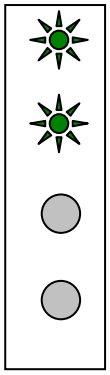
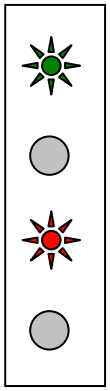
E-TES SD 240 Volt TROUBLESHOOTING

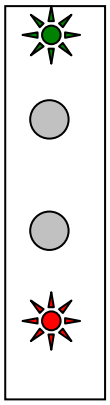
Indicates Light is ON

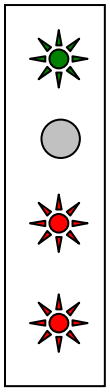
Indicates Light is OFF

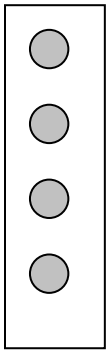
Light Configurations:

#1  Page 2

#2  Page 4

#3  Page 6

#4  Page 8

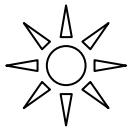
#5  Page 9

You can get a configuration with only the top light (POWER) ON, but if this happens, you should have a Shutdown message on the display.

All other configurations indicate a problem with the circuit board. Contact Bridgepoint for assistance

Wiring diagrams on Pages 11 - 13

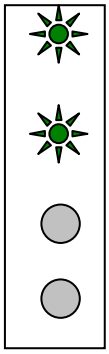
E-TES SD 120Volt TROUBLESHOOTING



Indicates Light is ON

Indicates Light is OFF

LIGHT CONFIGURATION #1



POWER

HEATING

AIR FLOW

OVERTEMP

Step # 1

Usually, when the two green lights are ON and two red lights are OFF, as shown above, the heater is operating normally and the heating elements are receiving power. If you suspect that the heater is not heating properly even with only the two green lights on, use a clamp-on amp meter to measure the amp draw of the E-TES SD 240Volt unit.

(The actual amp draw will vary with the voltage available and the temperature of the heating elements.)

- If the amp draw is approximately 25 – 20amps the unit is working OK - Exit.
- If the amp draw is approximately 19-5amps, power is getting to the heating elements and at least one element is working, but one or more of the heating elements are disconnected or defective - Go to Step #2.
- If the amp draw is approximately 2-0amps all four heating element are disconnected or defective - Go to Step #3

Step # 2

Remove the heating elements and check the wiring which connects the four elements to assure that there is continuity between the three elements. Check each of the power terminals to be sure there is no continuity to ground. Replace any heating element that has a terminal shorted to ground. Re-install the heating elements into the E-TES SD 240 and test unit.

- If the amp draw is approximately 25 – 20amps the unit is working OK - Exit.
- If the amp draw is approximately 19-5amps continue with testing. Check the resistance between the two terminals on each individual heating element. Resistance should be 36 - 37 ohms. Replace any heating elements with resistance readings outside this range. Reconnect heating elements and check to assure that you have continuity between the inside terminals on all four heating elements. Then check to be sure there is continuity between the outside terminals on all four heating elements. Then check the resistance of the inside & outside terminals it should read approximately 9 ohms. If the resistance reads 12 ohms only three heating elements are connected. If the resistance reads 18 ohms only two elements are connected.

  Repair wires as needed to assure that all elements are connected properly and reinstall the elements into the E-TES 240 and test the unit.

  - If the amp draw is approximately 25 – 20amps the unit is working OK.
  - If the amp draw is approximately 19-5amps return to Step #1 and check everything again or check your incoming voltage. Amperage may read lower if the voltage is less than 208volts. Check voltage at source and at GFCI cord plug where it connects to the E-TES unit. Repair cord, repair voltage source or find new source as needed to deliver 240-208 volts and repeat testing.

Step # 3

With the power cord connected to the E-TES SD 240Volt unit and the air mover ON, turn the switch to the ON position.

Check the indicator lights.

- If only the Power light & Heating light are ON – Proceed to Step #4.
- If only the Power light is ON – Contact Bridgepoint to replace the circuit board.
- If only the Power light & Air Flow light are ON – Go to Light Configuration #2
- If only the Power light & Overtemp light are ON – Go to Light Configuration #3
- If the Power light, Air Flow light & Overtemp light are ON – Go to Light Configuration #4
- If all of the four indicator lights are ON – Contact Bridgepoint to replace the circuit board.
- If none of the four indicator lights are ON – Go to Light Configuration # 5

Step # 4

Check the voltage between terminal # E10 of the Circuit Board where the red striped wire to the heating elements is connected and terminal # E8 of the Circuit Board where the black striped wire to the heating elements is connected.

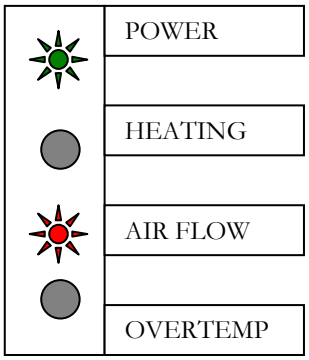
- Voltage found – Repair wires as needed to restore power to the heating elements and proceed to Step #5.
- No voltage found – With both power cords connected to the E-TES SD 240Volt unit, the air mover on and the E-TES SD power switch on, since the Power light is ON & the Dual Circuit indicator light is on, there must be power coming in to the circuit board. Contact Bridgepoint to replace the Circuit Board.

Step # 5

Now that you know that power is being supplied to the heating elements, retest the amp draw of the power cord. (The actual amp draw will vary with the voltage available and the temperature of the heating elements.)

- If the amp draw of the cord is approximately 25-20amps the unit is working OK - Exit.
- If the amp draw of either cord is approximately 19-5amps, power from that cord is getting to the heating elements and one element is working, but the other heating element is disconnected or defective - Go to Step #2.
- If the amp draw of either cord is approximately 1-0amps both heating elements on that cord are defective – Replace both heating elements and return to Step #1.

LIGHT CONFIGURATION #2



Step # 1

Usually, when the green Power light is ON and the red Air Flow light is ON, as shown above, the heater is operating normally except the air flow has been shutoff or has dropped below the minimum level needed to activate the air flow sensor and since the Heating light is OFF the heating elements are no longer receiving power.

Make sure air mover snout is directed at a 45˚ downward angle pointing toward the E-TES snout. Place furniture blocks on top of the E-TES box to hold the air mover at the correct angle if needed. If the air mover is properly directed, turned ON and the E-TES snout is not restricted, there may be a problem with the air flow sensor. First try recalibrating the air flow sensor. With the power cords connected to the E-TES, turn the power switch ON. When the display moves to the main screen, use the UP or DOWN button to scroll through the menu to the Air Flow Setup screen. Press SELECT, to enter Air Flow Setup. Turn the air mover OFF. When the air mover fan has stopped turning, press DOWN. This will set the Fan Off resistance reading. The Fan OFF reading should be in the range of 12 – 40.

- If the Fan Off reading is in this range – Continue with testing.
- If the Fan Off reading is outside this range – Replace the air flow sensor and return to Step #1.

Next, turn the air mover on LOW speed. As the fan speed increases the numbers displayed on the right side of the screen will start to increase.

- If the numbers do not increase – Go to Step #2.
- If the numbers increase – How does the number compare to the Fan Off reading?
    - If the number does not increase over the Fan Off reading by more than 20 – Replace the air flow sensor and return to Step #1.
    - If the number increases over the Fan Off reading by more than 20 – How high does the number go?
        - If the number is less than 150 – Continue with testing.
        - If the number is over 150 – Replace the air flow sensor and return to Step #1.

When the fan is up to speed, the numbers should stop increasing. Press DOWN, the E-TES SD will then set a trigger point between the sensor reading when the fan was off and the reading when the fan was on to set the trigger point at which the fan will turn on & off. Press SELECT, to exit Air Flow Setup and enter the trigger point.

Now with the air mover running, check the indicator lights.

- If only the Power light & Air Flow light are ON – Go to Step #2
- If only the Power light & Heating light are ON – Go to light Configuration #1.
- If only the Power light is ON – Contact Bridgepoint to replace circuit board.
- If only the Power light & Overtemp light are ON – Go to Light Configuration #3
- If the Power light, Air Flow light & Overtemp light are ON – Go to Light Configuration #4
- If none of the four indicator lights are ON – Go to Light Configuration # 5
- If all of the four indicator lights are ON – Contact Bridgepoint to replace the circuit board.

Step # 2

Remove the back cover to get inside the E-TES box. Remove the cover from the back of the control panel. The small red connector from the air flow sensor wires should be connected to the small white three pin connector on the lower left corner of the circuit board. The connector should be aligned so the black wire connects to the middle pin and the red wire to the pin on the left. The pin on the right does not have a wire connected to it.

- If the wires are disconnected or connected wrong - Reconnect the wires to the Circuit Board and continue with testing.
- If the wires are connected correctly – Continue with testing.

Set the rear cover back in place (Do not insert screws), put an air mover in place and turn air mover ON. Reconnect power cords and turn power switch ON to retest the E-TES operation.

- If only the Power light & Heating light are ON – Go to light Configuration #1.
- If only the Power light & Air Flow light are ON – Continue with testing.

With the back cover and air mover in place and turn air mover ON. Reconnect power cords and turn power switch ON. When the display moves to the main screen, use the UP or DOWN button to scroll through the menu to the Air Flow Setup screen. Press SELECT, to enter Air Flow Setup. Turn the air mover OFF. When the air mover fan has stopped turning, press DOWN. This will set the Fan Off resistance reading. The Fan OFF reading should be in the range of 12 – 40.

- If the Fan Off reading is in this range – Continue with testing.
- If the Fan Off reading is outside this range –
    - If you have already replaced the Air Flow sensor - Contact Bridgepoint to replace the circuit Board.
    - If you have not yet replaced the Air Flow sensor – Replace the Air Flow sensor and retest.
        - If the reading is still outside the range – Contact Bridgepoint to replace the circuit board.
        - If the reading is in the normal range – Continue with testing.

Next, turn the air mover on LOW speed. As the fan speed increases the numbers displayed on the right side of the screen will start to increase.

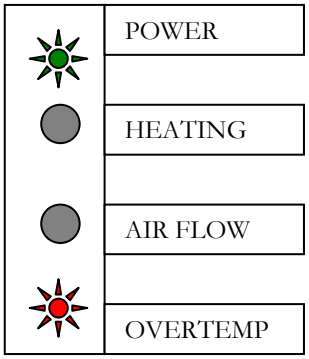
- If the numbers do not increase –
    - If you have already replaced the Air Flow sensor - Contact Bridgepoint to replace the circuit Board.
    - If you have not yet replaced the Air Flow sensor – Replace the Air Flow sensor and retest.
- If the numbers increase – How does the number compare to the Fan Off reading?
    - If the number does not increase over the Fan Off reading by more than 20 – Contact Bridgepoint to replace the circuit Board.
    - If the number increases over the Fan Off reading by more than 20 – How high does the number go?
        - If the number is less than 150 – Continue with testing.
        - If the number is over 150 – Contact Bridgepoint to replace the circuit board.

When the fan is up to speed, the numbers should stop increasing. Press DOWN, the E-TES SD will then set a trigger point between the sensor reading when the fan was off and the reading when the fan was on to set the trigger point at which the fan will turn on & off. Press SELECT, to exit Air Flow Setup and enter the trigger point.

Now with the air mover running, check the indicator lights.

- If only the Power light & Air Flow light are ON – Return to Step #1 and check everything again or contact Bridgepoint for assistance.
- If only the Power light & Heating light are ON – Go to light Configuration #1.
- If only the Power light is ON – Contact Bridgepoint to replace the circuit board.
- If only the Power light & Overtemp light are ON – Go to Light Configuration #3
- If the Power light, Air Flow light & Overtemp light are ON – Go to Light Configuration #4
- If none of the four indicator lights are ON – Go to Light Configuration # 5
- If all of the four indicator lights are ON – Contact Bridgepoint to replace the circuit board.

LIGHT CONFIGURATION #3



Step # 1

Usually, when the green Power light is ON and the red Overtemp light is ON, as shown above, the heater has been shutoff by the high temperature switches on the heating elements. In normal operation, since the Air Flow light is off, the air mover is running and the air flow will cool down the heating elements and allow the heater to turn back ON.

- If the heater is cool and the red Overtemp light is still ON – Go to Step #3.
- If the air mover is OFF and the Air Flow light is still OFF – Go to Step #2.
- If only the Power light is ON – Contact Bridgepoint to replace the circuit board.
- If only the Power light & Heating light are ON – Go to light Configuration #1.

Step # 2

Remove the back cover to get inside the E-TES box. Remove the cover from the back of the control panel. The small red connector from the air flow sensor wires should be connected to the small white three pin connector on the lower left corner of the circuit board. The connector should be aligned so the two black wires connect to the middle pin and the red wire to the pin on the left. The black jumper wire from the middle pin connects to the pin on the right.

- If the wires are disconnected or connected wrong - Reconnect the wires to the Circuit Board and continue with testing.
- If the wires are connected correctly – Continue with testing.

Set the rear cover back in place (Do not insert screws) and put an air mover in place. Keep turn air mover OFF. Reconnect power cord and turn power switch ON to retest the E-TES operation.

- If the Air Flow light is OFF – Continue with testing.
- If the Air Flow light is ON – Turn the air mover ON.
    - If the Air Flow light turns OFF – Return to Step #1.
    - If the Air Flow light stays ON – Continue with testing.

With the back cover and air mover in still in place, turn air mover ON. Reconnect the power cord and turn power switch ON. When the display moves to the main screen, use the UP or DOWN button to scroll through the menu to the Air Flow Setup screen. Press SELECT, to enter Air Flow Setup. Turn the air mover OFF. . When the air mover fan has stopped turning, press DOWN. This will set the Fan Off resistance reading. The Fan OFF reading should be in the range of 12 – 40.

- If the Fan Off reading is in this range – Continue with testing.
- If the Fan Off reading is outside this range –
    - If you have already replaced the Air Flow sensor - Contact Bridgepoint to replace the circuit Board.
    - If you have not yet replaced the Air Flow sensor – Replace the Air Flow sensor and retest.
        - If the reading is still outside the range – Contact Bridgepoint to replace the circuit board.
        - If the reading is in the normal range – Continue with testing.

Next, turn the air mover on LOW speed. As the fan speed increases the numbers displayed on the right side of the screen will start to increase.

- If the numbers do not increase –
    - If you have already replaced the Air Flow sensor - Contact Bridgepoint to replace the circuit Board.
    - If you have not yet replaced the Air Flow sensor – Replace the Air Flow sensor and retest.
- If the numbers increase – How does the number compare to the Fan Off reading?
    - If the number does not increase over the Fan Off reading by more than 20 – Contact Bridgepoint to replace the circuit Board.
    - If the number increases over the Fan Off reading by more than 20 – How high does the number go?
        - If the number is less than 150 – Continue with testing.
        - If the number is over 150 – Contact Bridgepoint to replace the circuit board.
        -

When the fan is up to speed, the numbers should stop increasing. Press DOWN, the E-TES SD will then set a trigger point between the sensor reading when the fan was off and the reading when the fan was on to set the trigger point at which the fan will turn on & off. Press SELECT, to exit Air Flow Setup and enter the trigger point.

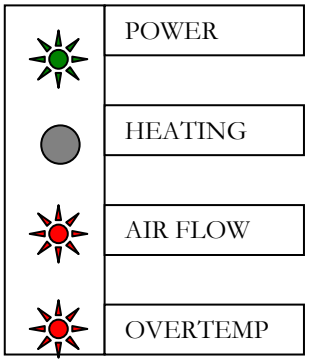
- If the Air Flow light stays ON - Contact Bridgepoint to replace the circuit board.
- If the Air Flow light turns OFF – Check the indicator lights.
    - If only the Power light & Heating light are ON – Go to light Configuration #1.
    - If only the Power light is ON – Go to Light Configuration #6
    - If only the Power light & Overtemp light are ON – Go to Light Configuration #3
    - If none of the four indicator lights are ON – Go to Light Configuration # 5

Step # 3

Remove the back cover to get inside the E-TES box. Remove the cover from the back of the control panel. The small red connector from the temperature switch wires should be connected to the small white two pin connector in the middle of the circuit board.

- If the wires are disconnected - Reconnect the wires to the Circuit Board and return to Step #1.
- If the wires are connected – Test the continuity between the red and black wires at the small red connector.
    - Continuity found – Return to Step #1 and check everything again or contact Bridgepoint to replace the circuit board.
    - No continuity found – Test for continuity at the two connection spades on the temperature switches on the heating elements where the wires are connected.
        - Continuity found – Repair or replace the wires from the temperature switches to the circuit board as needed to restore continuity through the black and red wires where the connect to the circuit board. Reconnect the wires and return to Step #1
        - No continuity found – Remove the temperature switch plate and test the temperature switches individually. Replace temperature switches and jumper wire as needed to restore continuity through the temperature switch assembly. Reconnect the wires and return to Step #1.

LIGHT CONFIGURATION #4



Step # 1

Usually, when the green Power light is ON, the red Air Flow light is ON and the red Overtemp light is ON, as shown above, the air flow has been shutoff or is too low to activate the air flow sensor. With the lack of air flow, when the fan is shutoff before the heater, the residual heat may cause the heater to be shutoff by the high temperature switches on the heating elements.

Without air flow, it may take a long time to cool the unit and turn the Overtemp light OFF. Remove any restriction from the E-TES snout to allow full air flow and turn the air mover ON.

- If the Air Flow light stays ON – Go to Step #2
- If the Air Flow light turns OFF – Allow the air mover to run for about 5 minutes to cool the heating elements. Check the indicator lights.
    - If the heater is cool and the red Overtemp light is still ON – Go to Step #3.
    - If only the Power light is ON – Go to Light Configuration #6
    - If only the Power light & Heating light are ON – Go to light Configuration #1.
    - If the Power light, Heating light and Overtemp light are all ON – Contact Bridgepoint to replace the circuit board.

Step # 2

Remove the back cover to get inside the E-TES box. Remove the cover from the back of the control panel. The small red connector from the air flow sensor wires should be connected to the small white three pin connector on the lower left corner of the circuit board. The connector should be aligned so the two black wires connect to the middle pin and the red wire to the pin on the left. The black jumper wire from the middle pin connects to the pin on the right.

- If the wires are disconnected or connected wrong - Reconnect the wires to the Circuit Board and continue with testing.
- If the wires are connected correctly – Continue with testing.

Set the rear cover back in place (Do not insert screws), put an air mover in place and turn air mover ON. Reconnect power cord and turn power switch ON to retest the E-TES operation.

- If the Air Flow light turns OFF – Return to Step #1
- If the Air Flow light stays ON - When the display moves to the main screen, use the UP or DOWN button to scroll through the menu to the Air Flow Setup screen. Press SELECT, to enter Air Flow Setup. Turn the air mover OFF. When the air mover fan has stopped turning, press DOWN. This will set the Fan Off resistance reading. The Fan OFF reading should be in the range of 12 – 40.
    - If the Fan Off reading is in this range – Continue with testing.
    - If the Fan Off reading is outside this range – Replace the Air Flow sensor and retest.
        - If the reading is still outside the range – Contact Bridgepoint to replace the circuit board.
        - If the reading is in the normal range – Continue with testing.

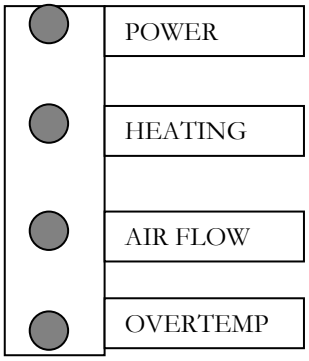
Next, turn the air mover on LOW speed. As the fan speed increases the numbers displayed on the right side of the screen will start to increase.

- If the numbers do not increase –
    - If you have already replaced the Air Flow sensor - Contact Bridgepoint to replace the circuit Board.
    - If you have not yet replaced the Air Flow sensor – Replace the Air Flow sensor and retest.
- If the numbers increase – How does the number compare to the Fan Off reading?
    - If the number does not increase over the Fan Off reading by more than 20 – Contact Bridgepoint to replace the circuit Board.
    - If the number increases over the Fan Off reading by more than 20 – How high does the number go?
        - If the number is less than 150 – Continue with testing.
        - If the number is over 150 – Contact Bridgepoint to replace the circuit board.

When the fan is up to speed, the numbers should stop increasing. Press DOWN, the E-TES XD will then set a trigger point between the sensor reading when the fan was off and the reading when the fan was on to set the trigger point at which the fan will turn on & off. Press SELECT, to exit Air Flow Setup and enter the trigger point.

- If the Air Flow light stays ON – Contact Bridgepoint to replace the circuit board.
- If the Air Flow light turns OFF – Check the indicator lights
    - If the heater is cool and the red Overtemp light is still ON – Go to Step #3.
    - If only the Power light is ON – Go to Light Configuration #6
    - If only the Power light & Heating light are ON – Go to light Configuration #1.
    - If the Power light, Heating light and Overtemp light are all ON – Contact Bridgepoint to replace the circuit board.
    - If none of the four indicator lights are ON – Go to Light Configuration # 5

LIGHT CONFIGURATION #5



Step # 1

The power supply from the Power Cord may have been cut off. Check the 240v circuit breaker for the outlet into which the Power Cord is plugged and reset the GFCI of the cord as needed. Test for power at the 240v outlet and at the receptacle end on the GFCI on the cord where it connects to the E-TES to assure that power is getting to the E-TES SD 240. Once you are sure that there is power being supplied, turn the E-TES switch power switch ON. Does the display turn ON?

- No the display stayed OFF – Proceed to Step #2
- Yes the display has turned ON – After the display advances to the master screen the green Power light should turn ON. (If the display does not advance – Contact Bridgepoint for assistance.)
    - If the power light stays OFF – Contact Bridgepoint to replace the circuit board.
    - If the power light turns ON – Proceed to Step #4.

Step # 2

Check the 240v power supply at the circuit board. The power from the Power Cord goes through the rocker switch to the circuit board where it connects to terminal #E1 & terminal #E2 of the circuit board. With the power cord connected and the rocker switch in the ON position test for power at terminal E1 & E2.

- 240V power found – Proceed to Step #3.
- No power Found – Check for power at the outlet terminals of the rocker switch.
    - Power found – Repair or replace the wires from the rocker switch to the circuit board to restore power to E1 & E2 and proceed to Step #3.
    - No power found – Test for power at the incoming terminals of the rocker switch.
        - Power found – Replace the rocker switch and return to the beginning of Step #2.
        - No power found – Repair or replace the wires from the Cord #1 flanged plug as needed to restore power to the rocker switch and return to the beginning of Step #2.

Step # 3

Once you are sure that there is power being supplied, turn the E-TES switch power switch on. Does the display turn ON?

- Yes – Continue with testing.
- No – Turn the power OFF and check the two jumper plugs to be sure they are in place and in the correct position for 240V operation. When you are sure the jumpers are in the proper location, turn the power switch back ON. Does the display turn ON?
    - Yes – Continue with testing.
    - No – Contact Bridgepoint to replace the circuit board.

Does the Power Light turn ON?

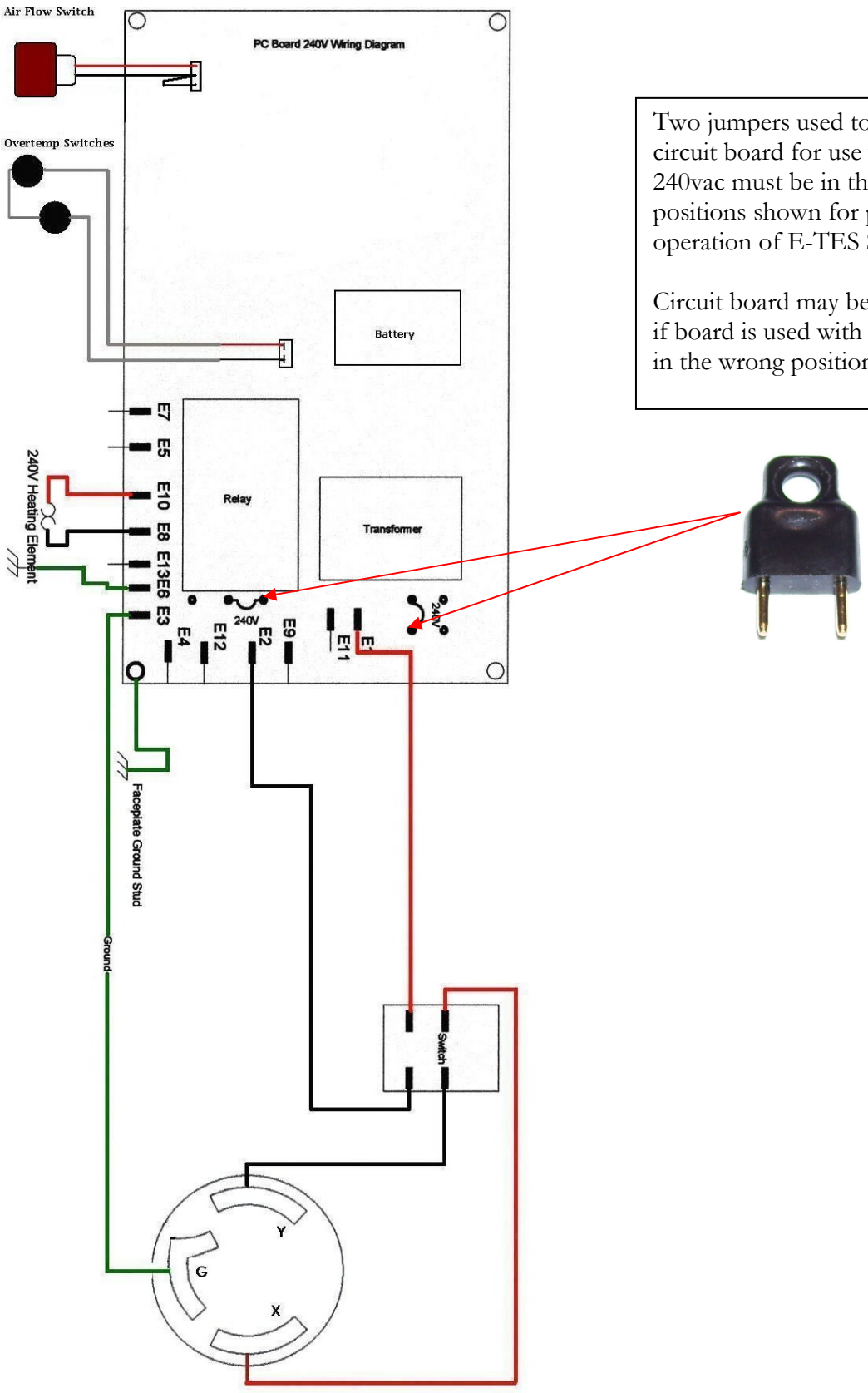
- Yes – Proceed to Step #4.
- No – Contact Bridgepoint to replace the circuit board.

Step # 4

With both cords connected and the power switch in the ON position, what other lights turn ON?

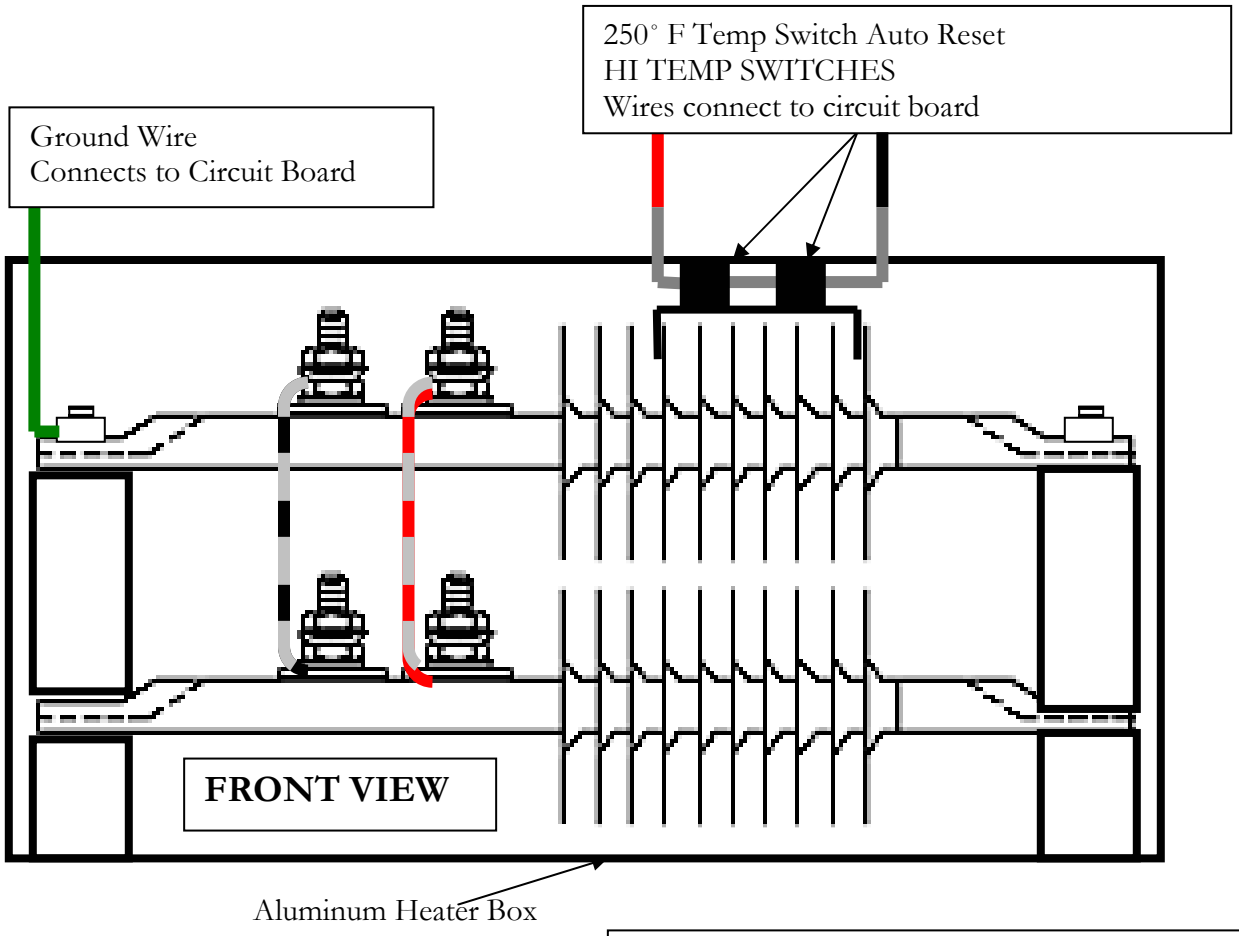
- No other lights turn ON – Go to Light Configuration #6
- Only the Airflow light turns ON – Go to light configuration #2.
- Only the Heating light turns ON – Go to light configuration #7
- Only the Overtemp light turns ON – Go to light configuration #9
- The Air Flow light & Overtemp light turn ON – Go to light configuration #4
- The Air Flow light & Heating light turn ON – Contact Bridgepoint to replace the circuit board.
- The Overtemp light & Heating light turn ON – Contact Bridgepoint to replace the circuit board.
- All four lights turn ON – Contact Bridgepoint to replace the circuit board.

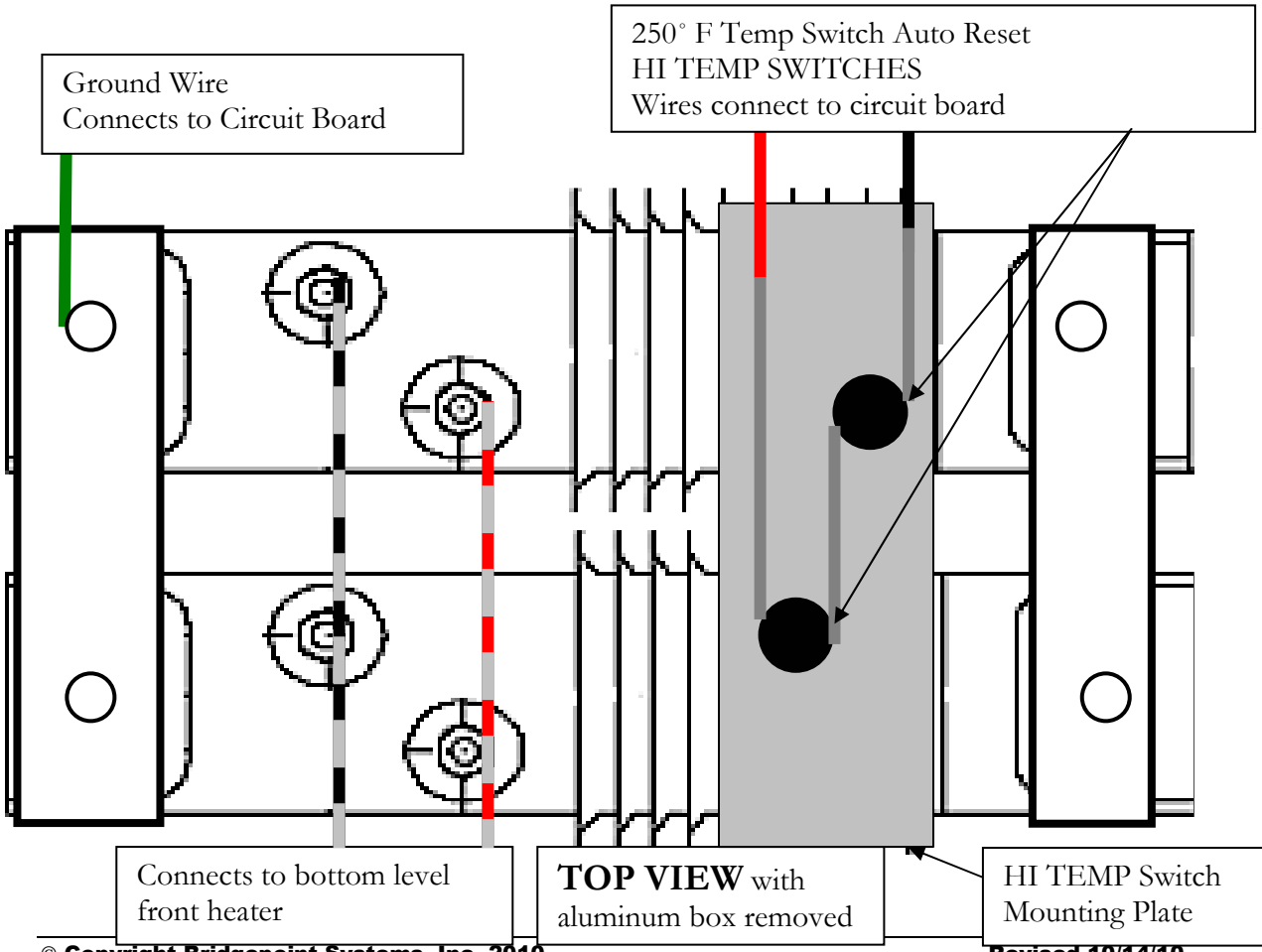
E-TES SD 240 Volt WIRING



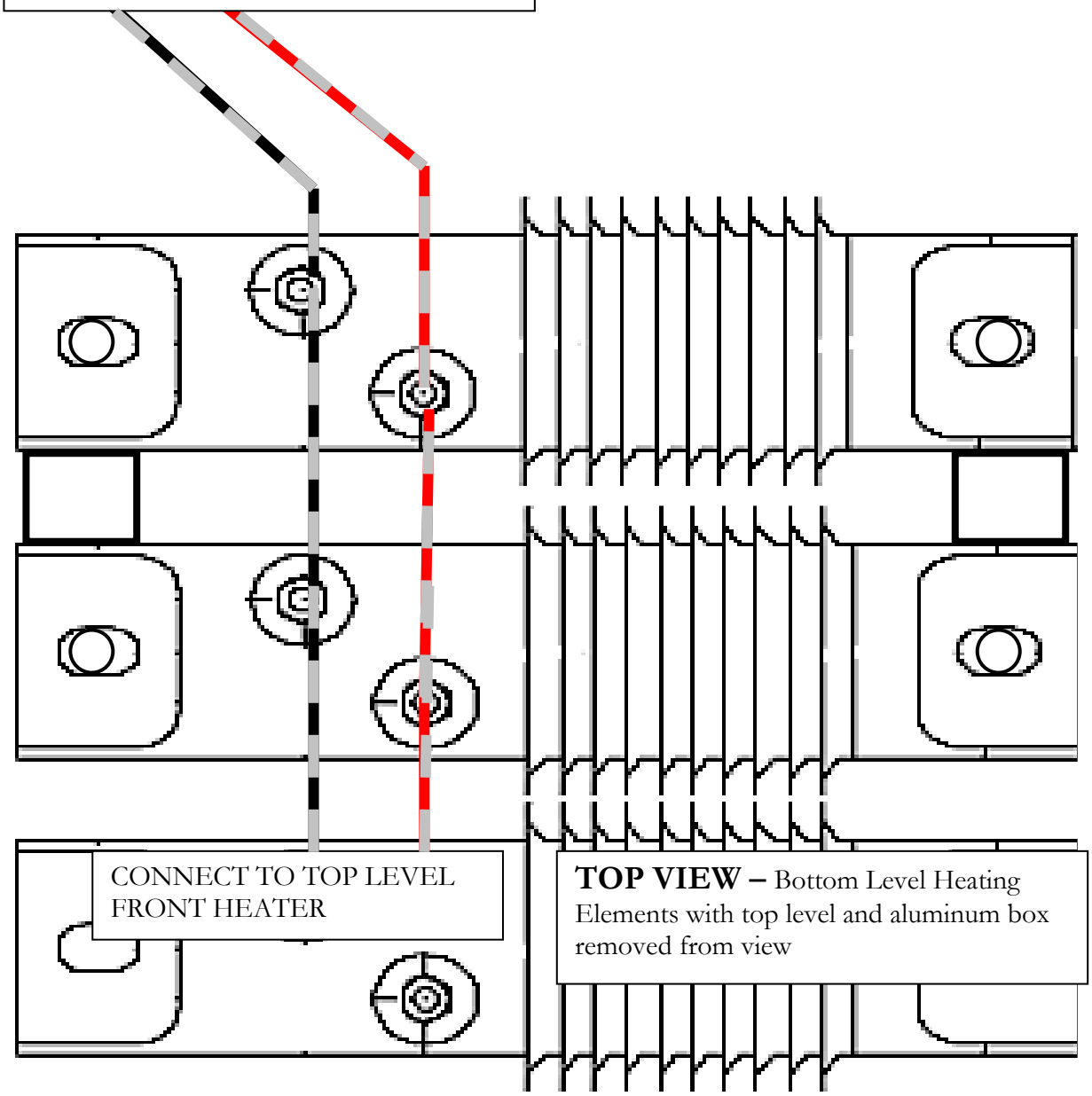
Two jumpers used to convert circuit board for use with 240vac must be in the positions shown for proper operation of E-TES SD unit.

Circuit board may be damaged if board is used with jumpers in the wrong position





240v Power in from Circuit Board
Terminals #E10 & #E8



CONNECT TO TOP LEVEL
FRONT HEATER

TOP VIEW – Bottom Level Heating Elements with top level and aluminum box removed from view