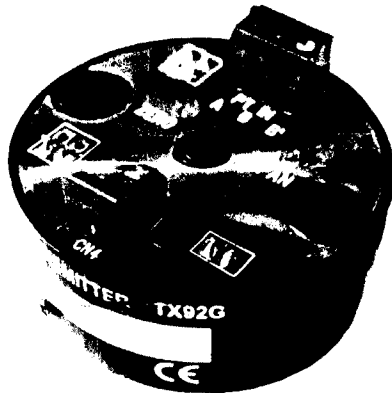


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TX92G (RTD) 4-20 mA Mini Temperature Transmitter



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The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice. **WARNING:** These products are not designed for use in, and should not be used for

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1.0 INTRODUCTION

The economical OMEGA TX 92G two-wire or 3wire transmitters Convert a RTD signal to a 4-20 mA output signal which is directly referenced to the mV input

The TX92 is very compact & can mount directly within OMEGA NB1 cast iron protection head. By having the transmitter near the sensor, the effects of electrical Noise can be minimized & long runs of RTD wire can be eliminated.

2.0 GETTING STARTED

2.1 Unpacking

Remove the packing list and verify that you have received all equipment. If you have any questions, contact the OMEGA Customer Service Department at 1 800 622 2378

Upon receipt of shipment, inspect the container and equipment for any 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 any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing materials and carton in the event reshipment is necessary.

2.2 General Description

The TX92G Series transmitter accepts platinum 100W sensor type RTDs and will produce a standard 4-20 mA output signal proportional to that produced by its attached RTD input. The transmitter does NOT provide isolation between its input and the 4-20 mA output; therefore, an ungrounded RTD is suggested to prevent possible ground loops.

The transmitter provides amplification, common-mode rejection and controlling the current draw from an 9 to 42 Vdc source to produce the 4 to 20 mA output signal. As much as 600 ohms dropping resistance may be used in the power leads of the TX92G when the unit is energized from a 24 Vdc source because of the small compliance voltage needed by the unit.

2.3 Available Ranges

As specified in Table 1-1, the transmitter has 6 ranges. Depending upon the range, the transmitter can measure temperature span as narrow as 180 F (82 C) or as wide as 1000 F (538 C). A multi-turn, top-accessible potentiometer provides Fine span tuning. A second top-accessible, multi-turn potentiometer provides a zero adjustment which allows placement of the 4-mA output temperature within $\pm 25\%$ for Fahrenheit and $\pm 10\%$ for Celsius of nominal span (refer to Section 4.0, Calibrating the Transmitter, for more details).

2.3 Available Ranges (Continued)

Table 1-1. Range/Models

Range	Model
-40~ 49 °C	TX92G-1
-18~ 93 °C	TX92G-2
-18~149 °C	TX92G-3
-18~260 °C	TX92G-4
-18~399 °C	TX92G-5
-18~538 °C	TX92G-6

2.4 Accessories

<u>PART NO.</u>	<u>DESCRIPTION</u>
TX90-BR	MOUNTING BRACKET
PSU-93	UNREGULATED POWER SUPPLY
TX82B	PROCESS LOOP-POWERED INDICATOR
RT	1.2 m (48") MOUNTING TRACK
TX90-DIN	DIN RAIL MOUNTING ADAPTOR
RAIL-35-2	2 m (6.5')SECTION 35 mm DIN RAIL

2.5 Installation

Lightweight TX92G transmitter circuit boards are fabricated from rigid, shock resistant materials with the components soldered to the circuit board.

The TX92G transmitter's small size permits mounting into thermowells or wall mounting in confined areas.

3.0 SAFETY CONSIDERATIONS



This device is marked with the international Caution symbol. It is important to read the manual before installing or commissioning this device as it contains important information relating to Safety and EMC (Electromagnetic Compatibility).

Unpacking & Inspection

Unpack the instrument and inspect for obvious shipping damage. Do not attempt to operate the unit if damage is found.

NOTE

This instrument is a panel mount device protected in accordance with Class I of EN 61010 (115/230 AC power connections). Installation of this instrument should be done by Qualified personnel. In order to ensure safe operation, the following instructions should be followed.

This instrument has no power-on switch. An external switch or circuit-breaker shall be included in building installation as a disconnecting device. It shall be marked to indicate this function, and it shall be in close proximity to the equipment within easy reach of the operator. The switch or circuit-breaker shall not interrupt the Protective Conductor (Earth wire), and it shall meet the relevant requirements of IEC 947-1 and IEC 947-3 (International Electrotechnical Commission). The switch shall not be incorporated in the mains supply cord.

Furthermore, to provide protection against excessive energy being drawn from the mains supply in case of a fault in the equipment, an overcurrent protection device shall be installed.



The Protective Conductor must be connected for safety reasons. Check that the power cable has the proper Earth wire, and it is properly connected. It is not safe to operate this unit without the Protective Conductor Terminal connected.

NOTE

- Do not exceed voltage rating on the label located on the top of the instrument housing.
- Always disconnect power before changing signal and power connections.
- Do not use this instrument on a work bench without its case for safety reasons.
- Do not operate this instrument in flammable or explosive atmospheres.
- Do not expose this instrument to rain or moisture.

EMC Considerations

- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use signal wire connections with twisted-pair cables.
- Install Ferrite Bead(s) on signal wires close to the instrument if EMC problems persist.

4.0 CONNECTING POWER AND SIGNAL INPUTS

1. Verify that the transmitter is connected for the correct power voltage rating.
2. Connect the power supply to pin 4 and the resistance load to pin 5.
3. Connect the sensor to pins 1 and 2.

The transmitter has no power-on switch, so it will be in operation as soon as you apply power.

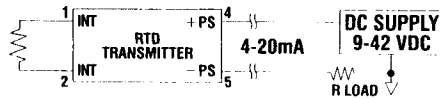


Figure 3-1. Power Input Setup

+PS and -PS screws accept 2 mm (13 gauge) or lighter wire. Input range is 9-42 VDC

1	RTD
2	RTD
3	M (Sense)
4	+ Power/Signal Output
5	- Power/Signal Output

Table 3-1. Screw-Terminal Pin Assignment

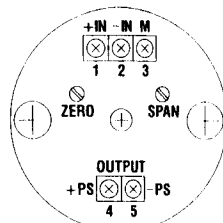


Figure 3-2. Pin Assignment

5.0 CALIBRATING THE TRANSMITTER

Calibration Setup:

1. Insert the reference RTD.
2. Connect RTD simulator.
3. Connect DMM monitor and power supply

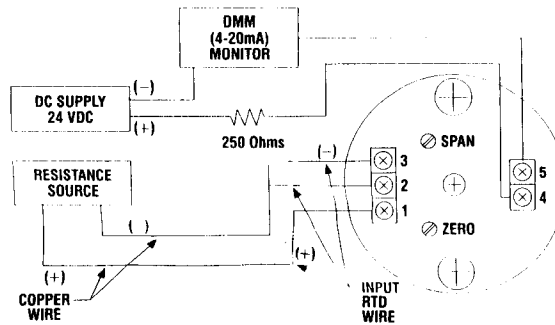


Figure 4-1. Calibration Setup (Resistance Source)

To calibrate the transmitter, follow these steps (refer to Figure 4-1):

1. Locate the model number in Table 4-1 and set the resistance source to the LO-IN value.
2. Adjust the Zero potentiometer until the milliammeter reads 4.00 mA.
3. Set the resistance source to the HI-IN value (in your appropriate table) and read the output current on the milliammeter.
4. Adjust the Span potentiometer to obtain the 20 mA on the milliammeter.
5. Set the millivolt source to LO-IN resistance. If the output current is not 4.00 mA, repeat steps 2 through 7.
6. When calibration is complete, remove the transmitter from the setup.

5.0 CALIBRATING THE TRANSMITTER (Continued)

An RTD calibrator may be used in place of the resistance source - refer to Figure 4-2

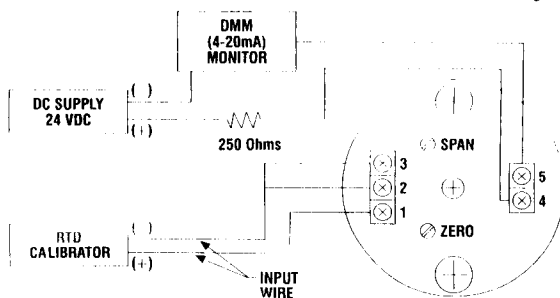


Figure 4-2. Calibration Setup (RTD Simulator)

Table 4-1. Celsius Temperature to OHMS Conversion Chart

Value	Model Number/Range					
	G1 (-40~49°C)	G2 (-18~93°C)	G3 (-18~149°C)	G4 (-18~260°C)	G5 (-18~399°C)	G6 (-18~538°C)
LO IN	84.271 Ω	92.946 Ω	92.946 Ω	92.946 Ω	92.946 Ω	92.946 Ω
HI IN	119.01 Ω	135.85 Ω	156.95 Ω	197.71 Ω	246.75 Ω	293.55 Ω

6.0 SPECIFICATIONS

INPUT

Configuration:	Non-Isolated input
Transducer types:	Platinum RTD (Pt 100 DIN 43760)
Burnout indication:	Upscale over-range Indication, 40 mA max.

OUTPUT

Linear range:	4 to 20 mA _{dc}
Current Output limits:	<2 to >40 mA (open RTD)
Compliance (supply-voltage):	9 to 42 V _{dc}
Reverse polarity protection:	350 V peak
Maximum loop resistance:	(Supply Voltage -8.2V)/20 mA

ACCURACY

Hysteresis and repeatability:	Within $\pm 0.1\%$ of Span
Linearity with respect to input:	$\pm 0.1\%$ of Span
Power supply effect:	Within $\pm 0.01\%$ / V
Temperature effect:	Zero and Span: Within $\pm 0.1\%$ FS/°F

ENVIRONMENTAL

Operating temperature:	-40 to 185 °F (-40 to 85 °C)
Storage temperature:	-50 to 250 °F (-45 to 121 °C)
Humidity:	To 90% (non-condensing)

MECHANICAL

Weight:	less than 1.2 oz (34g)
Diameter:	1.76 in (44.45 mm)
Height (including barriers):	1.06 in (27.00 mm)

6.0 SPECIFICATIONS (Continued)

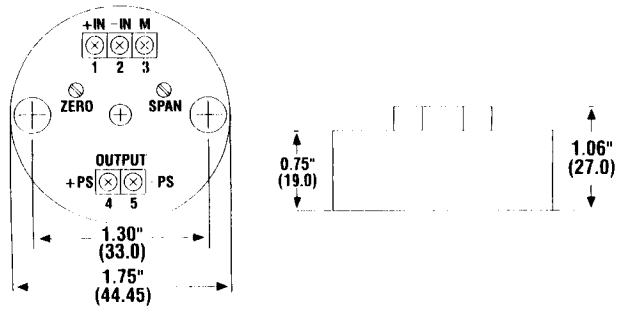


Figure 5-1. Case Dimensions

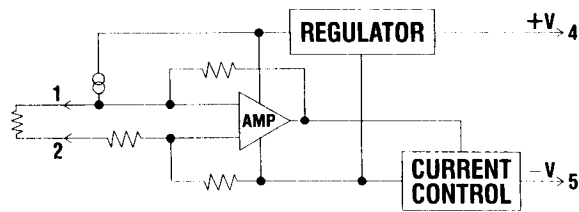


Figure 5-2. Transmitter Block Diagram

WARRANTY/DISCLAIMER

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. Product(s) in such a manner.

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Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

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:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product. ENGINEERING, INC.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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