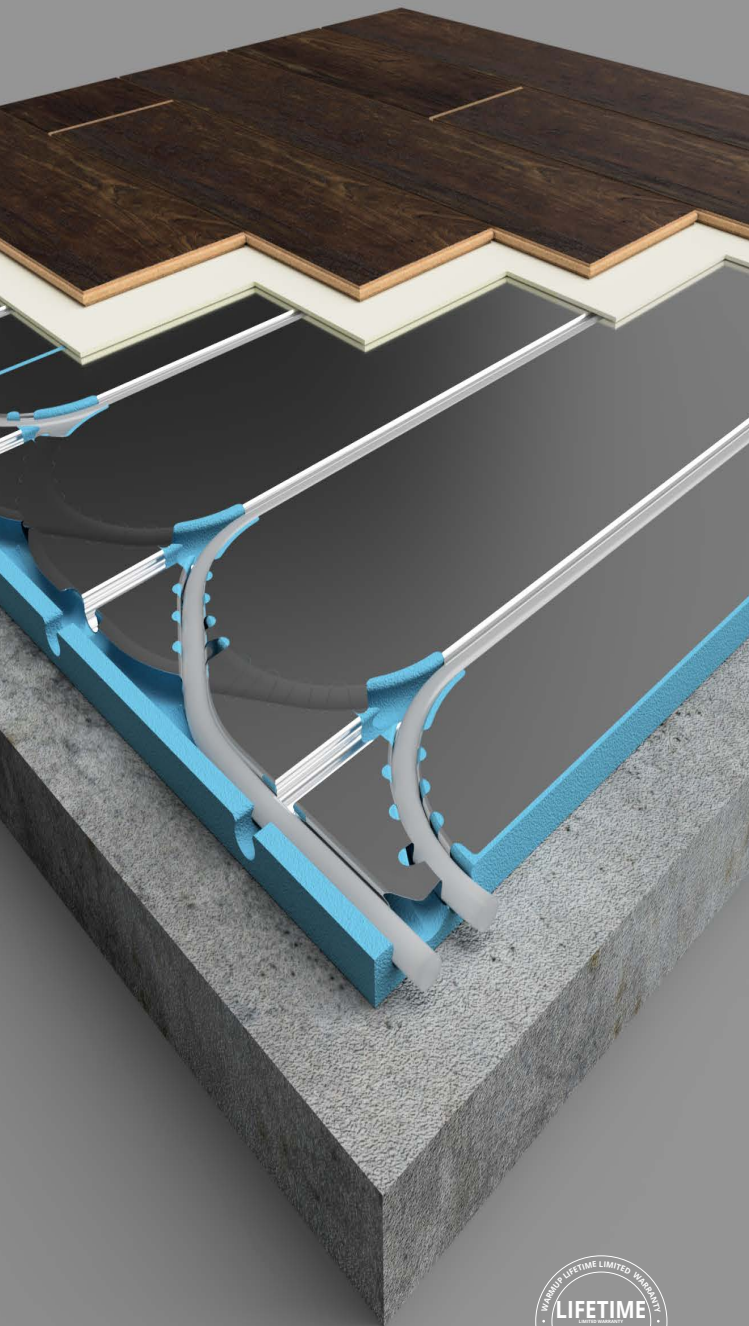


Warmup®



**Lo-16**

Low Build System

Installation manual



**SAFETYNet™**  
Installation-Guarantee





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**Warmup**<sup>®</sup>

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

# Installation summary

Please also read the full instructions that follow this section.



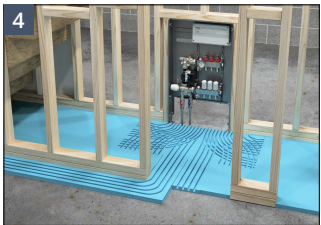
- Ensure the subfloor is clean, dry and prepared to an SR1 standard. See subfloor considerations page for more information.



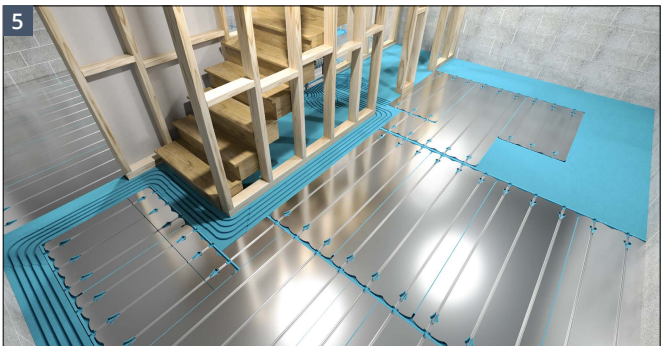
- For bonded constructions in dry areas a high temperature acrylic adhesive, e.g. Warmup Stick & Go can be used to bond the Lo-16 panels to the subfloor.
- Press the panels down firmly into the adhesive to create the necessary adhesion.



- For bonded constructions in wet or dry areas a compatible S2 flexible tile adhesive is recommended.
- Press the panles down firmly into the adhesive to create the necessary adhesion.

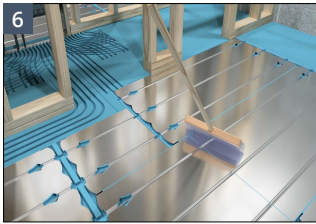


- Starting from the manifold location fit the Manifold Panel **B** and Plain Panels **E** following the pipe layout shown on the working drawings.
- For bends use the Curve Service Panels **D**, cutting the Straight Service Panels **C** at 45° and butting them tightly together.

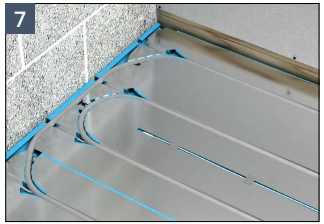


- Fit the Universal Heating Panels, **A**, at the end of the room first referring to the working drawings.
- In-fill the heated area with the Universal Heating Panels, **A**.
- The Plain Panels **E** can then be used in areas where underfloor heating will not be installed, i.e. under kitchen units.

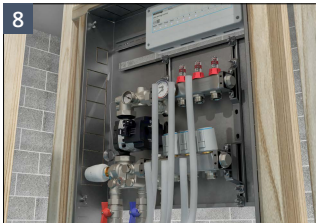
## Installation summary



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



- Install the pipe in line with the projects working drawings, pressing it into the grooves of the Lo-16 panels. Ensure the pipe is securely fixed into the grooves.
- Rout a 6 mm channel into the panel for the floor sensor to be recessed into and install at least 300 mm into the heated area it will be controlling.



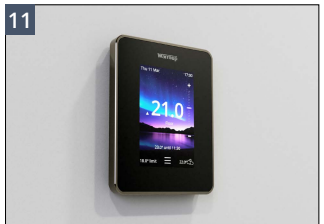
- Measure and cut the pipe so that it reaches both the flow and return ports on the manifold.
- Refer to the manifold manual for detailed information on mounting, pressure testing and commissioning.



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

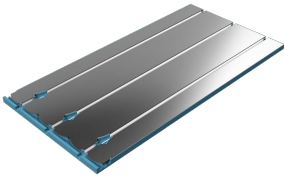
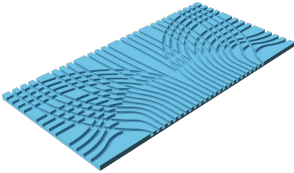
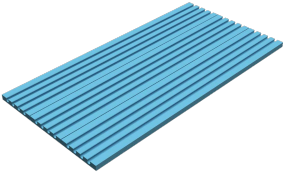
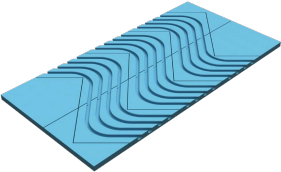
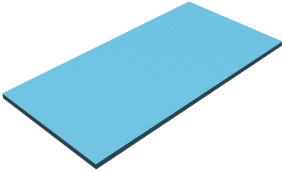


- Lay your chosen floor covering in accordance with floor manufacturers instructions.



- 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
 LO16-SP-PANEL	<b>(A) Lo-16 Low Build</b> Universal Heating Panel
 LO16-MP-PANEL	<b>(B) Lo-16 Low Build</b> Manifold Panel
 LO16-SS-PANEL	<b>(C) Lo-16 Low Build</b> Service Straight Panel
 LO16-CS-PANEL	<b>(D) Lo-16 Low Build</b> Curve Service Panel
 LO16-PP-PANEL	<b>(E) Lo-16 Low Build</b> Plain Panel
WHS-P-PERT-XX <i>XX = pipe length in meters</i> 25, 50, 60, 70, 80, 90, 100, 110, 120, 300m	Warmup PE-RT pipe 16 mm
ACC-PRIMER	Warmup Primer
WHS-P-BEND	Pipe bend supports

## Components available from Warmup














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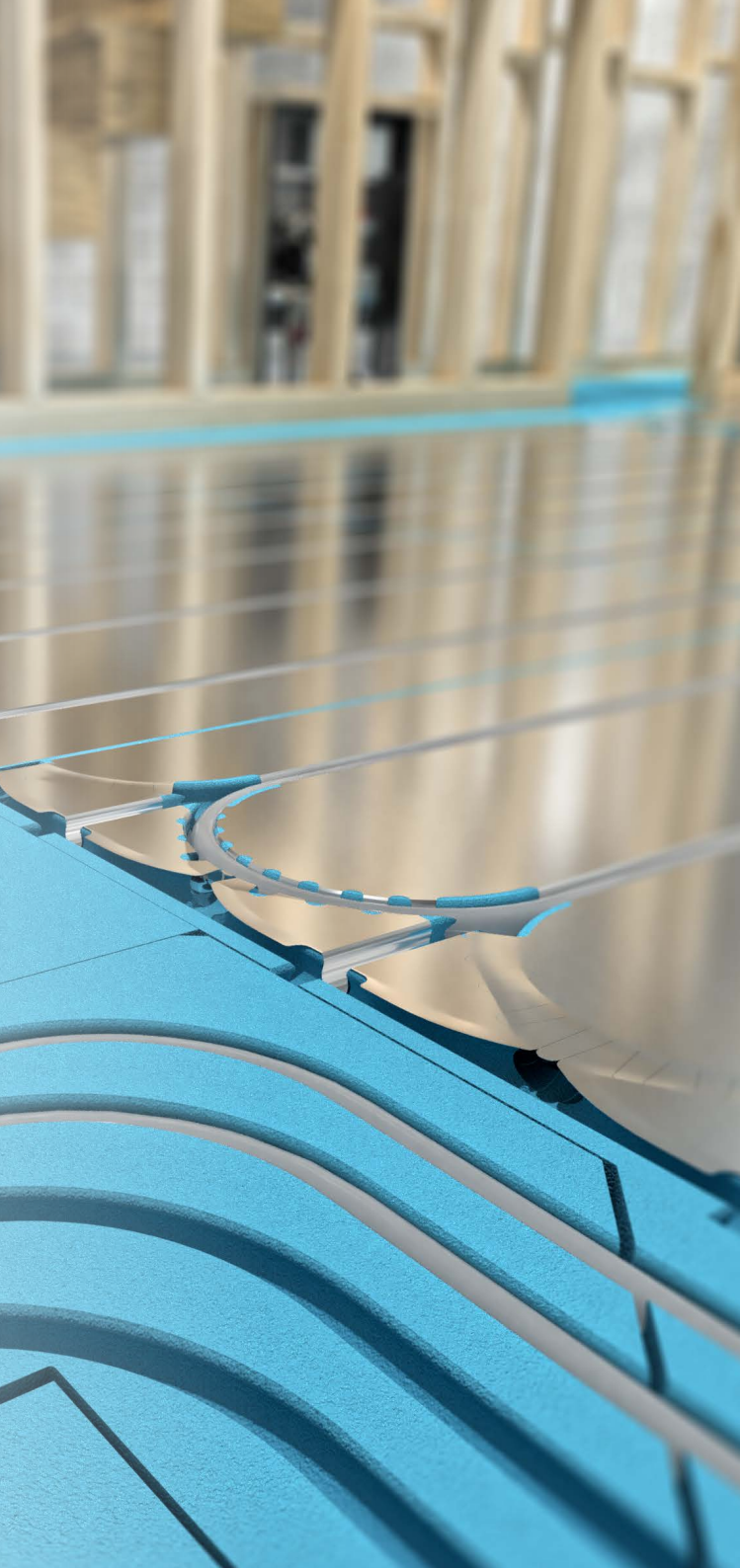
**Additional components that may be required as part of your Warmup heating installation:**

Manifold, mixing unit, actuators, valves and euroconus connectors
Warmup UFH Wiring centre
Warmup Thermostats
Warmup Stick & Go
Electrical trunking/conduit
Digital multi-meter required for testing the resistance of the sensor
HiDECK Overlay 18
HiDeck PRO Adhesive
Perimeter Expansion Strip
Mapei Ultraplan Renovation Screed 3240
Mapei Ultrabond VS90 Plus
S2 Tile Adhesives

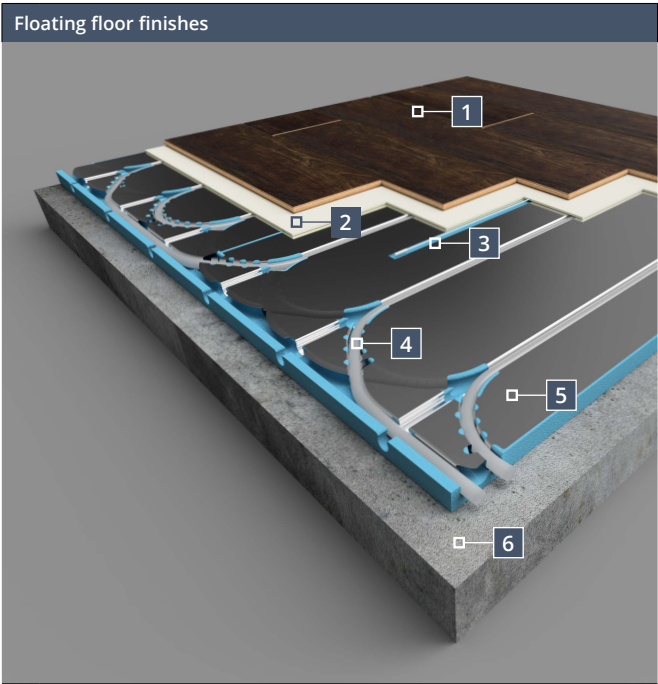
## Important installation information

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-  On delivery of the 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 the system, ensure it is suitable for use with compressible underfloor heating panels and applied as a single layer.
-  The panels can be installed on both concrete or suspended timber subfloors. Timber subfloors must be installed as per building regulations and have a structural floor deck to support the system.
-  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.
-  Warmup Primer MUST be used when applying tile adhesive or levelling compound over Lo-16 Panels to ensure good adhesion and prevent corrosion of the aluminium plate.



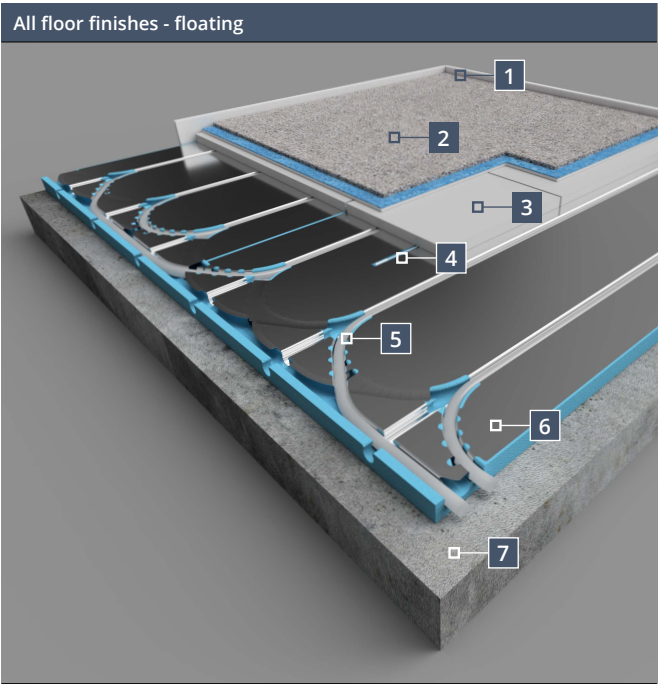
# Step 1 - Selecting the installation method



- |   |   |
|---|---|
| 1 | Floating floor finish   |
| 2 | UFH compatible underlay   |
| 3 | Floor sensor<br><i>Must be recessed into the Lo-16 panel and taped in position.</i> |
| 4 | Warmup 16 mm PE-RT pipe   |
| 5 | Universal Heating Panel *   |
| 6 | Subfloor with a Surface Regularity of SR1   |

\* Lo-16 panels can also be adhered to the subfloor to improve stability

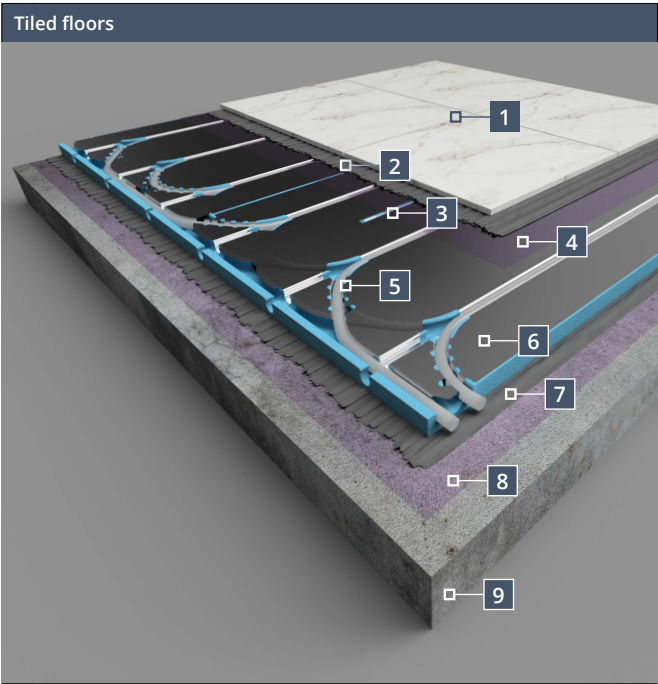
# Step 1 - Selecting the installation method



- |   |   |
|---|---|
| 1 | Perimeter strip<br><i>DCM-E-25</i>  |
| 2 | Floor finish  |
| 3 | Floating floor deck<br><i>Such as HiDECK 18 or 18mm P5 T&amp;G chipboard. Install referring to their instructions</i> |
| 4 | Floor sensor<br><i>Must be recessed into the Lo-16 panel and taped in position.</i>                                   |
| 5 | Warmup 16 mm PE-RT pipe   |
| 6 | Universal Heating Panel*  |
| 7 | Subfloor with a Surface Regularity of SR1   |

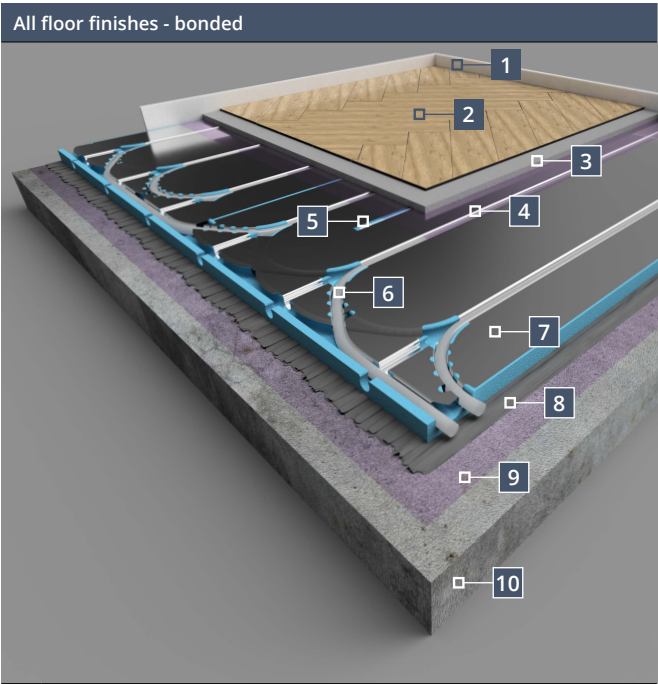
\* Lo-16 panels can also be adhered to the subfloor to improve stability

Step 1 - Selecting the installation method



- |   |   |
|---|---|
| 1 | Tile Floor Finish   |
| 2 | Flexible tile adhesive<br><i>Tile adhesive used must be compatible with compressible panels such as Lo-16, e.g. Warmup S2 flexible tile adhesive</i>      |
| 3 | Floor sensor<br><i>Must be recessed into the Lo-16 panel and taped in position.</i>   |
| 4 | Warmup Primer [ACC-PRIMER]<br><i>Diffuser plates require priming to ensure proper adhesion of tile adhesive</i>   |
| 5 | Warmup 16 mm PE-RT pipe   |
| 6 | Universal Heating Panel   |
| 7 | Flexible tile adhesive<br><i>e.g. Warmup S2 flexible tile adhesive for wet or dry areas or compatible high temperature acrylic adhesive for dry areas</i> |
| 8 | Warmup Primer [ACC-PRIMER]<br><i>Refer to tile adhesive manufacturers instructions for priming requirements</i>   |
| 9 | Subfloor with a Surface Regularity of SR1   |

# Step 1 - Selecting the installation method



- |    |   |
|----|---|
| 1  | Perimeter strip<br><i>To allow for differential movement between finished floor level and walls</i>   |
| 2  | Floor finish  |
| 3  | <b>MINIMUM</b> 12 mm single layer of compatible self-levelling compound<br><i>e.g. Mapei Ultraplan Renovation Screed 3240 fibre reinforced levelling compound</i> |
| 4  | Warmup Primer [ACC-PRIMER]<br><i>Diffuser plates must be primed to ensure proper adhesion of levelling compound</i>   |
| 5  | Floor sensor<br><i>Must be recessed into the Lo-16 panel and taped in position.</i>   |
| 6  | Warmup 16 mm PE-RT pipe   |
| 7  | Universal Heating Panel   |
| 8  | Flexible tile adhesive<br><i>e.g. Warmup S2 flexible tile adhesive for wet or dry areas or compatible high temperature acrylic adhesive for dry areas</i>         |
| 9  | Warmup Primer [ACC-PRIMER]<br><i>Refer to tile adhesive manufacturers instructions for priming requirements</i>   |
| 10 | Subfloor with a Surface Regularity of SR1   |





## Step 2 – Subfloor considerations

---

Lo-16 Panels 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, the panels must be adhered to the subfloor.
-  If using temperature sensitive materials above Lo-16, such as damp proofing or tanking systems, contact the manufacturer for advice.
-  Do not commence installation of the Lo-16 panels without ensuring that the resulting floor construction will meet the requirements of the floors intended use and its finish.

## Step 3 - Installing Lo-16 Panels



- 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.

### Bonding Applications - *If adhering the system to the subfloor*



- For bonded constructions in dry areas a high temperature acrylic adhesive, such as Warmup Stick & Go, can be used to bond the panels to the subfloor.
- Apply the adhesive following its instructions.
- For high temperature acrylic adhesives a B3 trowel is recommended.
- Press the panels down firmly into the adhesive to create the necessary adhesion.

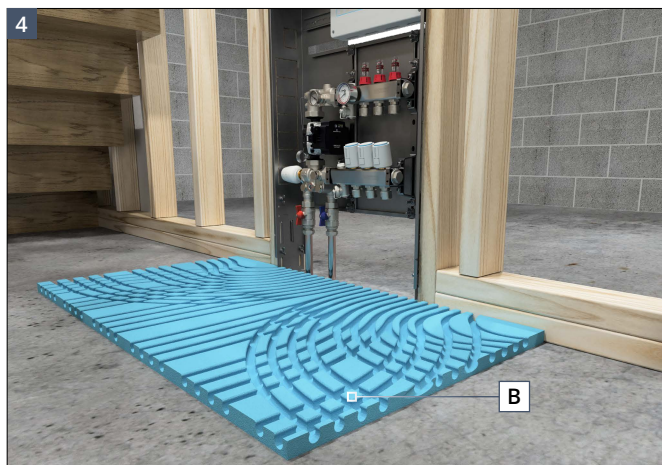


- For bonded constructions in wet or dry areas and compatible S2 flexible tile adhesive is recommended.
- Apply the adhesive following its instructions.
- For flexible tile adhesives a 6 mm square notched trowel is recommended.
- Press the panels down firmly into the adhesive to create the necessary adhesion.

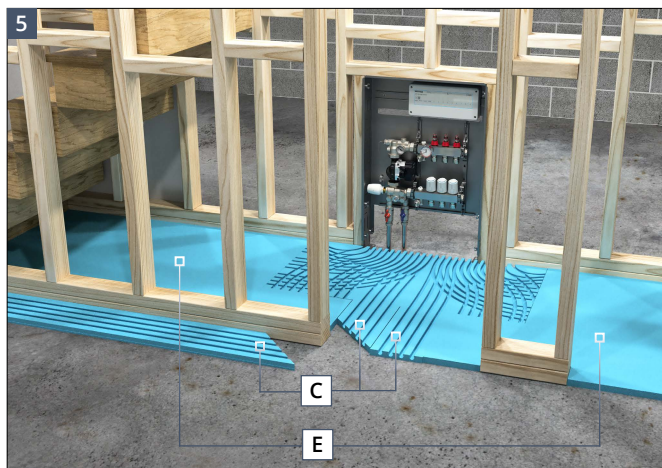


For irregular surfaces a larger trowel notch may be required.

### Step 3 - Installing Lo-16 Panels

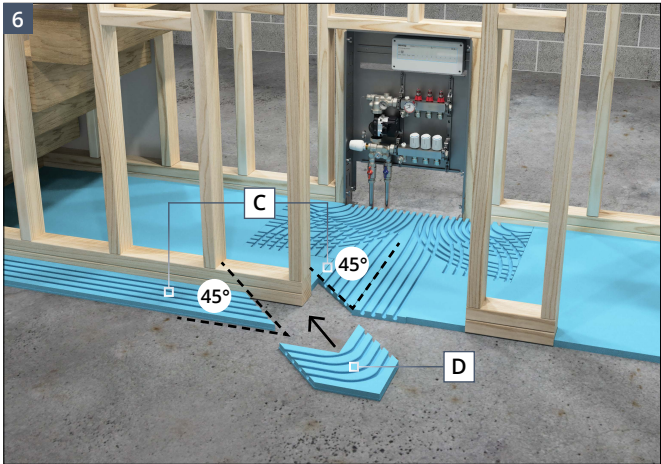


- Starting from the manifold location fit the Manifold Panel **B** following the pipe layout shown on the working drawings.

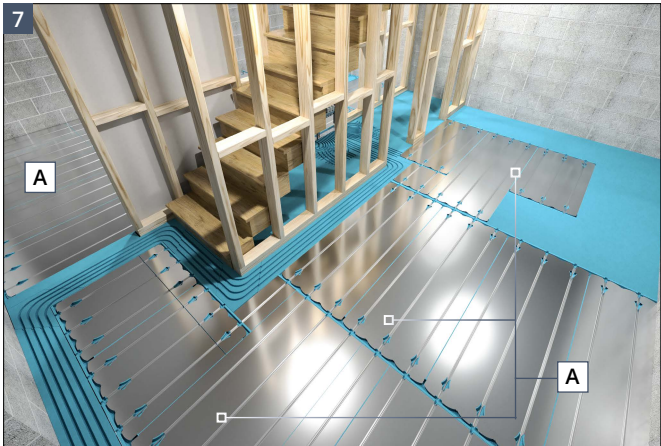


- Next, if applicable and following the working drawings fit the Plain Panels, **E** and Straight Service Panels **C**.
- The Plain Panels, **E**, can then be used in areas where underfloor heating will not be installed, i.e. under kitchen units or in under stairs cupboards.


### Step 3 - Installing Lo-16 Panels



- For bends use the Curve Service Panels, **D**. Cut the Straight Service Panels **C** at 45° and butt them tightly together.
- Curve service panels, **D**, can be snapped/cut to be used to navigate around obstacles.

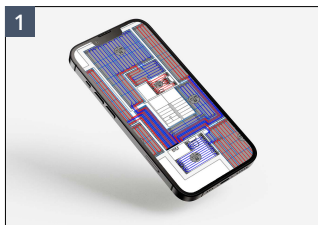


- Fit the Universal Heating Panels, **A**, at the end of the room first referring to the working drawings.
- In-fill the heated area with the Universal Heating Panels, **A**

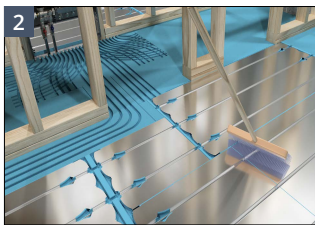
 The panels can be cut using a utility knife. To prevent damage to the pipe, remove sharp edges and burrs from the edges aluminium pipe channels.

## Step 4 - Lay the pipe

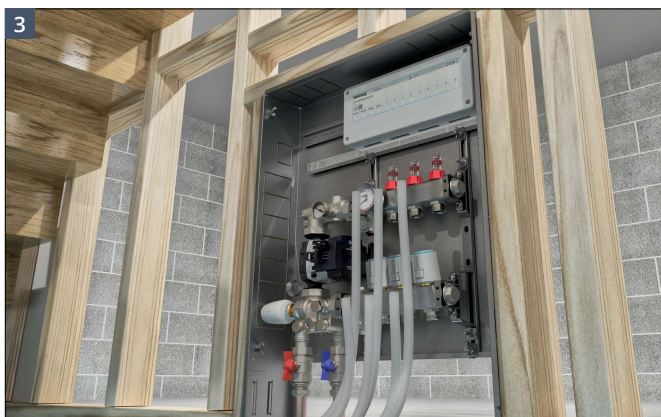
If the project has been supplied with a set of working drawings, follow the provided pipe layout. Ensure each circuit details are recorded in the commissioning log provided in the Warmup manifolds installation manual.



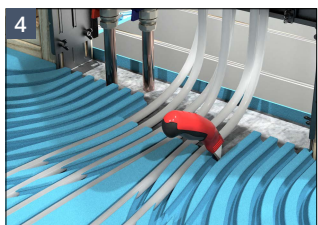
- Plan the circuit layout ensuring that the flow and return pipes can connect from the manifold to their respective heated area without crossing each other.



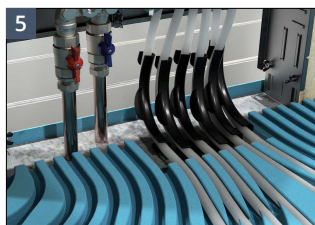
- Before installing the pipework ensure the adhesive has cured where used. Sweep or vacuum the panels to clear any debris.




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



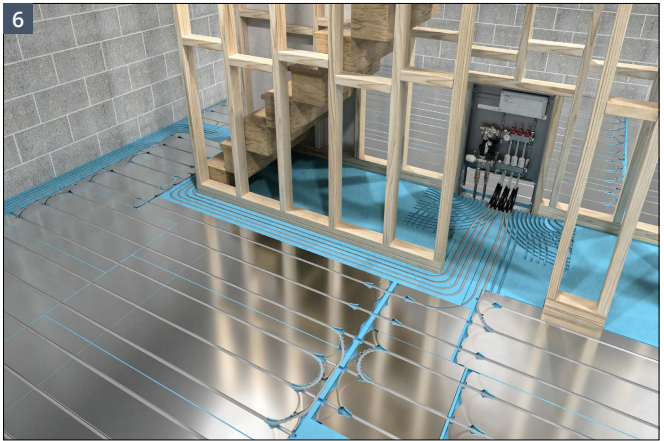
- Channel out a space in the Manifold Panel **B**, the width of the manifold arms to allow for the curve pipe supports.



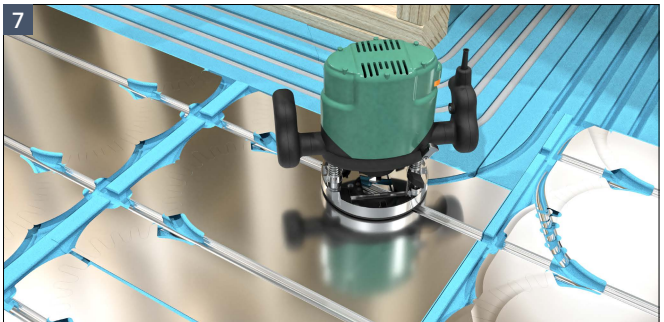
- Attach pipe bend supports to hold the pipe at a 90° angle as it enters the floor. Position the support so that the pipe rises straight to the manifold with approximately half the support within the floor.

 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.

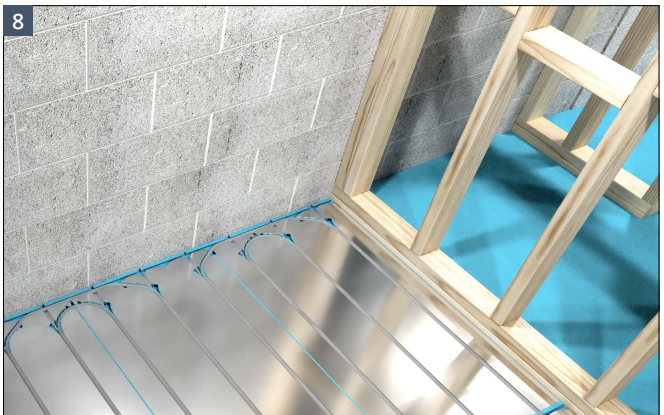
## Step 4 - Lay the pipe



- Beginning from the manifold location, following the projects working drawings, begin laying the pipe, pressing the pipe into the channels,

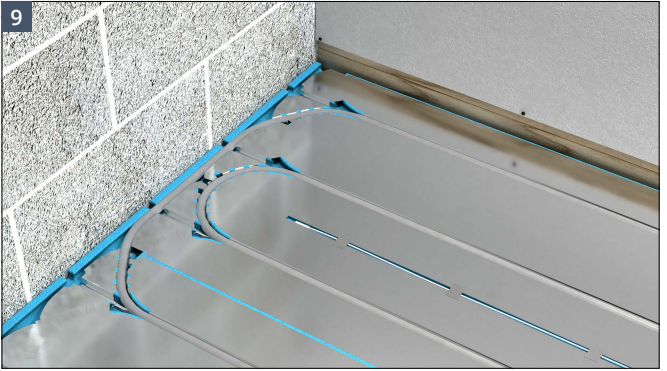


- Where required, rout channels into the Lo-16 Panels as shown.



- 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, will ensure a more even floor temperature.

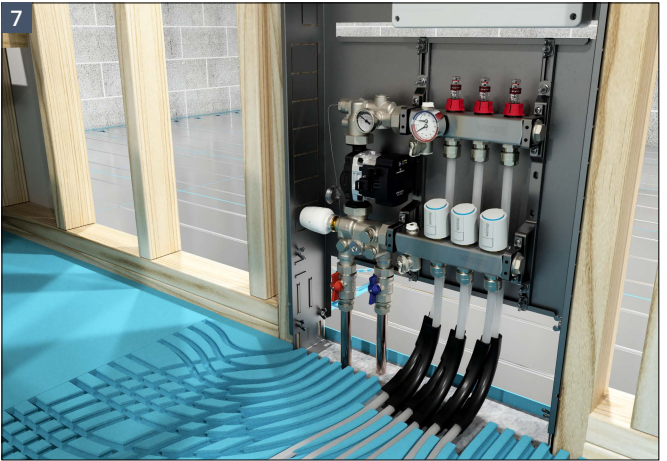
## Step 4 - Lay the pipe



- Rout a 6 mm channel into the 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**



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

## Step 5A - Laying a floating floor finish

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- Cover the 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 5B - All floor finishes - Dry

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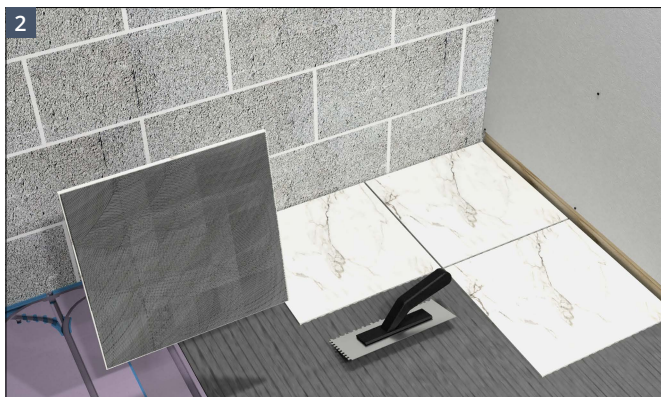


- Lay a floating floor deck, such as HiDECK 18. Refer to the floor deck manufacturers manual for correct installation.
- Finally lay the floor covering adhering to the flooring manufacturers instructions. If gluing the floor finish ensure the adhesive is suitable for use with underfloor heating.




## Step 5C - Laying a tile floor covering



- Prime the Lo-16 panels with Warmup Primer [ACC-PRIMER] following its instructions. The panels must be primed to ensure proper adhesion of tile adhesive.



- Cover the 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 Lo-16 is 200 mm x 200 mm, a levelling compound must first be applied when using smaller tiles, see 5D. Any tile adhesive used must be compatible for compressible panels such as Lo-16 panels.

## Step 5D - All floor finishes - Bonded



- If levelling over Lo-16 install Warmup perimeter strip around the perimeter of the room and any permanent structures to allow for differential movement between finished floor and walls.
- Prime the panels with Warmup Primer [ACC-PRIMER] following its instructions. The panels must be primed to ensure proper adhesion of levelling compound.



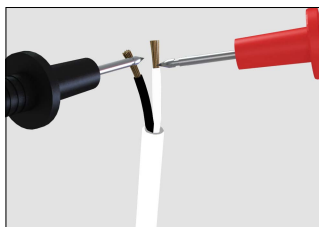
- Apply a **MINIMUM** 12 mm single layer of compatible self-levelling compound over the Lo-16 Panels.



- 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.

## Testing information

### Sensor resistance test



- Ensure that the sensor is tested before the final floor layer has been fitted. Warmup thermostats typically use a 10 k $\Omega$  sensor. Please 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 k $\Omega$	16 °C	15.0 k $\Omega$
2 °C	29.4 k $\Omega$	18 °C	13.7 k $\Omega$
4 °C	26.6 k $\Omega$	20 °C	12.5 k $\Omega$
6 °C	24.1 k $\Omega$	22 °C	11.4 k $\Omega$
8 °C	21.9 k $\Omega$	24 °C	10.5 k $\Omega$
10 °C	19.9 k $\Omega$	26 °C	9.6 k $\Omega$
12 °C	18.1 k $\Omega$	28 °C	8.8 k $\Omega$
14 °C	16.5 k $\Omega$	30 °C	8.1 k $\Omega$

## Troubleshooting

ISSUE 1 - Excessive movement or creaking	
PROBLEM	SOLUTION
Subfloor not structurally sound or level causing the Lo-16 Panels to flex and rub	Refit the panels in accordance with this manual.
ISSUE 2 - Cracked / Loose 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 Lo-16 panels and the subfloor.	The issue with the subfloor has to be resolved otherwise the tiles will continue to crack
Lo-16 Panels not primed with Warmup Primer resulting in poor adhesion and/or corrosion	Floor finish needs to be lifted and replaced
Incompatible tile adhesive used resulting in poor adhesion	Floor finish needs to be lifted and replaced
ISSUE 3 - Lo-16 Panels are unstable during installation	
PROBLEM	SOLUTION
Subfloor not level	Ensure the subfloor is smooth, flat and level to SR1 standards as required
Excessive tension in the pipe	Glue the Lo-16 Panels 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

## Technical specifications

### Lo-16 Panels - *Foam component*

Density	32 kg/m <sup>3</sup>
Thermal Conductivity	0.033 W/mK
Compressive Strength (10% deflection)	500 kPa
Water Absorption (2-day immersion)	<1.0% by volume
Water Absorption (Capillary)	Zero
Coefficient of linear expansion	0.07mm/mK
Water Vapour Permeability	3.2 ng/pa.m.s
Fire Behaviour	Euroclass F

### Lo-16 - *Universal Heating Panel*

Product code	LO16-SP-PANEL (Universal Panel)
Composition	XPS Panel with 0.20mm aluminium top layer Aluminium layer pressed inside the straight groves and sliced over the curves
Pipe centres	200mm
Dimensions	1200 x 600 x 25mm
Weight of the Panel	1.3 kg

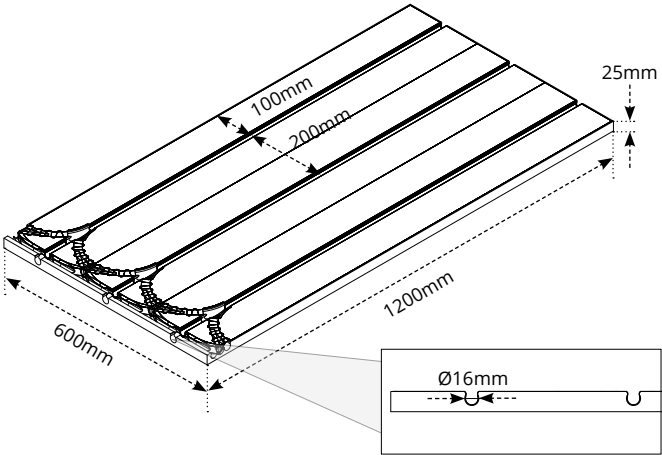
### Lo-16 - *Straight Service, Curve Service and Manifold Panel*

Product code	LO16-SS-PANEL (Service Straight); LO16-CS-PANEL (Curve Service); LO16-MP-PANEL (Manifold Panel)
Composition	Routed XPS Panels
Dimensions	1200 x 600 x 25mm
Weight of the Panel	0.5 kg

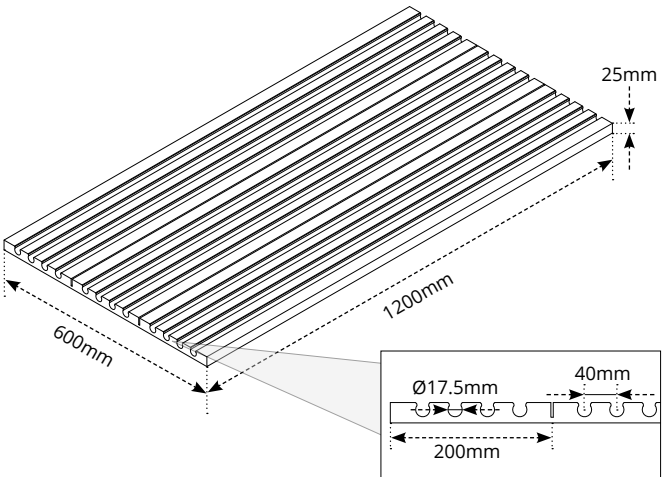
### Lo-16 - *Plain Panel*

Product code	LO16-PP-PANEL (Plain Panel)
Composition	XPS Panel
Dimensions	1200 x 600 x 25mm
Weight of the Panel	0.64 kg

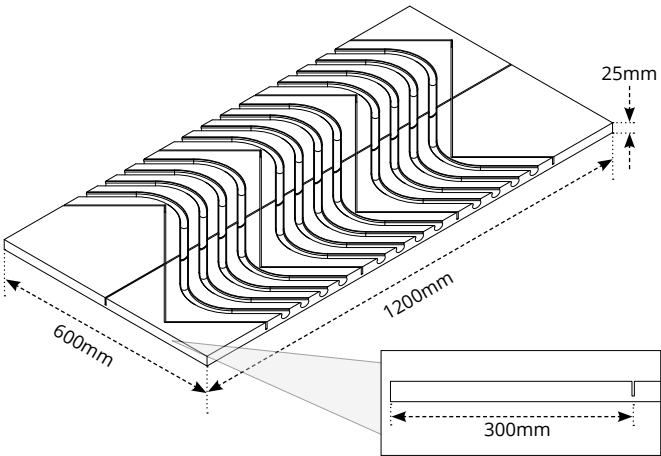
**LO16-SP-PANEL** *(Universal Panel)*



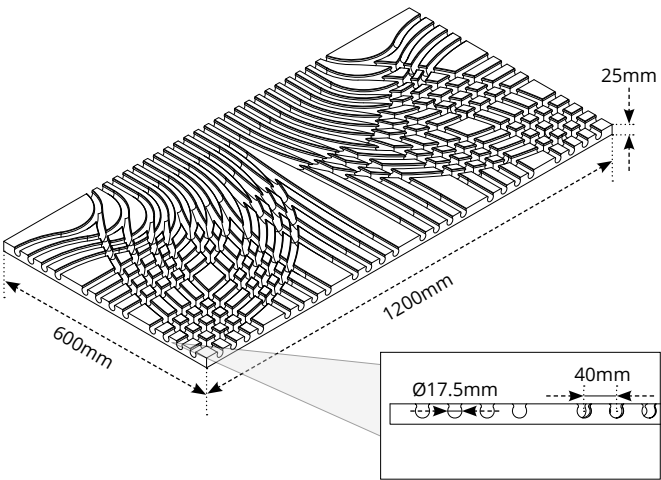
**LO16-SS-PANEL** *(Service Straight)*



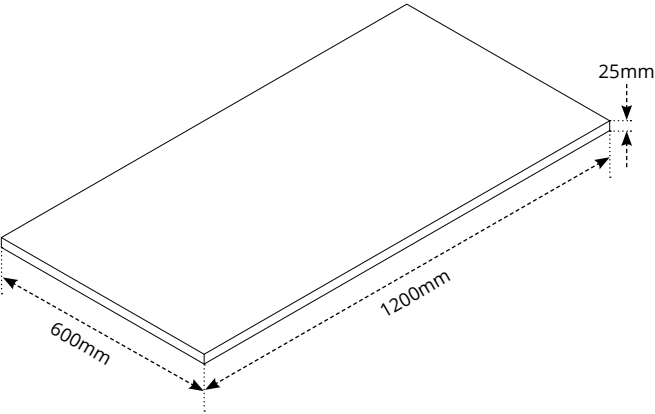
LO16-CS-PANEL *(Curve Service)*



LO16-MP-PANEL *(Manifold Panel)*



**LO16-PP-PANEL** *(Plain Panel)*



## Warranty

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### Warmup plc limited warranty – Hydronic floor heating pipe



Registration can be completed online at [www.warmup.co.uk](http://www.warmup.co.uk).

In the event of a claim, proof of purchase is required 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 warranted 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](http://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.



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](http://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.

System Performance

k <sub>H</sub> 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*	6.20	5.23	4.52	3.98	3.56	3.22	2.93	2.70	2.50	2.32	2.17	2.04	1.92

\* 200 mm pipe centres with no overboarding or levelling compound. If you are using a floating floor deck over Lo-16 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 <sub>H</sub> = System Performance Factor, W/m²K
T <sub>water</sub> = Mean water Temperature	T <sub>air</sub> = Room Air Temperature

Using the system k<sub>H</sub> value to calculate the system heat output:

q = k<sub>H</sub> x ( T<sub>water</sub> – T<sub>air</sub> )

Example:

The heat output through an 18 mm thick, ≈ 1.25 tog timber floor, over Lo-16, fitted with pipe at 200 mm centres, in a 21°C room heated with 40°C water is;  
q = 3.22 x (40 – 21) = 3.22 x 19 = 61.18 W/m²

Alternatively, using the system k<sub>H</sub> value to calculate the required water temperature, knowing the required heat output:

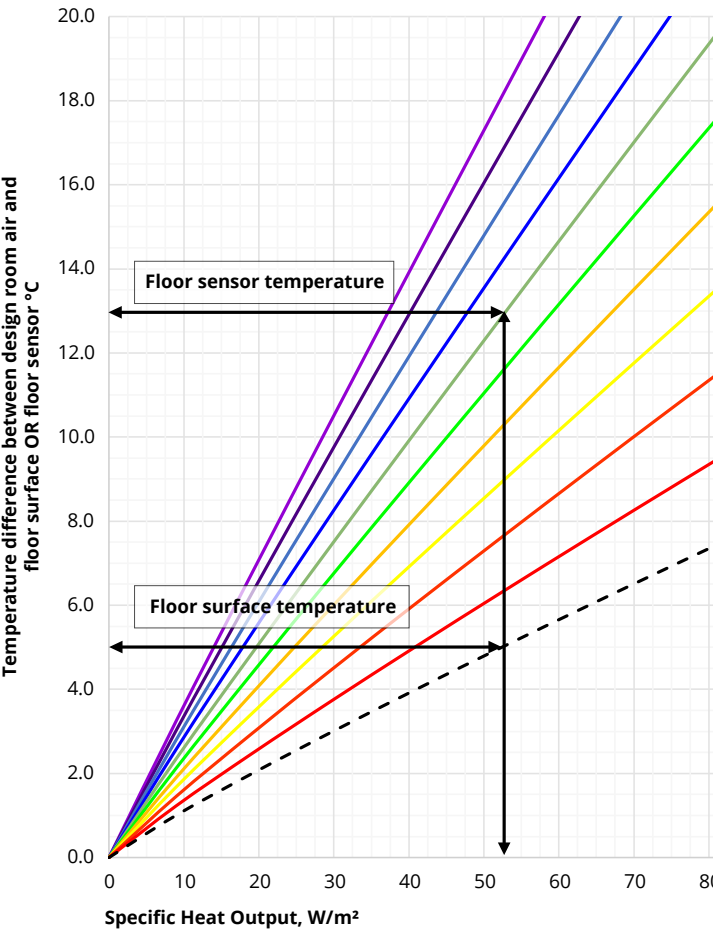
T<sub>water</sub> = ( q / k<sub>H</sub> ) + T<sub>air</sub>

Example:

The water temperature required to produce a heat output of 55 W/m², through a 0.3 tog, 3 mm thick LVT floor finish on HiDECK 18 (0.30 + 0.45 = 0.75 tog), over Lo-16 panels, fitted with pipe at 200 mm centres, in a 22°C room is;  
T<sub>water</sub> = ( 55 / 3.98 ) + 22 = 13.8 + 22 = 36°C



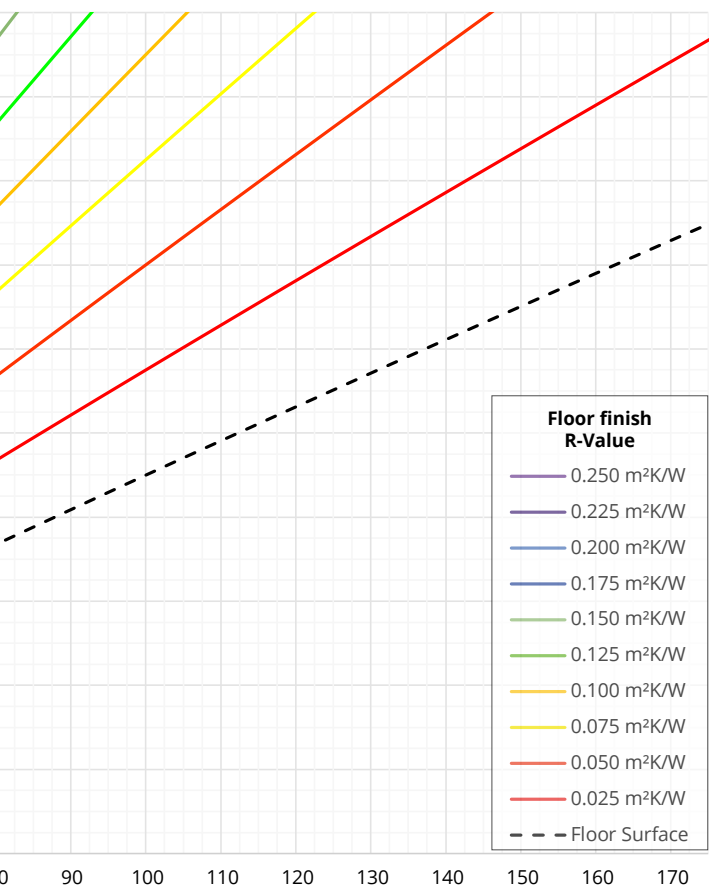
Floor sensor setting for target heat output



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  $20^{\circ}\text{C}$  and design heat output of  $52.5\text{W/m}^2$ . Based on a  $0.150\text{ m}^2\text{K/W}$  (1.5 tog) floor finish the floor sensor should be set to  $33^{\circ}\text{C}$  ( $20^{\circ}\text{C}$  room air +  $13^{\circ}\text{C}$   $\Delta\text{T}$ ) to resulting in floor surface temperature of  $25^{\circ}\text{C}$  ( $20^{\circ}\text{C}$  room air +  $5^{\circ}\text{C}$   $\Delta\text{T}$ ).



**Specific Heat Output, W/m²**

- i** The design floor surface temperature difference should not be more than 9 °C in occupied areas, 15 °C in unoccupied areas.
- i** Heat output is limited by the floor finish resistance combined with the maximum probe setting of 40 °C.
- i** Temperature limits of the floor finish or its adhesive may adversely limit the design heat output.



## Warmup plc

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**Tel:** 0345 345 2288

**Fax:** 0345 345 2299



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

**Warmup**

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5265707. E & OE.

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