HEATIZON SYSTEMS

RADIANT HEATING AND SNOW MELTING SYSTEMS

Cozy Heat®

Cozy Heat® Design & Installation Manual

Cozy Heat® is a Registered Trademark of Heatizon Systems

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Cozy Heat® Specifications

Heating cable	Cozy Heat®
Voltage	120, 208, 240, 277 or 480V
Watts	Up to 25W per lin. ft. in free air
Length	Refer to product label
Diameter/Height	5mm (Approx. 3/16")
Bending Radius	5D** (Approx. 1")
Cable Type	1 or 2 Conductor
Shield	Copper
Insulation	Fiberglass
Casing (optional)	HDPE 248°F (120°C)
Temperature Max	248°F (120°C)
Cap Thickness	1/2" min to 2" max

** 5 Times (5D) the Cozy Heat® Diameter

Electrical Connection Wiring

120V and 277V Connection	
Phase	Cold Lead
Neutral	Cold Lead
Ground	Shield

208, 240 and 480V Connection	
Phase	Cold Lead
Phase	Cold Lead
Ground	Shield

Sample Insulation Values

Source: *Radiant Flooring Guide—2008 Edition*
"Comparative R-Values of Flooring and Subfloors"

Vinyl floor tiles *	R = 0.200 to 0.400
Carpet, Standard (Some may be compatible)	R = 0.700 to 2.100
Ceramic Tile *	R = 0.250
Marble *	R = 0.400
Engineered Wood *	R = 0.250 to 0.750
Thinset Mortar*	R = 0.050

*Compatible with Cozy Heat® Floor Warming

Note: It is important that Cozy Heat® be installed only by a qualified individual who is familiar with the proper sizing, installation, construction and operation of floor warming systems and the hazards involved. Cozy Heat® products are designed for under floor heating purposes only.

Note: Cozy Heat® must be installed in accordance with the manufacturer's installation instructions, as well as the National Electric Code (NEC) or Canadian Electrical Code (CEC), part 1, and local regulations.

Note: A Ground Fault Protection device (GFCI) or a Residual Current Device (RCD) may be required. See the NEC, CEC and/or local building codes for details.

Note: The maximum insulation value of the flooring material where Cozy Heat® is installed should not exceed R= 1.5, There is no limit for the insulation under the sub floor.

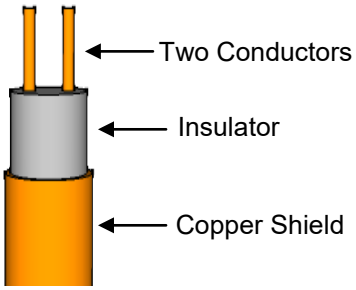
Note: A cementitous material is required as a cover for Cozy Heat® floor heating applications. Sleepers are required when installing nail down hardwood flooring over Cozy Heat®.

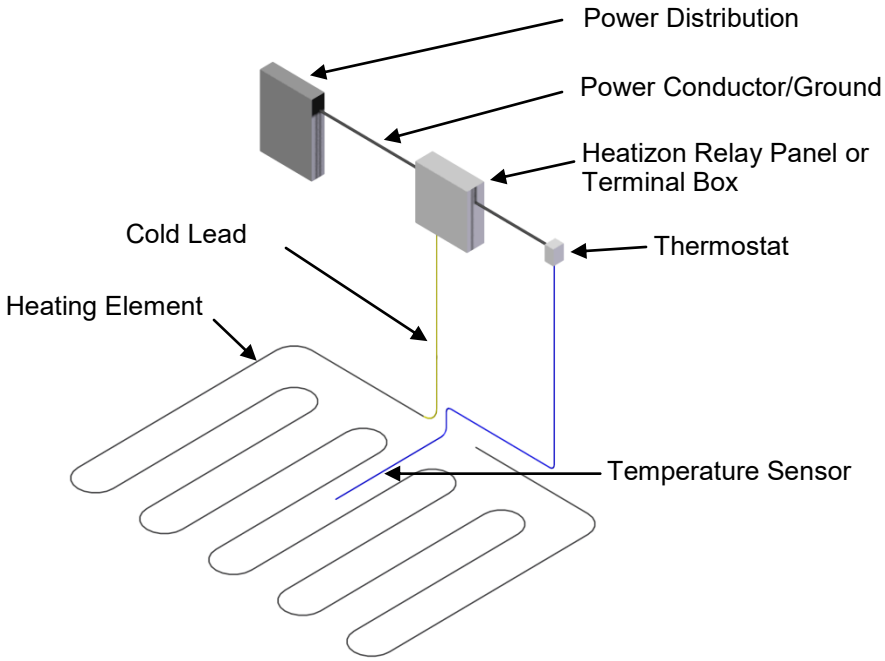
Note: See the floor covering manufacturer for the R-Value of its product, plus any pads, to determine if Cozy Heat® is appropriate for your application. Consult the floor covering manufacturer for special installation requirements for installing its products over Cozy Heat® .

Required Tools:
500 Vdc Megohmeter, Digital Multimeter
Screwdrivers, Utility Knife
Wire Stripper, Crimping Tool

Cozy Heat® Floor Warming and Space Heating System with Two-Conductor MI Cable

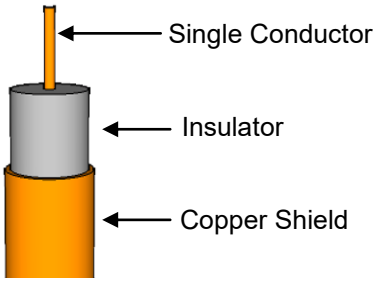
Cozy Heat® Cable

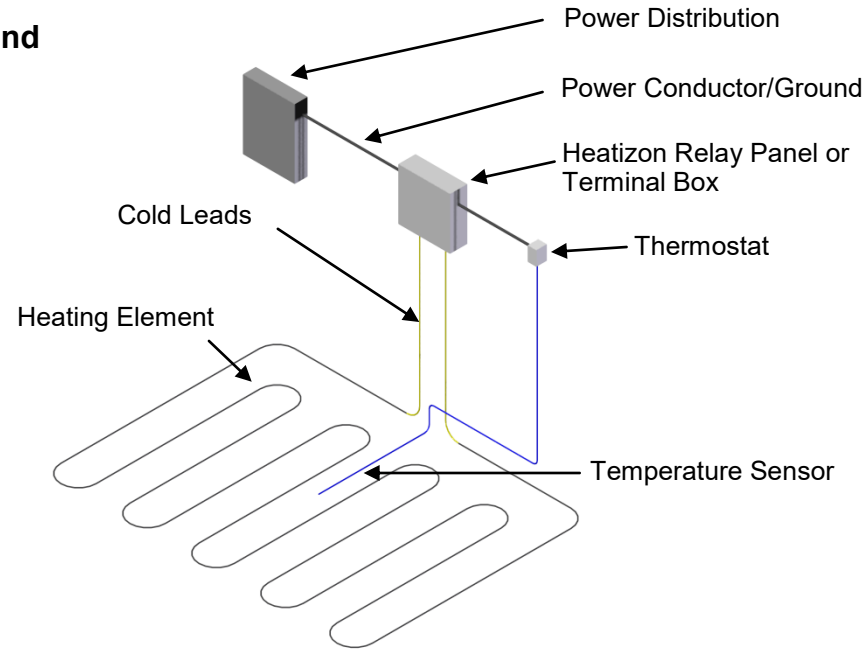




Cozy Heat® Floor Warming and Space Heating System with One-Conductor MI Cable

Cozy Heat® Cable





Warnings

- Read this entire Design and Installation Manual prior to installing Cozy Heat® .

- Always use a floor temperature sensing thermostat when installing Cozy Heat® for floor warming. Use an ambient temperature sensing thermostat when installing Cozy Heat® for space heating purposes.

- Do not install Cozy Heat® in walls or ceilings.

- Cozy Heat® must be embedded in mortar, self leveling concrete, thin set or other cementitious material for floor and space heating applications under floor coverings.

- The minimum installation temperature is 40ºF (5ºC).

- Do not cut Cozy Heat® 's heating element.

- Use only copper wire from the distribution panel to the thermostat. Size per the NEC or CEC.

- When installing Cozy Heat® , do not allow the Cozy Heat® Heating Element to touch or cross its Cold Leads, gas lines or any other electrical conductors.

- The maximum Watts per square foot should not exceed 15 for floor heating and 20 for slab heating. In the event the heat load required for space heating is greater than 15 Watts per square foot , call Heatizon Systems at 801-293-1232 prior to installing. Floor warming applications are typically satisfied with 8 to 12 Watts per square foot.

Reminders

Always measure, verify and record the actual resistance at specific points throughout the installation process. A resistance recording page is included in this manual for this purpose (see page 10). Compare each reading to the ratings on the product table. If the taken readings differ from those expected on the product table or previously taken, do not energize the Cozy Heat® , and call Heatizon Systems, 801-293-1232.

Always roll the Cozy Heat® spool or uncoil the coil to unreel the heating element. Do not pull Cozy Heat® from the spool.

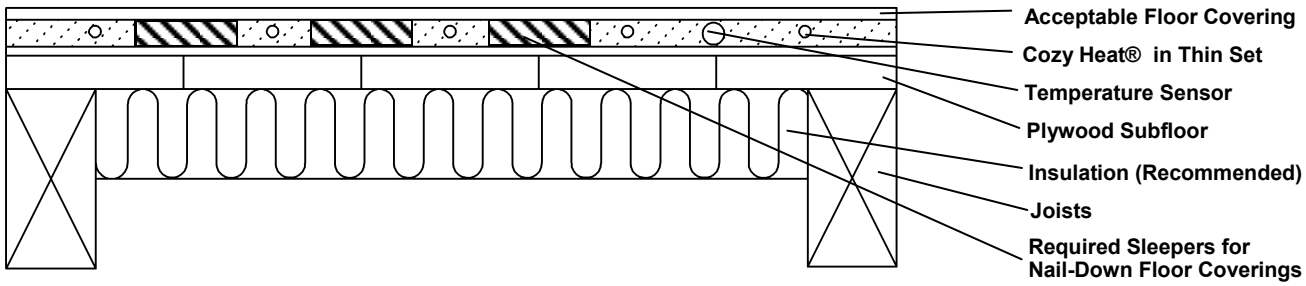
Remember to verify that the supply voltage matches the design voltage of the Cozy Heat® product you have purchased.

Interior space heating always requires heat loss or heat load calculations.

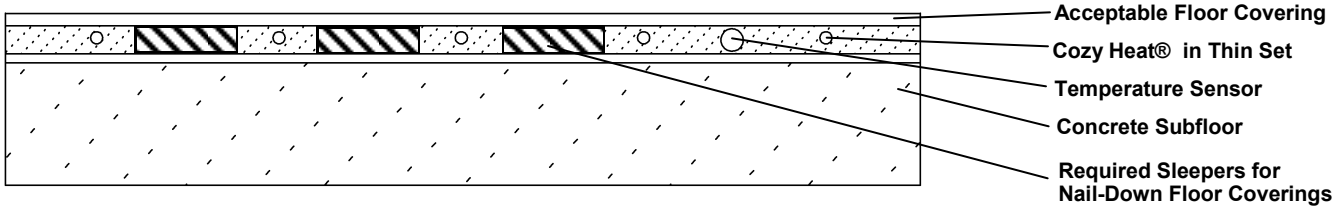
Metal structures or materials used to install or support the Cozy Heat® Heating Element must be grounded in accordance with CEC in Canada, and with the NEC in the US.

Please contact Heatizon Systems with additional questions @ 801-293-1232

Sample Application: Cozy Heat® on Wood Subfloor Under Acceptable Floor Covering



Sample Application: Cozy Heat® on Concrete Subfloor Under Acceptable Floor Covering

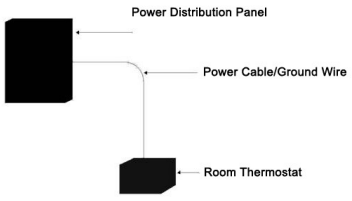


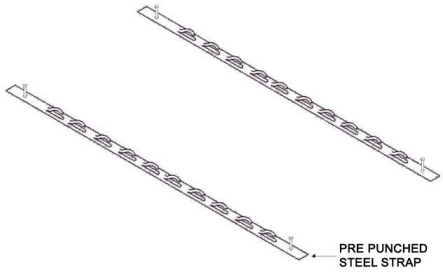
Design and Installation

STEP 1 SUBFLOOR PREPARATION

Ensure that the subfloor is flat and securely anchored to prevent it from moving and damaging the Cozy Heat® Heating Element and floor covering. Carefully fill in all gaps in the securely anchored subfloor.

Clean the subfloor thoroughly, removing dust , miscellaneous debris and all other materials from the subfloor that may damage the Cozy Heat® Heating Element. Eliminate protruding nails, staples, or any other objects that may damage the Cozy Heat® Heating Element prior to installation.

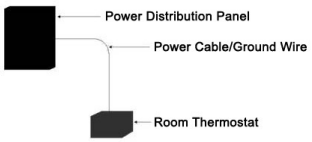


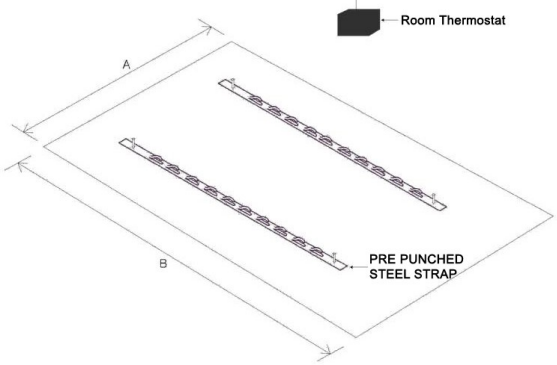


STEP 2 PLAN THE LAYOUT

Draw a sketch of the floor plan of the room where Cozy Heat® is to be installed. Include furnishings and fixtures, such as toilets, bathtubs, appliances, cabinetry etc. The sketch should show all measurements and dimensions in order to determine the floor area available for floor warming. Determine the location for the Cozy Heat® thermostat and floor sensor. Remember, the starting place for the Cozy Heat® Heating Element (and also the ending, if using single conductor Cozy Heat®) must be within 25 feet of the thermostat for standard cables. Custom cables may have longer cold leads per project requirements.

Note: 120 and 208/240/277 thermostats must be located at least 4 feet away from shower or bathtub openings so that it cannot be exposed to water, and so that persons in the shower or bathtub area cannot make contact with the thermostat.

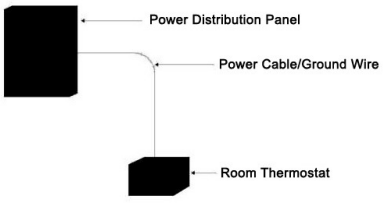


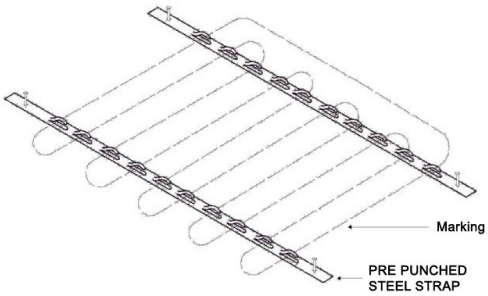


STEP 3 TRANSFER TO THE FLOOR

Using a chalk line or carpenter's pencil, draw an outline of the floor area to be heated directly on the sub floor, including permanently installed and uninstalled furnishings/fixtures.

Using your floor plan sketch, determine the desired appropriate spacing of Cozy Heat® Heating Element. Heatizon Systems recommends 6" to 12" spacing as required to satisfy heat loss calculations for slab heating or space heating or 3" to 9" spacing and 8 to 12 watts per square foot for floor warming, see an authorized Heatizon Systems distributor for more details. Note that the minimum distance between the cables cannot be less than 1 inch. Using a chalk line, crayon, chalk etc, mark the desired location where each run of Cozy Heat® Heating Element will be installed using the predetermined appropriate spacing for the Cozy Heat® Heating Element. Once the Cozy Heat® Heating Element locations are satisfactorily marked, you can optionally cover each chalk line with a clear spray lacquer.



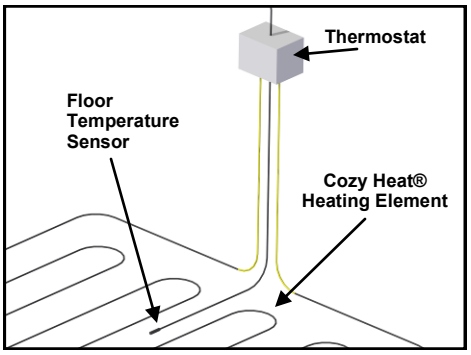


Establish the location of the connection points between the Cold Lead and the Heating Element. The connection must be embedded in cementitious material for floor and space heating applications.. For slab heat loss replacement, connections and heating element are typically not embedded and attached to the bottom of concrete slabs for floors over non-heated areas. See an authorized Heatizon Systems distributor for design parameters.

Design and Installation

STEP 4 LAYOUT AND PREPARE FLOOR SENSOR

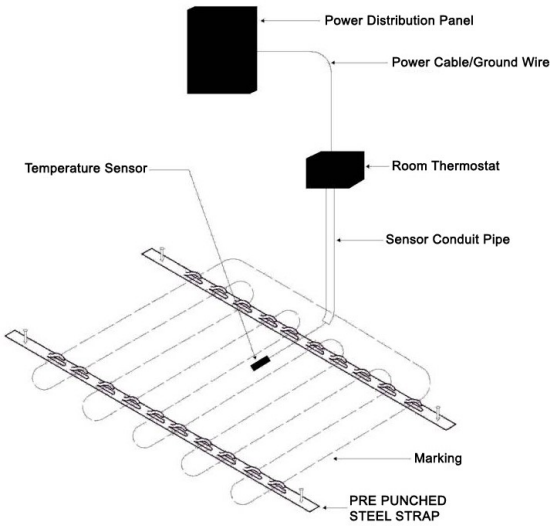
If a floor temperature sensor is being used, mark the sensor position between two Cozy Heat® Heating Element runs, approximately 10 inches away from the wall, and as close as possible to the thermostat.



STEP 5 INSTALL SENSOR CONDUIT

When using a conduit for an in-floor sensor, install it between the thermostat wall box and the sensor location. It may be necessary to countersink the conduit into the wood or concrete subfloor.

Cover the end of the conduit with tape so that cementitious materials cannot enter it. Use a quick drying glue or hot glue to hold the sensor conduit in the groove and prevent it from floating up while the cementitious material is installed for floor and space heating applications. For slab heat loss replacement, sensor leads can be installed in conduit or attached to the slab using the same method as the heating cable.

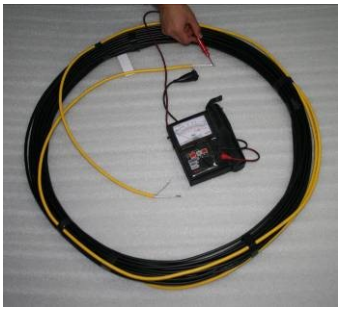


Note: The sensor conduit must be centered between two runs of Cozy Heat® Heating Element, and must extend out at least 10 inches away from the wall.

Warning: Do not allow the sensor conduit to cross the Cozy Heat® Heating Element. Do not allow the sensor head to touch the Cozy Heat® Heating Element. Do not run the sensor lead in the same conduit as the heating cable cold leads.

STEP 6 MEASURE & RECORD RESISTANCE

Remove the Cozy Heat® Heating Element from the box. Using a Megohmmeter Tester, check the insulation resistance of the Heating Element to make certain it is greater than 20MΩ. Confirm the Megohmmeter result by measuring the resistance with a Digital Multimeter and record the value measured on *Resistance Recording Table a*t the back of this manual. Resistance measurement must be taken several times during the installation process: Immediately upon removal from the packaging and after installation of the heating element. Cozy Heat® Cable should also be checked for electrical continuity.

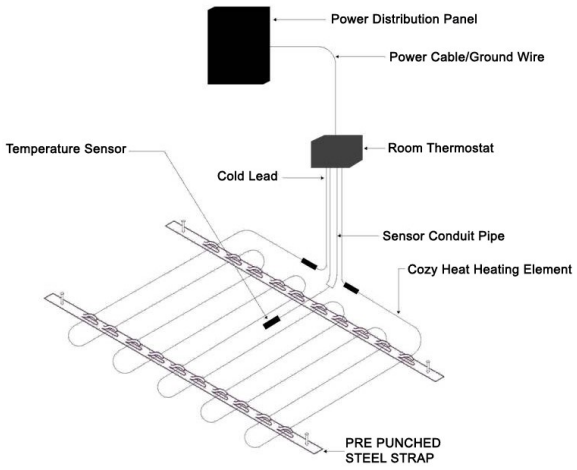


Design and Installation

STEP 7 INSTALL COZY HEAT® HEATING ELEMENT

Install the Cozy Heat® Heating Element so that the starting and ending connection points and the temperature sensor are in their desired locations. Make certain that two ends of the Cold Lead cables for one conductor Cozy Heat® , and one end of the Cold Lead cable for two conductor Cozy Heat® , return back to the thermostat, termination box or relay panel.

For embedded applications such as floor and space heating, begin laying the Cozy Heat® Heating Element across the subfloor on the previously marked and evenly spaced marked lines. You may use the optional pre-punched steel straps, construction glue, hot glue, foil tape or Heatizon Plastic Clips to secure the cable to the subfloor. For slab heat loss replacement, attach the heating cable in the pre-determined layout to the under side of the concrete slab using steel strapping or clips with masonry screws or anchors. Measure and record the resistance on *Resistance Recording Table a*t the back of this manual.



Warning: Do not cut or shorten the Cozy Heat® Heating Element. Do not damage or subject the Cozy Heat® Heating Element to mechanical or shear stress. Always avoid walking on the heating element. In the event Cozy Heat® Heating Element or its Cold Lead cables get damaged, contact Heatizon Systems at 801-293-1232 and do not cover.

Note: Heatizon recommends that photographs of the installed Cozy Heat® Heating Element be taken and/or hand drawings documenting the layout be completed prior to installing the cementitious material and flooring materials.

Note: If the optional pre-punched steel straps are utilized to attach the Cozy Heat® Heating Element to the subfloor, check for continuity between the Cozy Heat® Heating Element and each pre-punched steel straps prior to covering.

STEP 8 INSTALL THE IN-FLOOR SENSOR

If the optional sensor conduit has not been installed, the floor sensor must be installed now. Install the floor sensor designed for the thermostat you have selected per the manufacturer's instructions.

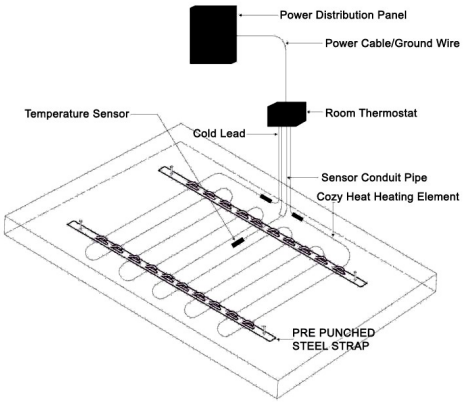
Note: the in-floor sensor must not cross or come into contact with the Cozy Heat® Heating Element or Cold Leads. The in-floor sensor should be installed between lengths of Cozy Heat® Heating Element and at least 10" from any wall.

STEP 9 FLOOR FINISHING

Ensure that the optional sensor conduit or that the in-floor sensor have been properly installed before proceeding beyond this point.

For stone and tiling applications
Proceed with the installation of the tiles by covering the Cozy Heat® Heating Element with a layer of cementitous material, as directed by the tile manufacturer. Ensure that the cementitous material covers the entire Cozy Heat® heating element ***and*** the connection between the heating element and Cold Leads before the stone or tiles are installed.

For other flooring applications
Proceed with the applying or self-leveling cement, or other cementitous material. Ensure that the cementitous material covers the entire heating element ***and*** the connection between the heating element and Cold Leads before the floor covering is installed.



For slab heat loss replacement
Be sure the Cozy Heat® heating element and cold leads are securely fastened to the slab and ready for insulating. Metal application tape can be placed over the heating cable adhered to the concrete slab or surface to help secure the heating cable and disperse heat. Always follow design specifications for insulation installation standards to finish the heat loss replacement installation.

Note: Consult the manufacturer of the carpet, wood (natural or engineered) or laminate floor coverings for maximum temperature tolerances. Always use a Cozy Heat® thermostat with a floor temperature sensor for these floor coverings.

When applicable, eliminate all moisture in the self leveling cement or other cementitous material in accordance with drying times recommended by the manufacturer. Cozy Heat® must not be turned on until cementitous material has fully dried (a minimum of 7 days is recommended). Once the cementitous material has dried, measure and record resistance on *Resistance Recording Table a*t the back of this manual. Determine that the megohms exceed 20 with a megohmmeter tester set at 500 Vdc.

STEP 10 CONNECT POWER SUPPLY & THERMOSTAT

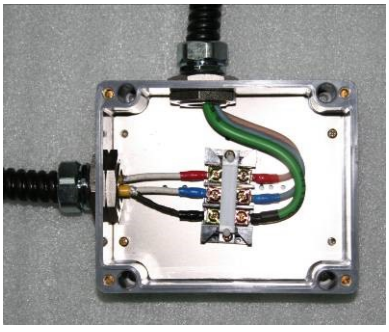
The connection of the power supply and the Ground Fault thermostat or power source must be done by a qualified individual in accordance with the National Electrical Code (NEC) and the Canadian Electrical Code (CEC). The qualified individual should also feed the sensor cable into the installed sensor conduit and connect it to the thermostat.

Wiring Instructions: The center of each Cold Lead is to be wired as follows:

120 and 277VAC — One to phase and one to neutral
208, 240, or 480VAC — Both to phase

The braided, foil or copper shield from the Cold Leads (for single conductor Cozy Heat®) or from one Cold Lead (for double conductor Cozy Heat®) must be wired to Ground for all primary power installations.

Measure and record a final resistance reading at this stage in the installation on the *Resistance Recording Table a*t the back of this manual. Determine that the megohms exceed 20 with a megohmmeter tester set at 500 Vdc.



Optional Terminal Box

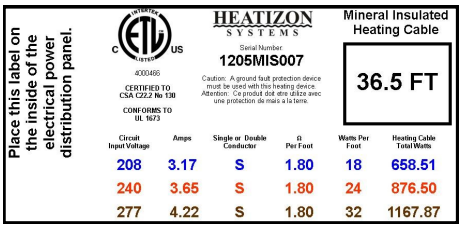
STEP 11 TROUBLESHOOTING

Problem: Cozy Heat® Cable fails the Megohmmeter Test
Potential Causes:

- Inspect the Cozy Heat® Cable for damage to the insulator or copper shield, and/or contact between the copper shield and the core wire(s). Replace entire length of damaged Cozy Heat® Cable.
- Call Heatizon Systems technical support @ 801-293-1232

Note: In the event the Cozy Heat® Cable has not been damaged in any way, remove and replace the entire length of Cozy Heat® or seek repair assistance from Heatizon Systems. For Warranty claims, please return the entire length of Cozy Heat® to Heatizon Systems, with the end termination and power termination connections intact, for evaluation prior to replacement.

STEP 12 COMPLETE AND ATTACH LABELS



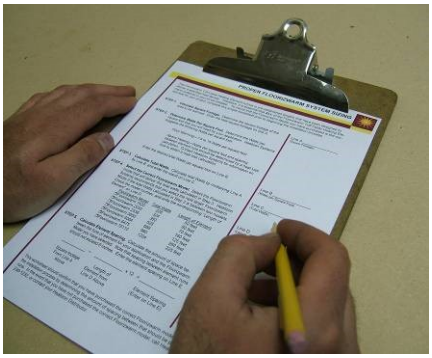
Place the included labels in the following locations:

- Electrical Panel Label — Inside door at electrical service panel. This label matches the label that is attached to the non-heating Cold Lead in the factory.
- Stop Sign Warning Label — on or near the area to be warmed/heated by Cozy Heat®

Note: Make certain to record information from the Product Identification Label, which can be found on the Cold Lead portion of each heating cable.

STEP 13 COMPLETE WARRANTY CERTIFICATE

Mail in the warranty certificate for Cozy Heat® and one for the thermostat immediately after installing the Cozy Heat® system. Failure to do so could void the manufacturer's warranty. The warranty is subject to the guarantee conditions listed on the warranty certificate, and upon documentation that the required resistance readings were completed. You may wish to keep a copy of the warranty card for your reference.



The Cozy Heat® system is now ready to use and enjoy! Adjust the floor temperature sensing thermostat until the floor reaches a comfortable level for floor warming applications. For space heating applications adjust the thermostat to your comfort level, usually 65º to 70º F. For slab heat loss replacement, adjust the thermostat to the design temperature to maintain zero heat loss on the slab.

Keep these instructions and all other owner/operating manuals for future reference.

Note: The Cozy Heat® Heating Element is designed for in floor heating and space heating applications or slab heat loss replacement.

Note: The Cozy Heat® Heating Element must be embedded in a cementitious material for floor and space heating applications under floor coverings.

Resistance Recording Page

Use a Digital Multi Meter to measure the resistance of the Cozy Heat® Heating Element, and compare it to the expected resistance for the product purchased. Expected Ohms/ft are shown in Table 1 or Table 2. Cozy Heat® MI Cable should be tested using a megohmmeter, set at 500 Vcd. The measured value should not be less than 20 megohms. Record all test results below.

Prior to Installation (When removed from Package)	After Installation of Cozy Heat® Heating Element	After Thin Set or Self Leveling Cement Application if Applicable	After Covering Material Installation/ Startup
Ohms	Ohms	Ohms	Ohms
Date Time	Date Time	Date Time	Date Time

Customer Warranty Information

Name					
Address					
City		**State**		**Zip**	
Phone		**Email**			

Purchased Product Details

Model		**Size**	Sq. Ft.
Manufacture Date		**Serial Number**	
Watts & Volts	Watts Volts	**Ohms**	Ω

Floor Covering	Tile/Stone ❒	Vinyl/Laminate ❒	Wood ❒	Carpet ❒	Other ❒

Heatizon Systems Cozy Heat® Warranty

Heatizon Systems warrants Cozy Heat® Heating Element to be free from defects in material and workmanship for a period of ten (10) 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, installation, 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 within ninety (90) days of the date of sale.

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.

How to make a Warranty Claim

1. Gather the following information:
   - Date of purchase
   - Who product was purchased from
   - Date of installation, if installed
   - Names and phone numbers of electrician/installer
   - Completed resistance recording page from installation
   - Serial number from product label

2. Contact Heatizon Systems for a Return Materials Authorization number, and information on the next required steps to complete your warranty claim.

HEATIZON SYSTEMS

Mail: Heatizon Systems
4137 South 500 West
Murray, UT 84123
USA

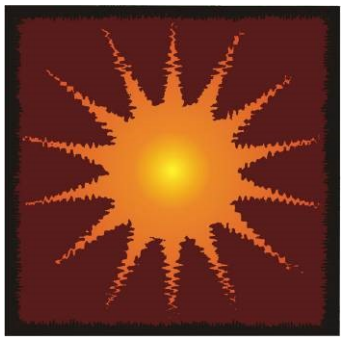
Phone: (801) 293-1232

Toll Free: (888) 239-1232

Fax: (801) 293-3077

Email: info@heatizon.com

Website: www.heatizon.com



Mail: Heatizon Systems
4137 South 500 West
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Phone: (801) 293-1232

Toll Free: (888) 239-1232

Fax: (801) 293-3077

Email: info@heatizon.com

Website: www.heatizon.com