



OPERATING INSTRUCTIONS FOR THERMOSTATIC 3- WAY-VALVE

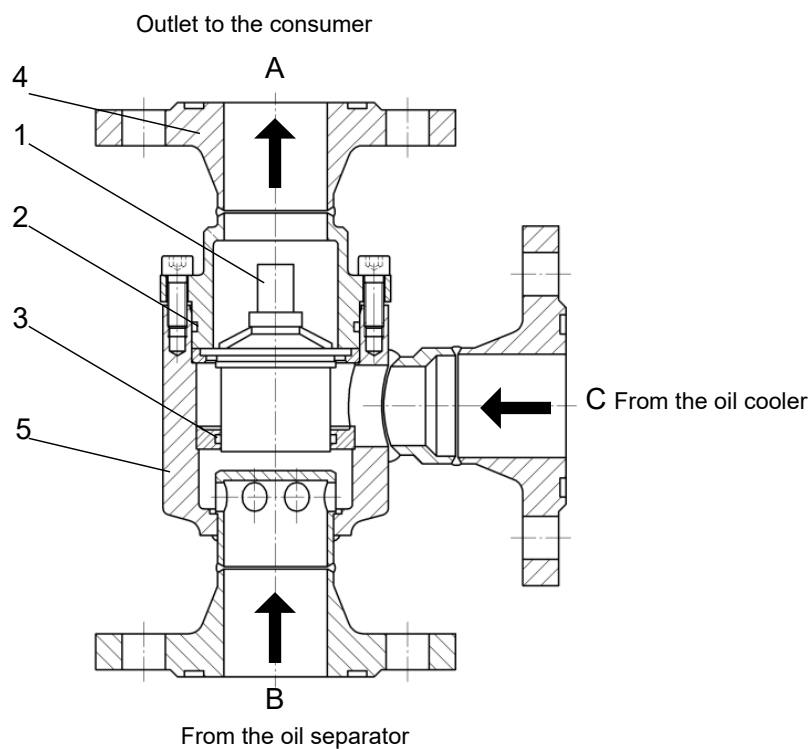
TR (470, 477)

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1 Overview of types

1.1 Type 470 DN 15 - DN 50



1 Temperature control element

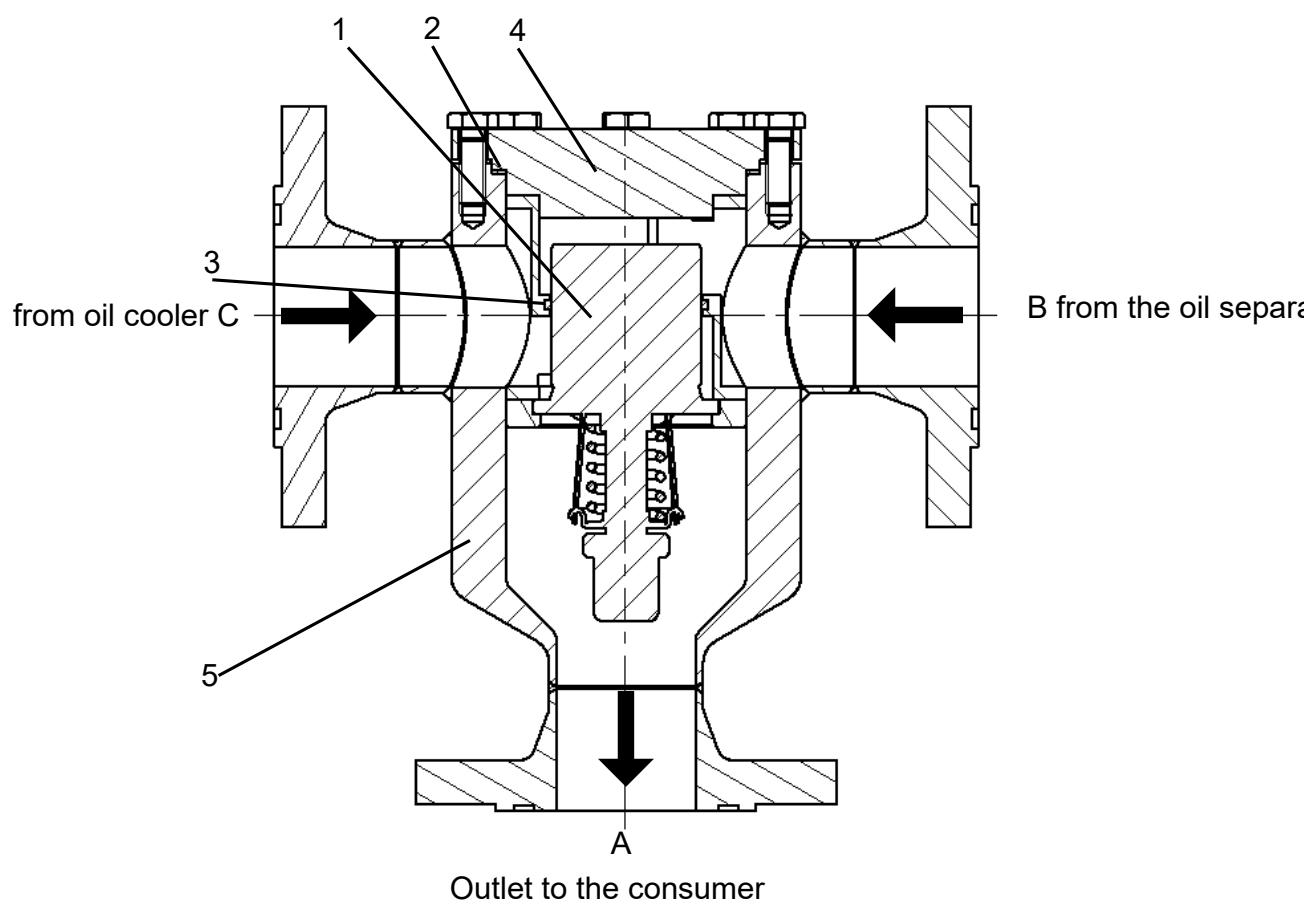
2 O-ring D

3 Piston ring

4 Bonnet, complete

5 Body, complete

1.2 Type 477 DN 15 - DN 50



1 Temperature control element

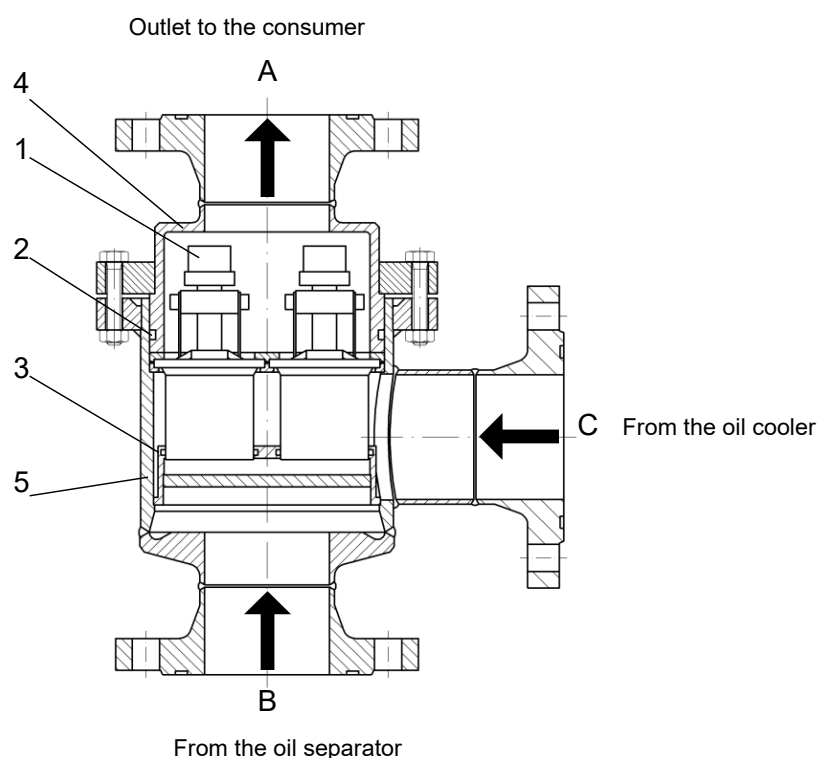
2 Bonnet gasket

3 Piston ring

4 Bonnet

5 Body, complete

1.3 Type 470 DN 65 - DN 200



1 Temperature control element

2 O-ring D

3 Piston ring

4 Bonnet, complete

5 Body, complete

2 Technical characteristics

Body material	Selection acc. to AD-2000 Series W
Steel	P235GH, S235JR, S235JR, S355J2+N
Low-temperature steel	P355NL1
Stainless steel	X6CrNiMoTi17-12-2

2.1 Pressure/temperature operating limits

When using screws of property class 8.8:

PN	TB (MWT) [C°]	-35 ²⁾	-35 ²⁾	-10	+50	+120
25	PS (MWP) [bar]	12.5	18.7	25	25	25
40		20	30	40	40	40
63		31.5	47.2	63	63	63

When using screws of property class A2-70:

PN	TB (MWT) [C°]	-35 ²⁾	-35 ¹⁾	-10	+50	+120
25	PS (MWP) [bar]	18.7	25	25	25	25
40		30	40	40	40	40
63		47.2	63	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 media

- All commercially available refrigeration machine oils. A system-related proportion of refrigerant in the oil of up to 30% is permissible.
- External leakage, seat <15g refrigerant per year
- Temperature control element DN 20-40 $\varnothing$ 45.6 mm and DN 50-200 $\varnothing$ 58.8 mm applicable for refrigerant media oil/freons and ammonia
- For temperature ranges, see spare parts list

2.3 Flow coefficient

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

Type	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150
470	8.9	11.3	14.7	16.1	40.5	73.7	81	162	243	361
477	11.2	13.5	15.7	17.6	40.5	–	–	–	–	–

Any installation position; the direction of flow (see arrow on nameplate) must be observed.

3 Safety instructions

NOTICE

Improper handling!

Risk of property damage.

- ▶ Do not install filters with transport or storage damage.
- ▶ Filters must be free of axial forces, bending moments, and torsional moments and must not serve as fixed points for pipework.
- ▶ Keep the interior of the filters free of contamination.
- ▶ Only change the strainer insert when the filter housing is depressurised and sufficiently ventilated.
- ▶ Oil residues in the body can lead to pressure increases due to subsequent evaporation of refrigerant.

4 Application

AWP temperature regulators are used in the oil management of compressor and oil circuits. They regulate the temperature of the oil flow within defined tolerances. The inlets and the outlet are provided with flanges according to DIN EN 1092-1 in pressure ratings PN 25, PN 40, PN 63, or with flanges according to ASME B16.5 150lbs, 300lbs. Welding and soldering end versions are also available.

5 Functional description

AWP temperature regulators regulate the temperature in oil circuits by utilising the thermal linear expansion of the installed temperature control elements. If the warm oil hits the temperature control elements, they expand and clear an opening gap for the cold oil. Warm oil, e.g. from the oil separator (connection B), is mixed with the cooled oil, e.g. from the oil cooler (connection C). This keeps the oil temperature at the outlet (connection A) of the temperature regulator almost constant. The greater the distance between the outlet (connection A) and the consumer, the more homogeneous the mixing and thus the nominal temperature. Here, a minimum distance of approx. 1 metre should be maintained. The nominal temperature is determined by the control elements used and is shown in the spare parts list. The pressure differential between the two inlets (connections B and C) must not exceed 1.5 bar, otherwise functional malfunctions may occur. Care must be taken to ensure professional design of the oil cooler capacity.

6 Installation

Installation must be carried out at easily accessible locations.

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. Observe the marking of the connections on the body. **NOTICE! When using modern welding processes (e.g. TIG, CO2 arc welding), do not dismantle weld-in valves.**

3. Tighten the mounting screws and nuts in a crisscross pattern and evenly.

Provide sufficient space on the bonnet/hood side for the disassembly of the bonnet/hood.

DN	15–25	32–50	65–200
mm	50	70	90

7 Maintenance

AWP temperature regulators operate 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.

7.1 Changing the piston ring and O-ring

Type 470, DN 15 - DN 200

1. Loosen the bonnet bolts anti-clockwise.

Nominal size	DN 15-40	DN 50	DN 65-80	DN 100	DN 125-150	DN 200
	M8	M8	M10	M16	M16	M20
	ISO 4762		ISO 4017			
Wrench size	6	6	16	24	24	30
Tightening torque for 8.8 screws [Nm]	25	25	49	210	210	425
Tightening torque for A2-70 screws [Nm]	16	16	32	135	135	275

2. Unscrew the bonnet bolts.
3. Remove bonnet and temperature control elements.
4. Remove and replace piston ring (see spare parts list).
5. Clean all individual parts before assembly.

- Then pull a new O-ring D onto the bonnet and fasten the bonnet using the bonnet bolts.

7.2 Replacing temperature control elements

- Remove the bonnet as described in replacing **Changing the piston ring and O-ring** [► 8].
- Remove and replace temperature control element. (Nominal temperatures see spare parts list).

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

O-ring D CR75		
Nominal size	Item number	Dimensions Inner Ø x cord
DN 15-40	737506	60 x 3
DN 50	737581	75 x 3
DN 65-80	737510	140 x 5
DN 100	737547	210 x 6
DN 125	737541	240 x 6
DN 150	737519	290 x 6
DN 200	737643	420 x 8

Piston ring PTFE		
Nominal size	Order number	Dimensions Outer Ø x inner Ø x width
DN 15-40	47050.11.2325003	⌀ 50.4 x 45.5 x 3.5
DN 50-200	47050.15.2325003	⌀ 63.9 x 58.7 x 3.5

Nominal size	Quantity per DN
Quantity of temperature control elements	

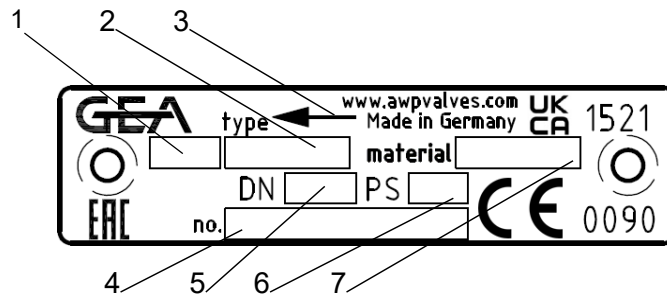
Nominal size	Quantity per DN
DN 15-50	1
DN 65	2
DN 80	2
DN 100	4
DN 125	6
DN 150	8
DN 200	16

Temperature control elements DN 15-40			Temperature control elements DN 50-200		
Nominal temperature		Temp. range	Nominal temperature		Temp. range
F	°C	°C	F	°C	°C
85	29	26–34	55	13	8–20
95	35	30–40	57	14	10–18
100	38	33–42	75	24	20–30
110	43	38–47	80	27	22.5–32
120	49	44–55	85	29	25–34
130	54	49–60	90	32	27–35
140	60	54–66	95	35	29.5–40.5
150	66	60–71	100	38	34–42
160	71	66–77	105	41	35–45
170	77	73–82	110	43	37.5–47
175	79	77–85	115	46	40–50
180	82	79–88	120	49	43–54.5
190	88	85–93	130	54	51–60
205	96	93–103	135	57	54–63
237	114	107–123	140	60	57–66
			145	63	60–69
			150	66	62.5–71.5
			155	68	65.5–74
			160	71	68–78
			165	74	71–79.5
			170	77	74–83
			175	79	76.5–85
			180	82	79.5–88
			185	85	82–91
			195	91	86.5–98
			205	96	93–101.5
			215	102	98.5–107
			225	107	102–113
			230	110	104–115

Temperature control elements DN 15-40			Temperature control elements DN 50-200		
Nominal temperature		Temp. range	Nominal temperature		Temp. range
			240	116	108–122

11 Marking

The marking of AWP temperature regulator 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
Additional marking on the body	A= outlet to the consumer B = inlet oil separator C = inlet oil cooler

12 Note on residual hazards in accordance with Pressure Equipment Directive 2014/68/EU

NOTICE

- ▶ Do not loosen the bonnet (without authorisation) during operation or when under internal pressure.
- ▶ There may be defects in weld seams that could not be detected in previous inspections.
- ▶ Do not incorrectly assemble flange connections (inlet and outlet flanges, bonnets).
- ▶ Contamination in the operating medium or improper handling of internal components can lead to damage to gaskets.
- ▶ Observe operating limits and manufacturer's instructions in accordance with these operating instructions.

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