

INSTALLATION MANUAL



Suitable for
most floor coverings
(always check with floor manufacturer)

- Ideal for large areas
- Fully compliant to latest regulations
- Easy to install
- CE approved

UNDERFLOOR HEATING MAT

Before you begin Installing:

Please read through these instructions carefully and check that you have all the components required.

This UFH-Direct heating system is designed for installation below most tile/stone floor coverings, it may also be installed below engineered/laminate wood floors, vinyl and low tog thin carpets but in these cases the heating mat/s must be first covered with an 8-10mm thick suitable latex based levelling compound

Always check with the floor covering manufacturer for suitability of use with electric Underfloor heating systems, also check the suitability of any adhesives/latex compounds that are intended to be used with both the floor coverings and the heating system.

Contents of Heating Mat Kit

- 3mm twin-core heating mat
- Disposable roller for application of primer
- Digital thermostat and separate floor sensor
- Guarantee Certificate
- Instructions
- Conduit for floor sensor
- Bottle of thermal primer/s

Installation Notes

- The system requires a mains voltage 230/240v and must be connected by a suitably qualified person.
All wiring must conform to IEE 17th Edition Part P regulations.
- The cold tail on the mat is coloured black and is a twin core and earth cable, or in some instances it may have a silver earth braiding wrap around the twin cores. The heating element also contains a built in return meaning that it only has to be connected to the thermostat from one end.
- For larger areas, if two or more mats are supplied, these can usually be connected together at the thermostat (max 2 mats) or by using a small blank fronted connection box for 3 mats or more.
- The system is suitable for installing on any sub-floor which is sound and suitable for tiling, in the main this will be concrete, plywood or cement faced tile-backer boards. Some water resistant composite boards may also be suitable, but it is not recommended to tile directly onto hardboard, MDF or standard grade chipboard as these substances absorb moisture and subsequent swelling could cause tiles to crack or dislodge.
NOTE: if installing on a newly finished concrete screed the required minimum drying out or 'curing' period should be followed before installing (this is typically 1mm per day in good conditions).
- The electrical and electromagnetic fields generated are negligible and well within all recommended European and International guidelines.
- The heating mats must not overlap and the heating cable **MUST NOT** be cut or cross at any point.
- The joint between the heating cable, cold tail and end joint **MUST** be located under the floor and encapsulated in self levelling or tile adhesive and **MUST NOT** be taped over.

Professional Electrical Installation

The installation of electrical systems presents risks of fire and electrical shock which can result in personal injury. Caution should always be taken to guard against each such risk. Only a qualified electrician should connect the heating mat/s to the thermostat and / or to the electrical supply circuit.

Carry out all electrical work required to install ie. chase walls and install back boxes for fused spurs and thermostat position. Please make sure all works conform to the current regulations.

Caution:

Due to the new requirements of the Part P Regulations, only a qualified person who is familiar with the construction and operation of the apparatus and the hazards involved shall make the final connections to the electricity supply and test the installation.

UFH-Direct Underfloor Heating Systems

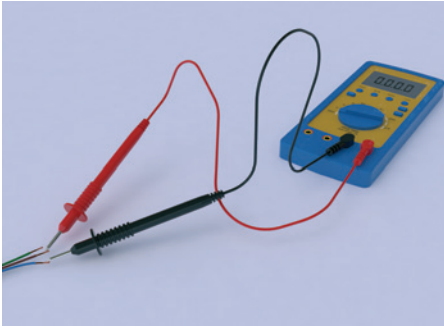
Must be controlled via an rcd protected circuit, for systems not exceeding 13 amps a fused spur that has contact separation in all poles that provides full disconnection under Cat 3 conditions can be used, for systems larger than 13 amps a suitable protective device that complies with regulations must be used (please contact us for technical assistance or consult a fully qualified approved electrician). If you are in any doubt about the electrical installation then please contact our technical advice centre.



IMPORTANT

All such connections MUST be in accordance with BS7671 17th Edition Part P wiring regulations.

Note: When installing thermostats in bathrooms they should always be located outside the room and use the floor probe supplied, always check with a qualified electrician that all electrics are in safe and suitable zones.



Testing

Each and every UFH-Direct mat is carefully tested before it is shipped from the factory and is packed suitably to avoid damage during transit. However, damage does sometimes occur in storage or transit, and sometimes during installation. We strongly recommend you test your mats:

- After unpacking them but before you install them.
- After you have installed them but before you install the floor covering (i.e. while the mats are still exposed).
- After installation of the floor covering but before the thermostat is connected.

A simple test is a visual inspection to make sure there is no visible damage to the heater, and in particular to the cable component in the heater. A simple electrical inspection can be done with an ohm metre to make sure the ohm resistance is what it should be (see page 9). Ohms resistance can vary significantly depending on the ambient temperature and an allowance of - 10% to + 10% from the nominal value is acceptable. At this point an insulation resistance test must be carried at 500v DC out by a qualified electrician.

Please see table on page 9 for the values you should see when testing the mat.

Installation Instructions

STEP 1

1 Ensure that the sub-floor is solid and suitable for tiling, free from dust and debris. Wooden sub-floors should ideally be reinforced to prevent flexing and the possibility of tiles dislodging.

This can be reinforced using a suitable WBP or Marine plywood or insulated tile-backer boards such as UFH-Direct Backerboards. Bitumen bases should be covered with a suitable backerboard or a 3-5mm levelling compound.

DO NOT install the heating mat directly onto a bitumen base.



STEP 2

2

Prime the floor using the acrylic based primer contained in the kit (not suitable for anhydrite screeds)

Once primed leave to dry (typically 1-2 hours) . Once primed avoid any excess foot traffic over this area. The purpose of priming is to promote greater adhesion of the tape and reduce the amount of moisture absorbed into the sub-floor.



ALWAYS CHECK with tile adhesive/levelling compound manufacturer that the primer is suitable for use with their product/s, please contact our technical help centre if you are in any doubt.

STEP 3

3

If using UFH-Direct tile backerboards or XPS insulation boards, do so in accordance with the manufacturer's instructions, we do advise staggering the boards in a brick bond style and making sure the boards are fixed using suitable flexible adhesives to solid floors and/or mechanically fixed to wooden sub-floors @ 300mm centres using suitable screws and washers.

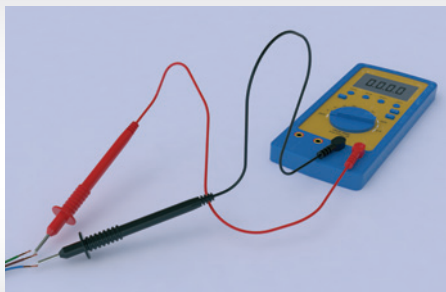


(DO NOT use XPS insulation boards on wooden sub-floors)
(DO NOT use EPS insulation boards with this heating system)

STEP 4

4

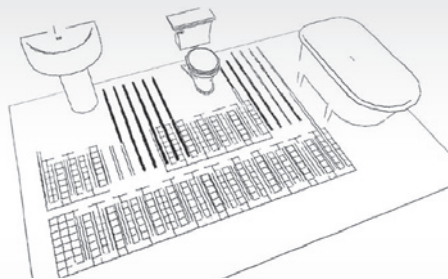
At this point we recommend referring to the testing procedure on page 6, please take time to carry this out as it is extremely important.



STEP 5

5

Prepare floor plan of the area to be heated and identify suitable location of the fused spur and thermostat position – mark the layout of the underfloor heating mat on the floor plan. This is an important step and must be carried out correctly to ensure that all the mat is used up. Once a mat has been unrolled it can not be returned.



STEP 6

6

Now start installing the floor heating mat from the location of the thermostat position. Roll out and secure the floor heating mat by peeling off the 3 self adhesive strips on the back of mat. A small amount of additional cloth tape is provided to ensure the mat is flat to the floor in places where it is uneven.

DO NOT use excessive long strips of tape along the edges of the heating mat /s as this can cause problems with adhesive/latex bonds, please ensure any tape used is primed with suitable primer before applying adhesives/latex.

The floor heating mat should be between 50-100mm from the wall perimeter. Note: when installing around awkward shapes like a toilet or sink the cable can be removed from the mesh matting and placed loose on the floor to suit the shape (fix with minimal duct tape to hold in place), at no point must the cable be spaced closer than 50mm between any 2 loops of cable.



NOTE: thermostat shown for illustration is to be sited outside the bathroom, please consult qualified electrician if in any doubt of zoning regulations.

Resistance Values

Twin Conductor 100W / m² / 230 VOLTS

Width	Length	Area	Watts	Resistance
(M)	(M)	(Sq.M)	(W)	(Ohms)
0.5	2	1	100	529.00
0.5	3	1.5	150	352.70
0.5	4	2	200	264.50
0.5	5	2.5	250	211.60
0.5	6	3	300	176.30
0.5	7	3.5	350	151.10
0.5	8	4	400	132.30
0.5	9	4.5	450	117.56

Width	Length	Area	Watts	Resistance
(M)	(M)	(Sq.M)	(W)	(Ohms)
0.5	10	5	500	105.80
0.5	12	6	600	88.17
0.5	14	7	700	75.60
0.5	16	8	800	66.13
0.5	18	9	900	58.80
0.5	20	10	1000	52.90
0.5	22	11	1100	48.09
0.5	24	12	1200	44.08

Twin Conductor 150W / m² / 230 VOLTS

Width	Length	Area	Watts	Resistance
(M)	(M)	(Sq.M)	(W)	(Ohms)
0.5	2	1	150	352.70
0.5	3	1.5	225	235.10
0.5	4	2	300	176.30
0.5	5	2.5	375	141.10
0.5	6	3	450	117.60
0.5	7	3.5	525	100.80
0.5	8	4	600	88.20
0.5	9	4.5	675	78.37

Width	Length	Area	Watts	Resistance
(M)	(M)	(Sq.M)	(W)	(Ohms)
0.5	10	5	750	70.50
0.5	12	6	900	58.80
0.5	14	7	1050	50.40
0.5	16	8	1200	44.10
0.5	18	9	1350	39.20
0.5	20	10	1500	35.30
0.5	22	11	1650	32.06
0.5	24	12	1800	29.39

Twin Conductor 200W / m² / 230 VOLTS

Width	Length	Area	Watts	Resistance
(M)	(M)	(Sq.M)	(W)	(Ohms)
0.5	2	1	200	264.50
0.5	3	1.5	300	176.30
0.5	4	2	400	132.30
0.5	5	2.5	500	105.80
0.5	6	3	600	88.17
0.5	7	3.5	700	75.57
0.5	8	4	800	66.13
0.5	9	4.5	900	58.79

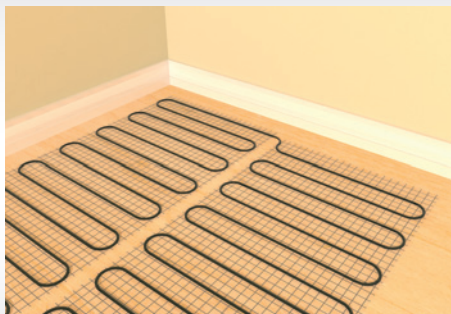
Width	Length	Area	Watts	Resistance
(M)	(M)	(Sq.M)	(W)	(Ohms)
0.5	10	5	1000	52.90
0.5	12	6	1200	44.08
0.5	14	7	1400	37.79
0.5	16	8	1600	33.06
0.5	18	9	1800	29.39
0.5	20	10	2000	26.45
0.5	22	11	2200	24.05
0.5	24	12	2400	22.04

STEP 7

7

When you reach the end of the room the mat can be cut as shown here.

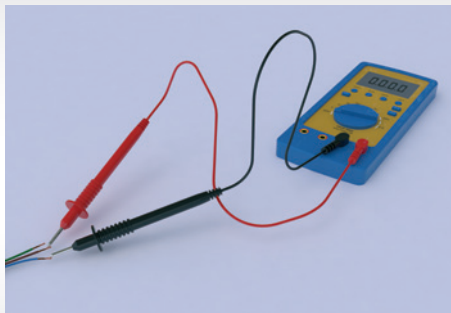
DO NOT cut the cables.



STEP 8

8

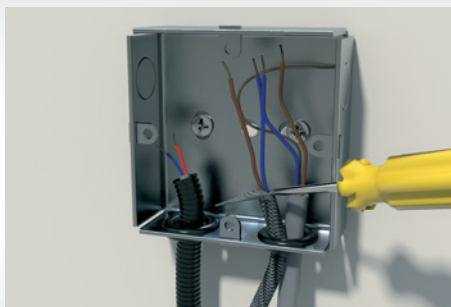
Check the cable resistance and insulation resistance values after laying. Check if these values are consistent with pre-install values. Record values on the guarantee certificate.



STEP 9

9

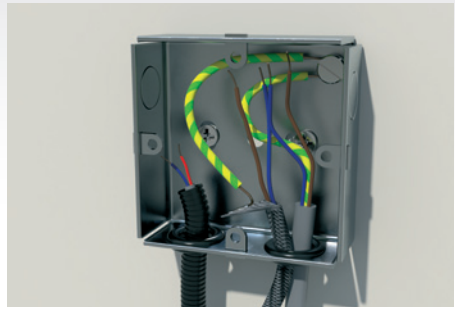
Depending on the type of mat supplied the cold tail (black lead) may have either a solid earth cable or an earth braid wrapped around the internal cores, this needs to be unbraided by using a screwdriver and pulling down the braid to separate the strands, these can then be twisted into a single strand.



STEP 9 cont'd

The earth from the mat can then be connected to the earth from the incoming supply by using the earth terminal in the back box. If using a plastic box with no terminal then a suitable terminal block can be used.

At this point an insulation resistance test must be carried at 500v DC out by a qualified electrician. The rest of the thermostat connections can be made according to the separate instructions provided.



STEP 10

10

Position the sensor in the black conduit supplied from the thermostat position down in between two runs of cable and tape into position. If using insulation boards, these can be cut to allow the conduit to be placed inside. If installing directly onto plywood then a groove can be cut using a sharp chisel (beware of pipes). The joint between the heating cable and the cold tail can also be placed inside a groove in the floor as this can be bulky and difficult to tile over. The sensor wire can be shortened or lengthened. If you need to cut the sensor wire you must only cut the end with the exposed wires.

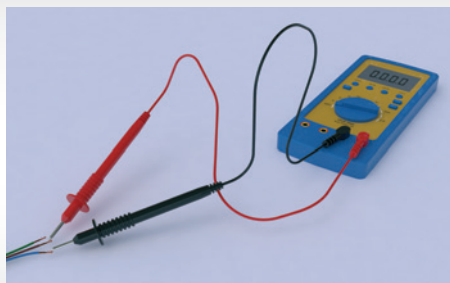
DO NOT cut the end which contains the plastic sensor. The connections to the thermostat can now be made.



STEP 11

11

Test the cable's resistance again using a multi-meter, an insulation resistance test should also be carried out to ensure the cable is free from damage.

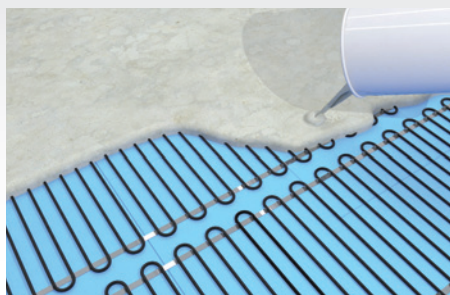


STEP 12

12

If possible cover the cables with a thin layer of suitable latex based levelling compound (5-6mm).

This will help protect the cables when tiling. You may tile directly over the cables, however extra care must be taken not to dislodge the cables or to damage the cable in anyway



If you are using a suitable vinyl/ carpet or engineered/laminate floor as the final covering then we recommend a minimum of 8mm suitable latex levelling compound to cover the heating mat/cables to ensure even heat distribution.

You can now lay your flooring according to your floor manufacturer's instructions. Please refer to adhesive manufacturer's guidelines for drying times before turning on your heating system, this is usually around 7 days, the floor temperature should be increased gradually by 1-2 degrees per day over a 2 week period to reduce the risk of force drying. If in any doubt please check with adhesive/latex manufacturers for advice.



















STEP 13

13

Tile the floor using a flexible tile adhesive and grout as per industry standards and manufacturers conditions. Finally wait at least 1 week before turning on to allow time to dry. NOTE the heating may be slow to react at first, especially if installed on a new screed floor or in a new building. Start by setting the floor temperature at approx 18°C - and build up by 1°C per day until your desired temperature is reached.

Please see separate instructions for connection and operation of digital thermostat.

Do's and Don'ts for Installation

-  **Do** read through these instructions carefully before beginning work.
-  **Do** use flexible adhesives and grouts.
-  **Do** test the cable before tiling.
-  **Do** be careful not to damage or dislodge the cable during tiling.
-  **Do** ensure the cable is spaced no closer than 50mm between loops.
-  **Do** try to protect the cable with cardboard or carpet during tiling.
-  **Do** wait at least 7 days before turning on the system.
-  **Do** read the separate installation and operating instructions for the thermostat.
-  **Do** ensure the joint between the cold tails and heating cable is beneath the tiles.
-  **Don't** attempt to cut the heating cable at any point.
-  **Don't** allow the wires to cross or touch.
-  **Don't** allow excessive foot traffic over the wire before tiling.
-  **Don't** cut tiles over the heating cable.
-  **Don't** place tools or stacks of tiles on top of cable.
-  **Don't** place any product over the floor covering that has a higher tog value than 2.5.
-  **Don't** place any bean bags or fixed furniture over the floor covering.
-  **Don't** place cable closer than 100mm near any pipes.
-  **Don't** turn on the heating mat/cable while it is rolled up or still on the drum.



IMPORTANT

Please ensure that the cold tail joint (the join between the heating cable and flexible supply lead) is fully encapsulated in adhesive or levelling compound underneath the floor covering

Please ensure that the end joint (the join at the end of the cable which is black) is also fully encapsulated in tile adhesive or levelling compound

Both the cold tail joint and end joint MUST NOT be placed into a cut out of insulation or subfloor and just covered with tape, this can cause the cable to overheat and eventually fail!

DO NOT BEND THE COLD TAIL JOINT AT ANY POINT

SAFETY GUIDELINES

This installation manual has been designed for your safety. For a successful installation please make sure you have understood the guidelines and adhered to all the instructions



IMPORTANT

Flat bottomed furniture **MUST NOT BE** placed over areas where the heating mat/cable is installed as this can restrict airflow to the floor, causing thermal blocking, and in extreme cases may lead to the cable overheating causing a possible fire hazard. This also includes rugs, bean bags, or any item which has a tog value greater than 2.5.

The supplied Commissioning **MUST BE** completed, including a floor plan sketch, to indicate heated areas, which must be permanently fixed in or near the distribution/fuse board as required by the 17th Edition BS7671 amendment 3



MATTRESSES



BEAN BAGS



ANIMAL BEDS



RUGS



FLAT BASED FURNITURE