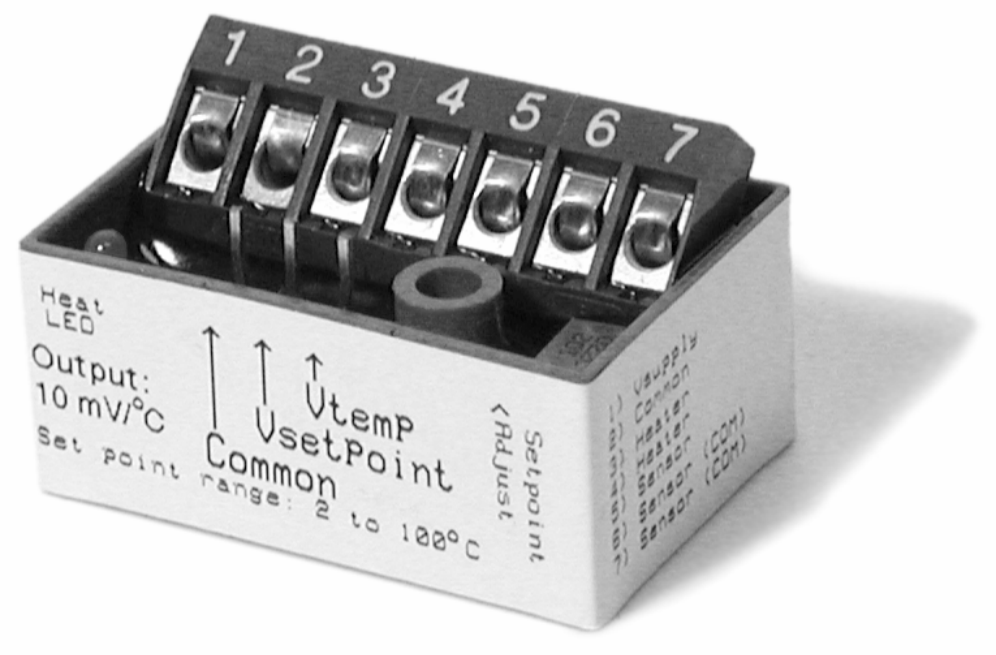
CT325 Temperature Controller
Installation and Operation Instructions



- Heat items with up to 240 watts
- DC only – for battery-powered or 5 volt-powered heaters
- Signals to display, on your voltmeter, the set point and actual temperatures in °C
- Heat items to boiling temperature or just heat it to body temperature
- Quiet, solid-state reliability

Why pay more for a controller with a digital display which is not used after installation? The temperature which the sensor sees is turned into a voltage signal. Simply connect a voltmeter to the test pins to read the actual temperature and the set point temperature.

The CT325 is an ON/OFF temperature controller. The resistance of a temperature sensor is compared to the setting of the potentiometer. When the temperature is below setpoint, the solid-state output transistor switches the heat on. At temperatures above setpoint, the output transistor is turned off, and there is not heating. The Heat LED" light is on when the heater is on.

Installation:

Locate the CT325 near the sensor and heater, in a location away from heavy dust and condensation. The ambient temperature range must be between –40 and 70°C (-40 and 158°F). Mount with a #6 machine or #8 self-tapping screw.

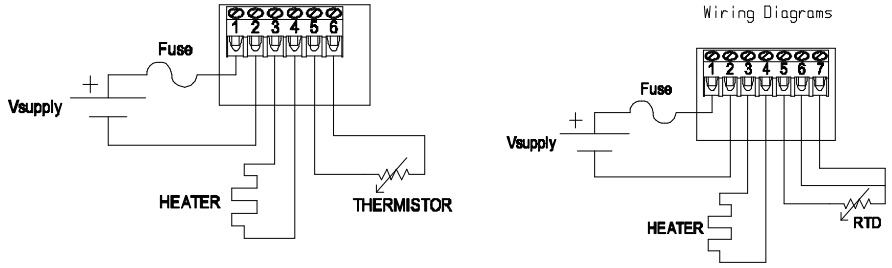


Figure 1

Power: Wire the CT325 as shown below, observing the +/- polarity power supply. Add a fuse that is sized to protect your heater load. A separate thermostat may be used for added protection. Maximum DC supply voltage is either 10 or 60 VDC depending on the CT325 being used.

Sensor:

Thermistor – Wire as in Figure 1 at left.

3-wire RTD – Wire as in Figure 1 at right. The controller will compensate for the resistance in the leadwires going to the RTD. For a 3-wire RTD, the two common wires are usually of the same color and they go to terminals 6 and 7. You can identify the common wires because their measured resistance will be only a few tenths of an ohm.

2-wire RTD – Connect the 2-wire RTD to terminals 5 and 6 and jumper terminal 6 and 7. To determine the amount of error due to lead resistance use the following formula:

$$\text{Error (°C)} = (D \times R_L \times 2) / \Delta R_{RTD}$$

Where D = Distance between RTD and CT325, RL = Resistance of leadwire per foot

ΔR_{RTD} = change in resistance of RTD per °C (.385Ω for PD, 3.85Ω for PF)

Extension wires – To locate the RTD farther away, add 3 extension wires, using wire of the same gauge, from the same spool, and make the length of all wires identical. To extend wires for RTDs having only two wires, using the same guidelines, run three wires out to the two leadwires from the RTD.

Temperature sensor resistances:

	0°C	*10°C*	*20°C*	*25°C*	*30°C*	*40°C*	*50°C*
	32°F	**50°F**	**68°F**	**77°F**	**86°F**	**104°F**	**122°F**
PD (O)	100.00	103.90	107.79	109.74	111.67	115.54	119.40
PF (O)	1000.0	1039.3	1077.9	1097.4	1116.7	1155.4	1194.0
TF (O)	155,600	97,490	62,240	50,000	40,350	26,640	17,940

	60°C	*75°C*	*100°C*	*125°C*	*150°C*	*175°C*	*200°C*
	140°F	**167°F**	**212°F**	**257°F**	**302°F**	**347°F**	**392°F**
PD (O)	123.24	128.99	138.51	147.95	157.33	166.63	175.86
PF (O)	1232.4	1289.9	1385.1	1479.5	1573.3	1666.3	1758.6
TF (O)	12,310						

Operation:

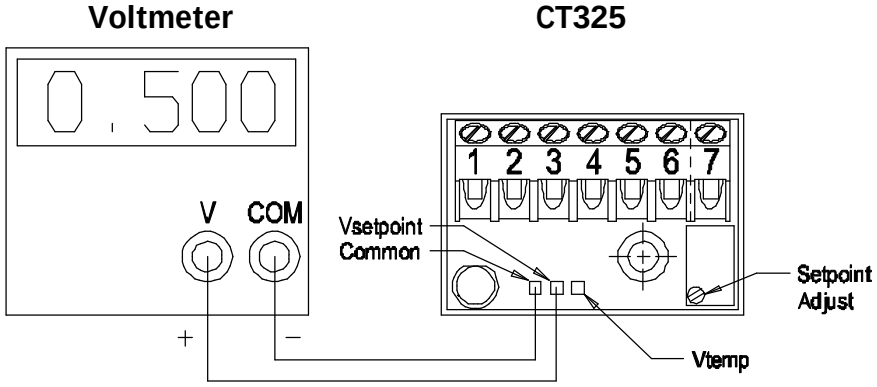


Figure 2: 50.0°C set point is shown.

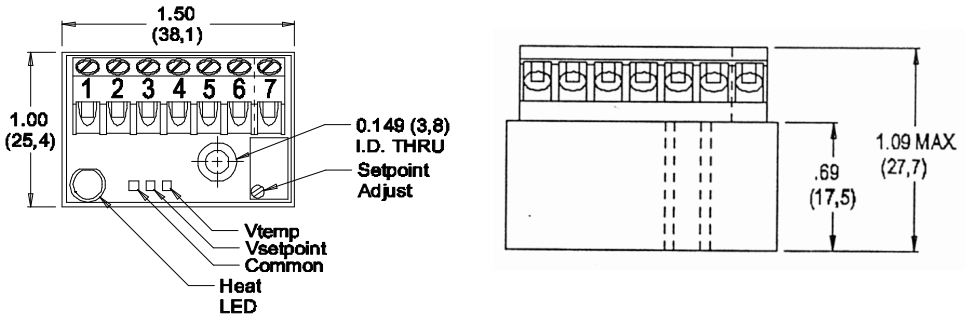
Adjust Setpoint:

1. Connect voltmeter as shown above.
2. Turn the Setpoint Adjust screw until the voltmeter displays the setpoint temperature you want, simply shifting the decimal point on your voltmeter reading. In the example drawn above, the voltmeter reading is 0.500 volts means 50.0°C. To raise the temperature turn the adjustment screw clockwise.

Reading temperature sensor:

1. Connect voltmeter as shown above except move the positive voltmeter lead to the V_{temp} pin of the CT325.
2. The V_{temp} pin output 0.010V/°C, exactly the same as the $V_{setpoint}$ pin does. For example, if the voltmeter is displaying 0.603 volts, this corresponds to a temperature of 60.3°C.

Dimensions:



How to Order

CT325	Model Number: CT325
PD	Sensor type: PD = 100Ω platinum RTD (2 to 100°C) PF = 1000Ω platinum RTD (2 to 100°C) TF = 50kΩ thermistor (25 to 75°C)
1	Power Supply: 1 = 4.75 to 10 VDC 2 = 7.50 to 60 VDC
A	Temperature Range: A = 25 to 75°C (Thermistor only) C = 2 to 200°C (RTD only)
1	Deadband: 1 = 0.1°C
CT325PD1A1 ← Sample Part Number	

Specifications

Input: 100 ohm or 1000 ohm platinum RTD, 0.00385 ohm/ohm/°C, 2- or 3-leads; or 50kΩ NTC thermistor, 2-lead.

Setpoint Range: 2 to 200°C (36 to 392°F) for platinum RTD models.

25 to 75°C (77 to 167°F) for thermistor model.

Consult factory for other ranges.

Setpoint Stability: +/- 0.02% of span/°C

V_{temp} Signal: 0.010V/°C over specified range.

	Platinum RTD Sensor		Thermistor Sensor	
	2°C	0.02V	25°C	0.25V
	50°C	0.50V	50°C	0.50V
	100°C	1.00V	75°C	0.75V
	200°C	2.00V		
Accuracy:	±1% of span		±2% of span	
Linearity:	±0.1% of span		±2% of span	

Deadband: 0.1°C

Input Power: 4.75 to 60 VDC.

Output: Open drain, 4 amps max. DC.

Leadwire Compensation (3-wire RTD): ±0.06°C/ohm for 100 ohm or 1000 ohm platinum up to 25 ohms per leg.

Fault Protection: Heater disabled on RTD short or thermistor open. No heater protection; external fuse recommended.

Operating Ambient Temperature Range: -40 to 70°C (-40 to 158°F)

Relative Humidity: 0 to 95% non-condensing.

Physical: Polycarbonate case, epoxy-sealed. 1 oz. (28g).

Connections: Terminal block for wires AWG 22 to AWG 14.

Mounting: Mounting hole for #6 screw through or #8 thread-forming screw.

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