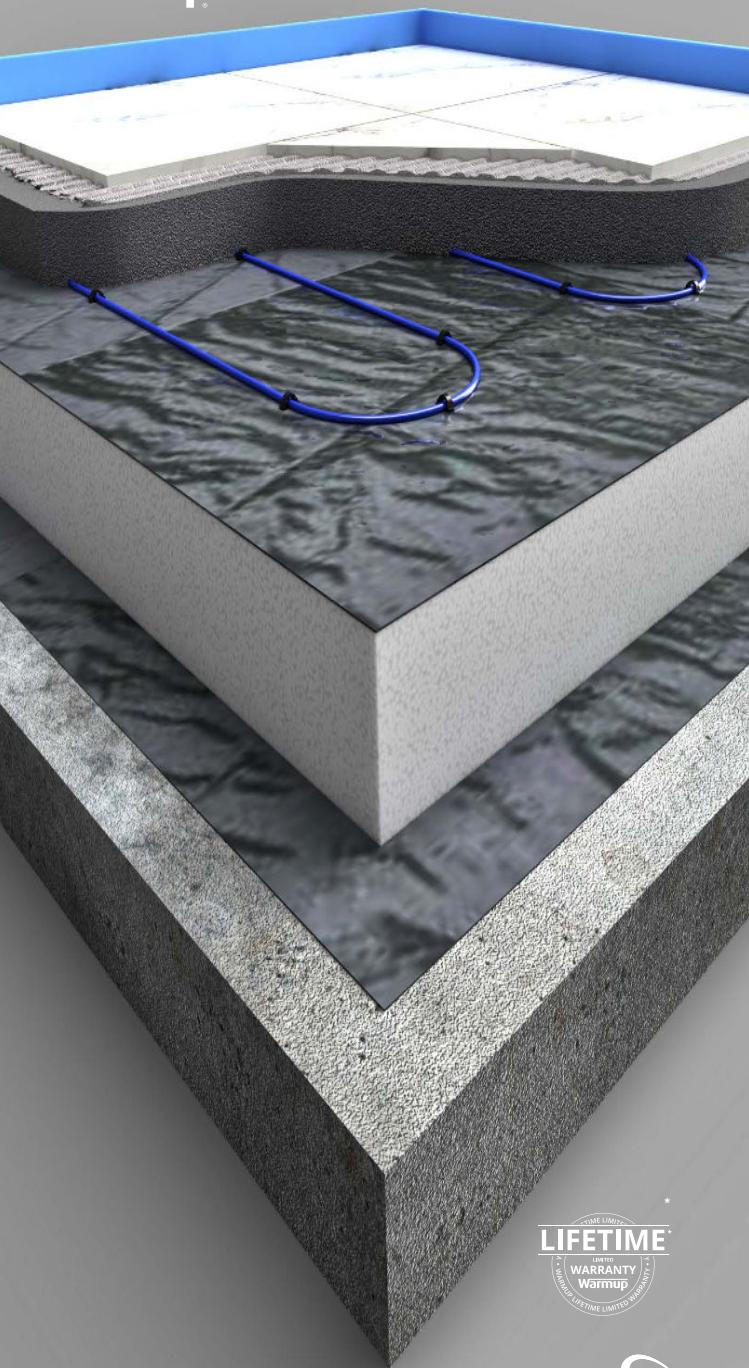


Warmup®



Warmup Inscreen
Installation manual

SAFETYNet™
Installation-Guarantee

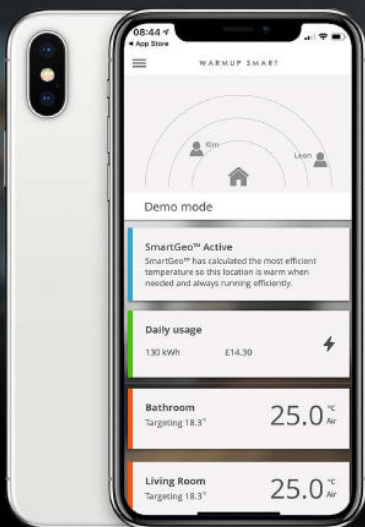


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Unique **SmartGeo™** automatically turns down the heating when you're out.



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Warmup heating systems have been designed so that installation is quick and straight forward, but as with all electrical systems, certain procedures must be strictly followed. Please ensure the correct number of heater(s) has been specified for the area you wish to heat. Warmup plc, the manufacturer of the Warmup Inscreed cable 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, there should be no problems. If assistance is required, please contact our helpline.

There is other helpful information on our website:

www.warmup.co.uk

Installation summary

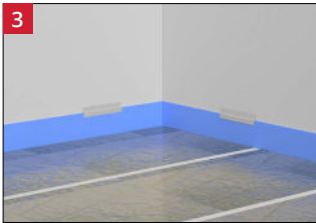
Please also read the full instructions that follow this section.



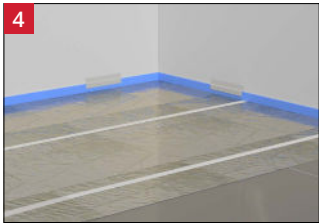
- Make electrical provision for the heater (30 mA RCD, overcurrent protection, 35 mm deep electrical back boxes, trunking).



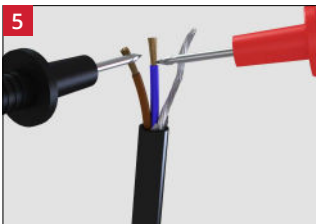
- The subfloor must be clean, level, smooth, dry, frost-free, solid, suitably weight-bearing and dimensionally stable.



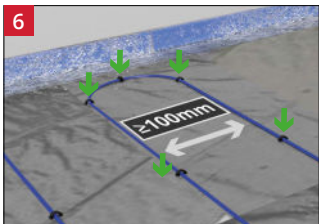
- Lay a damp proof membrane over the subfloor to prevent water ingress.
- Install perimeter strip around the perimeter of the room to allow for differential movement between finished floor level and walls.



- Lay insulation board over the membrane. Insulation should be chosen and installed in line with building regulations.
- Lay a vapour control layer over the insulation to prevent water ingress.

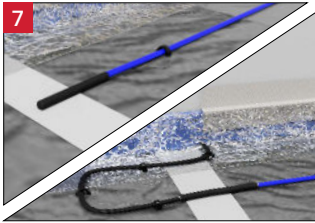


- Test and record the resistance of the heating cable ensuring it is within the range set out in the reference resistance band table.

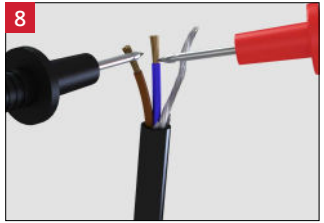


- Begin laying the Warmup Inscreeed cable, at the necessary cable to cable spacing for the heat output required. Push the supplied clips, at 300 mm intervals, through the vapour control layer to secure the cable to the insulation layer.
- The heating cable must be installed at no less than 100 mm intervals.
- Install the floor sensor centrally between the two closest parallel runs of heating cable.

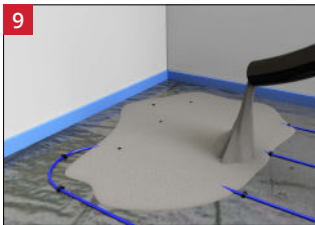
Installation summary



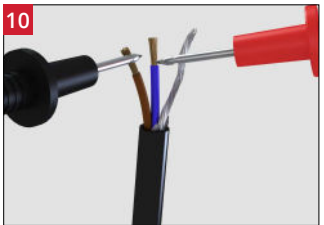
- The coldtail joint and termination joint must be laid within the area to be heated and embedded within the screed.



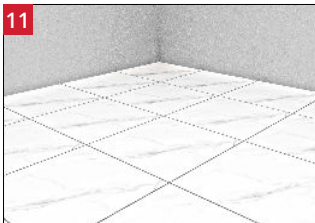
- Test and record the resistance of the heating cable after installation and check against the previous value to ensure no damage has occurred.



- Lay your chosen screed directly over the heating system in accordance with manufacturer instructions, building regulations and standards taking care not to damage the cable.



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

















- Lay your chosen floor covering once the screed layer has cured and dried, in accordance with floor manufacturers instructions.














- Install your Warmup thermostat referring to their installation instructions. The heating cable must be connected to and controlled with a thermostat and sensor.

Safety information

-  Perform a site inspection. You will need to confirm that all measurements and other requirements on site match your working drawings.
-  Inspect the site for possible hazards that could damage the heating cable, such as nails, staples, materials or tools. Ensure that during the course of the installation no damage is caused to the heating cable by falling or sharp objects.
-  Ensure all electrical connections conform to the current BS 7671 National Wiring Regulations. Final connections to the main electricity supply **MUST** be completed by a qualified electrician.
-  The installation of the system must comply current edition of building regulations.
-  Ensure the heating cable is protected by a dedicated 30 mA RCD/RCBO or an existing RCD/RCBO). Time delay RCD's must not be used.
-  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.
-  The subfloor must be clean, level, smooth, dry, frost-free, solid, suitably weight-bearing and dimensionally stable. Insulation under the screed should be chosen and installed in line with building regulations.
-  Screed layers used over the Warmup Inscreed cable should be chosen and installed in line with building regulations.
-  Install the floor sensor centrally between the two closest parallel runs of heating cable and away from other heat sources such as hot water pipes, lighting fixtures, chimneys etc.
-  Before installing the floor finish, its suitability for use with underfloor heating and its maximum operating temperature should be checked against required operating conditions. Ensure the heat output of the floor meets your requirements.
-  Ensure adhesives, grouts, glues and screeds used are compatible with underfloor heating and suitable for application onto electric underfloor heating systems.
-  Underfloor heating performs the most efficiently with conductive, low resistance floor finishes such as stone and tiles. Consideration should be given to the thermal resistance and temperature limits of the chosen floor covering and its impact on the system heat output.
-  Ensure all furniture installed over underfloor heating has feet, maintaining a minimum 50 mm ventilated space above the floor to allow heat flow into the room.
-  This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Safety information

-  DO NOT cut, shorten or extend the heating cable, it must be fully installed within the screed layer. The heating cable must not be installed over another cable run, over coldtails or the floor sensor.
-  DO NOT leave surplus heating cable rolled up under units or fixtures, use the correct size heating cable for your installation.
-  DO NOT attempt a DIY repair if you damage the heating cable , contact Warmup for assistance.
-  DO NOT tape over manufactured joints or the floor sensor tip. Doing so will cause air pockets and damage the heating cable and sensor. The manufactured joints must be covered with the screed layer.
-  DO NOT place items above the heating system which, when combined with the floor finish, have a thermal resistance of more than 0,15 m²K/W. Such items include bean bags, heavy rugs, flat furniture, animal beds or mattresses.
-  DO NOT bend the heating cable under 50 mm radius.
-  DO NOT switch on the heating cable until the screed layer has fully cured.
-  DO NOT install the heating cable in temperatures less than - 10 °C.
-  DO NOT install the heating cable on irregular surfaces such as on stairs or up walls.
-  DO NOT use metal staples to secure the heating cable to the subfloor. Only use staples supplied with the product or an equivalent specification.
-  DO NOT install heating cable in locations where they will increase the ambient temperature of any existing electrical installation above its rated value.

WARNING! Radiant floor heating system.

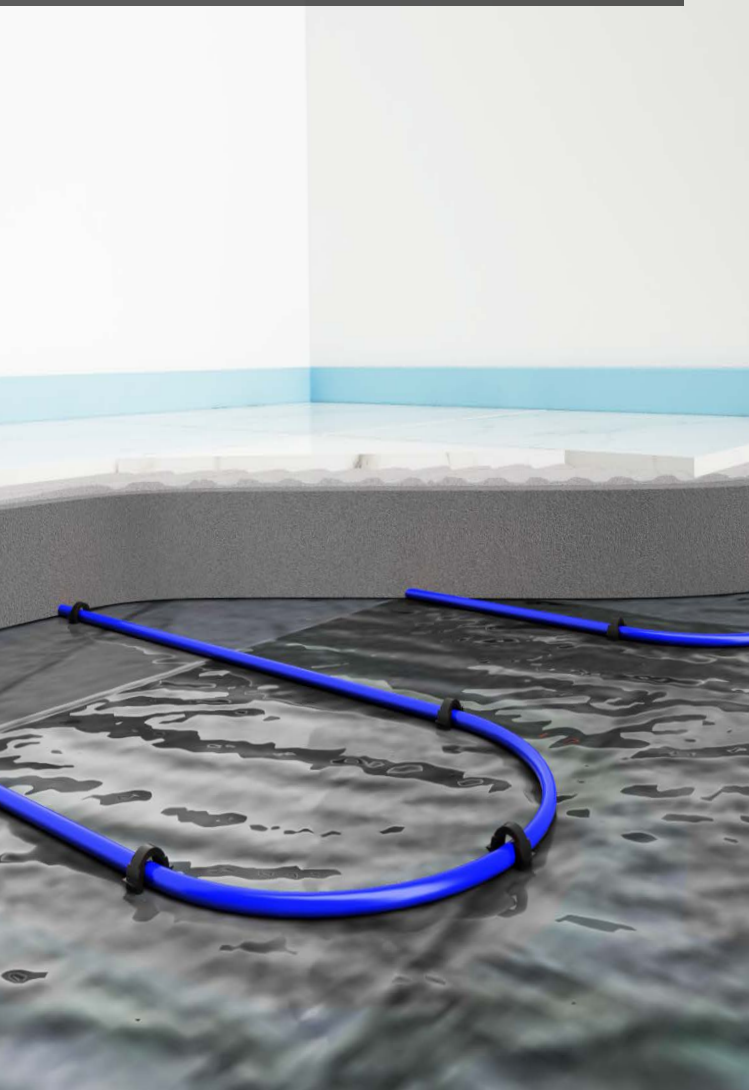
Risk of shock or fire

Failure to comply with local wiring regulations or the contents of this manual may result in electric shock or fire!

Warmup Inscreeed Cable is an electric underfloor heating system designed for use within a screed floor construction and is suitable for a variety of floor finishes.

Screeded heating systems such as Warmup Inscreeed have slower heat up and cool down times due to the screed depths used. The heater will heat the screed but then release heat slowly into the room.

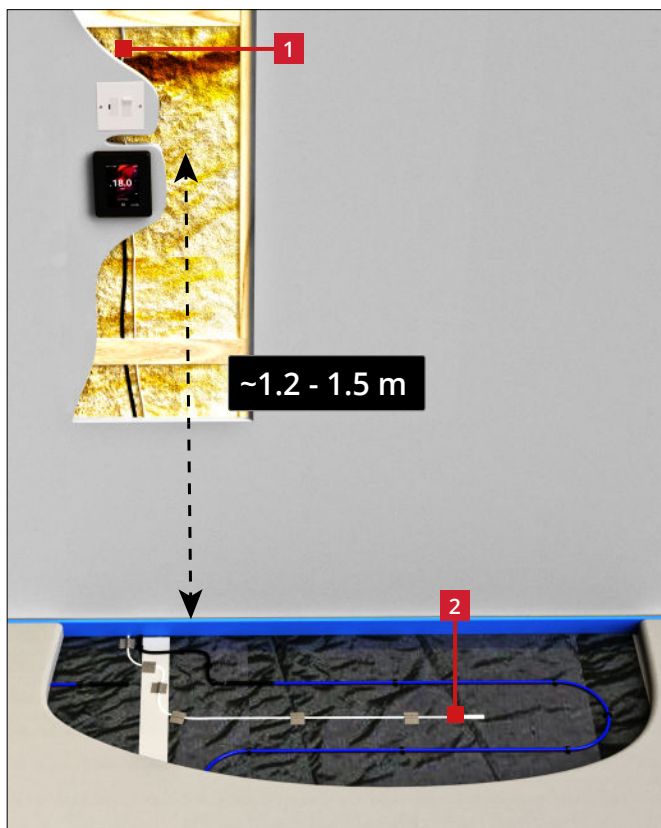
As the system is safely embedded in screed there is less of a risk of damaging the heating cable if the floor covering is changed.



Components available from Warmup

Product Code	Description
WIS-XXX <i>xxx = wattage</i>	Warmup Inscreed Cable
6IE-01-OB-DC 6IE-01-BP-LC	Warmup 6iE
RSW-01-WH-RG (ELM-01-WH-RG) RSW-01-OB-DC (ELM-01-OB-DC)	Warmup Element
ELT PW (ELT-01-PW-01) ELT PB (ELT-01-PB-01)	Warmup tempo
WHS-X-EDGE50	Warmup perimeter strip
CLIP-26 CLIP26-GUN	Warmup clips Warmup clip gun
MFB1	Warmup metal fixing bands
50MTAPE TAPEINS45M	Warmup fixing tape
WHS-FO-TIE	Cable ties
Additional components that may be required as part of your Warmup heating installation:	
30 mA Residual Current Device (RCD/RCBO), required as part of all installations	
Overcurrent protection, such as MCB's, RCBO's or fuses	
Electrical housing, back boxes and junction boxes	
Electrical trunking/conduit for housing the power leads	
Digital multi-meter required for testing the resistance of the heater and sensor	
Electrical tape to secure the sensor	
Screed	
Damp proof membrane (DPM) and Vapour control layer (VCL)	
Insulation	

Step 1 - Electrical supply



- 1** The supply to the thermostat **MUST** be protected by a 30mA RCD or RCBO at all times. Time delay RCD's or RCBO's must not be used. No more than 7.5 kW of heating should be connected to each 30 milliamp RCD or RCBO. For larger loads, use multiple RCD's or RCBO's.

The heating cable must be separated from the power supply by suitably rated circuit breaker that disconnects all poles with at least 3 mm contact separation. Use MCB's, RCBO's or fuses for this purpose.

Final connections to the main electricity supply **MUST** be completed by a qualified electrician.

- 2** Sensor installed (300 mm) centrally between two closest parallel runs of heating cable and away from other heat sources such as hot water pipes, lighting fixtures etc.

i If taking the power supply to the heaters from an existing 30 mA RCD/RCBO protected circuit, it should be calculated whether or not the circuit can handle the additional load and if necessary the supply must be de-rated to ≤ 16 amps.

i A junction box is required if more than two heaters are being connected to a single Warmup thermostat.

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



Zoning information

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 practical to install the thermostat within the wet room.

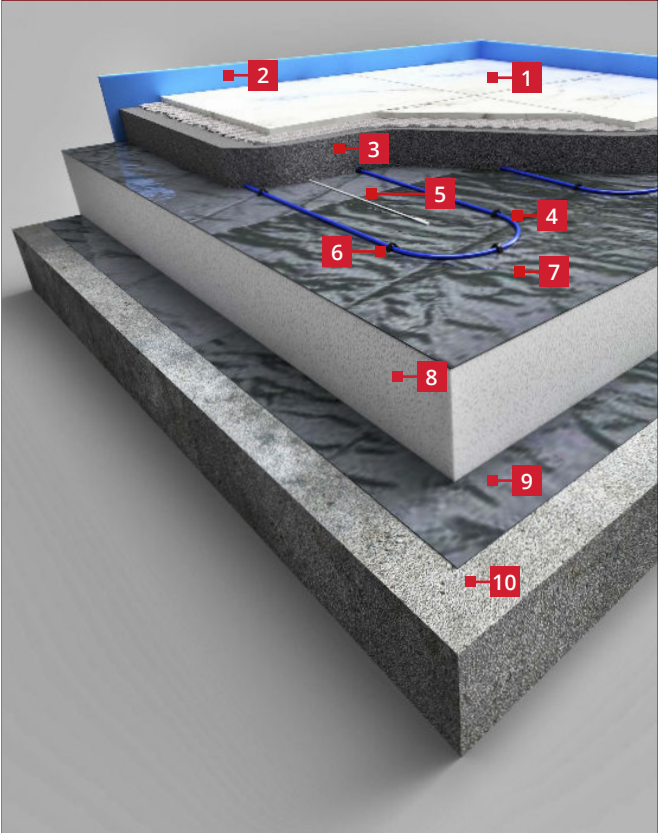
When installed in this way, using only the sensor to control the heating, it is not possible to directly control the air temperature, only the surface temperature.



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

Typical floor build-up

Recommended subfloor - All floor finishes






1	Floor covering
2	Perimeter strip <i>To allow for differential movement between finished floor level and walls</i>
3	Screed layer
4	Warmup Inscreed Cable <i>DO NOT cut the heating cable at any stage!</i>
5	Floor sensor <i>Tab tape the sensor to the subfloor. Do not tape over the sensor tip!</i>
6	Warmup clips
7	Vapour control layer (VCL) <i>To prevent water ingress</i>
8	Insulation layer
9	Damp proof membrane <i>To prevent water ingress</i>
10	Concrete subfloor

Step 2 - Subfloor considerations

The concrete subfloor must be clean, level, solid, structurally sound and dimensionally stable. Ensure the subfloor is prepared to an SR1 standard (SR1 - the maximum permissible departure over a 2 m straight is 3 mm).

If necessary an appropriate blinding layer should be applied.

-  Any materials on or within the subfloor must be suitable for supporting electric underfloor heating systems. If using temperature sensitive materials beneath the heating cable, such as damp proofing or tanking systems, contact the manufacturer for advice.
-  Where ceramic tiles are to be used, ensure that the subfloor meets the local tiling standard requirements.
-  Do not commence installation of the heating cable without ensuring that the resulting floor construction will meet the requirements of the floors intended use and its finish.

Step 3 - Subfloor preparation




- The subfloor must be clean, solid, structurally sound and dimensionally stable. Ensure the subfloor is prepared to an SR1 standard (SR1 - the maximum permissible departure over a 2 m straight edge is 3 mm).
- If necessary a blinding layer should be applied.

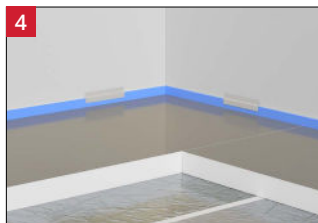


- Lay a damp proof membrane over the subfloor to prevent water ingress.



- Install perimeter strip (around the perimeter of the room to allow for differential movement between finished floor level and walls).
- Tape the perimeter strip to the wall to hold in position.

 Ensure the perimeter strip is installed with the integrated polyethylene skirt facing out from the wall.



- Lay insulation board over the membrane referring to manufacturer instructions and in line with building regulations
- Ensure the insulation board is pressed against the perimeter strip.



- Lay a vapour control layer over the insulation to prevent moisture ingress.








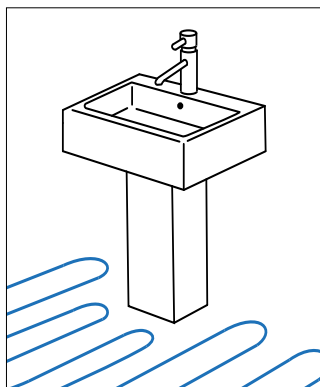
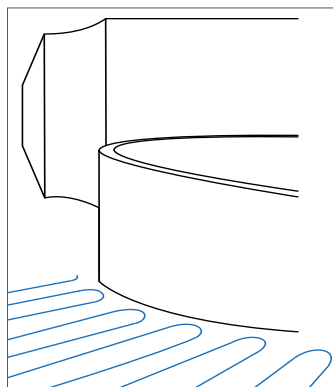
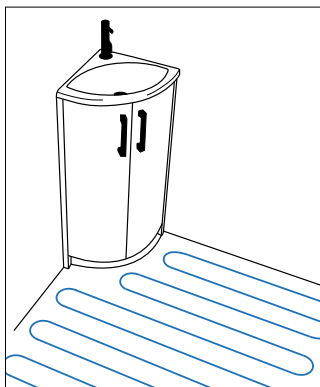
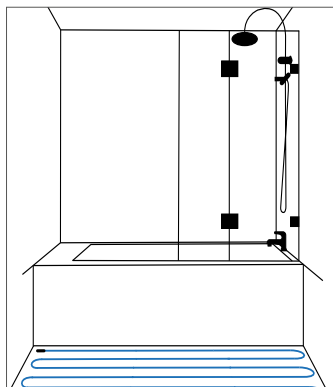
- Fold the polyethylene skirt over the vapour control layer and tape into position.

Step 4 - Layout Planning

Cable layouts

In order to fit the cable into a specific area, it may be necessary to lay the heating cable around obstacles. Please refer to the examples below for guidance.

-  Maintain a minimum of 100 mm between heating cable runs. Secure heating cable using supplied clips.
-  When installing the cable, maintain a spacing of half its cable to cable spacing, between itself and the perimeter or any unheated areas.
-  Please take a moment to double-check that your plan has the proper room dimensions and that you have the correct size and proper number of heating cables. Do not install under fixed objects such as kitchen or bathroom units.
-  When laying two or more heating cables, ensure all coldtails reach the thermostat.
-  Do not use the heating cable in areas subject to high mechanical loads or impact.



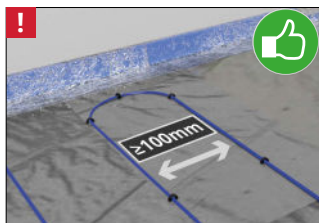
Step 4 - Layout planning



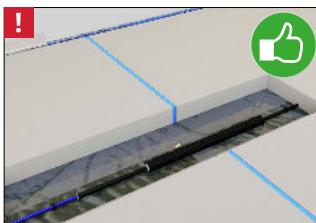
A plan of the heater layout is required as part of the control card so that any cutting or drilling after installation will not result in injury or damage.



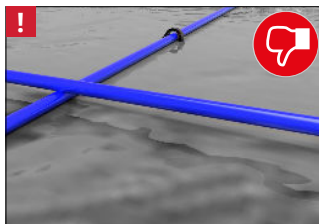
The system should not be installed on irregular surfaces such as on stairs or up walls.



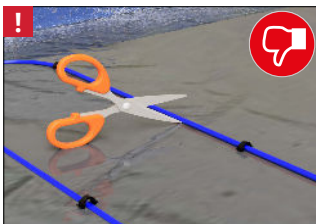
- Ensure that there is a minimum of 100 mm between any parallel heating cable runs and that the cable is away from the influence of other heat sources, such as heating and hot water pipes, lighting fixtures or chimneys at all times.



- Where a heated floor is divided by expansion joints, individual heating cables should be used to heat each area. The cold tail may cross the expansion joint within a 300 mm long conduit as shown.



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







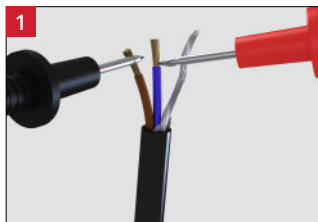
- The heating cable must not be cut, shortened, extended or left in a void, it must be fully installed within the layer of screed.

Warmup Inscreed cable

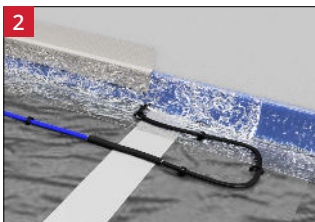
Heated area at different spacings, m²				
Product code	Cable length (m)	Heat output		
		100 W/m²	150 W/m²	200 W/m²
		c/c Spacing		
		200 mm	133 mm	100 mm
WIS180	9.0	1.8	1.2	0.9
WIS280	14.0	2.8	1.9	1.4
WIS390	19.5	3.9	2.6	2.0
WIS500	25.0	5.0	3.3	2.5
WIS650	32.5	6.5	4.3	3.3
WIS760	38.0	7.6	5.1	3.8
WIS1000	50.0	10.0	6.7	5.0
WIS1200	60.0	12.0	8.0	6.0
WIS1460	73.0	14.6	9.7	7.3
WIS1550	77.5	15.5	10.3	7.8
WIS1770	88.5	17.7	11.8	8.9
WIS2070	103.5	20.7	13.8	10.4
WIS2600	130.0	26.0	17.3	13.0
WIS3140	157.0	31.4	20.9	15.7
WIS3370	168.5	33.7	22.5	16.9

Step 5 - Heating cable installation

-  Maintain a minimum of 100 mm between heating cable runs.
-  Maintain a spacing of half its cable to cable spacing, between itself and the perimeter or any unheated areas.
-  The heating cable should be evenly spaced to prevent thermal striping.
-  **DO NOT** install the heating cable in temperatures less than -10 °C.



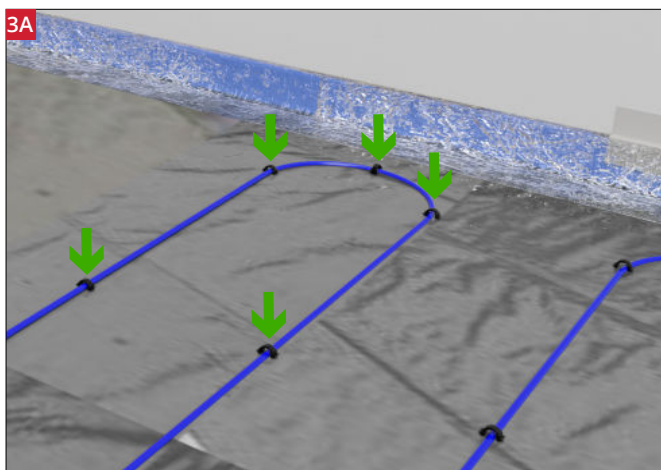
- Measure and record the resistance of the heating cable in the "Resistance Before" column of the control card, supplied as part of this installation guide.
- Stop installation immediately and contact Warmup if its resistance falls outside the range set out in the Reference resistance band table.



- Place the coldtail on the floor. Secure the coldtail using supplied staples at 300 mm intervals or tab tape to the subfloor



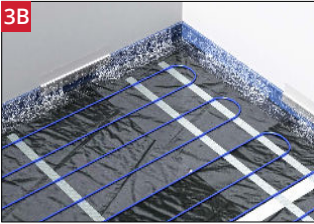
DO NOT tape over the coldtail joint. It must be fully embedded within the screed layer.



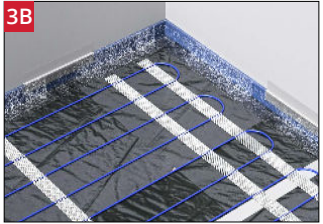
- Begin laying the heating cable at the necessary cable to cable spacing for the heat output required.
- Using the supplied clips, secure the heating cable to the insulation layer, 1 at each loop end, 2 at the beginning of each straight and then at 300 mm intervals. Push the supplied clips through the vapour control layer to secure the cable to the insulation layer.

Step 5 - Heating cable installation

Alternate heating cable installation - Taping

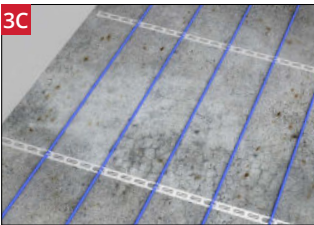


- Attach Warmup double-sided tape to the vapour control layer, the 1st run 150mm from the wall and the 2nd 150mm from the 1st, then at 500mm intervals. The tape should be laid perpendicular to heating cable runs, observing wall perimeter spacing.
- Begin laying the heating cable at the necessary cable to cable spacing for the heat output required.



- Once the heating cable layout has been completed, apply Warmup fibre glass tape over the runs of double-sided tape.

Alternate heating cable installation - Metal Fixing Bands



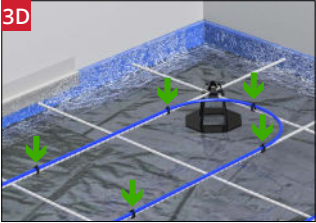
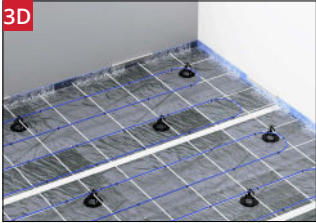
- If installing on a concrete subfloor, secure metal fixing bands to the subfloor using fixing nails or adhesive. The bands should be laid perpendicular to heating cable runs in 500 mm intervals, observing wall perimeter spacing.
- Begin laying the heating cable at the necessary cable to cable spacing for the heat output required.



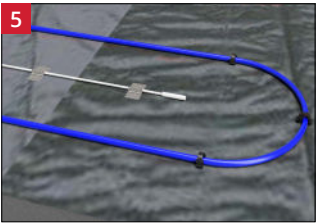
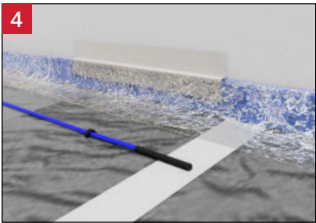
- Secure the heating cable into the fixing bands as shown.

Step 5 - Heating cable installation

Alternate heating cable installation - Reinforcement mesh



- The Inscreed Cable can also be installed in a structural concrete floor by securing the heating cable to the reinforcement mesh using cable ties,
- Begin laying the heating cable at the necessary cable to cable spacing for the heat output required.
- Secure the heating cable to the reinforcement mesh as shown, 1 at each loop end, 2 at the beginning of each straight and then at 300 mm intervals.



- At the end of the heating cable, you will find a termination joint. As with the coldtail joint at the beginning of the heating cable, this joint must be installed in the floor, covered in the screed layer.
- Install the sensor at least 300 mm into the heated area it will be controlling. It should be located centrally between the closest parallel runs of heating cable and not in an area influenced by other heat sources.
- The sensor can be secured to the subfloor with tabs of tape.



DO NOT tape over the termination joint. It must be fully embedded within the screed layer.

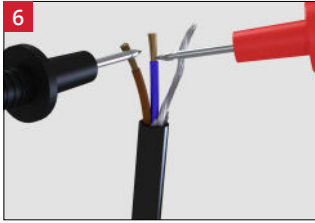


If installing the floor sensor on reinforcement mesh, secure to the reinforcement mesh as above using cable ties.




DO NOT tape over the sensor tip it must be in full contact with the screed layer.


Step 5 - Heating cable installation



- 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.

Step 6 - Lay the screed layer

- 

Before installing any screed, floor finish, adhesives or glues over the heating cable, the installation requirements of each must be checked to ensure compatibility with underfloor heating.
- 

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 [m²K/W].

Table 1 - Screed types and minimum thicknesses

Screed Type	Minimum thickness (mm)	Standard
Traditional cementitious sand/cement	75 (65)	BS 8204-1
Traditional calcium sulfate	40	CIRIA Report 184
Pumpable self-smoothing calcium sulfate	40 (35)	BS 8204-7
Pumpable self-smoothing cementitious	40 (35)	BS 8204-7


- 

Table 1 shows different screed materials used and minimum thicknesses required with underfloor heating systems. Domestic measurements are in brackets. This table is for guidance only, screed layers used over the Warmup Inscreed cable must be chosen and installed in line with the latest edition of building regulations and standards.

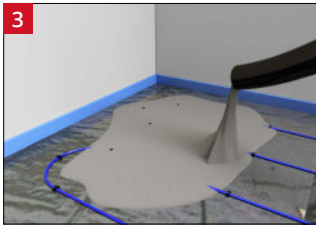


- Ensure the floor is clear of debris before laying the screed.

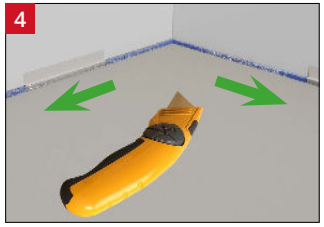


- Heated screeds will expand and contract slightly during use therefore expansion joints may also be required.
- As per BS EN 1264-4 heated screeds intended for the application of stone or ceramic coverings, joint areas shall not exceed 40m² with a maximum length of 8m.
- Expansion joints in rectangular rooms can exceed these dimensions but maximum to the length relation of 2 to 1.

Step 6 - Lay the screed layer



- Apply the screed layer referring to the screed manufacturers instructions for mixing, drying and curing information.

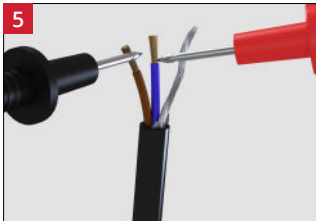


- The perimeter strip should finish just proud of the screed layer but can be trimmed back flush with a utility knife if required.

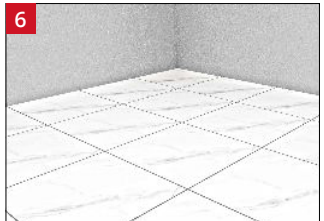


Curing times for sand/cement screeds are typically 21 days. DO NOT switch on the heater until the screed has fully cured.

The heating should not be turned on until the screed has fully cured. Once cured the heater can be switched on and the floor brought up to 20-25° C. This shall be maintained for at least 3 days after which the maximum design temperature shall be set and maintained for at least a further 4 days.



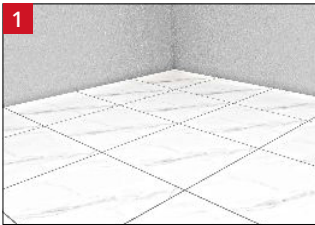
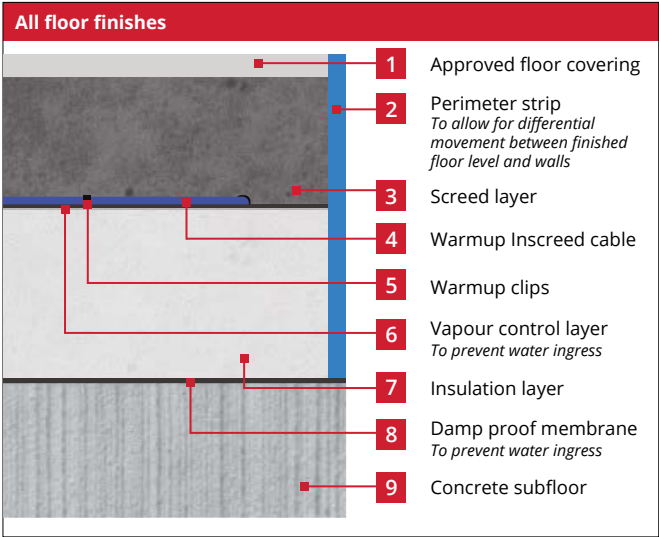
- When the screed has been laid, conduct another resistance test to ensure the sensor and heater have not been damaged and record in the control card.



- Lay the floor covering adhering to the flooring manufacturers instructions.
- Ensure any floor coverings, underlays and adhesives used are suitable for use with underfloor heating at the intended operational temperatures and conditions.

Step 7 - Floor covering

- i** Before installing any floor finish, adhesive or underlay over the screed layer, the installation requirements of each must be checked to ensure compatibility with underfloor heating.
- i** 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 [m²K/W].



- Lay the floor covering adhering to the flooring manufacturers instructions.
- Ensure any floor coverings, underlays and adhesives used are suitable for use with underfloor heating at the intended operational temperatures and conditions.


Warmup



ElementTM WiFi Thermostat

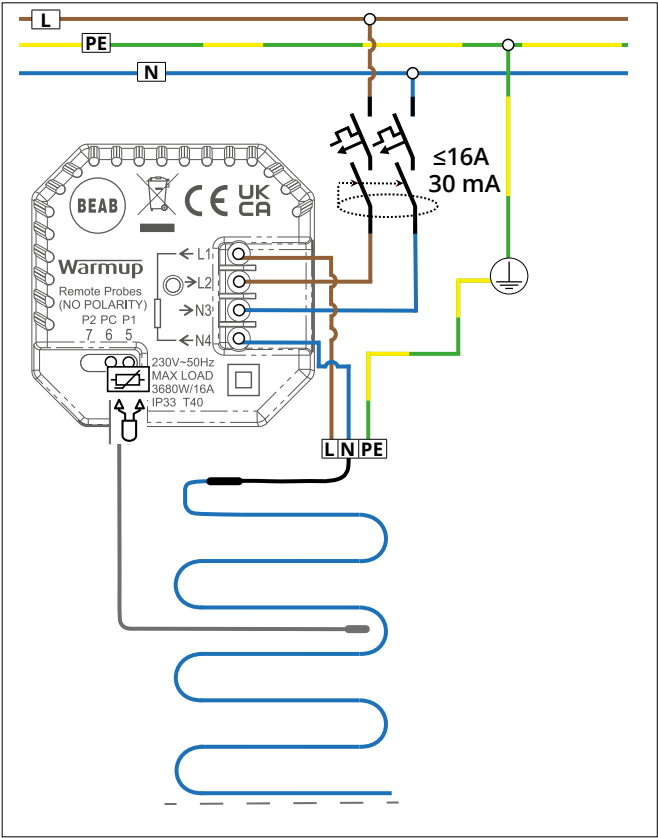
Smart Heating. Simplified.

Step 8 - Connect the thermostat

 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 by suitably rated circuit breaker that disconnects all poles with at least 3 mm contact separation. Use MCB's, RCBO's or fuses for this purpose.


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. Final connections to the main electricity supply MUST be completed in accordance with the wiring regulations by a qualified electrician.

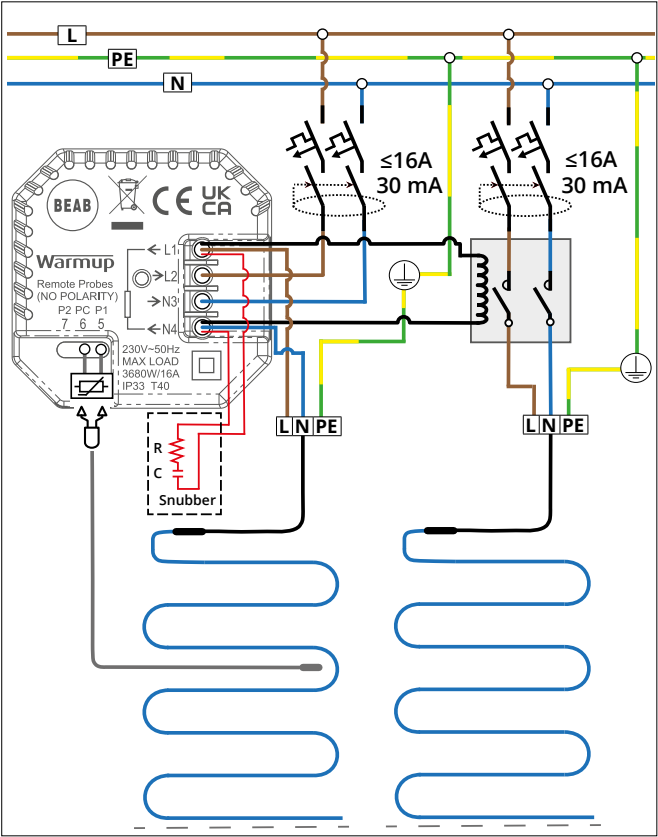


Step 8 - Connect the thermostat (Load exceeding 16 Amps)

Warmup thermostats are rated for a maximum of 16 amps (3680 W at 230 V). A contactor must be used to switch loads exceeding 16 amps.

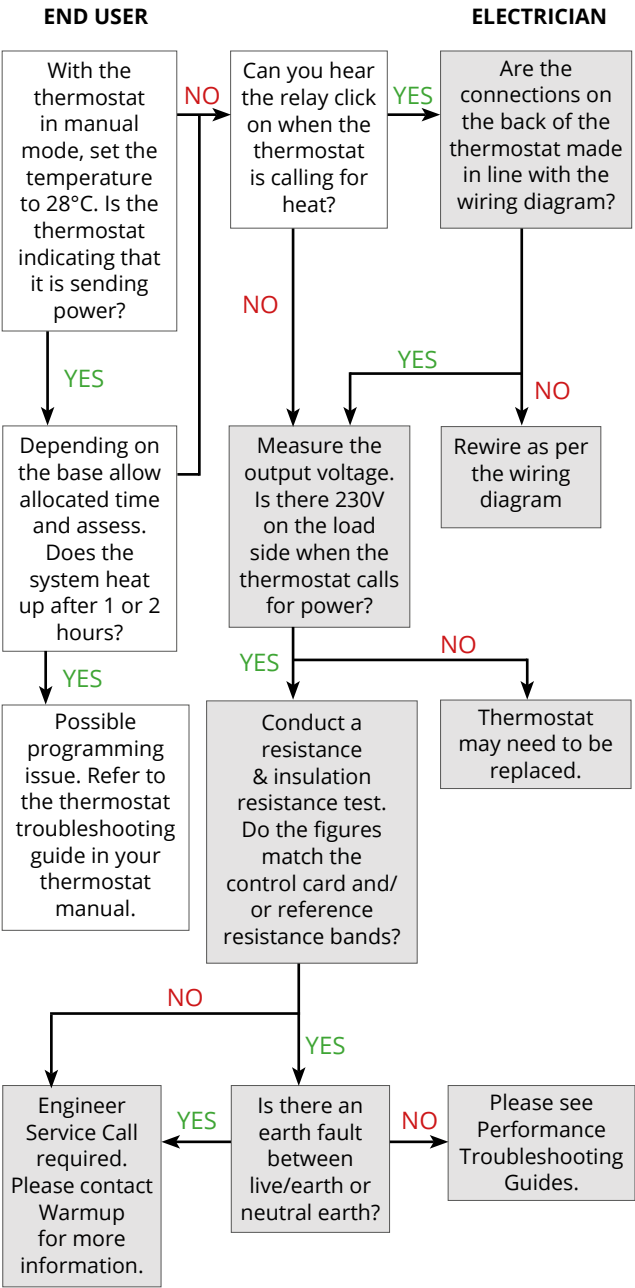
If using contactors which exceed 16 amps, the supply to the heaters must be de-rated to ≤ 16 amps to provide overcurrent protection. Multiple external relays can be used for larger loads. Please see wiring diagram below.

 Thermostat wiring with a contactor must be completed by a qualified electrician.



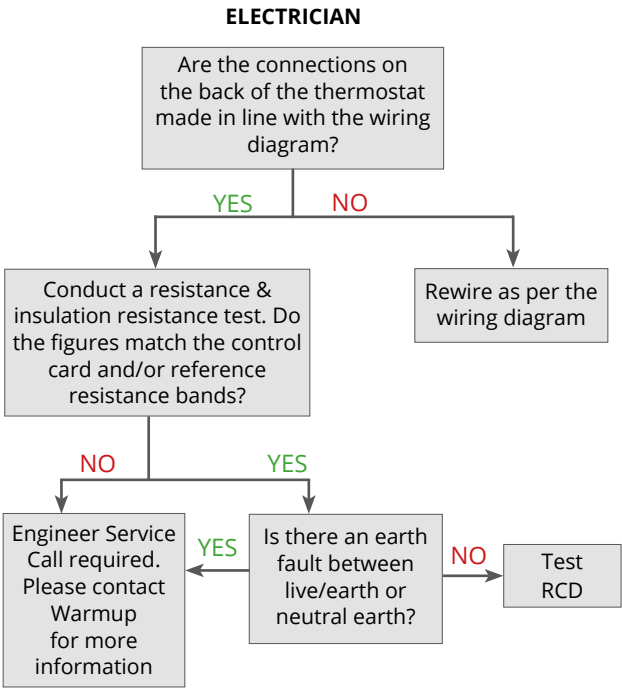
HEATING ISSUE 1 - The floor does not heat up


Instructions which are shaded must be completed by a qualified electrician







HEATING ISSUE 2 - The heater trips the RCD

Instructions which are shaded must completed by a qualified electrician



ISSUE 1 - My floor is getting too hot		
PROBLEM		SOLUTION
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.
ISSUE 2 - My floor does not get up to temperature		
PROBLEM		SOLUTION
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.
	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.	
2	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.
3	The heating system may be uninsulated. If the heater has not been installed over a layer of insulation, 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.

4	The heat output of the installed system may not be sufficient. The system will require a power output of approximately 10 W/m ² 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.
5	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 0,15 m ² 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 0,25 m ² K/W or 2,5 tog are not permitted.
ISSUE 3 - I am getting patchy heat across my floor		
	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.	
	If the floor covering over the underfloor heating changes, each floor finishes characteristics will affect the warm up period and the achievable surface temperature.	
	Hot water pipes under the floor could cause parts of the floor to seem warmer than others.	
	Irregularly spaced cables will cause the floor to be warmer above the closer cables and cooler where the cables are spaced further apart.	

Testing information

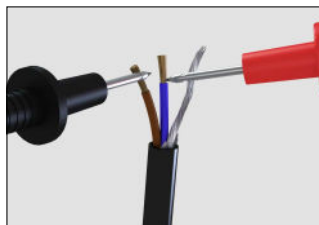


Each heating cable and sensor must be tested before they are installed, once they have been laid but before laying the screed and again before they are connected to the thermostat. The resistance (ohms) should be measured and recorded in the control card at the end of the manual.



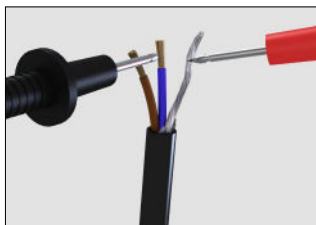
Due to the high resistance of the heating element, it may not be possible to get a continuity reading from the heating cable and as such, continuity testers are not an acceptable substitution for testing. When checking resistance, make sure your hands do not touch the meter's probes as the measurement 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 for guidance.

Heating cable resistance test



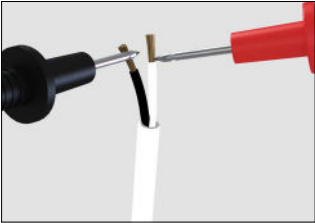
- Set a multimeter or ohmmeter to record resistance in the range of 0-500 Ω . Measure the resistance across the live (brown) and neutral (blue) wires. Ensure the measured resistance is within the Reference Resistance Band for the cable size being tested

Earth fault test



- Set a multimeter or ohmmeter to record resistance in the range of 1 M Ω or greater if available. Measure the resistance across the live (brown) and neutral (blue) wires to the earth braid. Ensure the measured resistance is showing as greater than 500 M Ω or infinite if the meter cannot read this high.
- Set an insulation resistance tester to 500 V DC. Measure the resistance across the live (brown) and neutral (blue) wires to the earth braid wire. Ensure the measured resistance is showing greater than 500 M Ω to indicate a pass.

Sensor resistance test



- Ensure that the sensor is tested before the final finish has been fitted. Warmup thermostats typically use a 10 kΩ sensor. Please to refer to the thermostat manual for further details.

The expected resistance depending on temperature is listed below.

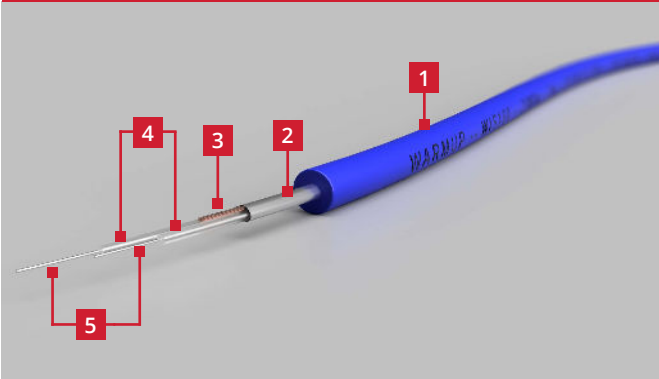
Sensor resistance by temperature - NTC10K			
Temperature	Resistance	Temperature	Resistance
0 °C	32.5 kΩ	16 °C	15.0 kΩ
2 °C	29.4 kΩ	18 °C	13.7 kΩ
4 °C	26.6 kΩ	20 °C	12.5 kΩ
6 °C	24.1 kΩ	22 °C	11.4 kΩ
8 °C	21.9 kΩ	24 °C	10.5 kΩ
10 °C	19.9 kΩ	26 °C	9.6 kΩ
12 °C	18.1 kΩ	28 °C	8.8 kΩ
14 °C	16.5 kΩ	30 °C	8.1 kΩ

Technical specifications

Warmup Inscreed

Product code	WISXXX <i>XXX = Total wattage</i>
Operating voltage	230 V AC: 50 Hz
Connection	1.5 mm ² , 2.50 m long coldtail
IP rating	X7
Output rating	200 W/m ² / 150 W/m ² / 100 W/m ²
Cable diameter	5.30 mm
Heating cores	Dual core, single-strand heating element
Inner / Outer insulation	Fluoropolymer / Polyolefin
Cable sheath colour	Blue
Cable spacing	100 mm (200 W/m ²), 133 mm (150 W/m ²), 200 mm (100 W/m ²)
Earth protection	Aluminium mylar tape with copper drain wire
Minimum installation temperature	-10 °C

Cable section

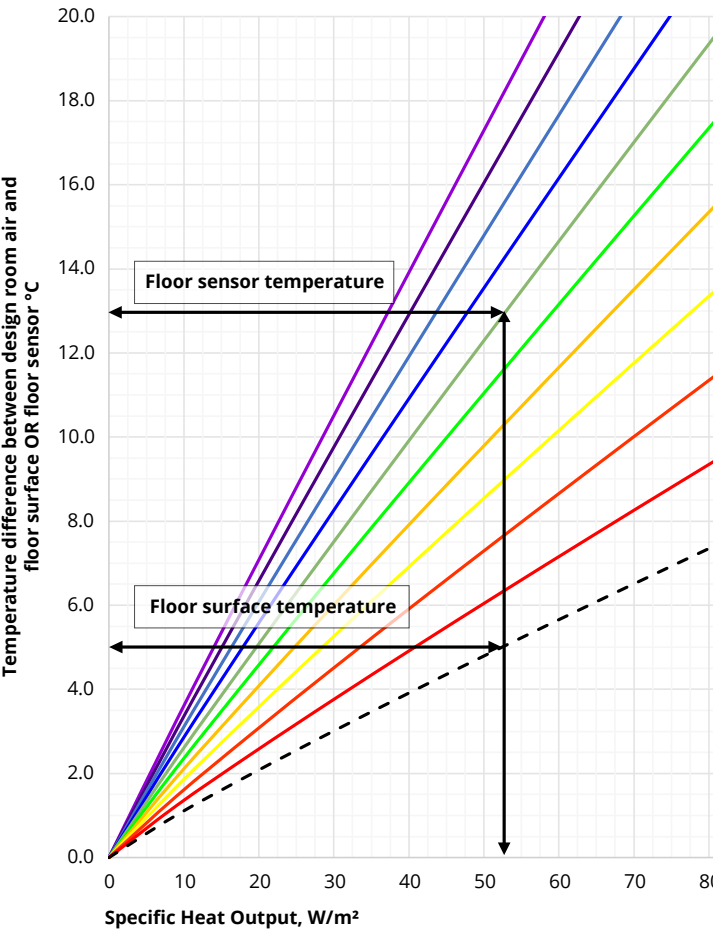


1	Polyolefin
2	Aluminium mylar tape
3	Copper drain wire
4	Fluoropolymer
5	Dual core, single-strand heating element

Warmup Inscreed Cable

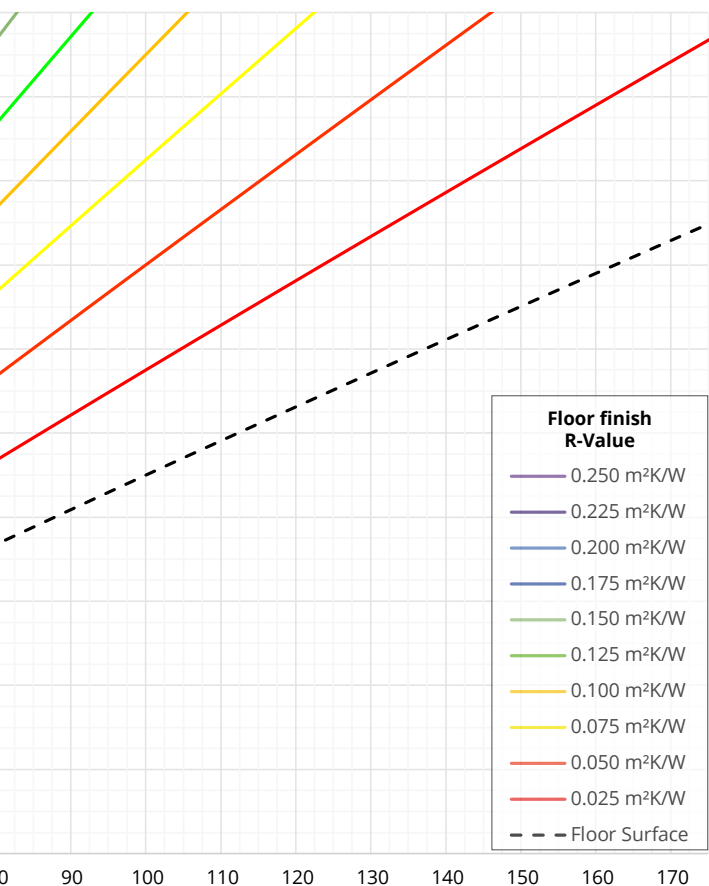
Product code	Cable length (m)	Power (W)	Current (A)	Resistance (Ω)	Resistance Band (Ω)	Heated Area, m²			
						100 W/m²	150 W/m²	200 W/m²	200 W/m²
WIS180	9.0	180	0.8	287.5	273.1 - 301.9	200 mm	133 mm	100 mm	0.9
WIS280	14.0	280	1.2	193.2	183.5 - 202.9	2.8	1.9	1.4	1.4
WIS390	19.5	390	1.7	138.0	131.1 - 144.9	3.9	2.6	2.0	2.0
WIS500	25.0	500	2.2	107.4	102.0 - 112.8	5.0	3.3	2.5	2.5
WIS650	32.5	650	2.8	81.6	77.5 - 85.7	6.5	4.3	3.3	3.3
WIS760	38.0	760	3.3	69.8	66.3 - 73.3	7.6	5.1	3.8	3.8
WIS1000	50.0	1000	4.4	53.7	51.0 - 56.4	10.0	6.7	5.0	5.0
WIS1200	60.0	1200	5.2	44.2	42.0 - 46.4	12.0	8.0	6.0	6.0
WIS1460	73.0	1460	6.4	36.2	34.4 - 38.0	14.6	9.7	7.3	7.3
WIS1550	77.5	1550	6.7	34.1	32.4 - 35.8	15.5	10.3	7.8	7.8
WIS1770	88.5	1770	7.7	29.9	28.4 - 31.4	17.7	11.8	8.9	8.9
WIS2070	103.5	2070	9.0	25.6	24.3 - 26.9	20.7	13.8	10.4	10.4
WIS2600	130.0	2600	11.3	20.3	19.3 - 21.3	26.0	17.3	13.0	13.0
WIS3140	157.0	3140	13.7	16.8	16.0 17.6	31.4	20.9	15.7	15.7
WIS3370	168.5	3370	14.7	15.7	14.9 16.5	33.7	22.5	16.9	16.9

Floor sensor setting for target heat output



Using the graph above it is possible to get the specific heat output of an eUFH system based on the temperature difference between the design room air temperature and the floor surface or floor sensor temperature by floor finish.

The example above shows a design room air temperature of 20 °C and floor surface temperature of 25 °C. Based on the temperature difference of 5 °C the resulting heat output would be 52.5 W/m². Based on a 0.150 m²K/W (1.5 Tog) floor finish the floor sensor would have to be set to 33 °C to achieve this heat output.



Specific Heat Output, W/m^2



The design floor surface temperature difference should not be more than 9 °C in occupied areas, 15 °C in unoccupied areas.



Heat output is limited by the floor finish resistance combined with the maximum probe setting of 40 °C.



Temperature limits of the floor finish or its adhesive may adversely limit the design heat output.



Lifetime Warranty applies for residential domestic use only.
25 Year Warranty applies if the final floor finish is concrete / polished concrete.
10 Year Warranty applies for commercial use / projects.

Warmup® Inscreeed Cable 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. Warmup Inscreeed Cable is guaranteed for the Lifetime of the floor covering under which it is fitted, except as provided below (and your attention is drawn to the exclusions listed at the end of this guarantee).

The 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**. 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/RCBO) at all times.



All Warmup warranties are voided if the floor covering over Warmup heater(s) are 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 of any country or territory within which Warmup operates.
- 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.

- 1** 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.
- 2** 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.
- 3** 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.

**Register your Warmup® warranty online at
www.warmup.co.uk**



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

[illegible]

Warning!**Radiant floor heating system.****Risk of shock or fire**

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.



Heating cable location

Total wattage

Checklist - Installer

Is the heating cable, including manufactured joints, underneath the floor covering embedded in screed? ☐

Can you confirm that the manufactured joints and floor sensor tip, have **NOT** been taped over during installation? ☐

Model	System resistance			Insulation resistance test	Sensor resistance
	Before	During	After		

Installer name, company:

Installer signed: **Date:**

Checklist - Electrician

Is the heating cable is protected a dedicated 30 mA RCD/RCBO or an existing RCD/RCBO? ☐

Time delay RCD's must not be used.

Is the system separated from the power supply by suitably rated circuit breaker that disconnects all poles with at least 3 mm contact separation, for example, MCB's, RCBO's or fuses? ☐

Model	System resistance			Insulation resistance test	Sensor resistance
	Before	During	After		

Electrician name, company

Electrician signed **Date:**

This form must be completed as part of the Warmup Guarantee. Ensure that the resistance values are as per the instruction manual. This control card, layout plan and installation manual must be left permanently fixed near the consumer unit.

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Warmup GmbH ■ Ottostraße 3 ■ 27793 Wildeshausen ■ DE





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**Please scan the QR code to provide
feedback on your installation**

Warmup

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