ENERGY SMART®
TROUBLESHOOTING GUIDE

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NO HOT WATER

Flash Code:
1 Flash, go to page 4.
2 Flashes, go to page 5.
3 Flashes, go to page 6.
4 Flashes, go to page 7.
5 Flashes, go to page 8.
6 Flashes, go to page 9.
Continuous flash and clicking sound, go to page 9.

Is the green light flashing? NO
Is the green light on? NO
Is the green light on? YES
Remove the control box cover and check the voltage from the red and black wires on top of relays. See Figure 1A & 1B.

Ensure temperature control is set to a temperature above 115 °F. Ensure operating mode is in EnergySmart mode or Smart Mode. Allow heater time to recover from heavy hot water use or change in operating mode.

Supply voltage incorrect. Replace control board.

Check supply voltage at circuit breaker or fuse box.

FIGURE 1A - TOD BOARD

FIGURE 1B - UTEC BOARD
UNIT OK.

1 FLASH (GREEN DIAGNOSTIC LIGHT)

Indicates power has been applied to the heater prior to filling with water.

Open the nearest hot water faucet, and fill the water heater until a steady stream of water flows out of the faucet. Once the water heater is completely filled, then shut-off the faucet.

Reset the heater. UTEC boards, turn the power off then back on. TOD boards, press the reset button on the control box. Wait 10 minutes. Is the green diagnostic light still flashing 1 time?

Repeat this process 3 times. Is this the 3rd try?

YES
Replace control board.

NO

Unit OK.

YES

Replace control board.

NO
2 FLASH (GREEN DIAGNOSTIC LIGHT)

The water heater has reacted to an indicated high water temperature and shut down.

Turn off power to the heater, and remove the control box cover. See page 2. Using an ohm meter, check resistance between the blue and yellow wire connections (top element) and the orange and blue wire connections (lower element). Are readings between 5-25 ohms?

Replace the defective element(s).

Check position of wires on board. TOD- (left to right): black, orange, yellow, blue, & red. See page 2. UTEC- (left to right): yellow, orange, red, black, & blue. See page 2. Are the wires in the correct order?

YES

Replace thermistors.

Remove the thermistor plug from the control board. Using an ohm meter measure resistance between the red wires in the thermistor plug, then measure the resistance between the two black wires in the plug. See figure 2. Measure the water temperature at a nearby hot water faucet. Using the chart on page 10, compare the measured resistance values with the measured temperature value. Are they within range according to the chart?

TOD- (left to right): black, orange, yellow, blue, & red. See page 2.

UTEC- (left to right): yellow, orange, red, black, & blue. See page 2.

YES

YES

Replace control board.

Correct wiring order and replace control cover. Turn the power back on.

FIGURE 2 - MEASURING THERMISTORS
Indicates thermostors are not operating properly.

Turn off power to the heater, and remove the control box cover. See page 2. Ensure thermistor plug is seated tightly and correctly oriented.

Correct orientation of the thermistor plug and replace control cover. See page 2. Restore power. Still flashing 3 times?

Are the thermistor wires damaged or shorted to the tank?

Remove the thermistor plug from the control board. Using an ohm meter measure resistance between the red wires in the thermistor plug, then measure the resistance between the two black wires in the plug. See figure 3. Measure the water temperature at a nearby hot water faucet. Using the chart on page 10, compare the measured resistance values with the measured temperature value. Are they within range according to the chart?

Replace the control board.

Unit ok.
4 FLASH (GREEN DIAGNOSTIC LIGHT)

The control board is sensing the upper element is bad.

Turn off power to the water heater and remove the control box cover. See page 2. Inspect the yellow and blue wires connected to the relays. Do they appear to be damaged?

Using an ohm meter measure resistance between the yellow and blue wires connected to the relays. Is the resistance 5 - 25 ohms?

With power turned off to the heater replace the upper element. Re-attach the control box cover, and restore power to the water heater.

Replace the control board. The board replacement kit includes replacement yellow and blue wires with new connectors. See Figure 4.

Is the heater connected to a recirculating or heating system?

Check for hidden leaks in hot water system, possibly under a slab floor. Is there a leak?

Repair leak and reset heater.

Is the heater connected to a recirculating or heating system?

FIGURE 4

CONTROL BOARD REPLACEMENT KIT CONTENTS

Electronic Control Board with Red and Black Wires Attached

Yellow (Y)

Orange (OR)

Blue (BL)

3 Replacement Wires

3 Wire Nuts
The control board is sensing the lower element is bad.

Turn off power to the water heater and remove the control box cover. See page 2. Inspect the orange and blue wires connected to the relays. Do they appear to be damaged?

NO

Using an ohm meter measure resistance between the orange and blue wires connected to the relays. Is the resistance 5 - 25 ohms?

NO

With power turned off to the heater replace the lower element. Re-attach the control box cover, and restore power to the water heater.

YES

Replace the control board. The board replacement kit includes replacement orange and blue wires with new connectors. See Figure 5.

NO

Is the heater connected to a recirculating or heating system?

NO

Check for hidden leaks in hot water system, possibly under a slab floor. Is there a leak?

YES

Repair leak and reset heater.

YES

Disconnect the water heater from the system.

FIGURE 5

CONTROL BOARD REPLACEMENT KIT CONTENTS

Electronic Control Board with Red and Black Wires Attached

Yellow (Y)

Orange (OR)

Blue (BL)

3 Replacement Wires

3 Wire Nuts
The water heater has locked out due to a malfunction in the control board.

Reset the unit by turning off power and waiting 10 minutes. Is the green light still flashing 6 times?

The water heater should be ok. However, if the 6 flash lock-out should occur again, replace the control board.

Green light continuously clicking and flashing?

Replace the control board.
## THERMISTOR RESISTANCE CHART

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<tr>
<th>WATER TEMPERATURE</th>
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<tr>
<td>80° F - 100° F</td>
<td>50KΩ - 20KΩ</td>
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<tr>
<td>100° F - 120° F</td>
<td>40KΩ - 15KΩ</td>
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<tr>
<td>120° F - 150° F</td>
<td>30KΩ - 5KΩ</td>
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**USING THE CHART:**
Make sure power to the heater has been turned off before performing the following steps. Remove the control box cover and unplug the thermistor plug from the control board. See page 2. Using an ohm meter measure the resistance value between the two red wires in the thermistor plug, then measure the resistance value between the two black wires in the plug. See Fig 6. Record the water temperature at a nearby hot water faucet. Using the recorded resistance values check to see if the heater is in the correct range. For example: In Fig. 6 the measured temperature is 129° F. Using the chart above a temperature reading of 129° F should have a resistance reading between 15KΩ - 10KΩ.