

### General Description & Applications

The TC-140 series panel mount temperature controllers provide temperature display, relay control, and feature programmable set points, differentials and calibration. Applications for use include heating, cooling, refrigeration, HVAC, food service, medical and industrial equipment.

### Features

- Membrane touch-pad programming
- 0.56" high red LED display
- Programmable setpoint and differential
- Snap-in panel mount enclosure
- Available with single or dual stage relay outputs

### TC-140 Series Panel Mount Temperature Controllers



TC-140

- Current Temperature Display
- LED relay status indicator
- Easy programming via LED display prompts
- Tamper resistant programmable setpoint limit
- Temperature Sensor included

### Specifications

**Power requirements:** 12 VAC and 24 VAC standard , 12 VDC and 24 VDC optional

**Relay status indicator:** Lighted while relay is activated

**Relay(s) contact rating:** SPST relay, 10 amp (120 VAC resistive)

**Ambient operating temperature range:** 20° to 158° F, -6° to 70° C

**Ambient operating humidity range:** 90% non-condensing

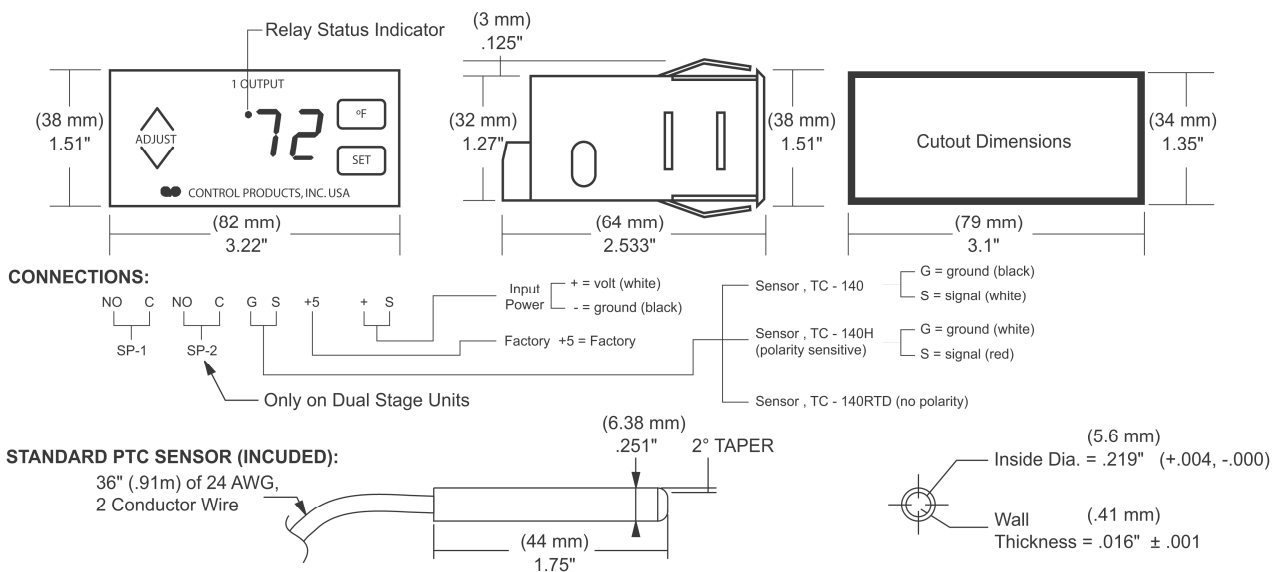
**Accuracy:** ± 2° F, ± 2° C

**Connectors:** Screw type terminal block for all connections.

**Temperature sensor range:** PTC sensor standard -67° F to 302° F (-55° C to 150° C). Sensor is on a 36" (.91m) wire and sensor is encased in a nickel plated brass cap. Sensor can be extended up to 100ft (30.5m).

**Agency approvals:** U.L. and C.U.L recognized, NSF

### Dimensions & Wiring



## Programming Instructions & Operation

The TC-140 is easy to program using the soft-touch keys on the front of the controller. There are tamper-proof functions built in to prevent unauthorized changing of settings after set up is completed.

During NORMAL OPERATION, the current temperature is displayed. A SETPOINT temperature is maintained via a relay control that is energized when the setpoint is reached. The TC-140 controller will open or de-energize the relay based on the differential setting. Setting a positive differential (heating mode) will energize (or close) the relay when the temperature falls just below the setpoint value and de-energize, or open the relay when the temperature rises above the setpoint plus the differential. Setting a negative differential (cooling mode) will energize (or close) the relay when the temperature is just above the setpoint and de-energize (or open) the relay when the temperature falls below the setpoint minus the differential.

**NOTE:** *It is important to go through the entire programming sequence, even if you are just changing one value. If you don't scroll through all the menu options, your settings will not be saved. In addition, if the programming sequence is interrupted for more than 15 seconds or not completed to the blank screen stage, the unit will automatically revert to the temperature display mode WITHOUT acknowledging any new values. This is a tamper resistant feature.*

### Setting the Temperature Setpoint(s):

1. To start the programming sequence, press the SET button once. Unit displays "SP1" (setpoint 1).
2. Press the SET button again to display the current SP1 value.
3. To program an increase or decrease in SP1, press the appropriate ADJUST arrow until the desired value is displayed.
4. Repeat steps 1 thru 3 for SP2 (setpoint 2). Only dual stage models will have an SP2 or setpoint 2 value option.
5. To complete the programming sequence, press the SET button until the screen goes blank. After five seconds, the unit will automatically display sensor temperature. If you do not press SET until the blank screen appears, your settings will not be saved.

### Setting Differential(s), High and Low Setpoint Limits and Calibration:

To program these parameters, press the "hidden" button located behind the "° F" or "° C" symbol (instead of the SET button). Follow the same procedure as outlined above for temperature setpoints to program these parameters.

1. **Differential "dF1"** – See discussion above how the differential determines whether the controller is used in a heating or cooling application. Differential is programmable from -30° to +30°. **NEVER SET DIFFERENTIAL AT "0"**.
2. **High and Low Setpoint Limits "HI" and "LO"** – allow you to limit the range in which the setpoints can be programmed. Also, by programming the high and low setpoint limit values to the same number, a tamper-resistant fixed setpoint is established.
3. **Calibration "CAL"** – Controller calibration can be programmed  $\pm 30$  degrees from the current displayed temperature value. Use this function only if you know the controller to be displaying an incorrect temperature.

## Ordering Information

The TC-140 Series Temperature Controller is available in several different configurations. Custom configurations are available for different relays, customized programming options, different voltage requirements or custom sensor options. 12 VDC versions are also available, but may not be stocked on a regular basis. Input voltage refers to the voltage required for the unit to operate. The following part numbers are generally stocked and ready for shipment.

<u>Model</u>	<u>Relay Outputs</u>	<u>°F or °C</u>	<u>Sensor Type</u>	<u>Input Voltage</u>
TC-140S-24	1, 10amp relay (120VAC resistive)	°F	PTC	24 VAC
TC-140D-24	2, 10 amp relays (120VAC resistive)	°F	PTC	24 VAC
TC-140S-12	1, 10amp relay (120VAC resistive)	°F	PTC	12 VAC
TC-140D-12	2, 10 amp relays (120VAC resistive)	°F	PTC	12 VAC

**CUSTOM DESIGN AND MODIFICATIONS:** In addition to standard models, Control Products specializes in complete custom design and manufacture of electronic controls. Modifications of our standard controls are also available. Please contact our Customer Service department to arrange for a consultation of your specific project and application.

## Warranty

Control Products warrants its products to be free from defects in material and workmanship under normal use for one year and is not responsible for consequential damages or installation costs of any nature. Exposure to contaminants and extreme environmental conditions such as moisture, temperature, chemicals, etc. may cause the unit to degrade or fail. Control Products accepts no liability for product applications or customer application testing.

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