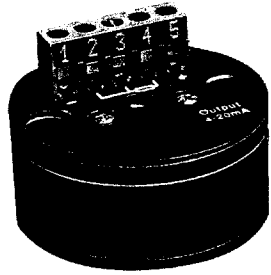
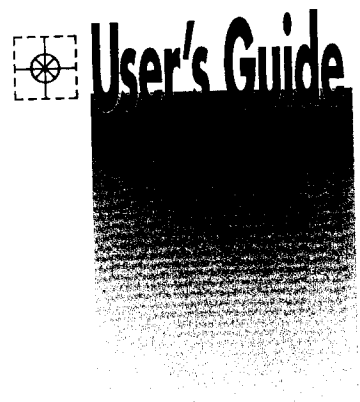


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# TX254 RTD Transmitter

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## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **25 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **two (2) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, 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 being 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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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. P.O. 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.

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1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
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## 1.0 Introduction

### TX254 RTD Input

The TX254 is a non-isolated two-wire transmitter which converts the measuring signal of a 3-wire 100 ohm Pt RTD into a standardized load-independent, 4-20 mA, current which is linearly proportional to the measured temperature. The TX254 transmitter is provided with excellent lead resistance compensation and Pt-100 linearization conforming to BS1904 and DIN 43760 characteristics ( $\alpha = 0.00385$ ).

The transmitter calibration is set by six dip-switches located behind the top cover.

Three dip-switches set the lower measured course temperature and the other three dip-switches set the measured course temperature span.

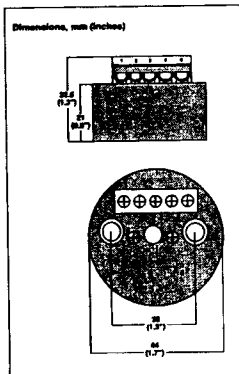
Zero and Span trimmers provide the fine tuning calibration.

## 1.1 Specifications

Output Current:	4-20 mA, 28 mA, limited
Supply Voltage:	10-36 Vdc (24 Vdc recommended)
Supply Variation Effect:	<0.001%/1V change
Accuracy:	Better than 0.1% of span
Temperature Stability:	<0.01% of span/1°C
Operating Temperature:	-20 to +70°C
Humidity:	5-95% relative, non condensed
Housing:	Die-cast zinc alloy
Dimensions:	Diameter: 44mm (1.7"); Height: 32.5 mm (1.3") including the terminal block.
Load Resistance:	$R_{max} (\Omega) = (V_{supply} - 10) / .02$
Input:	3-wire Pt-100 according to BS 1904 and DIN 43760 characteristics
Input Span Range:	30 to 800°C
Input Zero Range:	-50 to +200°C

**Calibration:** Three "Zero" DIP switches, three "Span" DIP switches and two fine-tuning trimmers  
**Sensor Lead Resistance:** 50  $\Omega$  maximum (two ways)  
**Lead Compensation Error:** <0.05°C/10 $\Omega$  lead resistance  
**Sensor Excitation:** <1 mA

Model No.	Input Type	Range Table		Zero Offset Range
		Span Range	Minimum Span	
TX254	RTD 100 ohm Pt	-50 to 750°C -58 to 1380°F	30°C 54°F	-50 to 200°C



## 2.0 Dimensions & Mounting

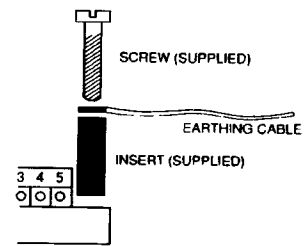
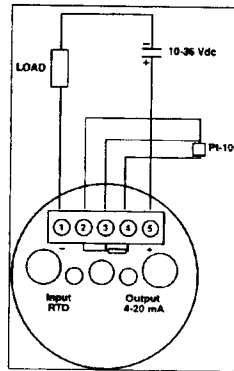
**Caution:** The length of the cover screws is critical. Do not attempt to use longer screws as permanent damage will occur, thus voiding the warranty.

### Earthing (Grounding)

In cases when earthing the transmitter case is required, use the brass insert and fasten the earth lead to it, using the long screw supplied. The cover screws are not designed for this application.

### 3.0 Wiring

**NOTE:** Input and output are not isolated



### 4.0 Calibration (Scaled) Instructions

The TX254 can be ordered set up for a particular temperature range prior to shipment. If not, it can be set up in the field using the following instructions.

#### Calibration

To calibrate RTR-2 the limits must be defined.  $T_{min}$ , often called  $T_{zero}$ , is the temperature at which the transmitter output current is 4 mA.  $T_{max}$ , often called  $T_{span}$ , is the temperature at which the transmitter output current is 20 mA. The difference between  $T_{max}$  and  $T_{min}$  is defined as the Span of the transmitter.

An array of 6 dip-Switches controls the transmitter coarse range.  
 Set switches no. 1 to 3 control the Zero (Tmin), and set switches 4 to 6 control the Span.

**NOTE:** "1" represents the switch ON state.

Connect a Tmin simulation resistor\* between terminals #3 and #4. Short-circuit terminals #2 and #3. Start the calibration by adjusting with the Zero trimmer to obtain an output current of 4.000mA, next replace the resistor with a Tmax simulation resistor\* and then adjust the Span trimmer to obtain an output current of 20.000mA. Repeat this procedure until satisfactory results are achieved.

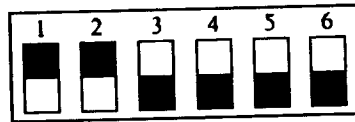
\*Tmin and Tmax simulation resistor values are according to DIN 43760 Pt-100 table ( $\alpha = 0.00385$ )

"Zero" Table	SW1	SW2	SW3
-55 - -25	0	0	0
-25 - +7	1	0	0
+7 - +40	0	1	0
+40 - +73	1	1	0
+73 - +105	0	0	1
+105 - +138	1	0	1
+138 - +170	0	1	1
+170 - +202	1	1	1

"Span" Table	SW4	SW5	SW6
30 - 55	0	0	0
55 - 90	1	1	0
90 - 185	1	0	1
185 - 380	0	1	1
380 - 810	1	1	1

Example: Range needed:  $T_{min} = 50^{\circ}\text{C}$ ;  $T_{max} = 100^{\circ}\text{C}$ ; The Span is then  $50^{\circ}\text{C}$ .  
From the tables on page 4:



#### 4.1 Equipment Required

- Precision Decade Resistance Box, with 0.01 ohm resolution  $\pm 0.002$  ohm accuracy or
- Precision RTD Simulator, such as the OMEGA<sup>®</sup> Model CL511 Precision Calibrator
- Precision DMM capable of measuring mA, with 0.001 mA resolution and  $\pm 0.002$  mA accuracy
- 100 $\Omega$  Pt RTD ( $\alpha = 0.00385$ ) resistance vs temperature reference table (refer to the OMEGA Complete Temperature Measurement Handbook and Encyclopedia<sup>®</sup>)

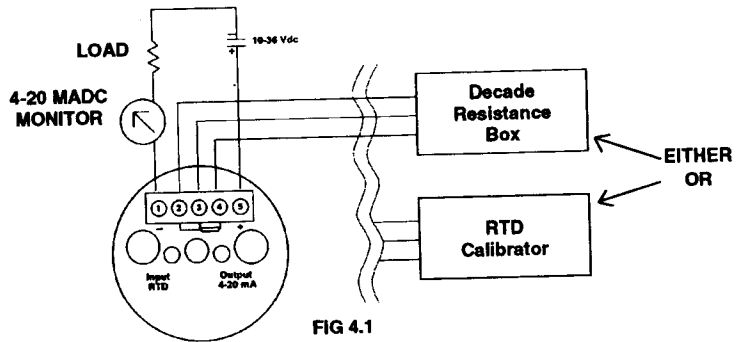


FIG 4.1

1. 2. 3. 4. 5.

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Notes



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1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

 **Notes**



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1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

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**Notes**



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