

## **Model- TTC**



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### **Temperature Controllers with Digital Display**

#### **Specifications**

**Sensor:** Thermocouple (Type J or K)

**Accuracy:** 1% Full Scale  $\pm$  1 LSD

#### **Ambient Operating**

**Temperature:** -30°F to 140°F (-35°C to 60°C)

**Ambient Storage Temperature:** -40°F to 180°F  
(-40°C to 82°C)

**Power:** 12 VAC/DC

**Package:** Panel Mount Epoxy Encapsulated

**Output:** 10A Relay, (Resistive Load)

or 12 – 16 VDC @ 30 mA

**Control:** On/Off

**Display:** 3 Digit LED (0.56" (14 mm) High)

**Connections:** Screw Terminal

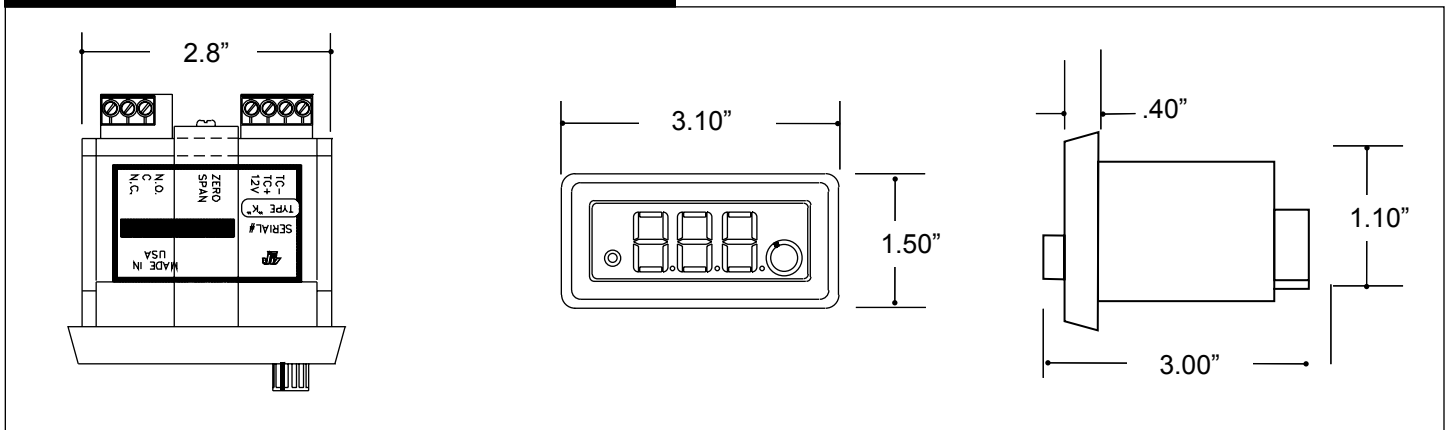
**Hysteresis:** Typically 1° to 2°

**Temperature Range:** 50°F to 940°F (10°C to 530°C)

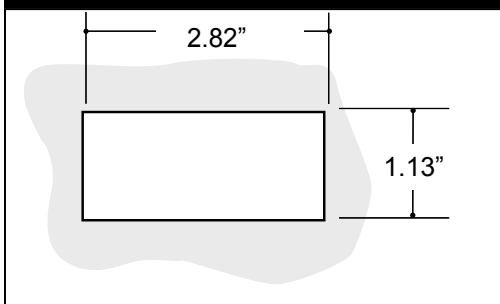
These temperature controllers are compact and easily installed. Please read these instructions carefully to assure correct installation.

This equipment must be installed by a licensed electrician. Prior to being put into operation, check all wiring and function of unit.

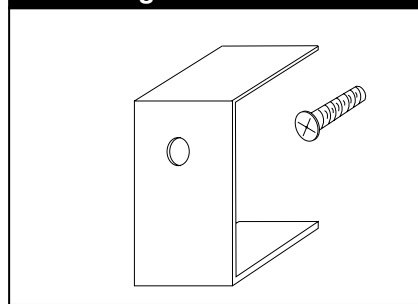
## Dimensions



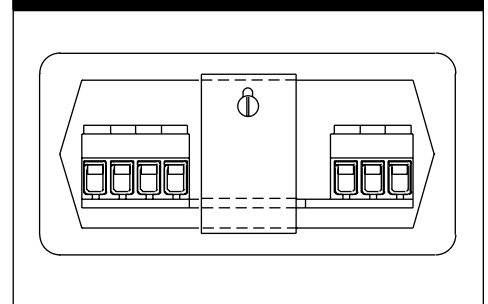
## Panel Cut-out



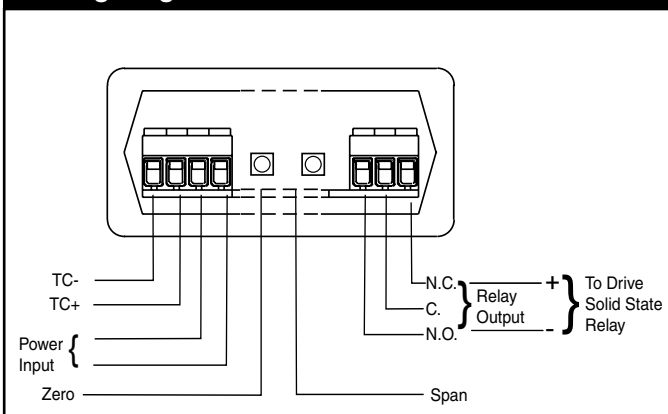
## Mounting Bracket and Screw



## Bracket and Screw Positions



## Wiring Diagram



Refer to wiring diagram on next page for transformer connections which also show the Type J or K thermocouple wire terminals. For long thermocouple runs the proper thermocouple extension wire must be used, and the proper polarity must be maintained. If these precautions are not observed, the unit may not meet specifications.

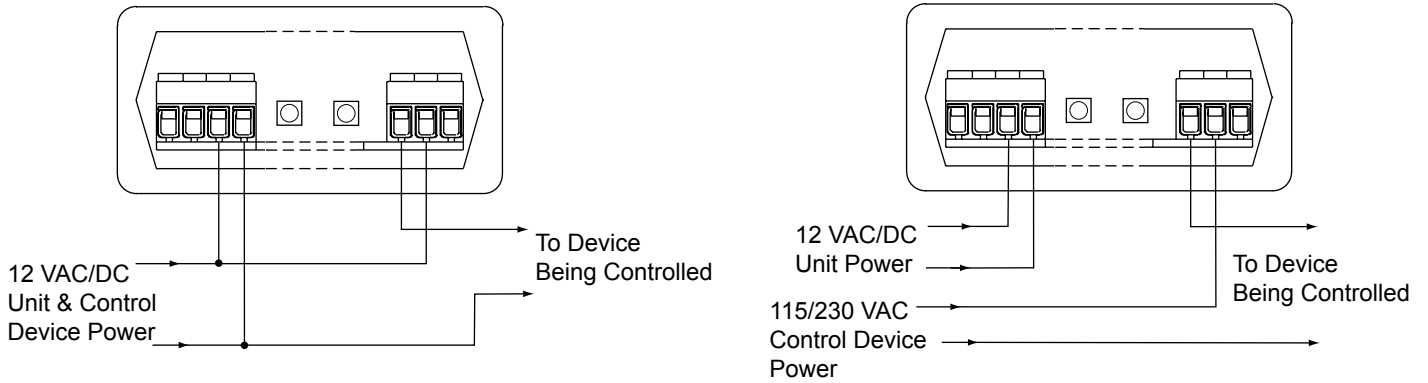
Power and thermocouple wire should not be placed in the same conduit or wiring trough. However, wires from several thermocouples may be in the same conduit or wiring trough. If shielded thermocouples are used, the shields should be insulated electrically from the thermocouple wires and terminated to earth ground.

Ungrounded thermocouples are required when multiple controllers/indicators are used or if the transformer is grounded.

## Wiring Information

The wiring diagram provides required wiring information. 12 VAC/DC @ 250 mA must be supplied to the unit's "power input." Connect unit as indicated. If the unit is powered by a step down transformer, then 24, 115 or 230 VAC must be connected to the transformer primary and the secondary connected to the power input of the controller/indicator.

## Wiring Diagram: Different Power Requirements



The Diagram above illustrates how to wire the relays for the different power requirements.

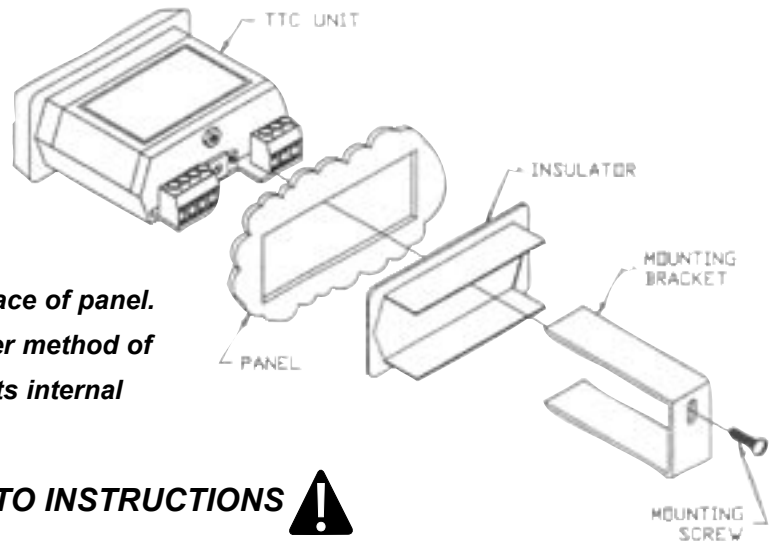
The relay must have an external power source for you to be able to control your device.

## TTC Unit to Panel Instruction

### Assembly Instructions:

1. Remove Bracket and insulator from TTC Unit.
2. Place TTC Unit through panel cut-out.
3. Place insulator on TTC Unit and attach bracket.

**Note: Bracket is not to touch metal surface of panel. Bracket must rest on insulator. Any other method of mounting will cause damage to TTC units internal operation.**

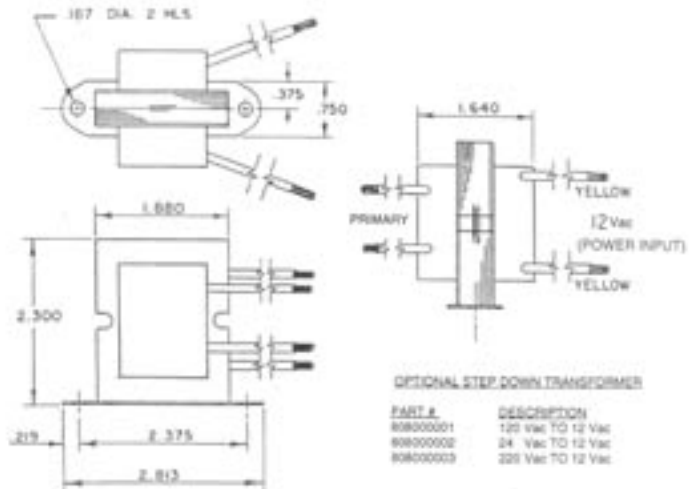


**! MUST INSTALL ACCORDING TO INSTRUCTIONS !**

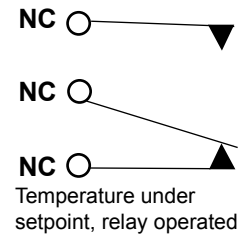
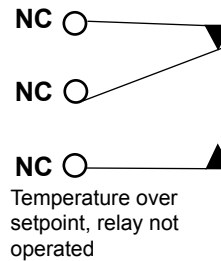
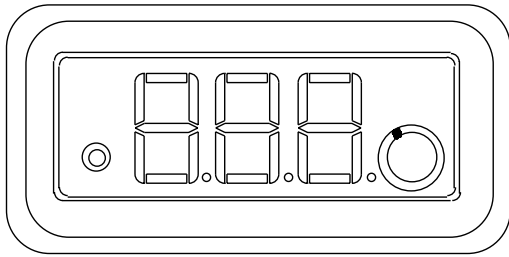
## Set Point Calibration and Output States

If transformers other than those supplied by Antunes Controls are used, the transformer colors/leads and power capabilities may not be the same.

If field calibration is required, a two point calibration with a millivolt generator can be used. Allow 30 minutes for the unit to stabilize before calibrating. Calibrate the low reading by adjusting the zero pot. Enter the second calibration higher than the first point and adjust the span. Recall these two points if needed.



## Set Point Calibration and Output States



When the button on the lower left of the unit is pushed in and held, the setpoint is displayed. As long as the button is held in, the setpoint is displayed. When the button is out, the temperature at the thermocouple is displayed.

The knob on the lower right is used to change the setpoint. Turn the knob clockwise to increase the setpoint. Turn the knob counter clockwise to decrease the set point.

The diagram above shows the output states of the controller internal relay when the temperature as seen by the thermocouple is above and below the setpoint. Make connection accordingly observing the power rating of the contacts. The unit will read “EEE” for over range inputs. If the thermocouple “opens” the internal relay will go to its “not operated” state.

**Caution:** The setpoint can be changed without displaying the setpoint. Do not turn the setpoint knob unless you want the setpoint changed.

## Solid State Relay Output

When the temperature seen by the thermocouple is above the setpoint, there will not be any voltage between – and + terminals. If the temperature seen by the thermocouple is below

the setpoint, there will be 12 – 16 VDC output. This output is capable of providing 30 mA. If an “open” thermocouple condition occurs, the voltages between – and + terminals will be zero.

## Limitation of Liability

It is understood and agreed that seller's liability whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the return of the amount of the purchase price paid by purchaser and under no circumstances shall seller be liable for special, indirect or consequential damages.

The price stated for the equipment is a consideration in limiting seller's liability. No action, regardless of form, arising out of the transactions may be brought by purchaser more than one year after the cause of action has accrued.

## Warranty

1. Antunes Controls products are guaranteed to be free from mechanical and electrical defects for a period of one year from date of shipment under normal use and service provided installation is made in accordance with manufacturers' recommendations.
2. Parts deemed defective shall be repaired or replaced at manufacturers option and at manufacturers expense but shall not include foreign or federal excise taxes, state or municipal sale or use taxes, all such taxes not limited to the foregoing being responsibility of the purchaser.
3. No charge for travel and/or mileage will be allowed to purchaser.
4. Antunes Controls reserves the right to make changes in design or make any improvements on any products. The right is always reserved to modify our equipment because of new technology, underwriter's requirements and/or government regulations.
5. The following are not covered under warranty:
  - a. Failure from neglect, abuse, careless handling and mis-application of unit.
  - b. Failure to observe guidelines for installation or improper voltage hook-up.
  - c. Failure caused by improper maintenance. (See maintenance guidelines found in operation instructions.)
  - d. Unless specifically allowed by Antunes Controls, no other charges may be included under warranty.



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180 Kehoe Boulevard • Carol Stream, Illinois 60188 • USA • Ph: (630) 784-1000 • (800) 253-2991 • Fx:(630) 784-1650

www.ajantunes.com