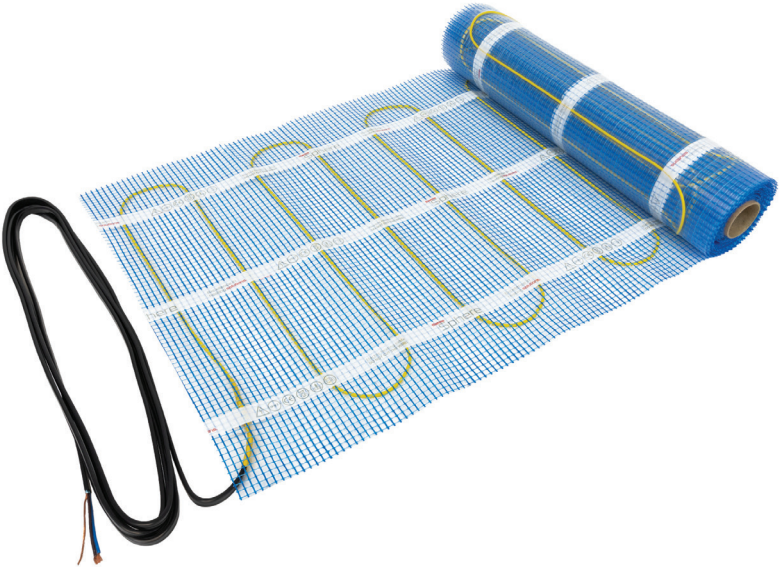
Instructions

thermo Sphere

ThermoSphere Self-adhesive Mesh

Designed with ease installation im mind, backed with a lifetime guarantee



Electric heating made easy

Contents

3	Product checklist
7	Preparation
9	Pre-installation testing
11	Floor Sensor resistance test
12	Installing Mesh
13	How to secure loose heating cable
14	What not to do
15	Mesh Mat Resistance test 2
17	Installing the floor sensors
19	Fixing the Mesh heating mat
20	Post installation sensor testing
21	Tiling over Mesh
23	Final testing
25	Floor Sensor Resistance test
26	Wiring your underfloor heating thermostat
28	Commissioning your underfloor heating
29	Test results record and customer handover
30	Warranty terms and conditions

Watch the installation video!
Heating cable

Product Checklist

ThermoSphere Mesh®

Designed for seamless installation into ThermoSphere Mesh.

ThermoSphere Mesh combines in-line joint technology with TwistedTwin cable construction to provide the most robust heating cable that's fast and easy to install.

Timber and Concrete Insulation Boards

ThermoSphere insulation boards provide a thermally insulated, prepared surface for the installation of electric underfloor heating systems.

Insulation boards should be installed directly below the heating system to increase efficiency and reduce running costs.

Perimeter Insulation Foam

This 8mm thick edge insulation strip should be installed around the perimeter of the room to act as a cushion for the slight expansion/ contraction your floor will experience during heating and cooling.

The foam also acts as a thermal barrier around the edge of the floor, reducing heat loss into the walls.

Fixing Screws and Metal Washers

Use these to secure Timber Insulation Boards to timber sub-floors.

Tile Adhesive

Used to adhere ThermoSphere Mesh to the sub-floor. Use a trowel to spread in metre square sections to ensure the adhesive doesn't dry before laying your Mesh.

Self-levelling Compound

An optional step in your Mesh installation. Used to smooth and level floors in preparation for laying tiles, and to encapsulate heating cables.

Fixing Tape

Premium grade high strength adhesive tape for use in electric underfloor heating installations.

Fibreglass Mesh Tape

Use along the seams of Insulation Boards to reinforce the joints.

Flexible Conduit

Protect your underfloor heating cold tail and temperature sensors from damage, impact or moisture and ensure you can replace the floor sensors if required.

Floor Sensor Probe

Found within your BT21 thermostat box are your Floor Sensor Probes (second sensor sold seperately with other thermostats). They are an essential part to your installation to ensure your thermostat knows when your floor needs heat and when it doesn't.

Electrical Back Box

Required for installing a thermostat onto a cavity wall.

ThermoSphere Controls

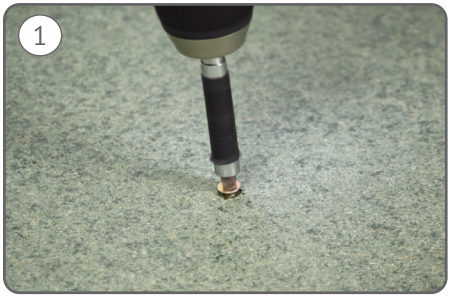
ThermoSphere Mesh is compatiable with our complete thermostat range.

Model shown in this guide is the BT21 Bluetooth Programmable Thermostat

Substrate preparation

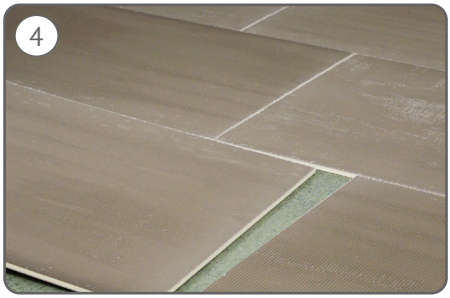
Preparing the substrate is the vital first step in any underfloor heating installation. Before you start the sub-floor must be clean , stable and ready for tiling. Be sure to follow the correct steps for your substrate!

Timber Substrates

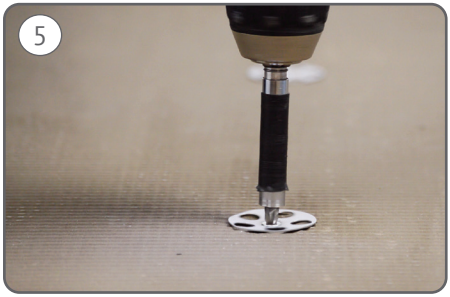


Make sure that the sub floor is level, stable, clean and free from any dust or debris.

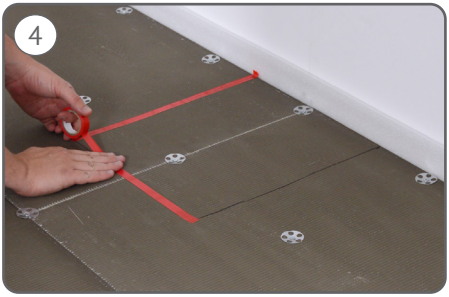
Fix perimeter insulation foam around the edge of the room using the self-adhesive strip or strong double sided tape.



Loosley lay the coated insulation boards in a brickwork pattern over the whole floor. Use a knife to cut boards to fit your space.



Fix the insulation boards to the substrate at 300mm centres, with screws and washers. You can aslo use mesh tape along the seams.



Mark the areas where permanent fixtures like toilets or pedestals will be positioned.

Tip!

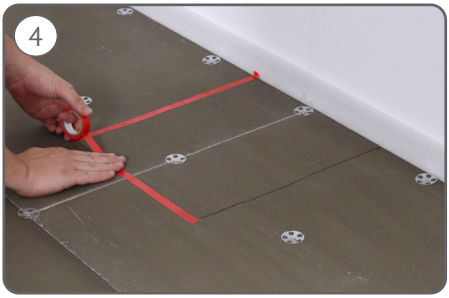
We recommend using our fibreglass mesh Joint Tape along the seams to reinforce the board joints and create a flat base before tiling.

Concrete substrates

Make sure the substrate is clean, level and ready for tiling.

Trowel out the tile adhesive.

lay uncoated insulation board over the whole floor.

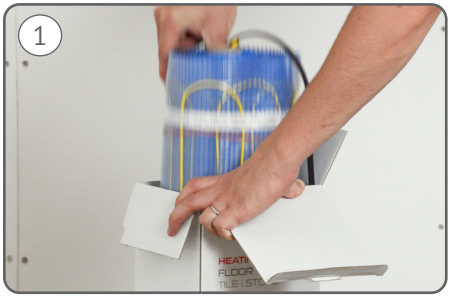


Mark the areas where permanent fixtures like toilets or pedestals will be positioned.

Pre-installation testing

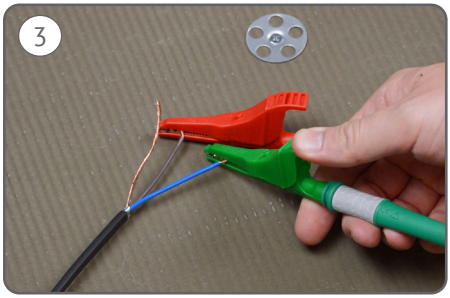
ThermoSphere Mesh cables must be properly tested before and after installing, as well as once the floor finish has been applied. This ensures no damage has been done prior, to or during your installation.

Heating cable resistance test



Take the Mesh heating mat out of the box.

Turn your test meter on and set to ohms.



Connect the live to one terminal and the neutral to the other terminal.

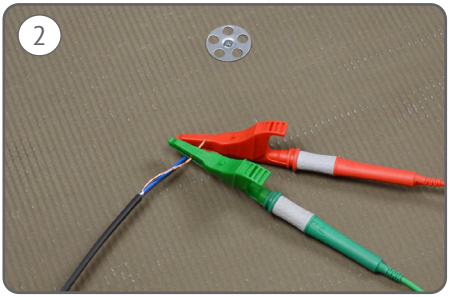
The meter reading should be within -5 to +10% of the expected readings published in the instruction manual.

Note the part number and the readings in the instructions ready to hand over to the homeowner for warranty registration.

All electrical testing and connections should be done by a skilled, professional electrician.

Heating cable insulation resistance test

Turn on your insulation tester and set it to 500V.



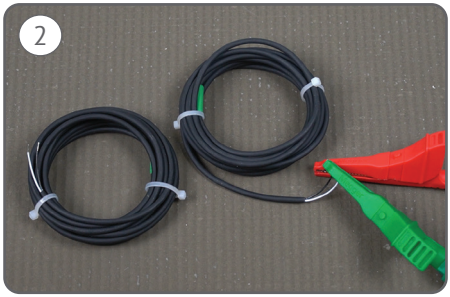
Connect the live and neutral to one of the terminals and earth to the other.

Press test and note the results. The tester should read more than 999 Megaohms or infinity.

All electrical testing and connections should be done by a skilled, professional electrician.

Floor Sensor resistance test

Set your meter to ohms.



Connect the cables to the terminals.

ThermoSphere floor sensors are rated at 10k ohms at 25°C. Reading will be between 8-12K depending on temperature.

Temperature °C	Resistance kΩ
0°C	32
5°C	25
10°C	20
15°C	16
20°C	12
25°C	10
30°C	8

(Floor Sensor resistance values table)

Installing ThermoSphere Mesh

Now it's time to install your mesh.

Mesh

1

Star near your thermostat position and roll out the underfloor heating Mesh.

2

When you reach an obstacle or the end of the room, carefully cut the Mesh using scissors.

3

Rotate the roll 90 degrees and arrange to avoid the marked unheated areas.

4

Continue rolling out the mat to the next unheated area. This section of mat is wire side up.

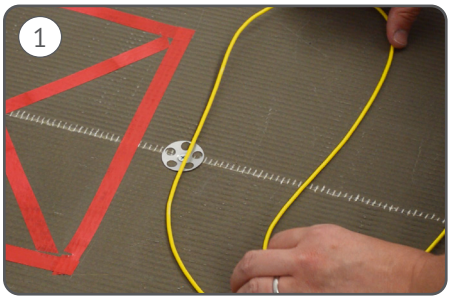
5

When you reach the wall carefully cut the Mesh, flip the roll over and continue rolling in the opposite direction.

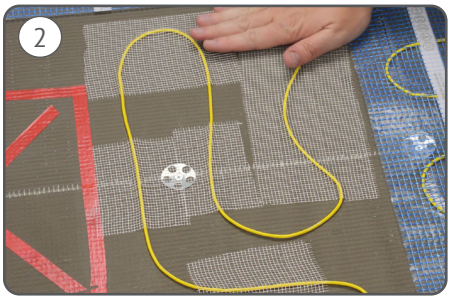
6

Repeat these steps until the whole floor is covered.

How to secure loose heating cable



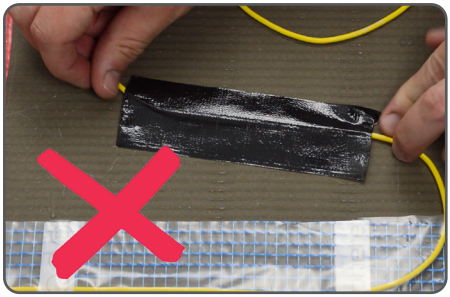
Arrange the loose section of heating cable with a minimum spacing of 50mm.



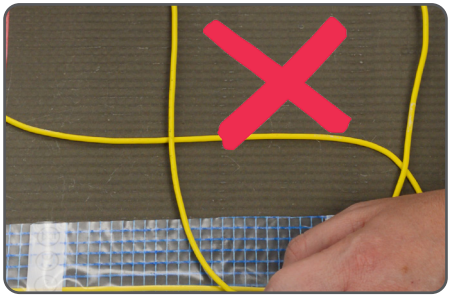
Use mesh tape to hold loose heating cable in place. This prevents air voids and allows full coverage of tile adhesive.

What not to do with your Mesh and heating cable

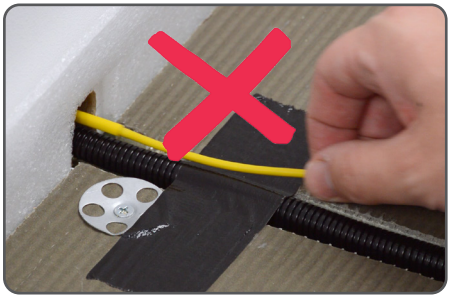
Make sure you understand what not to do with your Mesh and heating cable so that you can avoid common mistakes in your installation.



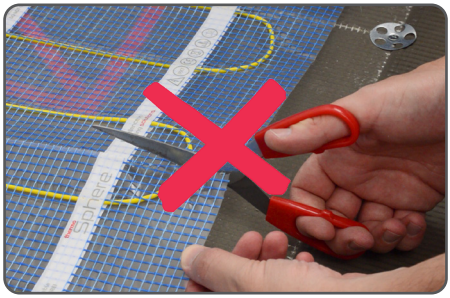
Don‘t use fixing tape over any part of the cable. This causes overheating and cable failure.



Don’t cross the heating cable!

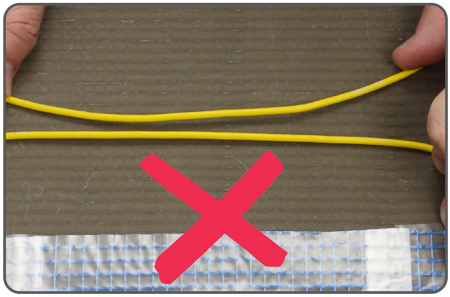


Don’t feed heating cable or cold tail joints into the wall! This wil cause overheating and cable failure!



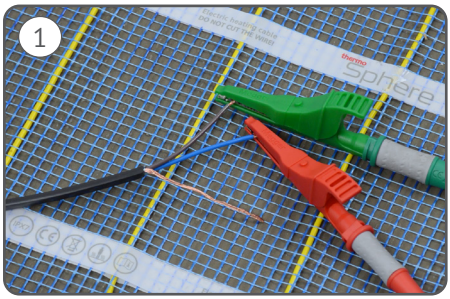
Don’t use a knife/scissors to cut the Mesh!

Do not tape over the end termination because it can cause overheating.



Don’t position the heating cable closer than 50mm.

Mesh mat resistance test 2

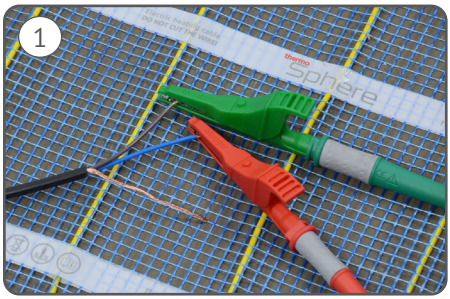


After you've finished laying the Mesh its time to do the second test.

This makes sure no accidental damage has been caused during the cut-and-roll process.

Make sure to record the results. Repeat steps 1-3 for Mesh heating mat insulation test.

Mesh mat insulation resistance test 2



After you've finished laying the Mesh its time to do the second insulation test.

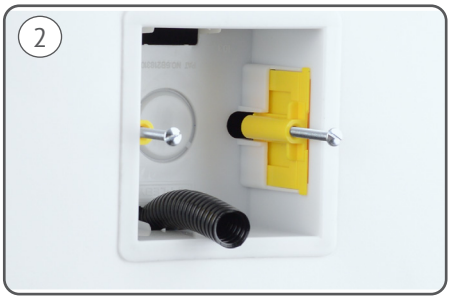
This makes sure no accidental damage has been caused during the cut-and-roll process.

Make sure to record the results. Repeat steps 1-3 for Mesh heating mat insulation test.

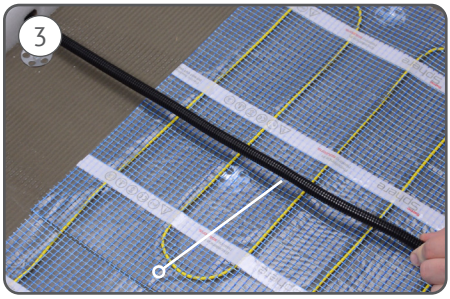
Installing the Floor sensor

Having a floor sensor ensures that you can monitor and limit the floor temperature. We always recommend installing the additional spare sensor found in your BT21 thermostat box, or supplied separately.

Drill a hole at the base of your wall for your cables below your backbox location. Then feed your conduit through the back box.

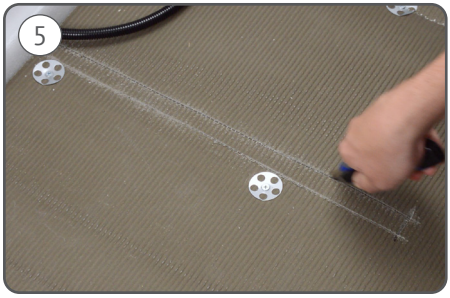


Feed the sensor probe down the conduit until you feel it touch the end.

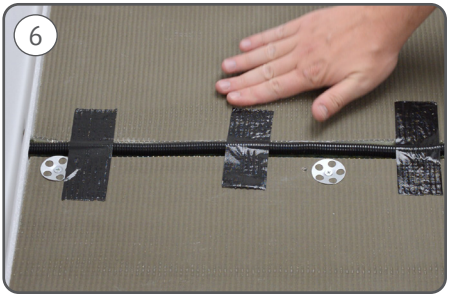


Pull the conduit to the centre of the heating cable.

Pull the Mesh back so you can mark the distance and area for cutting into the coated board.

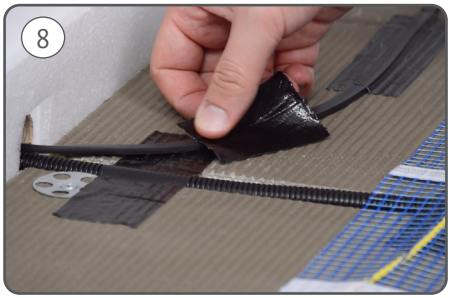


Cut a channel for the conduit from the coated board.



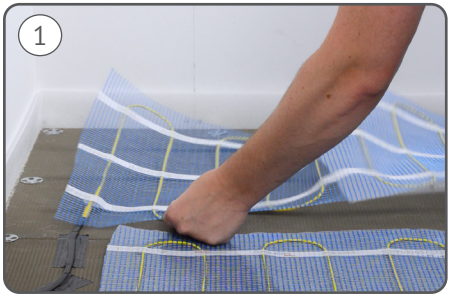
Lay the conduit in the channel and check the floor sensor is visible at the end of the conduit, then secure the conduit in posiiton with fixing tape.

Feed the cold tail up to the back box. Don't feed heating cable or cold tail joints into the wall!

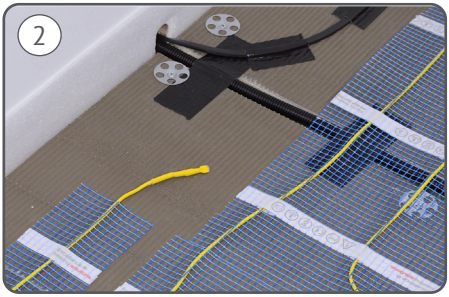


Fix the cold tail with fixing tape, ready for fixing the Mesh mat. Our LayFlat cold tail creates a flat finish, even around corners.

Fixing the Mesh heating mat



Remove the plastic backing and firmly press the mat into position.



The end termination must be positioned so it can be completely encased in tile adhseive or levelling compound.

Post installation sensor testing

Floor sensor resistance test

To make sure there's been no damage during installation, you need to repeat the resistance test for your floor sensors, including the spare!

All electrical testing and connections should be done by a skilled, professional electrician.

Repeat the floor sensor resistance tests for the sensor and the spare floor sensor and record the results.

Record the results of the resistance test for both floor sensors.

Temperature °C	Resistance kΩ
0°C	32
5°C	25
10°C	20
15°C	16
20°C	12
25°C	10
30°C	8

(Floor sensor resistance values table)

Tiling over Mesh

You can tile directly over Mesh or use self levelling compound before tiling. Either step is essential as it provides a heat sink for the heating cable.

Tile adhesive before tiling

1

Carefully trowel tile adhesive over the cold tail joint and work it through the Mesh.

2

Use the flat side of the trowel to push adhesive into the grooves.

3

Make sure the floor sensor ends are completely covered in adhesive.

4

Cover the rest of the heating cable in adhesive and comb over using a notched trowel.

5

Ensure the cable is covered with a full bed of tile adhesive that is at least 5mm thick.

6

Fix tiles over the rest of the floor. For best results back butter your tiles.

To ensure a flat, smooth surface you may decide to use self-levelling compound before tiling. This is an optional step that covers the heating cable well.

Levelling compound before tiling

1

Mix self levelling compound according to instructions and pour over the floor, ensure the cable is covered.

2

Ensure the entire cable is covered, including the hot/cold junction, the hot cable and end termination.

3

When levelling compound is ready for tiling, spread tile adhesive over using a notched trowel.

4

Back butter and lay the tiles over the floor.

Electric underfloor heating must not be switched on until all tile adhesives and levelling compound layers have fully cured. Check instructions for curing times.

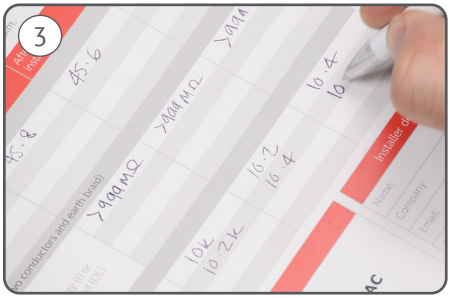
Final testing post installation

ThermoSphere Mesh cables must be properly tested after installing, as well as once the floor finish has been applied. This ensures no damage has been done prior to or during the installation.

Mesh heating mat resistance test

Get your test meter, turn it on and set to ohms and measure the resistance.

Connect the underfloor heating cold tail neutral (blue) and live (brown) wires to one meter clip.

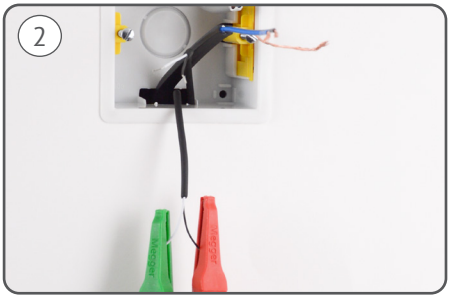


Note the results in the customer handover document found on page 30.

All electrical testing and connections should be done by a skilled, professional electrician.

Mesh heating mat insulation test

Set your test meter to Mega Ohms 500V.



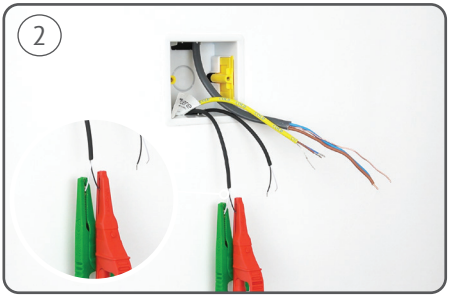
Connect the underfloor heating cold tail neutral (blue) and live (brown) wires to one meter clip.

Note the results in the customer handover document found on pg.30.

All electrical testing and connections should be done by a skilled, professional electrician.

Floor sensor resistance test

Conduct the final resistance test on both floor sensors.



Make a note of the results.

Temperature °C	Resistance kΩ
0°C	32
5°C	25
10°C	20
15°C	16
20°C	12
25°C	10
30°C	8

(Floor sensor resistance values table)

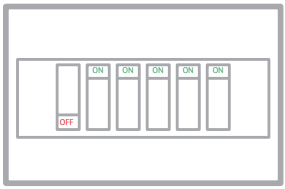
Watch how to wire

your thermostat

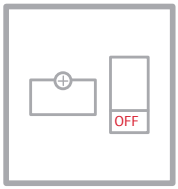
Wiring your underfloor heating thermostat

The next steps show how to wire a BT21 thermostat. Make sure to check your specific thermostat's instructions as wiring varies between models.

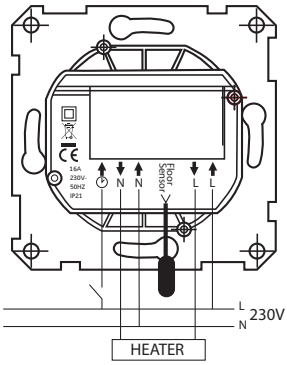
To ensure your safety and to protect the thermostat, safely isolate the circuit from mains power before carrying out any electrical work.

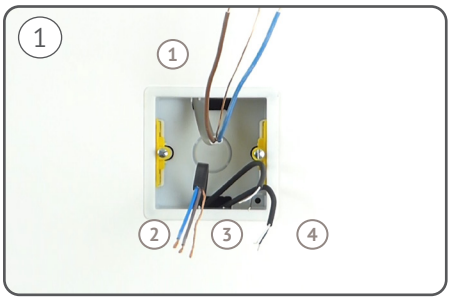


Fuse Box

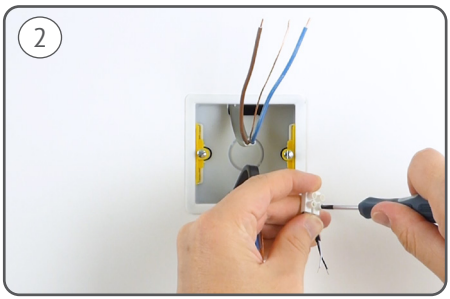


Fused Switch

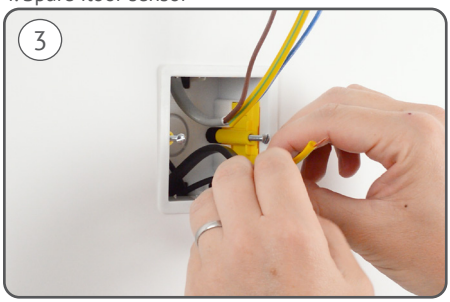




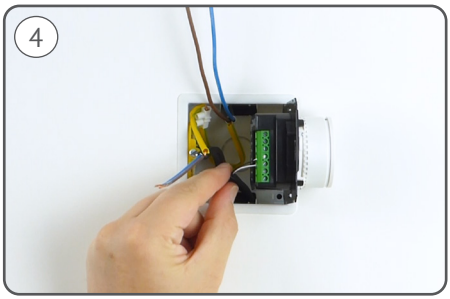
You should have 4 cables at your wiring point. 1. 230V supply 2. Heating cold tail 3. Floor sensor 4. Spare floor sensor



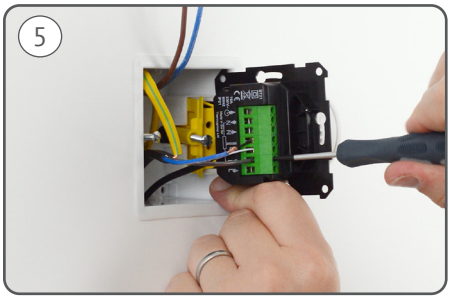
Terminate the spare floor sensor with a terminal block and tuck into the back box.



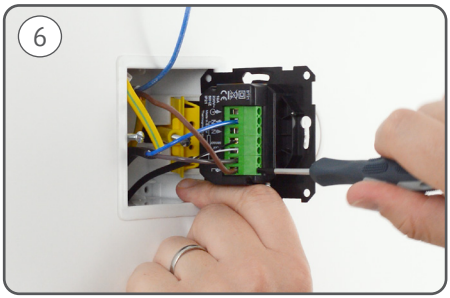
Insulate the supply and cold tail earths. Connect them with a terminal block or into the back box terminal.



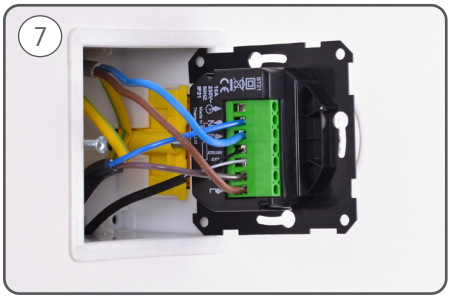
Connect the floor sensor to the labelled terminals. Floor sensor is not polarity sensitive.



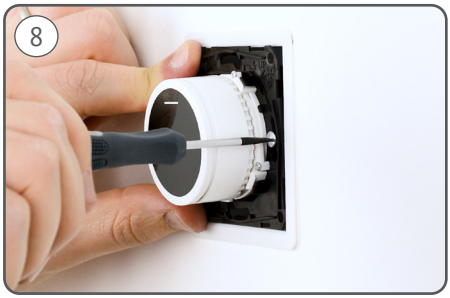
Connect the underfloor heating live and neutral to the output terminals.



Connect the supply live and neutral to the input terminals.



Make sure you have a good connection in all terminals and no copper wiring is exposed.



Fit the thermostat to the back box with the supplied screws and add the fascia.
Final electrical connections must be carried out by a skilled, professional electrician!

Commissioning your underfloor heating

Now you've installed your ThermoSphere Mesh® underfloor heating system it's important to follow the next few steps to ensure your floors adjust to the heat gradually, and avoid thermal shock.

1. Wait until the self levelling compound or tile adhesive is fully cured before switching on your underfloor heating.

   Curing usually takes between 7-14 days. Check your manufacturer's guidelines.

2. Turn on the electrical power. Ensure heating is off by setting a low temperature eg:5°C.

3. Set thermostat to floor sensing.

4. Set your floor sensor limit to 27°C.

5. Make sure heating is off.

6. Leave for the first 24 hours and let the floor reach and maintain that temperature.

7. Increase the temperature on your thermostat by a maximum of 2°C every 24 hours, until you've reached your desired floor temperature. **Note: max 27°C.**

8. You can now switch your thermostat to ambient temperature setting (with floor limit) to maintain room temperature.

How to set up

your thermostat

Test results record and customer handover

Installer: The installer must complete the full test procedure and complete this page in full before giving it back to the home owner to keep in case of a warranty claim.

Homeowner: Use this information to register your Lifetime Warranty at www.thermosphere.com. You must keep this document and proof of purchase for your records in case of a warranty claim.

Stock No	Manufacturer's Values	Before installation	After cable installation	After tile installation
Resistance measurement of the electric heating cable				
Insulation resistance test (two conductors and earth braid)				
	Greater than 499 MΩ			
Floor temperature sensor test				

Installer details	
Name:	Address:
Company:	Postcode:
Email:	Part P number:
Phone:	Date & Signature:

Warranty terms and conditions

Thermogroup Ltd (T/A ThermoSphere) will repair or, if necessary, at its sole discretion, replace a faulty cable, which falls within the Warranty Periods and Territory specified below, subject to the warranty conditions and the warranty exclusions. Warranty Period within the United Kingdom is 25 years from the date of purchase by the consumer as defined by the Competition and Consumer Act 2010. ThermoSphere Mesh are covered by a Lifetime Warranty when the installation is registered online with ThermoSphere and a Lifetime Warranty Confirmation has been sent, in writing, by ThermoSphere.

Our goods come with guarantees that cannot be excluded under the UK Consumer Law. You are entitled to a replacement or refund for a major failure that occurs because of a manufacturing fault or manufacturing defect. It is the responsibility of the end user to provide proof of purchase within the Territory, to initiate a warranty claim.

WARRANTY CONDITIONS

This warranty is applicable only for ThermoSphere Mesh and Heating Cables (herein referred to as "The heating system").

The heating system must be installed in accordance with the ThermoSphere Installation Instructions, to be supplied with the heating system and/or available as a digital download, and in accordance with all relevant statutory and local regulations of the Territory in which the heating system is installed.

Where a failed component or heating system is replaced under warranty, the balance of the original warranty period will remain effective. The replaced part or heating does not carry a new warranty.

Where a failed component is replaced or repaired under warranty, ThermoSphere will incur costs associated with shipping and repair at its sole discretion, if the unit is installed within the UK. If the unit is outside the UK, the associated costs are the responsibility of the owner.

Where the heating system is installed in a position that does not allow safe, ready access, the cost of accessing the site safely, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility.

The warranty only applies to the heating cable and Mesh only and, therefore, does not cover any electrical or flooring parts supplied by others that are not an integral part of the ThermoSphere heating system, for example but not limited to; tile adhesive, floor coverings, electrical accessories, thermostats and contactors.

The benefits of this warranty are in addition to other rights and remedies of the consumer under laws in relation to the goods and services to which the warranty relates.

PROCEDURE FOR HONOURING WARRANTY

To initiate a claim for a warranty against defects, the consumer shall contact: Thermogroup Ltd T/A ThermoSphere, Bridge House, Pattenden Lane, Marden, Kent, TN12 9QJ, United Kingdom. hello@thermosphere.com. 0800 0195899.

The process will then follow the ThermoSphere Product Warranty Flow Chart to assess whether the product is under warranty.

WARRANTY EXCLUSIONS

Repair and replacement work will be carried out as set out in the ThermoSphere warranty. However, the following exclusions may cause the ThermoSphere warranty to become void and may incur a service charge and/or cost of parts:

Accidental damage to the heating system or any component, including: Acts of God; failure due to misuse, abuse, fire or flood damage; incorrect installation; damage as the result of transportation, removal or storage; attempts to repair the heating system other than by a ThermoSphere Accredited Service Agent, the ThermoSphere Service Department or a repairer not approved by ThermoSphere.

Where it is found there is nothing wrong with the heating system; where the complaint is related to circumstances where there is no power supply due to faulty electrics; where faults are related to the electrical supply or incorrect installation and not the heating system or heating system components; where there is a failure of electricity supply; where the supply of electricity does not comply with relevant standards, codes or acts, ThermoSphere may then charge the consumer a nominal service charge if inspection reveals no fault with the heating system.

Where the heating system or heating system component has failed directly or indirectly as a result of incorrect cable installation, overheating due to incorrect cable placement, incorrect treatment of the cold tail joint or end termination, failure to encase the entire heated section of the cable as well as the cold tail connection and element in a full bed of tile adhesive or levelling compound, insulating the heating cables from above with permanent fixtures, sanitary ware, furniture or carpets/rugs.

Where the heating system is installed and/or located in a position or fashion that does not comply with the ThermoSphere Installation Instructions or relevant statutory requirements, causing the need for major dismantling or removal of cupboards, doors or walls, or use of special equipment to repair the heating system.

Subject to any rights you have under UK Consumer Law or other statutory provisions to the contrary, this warranty excludes any and all claims for damage to floors, furniture, carpets, walls, foundations, building fabric, possessions or any other consequential loss either directly or indirectly due to damage from the heating system, workmanship or other.

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Find us on LinkedIn
Search "ThermoSphere"

Check out our Youtube channel
Search "ThermoSphere underfloor heating"

Find us on Instagram
Search "ThermoSphere"

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GREAT BRITISH MANUFACTURING