

TROUBLE-SHOOTING PROCEDURES

WARNING: HIGH VOLTAGE PRESENT! TROUBLE- SHOOTING PROCEDURES AND MEASUREMENTS MUST BE PERFORMED WITH THE SYSTEM ENERGIZED AND THE COVERS REMOVED. ALWAYS MAKE CERTAIN THAT THE PERSON PERFORMING THESE PROCEDURES IS FAMILIAR WITH SAFE PRACTICES REQUIRED FOR WORKING WITH HIGH VOLTAGE EQUIPMENT. A QUALIFIED TECHNICIAN OR ELECTRICIAN SHOULD PERFORM THE FOLLOWING PROCEDURES!

NOTE: Always turn power off prior to removing or reinstalling covers.

NOTE: Never install or reinstall the Control Board with the primary power in the "ON" position.

NOTE: Prior to trouble-shooting the system, check for obvious problems such as loose connections, cut or broken wires, etc.. Check the jumpers on the printed circuit board for proper settings (see Step 3, and Illustrations 3.11, 3.12, and 3.13 in this Installation Manual).

STATUS INDICATOR

The CBX series Control Boxes are equipped with a status indicator LED on both the activation device and the controller itself. This indicator monitors whether the unit is heating or not heating and gives other vital diagnostic information.

Indication

-On -Solid

-Off

-Slow Blink

-2 Blinks - Pause

-3 Blinks - Pause

-Rapid Blink

Status

System heating - normal heating mode

System not heating - no call for heat

Under/Over Current

Transformer over temperature

Arcing or Shorting of heating Element

SCR Failure--Actions required when a diagnostic signal is given by the status indicator are listed in the troubleshooting section below.

TROUBLESHOOTING PROCEDURES

The following procedures cover most problems that can be encountered when installing or servicing Heatizon Systems products with CBX6 and CBX23 Series Control Boxes. If your Heatizon Systems product cannot be repaired using the following procedures, contact Heatizon Systems for further assistance.

A. **System shuts off every 30 minutes for one minute.**

1. It is normal for the Control Box to shut the system off every 30 minutes to perform a diagnostic test of the system's safety features.

B. **No power to control unit** (no LED indication on control board)

1. Test for input power.
2. Check panel circuit breaker, reset or turn on as necessary.
3. Check controller circuit breaker, reset or turn on as necessary.
4. If power is measured at the input but the Control Board indicates no power is present, the problem could be within the Control Box itself. Contact Heatizon for technical assistance.

C. **"Hard starting" or breaker trips when thermostat is activated.** Under normal conditions the controller incrementally powers up the transformer during the first one second of operation. Failure of the controller to do this properly will result in a "hard start", (hard starting is characterized by a noticeable "bang" or shaking in the transformer and/or conduits upon start-up).

1. Check for proper wiring of the transformer primary for the supply voltage you are using. Improper wiring of the primary will possibly trip circuit breaker. Improper primary wiring can also damage the transformer if allowed to run for any length of time.
2. Check for continuity of the heating element. Heating element may be damaged, broken or shorted out to something metal or electrically conductive.

D. **Power to Control Unit, but system will not activate**

1. LED indicators #D24 and #D25 on the Control Board should be lit when system is energized (but not activated). Check voltage select jumpers on control board, (JP12 - JP13 - JP14). Jumper settings must be set for the supply voltage. Control Board will not operate properly if voltage is set incorrectly and **will be damaged if set for a value lower than the supply voltage.**
2. Test the Control Box by jumpering Red and White terminals for the activation device, Control Box should start. If system starts, fault is in the activation device or Thermostat Wire.
3. Check the installation and wiring of the Activation Device. To test Activation Device, connect an ohm meter to the Thermostat Wire terminals (the "R" & "W" terminals) of the Control Box. The ohm meter should read continuity when the device is adjusted to call for heat, and should read open when the device is set for no heat. Repair or replace Activation Device or Thermostat Wire as necessary.
4. Check to see if LED #D23 ("Overtemp") is illuminated. Check connection and placement of thermistor on the Control Board. If thermistor is missing or not installed properly, system will not operate.

E. **System starts when power is turned on, but will not turn off via activation device.**

1. Remove red or white wire from control box at activation terminals. If control unit shuts off, test activation device as described above.

F. **System starts, but won't stay running; LED's #D24 through #D27 won't change status when potentiometer is adjusted.**

1. Check that the torroid is properly installed over one of the Cold Leads and plugged into the proper connector in the Control Box
2. Attach clamp-on amp meter around a Cold Lead and activate the system. Check for the presence of current in the secondary circuit during the 5-second period prior to system shut down (current should be 40 to 100 amps). If there is no current present in the secondary, check the Transformer for voltage on the taps you are connected to 1.6 to 66 VAC depending on Transformer size). The presence of voltage on the Transformer taps but no current on the Cold Leads indicates no continuity in the heating element or Cold Lead. To check for continuity in the heating element and Cold Lead, remove one of the Cold Leads from the Transformer and place an ohm meter across the Cold Leads. Normal resistance should be less than 1 ohm.
3. If there is current present and the unit will not adjust, check for a feedback voltage using a voltage meter connected to TP3 and TP4 while system is running. Normal volts should be approximately 3 to 4 volts. If none is detected, replace the torroid.
4. CBX23 and CBX23T Control Boxes are a special case. If a CBX23 Control unit will not adjust, the problem could be the result of improperly installed dual torroids. To solve this, check the feedback voltage at test points TP3 and TP4. If there is current and the voltage at TP3 and TP4 is zero, turn power off, remove one of the two torroids from its cold lead, reverse direction and reinstall torroid back on the cold lead.

G. **System starts, but will not stay running. LED # D21 (undercurrent) or #D22 (overcurrent) turns on and status LED blinks slowly.**

1. Verify secondary voltage and amperage is the same as those taken when heating element was originally installed. If they are the same, return the Control Box to Heatizon Systems. If they are different, then call Heatizon Systems Technical Support Department at (801) 293-1232.
2. Open heating element. Test for continuity as described in previous section.

WARNING. An out of adjustment potentiometer may be caused by shorted or damaged heating element or Cold Lead which may result in a danger of fire and risk to property or life. Shorted or damaged heating element or Cold Lead must be repaired prior to energizing the Control Box and/or any adjustment to the potentiometer.

H. **System starts and runs, but Transformer is operating at greater than 200°F.**

1. Check thermistor for proper location and connection.

I. **System may start and run, but shuts down after a period of time. LED # 23 (overtemp) lights and status indicator flashes a pattern of two blinks and a pause. This is transformer overtemp fault.**

1. Check to see if the Transformer is operating at a temperature less than 200°F. If it is operating at less than 200°F, then:
2. Check Cold Lead operating amperage. If higher than original Amperage measured when the Control Box was originally installed, see Trouble Shooting Guide, Section F.
3. Check for restricted air flow to the transformer. Correct as necessary.
4. Check for air temperature where the Control Box is mounted. Make certain it is 72°F or less. Correct as necessary.
5. Check that thermistor is properly installed on the controller, (if thermistor is missing or not installed properly system will not operate).

J. **System may or may not start, but shuts down and status LED blinks three times then pauses, LED #D21 & D22 will light. This is an arcing or shorting fault.**

1. Turn primary power off. Check for loose connections at the transformer. Correct as necessary.
2. Check for loose connections at the Control Box, (power input and transformer primary). Correct as necessary.
3. If Control Box connections are found to be good, the problem could be in the cold leads or heating element, or the connections between them at the transition plate or butt splice. Check for poor solder or crimp connections. Repair as necessary.
4. Check for anything that could be shorting between adjacent runs of heating element or cold leads, such as nails that pass through the heating element into air ducts below the floor, metal carpet strips or thresholds, a frayed wire from the screen element, a foil candy wrapper, etc. Correct as necessary.
5. An erratic power source may also cause an erroneous arcing detection in the system. Check for defective panel circuit breakers or loose connections at these breakers. Correct as necessary. If primary power to the breaker panel is the source of the problem, contact your electrician or your power company for technical assistance.

K. **System shuts down immediately upon call for heat, status LED flashes rapidly. This indicates SCR has failed.**

1. Turn the power to the Control Box OFF. Contact Heatizon Systems.

L. System will stay in adjustment. After running a given period of time, an overcurrent or undercurrent fault occurs.

1. Check jumpers on control board for proper over/under current tolerance settings. If the system is using Tuff Cable heating element set for 5% tolerance, set it for 15% tolerance (JP5, JP7, JP9 and JP11). If the system is using Z Mesh screen element and is set for 15% tolerance, set it for 5% tolerance (JP4, JP6, JP8, and JP10). These adjustments are made on the Control Board.
2. Check for poor connections, burnt or damaged heating element. Correct as necessary.

M. Television Screen or Computer Monitor interference occurs only when Heatizon System is on.

1. Change the distance from the Heatizon heating element and the television or computer monitor, and/or change the location of the television or computer monitor in the room.
2. Turn the Heatizon system thermostat to the off position when watching the affected television or when using the affected computer monitor.
3. Contact your Heatizon Systems Dealer and discuss whether the purchase of one of Heatizon systems DC products may solve your problem.
4. Replace the affected television or computer monitor with one that utilizes Plasma Display Panel or Liquid Crystal Display technology.

Note: Prior to returning anything to Heatizon Systems, 4403 South 500 West, Murray, UT 84123, call (801) 293-1232 for a Return Materials Authorization form.