

Heatizon Systems Floorizwarm System Design and Installation Manual

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System Description, Design Information, and Requirements



Floorizwarm Heating Element Layout

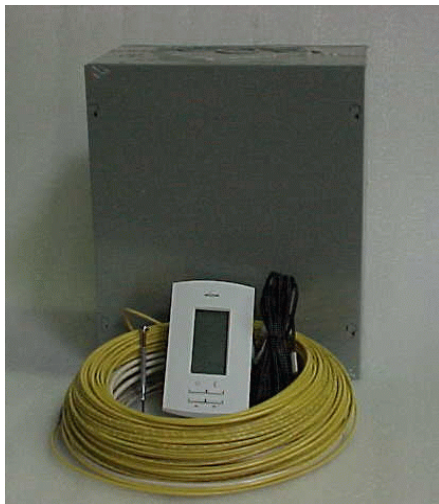
SYSTEM DESCRIPTION

The Floorizwarm System is a low voltage, resistance type heating system which is ideal for floor warming and space heating in areas 110 square feet and smaller. Floorizwarm Systems are designed to deliver approximately 10 to 15 watts per square foot, and to cover 15 to 110 square feet of floor area. A Floorizwarm System consists of **three** primary components:

1. The Power Unit-- The Floorizwarm Power Unit includes a step-down transformer and other electronic components necessary to provide low-voltage electricity to the heating element. It is engineered to provide simple and problem free operation. The Power Unit measures 12" x 10" x 6".

2. The Heating Element – The Floorizwarm Heating Element is a durable coated copper cable that is chemical and gasoline resistant. Floorizwarm Heating Element (referred to herein as both "Floorizwarm Heating Element" and "Tuff Cable") comes in various lengths and gauges, depending on system size and area to be heated. The Floorizwarm Heating Element is factory-connected to non heating **Cold Leads**, which are 20 feet long, and are connected to the Power Unit by the installer.

5. Activation Device – The Floorizwarm System is activated by an M337 Programmable Thermostat which includes a remote bulb sensor with 15' of cable. This thermostat requires 120 VAC power to operate. The thermostat provides a digital readout, and can be used in auto mode or manual mode.



Floorizwarm Cable, Power Unit and Thermostat

DESIGN INFORMATION

Heatizon Floorizwarm system is a low-voltage electric radiant heating system. Installations include:

- concrete, light-weight concrete or mortar bed
- Heatizon Heatsink Kit

Floorizwarm utilizes AC power supply for various sized heating applications. Floorizwarm Heating Element is designed to be spaced at specific intervals and lengths to produce a specified amount of heat per square foot. Floorizwarm Heating Element must always be installed in a heat sink, such as concrete, light-weight concrete or mortar bed, or a Heatizon Heatsink Kit.



**M337
Programmable Thermostat with
Remote Bulb Sensor**

The heat density per square foot of the Floorizwarm System is dependent on the spacing between adjacent runs of Floorizwarm Heating Element, the length of the heating element, and the size of the Power Unit.

APPLICATIONS

System Sizing Information

Model #	Area to be Heated	Cable Length	Element Spacing	Watts Per Square Foot
FLZ1520AC	15 ft ² to 20 ft ²	50 feet	3.6" to 5.0"	14.7 to 11.03
FLZ2030AC	20 ft ² to 30ft ²	80 feet	2.5" to 3.5"	14.9 to 9.9
FLZ2536AC	25 ft ² to 36 ft ²	70 feet	3.8" to 5.5"	14.8 to 10.3
FLZ3650AC	36 ft ² to 50 ft ²	160 feet	2.7" to 3.5"	14.7 to 10.6
FLZ5064AC	50 ft ² to 64 ft ²	125 feet	4.8" to 6.1"	13.5 to 10.59
FLZ6475AC	64 ft ² to 75 ft ²	260 feet	2.8" to 3.3"	14.9 to 12.99
FLZ75110AC	75 ft ² to 110ft ²	225 feet	3.7" to 5.5"	14.8 to 10.5

Floorizwarm is configured and packaged in the seven different area sizes listed above. Floorizwarm comes complete with a pre-measured length of the appropriate gauge Floorizwarm Heating Element, which is attached to the floor prior to the application of mortar. The cable spacing is varied to fit a specific area within the intended range of sizes. The non-heating Cold Leads are spliced to the element at the factory, and are run to the power supply by the installer. Cold Leads are connected to the modules using wire nut connectors.

SPACE HEATING

Floorizwarm products can provide total space heating. Like all other space-heating products, heat-loss calculations should be performed prior to selecting the appropriate Floorizwarm System. Heat-loss calculations define the amount of heat which must be delivered in order to heat the given space. Heatizon Systems Floorizwarm products are suitable for installation under most floor coverings.

FLOOR WARMING

Floorizwarm products can be used in conjunction with a primary heat source to provide warm floors or supplemental heat. Floorwarming applications typically provide approximately 10 to 15 Watts per square foot. Heatizon Systems Floorizwarm products are suitable for installation under most floor coverings.

SYSTEM SIZING INFORMATION

The adjacent table indicates the Floorizwarm packages that are available. Each Floorizwarm package contains a pre-measured length of Floorizwarm Heating Element with attached Cold Lead, the appropriate sized Power Unit, and a Programmable Thermostat with Remote Bulb Sensor.

ELECTRICAL SERVICE REQUIREMENTS

The Floorizwarm Power Unit requires an input of 120 VAC with a dedicated single pole, 20-Amp breaker.

INSULATION

Properly installed insulation is always recommended by Heatizon to enhance the efficiency and improve the performance of all Heatizon Systems products.

CUSTOMER INFORMATION

WARNING: The installation of all Heatizon Systems products must be done in accordance with the instructions provided in the Heatizon Systems Installation Instructions or Installation Manual and the Sales Agreement. After you have completely read the installation manual, Heatizon Systems encourages you to call our Technical Support Department at (801) 293-1232 with any comments or questions you have regarding our products or the installation and operation thereof. All work must be done by a qualified person and conform to local building codes, ordinances, trade practices and in accordance with all applicable sections of the National Electric Code (NEC).

Heatizon Tuff Cable System (including Floorizwarm products)

● *Tuff Cable in concrete* – All concrete forms, insulation, chairs or dobies and remesh are to be in place prior to installation of Heatizon's Tuff Cable. Heatizon recommends 6"x6" - 4 gauge remesh for 6" spacing and 4"x4" – 4 gauge remesh for 4" spacing. The Tuff Cable is to be installed so that it will be 1.5 to 2 inches below the finished surface. Tuff Cable is to be installed prior to the concrete pour. Do not attempt to raise the Tuff Cable during the concrete pour. Caution must be exercised such that the Tuff Cable is not damaged before, during or after the concrete pour. Never run the Tuff Cable through cold/expansion, crack control, saw cut or any other joints regardless of whether the joints are created prior to, during or after the pour. Heatizon does not warrant damage to the Tuff Cable caused by actions of others, including but not limited to, saw cutting of expansion or control joints, core cutting or any other penetration of concrete, movement of concrete, cracking of concrete, abuse of the Tuff Cable prior to the pour, etc.

● *Tuff Cable in mortar, asphalt, or Heatsink roof application* – Tuff Cable must always be imbedded completely in asphalt, concrete, a mortar bed or Heatsink Kit regardless of which floor covering or roofing material is going over it. Heatizon Systems manufactures a Heatsink Kit that should be used whenever Tuff Cable is used for roof deicing and snow melt. Tuff Cable should never be installed in open-air applications.

Heatizon Z Mesh System

● *Z Mesh is not insulated* – Electrically conductive materials, other than nails or screws that are not in anyway also touching any other electronically conductive material, must never come in contact with the Z Mesh. Any time electrically conductive materials are allowed to come in contact with the Z Mesh a risk of fire will result. Examples of electrically conductive materials include, but are not limited to, metal thresholds, metal lathe, metal carpet strips, metal fasteners for metal roofing, drip edge, valley metal, any other metal object, etc. Once the Z Mesh is installed, it should be covered as soon as possible to avoid damage.

● *Z Mesh under tile, marble, etc.* – Z Mesh is to be installed under thinset mortar, Durarock, Wonderboard or Hardi Backerboard. Z Mesh should not be installed when metal lathe is used in the flooring installation.

● *Z Mesh on concrete and wood sub-floors* – Z Mesh is suitable for installation under most floor coverings. Heatizon Systems recommends an overlayment be installed over the Z Mesh prior to the installation of the floor covering anytime a danger of cutting or damage to the Z Mesh exists or may exist in the future.

To avoid danger of fire, NEVER cut Z Mesh. If Z Mesh is cut, use Heatizon Systems approved methods and materials to immediately repair damage.

Heatizon Roof De-icing System

● *Z Mesh under non-metal roof* – One layer of ice and water shield layer must be installed on the sub roof prior to the installation of the Z Mesh and a second layer must be installed over the Z Mesh. As stated above under the section headed "Heatizon Z Mesh System" electrically conductive materials must not come in contact with the Z Mesh or a risk of fire will result. Examples of some electrically conductive materials commonly used on roofs include valley metal, drip edge, metal roofing material, etc. Z Mesh is not recommended for use under metal roofing material.

● *Z Mesh over drip edge* – One layer of ice and water shield must be installed under the drip edge and a layer of EPDM over the drip edge and under the Z Mesh as shown in Heatizon's diagram labeled "Eave Detail with Z Mesh Over Drip Edge." A final layer of ice and water shield must cover all Z Mesh. Nails cannot be placed through the drip edge and Z Mesh simultaneously.

● *Z Mesh near conductive materials* – The drip edge, flashing, and valley metal and the screws or other attachments securing the drip edge, flashing or valley metal to the roof must not penetrate the Z Mesh or a risk of fire will result. A continuous continuity check should be made between any and all electronically conductive material or metal being placed over Z Mesh and one of the cold leads of the Heatizon system. The circuit should always be open.

● *Metal Roof* – Tuff Cable is recommended whenever metal roofing or other electronically conductive material is to be used or greater heat density is required. When Tuff Cable is installed in a roofing application it should always be imbedded in Heatizon Systems ¼ inch thick Heatsink kit. Prior to the Tuff Cable being installed, the roofing contractor must place ¼ inch thick sleepers in all areas where the roof will be attached to the sub-roof.

General

● *Electrical Requirements* – Floorizwarm AC, Floorizwarm DC and SLC500 products require a single pole, 120 V power supply with 20 amp breaker and with proper conductors run from the breaker to each Control Unit. Heatizon Systems CBX products sized ½ and 1kVA can operate on 120V, single pole, 15 amp breaker or 240V, double pole, 15 amp breaker. Heatizon Systems CBX products sized 2kVA and 3kVA require a 2-pole, 208/240V, 20 amp breaker with proper conductors run from the breaker to each Heatizon Control Unit and products sized 4kVA, 5kVA, 6kVA, 2x2kVA and 2x3kVA require a 2-pole, 208/240/277V, 30 amp breaker with proper conductors run from the breaker to each Control Unit. Heatizon Systems products requiring 208/240/277 V do not use a Neutral.

● *Insulation* – Properly installed insulation is always recommended by Heatizon to enhance the efficiency and improve the performance of your Heatizon Systems product.

● *Continuity Check* – A continuous continuity check should be conducted on the Tuff Cable or Z Mesh Screen and all electrically conductive material prior to, during the pouring of concrete, installation of floor coverings or roofing materials, and immediately prior to energizing all Heatizon System products. The circuit should always be open. It is highly recommended that an alarm buzzer, (available for purchase from Heatizon Systems), or other warning device be used at all times the danger of damaging or shorting the heating element to something conductive is present.

● *Element Test* – Always complete a Heatizon Systems "After Installation Element Test Form" immediately following the installation of the Tuff Cable or Z Mesh, and again just prior to energizing your Heatizon Systems product.

● *Magnetic Field* – 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 your sales representative about the Heatizon Systems DC Alternatives, prior to making your purchase.



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AND UL
STANDARD 1012



HEATIZON
S Y S T E M S™



Installation Instructions

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

Warning: Read this installation manual in its entirety before attempting to install Heatizon Systems Tuff Cable and Floorizwarm Products.

Warning: 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).

Warning: Risk of fire! Risk of fire possible if installation of system is not completed according to all of the installation instructions including but not limited to the warnings and notes. In addition, allowing metal or any other conductive material to come into contact with the Tuff Cable heating element may result in fire.

Warning: 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.

Warning: All connections/joints between Colds Leads and Tuff Cable heating element must be embedded into mortar, asphalt, or other acceptable heat sink.

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

Warning: Failure to eliminate loose strands of Tuff Cable or failure to repair cuts in Tuff Cable properly may result in fire danger.

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

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

Warning: Like all electric products, Heatizon Systems products create a magnetic field that may interfere with certain brands of televisions, computer monitors, etc. Contact Heatizon Systems prior to installing any of its products if magnetic field interference is a concern for you.

Warning: Never install Heatizon Systems products in space heating or floor warming applications to deliver more than 15 watts per square foot (or 160 watts/m²).

Please call Heatizon Systems Technical Support Department at (801) 293-1232 with any questions you have regarding these Installation Instructions and The Customer Information Sheet, or the installation, operation, and maintenance of Heatizon Systems products.



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Installation Instructions

This installation manual is designed to assist in the installation of:

- Floorizwarm AC Series Products**

A complete Heatizon System Floorizwarm installation typically incorporates three main steps which are described in this manual:

- Step 1. Location & Installation of Floorizwarm Power Unit**
- Step 2. Floorizwarm Heating Element Lay-out and Installation**
- Step 3. Activation Device**

Installation Instructions

Note: All Heatizon Systems L.C. products must be installed in a manner that is in conformity with the National Electric Code and local building codes, ordinances, and regulations.

Step 1. Determining Placement of the System.

Determining the placement location of the Floorizwarm Power Unit is one of the most important steps in the installation process. The Power Unit must be located within 20 total vertical and horizontal feet from where the Floorizwarm Heating Element will begin and end.

As stated above, placement of the Floorizwarm AC Power Unit is a very important step in the installation process. Heatizon Systems has the following guidelines to help you in locating the Floorizwarm AC Power Unit:

- a. Accessibility is important.
- b. Maintain a minimum clearance of six (6) inches between the sides of the Power Unit and the ceiling, walls, floor and adjacent Power Units.
- c. Locate the Power Unit within twenty (20) total horizontal and vertical feet of the beginning and ending of the Floorizwarm Heating Element.
- d. Avoid placement of the Power Unit in an area where it may be exposed to water.
- e. When operating the Power Unit, proper sound attenuation insulation or vibration isolation may be required because the Power Unit may create a small amount of noise and/or vibration.

Step 2. Installation of the Floorizwarm AC Power Unit

- a. The Floorizwarm Power Unit requires an input power of 120 VAC with a 20 Amp breaker. AWG #12-2 with ground wire electrical conductor must extend from the electrical distribution panel to the Power Unit. Connect the electrical conductor wire from the electrical distribution panel to the wires in the Power Unit marked 120 VAC using the provided solderless connectors for copper wire. See attached Floorizwarm AC Models wiring diagram.
- b. Connect the AWG #12-2 electrical conductor with ground wire (see the section titled “Installation of the Thermostat”) from the thermostat single gang box to the wires marked thermostat using the provided solderless connectors for copper wire. See attached Floorizwarm AC Models wiring diagram and page 9.
- c. Connect the INPUT POWER GROUND WIRE and the GROUND WIRE FROM THE THERMOSTAT SINGLE GANG BOX to the GROUND WIRE in the Power Unit.
- d. Supply power to the thermostat as required by the manufacturer instructions.
- e. Attach the Power Unit enclosure on studs or other adequate surfaces using the four (4) holes in the back of the Power Unit enclosure and anchoring devices designed to accept shear loads and lateral loads of 50 lbs. for the Floorizwarm Power Unit.
- f. Mark the appropriate circuit breaker(s) reference label(s) indicating which branch circuit supplies the circuit(s) to your Heatizon Systems Power Unit(s) and provided thermostat(s).

Step 3. Installation of the Thermostat

The provided thermostat should be located in a convenient location in close proximity to the area where the Floorizwarm Heating Element will be located and installed per the manufacturer instructions.

- a. Install one (1) single gang box for the provided thermostat in a stud-framed wall at a suitable location.
- b. Install the in-floor sensor provided with the thermostat from the single gang box to the area where the heating element will be installed. It is recommend that the sensor for the provided thermostat be installed at the midpoint between two runs of Floorizwarm Heating Element. As a result you may wish to wait and install the in-floor sensor at the same time as you install the heating element if possible.

Warning: Do not cross the Floorizwarm Heating Element with itself, the in-floor sensor wire or with any other conductive material.

- c. Run AWG #12-2 electrical conductor with ground wire from the thermostat single gang box to the Floorizwarm Power Unit.
- d. Power the thermostat with a dedicated power supply directly from the electrical distribution panel using AWG #12-2 electrical conductor with ground wire and a 20 Amp breaker and following the thermostat manufacturers instructions.
- e. Install the thermostat as directed by the thermostat manufactures instructions.

Step 4. Installation of Floorizwarm Floorizwarm Heating Element

Note: A continuous continuity check should be conducted on the Floorizwarm Heating Element and all electrically conductive material prior to and during the pouring of concrete, installation of floor coverings, and immediately prior to energizing all Floorizwarm products. The circuit should always be open. Always complete a Heatizon systems “After Installation Element Test Form” immediately following the installation of the Floorizwarm Heating Element, immediately prior to covering the Floorizwarm Heating Element, and again just prior to energizing your Floorizwarm Power Unit.

In order to minimize the risk of damage to the Floorizwarm Heating Element, Heatizon Systems recommends that the Floorizwarm Heating Element be installed immediately prior to the installation of the light-weight concrete or mortar material that goes over it.

The Floorizwarm Heating Element comes in pre-established lengths that have been designed to deliver a specified heat density. Therefore, it is essential that **all** of the Floorizwarm Heating Element contained in your kit must be installed.

- a. Design the layout of the Floorizwarm Heating Element. The design and installation of the Floorizwarm Heating Element will be easier if you:
 1. Purchase the correct Floorizwarm product with the proper amount of Floorizwarm Heating Element for your project.
 2. Plan the layout of the Floorizwarm Heating Element before you begin the actual installation
 3. Begin and end the Floorizwarm Heating Element in approximately the same area.
 4. Run the Floorizwarm Heating Element in evenly spaced runs parallel to each other
 5. Never cross the Floorizwarm Heating Element over itself or any other conductive material or wire.

Warning: Never cut or otherwise attempt to alter the length of the Floorizwarm Heating Element. Always inspect the Cold Leads and the Floorizwarm Heating Element just prior to embedding in the light-weight concrete or mortar material. In the event the Floorizwarm Heating Element gets cut, nicked, or otherwise damaged it must be replaced with new

Floorizwarm Heating Element with factory attached Cold Leads from Heatizon Systems. Do not use Floorizwarm Heating Element that has been altered, cut, nicked or otherwise damaged in any way.

Note: Floorizwarm Heating Element must not be installed in ceilings, closets (floor areas that are or will be covered or obstructed by shelves, cabinets, clothing, storage items, etc.) nor over or in walls or partitions.

Note: Always allow a minimum of 1.5 inches of distance between the runs of Floorizwarm Heating Element.

- b. Once the layout designed is complete, attach the Floorizwarm Heating Element using the appropriate cable staples for wood surfaces, a UL Listed tape, adhesive or glue for cement surfaces, or UL Listed tape to attach the Floorizwarm Heating Element to reinforcement mesh for new pour concrete.
- c. Apply enough light-weight concrete or mortar over the Floorizwarm Heating Element to completely cover it in its entirety and to cover the connections of the Cold Leads and the Floorizwarm Heating Element.

Step 5. Finalizing the Installation and Connections

Warning: Prior to making final installation and connections make certain that all power to the Power Unit and thermostat is still turned off at the electric distribution panel.

Warning: Do not ground the output power.

- a. Run the Cold Leads (larger gauge wires attached to the Floorizwarm Heating Element) to the Power Unit and connect one to the Red wire and the other to the Black wire in the Power Unit using the provided solderless connectors for copper wire.
- b. Connect the wire for the in-floor temperature sensor to the thermostat as directed in the manufacturer instructions.
- c. Energize your Heatizon System Floorizwarm product by turning the supply power on.
- d. Program the thermostat to fit your lifestyle.
- e. Complete and return your Warranty Registration card to Heatizon Systems

Make sure the Floorizwarm AC Model you have purchased is the correct size for your project by completing this worksheet.

To select the Floorizwarm AC Model that will best suit your needs, simply follow these five steps:

FLOORIZWARM AC MODEL

15-110 Square Feet

Step 1: Calculate Square Footage. Determine the square footage of the area to be warmed or snow melted. Enter the total square footage on line A.

Line A _____
(Square Footage)

Step 2: Determine Watts Per Square Foot. Determine the watts per square foot that you will need for your application. Note: Heatizon Systems suggests the following watts per square foot:

Floor-warming — 7.5 to 15 watts per square foot.

Space heating— watts per square foot and spacing between element runs should be determined by a heat loss calculation.

Snow-melting — 18 watts per square foot or greater.

Enter the desired total watts per square foot on Line B.

Line B _____
(Watts Per Square Ft)

Step 3: Calculate Total Watts. Calculate Total Watts by multiplying Line A by Line B and enter the result on Line C.

Line C _____
(Total Watts)

Step 4: Select the Correct Floorizwarm Model. Select the Floorizwarm unit that will deliver the total watts calculated in Step 3. Heatizon Systems recommends that you select the next larger Floorizwarm AC Model if the total watts calculated in Step 3 is between two models. Check the model number and write the corresponding “Length of Element” on Line D.

<u>Floorizwarm Model</u>	<u>Total Watts</u>	<u>Length of Element</u>
<input type="checkbox"/> Floorizwarm AC 15-20	228	50 feet
<input type="checkbox"/> Floorizwarm AC 20-30	324	80 feet
<input type="checkbox"/> Floorizwarm AC 25-36	360	70 feet
<input type="checkbox"/> Floorizwarm AC 36-50	528	160 feet
<input type="checkbox"/> Floorizwarm AC 50-64	688	125 feet
<input type="checkbox"/> Floorizwarm AC 64-75	980	260 feet
<input type="checkbox"/> Floorizwarm AC 75-110	1204	225 feet

Line D _____
(Length of Element)

Step 5: Calculate Element Spacing. Calculate the amount of space between the runs of element for your application for the Floorizwarm AC Model you have chosen: (Note: spacing between element runs should not exceed 6 inches.)

$$\frac{\text{Square Footage from Line A. Above}}{\text{Length of Element from Line D Above}} \times 12 = \text{Element Spacing Enter on Line E}$$

Line E _____ inches
(Element Spacing)

Congratulations! You have chosen the finest floor-warming and snowmelting product available. Remember, please read the installation instructions completely before you begin installation.

Call (801) 293-1232 or (888) 239-1232 to order the Floorizwarm AC Model number checked above.



HEATIZON
S Y S T E M S

M337 Programmable Thermostat With Remote Bulb Sensor

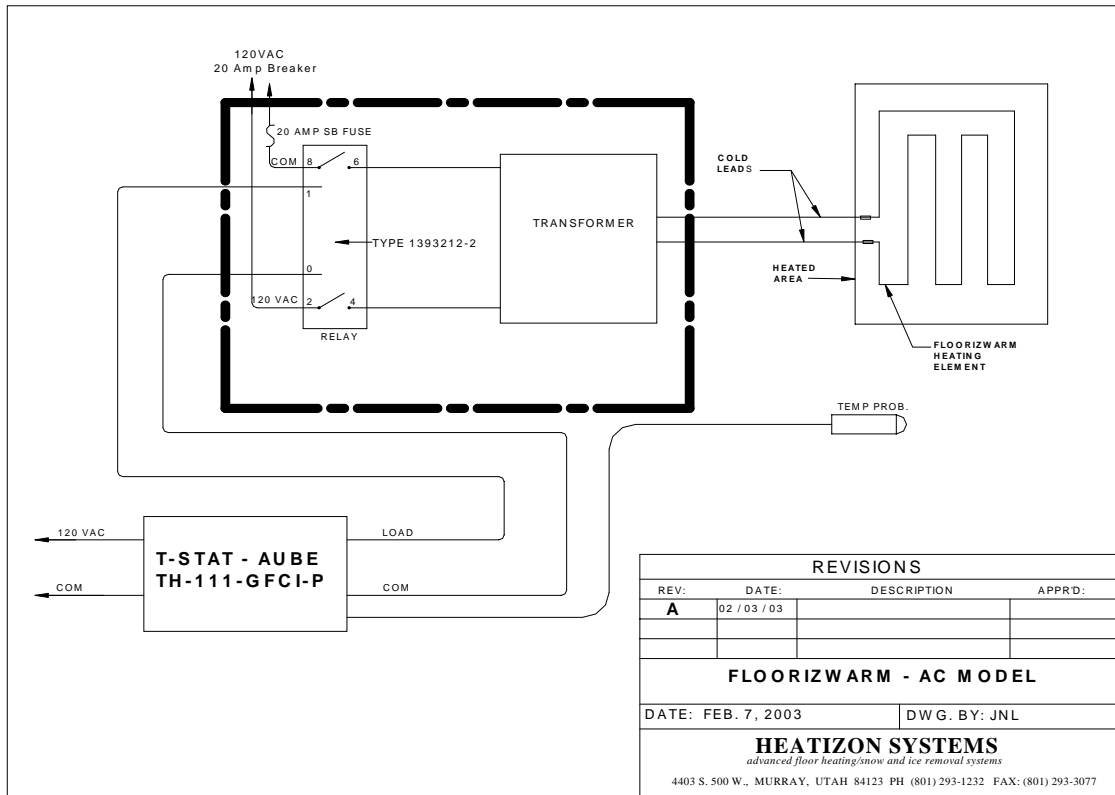
Wiring Instructions for the

Features:

- C Digital readout
- C Auto mode shows temperature settings
- C Manual mode maintains selected temperature
- C 120VAC power required

Applications:

- C Floor warming
- C Space Heating



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Toll Free (888) 239-1232

MODEL TH111GFCI-P (120 VAC)

SUMMARY

OPTIONS SELECTION

At the back of the thermostat, there are three selection switches to set at your preferences.

⇒ Temperature in °C or °F, time in 12 or 24 hours and early start function.

TO SET TIME AND DAY

Press on DAY, HOUR and MIN buttons to adjust time and day.

TO RECORD THE ☼ (COMFORT) SETPOINT TEMPERATURE

Select chosen setpoint temperature by using ▲ or ▼ button. Press on ☼ button (2 to 3 seconds) until icon appears on display.

TO RECORD THE ☾ (ECONOMIC) SETPOINT TEMPERATURE

Select chosen setpoint temperature by using ▲ or ▼ button. Press on ☾ button (2 to 3 seconds) until icon appears on display .

CHECKING GROUND FAULT CIRCUIT INTERRUPTER (GFCI)

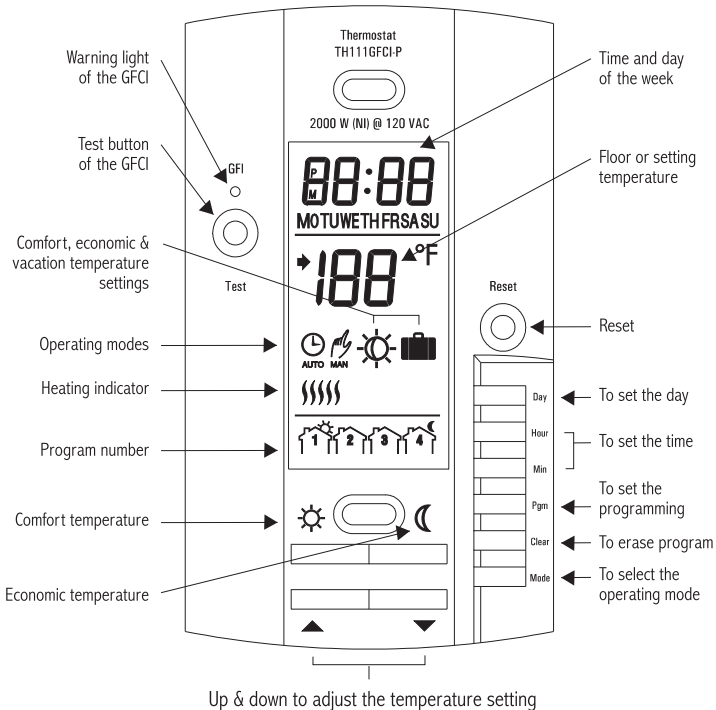
Adjust the setpoint temperature until heating indicator (|||||) appears on display. Press on TEST button. The test is conclusive if the warning light (GFI) on thermostat is ON and power to the load is cut-off (||||| remain on display though). If these events do not occur, check the installation. Press on RESET button to reset the GFCI.

OPERATING MODES

To select an operating mode, use MODE button.

AUTO: Runs the program. ▲ or ▼ shows temperature setting and can override temporarily your programming up to the next program

MAN: Maintains the selected temperature. ▲ or ▼ changes the temperature setting.



INSTALLATION

This thermostat is designed to control floor electric heating systems. The resistive load must not exceed 2000 watts (NI) @ 120 VAC (16.7 A). The thermostat is equipped with a ground fault circuit interrupter (GFCI) and therefore the isolation of the line and load are required for operation. The polarity of line connection (line and neutral) must be respected. During a ground fault, only the current in the black wire (line) of the load will be cut-off. Connect thermostat as shown on diagram.

Electricians or experienced technicians should install the thermostat.

This thermostat is designed to be used with a self-protected heating system equipped with thermal cut off and circuit breaker.

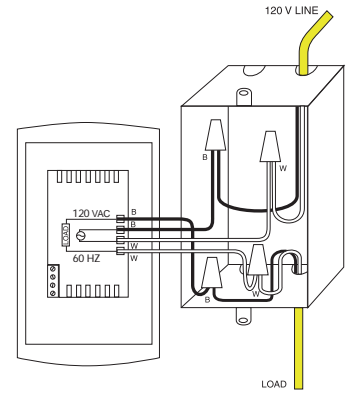
PARTS INCLUDED

- One (1) TH111 GFCI-P (120 VAC) thermostat
- Two (2) 6-32 screws
- Four (4) solderless connectors (for copper wire)
- One (1) Temperature sensor with a 15 foot extension

TURN OFF POWER OF THE HEATING SYSTEM AT THE MAIN POWER PANEL TO AVOID ELECTRICAL SHOCK. Keep air vents of the thermostat clean and free from obstructions.

1) Connecting wires and mounting thermostat

Connect the rear thermostat wires to the power supply and to the load using solderless connectors for copper wires. See schematic diagram.



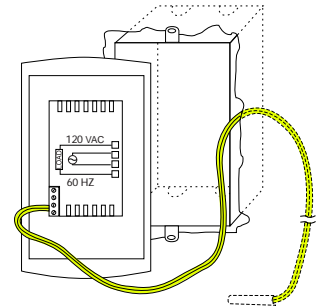
Push the excess wire back into the electrical box to prevent interference with the thermostat. Secure the thermostat using two (2) 6-32 screws . Once the thermostat is properly installed, return power to heating system.

Note 1 : All cables and connections must conform to the local electrical code.

WARNING : Special CO/ALR solderless connectors must be used when connecting with aluminum conductors.

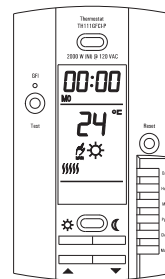
2) Connecting temperature sensor wire

Connect the temperature sensor wire to the two lower screws of the terminal block at the back of the thermostat (no polarity need to be respected). The wire must pass outside the electrical box and follow the wall down to the floor. The sensing probe should be placed in a representative heat area for maximum system performance. The sensing probe should be centered between the wires in the mat. The temperature sensor wire cannot cross any heater wires and the sensing probe must not be directly or adjacent to a heating wire.



Power-up

To power up thermostat:

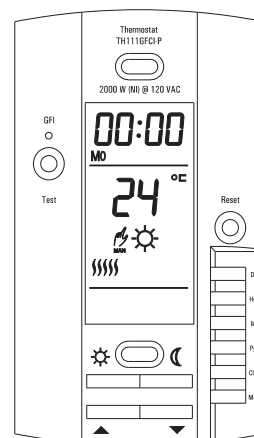


When power is applied for the first time, the display must show the time 00:00, the floor temperature and the manual mode icon (MAN). Other information might show up on the display if installation is defective or does not comply with the instructions. The warning light (GFI) must be off.

The message L0 or HI will appear on the display if the temperature sensor is defective or the temperature is below 0 °C (32 °F) or higher than 60 °C (140 °F). Also, the heating indicator will be present on display and the relay will be closed (current going in the load).

Checking ground fault circuit interrupter (GFCI)

Adjust the setpoint temperature until heating indicator (|||||) appears on display. Press on TEST button. The test is conclusive if the warning light (GFI) on the thermostat is ON and power to the load is cut-off. If these events do not occur, check the installation. Press on RESET button to reset the GFCI.



If the GFCI test fails: Check the load wires. The thermostat must be in heating mode to carry out the test (heating indicator ON).

The GFCI test should be carried out monthly. If the test fails, cut off the electric power to the heating system and call customer service or return the thermostat to your supplier for verification. If the warning light comes on during normal operation, cut off power to the heating system and have an electrician verify the installation.

OPERATING MODES

The TH111GFCI-P have two (2) operating modes.

MANUAL (MAN)

This mode allows you to maintain a constant temperature of the floor.

- 1- To activate this mode, press on Mode button to display the MAN icon.
- 2- Set the desired temperature using the ▲ ▼ buttons or select the pre-programmed ☼ or ☾ or ■ settings.
(To select the ■ setting, press on ☼ and ☾ simultaneously.)

AUTOMATIC (AUTO)

This mode executes your own programming.

To activate this mode, press on Mode button to display the AUTO icon. The ☼ or ☾ icon indicates which temperature setting is used. Also, the icon of the program number will be shown.

Memory back-up

In the event of a power failure, an internal circuit will maintain the programming and the time. But only the time could have to be set if power failure is more than 6 hours.

Early start function

The thermostat is providing a built-in function enabling it to calculate the optimum time to start the heating system to achieve the desired temperature setting at the programmed time. This function could start the heating system as early as 6 hours prior to the programmed time. To enable this function, set the switch E.S. to "ON" at the back of the thermostat.

PROGRAMMING

Programming the time and day

- 1-Set the time using the Hour and Min buttons.
- 2-Set the day using the Day button.

Programming the Comfort, Economic and Vacation settings

The Comfort ☀, Economic ☾ and Vacation ■ settings respectively represent the temperatures that you wish to have during the day ☀, at night ☾ or while you are away at work ☾, or while you are away for an extended period ■.

To program your settings

- To program the Comfort temperature, select the desired degree using the ▲ ▼ buttons and press the ☀ button until the ☀ icon is displayed (app. 3 seconds).
- To program the Economic temperature, select the desired degree using the ▲ ▼ buttons and press the ☾ button until the ☾ icon is displayed (app. 3 seconds).
- To program the Vacation temperature, select the desired degree using the ▲ ▼ buttons and press on the ☀ and ☾ buttons simultaneously until the ■ icon is displayed (app. 3 seconds).
- Press the Mode button to exit this function and return to the normal operating mode.

Schedule programming

The TH111GFCI-P allows 4 setting changes for each day of the week. There are no pre-set programs. The programs are tailored to perfectly adapt to your life style. The principle is very simple. For each day, enter the time at which you wake up (P1), the time you leave for work (P2), the time you arrive back home (P3) and the time you go to bed (P4).

Program	Mode	Time
1	☀	Wake-up time
2	☾	Leaving time
3	☀	Return time
4	☾	Bed time

NOTE : For temperature increases (Prog. 1 and 3), allow at least 15 minutes per °C. If you have lowered the temperature by 3 °C during the night and you wake up at 7 AM, change the setting at 6:15 AM.

For savings to be obtained, you must lower the temperature for a period of 2 to 3 times the delay required to bring the temperature back to your comfort level.

Example : If your system takes one hour to go from your saving temperature level to your comfort temperature level, it is useless to lower the temperature for a period less than 3 hours.

a) To Program your Schedule

- 1- Press on PGM button to access the programming mode.
- 2- Press on Day button to select the day to be programmed. You can select all days of the week by pressing on Day button for 3 seconds.
- 3- Press on PGM button to select program 1, 2, 3 or 4.
- 4- Press on Hour and Min buttons to program the time.
- 5- When you have completed your programming, press on Mode button to exit this function.

b) To Erase a Program :

Select the program using PGM and Day buttons, and press on Clear button. The time field displays ---:-- when the program is inactive.

c) Example 1 : Comfort period from 7:00 AM to 10:30 PM
Economy period from 10:30 PM to 7:00 AM
Identical schedule for all days of the week.

- 1- Press on PGM button to access the programming mode.
- 2- Press on Day button 3 seconds to select every day of the week.
- 3- Press on Hour button to enter 7:00 AM, Prog. 1 (☀).
- 4- Press on PGM button again to select Prog. 2 (☾), and press on Hour and Min buttons to enter 10:30 PM.
- 5- Press on Mode button to exit this function.

d) Example 2 : Comfort period: Monday to Friday from 6:15 AM to 8:15 AM and from 5:00 PM to 10:00 PM.

Schedule/Day	MON.	TUES.	WED.	THU.	FRI.	SAT.	SUN.
PROG. 1 ☀	6:15 AM	6:15 AM	6:15 AM	6:15 AM	6:15 AM	7:30 AM	7:30 AM
PROG. 2 ☾	8:15 AM	8:15 AM	8:15 AM	8:15 AM	8:15 AM	---	---
PROG. 3 ☀	5 PM	5 PM	5 PM	5 PM	5 PM	---	---
PROG. 4 ☾	10 PM	10 PM	10 PM	10 PM	10 PM	11 PM	11 PM

NOTE : It is faster to program the same schedule for every day and then modify the exception days.

- 1- Press on PGM button to access the programming mode.
- 2- Press on Day button 3 seconds to select every day of the week.
- 3- Press on Hour and Min buttons to enter 6:15 AM Prog. 1, (☀).
- 4- Press on PGM button to select Prog. 2 (☾) and Hour and Min buttons to enter 8:15 AM.
- 5- Repeat step 4 to enter Prog. 3 (5:00 PM) and Prog. 4 (10:00 PM).

NOTE : When making modifications, make sure you are in the right program.

To modify the Saturday and Sunday schedules:

- 6- Press on Day button until SA or SU is displayed.
- 7- Press on PGM button to select Prog. 1 (☀) and Hour and Min buttons to enter 7:30 AM.
- 8- Press on PGM button to select Prog. 2 (☾) and then Clear button to erase it.
- 9- Press on PGM button to select Prog. 3 (☀) and then Clear button to erase it.
- 10- Press on PGM button to select Prog. 4 (☾) and then Hour and Min buttons to enter 11:00 PM.
- 11- Press on Mode button to exit this function.

Temporary or permanent temperature bypass

This operation allows you to temporarily modify the floor temperature while you are in the Automatic mode. Simply press on ▲ or ▼ buttons to select the desired temperature, or the ☀ or ☾ button to select the Comfort or Econo settings you have programmed. This temperature will be maintained until the beginning of the next programmed schedule.

You can also switch to the Vacation setting for a prolonged absence by pressing on ☀ and ☾ at the same time. The display will show ■ icon. In that case, the temperature bypass is permanent. To return to the normal operating mode, press on Mode button.

If you wish to immediately return to the programmed settings, press on Mode button twice.

CHARACTERISTICS

- Model: TH111GFCI-P (120 VAC)
- Supply: 120 VAC, 50/60 Hz
- Load: 16.7 A maximum (Resistive only)
- Power: 2000 watts (NI) @ 120 VAC
- Ground fault circuit interrupter (GFCI): Class A (5 mA TRIP LEVEL)
- Approvals: CSA / C, US
- Display range: 0 to 60 °C (32 to 140 °F)
- Setting range: 5 to 40 °C (40 to 104 °F)
- Comfort default setting: 28 °C (82 °F)
- Econo default setting: 18 °C (64 °F)
- Storage: -20 to 50 °C (-4 to 120 °F)

WARRANTY

AUBE TECHNOLOGIES INC. ONE (1) YEAR LIMITED WARRANTY

This product is warranted against material defects and workmanship in normal use for a period of one year, from the date of the original purchase from authorized dealers. During this period, AUBE technologies inc. will repair or replace the product with a new or of equivalent quality at AUBE'S option, without charge, any product proven defective in normal use.

Warranty does not cover transportation costs. Nor does it cover a product subjected to misuse or accidental damage. This warranty does not cover the cost of installation, removal or reinstallation.

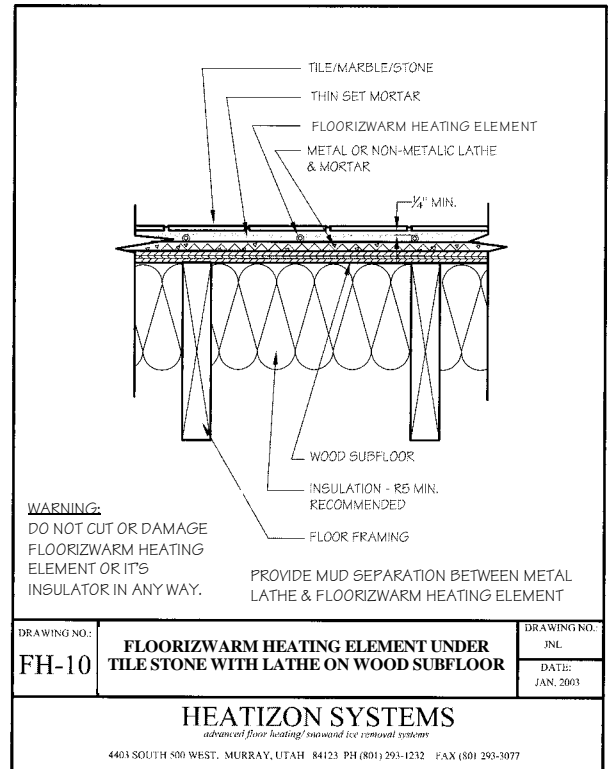
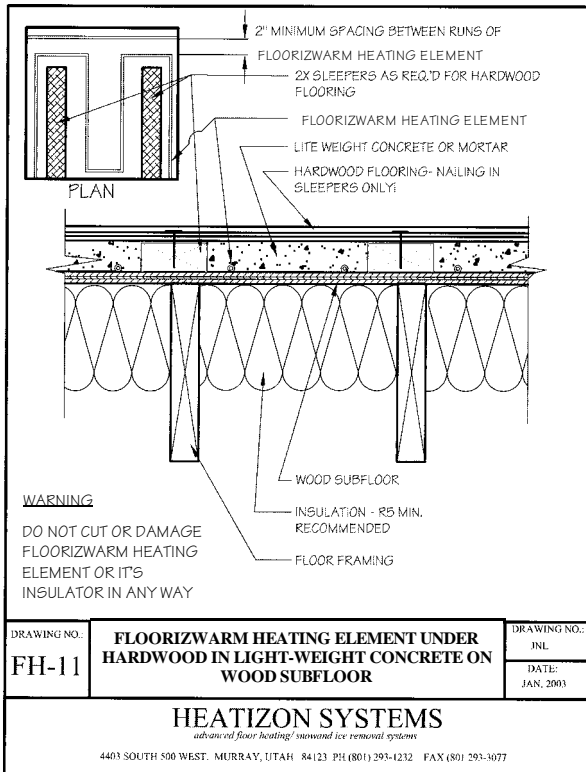
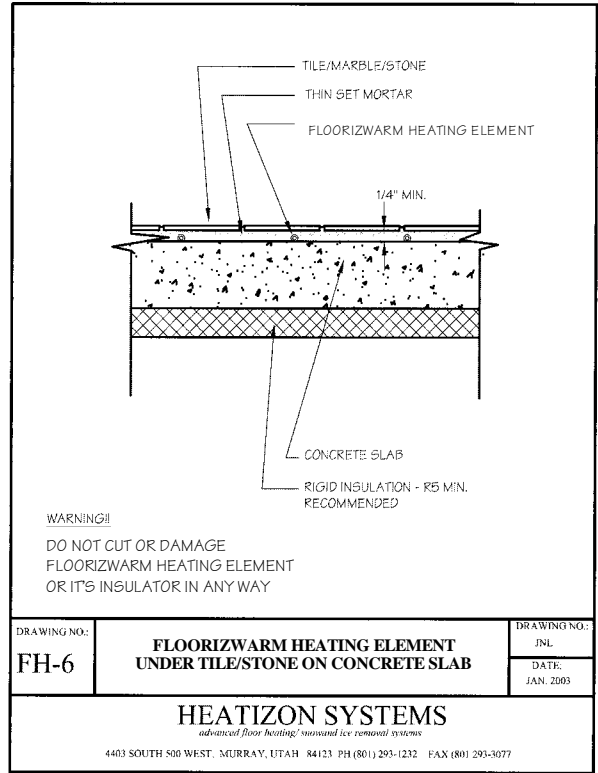
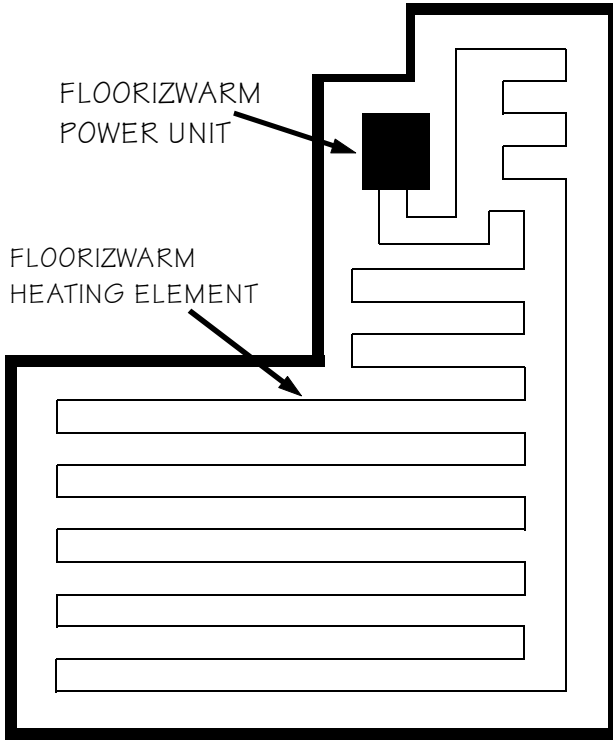
This limited warranty is in lieu of all other warranties, obligations or liabilities expressed or implied by the company. In no event shall AUBE technologies inc. be liable for consequential or incidental damages resulting from installation of this product. Some states or provinces do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above exclusions or limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

The defective product and the original sale receipt must be returned to the original dealer or shipped pre-paid, insured and addressed to:

Aube technologies inc., 705 Montrichard, Iberville (Quebec), Canada, J2X 5K8

If you have any questions concerning the installation or programming of this product, please call our technical assistance at (450) 358-4600 for the Montreal area or **1-800-831-AUBE** for outside area, Monday to Friday between 8:30 AM and 5:00 PM Eastern time.

FLOORIZWARM SYSTEM SAMPLE LAYOUT



COMPARATIVE R-VALUES OF FLOORING AND SUBFLOORS

Material	Typical R-Value	R-Value Per Inch	Typical Thickness
Plywood	0.825	1.10	0.750
OSB	1.050	1.40	0.750
Softwood	0.825	1.10	0.750
Sheet Vinyl	0.200	1.60	0.125
Vinyl Composition Tile (VCT)	0.200	1.60	0.125
Linoleum	0.400	1.60	0.250
Linoleum	0.200	1.60	0.125
Dense Rubber Flooring	0.250	1.30	0.325
Recycled Rubber Flooring	1.100	2.20	0.500
Cork	1.125	3.00	0.375
Cork/MDF/Laminate	1.175	2.35	0.500
Brick	3.375	2.25	1.500
Marble	0.400	0.80	0.500
Ceramic Tile	0.250	1.00	0.250
Thinset Mortar	0.050	0.40	0.125
MDF/Plastic Laminate	0.500	1.00	0.500
Laminate Floor Pad	0.300	1.92	0.160
Engineered Wood	0.250	1.00	0.250
Engineered Wood	0.375	1.00	0.375
Engineered Wood	0.625	1.00	0.625
Engineered Wood	0.750	1.00	0.750
Engineered Wood Flooring Pad	0.200	1.60	0.125
Engineered Bamboo	0.720	0.96	0.750
Oak	0.638	0.85	0.750
Ash	0.750	1.00	0.750
Maple	0.750	1.00	0.750
Pine	0.975	1.30	0.750
Fir	0.900	1.20	0.750
Carpet Pad/ Slab Rubber 33 lb.	0.320	1.28	0.250
Carpet Pad/ Slab Rubber 33 lb.	0.480	1.28	0.375
Carpet Pad/ Slab Rubber 33 lb.	0.640	1.28	0.500
Carpet Pad/ Waffle Rubber 25 lb.	0.620	2.48	0.250
Carpet Pad/ Waffle Rubber 25 lb.	1.240	2.48	0.500
Hair Jute	1.940	3.88	0.500
Hair Jute	1.250	3.88	0.325
Prime Urethane	1.400	4.30	0.325
Prime Urethane	2.150	4.30	0.500
Bonded Urethane	1.350	4.20	0.325
Bonded Urethane	2.100	4.20	0.500
Carpet	0.700	2.80	0.250
Carpet	1.050	2.80	0.375
Carpet	1.400	2.80	0.500
Carpet	1.750	2.80	0.625
Carpet	2.100	2.80	0.750
Wool Carpet	15.75	4.20	0.375
Wool Carpet	2.100	4.20	0.500

R-Values are approximate. Check with manufacturer for individual products.
 Excerpted from Radiant Panel Association *Radiant Flooring Guide*.

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.

IF FLOORIZWARM UNIT DOES NOT HEAT FLOOR:

1. There is no power in the Floorizwarm Power Unit:

- Turn circuit breaker to the "off" position. Check for proper power connection to the control unit.
- Turn circuit breaker to the "off" position. Check all connections in control unit.
- Check that the 20 amp circuit breaker panel is in the "on" position.

2. There is power in the Floorizwarm Power Unit:

- Check the fuse in the Floorizwarm Power Unit.
- Check that the Thermostat is wired properly.
- Check that the Thermostat is programmed correctly and is calling for heat.
- Push the GFI reset on the Thermostat.
- Check for 120 VAC on relay coil across pin 0 and 1.
- Check for 120 VAC on primary of Transformer.
- Check for proper voltage on secondary of Transformer.
- Using a clamp on Amp meter, check for current in the heating element. If not amperage is present, turn the circuit breaker to the Power Unit to the "off" position, disconnect the Cold Lead from the Transformer, and check for continuity of the Floorizwarm Heating Element.

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.

Heatizon Systems After Installation Element Test

WARNING: Danger of Fire. This test will not detect cuts in Z Mesh, Tuff Cable, or Floorizwarm Heating Element.

Attached please find three forms titled "Heatizon Systems After Installation Element Test." Heatizon Systems recommends that the measurements be taken and the attached forms be completed on all zones on three different occasions. The First Element Test should be conducted immediately after the Cold Lead and Z Mesh, Tuff Cable, or Floorizwarm Heating Element has been installed and before it has been covered up with floor covering, roofing material, concrete, etc. The Second Element Test is to be conducted following the covering of the heating element and immediately prior to installing the Control Box. The third Element Test should be conducted immediately following the energizing of the system. All of these tests may be conducted by using either the Control Box and Transformer provided as part of your Heatizon Systems Product, or by using Heatizon Systems Element Tester (Part Number NI113). It is important that the same source be used to energize the Z Mesh, Tuff Cable and Floorizwarm Heating Element for all tests taken.

It is Heatizon Systems recommendation that each test be completed by the party responsible for the installation and witnessed by a representative of the party which contracted for the installation. It is essential that all of the blanks on each "After Installation Element Test" form be completely filled out and that the form be signed by both the party completing the test and the party witnessing the test.

Conducting these tests will help insure that a third party or an unknown event has not adversely impacted the heating element. In addition the results of these tests may help you in any troubleshooting that must be performed on the system(s).

Warning: In the event any of the measurements taken during the three After Installation Element Tests are different, a problem may exist. Do not energize your Heatizon Systems product, and call Heatizon systems Technical Support at (801) 293-1232 to discuss the options available.

Element Tester Instructions

Part Number NI113

1. Connect one of the welding cable leads from the Element Tester to one of the Cold Leads near the point where the Cold Leads will eventually connect to the transformer.
(Note: Cold leads are the Number 2 wires extending from the heating element to the transformer).
2. Connect the other welding cable lead from the Element Tester to the other Cold Lead near the point where the Cold Leads will eventually connect to the transformer.
3. Plug the Element Tester power cord into a 120 VAC power source.
4. Turn the Tester to the "on" position.
5. Using an Amp meter, read the amperage (Amps) and Voltage (Volts) and record them on the form titled "Heatizon Systems After Installation Element Test." The voltage is to be read at the connection of one of the Cold Leads and the welding cable lead from the Element Tester. Amperage can be read anywhere along either Cold Lead.
5. Continue taking the amperage and voltage readings every five (5) minutes or until the readings remain the same. (Note: At the point where the readings remain the same, the temperature of the element should be stabilized.)
6. Read and record the temperature of the area where the heating element is located.
7. Using the numbers recorded on the form titled Heatizon Systems after Installation Element Test and the form titled Calculation of Element Length, the length of the heating element can be calculated or verified.

Note: When using the Control Box and Transformer provided as part of your Heatizon product to conduct the "Heatizon Systems After Installation Element Tests," the entire product must be installed per this manual. Once installation is complete, conduct three Element Tests by following steps 4 through 7 above.

Heatizon Systems After Installation Element Test #1

Date: _____

Time Test Began: _____AM/PM

Time Test Ended: _____AM/PM

Zone Number:_____ Direction:_____ Area Covered: _____

Primary Input Power _____Amps _____ Volts

Length of Element: _____ Feet

Type of Element: ▪ 12" Screen ▪ 9"Screen ▪ Tuff Cable ▪ Floorizwarm

Total Length of Cold Leads Including Jumpers: _____ Feet

Surface Temperature of Heatizon Heated/Snowmelt Area at the Beginning of Test: _____^oF

At Beginning of Test: Amps _____ Volts _____

After 5 Minutes: Amps _____ Volts _____

After 10 Minutes: Amps _____ Volts _____

After 15 Minutes: Amps _____ Volts _____

After 20 Minutes: Amps _____ Volts _____

Surface Temperature of Heatizon Heated/Snowmelt Area at the End of Test: _____^oF

Communication tested with: ▪ drip edge ▪ valley metal ▪ other metal

Other metal described: _____

Test Completed by: _____ Daytime Phone # _____
(Please Print)

(Signature)

Test Witnessed by: _____, on this _____ Day of _____, 200____
(Please Print)

(Signature)

Heatizon Systems After Installation Element Test #2

Date: _____

Time Test Began: _____AM/PM

Time Test Ended: _____AM/PM

Zone Number:_____ Direction:_____ Area Covered: _____

Primary Input Power _____Amps _____ Volts

Length of Element: _____ Feet

Type of Element: - 12" Screen - 9"Screen - Tuff Cable - Floorizwarm

Total Length of Cold Leads Including Jumpers: _____ Feet

Surface Temperature of Heatizon Heated/Snowmelt Area at the Beginning of Test: _____ °F

At Beginning of Test: Amps _____ Volts _____

After 5 Minutes: Amps _____ Volts _____

After 10 Minutes: Amps _____ Volts _____

After 15 Minutes: Amps _____ Volts _____

After 20 Minutes: Amps _____ Volts _____

Surface Temperature of Heatizon Heated/Snowmelt Area at the End of Test: _____ °F

Communication tested with: - drip edge - valley metal - other metal

Other metal described: _____

Test Completed by: _____ Daytime Phone # _____
(Please Print)

(Signature)

Test Witnessed by: _____, on this _____ Day of _____, 200____
(Please Print)

(Signature)

Heatizon Systems After Installation Element Test #3

Date: _____

Time Test Began: _____AM/PM

Time Test Ended: _____AM/PM

Zone Number: _____ Direction: _____ Area Covered: _____

Primary Input Power _____Amps _____ Volts

Length of Element: _____ Feet

Type of Element: ▪ 12" Screen ▪ 9"Screen ▪ Tuff Cable ▪ Floorizwarm

Total Length of Cold Leads Including Jumpers: _____ Feet

Surface Temperature of Heatizon Heated/Snowmelt Area at the Beginning of Test: _____^oF

At Beginning of Test: Amps _____ Volts _____

After 5 Minutes: Amps _____ Volts _____

After 10 Minutes: Amps _____ Volts _____

After 15 Minutes: Amps _____ Volts _____

After 20 Minutes: Amps _____ Volts _____

Surface Temperature of Heatizon Heated/Snowmelt Area at the End of Test: _____^oF

Communication tested with: ▪ drip edge ▪ valley metal ▪ other metal

Other metal described: _____

Test Completed by: _____ Daytime Phone # _____
(Please Print)

(Signature)

Test Witnessed by: _____, on this _____ Day of _____, 200____
(Please Print)

(Signature)

