

**Ordering Information**

INSTALLATION	SENSOR	PROBE LENGTH	ADAPTER		
<b>703 A</b> Immersion style with adapter	1 100-ohm platinum RTD	<b>A</b> 4 inches/ 100 mm	1 1/8" NPT		
	3 1,000-ohm platinum RTD				
	<b>703 B</b> Immersion, polycarb plastic enclosure IP-54	4 1,000-ohm nickel RTD	<b>B</b> 6 inches/ 150 mm	2 1/4" NPT	
		5 1,000-ohm Balco RTD			
	<b>703 C</b> Immersion, galvanized steel enclosure NEMA-1/IP-30	7 10,000-ohm NTC thermistor	<b>C</b> 8 inches/ 200 mm	3 1/2" NPT	
		10 3,000-ohm NTC thermistor			
		<b>703 D</b> Immersion, painted steel enclosure NEMA-4/IP-65	12 10,000-ohm NTC thermistor	<b>D</b> 12 inches/ 300 mm	
			13 5,000-ohm NTC thermistor		
		15 100,000-ohm NTC thermistor			
		17 20,000-ohm NTC thermistor			
	18 2,252-ohm NTC thermistor				
	21 1,800-ohm NTC thermistor				
<b>704 A</b> Surface mount strap-on	1 100-ohm platinum RTD	—	—		
<b>704 B</b> Surface mount, polycarb plastic enclosure IP-54	3 1,000-ohm platinum RTD	—	—		
	4 1,000-ohm nickel RTD				
<b>704 C</b> Surface mount, galvanized steel enclosure NEMA-1/IP-30	5 1,000-ohm Balco RTD	—	—		
	7 10,000-ohm NTC thermistor				
<b>704 D</b> Surface mount, painted steel enclosure NEMA-4/IP-65	10 3,000-ohm NTC thermistor	—	—		
	12 10,000-ohm NTC thermistor				
	13 5,000-ohm NTC thermistor				
	15 100,000-ohm NTC thermistor				
	17 20,000-ohm NTC thermistor				
	18 2,252-ohm NTC thermistor				
	21 1,800-ohm NTC thermistor				

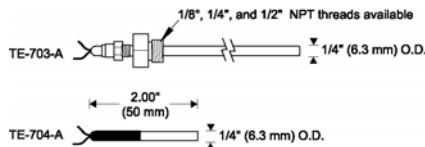
**Dimensions**


Figure 1. TE 703 A and 704 A Dimensions

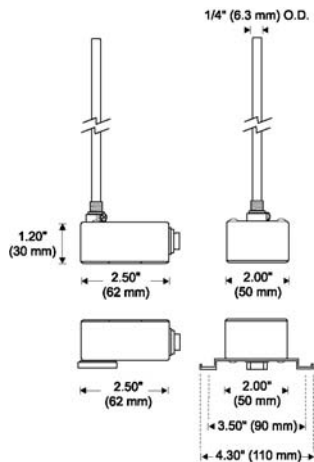


Figure 2. TE 703 B and 704 B Dimensions

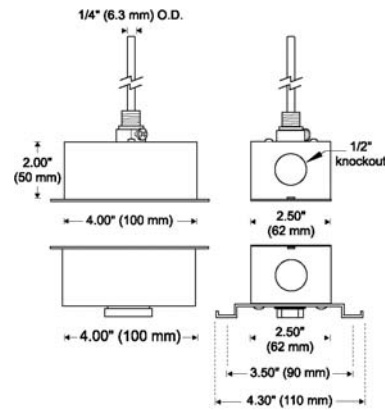


Figure 3. TE 703 C, D and 704 C, D Dimensions

**Specifications**

**Platinum RTD Sensors:**  $\pm 0.1\%$  @ 32°F (0°C), Alpha: 385 per DIN 43760

**Nickel RTD Sensors:**  $\pm 0.5^\circ\text{F}$  @ 70°F (21.1°C), 6,000 PPM/K T.C.R.

**Balco RTD Sensors:**  $\pm 0.5^\circ\text{F}$  @ 70°F (21.1°C), 4,300 PPM/K T.C.R.

**Thermistor Sensors:**  $\pm 0.2^\circ\text{C}$  interchangeability @ 77°F (25°C)

**Operating Temperature:** -40°F to 250°F (-40°C to 125°C)

**Probe Material:** 1/4-inch (6.3 mm) O.D., 0.5 mm wall 304 stainless steel

**Threaded Adapter:** Brass with set screw

**Plastic Enclosure:** Polycarbonate, 30% glass filled, rated UL 94V-5-0

**Steel NEMA-1/IP-30:** 18 Ga. galvanized steel

**Steel NEMA-4/IP-65:** 18 Ga. cold-rolled steel, powder coated

**Installation**
**Before Installation**

- Read these instructions carefully. Failure to do so can result in damage or electrical shock.
- Inspect packaging for signs of damage. If damaged, notify the carrier immediately.
- Verify that the sensor specifications are suitable for the particular application.
- Installers must be trained and qualified technicians.
- **Important:** All wiring must be compatible with applicable codes, ordinances, and instructions.

**Mount the Immersion Sensor**

- TE 703 A:
  - Loosen the compression fitting and remove the probe. See Figure 4.
  - Screw the adapter into the thermowell or Thredolet®.
  - Apply A-505 thermal compound to the probe tip and insert the probe until it is seated against the thermowell or Thredolet®.
  - Tighten the nut.
- TE 703 B, C, or D:
  - Loosen the set screw. See Figure 4.
  - Remove the adapter and thread it into the thermowell. Tighten.
  - Apply A-505 thermal compound to the probe tip and insert the probe until it is seated against the thermowell. Ensure that the set screw is accessible.
  - Lock the adapter into place and tighten the set screw.
  - Remove the screw(s) on the back of the sensor and place the screw(s) and cover aside.
- Make the wiring connections.
- Replace the sensor's cover and screw(s) where applicable.

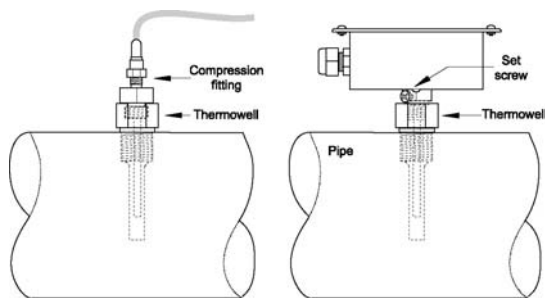


Figure 4. Installing the Immersion Sensor

**Mount the TE 704 A Sensor**

1. Scrape any rust or scale off the pipe surface.
2. Apply a thin layer of A-505 thermal compound to the sensor.
3. Position the sensor flat against the pipe and fasten with a hose clamp (not provided). See Figure 5.
4. Make the wiring connections. Insulate around the sensor if necessary.

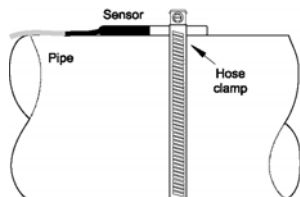


Figure 5. Installing the TE 704 A Sensor

**Mount the TE 704 B, C, or D Sensor**

1. Scrape any rust or scale off the pipe surface.
2. Apply a thin layer of A-505 thermal compound to the sensing element. See Figure 6.
3. Position the sensor's sensing element so that it makes contact with the pipe and fasten with two hose clamps (not provided).
4. Remove the screw(s) on the back of the sensor and place the screw(s) and cover aside.
5. Make the wiring connections. Replace the sensor's cover and screw(s).

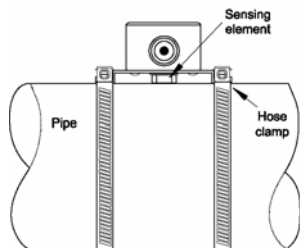


Figure 6. Installing the TE 704 B, C, or D Sensor

**Checkout**

Allow the sensor to stabilize in (or against) the pipe for a minimum of five minutes before taking a resistance measurement.

1. Disconnect the sensor lead wires from the controller.
2. Connect an ohmmeter across the lead wires.
3. Ensure that nominal resistance measurements are in accordance with the resistance / temperature curves.
4. Reconnect sensor lead wires to the controller.
5. Check operation of the complete control system.

**Warranty**

See the accompanying data sheet for additional information. For technical or application assistance, contact the nearest office.

EUROPE
Baird House, Units 6 & 7 Dudley Innovation Centre Pensnett Estate • Kingswinford West Midlands • DY6 8XZ United Kingdom 01384-271113 • Fax 01384-271114

AUSTRALIA
4 Armiger Court, Unit 2 Holden Hill • S.A. 5088 Australia 08-8359-4333 • Fax 08-8395-4433

ASIA
No. 22 Lorong 21A Geylang #11-02 Chin Hin Heng Building Singapore • 388431 65-6392-7273 • Fax 65-6392-7276

CANADA
155 McIntosh Drive, Unit 5 Markham • Ontario • L3R 0N6 Canada 905-474-9215 • Fax 905-474-0876

**Table 1. Resistance Versus Temperature**

°F	°C	Type 1 RTD	Type 3 RTD	Type 4 RTD	Type 5 RTD	Type 7 thermistor	Type 10 thermistor
72	22.2	108.66	1,086.6	1,006.0	1,004.4	11,194	3,392
72.5	22.5	108.76	1,087.6	1,007.5	1,005.5	11,068	3,350
73	22.8	108.87	1,088.7	1,009.0	1,006.6	10,943	3,309
73.5	23	108.98	1,089.8	1,010.5	1,007.6	10,820	3,269
74	23.3	109.09	1,090.9	1,012.0	1,008.7	10,698	3,229
74.5	23.6	109.19	1,091.9	1,013.5	1,009.8	10,578	3,189
75	23.9	109.30	1,093.0	1,015.1	1,011.0	10,459	3,150
75.5	24.1	109.41	1,094.1	1,016.6	1,012.1	10,343	3,112
76	24.4	109.52	1,095.2	1,018.1	1,013.2	10,227	3,074
76.5	24.7	109.62	1,096.2	1,019.6	1,014.3	10,113	3,037
77	25	109.73	1,097.3	1,021.1	1,015.4	10,000	3,000
77.5	25.3	109.84	1,098.4	1,022.6	1,016.5	9,889	2,964
78	25.5	109.95	1,099.5	1,024.1	1,017.6	9,779	2,928
78.5	25.8	110.06	1,100.1	1,025.6	1,018.7	9,671	2,890
79	26.1	110.17	1,101.7	1,027.2	1,019.8	9,563	2,858
79.5	26.4	110.27	1,102.7	1,028.7	1,020.9	9,458	2,823
80	26.7	110.38	1,103.8	1,030.2	1,022.1	9,353	2,789
80.5	27	110.49	1,104.9	1,031.7	1,023.2	9,250	2,756
81	27.2	110.60	1,106.0	1,033.3	1,024.3	9,148	2,723
81.5	27.5	110.70	1,107.0	1,034.8	1,025.4	9,045	2,690
82	27.8	110.81	1,108.1	1,036.3	1,026.5	8,943	2,658

**Table 2. Resistance Versus Temperature**

°F	°C	Type 12 thermistor	Type 13 thermistor	Type 15 thermistor	Type 17 thermistor	Type 18 thermistor	Type 21 thermistor
72	22.2	11,307	5,654	113,080	22,825	2,546	2,005
72.5	22.5	11,169	5,584	111,680	22,525	2,515	1,983
73	22.8	11,031	5,515	110,300	22,226	2,484	1,962
73.5	23	10,896	5,448	108,960	21,935	2,454	1,941
74	23.3	10,762	5,381	107,620	21,645	2,424	1,920
74.5	23.6	10,631	5,316	106,320	21,362	2,394	1,899
75	23.9	10,501	5,251	105,020	21,080	2,365	1,879
75.5	24.1	10,374	5,188	103,760	20,806	2,336	1,859
76	24.4	10,247	5,124	102,480	20,532	2,308	1,839
76.5	24.7	10,123	5,062	101,240	20,266	2,280	1,819
77	25	10,000	5,000	100,000	20,000	2,252	1,800
77.5	25.3	9,880	4,940	98,800	19,741	2,225	1,791
78	25.5	9,760	4,880	97,600	19,483	2,198	1,762
78.5	25.8	9,643	4,821	96,420	19,232	2,171	1,743
79	26.1	9,526	4,763	95,260	18,981	2,145	1,725
79.5	26.4	9,412	4,706	94,120	18,737	2,119	1,707
80	26.7	9,298	4,649	92,980	18,494	2,094	1,689
80.5	27	9,187	4,616	92,320	18,257	2,069	1,671
81	27.2	9,077	4,583	91,660	18,020	2,044	1,653
81.5	27.5	8,969	4,507	90,140	17,790	2,020	1,636
82	27.8	8,861	4,431	88,620	17,560	1,996	1,619

Copyright © MAMAC Systems 2003. All rights reserved.

MAMAC Systems reserves the right to change any specifications without notice to improve the performance, reliability, or function of our products.

For complete resistance versus temperature tables, please refer to TI.700-11.