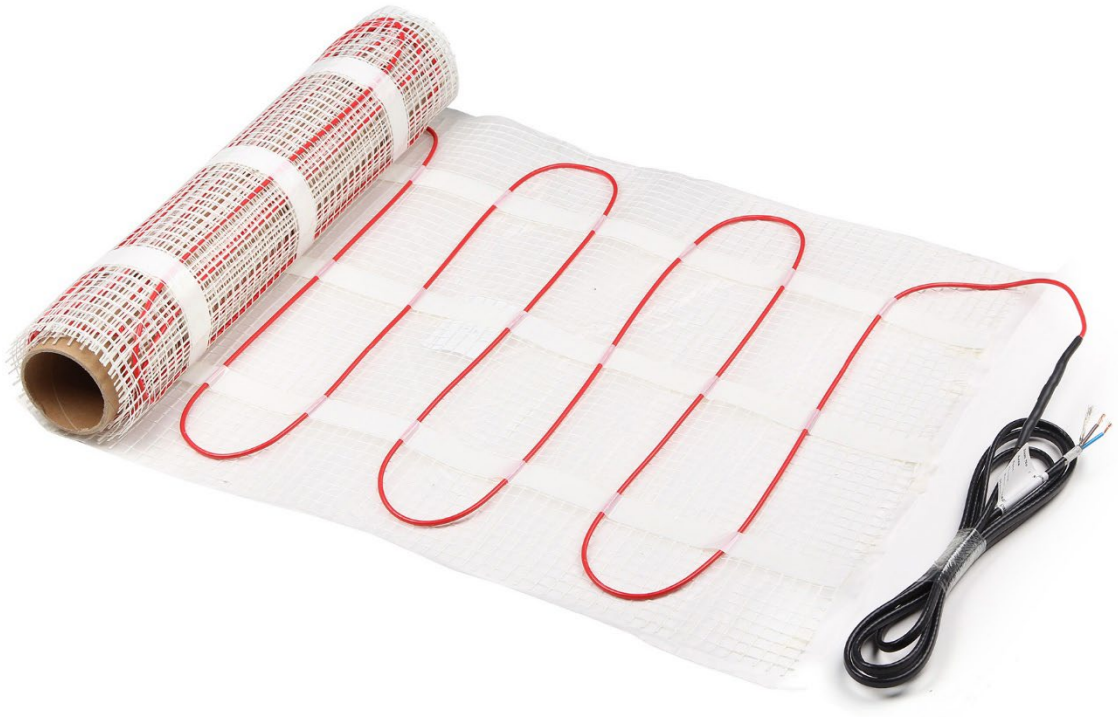
TRUEHEAT

Heating Mat System

Installation Manual



Contents

Important Safeguards & Warnings

⚠ Warning: Shock and Fire Hazard

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

· A thermostat must be used.

· Do not wire up to a plug, and do not switch on whilst it is still coiled up. It is important that this equipment is installed only by qualified electricians who are familiar with the proper sizing, installation, construction and operation of floor warming system and the hazards involved. The installation must comply with all national and local electrical codes. If you are unfamiliar with these requirements, contact an electrician.

· The Heating cable System is designed for underfloor heating purposes only. Be sure that the floor is not penetrated by nails, screws, or similar devices that can cause damage on first installation or during subsequent floor repairs in the future.

· If the Heating cable System is damaged, it must be replaced. Do not attempt to splice or repair any part of the system.

1. General Information

1.1 Use of the Manual

This manual describes the Heating 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 following document prior to installation:
Thermostat Installation and Operation Manual

For additional information regarding any aspect of the Heating cable System, contact:
mail@trueheat.co.uk

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 cable system performs reliably.

Pay special attention to the following:

Instructions marked as  **Important**
Safety warning identified as ⚠ **WARNING**

1.3 Remember to Measure Resistance

The resistance should be measured between the two conductors, blue and brown. Compare this resistance reading to the resistance specified in the Product Selection Table. Without these readings, your warranty will be invalid. The value should be within -5%~+10%. If you get a different reading,

contact TrueHeat (mail@trueheat.co.uk). Also, measure the resistance between the blue, brown, and shielding / grounding wire. Both should read infinity. If you get a different reading, contact TrueHeat (mail@trueheat.co.uk). **Please refer to "5 Commissioning" for instructions on how to measure the resistance.**

Important: Measure the resistance four times during the installation process.

Remember to always measure, verify, and record the actual resistance throughout the installation process (out of the box, after you have laid the mat on the floor, after thin-set cement or self-leveller application and after the final floor finish has been laid). Your warranty will be void if this is not done and recorded.

1.4 Lifetime Warranty

From the date of purchase, TrueHeat warrants that the heating cable is free from defects in material, design and workmanship. The extended warranty is only valid if the warranty certificate has been properly completed and mailed, and the installation is in accordance with the installation instructions.

Please contact mail@trueheat.co.uk for your warranty form.

2. Heating Cable Systems

2.1 Heating Cable Specifications

Cable Construction:	Twin conductor
Rated Voltage:	230V
Output:	160W/m^2 & 200W/m^2
Cable spacing:	80mm
Cable Diameter:	2mm
Conductor Insulation:	Fluoropolymer
Outer Insulation:	Nylon
Max. Ambient Temp.:	85°F(30°C)
Min. Installation Temp.:	40°F(5°C)
Cold lead	Two wires plus ground braid; 2.5m length each

2.2 Heating Mat Typical Installations and Applications

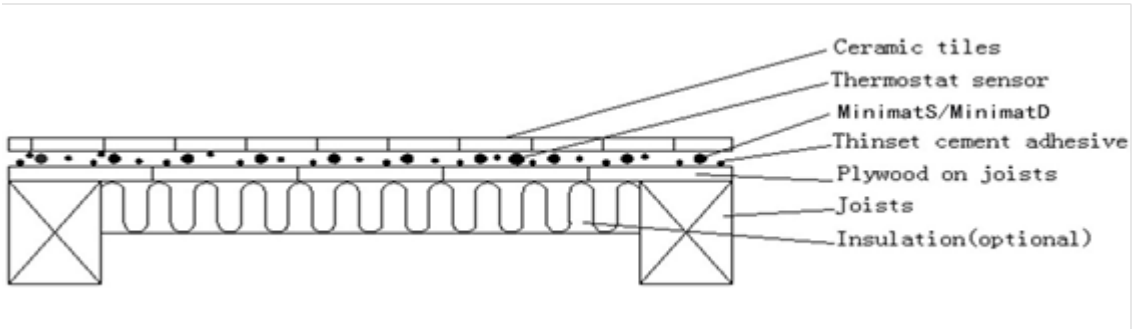


Figure 1: Directly on Plywood

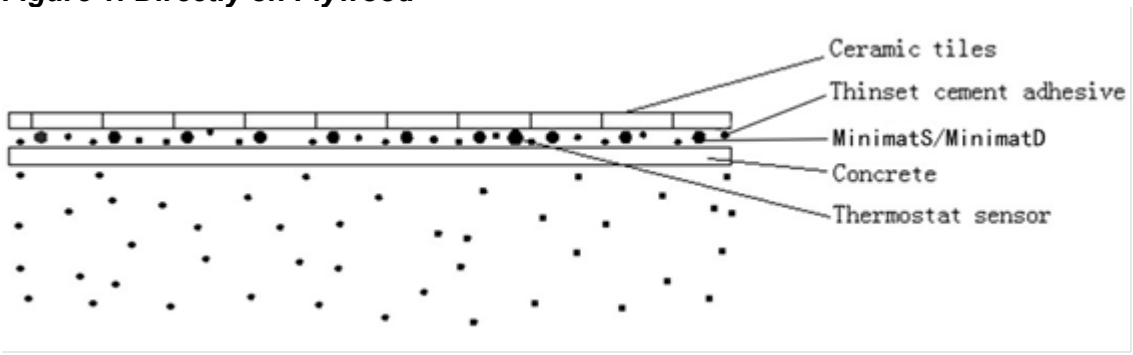


Figure 2: Directly on Concrete (use suitable insulation beneath the mat)

Alternative method: self-levelling cement is recommended for large surfaces and the following floor materials: engineered wood, laminate, floating floors, vinyl, linoleum, and carpet (that is rated suitable for use with electric underfloor heating).

⚠ **WARNING:** Consult the manufacturer for information on special installation requirements for wood, laminate and vinyl or linoleum flooring.

Important:

- Read the instructions carefully before installing.
- Remember to measure the resistance four times. Warranty is invalid if no readings are taken and recorded.
- Do not install heating cable in walls or ceilings.
- The cable must be embedded in mortar, thin-set, concrete or similar material.
- The minimum installation temperature is 5°C (40°F).
- The heating cable cannot be cut to length, crossed over itself, or installed too close together.
- Remember to check that the supply voltage matches the voltage of the heating cable.
- Remember to place the labels as written in these instructions.
- Only for indoor installation.
- Please contact TrueHeat for any other questions or advice.

3. Floor Heating Design and Product Selection

3.1 Design the Installation

• Step 1: Measure the Heated Area
Determine the heated area of the floor where there are no permanent fixtures or furniture such as baths, showers, toilets, vanities, or cabinets. Measure the heated area of the floor. For example, in figure 3, the area of the bathroom is 96ft². When you subtract the area of the vanity, shower and toilet, the total heated area is only 74ft² (6.8m²).

• Step 2: Determine the Power Supply Voltage
Make sure the power supply voltage is 230V.

Important:
Operating the 230V cable at 220V will reduce the output by 8.5%; at 240V will add 8.9% to the output.

• Step 3: Plan the Design
Determine the optimum floor heating cable layout for your heated area to ensure coverage. Select a spot for the thermostat in the wall above the heated area where it can be reached by the 2.5m cold lead on the heating cable, and the 3m floor temperature sensor. Please refer to Figure 4.

Important:
The pre-determined heating cable spacing must be maintained to ensure proper floor heating. Do not change the heating cable spacing when you lay out the cable or the floor may have cold spots.

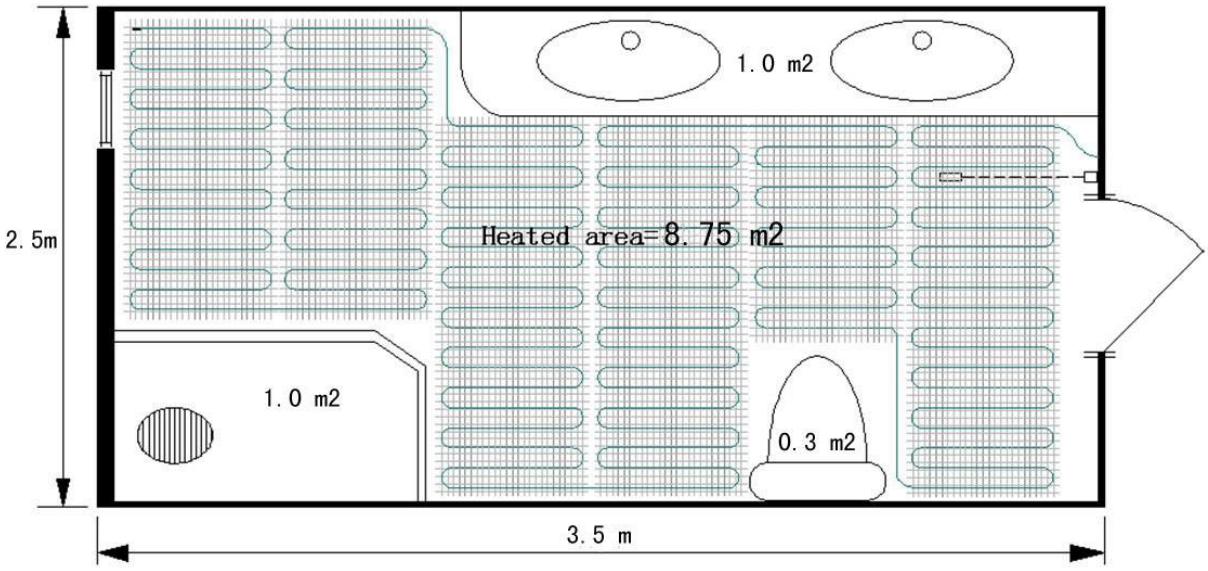


Figure 3: Heated area example

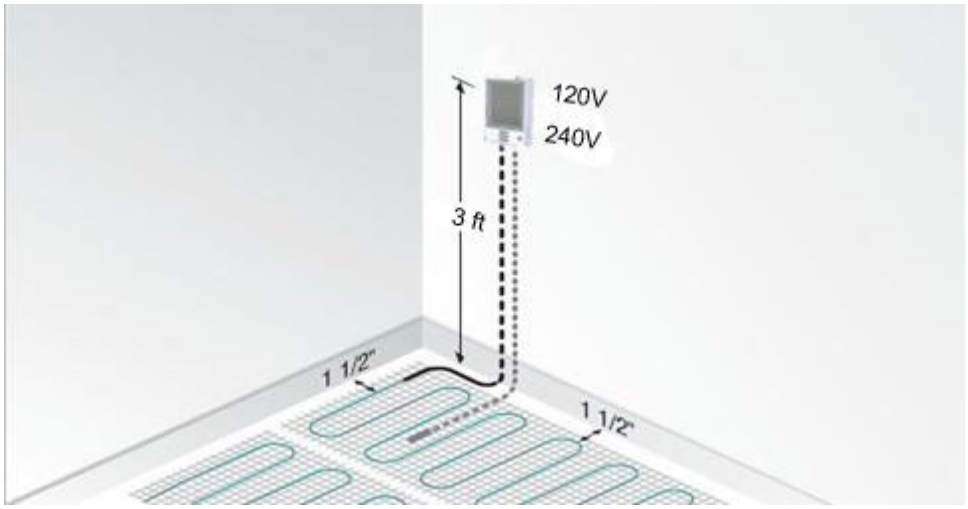


Figure 4: Typical cold lead and floor

3.2 Confirm Your Product Selection

Confirm that your heating mat is no larger than the heated area. Following the example from figure 3, if the heated area is 6.45m², select the 6.0m² heating mat system.

Important:
When installing the heating mat, all “cold tails” (blue/black wires) must be taken back to the connection point/controller.

Table: 230V Product Selection

230V	Heated Area		Mat Dimensions		Watts ($100W/m^2$)	Amps	ohms
Catalogue Number	m^2	sq.ft.	m*m	in.*ft.			
HM100/1	1.0	10.8	0.5*2	20*6.5	100	0.4	529.0
HM100/1.5	1.5	16.1	0.5*3	20*9.7	150	0.7	352.7
HM100/2	2.0	21.5	0.5*4	20*12.9	200	0.9	264.5
HM100/2.5	2.5	26.9	0.5*5	20*16.1	250	1.1	211.6
HM100/3	3.0	32.3	0.5*6	20*19.4	300	1.3	176.3
HM100/3.5	3.5	37.7	0.5*7	20*22.6	350	1.5	151.1
HM100/4	4.0	43.1	0.5*8	20*25.8	400	1.7	132.3
HM100/5	5.0	53.8	0.5*10	20*32.3	500	2.2	105.8
HM100/6	6.0	64.6	0.5*12	20*38.8	600	2.6	88.2
HM100/7	7.0	75.3	0.5*14	20*45.2	700	3.0	75.6
HM100/8	8.0	86.1	0.5*16	20*51.7	800	3.5	66.1
HM100/10	10.0	107.6	0.5*20	20*64.6	1000	4.3	52.9
HM100/12	12.0	129.2	0.5*22	20*77.5	1200	5.2	44.1

230V	Heated Area		Mat Dimensions		Watts (160W/m²)	Amps	Ohms
Catalogue Number	m²	sq.ft.	m*m	in.*ft.			
HM160/1	1.0	10.8	0.5*2	20*6.5	160	0.7	330.6
HM160/1.5	1.5	16.1	0.5*3	20*9.7	240	1.0	220.4
HM160/2	2.0	21.5	0.5*4	20*12.9	320	1.4	165.3
HM160/2.5	2.5	26.9	0.5*5	20*16.1	400	1.7	132.3
HM160/3	3.0	32.3	0.5*6	20*19.4	480	2.1	110.2
HM160/3.5	3.5	37.7	0.5*7	20*22.6	560	2.4	94.5
HM160/4	4.0	43.1	0.5*8	20*25.8	640	2.8	82.7
HM160/5	5.0	53.8	0.5*10	20*32.3	800	3.5	66.1
HM160/6	6.0	64.6	0.5*12	20*38.8	960	4.2	55.1
HM160/7	7.0	75.3	0.5*14	20*45.2	1120	4.9	47.2
HM160/8	8.0	86.1	0.5*16	20*51.7	1280	5.6	41.3
HM160/10	10.0	107.6	0.5*20	20*64.6	1600	7.0	33.1
HM160/12	12.0	129.2	0.5*22	20*77.5	1920	7.3	27.6

230V	Heated Area		Mat Dimensions		Watts (200W/m²)	Amps	ohms
Catalogue Number	m²	sq.ft.	m*m	in.*ft.			
HM200/1	1.0	10.8	0.5*2	20*6.5	200	0.9	264.5
HM200/1.5	1.5	16.1	0.5*3	20*9.7	300	1.3	176.3
HM200/2	2.0	21.5	0.5*4	20*12.9	400	1.7	132.3
HM200/2.5	2.5	26.9	0.5*5	20*16.1	500	2.2	105.8
HM200/3	3.0	32.3	0.5*6	20*19.4	600	2.6	88.2
HM200/3.5	3.5	37.7	0.5*7	20*22.6	700	3.0	75.6
HM200/4	4.0	43.1	0.5*8	20*25.8	800	3.5	66.1
HM200/4.5	4.5	48.4	0.5*9	20*29.1	900	3.9	58.8
HM200/5	5.0	53.8	0.5*10	20*32.3	1000	4.3	52.9
HM200/6	6.0	64.6	0.5*12	20*38.8	1200	5.2	44.1
HM200/7	7.0	75.3	0.5*14	20*45.2	1400	6.1	37.8
HM200/8	8.0	86.1	0.5*16	20*51.7	1600	7.0	33.1
HM200/9	9.0	96.9	0.5*18	20*58.1	1800	7.8	29.4
HM200/10	10	107.6	0.5*20	20*64.6	2000	8.7	26.5
HM200/12	12	129.2	0.5*22	20*77.5	2400	10.4	22.0

4. Installation

Important: Tools and Materials Required

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

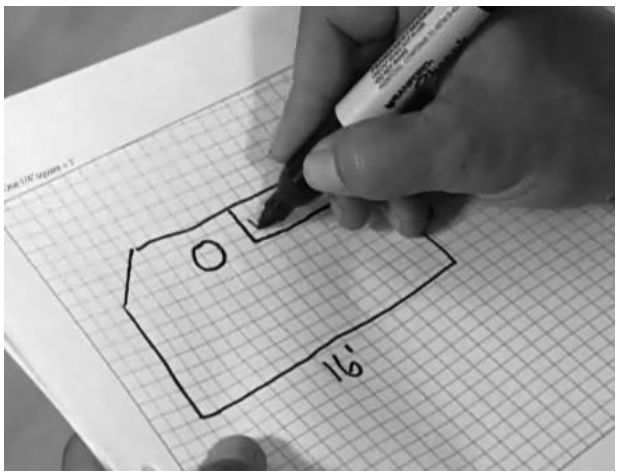
- Scissors
- Utility knife
- Wire strippers
- Tape measure
- Screwdriver
- Multi-meter

You will also need the appropriate tools and materials to install your floor. These will likely include products like self-levelling mortar, thin-set mortar, backer board, tile, a noticed trowel, and any other tools for your specific floor.

Follow these steps to ensure a successful heating mat installation.

Step 1: Plan Layout

Make a sketch or a floor plan of the room; include all permanent furnishings such as toilets, bathtubs, appliances, cabinets, etc. Indicate all dimensions required to determine the available floor area and the position of the thermostat. TrueHeat recommends that the installation is documented with photos to note the location of connections and the sensor.

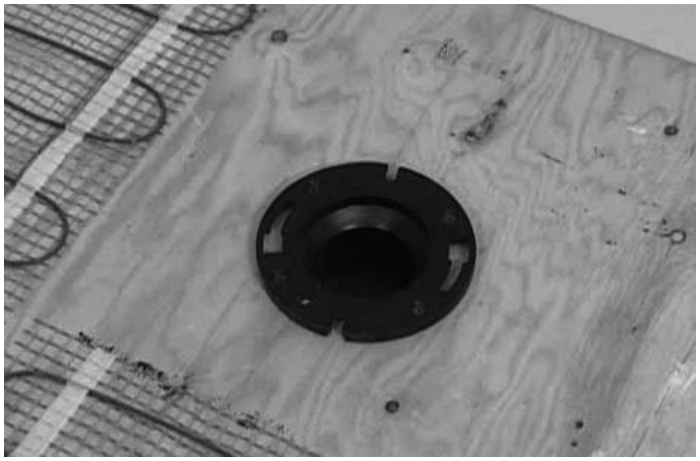


Step 2: Transfer Layout to Floor

Draw an outline of the layout on the room floor including a footprint of all furnishings that are not yet installed. Unroll the first few meters of heating mat. The starting point of the cable must be placed within 2.5m from the thermostat.

Important:

Mark the position of the connection point between the power lead and the heating mat cable. This connection must be concealed in thin-set or self-levelling cement. When using a floor temperature sensing thermostat, mark the sensor position in the middle of 2 heating cables, about 25cm away from the wall (within the heated area), as close as possible to the thermostat.



Step 3: Install Sensor

The floor temperature sensing thermostat, install the sensor now, it is recommended that the sensor be installed in conduit tube. This will allow the sensor to be easily replaced in the unlikely event of failure. The sensor 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 (approx. 8mm x 8mm) in the floor and wall up to the thermostat for the sensor conduit. The conduit must go from the thermostat and a minimum of 25cm away from the wall towards the middle of the floor.

Important:

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

Step 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.

Step 5: Measure the Resistance (First Time)

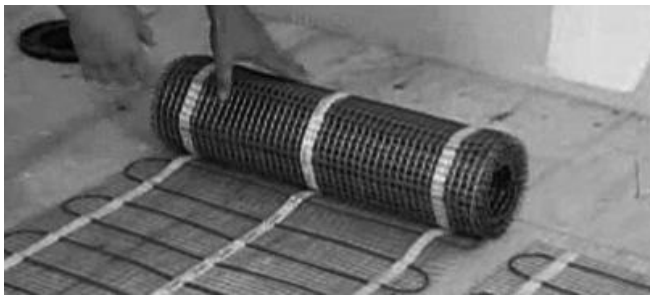
Using a digital ohm meter to measure the resistance of the heating mat and compare it to “Table 1” or “Table 2”. Record the measured resistance on the warranty form. Documenting the resistance at each stage of the installation is required for warranty purposes. Also, measure the resistance between the white, black and shielding/ground wire. Both should read infinity. Please refer to “5. Commissioning” for instructions on how to measure the resistance.

Step 6: Begin Laying the Heating Mat

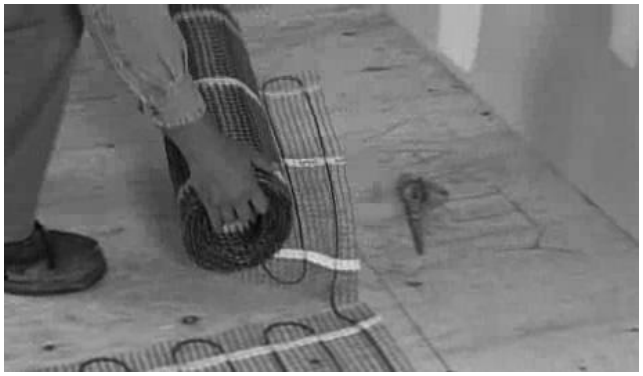
An adhesive has been added to the bottom of the mat which will prevent the mat from moving during installation. Start by placing the mat such that the connection point and the temperature sensor are in their intended positions and bring the power cable to the thermostat or connection box.

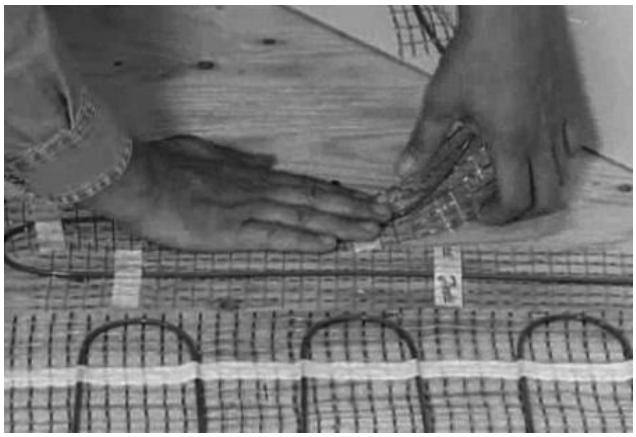
Begin unrolling the heating mat evenly across the floor outside the areas that you marked previously. The adhesive on the mat is made such that the mat may be moved several times before it loses its adhesiveness. When you reach the next wall, cut the mesh, turn the mat, and begin rolling in the desired direction. **NEVER CUT OR SHORTEN THE HEATING CABLE!**

Ensure that the heating mat is always in full contact with the subfloor. Avoid walking on the heating mat. If this is not possible, use shoes with soft soles.



When approaching obstacles (toilets cabinets, etc), carefully remove some of the heating cable from the mat and lead the cable around the obstacle. In some cases, pieces of the mesh will be cut away entirely. Remember to never cut the cable. Use hot melt glue or a thin strip of tape to secure the loose cable to the floor. **It is highly recommended to take photographs of the installed heating mat before installing the floor.**





Step 7: Measure the Resistance (The Second Time)

Please refer to step 5.

Step 8: Install Floor Covering

Ensure that the sensor conduit has been properly installed before proceeding (see Step 3).

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 5cm of self-levelling cement over the heating cable is recommended. Ensure that all moisture in the self-levelling cement has been fully eliminated in accordance with the drying times recommended by the manufacturer (consult the manufacturer for exact drying times).

 **Important:**

The system must not be turned on until the thin set cement has fully dried. A minimum of 2 weeks is recommended.

Step 9: Measure the Resistance (The Third Time)

This is to be done after the thin-set cement has been laid and before the final floor finish,

Please refer to step 5.

Step 10: Install the Tiles

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

Step 11: Connect Power Supply and Thermostat

The electrician should take the final set (**Fourth set**) of resistance readings before connecting the power, and record it on the warranty card, (see step 12). The connection of the power supply and the thermostat must be done by a qualified electrician. The electrician should then connect the floor sensor to the thermostat and connect the power supply.

Note: You need to mark the appropriate circuit breaker reference label indicating which branch circuit supplies the circuits to the underfloor heating mat.

Step 12: Record Information and Affix Labels

It is important for the homeowner to mail in the certificate immediately after installing the system (cable and thermostat). Failure to do so could void the manufacturers warranty. The warranty is subject to the guaranteed conditions listed on the warranty certificate. Keep a copy of the warranty card for the reference.

Step 13: Enjoy the Comfort of Underfloor Heating

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

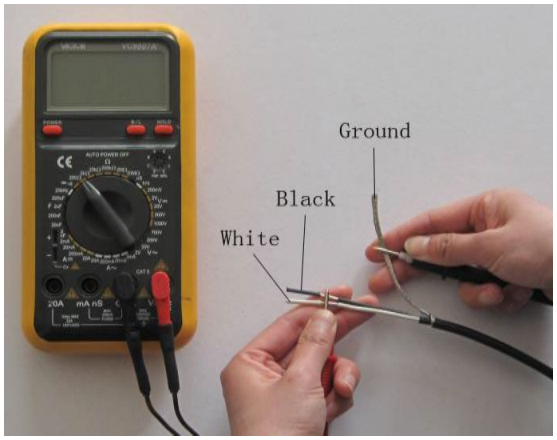
5. Commissioning

Important:

For the extended Lifetime Warranty to apply, you must perform these tests, record the results on the warranty card, and retain of copy of the record.

You must perform the Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test for times (please refer to 4 installation) during the installation process.

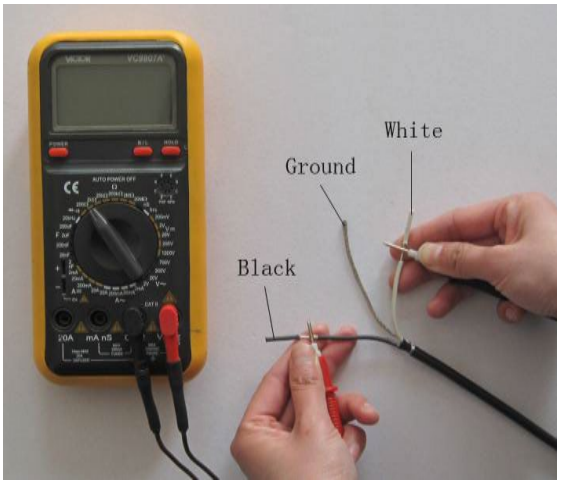
5.1 Insulation Resistance Test



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

1. Connect the ground wire to the black lead and both power wires to the red lead of the multi-meter.
2. Make sure the meter reads “Open” or “OL”. If you get a different reading, contact TrueHeat at mail@trueheat.co.uk.
3. **Record these readings on the warranty card.**

5.2 Heating Cable Resistance Test



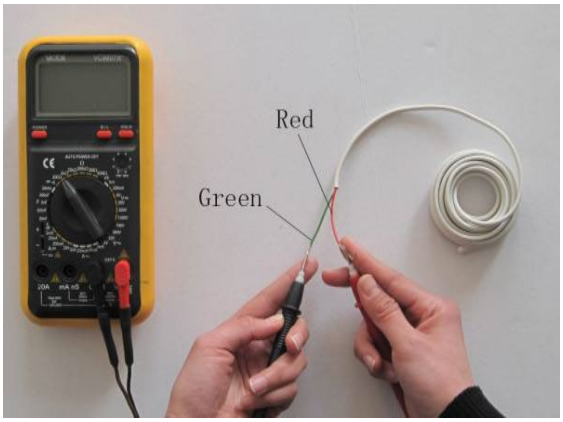
This test measures the resistance of the Heating Mat and is used to determine circuit integrity.

1. Set your multi-meter to the 200 or 2000 ohm range.
2. Connect the multi-meter leads to the black and white cold lead wires.
3. Compare the resistance reading to the resistance specified in the product selection “Table 1” or “Table 2”. The value should be within -5% to +10%. If you get a different reading, contact TrueHeat at mail@trueheat.co.uk.
4. **Record these readings on the warranty card.**

5.3 Sensor Resistance Test

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

1. Set your multi-meter to the 200K ohm range.
2. Connect the multi-meter leads to the red and green lead wires.
3. Make sure the meter reads between 9-25K ohms. If you get a different reading, contact TrueHeat at mail@trueheat.co.uk.
4. **Record these readings on the warranty card.**



6. 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 mats or other appliances connected on the same circuit. The underfloor heating mat may require a dedicated circuit. See the Product Selection "Table 1 or Table 2" 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 floor sensor.	Contact TrueHeat mail@trueheat.co.uk
Floor warm all the time	Clock not set correctly.	Refer to Thermostat Installation and Operation Manual.
Floor not warm enough	Thermostat setting not set correctly.	Refer to Thermostat Installation and Operation Manual.
Installation instructions not available		Contact TrueHeat at mail@trueheat.co.uk

EXTENDED WARRANTY:
TrueHeat offers a lifetime warranty on underfloor heating mats to the original purchaser. This warranty is non-transferable and only applicable providing that the warranty form is filled in and returned to us completed with all test readings recorded and installed in accordance with the installation instructions. **Failure to provide this will void the warranty.**

TrueHeat will, when the customer has documented that a defect in the heating mat was present at the date of delivery, repair or supply a new heating mat. All claims shall be made within the extended warranty period. TrueHeat will not be liable for any consequential and secondary costs or damages linked to the defect or replacement of the heating mat. TrueHeat will be liable for any costs related to the dismantling of defective product(s) and the installation of a new product; however, such liability is limited to the amount of five (5) times the initial product costs for each damage/case.

THE FOREGOING WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ON THE PART OF TrueHeat. TrueHeat DISCLAIMS ANY WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TrueHeat NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON, FIRM OR CORPORATION TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH SALE OR PRODUCT. TrueHeat SHALL NOT BE HELD RESPONSIBLE FOR DAMAGE TO PERSON OR PROPERTY, CONSEQUENTIAL LOSS, LOSS OF PROFIT, LOSSES ON GOODS IN STORE, OR THE LIKE WHICH MIGHT ARISE OUT OF THE FAILURE OF THE EQUIPMENT DELIVERED, IRRESPECTIVE OF THE CAUSE (INCLUDING FAULTY MANUFACTURE).

How to claim this warranty:

Contact the company's Customer Service department and provide the following information:

1) Nature of the manufacturing defect

2) Date of purchase and, if already installed, date of installation

3) If installed, name of electrician and flooring installer

4) Resistance readings taken by installer

5) Proof of purchase and serial number from product label

Our Customer Service department will provide you with an authorization number and advise you on the next steps to complete your warranty claim.

Disclaimer:

This warranty gives you specific legal rights and you may also have some legal rights which may vary from state to state or province to province. TrueHeat hereby disclaims, and it is as a condition of the sale, that there are no implied warranties. Some states and provinces do not allow limitations on an implied warranty so the above limitation may not apply to you.

TrueHeat

mail@trueheat.co.uk