

# HEATIZON SYSTEMS

RADIANT HEATING, FLOOR WARMING AND  
SNOW MELTING SYSTEMS



# HEATWAVE

Heating Cable and Heating Mat Floor Warming Systems

Installation Manual  
Operating Manual  
Warranty Registration

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[www.heatizon.com](http://www.heatizon.com)

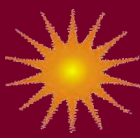
**The Heatwave Heating Cable comes in pre-established lengths that have been designed to deliver a specified heat density. Therefore, it is essential that all of the Heatwave Heating Element contained in your kit be installed.**

**In order to minimize the risk of damage to the Heatwave Heating Cable, Heatizon Systems recommends that the Heatwave Cable be installed immediately prior to the installation of the cementitious material that goes over it.**

**Never cross the Heatwave Heating Cable over itself, the in-floor sensor wire , or any other conductive material or wire.**

**When installing Heatizon Systems products, strict compliance with the National Electrical Code, local Building Codes, and Heatizon's Installation Manual is essential.**

**It is highly recommend to take photographs of the installed Heatwave before installing the flooring.**



Distributed by: Heatizon Systems  
 4137 South 500 West  
 Murray, UT 84123  
 Phone: (801) 293-1232  
 Fax: (801) 293-3077  
 Email: info@heatizon.com  
 Website: www.heatizon.com

## Table of Contents

General Information .....	4
Planning the Installation .....	5
Important Safeguards and Warnings .....	6
1. General Guidelines .....	6
1.1 Use of the Manual.....	6
1.2 Safety Guidelines .....	6
1.3 Remember to Measure Resistance .....	7
1.4 15-year Limited Warranty .....	7
2. Heatwave System .....	7
2.1 Heatwave Specifications.....	7
2.2 Thermostat Specifications .....	7
2.3 Heatwave Typical Installations and Applications .....	8
3. Floor Heating Installation Design .....	9
3.1 Design the Installation .....	9
4. Product Selection .....	10
4.1 Heatwave Mat Selection .....	10
4.2 Heatwave Cable Selection.....	11
5. Heatwave Layout and Installation.....	12
5.1 Before Laying Your Heatwave Product.....	12
5.2 Heatwave Mat Installation.....	14
5.3 Heatwave Cable Installation .....	15
6. Completing Installation .....	16
7. Commissioning .....	18
7.1 Insulation Resistance Test.....	18
7.2 Heating Cable Resistance Test .....	18
7.3 Sensor Resistance Test.....	18
8. Troubleshooting.....	19
Additional Information	
Electrical Connection Details .....	20
Heatwave Warranty .....	21
Heatwave Installation Registration Form .....	22
Layout Grid .....	23

## General Information

The instructions in this manual must be followed when preparing and installing the Heatwave Cable or Mat Floor Warming System. This manual and the installation layout should be made available to all contractors and installers working on the job. Both should then be turned over to the building owner after the installation is complete.



**NOTE: FAILURE TO FOLLOW THE INSTRUCTIONS IN THIS MANUAL MAY VOID THE WARRANTY ON THE FLOOR-WARMING SYSTEM.**

### Temperature and Time Control

For optimal control of the Heatwave floor warming system, contact your Heatizon Systems distributor for a variety of floor-sensing thermostat options.

### Maintenance

The Heatwave floor-warming system has no moving parts and is virtually maintenance-free. The GFCI (Ground Fault Circuit Interrupt), internal to the thermostat if Heatizon Systems supplied it, should be tested monthly as described in the manufacturer's pamphlet to insure its continued safe operation. If an external GFCI is utilized instead, it should be tested monthly.

### Subfloors

Heatwave may be installed over any well insulated subfloor (i.e. plywood, concrete, or underlayment material) prepared in accordance with the most recent TCA (Tile Council of America) guidelines and rated to withstand 180 degrees Fahrenheit.

### Floor Coverings

Heatwave will be most effective if installed under rigid floors that are naturally good conductors of heat such as ceramic tile, marble, and other stone floorings. There are limitations in applications that utilize different floor coverings. Please consult with your Heatizon Systems Distributor for details on heating wall-to-wall carpeting, parquet, laminate or engineered wood floors and vinyl or linoleum flooring

### Insulation

Heatwave will be most effective and efficient if installed over well-insulated areas. Insulation will minimize heat loss into the subfloor (i.e. concrete slab), allowing the heat to transfer to the surface more quickly.





## Planning the Installation

Before laying the Heatwave Cable or Mat Floor Warming System, review the installation layout and verify that all dimensions match the need of the project. The installation plan should include the following:

1. Placement, direction, and dimensions of the Heatwave Cable or Mat
2. The starting and ending points of each Heating Cable length or Mat size
3. The location of the thermostat or other suitable activation
4. The location of the floor sensor between two heating cables

**REMEMBER!** The installation plan for each area should be attached to this manual and be provided to the building owner when the installation is complete.

## Installation Considerations

### DO

1. Completely inspect the Heatwave System immediately upon its arrival and report any damage to Heatizon Systems and the delivery party.
2. Clean the floor of all debris before placing the mat/cable on the floor.
3. Make sure there are no protruding objects (nails, staples, etc.) on the subfloor that could damage the heating element.
4. Walk over the unprotected Cable/Mat with rubber soled shoes.
5. Measure and record Cable/Mat resistance according to the instructions.
6. Use Cables/Mats connected to the same controller or used in the same room or area, that have the same heat output. i.e. ALL Cables/Mats should be EITHER 10 watts/sq. ft. OR ALL 15 watts/sq. ft.
7. Make sure all components of the system are rated for the same Voltage (120V OR 240V).
8. Have all electrical work completed by a professional electrician in accordance with all local and national codes and regulations.
9. Connect Heatwave to a dedicated circuit.
10. Call our Technical Support Hotline at 888-239-1232 if you need answers to installation questions, need help solving a problem, or believe that the Heatwave system got cut or damaged during installation.

### DON'T

1. DON'T shorten the heating Cable/Mat.
2. DON'T cut the heating wire.
3. DON'T drop or bang any tools (i.e. trowel) on or hit the heating wires with any sharp objects.
4. DON'T install any fasteners such as nails, screws, etc. through any area covered by the Heatwave Cable/Mat.
5. DON'T install Heatwave under cabinets, built-in appliances, etc. to avoid excessive heat from building up in those areas.
6. DON'T install Cables/Mats over expansion joints.
7. DON'T install Heatwave in walls.
8. DON'T install Heatwave in showers.
9. DON'T overlap Cables/Mats or allow any wires to cross or touch each other.
10. DON'T crimp the heating wire while customizing the mat.
11. DON'T place area or throw rugs thicker than ½" (or other objects) over the heated area to avoid excessive build-up of heat in these areas.
12. DON'T attempt to repair cut or damaged heating wire without the proper instructions and repair kit (obtained from your distributor or Heatizon Systems).
13. DON'T forget to install the floor sensor if you are installing a floor-sensing thermostat.
14. DON'T install Heatwave in glues other than cement-based, self leveling tile-setting mortars.

## Important Safeguards and Warnings

WARNING: Shock and fire hazard

If the Heatwave System is damaged or not installed properly, fire or shock could occur resulting in serious personal injuries or damage to property. You must carefully follow the warnings and instructions contained in this manual.

- It is important that this equipment is installed only by qualified persons who are familiar with the proper sizing, installation, construction and operation of floor warming systems and the hazards involved. The installation must comply with all national and local electrical codes. If you are unfamiliar with these requirements, contact the NEC (National Electric Code), CSA (Canadian Standard Association) or an Electrician.
- The Heatwave System is designed for under floor heating purposes only. Be sure that the floor is not penetrated by nails, screws, or similar devices that can cause damage during and after installation or during subsequent or future floor work .
- If the Heatwave System is damaged, it must be replaced. Do not attempt to splice or repair any part of the system.

### 1 General Guidelines

**1.1 Use of the Manual** This manual describes the Heatwave Mat and Cable floor heating system — how to design the room, select the product, and install the system. It is important to thoroughly review this manual and the Thermostat Installation and Operation Manual prior to installation:

For additional information regarding any aspect of the Heatwave System, contact:

Heatizon Systems  
4137 South 500 West  
Murray, UT 84123 USA  
Tel: 888-239-1232  
Tel: 801-293-1232  
Fax: 801-293-3077  
[www.heatizon.com](http://www.heatizon.com)

### 1.2 Safety Guidelines

The safety and reliability of any floor heating system depends on proper design, installation, and testing. Incorrect installation or mishandling of the product can cause damage to the heating cable, system components and property, and can create a risk of fire or shock. The guidelines and instructions contained in this guide are important. Follow them carefully to minimize these risks and to ensure that the Heatwave System performs reliably.

Pay special attention to the following:

- Instructions marked  IMPORTANT
- Safety warnings identified as  WARNING

### 1.3 Remember to Measure Resistance

The resistance should be measured between the two conductor wires. Compare this resistance reading to the resistance specified in the Product Selection “Table 1.” The value should be within  $\pm 10\%$ . If you get a different reading, contact Heatizon Systems at 888-239-1232. Also, measure the resistance between each of the two conductors and the shielding/ground wire. Both should read infinity. If you get a different reading, contact Heatizon Systems at 888-239-1232. Please refer to “7 Commissioning” for instructions on how to measure the resistance.



**Important: measure the resistance four times during the installation process**

Remember to always measure, verify and record the actual resistance throughout the installation process (out of the box, after installation, after covering with cementitious material, and after installation of floor tiles).

### 1.4 Fifteen-year Limited Warranty

For a period of fifteen (15) years, from the date of purchase, Heatizon warrants that the Heatwave heating cable is free from defects in material, design and workmanship. The warranty is only valid if the warranty certificate has been properly completed and mailed, and the installation is in accordance with the installation instructions.

## 2 Heatwave System

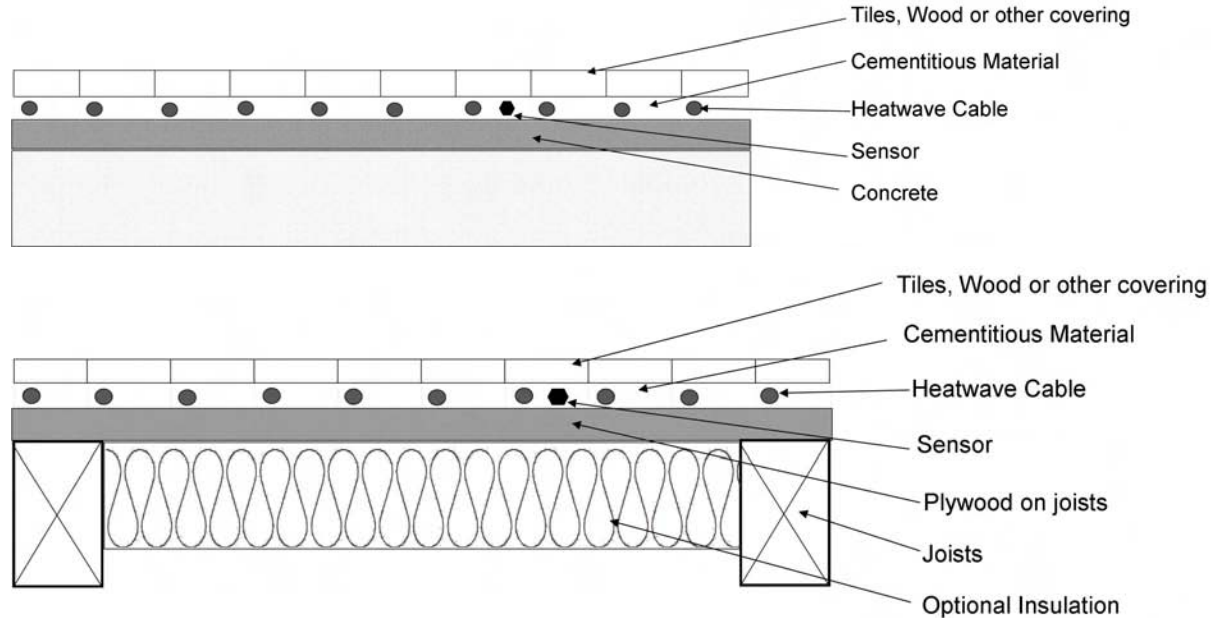
### 2.1 Heatwave Specifications

	Mats	Cables
Cable Construction	Twin Conductor	Twin Conductor
Rated Voltage	120V, 240V	120V, 240V
Output	12W/ft <sup>2</sup> (130W/m <sup>2</sup> ) $\pm 10\%$	2.73 to 4.36W.ft (8.66 to 14.30W/m) $\pm 10\%$
Cable Spacing	3" (76.2mm)	2.5" to 4.5" (64.5mm to 114.3mm)
Cable Diameter	1/8" to 1/6" (3.2mm to 4.2mm)	1/8" to 1/6" (3.2mm to 4.2mm)
Conductor Insulation	Fluoropolymer	Fluoropolymer
Outer Insulation	Fluoropolymer or TPE	Fluoropolymer or TPE
Max. Ambient Temp.	85°F (30°C)	85°F (30°C)
Min Installation Temp	40°F (5°C)	40°F (5°C)
Cold Lead	2-wire heating conductor plus ground braid; 15 ft (4.57 M)	2-wire heating conductor plus ground braid; 15 ft (4.57 M)

### 2.2 Thermostat Specifications

Functions	On/Off Control
Supply Voltage	120/240V $\pm 15\%$ , 50/60 Hz
Maximum Switching Current	16 AMP
Temperature Control Range	40° to 104°F (5° to 40°C)
Ambient Range	32° to 104°F (0° to 40°C)
Floor Temperature Sensor	2-wire, 10 foot lead wire

## 2.3 Heatwave typical installations and applications



Alternative method: self-leveling cement is recommended for large surfaces and the following floor materials: engineered wood, laminate, floating floors, vinyl, linoleum and carpet.

### **Warning**

Consult the manufacturer for information on special installation requirements for carpets, wood, laminate and vinyl or linoleum flooring.

### **Important**

- Read the instructions carefully before installing Heatwave system.
- Remember to measure the resistance four times.
- Do not install Heatwave in walls or ceilings.
- The cable must be embedded in cementitious material.
- The minimum installation temperature is 40°F (5°C ).
- The heating cable cannot be cut to length, crossed over itself, or installed too close.
- Use copper conductor wire only.
- Remember to check that the supply voltage matches the voltage of the Heatwave.
- Remember to place the labels as written in this instruction.
- Only for indoor installation.
- Metal structures or materials used for the support of or on which the Heatwave is installed must be grounded in accordance with applicable CSA or NEC requirements.

Please consult Heatizon Systems for any other questions.



# 3 Floor Heating Installation Design



## 3.1 Design the Installation

### 3.1.1 Measure the heated area

Determine the heated area of the floor where there are no permanent fixtures or furniture such as showers, toilets, vanities, or cabinets. Measure the heated area of the floor. For example, in Figure 3, the area of the bathroom is 96 ft<sup>2</sup>, but when you subtract the area of the vanity, shower and toilet, the total heated area is only 74 ft<sup>2</sup>.

### 3.1.2 Determine the power supply voltage

The available supply voltages include 120 V, 208 V or 240 V.



#### Important

Operating the 240V cable at 208V reduces the power output to approximately 9W/sq.ft. (25% reduction)

### 3.1.3 Plan the design

Determine the optimum Heatwave Cable or Mat layout for your heated area to ensure coverage. Select a spot for the thermostat in the wall above the heated area where it can be reached by the 10-foot cold lead on the Heatwave, and the length of the floor temperature sensor. Please refer to Figure 4.



#### Important

The predetermined Heatwave spacing must be maintained to ensure proper floor heating. To avoid cold areas on the floor, do not change the Heatwave heating cable spacing when you lay out the Mat or Cable.

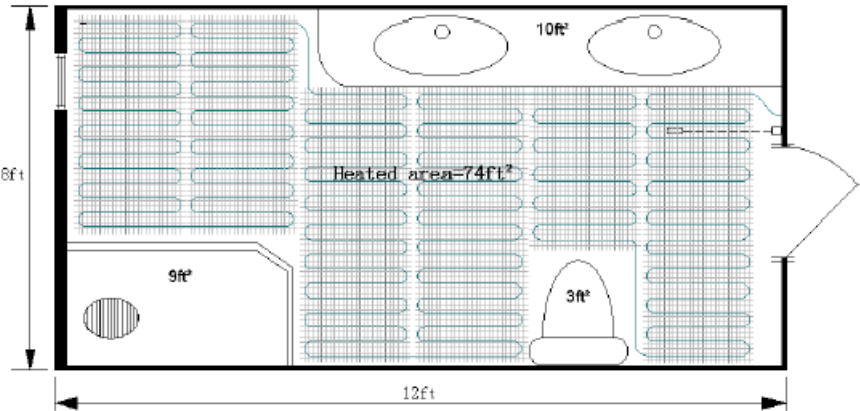


Figure 3: Heated area example

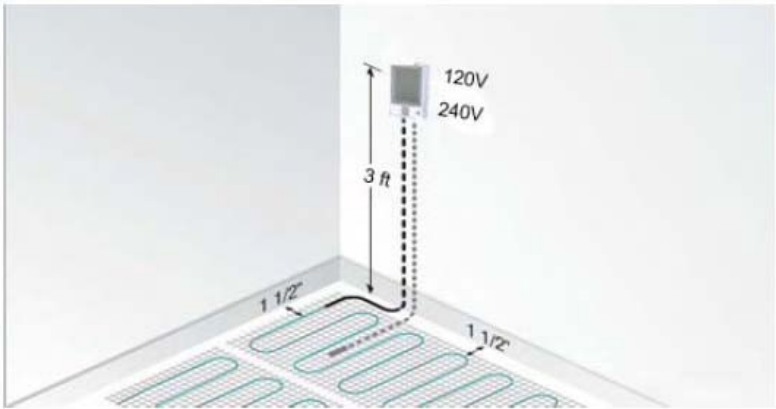


Figure 4: Typical cold lead and floor



## 4.0 Product Selection—Select Either Heatwave Mat or Heatwave Cable

### 4.1 Heatwave Mat Selection

Confirm that your Heatwave is no larger than the heated area. Following the example from Figure 3, if the heated area is 74 ft<sup>2</sup>, select the 70 ft<sup>2</sup> Heatwave Heating Mat.

### Heatwave Mats, 12 Watts/Ft<sup>2</sup>, 120 VAC

Heatizon Part Number	Manufacturer Number	Total Watts	Total Ohms	Amp Load	Watts/ Foot	Coverage Area/Square Foot	Watts/ Square Foot	Mat Length	Mat Width	Cable spacing (O.C.)	14AWG Cold Lead Length
HW2012-100	HW2012-10	120	120.0	1.0	2.73	10.0	12.00	6.1'	20"	2.90"	10'
HW2012-150	HW2012-15	180	80.0	1.5	3.59	15.0	12.00	9.1'	20"	3.81"	10'
HW2012-200	HW2012-20	240	60.0	2.0	3.13	20.0	12.00	12.2'	20"	3.33"	10'
HW2012-250	HW2012-25	300	48.0	2.5	2.63	25.0	12.00	15.2'	20"	2.79"	10'
HW2012-300	HW2012-30	360	40.0	3.0	2.55	30.0	12.00	18.3'	20"	2.71"	10'
HW2012-350	HW2012-35	420	34.3	3.5	3.47	35.0	12.00	21.3'	20"	3.69"	10'
HW2012-400	HW2012-40	480	30.0	4.0	3.12	40.0	12.00	24.4'	20"	3.31"	10'
HW2012-500	HW2012-50	600	24.0	5.0	3.20	50.0	12.00	30.5'	20"	3.40"	10'
HW2012-600	HW2012-60	720	20.0	6.0	3.40	60.0	12.00	36.6'	20"	3.61"	10'
HW2012-700	HW2012-70	840	17.1	7.0	2.93	70.0	12.00	42.7'	20"	3.11"	10'
HW2012-800	HW2012-80	960	15.0	8.0	2.65	80.0	12.00	48.8'	20"	2.82"	10'
HW2012-900	HW2012-90	1080	13.3	9.0	3.36	90.0	12.00	54.9'	20"	3.56"	10'
HW2012-1000	HW2012-100	1200	12.0	10.0	4.15	100.0	12.00	61.0'	20"	4.44"	10'

### Heatwave Mats, 12 Watts/Ft<sup>2</sup>, 240 VAC

Heatizon Part Number	Manufacturer Number	Total Watts	Total Ohms	Amp Load	Watts/ Foot	Coverage Area/Square Foot	Watts/ Square Foot	Mat Length	Mat Width	Cable spacing (O.C.)	14AWG Cold Lead Length
HW2012-400B	HW2024-40	480	120.0	2.0	3.13	40.0	12.00	24.4'	20"	3.33"	10'
HW2012-500B	HW2024-50	600	96.0	2.5	2.63	50.0	12.00	30.5'	20"	2.79"	10'
HW2012-600B	HW2024-60	720	80.0	3.0	2.55	60.0	12.00	36.6'	20"	2.71"	10'
HW2012-700B	HW2024-70	840	68.6	3.5	2.39	70.0	12.00	42.7'	20"	2.54"	10'
HW2012-800B	HW2024-80	960	60.0	4.0	3.12	80.0	12.00	48.8'	20"	3.31"	10'
HW2012-900B	HW2024-90	1080	53.3	4.5	2.59	90.0	12.00	54.9'	20"	2.75"	10'
HW2012-1000B	HW2024-100	1200	48.0	5.0	3.20	100.0	12.00	61.0'	20"	3.40"	10'
HW2012-1100B	HW2024-110	1320	43.6	5.5	2.86	110.0	12.00	67.1'	20"	3.03"	10'
HW2012-1200B	HW2024-120	1440	40.0	6.0	3.40	120.0	12.00	73.2'	20"	3.61"	10'
HW2012-1450B	HW2024-145	1740	33.1	7.3	3.14	145.0	12.00	88.4'	20"	3.33"	10'
HW2012-1600B	HW2024-160	1920	30.0	8.0	2.65	160.0	12.00	97.6'	20"	2.82"	10'

## 4.2 Heatwave Cable Selection

The Heatwave® Heating Cable comes in pre-established lengths that have been designed to deliver a specified heat density. To insure that the Heatwave® Heating Element length you have purchased is the correct size for your project, complete this simple worksheet prior to beginning the installation process.



**STEP 1. Calculate Square Footage to be Heated.** Determine the square footage of the area to be warmed. Note: this is not necessarily the same as the room dimensions. 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. Heatizon Systems suggests the following Watts per square foot:

- Floor Warming—8 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.

Contact Heatizon Systems for information on how to obtain a heat loss calculation.

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

Line B \_\_\_\_\_  
(Watts per Square Foot)

**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. Determine Input Voltage.** Determine if the Heatwave® Heating Cable will be powered by 120VAC or 240VAC, and check the correct input voltage on Line D.

Line D 120VAC 240VAC  
(Circle One)

**STEP 5. Select the Correct Heatwave® Heating Cable Length.** Use the table below to select the Heatwave® Heating Cable Model that is the correct input Voltage from line D, and will deliver the total watts calculated on Line C. Heatizon Systems recommends that you select the next larger Heatwave® Heating Cable Length if the total Watts calculated in Step 3 is between two models. Select the model number, and write the corresponding Element “Cable Length” on Line E.

Line E \_\_\_\_\_  
(Element Length)

Heatizon Part Number 120V Input	Manufacturer Number	Total Watts	Total Ohms	Amp Load	Watts/ Foot	Coverage Area/Square Foot	Watts/ Square Foot	Cable Length	Cable spacing (O.C.)
HWC-815	HWC2012-44	120	120.0	1.0	2.73	8-15	14-8	44'	2.5-4.5"
HWC-1630	HWC2012-77	240	60.0	2.0	3.12	16-30	14-8	77'	2.5-4.5"
HWC-3260	HWC2012-154	480	30.0	4.0	3.12	32-60	14-8	154'	2.5-4.5"
HWC-5094	HWC2012-203	750	19.2	6.3	3.69	50-94	14-8	203'	2.5-4.5"
HWC-64120	HWC2012-362	960	15.0	8.0	2.65	64-120	14-8	362'	2.5-4.5"

Heatizon Part Number 240V Input	Manufacturer Number	Total Watts	Total Ohms	Amp Load	Watts/ Foot	Coverage Area/Square Foot	Watts/ Square Foot	Cable Length	Cable spacing (O.C.)
HWC-1631B	HWC2024-86	245	235.1	1.0	2.85	16-31	14-8	86'	2.5-4.5"
HWC-3260B	HWC2024-110	480	120.0	2.0	4.36	32-60	14-8	110'	2.5-4.5"
HWC-56105B	HWC2024-242	840	68.6	3.5	3.47	56-105	14-8	242'	2.5-4.5"
HWC-80150B	HWC2024-375	1200	48.0	5.0	3.20	80-150	14-8	375'	2.5-4.5"
HWC-114214B	HWC2024-564	1710	33.7	7.1	3.03	114-214	14-8	564'	2.5-4.5"
HWC-128239B	HWC2024-726	1915	30.1	8.0	2.64	128-239	14-8	726'	2.5-4.5"

**STEP 6. Calculate Element Spacing.** Calculate the amount of space between the runs of element for your application and the Heatwave® Heating Element Model you have selected. Enter the element spacing on Line F.

Line F \_\_\_\_\_ inches  
(Element Spacing)

$$\frac{\text{Square footage From Line A Above}}{\text{Element Length from Line E Above}} \times 12 = \text{Element Spacing (Enter on Line F)}$$

## 5 Installation



### Important: Tools and materials required

The following items may be required to install and test the floor heating system:

- Scissors
- Utility knife
- Wire strippers
- Heatizon Plastic Cable Clips or Spacing Band
- Tape measure
- Screwdriver
- Multimeter

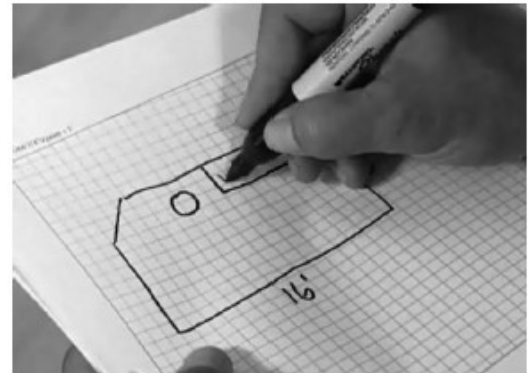
### 5.1 Before Laying the Heatwave Mat or Cable

Note: A continuous continuity check should be conducted on the Heatwave Heating Cable or Mat and all electrically conductive material prior to and during the pouring of concrete, installation of floor coverings, and immediately prior to energizing all Heatwave products. The circuit should always be open. Always complete a Heatizon Systems "Resistance in OHMS Form" (see form in the back of this manual) out of the box, immediately following the installation of the Heatwave Heating Cable/Mat, immediately prior to covering the Heatwave Heating Cable/Mat, and again just prior to energizing the Heatwave Heating Cable/Mat.

### Follow these steps to ensure a successful Heatwave installation.

#### 5.1.1 PLAN YOUR LAYOUT

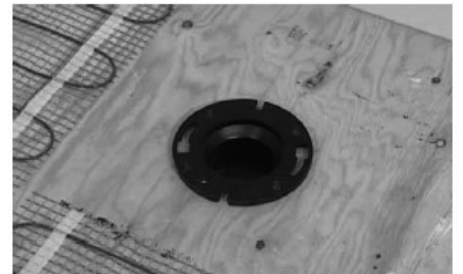
Using the last page of this manual, make a sketch layout or a floor plan of the room; include all permanent furnishings such as toilets, bathtubs, appliances, cabinetry, etc. Indicate all dimensions required to determine the available floor area and the position of the thermostat.



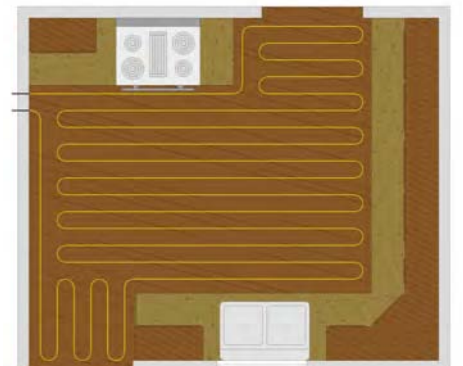
**Important** Heatizon recommends that the installation is documented with photos and drawings to note the location of connections and the sensor.

#### 5.1.2 TRANSFER LAYOUT TO FLOOR

Draw an outline of the layout on the room floor including a foot print of all furnishings that are not yet installed. Unroll the first few feet of the Heatwave Mat or Cable. The starting point of the cable must be placed within 10 ft. of the thermostat.



**Important** Mark the position of the connection point between the power lead and the red Heatwave heating cable. **This connection must be concealed in cementitious material.** When using a floor temperature sensing thermostat, mark the sensor position in the middle of two heating cables, about 10 in. (25 cm) away from the wall (within the heated area), as close as possible to the thermostat.



### 5.1.3 INSTALL SENSOR

If using a floor temperature sensing thermostat, install the sensor now, either in conduit tube, or directly to the subfloor. The sensor and/or tube needs to be installed between the thermostat wall box and the sensor position. The conduit tube must be partially countersunk into the subfloor. Cut a channel approximately 5/16" deep x 5/16" wide in the floor and wall up to the thermostat for the sensor conduit. The conduit has to go from the thermostat and minimum of 10" away from the wall towards the middle of the floor.



**Note:** It is recommended that the sensor be installed in conduit tube. This will allow the sensor to be easily replaced in the unlikely event of failure.



#### **Important**

The sensor conduit must be centered in the cable loop (between two red heating wires). Use duct tape to close the end of the conduit so that the cementitious material can't penetrate the conduit. Use duct tape to hold the sensor conduit into the groove to prevent it from floating up when the cementitious material is poured. If the sensor is installed directly in the mortar bed, use duct tape to secure to subfloor.

### 5.1.4 PREPARE SUBFLOOR SURFACE

Clean and vacuum the floor thoroughly and remove dust and debris from the floor that may damage the heating cable. Ensure that the subfloor is secure and stable. Carefully fill in all cracks to prevent any potential damage to the new tiles resulting from shifts in the subfloor.



### 5.1.5 MEASURE THE RESISTANCE (TEST #1)

Use a digital OHM meter to measure the resistance of the Heatwave Mat/Cable and compare it to the total OHMS in table in Section 4.1 for Mats or in Section 4.2 for Cables. Record the measured resistance on the Registration Form. Documenting the resistance at each stage of installation is required for warranty purposes. Also, measure the resistance between each conductor and the shielding/ground wire. Both should read infinity. Please refer to "7 Commissioning" for instructions on how to measure the resistance.



**NEVER CUT OR SHORTEN THE RED HEATING CABLE!**



**DO NOT STAPLE THE RED HEATWAVE HEATING CABLE. STAPLE ONLY THE WEBBING ON HEATWAVE MATS WHERE NO CABLE IS LOCATED!**



**NEVER PLACE RED CABLE WITHIN 6" OF A WAX TOILET RING.**

If you are installing  
**HEATWAVE MATS,**  
 continue with your installation  
 below beginning with section 5.2.

**OR**

If you are installing  
**HEATWAVE CABLES,**  
 skip to Section 5.3 to continue  
 with your installation.

## 5.2 Heatwave Mat Installation

**5.2.1** Start by placing the mat such that the connection point and the temperature sensor are in their intended positions and bring the power cable to the thermostat or connection box. Begin unrolling the Heatwave Mat evenly across the floor outside the areas that you marked previously. When you reach the next wall, cut the mesh (**being careful not to cut the heating cable**), turn the mat, and begin rolling in the desired direction.

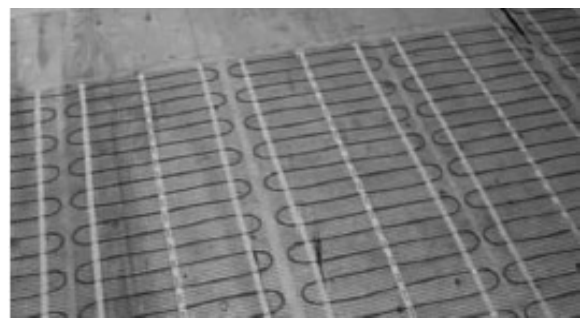
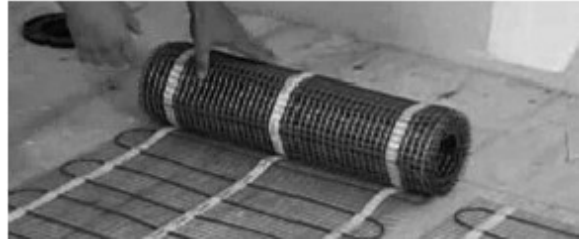
**5.2.2** Ensure that the Heatwave is in full contact with the subfloor at all times. Avoid walking on the heating mat. If this is not possible, use shoes with very soft rubber soles. When approaching obstacles (toilets, cabinets, etc.), carefully remove some of the red heating cable from the mat and lead the cable around the obstacle. In some cases pieces of the mesh will be cut away entirely.

**5.2.3** Use Heatizon Plastic Cable Clips or a thin strip of tape to secure the loose cable to the floor.

### 5.2.4 MEASURE THE RESISTANCE (TEST #2)

Use a digital OHM meter to measure the resistance of the Heatwave Mat and compare it to the total OHMS in table in Section 4.1. Record the measured resistance on the Registration Form. Documenting the resistance at each stage of installation is required for warranty purposes. Also, measure the resistance between each conductor and the shielding/ground wire. Both should read infinity. Please refer to “7 Commissioning” for instructions on how to measure the resistance.

**GO TO STEP 6.**



If you are using Heatwave Cable, continue your installation beginning with 5.3 below.



### 5.3 Heatwave Cable Installation

Make sure you have verified that you have purchased the correct Heatwave Cable to heat the area you have selected and that you have determined the correct spacing for the area you are heating, the Watts you need the system to deliver, and the size of system you purchased See Table in Section 4.2.



**5.3.1** Plan room layout using tape measure, marking pencil, and chalk line. Lay out perimeter of area to be heated first, keeping a minimum of 3 inches from walls and or cabinets and the first run of element. Once the layout is complete, roll out the Heatwave Heating Cable, making sure that both ends of the heating element (where the Heatwave Heating Cable is pre-connected to the Cold Lead segment) are within 10 vertical and horizontal feet of the power switching thermostat location to accommodate Cold Lead length.



**Note:** All of the Heatwave Heating Cable and the connection between it and Cold Lead must be surrounded by cementitious material.



**5.3.2** Tie off one Cold Lead at the location where the Power Switching Thermostat will be located. Continue by laying out Heatwave Heating Cable on the predetermined layout, and fasten with plastic clips as described below for your floor surface.



**5.3.3** When anchoring the Heatwave Heating Cable to wood subfloors use either the Plastic Clips and Nails Heatizon Part #ANCHPLUGKIT or Metal Spacing Banding Heatizon Part #HWCSTRAP33. Never use any attachment that will compromise the Heatwave Heating Cable or its insulation in any way. Each 90 degree bend and each 180 degree turn requires two Heatizon Plastic Clips. Heatizon Plastic Clips should be spaced approximately every 24 inches along the length of the Heating cable. Heatizon Plastic Clips can be inserted around Heatwave Heating Cable, and secured to sub floor by hammering nail or driving a screw through anchor ends until both plastic tails are flat against sub floor surface. Repeat with each Heatizon Plastic Clip until all clips are secure. If Heatizon's Metal Spacing Bands are used please check continuity between the Heatwave Heating Cable and the Band as the cable is installed.





**5.3.4** If Heatwave Heating Cable is being installed directly on existing concrete, a Heatizon Anchoring Plug Kit may be purchased. Use a 1/4" cement drill bit to drill holes 1" deep in every location where a nail or screw will be located. Install one Anchoring Plug into each pre-drilled hole by tapping plugs until they are flush with the surface of the concrete. Anchoring Plugs should fit tightly in pre-drilled holes. If using Heatizon Plastic Clips, put a clip around Heatwave Heating Cable and secure by hammering nail through anchor ends directly into the wood plug, until both plastic tails of the clip are flat against the concrete and plug. Repeat with each Heatizon Plastic Clip until all clips are secure.

**5.3.5** Continue laying out and anchoring Heatwave Heating Cable until complete. Make certain the end of the Cold Leads attached to the Heatwave Heating Cable return to the thermostat location. When all of the Heatwave Heating Cable has been installed and secured, run the second Cold Lead parallel to the first Cold Lead back to the thermostat, and secure both Cold Leads to the stud nearest the chosen location for the thermostat.

**5.3.6 MEASURE THE RESISTANCE (TEST #2)**

Use a digital OHM meter to measure the resistance of the Heatwave Mat/Cable and compare it to the total OHMS in table in section 4.1 for Mats or in section 4.2 for Cables. Record the measured resistance on the Registration Form. Documenting the resistance at each stage of installation is required for warranty purposes. Also, measure the resistance between each conductor and the shielding/ground wire. Both should read infinity. Please refer to "7 Commissioning" for instructions on how to measure the resistance.

**6 Completing Installation**

**ENSURE THAT THE SENSOR CONDUIT HAS BEEN PROPERLY INSTALLED BEFORE PROCEEDING**

In the case of tiles, proceed with the installation of the tiles by covering the heating cables with a layer of thin-set cement as directed by the tile manufacturer. Ensure that the thin-set mortar covers the entire height of the heating cable as the tiles are installed. In the case of a wood, engineered or laminate floor covering, it is recommended that the flooring manufacturer be contacted. For wooden floors, a minimum of 3/16 in. of self-leveling cement over the heating cable is recommended. Ensure that all moisture in the self-leveling cement has been fully eliminated in accordance with the drying times recommended by the manufacturer (consult the manufacturer for exact drying time) prior to energizing your Heatwave product. Do not use Heatwave to dry self-leveling or other cementitious material.



**Important**

The system must not be turned on until the cementitious material has fully dried. A minimum of two weeks is recommended.





### **6.1 MEASURE THE RESISTANCE (TEST #3)**

Use a digital OHM meter to measure the resistance of the Heatwave Mat/Cable and compare it to the total OHMS in table in section 4.1 for Mats or in section 4.2 for Cables. Record the measured resistance on the Registration Form. Documenting the resistance at each stage of installation is required for warranty purposes. Also, measure the resistance between each conductor and the shielding/ground wire. Both should read infinity. Please refer to “7 Commissioning” for instructions on how to measure the resistance.

### **6.2 INSTALL THE LOW RESISTANCE FLOOR COVERING**

To install tile, apply a layer of acrylic or latex modified thin-set using the ridged side of your trowel. Tile and grout the floor using best industry practices and in accordance with instructions provided by the manufacturer of the tile.

### **6.3 CONNECT POWER SUPPLY AND THERMOSTAT**

The connection of the power supply and the thermostat must be done by a qualified person in accordance with the National Electrical Code (NEC) and the Canadian Electrical Code (CEC). Connect the floor sensor to the thermostat, take the final resistance reading and record it on the Registration Form, see 6.5.

**Note:** You need to mark the appropriate circuit breaker reference label indicating which branch circuit supplies the circuits to those electric space heating cables.

### **6.4 MEASURE THE RESISTANCE (TEST #4)**

Use a digital OHM meter to measure the resistance of the Heatwave Mat/Cable and compare it to the total OHMS in table in section 4.1 for Mats or in section 4.2 for Cables. Record the measured resistance on the Registration Form. Documenting the resistance at each stage of installation is required for warranty purposes. Also, measure the resistance between each conductor and the shielding/ground wire. Both should read infinity. Please refer to “7 Commissioning” for instructions on how to measure the resistance.

### **6.5 RECORD INFORMATION AND AFFIX LABELS**

It is important for the homebuilder/owner to mail in the warranty certificate immediately after installing the system (Heatwave Mat or Cable and Thermostat). Failure to do so could void the manufacturer's warranty. The warranty is subject to the guarantee conditions listed on the warranty certificate. Keep a copy of the Registration Form for your reference. Place the included label “Electric Shock or Fire Hazard” on the inside of the electrical power distribution panel.

### **6.6 ENJOY THE COMFORT OF HEATWAVE**

The Heatwave Heating System is now ready to use. Increase the floor temperature gradually and adjust it until it reaches a comfortable level depending on the type of room and your personal preferences.

## 7 Commissioning



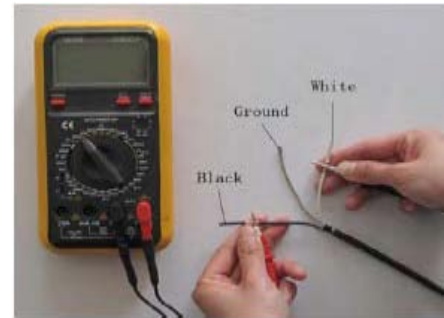
### Important

**For the 15-year limited warranty to apply, you must perform these tests, record the results on the Registration Form, and retain a copy of the record.** You must perform the Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test four times (Please refer to 4 Installation) during the installation process.

### 7.1 Insulation Resistance Test

This test ensures that the insulating jackets of the heating cable are not damaged. A low value indicates the cable has been damaged and must be replaced.

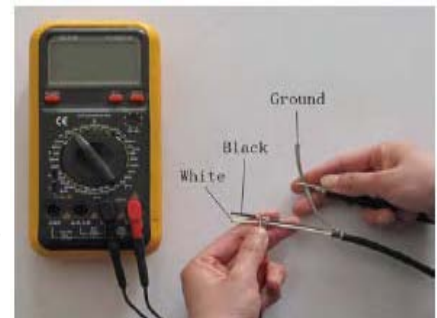
- Connect the ground wire to the black lead and both power wires to the red lead of the multimeter.
- Make sure the meter reads “Open” or “OL.” If you get a different reading, contact Heatizon at 888-239-1232.
- Record these readings on the Registration Form.



### 7.2 Heating Cable Resistance Test

This test measures the resistance of the Heatwave and is used to determine circuit integrity.

- Set your multimeter to the 200 or 2000 ohm range.
- Connect the multimeter leads to the black and white cold lead wires.
- Compare this resistance reading to the resistance specified in the Product Selection “Table 1 or Table 2”. The value should be within  $\pm 10\%$ . If you get a different reading, contact Heatizon at 888-239-1232.
- Record these readings on the Registration Form.



### 7.3 Sensor Resistance Test

This test measures the resistance of the floor sensor and is used to verify the sensor integrity.

- Set your multimeter to the 200K ohm range.
- Connect the multimeter leads to the red and green lead wires.
- Make sure the meter reads between 9-25K ohms. If you get a different reading, contact Heatizon at 888-239-1232.
- Record these readings on the Registration Form.



## 8 Troubleshooting



Symptom	Probable Causes	Corrective Action
Floor doesn't heat	No voltage.	Check circuit breaker.
	Circuit breaker tripped.	Ensure that there are not too many appliances connected on the same circuit. The Heatwave Mat may require a dedicated circuit. See the Product Selection "Table 1" of this manual
	Ground-fault tripped in the thermostat.	Refer to Thermostat Installation and Operation Manual.
	Thermostat not turned on	Refer to Section 4 of this manual and the Thermostat Installation and Operation Manual
	Cable not connected to thermostat	Refer to Thermostat Installation and Operation Manual.
	Floor temperature sensor not connected	Refer to Thermostat Installation and Operation Manual.
	Faulty sensor.	Contact Heatizon Systems at 888-239-1232.
Floor warm all the time	Clock not set correctly.	Refer to Thermostat Installation and Operation Manual.
Floor not warm enough	Thermostat setting not set correctly	Refer to Thermostat Installation and Operation Manual.
Installation instructions		Download Heatwave Installation instructions from <a href="http://www.heatizon.com">www.heatizon.com</a>



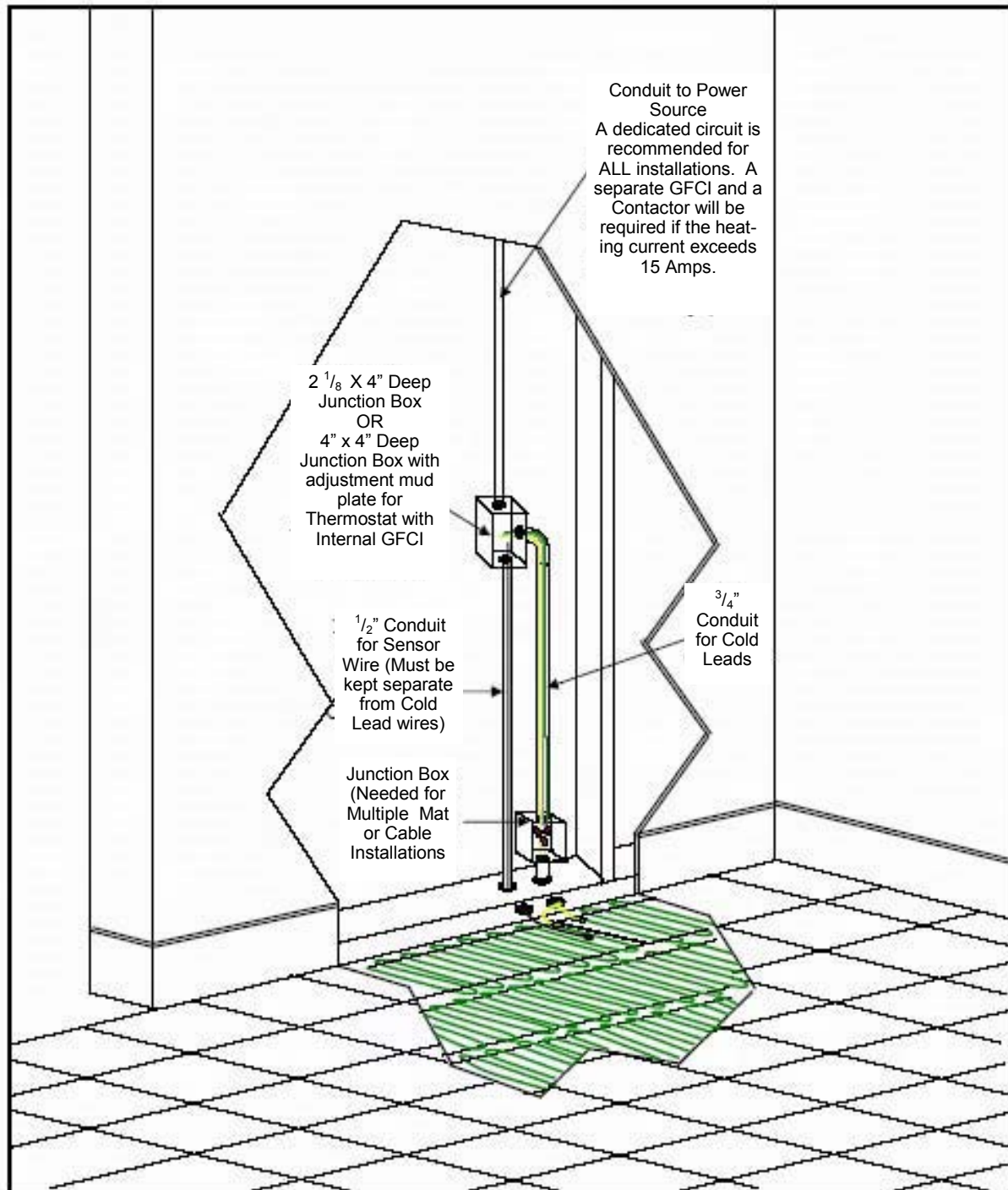
**888-239-1232**  
**[www.heatizon.com](http://www.heatizon.com)**

Note: All Electrical Connections for the Heatwave Floor-Warming System and Controls should be performed by a Professional Electrician in accordance with all Local and National Electrical Codes.



## Electrical Connection Details

A deep, 2 1/8" X 4" single-gang junction box (OR a "roomier" 4" X 4" double-gang box with a mud plate) should be provided by the electrician for the thermostat connections. See Rough-In Electrical Preparation Diagram, below.



## Heatwave Limited Warranty



Heatizon Systems warrants the Heatwave product to be free of defects in materials and workmanship for 15 years from the date of installation while in possession of the original owner, provided:

1. The product is installed and tested in accordance with the Installation/ Homeowners Manual and Heatwave Resistance Documentation Procedures.
2. The installation is registered with Heatizon Systems within 10 days of the installation date. This registration is accomplished by the installer and/or homeowner, who must complete and return the Installation Registration Form to Heatizon Systems (at the address given below).
3. The product was not damaged or misused by the homeowner or any tradesman/agent of the owner. Heatizon Systems takes no responsibility under this warranty for damage caused by the homeowner or tradesman retained by the homeowner to install the Heatwave product.

Heatizon Systems staff will be available to provide advice and consultation to the installers of the Heatwave product to assure that they are informed concerning the procedures required to complete a proper installation. Controls used to operate the Heatwave product are warranted by their manufacturers according to their warranty policies. Under this Limited Warranty, Heatizon Systems will, at its option, provide either or both of the following:

- A. Technical support (by phone) to assist the installer(s) in isolating the problem area. If deemed repairable, the appropriate repair kit shall be provided. In such a case, ALL OTHER MATERIALS AND LABOR necessary to complete the repair of the affected area must be supplied by the homeowner.
- B. Credit for the faulty Heatwave product up to the limit of the original price of the Heatwave product used in the installation, as Heatizon Systems' sole obligation under this LIMITED warranty.

This LIMITED Warranty is null and void if the owner does not inform Heatizon Systems of the problem within thirty (30) days of it's discovery OR if the homeowner or any tradesman retained by the homeowner attempts to repair the problem without informing and consulting with a staff member of Heatizon Systems regarding the appropriate testing and/or repair procedures.

HEATIZON SYSTEMS DISCLAIMS ANY WARRANTY NOT PROVIDED HEREIN INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. HEATIZON SYSTEMS FURTHER DISCLAIMS ANY RESPONSIBILITY FOR LOSSES, EXPENSES, INCONVENIENCES, SPECIAL, INDIRECT, SECONDARY, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THE PRODUCT. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE FACE HEREOF.

**Heatizon Systems**  
4137 South 500 West  
Murray, UT 84123  
Phone (801) 293-1232 Fax (801) 293-3077  
[www.heatizon.com](http://www.heatizon.com)



# Heatwave Installation Registration Form

**Instructions:** This form must be completed and returned for each installation. A copy should be retained by the homeowner. An installation is defined as each individual space or room in which Heatwave is installed such as a bathroom, kitchen, sunroom, etc. Each Heatwave shipment includes the following information essential to the proper installation of the products: Installation/Homeowners Manual, Wiring Diagrams, and Theoretical Ohm Readings necessary to test the products. If any of this information is missing from the shipment, please call your dealer or our service department at 1-888-239-1232.

**TO INSURE WARRANTY PROTECTION FOR THE INSTALLATION(S), THE HOMEOWNER OR INSTALLER MUST COMPLETE ALL THE INFORMATION BELOW FOR EACH INSTALLATION AND RETURN THIS FORM TO HEATIZON SYSTEMS AT THE ADDRESS LISTED BELOW WITHIN 10 DAYS OF THE COMPLETED INSTALLATION.**

## I. Installer Information:

Installer's Name: \_\_\_\_\_ Installation Date: \_\_\_\_-\_\_\_\_-\_\_\_\_  
 Business Address \_\_\_\_\_  
 Phone Number: \_\_\_\_-\_\_\_\_-\_\_\_\_ Fax Number (if available): \_\_\_\_-\_\_\_\_-\_\_\_\_  
 Name of Company (from which Heatwave was purchased) \_\_\_\_\_

## II. Owner Information:

Owner's Name: \_\_\_\_\_  
 Home Address: \_\_\_\_\_  
 Phone Number: \_\_\_\_-\_\_\_\_-\_\_\_\_ Fax Number (if available): \_\_\_\_-\_\_\_\_-\_\_\_\_  
 Name of Space and Location in Structure where installed: \_\_\_\_\_

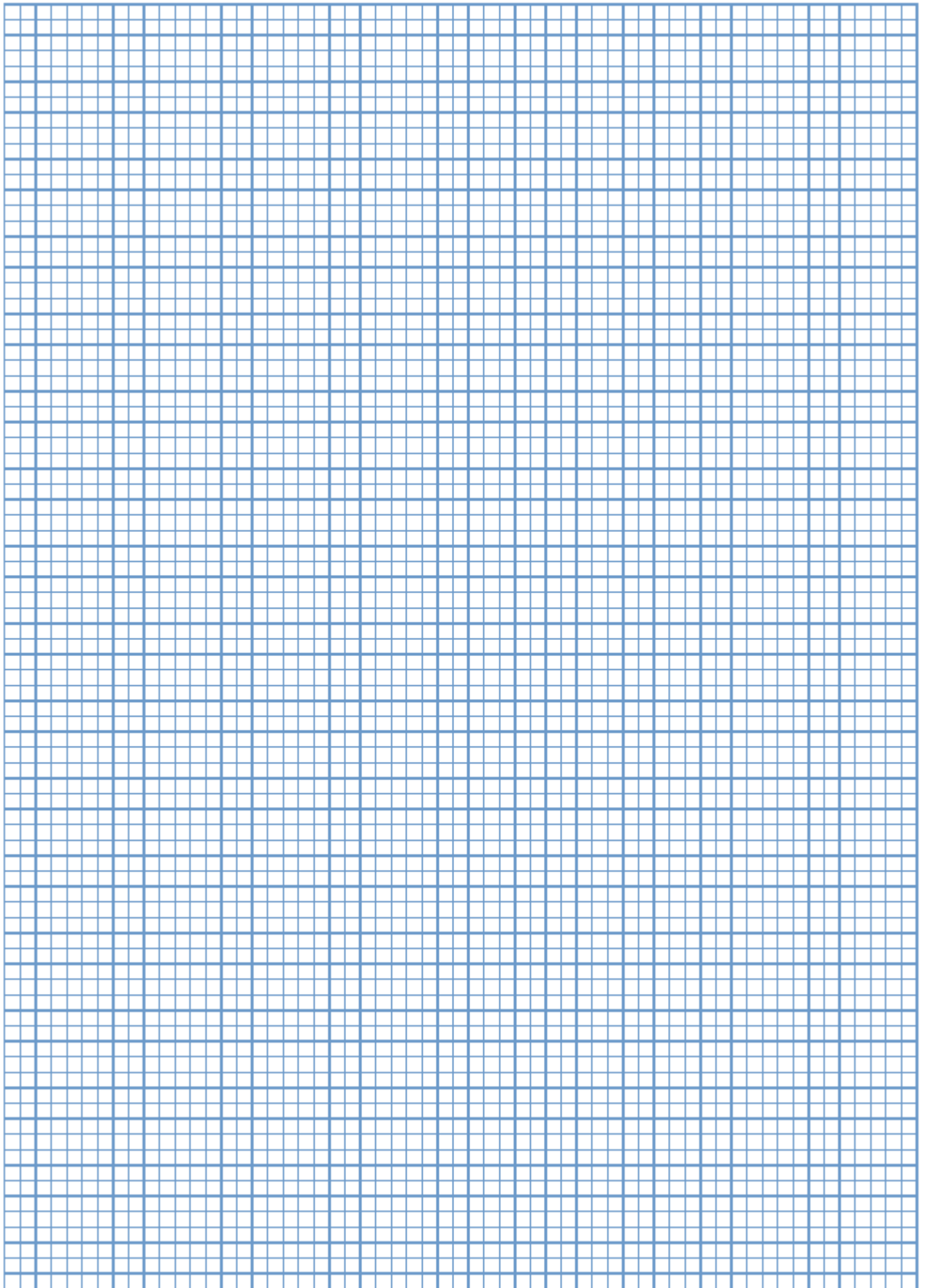
## III. Products Used in Installation: (List Each Heatwave Mat or Cable on a Separate Line)

Mat Number	Size	Total Watts	Volts	RESISTANCE IN OHMS															
				Received				After Mat is Customized/Cut			After Mat is Stapled or Bound to Subfloor/Underlayment			After Mat is Embedded in Thinset or Mortar			After Tile has Been Installed on Top of Mat		
				Hot to Neutral	Hot to Neutral	Hot to Ground	Neutral to Ground	Hot to Neutral	Hot to Ground	Neutral to Ground	Hot to Neutral	Hot to Ground	Neutral to Ground	Hot to Neutral	Hot to Ground	Neutral to Ground			
SAMPLE	1 x 50	750	120	19.2	19.2	None	None	19.2	None	None	19.2	None	None	19.2	None	None			
#1																			
#2																			
#3																			
#4																			
#5																			
#6																			

**Confirmation:** The above information was measured and recorded correctly as indicated on the measuring instrument, and the enclosed drawing shows the final layout of the products and the electrical connections.

Installer's Signature: \_\_\_\_\_

**Heatizon Systems**  
 4137 South 500 West  
 Murray, UT 84123  
 Phone 1-888-239-1232  
 Fax 1-801-293-3077





**888-239-1232**  
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