Electric Underfloor Heating Systems

THERMFLOOR

Installation Instructions

ThermMAT

ThermMAT is suitable for a wide range of floor coverings – ceramic, slate, terracotta, porcelain, marble, stone or limestone. A ThermMAT electrical underfloor heating system is designed for installation directly under these top floor coverings and the following instructions should be read carefully before you begin your installation.

For vinyl, carpet or laminate floors first check with the manufacturer that it is suitable for underfloor heating. ThermFloor will offer responsible advice on these applications with regard to flexible floor screeds or self levelling compound over the heat source. Please call 0845 644 3632.

Please read these instructions in conjunction with the Guarantee Card enclosed with your ThermFloor heating system.

The best subfloors for applying ThermMAT are tile backer boards (insulation construction boards), concrete, WBP plywood (weather & boil proof plywood) and existing old tile surfaces. There is no need to prime the surface of ThermBOARD tile backer board since it already has good quality construction properties comprising a cement polymer mortar finish on both sides of the board.

If the subfloor is asphalt or bitumen it must be either removed or a layer of insulation backer board applied over the floor as a barrier.

Electrical Requirements

It is recommended the installation is carried out in accordance with local electrical regulations and the wiring of the system to the mains electrical supply is performed by a qualified electrician.

The heating system is designed for operation at 230V 50Hz.

All installations require an RCD (residual current device) for safe operation.

We recommend the heating is connected to a dedicated circuit to reduce interference between appliances. If connecting to an existing circuit, make sure the total current (amps) of all ThermMAT and other appliances connected to the circuit do not exceed the current capacity of the circuit – always consult your electrician.

120 w/m²					
Part Number	**Area (m²)**	**Width (m)**	**Length (m)**	**Total Watts**	**Total Mat Resistance (ohms)**
120MAT1	1	0.5	2	120	441
120MAT15	1.5	0.5	3	180	294
120MAT2	2	0.5	4	240	220
120MAT3	3	0.5	6	360	147
120MAT4	4	0.5	8	480	110
120MAT5	5	0.5	10	600	88
120MAT6	6	0.5	12	720	73
120MAT7	7	0.5	14	840	63
120MAT8	8	0.5	16	960	55
120MAT9	9	0.5	18	1080	49
120MAT10	10	0.5	20	1200	44
160 w/m²					
160MAT1	1	0.5	2	160	331
160MAT15	1.5	0.5	3	240	220
160MAT2	2	0.5	4	320	165
160MAT3	3	0.5	6	480	110
160MAT4	4	0.5	8	640	83
160MAT5	5	0.5	10	800	66
160MAT6	6	0.5	12	960	55
160MAT7	7	0.5	14	1120	47
160MAT8	8	0.5	16	1280	41
160MAT9	9	0.5	18	1440	37
160MAT10	10	0.5	20	1600	33

You can combine more than one size of ThermMAT to cover the total floor space. Each ThermMAT comes with a single 4m long cold lead wire at one end only, and with multiple circuits the lead wires must be connected electrically in parallel.

IMPORTANT: Before and during installation carry out continuity tests by measuring the cable resistance of the heating element. Also, measure the insulation resistance value as required by BS7671 - the minimum insulation resistance reading should be 10megohms regardless of the element length.

- Perform both tests at each stage of the installation as recommended (i.e. before installing, immediately after installing and before putting the heating into operation).
- Record the results on your guarantee card.

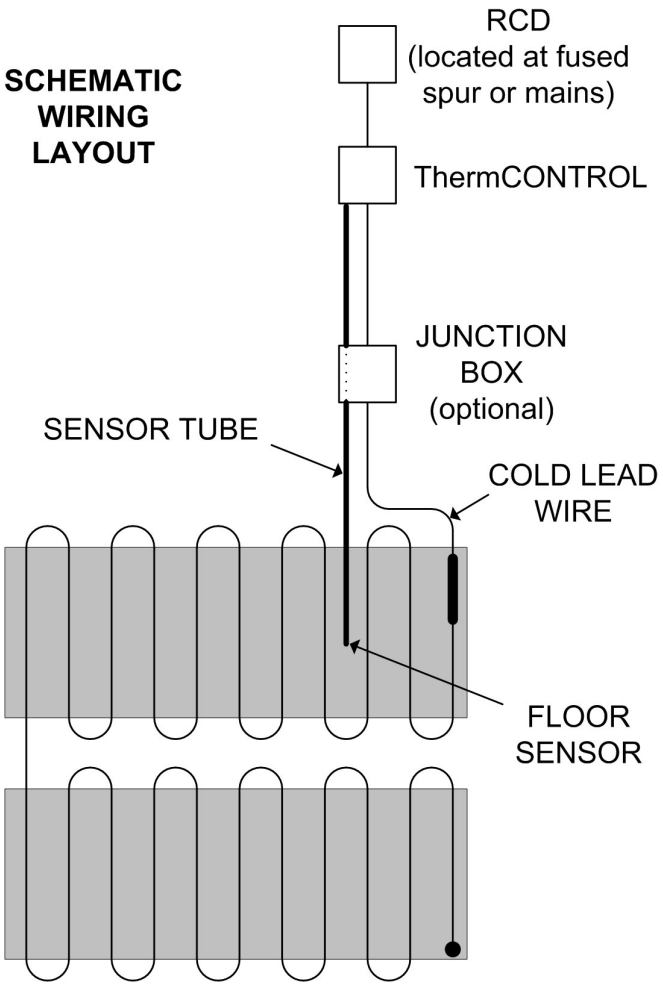
ThermMAT has been tested in accordance to National and International Standards for safety. All mats comply with rules regarding the EMC (Electro Magnetic Compatability) and fulfil the ICNRIP guidelines and regulations with regards to EMF (Electro Magnetic Fields) and are suitable for use in any room.

The ThermCONTROL range of thermostats are rated at 16A – this will enable direct switching of loadings up to approx. 3600 watts. Higher loadings must be switched by a suitably rated contactor – or alternatively split the heating into more than one heating zone each operated by its own thermostat.

In bathrooms the thermostat control MUST be mounted outside the bathroom.

THE HEATING CABLE MUST NOT BE CUT

To facilitate installation it is possible to cut the 4m long cold lead wire to suit.



The above schematic is a basic configuration of the wiring requirements. The 230V electrical supply is provided from an RCD protected mains or via an RCD protected fused spur unit.

The above demonstrates a plain wall cut and the ability of ThermMAT to be applied uniformly.

Floor Preparation

Wooden Subfloors – timber floorboards, chipboard etc. Before proceeding with the installation make sure any loose boards and/or chipboard are firmly fixed and reinforce the floor if necessary to prevent any movement in the floor that could cause tiles to crack. The floor should be level.

Reinforcement can be performed by covering the complete floor with 18mm WBP plywood (weather & boilproof plywood).

When the floorboard or chipboard flooring has been firmly fixed and is considered to be level, an alternative to WBP plywood would be to cover the floor with ThermBOARD insulation backing board.

Concrete Subfloors – Before proceeding with the installation repair any imperfections in the floor and level the floor with approved building materials.

Wooden & Concrete Subfloors - Clean the floor surface so that it is free from dust, dirt, grease or oil marks.

Prime floors with a water based PVA adhesive primer to improve bonding between the adhesives and the subfloor.

Use a primer recommended by your tile/screed adhesive supplier. Any good tile or hardware outlet will supply this inexpensive item. You will be able to purchase the exact specification and quantity required for the floor area involved.

When installing ThermBOARD insulation backer boards use tile adhesive to fix the boards to concrete floors and galvanised screws/washers on wooden subfloor

Opposite shows a floor prepared with a layer of insulation tile backer board.

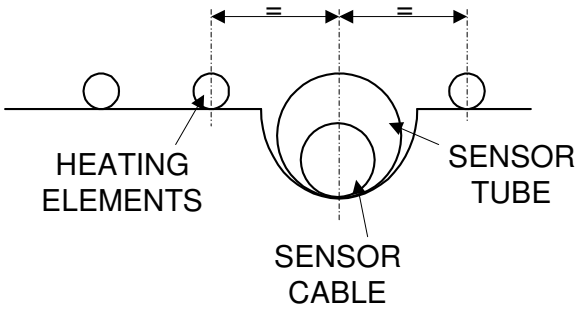
First Step

Plan the installation.

Draw a general view of the room and mark the area which will be covered with heating elements. Avoid heating under units and sanitary ware as this can cause heat blockage and it is unnecessary to heat these areas anyway.

Mark the location of the supply lead – the cold lead wire. See the schematic wiring layout for guidance.

Having decided on this position you can cut a groove in the floor to accommodate the protective floor sensor tube. The sensor must run centrally (in the middle) between two runs of heating element so it is important to note where the element will be positioned. The object is to make the sensor tube level with the heating element.



Make sure the sensor tube has a gradual bend when it enters floor level - this will ensure the sensor cable can be easily inserted or withdrawn. The tube can be cut to length to suit. Seal the end of the tube with masking tape.

The cable joint between heating element (yellow cable) and cold lead wire (black cable) must be located on the floor. Ensure this joint also lies level with the heating system – another small groove may be necessary.

Floor Insulation

Heat travels in both directions, up and down, and without insulation in a concrete subfloor you can expect to lose up to 30% of the installed heat to absorption in the subfloor.

Whatever the subfloor material, wood or concrete, a thermal barrier between the heating element and subfloor will increase performance, heat up time and save electricity costs.

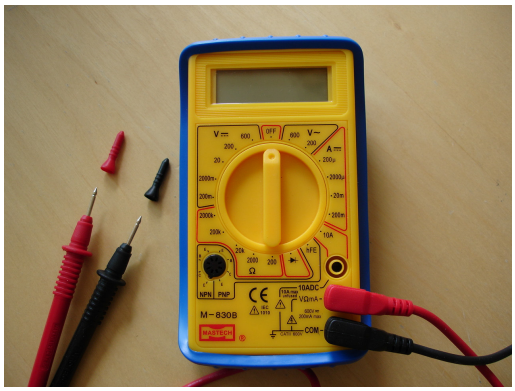
To make the best use of the installed energy, insulation should be installed, either below the subfloor or as a layer of backer board on top of the subfloor, OR BOTH.

Testing

IMPORTANT: Before and during installation carry out continuity tests by measuring the cable resistance of the heating element. Also, measure the insulation resistance value - the minimum reading should be 10Megohms regardless of the element length.

- Perform both tests at each stage of the installation as recommended (three times – i.e. before installing, immediately after installing and before putting the heating into operation).
- Record the results on your guarantee card.

Please consult your electrician - electrical safety is paramount



The instrument opposite is a digital multimeter and the model shown is perfect for testing cable continuity and its resistance (ohms), as well as the resistance of the sensor cable.

However, this model of multimeter will not be capable of taking insulation resistance readings, which is a very important reading to record for all electrical installations.

Insulation resistance readings should also be carried out as required by BS7671.

When taking the measurement of insulation resistance it should give a minimum reading of 10megohms regardless of the heating element length.

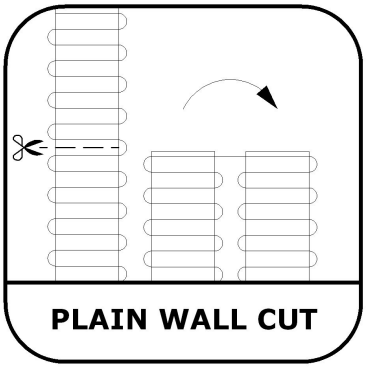
Mat Layout & Fixing

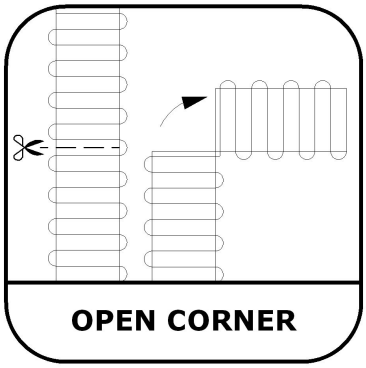
Bear in mind to leave a minimum 50mm unheated gap around the room perimeter.

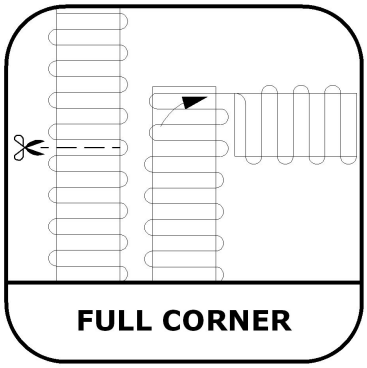
Planning the installation is important. Refer to the **First Step** instructions and general view of the room that you made.

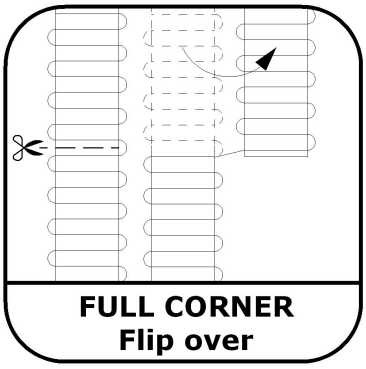
Make sure the ThermMAT can fit the floor area to be heated. It is better to have just too little than too much over. **Remember, NEVER cut the heating element.** Cut only the fibreglass mesh carrier when needed, and turn / flip the mat to meet your requirements as shown in the small illustrations that follow.

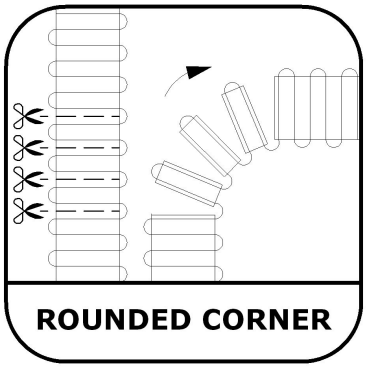
MAT CUSTOMISATION

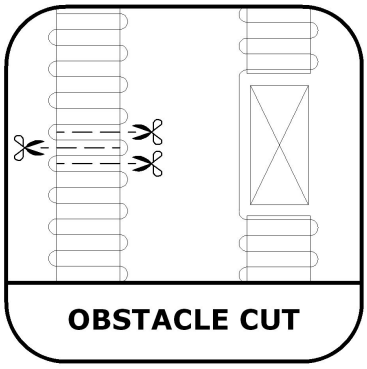


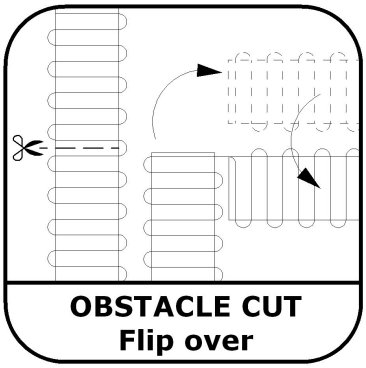


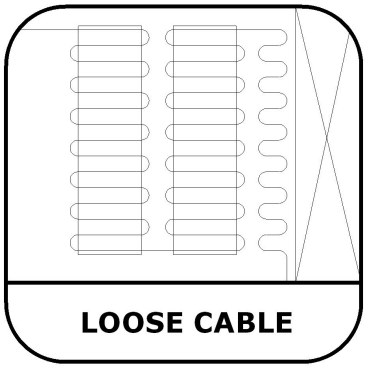


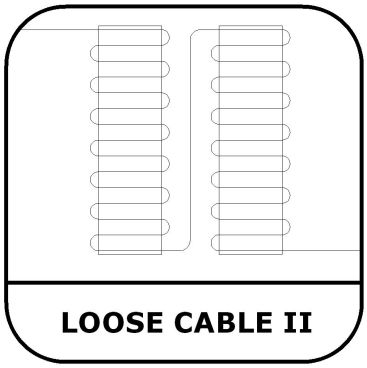










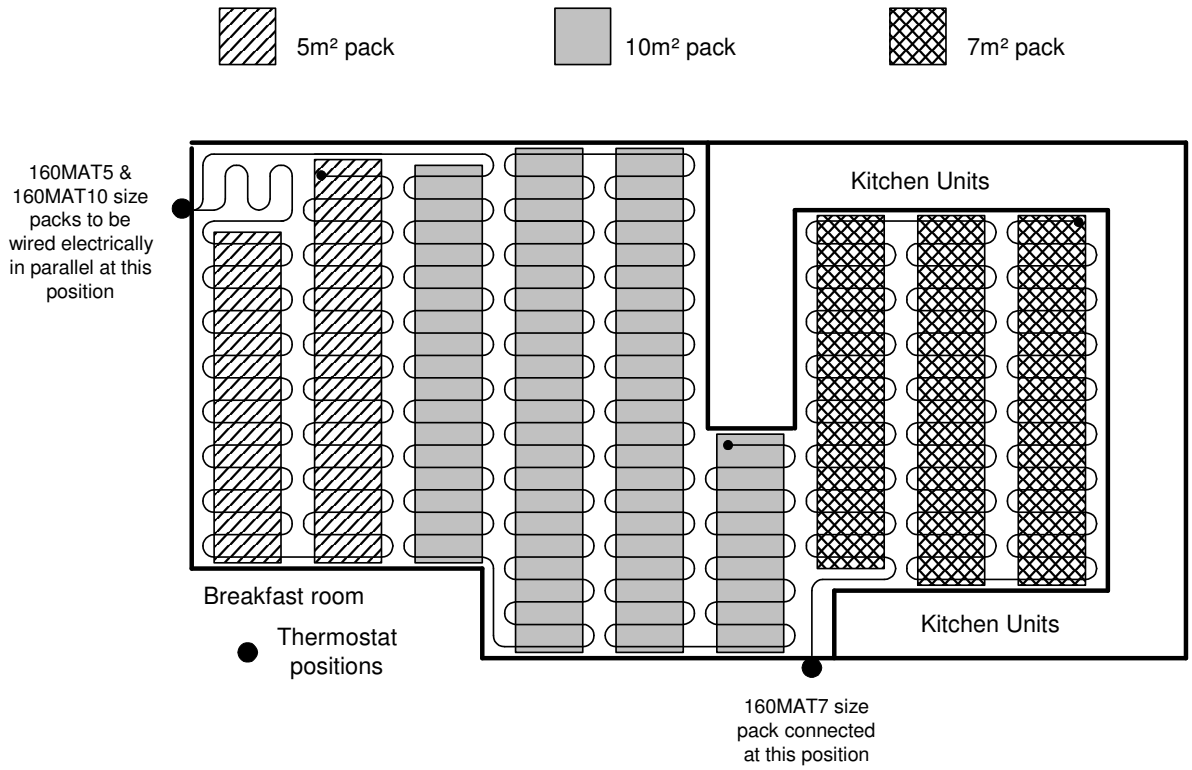


Leave the mat inside its packaging until you are sure. Once the mat has been rolled out and cut it is not suitable for return and resale.

The position for the thermostat should already have been decided in the **First Step**.

Check that the cold lead wire for the mat(s) will reach the connection – (depending on the number of mats, this is the connection with the junction box, or direct to the thermostat). If it does not reach, extend by removing some of the heating element from the carrier and fix the heating element to the floor with fixing tape.

Typical Mat Layout



ThermMAT is extremely sticky on one side and the adhesive extends to the cable loops that run along the side of the mat.

Using your hands, or even walking on the mat in your stocking feet, apply light pressure overall to the heating mat. This will help to stick the mat to the subfloor.

Tiling

The next stage is the fixing of the tiles. You can select a single step or two step method. Latex, acrylic or polymer based adhesives are acceptable.

Spread adhesives with a PLASTIC notched trowel to avoid damage to the heating element.

Single Step: Using a flexible adhesive the tiling can be carried out as a single operation directly on top of the heating mat. Allow a depth of adhesive sufficient to lay the tile and to encapsulate the heating element with no air gaps

Two Steps: Apply a thin layer of flexible self levelling compound just sufficient to cover the mat and encapsulate the heating elements with no air gaps. Allow to cure in accordance with the manufacturers instructions. This will provide protection to the heating mat prior to tiling. Then apply the tiles in flexible tile adhesive in the normal manner.

Both steps are approved for under tile heating.

All adhesives must be flexible and suitable for underfloor heating. These are available from any good tile, building or hardware outlet and the outlet will provide full instructions on the application of the adhesives and screed materials.

Grouting

Use a **latex, acrylic or epoxy grout** for grouting between the tiles. Latex, acrylic and polymers add flexibility to grouts to resist cracking. Epoxy grouts provide high strength, good thermal shock resistance and fast cure. Do not use sharp objects to clean the grout from between the tiles. Most damage to the heating cable occurs when excess grout is scraped away and a sharp tool goes deep enough to cut the cable.

If in any doubt please contact ThermFloor for support – 0845 644 3632

Reminders

Do – read the instructions
Do - Use approved adhesives and floor screeds – consult your local tile, builder or hardware outlet
Do - use the right size of mat and only apply the mat to the area to be heated
Do - consult a qualified electrician
Do - make sure the heating is connected to an RCD rated 30mA maximum.
Do - make sure the black joint between the yellow heating element and the black cold lead wire is in the floor beneath the tiles.
Do - keep a record of where the floor probe is positioned and the general layout of the heating mat for future reference.

Do Not - cut the heating element
Do Not - Allow heating element to touch or cross over itself
Do Not - cut or prepare tiles on top of the mat

Support

a. ThermFloor deliver next day carriage free
b. You can send detailed drawings with dimensions and scale and we will send you a heating scheme by return.
c. Include your phone and fax numbers and email address.
d. Phone 0845 644 3632, fax 01772 761 222 or email sales@thermfloor.co.uk for Technical and Design advice and Commercial support