

# Cement Coated Insulation boards

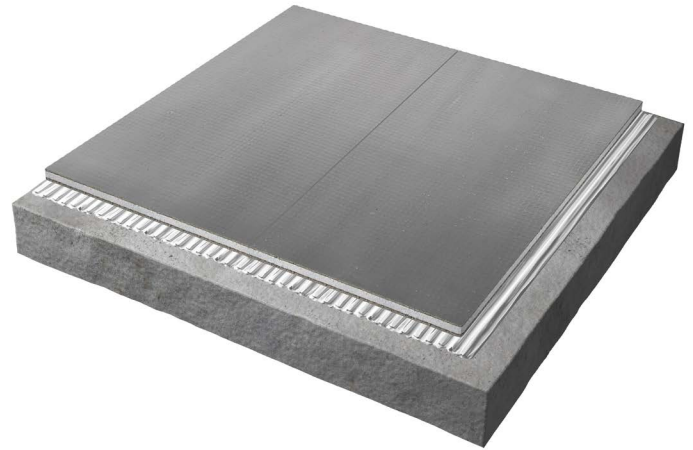
## Installation (Floors)

### Concrete Floors

**STEP 1** - The subfloor must be clean and dry and if necessary, smoothed with a latex/cement self-levelling compound to give an SR1 surface regularity.

**STEP 2** - The insulation board should be installed using a flexible, cement-based adhesive. The adhesive should be trowelled out and combed through with a 6/8 mm notched trowel to give a ribbed bed, any slight depressions being filled by the mortar.

**STEP 3** - The boards should be laid on the freshly applied ribbed bed and thoroughly bedded in to ensure that no voids are left beneath the boards and they are solidly supported. All boards should be laid with staggered joints.

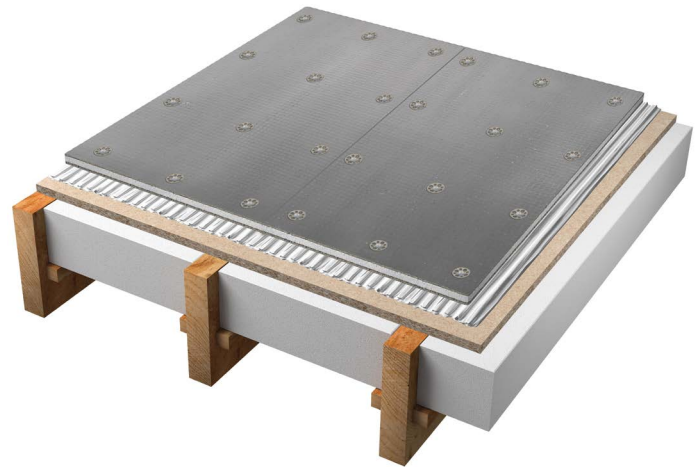


### Timber Floors

**STEP 1** - The subfloor must be clean and dry. Existing floorboards should be structurally sound and if necessary, smoothed with a latex/cement self-levelling compound to give an SR1 surface regularity.

**STEP 2** - The insulation board should be installed using a flexible, cement-based adhesive. The adhesive should be trowelled out and combed through with a 6/8 mm notched trowel to give a ribbed bed, any slight depressions being filled by the mortar.

**STEP 3** - The boards should be laid on the freshly applied ribbed bed and thoroughly bedded in to ensure that no voids are left beneath the boards and they are solidly supported. All boards should be laid with staggered joints.



**STEP 4** - When the adhesive has cured, the boards should be secured using screws and washers. These are installed at the rate of 12 per board (3 rows of 4). The screws should be a minimum of 30 mm from the edge of the insulation board. Tighten the screw and washer into the board until the screw head is flush with the surface.

**NOTE:** Allow the adhesive attaching the boards to the subfloor to cure before laying electric underfloor heating directly onto the boards. Tile over heater using cement-based flexible adhesive and grout.

**WATERPROOFING:** To attain waterproof joints the boards should be sealed during installation using silicone sealant. The sealant should be applied to the edge of the fixed board immediately prior to the next board being installed and placed in position.



# Installation (Walls)

## Solid walls

**STEP 1** - The substrate must be clean and dry. It is possible to adhere the boards to existing plaster however plastered walls must be sealed before fixing the boards.

**STEP 2** - The insulation board should be installed using a flexible, cement-based adhesive. The adhesive should be trowelled out and combed through with a 6/8 mm notched trowel to give a ribbed bed, any slight depressions being filled by the mortar.

**STEP 3** - The boards should be laid on the freshly applied ribbed bed and thoroughly bedded in to ensure that no voids are left beneath the boards and they are solidly supported. All boards should be laid with staggered joints.

**NOTE:** Allow the adhesive attaching the boards to the substrate to cure before laying electric wall heating directly onto the boards. Tile over heater using cement-based flexible adhesive and grout.



## Stud walls

**IMPORTANT:** For stud walls at 600 mm centres you must use 20 mm insulation boards or thicker. 10 mm boards are suitable for stud walls at 300 mm centres only.

**STEP 1** - All board edges must be supported by noggins. Install noggins between studwork where board edges are likely to need supporting.

**STEP 2** - The insulation board should be installed using screws and washers. These should be applied every 300 mm on each stud. For studs at 600 mm, use 2 rows of 5 fixings. At 300 mm centres use 3 rows of 5 fixings. All boards should be laid with staggered joints.

**STEP 3** - Tighten the screw and washer into the board until the screw head is flush with the surface.

**NOTE:** Electric wall heating can be applied directly onto the boards. Tile over heater using cement-based flexible adhesive and grout.

**WATERPROOFING:** To attain waterproof joints the boards should be sealed during installation using silicone sealant. The sealant should be applied to the edge of the fixed board immediately prior to the next board being installed and placed in position.



**Electric**  
Heating System

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## WARNING

Your Warmup® Underfloor heating system has been designed so that installation is quick and straight forward, but as with all electrical systems, certain procedures must be strictly followed. Please ensure that you have the correct heater(s) for the area you wish to heat. Warmup plc, the manufacturer of the Warmup® DCM-PRO System, accepts no liability, expressed or implied, for any loss or consequential damage suffered as a result of installations which in any way contravene the instructions that follow.

It is important that before, during and after installation that all requirements are met and understood. If the instructions are followed, you should have no problems. If you require help at any stage, please contact our helpline.

You may also find a copy of this manual, wiring instructions and other helpful information on our website:

**[www.warmup.co.uk](http://www.warmup.co.uk)**





**Quick Install Guide** - Please also read the full instructions that follow this page.



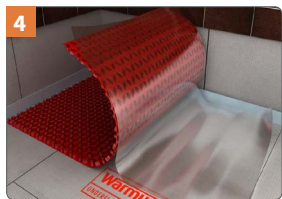
- Make electrical provision for the heater (30mA RCD, 35 mm deep electrical back boxes, trunking).



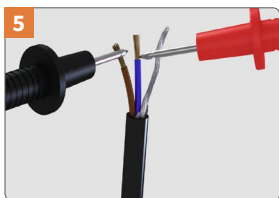
- Ensure the subfloor is smooth, dry and free from dust.



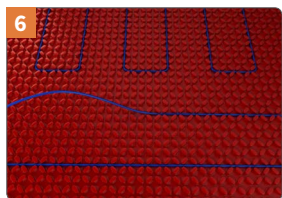
- We recommend installing Warmup insulation boards for optimum performance.
- Install perimeter strip around the perimeter of the room to allow for differential movement between finished floor level and walls.



- The surface the mat is being applied to must be SBR primed (1:4) and smooth, such that a clean and continuous bond can be made.
- Cut mat to size, peel off backing and tack in place pressing down once aligned.
- Lay additional sheets as above ensuring that the castellations are aligned.

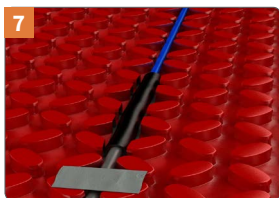


- Test the resistance of the heater ensuring it is within the range set out in the Reference Resistance Band Tables.

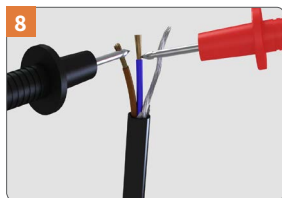


- Install the heating cable at the chosen spacing, minimum 60 mm.
- Maintain a perimeter spacing of half the chosen cable spacing.

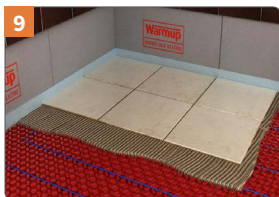




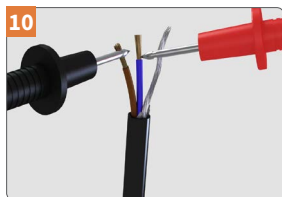
- Channel a groove in the mat and subfloor for the coldtail & termination joints, enabling them to fit flush with the top of the mat. DO NOT tape over these joints!
- Install the floor sensor centrally between two runs of the heater.



- Test the resistance of the heating cable after installation and check against the previous value to ensure no damage has occurred.



- Lay the tiles or levelling compound over the system.
- The heater, including its joints, must be wholly within the adhesive or levelling compound and not exposed.
- Use flexible grout when grouting.



- Test the resistance of the heating cable after tiling and check against previous values to ensure no damage has occurred.

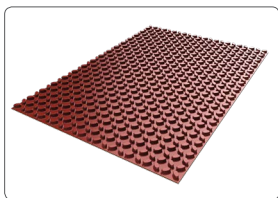


- Connect your Warmup thermostat.

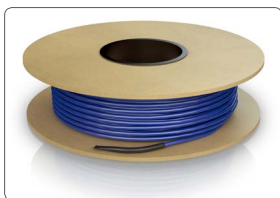




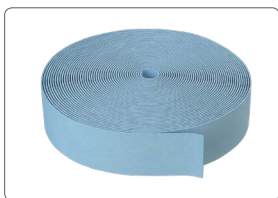
### Components available from Warmup



DCM-PRO Mat



DCM-PRO Cable



DCM-PRO Perimeter Strip



DCM-PRO Waterproofing Tape



Warmup Insulation Boards



Warmup Thermostat & Floor Sensor

### Additional components needed as part of your Warmup heating installation:

- ☒ 30mA Residual Current Device (RCD), required as part of all installations.
- ☒ Digital Multi-meter required for testing the resistance of the heater and floor sensor.
- ☒ Electrical tape to secure the floor sensor.
- ☒ Electrical housing, back boxes and junction boxes.
- ☒ Electrical trunking/conduit for housing the power leads.
- ☒ SBR based primer.
- ☒ Flexible tile adhesive & grout.



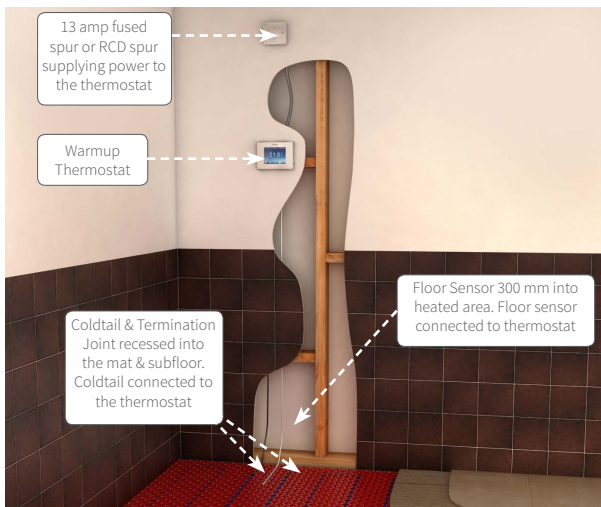


- ☒ Ensure that the control card at the back of the manual is completed and fixed at the consumer unit along with any plans and electrical test records as per the current edition of BS7671.
- ☒ Ensure that adhesives or levelling compounds used are compatible with underfloor heating and suitable for application with non porous underlayments such as the DCM-PRO mat.
- ☒ Ensure the termination and coldtail joint are within a full bed of adhesive or levelling compound directly beneath the heated floor finish.
- ☒ Ensure the heat output of the floor meets your requirements.
- ☒ Ensure that the minimum free bending radius of the heater is not less than 25 mm.
- ☒ Ensure the subfloor is fully cured and stable before commencing installation of the heater.
- ☒ Install the floor sensor centrally between two parallel runs of heating cable and away from other heat sources such as hot water pipes.
- ☒ Ensure all furniture installed over the underfloor heating has feet, creating a minimum 50 mm ventilated space beneath it to allow heat flow into the room.
- ☒ Ensure that during the course of the installation no damage is caused to the heater by falling or sharp objects.



- ☒ Cut, shorten the heating element at any time or cross the cable over another run, over coldtails or the floor sensor.
- ☒ Leave surplus heater rolled up under units or fixtures, use the correct size heater.
- ☒ Connect two heaters in series, only connect heaters in parallel.
- ☒ Attempt a DIY repair if you damage the heater, contact Warmup for assistance.
- ☒ Tape over manufactured joints or the floor sensor tip.
- ☒ Install items above the heating system which has a resistance of more than 1.5 tog, as this may cause overheating.
- ☒ Store the mat in direct sunlight. Prolonged exposure to UV radiation will alter the properties of the adhesive backing, voiding the product warranty.





## Install the RCD

Install a dedicated 30mA RCD or use an existing RCD. No more than 7.5 kW of heating may be connected to each 30 milliamp RCD. For larger loads, use multiple RCD's.

**NOTE:** It is possible to run the heater(s) from an existing circuit protected by a 30 mA RCD. It should be calculated whether or not the circuit can handle the additional load.

**NOTE:** A junction box is required if more than two heaters are being installed

**NOTE:** When conducting an insulation resistance test on the supply to the thermostat the thermostat and heaters must be isolated or disconnected.



## Zone Chart



**NOTE:** In the case of bathroom installations, electrical regulations prohibit the installation of Mains Voltage products such as thermostats, contactors, fused spurs, isolators or junction boxes, within Zones 0 or 1.

Any mains voltage product fitted within Zone 2 must have a degree of protection at least of IPX4 or IPX5 if water jets are present.

It is common to install the thermostat outside of wet rooms in the adjacent connected room in circumstances where it is not practicable to install the thermostat within the wet room.

When installed in this way, using only the floor probe to control the heating, it is not possible to directly control the air temperature, only the floor surface temperature.

**All electrical connections must conform to the current BS 7671 Wiring Regulations. Final connections to the main electricity supply MUST be completed by a Part P qualified electrician.**

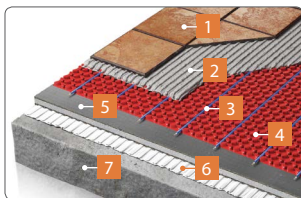




### Subfloor Preparation

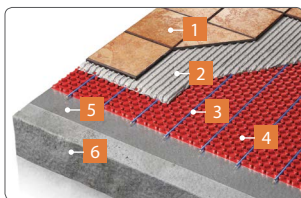
Subfloors previously covered in vinyl, cork or carpeting: all old flooring and adhesive must be removed. If there is bitumen as a damp proofing layer, it must be covered with a minimum 50 mm of sand/cement screed or overboarded with 10 mm Warmup Insulation Boards, taking care not to puncture the bitumen coating. The screed must be fully cured and dry before proceeding. If using other damp proofing or tanking systems, contact the manufacturer for advice.

### Concrete Subfloors



#### CONCRETE SUBFLOOR (Recommended)

- 1 Floor Finish
- 2 Minimum 6 mm tile adhesive or 10 mm levelling compound\*
- 3 Warmup DCM-PRO Cable
- 4 Warmup DCM-PRO Mat
- 5 Warmup Insulation Board\*\*
- 6 Flexible Tile Adhesive
- 7 Subfloor



#### CONCRETE SUBFLOOR

- 1 Floor Finish
- 2 Minimum 6 mm tile adhesive or 10 mm levelling compound\*
- 3 Warmup DCM-PRO Cable
- 4 Warmup DCM-PRO Mat
- 5 SBR Primer
- 6 Subfloor\*\*

For optimum performance it is recommended that you use Warmup® Insulation Boards beneath Warmup DCM-PRO. The insulation will improve the systems response to heating demand, saving energy and reducing running costs.

Where expansion joints are present in the subfloor, these must be preserved up through all covering layers, including insulation where installed and DCM-PRO.

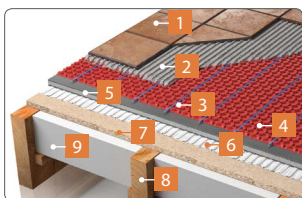
\* 6 mm minimum thinset or 10 mm levelling compound layer is measured from the top of the DCM-PRO mat. The levelling compound, when used, must be applied as a single layer. Additional layers of levelling compound must not be added.

\*\* A 3 mm layer of levelling compound is required over coarse and/or loose floors. The surface the mat is being applied to must be primed and smooth such that a clean and continuous bond can be made.



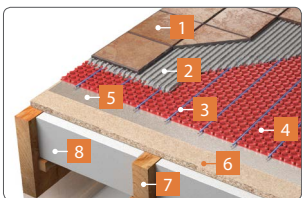
In addition to the general subfloor preparation instructions on the previous page, timber subfloors should be prepared for tiling in accordance with local tiling standards such as BS5385-3, ANSI A108 Series.

## Timber Subfloors



### TIMBER SUBFLOOR (Recommended)

- 1 Floor Finish
- 2 Minimum 6 mm tile adhesive or 10 mm levelling compound\*
- 3 Warmup DCM-PRO Cable
- 4 Warmup DCM-PRO Mat
- 5 Warmup Insulation Board\*\*
- 6 Flexible Tile Adhesive
- 7 Floor Deck
- 8 Joists
- 9 Insulation



### TIMBER SUBFLOOR

- 1 Floor Finish
- 2 Minimum 6 mm tile adhesive or 10 mm levelling compound\*
- 3 Warmup DCM-PRO Cable
- 4 Warmup DCM-PRO Mat
- 5 SBR Primer
- 6 Floor Deck\*\*
- 7 Joists
- 8 Insulation

\* 6 mm minimum thinset or 10 mm levelling compound layer is measured from the top of the DCM-PRO mat. The levelling compound, when used, must be applied as a single layer. Additional layers of levelling compound must not be added.

\*\* A 3 mm layer of levelling compound is required over coarse and/or loose floors. The surface the mat is being applied to must be primed and smooth such that a clean and continuous bond can be made.





- Ensure the subfloor is dry and smooth, such that the DCM-PRO mats adhesive will make full contact. If necessary an appropriate smoothing or levelling compound should be applied.



- Prime timber or sand and cement screeded subfloors with a dilute (1:4) SBR solution. For proprietary subfloors refer to the manufacturers instructions.



- **Recommended Step** - Install Warmup® Insulation Board over the subfloor referring to their installation instructions.

Warmup insulation boards are made of extruded polystyrene, faced on both sides with a fibreglass mesh embedded into a thin cement polymer mortar. They will help reduce the heat up times of your system for optimal performance.



- Install perimeter expansion strips within the DCM-PRO system, along any perimeter or sectional expansion joints within the subfloor to preserve their function. Remove the tape from the perimeter strip to expose the adhesive back and begin pressing it into the wall, ensuring the strip also touches the floor.

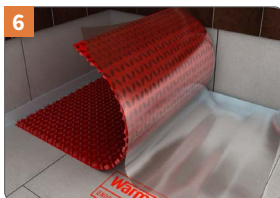
Installing the perimeter strip allows for differential movement between the finished floor level and walls.

**IMPORTANT:** When installing the DCM-PRO mat the surface the mat is being applied to must be primed and smooth, such that a clean and continuous bond can be made. If necessary an appropriate 3 mm levelling compound should be applied. Coarse and/or loose subfloor surfaces will prevent the mat from forming a continuous bond. For example; cement coated insulation boards with a raised pattern must have a levelling compound applied over.

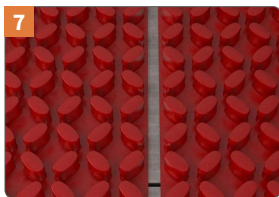




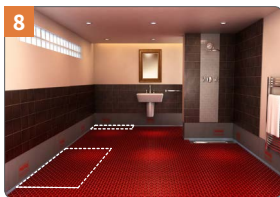
- Measure and cut a length of mat to suit your room using a utility knife and/or scissors.



- Position the mat and remove the backing from one edge/ corner and stick in position before removing the rest of the backing.



- Repeat steps 5 & 6 for subsequent runs of the mat, butting the mats together tightly until the floor area is covered, making sure to align the castellations between mat runs.
- Protect the mat with walking boards in areas of high foot traffic and under heavy loads.



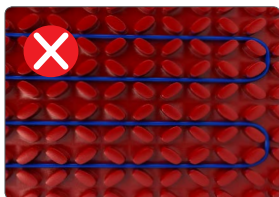
- Mark out the floor with a permanent marker showing where fixtures and other unheated areas are going to be.



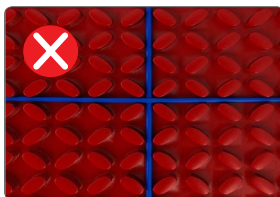


A plan of the cable layout is required as part of the control card so that any cutting or drilling after tiling will not result in injury or damage to the heater.

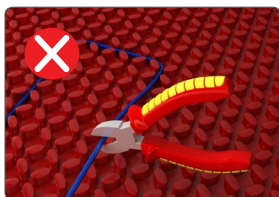
#### Before you begin



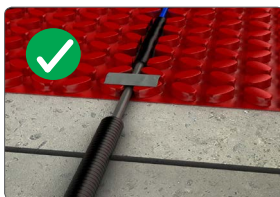
- Ensure that there is a minimum of 60 mm between parallel heating cables and they are away from the influence of other heat sources, such as heating and hot water pipes, lighting fixtures or chimneys at all times.



- When installing the cable **DO NOT** cross the cable over another run, over coldtails or the floor sensor. This will cause overheating and will damage the cable.



- The heating cable must not be cut, shortened, extended or left in a void, it must be fully installed within the layer of tile adhesive or levelling compound.



- Heating cables cannot be installed across expansion joints within the floor. Where a heated floor is divided by expansion joints, individual cables should be used to heat each area. The cold tail may cross the expansion joint within a 300 mm long conduit if necessary.

**NOTE:** The heater should not be installed on irregular surfaces such as stairs or up walls.

The standard specific heating load of the DCM-PRO system is  $150 \text{ W/m}^2$ . By adjusting the cable spacing, the installation can be customised to suit both the floor coverage and heat load requirements.

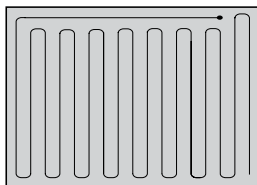
When installing the cable, maintain a spacing of half its cable to cable spacing, between itself and the perimeter or any unheated areas.



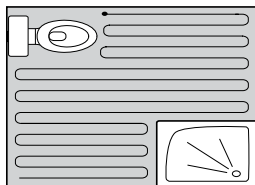
Heated area at different spacings, m <sup>2</sup>					
PRODUCT CODE	60mm	60/90mm	90mm	90/120mm	120mm
	225 W/m <sup>2</sup>	~180 W/m <sup>2</sup>	150 W/m <sup>2</sup>	~130 W/m <sup>2</sup>	112.5 W/m <sup>2</sup>
DCM-C-1	0.7	0.8	1.0	1.2	1.3
DCM-C-1.5	1.0	1.3	1.5	1.8	2.0
DCM-C-2	1.3	1.7	2.0	2.3	2.7
DCM-C-2.5	1.7	2.1	2.5	2.9	3.3
DCM-C-3	2.0	2.5	3.0	3.5	4.0
DCM-C-3.5	2.3	2.9	3.5	4.1	4.7
DCM-C-4	2.7	3.3	4.0	4.7	5.3
DCM-C-4.5	3.0	3.8	4.5	5.3	6.0
DCM-C-5	3.3	4.2	5.0	5.8	6.7
DCM-C-6	4.0	5.0	6.0	7.0	8.0
DCM-C-7	4.7	5.8	7.0	8.2	9.3
DCM-C-8	5.3	6.7	8.0	9.3	10.7
DCM-C-9	6.0	7.5	9.0	10.5	12.0
DCM-C-10	6.7	8.3	10.0	11.7	13.3
DCM-C-12	8.0	10.0	12.0	14.0	16.0
DCM-C-14	9.3	11.7	14.0	16.3	18.7
DCM-C-16	10.7	13.3	16.0	18.7	21.3

### Example installation diagrams

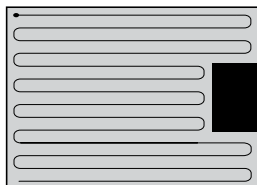
#### Standard room



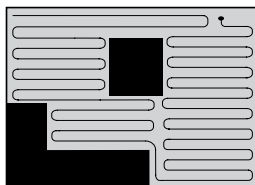
#### Bathroom



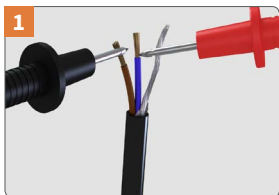
#### Room with recesses



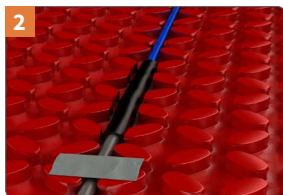
#### Kitchen



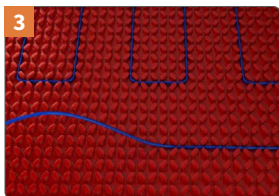




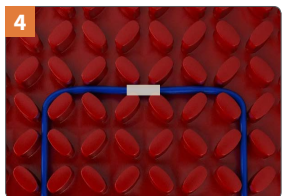
- Measure and record the resistance of the heating cable in the “Resistance Before” column of the control card, supplied as part of this installation guide.
- Stop installation immediately and contact Warmup if its resistance falls outside the range set out in the Reference Resistance Band table.



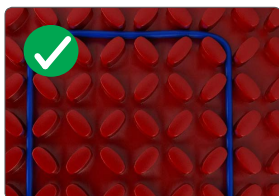
- Place the coldtail on the floor. Cut a section in the mat for the manufactured joint so that it sits at the same height as the heater.
- Secure the cold tail using tabs of electrical tape as necessary. **DO NOT** tape over the manufactured joint or heating cable. These must be fully embedded within the tile adhesive or levelling compound being laid over.



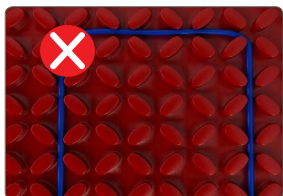
- Begin laying the heating cable, pressing it between the castellations.
- Follow the installation layout created in Step 4 to complete the cable placement.
- **DO NOT** install the heating cable in temperatures less than  $-10^{\circ}\text{C}$ .



- The DCM-PRO cable has a marker at its midpoint. When you reach it, review your progress up to that point and check that you are correctly spacing the cable, ensuring that you will have covered the whole of the heated area when you reach the end of the cable.

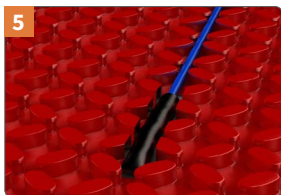


- Install the cable as shown, following the circular pattern within the castellations.

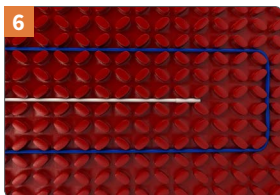


- **DO NOT** install the cable by bending it around the points of the castellations.

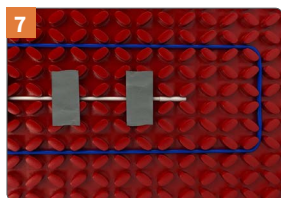




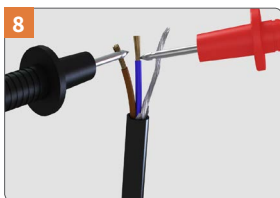
- At the end of the heating cable, you will find a termination joint. As with the manufactured joint at the beginning of the heating cable, this joint will have to be cut into the mat so that it sits at the same height as the heater.
- **DO NOT** tape over the termination joint, it must be in direct contact and fully embedded within the tile adhesive or levelling compound being laid over the heating cable.



- Install the floor sensor at least 150 mm into the heated area it will be controlling. It should be located centrally between parallel runs of heating cable and not in an area influenced by other heat sources.
- If the heating cable is installed at multiple spacings, then the sensor should be installed centrally between the narrowest parallel run.



- Measure the resistance of the floor sensor and record it in the control card. If it's resistance is outside the prescribed range contact Warmup.
- **DO NOT** tape over the floor sensor tip it must be in full contact with the heated tile adhesive or levelling compound.



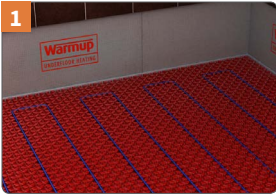
- Measure the resistance of the heating cable and verify it is still in line with the Resistance Before reading previously taken.
- Stop installation immediately and contact Warmup if its resistance has changed significantly or if it falls outside the range set out in the Reference Resistance Band table.





There are instances where waterproofing will be required, such as in wetrooms, where there will be significant exposure to water.

If using a proprietary waterproofing system, a levelling compound should first be laid over the Warmup DCM-PRO system to provide a finished surface to install over. Follow the steps below when using the Warmup DCM-PRO waterproofing products to waterproof the installation:



- Cut the perimeter strip to the same level as the DCM-PRO mat.



- Apply a suitable waterproof adhesive to the mat, walls and penetrations through the mat 100 mm either side of the joint, ensuring there are no gaps or voids.

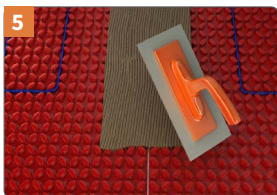


- Cut a length of Warmup tape to suit and press into the levelling compound using a trowel, removing any air gaps or creases.

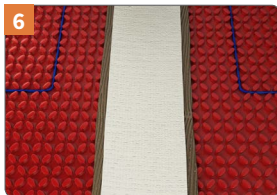


- Reapply the removed portion of the perimeter strip over the top of the Warmup tape flush with the floor.





- To waterproof the joints between mat runs and over the cable joints, apply a layer of waterproof adhesive, 100 mm either side of the joint, making sure the cavities of the mat are fully filled.



- Cut a length of Warmup tape to suit and press into the levelling compound using a trowel, removing any air gaps or creases.

**NOTE:** Where joints are required, overlap the tape by 100 mm bonding the two lengths together with a layer of adhesive.

**NOTE:** At the manufactured joint, the termination joint or anywhere that you have damaged or pierced the mat, cover the penetration with adhesive and cover with Warmup tape.

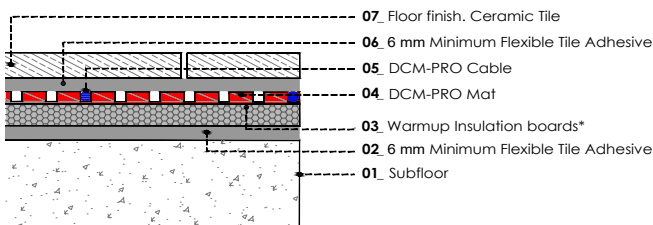




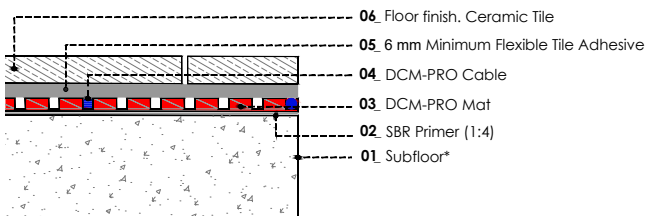
Before installing any floor finish, adhesive or levelling compound over DCM-PRO, the installation requirements of each must be checked to ensure compatibility with underfloor heating and plastic decoupling membranes.

Where used, levelling compounds must be suitable for single pour installation depths of at least 10 mm to 15 mm, measured from the top and bottom of the castellations respectively.

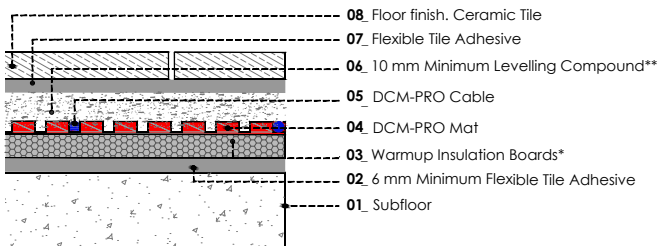
## Tiled Floor Finish - With Warmup Insulation Boards



## Tiled Floor Finish - Without Warmup Insulation Boards



## All Floor Finishes - With Levelling Compound and Warmup Insulation Boards



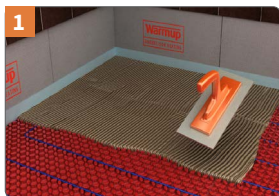
\* When installing the DCM-PRO mat, the surface the mat is being applied to must be primed and smooth such that a clean and continuous bond can be made. If necessary an appropriate 3 mm levelling compound should be applied. Coarse and/or loose subfloor surfaces will prevent the mat from forming a continuous bond. For example; cement coated insulation boards with a raised pattern must have a levelling compound applied over.

\*\*This method can be used to create a floor surface suitable for most floor finishes and when forming a drainage slope within a wetroom. The levelling compound, when used, must be applied as a single layer. Additional layers of levelling compound must not be added.

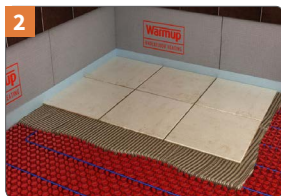


Underfloor heating performs the most efficiently with conductive, low resistance floor finishes such as stone and tiles. The maximum thermal resistance of the floor should not exceed 0.15 [m<sup>2</sup>K/W].

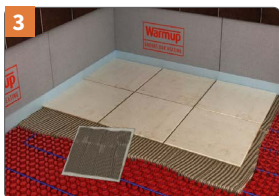
## Tiled Floors



- Cover the installation with a full bed of flexible tile adhesive using a notched trowel. Take care not to damage or dislodge the heating cable. If using tiles smaller than 90 mm cover the installation with a levelling compound first.



- Carefully lay the tiles and press into the adhesive bed.



- After laying the first tile remove and ensure the tile is getting a full coverage of adhesive from your application.
- Ensure the width of the grout line is in line with the manufacturers instructions for the size and type of tile being used. Tiles must not be removed once the adhesive has set, doing so will damage the heater.



- Grout the floor as soon as possible as per the ceramic tile adhesive manufacturer's instructions. **DO NOT** switch on the heater until the tile adhesive and grout has fully cured. **DO NOT** use the heater to accelerate the drying process of the adhesive or levelling compound.

**NOTE:** If using tiles smaller than 90 mm<sup>2</sup> you **MUST** cover the installation with levelling compound first.

**NOTE:** Please ensure that the tile adhesive used is compatible with underfloor heating and suitable for application onto non porous materials such as the DCM-PRO Mat.





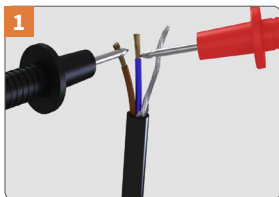
### Other Floor Coverings



If you are planning to install wood, carpet or vinyl over the heater lay a minimum 10 mm levelling compound over the heater. You must ensure that all heating cables are completely covered. It is important that the levelling compound is suitable for use with underfloor heating.

**NOTE:** Before installing the floor finish its suitability for use with underfloor heating and its maximum operating temperature should be checked against required operating conditions.

### Final Steps



When the tiles or levelling compound has been installed, conduct another resistance test to ensure the sensor and heater have not been damaged and record in the control card.



The perimeter strip should be cut flush with the tiles or levelling compound using a utility knife once complete.

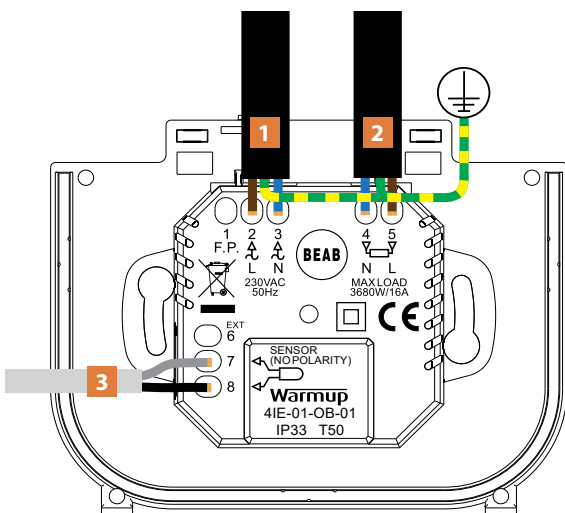


## Install the thermostat in accordance with its installation instructions

Instructions for fitting Warmup® Thermostats can be found inside the thermostat box. The thermostat should be connected to the main electrical supply via a fuse, circuit breaker or 'double pole isolator' in accordance with the wiring regulations.

The heater power cable consists of conductors coloured brown (live), blue (neutral) and earth braid. If you are installing more than one heater a junction box will be required. These should be connected in accordance with current wiring regulations by a qualified Part P electrician.

## Typical Warmup Thermostat Wiring Diagram



### THERMOSTAT WIRING

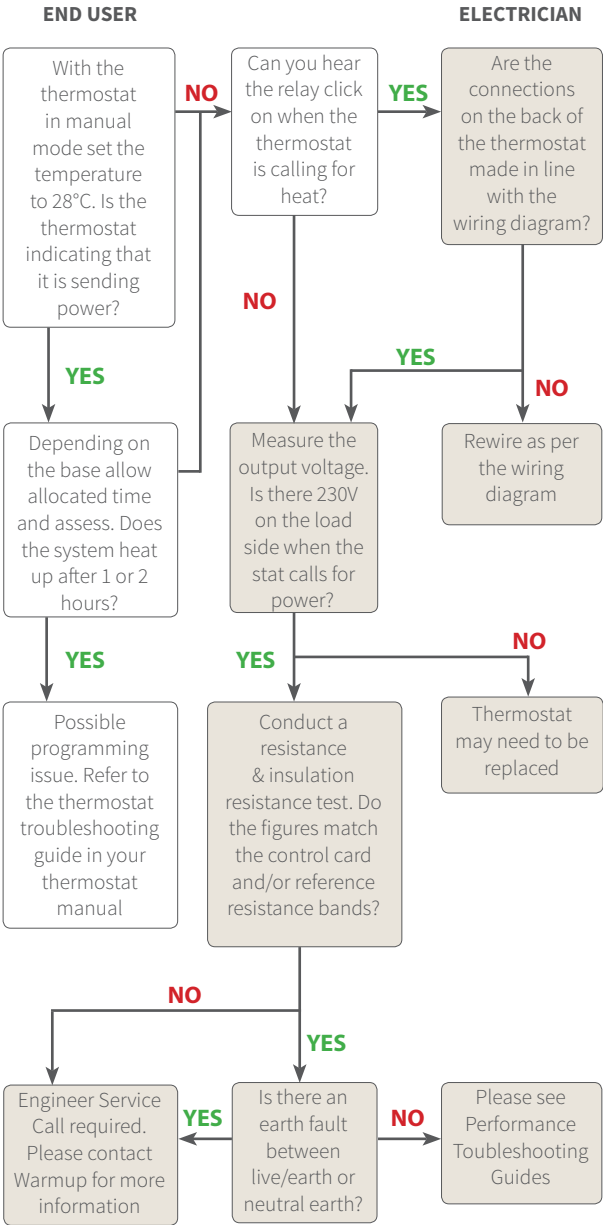
- 1 Power Supply Cable 230 V AC**  
Wired via 30 mA RCD spur supplying power to thermostat
- 2 Heaters (16 amp 3,680 W max.)**  
Over 16 amps a contactor will have to be installed
- 3 Floor Sensor (No Polarity)**





HEATING ISSUE 1 - The floor does not heat up

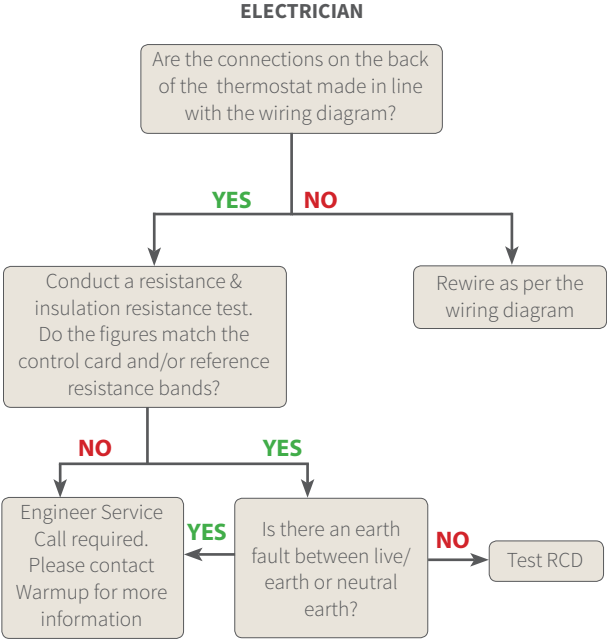
Instructions which are shaded grey must completed by a qualified electrician





HEATING ISSUE 2 - The heater trips the RCD

Instructions which are shaded grey must completed by a qualified electrician







## *My floor is getting too hot*

- 1. The floor temperature settings on the thermostat may be incorrect.**

*Check the thermostat settings ensuring that it is controlling the floor surface temperature and that the set target and limiting temperatures are correct.*

- 2. The floor sensor may be poorly positioned, if so the thermostat will be displaying a floor temperature that is not indicative of the floor surface temperature.**

*Recalibrate the floor sensor in the thermostat settings.*

- 3. The thermostat may be set in regulator mode with the duty cycle set too high.**

*If the thermostat cannot be set to reference a floor sensor, reduce the regulation value to its minimum selectable value. With the heating active, incrementally increase the setting at an hourly interval until the required floor surface temperature is achieved.*

## *My floor does not get up to temperature*

- 1. Underfloor Heating is normally designed to heat floors to up to 9°C above the design room air temperature, which is typically 29°C. Delicate floor finishes, such as vinyl and some timbers, may be limited to 27°C. Our hand and foot temperature is normally similar to this, at around 29 - 32°C, so the heated floor will feel slightly cooler than touching your own hands together.**

*If you wish to raise the floor temperature, such that it feels warm, it is permissible to set it up to 15°C higher than the design room air temperature. The higher heat output of the floor may overheat the room, making it uncomfortable. The manufacturer of the floor finish should be consulted to ensure compatibility with the chosen temperature before making any changes to the thermostat settings.*

- 2. Refer to points 1, 2 & 3 in the “My floor is getting too hot” above, as each issue can also be the cause of under heating a floor.**

- 3. If the thermostat is controlling the heating using the air temperature, with a floor temperature limit then the floor may be turned off before it reaches its limit.**

*This is normal as the thermostat is preventing the room air temperature from becoming overheated.*



*My floor does not get up to temperature*

**4. The heating system may be uninsulated. If the heater has not been installed over a layer of Warmup Insulation Boards, it will be actively heating the subfloor as well as the floor finish. The warm up period of the floor will therefore be slower as the system is heating a much greater mass. It could take several hours if it is installed directly on a thick layer of uninsulated concrete.**

*If your thermostat has an optimised start feature, ensure it is enabled so that the thermostat can compensate for the mass of the floor. If your thermostat does not have an optimised start feature, measure the time taken for the floor to warm up and adjust the heating start time to compensate.*

**5. The heat output of the installed system may not be sufficient. The system will require a power output of approximately 10W/m<sup>2</sup> for every degree warmer you require the floor to be than the air. This is in addition to any heat loss downwards through the subfloor.**

*If the room air temperature is also lower than desired, supplementary heating may be required to overcome the room heat losses.*

*If access is available to the underside of the subfloor, installing insulation within the floor will reduce the amount of heat lost through the floor.*

**6. Floor coverings such as carpets, underlays and timber are thermally resistive and will reduce the achievable floor surface temperature. They may also require the floor sensor to be recalibrated.**

*Floor finish combinations with a thermal resistance of more than 0.15m<sup>2</sup>K/W or 1.5 tog are not recommended and we recommend that you look to fit a less resistive floor finish. Floor finish combinations with a thermal resistance of more than 0.25m<sup>2</sup>K/W or 2.5 tog are not permitted.*

*I am getting patchy heat across my floor*

**1. If the subfloor varies across the floor, the amount of heat absorbed by it and lost through it will affect the floor surface temperatures differently above each case.**

**2. If the floor covering over the underfloor heating changes, each floor finishes characteristics will affect the warm up period and the achievable surface temperature.**

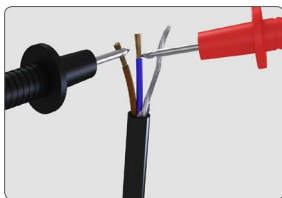
**3. Hot water pipes under the floor could cause parts of the floor to seem warmer than others.**

**4. Irregularly spaced cables will cause the floor to be warmer above the closer cables and cooler where the cables are spaced further apart.**





The heaters and floor sensors must be tested before they are laid, once they have been laid but before the tiles or levelling compound has been laid and again before they are connected to the thermostat. The resistance (ohms) of each heater should be measured. You should carry out the following tests and should expect the results detailed below:



### • Heating Cable Resistance Test

Set a multimeter or ohmmeter to record resistance in the range of 0-500Ω. Measure the resistance across the live (brown) and neutral (blue) wires. Ensure the measured resistance is within the Reference Resistance Band for the cable size being tested.

Record the readings on the control card in line with the installation procedure.

### • Earth Fault Check

Set a multimeter or ohmmeter to record resistance in the range of 1MΩ or greater if available. Measure the resistance across the live (brown) and neutral (blue) wires to the earth braid wire.

Ensure the measured resistance is showing as greater than 500MΩ or infinite if the meter cannot read this high.

### *Insulation resistance test*

Set an insulation resistance tester to 500VDC. Measure the resistance across the live (brown) and neutral (blue) wires to the earth braid wire. Ensure the measured resistance is showing greater than 500MΩ to indicate a pass.

**NOTE:** Due to the high resistance of the heating element, it may not be possible to get a continuity reading from the heating cable and as such, continuity testers are not recommended. When checking resistance, make sure your hands do not touch the meter's probes as the measurement will include your internal body resistance and render the measurement inaccurate. If you do not get the expected results or at any time you believe there may be a problem, please contact Warmup's Technical Team for guidance.

## Floor Sensor

Ensure that the floor sensor is tested before the final floor finish has been laid. The floor sensor values can be found in the thermostat instructions. When testing the floor sensor ensure that the meter can read up to 20kΩ. Warmup thermostats use a 10kΩ floor sensor @ 25°C. For temperatures between 20°C and 30°C the resistance of the floor sensor should measure between 8kΩ and 12kΩ.



**NOTE:** Draw a plan showing the layout and location of the heating cable(s)

A large grid for drawing a layout plan. The grid is composed of 15 columns and 30 rows of squares, forming a rectangular area for drawing.





Heater Location

.....  
.....

Total Wattage

.....

WARNING

Radiant Floor Heating  
Systems - Risk of  
electric shock



Electric-wiring and heating panels  
contained within the floor. DO NOT  
penetrate with nails, screws, or similar  
devices. DO NOT restrict the thermal  
emission of the heated floor.

ATTENTION:

DO NOT cut or shorten the heating element.

Ensure that the entire heating element(s) including the joints  
are installed within the layer of tile adhesive or levelling  
compound. DO NOT tape over the joints or heating cable as this  
may insulate them, causing them to fail. The heating element  
must be used in conjunction with a 30mA RCD.

Heater Model	Resistance Before	Resistance After	Insulation Resistance (Pass)	Floor sensor resistance

.....

Date                      Signed                      Company stamp/name

This form must be completed as part of the Warmup Guarantee.  
Ensure that the values are as per the instruction manual.

This card along with a plan showing the heater layout must be  
situated close to the consumer unit in a visible place.

Warmup Plc 702 & 704 Tudor Estate Abbey Road  
London NW10 7UW

T: 0345 345 2288 F: 0345 345 2299 [www.warmup.co.uk](http://www.warmup.co.uk)











Warmup® Underfloor Heating is guaranteed by Warmup plc ("Warmup") to be free from defects in materials and workmanship under normal use and maintenance, and is guaranteed to remain so subject to the limitations and conditions described below. The DCM-PRO Cable is guaranteed for the LIFETIME of the floor covering under which it is fitted when installed in combination with the DCM-PRO Mat, except as provided below (and your attention is drawn to the exclusions listed at the end of this guarantee). If installed separately DCM-PRO Cable is guaranteed for 10 Years. The DCM-PRO Mat is guaranteed for 5 Years.

### **This Lifetime guarantee applies:**

1. Only if the unit is registered with Warmup within 30 days after purchase. Registration can be completed online at [www.warmup.co.uk](http://www.warmup.co.uk). In the event of a claim, proof of purchase is required, so keep your invoice and receipt - such invoice and receipt should state the exact model that has been purchased;
- &
2. Only if the heater has been earthed and protected by a Residual Current Device (RCD) at all times.

All Warmup warranties are voided if the floor covering over the Warmup heater(s) is damaged, lifted, replaced, repaired or covered with subsequent layers of flooring. The warranty period begins on the date of purchase. During the period of the guarantee Warmup will arrange for the heater to be repaired or (at its discretion) have parts replaced free of charge or issue a refund for the product only. The cost of the repair or replacement is your only remedy under this guarantee which does not affect your statutory rights.

Such cost does not extend to any cost other than direct cost of repair or replacement by Warmup and does not extend to costs of relaying, replacing or repairing any floor covering or floor. If the heater fails due to damage caused during installation or tiling, this guarantee does not apply. It is therefore important to check that the heater is working (as specified in the installation manual) prior to tiling.

WARMUP PLC SHALL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO EXTRA UTILITY EXPENSES OR DAMAGES TO PROPERTY.

### **WARMUP PLC is not responsible for:**

1. Damage or repairs required as a consequence of faulty installation or application.
2. Damage as a result of floods, fires, winds, lightening, accidents, corrosive atmosphere or other conditions beyond the control of Warmup plc.
3. Use of components or accessories not compatible with this unit.
4. Products installed outside the United Kingdom.
5. Normal maintenance as described in the installation and operating manual, such as cleaning thermostat.
6. Parts not supplied or designated by Warmup.
7. Damage or repairs required as a result of any improper use, maintenance, operation or servicing.
8. Failure to start due to interruption and/or inadequate electrical service.
9. Any damage caused by frozen or broken water pipes in the event of equipment failure.
10. Changes in the appearance of the product that does not affect its performance.





SafetyNet™ Installation Guidelines: If you make a mistake and damage the new heater before laying the floor covering, return the damaged heater to Warmup within in 30 days along with your original dated sales receipt. WARMUP WILL REPLACE ANY PRE-TILED HEATER (MAXIMUM 1 HEATER) WITH ANOTHER HEATER OF THE SAME MAKE AND MODEL - FREE.

**Register your Warmup® warranty online at  
[www.warmup.co.uk](http://www.warmup.co.uk)**

- (i) Repaired heaters carry a 5 year warranty only. Under no circumstances is Warmup responsible for the repair or replacement of any tiles / floor covering which may be removed or damaged in order to affect the repair.
- (ii) The SafetyNet™ Installation Guarantee does not cover any other type of damage, misuse or improper installation due to improper adhesive or subfloor conditions. Limit of one free replacement heater per customer or installer.
- (iii) Damage to the heater that occurs after tiling, such as lifting a damaged tile once it has set, or subfloor movement causing floor damage, is not covered by the SafetyNet™ Guarantee.





## TECHNICAL SPECIFICATIONS - DCM-PRO MAT

THICKNESS	5.5 mm
COMPOSITION	POLYPROPYLENE MEMBRANE WITH SELF-ADHESIVE BACKING
COLOUR	RED
SPACING	60 mm, 90 mm & 120 mm

## TECHNICAL SPECIFICATIONS - DCM-PRO CABLE

OPERATING VOLTAGE	230 V AC: 50 Hz
IP RATING	IPX7
COLOUR	BLUE
THICKNESS	4.5 mm (+/- 0.2 mm)
OUTPUT RATING	150 W/m <sup>2</sup> (3 CASTELLATIONS - 90 mm)
INNER INSULATION	ETFE
OUTER INSULATION	PVC
MIN. TEMPERATURE INSTALLATION	-10 °C
CONNECTION	3 m LONG "COLDTAIL" CONNECTION

## DCM-PRO-ADDITIONAL COMPONENTS

PRODUCT CODE	PRODUCT DESCRIPTION	LENGTH (Varies)	WIDTH (mm)	HEIGHT (mm)	THICKNESS (mm)
DCM-E-25	PERIMETER STRIP	25 m	-	30 mm	10 mm
DCM-T-50	WATERPROOFING TAPE	50 m	-	120 mm	1 mm
DCM-R-I	INTERNAL CORNER	120 mm	120 mm	60 mm	1 mm
DCM-R-E	EXTERNAL CORNER	120 mm	120 mm	60 mm	1 mm



## Cable size guide

DCM-PRO CABLE					REFERENCE RESISTANCE BANDS (Ω)
PRODUCT CODE	HEATED AREA (m²)	POWER (W)	LOAD (A)	RESISTANCE (Ω)	
DCM-C-1	1	150	0.7	352.7	335.0 - 370.3
DCM-C-1.5	1.5	225	1.0	235.1	223.3 - 246.9
DCM-C-2	2	300	1.3	176.3	167.5 - 185.1
DCM-C-2.5	2.5	375	1.6	141.1	134.1 - 148.2
DCM-C-3	3	450	2.0	117.6	111.7 - 123.5
DCM-C-3.5	3.5	525	2.3	100.8	95.8 - 105.8
DCM-C-4	4	600	2.6	88.2	83.8 - 92.6
DCM-C-4.5	4.5	675	2.9	78.4	74.5 - 82.3
DCM-C-5	5	750	3.3	70.5	67.0 - 74.0
DCM-C-6	6	900	3.9	58.8	55.9 - 61.7
DCM-C-7	7	1050	4.6	50.4	48.0 - 52.9
DCM-C-8	8	1200	5.2	44.1	42.0 - 46.3
DCM-C-9	9	1350	5.9	39.2	37.2 - 41.2
DCM-C-10	10	1500	6.5	35.3	33.5 - 37.1
DCM-C-12	12	1800	7.8	29.4	27.9 - 30.9
DCM-C-14	14	2100	9.1	25.2	23.9 - 26.5
DCM-C-16	16	2400	10.4	22.0	20.9 - 23.1

**NOTE:** Warmup thermostats use a 10kΩ floor sensor. The expected resistance is:

10kΩ at 25°C,  
12.1kΩ at 20°C,  
14.7kΩ at 15°C.



**Warmup plc**

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5265707. E & OE.



**Electric**  
Heating System

[www.warmup.co.uk](http://www.warmup.co.uk)





# Installation Guide:

## for the Warmup 3iE Programmable Thermostat

**Warmup**<sup>®</sup>

The world's **best-selling** floor heating brand™

### Introduction:

The 3iE thermostat is designed to aid in the comfort of your home by providing timed regulation of your Warmup underfloor heating system. The thermostat is designed to receive temperature input signals from the following sensors:

1. Air sensor located inside thermostat
2. Floor sensor installed in floor to be heated (see Warmup heater instructions for details)
3. Optional 2nd sensor (either installed in floor or outside house)
  - Installed in floor: This is to be used if the floor surface area is very large and delicate to overheating. The reading from this secondary floor sensor will be used to monitor the overheat limit.
  - Installed outside house: The 2nd floor sensor will engage weather compensation. Weather compensation saves energy by delaying the start of heating period by 10 minutes if the difference between internal and external temperature is less than 5°C.

The thermostat is not a safety device and should only be used with Warmup heating products. In order to avoid damaging your flooring the correct floor type should be selected during the thermostat programming process.

### Electrical Specification:

- Supply voltage: 230V +/-15% at 50Hz
- Thermostat is not designed for use with intermittent power supply.
- Maximum Switch Load: 16A resistive
- Insulation Class : II
- Housing : IP20 (IP32 when used with gasket- see fitting instructions)
- Standards: EN60730-1 & EN60730-2-9 standards

### WARNING – Important safety note

This product uses mains voltage electricity and work should only be carried out by a qualified electrician. You should always isolate the power supply before attempting to install or repair the 3iE thermostat. The thermostat should not be put into operation unless you are certain that the entire heating installation complies with current general safety requirements for electrical installations. Electrical installation to be in accordance with latest IEE Wiring Regulations and appropriate Statutory Regulations.

### Location of Thermostat:

The thermostat should be installed inside a single gang electrical wall box that is at least 35mm deep. For optimal performance the thermostat should be located in an area with good ventilation. It should not be beside a drafty window/door, in direct sunlight or above another heat generating device (e.g. radiator or TV).

In most bathroom installations the thermostat cannot be located within the bathroom itself as the thermostat is IP20 rated and must be located outside of Zone 2. In such cases the thermostat must be fitted to the outside of an internal wall of the bathroom using the floor sensor to regulate the temperature.

The thermostat is designed for operation between 0°C and 55°C with relative humidity less than 80%.

### Location and installation of floor sensor:

The optimum location of the floor sensor is described in each Warmup heater installation manual. Refer to that manual when selecting floor sensor location.

The floor sensor provided with the 3iE thermostat enables accurate temperature control of the floor heating system. Floor sensors are required to regulate electric underfloor heating systems. It is recommended that floor sensors are also fitted with hydronic underfloor heating systems, providing improved floor temperature control.

The floor sensor must be at least 300mm from the wall and should be placed centre of two heating element runs. When positioning the floor sensor avoid placing the sensor in areas where it may be exposed to sunlight or draughts. Avoid areas where there are hot water pipes that may affect the temperature reading.

As the warranty does not cover the floor, it is recommended that the floor sensor is installed into a non-conductive conduit. This will allow for easy replacement of sensor after the flooring has been laid.

Make sure the conduit has a gradual bend when it enters floor, this will ensure the sensor cable can be easily inserted or withdrawn. Seal the end with tape to prevent adhesive/screed from entering the conduit. Route the conduit to the connection box. The end of the conduit should be easily accessible after the flooring has been fixed.

Warning: Do not attempt to cut conduit with sensor installed. This could lead to irreparable damage to your sensor.



## Installation:

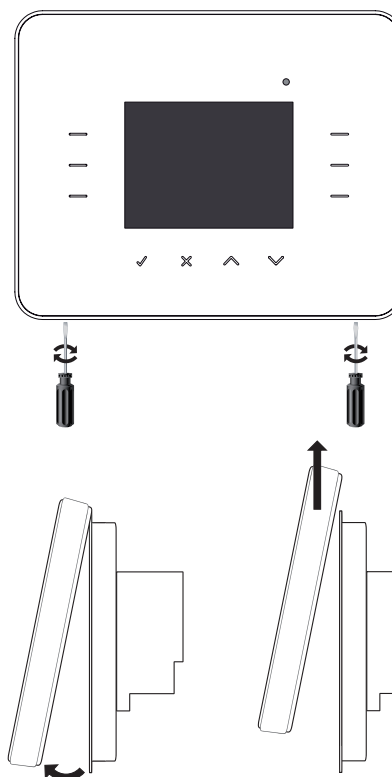
Separate the front housing of thermostat from wall module:

1. Unscrew both closing screws (bottom of stat) until they will not turn any further.
2. Release front housing by gripping lower half of outer frame and pulling outwards then upwards
3. Place front housing somewhere safe
4. Run all wires to the wall box. Check to ensure that you have included the following:
  - Power (Live and Neutral)
  - Heater (Live and Neutral)
  - Floor sensor
  - Fil pilote (if necessary)
  - External/ 2nd floor Sensor (if necessary)
5. Pull wires through wall box and complete terminal wiring.

**IMPORTANT:** Ensure that multi stranded wires are fully inserted into the terminals and secured tightly. Any loose strands should be trimmed as they could cause a short-circuit.

If connecting more than two heaters, an electrical junction box will be required.

**NOTE:** Always ensure that the sensor cable is installed in a separate conduit to the power cables supplying the thermostat and heating system.



### Normal electrical installation (see numbering on diagram to right)

2. Connect to Power Supply (Live – 230V AC)
3. Connect to Power Supply (Neutral – 230V AC)
4. Connect to Warmup heater(s) (Neutral – MAX 3600W/ 16 Amps)
5. Connect to Warmup heater(s) (Live – MAX 3600W/ 16 Amps)
7. Connect to 1st wire of floor sensor (colour not important)
8. Connect to 2nd wire of floor sensor (colour not important)

### Special installations:

(should only be performed under the supervision of Warmup)

#### Fil Pilote installation: (only for use in France)

Connect fil pilote (F.P.) to terminal 1

#### Second sensor installation: (2nd floor probe or exterior probe)

You are able to attach a second sensor to terminals 6 and 7. You can then use external sensor function to define the use of that sensor:

- Installed in floor: This is to be used if the floor surface area is very large and delicate to overheating. The reading from this secondary floor sensor will be used to monitor the overheat limit.
- Installed outside house: 2nd floor sensor will engage weather compensation. Weather compensation saves energy by delaying the start of heating period by 10 minutes if the difference between internal and external temperature is less than 5°C.

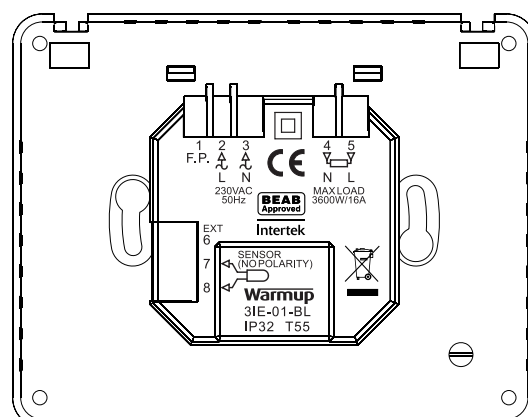
#### Master/Relay installation: (connecting 2 stats together)

This feature allows you to use one thermostat to control another. This is useful if you need to control multiple underfloor heating elements with one program.

Use low voltage electric cable to connect terminal 6 on the “master” to terminal 6 on the “relay”

Use low voltage electric cable to connect terminal 7 on the “master” to terminal 7 on the “relay”

On the “master” thermostat these connector cables are in addition to the floor sensor but on the “relay” thermostat the floor sensor is not necessary. The “relay” thermostat will no longer use its sensors for thermal regulation. It will now turn on/off in tandem with the “master” thermostat.

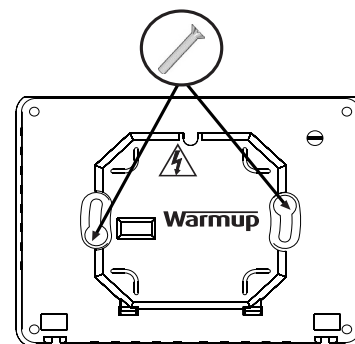






## Mounting thermostat into the wall box:

1. Push excess wire back through the wall box and insert thermostat back module into wall box.
2. Put fixing screws through mounting holes and tighten.
3. Ensure that thermostat is straight before tightening completely.
4. Replace thermostat front housing;
  - i) align and sit front housing on to hinges,
  - ii) push lower half of front housing until a 'click' is heard.
5. Ensure front housing is securely fixed.
6. **IMPORTANT:** Tighten both retaining screws



## Powering-up:

You can now power up the thermostat and begin the programming process. An easy to follow menu will guide you through the rest. If you want to turn on / off the thermostat and heating system then hold down the recessed button on the bottom of the stat for 3 seconds

When you have ensured that both the floor sensor and heating elements are working correctly you can complete the installation of floor covering and remove the protective cover on the front of the thermostat.

## Error Messages:

Your thermostat can give you two error indications:

1. "er1": This will occur if no floor sensor is detected
2. "er2": This will occur if the floor sensor has a short circuit

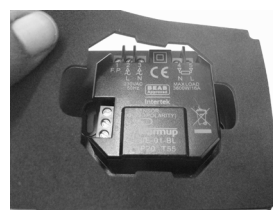
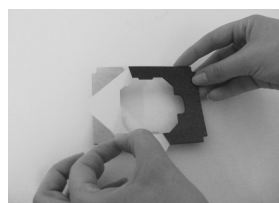
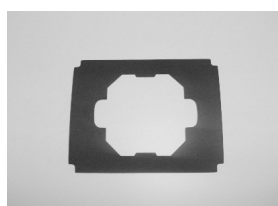
## Using the Gasket with the 3iE

The 3iE has a Ingress Protection rating of IP20 but this rating can be increased when used in conjunction with the Gasket (supplied separately), in which case it is ingress Protection rated to IP32 but only when used in accordance with these instructions.

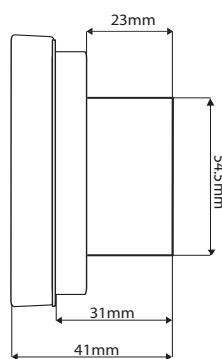
### Fitting the Gasket

Remove backing from seal and attach to the back of the thermostat ensuring that there is a tight bond between the seal and the back of the thermostat.

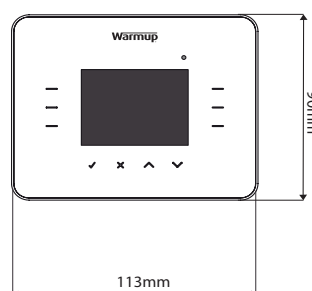
Once fitted do not remove or attempt to refit the seal as this may affect the protection against ingress of water if the not fixed correctly.



## Dimensions :



Dimensions (mm)







## Installer's Notes:

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**Disposal**  
Appliances with this symbol must not be disposed of with general waste. Seek guidance from you local government or the retailer where you purchased the product.