OPERATING INSTRUCTIONS FOR CHECK VALVES

RV (283, 284, 28G)

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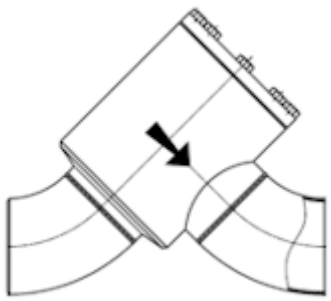
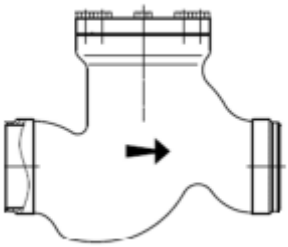
Content

1 Overview of Types

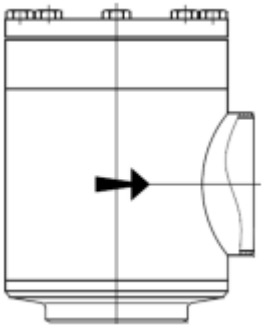
Type	Type
283	Straight-way check valve, Y-pattern, with damping
28G	Straight-way check valve, T-pattern, with damping (DN 25 – 65 only)
284	Angle check valve, with damping
285	Straight-way check valve, Y-pattern, with linear ball bearing and damping
28I	Straight-way check valve, T-pattern, with linear ball bearing and damping (DN 25 – 65 only)
286	Angle check valve, with linear ball bearing and damping
287	Angle check valve, Y-pattern, without damping, with linear ball bearing
28K	Straight-way check valve, T-pattern, without damping, with linear ball bearing (DN 25 – 65 only)
288	Angle check valve, without damping, with linear ball bearing



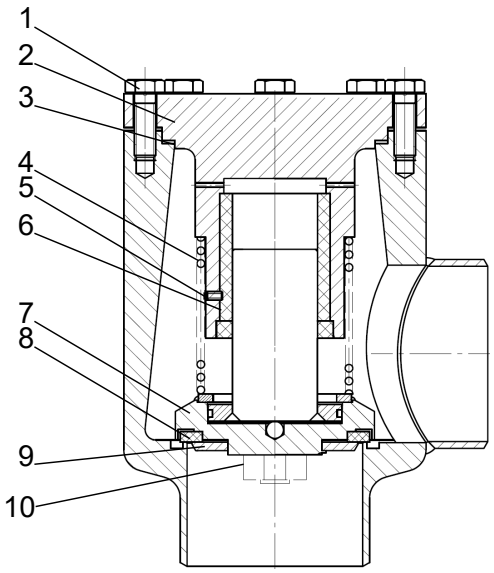
Type 283, 285, 287



Type 28G, 28I, 28K



Type 284, 286, 288



1	Bonnet screws	2	Bonnet
3	Bonnet gasket (flat gasket K)	4	Compression spring
5	Grub screw (types 283, 284, 28G only)	6	Linear ball bearing (types 285, 286, 28I, 287, 288, 28K only)
7	Valve disc	8	Seat seal (flat gasket S)

9 Washer	10 Valve disc nut (DN 25 - 32 only)

2 Technical Parameters

Body material	Selection acc. to AD-2000 Series W
Steel	P235GH, S235JR, S355J2
Low-temperature steel	P355NL1, G20Mn5QT
Stainless steel	X5CrNi18-10, GXCrNiMoNb19-11-2 or equivalent

2.1 Pressure/temperature operating limits

Pressure/temperature operating limits:
PS: Max. allowable operating pressure in bar
TS: Permissible operating temperature in °C corresponding to the permissible operating pressures (PS)
PN: Nominal pressure rating
When using screws of property class 8.8:

PS	TB (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:

PS	TB (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[3)]

[1)] Load case I (low-temperature steel, NIRO)
[2)] Load case II (acc. to AD2000-W10, ISO21922) (Steel)
3) G20Mn5QT = 43bar/ GXCrNiMoNb19-11-2 = 50bar

The following values apply to check valves in heating technology (type 28...HT) (for both valves with 8.8 and A2-70 screws):

PN	TB (MWT) [°C]	-10	+50	+200
25	PS (MWP) [bar]	25	25	25
40		40	40	40
63		63	63	63

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 Factor (Kvs)

K_v-value of the valve at rated stroke (100% opening) in m^3/h

Type	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
283, 285, 287	16.2	24.1	37.1	53.5	80	159	231	360	530
28G, 28I, 28K	12.9	19.2	26.4	31.7	58.7	-	-	-	-
284, 286, 288	17.1	27.7	39	57	86	164	242	373	541

Any installation position; the direction of flow (see arrow on nameplate) must be observed.
External leakage and on the valve seat <15g refrigerant per year at Δp = 10 bar above the 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 due to improper handling!

Property damage is possible.

- ▶ Do not install valves that have been damaged during transport or storage.
- ▶ Valves must be free from axial forces, bending moments, and torsional moments, and must not be used as fixed points in piping systems.
- ▶ When performing oxy-fuel welding or brazing, the flame must not come into contact with the valve.
- ▶ Keep contaminants away from the interior of the valves.
- ▶ Only remove valves when the piping is depressurized, drained, and adequately ventilated.

NOTICE

Danger due to excessive pressure buildup!

Property damage is possible.

- ▶ Avoid operating the valve against trapped fluid.
- ▶ Connect the outlet fittings in the fluid lines sequentially to a container containing gas.

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 open automatically via the pressure of the medium on the valve disc. They begin to open at a differential pressure of 0.01 to 0.05 bar and are fully open between 0.1 and 0.2 bar. As soon as the medium flow is interrupted or the flow direction is reversed, the valve closes automatically.
Due to the presence of a damping device (in types 283, 284, 28G, 285, 286, 28I), this type is particularly suitable for 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.

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, CO_2 arc welding), do not remove valves intended for welding.**
3. Tighten the mounting screws and nuts in a crisscross pattern and evenly.

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

Nominal diameter	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Distance [mm]	115	115	130	130	145	170	170	240	270

7 Maintenance

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

7.1 Replacing the valve insert

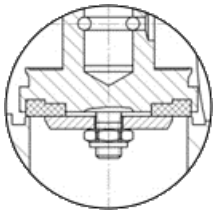
1. Loosen bonnet bolts ISO 4762 and ISO 4017. See the following table for this:

Nominal size	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Bonnet screws	M8x25	M8x25	M8x25	M8x25	M8x25	M10x30	M12x35	M16x45	M16x45
	ISO 4762					ISO 4017			
Wrench size	6	6	6	6	6	16	18	24	24

2. Unscrew bonnet bolts and pull out the bonnet including internal parts.
3. After removing the grub screw, remove the valve disc from the bonnet.

Nominal size	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
Grub screw	M4x4	M4x4	M4x6	M4x6	M4x6	M6x8	M6x8	M8x12	M8x12

7.2 Remove the seat gasket (flat gasket S)



Option 1: (DN 25 - DN32)

1. For nominal diameters DN 25 to DN 32, the seat gasket is screwed onto the valve disc (see sketch). Unscrew the valve disc nut and remove the seat gasket.

Option 2: (DN 40 - DN 150)

2. In nominal diameters DN 40 to DN 150, the seat seal is press-fitted. To loosen, remove the notches on the valve disc with a suitable tool (files, saws).
3. Then remove the washer and flat gasket 2.

Option 3: DN 200

4. For a nominal diameter of DN 200, the seat gasket is secured to the valve disc with several screws (M6 x M20).
5. Loosen the screws with a 10 mm wrench.
6. Remove flat gasket S.
7. Install a new seat gasket (flat gasket S). **NOTICE! For DN 40 to DN 150, secure the washer by restoring the notches (using suitable methods, such as a hand-operated press). For other nominal diameters, secure the washer by tightening the screws or nuts.**
8. Clean individual parts of the valve before assembly.
9. Grease the bonnet.
10. Insert a new bonnet gasket (flat gasket K) and replace the bonnet.
11. Tighten the bonnet bolts evenly and in a crisscross pattern. For screw sizes, wrench sizes, and tightening torques, see the table below:

Nominal size	DN 25-65	DN 80	DN 100	DN 125-200
Bonnet screws	M8x25	M10x30	M12x32	M16x45
	ISO 4762	ISO 4017		
Wrench size	6	16	18	24
Tightening torque for 8.8 screws [Nm]	25	49	85	210
Tightening torque for A2-70 screws [Nm]	16	32	56	135

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

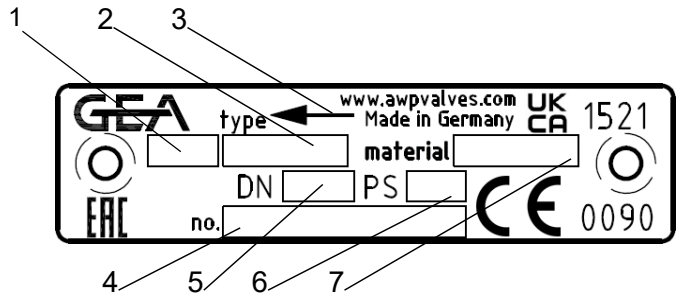
For AWP shut-off check valves, the following spare parts are available according to the overview in **Overview of Types [▶ 4]**.

Nominal size	Seal kit	Valve insert (Steel, CR), complete		
		Type 283, 284, 28G	Type 285, 286, 28I	Type 287, 288, 28K
DN 25-32	28300.12.5/00019	28300E12.5110001	28500E12.5110001	28700E12.5110001
DN 40-50	28300.14.5/00019	28300E15.5110001	28500E15.5110001	28700E15.5110001
DN 65	28300.17.5/00019	28300B17.5110001	28500B17.5110001	28700B17.5110001
DN 80	28300.18.5/00019	28300E18.5110001	28500E18.5110001	28700E18.5110001
DN 100	28300.19.5/00019	28300E19.5110001	28500E19.5110001	28700E19.5110001
DN 125	28300.20.5/00019	28300E20.5110001	28500E20.5110001	28700E20.5110001
DN 150	28300.21.5/00019	28300E21.5110001	28500E21.5110001	28700E21.5110001

A valve insert contains all internal parts including seals, i.e. valve disc, compression spring, bonnet with screws and nameplate (with new serial number), as well as cap, pre-assembled. All spare parts mentioned above refer to the standard design of the valves, i.e. body material = steel, pressure rating = PS 8.8, pressure rating = PS 25. 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 EN 12284 using a nameplate affixed to the side edge of the valve cover.



1	Type designation	2	Type no.
3	Flow direction	4	Serial number
5	Nominal size (DN)	6	Pressure rating (PS)
7	Material number		

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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Latest revision: 17.06.2026