

TW304 THERMOCOUPLE INPUT TWO-WIRE TRANSMITTER



DESCRIPTION

The TW304 regulates the current in a two-wire current loop to be proportional to the input from a thermocouple temperature sensor. The transmitter's output is linear with the thermocouple's voltage and is compensated automatically for "cold junction" temperature changes at its input.

The TW304 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.

CONTROLS

Zero and span controls (*accessible through the top of the TW304 housing*) calibrate the output current.

OUTPUT CALIBRATION

The TW304 is shipped precalibrated. If there is a need to recalibrate, proceed as follows: Connect the transmitter's output in series with a 24 volt DC power supply and a precision digital current meter per the "Typical Connection" shown in the Block Diagram.

If a thermocouple simulator is available use it to provide the calibration input, connecting it to the transmitter with the appropriate pair of thermocouple wires. Otherwise, use copper wires to connect a precision DC millivolt source to the input.

When a millivolt source and copper wires are used it will be necessary to measure and correct for the temperature at the transmitter's input connection.

Using standard tables for your thermocouple, find the millivolt level corresponding to the temperature at the input terminals. Then, at each calibration temperature, subtract this voltage from the voltage given by the thermocouple table. Remember, calibration accuracy will be no better than the accuracy of this temperature measurement.

Using standard thermocouple tables, set the input to the low end of the input range and 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 output. Repeat, as the controls may interact slightly.

OPTIONS

U All circuit boards conformal coated for protection against moisture.

MOUNTING

The TW304 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 10 % of the original purchase price.

SPECIFICATIONS

Thermocouple Input

J, K, T, E, R, S, B, N

Output

4/20 mA (2-wire)

Minimum Span

5 mV

Maximum Span

Thermocouple limit

Calibration Accuracy

$\pm 0.05\%$ or 5 microvolts, whichever is greater

T/C Burnout Indication

Upscale

Input/Output Relationship

Linear with input mV

Temperature Stability

$\pm 0.02\%$ of span plus
0.5 microvolts per °C

Power Supply

12 to 48 volts DC

Maximum Load Resistance

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

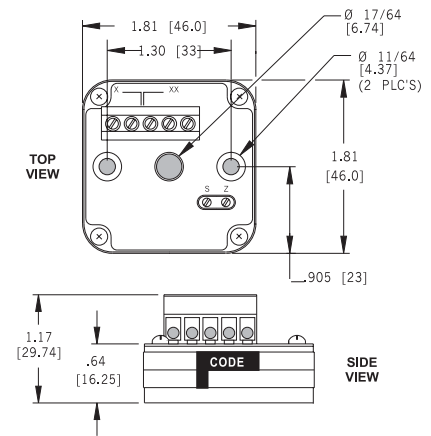
Supply Voltage Effect

0.02% of span max, 12 to 48 volts

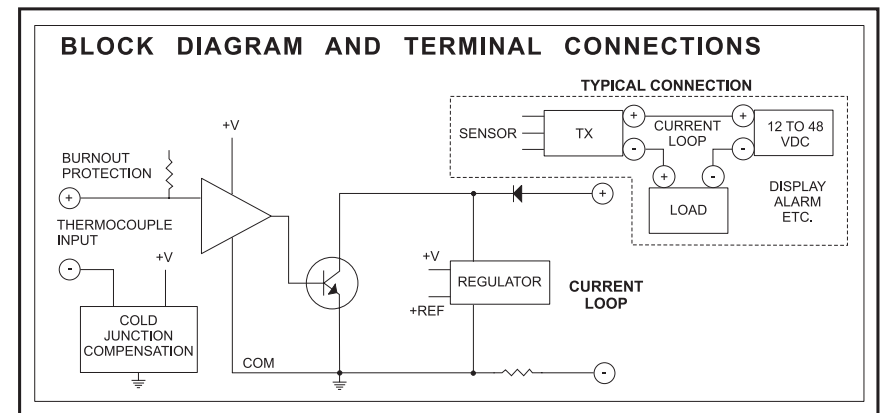
Operating Temperature

25 to 80°C (-13 to 176°F)

CASE DIMENSIONS INCHES [mm]



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



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