UNDERFLOOR HEATING DIRECT

INSTALLATION MANUAL

- Ultra thin cable
- Easy to install
- Fully compliant to latest regulations
- CE approved

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

LOOSE CABLE HEATING SYSTEM

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 cable/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 Cable Kit

- 3mm twin-core heating cable on drum(s)
- Bottle/s of thermal floor primer
- Disposable roller for application of primer
- High adhesion fixing tape
- Digital thermostat & separate floor sensor
- Guarantee Certificate
- Conduit for floor sensor

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.**
- Our ProWarm™ heating cable/s are 10w per linear metre, total wattage per metre squared is determined by the spacing of the cable 150watts per sqm is achieved by **spacing the cable at around 6.5cms between the loops.** (**DO NOT** place the cables any closer than 50mm at any point).
- The first part of the cable is the cold tail (coloured black), this carries an earth screen which is either a solid green/yellow earth cable or a silver coloured braid which is connected to the main incoming earth from the supply. The heating cable (red or blue) contains a built in return meaning that the cable only has to be connected to the thermostat from one end, this cable is double insulated.
- For larger areas, if two or more cables are supplied, these can usually be connected together at the thermostat or by using a small blank fronted connection box.
- 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. Please check with installer that the sub-floor is suitable – or please call our technical advice centre for suitability. **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 red/blue heater 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 cable/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.

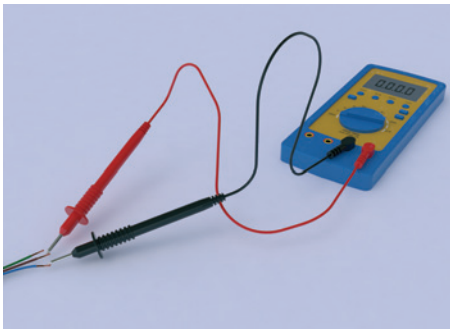
UFH-Direct Underfloor Heating Systems

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 cable is carefully tested before it is shipped from the factory and is packed suitably to avoid damage during transit. However, damage does sometime occur in storage or transit, and sometimes during installation. We strongly recommend you test your cable/s:

- After unpacking them but before you install them.
- After you have installed them but before you install the floor covering (i.e. while the cable is 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 8). 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 8 for the values you should see when testing the cable.

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 Backerboards. Bitumen bases should be covered with a suitable backerboard or a 3-5mm levelling compound.

DO NOT install the heating cable 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).

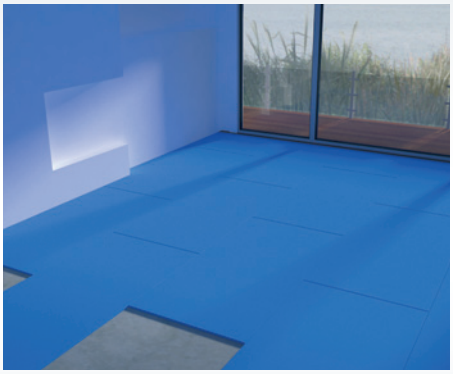
Once primed leave to dry (typically 1-2 hours). Once primed avoid any excess foot traffic over this area. The purpose of priming is to promote greater adhesion of the tape and reduce the amount of moisture absorbed into the sub-floor.

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 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.

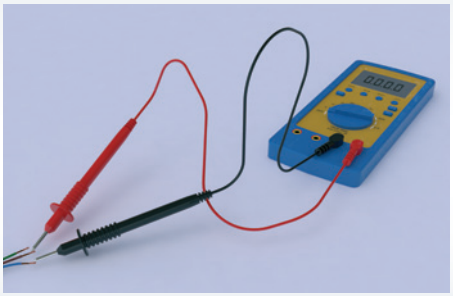


(**DO NOT** use XPS insulation boards on wooden sub-floors)
(**DO NOT** use EPS insulation boards with this heating system)

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.



Resistance Values Twin Conductor 10W / m / 230 VOLTS

Length (M)	Watts (W)	Resistance (Ohms)	Length (M)	Watts (W)	Resistance (Ohms)
11.5	115W	460.0	70	700W	75.6
14	140W	377.9	76	760W	69.6
17	170W	311.2	82	820W	64.5
22.5	225W	235.1	92	920W	57.5
29	290W	182.4	104	1040W	50.9
35	350W	151.1	114	1140W	46.4
40	400W	132.3	125	1250W	42.3
48	480W	110.2	145	1450W	36.5
56	560W	94.5	160	1600W	33.1
64	640W	82.7	180	1800W	29.4

STEP 5

5

Calculate the cable spacing.

IMPORTANT

This is a very important step and MUST be done correctly to ensure all the cable is used up and avoid extra work later.

First measure the area to be heated in sqm (do not include the area taken up by fixed objects such as baths/showers and kitchen units), then divide this area by the length of the cable shown on the drum. The cable is 10 watts per linear metre so a 750 watt kit contains 75 metres of heating cable. The spacing is calculated by dividing the total sqm of the area to be heated by the cable length in metres (see example below).

Example room: 2x3m (6m2) less 0.9 for bath and WC = 5.1m2. A 4.6 to 5.8m2 loose cable kit would be suitable (cable length 76 metres).

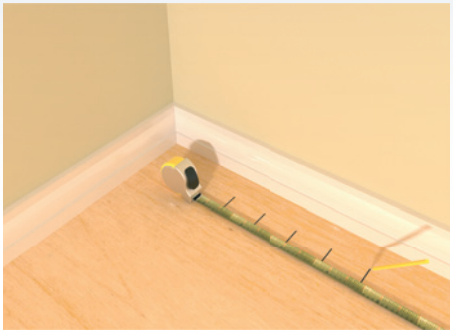
Cable spacing is calculated at 5.1 (room size) divided by 76 (cable length) = 0.067m (6.7cms) leaving a gap of approx 4cms from edge of the room.

Space at 10cm apart for output of 100w per m2
Space at 7.5cm apart for output of 135w per m2
Space at 6.7cm apart for output of 150w per m2
Space at 6cm apart for output of 165w per m2
Space at 5.5cm apart for output of 180w per m2
Space at 5cm apart for output of 200w per m2

STEP 6

6

Once the spacing has been determined, leaving a perimetre of 5-10cms around the edge of the room mark out the floor at the calculated intervals. This will usually be between 5 and 10cms.
If your calculated spacing is less than 5cms **STOP** and do not install. The kit size is too big for the room.



A spacing of 10cms will, in many cases, only take the chill off the floor.

Used as a heating source in most domestic situations the spacing should be between 5.5-7.5cms (this is always dependent on insulation levels and type of construction).

STEP 7

7

The red/blue heater cable **MUST NOT** be cut or cross at any point (the heater cable/s should not be spaced closer than 50mm at any point to each other).

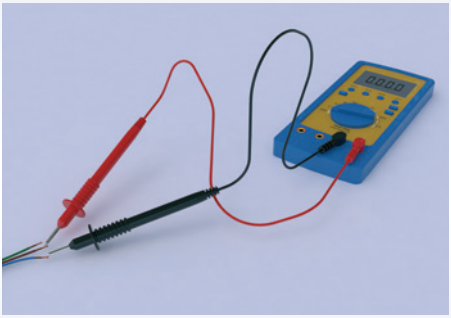
Adjust the spacing if necessary to ensure all the cable is used up and the floor has an even covering. Tape over the cable at regular intervals ensuring that it is well secured to the floor.

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

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.



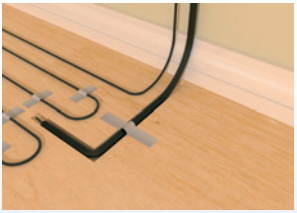
STEP 9

9

Position the sensor in the black conduit supplied between two runs of cable and tape into position. The sensor wire can be shortened or lengthened. If you need to cut the sensor wire you must only cut the end containing the wires. **DO NOT** cut the end which contains the plastic sensor. The connections to the thermostat can now be made.

The earth from the cable 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.

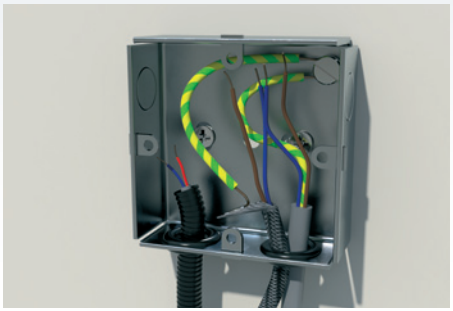
At this point an insulation resistance test must be carried at 500v DC out by a qualified electrician. The rest of the thermostat connections can be made according to the separate instructions provided.

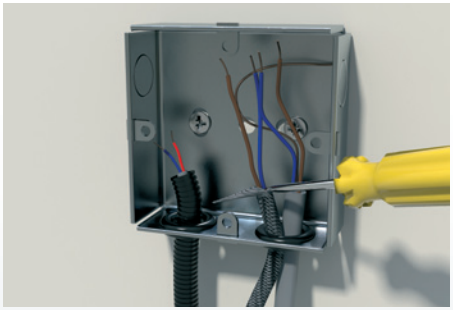


STEP 10

10

Run the power leads from the start of the cable up to the thermostat position. If the cable contains a silver earth braid around the cold tail this can be unbraided by using a screwdriver and pulling down the braid to separate the strands these can then be twisted into a single strand, this is then connected to the main earth supply - if the cold tail contains a solid green/yellow earth then this can connected straight to the main earth supply. If using multiple cables route all power leads through a conduit from the floor to a junction box and supply the junction box from the thermostat. The earth from the cable can then be connected to the earth terminal in the back box, (shown here) if using a plastic box with no terminal then a terminal block can be used.

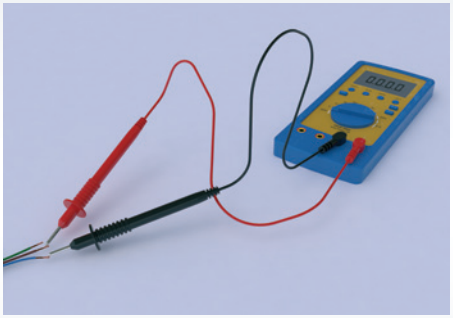




STEP 11

11

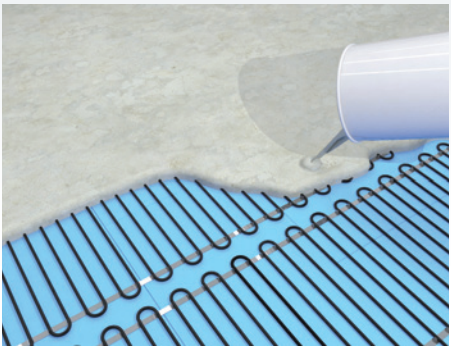
Test the cable's resistance again using a multi-meter, an **insulation resistance test** should also be carried out to ensure the cable is free from damage.



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 Dont's 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