

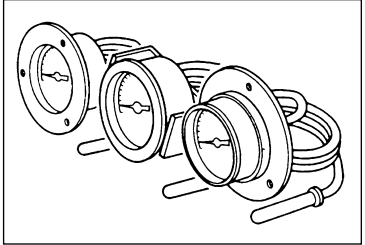


# VA Series

## Vapor Actuated Dial Thermometer



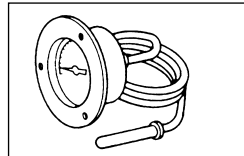
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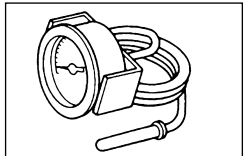
### General Description

The OMEGA® VA Series Vapor Actuated Thermometer is ideal for remote readings, such as panel installations, with capillary lengths from 5 to 100 feet. This thermometer gives excellent readings above and below ambient temperature and, being vapor actuated, is not subject to reading errors due to either RFI/EMI interference or ambient temperature variations along the capillary tube length.

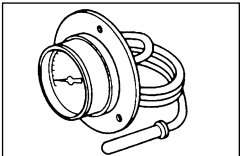
### Available Models



Front Flange (Panel Mount)



U-Clamp (Panel Mount)



Rear Flange (Surface Mounted)

Figure 1. Case Style

Model VA Vapor Actuated	<b>Table 1</b> Case Style & Size	<b>Table 2</b> Temperature Range	<b>Table 3</b> Capillary & Bulb	<b>Table 4</b> Capillary Length (in feet)	<b>Table 5</b> Process Connection
<b>VA</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Example:	<b>VA - 20FR</b>	<b>21</b>	<b>D</b>	<b>05</b>	<b>L2</b>

### Installing the Vapor Actuated Thermometer

#### Unpacking Instructions

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

- Vapor Actuated Dial Thermometer (1)
- Operator's Manual (1)

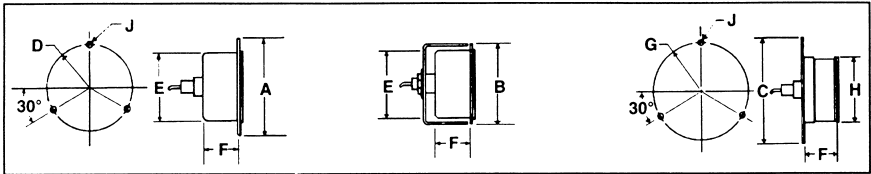
If you have any questions about the shipment, please call the OMEGA Customer Service Department.

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

**NOTE**

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

**Case and Mounting Dimensions**



Front Flange  
(Panel Mount)

U-Clamp  
(Panel Mount)

Rear Flange  
(Surface Mount)

Dial Size	A	B	C	D	E	F	G	H	J
1½"	-	1.82	-	-	1.60	.70	-	-	-
2"	2.94	2.24	3.50	1.28R	2.05	1.09	1.59R	2.13	.156
2½"	3.35	2.81	-	1.52R	2.53	.94	-	-	.175
3½"	4.30	3.94	4.67	2.00R	3.69	1.09	2.125R	2.75	.180
4½"	6.25	-	5.83	2.69R	4.87	1.30RF/1.81FF/2.30TB	2.68R	5.00	.230

Figure 2. Case and Mounting Dimensions

**Installing the Indicating Head**

**Surface Mount (Rear Flange)**

CODE	DIAL	CASE	LENS	CONNECTION LOCATION
20RR	2"	S.S.	Polycarbonate	Rear
35RR	3 ½"	S.S.	Polycarbonate	Rear
35RA	3 ½"	Black Steel	Glass	Adjustable, Rear or Bottom
45RA	4 ½"	Valox	Glass	Adjustable, Rear or Bottom
45RR	4 ½"	Valox	Glass	Rear
45TB	4 ½"	Phenolic	Glass	Bottom (Turret Mount)

1. Make a circular cutout in the center of the hole mounting pattern for the capillary tube to fit through.
2. Drill the three (3) mounting holes.
3. Using the screw holes that you drilled, screw the back of the head to your wall or panel.



Flush Mount (Front Flange and U-Clamp)

CODE	DIAL	CASE	LENS	CONNECTION LOCATION
20FR	2"	S.S.	Polycarbonate	Rear
20FB	2"	S.S.	Polycarbonate	Bottom
25FR	2½"	S.S.	Polycarbonate	Rear
35FR	3½"	S.S.	Polycarbonate	Rear
45FR	4½"	Black Aluminum	Glass	Lower Rear

CODE	DIAL	CASE	LENS	CONNECTION LOCATION
20UR	2"	S.S.	Polycarbonate	Rear
25UR	2 ½"	S.S.	Polycarbonate	Rear
35UR	3 ½"	S.S.	Polycarbonate	Rear

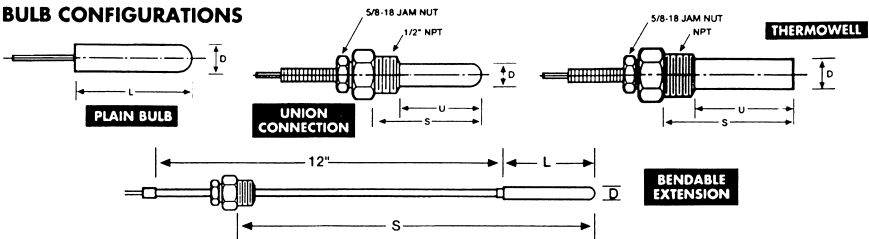
1. Make a circular cutout in the panel slightly larger than the case.
2. Drill three (3) mounting holes for the Front Flange Model.
3. From the front of the panel, pass the bulb and capillary through the cutout.
4. Affix the head to the panel:
  - 4a. U-clamp Model: Tighten U-clamp(s) against the back of your panel.
  - 4b. Front Flange Model: Screw the flange to the front of your panel, using the screw holes that you drilled.

Installing the Bulb

NOTE

If the bulb is installed more than 10 feet above or below the dial, it may be necessary to recalibrate the instrument.

BULB CONFIGURATIONS



## VA Series Vapor Actuated Dial Thermometer

### Standard Bulb Dimensions (inches)

CAPILLARY LENGTH	PLAIN BULB		UNION CONNECTION			THERMOWELL			BENDABLE EXT.		
	L	D	U	S	D	U	S	D	L	S	D
1-10 feet	2.62	7/16	2.00	2.68	7/16	2.25	2.93	7/16	2.25	3"-13 1/4"	7/16
11-50 feet	4.62	7/16	4.00	4.68	7/16	4.25	4.93	7/16	4.25	5"-15 1/4"	7/16
51-100 feet	6.62	7/16	6.00	6.68	7/16	6.25	6.93	7/16	6.25	6 1/2"-17 1/4"	7/16

Immerse the thermometer stem at least A inches (or entire stem, whichever is less) in the medium being measured, for best reading.

### Union Connections

CODE	CONNECTION TYPE	MATERIAL
J1	None (Plain bulb)	--
J2	Jam Nut Only	Brass (For Existing Brass Well)
J3	Jam Nut Only	316 S.S. (For Existing Stainless Well)
K2	1/2" NPT Union	Brass
L2	1/2" NPT Union	316 S.S.
M2	1/2" NPT Sliding Union on bendable extension	316 S.S.
N2	Thermowell, 1/2" NPT	Brass
N3	Thermowell, 3/4" NPT	Brass
P2	Thermowell, 1/2" NPT	316 S.S.
P3	Thermowell, 3/4" NPT	316 S.S.
Q2	Thermowell, 1/2" NPT	Brass
Q3	Thermowell, 3/4" NPT	Brass
R2	Thermowell, 1/2" NPT	316 S.S.
R3	Thermowell, 3/4" NPT	316 S.S.
S2	Thermowell, 1/2" NPT	Brass
S3	Thermowell, 3/4" NPT	Brass
T2	Thermowell, 1/2" NPT	316 S.S.
T3	Thermowell, 3/4" NPT	316 S.S.

### CAUTION



Tighten the thermometer to its fitting using a wrench applied to the hex or flats above the threads. Never tighten by hand.

1. Unscrew and remove the 1/2" NPT fitting, using a 7/8" wrench.
2. Screw the 1/2" NPT fitting into the threaded process opening.
3. Insert the bulb through the 1/2" NPT fitting. Tighten it in place by screwing the jam nut into the top of the 1/2" NPT fitting with an 11/16" wrench.

**NOTE**

Use a thermowell in all pressurized applications. Be sure case temperature does not exceed 200°F (93°C).

**Thermowells**

1. Remove the thermowell and screw it into the process so that no leaking occurs. Use thread sealant as required.
2. Place the bulb in the thermowell. Tighten the bulb in place by screwing the jam nut into the top of the 1/2" fitting with an 1/16" wrench.

**Bendable Extensions**

- I. Place the bulb in the thermowell, or directly in the process.

**NOTE**

Use a thermowell whenever the bulb would be exposed to pressure, fluid velocity, or corrosive media.

2. Slide the compression fitting down and screw the 1/2" NPT fitting into the process (or thermowell) threads.
3. Tighten the top hex of the sliding union until the bendable extension does not slide in or out.
4. Gently bend the remaining portion of the extension out of the way.

**Operation**

Recommended operating temperature is in the upper 2/3 of the dial scale.

CODE	°F RANGES
20	-40 TO 65°F
30	-40 TO 110°F
32	-20 TO 120°F
72	0 TO 180°F
49	0 TO 150°F
80	20 TO 220°F
50	30 TO 240°F
56	50 TO 250°F
60	30 TO 300°F
68	100 TO 350°F
70	200 TO 450°F

CODE	°F AND °C RANGES
21	-40 TO 65°F / -40 TO 20°C
31	-40 TO 110°F / -40 TO 40°C
33	-20 TO 120°F / -30 TO 50°C
73	0 TO 180°F / -20 TO 80°C
79	0 TO 150°F/-15 TO 65°C
81	20 TO 220°F / 0 TO 105°C
51	30 TO 240°F / 0 TO 115°C
57	50 TO 250°F / 10 TO 120°C
61	30 TO 300°F / 0 TO 150°C
66	100 TO 350°F / 40 TO 180°C
71	200 TO 450°F / 100 TO 230°C

Vapor actuated thermometers give excellent readings when the bulb temperature is either above or below the temperature of the indicating head. Avoid applications in which the bulb and head are the same temperature (ambient applications). If the bulb “crosses ambient” (i.e., goes from hotter than the indicating head to cooler or vice versa), some pointer fluctuations will occur for up to two minutes during this transition.

## Recalibration

The VA Series vapor actuated thermometers are manufactured with threaded, press fit and snap-ring lenses which can be easily removed for field calibration.

To recalibrate your vapor actuated thermometer:

1. Remove the thermometer from its fitting.
2. Remove the lens.
4. Immerse the bulb totally in an agitated liquid for at least 3 minutes with a master reference thermometer, until they reach equilibrium.
5. Use a wrench, coin or screwdriver to turn the slotted hex nut on the back of the thermometer case until the pointer is at the proper reading on the scale.
6. Replace the lens and reinstall the thermometer in its fitting.

## Care of the Vapor Actuated Thermometer

CODE	CAPILLARY & BULB MATERIAL	CAPILLARY PROTECTION
A	Nickel Plated Copper	-
C	Copper	Bronze Braid
D	316 S.S.	-
E	316 S.S.	S.S. Armor

- Avoid bending the stem, as this will result in frictional errors in indication.
- Do not kink or flatten the capillary tube.
- Dampen any capillary vibration, as this may cause capillary breakage over time.



## Specifications

<b>Dial Sizes:</b>	2", 2 ½", 3 ½", 4 ½"
<b>Dial:</b>	Aluminum with white finish and black markings
<b>Pointer:</b>	Furnished standard adjustable
<b>Movement:</b>	Brass with precision gearing
<b>Bourdon Tube:</b>	Phosphor bronze
<b>Accuracy:</b>	Plus or minus one scale division
<b>Case:</b>	Stainless steel on all front flange and U-clamp models. Back flange models in stainless (2"), black steel (3 ½") or Valox (4 ½")
<b>Process Connection:</b>	Plain bulb, ½" NPT Union, ½" NPT sliding union on 12 Connection: bendable extension, or thermowell.
<b>Window:</b>	Polycarbonate. Glass in 3 ½" and 4 ½" back flange models
<b>Bulb:</b>	Stainless steel or nickel plated copper. Bulb O.D. ⅝" (optional ¼" O.D. x 2" length on -40 to 65°F range only). Bulb lengths vary from 2" to 6" depending on capillary length
<b>Capillary:</b>	Nickel plated copper, copper with bronze braid armor, stainless steel, stainless steel with stainless steel armor. Capillary lengths 1 to 100 feet (standard length 5 feet)
<b>Ranges:</b>	Over twenty °F and °F/°C ranges available, from -40° to +450°F
<b>Applications:</b>	Control panels, chemical processing, pipelines, food processing, OEM applications, ovens, solar heating,

Vapor actuated thermometers give excellent readings when the bulb temperature is either above or below the temperature of the indicating head. Avoid applications in which the bulb and head are the same temperature (ambient applications). If the bulb "crosses ambient" (i.e., goes from hotter than the indicating

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**WARNING:** These products are not designed for use in, and should not be used for, patient-connected applications.



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OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY RETURNS**, please have the following information available BEFORE contacting OMEGA:

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2. Model and serial number of the product under warranty, and
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2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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