

# TEMPCO®

## USER MANUAL

### TEC-900

1/16 DIN Solid State Temperature Indicator



The TEC-900 is designed to fit panel cutouts that are 1.81" (46mm) x 1.81" (46mm). 3.5" minimum depth is required to provide clearance for rear terminal connections.

## Input

Thermocouple (T/C):	Type K, J. See label.
RTD:	3-wire PT100 DIN or JIS.
Sampling rate:	3 times per second
Accuracy:	±1% of span
Cold junction compensation:	±0.1°C/1°C
Sensor break protection:	Upscale
Common mode rejection (CMRR):	120dB
Normal mode rejection (NMRR):	60dB

## Display

Process indicator: 0.4" (10mm) 3½ digit red LED display.

## Power

Standard: 90–240VAC, 50/60Hz, 5VA  
Optional: 12–36VAC, 50/60Hz, 19–48VDC.

## Environmental and Physical

Operating Temperature: 32–122°F (0–50°C)  
Humidity: 0–90% RH (non-condensing)  
Breakdown: 2000VAC, 50/60Hz, 1 minute  
Vibration: 10–55Hz, amplitude 1mm  
Shock: 200m/s<sup>2</sup> (20g)  
Weight: 0.42 lb. (190g)

## Dimensions

1.875"(48mm) x 1.875"(48mm) x 3.7"(94mm) H x W x D  
Depth behind panel: 2.91"(74mm)  
Panel cutout: 1.81" x 1.81" (46mm x 46mm)

## Approval Standards

Safety standard: UL3121-1  
Protective class: Front panel: IP 30  
Housing and terminals: IP 20  
EMC: EN61326

## Instructions For Use:

Unpack and inspect to make sure the unit was not damaged in transport. Check the label on the unit to verify the model number and options. Insert into appropriate sized panel cutout (see above). Connect power wiring and thermocouple or RTD (as appropriate for the unit ordered) as shown in figure 1. When wiring a thermocouple, make sure that the thermocouple and extension wire conform to the thermocouple type specified by the instrument. To assure effective lead resistance compensation when wiring three wire RTDs, make sure that all of the leads that connect to the unit are the same gauge and composition.

Follow appropriate wiring and safety precautions at all times when working with this unit. All wiring should conform to local and national codes. When power is supplied, the unit will display the temperature of the process it is connected to in the units indicated on the front panel (°F or °C, as ordered).

## Ordering Code: TEC-900- \_ \_ \_ 000

- (1) Power input
  - 4 90–240VAC 50/60Hz
  - 5 12–36VAC 50/60Hz, 16–48VDC
  - 9 Other
- (2) Signal input
  - 1 Thermocouple Type J
  - 2 Thermocouple Type K
  - 3 RTD — 100 ohm PT, DIN
  - 4 RTD — 100 ohm PT, JIS
  - 9 Other
- (3) Range code
  - 2 -199–199°C Q 0–99.9°F
  - 3 -99.9–99.9°C R 0–199°F
  - 4 -99–99°C S 0–399°F
  - 5 -49.9–49.9°C T 0–599°F
  - 6 0–49.9°C U 0–799°F
  - 7 0–99°C V 0–999°F
  - 8 0–99.9°C W 0–1999°F
  - A 0–199°C
  - B 0–199.9°C
  - C 0–299°C
  - D 0–399°C
  - E 0–499°C
  - F 0–599°C
  - G 0–799°C
  - H 0–999°C
  - J 0–1200°C
  - K -399–399°F
  - L -199–199°F
  - M -99.9–99.9°F
  - N -99–99°F
  - P 0–99°F

## WARNINGS:

- Dangerous voltages may be present in these instruments. Before installation or troubleshooting, switch off and isolate power to all equipment. If a unit is suspected of being faulty, it should be disconnected and removed to a properly equipped workshop for testing and repair. Component replacement and internal adjustments should be performed by qualified maintenance personnel only.
- To minimize the risk of fire or shock hazards, avoid exposing these instruments to rain or excessive moisture.
- Do not use these instruments in areas that are prone to hazardous conditions such as excessive shock, vibration, dirt, moisture, corrosive gases, or oil. The ambient temperature of the areas should not exceed the maximum rating specified.

## Wiring Precautions:

- Before wiring, verify the correct model number and options on the label. Switch off the power while checking.
- Care must be taken to ensure that the maximum voltage rating specified on the label is not exceeded.
- It is recommended that the power for these units be protected by fuses or circuit breakers rated at the minimum value possible.
- All units should be installed in a suitable enclosure to prevent live parts from being accessible to human hands and metal tools. Metal enclosures and/or subpanels should be grounded in accordance with national and local codes.
- All wiring must conform to appropriate standards of good practice and local codes and regulations. Wiring must be suitable for the voltage, current, and temperature rating of the system.
- Beware not to over-tighten the terminal screws. The torque should not exceed 1 N-m (8.9 lb-in or 10 KgF-cm).
- Unused control terminals should not be used as jumper points as they may be internally connected, causing damage to the unit.
- Verify that the ratings of the output devices and the inputs as specified are not exceeded.
- Except for thermocouple wiring, all wiring should use stranded copper conductor with a maximum gage of 14 AWG.
- Electrical power in industrial environments contains a certain amount of noise in the form of transient voltage and spikes. This electrical noise can adversely affect the operation of microprocessor-based controls. For this reason the use of shielded thermocouple extension wire which connects the sensor to the controller is strongly recommended. This wire is a twisted-pair construction with foil wrap and drain wire. The drain wire is to be attached to ground in the control panel only.

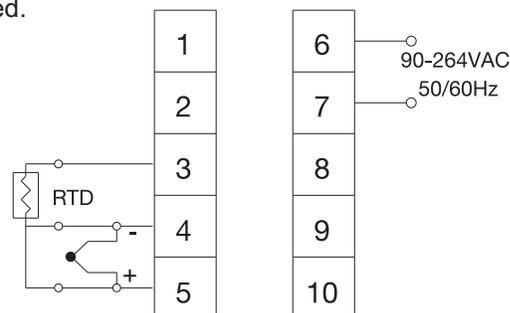


Figure 1 Rear Terminal Connections

## Troubleshooting

Common causes of failures:

- Line wires improperly connected
- Incorrect voltage between line terminals
- No voltage between line terminals
- Connections to terminals are loose, open, or missing
- Short across terminals
- Shorted thermocouple leads
- Thermocouple is open at tip
- Thermocouple lead is broken
- Burned out line fuses
- Defective line switches
- Defective circuit breakers

If the unit still does not function after these points have been checked, it is recommended that the instrument be returned to Tempco for inspection. Do not attempt to repair it yourself, as this often results in costly damage. Make sure to use adequate packing materials to prevent damage during shipment.

## RETURNS

No product returns can be accepted without a completed Return Material Authorization (RMA) form.

## TECHNICAL SUPPORT

Technical questions and troubleshooting help is available from Tempco. When calling or writing please give as much background information on the application or process as possible.

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**Note:** Information in this manual was deemed correct at the time of printing. The policy of Tempco is one of continuous development and product improvement, and we reserve the right to modify specifications and designs without prior notice. Not responsible for typographical errors.

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