

# Wafer check valve

Operating manual

Series  
RSK 500



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Subject to technical modifications.

Read carefully before use.  
Save for future use.



## Table of contents

<b>1</b>	<b>About this document</b>	3
1.1	Target groups	3
1.2	Other applicable documents	3
1.3	Warnings and symbols	3
<b>2</b>	<b>General safety instructions</b>	4
2.1	Intended use	4
2.2	General safety instructions	4
2.2.1	Obligations of the operating company	4
2.2.2	Obligations of personnel	4
2.3	Specific hazards	4
2.3.1	Hazardous media	4
<b>3</b>	<b>Layout and Function</b>	5
3.1	Name plate	5
3.2	Description	5
3.3	Assembly	5
3.4	Direction of flow	5
<b>4</b>	<b>Transport, Storage and Disposal</b>	6
4.1	Unpacking and inspection on delivery	6
4.2	Transportation	6
4.3	Storage	6
4.4	Disposal	6
<b>5</b>	<b>Installation and connection</b>	7
5.1	Check operating conditions	7
5.2	Planning pipelines	7
5.3	Installing fitting in pipe	7
5.3.1	Preparing the pipe for connection	8
5.3.2	Install fitting	8
5.4	Performing the hydrostatic test	9
<b>6</b>	<b>Operation</b>	9
6.1	Commissioning	9
<b>7</b>	<b>Maintenance</b>	10
7.1	Servicing	10
7.2	Maintenance	10
7.2.1	Removing fitting	10
7.2.2	Replacement parts and return	10
<b>8</b>	<b>Troubleshooting</b>	11
<b>9</b>	<b>Appendix</b>	12
9.1	Technical specifications	12
9.1.1	Working pressure	12
9.1.2	Pressure and temperature limits	12
9.1.3	Tightening torques	12
9.2	Sectional drawing	12

## List of figures

Fig. 1	Name plate (example)	5
Fig. 2	Assembly	5
Fig. 3	Fitting with directional arrow (example)	5
Fig. 4	Installing fitting in pipe	8
Fig. 5	Sectional drawing	12

## List of tables

Tab. 1	Other application documents, purpose and where found	3
Tab. 2	Warnings and symbols	3
Tab. 3	Troubleshooting	11
Tab. 4	Tightening torque of flange connection	12

# 1 About this document

This manual

- is part of the valve
- 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: <b>Resistance lists</b> Resistance of materials used to chemicals	
<a href="http://www.asv-stuebbe.de/pdf_resistance/300051.pdf">www.asv-stuebbe.de/pdf_resistance/300051.pdf</a>	
	To download: <b>RSK 500 data sheet</b> Technical data and conditions of operation
<a href="http://www.asv-stuebbe.de/pdf_datasheets/301266.pdf">www.asv-stuebbe.de/pdf_datasheets/301266.pdf</a>	
To download: <b>CE declaration of conformity</b> Conformity with standards	
<a href="http://www.asv-stuebbe.de/pdf_DOC/300168.pdf">www.asv-stuebbe.de/pdf_DOC/300168.pdf</a>	


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 ► 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

The fitting is intended for controlling the flow of a medium in a pre-determined direction of flow (prevention of return flow):

- Only use the fitting with suitable media (→ resistance lists). Media containing solid particles will impair the operating life of the valve.
- Adhere to the operating limits (→ Data sheet).
- Install the fitting exclusively in the prescribed installation position as marked on the body of the fitting.
- Do not exceed the permissible maximum opening angle of the shut-off disc.
- Install the fitting exclusively to connections with smooth mating faces.
  - Inlet side: Flange adaptor or welding stub
  - Outlet side: Outlet adaptor (ASV outlet adaptor recommended)

### 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 valve 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 valve 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 valve under supervision of specialist technicians.

#### 2.2.2 Obligations of personnel

- Observe the instructions on the valve and keep them legible, e.g. name plate and identification marking for fluid connections.
- Only carry out work on the valve 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 valve.
- Collect leaking pumped liquid and residues in a safe manner and dispose of in accordance with environmental regulations.

### 3 Layout and Function

#### 3.1 Name plate

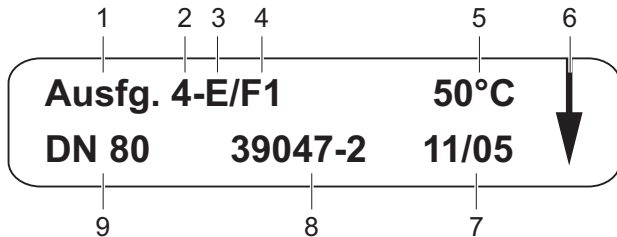


Fig. 1 Name plate (example)

- 1 Version
- 2 Material: Housing / disc (4 = PVC-U / 5 = PP / 8 = PVDF)
- 3 Material: Seals (V = FPM / E = EPDM / T = PTFE)
- 4 Material: Return spring (F1 = stainless steel / F2 = Hastelloy)
- 5 Operating temperature
- 6 Direction of flow
- 7 Date of production
- 8 ID number
- 9 Nominal diameter

Device types

- RSK 500

#### 3.2 Description

The fitting is a wafer check valve. The fitting controls the flow of a medium in a pipe in a pre-determined direction of flow.

Versions available:

- RSK 500 with return spring
  - horizontal or vertical pipe alignment
  - suitable for pulsating flow conditions.
- RSK 500 without return spring
  - vertical pipe alignment
  - Direction of flow from bottom to top

Closing pressure:

- hermetic seal at 0.3 bar

Mounting position:

- vertical or horizontal
- Direction of flow as per direction of arrow on the fitting body (→ 3.4 Direction of flow, Page 5).

Installation:

- Wafer type flange

Connection:

- Inlet side: Connections with smooth mating faces (e.g. flange adaptors or welding stubs)
- Outlet side: For correct installation an outlet adaptor is required (see data sheet for suitable alternatives)

#### 3.3 Assembly

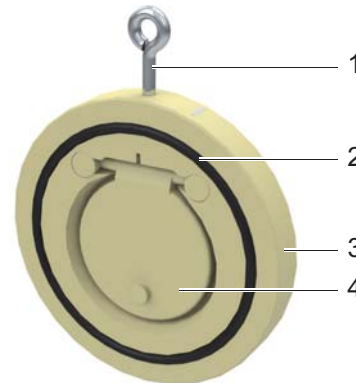


Fig. 2 Assembly

- 1 Eye bolt
- 2 O-ring
- 3 Fitting body
- 4 Shut-off disc

#### 3.4 Direction of flow

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

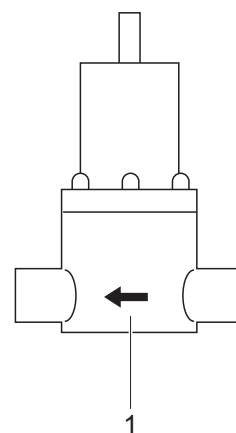


Fig. 3 Fitting with directional arrow (example)

- 1 Directional arrow

## 4 Transport, Storage and Disposal

### 4.1 Unpacking and inspection on delivery

1. Unpack the valve 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 valve in the original packaging.

### 4.2 Transportation

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#### NOTE

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##### Damage to the shut-off disc by incorrect transport!

- ▶ Transport the fitting with the shut-off disc facing upwards.
- ▶ Secure the shut-off disc against uncontrolled opening.
- ▶ Transport the fitting horizontally if possible.

1. If possible, transport fitting in original packaging.
2. Lift fitting manually for transport. For weight specifications (→ Data sheet).

### 4.3 Storage

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#### NOTE

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##### 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.

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#### WARNING

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##### Risk of poisoning and environmental damage from medium.

- ▶ Use personal protective equipment when carrying out any work on the valve.
  - ▶ 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 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).
  - Direction of flow (→ 3.4 Direction of flow, Page 5).
3. Consult with the manufacturer regarding any other use of the device.

### 5.2 Planning 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)
  - Observe direction of flow
  - Observe installation position and installation direction of the fitting
2. Dimensions (→ Data sheet).
3. Fit the outlet adaptor on the outlet side.
4. Use connections with smooth mating faces.

### 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 from incorrect installation of fitting!**

- ▶ Install fitting vertically or horizontally.
- ▶ Comply with the direction of flow marked on the fitting.
- ▶ If the fitting does not have a return spring, install it exclusively with the direction of flow from bottom to top.

#### NOTE

**Material damage due to contamination of the fitting!**

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

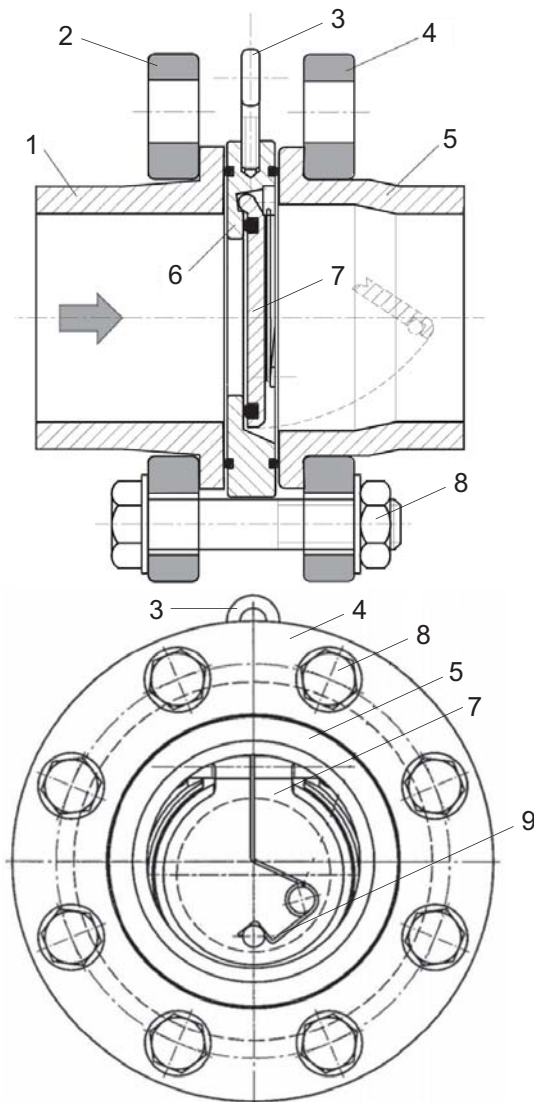



Fig. 4 Installing fitting in pipe

- 1 Connection welding stub / flange adaptor (inlet side)
- 2 Flange ring (inlet side)
- 3 Eye bolt
- 4 Flange ring (outlet side)
- 5 Outlet adaptor
- 6 Valves
- 7 Shut-off disc
- 8 Bolt / washer / nut
- 9 Return spring (optional)

### 5.3.1 Preparing the pipe for connection

- ✓ Flange rings must be available
- ✓ Connections must be available

 Use connections with smooth mating faces. ASV recommends the use of an ASV outlet adaptor (→ data sheet).  
Work to the installation drawing (→ [Figure Installing fitting in pipe, Page 8](#)).

### NOTE

#### Risk of breakage of the shut-off disc if installed with the wrong outlet adaptor!


- ▶ Make sure that the shut-off disc contacts the inner wall of the outlet adaptor before it reaches its maximum opening angle.
- ▶ Ensure that the version of the outlet adaptor is correct (→ data sheet).

1. Prepare pipe ends according to connection type.
2. Slide the flange ring (2) over the pipe (inlet side)
3. Fit or weld the connection (1) to the end of the pipe (inlet side).
4. Slide the flange ring (4) over the pipe (outlet side)
5. Fit or weld the outlet adaptor (5) to the end of the pipe (outlet side).

The pipe is now ready for installation of the fitting.

### 5.3.2 Install fitting


- ✓ Pipe prepared for connection

 Work to the installation drawing (→ [Figure Installing fitting in pipe, Page 8](#)).

1. If necessary, attach the eye bolt (3) to suitable lifting gear
2. Align the fitting (6) to the prescribed installation position. Whilst doing this, secure the shut-off disc (7) against uncontrolled opening.
3. Check that the direction of flow of the fitting (6) matches that of the pipe.
4. Insert the fitting (6) between the connection (1) and the outlet adaptor (5).
5. Align the fitting (6) radially between the flanges (1, 4).
6. Insert the bolts (8) through the holes in the flange rings (1, 4) and tighten them in stages, working across diagonals (→ [9.1.3 Tightening torques, Page 12](#)).



## 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 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 valve.
- ▶ After the first loads from pressure and operating temperature, check that the fitting is not leaking.

## 7 Maintenance

### WARNING

**Risk of injury and poisoning due to hazardous media liquids!**

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

### 7.1 Servicing

1. Visual and function check (every three months):
  - Normal operating conditions unchanged
  - No leaks
  - No unusual operating noises or vibrations
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 valve.
- ▶ 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.

#### 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 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 valve.
- ▶ 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 fails to close	Wrong outlet adaptor installed	▶ Install the correct outlet adaptor (→ data sheet).
	Type of fitting without return spring installed in a horizontal alignment position	▶ In a horizontal alignment position, install exclusively types of fitting with a return spring.
	Shut-off disc broken	▶ Change fitting (→ 7.2.1 Removing fitting, Page 10).
Fitting fails to open	Installed in the wrong position	▶ Install the fitting correctly so the direction of flow matches that marked on the fitting body. (→ 3.4 Direction of flow, Page 5).
Medium is leaking out of the flange	Fitting clamped between the flanges by bolts tightened to the wrong torque.	▶ Tighten the flange connection bolts to the correct torque (→ 9.1.3 Tightening torques, Page 12).
	Wrong connection installed	▶ Use connections with smooth mating faces, to ensure an effective seal..
Low flow values	Wrong outlet adaptor installed	▶ Install the correct outlet adaptor (→ data sheet).
	Fitting not installed centrally to the axis of the pipe	▶ Install the fitting centrally to the axis of the pipe (→ 5.3.2 Install fitting , Page 8).


Tab. 3 Troubleshooting

## 9 Appendix


### 9.1 Technical specifications

 Technical data (→ Data sheet).

#### 9.1.1 Working pressure

 Operating pressure (→ Data sheet).

#### 9.1.2 Pressure and temperature limits

 Pressure and temperature limits (→ Data sheet).

#### 9.1.3 Tightening torques

Version		Tightening torque [Nm]
Diameter [d]	Nominal width [DN]	
50	40	15
63	50	20
75	65	20
90	80	20
110	100	20
125	100	20
140	125	25
160	150	30
180	150	30
200	200	35

Tab. 4 Tightening torque of flange connection

### 9.2 Sectional drawing

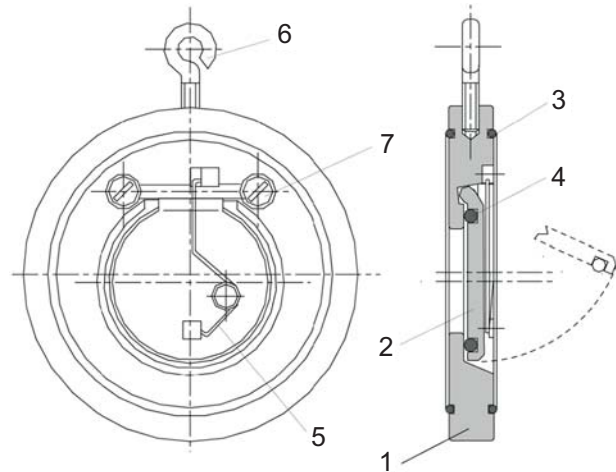


Fig. 5 Sectional drawing

- 1 Housing
- 2 Shut-off disc
- 3 O-ring
- 4 O-ring
- 5 Return spring
- 6 Eye bolt
- 7 Screw