

**CHECKOUT PROCEDURE**

Before leaving the installation, a complete operating cycle should be observed to ensure that all components are functioning properly. Check for correct operation in the following sequence:

1. Check to make certain the immersion controller has been installed and adjusted correctly. Put the heating system into operation and watch the action of the device through several cycles to be sure it controls the system as described under OPERATION. Make further adjustments to meet requirements as necessary.

If the device includes manual reset (model TP529), adjust the limit setting low enough so that temperature reaches the high limit setting. When the limit setting is reached, the immersion controller locks out and the burner shuts down. When temperature falls to the high limit setting, minus differential, push the manual reset button and the system should again be operative. Reset control to proper high limit setting.

**Operation**

For proper immersion controller selection, follow the heater manufacturer's recommendations:

1. High Limit Controller (TP527, TP528, TP529) - shuts off burner if temperature exceeds high limit setting. Burner resets when temperature falls to differential temperature, or is manually reset using TP529.
2. Low Limit Controller (TP527, TP528) - maintains minimum temperature for domestic hot water. Turns on burner at temperature setting, minus differential.
3. Circulator Controller (TP527, TP528) - Prevents circulation of water that is not hot enough. Opens the circulator circuit at temperature setting, minus differential, closes the circuit at temperature setting.

**NOTE:** No Replacement parts available. Do not attempt any field repair.

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**Operating Instructions**

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

# Tempro™ Immersion Controllers

**Description**

These immersion controllers are designed for reliable use for limiting or regulating the temperature of liquids in heater, storage tanks, and other applications where temperature control is necessary. A variety of models offer a broad temperature range between 65°F and 240°F (20°C and 115°C) allowing for a wide range of limiting or regulating temperature applications.

All models have a NEMA 1X rated steel enclosure and must be mounted in a dry environment where they will not be exposed to rain or water spray.

Model numbers and electrical ratings are found on the rating plate attached to the immersion controller.

Tempro Products is committed to significantly reducing and diverting waste. We encourage owners of our controls to responsibly recycle their equipment when it is no longer needed.

See the full range of Tempro Products @ <https://www.tempro-products.com>.

**General Safety Information**

**⚠ WARNING** Disconnect all power before installing or servicing this product. If the power disconnect is out of view, lock it in the open position and tag it to prevent unexpected restarting of power. Failure to do so could result in fatal electric shock.

1. Special attention must be given to any grounding information on this product and to other equipment associated with its installation and use. To ensure a proper ground, the grounding means must be checked by a qualified electrician.
2. Be certain that the electrical ratings of the thermostat conform to the power source and the load(s) being controlled. Loads that exceed the rating of the thermostat should be handled with a suitable rated relay or motor starter.

**⚠ WARNING** Do not depend upon the thermostat as the sole means of disconnecting power when installing or servicing the product it is controlling. Always disconnect power at the main circuit breaker as described above. Failure to do so could result in fatal electric shock.

3. This thermostat is intended ONLY for permanent installation in accordance with the United States National Electrical Code (NEC), all applicable local codes and ordinances, and all sections of this manual. All wiring should be done by a qualified electrician, using copper wire only.

**⚠ WARNING** These immersion controllers are intended for limiting or regulating temperatures. They must NOT be used in potentially dangerous locations such as flammable, explosive, chemical laden areas or in wet atmospheres.

**⚠ WARNING** These thermostats are designed for use as operating controls only. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (supervisory alarm systems) that protect against, or warn of control failure.

**Installation****LOCATION**

The heater manufacturer generally provides a tapping for insertion of the immersion controllers sensing element. This tapping is located in a representative point where typical heater water temperature can be measured. Depending on model, the element is either inserted in an immersion well or through a bulb compression fitting.

**MOUNTING – IMMERSION CONTROLLER & BULB**

The immersion well of the immersion controller must always be exposed to average temperature circulating water, and must never be located close to a hot or cold inlet or steam coil. Where the tapping is on the side of the tank unit, mount the immersion controller horizontally. If the tapping is on top of the unit, mount the immersion controller vertically.

The sensing bulb should fit tightly to the immersion well for good thermal response. The bulb should be inserted until it rests against the bottom of the well, and then hold it there while tightening the tubing clamp.

**⚠ CAUTION** Do not dent or deform the sensor coil of this control. A dent or deformation will change the calibration and cause the control to cycle at a temperature lower than the knob setting.

**Installation (Continued)**

**IMMERSION CONTROLLER INSTALLATION (TP527, TP528)**

Models TP527 (surface mount), TP528 (immersion well) make or break the circuit (SPDT) on temperature rise to the control setting. They can be used as a circulator controller, delaying circulator operation if heater water temperature is below the control setting. They can also be used for high limit or low limit control. When used as a controller or as a low limit, a separate high limit must be used.

**MANUAL RESET IMMERSION CONTROLLER (TP529)**

Model TP529 (remote sensor) includes a manual reset switch where the user must interfere before the controller can return to normal function. Whenever the temperature of the environment reaches the high limit setting, this controller's circuit breaks. A reset button at the top of the case must be pressed to re-establish the control circuit.

If the device includes manual reset (model TP529), be sure to press the red reset button on the top of the case to make sure that the controller is not locked out on safety.

**When replacing your immersion controller:**

1. Shut off the power.
2. If the system is filled, drain system to a point below the heater tapping.
3. Remove the old immersion controller.
4. Install the immersion well or sensing bulb into the existing immersion well.
  - \*\*Depending on size of heater tapping, a reducer fitting may be required.
5. Fill the system. Make sure that the well is screwed in tightly enough to prevent leakage. Do NOT use the controller as a handle to tighten well after controller is secured to well.

**WIRING**

**IMPORTANT:** All wiring should be done in accordance with applicable codes, ordinances and regulations. Use a disconnect device and overload protection to assure safe installation complying with local and national codes. Figures 1-6 illustrate typical wiring for control of heating systems (use copper conductors only).

**ADJUSTING**

Adjust the control point to correspond with the heater manufacturer's recommendations. To adjust insert a screwdriver in the slotted screw type head located beneath the window in the cover. Turn the scale to the desired control point.

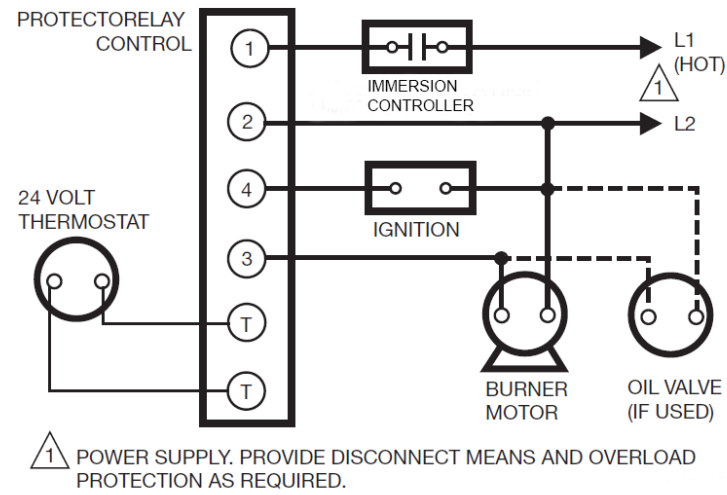


Figure 1 – Connection for a Typical oil-fired gravity system using TP527 or TP528 as a high limit.

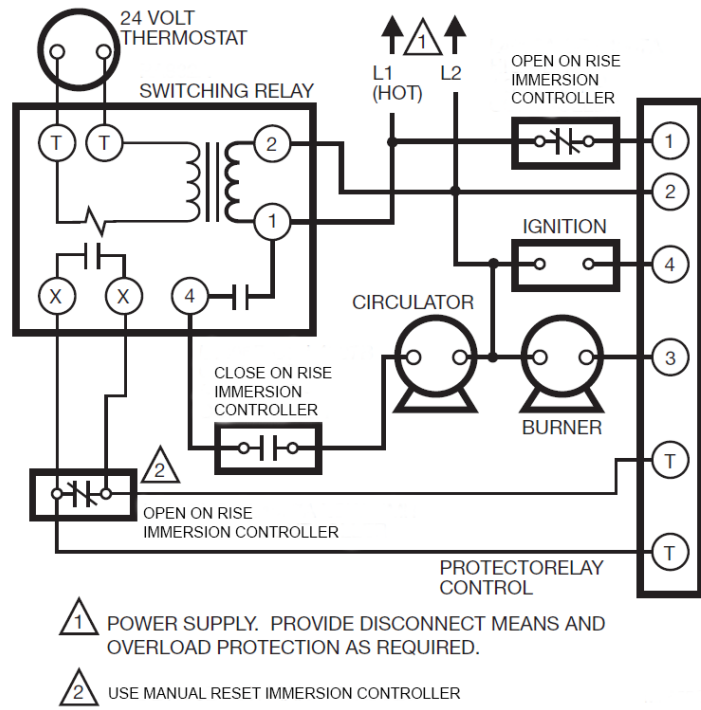
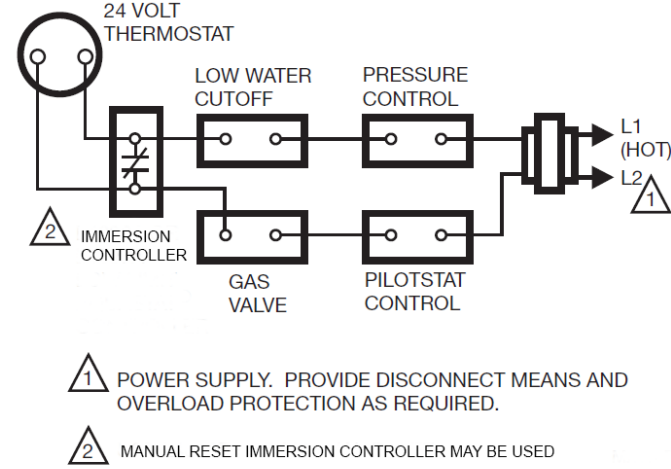


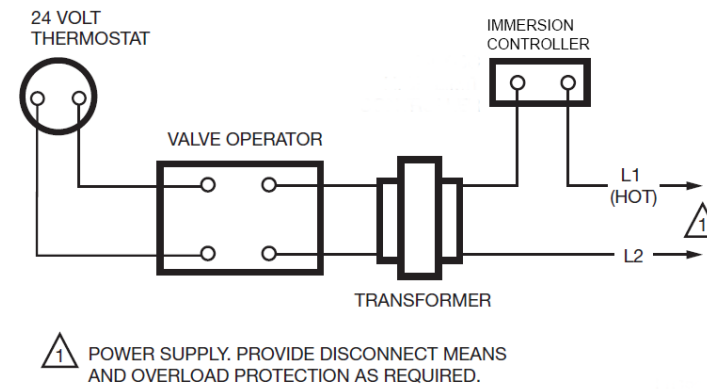
Figure 2 – Connection for a Typical oil-fired gravity system or hydronic system with domestic hot water using TP527 or TP528.

**Installation (Continued)**



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 MANUAL RESET IMMERSION CONTROLLER MAY BE USED

Figure 3 – Wiring diagram for gas-fire system with domestic hot water using TP527, TP528, and TP529.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

Figure 4 – Wiring diagram for 24-Volt gas system using TP527 or TP528 immersion controller.

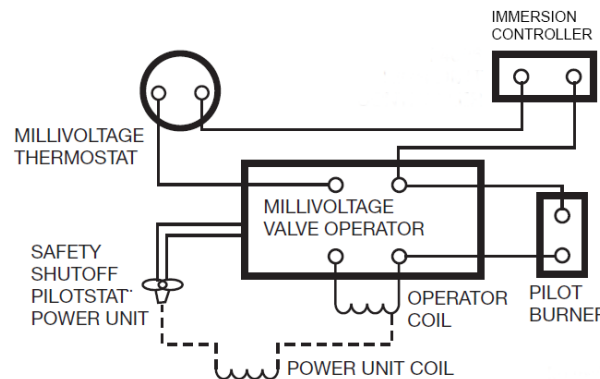
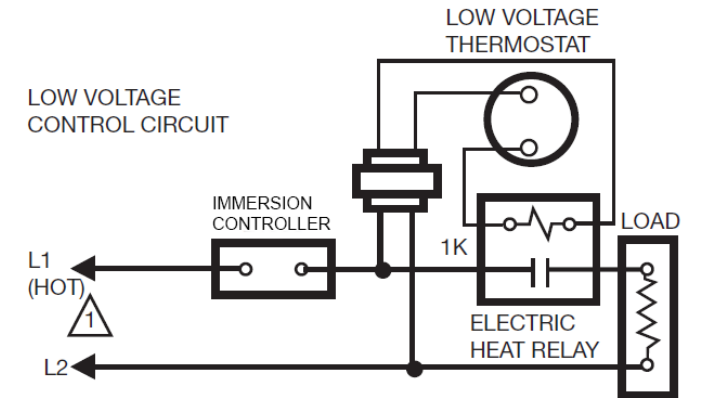
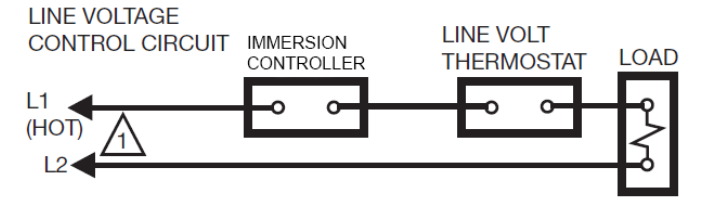


Figure 5 – Wiring diagram for Powerpile system using TP527 or TP528 immersion controller.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

Figure 6 – Wiring diagram for 120-Volt electrical heat primaries using TP527 or TP528 immersion controller.