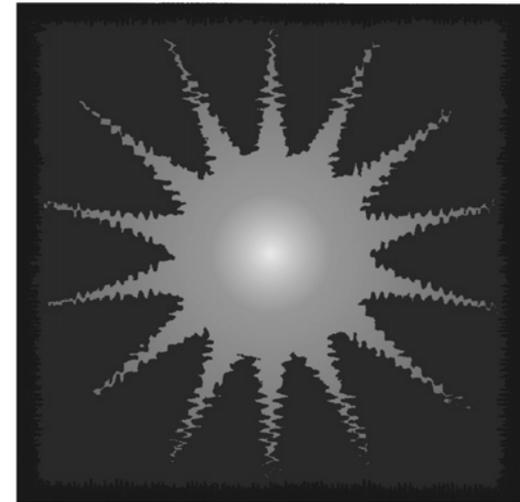


Owners Manual

Heatizon Systems Low Voltage Products

CBX6 System CBX23 System



HEATIZON
S Y S T E M S



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Owner's Manual

Heatizon Systems Low Voltage Products

CBX6, CBX23

Congratulations on your decision to purchase the finest floor warming, space heating, roof snow and ice melting and/or snow melting products available today. We are so confident that your decision to purchase our products will provide you with many years of satisfaction that we have backed them up with the longest warranty in the industry. In the event you ever have questions regarding the Heatizon Systems products please do not hesitate to contact us.

Heatizon Systems
4137 South 500 West
Murray, Utah 84123
(801) 293-1232 Phone
(801) 293-3077 Fax
www.Heatizon.com

Heatizon Systems Products

Utilizing state of the art components and low-voltage electricity, Heatizon's products are unprecedented in ease of operation. They are virtually maintenance free and efficient in operation. ZMesh and Tuff Cable have a limited 25 year warranty and are engineered to provide simple and problem-free solutions to your floor warming, in floor space heating, snow melting and roof snow and ice melting needs. Heatizon's ZMesh and Tuff Cable are tried and proven, and have been Warming American's Cold Spots since 1979.

Heatizon Systems products do not use chemicals or potentially explosive gases. The secondary side of all of our low voltage products operates at 65 volt AC or less.

CAUTION NOTICES

IMPORTANT! A plastic “STOP! DANGER!” sign and an “Electric Shock Or Fire Hazard” sticker indicating the presence of electric deicing, snow melting or warming equipment has been included with your Heatizon product packaging. These caution notices must be affixed at the fuse or circuit breaker panel and be clearly visible.

Never cut or in any other way damage the Tuff Cable or ZMesh. Never short the ZMesh or Tuff Cable to anything electronically conductive.



It is not recommend that you ever remove any of the covers on the Control Unit. Never open your Heatizon Systems Control Unit without first turning the power to the Control Unit completely off by turning both the Control Unit Switch, if so equipped, and the Circuit Breaker in the Electric Distribution Panel to the off position.



SYSTEM INFORMATION

Before Starting Your System:

1. Review all “Warnings” and “Start-Up Procedures” in both this manual and the Design and Installation manual which is available online at www.heatizon.com.
2. Make sure the “Warranty Card” has been sent to Heatizon Systems.
3. Start a file which includes a copy of the “After Element Installation Tests”, this owners manual, the “Design and Installation Manual” and “Activation Device instructions.”

Operating Your System:

Operation. Other than setting the activators and turning the breaker to the “On” position, Heatizon Systems products have nothing else that require your attention. In the event your Heatizon Systems products are not operating correctly, call a qualified electrical contractor or Heatizon certified installation professional to make any necessary adjustments or repairs.

Danger. Do not cut, short, or damage the Heatizon ZMesh or Tuff Cable heating elements once they have been installed. If you are performing work in the area where the heating element is located:

1. Turn the power off
2. Identify the exact location of the heating element
3. Contact Heatizon Systems (801-293-1232 or www.heatizon.com) if the heating element is damaged in any way

Maintaining Your System:

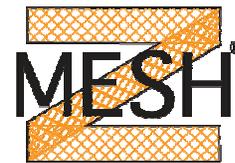
Maintenance. Other than keeping the airflow vents on the Control Unit clean and unobstructed, Heatizon Systems products do not require any routine maintenance. In the event your Heatizon Systems products are not operating correctly please call a qualified electrical contractor to make any necessary adjustments or repairs.

Summer Shut-down. Heatizon Systems recommends that the switch on the Heatizon Systems Control Unit, if so equipped, and the Circuit Breaker (located in your Electrical Distribution Panel) that services your Heatizon Systems product(s) be turned to the “off” position during the summer time and other extended periods of time when it will not be used.

Longevity and Reliability. There are no moving parts in your Heatizon Systems product. All controls are 100% solid-state for long term life and reliability.

PRODUCTS

Heatizon Systems carries a full line of Radiant Heating, Snow Melting, Roof Deicing and Pipe Freeze protection products. Contact Heatizon Systems or your local distributor for more product information.



RETURN MATERIALS

If it becomes necessary to return any purchased materials to Heatizon Systems, they need to be accompanied by a Return Materials Authorization (RMA) form and number. Please call Heatizon Systems to get an RMA number and form, or use the RMA form below. RMA Forms also available online or by Fax. Complete all information on the form, package products in their original shipping materials, and return them as directed. Products being returned for repair or warranty will be evaluated by our engineers prior to determining if repairs can be made and/or if warranty applies to returned materials. Please be aware of shipping, restocking, and other charges that may apply to your returned materials.



RETURN MATERIALS AUTHORIZATION

4137 South 500 West • Murray, UT 84123
Phone (801) 293-1232 • Fax (801) 293-3077

HOW TO RETURN MERCHANDISE

- Call Customer Service (1-888-239-1232) for a Return Materials Authorization number. Write your RMA number here.
- Complete steps 1 through 4 on this form **and return it with your shipment.**
- Pack and tape your shipment carefully in the original packaging, or in a strong cardboard carton to avoid damage in shipment. Heatizon reserves the right not to issue a refund if return merchandise is damaged due to poor packaging. Be particularly careful with electronic items and heavy items, such as transformers.
- Complete and detach the label below, and affix the return shipping label to your package. Be sure to write your RMA number on the shipping label.
- Ship your package prepaid and insured via UPS Ground or FedEx Ground (Sorry, we can not accept COD's). Return shipping charges are the customer's responsibility.
- A restocking fee will apply to all materials being returned to inventory. Special order items are not returnable.

RMA #

➔

RETURN CODES	
20	Ordered wrong materials
21	Ordered wrong quantity
22	Project changed after order
23	Decided didn't want
24	Shipped wrong materials
25	Item labeled incorrectly
26	Parts shipped do not match order
27	Defective material
28	Parts missing from product
29	Does not work (Explain on back)
30	Damaged in shipping
31	Repair and return

HEATIZON RETURN POLICY

Heatizon will provide an exchange or refund for new products returned within 30 days, less restocking fee and shipping and handling. All products must be in new, unused condition and in the original packaging to receive a refund or credit. Merchandise returned not in the original condition in which it was shipped will be subject to a restocking fee, a repair fee, or may be ineligible for refund. Beyond 30 days, items are returnable for exchange only after inspection. Items being returned for repair require credit card pre-authorization of up to \$100 to assess and repair the item. The customer will be contacted for authorization to proceed if repairs exceed \$100. **Any item that is shipped without completed RMA form, or any item left unclaimed for 30 days becomes the property of Heatizon Systems.**

STEP 1: Name _____ Purchased From (Distributor Name) _____
 Phone _____ - _____ - _____ Cell _____ - _____ - _____ Fax _____ - _____ - _____
 E-Mail Address _____ Date of Purchase _____ Invoice Number _____
 Comments _____

STEP 2: Please indicate the action you would like us to take: Exchange Refund Repair Other
 (Any credit or reimbursement is made to the distributor that the product was purchased from. Contact your Heatizon Distributor to advise them of this return and arrange for credit, if any, to your account.)

ITEMS BEING RETURNED			ITEMS EXCHANGING FOR		
ITEM # AND DESCRIPTION	QTY	REASON CODE	ITEM # AND DESCRIPTION	QTY	PRICE

STEP 4: Please check the form of payment for additional items or difference in price of the exchange items. Items being returned for repairs will be examined and repaired if cost to repair does not exceed \$100. Customer will be contacted for prior approval if repairs exceed \$100. Failure to complete this section may cause delays in the processing of your return.

Visa MasterCard Discover American Express Check is Enclosed

Card # _____ Exp. Date _____ / _____

Signature _____
Cardholder agrees to pay the total amount owing according to the card issuer agreement.

SHIPPING LABEL

FROM: _____ _____ _____ RMA NUMBER _____	TO: Attention: Return Materials Heatizon Systems 4137 South 500 West Murray, UT 84123-1399
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TROUBLESHOOTING

WARNING: HIGH VOLTAGE PRESENT! TROUBLESHOOTING 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 Design and Installation Manual.

STATUS INDICATOR LIGHTS—WHAT DO THEY MEAN?

The **CBX6** and **CBX23** series Control Units are equipped with a status indicator LED on most activation devices and the Control Unit itself. This indicator monitors whether the unit is heating or not heating and gives other vital diagnostic information.

<u>Indication</u>	<u>Status</u>
-On -Solid	System heating - normal heating mode
-Off	System not heating - no call for heat
-Slow Blink	Under/Over Current
-2 Blinks - Pause	Transformer over temperature
-3 Blinks - Pause	Arcing or Shorting of Heating Element
-Rapid Blink	SCR Failure--Actions required when a diagnostic signal is given by the status indicator are listed in the troubleshooting section below.

TROUBLESHOOTING PROCEDURES FOR CBX6 and CBX23



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

Problem: The system shuts off every 30 minutes for one minute.

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

Problem: There is no power to control unit (no LED indication on control board)

Solution:

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 Unit itself. Contact Heatizon for technical assistance.

Problem: The system is "Hard starting" or a breaker trips when the 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).

Solution:

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.

Problem: The Control Unit has power, but the system will not activate

Solution:

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.**

Twenty-five Year Limited Warranty for Heatizon Systems

"Tuff Cable" Element (E101), "Z Mesh" Screen Element (E102) and Specified Radiant Panel Heating Components

Heatizon Systems warrants to the original purchaser/end user of the following products that for the periods noted such products shall be free from defects in material and workmanship: Tuff Cable (E101) Heating Element and ZMesh (E102) Heating Element for a period of twenty-five (25) years, the Control Unit for a period of one (1) year, power Transformer for a period of five (5) years, and Activation Device(s) for a period of one (1) year. Such warranty periods shall commence on the date of shipment by Heatizon Systems. If any parts are found to be defective in manufacture during such time period, Heatizon Systems will, at its sole option, replace or repair defective parts.

This Limited Warranty applies only if articles sold hereunder (a) are selected, designed, and installed according to instruction and operation manuals furnished by Heatizon Systems and installed in a "workmanlike manner" according to the building association standards adopted by Heatizon Systems, (b) remain in their originally installed location, (c) are connected to proper power supplies, (d) are not misused or abused, (e) show no evidence of tampering, mishandling, neglect, damage (accidental or otherwise), modifications or repair without the approval of Heatizon Systems, or damage done to the product by anyone other than Heatizon Systems, and (f) are installed in accordance with applicable code requirements. Any warranty claims must be made in writing, no later than one (1) month following expiration of the warranty period, and must be accompanied by the warranted part or component. Any claim not made in such manner shall not be honored by Heatizon Systems.

This Limited Warranty does not cover:

1. The workmanship of any installer of Heatizon Systems radiant panel heating products.
2. Any Heatizon Systems radiant heating products that have a failure or malfunction resulting from improper or negligent operation, accident, abuse, misuse, unauthorized alteration or improper repair or maintenance.
3. Any Heatizon Systems radiant heating products that have had components not purchased from Heatizon Systems integrated into or connected to them.
4. Any labor costs for removal of alleged defective part(s) and/or reinstallation of replacement part(s), transportation to and from Heatizon Systems (if necessary) and any other material necessary to perform the exchange or repair.
5. Any Heatizon Systems heating products that have not been properly registered by completion and return of the Warranty Registration Card attached hereto.

DISCLAIMER OF WARRANTIES:

This warranty described above is in lieu of all other warranties, express or implied, including but not limited to any implied warranties of fitness for a particular purpose and merchantability. Heatizon Systems expressly disclaims and excludes any liability for losses, expenses, inconveniences, consequential, incidental, indirect, or punitive damages for breach of any express or implied warranty. By installing and/or purchasing Heatizon Systems products, you accept the terms of this limited warranty.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

WARNINGS

Read this Installation Manual in its entirety before attempting to install any Heatizon Systems Products.

Installation of Heatizon Systems products and associated work must be performed by qualified persons and conform to local building codes, ordinances, trade practices, and in accordance with all applicable sections of the National Electric Code (NEC) or the Canadian Electrical Code (CEC).

Risk of fire! Risk of fire possible if installation of system is not completed according to all of the installation instructions contained within this Installation Manual, including but not limited to the warnings and notes throughout. Risk of fire possible if metal or any other conductive material is allowed to come into contact with the Cold Leads and Tuff Cable or ZMesh Heating Element. Risk of fire possible if connections/joints between Cold Leads and Tuff Cable, Colds Leads and ZMesh, Tuff Cable and Tuff Cable, and or ZMesh and ZMesh are not crimped and/or soldered correctly. Risk of fire possible if loose strands of ZMesh or Tuff Cable Heating Element or cuts or other damage to ZMesh or Tuff Cable are not repaired correctly. Note: The safety features incorporated into Heatizon Systems products cannot detect cuts in Cold Leads and ZMesh or Tuff Cable Heating Elements. Do not allow ZMesh to cross itself—maintain a minimum of 2" distance between adjacent runs of ZMesh Heating Element. Do not allow Tuff Cable to touch or cross itself.

Risk of shock! Make sure all power to your Heatizon Systems product and thermostat is shut off at the electric distribution panel before installing, removing covers, servicing, or working on any of the components of any Heatizon System product.

All connections/joints between Colds Leads and Tuff Cable heating element must be embedded into mortar, asphalt, or other acceptable cementitious Heatsink.

Knockout openings shall not be used except with devices that are designed to fill such openings.

Obtain written approval from Heatizon Systems for applications and installations that are different from those described herein.

In order for your Heatizon Systems product to operate correctly, the transformer portion of the Control Unit must be installed so that it can dissipate the heat that it generates

Like all electric products, Heatizon Systems products create a magnetic field that may interfere with certain brands of televisions, computer monitors, etc. Unlike Cathode Ray Tubes ("CRT"), Plasma Display Panels ("PDP") and Liquid Crystal Displays ("LCD") do not seem to be affected by magnetic fields. In the event magnetic field interference is a concern for you please consult Heatizon Systems or your sales representative prior to making your purchase.

Mattresses, Bean Bag Chairs, LoveSacs, Futons, and all other items which have high insulating values should never be placed directly on any surface which has a radiant heating product under it.

Never install Heatizon Systems products in space heating or floor warming applications to deliver more than the 15 watts per square foot (or 160 watts/m²) recommended by the Radiant Panel Association.

"Field installed wiring is to be in compliance with the National Electrical Code (NFPA-70) and/or ordinances," or the Canadian Electrical Code, or equivalent, as applicable to installation location.

Never install heating element near a wax toilet ring.

2. Test the Control Unit by jumpering Red and White terminals for the activation device, Control Unit 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 Unit. 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.

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

Solution: Remove red or white wire from Control Unit at activation terminals. If Control Unit shuts off, test activation device as described above.

Problem: System starts, but won't stay running; LED's #D24 through #D27 won't Change status when potentiometer is adjusted.

Solution:

1. Check that the torroid is properly installed over one of the Cold Leads and plugged into the proper connector in the Control Unit
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 Units 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.

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

- Solution:
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 Unit 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.

Problem: System starts and runs, but Transformer is operating at greater than 200EF.

- Solution: Check thermistor for proper location and connection.

Problem: 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.

- Solution:
1. Check to see if the Transformer is operating at a temperature less than 200EF. If it is operating at less than 200EF, then:
 2. Check Cold Lead operating amperage. If higher than original Amperage measured when the Control Unit was originally installed, see Trouble Shooting Guide, "System starts, but won't stay running."
 3. Check for restricted air flow to the transformer. Correct as necessary.
 4. Check for air temperature where the Control Unit is mounted. Make certain it is 72EF 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).

Problem: 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.

- Solution:
1. Turn primary power off. Check for loose connections at the transformer. Correct as necessary.
 2. Check for loose connections at the Control Unit, (power input and transformer primary). Correct as necessary.
 3. If Control Unit 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.

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

- Solution: Turn the power to the Control Unit OFF. Contact Heatizon Systems.

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

- Solution:
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 ZMesh 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.

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

- Solution:
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. Replace the affected television or computer monitor with one that utilizes Plasma Display Panel or Liquid Crystal Display technology.

Check contents of all boxes immediately upon receipt of your Heatizon shipment and notify Heatizon within 24 hours of any discrepancy or missing part.