



Applications:



AVTB-RA is a reverse acting thermostatic temperature controller used to regulate the water temperature where cooling is required. As the water temperature rises the thermostatic controller opens.

Typical applications could involve:

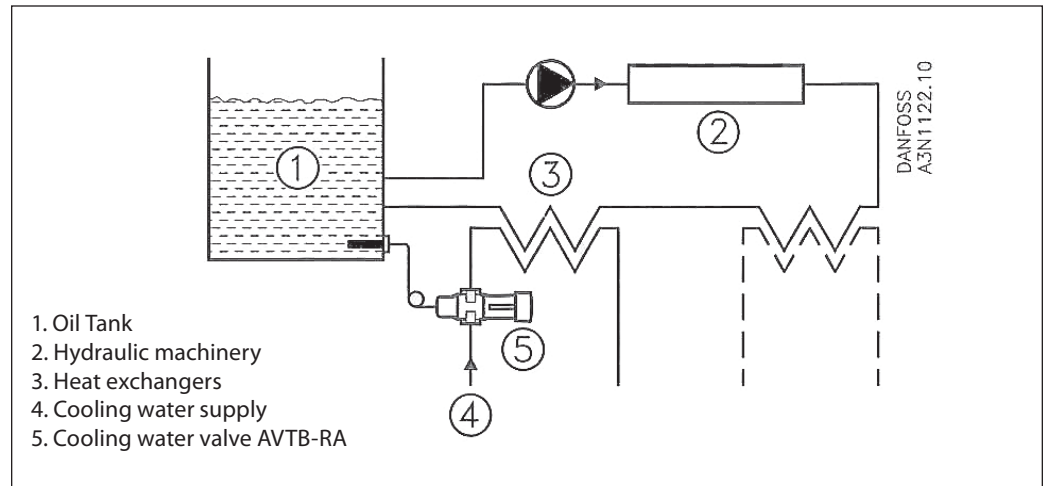
- Injection molding machines
- Compressors
- Vacuum pumps
- Dry cleaning machines

The thermostatic controller is a three part assembly consisting of the valve body, the thermostatic element and an adjustment assembly.

Features:

- For water
- Self-acting
- Opens on rising temperature
- Can be fitted in the supply or return
- Pressure range PN 16 (232 psi/16 bar)

Typical Application:



Ordering Information:

Code No.	Model	Connection (FNPT)	Capillary Tube Length	Max. Sensor Temperature °F (°C)	C _v	Temperature Range °F (°C)
003N6032RA	AVTB-RA 15	1/2"	6' 6" (2.0 m)	130 (55)	2.2	32-85 (0-30)
003N6252RA				190 (90)		77-150 (20-60)
003N6272RA				255 (125)		125-190 (50-90)
003N7032RA	AVTB-RA 20	3/4"		130 (55)	4.0	32-86 (0-30)
003N7252RA				190 (90)		70-150 (20-60)
003N7272RA				255 (125)		125-190 (50-90)
003N8032RA	AVTB-RA 25	1"		130 (55)	6.4	32-86 (0-30)
003N8252RA				190 (90)		70-150 (20-60)
003N8272RA				255 (125)		125-190 (50-90)

**Ordering
Information
(Cont.):**

Accessories

Code No.	Components
003N0056	Capillary tube gland, 3/4" NPT
003N0418	Gasket for capillary tube gland
AVTBWELL	Sensor pocket, 3/4" NPT, brass
003N0053	Sensor pocket, 3/4" NPT, stainless steel

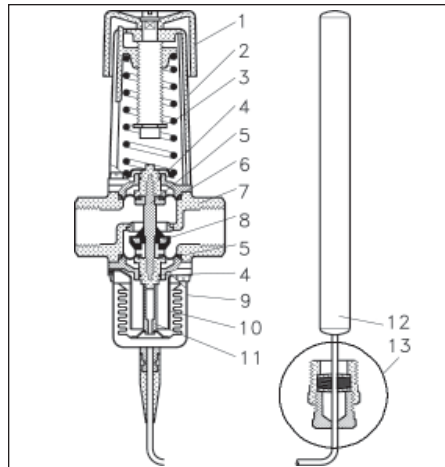
¹Include gasket for capillary tube gland

Spare Parts

Code No.	Components	Cap. tube length ft (m)
003N0075	Thermostatic element 32-85°F (0-30°C)	6'6 (2)
003N0078	Thermostatic element 77-150°F (20-60°C)	
003N0062	Thermostatic element 125-190°F (50-90°C)	
003N4006	For 1/2"	Repair set: Two diaphragms, two O-rings, one rubber cone, one tube of grease and eight valve cover crews
003N4007	For 3/4"	
003N4008	For 1"	
003N6100	1/2"	
003N7100	3/4"	Brass AVT body and adjustment knob, less element
003N8100	1"	
003N0520	AVT spare handle	

Design:

1. Handle for temperature setting
2. Spring housing
3. Setting spring
4. O-ring
5. Diaphragm
6. Spindle
7. Valve body
8. Valve cone
9. Bellows
10. Bellows stop
11. Pressure stem
12. Temperature sensor
13. Capillary tube gland



Materials, parts in contact with water:

- | | |
|-----------------------|---|
| Valve body: | Ms 58, hot-pressed |
| Other metal parts: | Ms 58 |
| Diaphragms: | EPDM rubber
(alt. NBR rubber for mineral oils) |
| Capillary tube gland: | NBR rubber |
| Valve cone: | NBR rubber |
| Valve seat: | CR Ni steel |
| Sensor: | Cu |
| Sensor pocket: | Ms 63 |

Specifications:

Supply temperature range:	-13°F to 266°F (-25°C to 130°C)
Maximum working pressure:	232 psi (16 bar)
Maximum differential pressure:	100 psi (7 bar)
Maximum test pressure:	365 psi (25 bar)

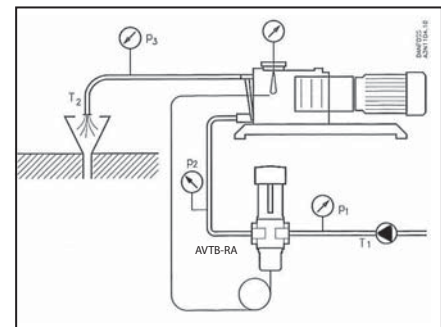
Sizing:

Example

Cooling water valve for temperature regulation of a vacuum pump. Regulation of the oil temperature is required. The sensor to be placed horizontally.

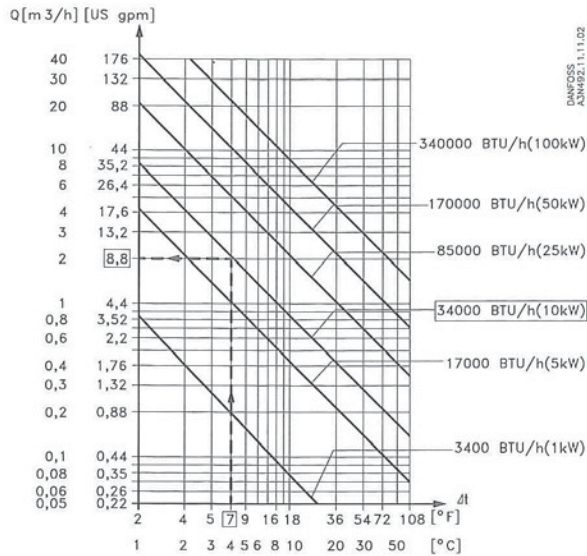
Given

- Necessary cooling effect at full load, 34,000 BTU/h
- Required oil temperature: 113°F (45°C)
- Cooling water pressure $P_1 = 28.5$ psi (2 bar)
- Outlet pressure $P_3 = 0$ psi (0 bar)
- Cooling water temperature $T_1 = 77^\circ\text{F}$ (25°C)
- Outlet temperature $T_2 = 84^\circ\text{F}$ (29°C), ($\Delta T = 7^\circ\text{F}$ (4°C))



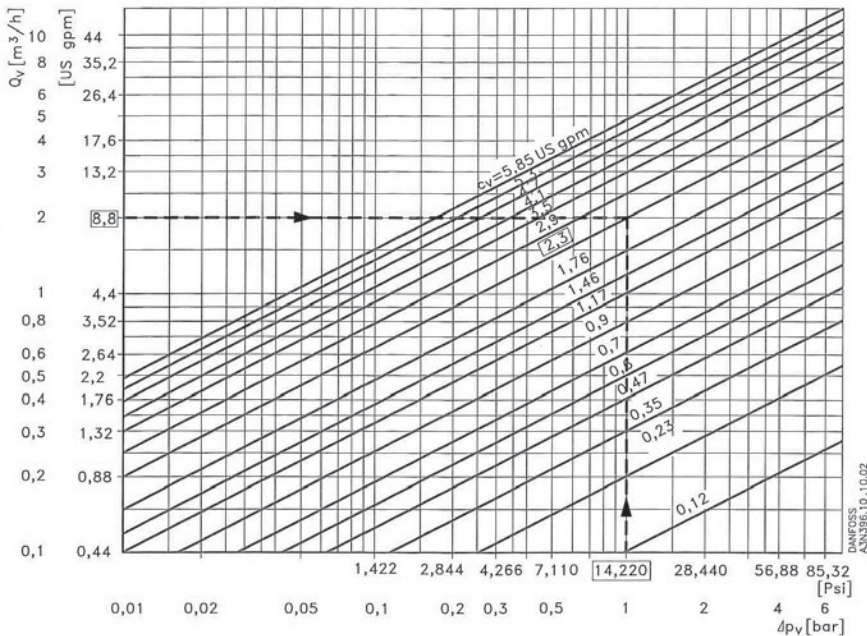
Sizing:

Heating or cooling with water



1. By means of the curves for heating or cooling with water the necessary amount of cooling water is detected to be 8.8 gpm at $\Delta T = 7^\circ F$ ($84 - 77 = 7^\circ F$)

Relationship between water flow and pressure drop across the valve



C_v values = water flow in US gpm at a pressure drop $\Delta p = 1$ psi

2. In order to obtain an effective regulation, the pressure drop across the valve should be half the entire pressure drop: $28 \text{ psi} (2 \text{ bar}) / 2 = 14.22 \text{ psi} (1 \text{ bar})$. By means of the curves for the water amount and pressure drop the necessary C_v value is detected to be 2.3 US gpm.

Nomogram showing the C_v -values



3. By means of the bar chart the AVTB-RA 20 is the appropriate valve size for the application.

Temperature range: 77 to 150°F. Code no. 003N7252RA will meet the requirements

Due to the mounting conditions a sensor pocket is required. The 3/4" brass sensor pocket, code no. AVTBWELL is selected.

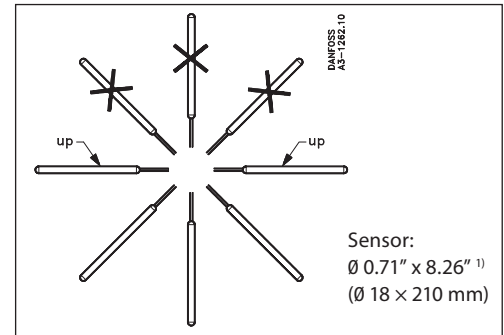
Setting:

Relation between scale numbers 1-5 and the closing temperature. The values given are approximate.

Scale setting	1	2	3	4	5		
Closing temperature (0 ... 30°C)		0	3	15	23	30	°C
(20 ... 60°C)	20		35	50	60	70	
(30 ... 100°C)30	35		55	75	95	120	
(32...85°F)		32	39	60	73	85	°F
(77...150°F)	77		95	122	140	158	
(125...190°F)	125		150	176	194	210	

Installation:

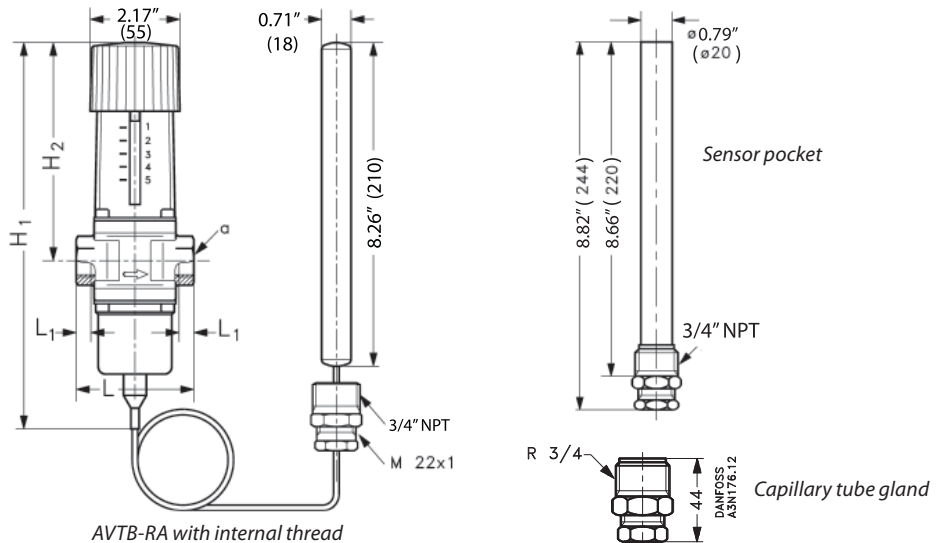
The valve can normally be fitted in the supply or return, in any position, provided the flow is always in the direction indicated by the arrow. Elements with a small sensor Ø 0.4" (9.5 mm) ("sensor warmer") must always have the valve housing fitted in the return.



¹⁾ The sensor can be mounted where the system temperature is either warmer or colder than the temperature in the valve body

Dimensions:

Type	H ₁ in (mm)	H ₂ in (mm)	L in (mm)	L ₁ in (mm)	L ₂ in (mm)	L ₃ in (mm)	L ₄ in (mm)	a (int. thread)
AVTB-RA 15	8.54 (217)	5.24 (133)	2.84 (72)	0.56 (14)	5.6 (141)	5.87 (149)	2.95 (75)	½" NPT
AVTB-RA 20	8.54 (217)	5.24 (133)	3.55 (90)	0.63 (16)	6.06 (154)	6.45 (164)	3.15 (80)	¾" NPT
AVTB-RA 25	8.54 (227)	5.43 (138)	3.74 (95)	0.75 (19)	6.61 (168)	6.57 (167)	3.27 (83)	1" NPT



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