

OPERATING INSTRUCTIONS FOR CHECK VALVES

RVZ (312, 313, 315, 316)

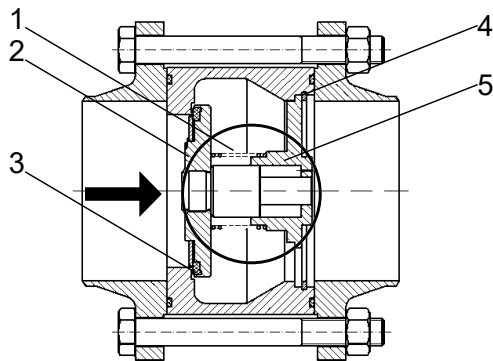
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1 Overview of types

31391	Check valve, wafer type, without damping
31392	Check valve, wafer type, with damping
31393	Check valve, wafer type, without damping, with hot gas connection
31394	Check valve, wafer type, with damping, with hot gas connection
31395	Check valve, wafer type, without damping, with hot gas connection, with oil drain
31396	Check valve, wafer type, with damping, with hot gas connection, with oil drain
31592	Check valve, wafer type, with damping, for vertical downward flow
31594	Check valve, wafer type, with damping, with hot gas connection, for vertical downward flow
31596	Check valve, wafer type, with damping, with hot gas connection, with oil drain, for vertical downward flow
31692	Check valve, wafer type, with damping, with linear ball bearing
31694	Check valve, wafer type, with damping, with hot gas connection, with linear ball bearing
31696	Check valve, wafer type, with damping, with hot gas connection, with oil drain, with linear ball bearing
31291	Integrated check valve, wafer type, for installation in the oil separator, without damping
31292	Integrated check valve, wafer type, for installation in the oil separator, with damping

DN 15- DN 150



1 Compression spring

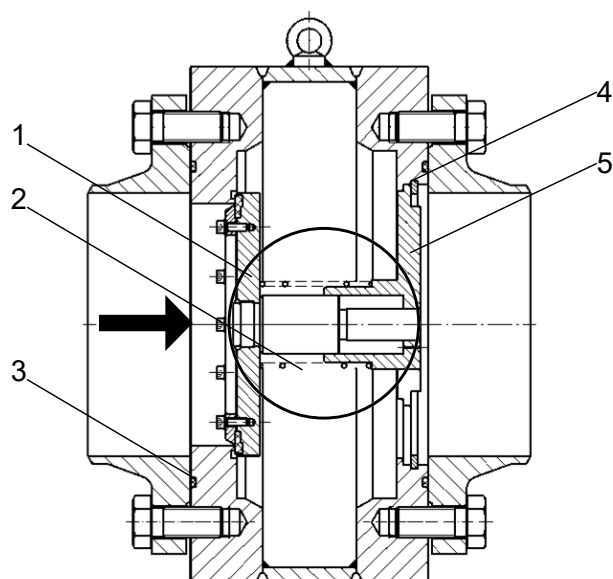
2 Valve disc

3 O-ring

4 Retaining ring

5 Guide bush

DN 200 - DN 350



1 Valve disc

2 Compression spring

3 O-ring

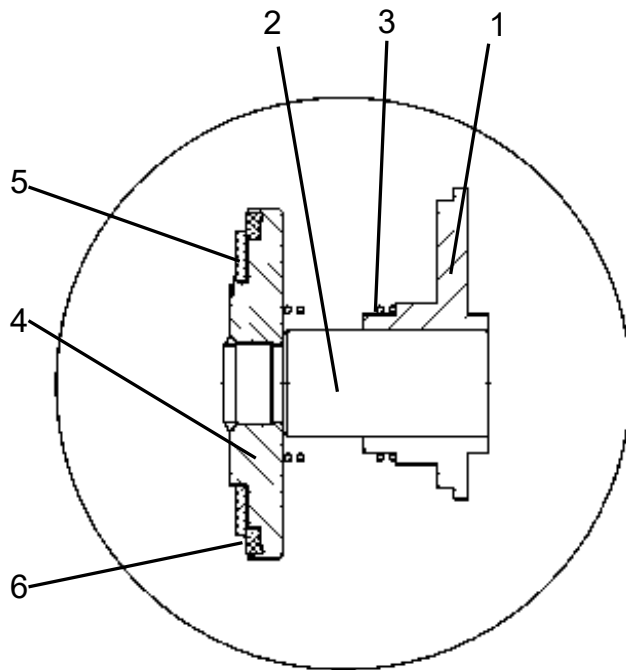
4 Retaining ring

5 Guide bush

1.1 Pressure spring without damping

Types:

- 31391
- 31393
- 31395



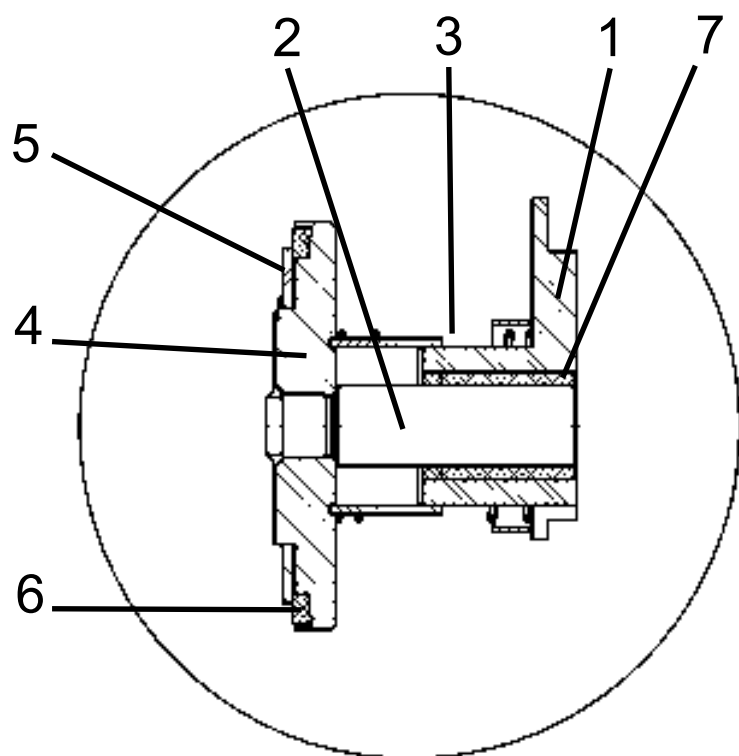
1 Guide bush	2 Guide shaft
3 Compression spring	4 Valve disc
5 Clamping washer	6 Seat seal

1.2 Pressure spring with damping and linear ball bearing

Types:

- 312, 313, 315, 316, 319 (92)
- 313, 315, 316, 319 (94)

– 313, 315, 316, 319 (96)



1 Guide bush	2 Guide shaft
3 Compression spring	4 Valve disc
5 Clamping washer	6 Seat seal
7 Linear ball bearing	

2 Technical characteristics

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

2.1 Pressure/temperature operating limits

PN	DN	TS (MWT) [C°]	-60 ¹⁾	-60 ²⁾	-10	+50	+150
25	15 - 350	PS (MWP) [bar]	25	18.7	25	25	25
40	15 - 350		40	30	40	40	40
63	15 - 150		63	47.2	63	63	63

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

²⁾ Load case II (steel)

Permissible ambient temperature range (°C) -50 to +50

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

Type	DN15	DN20	DN25	DN32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300	DN 350
[m ³ /h]	8.3	12.8	16.5	25.3	38	62.5	93	135	180	310	480	680	980	1370	2030

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

3 Safety instructions

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.

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. The closing function is supported by the spring force or the dead weight of the valve disc. Type RVZ check valves are intended for installation between two flanges connected directly to the valve body. Due to this design, the medium flow is not diverted as is the case with other types of check valves. Check valves from AWP 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.

Type 31391, 31393, 31395

Particularly suitable for horizontal installation, as it is without damping. In vertical installation with flow from bottom to top and low capacity requirement <40%, this type may tend to vibrate.

Type 312(313.316) 92, 313(316) 94, 313(316) 96

Particularly suitable for vertical installation with flow from bottom to top. Due to the presence of a damping device, this type is particularly suitable for strongly fluctuating capacity requirements. Even the lowest flow velocities do not cause the valve disc to vibrate.

Type 315(319) 92, 315(319) 94, 315(319) 96

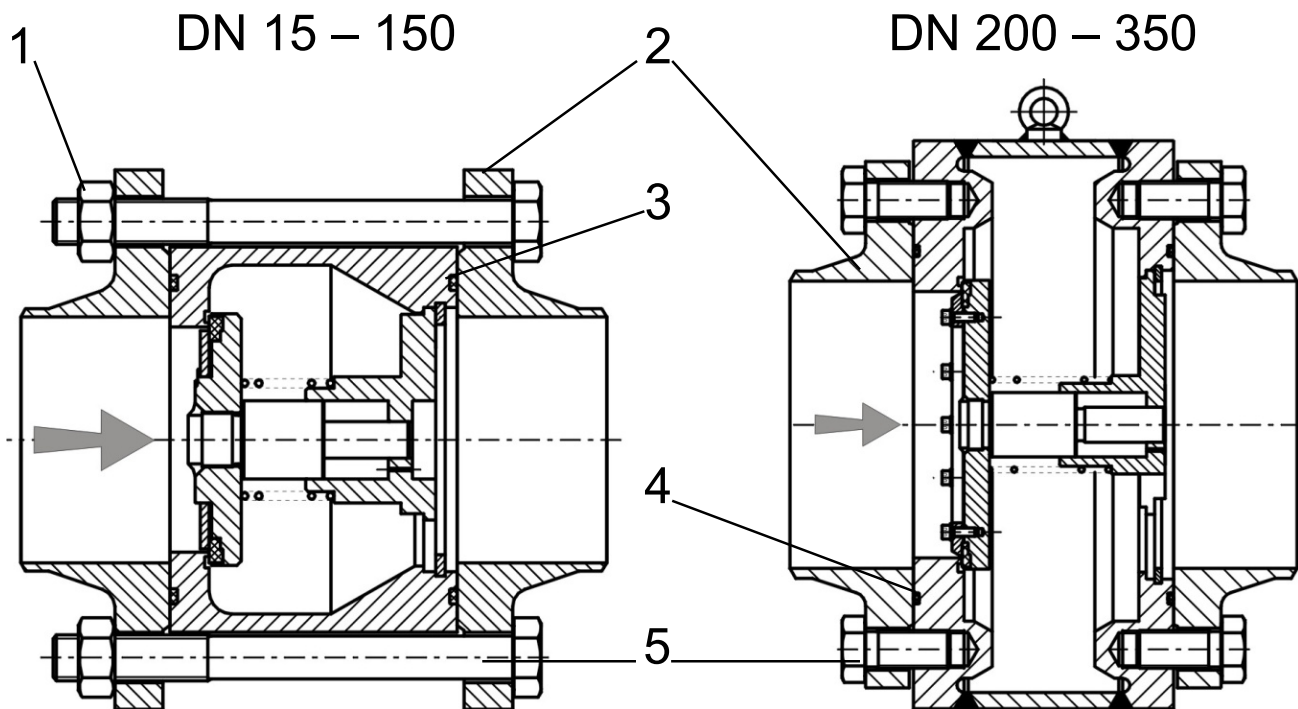
Particularly suitable for vertical installation with flow from top to bottom.

Type 31691 and 31991

Are suitable for use in oil circuits and liquid lines.

The tightness of the seal depends decisively on the differential pressure across the valve disc. The seal at the valve seat is provided by a Teflon flat sealing ring. 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.

6 Installation



1 Hexagon nuts

2 Welding neck flanges

3 O-rings

4 O-rings

5 Hexagon screws

Blowing out the pipelines after valve installation can damage the Teflon flat sealing ring on the valve disc and is not permissible. Welding neck flanges according to DIN EN 1092-1 in pressure ratings PN25, PN40, PN63 and flanges according to ASME B16.5 300lbs, 600lbs are used as clamping flanges.

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. Remove pipe plugs/foil.
3. Then install the valves.
4. Tighten hexagonal bolts and nuts crosswise and evenly.
5. Place O-rings into the grooves using low-temperature grease.

6.1 Installation position

Installation system

Type: 31391, 31393, 31395

Without damping

Horizontal only [$\pm 15^\circ$]

Type: 312(313,316) 92, 313(316) 94, 313(316) 96

With damping

Vertical [$\pm 15^\circ$] with flow from bottom to top and horizontal

Type: 315(319) 92, 315(319) 94, 315(319) 96

With damping

Vertical [$\pm 15^\circ$] with flow from top to bottom and horizontal

	Opening pressure [bar]
Horizontal	0.02 to 0.04 (fully open 0.1 to 0.15)
Vertical	0.025 (fully open 0.0)

External leakage, seat <15g refrigerant per year at $\Delta p=10$ bar above valve disc

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 Disassembly

After loosening the hexagon screws, remove as many screws as necessary until the valve can be rotated out of the clamping flanges. If the clamping flanges exert too much pressure on the check valve, they must be pushed apart using a suitable device. Remove retaining ring according to DIN 472 with suitable assembly pliers DIN 5256 ZGJ. Carefully remove the guide bush together with the pressure spring and the valve disc from the housing.

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

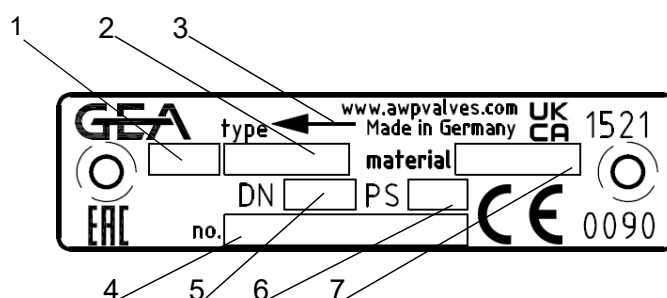
Nominal size	Valve insert, cpl.			O-rings (CR)
	Order number Type 312	Order number Type 313	Order number Type 316	Order number
DN 40	31292E14.5110001	31391(92)E14.5110001		737545
DN 50	31292E14.5110001	31391(92)E15.5110001		737534
DN 65	31292E17.5110001	31391(92)E17.5110001		737536

Nominal size	Valve insert, cpl.			O-rings (CR)
	Order number Type 312	Order number Type 313	Order number Type 316	Order number
DN 80	31292E18.5110001	31391(92)E18.5110001		737565
DN 100	31292E19.5110001	31391(92)E19.5110001	31692E19.5110001	737539
DN 125	31292E20.5110001	31391(92)E20.5110001	31692E20.5110001	737542
DN 150	31292E21.5110001	31391(92)E21.5110001	31692E21.5110001	737540
DN 200		31391(92)E23.5110001	31692E23.5110001	737541
DN 250		31391(92)E24.5110001	31692E24.5110001	737509
DN 300		31391(92)E25.5110001	31692E25.5110001	737584
DN 350		31391(92)E26.5110001	31692E26.5110001	737583

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

The marking of AWP check valves is carried out in accordance with Pressure Equipment Directive 2014/68/EU.



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

PS [bar]	Max. permissible operating pressure
DN [mm]	Nominal size
DIN EN ISO 21922	Refrigerating valves, safety requirements, testing and marking

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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