



OPERATING INSTRUCTIONS FOR CHECK VALVES

RVA (293, 294, 29G, 295, 296, 29I, 297, 298, 29K, 291, 292)
Stop Check Valves

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1 Overview of types

293	Straight-way check valve, shut-off type, Y-pattern, with damping
29G	Straight-way shut-off check valve, T-pattern, with damping
294	Angle shut-off check valve, with damping
295	Straight-way shut-off check valve, with linear ball bearing and damping, Y-pattern
29I	Straight-way shut-off check valve, with linear ball bearing and damping, T-pattern
296	Angle shut-off check valve, with linear ball bearing and damping
297	Straight-way shut-off check valve, with linear ball bearing, without damping, Y-pattern
29K	Straight-way shut-off check valve, with linear ball bearing, without damping, T-pattern
298	Angle shut-off check valve, with linear ball bearing, without damping
291	Straight-way shut-off check valve, with reinforced compression spring for vertical flow from top to bottom
292	Angle shut-off check valve, with reinforced compression spring for vertical flow from top to bottom

1.1 Overview of types RVA DN25-65

RVA DN 25 - DN 65

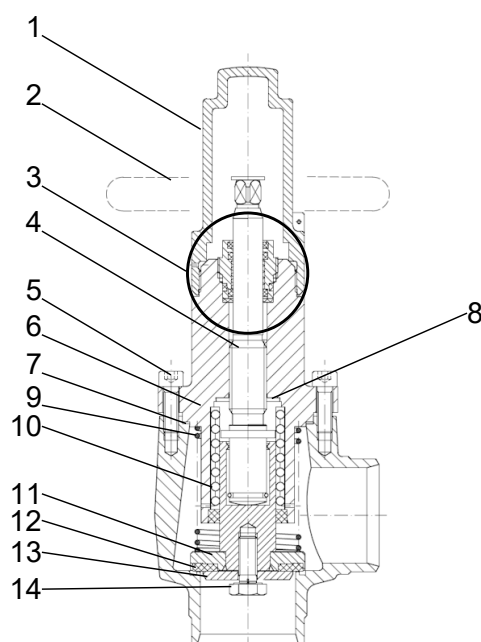


Illustration 1:

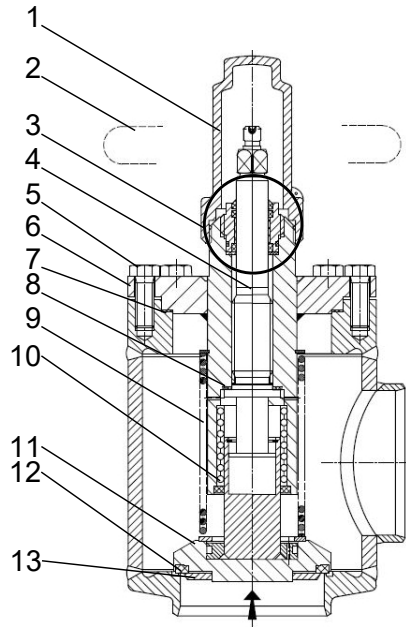
1 Cap	2 Handwheel (optional)
3 Threaded bush, complete	4 Stem
5 Bonnet screws	6 Bonnet
7 Bonnet gasket (flat gasket K)	8 Back seal (flat gasket R)
9 Compression spring	10 Linear ball bearing (types 295, 296, 29I, 297, 298, 29K only)
11 Valve disc	12 Seat seal (flat gasket S)

13 Washer

14 Valve disc screw (types 295, 296, 29I, 297, 298, 29K only)

1.2 Overview of types RVA DN80-DN200

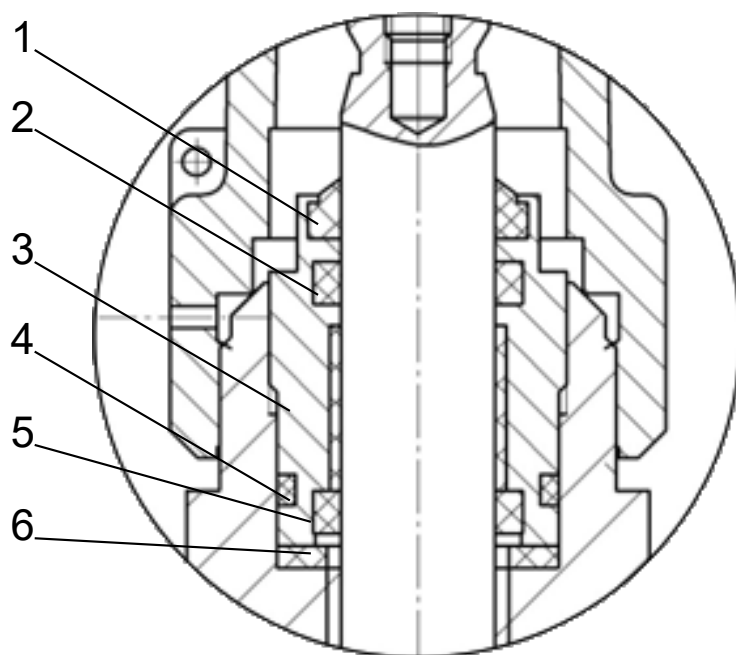
Type RVA DN 80 - DN 200



1 Cap	2 Handwheel (optional)
3 Threaded bush, complete	4 Stem
5 Bonnet screws	6 Bonnet
7 Bonnet gasket (flat gasket K)	8 Back seal (flat gasket R)
9 Compression spring	10 Linear ball bearing (types 295, 296, 297, 298 only)
11 Valve disc	12 Seat seal (flat gasket S)
13 Washer	

1.3 Threaded bush, complete

Item 3 in preceding overviews.



1 Wiper ring

2 O-ring A

3 Threaded bush

4 O-ring B

5 PTFE ring

6 Flat gasket SB

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

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 ³⁾

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 ³⁾

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

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

3) G20Mn5QT = 43bar/ GXCrNiMoNb19-11-2 = 50bar

The following values apply to shut-off check valves in heating technology (type 29...HT) (for both valves with 8.8 and A2-70 screws):

PN	TB (MWT) [°C]	-10	+50	+150	+200
25	PS (MWP) [bar]	25	25	25	25
40		40	40	40	40
63		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 coefficient

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

Type	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200
293, 295, 297, 291	14.0	21	30	42.0	66.5	109	151	245	352	526
29G, 29I, 29K	11.69	20.06	28.21	33	60	–	–	–	–	–
294, 296, 298, 292	14.9	24.4	37	53.5	80	159	231	373	464	790

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.

NOTICE

Danger from impermissible pressure rise!

Risk of property damage.

- ▶ Avoid operating the valve against trapped liquid.
- ▶ Close shut-off valves in liquid lines in sequence towards a vessel with a gas volume.

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 have a shut-off function with which the valve disc is permanently held on the valve seat, thereby closing the pipeline. The stem is sealed via a threaded bush with a spring-energised PTFE ring.

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. RVA shut-off check valves can additionally be closed manually via the rising stem using a handwheel. Turning the handwheel clockwise holds the valve disc on the valve seat and thus keeps the valve closed. Turning it counter-clockwise enables opening by the pressure of the medium. The shut-off function must only be used in a fully open or fully closed position. Due to the presence of a damping device (with types 293, 294, 29G, 295, 296), 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 gasket R). When the valve is fully open, the sealing elements (O-rings A and B, PTFE ring) 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	25	32	40	50	65	80	100	125	150	200
Distance [mm]	115	115	130	130	145	170	170	240	270	425

6.1 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 p = 10 bar above the valve disc.

Type 293, 294, 29G, 295, 296, 29I, 297, 298, 29K

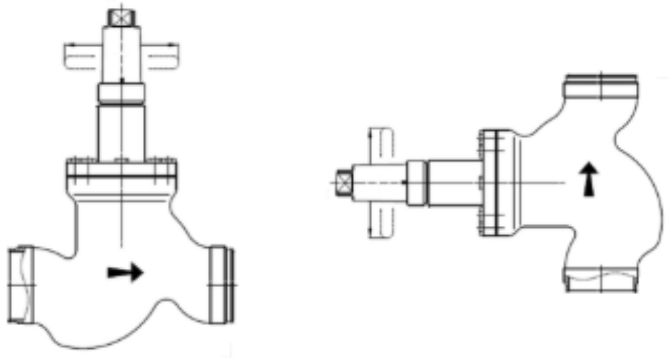
Horizontal: Bonnet pointing upwards or to the side.

Vertical: Bonnet pointing upwards or to the side, flow from bottom to top. Medium pushes against the valve disc from below.

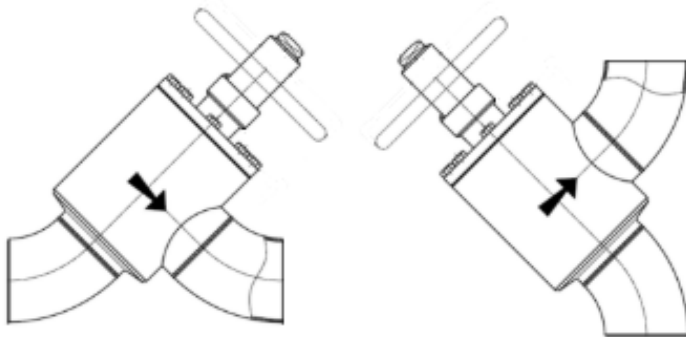
Type 291, 292

Vertical: Bonnet pointing downwards. Flow from top to bottom (reinforced spring). Medium pushes against the valve disc from above.

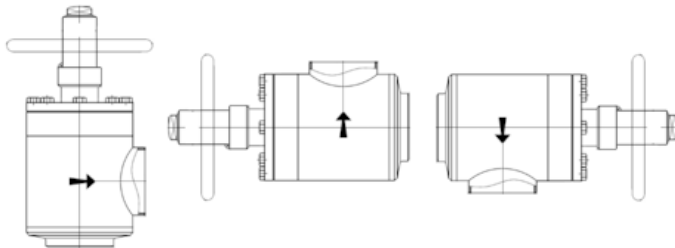
6.2 Type 29G, 29I, 29K



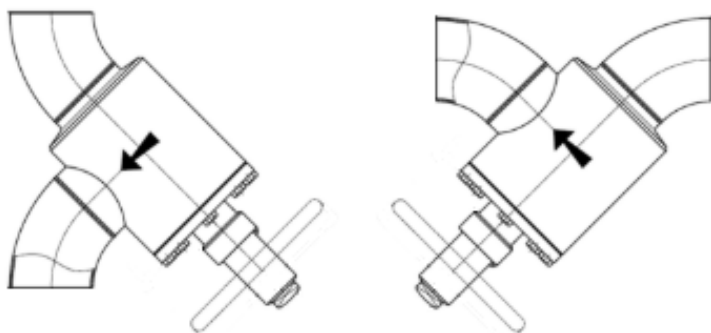
6.3 Type 293, 295, 297



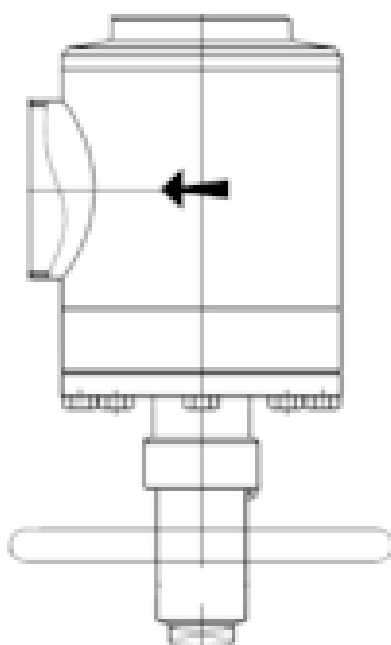
6.4 Type 294, 296, 298



6.5 Type 291



6.6 Type 292



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 25-30	DN 40-65	DN 80-100	DN 125-150	DN 200
Wrench size	24	32	41	50	60

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:
5. Remove O-rings A, B, 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/back seat/valve insert

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.**
2. To unscrew, use a wrench or screwdriver with the sizes specified in the following table:

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

3. After pressure equalisation, unscrew all bonnet bolts completely and pull out the bonnet, including all internal parts attached to it, by the handwheel.
4. Unscrew the handwheel from the stem and, after removing the grub screw (only DN 80 to DN 200), unscrew the stem from the bonnet.
5. Remove pressure spring from the underside of the bonnet. For types 295, 296, 297 and 298, remove the linear ball bearing.
6. Then remove the back seat gasket (flat gasket R) from the installation space on the underside of the bonnet and replace it with a new one.

7.3 Removing the seat seal (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. Insert new seat seal (flat gasket S). **NOTICE! For DN 40 to DN 150, secure using the washer and by restoring the indentations (using suitable methods, e.g. hand lever press). For the other nominal diameters, secure the washer by tightening the screws or nuts.**
8. Clean individual parts of the valve before assembly.
9. Grease the stem and bonnet.

10. Insert a new bonnet gasket (flat gasket K). Place pressure spring on the underside of the bonnet and screw the stem into the bonnet.
11. Put bonnet in place.
12. Tighten bonnet bolts evenly and crosswise. See the following table for screw size, wrench size and tightening torques:

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 **Overview of types** [► 4].

Nominal size	Handwheel		Cap	
	Item number	Dimensions	Item number	Thread size
DN 25	16300E13.5280001	Ø120-11/14	16402.13.3180001	M36 x 2.0
DN 32	16300E13.5280001	Ø120-11/14	16402.13.3180001	M36 x 2.0
DN 40	16300E15.5280001	Ø140-12/16	16402.15.3180001	M52 x 3.0
DN 50	16300E15.5280001	Ø140-12/16	16402.15.3180001	M52 x 3.0
DN 65	16300E15.5280001	Ø140-12/16	16402.15.3180001	M52 x 3.0
DN 80	16300E18.5280001	Ø175-14/20	16402.19.3180001	M60 x 3.0
DN 100	16300E18.5280001	Ø175-14/20	16402.19.3180001	M60 x 3.0
DN 125	16301.20.5280001	Ø315-22/28	16402.21.3180001	M76 x 3.0
DN 150	16301.21.5280001	Ø400-22/28	16402.21.3180001	M76 x 3.0

Nominal size	Handwheel		Cap	
DN 200	16301.23.5280001	Ø630-28/46	16402.23.3180001	M80 x 3.0

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. A seal kit contains all O-rings and flat sealing rings shown in the **Overview of types [► 4]** suitable for the respective nominal diameter.

Nominal size	Threaded bush (CR), complete	Seal kit (CR)
DN 25	16300E13.8142001	26302.12.5/00019
DN 32	16300E13.8142001	26302.13.5/00019
DN 40	16300E15.8142001	26302.14.5/00019
DN 50	16300E15.8142001	26302.15.5/00019
DN 65	16300E15.8142001	26302.17.5/00019
DN 80	16300E18.8142001	26302.18.5/00019
DN 100	16300E18.8142001	26302.19.5/00019
DN 125	16300E21.8142001	26302.20.5/00019
DN 150	16300E21.8142001	26302.21.5/00019
DN 200	16300E23.8142001	26302.23.5/00019

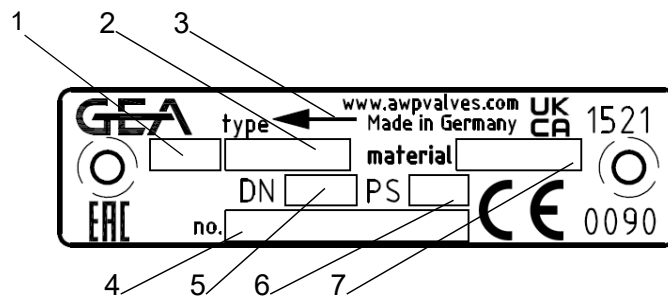
Nominal size	Valve insert (Steel, CR), complete			
	Type 293, 294, 29G	Type 295, 296	Type 297, 298	Type 291, 292
DN 25	29300E13.5110001	29500E13.5110001	29700E13.5110001	29100E13.5110001
DN 32	29300E13.5110001	29500E13.5110001	29700E13.5110001	29100E13.5110001
DN 40	29300E15.5110001	29500E15.5110001	29700E15.5110001	29100E15.5110001
DN 50	29300E15.5110001	29500E15.5110001	29700E15.5110001	29100E15.5110001
DN 65	29300B17.5110001	29500B17.5110001	29700B17.5110001	29100B17.5110001
DN 80	29300E18.5110001	29500E18.5110001	29700E18.5110001	29100E18.5110001
DN 100	29300E19.5110001	29500E19.5110001	29700E19.5110001	29100E19.5110001
DN 125	29300E20.5110001	29500E20.5110001	29700E20.5110001	29100E20.5110001
DN 150	29300E21.5110001	29500E21.5110001	29700E21.5110001	29100E21.5110001
DN 200	29300B23.5110001	29500B23.5110001	29700B23.5110001	29100B23.5110001

A valve insert contains all internal parts including seals, i.e. stem, valve disc, 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

The marking of AWP shut-off valves is carried out in accordance with Pressure Equipment Directive 2014/68/EU by means of a nameplate on the side edge of the bonnet.



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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