

TW303 RTD INPUT TWO-WIRE TRANSMITTER



DESCRIPTION

The TW303 regulates the current in a two-wire current loop to be proportional to temperature as measured by a resistance thermometer (RTD). When supplied for use with a platinum RTD, internal linearization circuitry corrects for the slightly non-linear response characteristic of the RTD. With non-platinum sensors its output is linear with resistance.

The TW303 is connected in series between a source of DC power and a readout, controller or other receiving device. An internal voltage regulator feeds a controlled portion of the transmitter's current to its internal circuitry. The block diagram at the end of these instructions illustrates the transmitter's operation.

An internally-generated DC excitation current is applied to the measurement RTD. The voltage which is developed across the RTD's resistance is amplified by a chopper-stabilized amplifier and applied to a circuit which regulates the total current flowing through the transmitter and thus, through the series loop. A three-wire input bridge provides compensation for connection lead resistance. For platinum RTDs, internal linearization circuitry automatically increases the RTD current with RTD temperature, compensating for the fact that platinum's temperature sensitivity drops as temperature increases.

CONTROLS

Zero and span controls (*accessible through the top of the TW303 housing*) calibrate the output current.

OUTPUT CALIBRATION

The TW303 is shipped precalibrated. If there is a need to recalibrate, proceed as follows: Connect the TW303 in series with a 24 volt DC power supply and a precision current meter. Connect a precision decade resistance or potentiometer to the input. To avoid errors due to the resistances of the connecting wires, use a three-wire connection as shown in the "Block Diagram and Terminal Connections" schematic.

Set the input to the low end of the range. Adjust the "Z" (zero) control for 4.00 mA output. Increase the input to full scale and adjust the "S" (span) control for 20.00 mA. Repeat, as the controls may interact slightly.

OPTIONS

U All circuit boards conformal coated for protection against moisture.

MOUNTING

The TW303 may be mounted in a thermocouple-type connection head or other convenient location using the two $\frac{11}{64}$ inch holes provided. The center hole's diameter is $\frac{17}{64}$ inch, allowing clearance for a $\frac{1}{4}$ inch diameter temperature probe.

WARRANTY

The TW Series of products carry a limited warranty of 5 + 5 years. In the event of a failure due to defective material or workmanship, during the 5 year period, the unit will be repaired or replaced at no charge. For a period of 5 years after the initial 5 year warranty, the unit will be repaired, if possible, for a cost of 5% of the original purchase price.

SPECIFICATIONS

RTD Input

2-wire or 3-wire,
100 ohms to 2000 ohms

Excitation Current

100 ohm 1 mA
500 ohm 1 mA
1000 ohm 0.5 mA
2000 ohm 0.2 mA

Output

4/20 mA (2-wire TX)

Minimum Span

50°F/28°C

Maximum Span

RTD limit

Calibration Accuracy

±0.1% or ±0.1°C, whichever is greater

Input/Output Relationship

Platinum: Linear with temperature
Other: Linear with resistance

Temperature Stability

±0.02% of span per °C

Power Supply

12 to 48 volts DC

Maximum Load Resistance

$R_{max} = (V_{supply} - 12)/I_{out\ max}$

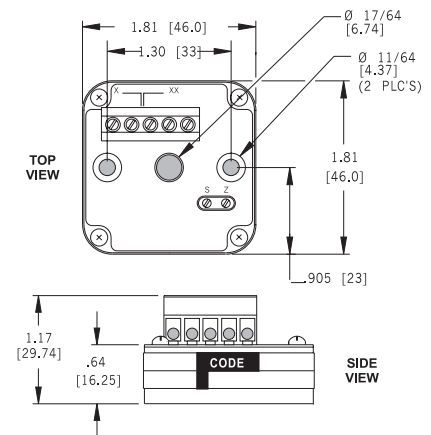
Supply Voltage Effect

0.02% of span max, 12 to 48 volts

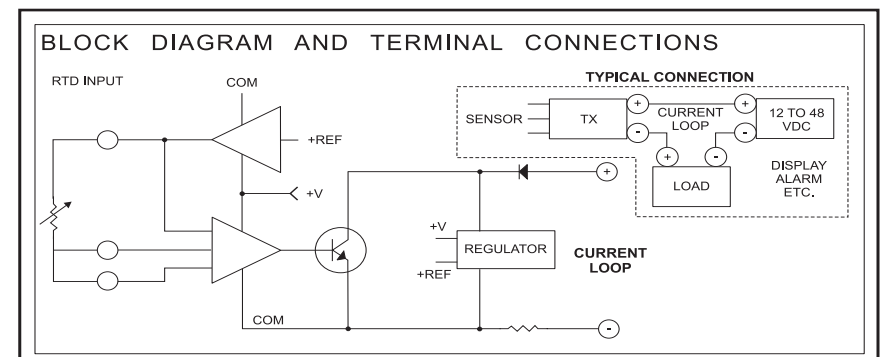
Temperature, Operating

-25 to 80°C (-13 to 176°F)

CASE DIMENSIONS INCHES [mm]



NOTE: Do not ground input RTD unless output current loop is isolated.



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2915 Parkway Street
Lakeland, FL 33811-1391 · USA

800-234-1343

Tel: 863-647-2000 · Fax: 863-644-5318
www.wici.com · E-mail: sales@wici.com