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Technical Information

Underfloor heating mats are constructed using insulated, twin core heating cable, which includes high performance insulation, around the heater wires and either a braided or wrapped metal earth screen, with a further outer layer of polymer insulation. This is then fixed into a special fibre mesh, with the cable spaced at 75mm. To give a regulated heating output of 150w/sqm for TMP. The cable complies with industry guidelines for safe use on timber as well as solid sub-floors. All mats have been rigorously tested and surpass all European standards requirements. The mats are normally installed under ceramic, quarry or natural stone tiles. For use under other surfaces, such as hardwood and laminate flooring, simply screed over the cable and lay the alternative flooring as normal.

The heating cable of each mat is terminated at one end with a 4 metre long cold power supply cable, for connection to the combined timer/ thermostat control unit. Each heating cable has a fixed resistive length and cannot, therefore, be shortened. There are 12 sizes of mat available, which can be used singly or in a combination to accommodate any floor area by connecting in parallel.

Controls

16 amp combined timer/thermostat unit (Timerstat) (sold individually). Note: a 16 amp timerstat unit can be used to control a maximum of 3500 watts.

Electrical Installation

We strongly recommend that all electrical work is carried out by a qualified electrician and must conform to current IEE wiring regulations. The heating mats should be installed in conjunction with a floor temperature sensing Timerstat control and be connected via a RCD (residual current device) protected circuit.

TMP1.0 (150w/0.7amp) - 0.5m x 2m = 1sq/m | 353Ω
TMP1.5 (225w/1.0amp) - 0.5m x 3m = 1.5sq/m | 235Ω
TMP2.0 (300w/1.3amp) - 0.5m x 4m = 2sq/m | 176Ω
TMP2.5 (375w/1.6amp) - 0.5m x 5m = 2.5sq/m | 141Ω
TMP3.0 (450w/2.0amp) - 0.5m x 6m = 3sq/m | 118Ω
TMP4.0 (600w/2.6amp) - 0.5m x 8m = 4sq/m | 88Ω
TMP5.0 (750w/3.3amp) - 0.5m x 10m = 5sq/m | 71Ω
TMP6.0 (900w/3.9amp) - 0.5m x 12m = 6sq/m | 59Ω
TMP7.0 (1050w/4.6amp) - 0.5m x 14m = 7sq/m | 50Ω
TMP8.0 (1200w/5.2amp) - 0.5m x 16m = 8sq/m | 44Ω
TMP9.0 (1350w/5.9amp) - 0.5m x 18m = 9sq/m | 39Ω
TMP10 (1500w/6.5amp) - 0.5m x 20m = 10sq/m | 35Ω

Preparing the Electrical Supply

We recommend that this work be carried out prior to preparing the sub-floor and laying the heating mat. This work should be carried out by a qualified electrician and comply with IEE regulations.

Having decided on the position for the timerstat control, ideally on an inside wall within the room to be heated (outside a bathroom to comply with I.E.E. regulations) and suitably positioned above floor level for easy viewing. Install a single deep (min 47mm) back box. On bathroom installations, the regulations require that the controls must not be sited within the bathroom and the timerstat should, therefore, be fitted on the outside of an internal wall as near to the underfloor heating as possible. A Wireless Timerstat has the receiver unit outside the bathroom and the transmitter (3volts) can go inside the bathroom.

If more than 2 mats are to be installed, a junction box will be required to connect up the heaters in parallel as the connections on the timerstat are too small in diameter for more cables. Run an RCD protected mains supply via a fused isolator switch taking into account the total load requirements. A maximum of 4.8Kw of heating can be connected to a 30 milliamp RCD. (Please note that the system guarantee is only valid when connected to a correctly rated RCD protected circuit). All wiring should be chased into the wall and protected by either conduit or plastic trunking.

Preparing the Sub-Floor

The most important consideration when installing a tiled floor, whether it is to be heated or not, is the preparation of the sub-floor prior to tiling. It is essential that it is sound and level and will support the weight without movement or deflection. The following recommendations are a general guide only and you should seek further advice from the Tiler and the tile and adhesive manufacturer.

Timber Floors

The existing floorboards must first be securely fixed and level. This should then be over boarded with either a suitable insulated tile backer board or 18mm W.B.P. plywood. The back and edges of the plywood should be sealed before laying and then, with plated screws, fixed to the floor joists at 200mm centres, plus additional fixings at the board edges. If using a tile backer board, this should be installed following the manufacturer's instructions. (Use 150w or 160w mats on a timber floor.)

Solid Floors

Concrete floors should be completely dry, which, with newly laid concrete, can take many weeks to fully cure and dry. Remove all traces of old floor coverings and adhesive and ensure that the surface is smooth and level. Although the heating mats can be laid directly onto a sound, dry concrete floor, we recommend the use of insulated tile backer board for improved performance and efficiency of the heating system. For example, the worst case scenario, is to fit an under floor heating system to a ground level non-insulated concrete slab. Unless the requisite amount of insulation is included, the heater will try to heat up planet earth as well as the floor surface! To a much lesser degree, fitting an under floor heating system to a properly insulated concrete floor as per current building regulations, means the heater will need to bring the floor mass to the required temperature so use 160w or 200w mat for quicker

heat up time. The heat up time will be much slower, as will the cool down period but allowances can be made with the Timerstat. We do not recommend installing underfloor heating on uninsulated concrete floors.
On some older properties asphalt or bitumastic compounds were used as a damp-proof membrane. As the heat from the cable may affect the floor membrane, it would be advisable to fit an insulated tile backer board before fitting the heating system.

Timber and Solid Floors

Having now determined the position of the control unit and the direction in which you intend to lay the mat, it is now advisable to cut a groove in to the sub-floor to accommodate the cold power supply cable, as they are slightly larger diameter than the heating cable.

The sub-floor should now be thoroughly cleaned to remove all dust and debris and primed if recommended by the adhesive manufacturer.

Planning the Installation

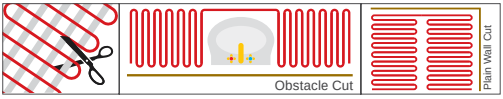
To calculate the free area available for heating, simply allow for a 100mm (0.1 metre) margin around the full perimeter of your room and any fixed objects and deduct the sum of this from the total area. You should then choose a mat or combination of mats that is equal to or less than this figure. (Remember mats can not be shortened). The mats should not be laid over or close to any existing hot water service or central heating pipes and bear in mind that all mats are 0.5 metres wide and that opposing runs of matting should be laid approximately 80mm apart, equal to the cable spacing, to maintain a consistent output and avoid hot or cold spots. Remember that areas under fixed objects, such as baths, toilets, shower trays, kitchen units, cookers etc. should not be heated and thought should be given to the final fixing of kitchen units and sanitary ware etc., to avoid fixing screw damage to the heating element.

Testing the Continuity and Resistance

Prior to installing the heating mat always check the continuity and resistance with an Ohmmeter, to ensure that there is a circuit and that the cable is not damaged. The readings should be approximately similar to that on the ratings label on the mat, or as shown in the table on the previous page under electrical installation. The test should also be repeated periodically during installation and prior to, during and on completion of tiling or installing the finished floor.

Installing the Heating Mat

It is a good idea to lay out the installation without securing the mat, to ensure that you have the correct size. Take care not to cut or damage the cable with sharp tools and wear soft soled shoes throughout. Never cross the heating element wire or cross the cold leads or temperature sensor wire underneath or over the top of the mat. The heating cable should not be closer than 50mm to avoid hot spots.



Starting with the cold connection lead as near to the electrical connection point as possible and the mat 100mm (0.1 metre) away from the wall, roll the mat away from you to the end of the area, when you reach the end of the room, cut across the fabric (taking care not to damage the cable) and roll the mat back towards you, keeping the gap between opposing runs at approximately 80mm, until the area to be heated is completed. Note: the mat should always be laid cable up, with its flat face to the sub-floor.

Securing the Heating Mat

The heating mat should now be secured to the sub floor using the in built self-adhesive tape by removing the protective strip and sticking the mat to the floor. When the mesh is fixed in place, it will help reinforce the tile adhesive or self levelling compound. Alternatively, the mesh can be secured using a hand stapler on a timber subfloor. Under no circumstances should the heating cable be fixed down using staples as this will cause it to deteriorate with time and will void any guarantee. A layer of self levelling compound will protect the heating cable from access damage, or cover the area with thick cardboard until tiling.

Installing the Timerstat and Floor Probe

The floor probe is packaged with the timerstat. The timerstat will not work with a probe from a different model. The floor probe has a 3m lead attached, that can be shortened or lengthened with suitable wire. Tape the probe end down to the floor midway between 2 heating wires (40mm from each wire) and run the cable up to the timerstat back-box.

Test the Heaters

Before completing the electrical installation, it is advisable to check that the heater is working correctly. This can be done by temporarily wiring the heater cable to a 3-pin plug. Connect the blue and black wires to the live and neutral terminals of the plug, they are not polarised so either can be used as positive/live. The braided earth screen is connected to the earth terminal; the plug should be correctly fused. This can then be connected to an extension lead or convenient 13amp socket. After a few minutes, the heater cable should be warm to the touch. If more than one heater is being installed, repeat the test with each heater. The heater should not be left connected for more than a few minutes during this test.

Final Connection

The probe and power supply cables can now be connected to the timerstat as per the instructions; a maximum of two heaters can be connected directly. If installing multiple heaters they should be wired via a junction box as previously described. Note: Multiple heaters must only be connected in parallel - i.e. blue wire to blue wire and brown wire to brown wire and should never be wired in series to the timerstat or junction box. A

single 16amp timerstat may be used to control a maximum of 3500 watts of heater load/23sqm of mat. The timerstat can now be finally connected to the previously prepared RCD protected supply and the installation completed. This work is required to be carried out by a properly qualified electrician.

Note: At this point and prior to tiling, it is advisable to do a sketch of the floor area, showing the position of the heating mat(s) and noting the resistance readings for the mat(s). This should be left with the homeowner for future reference. Once the system is installed, homeowners should ensure that the floor is not penetrated where the mat is located.

Tile and Grout

Only use a flexible tile adhesive and grout that is suitable for use with underfloor heating systems, and always follow the manufacturers instructions. Having ensured that the heating mat is firmly fixed to the sub-floor, the mat can either be covered by a layer of flexible tile adhesive or a self levelling latex compound, which is allowed to dry before tiling, or lay the tile adhesive and tiles in one operation. Make sure that the tiling covers the whole area of the heating mat. Care should be taken not to disturb or damage the heating mat during tiling, if possible cut and trim the tiles in a separate area. Ideally, using a plastic trowel spread the adhesive in straight lines, following the run of the matting. Ensure sufficient thickness of adhesive to completely cover the heating mat and allow the tiles to be fully bedded down, without the possibility of any air gaps underneath. If any tiles need to be lifted for adjustment, care should be taken not to damage the heating cable. Grout the floor as soon as possible after tiling, following the manufacturers instructions. Be careful if any tile joints need raking out as part of this operation so as not to cut through or damage the heating cable. Note: the tile adhesive should be allowed to fully cure naturally, before turning on the heating, normally a minimum of 7 days. Finally set the timerstat to the desired daily program as per the instructions.

Alternative Flooring

Underfloor heating mats have been especially designed to be installed under hard surfaces such as ceramic tiles, marble etc. but can be successfully used under most floor finishes such as hard wood and laminate (follow manufacturers advice), carpet and vinyl. Simply cover the heating cable with suitable self levelling compound - ideally a minimum of 5mm thickness of cover and lay the flooring as normal. Thought should be given to carpet grip strips for example so that their fixing doesn't affect the heating cable.