

# BRAUDE

Heating and Cooling Systems for Corrosive Solutions

## **THERMASTER THERMOSTATIC CONTROLLER to IP65 fitted with a PRTD sensor for accurate automatic control of corrosive solutions.**

### **INSTALLATION INSTRUCTIONS**

We strongly recommend that installation is carried out by a qualified electrician. This controller is manufactured from top quality non-corrodable materials and should give trouble free service provided it is installed, operated and maintained properly.

#### **Warning—This controller operates on Mains Voltage**

- Always disconnect supply before removing cover or attempting connections.
- The output lead (marked with a red warning label and fitted with a protective cap) becomes live once the mains supply lead is connected. **Always connect output lead first.**
- The output relay of the controller is rated at 5 amps, however, it is recommended that any heater should be connected through a contactor as shown in Figs 2 and 3.
- The mains supply must be fused with the correct size circuit breaker or fast blow fuse for the load.

#### **Note: Failure to connect the Earth may result in a serious safety hazard.**

- The casing of the Thermaster is manufactured to IP65 standard. If the cover is removed ensure that the gasket is firmly seated in the locating groove before replacing the cover and tightening the retaining screws.

#### **Installation**

##### 1. Mounting

Remove the clear plastic cover by undoing the 4 plastic screws at the corners. The controller should be fixed to a suitable surface within reach of the probe lead using suitable screws through the 4 fixing holes in the corner pillars.

##### 2. Electrical Connection

The controller is fitted with flying leads for easy connection. The output lead is marked with a red warning label and is fitted with a protective cap. The other lead is the mains supply.

- 2.1 Power Supplies The controller is supplied for 240V power supply as standard (unless otherwise specified) however, it can be adjusted simply for 110V operation as follows:

- a. Remove the transparent cover as above and then remove the faceplate by undoing the 4 screws.
- b. Remove the top pcb by unscrewing the 4 screws and taking care not to damage the connecting wiring underneath.
- c. Locate the red jumpers (J11) on the top left hand corner of the bottom board. (see fig 1)
- d. Both jumpers should be moved to select the desired voltage. ie Place them across pins 1 and 2 for 115V and 2 and 3 for 230V.

NB Both jumpers must be moved otherwise the pcb will be damaged.

2.2 Relay Operation Your Thermaster is fitted with a relay that will give a live voltage output as standard unless otherwise specified

The controller may have been supplied with a volt free relay if requested at placement of order, and this should be clearly marked on the controller. However, if this is not the case and a volt free relay is required please contact Braude on 01252 876123 for advice.

Once the set up is complete reassemble the controller and replace the cover, ensure the lid is correctly seated and the 4 retaining screws are firmly tightened.

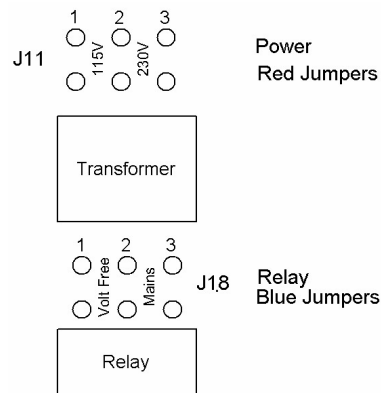


Fig 1: Schematic showing relay positions on the bottom board.

### 2.3 Wiring Connection

a. For application where no other controllers (such as level controllers) are connected, connect as in fig 2.

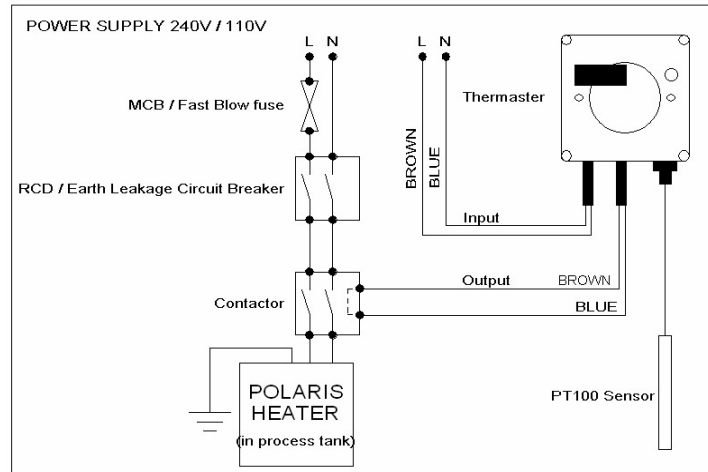


Fig 2 : Wiring diagram for Thermaster connected to Polaris heater

b. For applications involving the use of another controller, such as level or timer connect as in fig. 3. One of the controllers must have a volt free relay.

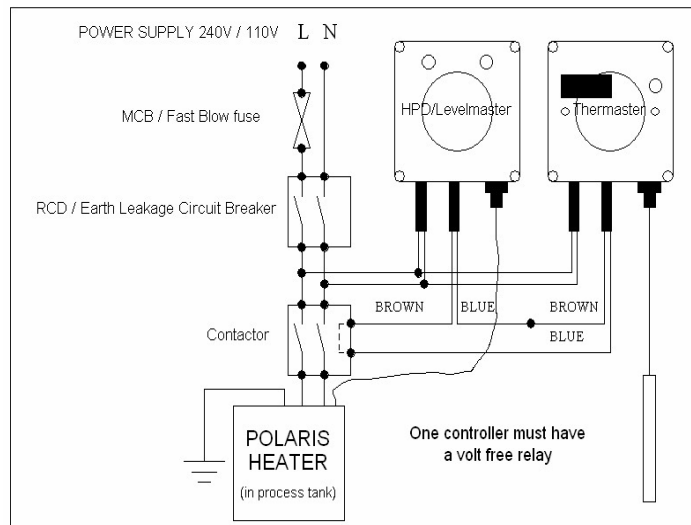


Fig. 3: Thermaster controller connected to level controller



## CALIBRATION

Note: Thermaster controllers are calibrated for use with standard probes with 2M leads. The use of probes with longer leads may necessitate recalibration of the controller against a known temperature.

- 1) If the unit is to be calibrated in situ, ensure that mains supply is connected.
- 2) If the unit is to be bench calibrated connect the mains supply ensuring that output lead is safely insulated. (See installation instructions supplied with the unit).

### Resistance Method

- 3) Unplug the probe.
- 4) Undo screws and remove transparent front cover from the controller.
- 5) Apply 100 ohm resistor across the probe socket. Temperature display should read zero. If not, set to zero using zero adjust screw slot on the front panel).

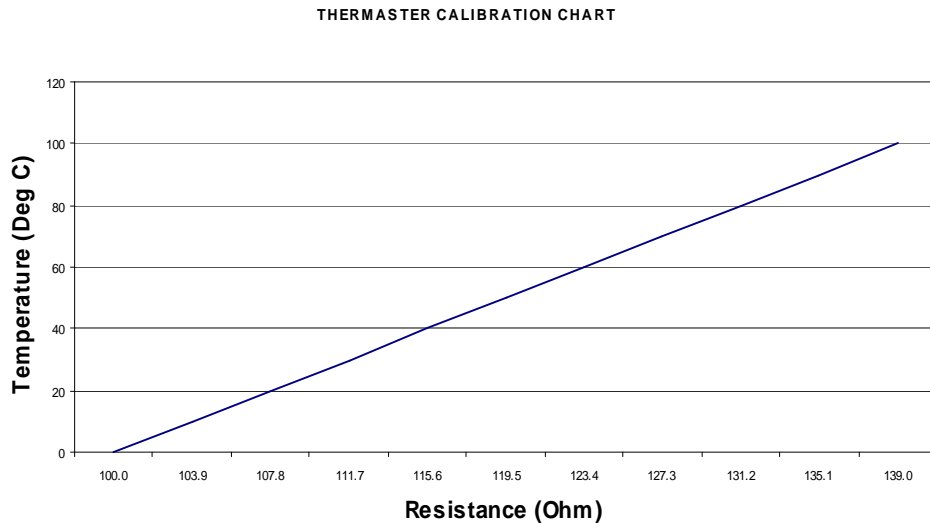


Fig 4 Variation of resistance against temperature

Temperature (°C)	0	10	20	30	40	50	60	70	80	90	100
Resistance (ohms)	100.0	103.9	107.8	111.7	115.6	119.5	123.4	127.3	131.2	135.1	139.0

Table 1: Resistance values for PT100 sensor

Please note that these are the resistance values for the PT100 sensor and a correction will need to be made for the connecting wire.

- 6) Replace 100 ohm resistor with suitable resistance from the table below (e.g. 124 ohm = +62°C) and check display. If incorrect, use range adjust screw on the front panel to set display to read correct temperature.
- 7) With no resistor in position display should flash +188.
- 8) Replace transparent cover.

Immersion Method Against Known Temperature.

1. Place the probe and a thermometer in a container of ice and water and allow to settle to temperature as near to zero as possible.
2. Adjust the Thermaster display to read the same as the thermometer using the zero adjust screw.
3. Place the thermometer and the sensor in a second container with water at an elevated temperature of say 70<sup>0</sup>C and allow to settle.
4. Adjust the display temperature to read the same as the thermometer using the range adjust screw.
5. Repeat the above procedure until satisfied the display is stable. The unit is now calibrated.

NB The above procedures are recommendations and do not constitute part of a certifiable test. It is recommended that you contact a standard testing centre if certification is required.

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