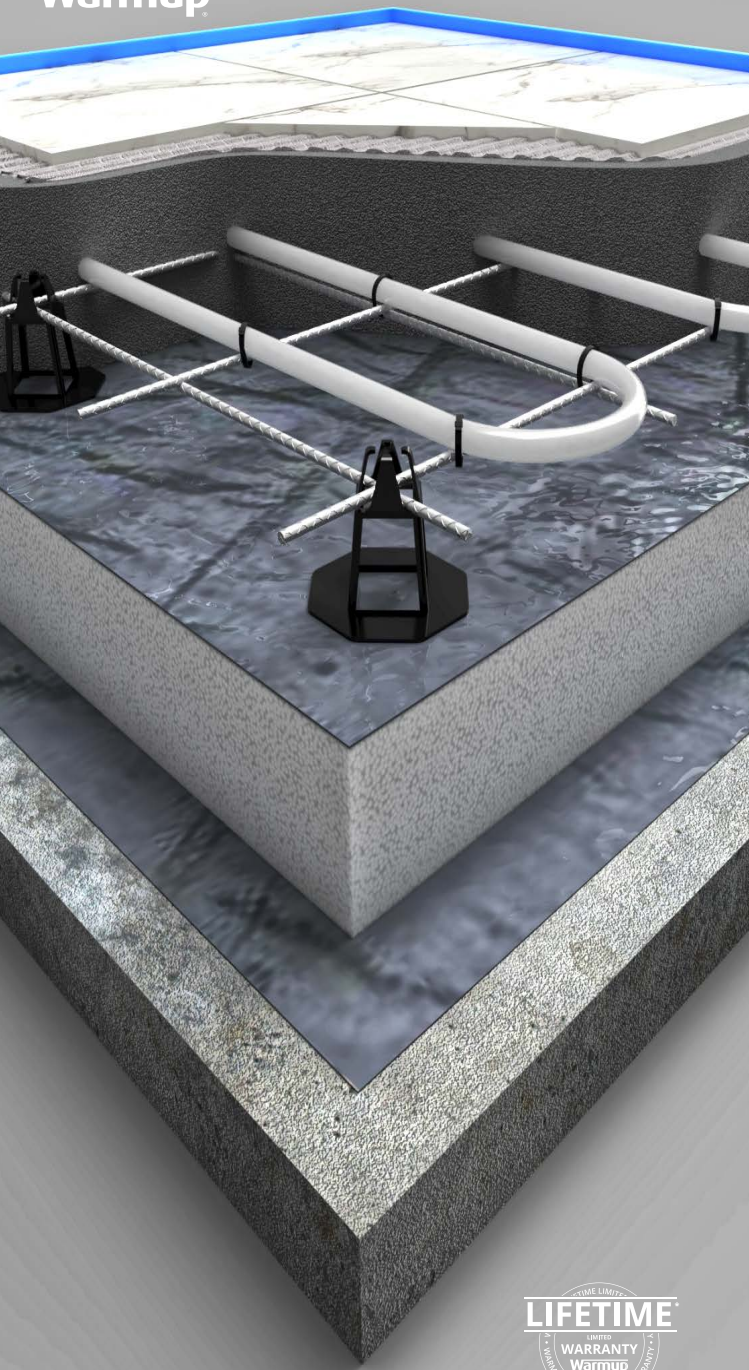
Warmup



LIFETIME LIMITED WARRANTY Warmup

Warmup Forte

Installation manual

SAFETY Net™ Installation-Guarantee

Warmup

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

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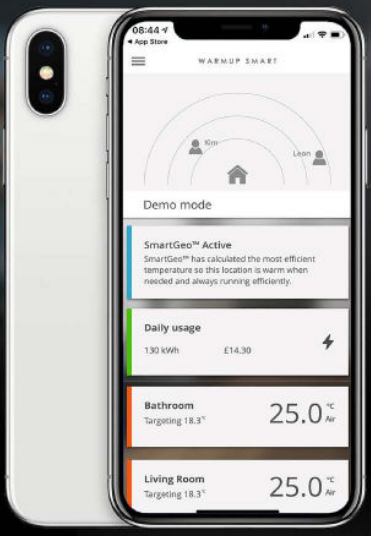

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6iE OB WiFi Thermostat

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Table of Contents

Your Warmup® underfloor heating system has been designed so that installation is quick and straight forward, but it is important that the instructions in this manual are followed to ensure that your underfloor heating system performs correctly. Please ensure that you have the components and working drawings necessary for this system before you begin installation.

Warmup plc 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.

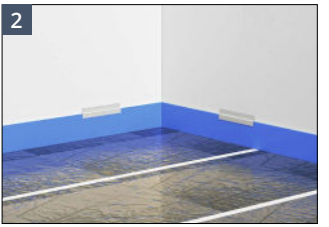
You may also find a copy of this manual, wiring instructions and other helpful information on our website

www.warmup.co.uk

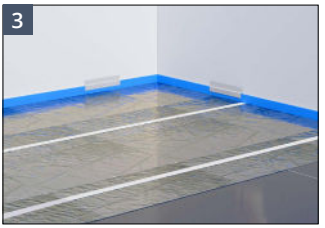
Installation summary

Please also read the full instructions that follow this section.

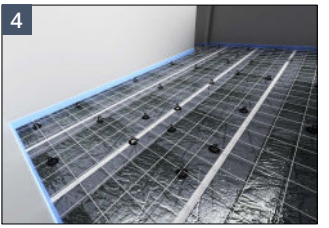
- The subfloor must be clean, level, smooth, dry, frost-free, solid, suitably weight-bearing and dimensionally stable.



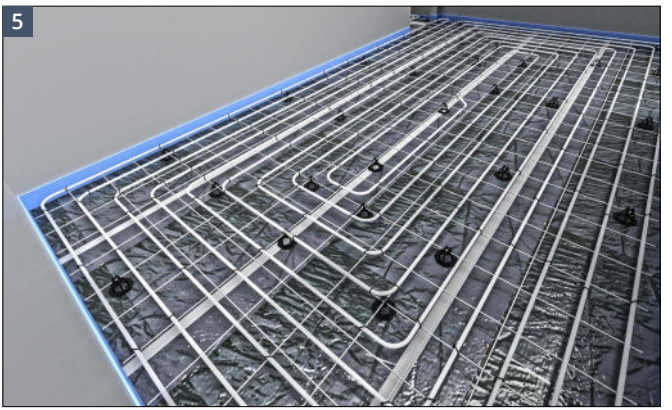
- Lay a damp proof membrane over the subfloor to prevent water ingress.
- Install perimeter strip around the perimeter of the room to allow for differential movement between finished floor level and walls.



- 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.

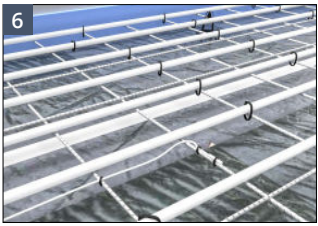


- Following the structural engineers design, install the reinforcement mesh taking care not damage the damp proof membrane.



- Install the pipe in line with the projects working drawings. It is recommended the pipe is installed using a **spiral** pattern to achieve an even surface temperature and a high heat output.
- Install the pipe at the necessary spacing for the heat output required. Secure the pipe to the reinforcement mesh with cable ties at approximately 500 mm intervals.

6



- Install the floor sensor as shown, centrally between the two closest parallel runs of pipe.

DO NOT tape over the sensor tip. It must be fully embedded within screed being laid over.

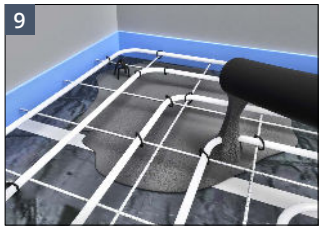
7

- Measure and cut the pipe so that it reaches both the flow and return ports on the manifold.
- Refer to the manifold manual for detailed information on mounting, pressure testing and commissioning.

8

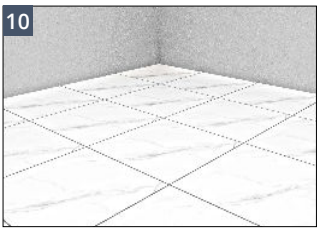
- Use Warmup pipe bend supports to hold the flow and return pipe at a 90° angle as it exits the floor towards the manifold.

9



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

10



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

11

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

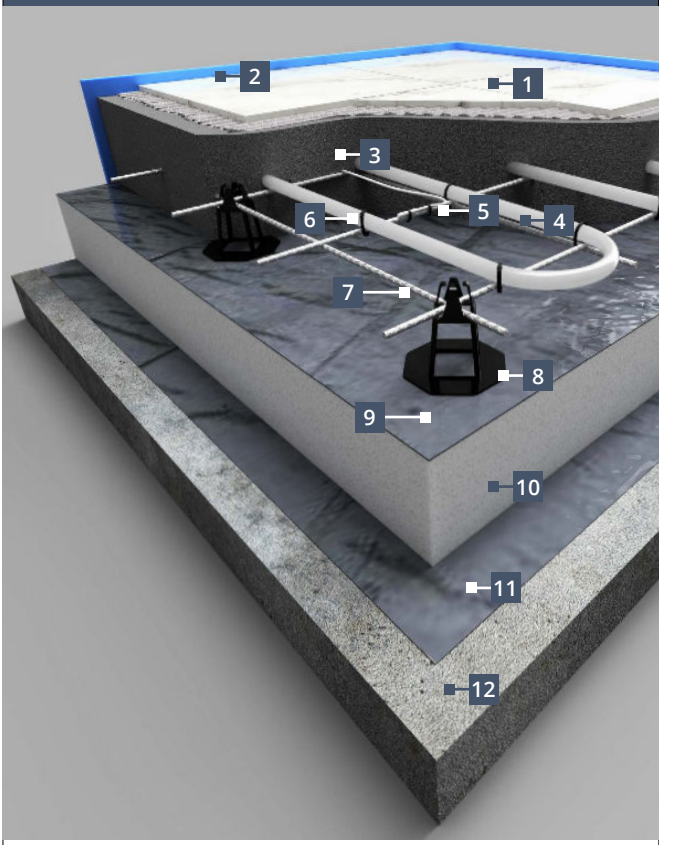
- Perform a site inspection. You will need to confirm that all measurements and other requirements on site match your working drawings. Ensure that all areas are correctly prepared, dry and protected from weather.
- Inspect the site for possible hazards that could damage the Warmup pipe, such as nails, staples, materials or tools.
- Use a pipe cutter designed for plastic pipe ensuring that there are no burrs on the pipe ends. It is important to achieve a clean cut.
- The installation of the system must comply current edition of building regulations.
- Do not pull pipe from the coil while it is sitting flat. It must be unwound from the coil, rotating the coil as the pipe is pulled from the inside.
- Do not force the pipe into bends. It is easier to lay the pipe with a large radius and then gently pull the pipe to the required bend. The minimum bending radius is 5 times the diameter of the pipe.
- Do not kink the pipe. Excessive bending of the pipe can cause it to kink, where this occurs flow may be obstructed or reduced. Kinked pipe must be repaired or replaced. To repair a kink, straighten the pipe and simply heat the area with a hot air gun until the kink disappears.
- Ensure the subfloor is prepared to an SR2 standard. The subfloor must be clean, level, smooth, dry, frost-free, solid, suitably weight-bearing and dimensionally stable.
- Screed layers used over the Warmup Forte should be chosen and installed in line with building regulations and standards.
- Install the floor sensor centrally between the two closest parallel runs of pipe 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.
- 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.
- It is recommended that 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.
- DO NOT switch on the heating system until the screed layer has fully cured.
- DO NOT use steel rebar tie wire to secure the pipe to the subfloor. Only use cable ties supplied with the product or an equivalent specification.

Components available from Warmup

Product Code	Description
WHS-FO-TIE *(Pack of 100)*	Cable ties
WHS-P-PERT-xx *xx = length: 25, 50, 60, 70, 80, 90, 100, 110, 120, 300m*	PE-RT Pipe- 16mm x 2mm
WHS-P-BEND	Pipe bend supports
WHS-CL-CONDUIT *25mm x 50m*	Pipe conduit
WHS-X-EDGE50	Warmup perimeter strip
WHS-P-DECOILER	Pipe decoiler
WHS-X-POL1200 WHS-X-POL500	Polythene DPM; 1200/500 gauge
WHS-MT-B0xxyy WHS-MT-B0xxyy+ *xx = kpa: 70 / 100* *yy = thicknesses: 25, 50, 70, 100mm* *+ = 0.030W/mK*	EPS Insulation
WHS-MT-INSxx *xx = thicknesses:* *25, 30, 40, 50, 60, 70, 75, 80, 90, 100mm*	PIR Insulation
Additional components that may be required as part of your Warmup heating installation:	
Manifold, mixing unit, actuators, valves and euroconus connectors	
Wiring centre	
Warmup thermostats	
Electrical trunking/conduit	
Digital multi-meter required for testing the resistance of the sensor	
Screed	
Reinforcement mesh	

Typical floor build-up

Recommended subfloor - All floor finishes



1	Floor covering
2	Perimeter strip *To allow for differential movement between finished floor level and walls*
3	Screed layer
4	Warmup PE-RT Pipe
5	Floor sensor *Secure the sensor to the reinforcement mesh with cable ties as shown.*
6	Cable ties
7	Reinforcement mesh
8	Reinforcement mesh supports
9	Vapour control layer (VCL) *To prevent water ingress*
10	Insulation layer
11	Damp proof membrane (DPM) *To prevent water ingress*
12	Concrete subfloor

Step 1 - Subfloor considerations

The concrete subfloor must be clean, level, solid, structurally sound and dimensionally stable. Ensure the subfloor is prepared to an SR2 standard (SR2 - the maximum permissible departure over a 2 m straight is 5 mm).

If necessary an appropriate blinding layer should be applied.

Any materials on or within the subfloor must be suitable for supporting underfloor heating systems. If using temperature sensitive materials beneath the heating cable, such as damp proofing or tanking systems, contact the manufacturer for advice.

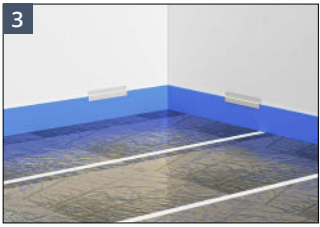
Where tiles are to be used, ensure that the subfloor meets the local tiling standard requirements.

Do not commence installation without ensuring that the resulting floor construction will meet the requirements of the floors intended use and its finish.

Step 2 - Subfloor preparation

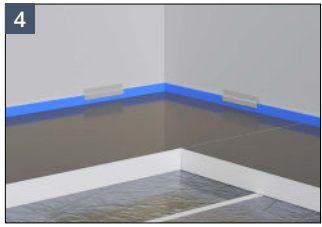
- The subfloor must be clean, solid, structurally sound and dimensionally stable. Ensure the subfloor is prepared to an SR2 standard (SR2 - the maximum permissible departure over a 2 m straight edge is 5 mm).
- If necessary a blinding layer should be applied.

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

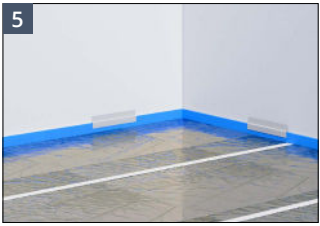


- Install perimeter strip around the perimeter of the room to allow for differential movement between finished floor level and walls.
- Tape the perimeter strip to the wall to hold in position.

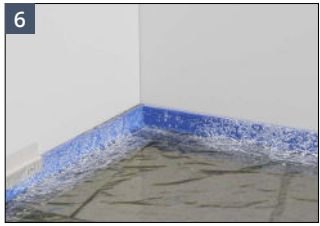
Ensure the perimeter strip is installed with the integrated polyethylene skirt facing out from the wall.



- 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.

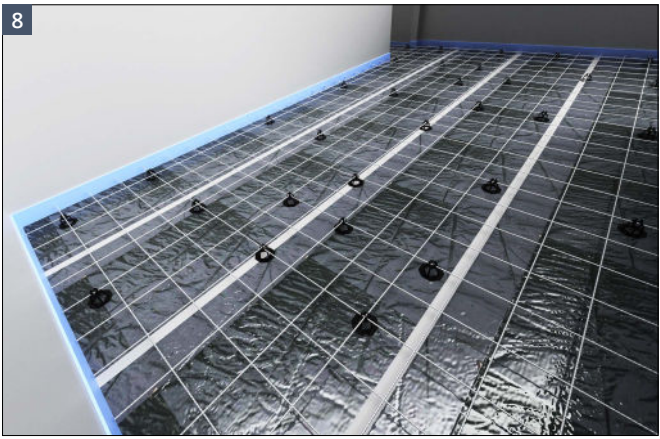


- Lay a vapour control layer over the insulation to prevent moisture ingress.



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

- Before installing the reinforcement mesh and pipework, sweep the floor to clear any debris.

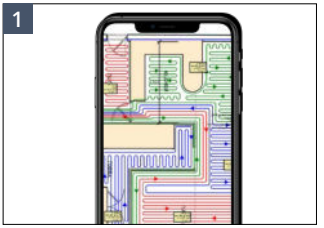


- Following the structural engineers design, install the reinforcement mesh taking care not damage the damp proof membrane.
- The steel reinforcement mesh should be held at mid depth using supports when the screed is applied.

Step 3 - Lay the pipe

If the project has been supplied with a set of working drawings, follow the provided pipe layout. Ensure each circuits details are recorded in the commissioning log provided in the Warmup manifolds installation manual.

1



- Plan the circuit layout ensuring that the flow and return pipes can connect from the manifold to their respective heated area without crossing each other.

2

- Ensure there is excess flow and return pipe at the manifold location which can be cut later after the pipe has been laid.

3

- Attach pipe bend supports to hold the pipe at a 90° angle as it enters the floor. Position the support so that the pipe rises straight to the manifold.

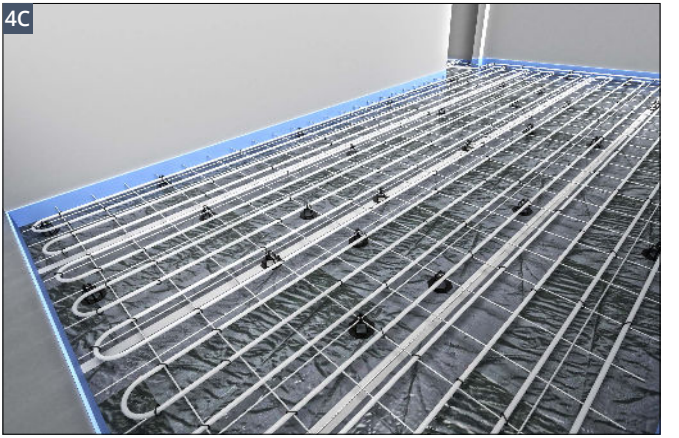
Feed pipes normally go through doorways but to minimise congestion, pipes can be fed through walls. Ensure holes drilled in the wall are below floor level and the pipe is protected with conduit.

Step 3 - Lay the pipe

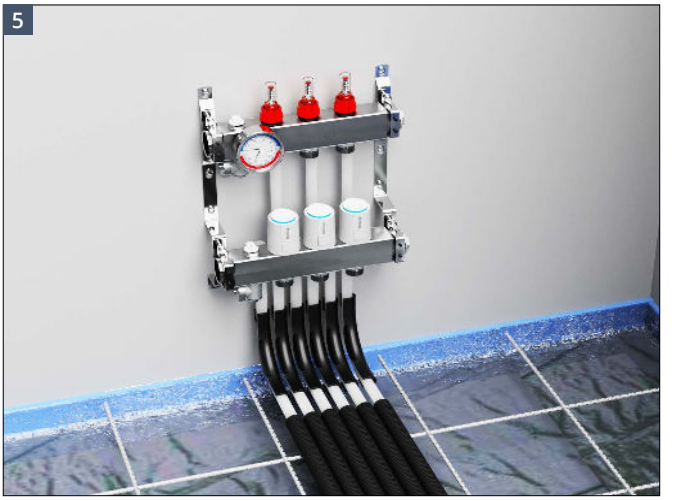
Beginning from the manifold location, following the projects working drawings, begin laying the pipe, maintaining a gap of half the design pipe spacing around the perimeter of the room.

- It is recommended to use the **spiral** pattern to achieve an even surface temperature and high heat output.
- The first loop should be laid around the perimeter of the room, then working inwards towards the centre at double the intended pipe spacings, securing to the reinforcement mesh with cable ties at 500mm intervals.
- Once you reach the centre, work back out, completing the spiral at the intended pipe spacing.
- For the pipe bends, secure the pipe to the reinforcement mesh using cable ties at the beginning and end of each bend.

- Where it is not practical to use the spiral pattern, a **double meander** pattern can be used, providing a more even surface temperature and higher heat output than a single meander pattern.
- The pipe should be laid referring to the working drawings, alternating the first run between 3 times and 1 times the design pipe spacing, before working back to the manifold location, securing to the reinforcement mesh with cable ties at approximately 500 mm intervals.
- For the pipe bends, secure the pipe to the reinforcement mesh using cable ties at the beginning, middle and end of each bend.



- If using the **single meander method**, ensure the pipe installed against the external walls is supplied with the hottest (supply) water. Meander up and down the floor area at your designed pipe spacing, securing to the reinforcement mesh with cable ties at 500mm intervals and then feeding the pipe back towards the manifold.
- For the pipe bends, secure the pipe to the reinforcement mesh using cable ties at the beginning, middle and end of each bend.

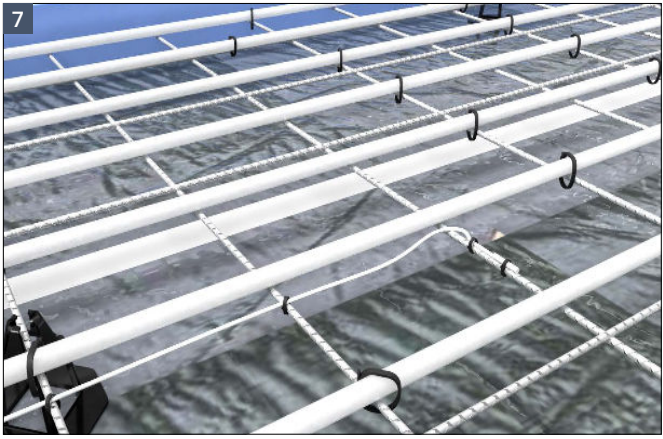


- Install pipe conduit or lagging over the service pipes as this will insulate the pipes and alleviate any hotspots.

6

- Measure and cut the pipe so that it reaches both the flow and return ports on the manifold.
- Refer to the manifold manual for detailed information on mounting, pressure testing and commissioning.

7



- 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 pipe and not in an area influenced by other heat sources.
- The sensor can be secured to the reinforcement mesh with cable ties as shown.

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

Before installing any screed, floor finish, adhesives or glues over the system, 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.

Table 1 - Screed types and minimum thicknesses

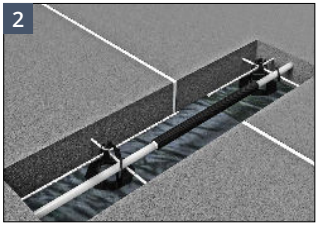
Screed Type	Minimum thickness (mm)	Standard
Traditional cementitious sand/cement	75 **(65)**	BS 8204-1
Traditional calcium sulfate	40	CIRIA Report 184
Pumpable self-smoothing calcium sulfate	40 **(35)**	BS 8204-7
Pumpable self-smoothing cementitious	40 **(35)**	BS 8204-7

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 Warmup Forte must be chosen and installed in line with the latest edition of building regulations and standards.

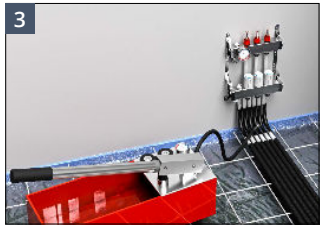
1

- Heated screeds will expand and contract slightly during use therefore expansion joints may also be required. As per: ISO 11855-5, an expansion joint plan (including type and place of joint) shall be drawn up by the building planner.
- A joint shall be applied above a building joint. The floor screed shall be separate from rising elements (border joints, e.g. walls doorways etc.).
- The determination of joint width, joint distance and joint areas depends on type of binder, floor covering geometry of the area, use of area and temperature change.

Step 4 - Lay the screed layer



- Any pipe crossing an expansion joint should be protected with a 300mm conduit, 150mm either side of the joint.



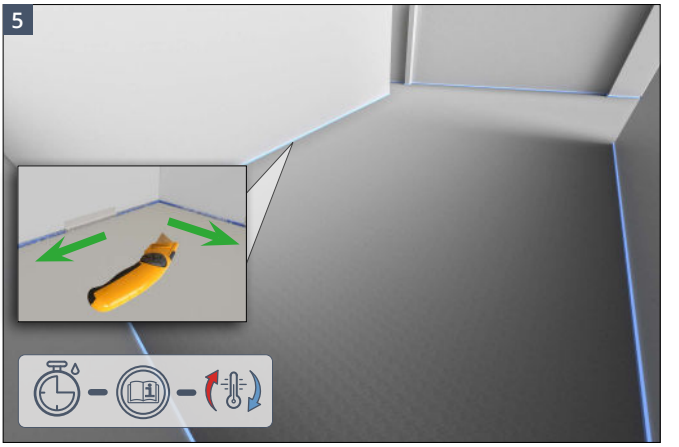
- Before the screed is laid the pipe should be pressure tested and then held at 3 bar whilst screeding. This will enable any leaks to be detected immediately. Please refer to the manifold manual for guidance.

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

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.

Step 4 - Lay the screed layer



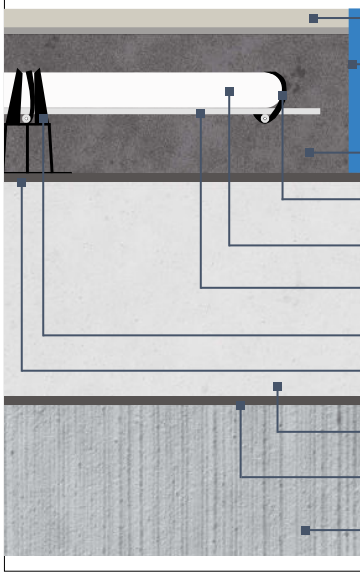
- Once the screed has cured a heat cycle will need to be conducted before your floor covering is laid. Please see the manifold manual for instructions on the initial heat cycle.
- DO NOT install the floor covering until the floor has cooled down.
- The perimeter strip should finish just proud of the screed layer but can be trimmed back flush with a utility knife if required.

Step 5 - Floor covering

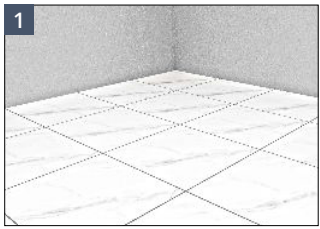
Before installing any floor finish, adhesive or underlay over the screed layer, the installation requirements of each must be checked to ensure compatibility with underfloor heating.

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].

All floor finishes

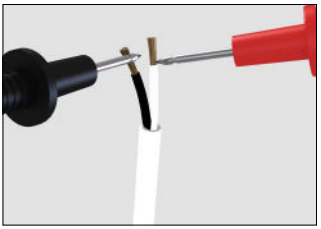


1. Approved floor covering
2. Perimeter strip
   To allow for differential movement between finished floor level and walls
3. Screed layer
4. Cable ties
5. 16mm PE-RT pipe
6. Reinforcement mesh
7. Reinforcement support
8. Vapour control layer
   To prevent water ingress
9. Insulation layer
10. Damp proof membrane
    To prevent water ingress
11. Concrete subfloor



- 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.

Sensor resistance test



- Ensure that the sensor is tested before the screed layer has been laid. 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

ISSUE 1 - Running out of pipe/excess pipe leftover	
PROBLEM	**SOLUTION**
When laying the pipe, incorrect pipe spacing has been used.	The pipe will have to be installed again at the correct spacing as per your design layout.
ISSUE 2 - Floor overheating at flow and returns to manifold	
PROBLEM	**SOLUTION**
As the pipes reach the manifold they are tightly packed together which will give a higher heat output.	The pipes will need to be insulated using 15mm conduit or pipe lagging.
ISSUE 3 - Excessive/insufficient heat output	
PROBLEM	**SOLUTION**
Incorrect water temperature	Refer to System Performance chart to calculate the required water temperature

k^H Value - W/m²K													
Resistance of Floor Covering, tog	**0.00**	**0.25**	**0.50**	**0.75**	**1.00**	**1.25**	**1.50**	**1.75**	**2.00**	**2.25**	**2.50**	**2.75**	**3.00**
Pipe Centres	**Warmup Forte - 100mm Concrete with A142 Steel Reinforcement Mesh Mid Depth, Thermal Conductivity λ = 1.80W/m·K**												
100mm	7.83	6.43	5.46	4.74	4.19	3.76	3.41	3.12	2.87	2.66	2.48	2.32	2.19
150mm	6.70	5.59	4.80	4.21	3.76	3.40	3.10	2.85	2.64	2.46	2.30	2.16	2.04
200mm	5.76	4.87	4.24	3.76	3.38	3.08	2.82	2.61	2.43	2.27	2.14	2.02	1.91
250mm	4.96	4.26	3.75	3.35	3.04	2.79	2.58	2.40	2.24	2.11	1.99	1.88	1.79
300mm	4.28	3.72	3.32	3.00	2.74	2.53	2.35	2.20	2.07	1.95	1.85	1.76	1.67

q = Specific Heat Output, W/m²	k_H = System Performance Factor, W/m²K
T_{water} = Mean water Temperature	T_{air} = Room Air Temperature

Using the system k_H value to calculate the system heat output:

$$q = k_H \times (T_{water} - T_{air})$$

Example:
The heat output through an 18 mm thick, ≈ 1.25 tog timber floor, over Warmup Forte, fitted with pipe at 200 mm centres, in a 21°C room heated with 40°C water is;

$$q = 3.08 \times (40 - 21) = 3.08 \times 19 = 58.52 \text{ W/m}^2$$

Alternatively, using the system k_H value to calculate the required water temperature, knowing the required heat output:

$$T_{water} = (q / k_H) + T_{air}$$

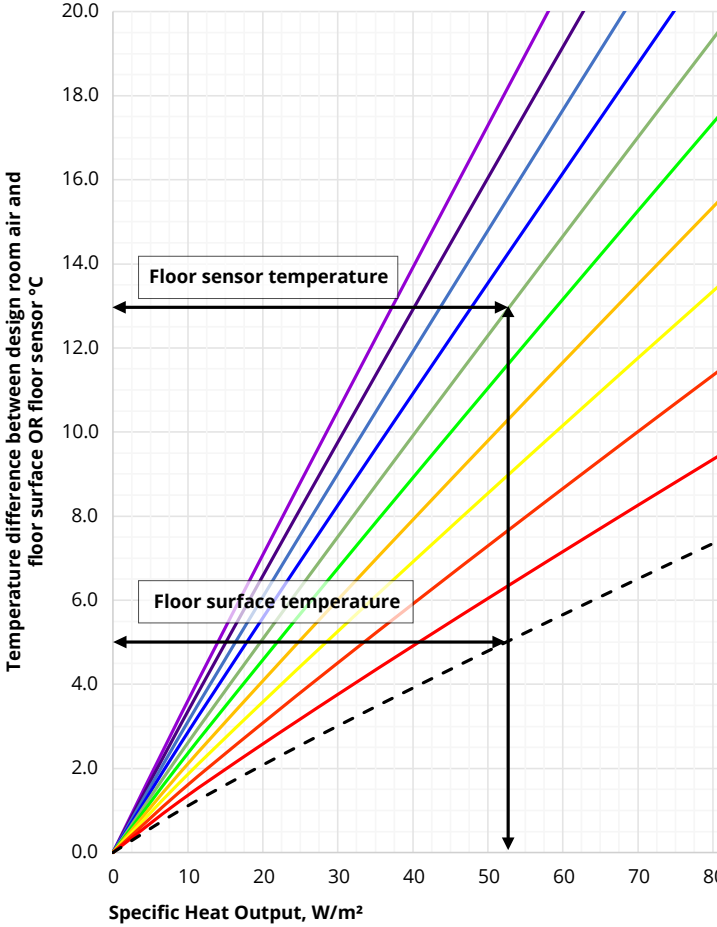
Example:
The water temperature required to produce a heat output of 55 W/m², through a 3 mm thick ≈ 0.25 tog LVT floor finish, over Warmup Forte, fitted with pipe at 200 mm centres, in a 22°C room is;

$$T_{water} = (55 / 4.87) + 22 = 13 + 22 = 33°C$$

S3 Manifold

FROM Warmup

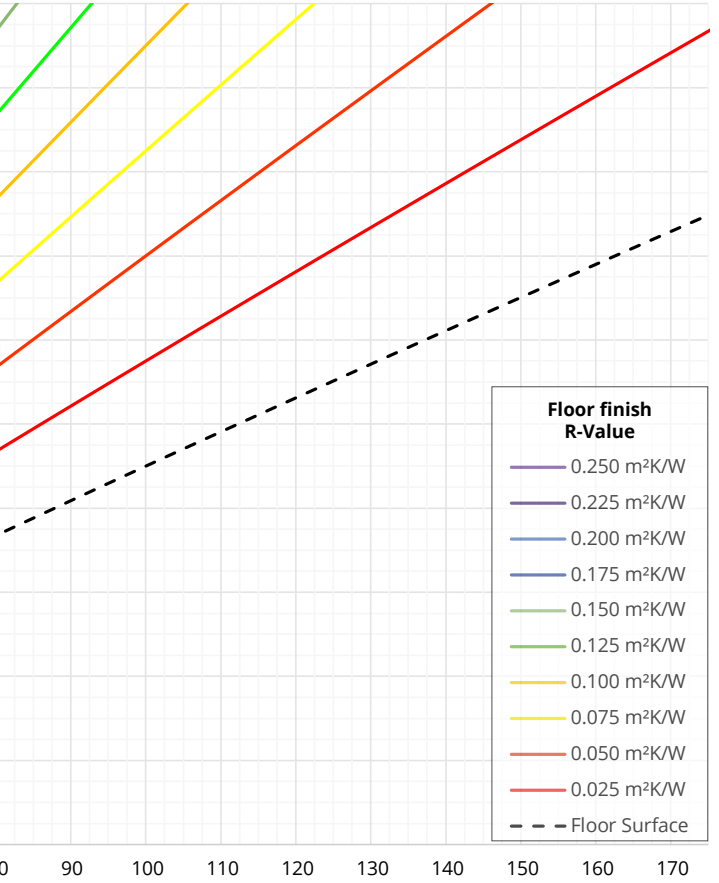
Floor sensor setting for target heat output



The room with the highest water temperature requirement sets the design water temperature for the whole system based on the calculations from the previous section.

Using the graph above it is possible to limit the specific heat output to the required value.

The example above shows a design room air temperature of 20°C and design heat output of 52.5W/m². Based on a 0.150 m²K/W (1.5 tog) floor finish the floor sensor should be set to 33°C (20°C room air + 13°C ΔT) to resulting in floor surface temperature of 25°C (20°C room air + 5°C ΔT).



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.

Warmup plc limited warranty –
Hydronic floor heating pipe

Registration can be completed online at **www.warmup.co.uk**.
In the event of a claim, proof of purchase is required in the form of an invoice or receipt.

THIS WARRANTY DOES NOT EXTEND TO OTHER COMPONENTS WHICH ARE COVERED BY SEPARATE WARRANTIES. THIS WARRANTY DOES NOT AFFECT YOUR STATUTORY RIGHTS.

Limited warranty:
Warmup® underfloor heating pipe is warrantied by Warmup plc ("Warmup") to be free from defects in manufacturing under normal use and maintenance, and is warranted to remain so subject to the limitations and conditions described below.

This warranty period begins on the date of purchase. The Lifetime warranty only applies if the product is registered with Warmup within 30 days after purchase and registered online at www.warmup.co.uk. Registration is confirmed only when confirmation of receipt is forwarded by Warmup plc

Warranty duration
- The PE-RT underfloor heating pipe is warranted for the **LIFETIME** of the floor under which it is fitted, except as provided below; your attention is drawn to the exclusions listed and the end of this warranty.

Notification of a suspected failure must be received in writing by Warmup within thirty (30) days of the suspected failure. Products believed to be defective must be made available to Warmup for testing and determination of cause.

Upon acceptance of any warranty claim, Warmup shall have ninety (90) business days in which to investigate and determine whether it recognises responsibility for any believed defects in material or workmanship and determines the appropriate course of action to be taken.

It is expressly agreed that the sole remedies under this limited warranty shall be at the discretion of Warmup, plc to either: issue a refund, repair or replace any article which is proven to be defective. Any and all allowances made to customers for transportation, labour, repairs or all other work, are at the exclusive discretion of Warmup and shall be authorised in writing, in advance, by Warmup. Such cost does not extend to any cost other than direct costs of repair or replacement by Warmup and does not extend to costs of relaying or repairing any floor covering or floor.

The lifetime warranty applies to the pipes(s) if they:

1. Are registered with Warmup within 30 days after purchase.

2. Have not operated at a pressure of greater than 8 Bar.

3. Have not operated at a temperature of greater than 60°C.

4. Are filled with treated water subtitle for use with PE pipes.

5. Are installed according to all applicable building code requirements.

6. Are selected, designed and installed by a qualified contractor according to installation instructions provided by Warmup which are current as of the applicable installation date.

7. Remain in their original installed location, such that the floor covering or screed over the product is not damaged, lifted, replaced, repaired or covered with subsequent layers of flooring.

8. Do not show evidence of accidental damage, misuse, lack of care, tampering, or repair or modification without the prior written approval of Warmup plc.

SAFETY Net™
Installation-Guarantee

SafetyNet™ Installation Guidelines: If you make a mistake and damage the pipe before covering the pipe with screed, levelling compound or floor covering, return the damaged pipe to Warmup within in 30 days along with your original dated sales receipt. WARMUP WILL REPLACE THE COIL OF PIPE (MAXIMUM 1 COIL OF PIPE PER ORDER) WITH ANOTHER COIL OF THE SAME MAKE AND MODEL - FREE.

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

(i) Pipes repaired by Warmup 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 is null and void once the pipe is covered with a screed, levelling compound, adhesive or floor deck.

(iii) Damage to the pipe that occurs after covering, such as lifting a damaged tile once adhesive has set, or subfloor movement causing floor damage, is not covered by the SafetyNet™ Guarantee.

Warmup plc
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Please scan the QR code to provide feedback on your installation

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