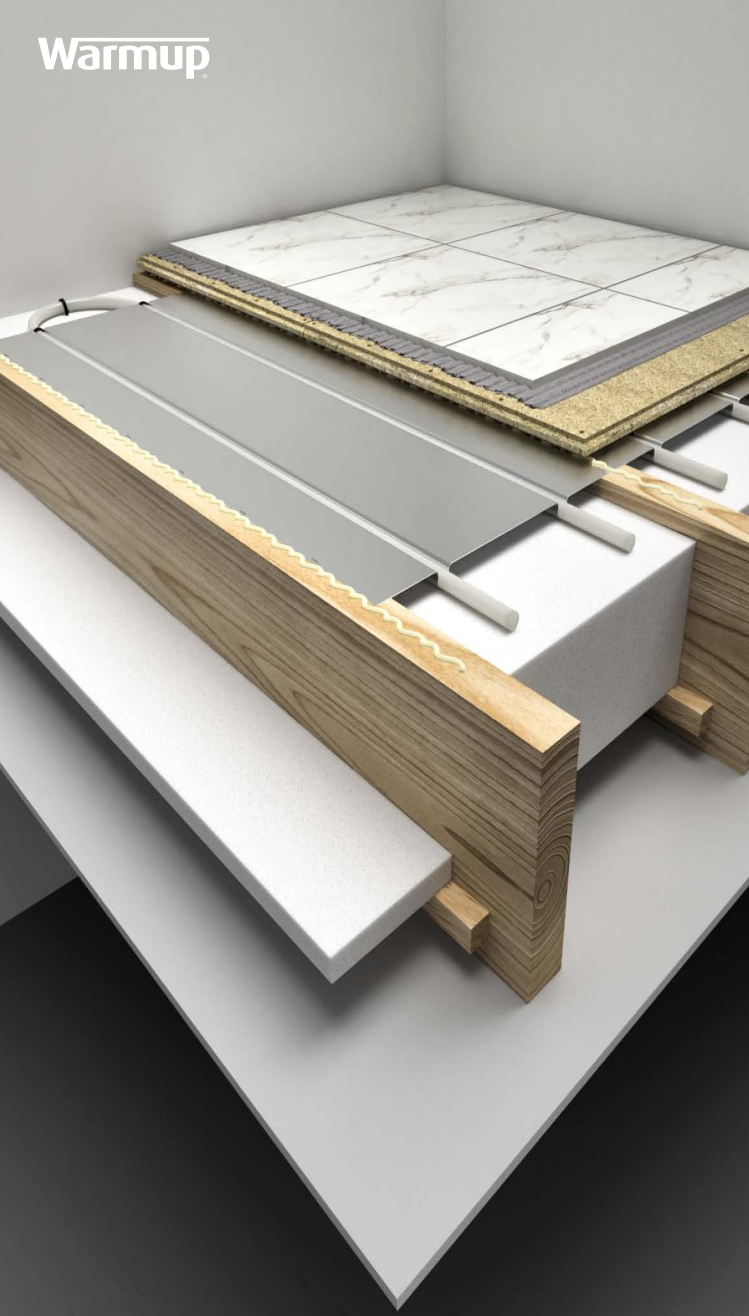
Warmup



Tectora

Joisted Floor System

Installation manual

LIFETIME LIMITED WARRANTY Warmup

SAFETY Net™ Installation-Guarantee

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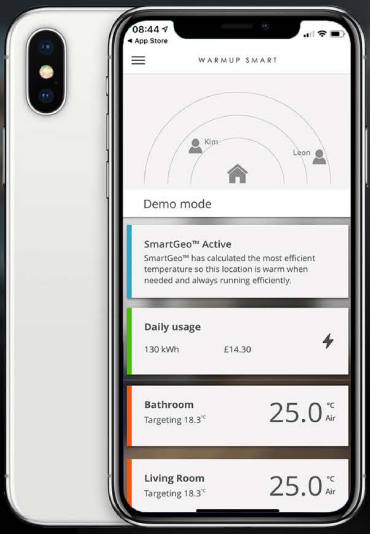

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Table of Contents

Installation summary 4
Components available from Warmup 6
Important installation information 7
Typical floor build-up 8
Step 1 - Subfloor considerations 9
Joist notching/drilling 9
Step 2 - Subfloor preparation 10
Step 3 - Install insulation 11
Step 4 - Install diffuser plates 12
Step 5 - Lay the service pipe 14
Step 6 - Lay the pipe 16
Step 7 - Lay the floor deck 17
Step 8 - Floor covering 18
Testing information 20
Troubleshooting 21
Warranty 22
Technical specifications 24
System performance 25

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.

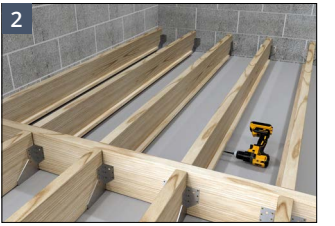
You may also find a copy of this manual, wiring instructions and other helpful information on our website

www.warmup.co.uk

Installation summary

Please also read the full instructions that follow this section.

- Tectora must only be installed on joists at 400mm centres.
- Ensure the joists are level and even, clear of debris and without any surface deviations such as knots or nails.

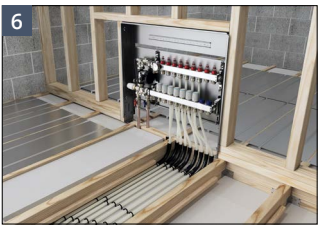


- 25 x 25mm battens must be installed in the joists to support the rigid insulation layer.
- Drill/notch the joists in line with building regulations.

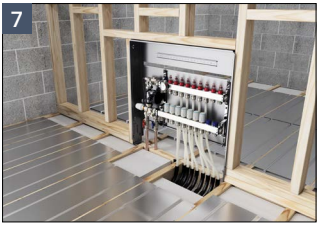
- Insulate the joist space with rigid insulation in line with building regulations.
- Rigid insulation must be installed with its top surface 19mm below the top of the joists, such that it properly supports the Tectora diffuser plate and the installed pipe.

- Begin installing the diffuser plates in the corner of the room, 150mm off the wall for pipe bends.
- Staple the diffuser plates to the joists every 150mm.

- Install the sensor centrally onto a joist creating a notch in the joist for the sensor tip.
- The diffuser plates where the sensor is to be located must be cut back 25mm on all sides.

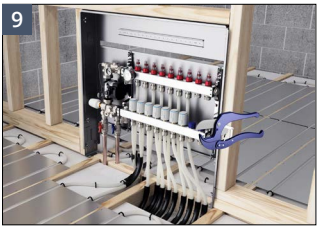


- Install the service pipe in the joist space using Warmup pipe bend supports and Warmup clips to secure to a thinner insulation layer.

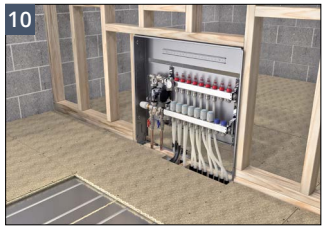


- Insulate the sevice pipes and install remaining diffuser plates.

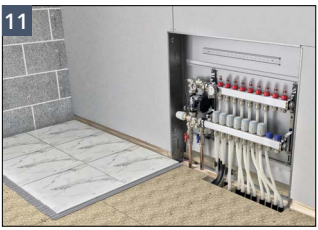
- Following the projects working drawings, begin laying the pipe, pressing the pipe into the channels and using pipe bend supports and clips.



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



- Install the floor deck over the system following the floor deck manufacturers instructions.



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

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

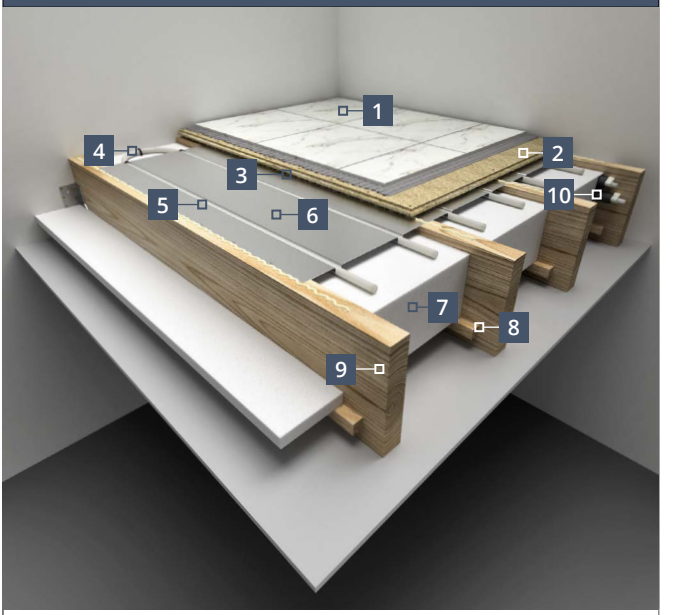
Components available from Warmup

Product Code	Description
WHS-TE-ALUDP1	Tectora Diffuser - Aluminium *2 x 16mm Channels* *0.5mm x 390mm x 1000mm*
WHS-P-PERT-xx *xx = length: 25, 50, 60, 70, 80, 90, 100, 110, 120, 300m*	PE-RT Pipe- 16mm x 2mm
WHS-CL-Txx *xx = length; 40 or 60mm*	Pipe clips
WHS-P-BEND	Pipe bend supports
WHS-MT-B0xxyyy *xx = kpa: 70 / 100* *yy = thicknesses: 25, 50, 70, 100mm* *+ = 0.030W/mK*	EPS 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	
Adhesive	
Wood screws	
Floor deck	

- 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.
- Ensure that insulation is installed between the joist in line with building regulations. Joists must be level and even, clear of debris and without any surface deviations such as knots or nails.
- Safety gloves must be worn. While all efforts have been made to ensure there no burrs or sharp edges, the aluminium diffuser plates may have some sharp edges.
- Dust particles may become airborne when cutting wood or insulation products. Therefore please follow relevant health and safety rules when cutting the diffuser plates or insulation by using a mask, goggles, gloves and ensuring adequate ventilation.
- 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.
- 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.

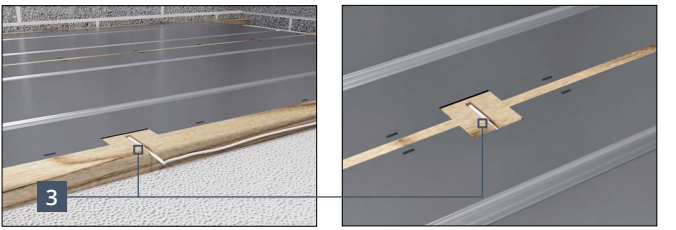
Typical floor build-up

All floor finishes



1	Floor finish
2	Floor deck *Floor deck to be fitted in line with manufacturer instructions.*
3	Floor sensor *Location shown below; Must be recessed into the joist.*
4	Pipe clips *Clipped into insulation layer at beginning, middle and end of the pipe turns.*
5	Warmup 16mm PE-RT pipe
6	Aluminium diffuser plates *Stapled to joists at 150mm spacings.*
7	Insulation layer *Thickness in line with building regulations.*
8	25 x 25mm battens *To support the insulation layer*
9	Joists at 400mm centres
10	Flow and return pipes* *Installed beneath the Tectora diffuser plates, notched or through holes drilled in the joists in line with building regulations.*

* Service pipes must be insulated within the joist space and supported at 300mm intervals on horizontal runs and 500mm on vertical runs using pipe clips



Step 1 - Subfloor considerations

To prevent excessive heat loss through the floor, ensure that insulation is installed between the joist in line with building regulations.

If using temperature sensitive materials above Tectora, 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.

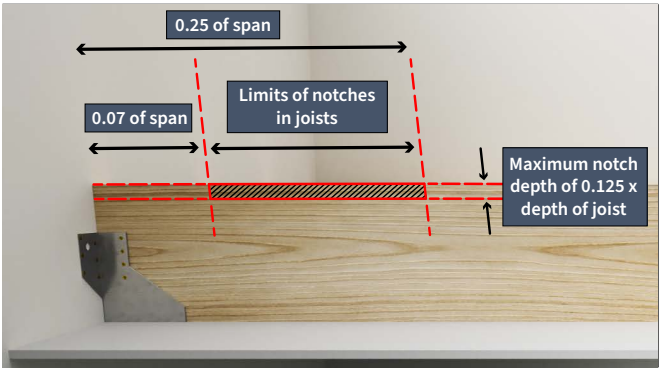
Do not commence installation of the Tectora without ensuring that the resulting floor construction will meet the requirements of the floors intended use and its finish.

Joist notching/drilling

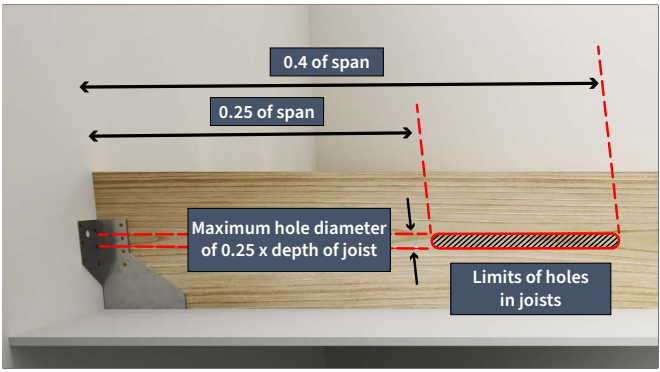
Joists must be level and even, clear of debris and without any surface deviations such as knots of nails before laying Tectora.

Joists will have to be drilled or notched in line with building regulations to allow for the flow and return pipes to enter the room. Ensure the notches or holes are large enough to allow for the expansion and contraction of the pipes. All exposed pipework within the joist spaces must be insulated.

Joist notching



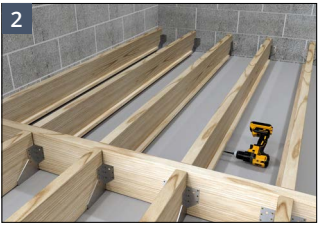
Joist drilling



The images above are for guidance only, please refer to building regulations for full information on how to notch/drill into joists.

Step 2 - Subfloor preparation

- Tectora must only be installed on joists at 400mm centres.
- Ensure the joists are level and even, clear of debris and without any surface deviations such as knots or nails.

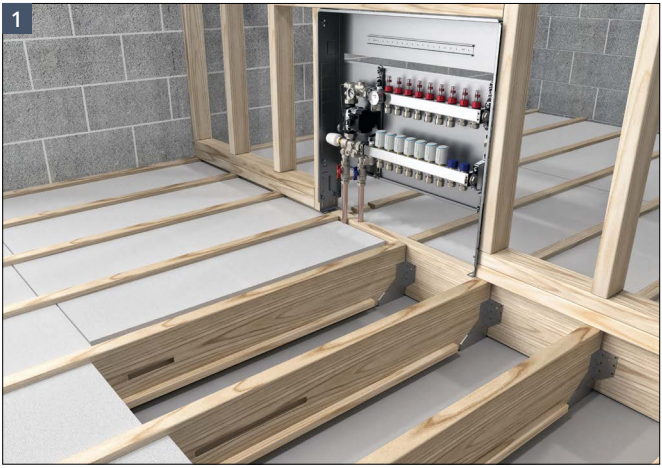


- 25 x 25mm battens must be installed in the joists bays to support the rigid insulation layer.

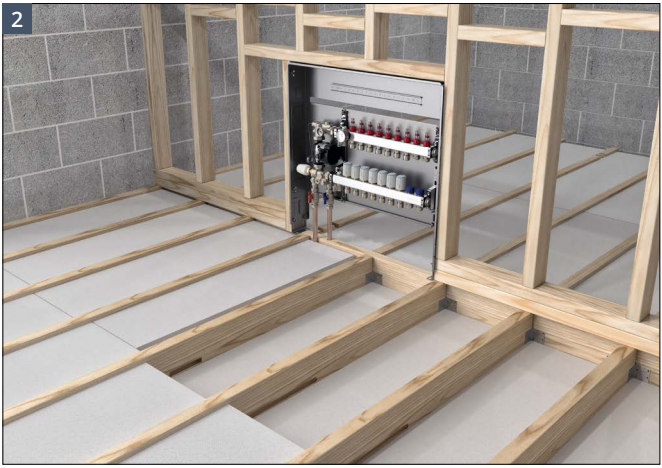
- Service pipes for underfloor heating in other rooms must be located in the joist space.
- Joists must be drilled in line with building regulations.

- The joists must also be notched for the loop ends of the pipe.
- Joists must be notched in line with building regulations.

Step 3 - Install insulation



- The joist space must be pre-insulated with rigid insulation in line with building regulations.
- Rigid insulation must be installed with its top surface 19mm below the top of the joists, such that it properly supports the Tectora diffuser plate and the installed pipe.



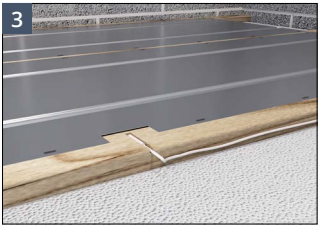
- For the service pipes, install a thinner layer of insulation at a lower level to support the service pipes.

Step 4 - Install diffuser plates

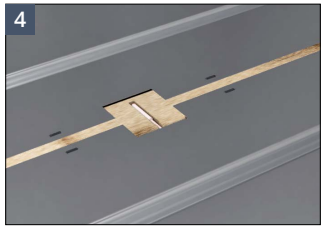
- Begin installing the diffuser plates in the corner of the room. Each diffuser plate must be supported by the joist and installed 150mm off the wall for pipe bends.
- Staple the diffuser plates to the joists every 150mm.

- When installing the diffuser plates they must be installed a minimum of 10mm apart. **The plates must not overlap or touch at any stage.**

Step 4 - Install diffuser plates



- The sensor must be installed centrally onto a joist. Create a notch in the joist for the sensor tip and run the sensor cable in the joist space to the thermostat location.



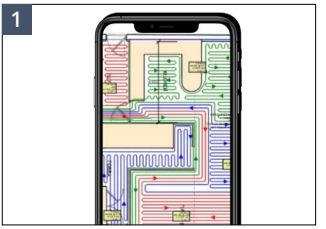
- The diffuser plates where the sensor is to be located must be cut back 25mm on all sides.

Test the resistance of the floor sensor at this stage

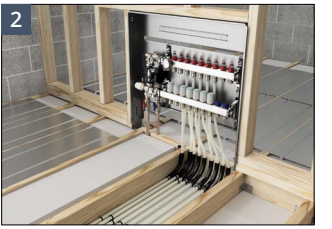
- In the service pipe location, do not install diffuser plates until the service pipes are installed in the joist space and fed to the relevant room locations.

Step 5 - Lay the service 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.



- 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.

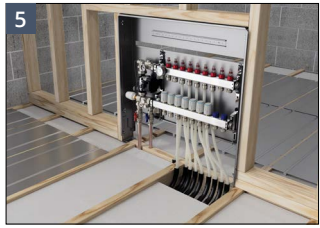


- First install the service pipe in the joist location, ensuring there is excess flow and return pipe at the manifold location which can be cut later after the pipe has been laid.
- Use Warmup pipe bend supports and Warmup clips where the pipe exits the floor at the manifold location.

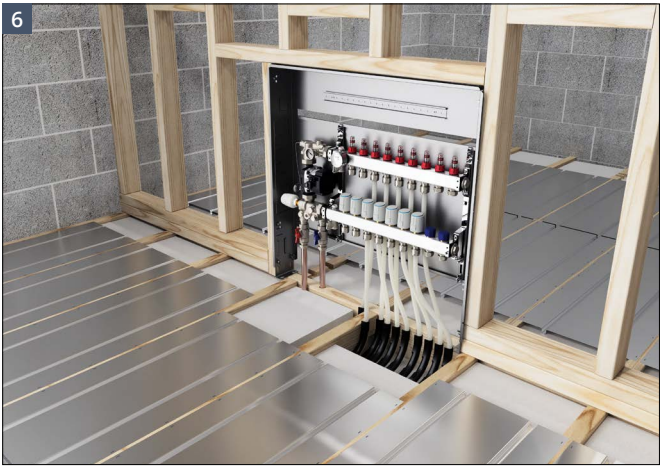
- Secure the pipe to the insulation layer using Warmup clips after the bend supports and then every 500mm.
- Secure bends in the pipe at the beginning, middle and end of the turn.

Step 5 - Lay the service pipe

- Install additional 25 x 25mm battens to the joists, above the service pipes. This is to support another layer of insulation which will insulate the service pipes.



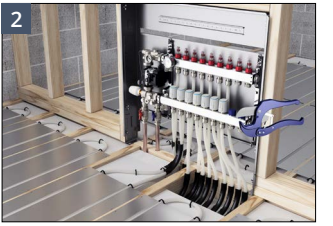
- Install another layer of rigid insulation to the battens to insulate the service pipes and support the Tectora diffuser plates.



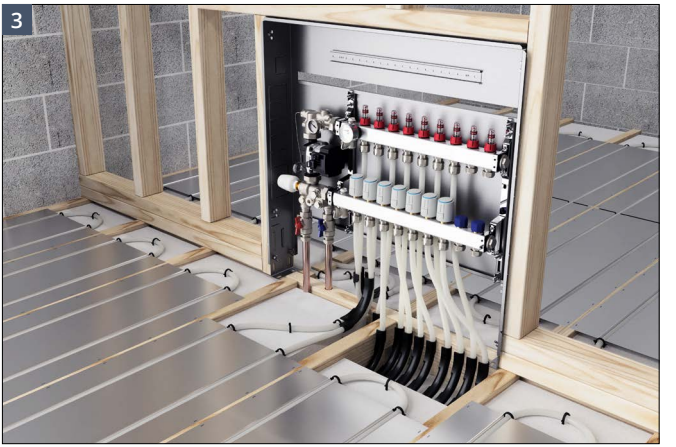
- Install the final diffuser plates to the joists in the service pipe location using the same fixing method as Step 2.

Step 6 - Lay the pipe

- Before installing the pipework in the diffusers it is advised to sweep the diffusers, paying particular attention to their channels to clear any debris.

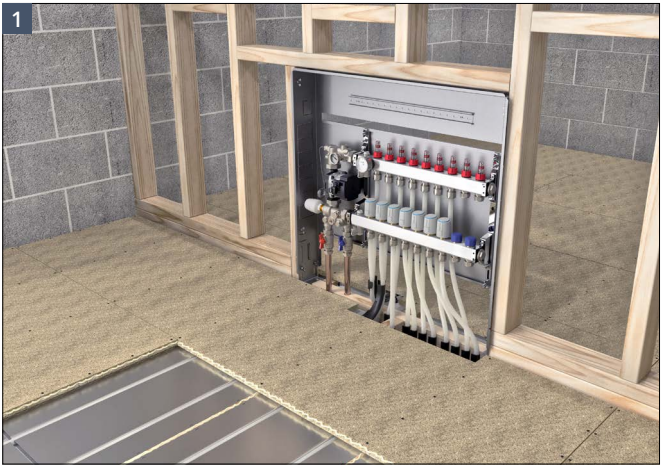


- Use Warmup pipe bend supports and Warmup clips where the pipe exits the floor at the manifold location.
- Measure and cut the pipe so that it reaches both the flow and return ports on the manifold and connect to the manifold.
- Refer to the manifold manual for detailed information on mounting, pressure testing and commissioning.



- Following the projects working drawings, begin laying the pipe, pressing the pipe into the channels.
- Secure pipe bends to the insulation layer at the beginning, middle and end of the turn.

Step 7 - Lay the floor deck



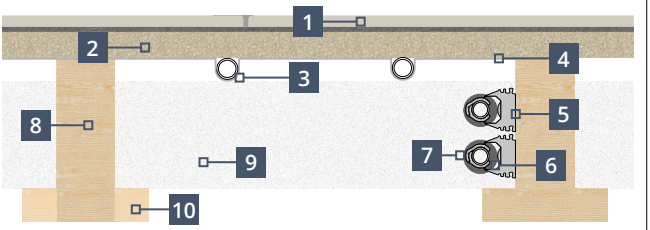
- Install the floor deck over the system following the floor deck manufacturers instructions.

Step 8 - Floor covering

Before installing any floor finish, adhesive or underlay over the floor deck, 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 Floor finish

2 Floor deck
Floor deck to be fitted in line with manufacturer instructions.

3 Warmup 16mm Pipe

4 Warmup Tectora diffuser plates
Stapled to joists at 150mm spacings.

5 Warmup pipe clips

6 Flow and return pipes
Installed beneath the Tectora diffuser plates, notched or through holes drilled in the joists in line with building regulations.

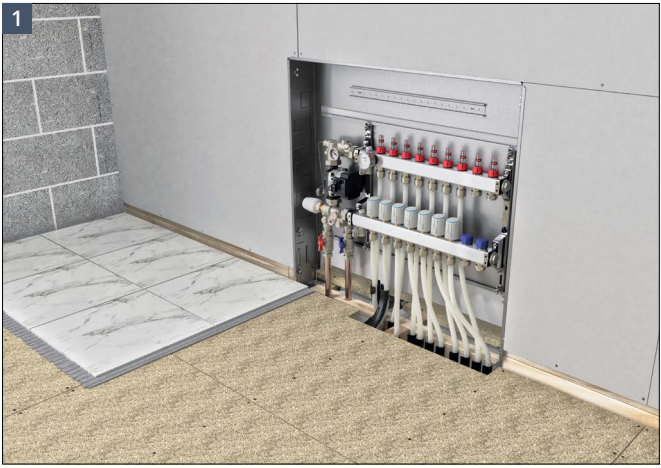
7 Service pipe insulation
Service pipes must be insulated within the joist space

8 Joists at 400mm centres

9 Insulation
Installed with its top surface 19mm below the top of the joists, such that it properly supports the Tectora diffuser plate and the installed pipe

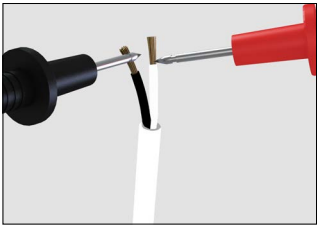
10 Battens / supports
To support the insulation layer

Step 8 - Floor covering



- 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 floor deck is 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**
The floor deck has not been installed in line with its manufacturers instructions.	Contact floor deck manufacturer and refit the diffuser plates in accordance with their manual.
Diffuser plates are touching or overlapping	Refit the diffuser plates in line with this manual. Diffuser plates must not touch or overlap at any stage.
ISSUE 2 - Cracked tiles	
PROBLEM	**SOLUTION**
There is excessive movement of the joists or the joist spacing is larger than recommended by building regulations 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.
ISSUE 3 - 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.

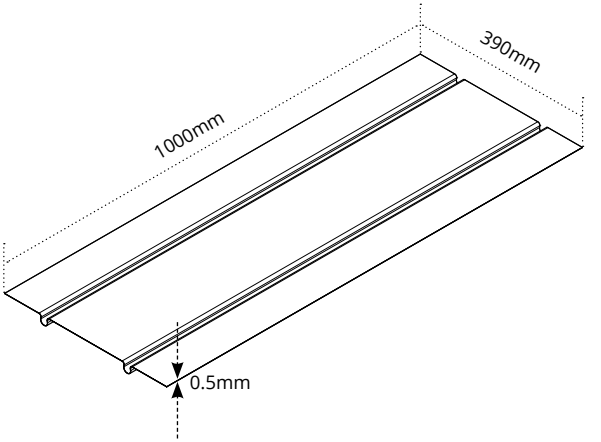
Register your Warmup® warranty online at www.warmup.co.uk

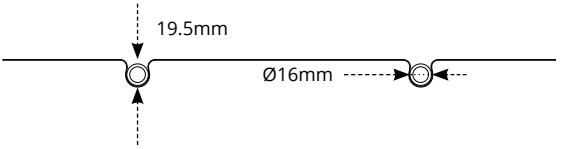
(i) Pipes repaired by Warmup carry a 5 year warranty only. Under no circumstances is Warmup responsible for the repair or replacement of any tiles / floor covering which may be removed or damaged in order to affect the repair.

(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.

Tectora	
Product code	WHS-TE-ALUDP1
Dimensions	390mm x 1000mm
Height	19.5mm
Aluminium thickness	0.5mm
Composition	Aluminium
Pipe centres	200mm
Pipe diameter	16mm





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**
200mm Pipe Centres	2.84	2.62	2.43	2.27	2.12	1.99	1.88	1.78	1.69	1.61	1.54	1.47	1.41

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 Tectora with 18mm T&G P5 chipboard floor deck, fitted with pipe at 200mm centres, in a 21°C room heated with 40°C water is;

$q = 1.99 \times (40 - 21) = 1.99 \times 19 = 37.8$ W/m²

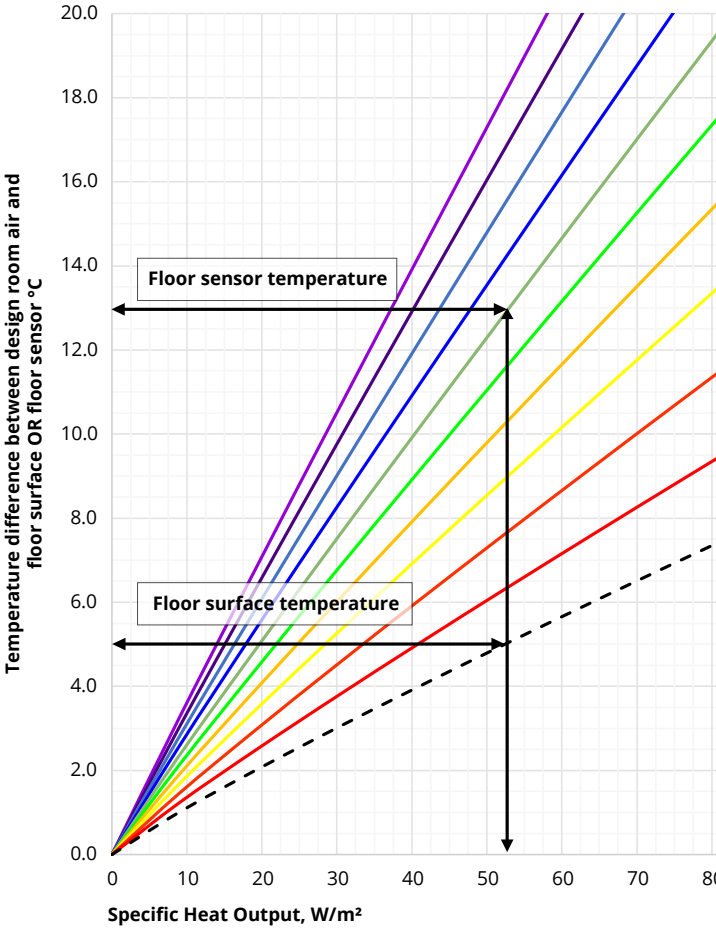
Alternatively, using the system k_H value to calculate the required water temperature, knowing the required heat output:

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

Example:
The water temperature required to produce a heat output of 55W/m², through a 3mm thick ≈ 0.25 tog LVT floor finish, over Tectora with 18mm T&G P5 chipboard floor deck, fitted with pipe at 200mm centres, in a 22°C room is;

$T_{water} = (55 / 2.62) + 22 = 21 + 22 = 43$°C

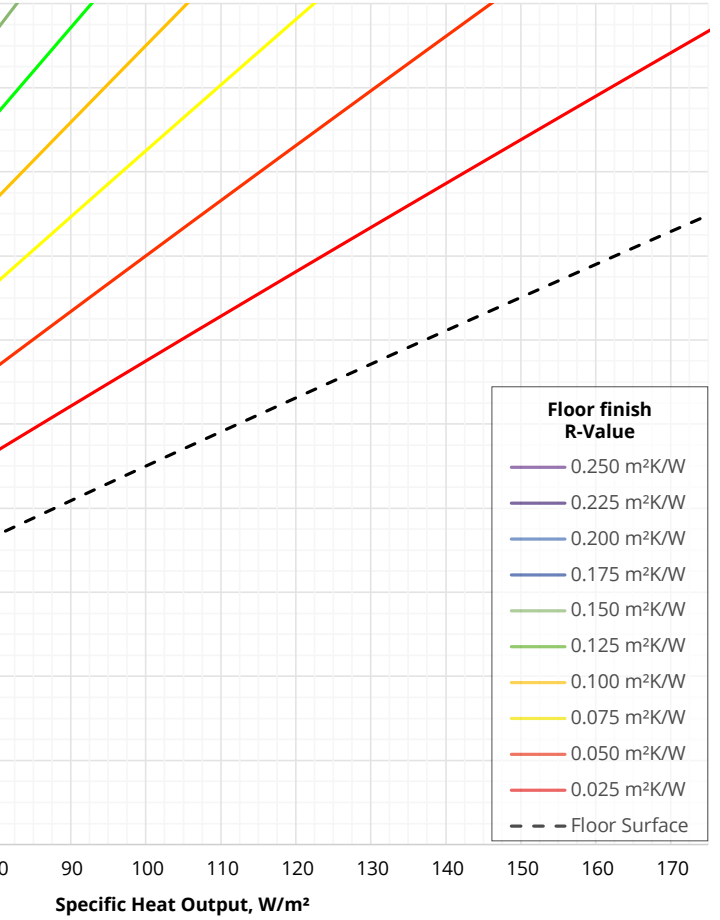
Floor sensor setting for target heat output



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 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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