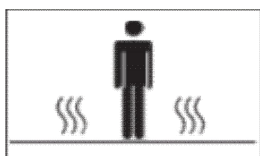




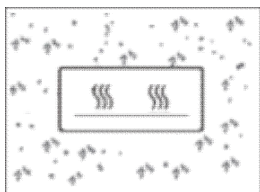
Heating Mat System SHIHM System

Flor heating system instalation manual

Indoor Heating System



Direct floor heating



Installation in concrete

WARNING

This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

<http://www.senphus.com/>

important safeguards and Warnings

WARNING: Fire and Shock Hazard.

The Heating mat must be installed correctly to ensure proper operation and to prevent shock and fire. Read these important warnings and carefully follow all the installation instructions.

- To minimize the danger of shock or fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of jiangyin Senphus Electrical Material Co.,Ltd Agence and national electrical codes, ground-fault protection for personnel must be used. The OCD4 - 1999 thermostat provides the required ground-fault protection and must be used. Arcing may not be stopped by conventional circuit protection.
- If the Heating system is damaged, it may be possible to repair it using the Heating mat Repair Kit . Do not attempt to repair it on your own. Contact jiangyin Senphus Electrical Material Co.,Ltd for repair assistance.
- When electric heating mats are installed in the floor be sure that the heating mats are not penetrated by nails, screws or similar devices that can cause damage to the installation.
- Do not cut or damage the heating cable during installation.
- The heating cable cannot be cut to length, crossed over itself, or installed closer than the spacing in the mat.



IMPORTANT: Installation Guidelines

- The Heating system must be installed by qualified personnel familiar with generally accepted construction techniques and safe electrical practices. The installation must comply with all national and local electrical codes. If you are unfamiliar with these requirements, contact a licensed electrician.
- The preassembled mats can be installed over wood, with or without a backer-board or on concrete. The mat is then embedded in mortar and covered with your particular flooring type following the manufacturer's instructions.
- The heating units are to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30mA. The RCD shall not be of the time delayed type. Alternatively, except for installations in floors surrounding swimming pools or walls below a height of 2,3m, they may be supplied through an isolating transformer. This statement is not required for class III heating units and for applications in.
- Be sure the subfloor is clean, rigid, flat, level and free of cracks.
- Do not install the Heating mat across expansion joints.
- Do not allow heating cable, cold lead, or floor temperature sensor to cross over themselves or each other. The heating cable cannot be cut to length, crossed over itself or installed closer than the spacing in the mat.
- Position the temperature sensor immediately under the tile, stone, laminate or engineered wood surface and in the middle of the space between two heating cable runs.
- Follow manufacturer's instructions for installing your finished floor.



Table of Contents

1	General Information	1
2	Heating Mat System	3
3	Floor Heating Design	6
4	Product Selection	8
5	Electrical Rough-In	10
6	Installation	11
7	Commissioning	16
8	Installing the Finished Floor	19



1 General Information

1.1 Use of the Manual

This manual describes the SHIHM Senphus 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 following document prior to installation:

OCD4-1999 Thermostat Installation and Operation Manual according to Thermostat information

For additional information regarding any aspect of the Heating mat system, contact:

jiangyin Senphus Electrical Material Co.,Ltd
Headquarters: No.8 Taoyuan Rd, Chengchang Industrial
Huangtu Town, jiangyin City, jiangsu Province,

China

Tel: 86-0510-86659868

Fax: 86-0510-86650038

<http://www.senphus.com/>



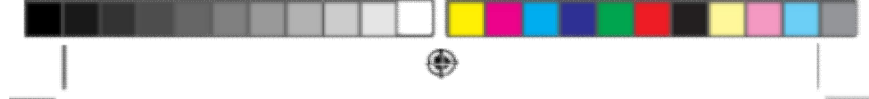
Important: For the jiangyin Senphus Electrical Material Co.,Ltd warranty and agency approvals to apply, the instructions that are included in this manual and product packages must be followed.

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 Heating system performs reliably.

Pay special attention to the following:

- Instructions marked  Important
- Safety warnings identified as  WARNING



1

General Information

1.3 15-year limited Warranty



The Heating system standard limited warranty is 15 years from the date of purchase.

1.4 Optional Accessories

Heating Mat-Check Continuity monitor

This battery-operated device is used to verify the continuity of the heating cable and the integrity of its outer jacket during the installation process. The monitor connects to the cold leads of the cable and, if the heating cable is damaged, the alarm on the monitor will sound. The monitor can also be re-used for subsequent installations and to help troubleshoot any problems that may arise.



2

HeatingMatSystem

2.1 System Description

The floor heating system is designed for comfort heating of:

- Ceramic or porcelain tile
- Granite
- Marble (except cultured marble)
- Natural stone
- Laminate wood flooring (floating only)
- Engineered wood flooring (floating or gluedown)

The preassembled mats can be installed over wood, with or without a backer-board or on concrete. The mat is then embedded in mortar and covered with your particular flooring type following the manufacturer's instructions. **Mat Must Not be installed beneath carpet, linoleum or other types of floors not mentioned above.**

The Heating Mat system includes the following components:

- floor heating mat (with cold lead)
- OCD4-1999 thermostat
- Floor temperature sensor

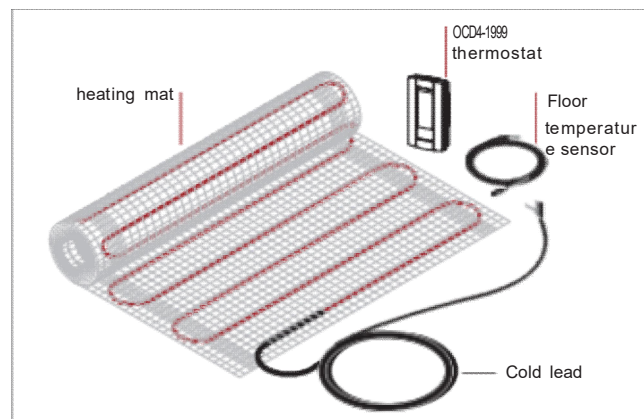


Figure 1: HEATING MAT system components

2

Heating Mat System

The **floor heating mat** has a blue heating cable attached to an adhesive-backed red fiberglass mesh. These are manufactured for 230 V, and in various lengths of 20-inch widths. The **cold lead** is a black non-heating cable that runs in the wall and connects the system to the thermostat. The **OCD4-1999 thermostat** has an adaptive function that switches the system on to ensure a comfortable floor temperature when you want it. The thermostat comes with a **floor temperature sensor** that is installed under the floor covering and connected to the thermostat to detect the temperature of the floor.

2.2 System Specifications

Technical data

	Indoor Heating System-90/150	Indoor Heating System-150/200
Nominal voltage	AC 230V	AC 230V
Power output	upto 90-150W ² /m	upto 150-200W ² /m
Circuit breaker	See Fig. C and D	
Min. bending radius	30 mm	30 mm
Min. cable spacing	90 mm	70 mm
Max. exposure temp.	+90°C	+90°C
Min. installation temp.	+5°C	+5°C
Conductor cross-section of cold lead cable	3 x 1,0-1.5mm ²	3 x 1.0-1,5 mm ²
Length of cold lead cable	2,0 m	2.0m
the maximum switching current	15A	15A
Max. current of heating element	16A	16A
Approvals	CE	CE

Thermostat

Function	On/Off control digital display, 7-day programmable; Class A, 5-mA GFCI.
Supply voltage	230V, 50 Hz
Maximum switching current	15 A
Ambient setpoint range (A/AF mode)	40°F to 86°F (5 to 30°C)
Floor setpoint range (F mode)*	40°F to 104°F (5 to 40°C)
Floor limit setpoint range (AF mode)*	40°F to 104°F (5 to 40°C)
Floor temperature sensor	2-wire, 15-foot lead wire

* For wood flooring installations, the maximum set point should be 82°F (28°C) unless specified otherwise by the wood flooring manufacturer.

2

Heating Mat System

2.3 Product use

floor heating mats can be used on typical interior floor constructions as follows:

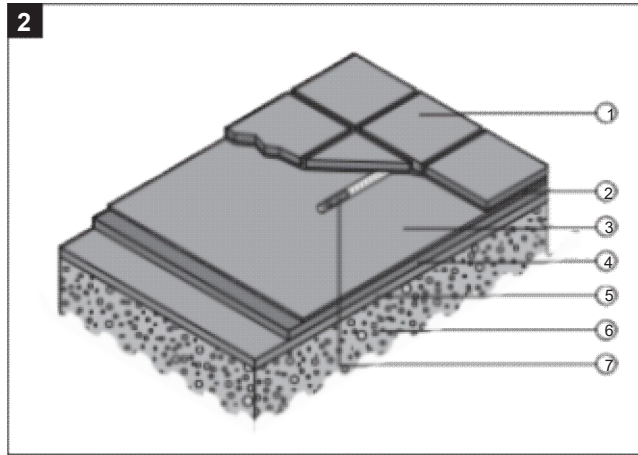


Fig 2: 1 tile glue + floor covering (e.g. floor tiles)
2 waterproofing layer (e.g. jointing compound): optional for shower areas
3 heating mat + primer (optional) + filler (min 5 mm)
4 sub-floor
5 insulation
6 bearing construction (e.g. concrete)
7 floor sensor

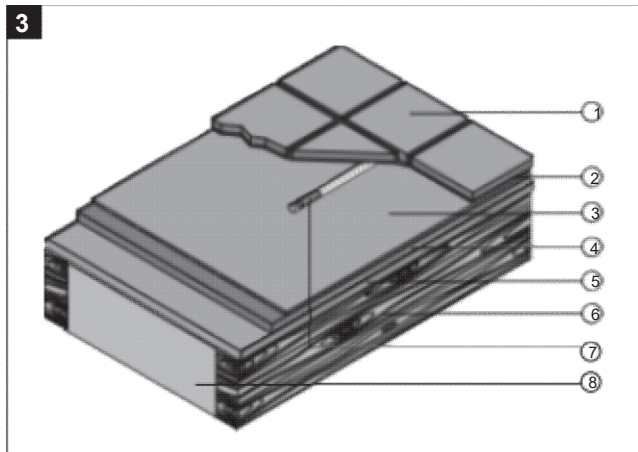


Fig 3: 1 tile glue + floor covering (e.g. floor tiles)
2 waterproofing layer (e.g. jointing compound): optional for shower areas
3 heating mat + primer (optional) + filler (min 5 mm)
4 gypsum plasterboard ≥ 13 mm
5 wooden plate (e.g. particle board, deal floor)
6 joist
7 floor sensor
8 insulation (Extruded Polystyrene Foam Board: Thickness ≥ 20 mm Closed-cell structure, water absorption $\leq 1\%$, high compressive strength, thermal conductivity of $0.024\sim 0.030$ W/m·K, moisture-proof and non-collapsible)

3

Floor Heating Design

3.1 Design the Installation

step 1: Measure the heated area

Determine the area of the floor to be heated. The heated area is the 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 (see Figure 4), if your bathroom is 2.0m x 3m = 6 sq m

minus the cabinet area - 2.5 sq m

minus the toilet space - 1.5 sq m

minus the linen closet - 2.0 sq m

minus the shower area - 4.0 sq m

Total area to be heated = 16 sq m

Solution:

Choose the 15 sq m Heating mat).

* If the shower area is to be heated, select a 6 sq m SHIHM Heating Mat also. See Section page 22 for details on how to install the heating mat inside wet areas.

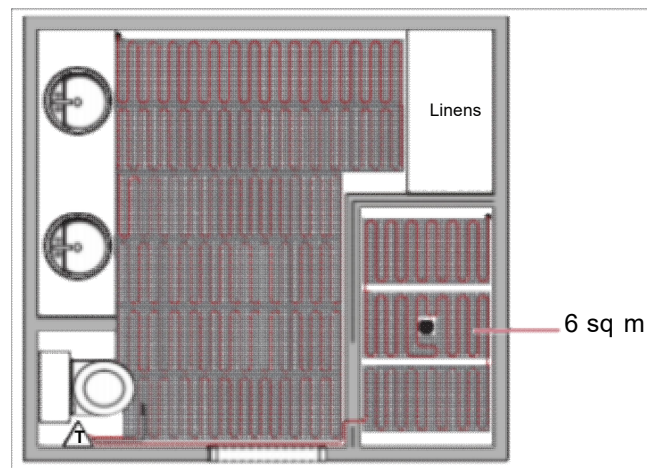


Figure 4: Heated area example

3

Floor Heating Design

Step 2: Plan the design

Determine the optimum floor heating mat layout for your heated area to ensure proper coverage. Select a spot for the thermostat on the wall above the heated area where it can be reached by the 1.5-meter cold lead on the mat, and the 2-meter floor temperature sensor.



Note: If the area of the floor is smaller than the mat you chose, **DO NOT CUT THE END OFF**. You may readjust the overall fit of the mat or you may need to replace the mat with a smaller size.

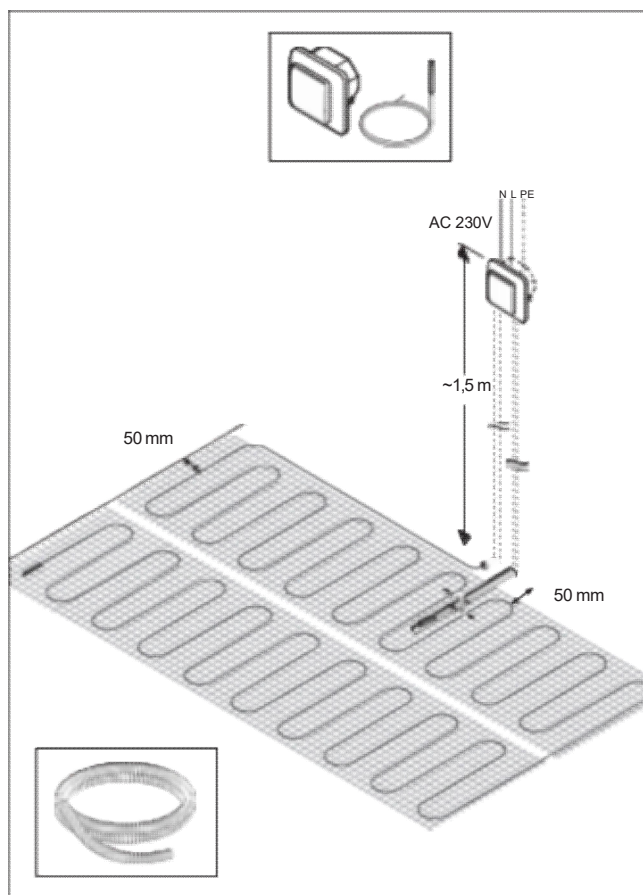


Figure 5: Typical cold lead and floor temperature sensor example

4

Product Selection

4.1 Confirm Your Product selection

AVAILABLE SHIHM THEATING MAT SIZES

Catalog number	Power Heated area		Mat dimensions
	W	m ²	
230 V SHIHM 90W/m ²			
90W/m ² - 0.5m ²	45	0.5	0.5m x 1.0m
90W/m ² - 1.0m ²	90	1.0	0.5m x 2.0m
90W/m ² - 1.5m ²	135	1.5	0.5m x 3.0m
90W/m ² - 2.0m ²	180	2.0	0.5m x 4.0m
90W/m ² - 2.5m ²	225	2.5	0.5m x 5.0m
90W/m ² - 3.0m ²	270	3.0	0.5m x 6.0m
90W/m ² - 3.5m ²	315	3.5	0.5m x 7.0m
90W/m ² - 4.0m ²	360	4.0	0.5m x 8.0m
90W/m ² - 4.5m ²	405	4.5	0.5m x 9.0m
90W/m ² - 5.0m ²	450	5.0	0.5m x 10.0m
90W/m ² - 6.0m ²	540	6.0	0.5m x 12.0m
90W/m ² - 7.0m ²	630	7.0	0.5m x 14.0m
90W/m ² - 8.0m ²	720	8.0	0.5m x 16.0m
90W/m ² - 9.0m ²	810	9.0	0.5m x 18.0m
90W/m ² - 10.0m ²	900	10.0	0.5m x 20.0m
90W/m ² - 12.0m ²	1080	12.0	0.5m x 24.0m
90W/m ² - 15.0m ²	1350	15.0	0.5m x 30.0m
230 V SHIHM 200W/m ²			
200W/m ² - 0.5m ²	100	0.5	0.5m x 1.0m
200W/m ² - 1.0m ²	200	1.0	0.5m x 2.0m
200W/m ² - 1.5m ²	300	1.5	0.5m x 3.0m
200W/m ² - 2.0m ²	400	2.0	0.5m x 4.0m
200W/m ² - 2.5m ²	500	2.5	0.5m x 5.0m
200W/m ² - 3.0m ²	600	3.0	0.5m x 6.0m
200W/m ² - 3.5m ²	700	3.5	0.5m x 7.0m
200W/m ² - 4.0m ²	800	4.0	0.5m x 8.0m
200W/m ² - 4.5m ²	900	4.5	0.5m x 9.0m
200W/m ² - 5.0m ²	1000	5.0	0.5m x 10.0m
200W/m ² - 6.0m ²	1200	6.0	0.5m x 12.0m
200W/m ² - 7.0m ²	1400	7.0	0.5m x 14.0m
200W/m ² - 8.0m ²	1600	8.0	0.5m x 16.0m
200W/m ² - 9.0m ²	1800	9.0	0.5m x 18.0m
200W/m ² - 10.0m ²	2000	10.0	0.5m x 20.0m
200W/m ² - 12.0m ²	2400	12.0	0.5m x 24.0m
200W/m ² - 15.0m ²	3000	15.0	0.5m x 30.0m

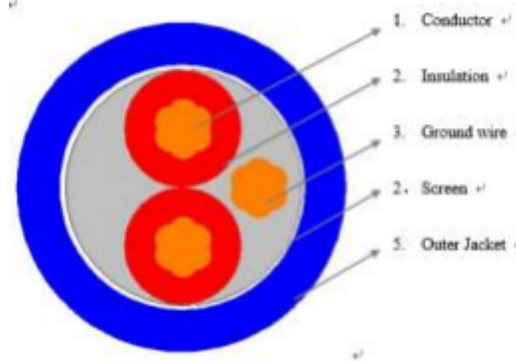
4

Product Selection

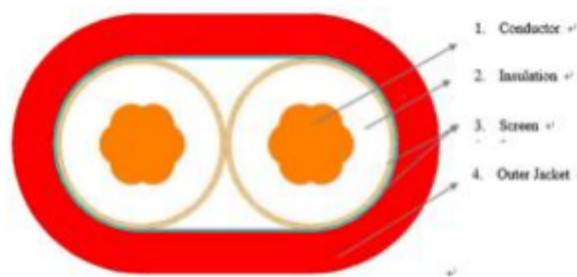
4.2 Confirm Your Product Type

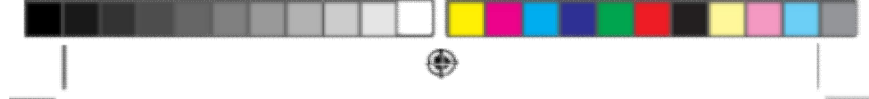
Three heating cable type can be selected

a. Option 1



b. Option 2





5

Electrical Rough-In

5.1

Electrical rough-in

 **WARNING:** The electrical rough-in must be done by qualified personnel familiar with generally accepted construction techniques and safe electrical practices. The installation must comply with all national and local electrical codes. If you are unfamiliar with these requirements, contact a licensed electrician.

Step 1: Confirm power supply

Confirm that the power supply is 230V. The floor Heating system must be connected to appropriately-sized electrical circuit. Refer to the product selection table on page 8.

Step 2: Install electrical junction box

Install the junction box for the thermostat at a convenient height—typically 1.5m above the floor and within reach of the cold lead and the floor temperature sensor.

Step 3: Notch the sill plate

Notch the sill plate under the electrical junction box location. You will use this hole to route the cold lead and the floor temperature sensor wire to the electrical junction box.



6

Installation

6.1 Laying Out the Heating mat

Tools and materials required

You will require the following items to install and test the floor heating system:

- Scissors
- Tape measure
- Multimeter

You will also need the appropriate tools and materials to install your particular floor.

Follow these steps to ensure a successful Heating Mat installation.



Important: Do not cut the heating cable.



Important: To prevent damage to the SHIHM system, do not overlap the heating cables.



Step 1: Perform commissioning tests



Important: Perform the commissioning tests outlined in Section 7 and record results in the Commissioning Record .

Step 2: Prepare the subfloor

Make sure the floor area to be heated is clean, flat, and free of debris that can damage the mat, such as nails, staples or protruding objects.

It is strongly recommended that a layer of insulation be installed above a concrete subfloor and underneath the SHIHM floor heating mat. The insulation layer must meet IEC standards and will help to transfer a greater amount of heat into the finished floor and room.



6 Installation

Step 4: Orient the SHIHM floor heating mat

Lay out the Heating mat so that the cold lead will reach the electrical junction box. Start the layout so that critical areas such as toe-kicks in front of a sink will have tight coverage. Loosely unroll the mat on the clean floor to ensure good coverage. Once the layout has been completed, remove the clear plastic lining and start to secure the mat (adhesive side down) to hold it in place. See Figure 6. When it is necessary to change direction, see step 4.



Note: When installing a 230-V mat with an Extension mat to accommodate a floor over 15 m² align the mats so that the red mesh is edge to edge, the heating cable spacing is no less than 50mm apart, and both cold leads can reach the electrical junction box.

If it is necessary to remove the heating cable from the mesh to route around an obstacle, be sure to maintain at least 50mm of separation between the heating cables.

6

Installation

Step 4: Change the direction of the mat to fit floor design

To make a turn in the direction the mat is being installed, cut the mesh with scissors being careful not to damage the heating cable.

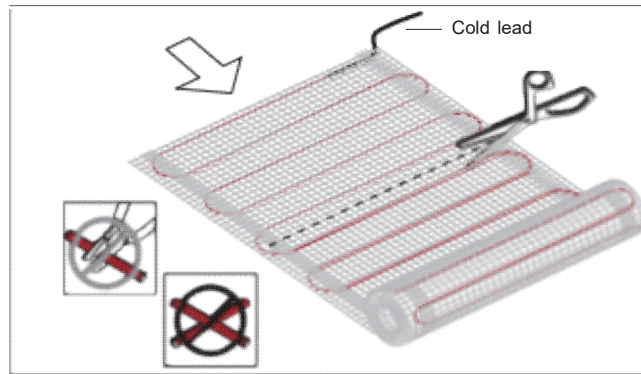


Figure 7: Cutting the mesh

Then align the mat in the desired direction ensuring that the adhesive side of the mat is down and continue to roll it into position.

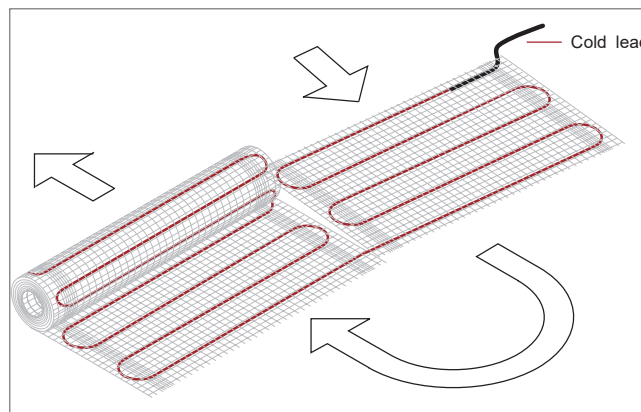


Figure 8: Changing direction

6

Installation

Step 5: Route the cold lead

Position the cold lead of the mat as close as possible to the wall near the electrical junction box. The cold lead must be routed outside of the heating mat, never under or over the heating cable and must not protrude higher than the heating mat.

If the splice is higher than the mat, you must gouge out the subfloor to allow the splice to lay flat under the floor surface.

Run the cold lead inside the wall to the electrical junction box location.



Important: Position the cold lead label on the cold lead inside the electrical junction box. If it is necessary to shorten the cold lead, be sure to store the cold lead label in the junction box.

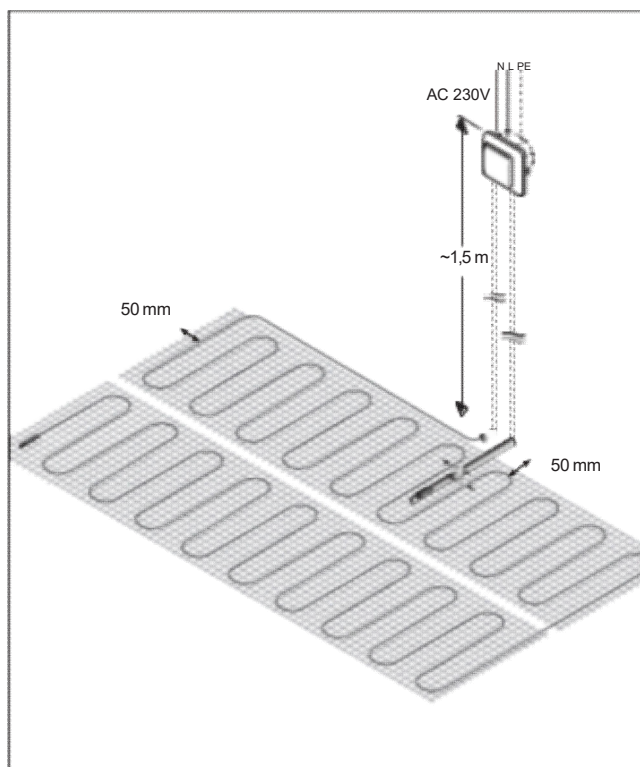


Figure 9: routing the cold lead

6

Installation

Step 6: Place the floor temperature sensor

Center the floor temperature sensor between two runs of the heating cable, 4 inches from the end of the heating cable loop (see Figure 10). Run the floor temperature sensor inside the wall to the electrical junction box location.

For floating wood floor installations, place the floor sensor above the underlayment.

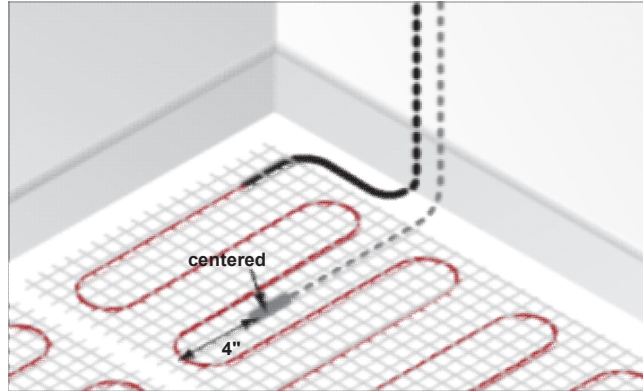


Figure 10: Placing the floor temperature sensor



Important: Do not allow heating cable, cold lead, or floor temperature sensor to cross over themselves or each other.



Note: When installing more than one mat, use only one floor temperature sensor and one thermostat to control both mats.



Important: After layout is complete and before mortar and tile are installed, take a picture of the layout for future reference.

Step 7: Perform commissioning tests



Important: Perform the Commissioning tests outlined in section 7 and record results in the Commissioning record in

7 Commissioning

7.1 Commissioning Tests



Note: For the extended 15-year limited warranty to apply, you must perform these tests, record the results on the Commissioning

You must perform the Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test four times during the installation process:

1. When you receive the mat.
2. Before you embed the mat in mortar.
3. After you embed the mat in mortar but before you install the flooring material.
4. After the flooring material has been installed.

Insulation Resistance Test

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

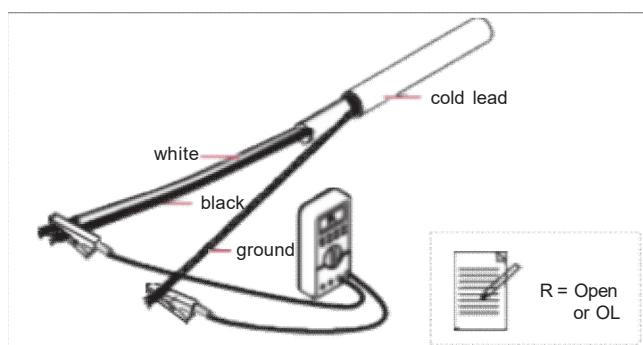


Figure 11: Insulation Resistance Test

1. Set your multimeter to the highest range.
2. Connect the ground wire to the black lead and both power wires to the red lead of the multimeter.
3. Make sure the meter reads "Open" or "OL."

7

Commissioning

4. Record these readings on the Commissioning Record.

Heating Cable Resistance Test

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

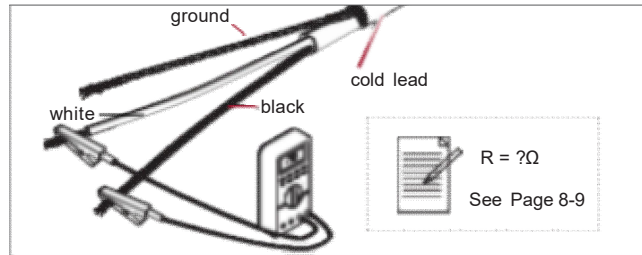


Figure 12: heating Cable resistance test

1. Set your multimeter to the 200K ohms range.
2. Connect the multimeter leads to the black and white cold lead wires.
3. Compare this resistance reading to the resistance specified in the product selection table on page 8. The value should be within $\pm 10\%$.
4. Note these readings on the Commissioning Record.

Sensor Resistance Test

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

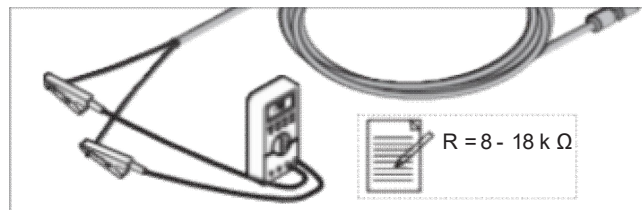
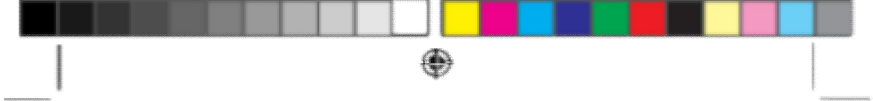


Figure 13: Sensor Resistance Test



7 Commissioning

1. Set your multimeter to the 200K ohms range.
2. Connect the multimeter leads to the sensor.
3. Make sure the meter reads between 8–18 k Ω .
4. Record these readings on the Commissioning Record.



Note: The range used in the sensor resistance Test (K ohm) is different from the one used in the other two commissioning tests.

8

Installing the Finished Floor

8.1 Tile/stone Floor installations

Step 1: Embed the floor heating mat in mortar (optional)

After laying out the floor heating mat and routing the cold lead and the floor temperature sensor to the electrical junction box, apply a thin coat of self-leveling mortar or acrylic or latex modified thin-set over the mat (Figure 14). Be sure to use the flat side of the trowel to avoid any damage to the mat. Spread the mortar evenly over the mat filling in all voids between the floor, mesh and heating cable. Once the surface is smooth and even, allow it to cure to a hard surface before installing the flooring material.

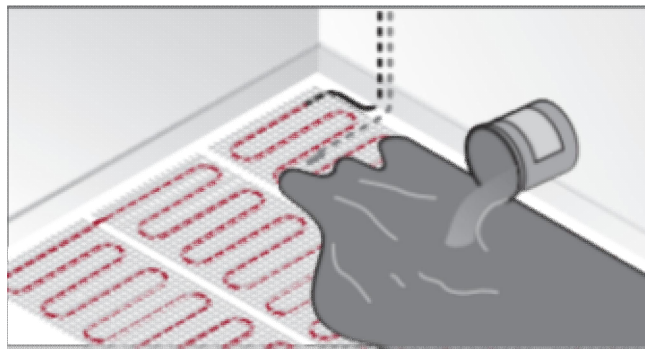


Figure 14: Applying self-leveling mortar or acrylic or latex modified thin-set

Step 2: Perform commissioning tests



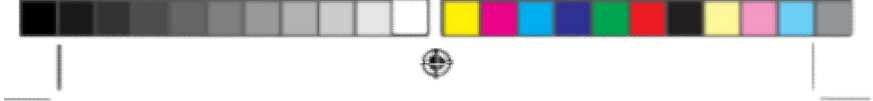
Important: Perform the Commissioning tests outlined in Section 7 and record results in the Commissioning record

Step 3: Install the tile/stone

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



Do not power the heating mat until all setting materials have cured as specified by the manufacturer.



8

Installing the Finished Floor

Step 4: Perform commissioning tests



Important: Perform the Commissioning tests outlined in section 7 and record results in the Commissioning record in

8.2 Floating Wood Floor installations



Important: Only species that are approved by the wood flooring manufacturer for use over radiant heating systems may be used. refer to your flooring manufacturer for recommendations.

Step 1: Embed the floor heating mat in mortar

After laying out the floor heating mat and routing the cold lead and the floor temperature sensor to the electrical junction box, apply a thin coat (at least 1/4 in) of self-leveling mortar or acrylic or latex modified thin-set over the mat (Figure 14). Be sure to use the flat side of the trowel to avoid any damage to the mat. Spread the mortar evenly over the mat filling in all voids between the floor, mesh and heating cable. Once the surface is smooth and even, allow it to cure to a hard surface before installing the flooring material.

Step 2: Perform commissioning tests

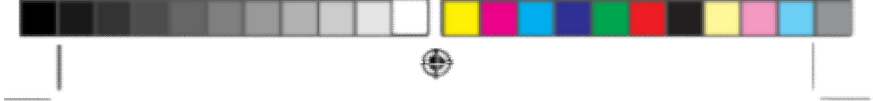


Important: Perform the Commissioning tests outlined in section 7 and record results in the Commissioning record

Step 3: Install foam underlayment

Install the foam underlayment as per manufacturer's instruction. If necessary, also install a vapor barrier. Place the floor temperature sensor above the foam underlayment and at least 12 inches from the edge of the heated area. Tape the floor temperature sensor in place and run the floor temperature sensor inside the wall to the electrical junction box location.

Step 4: install laminate or engineered wood flooring



8

Installing the Finished Floor



Important: Nail down installations of the wood flooring is not permitted.

Install the laminate or engineered wood flooring in accordance with instructions provided by the manufacturer of the flooring materials.



Do not power heating mat until all setting materials have cured as specified by the manufacturer.

Step 5: Perform commissioning tests



important: Perform the Commissioning tests outlined in section 7 and record results in the Commissioning Record

8.3 Glue Down Wood Floor installations



Important: Only species that are approved by the wood flooring manufacturer for use over radiant heating systems may be used. refer to your flooring manufacturer for recommendations.

Step 1: Embed the floor heating mat in mortar

After laying out the floor heating mat and routing the cold lead and the floor temperature sensor to the electrical junction box, apply a thin coat (at least 1/4 in) of self-leveling mortar or acrylic or latex modified thin-set over the mat (Figure 14). Be sure to use the flat side of the trowel to avoid any damage to the mat. Spread the mortar evenly over the mat filling in all voids between the floor, mesh and heating cable. Once the surface is smooth and even, allow it to cure to a hard surface before installing the flooring material.

Step 2: Place the floor temperature sensor

Place the floor temperature sensor at least 12 inches into the heated area. Tape the floor temperature sensor in place and run the floor temperature sensor inside the wall to the electrical junction box location.

8

Installing the Finished Floor

Step 3: Perform commissioning tests



Important: Perform the Commissioning tests outlined in section 7 and record results in the Commissioning Record in Section 10.

Step 4: Install engineered wood flooring



Important: Nail down installations of the wood flooring are not permitted.

Use an adhesive that is approved for use with radiant floor heating systems. Using a notched trowel, apply a layer of adhesive following adhesive manufacturer's instructions. Install the engineered wood flooring in accordance with manufacturer's instructions.

Do not power the SHIHM heating mat until all setting materials have cured as specified by the manufacturer.

Step 5: Perform commissioning tests



Important: Perform the commissioning tests outlined in section 7 and record results in the Commissioning Record in Section 10.

8.4

Installing SHIHM in a Wet Environment



Important: The extended warranty is not provided for SHIHM when installed in a wet environment.

Therefore, always use an extension mat for a wet area such as a shower. This will ensure that the bathroom floor mat remains operational, even if the mat in the shower area is damaged.



WARNING: Fire and shock hazard. To minimize the danger of shock or fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of national electrical codes, ground-fault protection for personnel must be used. The OCD4-1999 thermostat provides the required ground-fault protection and must be used. arcing may not be stopped by conventional circuit protection.

8

Installing the Finished Floor

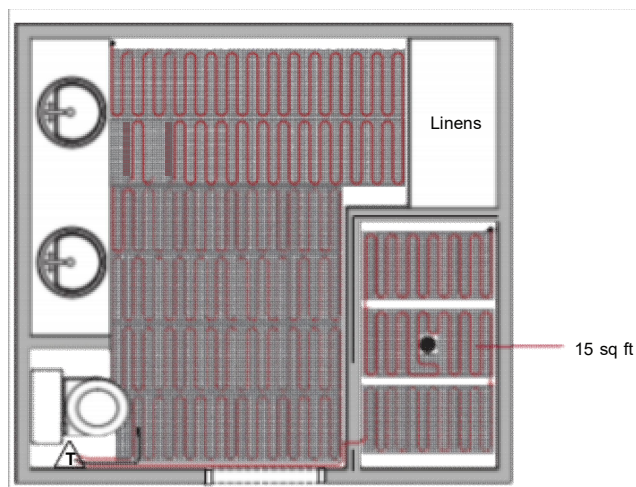


Figure 15: installing in a wet environment

Step 1: Prepare the subfloor and waterproofing of the wet area.

Ensure that the preparation meets or exceeds the IEC standards and that the waterproofing passes a shower pan test and local approvals.

Step 2: Ensure that the floor is clean and dry.

Lay out the Heating mat so that the cold lead reaches the electrical junction box. The cold lead and splice (black cable) should always remain outside of the wet area. Before laying out the mat, confirm the location of the shower partition walls and avoid installing Heating mat in that area. Unroll the mat and loosely fit it to ensure adequate coverage. Once the layout has been completed, remove the clear plastic lining and start to secure the mat (adhesive side down) to hold it in place.

Heating mat may be installed on a shower bench by running one line up to the area to be heated. Avoid installing Heating mat in any wall as this application method is not allowed by national electrical codes.



8

Installing the Finished Floor

Step 3: Perform commissioning tests



Important: Perform the commissioning tests outlined in section 7 and record results in the Commissioning Record

Step 4: Embed the floor heating mat in mortar

After laying out the floor heating mat and routing the cold lead and the floor temperature sensor to the electrical junction box, apply a thin coat (at least 1/4 in) of self-leveling mortar or acrylic or latex modified thin-set over the mat. Be sure to use the flat side of the trowel to avoid any damage to the mat. Spread the mortar evenly over the mat filling in all voids between the floor, mesh and heating cable.

Once the surface is smooth and even, allow it to cure to a hard surface before installing the flooring material.

Step 5: Install the tile/stone.

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

Do not power the heating mat until the thinset and grout are fully cured.

Step 6: Perform commissioning tests



Important: Perform the commissioning tests outlined in section 7 and record results in the Commissioning Record in .



8

Installing the Finished Floor

8.5 Installing the OCD4-1999 Thermostat

Step 1: Install the thermostat

Refer to the document OCD4-1999 Thermostat Installation and Operation Manual , included in the thermostat box for instructions on how to install the thermostat.

 **WARNING:** Fire and shock hazard. To minimize the danger of shock or fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of national electrical codes, ground-fault protection for personnel must be used. The OCD4-1999 thermostat provides the required ground-fault protection and must be used. arcing may not be stopped by conventional circuit protection.

Step 2: Program the OCD4-1999 thermostat

Refer to the document OCD4-1999 Thermostat Installation and Operation Manual included in the thermostat box for instructions on how to program the thermostat.

