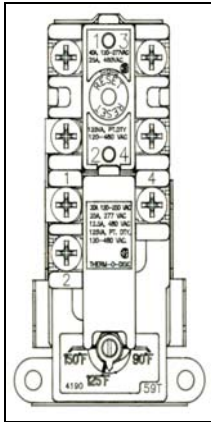




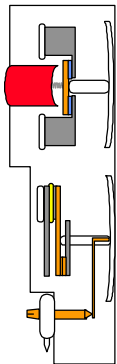
How An Electric Thermostat Works



A thermostat is a mechanical device that controls the flow of electrical current to various parts of the water heater. First, the thermostat senses the presence of heat. Second, by sensing the presence of heat, the thermostat can control electrical current that is sent to another thermostat or to a heating element. A water heater may contain one or two thermostats, called upper and lower thermostats. In this configuration, each thermostat controls one heating element.

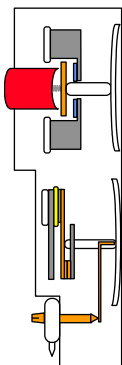
A residential electric water heater may operate in a simultaneous or non-simultaneous mode. Simultaneous means that both heating elements, the upper and the lower, can heat at the same time. This is useful when there is a requirement for a rapid recovery time. Non-simultaneous operations means that only one of the heating elements, either the upper OR the lower, may heat at a time.

Upper Thermostat



Normal Operation shows the red Energy Cut Off (ECO) is not tripped. Contacts below the RESET button allow current to pass from terminals 1 and 3 to terminals 2 and 4.

Abnormal operations shows the ECO is tripped. Excessive heat from the inner tank wall has caused the metal plate to expand. This causes the plate to invert from a convex to concave - pushing the pin out and tripping the ECO. Contacts below the red RESET button do not allow current to pass from terminals 1 and 3 to terminals 2 and 4.



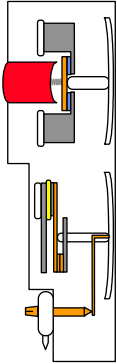
Press the red RESET button; you will hear a metallic 'click'. The ECO is now reset and ready for normal operations.

If the ECO trips frequently it is an indication of additional problems. Call your water heater professional.

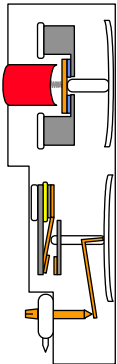


How An Electric Thermostat Works

The ECO functioning and allowing current to pass....

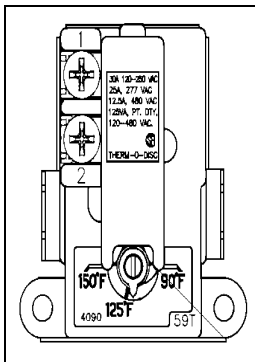


With a demand for heat from the upper thermostat, the contacts at terminal positions 1 and 2 on the lower half of the thermostat are closed. This relays power from terminal 2 through the yellow wire to the upper heating element.



When the demand for heat is satisfied, the contacts at terminal positions 1 and 2 on the lower half of the thermostat are open. Heat from the inner tank wall has caused the metal plate to invert from convex to concave - pushing the pin out. This closes the contacts between terminals 1 and 4 on the lower half of the thermostat and relays power through the black wire to the lower thermostat.

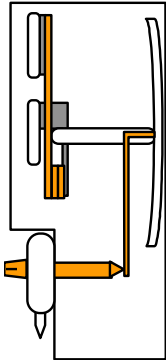
Lower Thermostat



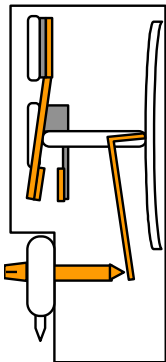
The lower thermostat performs the same basic function as the upper thermostat. It controls the flow of electricity to the lower heating element. When the water in the lower portion of the water heater becomes hot, the thermostat will open and stop the flow of electricity to the heating element. When the water cools to a temperature below the thermostat setting, the contacts close allowing electricity to flow to the heating elements.



How An Electric Thermostat Works



The lower thermostat calls for heat. The contacts are closed relaying power from terminal 1 through terminal 2 to the lower heating element.

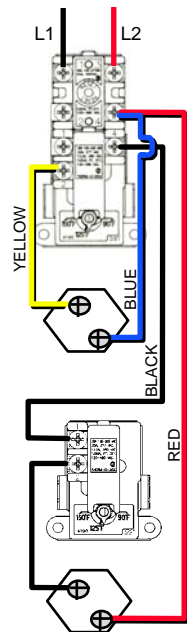


The lower thermostat is satisfied. Heat from the inner tank wall has caused the metal plate to invert from convex to concave - pushing the pin out. The contacts are open suspending power through the terminals to the heating elements.

The water inside the water heater is now hot.

Thermostat and Heating Element Arrangement

This is a typical arrangement for a dual element non-simultaneous operation water heater. (Check your specific water heater and the Use and Care Manual for the proper wiring diagram.)



Energy cut off (ECO)

Upper thermostat

Upper heating element

Lower thermostat

Lower heating element