Ensure uniform contact pressure.
10. Tighten housing screws (1) with tightening torque 2.5 Nm.

### 7.3 Replacement parts and return

1. Have the following information ready to hand when ordering spare parts (→ Type plate).
  - Fitting type
  - ID number
  - Nominal pressure and diameter
  - Body and seal material
2. Please complete and enclose the document of compliance for returns  
(→ [www.asv-stuebbe.com/service/downloads](http://www.asv-stuebbe.com/service/downloads)).



3. Only use spare parts from ASV Stübbe.

## 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
Control function is not right	Control connections mixed up	▶ Connect control connections correctly.
	Compressed air connection mixed up at solenoid pilot valve	▶ Check compressed air connection and correct if necessary (→ supplementary instructions for drives).
	Electrical connection faulty	▶ Check electric connect and correct if necessary (→ supplementary instructions for limit switch).
Medium escapes between housing and diaphragm	Housing screws too loose	▶ Tighten housing screws (→ <a href="#">9.2 Tightening torques, Page 13</a> ).
Medium escapes at the drive	Diaphragm leaky	▶ (→ <a href="#">7.2.2 Fixing leaks in the port, Page 11</a> ).
Fitting does not close completely	Control pressure too low	▶ Check compressed air supply. ▶ Ensure sufficient air pressure (→ <a href="#">9.1.2 Control air connections, Page 13</a> ).
	Diaphragm leaky	▶ (→ <a href="#">7.2.2 Fixing leaks in the port, Page 11</a> ).
	Drive defective	▶ Exchange drive.

Tab. 5 Troubleshooting

## 9 Appendix

### 9.1 Technical specifications

 Technical data (→ Data sheet).

#### 9.1.1 Mechanical specifications

Size	Value
<b>Process conditions (medium)</b>	
Pressure and temperature	See material-dependent pressure/temperature diagram
<b>Materials in contact with medium</b>	
Diaphragm	EPDM, FPM, PTFE (EPDM diaphragm, PTFE-coated on medium-side)
sealing	FPM, EPDM
Housing	PVC-U, PP, PVDF
<b>Materials not in contact with medium</b>	
Upper part	PP, glass fiber reinforced

Tab. 6 Mechanical specifications

#### 9.1.2 Control air connections

- Maximum control pressure
  - 7 bar
- Compressed air classes according to ISO 8573-1
  - 2 or 3 at  $T < 0\text{ °C}$
  - 3 or 4 at  $T > 0\text{ °C}$
- Control pressure diagram (→ Data sheet).

### 9.2 Tightening torques

Description	Size	Tightening torque [Nm]
Housing screws	d12 (DN12)	2.5
	d20 (DN15)	2.5
Union nut		hand-tight

Tab. 7 Tightening torques

### 9.3 Accessories

Description
limit switch unit

Tab. 8 Accessories

### 9.4 Parts

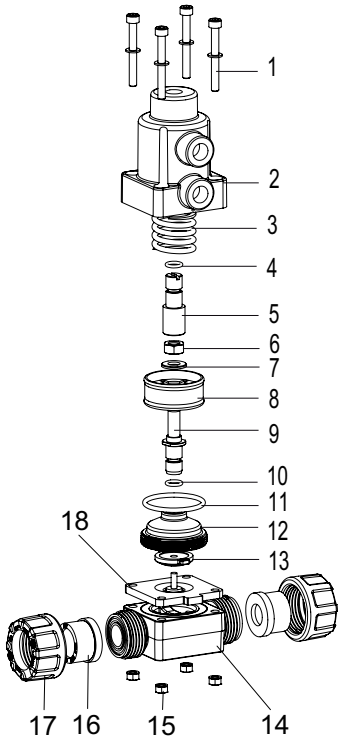


Fig. 7 Valve function NC

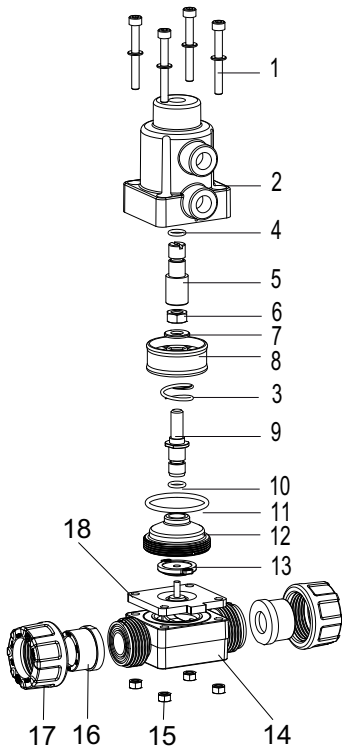


Fig. 8 Valve function NO

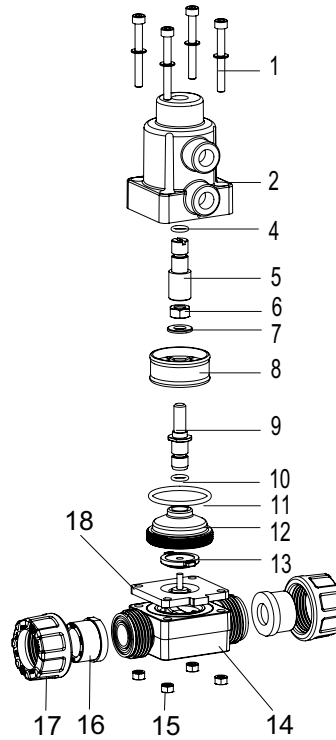


Fig. 9 Valve function DA

Pos.	Quantity	Designation
1	4	Housing screw
2	1	Upper part
3	1	Pressure spring
4	1	O-ring
5	1	indicator pin
6	1	Hexagon nut
7	1	O-ring diaphragm
8	1	Piston disc
9	1	Shaft
10	1	O-ring
11	1	O-ring
12	1	Union threaded neck
13	1	pressure piece
14	1	Valve body
15	4	Hexagon nut
16	1	Union end
17	4	Union nut
18	1	Diaphragm

Tab. 9 Part numbers and designations