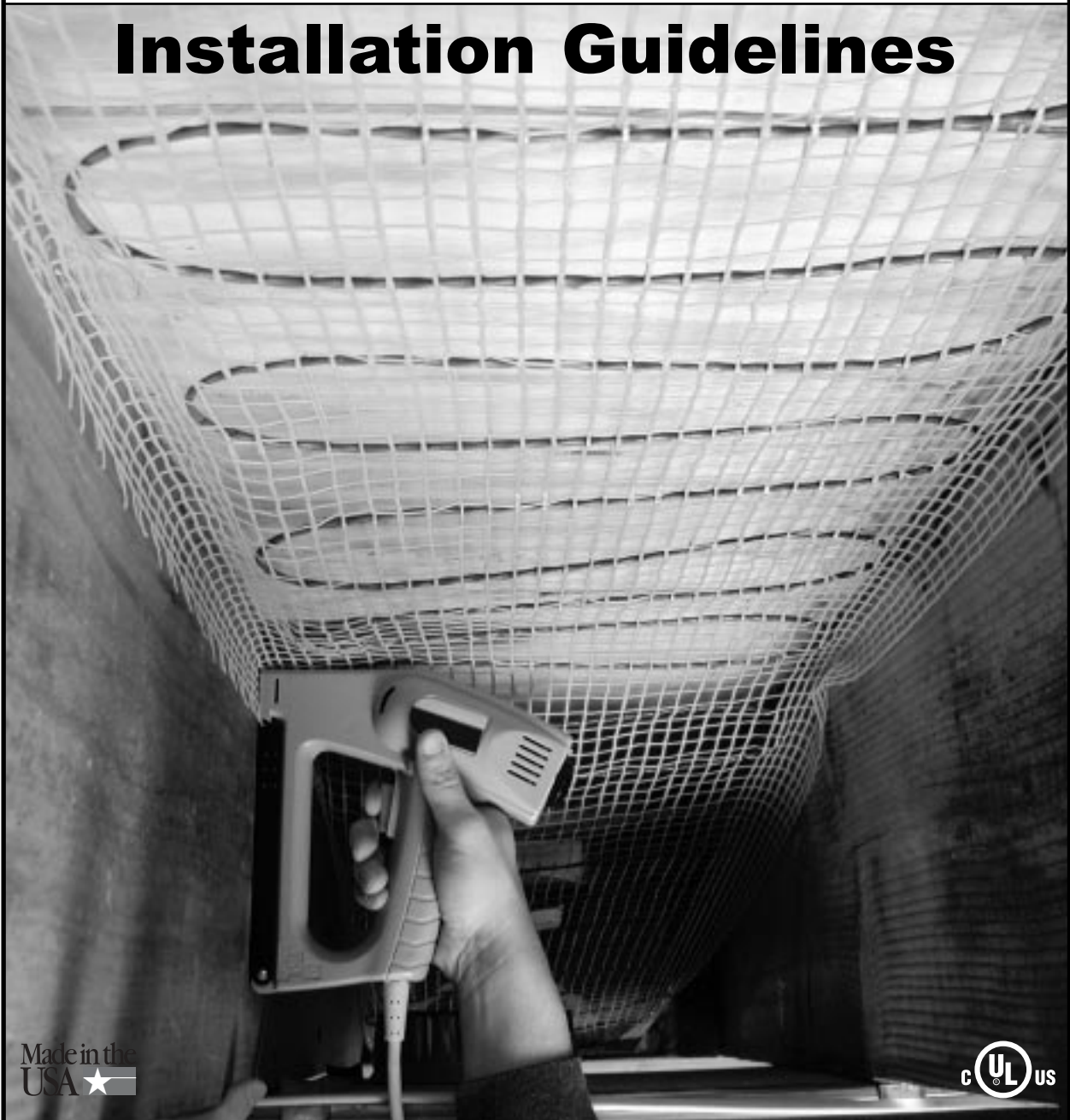


WATTS
SunTouch[®]
UnderFloor[™]

Electric Radiant Floor Warming

Installation Guidelines



Made in the
USA ★



www.suntouch.net

888-432-8932

② Introducing SunTouch® UnderFloor™!

SunTouch UnderFloor is a safe and efficient electric floor warming product for interior applications. It is only intended for installation under a wood subfloor in residential and light commercial installations.

SunTouch UnderFloor is designed to deliver approximately 11 watts/square foot of floor area. The temperature of the warm floor is dependent on how well the floor is insulated, as well as the insulating value of the flooring materials. If the joist space is sealed against air leakage, exterior rim joists are insulated, and the underneath side of the floor is insulated, most floors can be heated up to 15°F warmer than they would otherwise be. Due to the insulating value of carpet, carpeted floors may not achieve the same temperature rise. Your floor may or may not achieve this temperature rise, and no representations are made regarding the performance of any system.

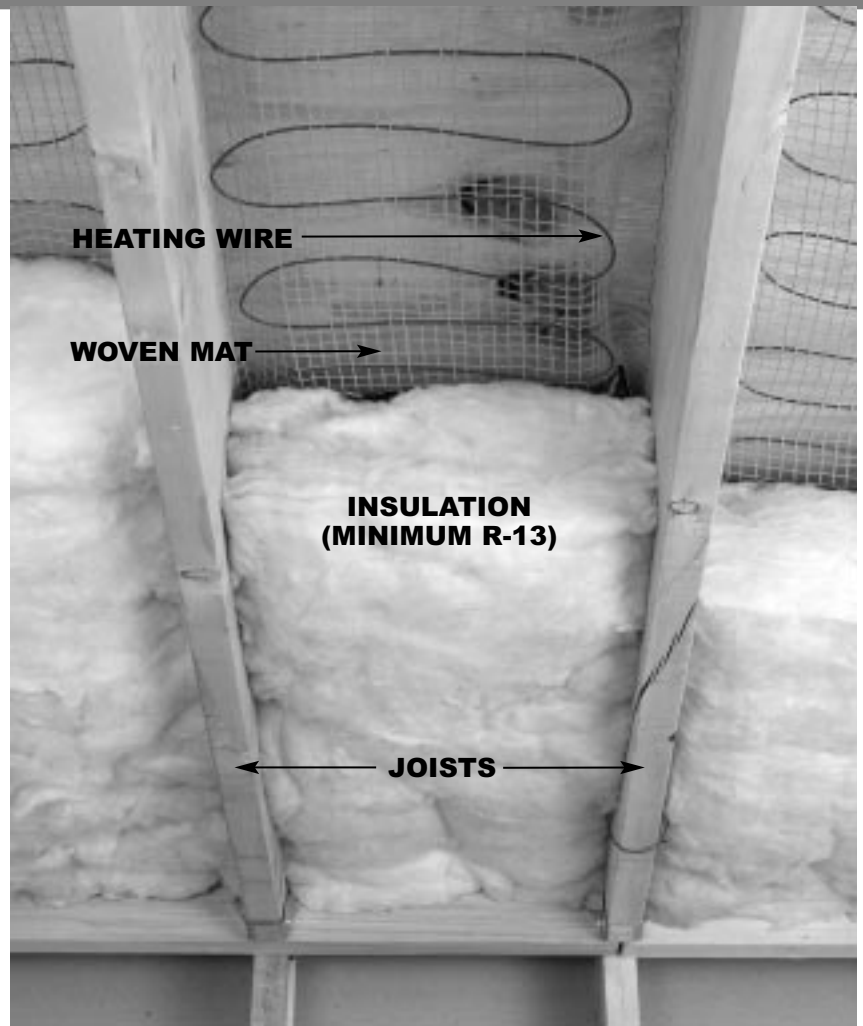
SunTouch UnderFloor can be used to heat a room, as well as warm the floor, provided the heat loss of the room falls within the mat's capabilities. Your designer must determine if the output from the SunTouch UnderFloor is enough to match the heat loss of your structure.

Refer to page 14 for helpful design guidelines.

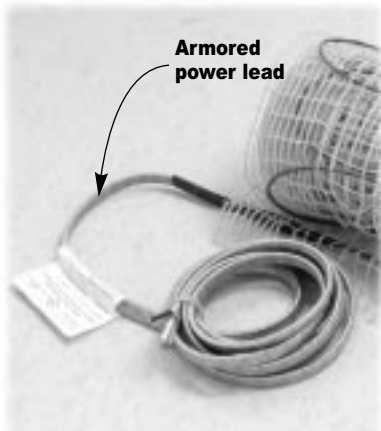
The SunTouch UnderFloor Mat

The blue heating wire is woven into a special orange fiber mesh. These mats are manufactured to heat 16" on-center joist spaces. Mats are rated either 120VAC or 240VAC. Multiple mats can be used to fill a larger area, however they must be wired together in parallel (not in series) if they are to be connected to the same controller. **Never** combine 120VAC mats with 240VAC mats. For example, to warm a 100 square foot area you may want to use one 120VAC 16" x 43' long mat and one 120VAC 16" x 38' long mat. Other combinations are possible.

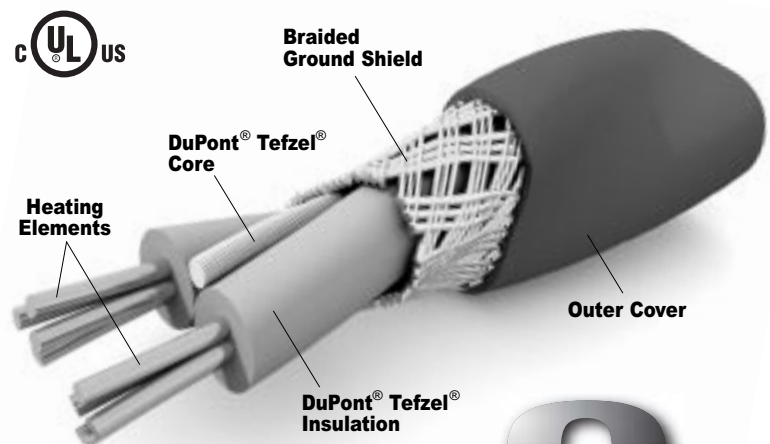
If you have any questions, please visit our Web site at www.suntouch.net, or call us at 888-432-8932.



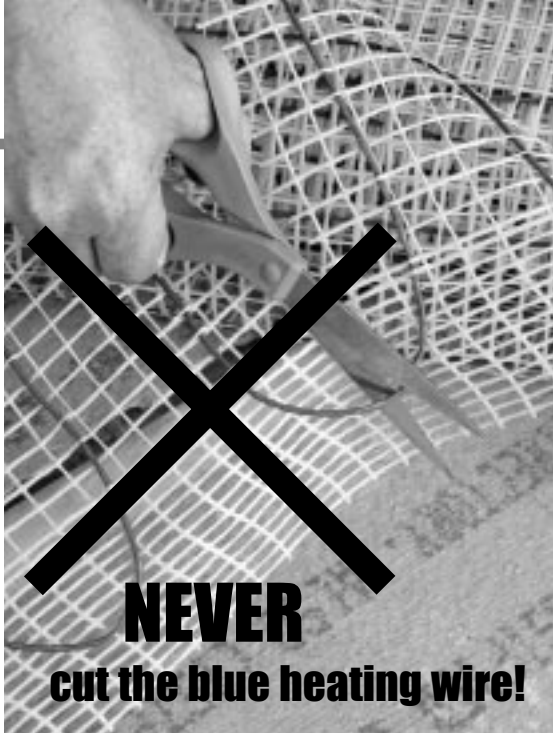
The SunTouch UnderFloor™ mats are only intended for installation below the subfloor.



An armored power lead makes for a tougher and safer connection to the controls.



*When measured at 1/2" above floor surface with a field EMF meter. SunTouch Internal Test Labs results; not UL verified.



CAUTIONS!

3

READ BEFORE INSTALLING SUNTOUCH UNDERFLOOR

NEVER cut the blue heating wire or power leads.

NEVER cut the mats to make them shorter.

NEVER attempt to repair the blue heating wire if it is damaged. Call the factory for instructions.

NEVER install one mat on top of another or overlap the mat on itself. This will cause dangerous over-heating.

NEVER forget to install the floor sensor.

NEVER remove the nameplate label at the end of the mat.

NEVER allow metal objects such as staples, metal pipes, ductwork, or straps to remain in contact with the heating wire.

NEVER install the heating wire closer than 2" from recessed fixtures, ventilation openings, and other openings.

NEVER install the heating wire closer than 8" from the edges of outlet boxes and junction boxes.

NEVER run mats across joists. Run blue heating wire across joists only as directed.

Here's What You'll Need for Your SunTouch UnderFloor Installation

To determine how much mat is needed for the space, go to page 14, "Designing a SunTouch UnderFloor System."

The primary components of the SunTouch UnderFloor system, depending on the project requirements, are:

1. SunTouch UnderFloor mat*
2. Floor-sensing FloorStat thermostat (programmable or non-programmable)**
3. GFCI breaker (if not included in the FloorStat)

Other items needed:

- SunTouch UnderFloor Installation Kit* (includes Installation Manual, Wire Clips, NailTites)
- Electrical box for thermostat
- 12-gauge electrical wiring
- LoudMouth monitor*
- Digital ohm meter (multi-meter)
- Various electrical and construction tools: (stapler, wire stripper, screwdriver, hex driver, chisel, scissors, etc.)
- Insulation (minimum R-13, foil-faced fiberglass recommended)

*Items available from SunTouch. All other items are not included and can be purchased locally.

**The FloorStat is approved for use in U.S. and Canada, separate from the SunTouch Listed assembly.

ALWAYS enter mat resistance in the log before, during and after the installation process.

ALWAYS pay close attention to voltage and amp requirements of the breaker, the thermostat, and the SunTouch mat. For instance, do not supply 240 VAC for 120 VAC SunTouch mats/thermostats.

ALWAYS make sure all electrical work is done by qualified persons in accordance with local building and electrical codes, Section 62 of the Canadian Electrical Code (CEC) Part I, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA 70.

ALWAYS use copper only as supply conductors.

ALWAYS affix the Warning label (included with this manual) to the control cover plate or other location where it is easily noticed.

ALWAYS seek our help if you have a problem. If you are ever in doubt about the correct installation procedure to follow, or if the product appears to be damaged, you must call us before proceeding with the installation, or proposed repair.

If you have any questions, please visit our Web site at www.suntouch.net, or call us at **888-432-8932**.

Check resistance before beginning installation.

Use Our LoudMouth Monitor:

We created the LoudMouth to monitor the mat during the installation process. If the mat is cut or damaged during installation, this device sounds an alarm.



CHECK OUT THAT WIRE!

Throughout the installation process it is very important to take resistance readings of the mat to make sure it is not damaged. Use a quality digital ohmmeter or multimeter to make these measurements. Analog meters (with the moving needle) are not accurate for this product.

The LoudMouth Monitor shown at left will help constantly monitor the mat for you during the entire installation. Ask about purchasing this valuable tool.

Essential Product Information and Warranty

There is a factory-applied nameplate label at the end of the mat and also on the cold leads as shown at lower left. Do not remove these. Record the mat serial number, mat size, voltage, and panel resistance range on the table below for each mat.

To retain the Limited Warranty as stated at the back of this manual, these items and the following measurements MUST be recorded, as well as all steps of this manual followed. Refer to the Limited Warranty now for complete requirements.

MEASUREMENTS

Make the following measurements (as a minimum)

- before you begin installation
- after the mat is fastened to the floor
- after insulation is installed

Checking for breaks

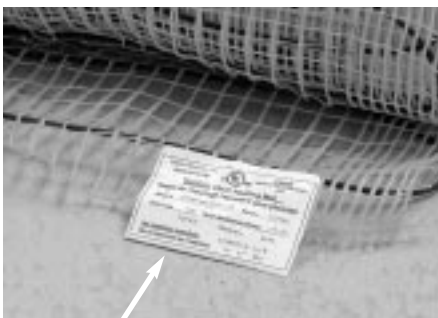
Measure resistance between the black and white leads (black and blue leads for 240V mats) and record this below. This measurement should be within the Mat Resistance range shown on the nameplate label, or if the label gives only a single number it must be within +/-10%. A cut or break in the wire is indicated by a resistance of "infinite" ohms (no continuity).

Checking for short-circuits

Measure resistance between the black and green leads and between the white and green leads (blue and green leads for 240V mats) and record these below. This measurement should be "infinite" ohms (no continuity). A cut or pinch in the wire is indicated by a resistance value between zero and the Mat Resistance.

If the resistance is not correct, or if you cut or damage the wire, quickly clean up the damaged area and call the factory for further instructions.

Record resistance checks in the chart at right



Record the information from this nameplate label into the Mat Resistance Log provided at right.

Leave this nameplate on the power leads for later inspection.



The Electric Radiant Heating Warning Label must be placed near, or on the face of the control.

Radiant Floor Heating Mat Warning - Risk of electric shock

Electric wiring and heating panels contained below the floor. Do not penetrate floor with nails, screws, or similar devices.

Mat Resistance Log

Note: Colors listed are for 120V mats. See directions above for 240V color combinations to check.

	Mat 1	Mat 2	Mat 3
Mat Serial Number			
Mat Size			
Mat Voltage			
Factory Mat Resistance Range			
OUT OF THE BOX BEFORE INSTALLATION (ohms)			
Mat black to white			
Mat black to green			
Mat white to green			
AFTER MAT IS FASTENED TO FLOOR (ohms)			
Mat black to white			
Mat black to green			
Mat white to green			
AFTER INSULATION IS INSTALLED UNDER THE MAT (ohms)			
Mat black to white			
Mat black to green			
Mat white to green			

RETAIN THIS LOG FOR WARRANTY!

DO NOT DISCARD!

**STEP 1.1
Install GFCI Breaker or GFCI-equipped FloorStat (Overcurrent Protection)**

The SunTouch mat must be protected by a ground fault circuit interrupter (GFCI). This can be done either by a GFCI-equipped SunTouch FloorStat (as long as it directly controls the mat) or an indicating-type GFCI circuit breaker. This GFCI breaker serves as a local disconnect.

Note: Follow all local building and electrical codes.

Note: It is possible to branch from an existing circuit, but this is not recommended. Please consult with a qualified electrician to determine if the circuit can handle the load and if the circuit is GFCI-protected.

Use a maximum 20-amp circuit breaker (see Table 1.) Do not load a 20-amp breaker with more than 16 amps of mat load. Do not load a 240V GFCI breaker with more than 14 amps of mat load. If your load exceeds these limits, you must use multiple breakers to avoid overloads and false trips on GFCI breakers.

TABLE 1. Mat Amperage Requirements.

Mat Size		Amperage Draw
120 VAC	240 VAC	
16" x 8'	16" x 16'	1.0
16" x 12'	16" x 24'	1.5
16" x 17'	16" x 34'	2.1
16" x 21'	16" x 42'	2.7
16" x 26'	16" x 52'	3.1
16" x 30'	16" x 60'	3.6
16" x 34'	16" x 68'	4.1
16" x 38'	16" x 76'	4.7
16" x 43'	16" x 86'	5.1
16" x 51'		6.3
16" x 60'		7.8
16" x 68'		8.3

**STEP 1.2 (For large systems only.)
Install External Contactor**

An external contactor may be required for larger projects. Consult with an electrician to determine the type and size of contactor. Do not load the FloorStat control with more than 14 amps. If you use a contactor, it must be on a GFCI-protected circuit.

**STEP 1.3
Install Electrical Boxes**

FloorStat Box: FloorStats (thermostats that control floor temperature) are usually located near the power leads. However, they

can be located almost anywhere, because the power leads and the sensor wire can be routed to electrical junction boxes and extended to a location outside the heated room (such as a utility room or basement).

The thermostat electrical box may be a single-gang plastic deep box, but you must follow all electrical code requirements for box fill, grounding, etc. in determining the correct box for your application. The thermostat box should be located on interior walls, typically 60" from the floor, according to code requirements.

Note: The FloorStat sensor wire can be up to 50' long.

Other Junction Boxes: It is highly recommended that a separate steel electrical junction box be mounted below the subfloor or in the wall where the power leads from the mats can be routed to. A separate wiring drop can be made from the thermostat box down to this junction box. This makes it much easier to install the system.

**STEP 1.4
Bottom Plate Work**

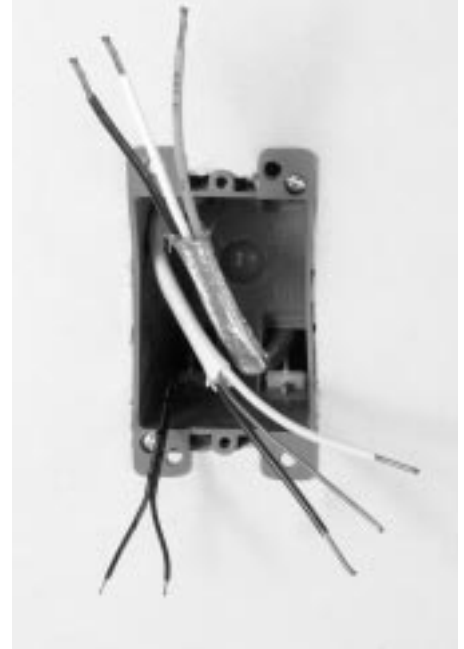
Drill a hole up through the wall bottom plate and route the power wiring from the junction box or thermostat box to the mats below the floor.

**STEP 1.5
Rough-in Wiring**

Install electrical wiring from the power source breaker to the thermostat box, and then to the junction box below the floor for the mat leads. Leave 6"-8" extra wire at the thermostat box and junction box. Refer to the Typical Wiring Diagrams at the end of this manual for help.

**STEP 1.6
Install FloorStat Sensor**

A floor sensor comes with the FloorStat control and must be installed correctly to con-



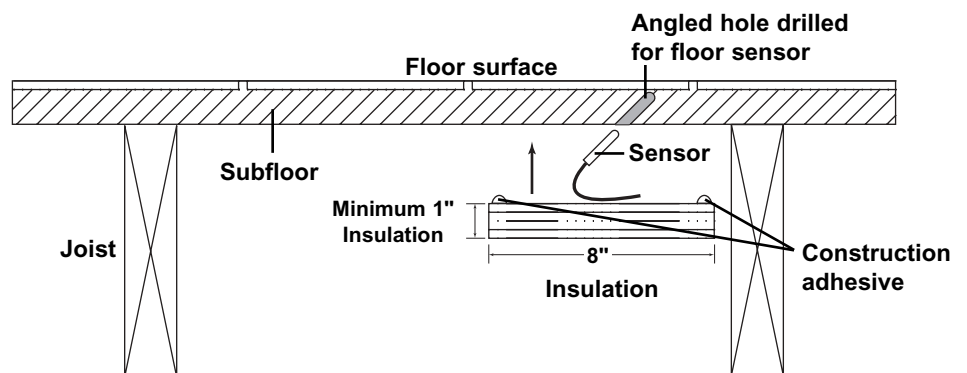
trol the floor temperature. The following are recommended methods for installing the sensor. Other equivalent methods may be used. Remember to locate the sensor in a floor where a mat is located.

Note: The sensor must be installed at least 2" away from the nearest blue wire.

Method 1: Since a sensor may be difficult to install in some existing floors, the sensor may be placed under the subfloor. However, remember the temperature the sensor gives you will not be a true floor surface temperature and you must adjust your thermostat appropriately.

Drill a hole through the bottom plate of your wall to route the sensor wire. Open a second knock-out in the bottom of the thermostat box. Feed the sensor wire down from the thermostat box through the floor.

The most accurate method is to drill a 3/4"-1"-long hole at an angle (so that you do not drill up through your floor surface) into the bottom of your subfloor. Locate this hole



Phase 1: Electric rough-in



Carve/route grout joint 1/2" deep. Install sensor. Reinstall grout over sensor and sensor wire.

over one of the mats, about 2" from the joist. Insert the sensor into the angled hole and seal it with adhesive. Insulate the sensor with additional "blueboard" or fiberglass insulation, 1"-2" thick and 8" square, adhered and sealed under the sensor. This will isolate the sensor from the heated joist space and give a truer floor surface temperature.

Method 2: If it is not possible to drill a hole to set the sensor in the subfloor, it may be held flat to the subfloor with a nylon wire clip. Locate the sensor over a mat about 2" from the joist. Insulate the sensor with additional "blueboard" or fiberglass insulation, 1"-2" thick and 8" square. This will help isolate the sensor from the heated joist space.

Method 3: If possible, install the sensor directly into or under the floor covering area.

If you have a tile floor surface, a grout line can be removed and the sensor laid into this grout line.

Drill a hole into the wall behind the baseboard trim area and directly below the thermostat box.

After the sensor is installed, open a second knock-out in the bottom of the thermostat box. Feed the sensor through the knock-out, down to the hole you drilled near the floor, and out into the floor where the heating mat will be installed. Locate the sensor at least 1' from outside walls and near the center of a joist space.

Complete the rest of the installation before covering or re-grouting over the sensor.



Stapling SunTouch UnderFloor mat to floor joists.

Phase 2: SunTouch UnderFloor Installation

STEP 2.1 SunTouch Installation

Bring all the mat power leads into the junction box below the floor.

Refer to the Appendix at the end of this manual for typical wiring schematics.

Observe the following rules plus all other electrical/building codes and the Cautions on Page 3 when installing the mat.

- Do not allow the blue heating wire to be mounted in contact with any metal objects such as nails, staples, metal pipes, heating ducts, and joist straps.
- Keep the blue heating wire at least 2" away from recessed fixtures (lights, etc.), ventilation openings, and other openings.
- Keep the blue heating wire at least 8" away from the edges of outlet boxes and junction boxes.
- Keep the blue heating wire at least 6" away from heat-sensitive items such as toilet rings, house wiring, flexible ducting, and other items rated less than 194°F (90°C) (consult manufacturers of those items).
- REMEMBER: Pay careful attention to areas where ductwork, wiring, or other items do not allow the mat to be installed. These areas will, of course, be unheated on the above floor surfaces.

The mat mesh may be stapled directly to the sides of the floor joists. However, you must be extremely careful not to staple or nick the heating wire. Keep staples at least 1/2" from the heating wire.

1. Notice that the mat is "one sided." Keep the "wire side" upward throughout the installation.

2. Begin installing the mat at the edge of the area you wish to warm. Press the mat flat (vertically) against a joist and move it upward until the edge of the mesh touches the subfloor. Staple along the edge of the mat mesh, 3/4" from the subfloor. Keep the staples at least 1/2" from the heating wire. Pull the slack out of the mat mesh as you staple.

3. When you finish stapling along this edge, raise the mat up parallel with the subfloor. Pull the mat mesh to the opposite joist and staple this edge about 3/4" below the subfloor.

4. Continue stapling the mat mesh, pulling the mat snug, but not overtight. A slight droop of the heating wire is expected and acceptable. Leave a gap of about 1" between the subfloor and the mat.

Phase 2: SunTouch UnderFloor Installation

Installation Tips

1. Where the mat must be run around objects such as pipes, ductwork, joist supports, etc., the mat mesh may be cut. **DO NOT cut the blue heating wire!** Use the included nylon wire clips to hold the heating wire to the sides of the joists. Keep the blue wire at least 1" below the floor. Use a hex screw and driver to secure clips, rather than a Phillips or flathead screwdriver which may slip and damage the heating wire. Keep the heating wires about 2"–3" from each other. Do not install the heating wires closer than 2" from each other and **DO NOT CUT OR DAMAGE THE BLUE HEATING WIRE!**

2. When the UnderFloor mat reaches the end of a joist cavity, the end of a room, or joist blocking, the mat mesh may be cut and the blue heating wire run underneath or through the floor joist. You have two options for crossing the joist with the blue heating wire: notching the bottom of the joist to provide room for the heating wire, or drilling a hole through the joist through which the mat can be passed or pulled through.

Notching: Where a mat wire must cross a joist, check your local building codes to see whether notching is allowed. Some areas may not allow notching of floor joists.

The BOCA National Building Code 2000 edition section 2308.8.2 allows notching, but not in the middle 1/3 of a joist span. If allowed by code, make the notch no more than 1/4" deep. Set the heating wire in the notch, and protect it with a steel nail plate, being careful not to damage the heating wire (see photo at top right).

Drilling: In some cases, such as an I-beam, you may not be allowed to notch the joist. You will need to drill a hole (per the

manufacturer's recommendations) large enough to pass the mat through the joist (usually a 2"-diameter hole). Carefully pull the mat through the hole to the next joist space, and cut away the orange mesh at the point where the blue heating wire passes through the joist (see photos at bottom right).

3. If a second mat is required to finish out a room area, begin the second mat next to the end of the first mat.

4. If you miscalculated and end up with a little too much mat and cannot extend it into another joist cavity, the heating wire must not be cut short! Instead, detach the extra heating wire from the mat mesh. Use the nylon wire clips to mount the wire along a joist side until it is used up. Be careful to follow all spacing and protection requirements listed above, as well as code requirements.

5. If you miscalculated and ended up with too little mat to fill an area, consult with your dealer to see if a small mat is available.

STEP 2.2 Power Lead Installation

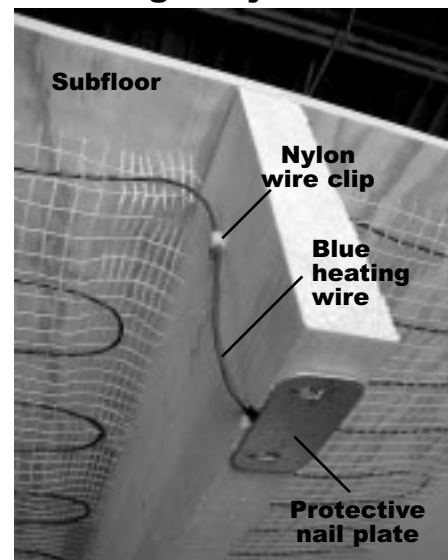
Route the power leads from the mat(s) to the junction box following all electrical and building codes using additional electrical boxes where required.

For multiple mats, follow all electrical codes for "box fill" maximums. Connect the leads in parallel (not series).

Connect the mat leads to the power drop from the thermostat box.

Again, do not overload the thermostat. The FloorStat control must not be loaded with over 14 amps of mats.

Notching the joist

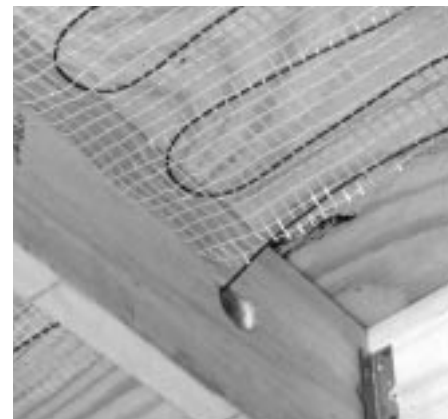


Heating wire routed from one joist to another through a notch cut into the bottom of the joist. Check local codes to make sure notching is permitted.

Drilling through the joist

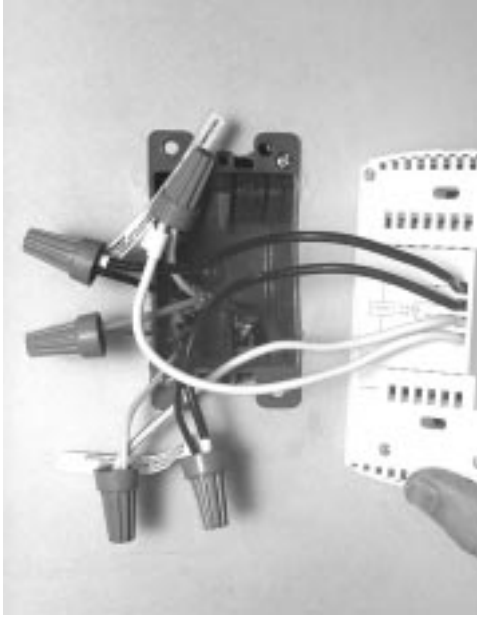


Drill 2" hole and pull mat through the joist . . .



. . . and carefully cut away the orange mesh where the blue heating wire passes through the joist.

Phase 3: Final Wiring



STEP 3.1 Install the Controls

Install the FloorStat in an extra deep electrical box, according to the installation sheets provided with the FloorStat. Connect the mat power leads, floor sensor, and power supply wiring as shown in this manual (pages 9 and 10) or in the FloorStat installation sheets.

If using multiple mats, wire the leads in parallel (not series) — black to black, white to white, and green to green. For 240V systems, black to black, blue to blue, green to green. Then wire a short “pig-tail” (of correctly-sized wire for the load) to the FloorStat.

STEP 3.2 System Test

After the controls are installed and connected, energize the system briefly to test operation of all components.

Refer to the installation sheets provided with the FloorStat for proper setting.

Without floor insulation, the mat will not heat the floor. When the FloorStat calls for heat to the mat, you should feel the blue heating wire begin to warm within 30 to 60 seconds or so. If not, recheck your FloorStat settings, wiring connections, and power supply.

Please leave the instruction sheets for the thermostat and this manual in a safe place for future reference by the homeowner.

STEP 3.3 Labels

Apply the Radiant Heating Warning Label (included with your installation kit) to the thermostat control cover plate on the control.



Phase 4: Insulation Installation

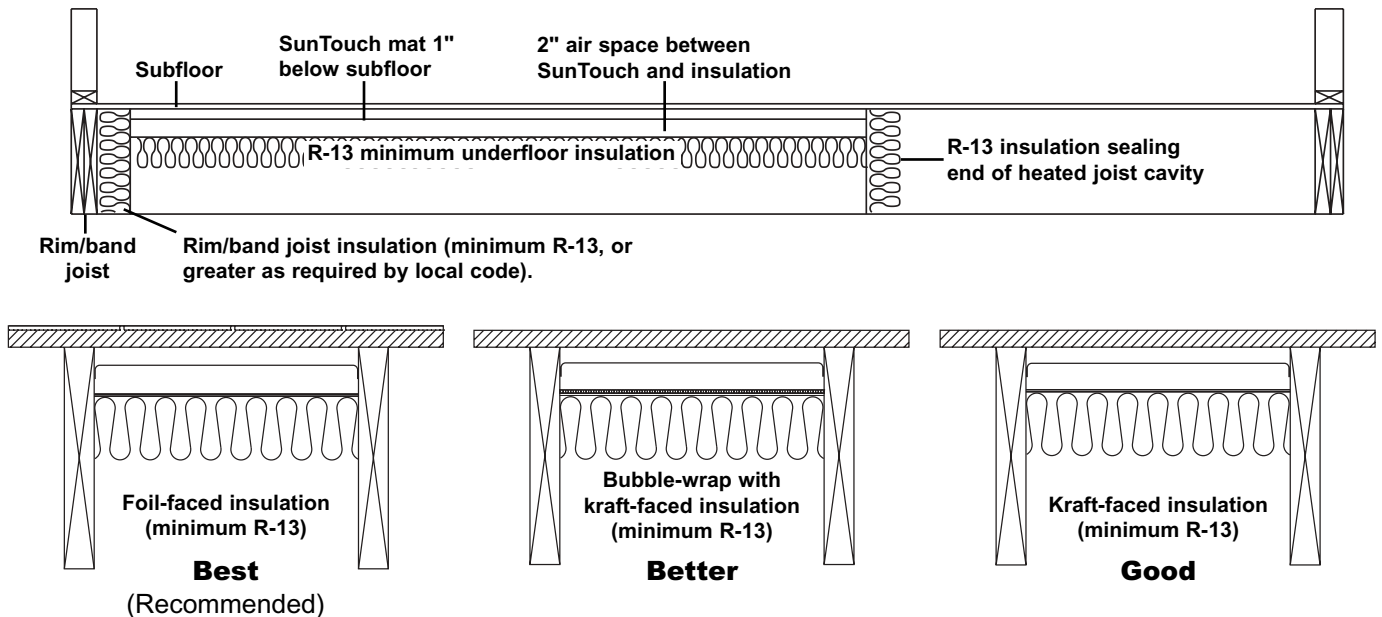
Install minimum R-13 fiberglass insulation or equivalent below the mat. Foil-faced insulation is recommended for best results. Press the insulation up to, but not touching the mat (leave about 1/2" to 1" gap between the mat and the insulation).

Make sure to insulate and caulk at the end of all heated joist cavities. Install insulation vertically in these areas to seal the ends of the heated joist areas, or six inches after the mat “stops” in a joist space, push the R-13 insulation up tight against the subfloor

and staple to the subfloor. This ensures that no heated air can escape from the heated joist space. If not, much heat will “escape” horizontally through band joists, rim joists, exterior walls, and open ends of joist spaces, and your floor will not warm as it should.

Seal openings around pipes, waste lines, ducts, joist blocking, and all other gaps with silicone caulking or urethane foam.

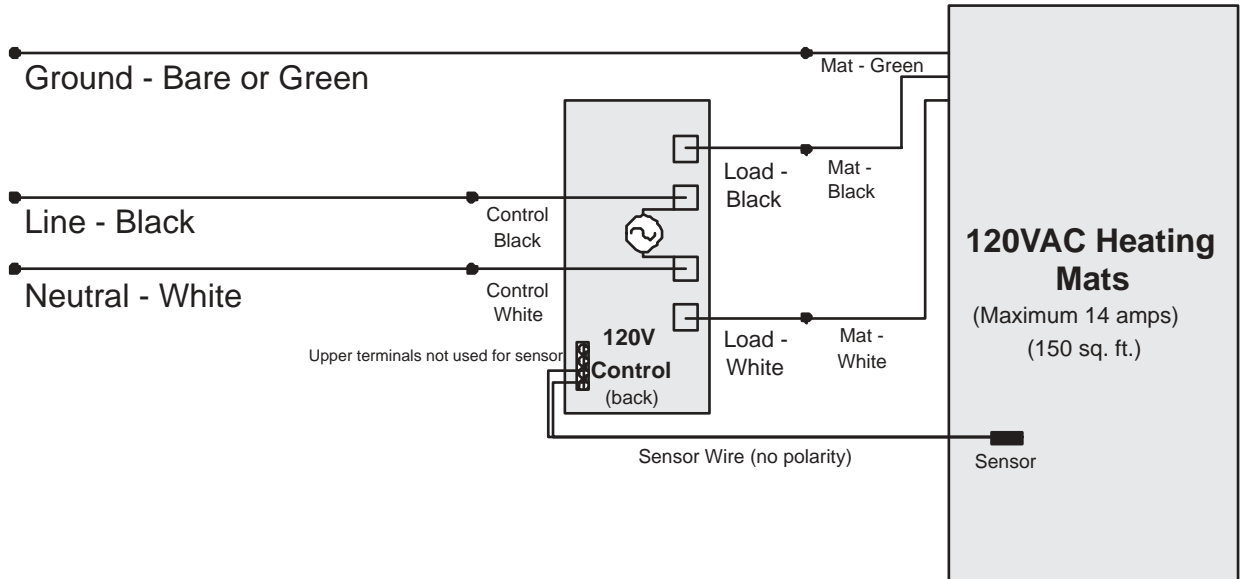
Remember, properly insulating and sealing the floor cavity is necessary for the performance of SunTouch UnderFloor mats.



APPENDIX: Control Wiring Diagrams

Typical Electrical Wiring Diagram with FloorStat Controller (120V)

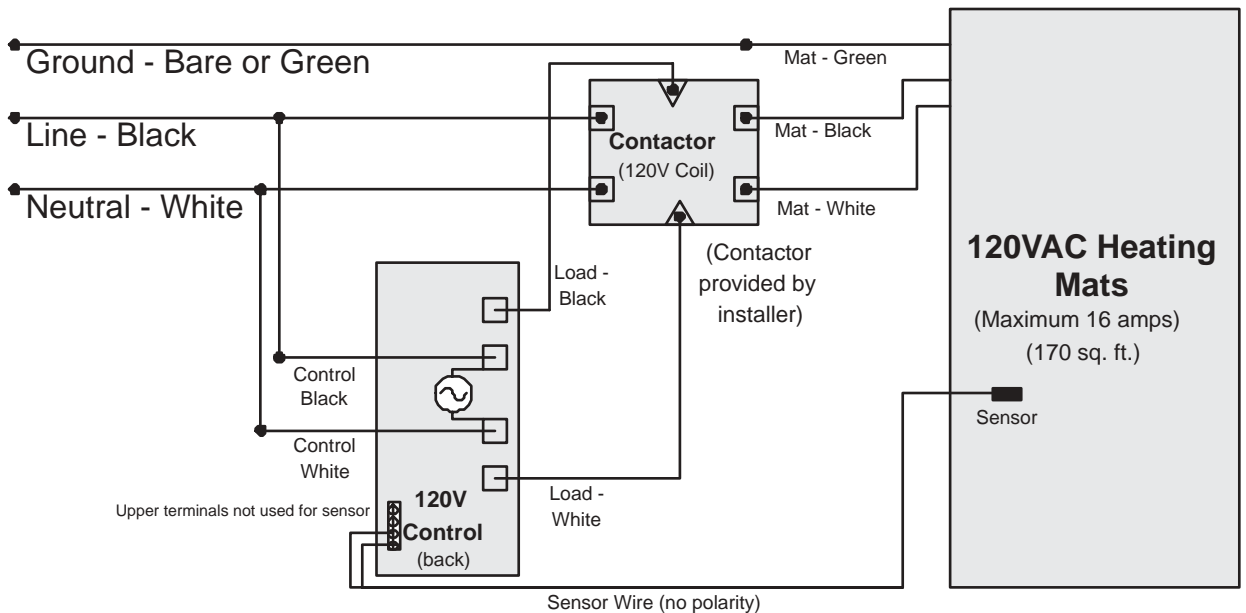
Dedicated 120V, 20 amp (maximum) circuit (must be GFCI protected unless GFCI FloorStat is used).



All electrical work must be done by a qualified, licensed electrician in accordance with local building and electrical codes, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA 70 and Section 62 of CEC Part I.

Typical Electrical Wiring Diagram with FloorStat Controller and Contactor (120V)

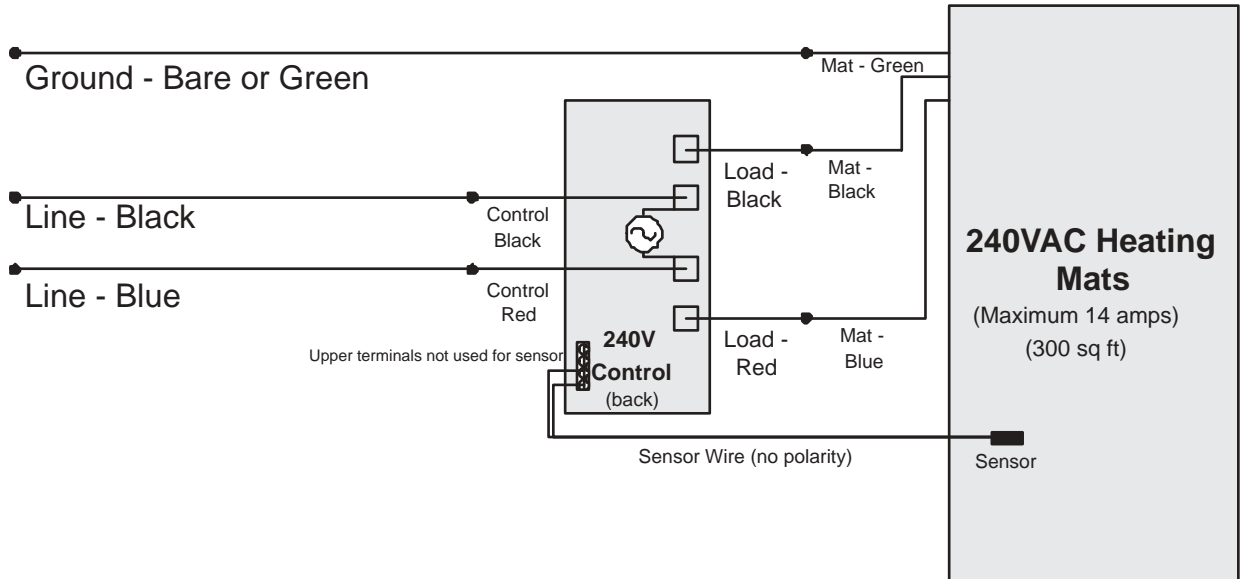
Dedicated 120V, 20 amp (maximum) circuit (with GFCI breaker provided by installer).



All electrical work must be done by a qualified, licensed electrician in accordance with local building and electrical codes, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA 70 and Section 62 of CEC Part I.

Typical Electrical Wiring Diagram with FloorStat Controller (240V)

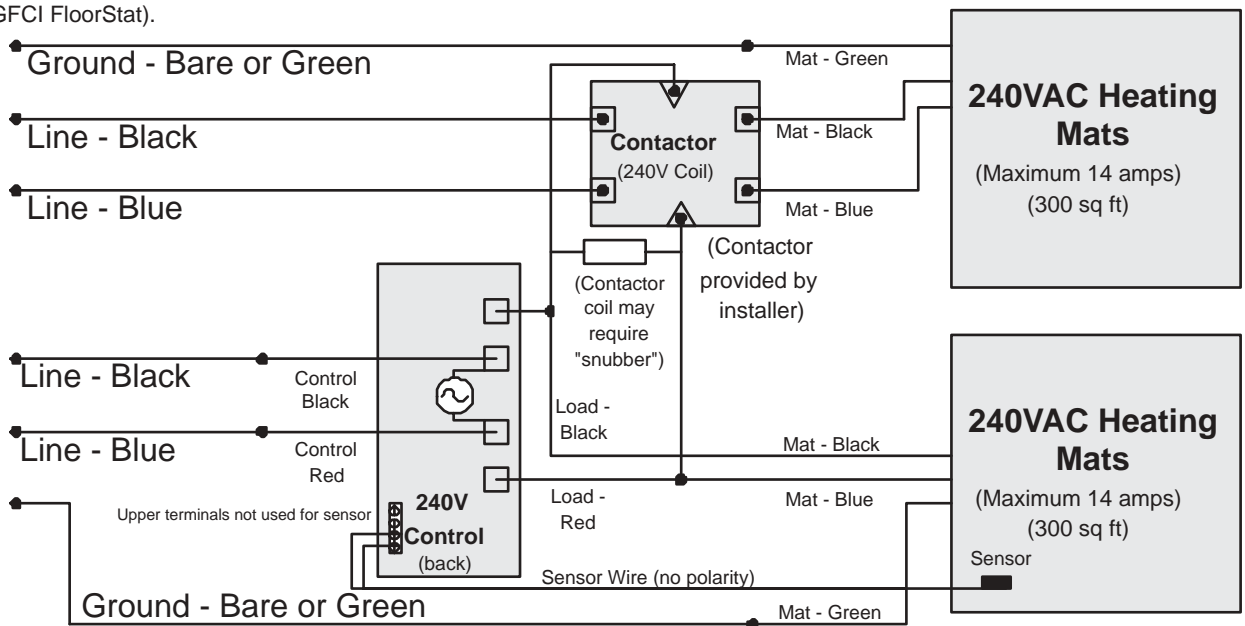
Dedicated 240V, 20 amp (maximum) circuit (must be GFCI protected unless GFCI FloorStat is used).



All electrical work must be done by a qualified, licensed electrician in accordance with local building and electrical codes, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA 70 and Section 62 of CEC Part I.

Typical Electrical Wiring Diagram with FloorStat Controller and Contactor (240V)

Dedicated 240V, 20 amp (maximum) circuits (with GFCI breaker provided by installer on circuits not protected by a GFCI FloorStat).



All electrical work must be done by a qualified, licensed electrician in accordance with local building and electrical codes, and the National Electrical Code (NEC), especially Article 424, Part IX of the NEC, ANSI/NFPA 70 and Section 62 of CEC Part I.

APPENDIX: Trouble-shooting SunTouch UnderFloor Installations

If you are not qualified to do electrical installations, you must hire a qualified, licensed electrician to install SunTouch UnderFloor and related electrical components. If you, or your electrician, continue to have problems please read below for trouble-shooting tips.

Any troubleshooting work should be done with the power turned off at the breaker panel, unless otherwise noted.

1. Mat resistance measurement is different than the nameplate label.

- The meter must be able to read from 0 ohms to 1000 ohms.
- Does the meter need to be zeroed (calibrated)? Check meter instructions for details.
- Is the meter digital? If not, consider a digital meter - the readings will be much more accurate.
- Have you checked the batteries? Low batteries will give bad readings.

2. The control is not operating.

- Carefully read all control instructions.
- Have you supplied the correct voltage to the control?
- Are the sensor wires connected to the control? They must be connected for it to operate correctly.
- Has the control or GFCI breaker "tripped," thus indicating a possible wiring problem?

3. The mat doesn't get warm.

- Have you supplied power to the control and mat? Check electrical schematics and control instructions.
- Have you supplied the correct voltage to the control and mat? 120 VAC supplied to a 240 VAC at will never allow it to heat properly. 120 VAC mats have black, white, and green leads. 240 VAC mats have black, blue, and green leads.
- Check the mat resistance with your digital ohm meter again.
- Are the sensor wires properly and firmly connected to the control?
- Use your digital ohm meter to confirm the ohmic reading of the sensor (not the mat). The sensor for a FloorStat (Aube) control should be 10,000 ohm (10K) at 77°F.

f. If using a programmable timer, read the instructions carefully to make sure the power supply is properly wired to the mat(s) and the control. Check and replace the battery, if necessary.

g. Has the timer turned the system off? Make sure the On/Off times are correctly entered.

h. If using our programmable thermostat, a separate timer should not be installed.

i. Has the control GFCI "tripped," thus indicating a possible wiring problem?

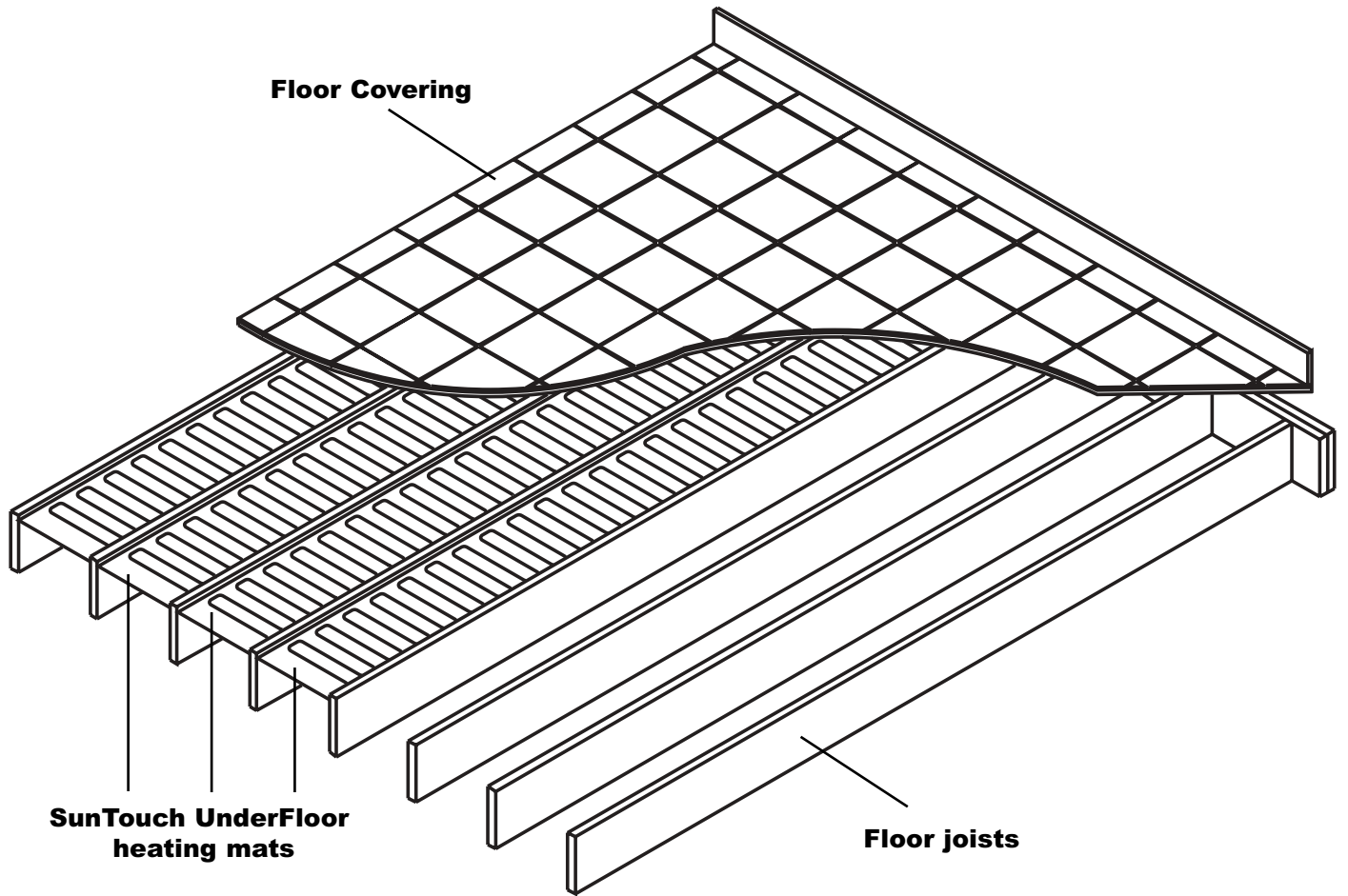
j. If using more than one mat, make sure both are wired in parallel (white-to-white, black-to-black, green-to-green for 120V mats) and connected to the control.

4. The ohm meter shows the mat resistance is open or at infinity.

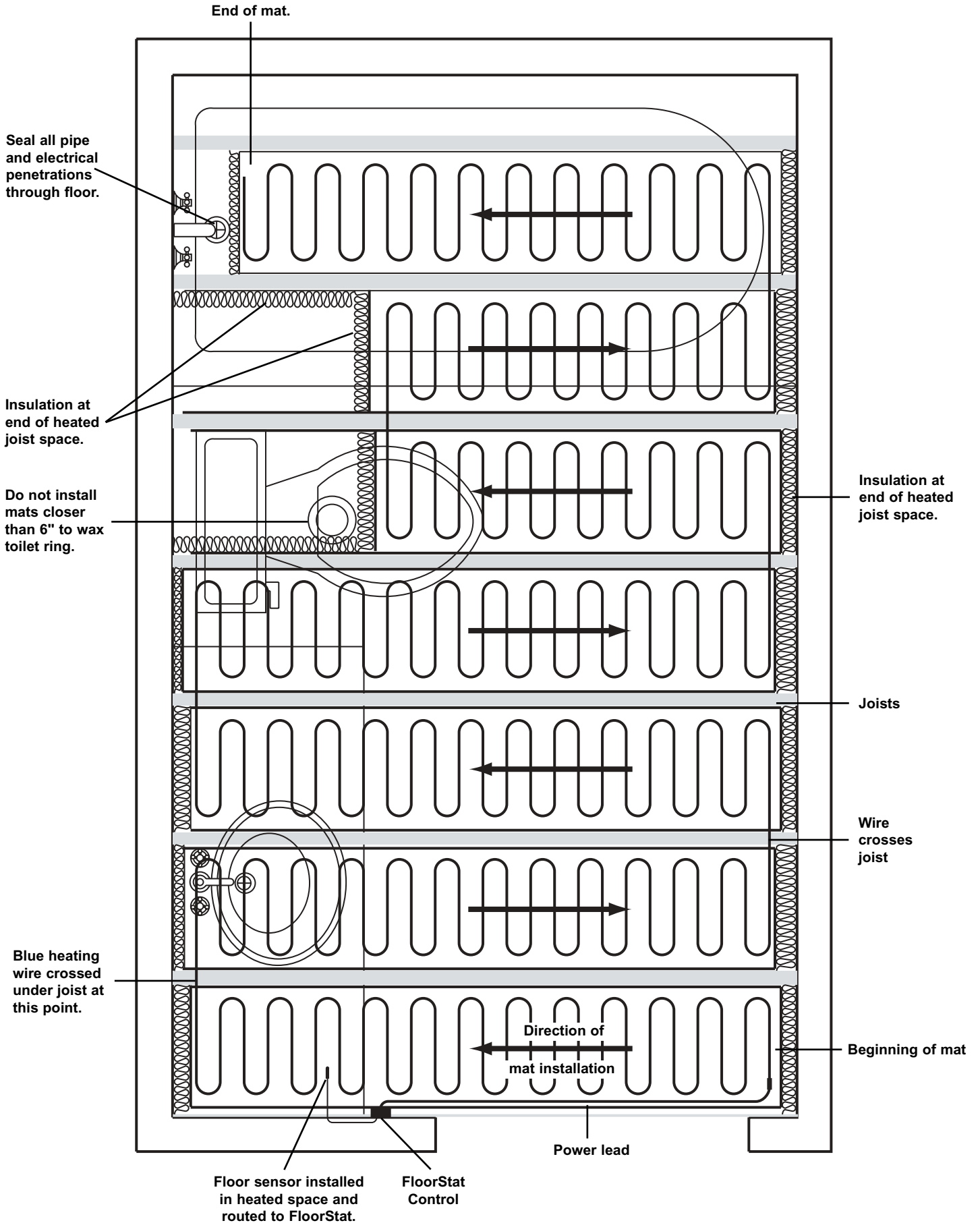
The mat has been damaged and must not be energized. If the mat has been damaged, stop immediately and look for the damaged area. If this damaged area cannot be found, take ohmic readings between the black and white wires (or black and blue wires for 240V mats), black and green wires, white and green wires and record these readings.

Then visit www.suntouch.net or call us toll free at **888-432-8932** for assistance.





APPENDIX: Plan View of SunTouch UnderFloor Installation



In general, SunTouch UnderFloor should be installed in all floor areas you want heated. It can be installed to warm the floor or to heat the space. If you want SunTouch to heat the space, first do a heat loss calculation. Use RadiantWorks™ or some other program to calculate the heat loss of the room(s). SunTouch can be expected to provide approximately 25 BTUH/sq. ft. of mat. This assumes the mats are installed per this manual, including proper insulation. Make sure insulation is installed as shown on page 8. There must be a “dead air space” for UnderFloor mats to be effective. This output also assumes a floor covering other than carpet and pad. The output will be greatly diminished with a carpet floor covering and/or the lack of proper insulation.

To determine how much mat is needed, take one of two approaches:

1. For a rough estimate, multiply the wall-to-wall area by 75–80%. Convert this to linear feet of mat and select from the lengths of mat shown in Table 1 on page 5.
2. For an accurate measurement, look under the floor to see where mats can be stapled. Looking carefully at each joist bay, add up the lengths of open joist bay that can receive mat. Take out the area(s) with obstacles in the way, such as return air ducts, supply ducts, light fixtures, etc. Where mats are not installed, the floor above will not get very warm.

Can multiple mats be wired together?

When selecting specific mats to fill the joist bays, mats can be wired together in parallel. Pick mats that will make wiring easier. If all the power leads end up at one end of the room, it will be much easier to wire them together into a common junction box.

What voltage should I use?

Select either 120 VAC mats or 240 VAC mats (see Table 1). Do not mix 120 VAC mats with 240 VAC mats. As a general rule:

- a. For areas up to about 150 sq. ft. total (about 14 amps), use 120 VAC mats with a 120 VAC FloorStat.
- b. For areas over about 150 sq. ft. up to 300 sq. ft., use 240 VAC mats with a 240 VAC FloorStat to have mats totaling 14 amps or less.
- c. Use 240 VAC mats and 240 VAC FloorStats with an external contactor (relay) for mats totaling more than 14 amps at 240 VAC. For any of these situations, make sure the circuit breaker can handle the load. Follow all electrical codes for determining the size of the breaker.

What control should I use?

For floor warming systems, install either a Programmable or Non-programmable, floor-sensing SunTouch FloorStat™. The sensor should be installed per instructions in Step 1.6 (page 5).

Please reference the Watts Radiant or SunTouch catalogs or contact your Watts Radiant distributor for more information.

Limited Warranty

Watts Radiant warrants SunTouch® UnderFloor™ electric floor warming mat (“the Product”) to be free from defects in materials and workmanship for ten (10) years from the date of manufacture, provided the Product is installed in accordance with: the accompanying SunTouch UnderFloor Installation Manual, any special written design or installation guidelines by Watts Radiant for this project, the National Electrical Code (NEC), the Canadian Electrical Code (CEC), and all applicable local building and electrical codes. This warranty is transferable to subsequent owners.

Controls sold under the SunTouch name are warranted, parts and materials, for one year. Other controls carry manufacturer’s factory warranty.

Watts Radiant assumes no responsibility under this warranty for any damage to the Product caused by any tradespeople, visitors on the job site, or damage caused as a result of post-installation work.

The staff at Watts Radiant is available to answer any questions regarding the proper installation or application of the Product at this toll free phone number: 888-432-8932. If you are ever in doubt about the correct installation procedure to follow, or if the Product appears to be damaged, you must call us before proceeding with the installation, or proposed repair.

Under this Limited Warranty, Watts Radiant will provide one of the following remedies:

a. If the Product is determined by Watts Radiant to be defective in materials and workmanship, and has not been damaged as a result of abuse or misapplication, we will refund the cost for repair of the Product, as well as labor and materials required to repair the Product. Watts Radiant will not assume responsibility for the cost of flooring materials, or the cost to remove and replace flooring materials.

b. Or, if Watts Radiant determines the repair of the Product is not feasible, we will replace the Product or refund the original cost of the Product.

This Limited Warranty is null and void if the project owner, or his designated representative, attempts to repair the Product without receiving prior authorization from Watts Radiant to proceed with field repairs or modifications. Upon notification of a real or possible problem, Watts Radiant will issue a written Authorization to Proceed under the terms of this Limited Warranty.

WATTS RADIANT DISCLAIMS ANY WARRANTY NOT PROVIDED HEREIN, INCLUDING ANY IMPLIED WARRANTY OF THE MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. WATTS RADIANT FURTHER DISCLAIMS ANY RESPONSIBILITY FOR SPECIAL, INDIRECT, SECONDARY, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THIS PRODUCT, INCLUDING INCONVENIENCE OR LOSS OF USE. HEATING ANY BUILDING MATERIAL, ESPECIALLY WOOD, MAY RESULT IN SETTLING OR SHRINKAGE OF FLOOR JOISTS OR OTHER MATERIALS. WATTS RADIANT SPECIFICALLY DISCLAIMS ANY WARRANTY RESPONSIBILITY FOR SHRINKAGE, CRACKING, OR SETTLING OF STRUCTURAL OR FINISH MATERIALS. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE OF THIS DOCUMENT. NO AGENT OR REPRESENTATIVE OF WATTS RADIANT HAS ANY AUTHORITY TO EXTEND OR MODIFY THIS WARRANTY UNLESS SUCH EXTENSION OR MODIFICATION IS MADE IN WRITING BY A CORPORATE OFFICER.

DUE TO DIFFERENCES IN BUILDING AND FLOOR INSULATION, CLIMATE, AND FLOOR COVERINGS, WATTS RADIANT MAKES NO REPRESENTATION THAT THE FLOOR TEMPERATURE WILL ACHIEVE ANY PARTICULAR TEMPERATURE, OR TEMPERATURE RISE. UL® STANDARD LISTING REQUIREMENTS LIMIT THE HEAT OUTPUT OF SUNTOUCH UNDERFLOOR MATS TO 11 WATTS PER SQUARE FOOT, AND AS SUCH, USERS MAY OR MAY NOT BE SATISFIED WITH THE FLOOR WARMTH THAT IS PRODUCED. WATTS RADIANT DOES WARRANT THAT ALL MATS WILL PRODUCE THE RATED WATT OUTPUT LISTED ON THE MAT NAMEPLATE, WHEN OPERATED AT THE RATED VOLTAGE.

Some states do not allow the exclusion or limitation of incidental or consequential damages and some states do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Terms and Conditions

Shipping Discrepancies: Incoming materials should be inventoried for completeness and for possible shipping damage. Any visible damages or shortages must be noted prior to accepting the material. Once the receiving personnel accepts the material on their dock, they have relieved the freight company of any responsibility. Any discrepancy concerning type or quantity of material shipped, must be brought to the attention of Watts Radiant within 15 days of the shipping date entered on the packing slip for the order.

Return Policy: Watts Radiant items may be returned, if they are not damaged or used. There will be a 25% restock charge applied to items returned due to overstock or customer order error. All returned items must not be damaged and in new condition. SunTouch UnderFloor heating mats, controls or other parts that have a quality defect will be replaced (not credited) at no charge to the customer. If an item is shipped in error, there will be no restocking charge. All items returned, for either replacement, credit or repair, must have a Returned Goods Authorization (RGA) number, or they will not be accepted. Please call our order desk for an RGA number. Products older than 180 days are excluded from these terms and conditions and may not be returned.

Products that have been damaged or heating mat(s) that have been cut, may not be returned for credit, but may be returned for free repair.

Please note: Watts Radiant offers free repair to mats that are damaged in the field. Ship the mat to Watts Radiant and we will repair it and ship it back by surface UPS at no charge. This offer does not apply to controls. You must call and ask for a Returned Goods Authorization (RGA) number before shipping damaged mats back to us.



4500 E. Progress Place

Springfield, MO 65803-8816

888-432-8932 Toll-free USA and Canada

417-522-6128 International

417-831-4067 Fax

www.suntouch.net

Charter Member:



Radiant Panel Association

U.S. and foreign patents and trademarks applied for: SunTouch, "SunTouch . . . like a walk on the beach," sunrise logo, beach scene design, and orange-colored mesh work mat.

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