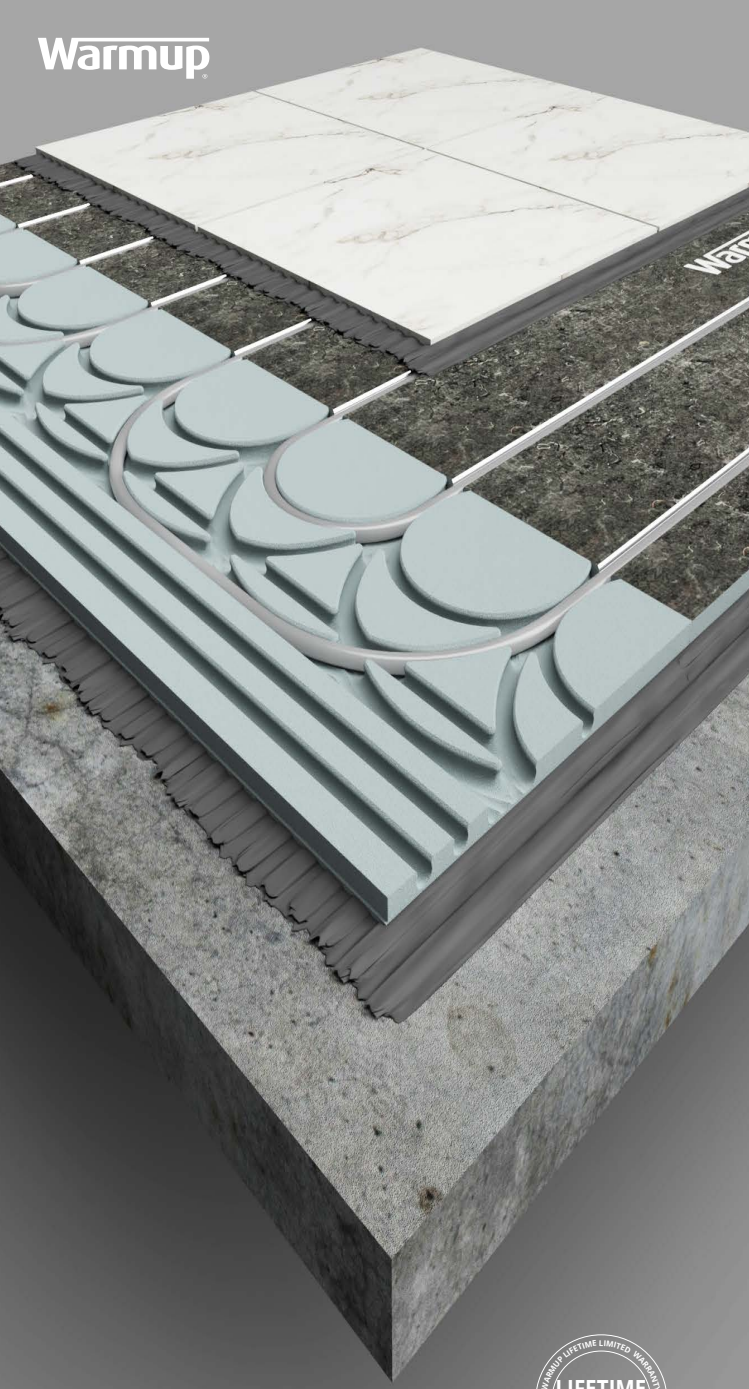
Warmup



VLo Ultra-12

Low Build System

Installation manual

LIFETIME Warmup

SAFETY Net™ Installation-Guarantee

Warmup®

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Over 2.5 million installations in more than 72 countries

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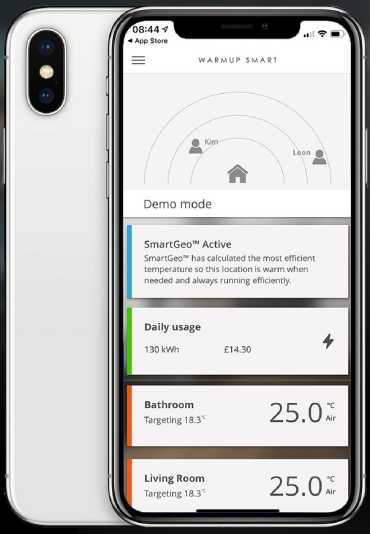

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Table of Contents

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.

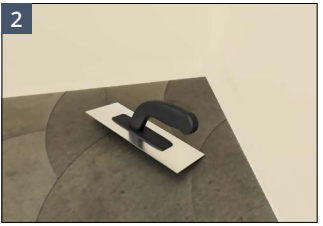
You may also find a copy of this manual, wiring instructions and other helpful information on our website

www.warmup.co.uk

Installation summary

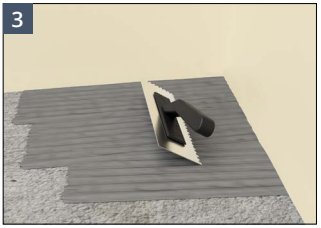
Please also read the full instructions that follow this section.

- Ensure the subfloor is clean, dry and prepared to an SR1 standard. See subfloor considerations page for more information.



- For bonded constructions in dry areas a high temperature acrylic adhesive can be used to bond the Ultra-12 panels to the subfloor.

  Press the boards down firmly into the adhesive to create the necessary adhesion.



- For bonded constructions in wet or dry areas and compatible S1 or S2 flexible tile adhesive is recommended.

  Press the boards down firmly into the adhesive to create the necessary adhesion.

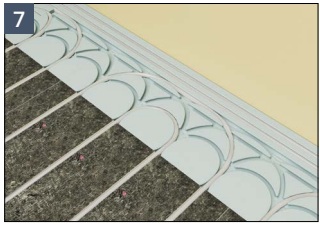
- Starting from the manifold location fit the service panels following the pipe layout shown on the working drawings.
- For bends use the curve service panels, snapping or cutting the straight service panels at 45° and butting them tightly together.

- Fit the curve panels at the end of the room referring to the working drawings.
- In fill the heated area with the straight panels.
- The plain panels can then be used in areas where underfloor heating will not be installed, i.e. under kitchen units.

6

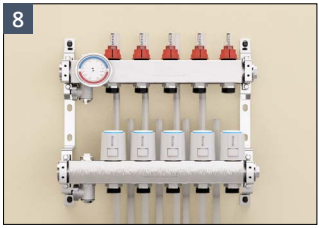
- Before installing the pipework in the panels it is advised to sweep or vacuum the floor area to clear any debris.

7



- Install the pipe in line with the projects working drawings, pressing it into the grooves of the Ultra-12 panels. Ensure the pipe is securely fixed into the grooves.
- Route a 6 mm channel into the Ultra-12 panel for the floor sensor to be recessed into and install at least 300 mm into the heated area it will be controlling.

8

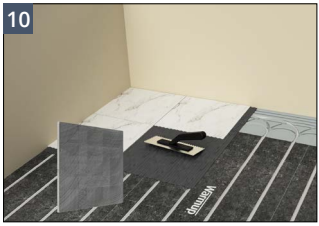


- Measure and cut the pipe so that it reaches both the flow and return ports on the manifold.
- Refer to the manifold manual for detailed information on mounting, pressure testing and commissioning.

9

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

10

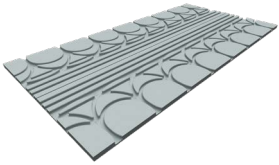
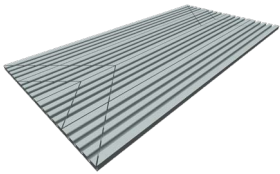
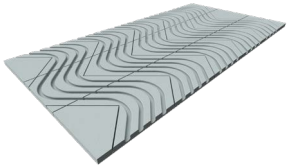


- Lay your chosen floor covering in accordance with floor manufacturers instructions.

11

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

Components available from Warmup

Product Code	Description
 ULTRA12-SP-PANEL	(A) VLo Ultra-12 Low Build Straight Panel
 ULTRA12-CP-PANEL	(B) VLo Ultra-12 Low Build Curve Panel
 ULTRA12-SS-PANEL	(C) VLo Ultra-12 Low Build Straight Service Panel
 ULTRA12-CS-PANEL	(D) VLo Ultra-12 Low Build Curve Service Panel
 ULTRA12-PP-PANEL	(E) VLo Ultra-12 Low Build Plain Panel
PERT-12xXX *XX = lengths, 50, 60, 70m*	Warmup PE-RT pipe 12 mm
ACC-PRIMER	Warmup primer
WHS-P-BEND12	Pipe bend supports
ACC-PIPECLIPS12	Pipe clips

Components available from Warmup

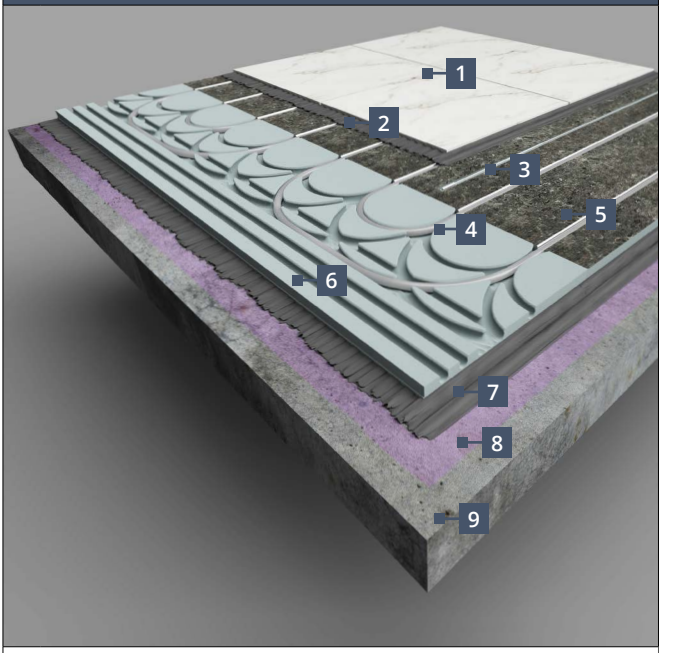
Additional components that may be required as part of your Warmup heating installation:
Manifold, mixing unit, actuators, valves and euroconus connectors
Wiring centre
Warmup thermostats
HiDECK Overlay 18
HiDeck PRO Adhesive
Warmup perimeter strip
Mapei Ultraplan Renovation Screed 3240
Adhesives

Important installation information

- On delivery of the Ultra-12 panels ensure that they are stored in a dry weather tight area, away from chemicals and that they are stacked horizontally on a flat and level surface.
- 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.
- Ensure the subfloor is prepared to an SR1 standard. Failure to do so may result in an unstable and noisy finished floor.
- 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.
- 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.
- If installing levelling compound over Ultra-12, ensure it is suitable for use with compressible underfloor heating panels and applied as a single layer.
- Before installing the floor finish, its suitability for use with underfloor heating and its maximum operating temperature should be checked against required operating conditions.
- 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.

Step 1 - Selecting the installation method

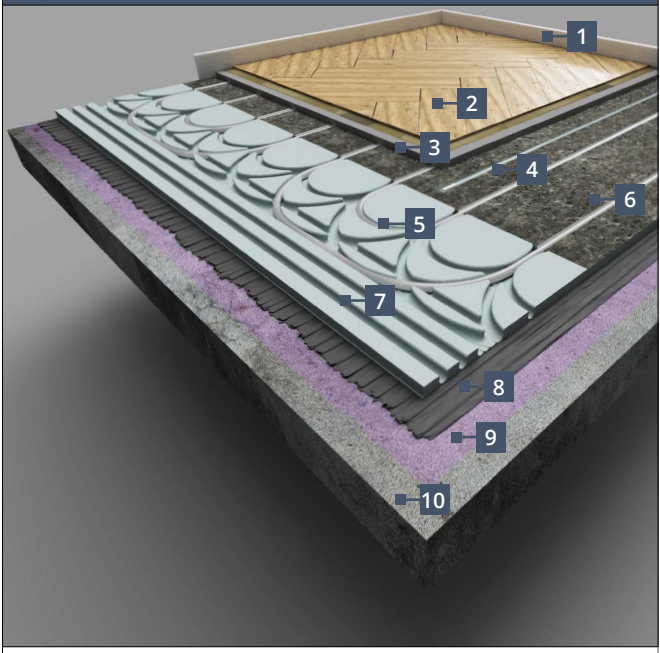
Tiled floors



1	Tile Floor Finish
2	Flexible tile adhesive *Tile adhesive used must be compatible with compressible panels such as Ultra-12, e.g. Warmup S2 flexible tile adhesive*
3	Floor sensor *Must be recessed into the Ultra-12 panel and taped in position.*
4	Warmup 12 mm PE-RT pipe
5	Ultra-12 - Straight Panel
6	Ultra-12 - Curve Panel
7	Flexible tile adhesive *e.g. Warmup S1/S2 flexible tile adhesive for wet or dry areas or compatible high temperature acrylic adhesive for dry areas*
8	Warmup primer *Refer to tile adhesive manufacturers instructions for priming requirements*
9	Subfloor with a Surface Regularity of SR1

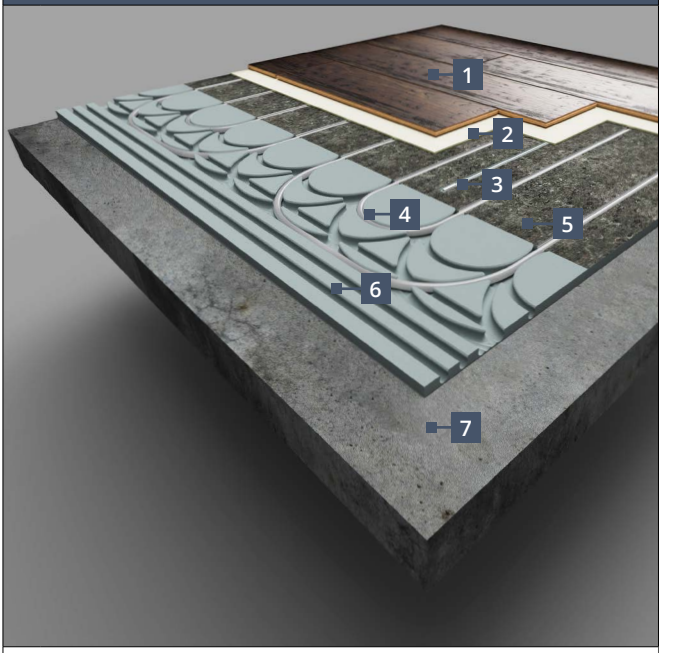
Step 1 – Selecting the installation method

All floor finishes - bonded



1	Perimeter strip *To allow for differential movement between finished floor level and walls*
2	Floor finish
3	Minimum 12 mm single layer of compatible self-levelling compound *e.g. Mapei Ultraplan Renovation Screed 3240 fibre reinforced levelling compound*
4	Floor sensor *Must be recessed into the Ultra-12 panel and taped in position.*
5	Warmup 12 mm PE-RT pipe
6	Ultra-12 - Straight Panel
7	Ultra-12 - Curve Panel
8	Flexible tile adhesive *e.g. Warmup S1/S2 flexible tile adhesive for wet or dry areas or compatible high temperature acrylic adhesive for dry areas*
9	Warmup primer *Refer to tile adhesive manufacturers instructions for priming requirements*
10	Subfloor with a Surface Regularity of SR1

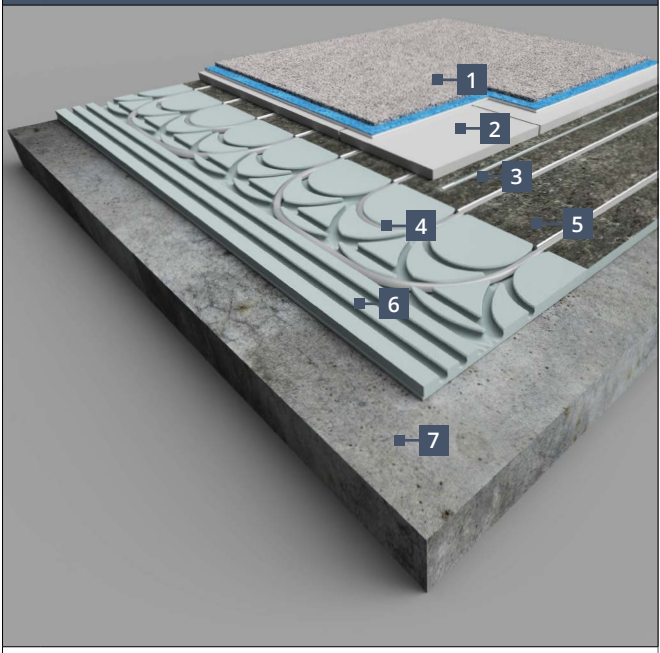
Floating floor finishes



1	Floating floor finish
2	UFH compatible underlay
3	Floor sensor *Must be recessed into the Ultra-12 panel and taped in position.*
4	Warmup 12 mm PE-RT pipe
5	Ultra-12 - Straight Panel*
6	Ultra-12 - Curve Panel*
7	Subfloor with a Surface Regularity of SR1

* *Ultra-12 panels can also be adhered to the subfloor to improve stability*

All floor finishes - floating



1	Floor finish
2	Floating floor deck *Such as HiDECK 18 or 18mm P5 T&G chipboard. Install referring to their instructions*
3	Floor sensor *Must be recessed into the Ultra-12 panel and taped in position.*
4	Warmup 12 mm PE-RT pipe
5	Ultra-12 - Straight Panel*
6	Ultra-12 - Curve Panel*
7	Subfloor with a Surface Regularity of SR1

* *Ultra-12 panels can also be adhered to the subfloor to improve stability*

Step 2 - Subfloor considerations

Ultra-12 may only be laid over structurally sound load bearing subfloors that are sufficient to support the additional load of the system, meet the requirements of the floor finish and the floors intended use.

Ensure the subfloor is dry and smooth, free of oil, grease and dust. If necessary an appropriate smoothing or levelling compound should be applied.

Where ceramic tiles are to be used over suspended floors ensure that the subfloor meets the Tile Associations minimum specifications.

Subfloors should be prepared to an SR1 standard.

For bonded floor finishes, Ultra-12 boards must be adhered to the subfloor.

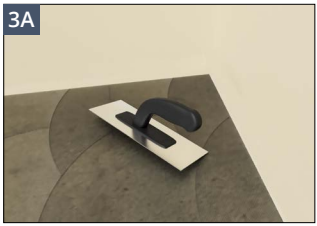
If using temperature sensitive materials above Ultra-12, such as damp proofing or tanking systems, contact the manufacturer for advice.

Do not commence installation of the Ultra-12 panels without ensuring that the resulting floor construction will meet the requirements of the floors intended use and its finish.

Step 3 - Installing VLo Ultra-12

- Ensure the subfloor is dry, clean, level to SR1 and free from dust or other substances that will prevent bonding.
- Prime the subfloor in line with the adhesive manufacturers instruction.

- If you are planning to use a levelling compound over Ultra-12 install Warmup perimeter strip around the perimeter of the room and any permanent structures to allow for differential movement between finished floor and walls.

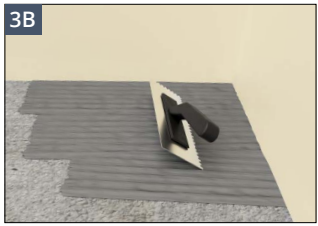


- For bonded constructions in dry areas a high temperature acrylic adhesive can be used to bond the Ultra-12 panels to the subfloor.

  Apply the adhesive following its instructions.

  For high temperature acrylic adhesives a 1-1.5 mm V-notch trowel is recommended.

  Press the boards down firmly into the adhesive to create the necessary adhesion.



- For bonded constructions in wet or dry areas and compatible S1 or S2 flexible tile adhesive is recommended.

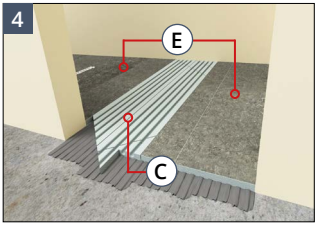
  Apply the adhesive following its instructions.

  For flexible tile adhesives a 6 mm square notched trowel is recommended.

  Press the boards down firmly into the adhesive to create the necessary adhesion.

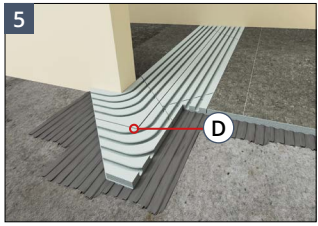
For irregular surfaces a larger trowel notch may be required.

4



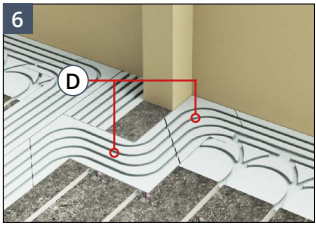
- Starting from the manifold location fit the straight service panels, **C**, following the pipe layout shown on the working drawings. Use the plain panels, **E** where applicable.

5



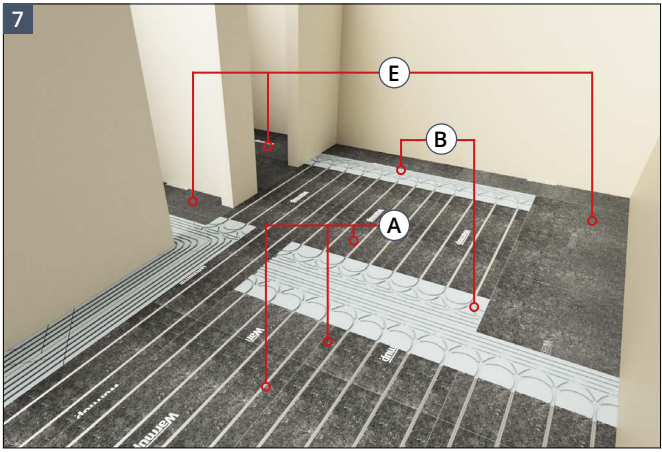
- For bends use the curve service panels, **D**, snapping or cutting the straight service panels at 45° and butting them tightly together.

6



- Curve service panels, **D**, can be cut to be used to navigate around obstacles as shown.

7



- Fit the curve panels, **B**, at the end of the room referring to the working drawings. The plain panels, **E**, can then be used in areas where underfloor heating will not be installed, i.e. under kitchen units.

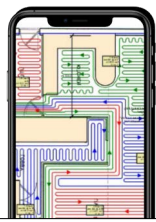
- In fill the heated area with the straight panels, **A**.

The boards can be cut using a utility knife. To prevent damage to the pipe, remove sharp edges and burrs from the edges aluminium pipe channels.

Step 4 - 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

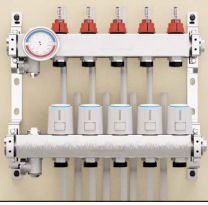


- Plan the circuit layout ensuring that the flow and return pipes can connect from the manifold to their respective heated area without crossing each other.

2

- Before installing the pipework ensure the adhesive has cured where used. Sweep or vacuum the panels to clear any debris.

3



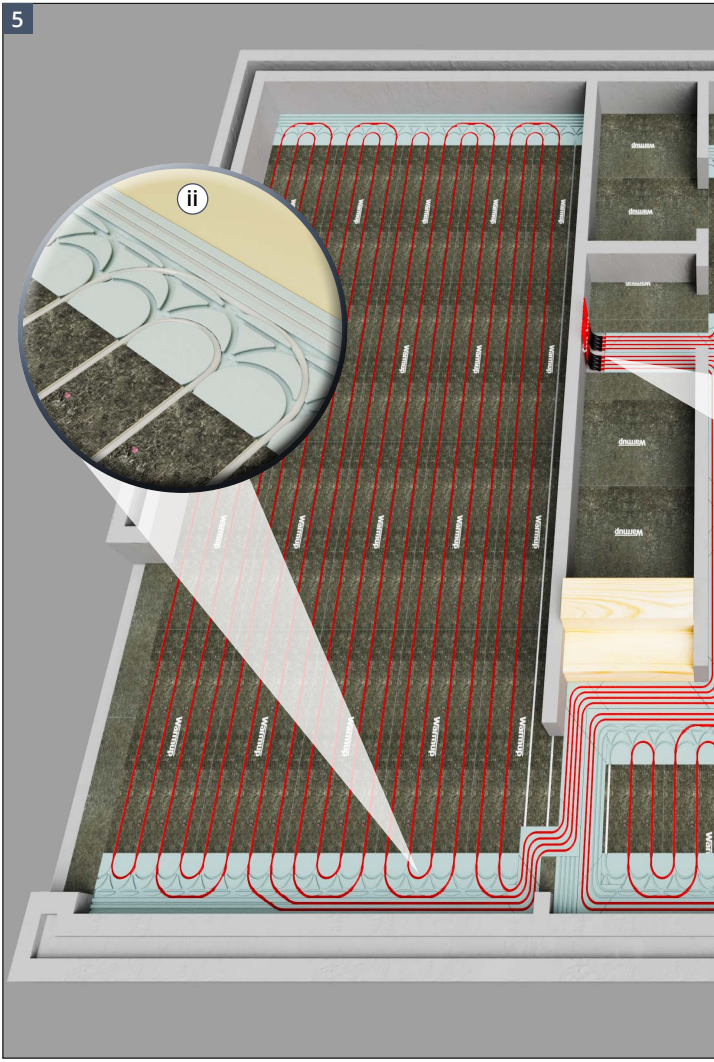
- Ensure there is excess flow and return pipe at the manifold location which can be cut later after the pipe has been laid.

4

- 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 with approximately half the support within the floor.
- Leave a 150mm space the width of the manifold arms to allow for the curve pipe supports.

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 a conduit.

Step 4 - Lay the pipe

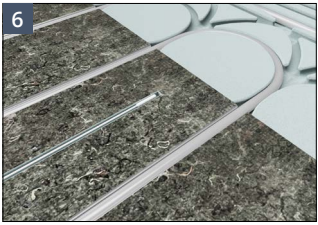


- Beginning from the manifold location, **(i)**, following the projects working drawings, begin laying the pipe, pressing the pipe into the channels,
- Meander up and down the floor using both the large and small radius turns to create the first half of a double meander pattern.
  Once you reach the mid point of your circuit, double back and infill the remaining channels. The resulting double meander pattern, **(ii)**, will ensure a more even floor temperature.
- Where required, route channels into the Ultra-12 panels as shown **(iii)**.

iii
i
Warmup

Step 4 - Lay the pipe

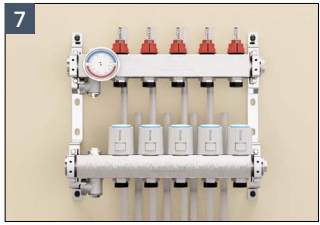
6



- Route a 6 mm channel into the Ultra-12 panel for the floor sensor to be recessed into.
- Install the sensor at least 300 mm into the heated area it will be controlling. It should be located centrally between parallel runs of pipe and not in an area influenced by other heat sources.
- The sensor can be secured to the subfloor with tabs of tape.

Test the resistance of the floor sensor at this stage

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.

Step 5A - Laying a tile floor covering

- Cover the Ultra-12 system with a full bed of compatible S2 flexible tile adhesive using a notched trowel ensuring there are no air gaps.

- 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.

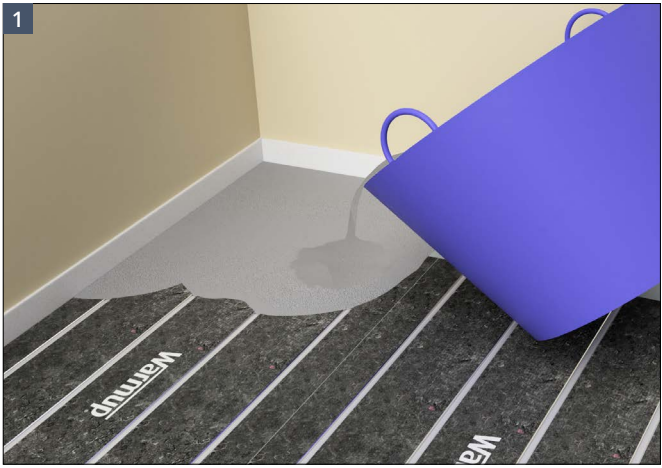
- Grout the floor as soon as possible as per the tile adhesive manufacturer's instructions.

Tiles must not be removed once the adhesive has set, doing so could damage the pipes.

DO NOT switch the system on until the tile adhesive and grout has fully cured. DO NOT use the heater to accelerate the curing process of the adhesive or levelling compound.

The smallest tile size allowable over Ultra-12 is 200 mm x 200 mm, a levelling compound must first be applied when using smaller tiles, see 5B. Any tile adhesive used must be compatible for compressible panels such as Ultra-12.

Step 5B - All floor finishes - Bonded



- Apply a minimum 12 mm single layer of compatible self-levelling compound over the Ultra-12 boards.

  When applied at the correct depth, the levelling compound should finish flush with the top of the perimeter strip.

- Lay the floor covering adhering to the flooring manufacturers instructions. If gluing the floor finish ensure the adhesive is suitable for use with underfloor heating.

Step 5C - Laying a floating floor finish

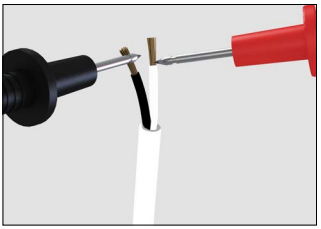
- Cover the Ultra-12 system with underfloor heating compatible underlay.
- Lay the floor finish at a 90° angle to the pipe runs, following the floor manufacturers instructions and national guidelines when laying the floor.

Step 5D - All floor finishes - Dry

- Lay a floating floor deck, such as HiDECK 18. Refer to the floor deck manufacturers manual for correct installation.

- Finally lay the floor covering adhering to the flooring manufacturers instructions. If gluing the floor finish ensure the adhesive is suitable for use with underfloor heating.

Sensor resistance test



- Ensure that the sensor is tested before the plywood layer 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

ISSUE 1 - Excessive movement or creaking	
PROBLEM	**SOLUTION**
Subfloor not structurally sound or level causing the Ultra-12 boards to flex and rub	Refit the panels in accordance with this manual.
ISSUE 2 - Cracked tiles	
PROBLEM	**SOLUTION**
Timber Subfloor - There is excessive movement in the subfloor causing the floor to flex leading to cracked tiles	The issue with the subfloor has to be resolved otherwise the tiles will continue to crack
The subfloor was not sufficiently level prior to the system being installed and there are air gaps between the Ultra-12 panels and the subfloor.	The issue with the subfloor has to be resolved otherwise the tiles will continue to crack
ISSUE 3 - Ultra-12 boards are unstable during installation	
PROBLEM	**SOLUTION**
Subfloor not level	Ensure the subfloor is smooth, flat and level to SR1standards as required
Excessive tension in the pipe	Glue the Ultra-12 boards to the subfloor
ISSUE 4 - Excessive / Insufficient heat output	
PROBLEM	**SOLUTION**
Incorrect water temperature	Refer to System Performance chart to calculate the required water temperature

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.

Ultra-12 panels - Foam component	
Density	50 kg/m^3
Thermal Conductivity (initial - >5yrs)	0.027 – 0.034W/mK
Compressive Strength (10% deflection)	500kN/m^2
Water Absorption (2-day immersion)	<1.0% by volume
Water Absorption (Capillary)	Zero
Coefficient of linear expansion	0.07mm/mK
Water Vapour Diffusion Resistivity factor (μ)	110 – 225
Fire Behaviour	Euroclass E
ODP (Ozone Depleting Potential)	Zero
GWP (Global Warming Potential)	<0.29

Ultra-12 Low Build Straight Panel	
Product code	ULTRA12-SP-PANEL
Composition	Extruded polystyrene with 150μm thick aluminium foil layer on top, with a fibreglass reinforcement mesh and a 100% recycled polyester fleece on top and bottom
Pipe centres	150mm
Dimensions	600 x 1200 x 18mm
Weight of the Panel	1 kg

Ultra-12 Low Build Curve Panel, Straight Service Panel, Curve Service Panel	
Product code	ULTRA12-CP-PANEL, ULTRA12-SS-PANEL, ULTRA12-CS-PANEL
Composition	Extruded polystyrene with a fibreglass reinforcement mesh and a 100% recycled polyester fleece on bottom
Dimensions	600 x 1200 x 18mm
Weight of the Panel	0.5 kg

Ultra-12 Low Build Plain Panel	
Product code	ULTRA12-PP-PANEL
Composition	Extruded polystyrene with a fibreglass reinforcement mesh and a 100% recycled polyester fleece on top and bottom
Dimensions	600 x 1200 x 18mm
Weight of the Panel	0.7 kg

	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**
150mm Pipe Centres*	6.96	5.74	4.90	4.27	3.79	3.41	3.09	2.84	2.62	2.43	2.27	2.13	2.00

* 150 mm pipe centres with no overboarding or levelling compound. If you are using a floating floor deck over Ultra-12 beneath the floor finish, you must also include its thermal resistance, for example:

18 mm Chipboard, R = 1.25 tog
18 mm HiDECK 18, R = 0.45 tog

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 Ultra-12, fitted with pipe at 150 mm centres, in a 21°C room heated with 40°C water is;

$$q = 3.41 \times (40 - 21) = 3.41 \times 19 = 64.79 \text{ W/m}^2$$

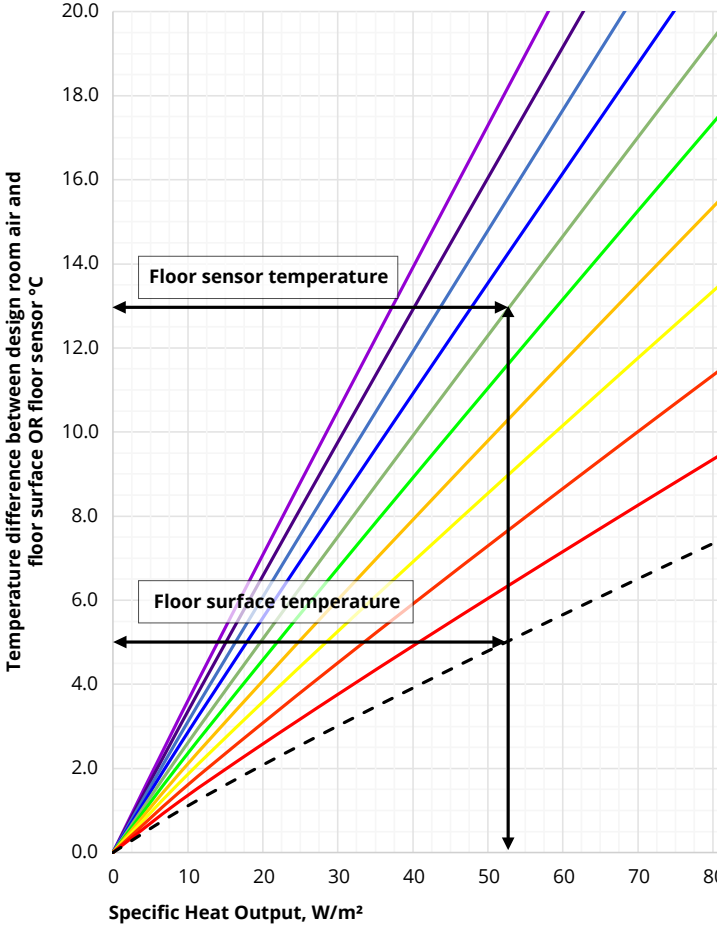
Alternatively, using the system k_H value to calculate the required water temperature, knowing the required heat output:

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

Example:
The water temperature required to produce a heat output of 55 W/m², through a 3 mm thick LVT floor finish on HiDECK 18 (0.30 + 0.45 = 0.75 tog), over Ultra-12 panels, fitted with pipe at 150 mm centres, in a 22°C room is;

$$T_{water} = (55 / 4.27) + 22 = 13 + 22 = 35°C$$

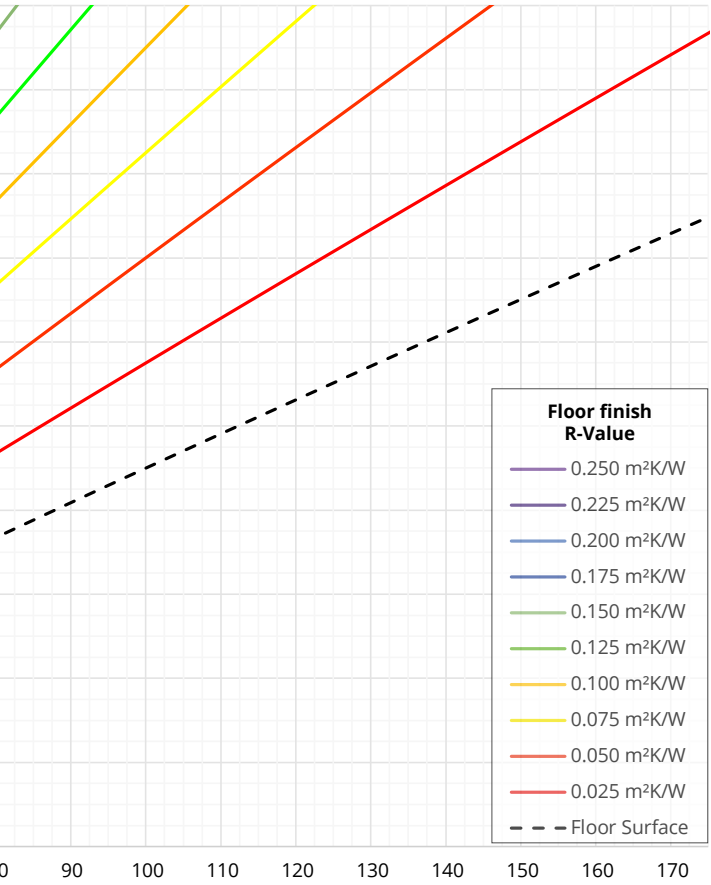
Floor sensor setting for target heat output



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

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Please scan the QR code to provide feedback on your installation

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