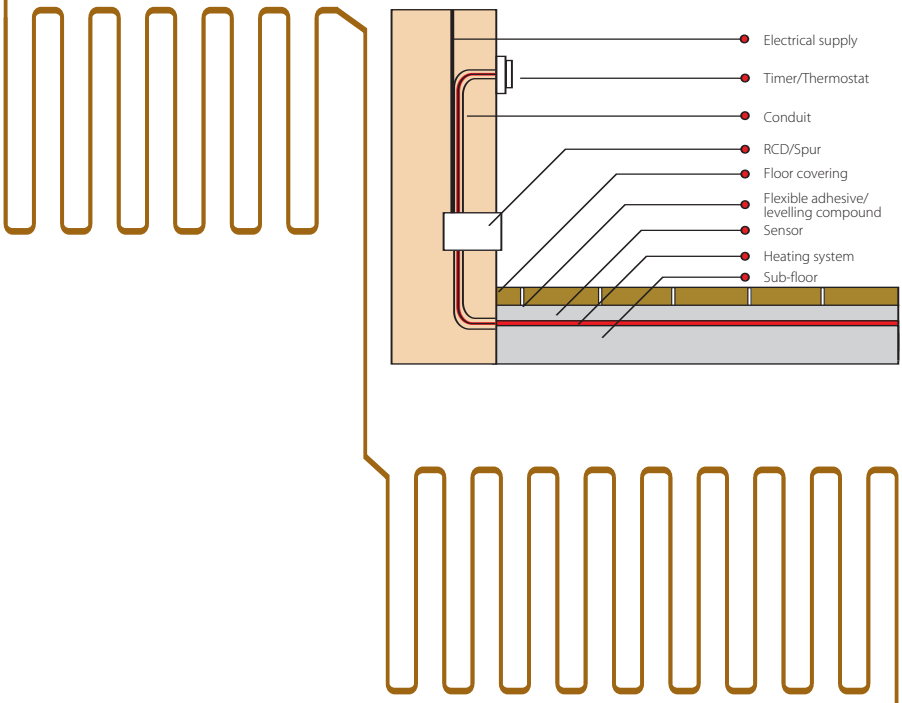
The Floor Warming Company

Choosing and installing your underfloor heating mat system



Information on mat systems

The Floor Warming Company's mat systems have all been designed to meet class 2 standards with an earth braid, allowing them to be used on any sub-floor and in any room. There are three layers of insulation around the heating cables making them the finest systems available. All the systems have been rigorously tested and with an output of 10 watts per linear metre surpass all European and International standards for use on timber or solid sub-floors. The heating systems are comprised of fixed lengths of heating cable stitched into fabric mats with 4m long, class 2 connection cables for easy installation. These systems are designed for use under tiled floors, but can with the correct guidance, be installed under other floor coverings.

If you are intending to install your underfloor heating under other floor finishes please contact our customer helpline on 01895 825288 for advice on our extensive range of systems.

How do I calculate the correct sized heating system?

Simply allow for a 10cm margin around the perimeter of the room and then calculate the remaining floor area in m^2, from this total you should deduct fixed furniture such as kitchen/bathroom units, the cable should only be laid in open areas so the floor can radiate heat. See our drawing package at: **www.floorwarmingcompany.co.uk**

What heating output should I have?

The power depends very much on the heating performance you expect from your underfloor heating system. See below for the heating output we recommend for different sub-floors and scenarios.

200 watt	160 watt	120 watt
Maximum heat. Can be used as a sole source of heating*.	Excellent for floor warming. Use on any sub-floor for fantastic results.	Floor warming on insulated or wooden sub-floors. Very effective for large areas but may not give enough heat on un-insulated concrete sub-floors.

What you need to fit your electrical underfloor heating mat

- Correct size mat
- Installation kit (recommended)
- Control device
- RCD (Residual Current Device)
- Adhesive or latex (with flexible additive)

We do not guarantee systems that have not been fitted in accordance with the following installation instructions or those that endure accidental damage.

*To use any underfloor heating system as the sole source of heating it is essential to have floor insulation. If there is no insulation in the floor we can supply tile-backer insulation boards that can be installed on top of your existing sub-floor. The depth of these boards ranges from 10mm-50mm. It is also important to be able to carry out a heat loss calculation to ensure that your underfloor heating can provide sufficient heat, contact us for details.

Read the 9 rules to ensure your heating system is fitted correctly

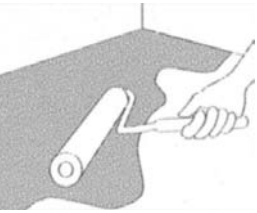
1. Never cut the heating element wire.
2. Heating elements must be protected by an R.C.D at all times.
3. Never leave excess heating mat rolled up under units or fixtures (if the mat is too long, return it to your place of purchase and replace it with a smaller size).
4. Never run the cold leads (connection leads) underneath or across the heating element wires.
5. Never cross or overlap the heating wires.
6. Do not switch the system on for at least 2 weeks after fitting the floor finish; you need to wait for the adhesives/latex/grout to dry naturally.
7. Do not cut or prepare tiles on top of the fitted heating system. When other work is going on in the room, avoid damage by keeping the heating covered until you are ready for the final floor finish to be put down.
8. The cables should never be spaced at intervals closer than 5cm or further than 10cm apart.
9. Only a qualified electrician should connect the heating element to the mains.

Now follow the 7 steps to install your system...

General Instructions

Step 1. Prepare sub-floor and electrics

a. Surface Preparation



The installer should prepare the floor as if they were laying ordinary floor tiles. They should ensure that the floor surface is completely smooth and flat and that loose floorboards are repaired. If necessary a layer of plywood should be used to ensure a completely smooth surface. You will need to make a groove in the sub floor for the cold lead connection joint, as this is slightly thicker than the heating cables. Only do this once the position of the mat has been finalised. We recommend the application of a primer over the sub-floor especially if installing with self-adhesive mats or tape so the system sticks adequately.

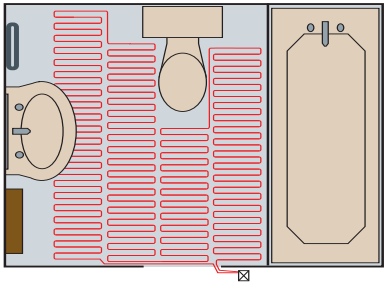
b. Electrical preparation

Before laying the heating system, a flush mounted deep electrical box should be installed, this is where the cold leads from the heating mat and the wiring from the controls can be connected. If installing the system in a bathroom, the regulations stipulate that the connections/controls must not be sited within the room. Usually it is possible to place them on a wall outside the room (as with a light switch). All wiring should be chased into the wall and protected by conduit or trunking.

Step 2. Positioning the heating mats

The mats are never laid beneath permanent furniture (cupboards or bathroom fixtures), therefore, we recommend that you draw up a detailed plan of the areas where the mats will be before you carry out the installation. Decide where you would like the mats to be and mark them out on the subfloor. Remember, if using a two

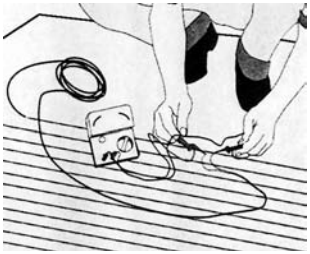
lead connection mat you need to pre-plan to bring the 2nd cold/connection lead back to the control.



The diagram (left) shows the typical area the underfloor heating should cover.

Plan where to put the floor sensor, it is installed about 3-4 cm from the heating cable, care must be taken to ensure that the temperature sensor does not touch the heating elements, this can be achieved by working out the placement of the heating cable prior to fitting the sensor (you will only need a floor sensor if you are fitting a floor thermostat).When positioning the sensor try to avoid hot water pipes in the floor or any draughty places such as external doorways as this may affect the thermostat. If necessary the sensor lead can be extended using bell wire or 1.0mm twin and earth cable. If more than one mat is used they must be connected in parallel (all cables brought back to the control) and not connected to each other end to end in series.

Step 3. Now test the system resistance



We recommend that you test the system resistance before you start the installation, then as you finish the installation/before the tiles are put down. To take a reading set your meter to the ohms position on the lowest setting (normally 200 or 2000 ohms). Hold one of the probes on the blue centre cable and one on the black centre cable. You have now completed the continuity test. There is a possibility of a degree of variance in the readings that you may take in the course of the installation, as long as this is not too significant you should not worry too much as it can be affected by moisture and other factors.

In the unlikely event that accidental damage has occurred during the installation of the mat this will show up when you put the meter at its highest ohms setting (20 or 200 million ohms), place one probe on either the black or blue centre cable and the other probe on the earth screen, making sure that the cables at the other end of the system are not touching each other. Do not hold the probes on with your fingers during this test, as this could affect the result. The reading for this test should be infinity or a blank screen.

Fill in your test readings at the back of this booklet.

Step 4. Installing the heating mat

Plain wall cut

Obstacle cut

Complete the installation without securing the mat, to ensure you have the correct size system, take care not to cut or damage the mat with sharp tools and wear soft-soled shoes throughout.

Never join the heating element wires or cross the cold leads underneath or on top of the mats.

Wooden sub-floors

It is recommended you prime the floor (installation kit). When primed we recommend using 3.5mm cable clips to hold the mat in place. These should be put in quite frequently to make sure no loose ends are sticking up. Be careful not to put a pin through the

cable as this will damage the system. You may be able to use a heavy staple gun to fix the mats, but with this method only staple the matting not the cable. Another effective, if slightly slower method, is to put a thin layer of flexible tile adhesive down, bed the mat into it and then put another thin layer on top. Always use good quality flexible adhesives and check with the supplier that they are suitable for use on wooden subfloors.

Concrete/Screeded sub-floors

Again, it's a good idea to prime the floor. Depending on how hard the screed/concrete is you may be able to install using the 3.5mm cable clips. If the concrete is too hard, we can supply plastic screw fixings that, with a pre-drilled 5mm hole can be used to fix the mats down. If installing on Detra matting, put a layer of flexible tile adhesive on top of the Detra matting. Put the mat down and put flexible tile adhesive on top.

Insulation/Tile backer boards

Use the same installation process as on wooden sub-floors, but you do not need to prime the floor.

Individual fitting guidelines are available for Matt Stretchy, RHE Parquet and WTBC (budget cable)

a. Single lead connection mats

Start with the cold lead (connection lead) as near to the electrical spur as possible. Roll the mat away from you to the end of the area making any cuts necessary to avoid furniture. Once you reach the end of the room, cut across the fabric backing, making a wall cut and roll the mat back towards you. Keep a space between the runs of mat of no less than 3cm apart. Continue until the desired area is covered

b. Dual lead connection mats

These mats are fitted in the same way as the single lead mats, but they have two cold leads (connection leads) at opposite ends of the roll of matting, so when planning how to position the mat(s) take into consideration that you must get both connection leads (on each end of the mat) back to the same electrical point.

c. Equipotential mat - for wet bathrooms with external earth braid

This mat has been designed to meet new wet bathroom wiring guidelines and regulations, it has an external earth braid, which needs to be linked to the secondary earth bonding in the bathroom (taps, pipe work etc). The laying of the mat is carried out in exactly the same way as the dual lead connection mats above. The silver earth strands that weave through the fabric may be cut in the same way as the fabric when fixing.

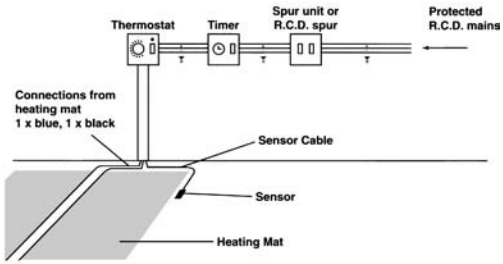
d. Sticky backed mats/Sticky tape

The sub floor must be clean and free from any dust or debris. We recommend a layer of floor primer is applied to ensue the adhesive works effectively. Cut and fit the mat in the usual manner then peel off the protective covering and firmly adhere the mat to the subfloor.

Step 5. Now cover the cables

Now the mat is firmly fixed to the subfloor we highly recommend you cover the cable with a thin layer of levelling compound or flexible adhesive. Other underfloor heating companies do not suggest this but we feel it is essential to avoid the possibility of damage occurring to the heating elements. Around 97% of damage caused to heating systems is due to the lack of any protection and cutting this out can cause problems later. We suggest testing the system again at this stage. Check with your supplier that the adhesive is suitable for use with the subfloor.

Step 6. Connecting the system



Now a qualified electrician should make the final connections in accordance with IECC guidelines. It is suggested that you use a connection box if more than one system is being connected to the device. The cold leads on the heating cables are not polarised so either can be used as positive/live, however, normal practice is to make blue positive and black negative. The cables are of co-axial construction and so have a braided earth screen running all the way though. This is a safety feature and the earth screen must be linked together and connected to the earthing point. All of our control units (timer/thermostats) have their own manufacturers wiring diagrams/instructions enclosed in the packaging.

Step 7. Tiling

Now you can lay the floor tiles as normal. Remember to leave all adhesives to dry naturally, we would recommend waiting for two weeks before turning the heating system on. If any tiles need to be taken up for any reason we recommend that extreme care is taken to avoid damaging the heating system.

Congratulations!

You have installed your mat system.

Fill in the test cards at the back of this booklet and attach your receipt. This will now act as your 10-year guarantee and will be used for reference in the unlikely event of the system malfunctioning.

Should you experience any problems please refer to the troubleshooting guide below before you contact our help-line.

If the readings were accurate during your testing the system itself should always be okay, however, should you experience any problems we recommend you check the following.

1. The circuit breaker or fuse is functioning and delivers the power through the thermostat to the heating element.
2. Make sure the R.C.D has not tripped. If it is a dedicated RCD and it has tripped there is a possibility there could be damage to the cable. Re-set the RCD (using the

reset button) and, if it trips again contact the customer help-line. NEVER BYPASS THE RCD.

3. Check the thermostat is programmed correctly and is switching on. There should be a light on your control to indicate that it is functioning. If the light is on and it is still not functioning, check you have allowed enough time for the floor to heat up. Above is a chart showing how long it usually takes to heat the floor up.

Sub-floor construction	Heat up time
Marine ply	0.5 hrs
Tile backer board (Marmox, Wedi)	0.5 hrs
Insulated screed/concrete	1-2 hrs
Un-insulated concrete	2-5 hrs

These are approximate times and depend on the thickness of the tiles, concrete and insulation that has been put down. If it is the first time you are turning the heating on it can take up to 24 hours for the heat to come through.

If your floor is still not warming up, call the customer helpline and you can speak to an engineer.

D. K. Heating Systems Warranty

D K Heating Systems guarantee all of their electrical underfloor heating systems for 10 years from date of purchase against any manufacturing defects. This warranty covers the repair/replacement of the underfloor heating systems and any associated costs at the discretion of the manufacturer. The ancillary products that we offer to compliment our underfloor heating range are covered by a separate manufacturer warranty (timer/thermostats/RCD's).

Our warranty is subject to the following conditions:

- The warranty is dependant on the ohms readings on the back of this booklet being completed fully and properly.
- We require proof of purchase in order to validate the warranty. Therefore, we ask that you retain your invoice, however, if there has been any default in payment for the goods or installation then the warranty is automatically null and void.
- The heating system must be covered by an RCD (Residual Current Device) at all times.
- The system must be fitted in accordance with our installation instructions; failure to install the heating mats in accordance with our installation instructions will invalidate the warranty.
- The warranty does not guarantee mats that endure accidental damage before, during or after installation. If D.K. Heating Systems or any of their agents are required to attend site to carry out inspections and subsequent repairs to heating systems and the faults are found to be caused by anything other than a manufacturing defect then D.K. Heating have the right to charge a reasonable sum for all works carried out.
- The warranty does not cover installations where a qualified electrician has not carried out the electrical connection.

We recommend drawing the layout of the heating element directly after the installation. Please use this space to accurately indicate on the drawing where the mat is laid and where you have placed the cold leads/ connection cables and floor sensor.

Test report

Do not install the cable if the temperature is less than +5ºC

Pay attention to the installation instructions.

Take care not to damage the cable.

This card is for your reference, please fill in the guarantee card and return it to us if you experience problems.

Test

BEFORE installing the heating element

Resistance of the heating wire.....ohm

Insulation test element/earth braid .....ohm

Signature .....Date .....

Test

BEFORE putting the heating element into operation

Resistance of the heating wire.....ohm

Insulation test element/earth braid .....ohm

Signature .....Date .....

Test

IMMEDIATELY AFTER installing the heating element

Resistance of the heating wire.....ohm

Insulation test element/earth braid .....ohm

Heating wire against metal sheath min. 500 KOhm

Signature .....Date .....

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