



OPERATING INSTRUCTIONS FOR 3-WAY VALVES

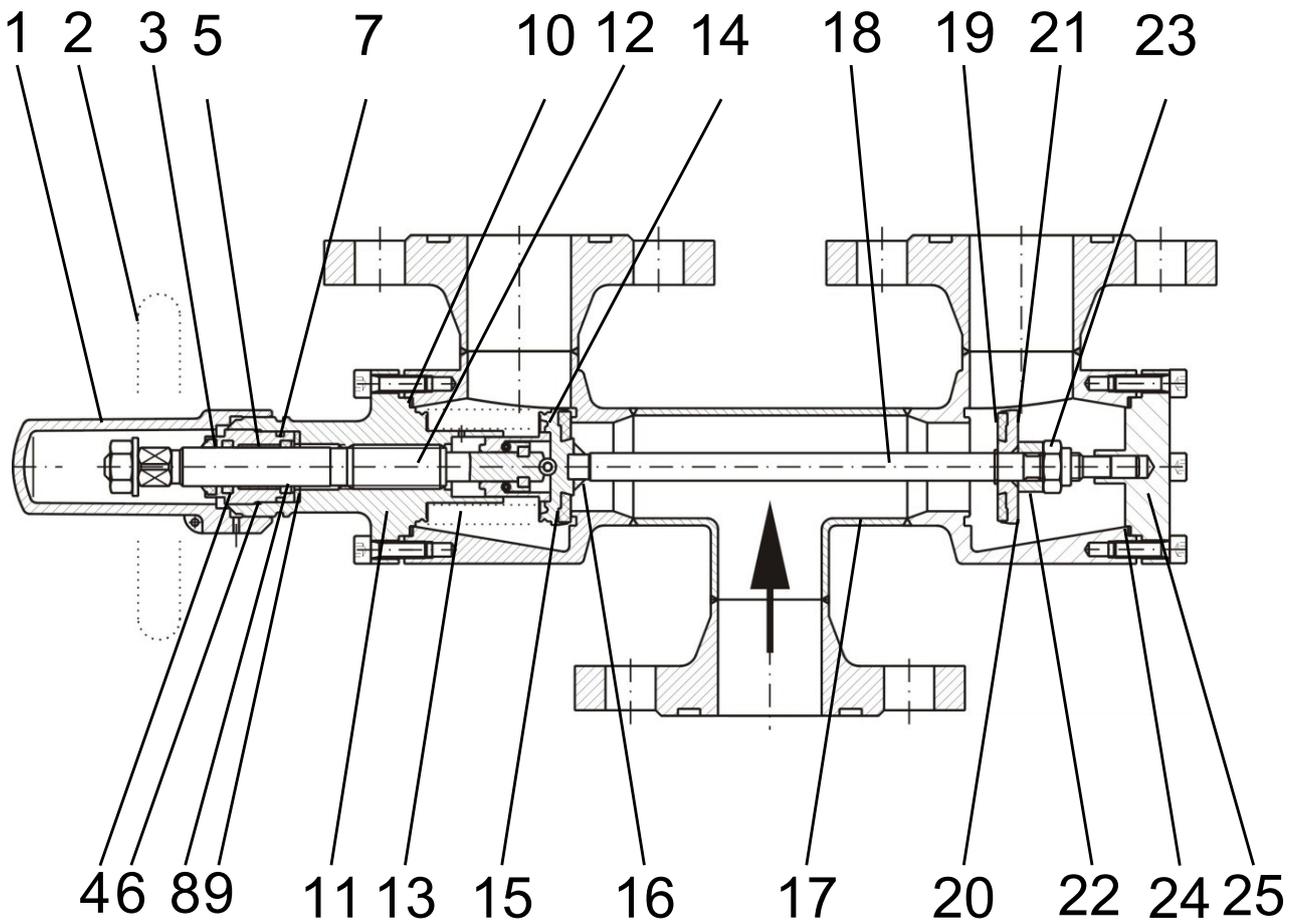
WVB 230

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1 Overview of types

WVB type 230 (with flange and welding ends)



| | |
|--------------------------------|------------------------------------|
| 1 Cap | 2 Handwheel (optional) |
| 3 Wiper ring | 4 O-ring A |
| 5 Slide bearing | 6 Threaded bush |
| 7 O-ring B | 8 PTFE ring |
| 9 Flat gasket SB | 10 Bonnet gasket 1 (flat gasket K) |
| 11 Bonnet 1 | 12 Stem 1 |
| 13 Metal bellows | 14 Valve disc 1 |
| 15 Seat seal 1 (flat gasket S) | 16 Retaining ring |
| 17 Body | 18 Stem 2 |
| 19 Seat seal 2 (flat gasket S) | 20 Valve disc 2 |
| 21 O-ring C | 22 Washer |
| 23 Hexagon nut (ISO 10511) | 24 Bonnet gasket 2 (flat gasket K) |
| 25 Bonnet 2 | |

2 Technical characteristics

| | |
|-----------------------|------------------------------------|
| Body material | Selection acc. to AD-2000 Series W |
| Steel | P235GH, S235JR, S355J2 |
| Low-temperature steel | P215NL, P255QL, P355NL1 |

| | |
|------|---------------------------|
| NIRO | X5CrNi18-10 or equivalent |
|------|---------------------------|

3 Pressure/temperature operating limits

Pressure / temperature operating limits:

PS: Max. permissible operating pressure in bar

TS: Permissible operating temperature in °C associated with the permissible operating pressures (PS)

PN: Nominal pressure rating

When using screws of property class 8.8:

| 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 |

When using screws of property class A2-70:

| 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 |

1) Load case I (TT, NIRO)

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

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

The following values apply to change-over valves for heating technology (type 230...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 |

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 10 | DN 15 | DN 20 | DN 25 | DN 32 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 230 | 8.6 | 12.9 | 14.3 | 17.6 | 24.3 | 38.2 | 51.6 | 82.0 | 178 | 204 |

Installation position: any; observe the direction of flow (see arrow on nameplate). Leakage at valve seat: <5 g refrigerant per year

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 outlet connections in liquid lines in sequence to a vessel with gas volume.

7 Applications

AWP change-over valves are intended for use in the cooling circuits of industrial refrigeration systems. They are usually installed between pressure vessels or between pressure lines and two safety valves. The stem is sealed via a threaded bush and metal bellows for a completely hermetic seal.

8 Functional description

AWP change-over valves must be actuated by a handwheel. Turning the handwheel clockwise opens the outlet connection facing away from the handwheel. When one outlet connection is closed, the other is forced to open. Both outlet connections cannot be shut off simultaneously.

The valves are shut-off valves and must only be operated in a fully open or closed position. When opening the valve, the stem must be turned until it reaches the stop (fully open / fully closed). When the outlet connection facing the handwheel is fully closed, the threaded bush can be unscrewed without danger. In this way, either the complete threaded bush or the seals located on it (O-ring A, O-ring B, PTFE ring) can be replaced.

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.

| Nominal size | DN 10 – 20 | DN 25 | DN 32 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
|---------------|------------|-------|-------|-------|-------|-------|-------|--------|
| Distance [mm] | 200 | 215 | 215 | 240 | 240 | 300 | 360 | 420 |

10 Maintenance

AWP change-over valves operate maintenance-free. If functional defects occur, repair is possible. During the warranty period, repairs may only be carried out by the manufacturer (AWP) or, with their consent, by the system operator's trained maintenance personnel.

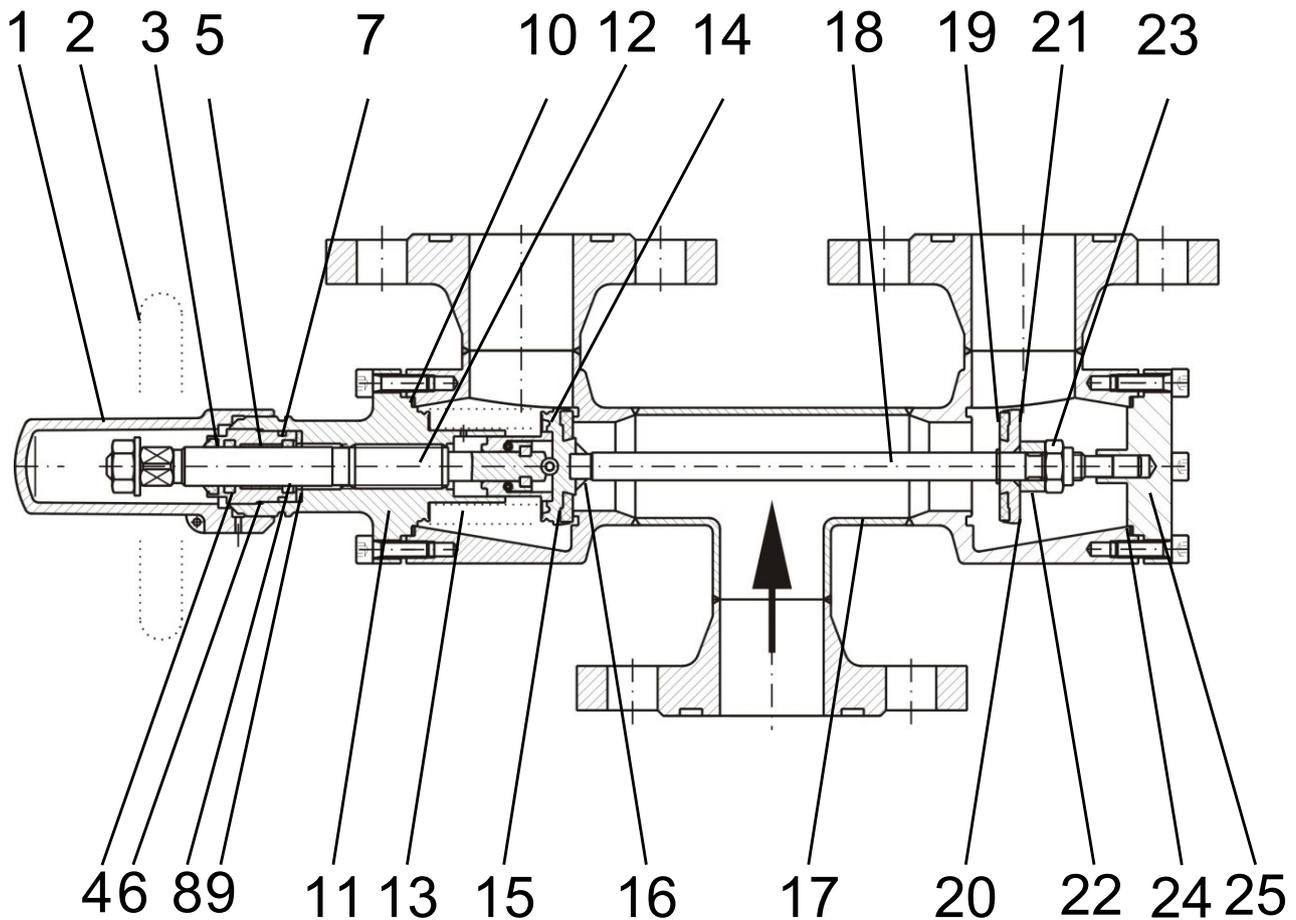
10.1 Changing the stem seal

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

| Nominal size | DN 10 – 20 | DN 25 – 32 | DN 40 – 65 | DN 80 – 100 |
|--------------|------------|------------|------------|-------------|
| Wrench size | 17 | 22 | 27 | 32 |

- Using the handwheel, turn the stem clockwise until the outlet connection facing away from the handwheel is fully open. The outlet connection facing the handwheel is then fully closed.
- 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.**
- Then unscrew it completely. To unscrew the threaded bush, use a wrench with the sizes specified in the following table:
- Remove O-rings A, B, PTFE ring and the wiper ring and replace them with new ones.
- Remove the flat gasket SB from the installation space in the bonnet.
- Clean the stem and insert a new flat gasket SB into the bonnet.
- Grease the threaded bush with refrigeration grease (e.g. RENOLIT UNITEMP 2) and tighten hand-tight.
- 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/valve insert



| | |
|--------------------------------|------------------------------------|
| 1 Cap | 2 Handwheel (optional) |
| 3 Wiper ring | 4 O-ring A |
| 5 Slide bearing | 6 Threaded bush |
| 7 O-ring B | 8 PTFE ring |
| 9 Flat gasket SB | 10 Bonnet gasket 1 (flat gasket K) |
| 11 Bonnet 1 | 12 Stem 1 |
| 13 Metal bellows | 14 Valve disc 1 |
| 15 Seat seal 1 (flat gasket S) | 16 Retaining ring |
| 17 Body | 18 Stem 2 |
| 19 Seat seal 2 (flat gasket S) | 20 Valve disc 2 |
| 21 O-ring C | 22 Washer |
| 23 Hexagon nut (ISO 10511) | 24 Bonnet gasket 2 (flat gasket K) |
| 25 Bonnet 2 | |

Replacing the seat seal

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 10 | DN 15 | DN 20 | DN 25 | DN 32 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
|---------------|----------|-------|-------|-------|-------|-------|-------|-------|----------|--------|
| Bonnet screws | M8x16 | M8x16 | M8x16 | M8x25 | M8x25 | M8x25 | M8x25 | M8x25 | M10x30 | M12x35 |
| | ISO 4762 | | | | | | | | ISO 4014 | |

| Nominal size | DN 10 | DN 15 | DN 20 | DN 25 | DN 32 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Wrench size | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 16 | 18 |

2. After pressure equalisation, completely unscrew all bonnet bolts and remove bonnet 2 (item 25). Unscrew ISO 10511 hexagon nut (item 23), and remove the washer (item 22) and valve disc (item 20). Then pull out bonnet 1 (item 11), including all attached internal parts, using the handwheel.
3. Unscrew the handwheel from stem 1 (item 12) and unscrew the stem from bonnet 1 (item 11). For nominal sizes DN 80 and DN 100, the grub screw must be removed beforehand.
4. Remove the bonnet gaskets (item 10 and item 24) from the body. Unscrew stem 2 (item 18) from valve disc 1 (item 11). Remove the retaining ring (item 17) and valve disc washer from valve disc 1.
5. Insert the new seat seal into valve disc 1 (item 11) and secure it with the valve disc washer and retaining ring (item 16).
6. Before assembly, clean all individual valve components and grease the stems and bonnets.
7. Screw stems (item 12 and item 18) into valve disc (item 20).
8. Screw the stem back into the bonnet; for DN 80 and DN 100, then re-insert the grub screw and mount the handwheel onto the stem.
9. Insert bonnet gasket 1 (item 10), hold the bonnet with all attached internal parts by the handwheel and guide it into the valve body.
- 10 Valve disc 2 (item 20) with the valve disc washer and seat seal 2 (item 19) onto the stem. Slide on the washer . (item 22) and fix it by screwing on the ISO 10511 hexagon nut (item 23).
- 11 Then fit bonnet 2 (item 25) and tighten all bonnet bolts evenly and in a crosswise pattern.

| Nominal size | DN 10 –20 | DN 25 – 65 | DN 80 | DN 100 |
|--------------------------------|-----------|------------|----------|--------|
| Bonnet screws | M8x16 | M8x25 | M10x30 | M12x35 |
| | ISO 4762 | | ISO 4014 | |
| Wrench size | 6 | 6 | 16 | 18 |
| Tightening torque (8.8) [Nm] | 25 | 25 | 49 | 85 |
| Tightening torque (A2-70) [Nm] | 16 | 16 | 32 | 56 |

Replacing the valve insert

A valve insert contains all internal parts including seals, i.e. stems, valve disc, threaded bush, bonnet with screws, nameplate (with new serial number!) and cap, pre-assembled.

- 12 First, remove the old internal parts of the change-over valve and remove the bonnet gaskets.
- 13 To guide the new valve insert into the body, first remove the hexagon nut (item 23), valve disc 2 (item 20), . seat seal 2 (item 19) and valve disc washer 2 from the new valve insert.
- 14 Insert bonnet gasket 1 (item 10), hold the bonnet with all attached internal parts by the handwheel and . guide it into the valve body.
- 15 Valve disc 2 (item 20) with the valve disc washer and seat seal 2 (item 19) onto the stem. Slide on the washer . (item 22) and fix it by screwing on the ISO 10511 hexagon nut (item 23).
- 16 Then fit bonnet 2 (item 25) and tighten all bonnet bolts evenly and in a crosswise pattern.

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

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 | Handwheel | | Cap | |
|--------------|------------------|---------------|------------------|------------|
| | Item number | Dimensions | Item number | Dimensions |
| DN 10 | 96300E10.5280001 | ∅ 60 x 6/9 | 96300E10.3180001 | M27x2.0 |
| DN 15 | 96300E10.5280001 | ∅ 60 x 6/9 | 96300E10.3180001 | M27x2.0 |
| DN 20 | 96300E10.5280001 | ∅ 60 x 6/9 | 96300E10.3180001 | M27x2.0 |
| DN 25 | 16300E13.5280001 | ∅ 120 x 11/14 | 16402.13.3180001 | M36x2.0 |
| DN 32 | 16300E13.5280001 | ∅ 120 x 11/14 | 16402.13.3180001 | M36x2.0 |
| DN 40 | 16300E15.5280001 | ∅ 140 x 12/16 | 16402.15.3180001 | M52x3.0 |
| DN 50 | 16300E15.5280001 | ∅ 140 x 12/16 | 16402.15.3180001 | M52x3.0 |
| DN 65 | 16300E15.5280001 | ∅ 140 x 12/16 | 16402.15.3180001 | M52x3.0 |
| DN 80 | 16300E18.5280001 | ∅ 180 x 14/22 | 16402.19.3180001 | M60x3.0 |
| DN 100 | 16300E18.5280001 | ∅ 180 x 14/22 | 16402.19.3180001 | M60x3.0 |

A seal kit contains all O-rings and flat gaskets shown on page 3 suitable for the respective nominal diameter. A valve insert contains all internal parts including seals, i.e. stem, valve disc, threaded bush, metal bellows, bonnet with screws and cap, pre-assembled.

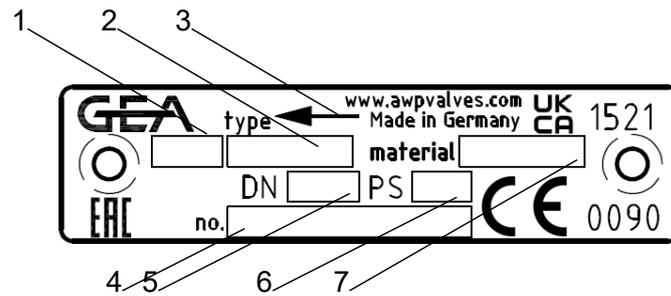
| Nominal size | Threaded bush | Seal kit | Valve insert |
|--------------|------------------|------------------|------------------|
| DN 10 | 96300E11.8142001 | 23000.10.5/00019 | 23000E08.5110021 |
| DN 15 | 96300E11.8142001 | 23000.10.5/00019 | 23000E10.5110021 |
| DN 20 | 96300E11.8142001 | 23000.10.5/00019 | 23000E11.5110021 |
| DN 25 | 16300E13.8142001 | 23000.12.5/00019 | 23000E12.5110021 |
| DN 32 | 16300E13.8142001 | 23000.12.5/00019 | 23000E12.5110021 |
| DN 40 | 16300E15.8142001 | 23000.14.5/00019 | 23000E14.5110021 |
| DN 50 | 16300E15.8142001 | 23000.14.5/00019 | 23000E15.5110021 |
| DN 65 | 16300E15.8142001 | 23000.17.5/00019 | 23000E17.5110021 |
| DN 80 | 16300E18.8142001 | 23000.18.5/00019 | 23000E18.5110021 |
| DN 100 | 16300E18.8142001 | 23000.19.5/00019 | 23000E19.5110021 |

All spare parts mentioned above refer to the standard design of the valves, i.e. body material = steel, pressure rating = PS 25, O-ring material = CR. Different spare part numbers may 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 change-over valves is carried out in accordance with Pressure Equipment Directive 2014/68/EU by means of a nameplate.



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

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