

## TCAT-2 Temperature Controller

- Controls heating blankets heat lamps or heating pad
- Can be used for both heating and cooling applications
- 110 to 230V AC line operation
- Control Range of -100 to +400°C
- Resolution 0.1°C



TCAT-2 Temperature Controller with RET-3 temperature probe and HL-1, Heat Lamp

Our new TCAT-2 family of general purpose PID Autotuning Controllers provides accurate temperature control in a variety of laboratory applications. Combined with a heat lamp or heating pad, the TCAT-2 may be used to maintain the body temperature of anesthetized animals during surgery or stereotaxic procedures. Small animal cages are easily warmed with a heat lamp. The TCAT-2 may also be used in cooling applications, such as to control independent perfusate cooling systems. Realizing that laboratory applications are diverse, Physitemp can provide several versions of the TCAT Controller. The model specified depends on whether a laboratory has a general or specific need for the controller:

**TCAT-2AC:** This version controls only AC powered heating or cooling devices such as a heat lamp. It is the least costly.

**TCAT-LV:** This model provides a low-voltage DC output for electrically sensitive applications where AC frequencies might interfere with other monitoring devices. It comes standard with a built in DC power supply designed to operate with our HP-1M Heating Plate for small rodents. The TCAT-2LV uti-

lizes a dual set point control circuit to prevent a heating element from overshooting the control point due to thermal lag in the control system. This is an important feature in preventing burns due to incorrect control settings or faulty feedback sensor. On a custom basis, we can provide a variety of DC power supplies depending on the load power requirements.

**TCAT-2DF:** This is a combination version which includes both an AC outlet for controlling primarily resistance loads such as heat lamps, AC powered warming blankets and a low-voltage, low-noise" DC output for heating pads. This version allows you to control a variety of different loads.

All TCAT-2 versions may be used with any of our extensive line of accurate Type T thermocouple probes, which act as the temperature feedback sensor. Most commonly used are the RET series of animal rectal probes, but the IT series of implantable flexible probes and MT series of needle probes may also be used depending on the specific application. All instruments are designed to operate on a 110V or 230V AC supply.

The unit comes in a durable baked enamel painted aluminum housing. Adjustable front feet allow the user to raise the front of controller to provide a more convenient viewing angle.

A heat/cool switch is provided when using the controller with cooling devices such as small refrigeration compressors or thermoelectric stages. In the cooling mode it inverts the control function and shuts off the load when feedback sensor temperature falls below the set point. A small lamp on the front of the control unit indicates when power is being applied to the load.

The TCAT-2 is simple to set-up; connect the feedback sensor to the animal and to the back of the controller, connect the heating pad, blanket, lamp or cooling device to the appropriate outlet on the rear of the controller. Adjust the set temperature as required (lower green display) according to the instruction label on top of the instrument. The set temperature is stored in memory after the unit is switched off.

(see over for accessories)

# ANIMAL TEMPERATURE CONTROL

## TCAT-2 ACCESSORIES

**Heat Lamp, HL-1:** Optional infrared heat lamp is table mounted with an adjustable swing arm providing for easy adjustment of radiant heat to specimen. The lamp is supplied with a 250W(infrared) heat lamp bulb and a built in reflector. A chrome bulb guard is also provided and easily snaps onto the lamp housing after the bulb is installed. Fits standard 110V AC socket.

### SPECIFICATIONS

<b>Model no.</b>	<b>HL-1-110, HL-1-220</b>
<b>Arm Length:</b>	2 spring loaded arms each 18" lengths
<b>Table Clamp:</b>	Standard "U" screw clamp expands to fit bench up to 2.25" deep
<b>Weight:</b>	2 lbs.
<b>Power:</b>	110VAC or 220VAC
<b>Bulb:</b>	250 watt infrared heat lamp

**Heating Plate, HP-1M, HP-4M:** Optional direct current heating plate for small rodents(mice and rats). Standard plates are black anodized aluminum and the HP-1M measures 4 3/8"W x 8.5"L and the HP-4M measures 1 1/2"W x 4"L. Both models have small feet attached giving them an elevation of 1/4" above the surface it sits on, such as a table or stereotaxic stage. They are easily cleaned with alcohol. They are provided with a feedback sensor to prevent overheating when used with our TCAT-2 series of controllers. Custom sizes are also available with longer lead times.

### SPECIFICATIONS

<b>Dimensions HP-1M:</b>	4 3/8" W x 1/4" H x 8.5"L
<b>Dimensions HP-4M:</b>	1.5" W x 1/4" H x 4"L
<b>Weight:</b>	.5 lbs.
<b>Power:</b>	25 watts
<b>Over Temperature Protection:</b>	100 Ohm RTD

## TCAT-2 CONTROLLER SPECIFICATIONS

<b>Accuracy:</b>	± 0.5°C
<b>Resolution:</b>	±0.1°C
<b>Range:</b>	Ambient +2° to 42°C for HP-1M, HP-4M, WB-1 & WB-2 maximum range of controller -100 to +400°C
<b>Readout:</b>	Dual display of Set(green) and Run(red) temperatures
<b>Max AC Power Output with resistive load:</b>	TCAT-2DF and TCAT-2AC: 700 watts (Does not apply to TCAT-2LV)
<b>DC Output Rating:</b>	TCAT-2DF and TCAT-2LV: 12V DC, 2 Amps Max. Custom output voltages available upon request (Does not apply to TCAT-2AC)
<b>AC ground leakage current:</b>	less than 1 millamp at 110 V AC
<b>Dual Setpoint Protection Feature:</b>	TCAT-2DF and TCAT-2LV only additional heating pad feedback sensor prevents temperature exceeding 42°C.
<b>Dimensions:</b>	7 1/4" W x 4 3/8" H x 10" D
<b>Weight:</b>	Less than 5 lbs.
<b>Power Supply:</b>	110V or 220 V AC

**Warming Blanket, WB-1, WB-2:** Physitemp now offers two sizes of flexible blankets for use with the TCAT-2LV and TCAT-2DF controllers. These blankets use far infrared radiation to penetrate deep into the body. The smaller blanket 8" x 6" is suitable for mice and small rats. The larger blanket 14" x 14" is suitable for adult rats and guinea pigs.

Both blankets feature overtemperature protection which prevents the blanket temperature from exceeding 42°C in the event that the primary feedback sensor becomes disconnected. Please note that the blanket must be supplied with the controller to match the overtemperature unit setting.

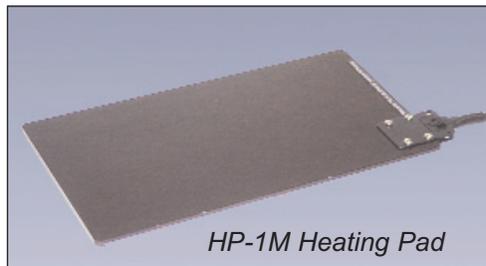


TCAT-2LV with WB-1 animal warming blanket

### SPECIFICATION

Model no.	WB-1	WB-2
<b>Dimensions:</b>	8" x 6"	14" x 14"
<b>Power:</b>	9.5 V @ 1.5 amps	
<b>Over Temperature Protection:</b>	100 Ohm RTD	
<b>Lead Length:</b>	3 feet	
<b>Material:</b>	Antibacterial Washable Surface	

See pages 4-7 in the Physitemp catalog for detailed information on our wide range of Type T thermocouple probes. For ordering information, see p. 34.



HP-1M Heating Pad

