OPERATING INSTRUCTIONS FOR SHUT-OFF VALVES

AVB (163, 164, 16G)

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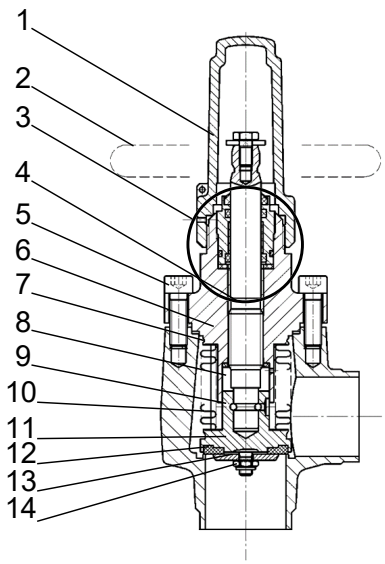
1 Overview of types

163	Straight-way shut-off valve, Y-pattern
164	Angle shut-off valve
16G	Straight-way shut-off valve, straight pattern, only DN 25-65

1.1 Type 163, 164, 16G

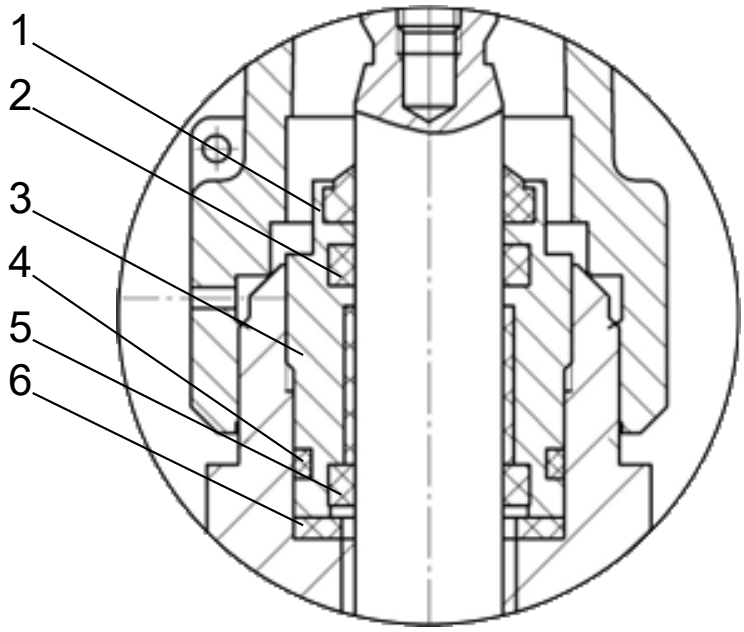
DN 10 - DN 200



1	Cap	2	Handwheel
3	Threaded bush, complete	4	Stem
5	Bonnet screws	6	Bonnet
7	Bonnet gasket (flat gasket K)	8	Back seal (flat gasket R)
9	Grub screw (DN 80 - DN 200)	10	Metal bellows
11	Valve disc	12	Seat seal (flat gasket S)
13	Washer	14	Valve disc nut

1.2 Threaded bush, complete

Item 3 in the preceding overview.



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

2.1 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 shut-off valves for heating technology (Types 163...HT, 16G...HT, 164...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					

2.2 Operating Mediums

Suitable for operation with refrigerants acc. to EN 378 Part 1, e.g. NH^3, 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-Wert des Ventils bei Nennhub (100 % Öffnungsgrad) in m^3/h

Type	DN 10	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200
163	2.42	5.45	7.71	12.4	19.1	30.0	42.0	66.5	109.0	151.0	426.0	681.0	910.0
16G	–	–	–	13.5	20.2	28.5	40.3	63	–	–	–	–	–
164	2.34	5.44	7.64	14.3	23.0	37.0	53.5	80.0	159.0	231.0	464.0	712.0	1,049.0

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

3 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.

4 Application

AWP shut-off valves are suitable for use in refrigerant circuits for industrial refrigeration systems.
The stem is sealed via a threaded bush and metal bellows for a completely hermetic seal.

5 Functional description

AWP shut-off valves are actuated by a handwheel. Close the valves by turning the handwheel clockwise and open them by turning it anti-clockwise. The valves are isolation fittings and must therefore only be operated in the "Open" or "Closed" position. To open the valve, bring the stem to the uppermost position up to the stop (fully open).
The valves are equipped with a back seat (flat sealing ring 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 Maintenance

AWP shut-off valves are maintenance-free. If functional defects occur, repair is possible. During the warranty period, repairs may only be carried out by AWP or, with their consent, by the system operator's trained maintenance personnel.

6.1 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	DN 120-150	DN 200
Wrench size	19	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:

Nominal size	DN 10-20	DN 25-32	DN 40-65	DN 80-100	DN 120-150	DN 200
Wrench size	17	22	37	32	46	55

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.

6.2 Replacing the seat seal/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 10-20	DN 25-65	DN 80	DN 100	DN 125-200
Bonnet screws	M8x16	M8x25	M10x30	M12x35	M16x45
	ISO 4762		ISO 4017		
Wrench size	6	6	16	18	24

3. After pressure equalisation, unscrew all bonnet bolts and pull out the bonnet, including all internal parts attached to it, by the handwheel.
4. Prepare a new valve insert or replace the old flat gasket S. To do this, loosen the valve disc screws (or nuts), then remove the washer and flat gasket S.
5. Insert a new flat gasket S, insert the washer and tighten the valve disc screws (or nuts).
6. Clean all individual parts before assembly.
7. Then insert a new bonnet gasket (Flat gasket K). Insert the valve insert into the body and tighten the bonnet bolts evenly and crosswise. See the following table for this:

Nominal size	DN 10-20	DN 25-65	DN 80	DN 100	DN 125-200
Bonnet screws	M8x16	M8x25	M10x30	M12x35	M16x45
	ISO 4762		EN 24014		
Wrench size	6	6	16	18	24
Tightening torque for 8.8 screws [Nm]	25	25	49	85	210
Tightening torque for A2-70 screws [Nm]	16	16	32	56	135

7 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.

8 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**.

9 Spare parts

The following spare parts are available for AWP shut-off valves in accordance with the **Overview of types [▶ 4]**.

Nominal size	Handwheel		Cap	
	Item number	Dimensions	Item number	Thread
DN 10	36302.10.5280001	Ø60 x 6/9	96300E10.3180001	M27 x 2
DN 15	36302.10.5280001	Ø60 x 6/9	96300E10.3180001	M27 x 2
DN 20	36302.10.5280001	Ø60 x 6/9	96300E10.3180001	M27 x 2
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
DN 200	16301.23.5280001	Ø630-28/46	16402.23.3180001	M80 x 3.0

A washer and a screw 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.

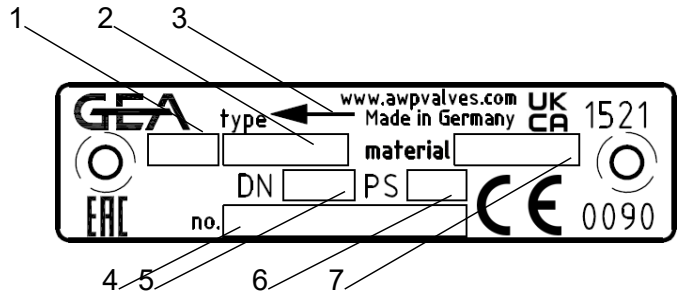
Nominal size (DN)	Threaded bush (CR), complete	Seal kit (CR)	Valve insert (Steel, CR), complete
DN 10	96300E11.8142001	16300.10.5/00019	16300E10.5110021
DN 15	96300E11.8142001	16300.10.5/00019	16300E10.5110021
DN 20	96300E11.8142001	16300.10.5/00019	16300E10.5110021
DN 25	16300E13.8142001	26302.12.5/00019	16300E13.5110021
DN 32	16300E13.8142001	26302.13.5/00019	16300E13.5110021
DN 40	16300E15.8142001	26302.14.5/00019	16300E15.5110021
DN 50	16300E15.8142001	26302.15.5/00019	16300E15.5110021
DN 65	16300E15.8142001	26302.17.5/00019	16300B17.5110021
DN 80	16300E18.8142001	26302.18.5/00019	16300E18.5110021
DN 100	16300E18.8142001	26302.19.5/00019	16300E19.5110021
DN 125	16300E21.8142001	26302.20.5/00019	16300E20.5110021
DN 150	16300E21.8142001	26302.21.5/00019	16300E21.5110021
DN 200	16300E23.8142001	26302.23.5/00019	16300B23.5110021

- A seal kit contains all O-rings and flat sealing rings shown in the **Overview of types [▶ 4]** suitable for the respective nominal diameter.
- 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 standard design of the valves, i.e. body material = steel, 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.

10 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	

11 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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