



**Applications:**



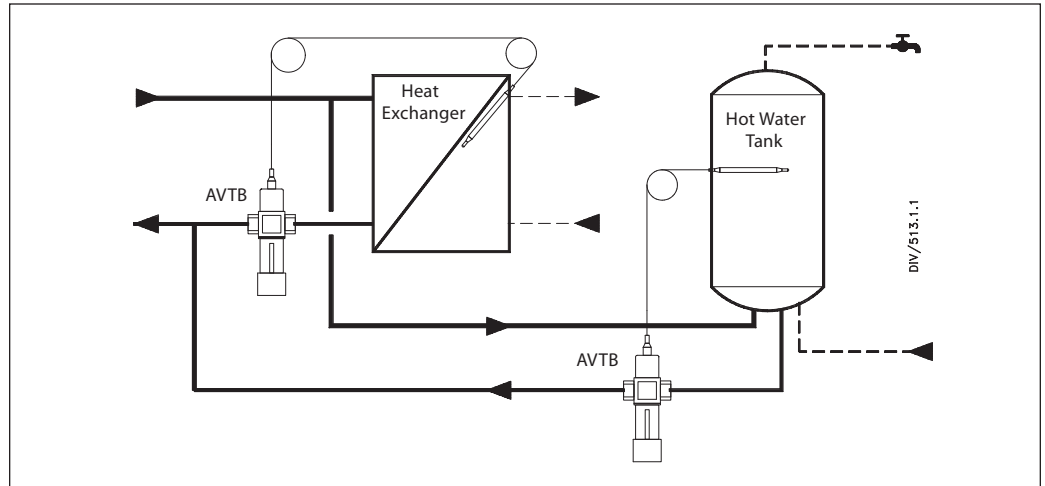
AVTB is a direct acting thermostatic temperature controller used to regulate the water temperature in hot water tanks, heat exchangers, oil preheaters, etc. The non-electric thermostatic controller closes on rising temperature.

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
- Closes 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 <sub>v</sub>	Temperature Range °F (°C)
003N6032	AVTB 15	1/2"	6'6" (2.0 m)	130 (55)	2.2	32-86 (0-30)
003N6252				190 (90)		70-140 (20-60)
003N6272				255 (125)		125-190 (50-90)
003N7032	AVTB 20	3/4"		130 (55)	4.0	32-86 (0-30)
003N7252				190 (90)		70-140 (20-60)
003N7272				255 (125)		125-190 (50-90)
003N8032	AVTB 25	1"		130 (55)	6.4	32-86 (0-30)
003N8252				190 (90)		70-140 (20-60)
003N8272				255 (125)		125-190 (50-90)

**Ordering Information (Cont.):**

*Accessories*

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

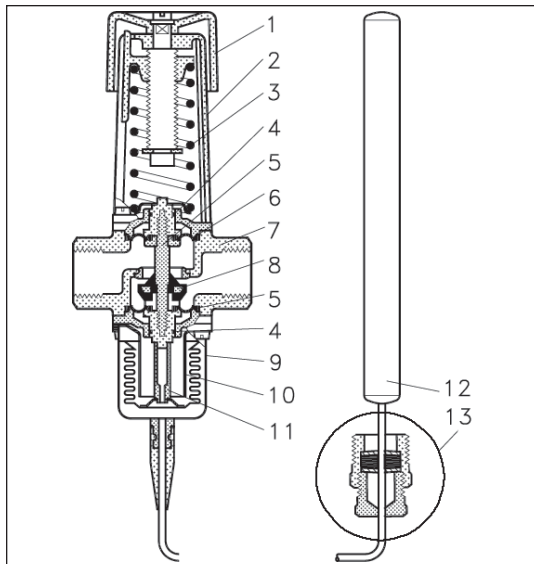
<sup>1</sup> Include gasket for capillary tube gland  
<sup>2</sup> Ø 0.4" (Ø 9.5 mm) sensor

*Spare Parts*

Code No.	Components	Cap. tube length ft. (m.)
<b>003N0075</b> <sup>1</sup>	Thermostatic element 32-85°F (0-30°C)	6'6 (2)
<b>003N0078</b> <sup>1</sup>	Thermostatic element 70-140°F (20-60°C)	
<b>003N0062</b> <sup>1</sup>	Thermostatic element 125-190°F (50-90°C)	
<b>003N4006</b>	AVTB 15	<i>Repair set:</i> Two diaphragms, two O-rings, one rubber cone, one tube of grease and eight valve cover crews
<b>003N4007</b>	AVTB 20	
<b>003N4008</b>	AVTB 25	
<b>003N6100</b>	1/2"	Brass AVT body and adjustment knob, less element
<b>003N7100</b>	3/4"	
<b>003N8100</b>	1"	
<b>003N0520</b>	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



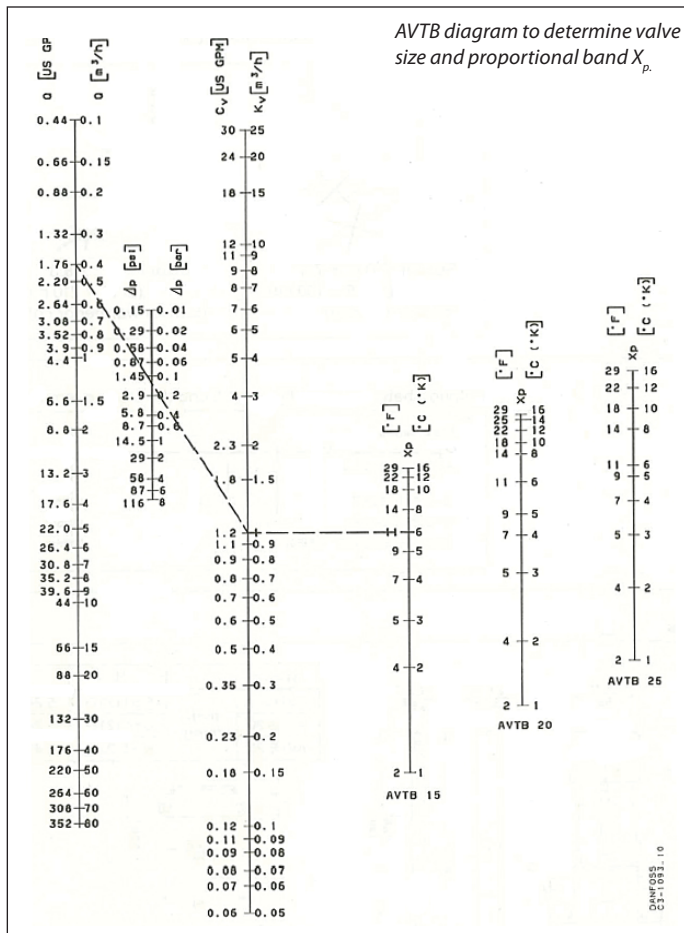
**Materials, parts in contact with water:**

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:**

Regulation of hot water temperature.  
Primary medium: water.

Given

Load:  
63,000 BTU/h (18.5 kW)

Primary temperature drop  $\Delta t$ :  
72°F (40°C[K])

Differential pressure  $\Delta p$  across valve:  
2.2psi (0.15 bar)

Maximum hot water temperature:  
130°F (55°C)

Volume:

$$Q = \frac{\text{load [BTU/h]}}{\Delta t [^\circ\text{F}] \times 500} = \frac{63,000}{72 \times 500} = 1.75 \text{ GPM} = (0.4 \text{ m}^3/\text{h})$$

Required

The correct valve size.  
Temperature range and P-band.

**Method**

Using the AVTB diagram, connect points  $Q = 1.75 \text{ GPM}$  ( $0.4 \text{ m}^3/\text{h}$ ) and  $\Delta p_v = 2.2 \text{ psi}$  ( $0.15 \text{ bar}$ ). Extend the line to intersect the  $C_v$ -scale ( $k_v$ -scale) and read the  $C_v$ -value ( $k_v$ -value); in this case  $1.2 \text{ GPM}$  ( $1.0 \text{ m}^3/\text{h}$ ). From this point, take a line horizontally to intersect the  $X_p$  columns. The selection is an AVTB 15 and the P-band of this temperature regulator at the selected capacity is approximately 11°F (6°C). If a smaller P-bands is required, an AVTB 20 can be chosen. The P-band is then approximately 7°F (4°C).

In this example a max. hot water temperature of 130°F (55°C) is required. According to page 1 an AVTB 15 (code no. 003N7032) with a temperature range 70-140°F (20-60°C) will be suitable for this application.

Note: To ensure the most stable regulation in connection with heat exchangers a P-band of 11-14°F (6-8°C) is recommended.

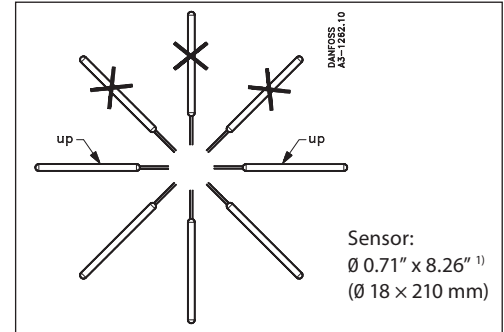
**Setting:**

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:**

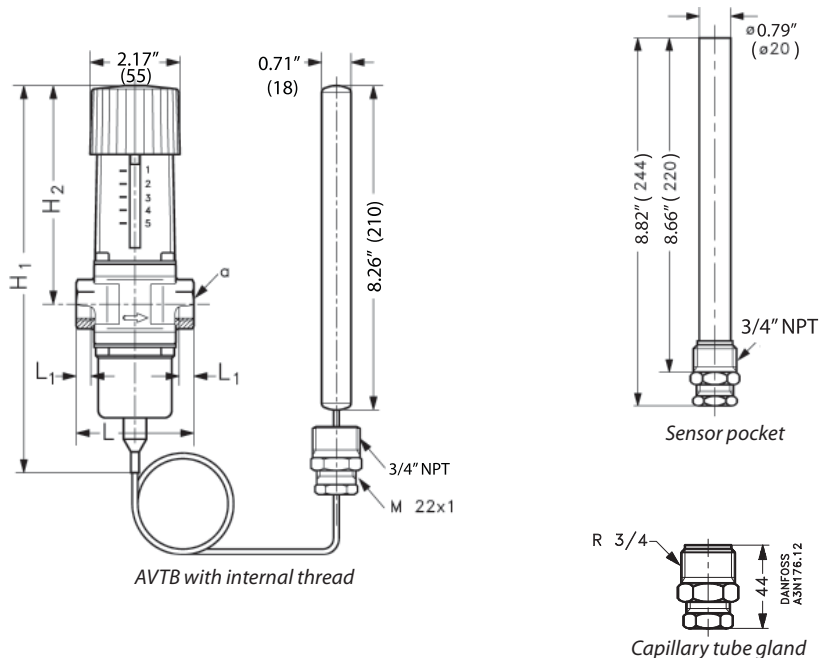
The valve can normally be fitted in the supply or return, in any position, provided the flow is always in the direction indicated by the arrow. Elements with a small sensor  $\varnothing 0.4''$  (9.5 mm) ("sensor warmer") must always have the valve housing fitted in the return.



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

**Dimensions:**

Type	H <sub>1</sub> in (mm)	H <sub>2</sub> in (mm)	L in (mm)	L <sub>1</sub> in (mm)	L2 in (mm)	L3 in (mm)	L4 in (mm)	a (int. thread)
AVTB 15	8.54 (217)	5.24 (133)	2.84 (72)	0.56 (14)	5.6 (141)	5.87 (149)	2.95 (75)	1/2" NPT
AVTB 20	8.54 (217)	5.24 (133)	3.55 (90)	0.63 (16)	6.06 (154)	6.45 (164)	3.15 (80)	3/4" NPT
AVTB 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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