



OPERATING INSTRUCTIONS FOR CHECK VALVES

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

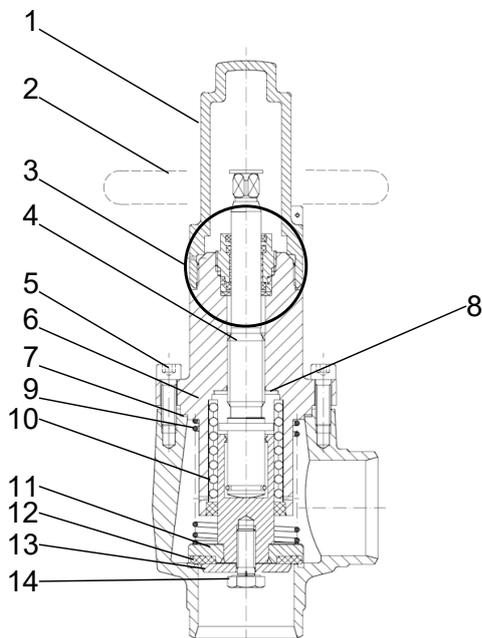
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1 Overview of types

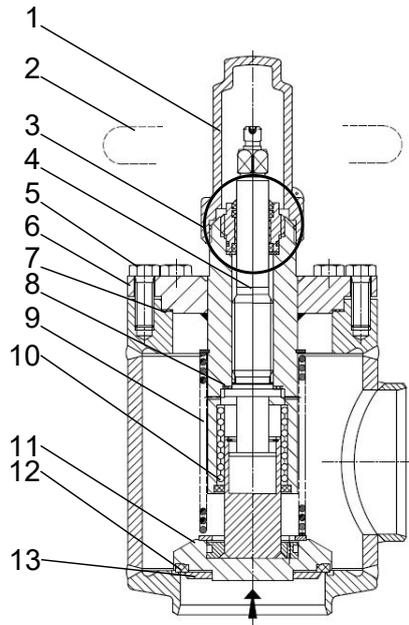
293	Straight-way shut-off check valve, Y-pattern, with damping
29G	Straight-way shut-off check valve, T-pattern, with damping
294	Angle shut-off check valve, with damping
295	Straight-way shut-off check valve, with linear ball bearing and damping, Y-pattern
29I	Straight-way shut-off check valve, with 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
29I	Straight-way shut-off check valve, with reinforced spring for vertical flow from top to bottom
292	Angle shut-off check valve, with reinforced spring for vertical flow from top to bottom

RVA DN 25 - DN 65



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)

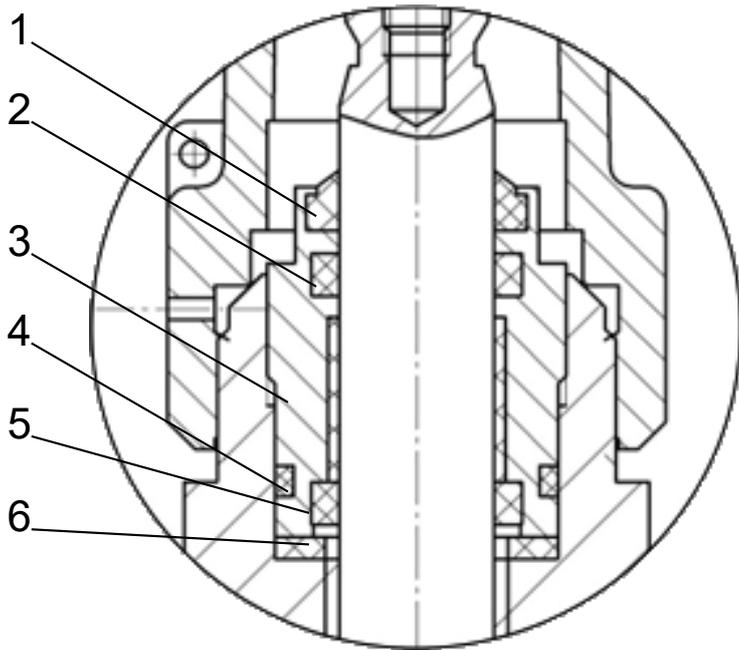
Type RVA DN 80 - DN 200



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	

1.1 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	Auswahl nach AD-2000 Reihe W
Steel	P235GH, S235JR, S355J2
Low temperature steel (TT)	P215NL, P255QL, P355NL1, G20Mn5QT
NIRO	X5CrNi18-10, GXCrNiMoNb19-11-2 oder gleichwertige

3 Pressure / temperature operating limits

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

PN	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 ³⁾

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

PN	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) (Steel)
3) G20Mn5QT = 43bar/ GXCrNiMoNb19-11-2 = 50bar
Permissible ambient temperature range: -50 to +50 °C

The following values apply to shut-off check valves for heating technology (types 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					

4 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.

5 Flow coefficient

K_v-Wert des Ventils bei Nennhub (100 % Öffnungsgrad) 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	21.0	30.0	42.0	66.5	109.0	151.0	245.0	352.0	526.0
29G, 29I, 29K	11.69	20.06	28.21	33.0	60.0	–	–	–	–	–
294, 296, 298, 292	14.9	24.4	37.0	53.5	80.0	159.0	231.0	373.0	464.0	790.0

6 Safety instructions

WARNING

Verbrennungsgefahr bei extremen Temperaturen!

Verbrennungen möglich.

- ▶ Ventil bei extremen Temperaturen mit Schutzhandschuhen bedienen.

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.

7 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.

8 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.

9 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 and 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 nameplate).

2. Vor dem Schweißen die Spindel mittels eines Handrades in Mittelstellung bringen (Ventil halb geöffnet).

NOTICE! Bei Anwendung moderner Schweißverfahren (z. B. WIG, CO₂-Lichtbogenschweißen) Ventile zum Einschweißen nicht demontieren.

3. Befestigungsschrauben und -muttern über Kreuz und gleichmäßig anziehen.

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).

Zur Demontage des Ventileinsatzes ist genügend Platz auf der Seite, auf der sich der Ventildeckel befindet, freizuhalten – siehe folgende Tabelle.

DN	25	32	40	50	65	80	100	125	150	200
Distance [mm]	115	115	130	130	145	170	170	240	270	425

9.1 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

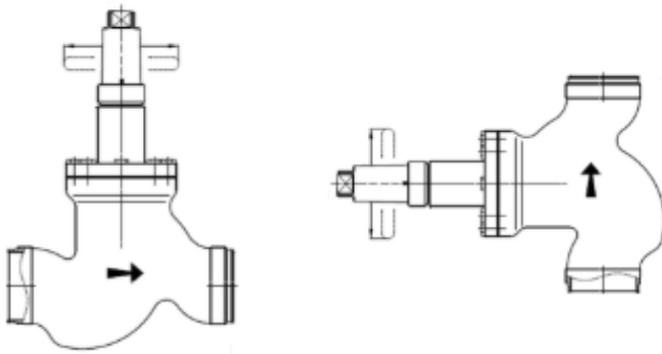
Horizontal: Bonnet pointing upwards or to the side.

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

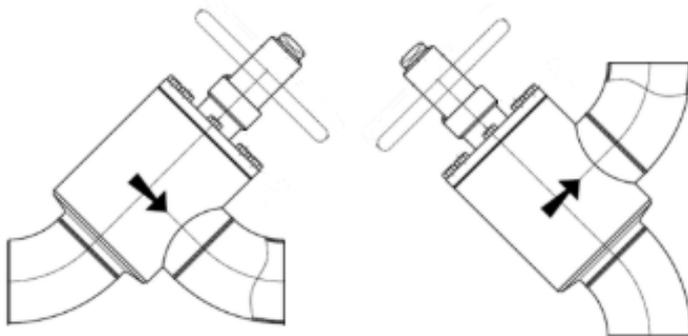
Type 291, 292

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

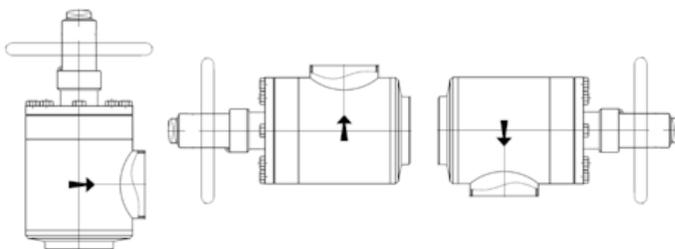
9.1.1 Type 29G, 29I, 29K



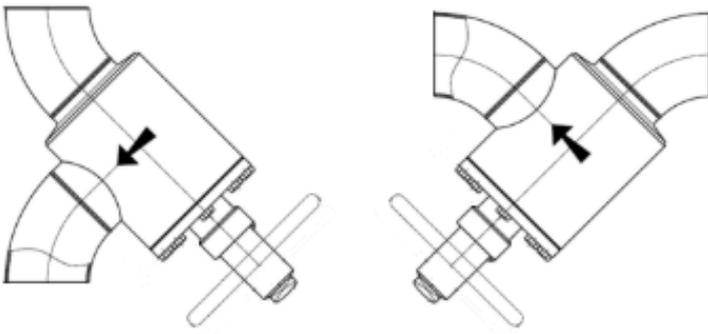
9.1.2 Type 293, 295, 297



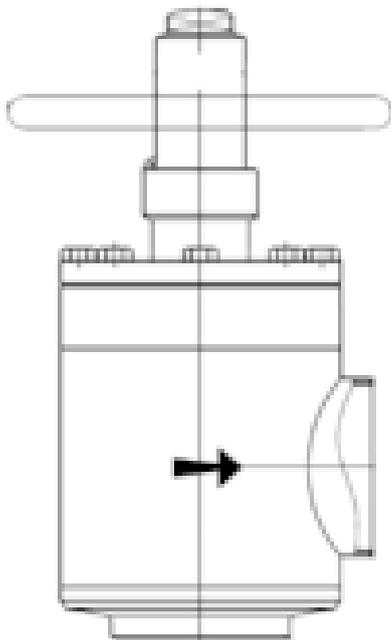
9.1.3 Type 294, 296, 298



9.1.4 Type 291



9.1.5 Type 292



10 Wartung

AWP-Rückschlagventile arbeiten wartungsfrei. Treten Mängel im Funktionsverhalten auf, ist eine Reparatur möglich. Während der Garantiezeit dürfen Reparaturen nur durch den Hersteller (AWP) bzw. mit dessen Einverständnis durch geschultes Instandhaltungspersonal des Betreibers der Anlage vorgenommen werden.

10.1 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.

10.2 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	80	100	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.

10.3 Removing the seat seal (flat gasket S)

Option 1: (DN 25 - DN32)

1. Bei Nennweite DN 25 bis DN 32 ist die Sitzdichtung an den Ventilteller angeschraubt (siehe Skizze). Ventiltellermutter abschrauben und Sitzdichtung entfernen.

Option 2: (Dn 40 - DN 150)

2. Bei Nennweite DN 40 bis DN 150 ist die Sitzdichtung eingepresst. Zum lösen die Einkerbungen am Ventilteller mit geeignetem Werkzeug (Feilen, Sägen) entfernen.

3. Anschließend Scheibe und Flachdichtung 2 abnehmen.

Option 3: DN 200

4. Bei Nennweite DN 200 ist die Sitzdichtung mit mehreren Schrauben (M6 x M20) an den Ventilteller geschraubt.
5. Die Schrauben mit einem Schlüssel der Weite 10 lösen.
6. Flachdichtung S abnehmen.
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	80	100	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

11 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.

12 Garantie

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.

13 Spare parts

For AWP shut-off check valves, the following spare parts are available according to **Overview of types** [► 4].

Nominal size (DN)	Handwheel		Cap	
	Item number	Dimensions	Item number	Thread size
25	16300E13.5280001	Ø120-11/14	16402.13.3180001	M36 x 2.0
32	16300E13.5280001	Ø120-11/14	16402.13.3180001	M36 x 2.0
40	16300E15.5280001	Ø140-12/16	16402.15.3180001	M52 x 3.0
50	16300E15.5280001	Ø140-12/16	16402.15.3180001	M52 x 3.0
65	16300E15.5280001	Ø140-12/16	16402.15.3180001	M52 x 3.0
80	16300E18.5280001	Ø175-14/20	16402.19.3180001	M60 x 3.0
100	16300E18.5280001	Ø175-14/20	16402.19.3180001	M60 x 3.0

Nominal size (DN)	Handwheel	Cap		
125	16301.20.5280001	Ø315-22/28	16402.21.3180001	M76 x 3.0
150	16301.21.5280001	Ø400-22/28	16402.21.3180001	M76 x 3.0
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 (DN)	Threaded bush (CR), complete	Seal kit (CR)
25	16300E13.8142001	26302.12.5/00019
32	16300E13.8142001	26302.13.5/00019
40	16300E15.8142001	26302.14.5/00019
50	16300E15.8142001	26302.15.5/00019
65	16300E15.8142001	26302.17.5/00019
80	16300E18.8142001	26302.18.5/00019
100	16300E18.8142001	26302.19.5/00019
125	16300E21.8142001	26302.20.5/00019
150	16300E21.8142001	26302.21.5/00019
200	16300E23.8142001	26302.23.5/00019

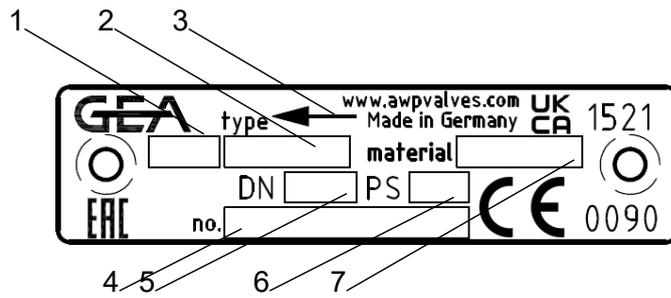
Nominal size (DN)	Valve insert (Steel, CR), complete			
	Type 293, 294, 29G	Type 295, 296	Type 297, 298	Type 291, 292
25	29300E13.5110001	29500E13.5110001	29700E13.5110001	29100E13.5110001
32	29300E13.5110001	29500E13.5110001	29700E13.5110001	29100E13.5110001
40	29300E15.5110001	29500E15.5110001	29700E15.5110001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

14 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	

15 Hinweis auf Restgefahren entsprechend Druckgeräterichtlinie 2014/68/EU

Residual risks that cannot be avoided by the manufacturer exist due to:

NOTICE

- ▶ Do not loosen bonnets (without authorisation) during operation.
- ▶ Do not incorrectly assemble flange connections (inlet and outlet flanges, flanged bonnets).
- ▶ Contamination in the operating medium or improper handling of internal components can lead to damage to the seat seal.
- ▶ Non-compliance with the operating limits and manufacturer's regulations according to these operating instructions.

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