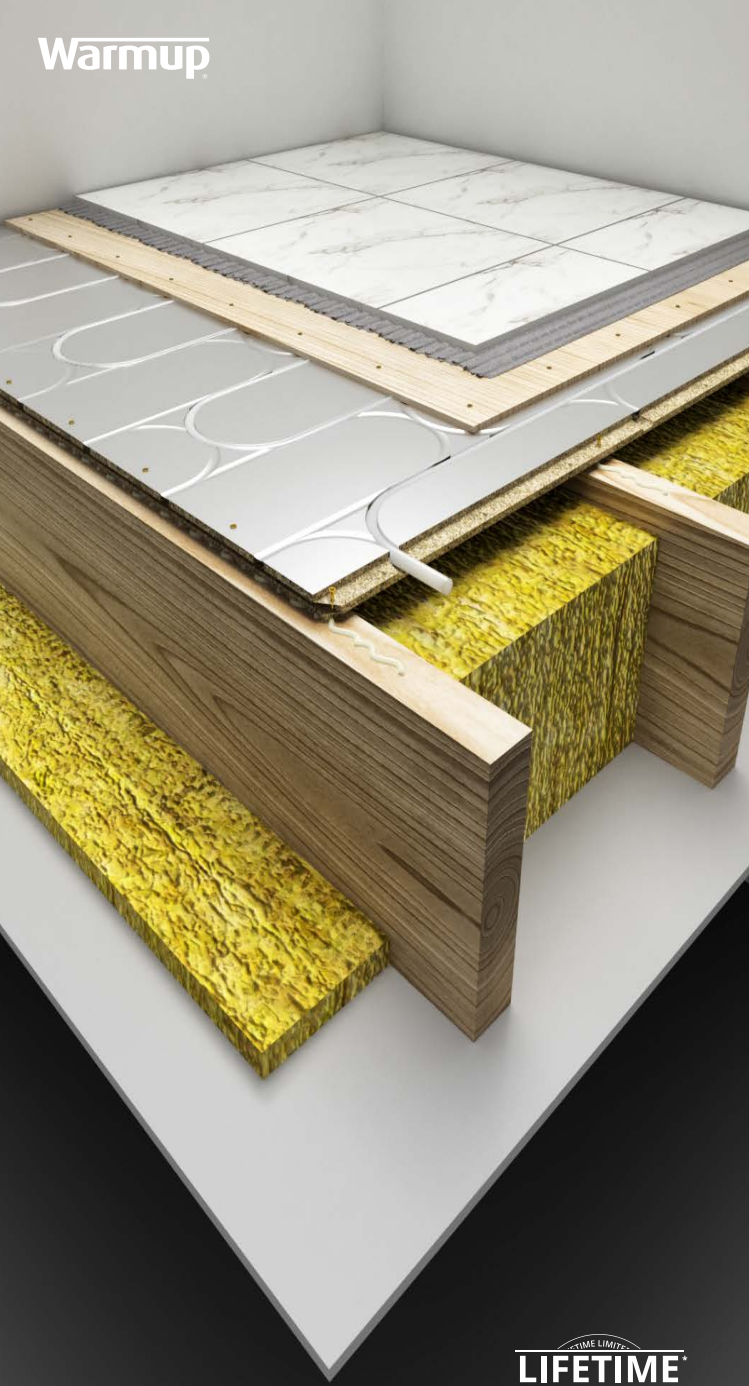
Warmup



LIFETIME LIMITED WARRANTY Warmup

VLo Econna-12

Joisted Floor System

Installation manual

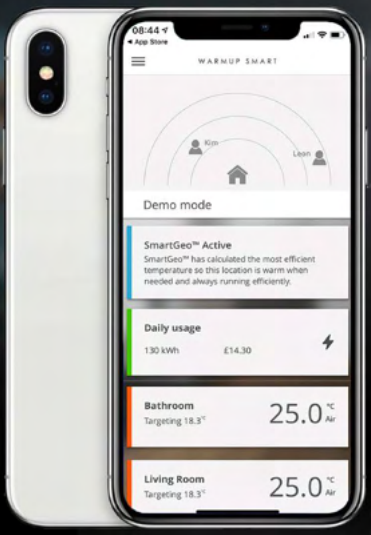
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Your Warmup® underfloor heating system has been designed so that installation is quick and straight forward, but it is important that the instructions in this manual are followed to ensure that your underfloor heating system performs correctly. Please 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.

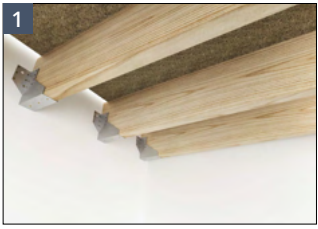
It is important that before, during and after installation that all requirements are met and understood. If the instructions are followed, you should have no problems. If you require help at any stage, please contact our helpline.

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

www.warmup.co.uk

Installation summary

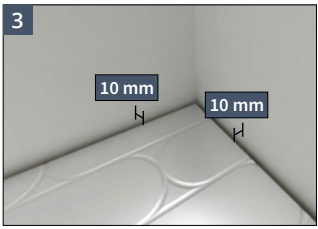
Please also read the full instructions that follow this section.



- If the floor void is accessible from below, steps 3 - 9 can be completed for the whole floor deck, no access panels will be required.



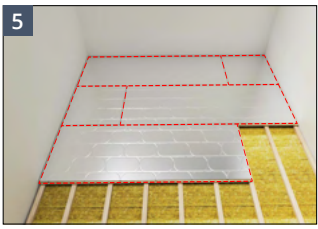
- If the floor void is not accessible, steps 3 - 9 will need to be completed room-by-room, beginning from the room furthest from the manifold.



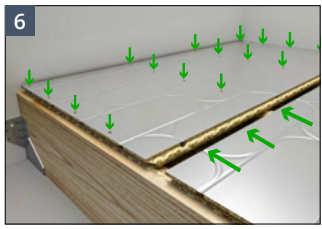
- Lay the first panel in the corner of the room, leaving a minimum 10 mm gap between the end and edge of the panel and the walls. The two groove edges of the panel should be placed in the corner. The opposite end of the panel must sit on the centre line of a joist.



- Drill a 12.5 mm hole in this first panel at a 20° angle where the flow pipe needs to drop into the joist space.
- Feed the pipe through the hole through to the manifold location, notching/drilling the joists as required in line with building regulations.

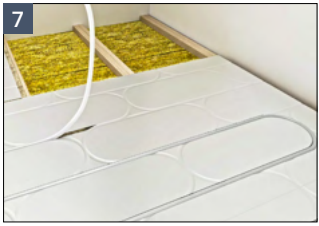


- Apply a 6mm bead of D4 adhesive to the joists.
- Lay the panels in a run, ensuring the end of each panel is on the centre line of a joist.
- Panels should be laid in a brickbond pattern with a min. overlap of 800 mm.
- Ensure that each row of panels has a group of return loops at each end.



- Secure the panels together using a D4 adhesive on BOTH sides of the tongue and groove and fit together. The panels should then be glued and screwed to the joists.

7



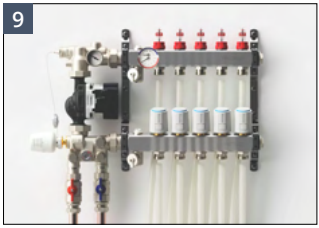
- Before installing the pipework in the panels it is advised to sweep or vacuum the floor area to clear any debris.
- Install the pipe in line with the projects working drawings.
- Econna-12 panels are structural, therefore additional pipe channels must not be routed.

8



- Before installing the final Econna-12 panel, drill another 12.5 mm hole in this last panel at a 20° angle where the return pipe needs to drop into the joist space.
- Feed the pipe through the hole through to the manifold location, notching/drilling the joists as required in line with building regulations.

9



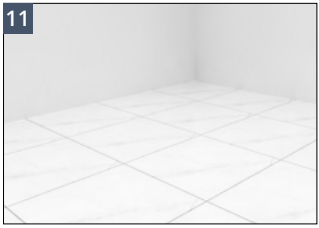
- Measure and cut the pipe so that it reaches both the flow and return ports on the manifold.
- Refer to the manifold manual for detailed information on mounting, pressure testing and commissioning.
- Use Warmup pipe bend supports where the pipe exits the floor at the manifold location.

10



- Lay a minimum 6 mm flooring grade plywood in the opposite direction to the Econna-12 panels. This layer must be screwed to the Econna-12 panels to complete the structural deck.
- The plywood should be positioned so that each plywood panel overlaps the tongue and groove edges of the Econna-12 panel by 300 mm.

11



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

12



- 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

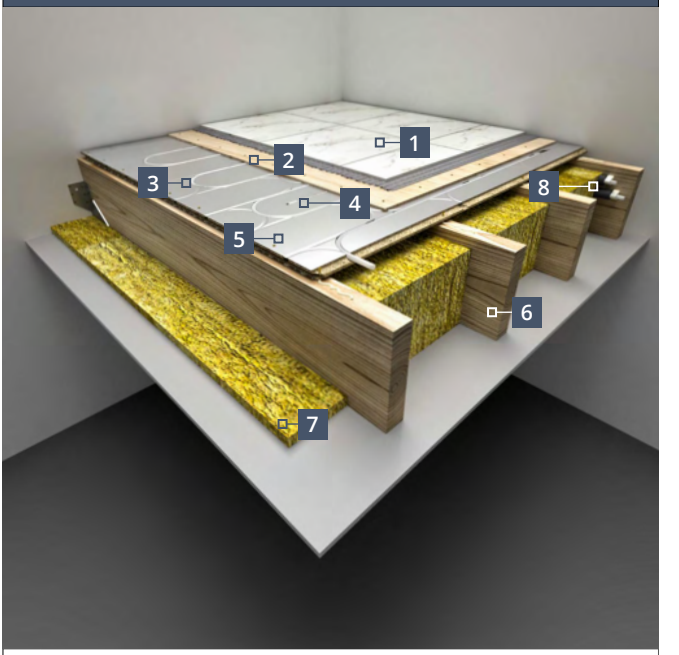
Product Code	Description
UK-WUK-HY-EC-PANEL	Econna-12 panels
UK-WUK-HY-PERT-12x50 UK-WUK-HY-PERT-12x60 UK-WUK-HY-PERT-12x70	Warmup PE-RT pipe 12 mm
UK-WUK-HY-ACC-PIPECLIPS12	Pipe clips
WHS-P-BEND12	Pipe bend supports
Additional components that may be required as part of your Warmup heating installation:	
Manifold, mixing unit, actuators, valves and euroconus connectors	
Wiring centre	
Warmup thermostats	
D4 adhesive	
Wood screws (55 & 25 mm long)	
Minimum 6 mm plywood	

Important installation information

- On delivery of the Econna-12 panels ensure that they are stored in a dry weather tight area, away from chemicals and that they are stacked horizontally and raised off the ground. The panels must not be exposed to moisture or high humidity.
- The moisture content of the Econna-12 panels and plywood layer should be no higher than 10 % and they should ideally acclimatised together before installation.
- 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.
- Dust particles may become airborne when cutting wood or insulation products. Therefore please follow relevant health and safety rules when cutting the panels or insulation by using a mask, goggles, gloves and ensuring adequate ventilation.
- Econna-12 panels are a structural floor deck therefore extra pipe channels must not be routed into the panels as this would weaken the system.
- Ensure the end of each Econna-12 panel falls on a centre line of a joist. The shortest length of panel should be supported across a minimum of three joists. If a shorter panel is required it must be supported by noggins. Ensure that each row of panels has a group of return loops at each end.
- 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	6 mm minimum plywood deck *This layer must be screwed to the Econna-12 panels to complete the structural deck*
3	Warmup 12 mm PE-RT pipe
4	Floor sensor *Must be recessed into the Econna-12 panel and taped in position.*
5	Econna-12 panels *Panels secured together using a D4 adhesive on BOTH sides of the tongue and groove and fit together. Panels then glued and screwed to the joists.*
6	Joists ≤ 600 mm centres *Refer to tiling standards for maximum joist centres for floors to receive tiles*
7	Insulation layer *Thickness in line with building regulations*
8	Flow and return pipes* *Installed beneath the Econna-12 panels, 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 300 mm intervals on horizontal runs and 500 mm 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 Econna-12, 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.

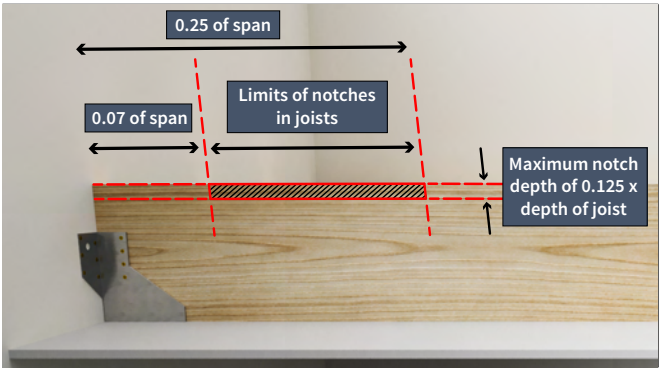
Do not commence installation of the Econna-12 panels without ensuring that the resulting floor construction will meet the requirements of the floors intended use and its finish.

Joist notching/drilling

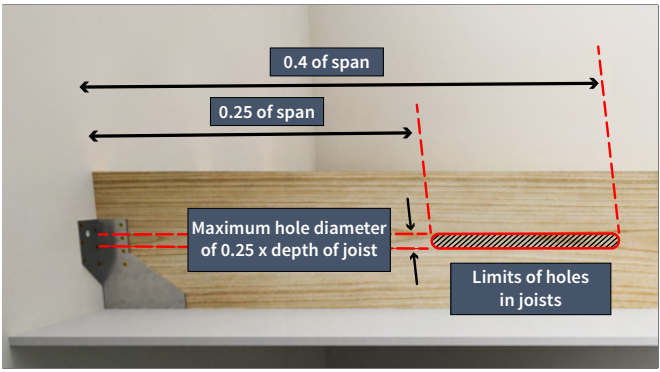
Joists must be level and even, clear of debris and without any surface deviations such as knots of nails before laying the Econna-12 panels

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

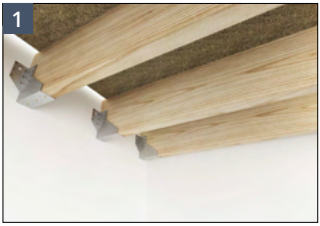


Joist drilling

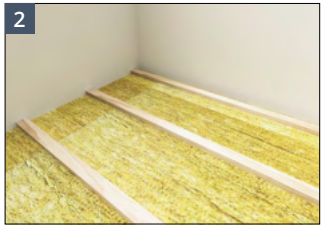


The images above are for guidance only, please refer to building regulations for full information on how to notch/drill into joists.

Step 2 - Install VLo Econna-12



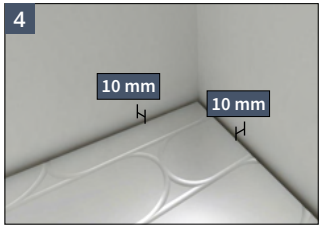
- If the floor void is accessible from below, steps 4 - 9 can be completed for the whole floor deck, no access panels will be required.



- The joist space must be pre-insulated in line with building regulations
- Ensure the joists are level and even, clear of debris and without any surface deviations such as knots or nails before laying the Econna-12 panels.



- If the floor void is not accessible, installation of the Econna-12 panels must be completed room-by-room, beginning from the room furthest from the manifold.



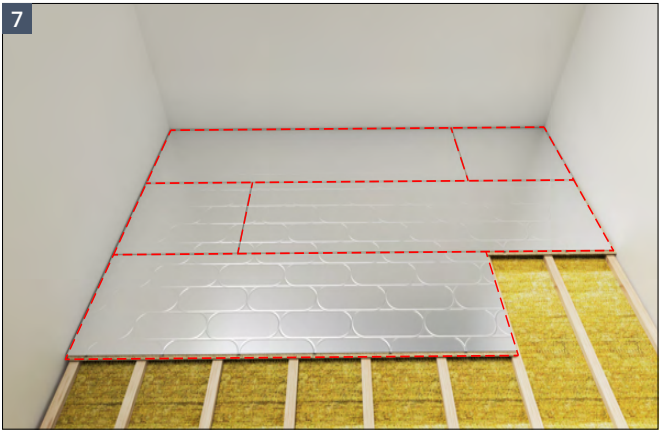
- Lay the first panel in the corner of the room, perpendicular to the joists, leaving a minimum 10 mm gap between the end and edge of the panel and the walls. The two groove edges of the panel should be placed in the corner. The opposite end of the panel must sit on the centre line of a joist.



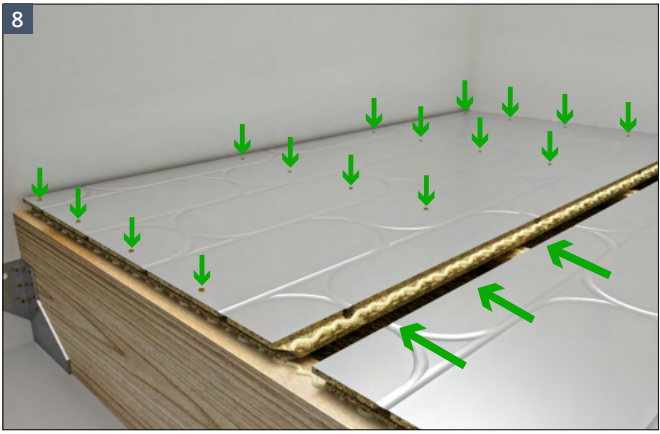
- Drill a 12.5 mm hole in this first panel at a 20° angle where the flow pipe needs to drop into the joist space.
- Feed the pipe through the hole through to the manifold location, notching/drilling the joists as required in line with building regulations.



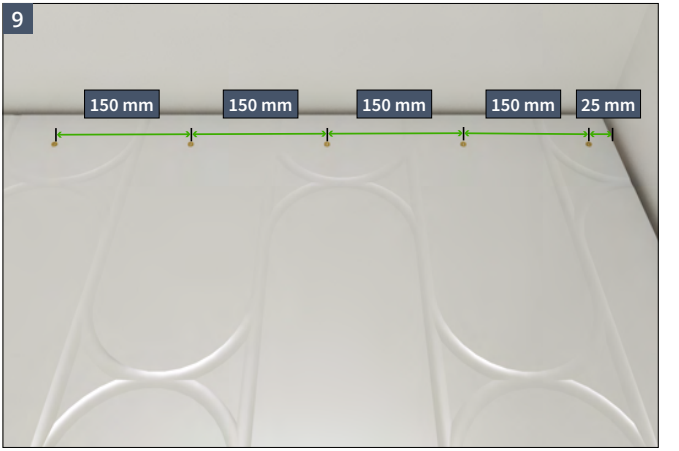
- It is recommended that the shortest length of panel should be supported across a minimum of three joists, e.g. if the supports are set nominally at 400 mm centres, the shortest panel length should be 800 mm. If a shorter panel is required it must be supported by noggins.



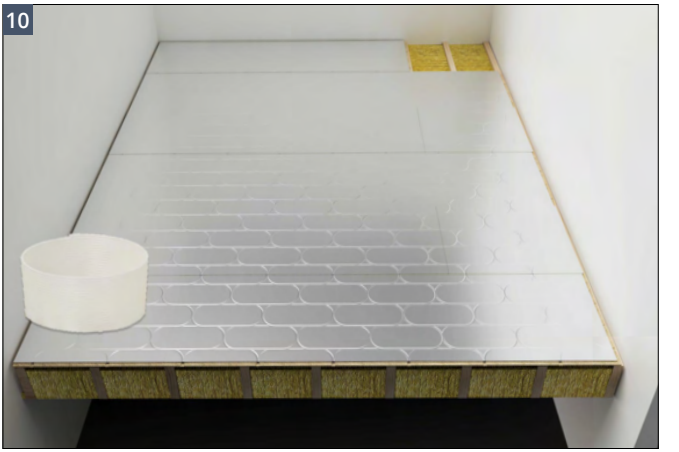
- Apply a 6mm bead of D4 adhesive to the joists.
- Lay the panels in a run, ensuring the end of each panel is on the centre line of a joist.
- Panels should be laid in a brickbond pattern with a minimum overlap of 800 mm.
- Ensure that each row of panels has a group of return loops at each end.



- Secure the panels together using a D4 adhesive on BOTH sides of the tongue and groove and fit together. The panels should then be glued and screwed to the joists.



- Screw the Econna-12 panels to the joists using 55 mm wood screws, 25 mm in from each top edge and then at 150 mm centres.

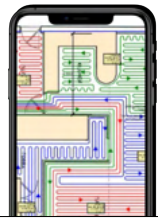


- DO NOT install the final Econna-12 panel until the pipework has been laid.

Step 3 - Lay the pipe

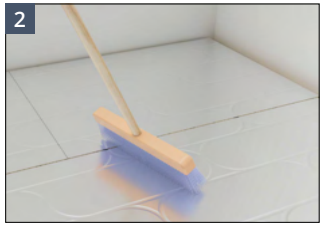
If the project has been supplied with a set of working drawings, follow the provided pipe layout. Ensure each circuits details are recorded in the commissioning log provided in the Warmup manifolds installation manual.

1



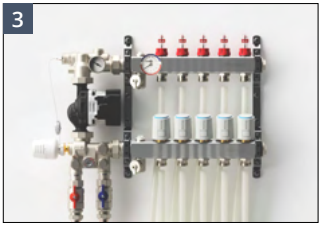
- Plan the circuit layout ensuring that the flow and return pipes can connect from the manifold to their respective heated area without crossing each other.

2



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



- Use Warmup pipe bend supports where the pipe exits the floor at the manifold location.

5



- Following the projects working drawings, begin laying the pipe, pressing the pipe into the channels.

Econna-12 panels are structural, therefore additional pipe channels must not be routed.

Step 3 - Lay the pipe

6

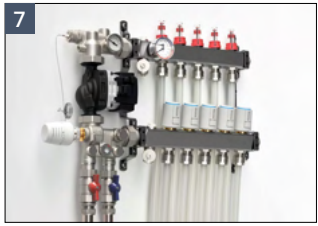


- Route a 6 mm channel into the Econna-12 panels for the floor sensor to be recessed into.
- Install the sensor at least 300 mm into the heated area it will be controlling. It should be located centrally between parallel runs of pipe and not in an area influenced by other heat sources.
- The sensor can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

⚠

Test the resistance of the floor sensor at this stage

7



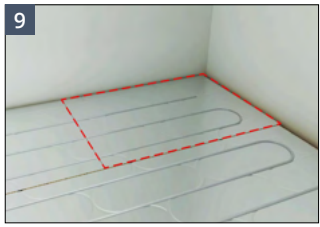
- Measure and cut the pipe so that it reaches both the flow and return ports on the manifold.
- Refer to the manifold manual for detailed information on mounting, pressure testing and commissioning.

8



- Before installing the final Econna-12 panel, drill another 12.5 mm hole in this last panel at a 20° angle where the return pipe needs to drop into the batten space.
- Feed the pipe through the hole through to the manifold location, notching/drilling the joists as required in line with building regulations.

9



- Glue and screw the final Econna-12 panel in place following the procedures in Step 2.

Step 3 - Lay the pipe



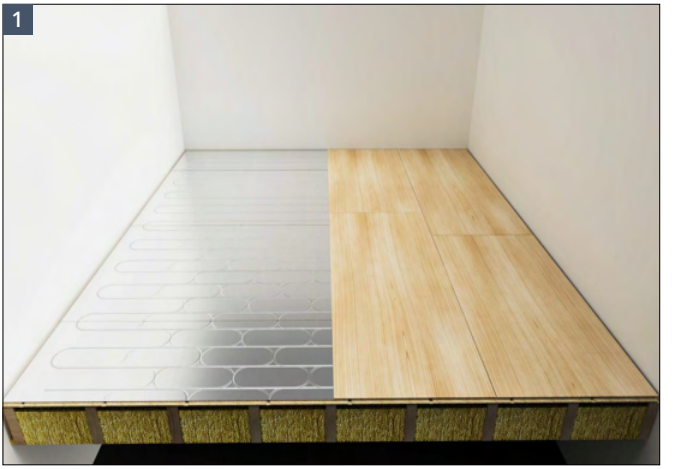
All exposed pipework within the joist spaces must be insulated with lagging.

Underfloor heating pipe within the joist space should be supported at 300 mm intervals on horizontal runs and 500 mm on vertical runs when fixing the pipe to vertical surfaces. Pipes should be secured to the joists using clips.

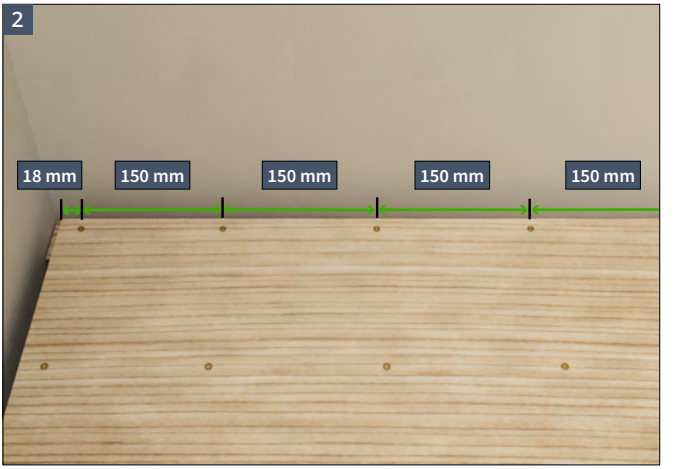
Use pipe bend supports on route to the manifold location.

Step 4 - Lay plywood covering

A minimum 6 mm flooring grade plywood covering must be installed in the opposite direction to the Econna-12 panels. This layer must be screwed into the Econna-12 panels to complete the structural deck.



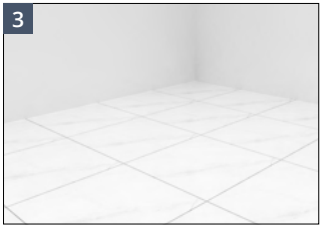
- Lay a 6 mm flooring grade plywood in the opposite direction to the Econna-12 panels. The plywood covering should be positioned so that each plywood panel overlaps the tongue and groove edges of the Econna-12 panels by 300 mm.



- Screw the plywood covering into the Econna-12 panels using 25 mm wood screws, 18 mm in from the edge of each plywood sheet and then at 150 x 150 mm centres, ideally in the centre line between the pipe runs.

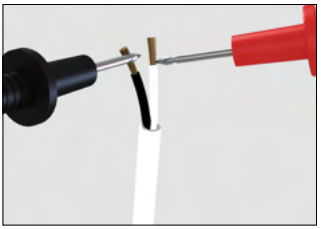
It is best practice to predetermine and mark the pipe and screw positions on the top surface of the ply layer to avoid the straights and loop ends of the pipe runs.

Step 4 - Lay plywood 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 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**
The Econna-12 panels layer have not been glued and screwed in line with the manual or the plywood layer has not be screwed down correctly.	Refit the panels in accordance with this manual.
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.

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.

Econna-12 panels	
Product code	EC-PANEL
Dimensions	2400 mm x 600 mm
Thickness	22 mm
Composition	Routed P5 grade chipboard with aluminium foil layer
Installation height	22mm (+ 6 mm plywood layer)
Pipe centres	150 mm
Weight with Water & 6mm Ply	Approx. 14 kg/m²
Thermal conductivity	0.12 W/mK
Soft Body Impact	**BS EN 12871** = Pass
Point load	**BS EN 12871, joists at 600mm centres** Ultimate Load, Fmax (kN) = 7.01 Deflection at Fmax (mm) = 28.25 Floor Stiffness, R (Nmm-1) = 407.40 Deformation at 0.4 Fmax, Wm (mm) = 7.99

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	3.41	3.11	2.86	2.64	2.46	2.30	2.16	2.04	1.93	1.83	1.74	1.66	1.58

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 Econna-12 with 6 mm ply, fitted with pipe at 150 mm centres, in a 21°C room heated with 40°C water is;

$q = 2.30 \times (40 - 21) = 2.30 \times 19 = 43.7$ W/m²

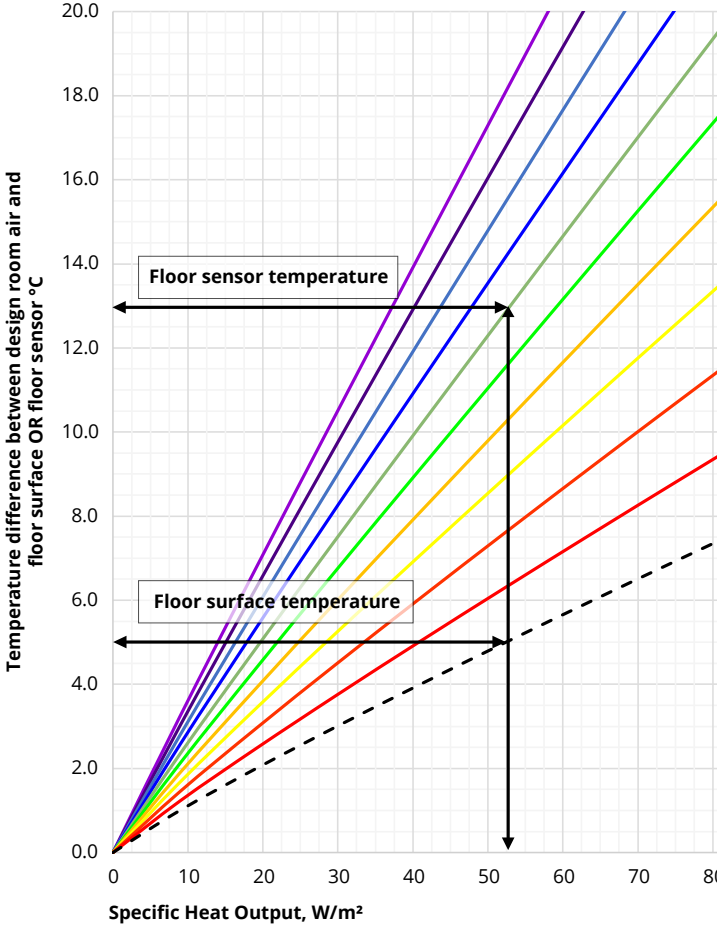
Alternatively, using the system k_H value to calculate the required water temperature, knowing the required heat output:

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

Example:
The water temperature required to produce a heat output of 55W/m², through a 3 mm thick ≈ 0.25 tog LVT floor finish, over Econna-12 panels with 6 mm ply, fitted with pipe at 150 mm centres, in a 22°C room is;

$T_{water} = (55 / 3.11) + 22 = 18.5 + 22 \approx 40.5$°C

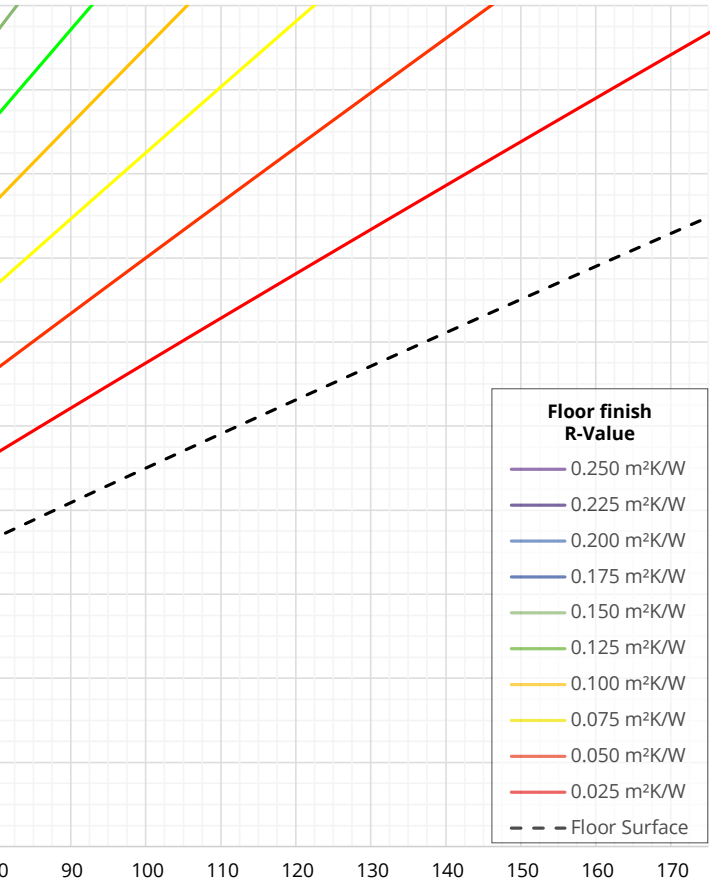
Floor sensor setting for target heat output



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.

Layout plan

Warmup plc

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Please scan the QR code to provide feedback on your installation

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