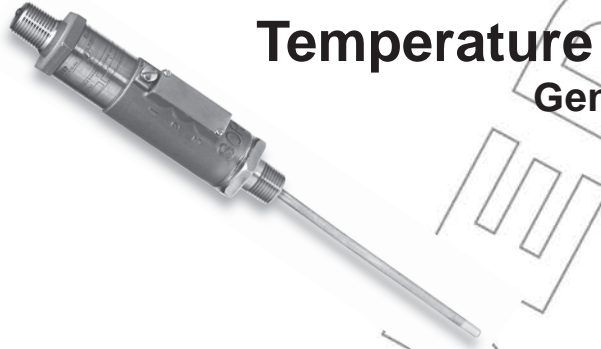




Temperature Transmitter General Instructions



General

These instructions provide information for installation, RTD connection, electrical connection and field calibration of SOR Series 534MT Temperature Transmitters. The 534MT Temperature Transmitter housing features external adjustments hermetically sealed, stainless steel construction.

The 534MT is capable of powering long cable lengths. See Figures 2 & 5 for Loop Resistance vs. Power Supply Voltage.

NOTE: This instrument is non-repairable. If you suspect that it is defective, contact the factory or the SOR representative in your area for a return authorization number.

Installation

Ensure that wiring conforms to all applicable local and national electrical codes and install unit(s) according to relevant national and local safety codes.

Normally, line mounting provides adequate support for the instrument. When the installation is complete, the external adjustments must be accessible. (See Figures 3) and 5.)

Process Connection - Direct Mount RTD

The temperature sensing probe is 300 series stainless steel. If the process is compatible, the probe may be directly inserted into the process without use of a thermowell. A thermowell increases response time (lag). A thermowell filled with thermal transfer media reduces lag. The electrical connection may be rigid or flexible conduit.

RTD Termination - Remote Mount RTD

Three 18" color coded flying leads (24 ga.) are provided for connection to a terminal strip within a cabinet or a splice within an outlet box (remote model only).

Two black leads Common point at RTD
One white lead Single point at RTD

The unit is designed for 3-wire RTD, Temperature Coefficient of Resistance .00385.

Making the Electrical Connection

The electrical connection may be installed on an adequately supported rigid conduit system.

To ensure EMI/RFI filter operation, both the shield wire and the transmitter housing need to be connected to a known earth ground. Terminate the shield wire to an earth ground at the control panel. The housing earth ground can be accomplished through use of the external ground lug or mounting of the control to either process piping or conduit that is physically grounded.

WARNING: Units in Hazardous Locations — Prior to calibration, make sure that the work area is declassified before removing the explosion proof cover to calibrate the unit. Failure to do so could result in severe personal injury or substantial property damage.

Specifications

Design and specifications are subject to change without notice.

Accuracy (L, H & R)	±0.3% URL
Temperature effects	
Compensated range	-20 to 120°F(-29 to 49°C)
Ambient limits	-40 to 160°F(-40 to 71°C)
Storage	-40 to 212°F(-40 to 100°C)
Zero shift per 100°F @ -20 to 160°F	±0.5% span
Span shift per 100°F @ -20 to 160°F	±0.5% span
External adjustability	
Span turndown ratio	5:1
Zero	20% URL
Supply voltage	loop powered 9 to 30 VDC
Max. load resistance	750 ohms @ 24 VDC
Housing construction	316SS (CF8M)
Electrical connection	
Size	1/2" NPT(M)
Termination	24 AWG wire leads, 18 inch long
RTD connection (remote)	
Size	1/2" NPT(F)
Termination	24 AWG wire leads, 18 inch long
RTD connection (direct)	
Process connection	1/2" NPT(M); 316SS
Insertion length (STD)	6 inch
Circuit protection	Reverse Polarity, EMI/RFI
Shipping weight	3 pounds (1.5 kg)

Electrical Termination 534MT - TN

Three 18" flying leads are provided for connection to a terminal strip within a cabinet or a splice within an outlet box:

Red (+) } Loop Voltage: 5 to 30 VDC; Output: 4 to 20 mA
Black (-) }
Bare (case ground) should be connected to earth ground to ensure EMI/RFI protection.

Calibration

Two calibration screws (zero and span) are located underneath the adjustment cover. (See Figure 3.) Loosen the cover screws slightly (do not remove) and rotate the cover to reveal the adjustment screws.

Numbers on the enclosure identify the adjustment screws: 1, 2 and 3.

- Adjustment #1: Zero
- Adjustment #2: Not used
- Adjustment #3: Span

Unless specified otherwise, the 534MT-TN Transmitter is factory calibrated to 4 mA at the low end of the range and 20 mA at the upper limit of the adjustable range as specified on the nameplate.

Calibration Procedure (Remote RTD only)

The zero and span calibration procedure should be performed under ambient process temperature conditions.

A calibrated RTD simulator, a milliammeter and a DC voltage supply are required. Note the adjustable range on the instrument nameplate. For both zero and span adjustments, turn the adjustment screw clockwise to increase, counterclockwise to decrease.

1. Connect the transmitter as shown in Figure 1. Case ground must be connected to earth ground to ensure EMI/RFI protection.
2. Set the RTD simulator to the desired zero level. 80% of span must be available when Zero is adjusted. Zero may be adjusted up to 20% of the upper range limit.
3. Adjust zero (#1) for a 4 mA indication on the milliammeter.
4. Set the RTD simulator to the temperature at which 20 mA output is desired. Span may be adjusted from 20 to 100% of the upper range limit specified on nameplate. (Maximum turn down is 5:1.)
5. Adjust span (adjustment #2) for a 20 mA indication on the milliammeter.
6. Repeat Steps 2 through 5 as needed if offsetting 4mA from the normal zero point. If interaction occurs, turn zero and span 15 turns counterclockwise. Repeat Steps 2 - 5 above.

Calibration Procedure (Direct Mount RTD)

Calibrate in same manner as RemoteMount, except use a circulated bath or dry well calibrator in place of the RTD simulator.

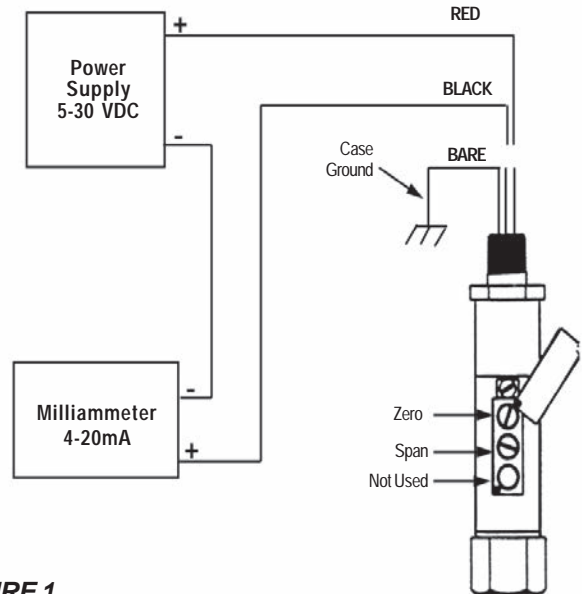


FIGURE 1
Loop Resistance vs. Power Supply Voltage

Formula for Determining Maximum Loop Resistance

$$R_L (\text{Max}) = \frac{V_{\text{Supply}} - 9V}{20 \text{ mA}}$$

FIGURE 2

Dimensions

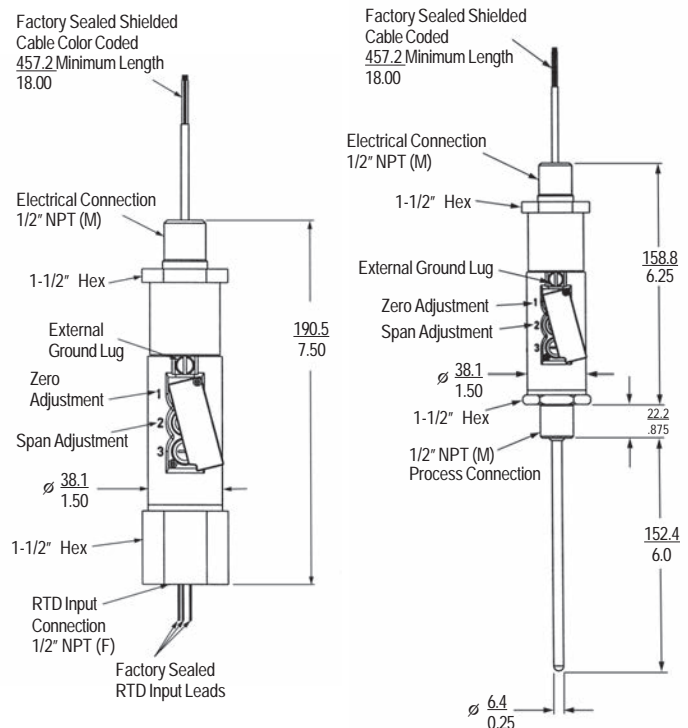


FIGURE 3

Electrical Termination 534MT-VN

Three screw terminals and center ground are provided for electrical connection, labeled as follows:

+	10 - 30 VDC + power connection
-	Power supply ground
1-5V	Output
GND	(case ground) should be connected to earth ground

Calibration

Two calibration screws (zero and span) are located underneath the adjustment cover. (See Figure 5.) Loosen the cover screws slightly (do not remove) and rotate the cover to reveal the adjustment screws.

Numbers on the enclosure identify the adjustment screws: 1, 2 and 3.

- Adjustment #1: Zero
- Adjustment #2: Span
- Adjustment #3: Not used

Unless specified otherwise, the 534MT-VN Transmitter is factory calibrated to 1 VDC at the low end of the range and 5 VDC at the upper limit of the adjustable range as specified on the nameplate.

Calibration Procedure (Remote RTD only)

The zero and span calibration procedure should be performed under ambient temperature conditions.

A calibrated RTD simulator, a voltmeter and a DC voltage supply are required. Note the adjustable range on the instrument nameplate. For both zero and span adjustments, turn the adjustment screw clockwise to increase, counterclockwise to decrease.

1. Connect the transmitter as shown in Figure 4. Case ground must be connected to earth ground.
2. Set the RTD simulator to the desired zero level. 80% of Span must be available when Zero is adjusted. Zero may be adjusted up to 20% of the upper range limit.
3. Adjust zero (adjustment #1) for a 1 VDC indication on the voltmeter.
4. Set the RTD simulator to the temperature at which 5 VDC (full scale) output is desired. Span may be adjusted from 20 to 100% of the upper range limit. (Maximum turn down is 5:1.)
5. Adjust span (adjustment #2) for a 5 VDC indication on the voltmeter.
6. Repeat Steps 2 through 5 as needed if offsetting 1 VDC from the normal zero point. If interaction occurs, turn zero and span 15 turns counterclockwise. Repeat Steps 2 through 5 above.

Calibration Procedure (Direct Mount RTD)

Calibrate in same manner as RemoteMount, except use a circulated bath or dry well calibrator in place of the RTD simulator.

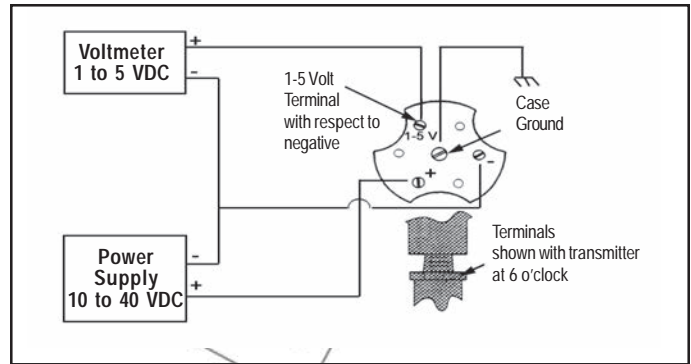


FIGURE 4

Dimensions

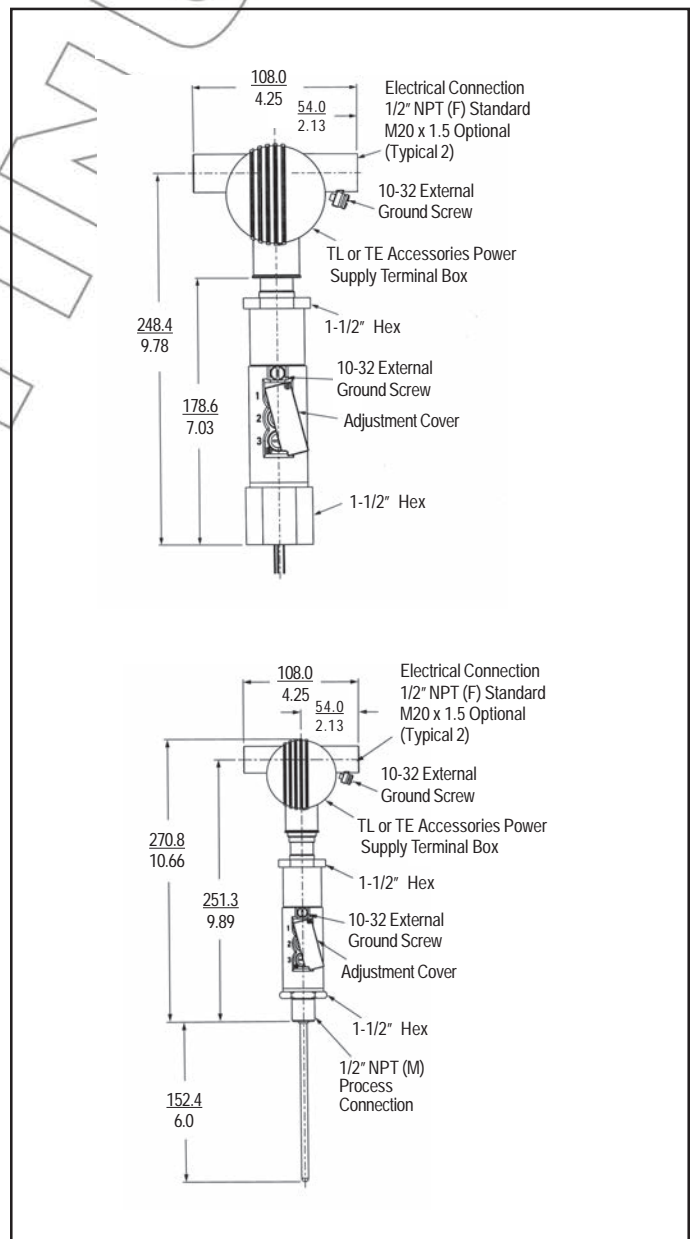


FIGURE 5

Agency Listings

Terminal Box
FM Approved
CSA Certified



Explosion Proof
Class I, Groups A, B, C, D
Class II, Groups E, F, G
Class III; Div. 1 & 2

Weathertight; NEMA 4X

DISCONTINUED

Model Number

534MT -

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TN		VN*		P9		C		2A	
VN*								7A**	
								BB	
								PK	
								PP	
								RR	
								TL	
								TM	
								TT	
								VV	
								YY	

Output

4 to 20 mA
 I to 5 Vdc
 *Requires TL Option

Span

°F		°C		
-328 to 0	(450 max)	-200 to -18	(232 max)	1
- 50 to 150	(450 max)	-46 to 66	(232 max)	15
0 to 400	(450 max)	-18 to 204	(232 max)	41
0 to 700	(1200 max)	-18 to 371	(469 max)	71
0 to 1000	(1200 max)	-18 to 538	(469 max)	111

Wetted Parts

316SS

Process Connection

1/2" NPT (F) - Remoute Mount RTD
 1/2" NPT (M) - Direct Mount RTD, 6" Insertion Length
 **Span 15 Only

Options/Accessories

Oxygen Cleaned
 Pipe Kit
 Fiber Tag attached with plastic wire
 Stainless Steel Tag attached with stainless steel wire
 Stainless Steel Terminal Box with terminal block
 Stainless Steel RTD Terminal Box with terminal strip
 Stainless Steel Oversized Nameplate permanently attached
 Fungicidal Varish
 Epoxy Coating

Mag Driver

..... P/N 9003-308
 10 ft., 100Ω Platinum RTD, 400°F Max P/N 8924-103
 10 ft., 100Ω Platinum RTD, 1000°F Max P/N 8924-104
 15 ft., 100Ω Platinum RTD, 400°F Max P/N 8924-114
 15 ft., 100Ω Platinum RTD, 1000°F Max P/N 8924-115
 20 ft., 100Ω Platinum RTD, 400°F Max P/N 8924-116
 20 ft., 100Ω Platinum RTD, 1000°F Max P/N 8924-117

NOTE: RTD leads are teflon insulated, PVC-coated flexible stainless steel armor, with 1/2" NPT(M) cable gland fitting. 12" insertion length, 1/4" o.d., 316SS sheathed sensor with 1/2" NPT(M) brass compression fitting. 0.00385 temperature Coefficient of Resistance

Certificate of Conformity

SOR INC.
14685 West 105th Street
Lenexa, Kansas 66215-5964

Phone 913-888-2630
Toll Free 800-676-6794
Fax 913-888-4837

www.sorinc.com

Process Instrumentation

Level Pressure Flow Temperature

DECLARATION OF CONFORMITY



We the Manufacturer: SOR Inc.
14685 West 105th Street
Lenexa, KS 66215

Declare under our sole responsibility that the product:

Type of Equipment: Mini Hermet Temperature Transmitter
Product Number(s): 534MT

To which this declaration relates is in conformity with the following directive, standards, or other normative documents:

EMC Directive 89/336/EEC
EN 61326: 1997/A1: 1998 Electrical Equipment for Measurement, Control and Laboratory Use
IEC 1000-4-2 Electrostatic Discharge Immunity Test
IEC 1000-4-3 Radiated Field Immunity Test
IEC 1000-4-4 Fast Transient/Burst Test
IEC 1000-4-5 Surge Immunity Test
IEC 1000-4-6 Immunity Test
IEC 1000-4-8 Power Frequency Magnetic Field

This product meets all of the above requirements with the following exceptions:

1. Radiated Test: Deviations of less than 1.0% were noted for the 230-270 MHz frequency range.
2. Fast Transient Test: Deviations of an unspecified magnitude were noted, but the product returned to normal operation after the transient passed.

Colbert Turney April 22-02 *Signature and Date*
Colbert Turney, Vice President of Quality

M.S. Bartrum 4/22/02 *Signature and Date*
Mark Bartrum, Vice President of Engineering

Peter Waters APRIL 22-02 *Signature and Date*
Peter Waters, SOR European Managing Director

