OPERATING INSTRUCTIONS FOR THERMOSTATIC 3-WAY-VALVE

TR 470

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1 Overview of types

1.1 Type 470 0/470 1/470 4/470 B

DN 15 - DN 50

1	Temperature control element	2	O-ring D
3	Piston ring	4	O-ring F

1.2 Type 470 0/470 1/470 4/470 8

DN 65 - DN 200

1	Temperature control element	2	O-ring D
3	Piston ring	4	O-ring F

2 Technical characteristics

Body material	Selection acc. to AD-2000 Series W
Steel	P235GH, S235JR, S235JR
Low-temperature steel	P275NL, P255QL
NIRO	X6CrNiMoTi17-12-2

3 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 (TT, NIRO)						

PN	TB (MWT) [C°]	-35 [2]	-35 [1]	-10	+50	+120
[2] Load case II (St)						
Permissible ambient temperature range (°C) -50 to +50						

4 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 ⌀ 45.6 mm and DN 50-200 ⌀ 58.8 mm applicable for refrigerant media oil/freons and ammonia
- For temperature ranges, see spare parts list

5 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.

6 Application

AWP temperature regulators are used in the oil management of compressors and 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.

7 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.

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

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

9 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.

9.1 Changing the piston ring and O-ring

Type 470, DN 15 - DN 200

1. Loosen the bonnet bolts anti-clockwise.

DN	15-40	50	65-80	100	125-150	200
M	8	8	10	16	16	20
	ISO 4762		ISO 4017			
SW	6	6	16	24	24	30

2. Unscrew the bonnet bolts and remove the internal parts attached to it.
3. Remove and replace piston ring (see spare parts list).
4. Clean all individual parts before assembly.
5. Then pull a new O-ring D onto the bonnet and screw on the bonnet.

9.2 Replacing temperature control elements

1. Remove bonnet as described in **Changing the piston ring and O-ring [▶ 7]**.
2. Remove and replace temperature control element. (Nominal temperatures see spare parts list).

10 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.

11 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**.

12 Spare parts

A spare parts order must contain the following information:

– Quantity
– Designation acc. to image for type
– Order number
– Nominal diameter of the filter drier
– Year of manufacture of the valve

O-ring D CR75			O-ring F CR75		
DN	Order number	Dimensions Inner x cord	DN	Order number	Dimensions
15-40	73 75 06	60 x 3	15	73 75 28	32 x 3
50	73 75 81	75 x 3	25	73 75 17	45 x 3
65-80	73 75 10	140 x 5	32	73 75 17	45 x 3
100	73 75 47	210 x 6	40	73 75 17	45 x 3 for AWP-Fl
125	73 75 41	240 x 6	40	73 75 45	63 x 5 for DIN-Fl
150	73 75 19	290 x 6	50	73 75 81	75 x 3
200	73 76 43	420 x 8	65	73 75 81	75 x 3 for AWP-Fl
			65	73 75 55	100 x 5 for DIN-Fl
			80	73 75 55	100 x 5
			100	73 75 39	130 x 5 DIN-Fl only
			125	73 75 38	150 x 5 DIN-Fl only
			150	73 75 40	190 x 5 DIN-Fl only
			200	73 75 41	240 x 6 DIN-Fl only

Piston ring PTFE		
DN	Order number	Dimensions outer x inner x width
15-40	470 50.11.2325003	⦰ 50.4 x 45.5 x 3.5
50-200	470 50.15.2325003	⦰ 63.9 x 58.7 x 3.5

Quantity of temperature control elements		
DN	Order number	Quantity per DN

Quantity of temperature control elements		
15-50		1
65		2
80		2
100		4
125		6
150		8
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		
			240	116	108-122

13 Marking

The marking of AWP temperature regulator is carried out in accordance with Pressure Equipment Directive 2014/68/EU.

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

14 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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