HEATIZON SYSTEMS

RADIANT HEATING AND SNOW MELTING SYSTEMS

Cozy Heat®

Self Regulating Cable

Cozy Heat® SR Design & Installation Manual

HEATIZON SYSTEMS

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Cozy Heat®

Cozy Heat® SR Specifications

Watts per linear foot at 32° in iced water	5	9	12
Cable type	Self Regulating (SR)		
Copper bus wire	22 AWG Min		
Maximum maintenance temperature	185ºF (85ºC)		
Maximum intermittent exposure temperature	212ºF (100ºC) T rating: T5		
Voltage AC	120, 208, 240, 277		
Maximum length	Refer to product label		
Approximate thickness/ width	0.25” x 0.50”		
Bending radius	1”		
Minimum spacing	2”		
Standard spacing	4” to 9”		
Cap Thickness	1 1/2” - 4”		

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 i.e. GFCI, GFEP etc.) 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: Do not bend Cozy Heat® SR within 1.6” (40mm) of a termination or connection between the Cozy Heat® Heating Element and the cold lead or power connection.

Electrical Connection Wiring

120V and 277V Connection	
Phase	Conductor
Neutral	Conductor
Ground	Shield

208, 240 and 480V Connection	
Phase	Conductor
Phase	Conductor
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

Required Tools:
- 2500 VDC Megohmmeter
- Digital Multimeter (DMM)
- Screwdrivers
- Wire Stripper
- Crimping tool
- Utility Knife
- Heatshrink Heating device

Note: Cozy Heat® SR should be stored in cool, dry location

STEP 2 COZY HEAT® SR SPECIFICATIONS

PERFORMANCE RATINGS

Watts per linear foot at 32° in iced water	5	9	12
Cable type	Self Regulating (SR)		
Copper bus wire	22 AWG Min		
Maximum maintenance temperature	185ºF (85ºC)		
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Maximum length	Refer to product label		
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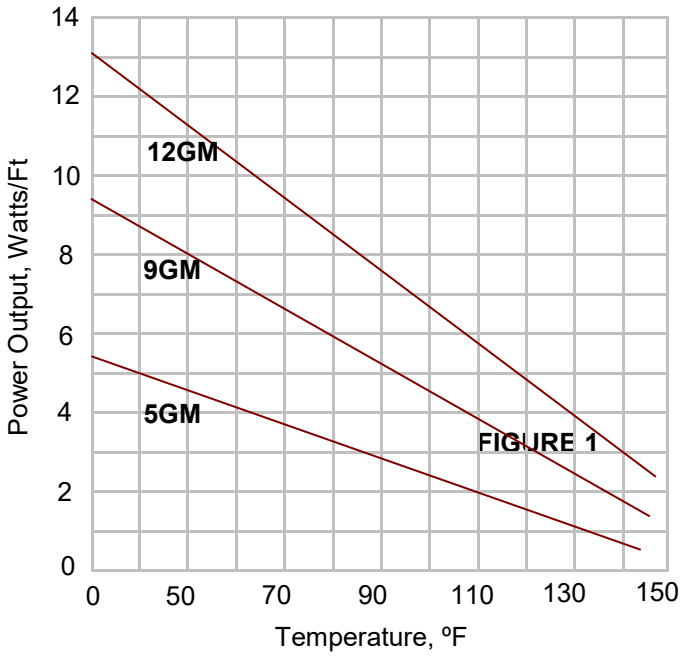
POWER OUTPUT CURVE



BREAKER SIZING AND MAX CIRCUIT LENGTH

120 Volt Breaker Sizing vs Max Circuit Length (ft)

		15A	20A	30A	40A
5GM1 If started at	40ºF	300	—	—	—
	0ºF	200	270	330	—
	-20ºF	180	230	330	—
9GM1 If started at	40ºF	150	200	210	—
	0ºF	95	125	190	210
	-20ºF	85	100	170	210
12GM1 If started at	40ºF	115	150	180	—
	0ºF	70	95	145	180
	-20ºF	60	85	120	165

240 Volt Breaker Sizing vs Max Circuit Length (ft)

		15A	20A	30A	40A*
5GM2 If started at	40ºF	660	—	—	—
	0ºF	410	560	660	—
	-20ºF	360	480	660	—
9GM2 If started at	40ºF	295	390	420	—
	0ºF	195	250	375	420
	-20ºF	170	225	340	420
12GM2 If started at	40ºF	230	305	360	—
	0ºF	150	200	300	360
	-20ºF	130	175	260	360

208 Volt Breaker Sizing vs Max Circuit Length (ft)

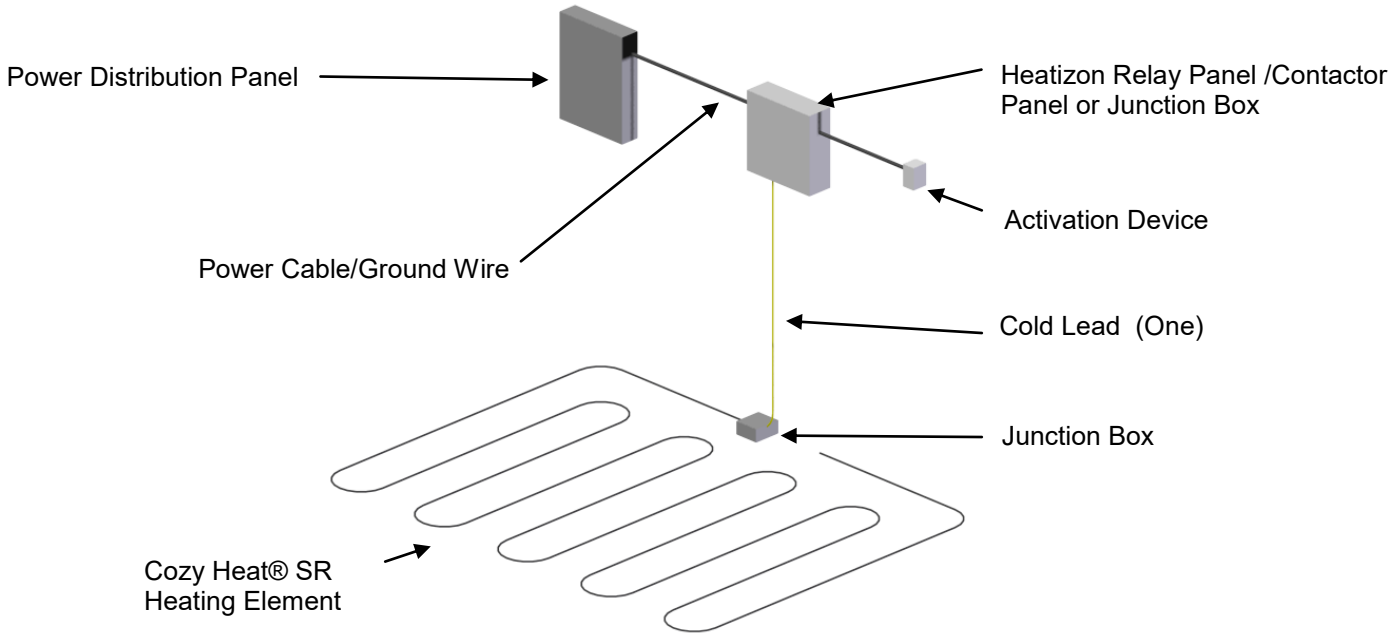
		15A	20A	30A	40A*
5GM2 If started at	40ºF	505	—	—	—
	0ºF	475	650	765	—
	-20ºF	420	560	765	—
9GM2 If started at	40ºF	320	425	455	—
	0ºF	210	270	405	460
	-20ºF	185	245	370	460
12GM2 If started at	40ºF	240	315	375	—
	0ºF	155	210	310	375
	-20ºF	135	180	270	375

277 Volt Breaker Sizing vs Max Circuit Length (ft)

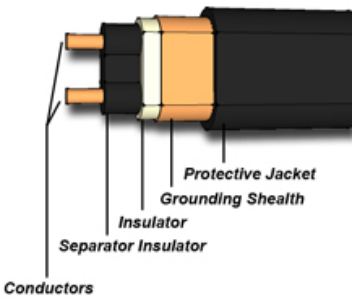
		15A	20A	30A	40A*
5GM2 If started at	40ºF	570	—	—	—
	0ºF	355	485	570	—
	-20ºF	310	415	570	—
9GM2 If started at	40ºF	270	355	385	—
	0ºF	180	230	345	385
	-20ºF	155	205	310	385
12GM2 If started at	40ºF	220	290	340	—
	0ºF	140	190	285	340
	-20ºF	125	165	245	340

* Appropriate sized butt splices may need to be sourced separately

Cozy Heat® SR Cable System



Cozy Heat® SR Cable



Warnings

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

- Do not twist, kink, or spiral the Cozy Heat® SR.

- 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.

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

- Cozy Heat® SR Heating Element may be cut to length in the field, but otherwise must not be altered, cut, damaged, or modified in any way.

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

- Do not allow Cozy Heat® SR Heating Element to touch or cross other electrical conductors or gas lines.

- The maximum Watts per square foot should not exceed 15. 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.

- Cozy Heat® SR braided grounding shield must be grounded to a suitable earth ground.

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.

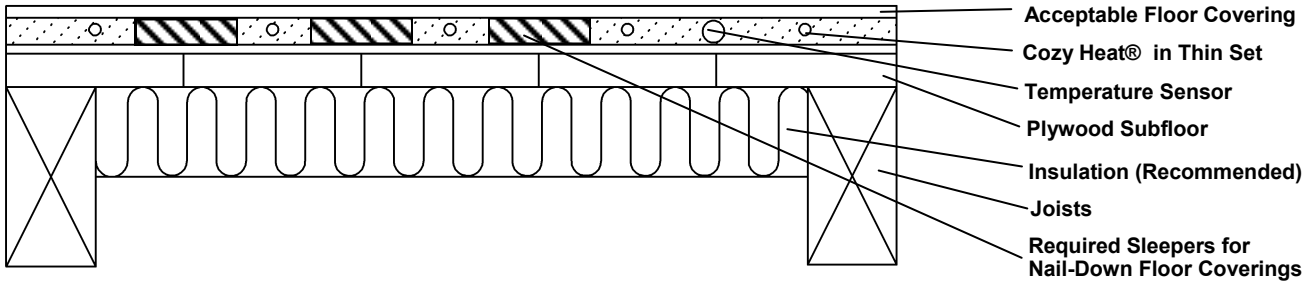
Cozy Heat® is for indoor and outdoor installations. Product labels may note outdoor products with the same specifications as indoor products.

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

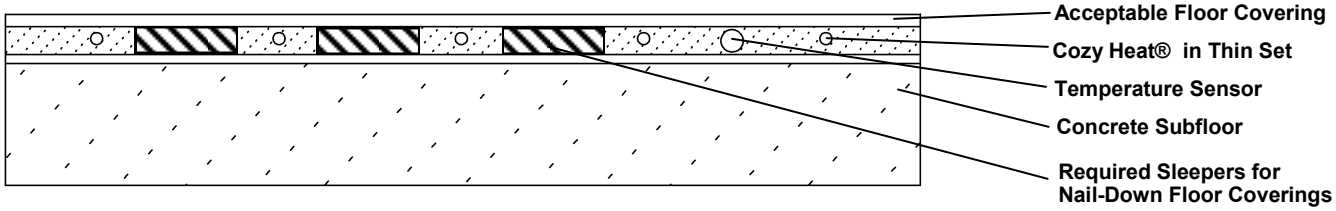
Metal structures or materials used to install or support the Cozy Heat® Heating Element must be grounded in accordance with CEC in Canada, and with the NEC in the US.

Please contact Heatizon Systems with additional questions, 801-293-1232.

Sample Application: Cozy Heat® on Wood Subfloor Under 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.

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 3" to 9" spacing as required to satisfy the heat loss calculation for spacing and 8 to 15 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, 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, the chalk lines can be covered with a clear spray lacquer.

Establish the location of the connection point between the Cold Lead and the Cozy Heat® Heating Element. Remember, The transition joint between Cozy Heat® SR Heating Element and the cold lead must be embedded in asphalt, concrete, sand, stone, other cementitious material, or be in a junction box.

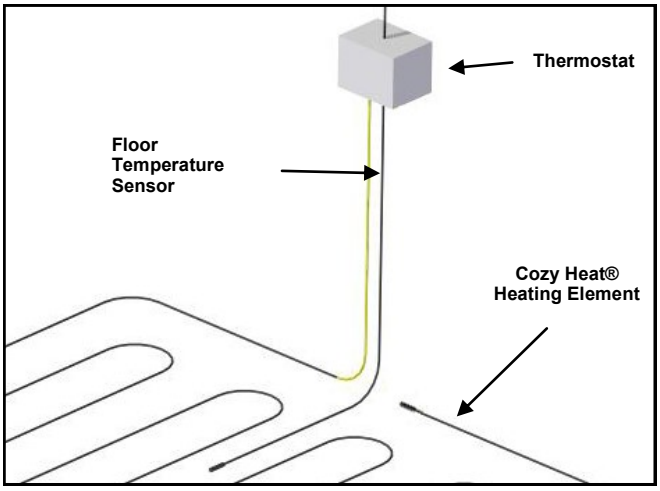
STEP 4 LAYOUT AND PREPARE FLOOR SENSOR

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 the cementitious material 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.



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.

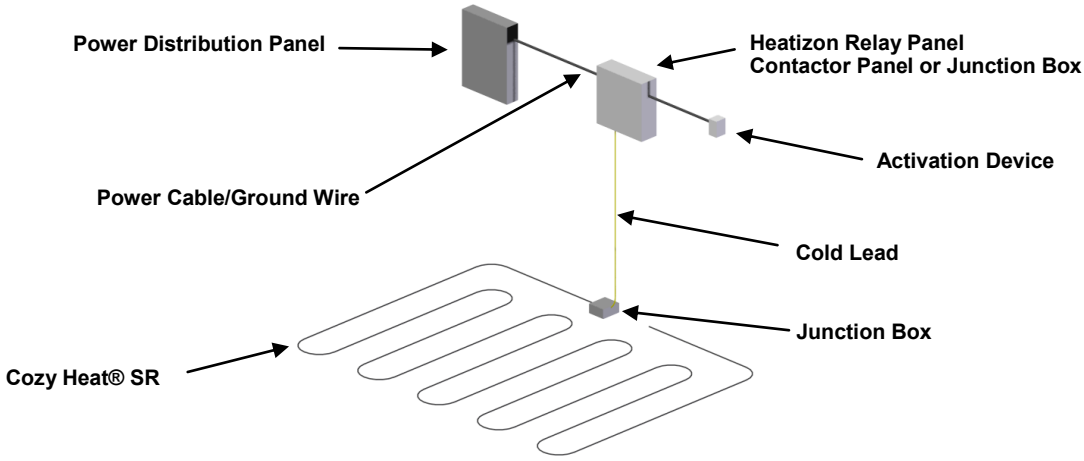
STEP 6 MEASURE & RECORD RESISTANCE

Remove the Cozy Heat® SR Heating Element from the box. Using a megohmmeter tester set at 2500 Vdc, check the insulation resistance of the Cozy Heat® SR 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* at the back of this manual. Resistance measurement and megohmmeter testing must be taken several times during the installation process: Immediately upon removal from the packaging, after installation of the heating element, and after cement, or asphalt application. Cozy Heat® SR Cable should also be checked for electrical continuity.

STEP 7 INSTALL COZY HEAT® HEATING ELEMENT

Install the Cozy Heat® SR Heating Element so that the starting and ending connection points and any activation sensor are in their desired locations. Make certain that the power end of the Cold Lead cable of the Cozy Heat® SR Cable has conductors which extend back to the Cozy Heat® SR Termination Box or Heatizon Relay Panel.

Begin laying the Cozy Heat® Heating Element across the subfloor on the previously marked and evenly spaced chalk lines or attach it to welded wire fabric for direct embedding or run in conduits. Use the grounding braid on one end to pull the Cozy Heat® through conduits. You may use the optional construction glue, hot glue or foil tape to secure the cable to the subfloor. Measure and record the resistance on *Resistance Recording Table a*t the back of this manual.



Warning: Do not damage or subject the Cozy Heat® Heating Element to mechanical or shear stress. Always avoid walking on the heating element. Never cut or damage the insulator on Cozy Heat® SR Heating Element. In the event Cozy Heat® Heating Element is damaged, contact Heatizon Systems at 801-293-1232 for repair options 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.

STEP 8 INSTALL THE IN-FLOOR SENSOR AND END SEAL

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

Install the Cozy Heat® End Seal Kit now before embedding the cable or applying the cementitious material. The end seal kit is included in the power connection kit or can be purchased separately. See www.heatizon.com for additional details and follow the instructions included in the power connection or end seal kit.

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

STEP 9 APPLY THE CEMENTITOUS MATERIAL

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 conduit.

For all other applications
Proceed with the applying or self-leveling cement, or other cementitous material. Ensure that the cementitous material covers the entire heating element and conduit before the floor covering is installed.

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.

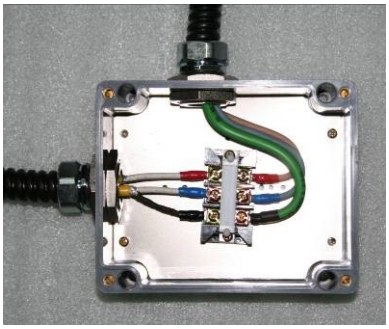
Eliminate all moisture in the self leveling cement or other cementitous material in accordance with drying times recommended by the manufacturer. Cozy Heat® must not be turned on until cementitous material has fully dried (a minimum of 7 days is recommended). Once the cementitous material has dried, 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 2500 Vdc.

STEP 10 CONNECT POWER SUPPLY & THERMOSTAT

The connection of the power supply and the floor sensing thermostat 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.

The braided shield from the Cozy Heat® SR Cable must be wired to ground for all 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 2500 VDC.



Example Terminal Box

Caution: Never energize Cozy Heat® SR until:
1. The Cozy Heat® SR Cable has been verified to be free of damage.
2. All splices and all power kit and end kit connections have been inspected.
3. A Megohmmeter Test has been used to verify a minimum of 20 Megohms between the heating element and the braided ground shield.

STEP 11 TROUBLESHOOTING

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

- Inspect the Cozy Heat® Cable for damage to the insulator or braided ground and/or contact between the braided ground and the core wires. Repair the length of damaged Cozy Heat® Cable with a splice kit or replace the entire length.
- Call Heatizon Systems technical support 801-293-1232

Note: In the event the Cozy Heat® Cable has not been damaged in any way call Heatizon Systems technical support @ 801-293-1232. For Warranty claims, please return the entire length of Cozy Heat® to Heatizon Systems with requested forms (RMA, Warranty, Resistance Recording), with the end termination and power termination connections intact, for evaluation prior to replacement.

Design and Installation

STEP 12 COMPLETE AND ATTACH LABELS

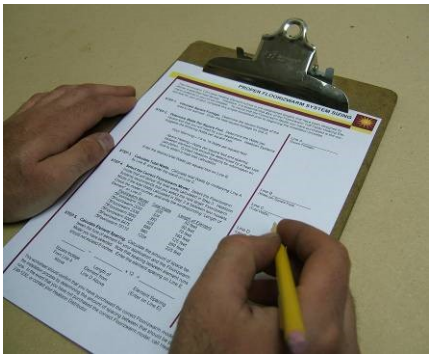
Place the included labels in the following locations:

- Electrical Panel Label — Inside door at electrical service panel.
- Stop Sign Warning Label — on or near the area to be floor warmed/in- floor heated by Cozy Heat®

Note: Make certain to record information from the Product Identification Label, if applicable.

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.

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 only. Product labeling may cross additional brands with same specifications as Cozy Heat® SR Cable

Note: The Cozy Heat® SR Heating Element must be embedded in a cementitious material or installed in conduit.

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. Cozy Heat® SR Cable should be tested using a megohmmeter, set at 2500 VDC. 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 on Subfloor	After Thin Set or Self Leveling Cement Application	After Floor Covering Material Installation
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® SR 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

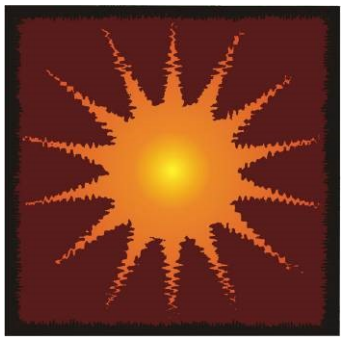
Phone: (801) 293-1232

Toll Free: (888) 239-1232

Fax: (801) 293-3077

Email: info@heatizon.com

Website: www.heatizon.com



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