



OPERATING INSTRUCTIONS FOR CHECK VALVES

RVAK (973, 974)

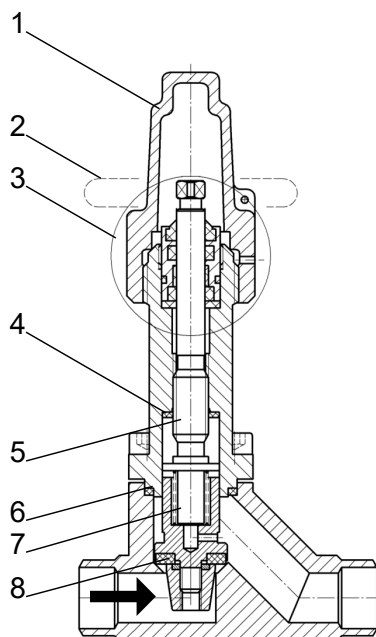
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1 Overview of types

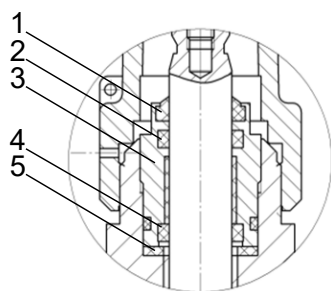
1.1 Type 973, 974

DN 6 - DN 20



1 Cap	2 Handwheel (optional)
3 Threaded bush, complete	4 Flat sealing ring R
5 Stem	6 Flat sealing ring K
7 Compression spring	8 Flat sealing ring S

1.2 Threaded bush, complete



1 Wiper ring	2 O-ring A
3 Threaded bush	4 PTFE ring
5 Flat gasket SB	

2 Technical characteristics

Body material	Selection acc. to AD-2000 Series W
Steel	P235GH, S355J2

Low-temperature steel	P355NL1
Stainless steel	X5CrNi18-10 or equivalent

2.1 Pressure/temperature operating limits

When using screws of property class 8.8, the following values apply:

PN	TS (MWT) [°C]	-60 ²⁾	-40 ²⁾	-25 ²⁾	-10	+50	+150
25	PS (MWP) [bar]	6.25	12.5	18.7	25	25	25
40		10	20	30	40	40	40
63		15.75	31.5	47.2	63	63	63

When using screws of property class A2-70, the following values apply:

PN	TS (MWT) [°C]	-60 ²⁾	-60 ¹⁾	-10	+50	+150
25	PS (MWP) [bar]	18.7	25	25	25	25
40		30	40	40	40	40
63		47.2	63	63	63	63

1) Load case I (low-temperature steel, stainless steel)

2) Load case II (acc. to AD2000-W10) (Steel)

Permissible ambient temperature range: -50 to +50 °C

2.2 Operating Mediums

Suitable for operation with refrigerants acc. to EN 378 Part 1, e.g. NH₃, R22, R134a or mixtures with refrigeration oil, as well as for neutral gaseous and liquid media and glycol-based cooling brine.

2.3 Flow coefficient

K_v value of the valve at nominal stroke (100% degree of opening) in m³/h

Type	DN 6	DN 8	DN 10	DN 15	DN 20
973	2.4	2.4	2.4	2.4	8.6
974	2.4	2.4	2.4	2.4	8.6

Installation position: horizontal and vertical with flow from bottom to top

External leakage, seat <15g refrigerant per year at Δp=10 bar above valve disc

3 Safety instructions

WARNING

Risk of burns at extreme temperatures!

Burns are possible.

- Operate the valve in extreme temperatures while wearing protective gloves.

NOTICE

Danger from improper handling!

Risk of property damage.

- ▶ Do not install valves with transport or storage damage.
- ▶ Valves must be free of axial forces, bending moments, and torsional moments and must not serve as fixed points for pipework.
- ▶ In the event of oxy-fuel welding or brazing, the flame must not touch the valve.
- ▶ Keep the interior of the valves free of contamination.
- ▶ Opening or closing the valves with a valve wheel wrench or other lever-extending objects is not permissible.
- ▶ Only dismantle valves when the pipework is depressurised, evacuated, and sufficiently ventilated.

4 Application

AWP check valves are suitable for use in refrigerant circuits of industrial refrigeration systems. They are used on both the discharge and suction sides of the compressor or in pipework where only one flow direction is permitted. They are intended for installation between two flanges connected directly to the valve body. Available with or without integrated damping and linear ball bearing.

5 Functional description

AWP check valves are self-acting shut-off devices. They are opened by the pressure of the operating medium beneath the valve disc. In the event of standstill or flow reversal, the check valve closes automatically. Additionally, the valve can be closed manually via the rising stem using the handwheel. The valves are closed by turning clockwise and opened by turning anti-clockwise when looking at the handwheel.

Due to the presence of a damping device, this type is particularly suitable for strongly fluctuating capacity requirements. To ensure perfect functional behaviour, ensure that the actual minimum flow rate (e.g. at partial load) is never less than 20% of the maximum nominal valve capacity based on a pressure loss of 0.1 bar. The tightness of the seal depends decisively on the differential pressure across the valve disc. The valves are equipped with a back seat (flat sealing ring R). When the valve is fully open, the sealing elements (O-rings A, B, PTFE rings) on the stem can be safely replaced by unscrewing the threaded bush. .

6 Installation

1. Clean pipework and system components before installation.

NOTICE! The deviation from parallelism or perpendicularity of the welding ends or flange facings must not exceed 1°. Connecting flanges must be axially aligned. Components with transport or storage damage must not be installed. After removing the pipe plugs, the component can be welded in or installed. Observe the direction of flow (see arrow on the nameplate).

2. Before welding, use the handwheel to move the spindle to the center position (valve half-open). **NOTICE! When using modern welding methods (e.g., TIG, CO₂ arc welding), do not remove valves intended for welding.**
3. Tighten the mounting screws and nuts in a crisscross pattern and evenly.
4. After installation, check the smoothness of the stem throughout the entire lift range.
 - ⇒ The thread for screwing on the cap must remain free of paint and must be greased (e.g. with RENOLIT UNITEMP 2).

To remove the valve insert, ensure there is sufficient space on the side where the valve cover is located—see the table below.

DN	6–15	20
mm	25	30

7 Maintenance

AWP check valves operate maintenance-free. If any malfunctions occur, repair is possible. During the warranty period, repairs may only be carried out by the manufacturer (AWP) or, with their consent, by trained maintenance personnel employed by the system operator.

7.1 Changing the stem seal

1. Unscrew the cap! Use a wrench with the size specified in the following table.

Nominal size	DN 6-20
Wrench size	19

2. Bring the stem to the uppermost position using the handwheel.
3. Unscrew the threaded bush anti-clockwise. **NOTICE! Watch out for any residual refrigerant escaping! Leave the threaded bush loose in the bonnet until pressure is completely equalised. Only unscrew it after this.**
4. Then unscrew it completely. To unscrew the threaded bush, use a wrench with the sizes specified in the following table:

Nominal size	DN 6-15	DN 20
Wrench size	15	17

5. Remove O-rings A, B, PTFE ring and the wiper ring and replace them with new ones.
6. Remove the flat gasket SB from the installation space in the bonnet.
7. Clean the stem and insert a new flat gasket SB into the bonnet.
8. Grease the threaded bush with refrigeration grease (e.g. RENOLIT UNITEMP 2) and tighten hand-tight.
9. To check for leaks, bring the stem to the middle position and brush the bonnet area with a foaming agent.

7.2 Replacing the seat seal (flat gasket S and R)

1. Open the valve up to the stop and loosen the bonnet bolts. **NOTICE! Watch out for any residual refrigerant escaping! Leave the bonnet bolts loose in the bonnet until pressure is completely equalised. Only unscrew it after this.**

Nominal size	DN 6-20
Wrench size	19

2. Unscrew bonnet bolts and pull out the bonnet including internal parts by the handwheel.
3. Unscrew the handwheel from the stem and, after removing the grub screw (> = DN 80 only), unscrew the stem from the bonnet.
4. Remove and replace flat sealing ring R.
5. Remove valve disc with compression spring from the body.
6. Unscrew the cone with the spring washer from the valve disc and replace the flat sealing ring S.
7. Clean all individual valve parts before assembly. Grease the stem and bonnet.
8. Then insert flat sealing ring K, fit the bonnet and tighten evenly in a crosswise pattern with the screws.

Nominal size	DN 6-15	DN 20
Bonnet screws	M6x18	M8x20
	ISO 4762	
Wrench size	5	6

Nominal size	DN 6-15	DN 20
Tightening torque for 8.8 screws [Nm]	10	25
Tightening torque for A2-70 screws [Nm]	6	16

8 Transport, storage and disposal

AWP components are transported protected against impact and covered with foil.

- Storage must take place in dry rooms.
- Ensure that the connection ports are sealed intact.
- Contamination of any kind must be kept away from the interior.
- The external surfaces are provided with a corrosion protection coating for dry storage at room temperature, which is effective for at least 1 year.
- The corrosion protection coating CELEROL® Reaktionsgrund 918 is a good adhesion promoter for 1- and 2-component top coats.
- Dismantle for disposal.
- Collect lubricants during dismantling. The materials must be separated from one another and disposed of in accordance with local regulations.

9 Warranty

Unless agreed otherwise, the statutory warranty provisions apply. For further information, please also refer to our General Terms and Conditions, available on our website awpvalves.com.

10 Spare parts

For shut-off check valves from AWP, the following spare parts are available according to the overviews.

Nominal size	Handwheel		Cap	
	Item number	Dimensions	Item number	Dimensions
DN 6-15	36302.10.5280003	Ø60 x 6/9	96300E10.3180013	M27 x 2
DN 20	36302.10.5280003	Ø60 x 6/9	96300E10.3180013	M27 x 2

A washer and a screw/nut for attachment to the stem are included in the scope of delivery of the handwheels. An O-ring for sealing is included in the scope of delivery of the caps.

Nominal size	Threaded bush (CR), complete	Seal kit (CR)	Valve insert (Steel, CR), complete
DN 6-15	96300E10.8142001	96300.10.5/00019	97300E10.5110001
DN 20	96300E11.8142001	96300.11.5/00019	97300E11.5110001

A valve insert contains all internal parts including seals, i.e. stem, valve disc with regulating cone and compression spring, threaded bush plus bonnet with screws and nameplate (with new serial number), as well as cap, pre-assembled. All spare parts mentioned above refer to the respective standard design of the valves, i.e. body material = steel, with 8.8 bonnet bolts, pressure rating = PS 25, O-ring material = CR, with cap, for valves without bonnet extension (i.e. without extended stem). Different spare part numbers apply to valves with a design deviating from this.

In case of doubt, please contact our Sales Support either via our website awpvalves.com/contact or by email to info@awpvalves.com. The most reliable method to correctly identify the required spare part is to send a photo of the nameplate on which the serial number of the valve is clearly visible.

11 Marking

AWP check valves are marked in accordance with Pressure Equipment Directive 2014/68/EU by means of a sticker as well as by stamping on the valve body. The following information is included on the label:

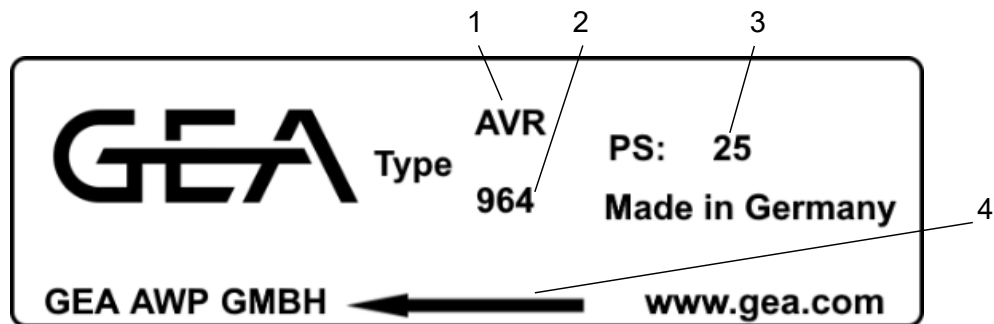


Illustration 1:

1 Type designation (e.g. AVR)	2 Type number (e.g. 963)
3 Max. permissible operating pressure	4 Flow direction

12 Notice regarding residual risks in accordance with the Pressure Equipment Directive 2014/68/EU

Residual hazards that cannot be eliminated by the manufacturer include:

NOTICE

- ▶ Do not remove the cover during operation (without authorization).
- ▶ Do not install flange connections (inlet and outlet flanges, flanged valve covers) incorrectly.
- ▶ Contaminants in the operating fluid or improper handling of components can cause damage to the seat seal.
- ▶ Failure to observe the operating limits and manufacturer's instructions as specified in these operating instructions.

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