

# SR8401 THERMOCOUPLE INPUT TWO-WIRE TRANSMITTER



The SR8401 regulates the current in a two-wire current loop to be proportional to 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 transmitter input and output are transformer isolated.

## DESCRIPTION

The SR8401 is connected in series between a source of DC power and a readout, controller or other receiving device. An input/output isolator chops the regulated supply voltage, couples it through a transformer and rectifies the resulting output to provide an isolated DC signal to the preamplifier. The preamplifier's output also is chopped, transformer coupled and demodulated to drive the output current regulator.

The transmitter is protected by a gasketed, glass-filled polyester housing and operates from -25° to +80°C.

The SR8401 is conformal coated for moisture protection.

## CONTROLS

Zero and span controls (*accessible through the top of the SR8401 housing*) calibrate the output current.

## OPTIONS

**B** Standard burnout protection is upscale. Option B provides downscale burnout protection.

## OUTPUT CALIBRATION

The SR8401 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. Connect a precision DC voltage source covering the desired input range. 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 the 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 the low-end output current (usually 4.00 mA). Increase the input to full scale and adjust the "S" (span) control for full-scale output (20.00 mA). Repeat, as the controls may interact slightly.

## MOUNTING

Mounting plate accessory DMP8500 allows the SR8401 to be mounted on a flat surface or on a 35mm DIN-rail.

Use the mounting plate as a template to locate and drill holes for surface mounting, then screw the plate to the bottom of the transmitter using the #6 thread-cutting screws provided.

Spring retainer clip accessory CLP8000 (factory installed) holds the SR8401 in place inside a Killark HK Series explosion-proof housing HKB-HFC, or other housing with a 3½" inside diameter.

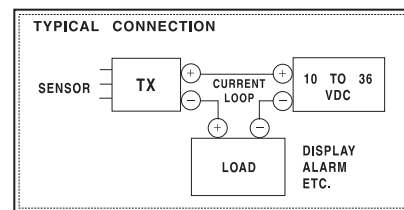
If you wish to provide your own mounting arrangements, use #6 type F thread-cutting screws or tap the bottom recesses with a #6-32 tap. The recesses are ½ inch deep. Exceeding this depth may damage the housing.

## WARRANTY

The SR8401 carries 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.

## TERMINATIONS

- Power Supply ..... +
- Power Supply ..... -
- T/C + ..... Terminal 1
- T/C - ..... Terminal 3
- Shield ..... Terminal 4



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## SPECIFICATIONS

### INPUT RANGE

select **any** type thermocouple  
(min span 5 mV)

### OUTPUT RANGE

4/20 mA

### MAX LOAD RESISTANCE

= [(V supply - 10)/20 mA]  
kilohms

### RESPONSE TIME

Step Change 250 ms  
for 99% of final value

### ACCURACY

±0.1% of span

### LINEARITY, INPUT/OUTPUT

±0.05% of span (mV)

### COMMON MODE REJECTION

120 dB, DC to 60 Hz

### ISOLATION

Output/Input  
1000 V rms sinewave

### OPERATING TEMPERATURE

-13°F to 176°F / -25°C to 80°C

### TEMPERATURE STABILITY

± 0.01% of span/°C max

### POWER REQUIRED

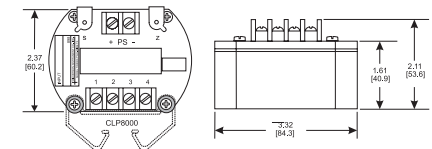
10 to 36 VDC

### SUPPLY VOLTAGE EFFECT

0.02% of span max,  
10 to 36 VDC

## CASE DIMENSIONS

INCHES [mm]



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