HEATIZON SYSTEMS

RADIANT HEATING SYSTEMS

- SNOW MELTING
- **FLOOR WARMING**
- SPACE HEATING
- ROOF DEICING
- GUTTER DEICING

Heatwave

Installation & Operating Manual

Warranty Registration

Heatizon Systems is glad to offer product phone support for the Heatwave product. It is VERY important to have read this manual first. Please have your resistance test numbers and system model name/number available BEFORE calling for technical support.

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 the kit be installed. ***Do not cut or alter the red heating cable in any way***.

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 conductor 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 to document the installed Heatwave® for future reference before installing the flooring.

HEATIZON SYSTEMS

Heatwave

Distributed by:
Heatizon Systems
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Murray, UT 84123
Phone: (801) 293-1232
Fax: (801) 293-3077
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heatizon.com

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 a 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 Interrupter), internal to the thermostat if Heatizon Systems supplied it, should be tested monthly as described in the manufacturer's pamphlet to ensure 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.

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 additional requirements for applications that utilize different floor coverings. For heating wall-to-wall carpeting, parquet, laminate or engineered wood floors and vinyl or linoleum flooring, a thicker heatsink bed is recommended for floating applications and glued down floor. A 1" to 1.5" spacing is recommended between the heating cable and the surface of the floor.

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. Call our Technical Support Hot line at 888-239-1232, for answers to installation questions, help solving a problem, or believe that the Heatwave® system was cut or damaged during installation.

DON'T

1. **DON'T cut the red heating wire.**
2. **DON'T POWER ON the Heatwave® system until COMPLETELY EMBEDDED in cementious material**
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 overlap Cables/Mats or allow any wires to cross or touch each other.
9. DON'T crimp the heating wire while customizing the mat
10. DON'T place high/thick insulating objects over the heated area to avoid excessive build-up of heat in these areas.
11. DON'T forget to install the floor sensor.
12. DON'T shorten the spacing in the Mat.
13. DON'T attempt to repair cut or damaged heating wire without contacting Heatizon Systems first 888-239-1232.
14. DON'T install the Heatwave® system within 6" of a wax toilet gasket.

* It is recommended that photographs be taken to document the installation of the layout.

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. 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. Consult the authority in the jurisdiction familiar with these requirements, either the NEC (National Electric Code), CSA (Canadian Standard Association) should there be any questions.
- 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 or repaired. To repair or to splice any part of the system, use only Heatizon Heatwave® Repair Kit (part number HWRPKIT).

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
info@heatizon.com
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 as designed.

Pay special attention to the following:

- **Instructions Marked:** 

- **Safety Warnings:** 

DO NOT CUT THE RED CABLE!

The HEATWAVE Mat/Cable systems are engineered to achieve specific heat output for the square footage to which they are designed. Cutting the red cable to fit a space is extremely dangerous and can result in a fire. Do not cut the red cable to avoid an obstacle or fixture, use other methods as described in this manual. Make sure to avoid damaging/ cutting the red cable during/after the installation of the flooring material by being aware of all red cable locations.

Consult the TROUBLESHOOTING section of the installation manual in the event that the cable is damaged or cut by accident.

DO NOT POWER ON!

HEATWAVE Mat/Cable systems MUST be completely embedded in a cementitious material BEFORE powering on. The cement material MUST cover all of the heating element, BOTH connection points (end and transistion between heating element and cold lead), and be completely dry before powering on. DO NOT power on the HEATWAVE mat/cable system in open air for testing (or any) purpose, this is an EXTREME FIRE DANGER. For testing, please follow the testing procedures in the HEATWAVE manual.

NOTE: HEATWAVE systems that have been powered on in open air are unrepairable and warranties are void.

1.3 Remember to Measure Resistance

The resistance between the two conductor wires should be measured. Compare this resistance reading to the "Total Ohms" column in Product section 4.1 for Heatwave® Mats, and section 4.2 for Heatwave® Cables. The value should be within ±10%. Also measure the resistance between each of the two conductors and the shielding/ground wire. Both should read infinity or open. If there is a different than expected readings for any of these measurements are observed, contact Heatizon Systems at 888-239-1232. Please refer to Section 7 (Commissioning) for instructions on how to measure the resistance.

NOTE:

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 covering).

DO NOT Power on the Heatwave® mat/cable until it is fully embedded in a cementious material and that material has completely dried.

1.4 Limited Lifetime Warranty

For the life of the floor covering and while in possession of the original owner, 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 the installation is in accordance with the installation instructions.

2. Heatwave® System

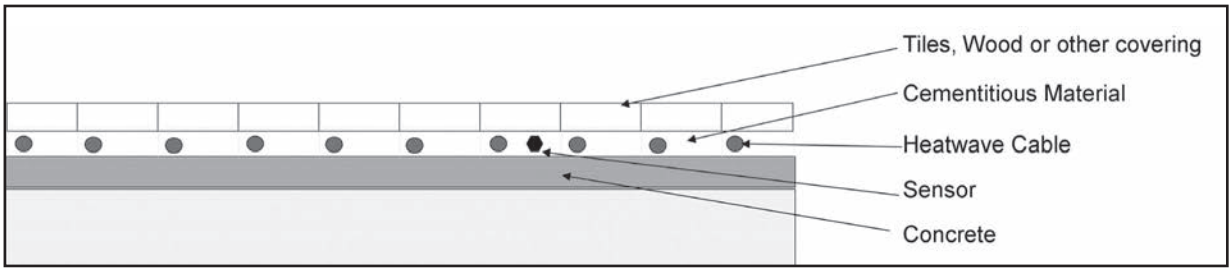
2.1 Heatwave Specifications

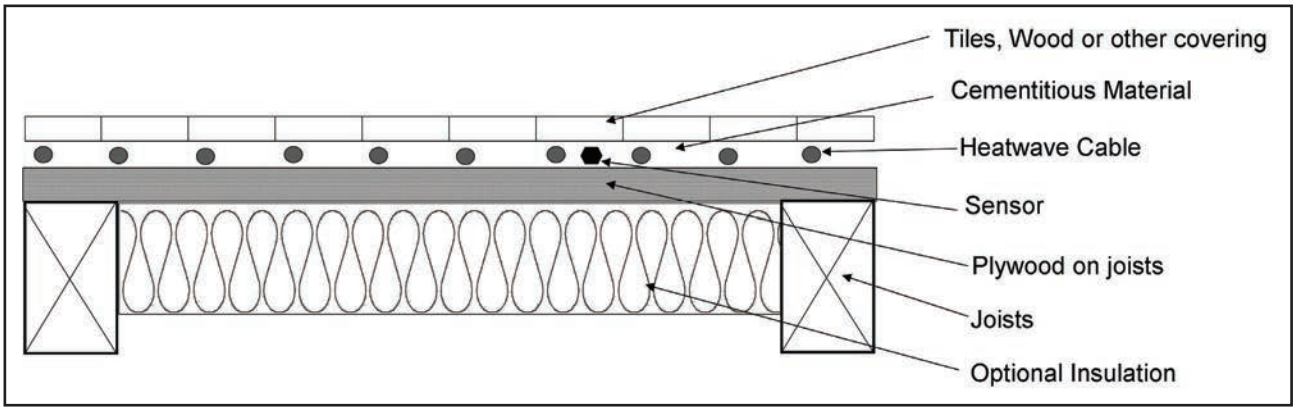
	MATS	CABLES
Cable Construction	Twin Conductor	Twin Conductor
Rated Voltage	120V, 240V	120V, 240V
Output	12W/ft2 (130W/m2) ± 10%	2.73 to 4.36W.ft (8.66 to 14.30W/m) ± 10%
Cable Spacing	3" (76.2mm)	2.5" to 4.5" (64.5mm to 114.3mm)
Cable Diameter	1/8" to 1/6" (3.2mm to 4.2mm)	1/8" to 1/6" (3.2mm to 4.2mm)
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 Sample Thermostat Specifications

Cable Construction	On/Off Control
Rated Voltage	120/240V ± 15%, 50/60 Hz
Output	15 AMP
Cable Spacing	40° to 104°F (5° to 40°C)
Cable Diameter	32° to 104°F (0° to 40°C)
Conductor Insulation	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.

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

NOTE:

- 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 to itself.
- Use copper conductor feeder 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*

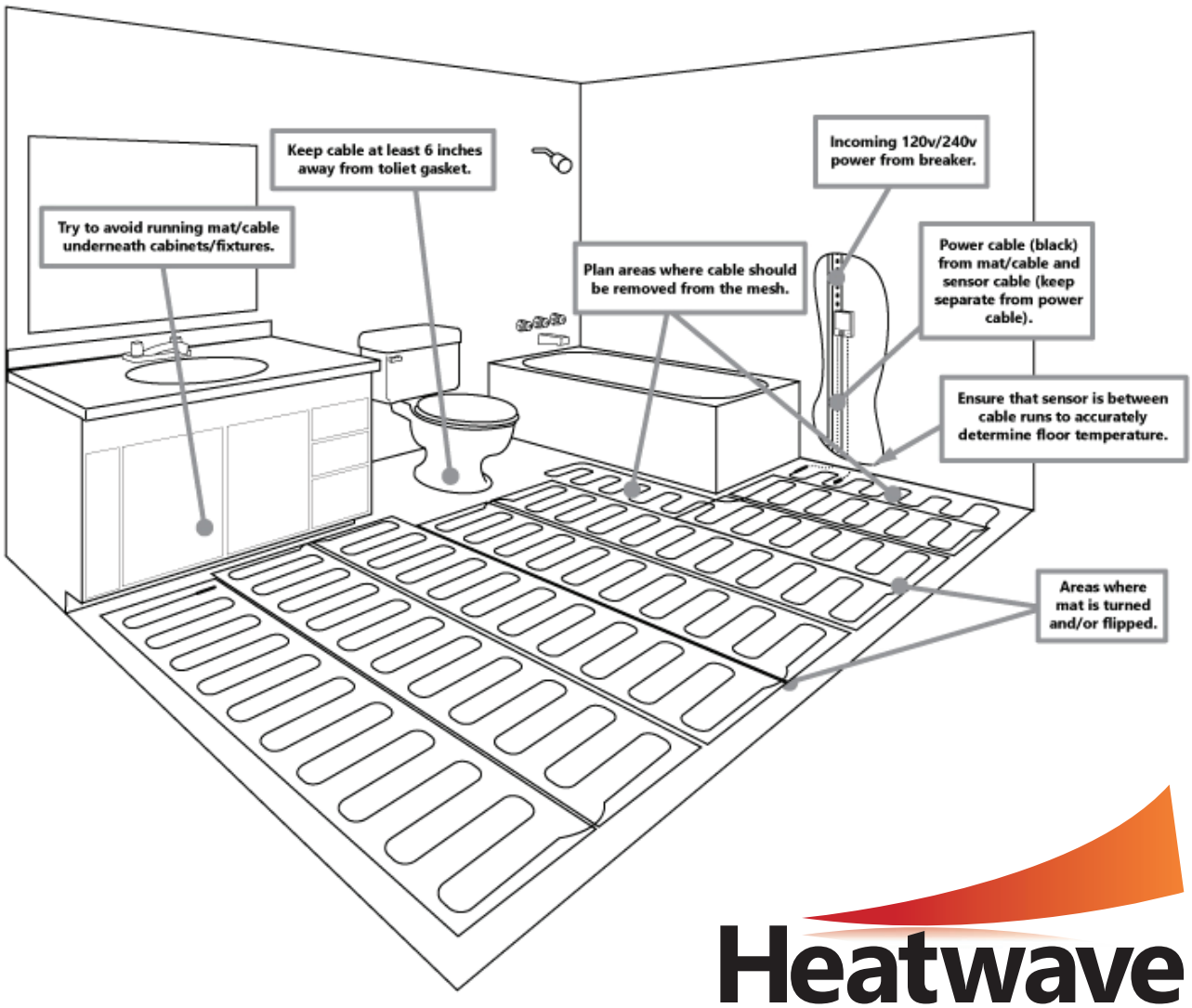
Determine the heated area of the floor where there are no permanent fixtures or furniture such as showers, toilets, vanities, or cabinets. Measure the heated area of the floor. For example, if the area of the bathroom is 96 ft^2, but when the area of the vanity, shower and toilet is subtracted, the total heated area is only 74 ft^2.

3.1.2 Determine the power supply voltage

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

NOTE:

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

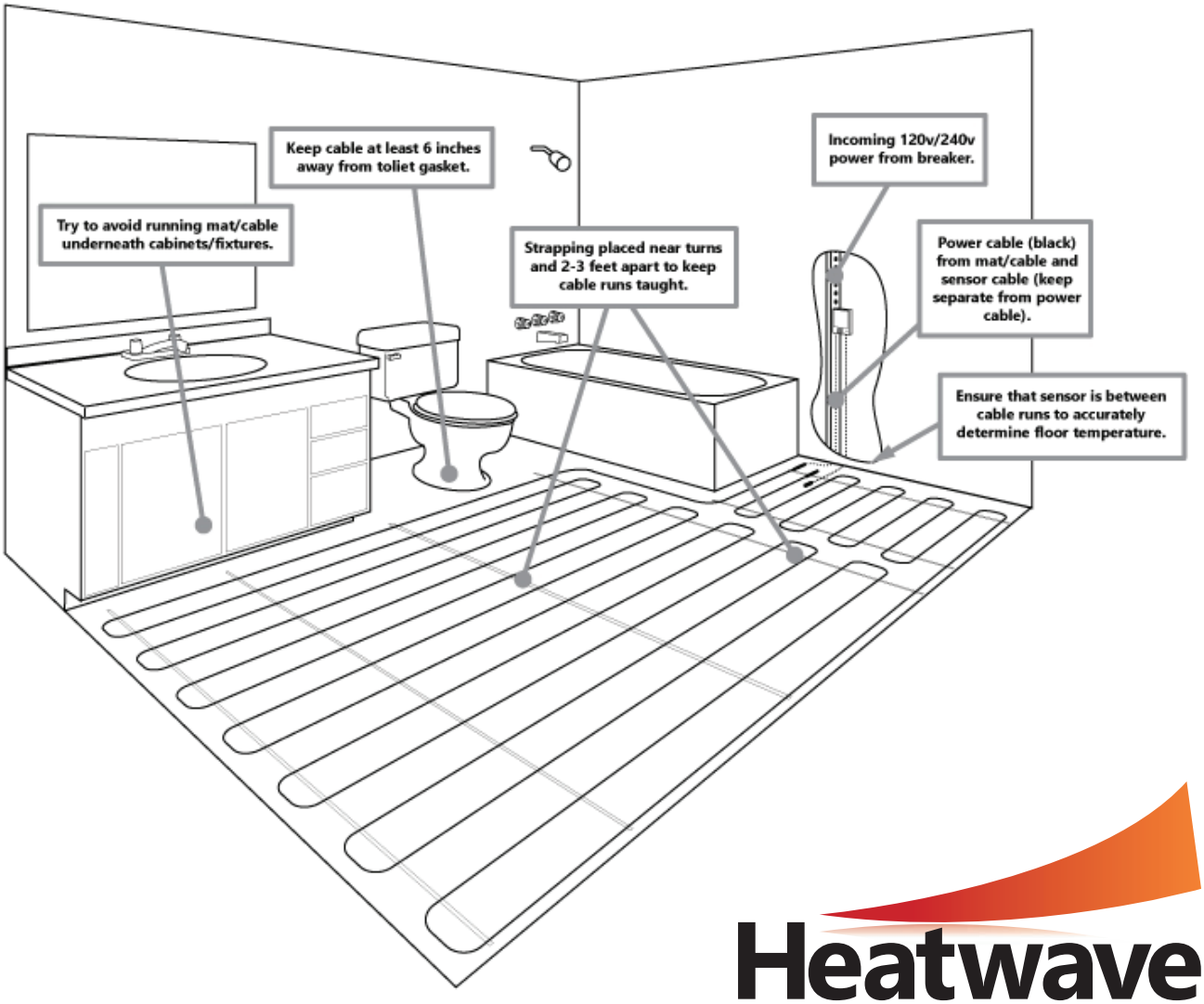


3.1.3 Plan the design*

Determine the optimum Heatwave® Cable or Mat layout for the 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 ten foot cold lead on the Heatwave, and the length of the floor temperature sensor.

NOTE:

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 laying out the Mat or Cable.



NOTE:

***If Installing Multiple Heatwave® Systems**
If the installation requires multiple Heatwave® units on one or two circuits, please review pages 26-29 of this manual before proceeding to address specific issues dealing with multiple Heatwave® Mats or Cables.

4. Product Selection—Select Either Heatwave® Mat or Heatwave® Cable

4.1 Heatwave® Mat Selection

Confirm that Heatwave® product is no larger than the heated area. Following the example from Figure 3, if the heated area is 74 ft², select the 70 ft² Heatwave® Heating Mat.

Heatwave® Mats, 12 Watts/Ft², 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	12.00	6.1′	20″	2.90″	15′
HW2012-150	HW2012-15	180	**80.0**	1.5	3.59	15	12.00	9.1′	20″	3.81″	15′
HW2012-200	HW2012-20	240	**60.0**	2.0	3.13	20	12.00	12.2′	20″	3.33″	15′
HW2012-250	HW2012-25	300	**48.0**	2.5	2.63	25	12.00	15.2′	20″	2.79″	15′
HW2012-300	HW2012-30	360	**40.0**	3.0	2.55	30	12.00	18.3	20″	2.71″	15′
HW2012-350	HW2012-35	420	**34.3**	3.5	3.47	35	12.00	21.3	20″	3.69″	15′
HW2012-400	HW2012-40	480	**30.0**	4.0	3.12	40	12.00	24.4	20″	3.31″	15′
HW2012-500	HW2012-50	600	**24.0**	5.0	3.20	50	12.00	30.5	20″	3.40″	15′
HW2012-600	HW2012-60	720	**20.0**	6.0	3.40	60	12.00	36.6	20″	3.61″	15′
HW2012-700	HW2012-70	840	**17.1**	7.0	2.93	70	12.00	42.7	20″	3.11″	15′
HW2012-800	HW2012-80	960	**15.0**	8.0	2.65	80	12.00	48.8	20″	2.82″	15′
HW2012-900	HW2012-90	1080	**13.3**	9.0	3.36	90	12.00	54.9′	20″	3.56″	15′
HW2012-1000	HW2012-100	1200	**12.0**	10.0	4.15	100	12.00	61.0′	20″	4.44″	15′

Heatwave® Mats, 12 Watts/Ft², 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	12.00	24.4′	20″	3.33″	15′
HW2012-500B	HW2024-50	600	96.0	2.5	2.63	50	12.00	30.5′	20″	2.79″	15′
HW2012-600B	HW2024-60	720	80.0	3.0	2.55	60	12.00	36.6′	20″	2.71″	15′
HW2012-700B	HW2024-70	840	68.6	3.5	2.39	70	12.00	42.7′	20″	2.54″	15′
HW2012-800B	HW2024-80	960	60.0	4.0	3.12	80	12.00	48.8′	20″	3.31″	15′
HW2012-900B	HW2024-90	1080	53.3	4.5	2.59	90	12.00	54.9′	20″	2.75″	15′
HW2012-1000B	HW2024-100	1200	48.0	5.0	3.20	100	12.00	61.0′	20″	3.40″	15′
HW2012-1100B	HW2024-110	1320	43.6	5.5	2.86	110	12.00	67.1′	20″	3.03″	15′
HW2012-1200B	HW2024-120	1440	40.0	6.0	3.40	120	12.00	73.2′	20″	3.61″	15′
HW2012-1450B	HW2024-145	1740	33.1	7.3	3.14	145	12.00	88.4′	20″	3.33″	15′
HW2012-1600B	HW2024-160	1920	30.0	8.0	2.65	160	12.00	97.6′	20″	2.82″	15′

4.2 Heatwave® Cable Selection

The Heatwave® Heating Cable comes in pre-established lengths that have been designed to deliver a specified watt density (see page 14 for models). To ensure that the Heatwave® Heating Element length purchased is the correct size for the 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.

STEP 2: **Determine Watts Per Square Foot.** Determine the Watts per square foot for the 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.

STEP 3: **Calculate Total Watts.** Calculate total Watts by multiplying Line A by Line B, and enter the result on Line C.

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.

CALCULATIONS*

Line A: 74
(Square Footage)

Line B: 12
(Watts Per Square Foot)

Line C: 888
(Total Watts)

Line D: (Circle One) **120VAC** **240VAC**

Line E: 203
(Element Length)

74 ÷ 203
Square Footage From Line A / Element Length From Line E

Result from above times 12 =

Line F: 4.374
(Element Spacing)

* Figures shown are for illustrative purposes only.

STEP 5: **Select the Correct Heatwave® Heating Cable Length.** Use the table (pg 12) to select the Heatwave® Heating Cable Model that is the correct input Voltage from line D, and will deliver the closest total watts calculated on Line C. Heatizon Systems recommends selecting 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.

STEP 6: **Calculate Element Spacing.** Calculate the amount of space between the runs of element for the application and the Heatwave® Heating Element.

Heatwave® Cables, 120/240 VAC

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″
240V Input									
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″

Important: Tools and materials required

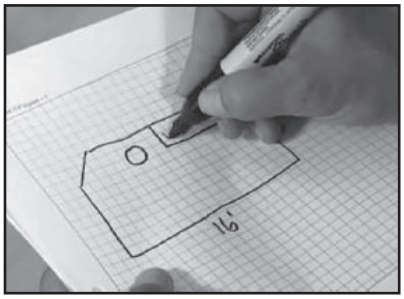
The following items may be required to install and test the floor heating system:

- Scissors
- Tape measure
- Hot glue gun
- Utility knife
- Screwdriver
- Tin snips
- Wire strippers
- Multimeter
- Heatizon Plastic Cable Clips or Cable Strap

NOTE:

Before Laying the Heatwave® Mat or Cable

Note: Measure the resistance between each conductor and the shielding/ground wire. Both should read infinity. 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.



5. INSTALLATION

Follow these steps to ensure a successful Heatwave® installation.

5.1.1 PLAN THE LAYOUT

Using the back 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.

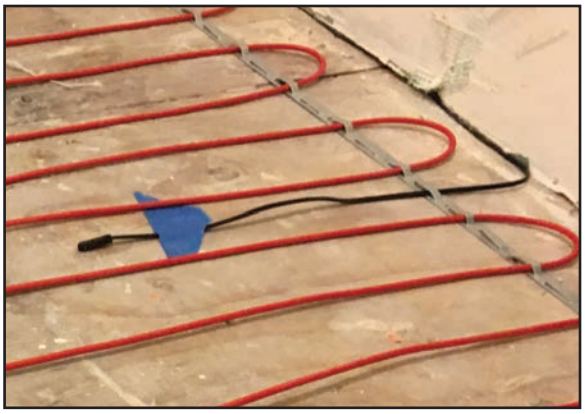
NOTE:

Heatizon recommends that the installation be documented with photos and drawings to note the location of connections and the sensor, as well as the cable layout.

Important: Mark the position of the connection point between the power lead and the red Heatwave® heating cable. **This connection must be embedded 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.

5.1.2 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 15 ft. of 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 in the floor to a location below the thermostat for the sensor conduit. The conduit has to go from the wall below the thermostat and minimum of 10" away from the wall towards the middle of the floor for placement between two runs of cable.

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 the tables 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 or open. Please refer to Section 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!

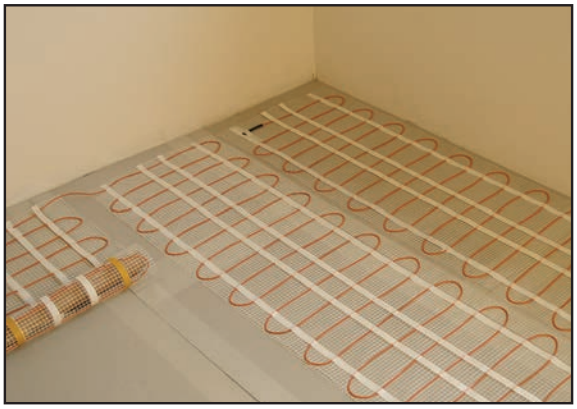
NEVER PLACE RED CABLE WITHIN 6" OF A WAX TOILET RING.

For installing
HEATWAVE® MATS,
continue with the installation below beginning with section 5.2.

For installing
HEATWAVE® CABLES,
skip to Section 5.3 to continue with the installation.

HEATIZON SYSTEMS

5.2 Heatwave® Mat Installation



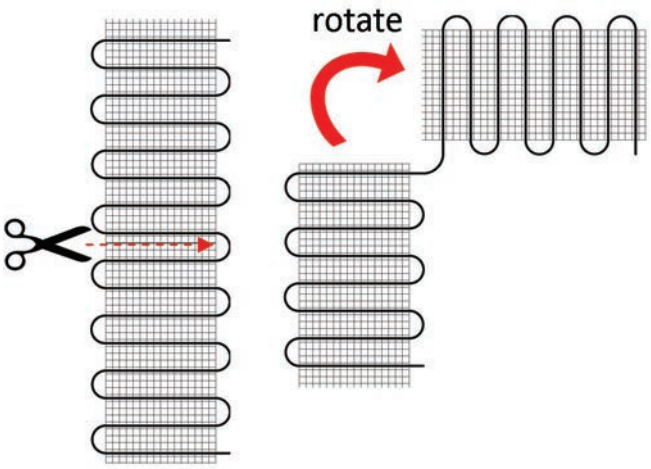
5.2.1 Start by placing the mat such that the connection point and the temperature sensor are in their intended final positions and bring the cold lead to the thermostat or connection box. If a floor alarm or "screamer box" is being used, attach it now (see section 7.4, FLOOR ALARM USAGE). Ensure the connection between the heating cable and cold lead will be properly embedded in thinset and/or mortar. Begin unrolling the Heatwave® Mat evenly across the floor outside the areas that were marked previously. When the next wall is reached, cut the mesh (being careful not to cut the red heating cable), turn the mat, and begin rolling in the desired direction. See Heatwave® Mat Layout Configurations on Page 17.

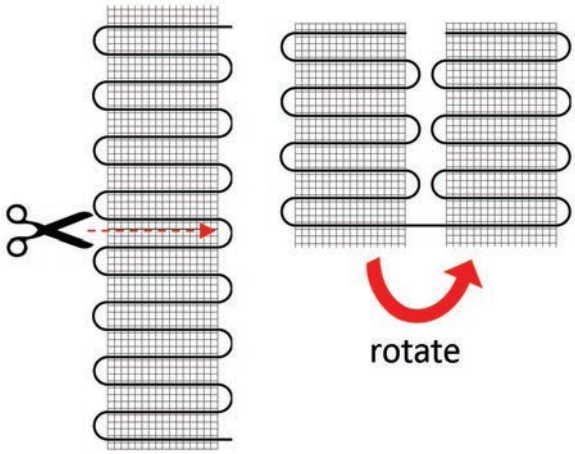
5.2.2 Ensure that the Heatwave® is in full contact with the subfloor at all times. Avoid walking on the heating mat. If this is not possible, use shoes with very soft rubber soles. When approaching obstacles (toilets, cabinets, etc.), carefully remove some of the red heating cable from the mat and lead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

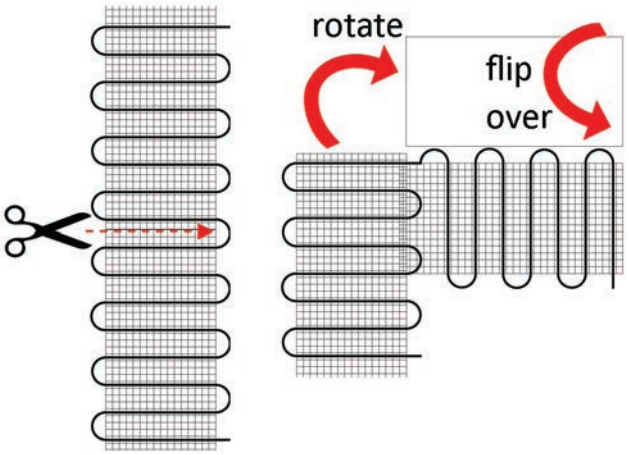
5.2.3 Use Heatizon Plastic Cable Clips, hot glue*, or a thin strip of tape to secure the loose cable to the floor.
*** Do not place hot glue gun tip directly on heating cable.**

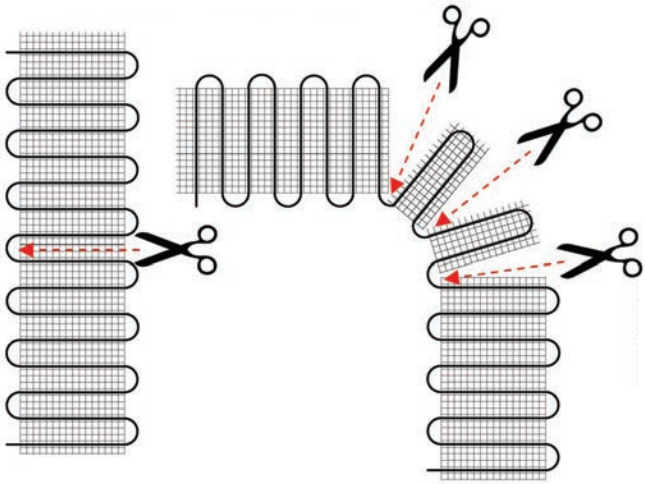
5.2.4 MEASURE THE RESISTANCE (TEST #2)
Use a digital Ohm meter to measure the resistance of the Heatwave® Mat/Cable and compare it to the total Ohms in the tables in Section 4.1 for Mats or in Section 4.2 for Cables. Record the measured resistance on the Registration Form. Documenting the resistance 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 Section 7 (Commissioning) for instructions on how to measure the resistance.

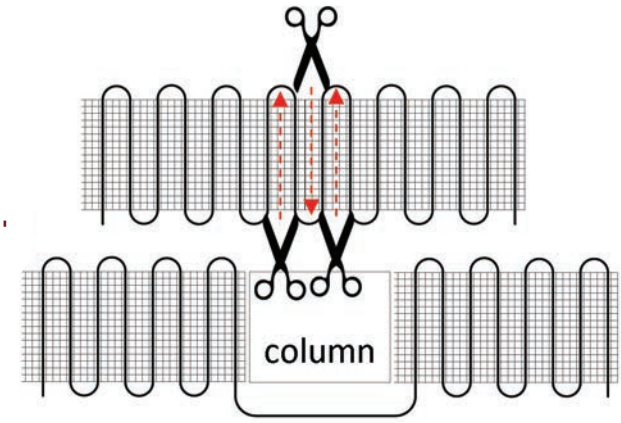
Heatwave® Mat Layout Configurations

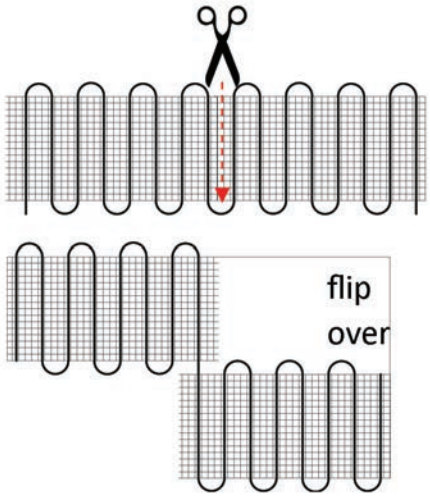












5.3 Heatwave® Cable Installation

Verify the correct Heatwave® Cable has been purchased to heat the area selected and that the correct spacing has been determined for the area being heated, the Watts to be delivered, and the size of system purchased. DO NOT CUT THE RED HEATING CABLE to fit an area. See the Tables in Section 4.2.

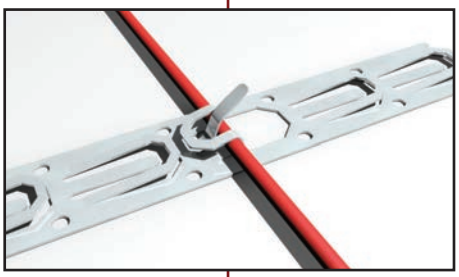
5.3.1 Plan room layout using tape measure, marking pencil, and chalk line. Lay out perimeter of area to be heated first, keeping a minimum of 1.5 inches from walls and or cabinets and the first run of element. Once the layout is complete, roll out the Heatwave® Heating Cable, making sure that both ends of the heating element (where the Heatwave® Heating Cable is pre-connected to the Cold Lead segment) are within 15 vertical and horizontal feet of the power switching thermostat location to accommodate Cold Lead length.

5.3.2 Start by placing the mat such that the connection point and the temperature sensor are in their intended final positions and bring the cold lead to the thermostat or connection box. If a floor alarm or "screamer box" is being used, attach it now (see section 7.4, FLOOR ALARM USAGE). Ensure the connection between the heating cable and cold lead will be properly embedded in thinset and/or mortar. Continue by laying out Heatwave® Heating Cable on the predetermined layout, and fasten with strapping or plastic clips as described below for the floor surface.

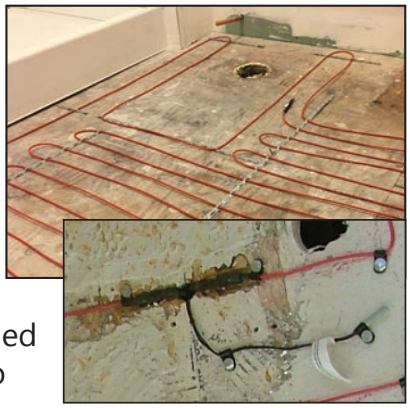
5.3.3 When anchoring the Heatwave® Heating Cable to wood subfloors use either the Plastic Clips (Heatizon Part #PLASCLIPKIT) or Heatwave® Cable Strap (Heatizon Part #HWCSTRAP33).

Plastic Clips: 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.

Cable Strap: Heatwave® Cable Strap is used to hold Heatwave® Cables in place on the sub floor surface at the spacing required. Variable spacing options can be maintained using this thin metal strapping. Cut the strap to length using ordinary snips. Anchor the strap with screws on plywood or backer board or with adhesive, hot glue or 2-sided tape on concrete. The strap should be installed on opposite ends of the room and every five feet in between. If additional securing of the cable is required, hot glue or tape can be used to hold in place during the thin set or self-leveling pour. Check continuity between the Heatwave® Heating Cable and the strap as the cable is installed.



5.3.4 If Heatwave® Heating Cable is being installed directly on existing concrete, a Heatwave® Anchoring Plug Kit (HWANCHPLUGKIT) may be purchased. Use a 1/4" cement drill bit to drill holes 1¼" 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.

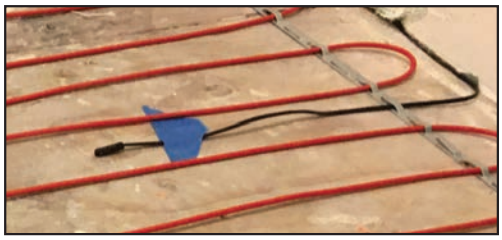


5.3.5 Continue laying out and anchoring Heatwave® Heating Cable until complete. Make certain the end of the Cold Leads attached to the Heatwave® Heating Cable return to the thermostat location. When all of the Heatwave® Heating Cable has been installed and secured, run the second Cold Lead (if there are two) 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. Ensure the connection between the heating cable and cold lead will be properly embedded in thinset and/or mortar. This can be accomplished by routing out a small amount of the floor (create a small channel) to lower the profile of the connection.

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 the tables 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 Section 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 the Heatwave® product. Do not use Heatwave® to dry self leveling or other cementitious material.

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 the tables 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 Section 7 (Commissioning) for instructions on how to measure the resistance.

6.2 INSTALL FLOOR COVERING

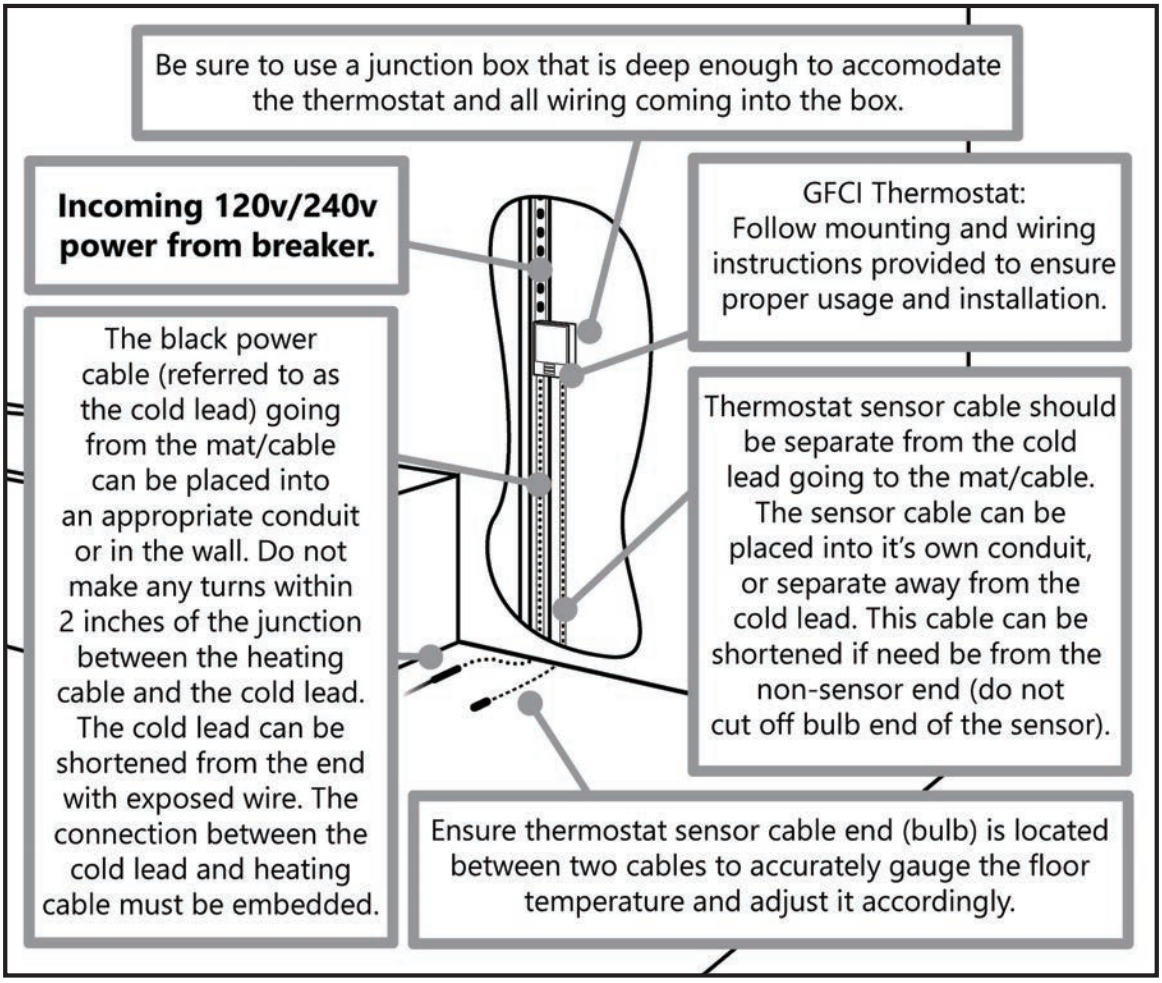
To install tile, apply a layer of thin-set mortar using the ridged side of the trowel (use trowel provided in Heatwave Premium Kit). Tile and grout the floor using best industry practices and in accordance with instructions provided by the tile manufacturer.

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.

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.

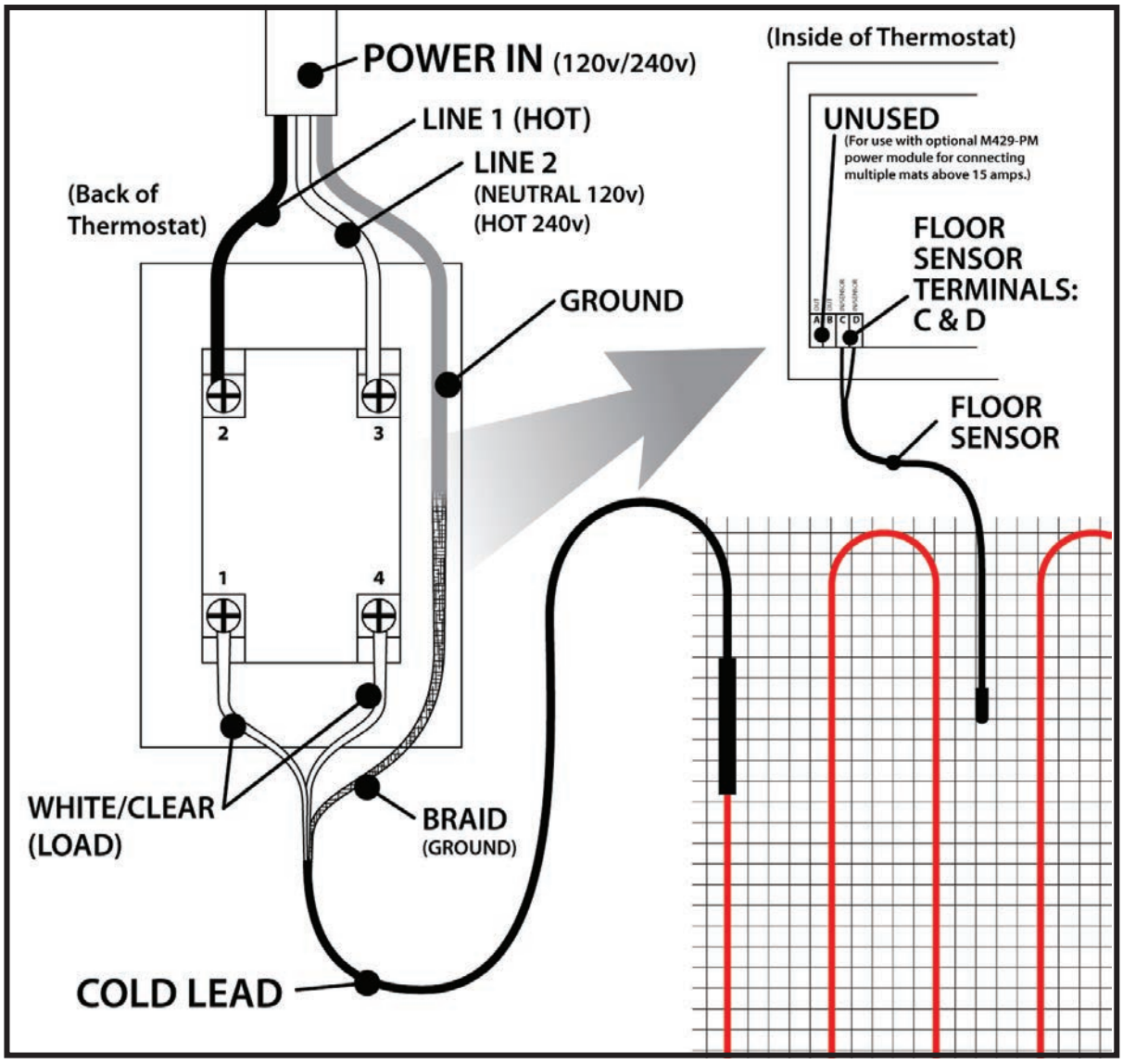


NOTE:

- Mark the appropriate circuit breaker reference label indicating which branch circuit supplies the power to each electric heating cable.
- 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.

Thermostat Electrical Connection Details

This diagram is a quick reference for the connections for power and mat/cable to the M429 thermostat and the M429-PM (optional). Consult the diagrams included with the thermostat for further information. (Please see Section 8 for wiring multiple systems to a thermostat.)



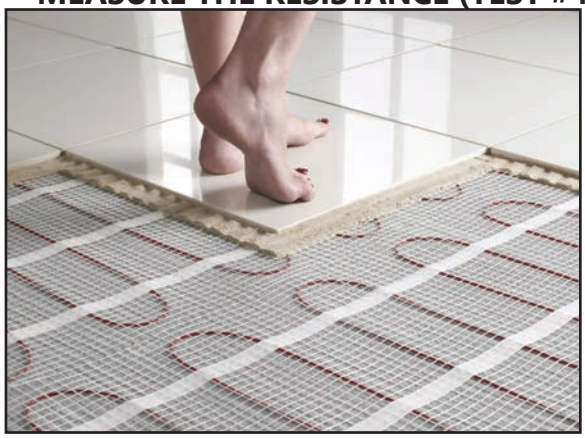
NOTE:

The M429-PM is and optional device available from Heatizon for instances when multiple cables or mats need to be controlled by one thermostat, but exceed the amp rating of the single thermostat. For information about this advanced install method, read section 8. HEATWAVE EXPANSION.

NOTE:

- Consult the quick start thermostat programming guide on pages 22-23 once the thermostat installation is completed.
- Instructions for programming, wiring and troubleshooting of the M429 thermostat are included in the box and available on the Heatizon website.
- The sensor cable and cold lead coming into the box for the thermostat can be shortened if needed.
- Ensure that the sensor cable is separate from all power cables and enters into a different box port.

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 the tables 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 Section 7 (Commissioning) for instructions on how to measure the resistance.

6.5 RECORD INFORMATION AND AFFIX LABELS

It is important for the home builder/owner to retain a copy and 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 future reference. Place the included label "Electric Shock or Fire Hazard" on the inside of the electrical power distribution panel.

ELECTRIC SHOCK OR FIRE HAZARD

HeatWave Mat Floor Heating System

Disconnect all power before installing or servicing heating cable. Heatwave® must be installed and serviced by a qualified person in accordance with the National Electrical Code, NFPA 70, and/or the Canadian Electric Code. Heatwave® must be effectively grounded to eliminate shock hazard. Damaged or worn heating cable or accessories must be replaced immediately. Failure to follow these warnings could result in personal injury or damage to property. For more information, contact Heatizon Systems at www.heatizon.com or call 801-293-1232.

HEATIZON SYSTEMS

HEATWAVE®

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 personal preferences.

NOTE:

Due to the varying thermal properties of rooms where the Heatwave® System may be installed, the size of the system installed, and the specific installation parameters, a firm time frame of how long it takes to heat to the desired temperature is hard to estimate without specific heat loss calculations.

Important: For the Limited Lifetime Warranty to apply, these tests MUST be performed, record the results on the Registration Form, and retain a copy of the record. These tests MUST be performed: Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test four times (please refer to Installation Instructions) during the installation process.

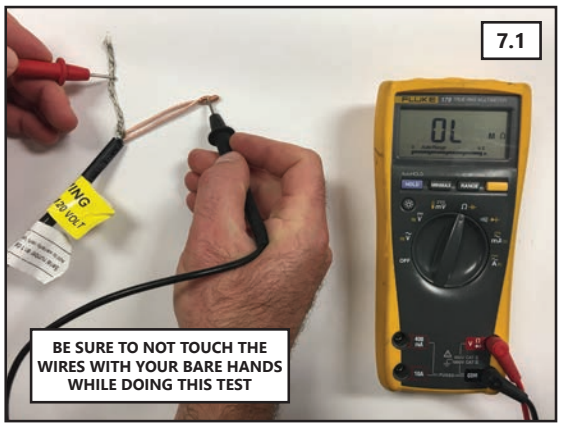
NOTE: Visit section 7.5 for specific instructions about using the Heatizon Multimeter supplied in the Premium Kit/Premium Add-on Kit.

7. Commissioning

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.

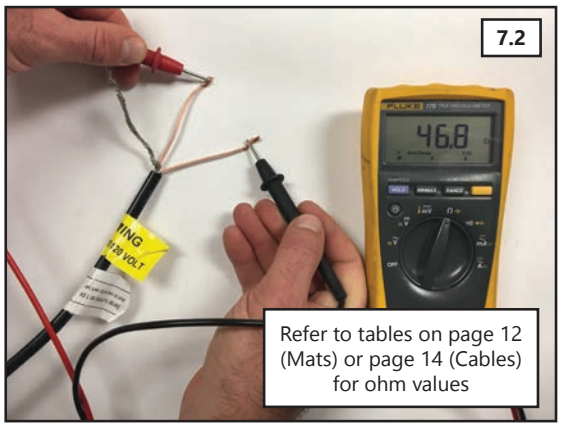
A. Set the multimeter to 2000K ohm.
B. Connect* the ground wire to the black lead and both white conductors to the red lead of the multimeter.
C. Make sure the meter indicates, "Open," "OL," "1," or infinity. If there is a different reading, contact Heatizon at 888-239-1232.
D. Record these readings on the Registration Form.



7.2 HEATING CABLE RESISTANCE TEST

This test measures the resistance of the Heatwave® Mat or Cable, and is used to determine circuit integrity.

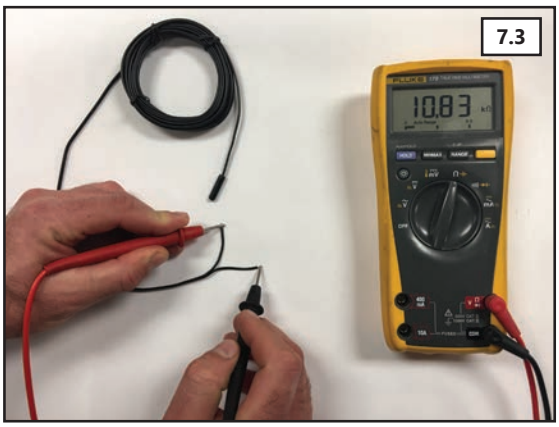
A. Set the multimeter to the 200 or 2000 ohm range.
B. Connect* the multimeter leads, one to each white conductor on the cold lead.
C. Compare this resistance reading to the resistance specified in the tables in Section 4.1 or 4.2. The value should be within ±10%. If there is a different reading than expected, contact Heatizon at 888-239-1232.
D. 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.

A. Set the multimeter to the 200K ohm range.
B. Connect* the multimeter leads to each sensor lead wire.
C. Make sure the meter reads between 9-25K ohms. If there is a different reading, contact Heatizon at 888-239-1232.

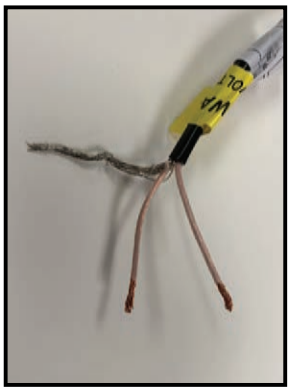


**** Be sure when connecting the multimeter to the leads, do not touch the connection with bare hands or that two connections do not touch.***

7.4 USING A FLOOR ALARM/SCREAMER

If a floor alarm/screamer unit is being used that was part of the Heatwave® Premium Kits or purchased separately, follow the following instructions for use.

A. Install two AAA batteries (included with Premium Kits) by removing compartment on the backside of the device, close the compartment.
B. Switch the power on to the unit using the power switch, the device alarm should sound, also the power and alarm lights should illuminate. If the unit does not power on correctly, check to see if batteries are installed properly. Power the unit off.
C. Be sure the cold lead has been ran into the connection box/thermostat location, BEFORE beginning the layout of the Heatwave® cable or mat.
D. Connect the two copper wires with clear/white sheath to the terminals marked "L1" and "L2" on the floor alarm, using the screwdriver supplied, making sure the terminals are tightly screwed down.

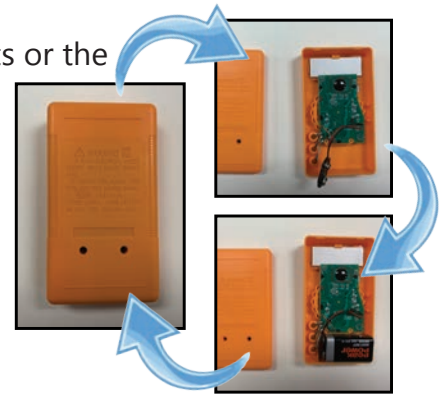


E. Twist the silver ground wire tight and connect to the terminal marked "E/G," again ensure the terminal is screwed down tight.
F. Power on the unit, the device should NOT make a sound and only the POWER light should illuminate, if the ALARM light is lit and the alarm sounds, turn it off and check the connections and power the unit back on.
G. Leave the floor alarm connected* and powered on whenever working on the Heatwave® system until it has been fully installed and flooring is complete, remove only when the system needs to be connected to the thermostat.
**Only disconnect the floor alarm when the manual requires the Heatwave system be tested using a multimeter, then reconnect after testing is complete.*
H. After you have finished using the Floor Alarm you may visit **Heatizon.com/alarmrecycle** to recycle the alarm responsibly and free of charge.

WARNING: IF THE FLOOR ALARM SOUNDS DURING THE INSTALLATION OF THE HEATWAVE® SYSTEM, STOP AND CHECK GROUND AND RESISTANCE (SECTION 7.1 AND 7.2), IF THE RESULTS DO NOT MATCH TO THE CHARTS, THE SYSTEM IS DAMAGED. CONTACT HEATIZON SYSTEMS 1-888-239-1232 FOR FURTHER INSTRUCTIONS ON HOW TO PROCEED WITH A REPAIR.

NOTE: The Floor Alarms are specifically designed to monitor floor heating systems only. Any use outside of that for which they are specifically designed, is not recommended. Heatizon is committed to responsibly recycling/disposing of these units free of charge. Visit Heatizon.com/alarmrecycle for more information.

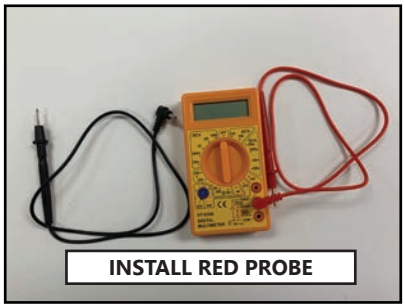
7.5 USING THE HEATIZON MULTIMETER

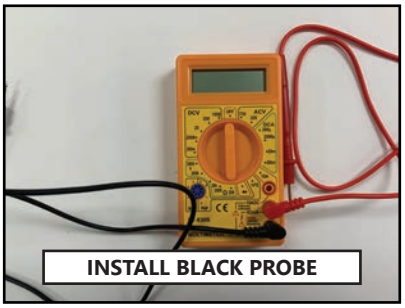


This multimeter is supplied with the Heatwave® Premium Kits or the Premium Add-on kit. This usage applies to testing the Heatwave® system only. For other uses/operations consult the devices manual*.

SETUP THE MULTIMETER:

- Install the battery (supplied) by removing the two screws on the back of the meter, then plugging the battery into the terminal inside. Replace the back of the meter and screw it tight.
- Install the red lead on the middle port on the front of the meter.
- Install the black lead in the lower port on the front of the meter.

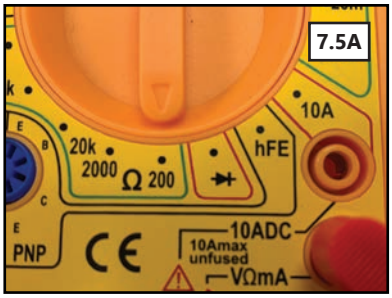


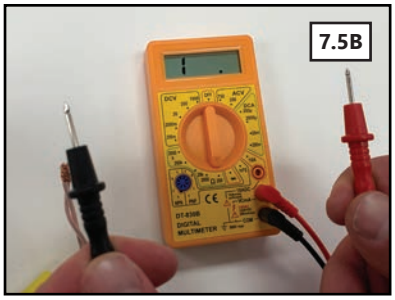


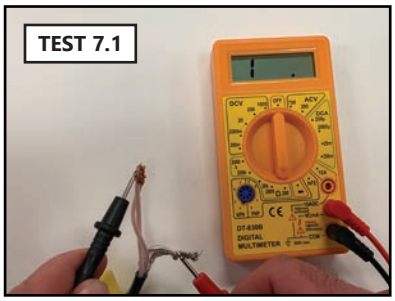
USING THE MULTIMETER:

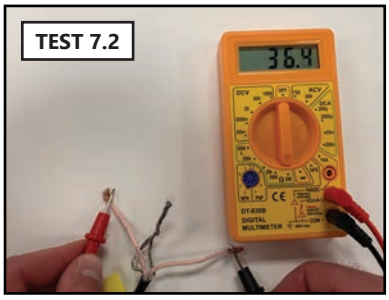
- For the **INSULATION RESISTANCE TEST** (7.1) rotate the dial should be set to 200 in the Ohms section (Denoted by the Ω symbol) (Image 7.5A). Ensure that the display reads "1," to indicate an open circuit (Image 7.5B) then proceed with the instructions outlined in step 7.1.
- For the **HEATING CABLE RESISTANCE TEST** (7.2) keep the dial at the 200 ohms setting then proceed with the instructions outlined in step 7.2.
- For the **SENSOR RESISTANCE TEST** (7.3), rotate the dial to the 20k ohm setting (image 7.5C) then proceed with the instructions outlined in step 7.3.

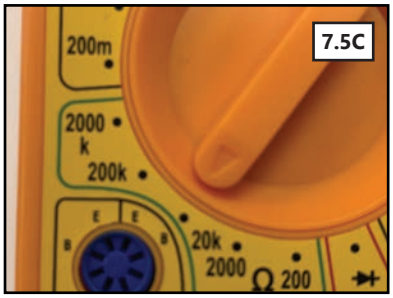
**Heatizon offers no warranty or support for the multimeter outside of this tutorial.*

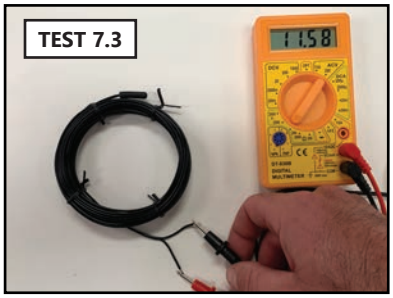












Heatwave

8. Expanding The Heatwave System

8.1 Expanding the Heatwave® System

The following sections cover special considerations when using multiple Heatwave Mats and/or cables for expanding overall coverage of the system. All other installation instructions remain the same. Failure to follow the complete installation instructions can result in voiding your warranty, and permanant damage to your system.
All applicable tests should be performed on EACH Heatwave system independently to ensure proper operation of EACH unit connected to the complete system.
Should you have more questions related to installing multiple Heatwave systems on one thermostat or a thermostat and power module, please contact Heatizon Systems at 888.239.1232, Monday through Friday, 8 am to 5 pm (MST), or email info@heatizon.com.

8.2 Purchase Heatwave® Expansion Components

Individual Heatwave® Cables or Mats are available for purchase outlined below:

1. Contact the distributor that you purchased your Heatwave® system from.
2. Visit heatizon.com/heatwave to explore various options for purchasing additional Cables, Mats, power modules, thermostats, etc.

Individual components of the Heatwave system are not available on Amazon.

8.3 Planning the Expansion 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® Cables or Mats.
2. The starting and ending points of each Heating Cables length or Mats size.
3. The location of the thermostat and/or power module or load switching relay.
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.

8.4 Thermostat Models

The Heatwave® Cable or Mat Floor Warming System can use different thermostats to control the system. Below is a list of compatible thermostats with the power module, the Heatizon part number, and associated features.

PART NUMBER	FEATURES
M429-PM	Power module for adding an extra circuit to a Heatwave system, to be controlled by an M429 line thermostat, with GFCI.
M429-NP	Non-programmable thermostat, temperature adjustment, floor sensor capable, GFCI, on/off.
M429	Programmable, with 3 different schedules, 4 daily events, floor sensor capable, temperature adjustment, GFCI, on/off.
M429-TS	Same as M429, but touch-screen interface.
M429-WIFI	Same as M429-TS, but WIFI connection that enables thermostat to be control via an app.

8.5 Heatwave® Multiple Units Scenarios

The following sections are for addressing planning and installation issues that come from installing multiple Heatwave® systems (cables or mats). There are two main expansion methods covered:

- **Multiple Systems, Single Circuit (15 Amps)**
  Multiple Heatwave® Cables or Mats that do NOT exceed 15 amps, that are powered by a single thermostat.
- **Multiple Systems, Two Circuits (30 Amps)**
  Multiple Heatwave® Cables or Mats that do NOT exceed 30 amps, using two circuits, and a power module (M429-PM) that are controlled by a single thermostat.
- **Multiple Systems, One or More Circuits (20 Amps+)** In the instance where complete systems go over two circuits (30 amps total), or need to use breakers larger than 15 amps, contact Heatizon Systems (888-239-1232) directly for solutions for these applications.

8.6 Using the Expanded System

If all the instructions were followed when installing these systems, the thermostat will control all units attached to both the thermostat and the connected power module. There is no difference for programming or use of the system when multiple units are connected.

Follow local codes according to whether or not the Heatwave® system can be installed on a shared or dedicated breaker. Best practice is to keep the Heatwave® system on it's own circuit breaker for optimal results, performance, and safety. When expanding the Heatwave® system, the system SHOULD be on a dedicated circuit.

8.7 Determining Heatwave® Total System Size

1. Determine total square footage of area(s) to be heated.
2. Use the following guidelines to determine system voltage and number of circuits:
   - Single Circuit Systems (15A):
     - 120v Mats: Maximum of 150 square feet of coverage.
     - 240v Mats: Maximum of 300 square feet of coverage.
     - 120v Cables: Range between
       - 114(15w per SQFT)-214(8w per SQFT) square feet of coverage.
     - 240v Cables: Range between
       - 242(15w per SQFT)-453(8w per SQFT) square feet of coverage.
   - Double Circuit Systems (2x15A):
     - 120v Mats: Maximum of 300 square feet of coverage.
     - 240v Mats: Maximum of 600 square feet of coverage.
     - 120v Cables: Range between
       - 228(15w per SQFT)-428(8w per SQFT) square feet of coverage.
     - 240v Cables: Range between
       - 484(15w per SQFT)-906(8w per SQFT) square feet of coverage.
3. Plan breakup of mats and cables*.

   If the area to be heated is continious, choosing the products is as easy as dividing the area between the available mats/cables until the desired size is reached, for example:

	120v Mats Single Circuit	120v Mats Double Circuit	240v Mats Single Circuit	240v Mats Double Circuit	120v Cables Single Circuit	120v Cables Double Circuit	240v Cables Single Circuit	240v Cables Double Circuit
SQFT:	135	275	270	505	125	338	255	560
Sys 1	HW2012-1000	HW2012-1000	HW2012-1600B	HW2012-1600B	HWC-64120	HWC-64120	HWC-128239B	HWC-114214B
Sys 2	HW2012-350	HW2012-400	HW2012-1100B	HW2012-1100B	HWC-815	HWC-5094	HWC-3260B	HWC-56105B
Sys 3	N/A	HW2012-1000	N/A	HW2012-1450B	N/A	HWC-64120	N/A	HWC-128239B
Sys 4	N/A	HW2012-350	N/A	HW2012-900B	N/A	HWC-1630	N/A	HWC-3260B

*Actual Size of combined systems may vary and be accomplished with different combinations.

Do NOT exceed 15 amps on either the thermostat (any model) or the power module. This will damage the unit and void your warranty.

NOTES:

- Combining of Heatwave® Mats and Cables is permissible if this is the best solution to your specific application. If installing differing systems, spacing for the free-roll cable must match to the spacing in the mat it is being paired with to ensure the same amount of heat output.
- When installing multiple Heatwave Cables, similar spacing should be followed across all the units to ensure matching heat output across the whole system.

In the event the combined systems are located in two separated areas, choose two systems that best match the square footage of the separate areas. Ensure that the total amperage per circuit is UNDER 15 amps, by using the charts below.

Heatwave® Mats, 12 Watts/Ft², 120 VAC

Heatizon Part Number	Amp Load	Coverage Area/Square Foot
HW2012-100	1.0	10
HW2012-150	1.5	15
HW2012-200	2.0	20
HW2012-250	2.5	25
HW2012-300	3.0	30
HW2012-350	3.5	35
HW2012-400	4.0	40
HW2012-500	5.0	50
HW2012-600	6.0	60
HW2012-700	7.0	70
HW2012-800	8.0	80
HW2012-900	9.0	90
HW2012-1000	10.0	100

Heatwave® Mats, 12 Watts/Ft², 240 VAC

Heatizon Part Number	Amp Load	Coverage Area/Square Foot
HW2012-400B	2.0	40
HW2012-500B	2.5	50
HW2012-600B	3.0	60
HW2012-700B	3.5	70
HW2012-800B	4.0	80
HW2012-900B	4.5	90
HW2012-1000B	5.0	100
HW2012-1100B	5.5	110
HW2012-1200B	6.0	120
HW2012-1450B	7.3	145
HW2012-1600B	8.0	160

Heatwave® Cables, 120/240 VAC

Heatizon Part Number 120V Input	Amp Load	Coverage Area/Square Foot
HWC-815	1.0	8-15
HWC-1630	2.0	16-30
HWC-3260	4.0	32-60
HWC-5094	6.3	50-94
HWC-64120	8.0	64-120
240V Input		
HWC-1631B	1.0	16-31
HWC-3260B	2.0	32-60
HWC-56105B	3.5	56-105
HWC-80150B	5.0	80-150
HWC-114214B	7.0	114-214
HWC-128239B	8.0	128-239

Do NOT mix voltages when combining systems. 120 volt systems MUST only be paired with other 120 volt systems. 240 volt systems are denoted by a "B" at the end of the Heatizon part number.

8.7.1 CALCULATE YOUR AMP LOADS HERE:

	AMPS 1st SYSTEM		AMPS 2nd SYSTEM	TOTAL AMPS*
SINGLE CIRCUIT:		+		

DOUBLE CIRCUIT	AMPS 1st SYSTEM		AMPS 2nd SYSTEM	TOTAL AMPS*	AMPS 3rd SYSTEM		AMPS 4th SYSTEM	TOTAL AMPS*
FIRST CIRCUIT:		+						
SECOND CIRCUIT:						+		

**** DO NOT EXCEED 15 AMPS!***

NOTE:

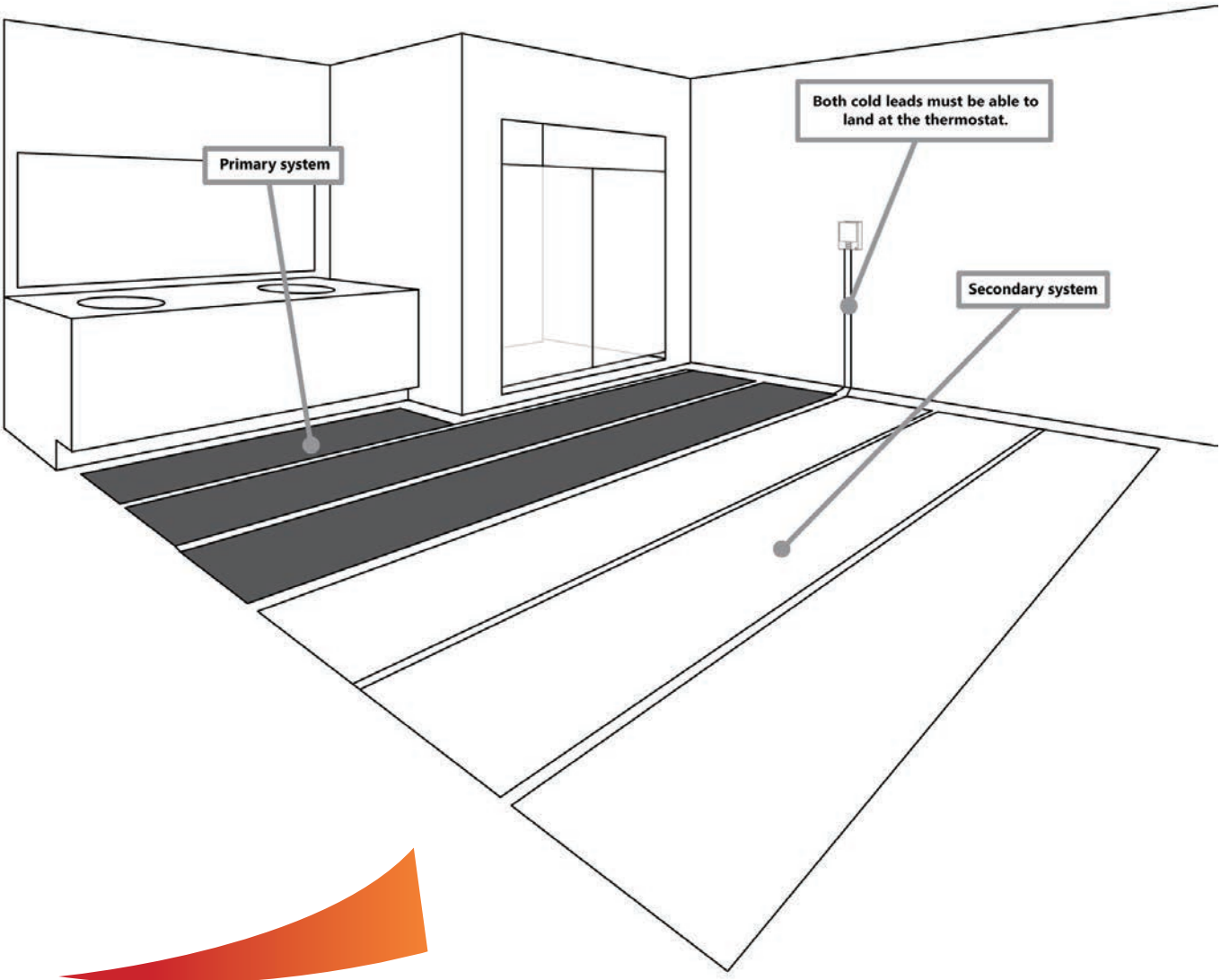
In any application of a Heatwave system involving a Power Module, If a floor sensor is being used, it is connected to the thermostat. See page 19 for more information about installing the floor sensor.

8.8 Expansion Layout Design

8.8.1 Option 1: Multiple Systems On One Thermostat (Single Circuit)

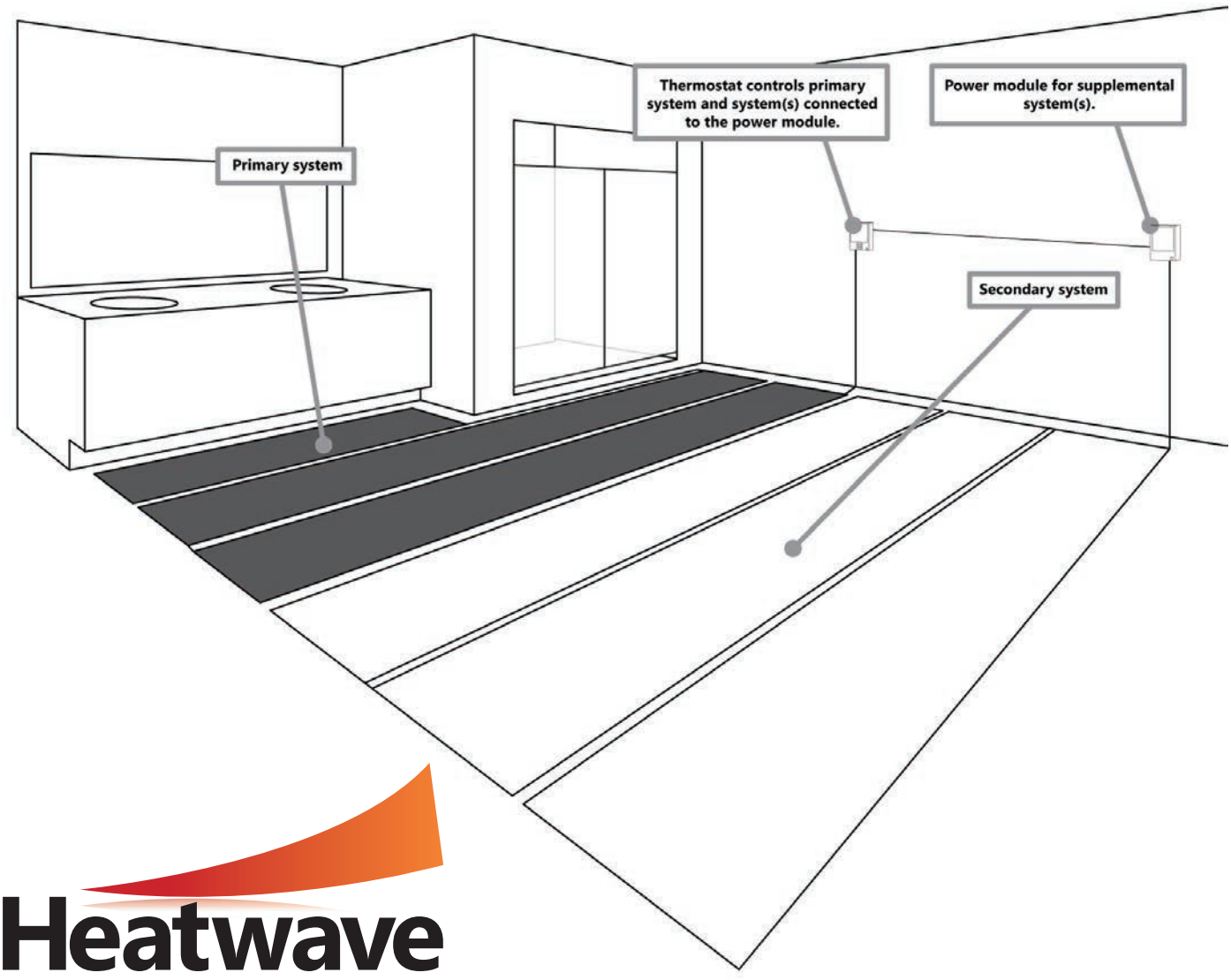
After you have measured your space(s), and determined which systems you will use, locating the thermostat is important. The systems cold lead's must be able to be terminated at the thermostat in order to be controlled simultaneously. The diagram below gives an example of how two systems should be laid out.

If there are two separate spaces to be heated, the thermostat should be located on a shared wall where cold leads can be connected at the thermostat.



8.8.2 Option 2: Multiple Systems Using A Thermostat & Power Module (Double Circuit)

If the desired method is to use multiple Heatwave systems with a thermostat and a power module, determine which systems will be connected to which unit ensuring that neither system exceeds 15 amps. In this method, the cold leads must be able to reach the designated unit in order to work properly. The diagram below shows an example of how this can be accomplished. The power module is connected to the thermostat via a wired connection. Therefore, as long as the thermostat and power module can be connected via this wire, the location of the power module has no location restrictions outside of local codes. The power module uses a standard single-gang electrical box for wall installation.

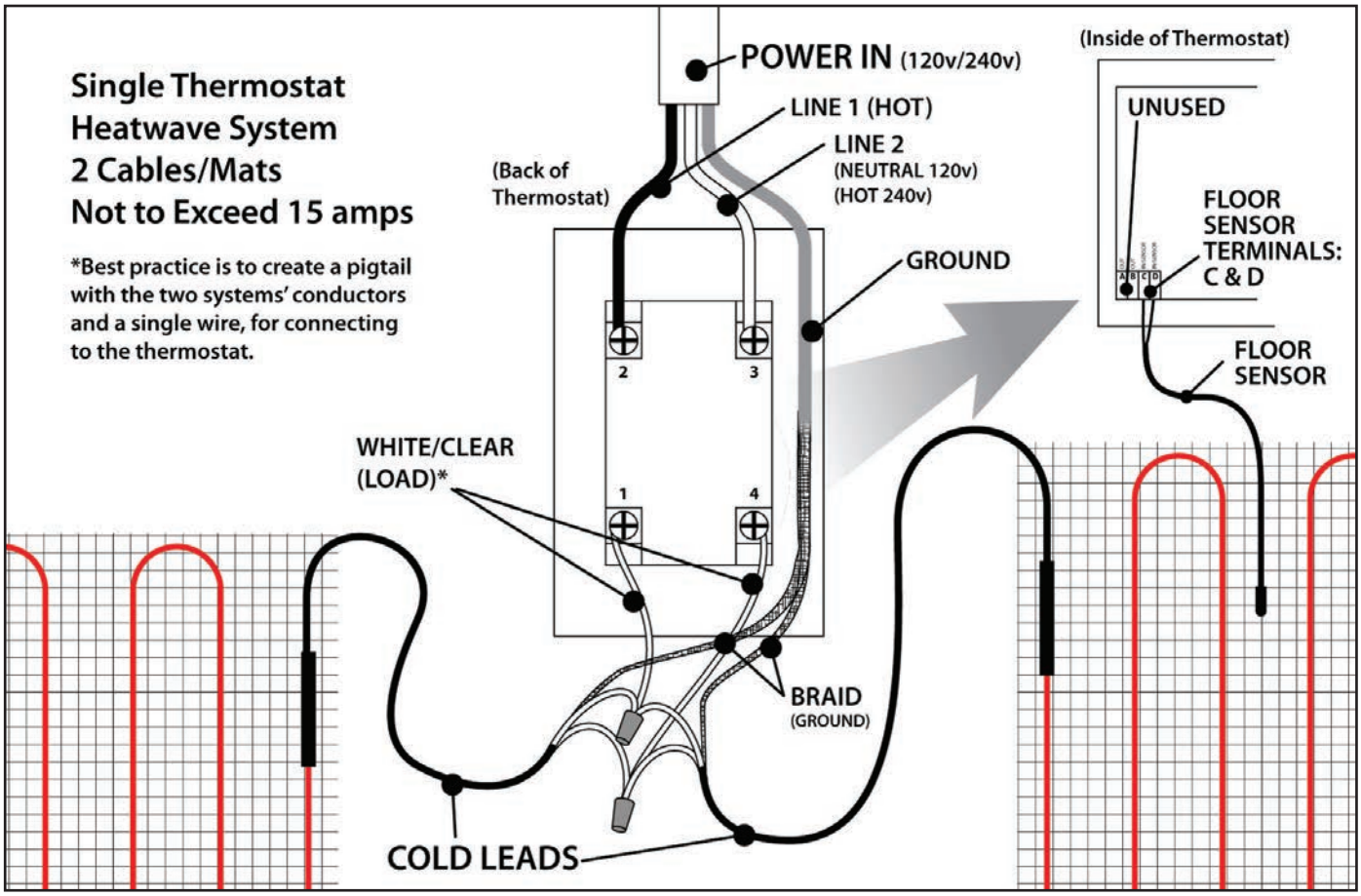


- **Do NOT exceed 15 amps for either the thermostat or power module.**
- **Failure to connect the power module to the thermostat will result in any systems connected to the power module to be non-functional.**

8.9 Wiring Expansion Systems

8.9.1 Multiple Systems On One Thermostat (Single Circuit)

See the following diagram about how to wire multiple systems to a single thermostat or power module.

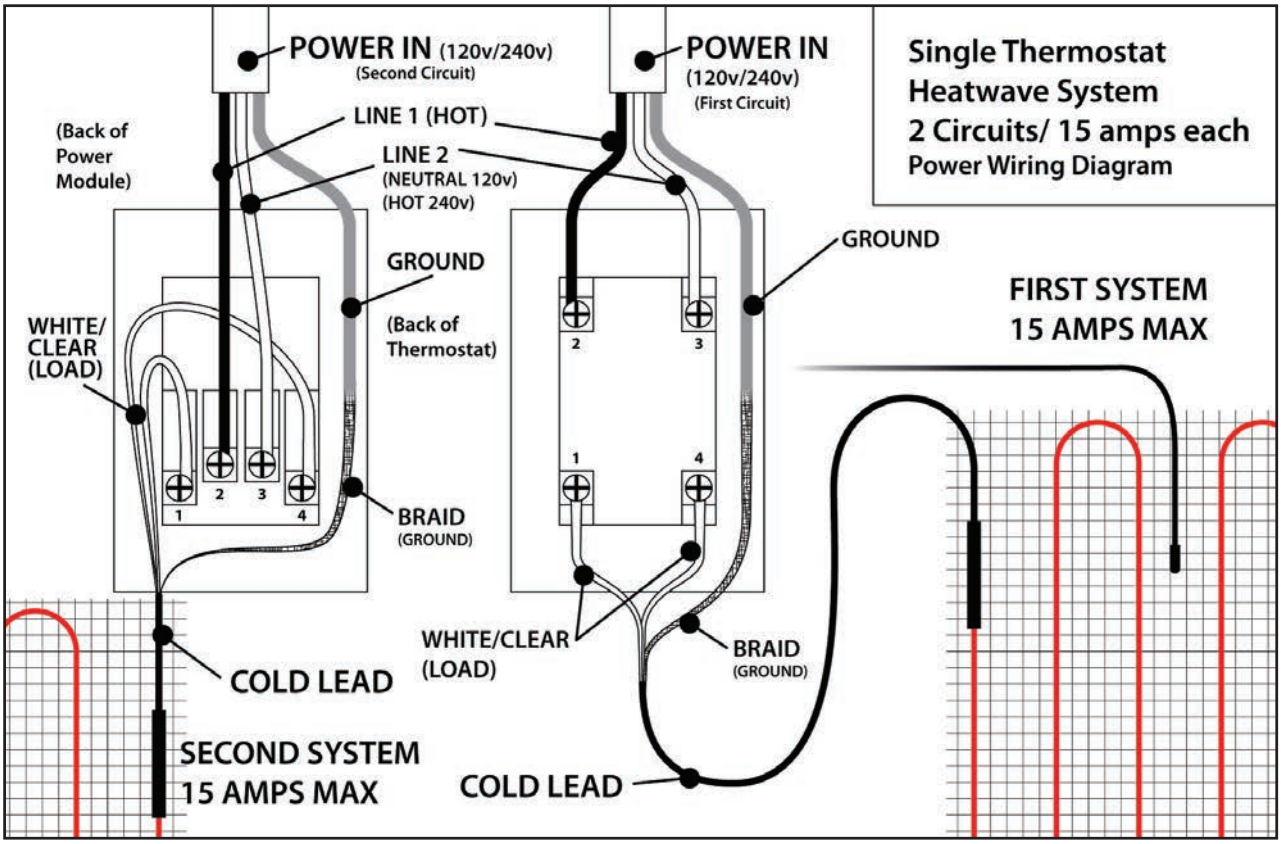


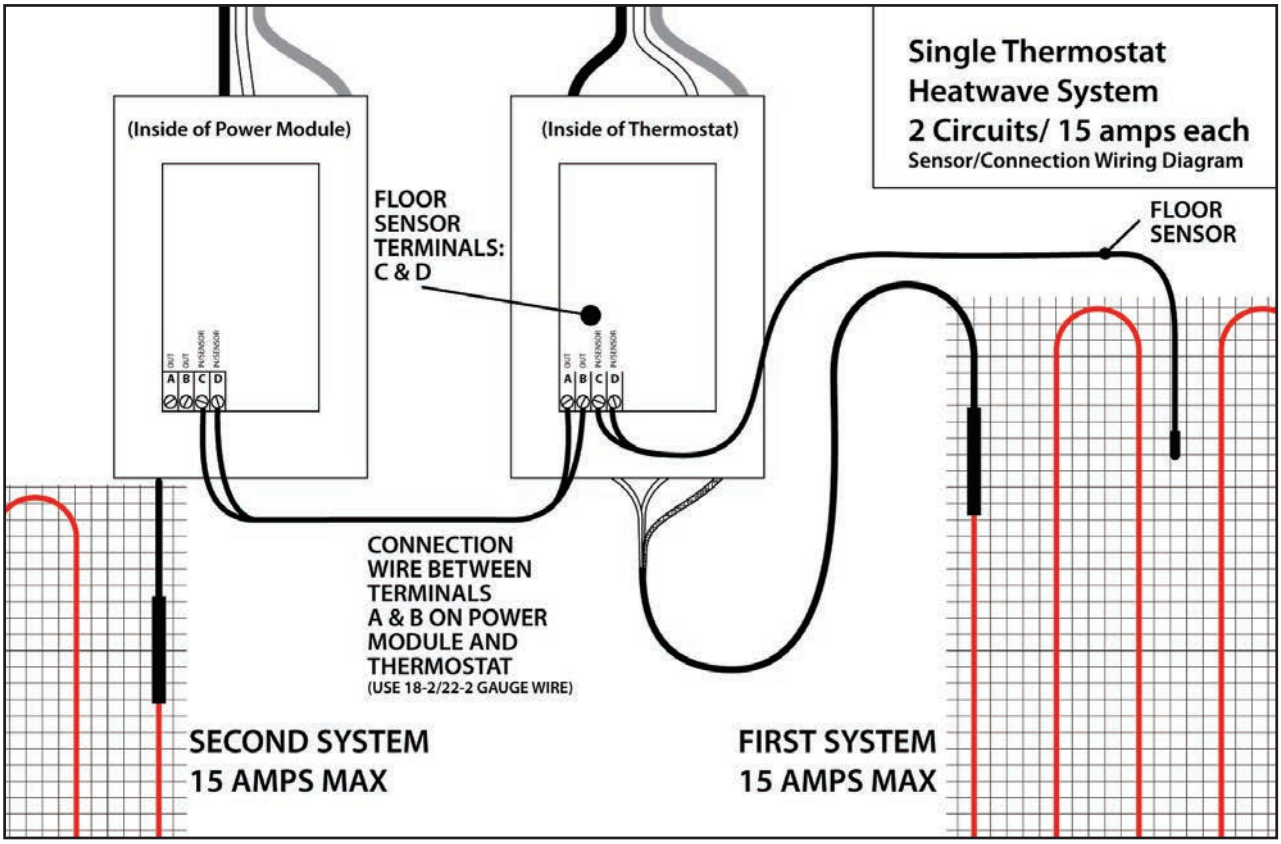
NOTE:

- Do not run floor sensor wire in the same conduit as the cold lead(s), or connect them in anyway. There is a chance that electronic interference can cause issues with getting accurate readings from the floor sensor.
- In the event that there is interest in adding more than one power module (more than two circuits), please contact Heatizon Systems (888.239.1232), for specific installation instructions for this application.
- Best Practice is to create two pigtails, each with a conductor (from the cold lead) and a segment of wire, which is connected to the thermostat, reducing the amount of wires physically connected to the thermostat. Check local codes for further information.

8.9.2 Multiple Systems Using A Thermostat & Power Module (Double Circuit)

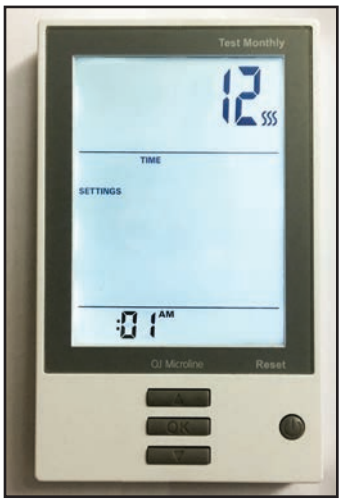
See the following diagrams about how to wire multiple systems to a thermostat and a power module.





9. Thermostat Quick Start

After the M429 GFCI Thermostat has been installed and powered on, there are a few settings to adjust in order to take full advantage of the Heatwave system. This is a quick start guide, for complete instructions, please consult the manual included with the thermostat. A downloadable installation manual for the complete system and the thermostat instruction manual are available online at: heatizon.com/heatwave.



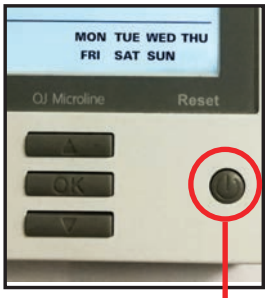
9.1 SET TIME AND DAY

9.1.1 SETTING THE TIME

Upon the first power-up the unit should automatically require setting the current time. Using the UP and DOWN arrow buttons adjust the hour to the current hour. Then press the OK button to move to the minutes, adjust minutes using the UP or DOWN buttons. Then press the OK button.

9.1.2 SETTING THE CURRENT DAY

After setting the time, there will be a prompting to choose the correct day of the week. Select the current day using the UP or DOWN buttons, then press the OK button. Then be returned to the main screen.



NOTE: **POWER BUTTON:** Pressing this button once powers on the unit, holding it down for a few seconds turns it off. While not in Active Mode (no screen backlight), press the OK button twice to enter the menu.

9.2 HOME SCREEN

This is the default screen for a powered on and partially setup unit.

9.3 SCHEDULE SELECT

On the main menu, the second option down SCHEDULE (press OK to select the SCHEDULE settings, and OK again to edit these settings) is for determining whether the unit will run a program based on the following options:

- **7:0** - Runs the same temperature and time settings every day of the week.
- **6:1** - Six days of the week the temperature and time settings are the same, while Sunday is on a separate program.
- **5:2** - The program will run the same temperature and time Monday through Friday, but will run a separate program on Saturday and Sunday.

Using the UP or DOWN buttons select a desired schedule for the thermostat, then press the OK to confirm the choice.

9.4 PROGRAM SELECT

The third option down PROGRAM (press OK to select the PROGRAM settings, and OK again to edit these settings) is where the majority of thermostat programming takes place. All the programming in this function will be done using the UP, DOWN and OK buttons.

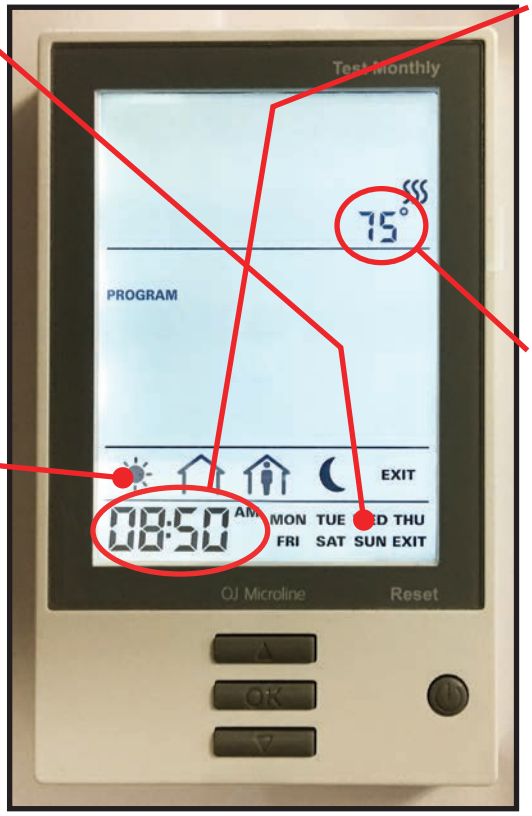
9.4.1 FIRST SELECTION:

Setting program based on preferred SCHEDULE settings (see section 8.4). This will either be one or two different programs. The first program will be blinking. To change the SCHEDULE to program, use the UP or DOWN buttons. Press the OK button to edit that program.

9.4.2 SECOND SELECTION:

Setting time period to be programmed. Using the UP or DOWN buttons to select one of the following, then pressing OK to edit:

- MORNING
- DAY (AWAY)
- EVENING (HOME)
- NIGHT



9.4.3 THIRD SELECTION:

This is where the exact activation time for the time period is set. Use the UP and DOWN buttons to adjust the time accordingly. Press OK once done. (Time is adjusted in 15 minute increments. Only one exact time per period is available.)

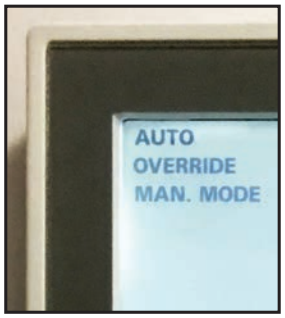
9.4.4 FINAL SELECTION:

The last setting is where the desired temperature is selected. Using the UP and DOWN buttons select a temperature. Press OK to confirm the setting. (The range is between 32° - 104° Fahrenheit, however the Heatwave system may not be able to heat to that same range based on several factors.)

NOTE: Each time OK is pressed, the program, will automatically move to the program section. In the case where there are two schedules, once the final setting for the first schedule is finalized, hitting the OK button will move to the next schedule to program, if applicable.

9.5 MODE SELECT

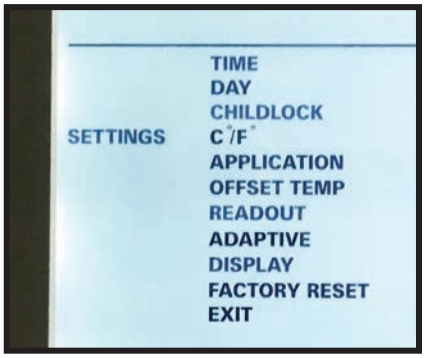
On the main screen, the MODE menu will be shown blinking first with three options:



- AUTO - Default mode that most users will want to use which sets temperature based on a user-created schedule.
- OVERRIDE - To temporarily override temperature/schedule settings.
- MAN. MODE - To use the thermostat to adjust the temperature on user input without a schedule.

9.6 OTHER SETTINGS

SETTINGS (fourth menu item from the top) is where several other options can be configured for this thermostat. Please consult the user manual included with the thermostat for complete information about these options.



10. 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.
Thermostat shows "E2" on screen	External Sensor not properly connected.	Check internal connections from floor sensor to thermostat. (For more troubleshooting directly related to the Thermostat, please see the thermostat instructions included. Also available on our website.)
Installation instructions		Download Heatwave® Installation instructions from www.heatizon.com/heatwave
Cut or damaged the cable		Call Heatizon immediately: 888.239.1232 or info@heatizon.com (8 am - 5 pm, (MST) M-F, Closed holidays)

11. FAQs

Q: What can I cut?
A: **The red heating cable in the mat and free-roll cable CANNOT BE CUT under any circumstances.** The mat (the white mesh part) can be cut. The end of the sensor cable (not the blub end) can be cut/shortened. The unconnected end of the cold lead (thicker black cable) can be cut/shortened.

Q: Can I power on the unit to test it?
A: **DO NOT POWER ON THE HEATWAVE CABLE UNTIL IT IS COMPLETELY INSTALLED!** The Heatwave system MUST be COMPLETELY embedded in a cement-like compound in order to properly function. Powering on an un-embedded Heatwave system is a fire danger and voids any/all warranties and support.

Q: Can either the mat or cable be used for an outside application?
A: No, but contact Heatizon to hear about one of our many other solutions for outdoor applications.

Q: The junction between the heating cable and the cold lead is thick, what methods can be used to ensure that it will not cause the flooring above it to lift up.
A: When installing and embedding the junction into thinset and/or mortar if there is a concern that the junction will cause issues with the flooring. There are two methods:

1. Raise the level of the thinset/mortar to account for the additional thickness of the junction.
2. Depending on the type of subfloor, make a groove/cut for the junction to sit down into, lowering the profile of the junction.

Q: Which system mat or cable is the better system?
A: Each system has it's advantages, but briefly, the mat system is installed faster and is better for areas that are square/rectangle. The cable system is better for odd shaped areas and allows for more customization as far as watt density.

Q: Where should the thermostat be located?
A: Wherever the end-user prefers, but take into account that the sensor is 10' long and the cold lead is 15' long. Walls without existing electrical is preferred.

Q: Can the thermostat be upgraded if a different model is preferred?
A: Yes, contact Heatizon (888-239-1232) for the available options.

Q: Can multiple mats/cables be controlled with one thermostat?
A: Yes as long as the amp load for the thermostat is not exceeded. (See Section 8 for using multiple mats cables)

Q: Can multiple mats/cables be controlled independently of each other with the same thermostat?
A: No, the thermostat will control mats/cables connected to it as if they are one unit.

Q: What is the difference between the 240V and 120V systems?
A: The 240V systems use half the amperage of the 120V systems, allowing them to be better suited for larger areas and combining multiple units.

Q: What do I do with the Floor Alarm after installation?
A: The Floor Alarm can be reused for other Heatwave installations, or returned to Heatizon for free recycling. Visit **Heatizon.com/alarmrecycle** for more information.

Q: Can I use tape and/or hot glue to secure the cable/mat to the floor?
A: Yes, a small amount of hot glue dropped onto the floor and cable pushed into the glue is fine. **DO NOT touch the hot glue gun tip to the cable!** Any tape is acceptable to secure the cable, provided a small amount of tape is perpendicular to the cable and only to secure it until completely covered.

Heatwave® Limited Warranty

Heatwave
From Heatizon Systems
4137 South 500 West
Murray, Utah 84123
888-239-1232 | heatizon.com

Heatizon Systems warrants the Heatwave® product to be free of defects in materials and workmanship for the life of the floor covering installed with the Heatwave® cable and mat product 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.
4. Heatwave® cable and mat products must be controlled by a thermostat with a floor sensor.
5. The density supply must not exceed 15 Watts per square foot.

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
heatizon.com

HEATIZON
SYSTEMS

Use this grid to layout the Heatwave® system.

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 the dealer or our service department at 1-888-239-1232.

Heatwave
From Heatizon Systems
4137 South 500 West
Murray, Utah 84123
888-239-1232 | heatizon.com

TO ENSURE 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: ____-____-_____ Email Address: _____
Name of Company (from which Heatwave® was purchased) _____

II. Owner Information:

Owner's Name: _____
Home Address: _____
Phone Number: ____-____-_____ Email Address: _____
Name of Space and Location in Structure where installed: _____

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

(Note: "Hot" or "Neutral" in this table indicates the white conductors in the Cold Lead)

Mat or Cable Number	Model #	Total Watts	Volts	RESISTANCE IN OHMS													
				Received	After Mat is customized/cut (Optional test—Mats only)			After Mat/Cable is attached to subfloor/underlayment			After Mat/Cable is embedded in thinset or mortar			After flooring has been Installed on top of Mat/Cable		
				Hot to Hot/ Neutral	Hot to Hot/ Neutral	Hot to Ground	Neutral to Ground	Hot to Hot/ Neutral	Hot to Ground	Neutral to Ground	Hot to Hot/ Neutral	Hot to Ground	Neutral to Ground	Hot to Hot/ Neutral	Hot to Ground	Neutral to Ground
SAMPLE	1x 50	750	120	19.2	19.2	Open	Open	19.2	Open	Open	19.2	Open	Open	19.2	Open	Open
#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: _____

SISTEMA HEATWAVE CONDENSADO VERSIÓN EN ESPAÑOL.

Esta guía no sustituye la lectura del manual de instalación y debe leerse antes de la instalación.

El cable calefactor rojo Heatwave NO PUEDE cortarse ni acortarse bajo ninguna circunstancia. La malla en la alfombra se puede cortar para ajustarse a la aplicación.

¡NO ENCIENDA EL SISTEMA HEATWAVE HASTA QUE ESTÉ COMPLETAMENTE INCRUSTADO EN EL ADHESIVO/MORTERO!

Disponga y configure completamente el cable/alfombra Heatwave ANTES de incrustar el sistema en el ahdesivo/mortero.

Asegúrese de conectar el voltaje correcto al sistema Heatwave. Las piezas con los números con una "B" indican un sistema de 240 voltios. NO conecte los sistemas de 120 voltios a los de 240 voltios.

El cable frío negro y el sensor de piso se pueden cortar a lo largo.

El cable/alfombra Heatwave DEBE estar completamente incrustado en el adhesivo o mortero. Esto incluye la conexión final y el cable calefactor rojo a la conexión de cable frío negro.

El cable Heatwave no puede tocarse ni cruzarse sobre sí mismo ni sobre ningún otro cable. Mantenga al menos dos pulgadas de espacio entre los cables.

El sensor de piso no debe cruzar ni tocar el elemento calefactor.

El sistema Heatwave está conectado a los terminales "1" y "4" del termostato. La alimentación entrante está conectada a los terminales "2" y "3". Si el sistema de 120 voltios, el cable CALIENTE se conecta al terminal "2".