



# WATER THERM



*...minimal  
thickness!*

The super-flat warm-water underfloor heating system for warming the floor, creating an ambient temperature for you in conjunction with a standard heating system, suitable for retrofitting on any surface

A low-temperature system that adjusts to the required temperature – comfort and safety through competence derived from 35 years of experience

# Problem-free installation direct under floor coverings, such as tiles, parquet flooring, fitted carpets, laminated floors or PVC – on any surface.

**With just a few easy steps, you can obtain the ultimate in comfort**

The heating mat, with its 3 1/8" of spacing between the conduits, is ideal for warming floors and walls in children's bedrooms, playrooms, bathrooms, kitchens, recreational rooms, holiday chalets and offices – in fact, anywhere you desire a pleasant and comfortable atmosphere.

## Competence that comes from 35 years of experience

PEROBE is one of the leading manufacturers of electrical and warm-water underfloor heating systems with more than 35 years of experience in this field.

## The super-flat heating mat

The minimal thickness of the heating mat (conduit 5/16" in diameter) allows it to be retrofitted anywhere it is needed, even if another heating system is already in use. The polyethylene heating conduit (Ø 5/16" x 3/64" DIN E 16833) is oxygen proof in accordance with DIN 4726. The supply lines are incorporated in the fabric.

The mat's heating performance depends on how high the flow temperature is (maximum operating conditions: 140° F at 43,5PSI). The heating conduit comes with a 10-year warranty.

## Connection and control for heating surfaces of up to 162 sq. ft.

For areas spanning no more than 162 sq. ft., the heating mat elements are directly integrated into the existing warm-water heating system. The floor temperature is regulated using a return temperature clipper (RTL valve).

## Connection and control for heating surfaces over 162 sq. ft.

Larger heating surfaces are regulated using a room thermostat, actuator and a load distributor complete with flowmeter.

## Important!

Only *same-sized* heating mats (= pipe lengths and/or maximum difference of 9 ft. 10") may be coupled *in parallel* using a multiple distributor.

The heating mats can be shortened. For heating systems which suffer from 'pipe silting', an oxygen binder\* should be added to the heating water, or a sludger to the boiler return\*.

Depending on the pipe system or the length of the inlets, it may be necessary to *add a heating circuit pump* for the heating mats.

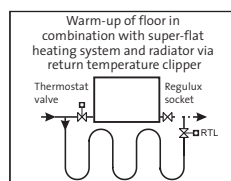
Size of heating mats		Art. No.	
10 3/4 sq. ft.		with connection kit	6751018
21 1/2 sq. ft.		with connection kit	6752030
27 sq. ft.		with connection kit	6752536
54 sq. ft.	(2 x 27 sq. ft.)	with connection kit	6755072
81 sq. ft.	(3 x 27 sq. ft.)	with connection kit	6757508
108 sq. ft.	(4 x 27 sq. ft.)	with connection kit	6750044
Accessoires			
Return temperature clipper			3960165
Concealed return temperature clipper with built-in wall box			5369460



Concealed return temperature clipper



Return temperature clipper



Installation (diagram)

\* Please consult the data specification sheets, which also contain instructions for installing and laying of the mats.



1

This is all you need to install the heating mat.



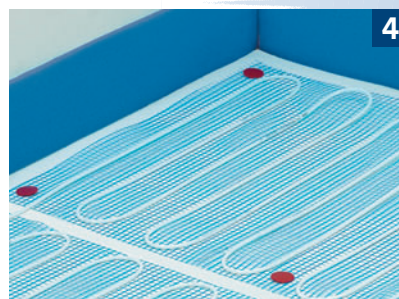
2

Lay the heating mat against the wall on one side of the room. Roll it out and cut to measure. Fold it over, secure and then roll it out in the opposite direction.



3

Allow for 3 1/8" spacing between each heating mat run. Then cover each run with a layer of thin-set mortar up to the top edge of the heating mat.



4

Affix each run of the heating mats with intouch dowels. Cover the heating mats with thin-set flexible mortar up to the top edge of the heating circuit.



5

Once the filler has dried out, apply a tile adhesive which is suitable for underfloor heating (layer should be at least 3/16" thick). Then lay the ceramic tiles in the normal manner.



6

Heating mats positioned against the wall. Use heat-resistant plaster or, when using tiles, a flexible adhesive.



## 1. Installation instructions for Low Profile Warm Water Underfloor Heating

- 1.1 Multiple heating mats must be connected in parallel.
- 1.2 **Only mats of equal size** (equal pipe length or with a maximum length of differential of 1/8") may be coupled together (to ensure balanced flows). The heating mat weave can be cut as required to enable the best fit to the surrounding area. The maximum permissible pipe length per heating circuit is 98 ft.  
*Example: Floor area 32 1/3 sq. ft. → 3 heating mats required, each measuring 10 3/4 sq. ft.!*  
*Example: Floor area 162 sq. ft. → 3 heating mats required each measuring 54 sq. ft. (2 heating mats at 27 sq. ft.!*  
*If the synthetic line is shortened on one of the heating mats, the other heating mats should be shortened by the same length for hydraulic reasons.*  
 Different large heating areas which are connected to separate connecting lines from a distributor for one storey (e.g. PB piping 5/8" x 3/32") function perfectly, provided that the different volume flows are hydraulically equalized at the relevant storey distributor (e.g. by a lift pump).
- 1.3 The lowest temperature permitted for laying mats is 41° F, and the highest permissible surface temperature is 176° F. The **maximum conditions for operation** are a **maximum 140° F operating temperature** at a **maximum operating pressure of 43 PSI**.
- 1.4 The heating tubes should not be crushed or crimped. The radius of any bends needs to be **at least 2 9/16"**.
- 1.5 The heating lines must not be laid across expansion joints.
- 1.6 To allow for **heat expansion** in the completed unit on the floor, a perimeter expansion strip (minimum thickness of 3/16") should be laid around the edge of the area to be heated. The heating lines should be completely covered by screed, plaster, an appropriate filler, or tiling cement along their entire length.
- 1.7 The heating mats may only be used in conjunction with a **temperature limiter** (e.g. a return flow temperature limiter). Where heating surfaces of 162 sq. ft. are concerned, the mats are regulated using a return flow temperature limiter; and surfaces of over 162 sq. ft. are regulated using room thermostats, lift motors and heating circuit distributor with a flow meter.
- 1.8 The **connection** is made to a distributor or multiple distributor located on the inflow and outflow lines and regulated by means of a return flow temperature limiter.
- 1.9 Line joints and connection points should not be subjected to tension.
- 1.10 Before **initiating operation**, the lines should be flushed. (*Note: For heating systems which may have a problem with pipe scale buildup, either an oxygen binding agent/corrosion inhibitor should be added to the heating water, or scale water should be added to the boiler return flow.*)
- 1.11 Before and after laying the heating mats, the seal should be tested using a **pressure testing** unit (test pressure: 72 PSI). For all wall heating units, the system should be maintained at a pressure of at least 22 PSI during all cleaning operations.
- 1.12 The installer shall provide the user with a description of the surface heating system (assembly, layout plan, etc.) at the time the system is handed over.
- 1.13 Examples of overlays with the maximum thickness specification and heat conducting capacity (Lambda  $\lambda$  in W/(m\*K):
- |  |  |                                       |   |
|--|--|---------------------------------------|---|
| a) Tiles                               | max. 1 3/16" thick $\lambda$ -value 1.00 | b) Calcium carb. based cement fillers | max. 23/32" thick $\lambda$ -value 0.87 |
| c) Calcium carb. based plaster fillers | max. 3/8" thick $\lambda$ -value 0.70    | d) PVC                                | max. 3/8" thick $\lambda$ -value 0.23   |
| e) Parquet                             | max. 5/8" thick $\lambda$ -value 0.14    | f) Carpeted floor                     | max. 3/8" thick $\lambda$ -value 0.09   |
| g) Laminated floor                     | max. 5/16" thick $\lambda$ -value 0.08   |                                       |   |
- 1.14 **Heating up** the system once laid may only commence once the fillers have dried out. For wall heating systems, where calcium carbonate based plaster fillers have been used, the minimum time is three days. Where a calcium carbonate based filler is used, the minimum time is 21 days. The heating temperature should not exceed 86° F during the first 4 days. The maximum heating performance is attained only after the overlay has dried out completely. *Note: Where tiles are used as the overlay, the drying process can take up to four weeks because water loss can only take place through the joints between the tiles.*
- 1.15 With regard to the laying procedure, please consult the currently applicable regulatory standards and requirements relevant to your locality (e.g. WSV0, HeizAnIV, DIN 4725, DIN 4108, DIN 1503, DIN 1060, DIN 1168, DIN 18202, DIN 18330, DIN 18550, DIN 18557, VOB, etc.)

## 2. Laying Instructions

- 2.1 All bases upon which the heating mat is to be laid must be dry, fully matured, solid, clean and free from separating agents and dirt, cracks and movement.
- 2.2 The bases must be primed with a suitable sealer before the heating mat is laid.
- 2.3 After ventilating the area for two hours from when the sealer had been applied, the heating mats (**with the fabric mesh facing the floor**) is laid out in accordance with the laying plan. Care must be taken to ensure that a 3/16" gap is left between the walls and the area to be heated.
- 2.4 **Only heating mats of the same size are allowed to be connected together.** If there is a variation, the heating mats must be shortened to ensure that this is the case (see 1.2 above). *Note: The connection lines of the heating mat(s) must be cut in a vertical plane with a sharp knife. Where the cut is made, the pipe should not be crushed (do not use pliers or scissors!).*
- 2.5 The heating mats are coupled in **parallel** using distributors connected to the inflow and return pipes associated with the hot water supply and return (see "Examples of Installation"). *Note: The connection lines of the heating mat(s) must be pushed firmly into the rapid coupling connections to ensure a secure connection. Two pressure points need to be overcome when pressing onto the coupling. To remove, move the blue securing ring back and pull out of the line. It is meaningful to locate the connections within a flush-mounted box on the wall. One connection line from the heating mats is coupled directly onto the heating inflow line by means of a distributor (multiple distributor). The other connection line is connected to the return flow temperature limiter attached to the heating system return pipe. If the distributors are mounted in a wall box, they must be covered.*
- 2.6 Before undertaking the pressure test (see point 1.10), each heating circuit must be flushed until the return flow contains no air bubbles. Initially, the system should be filled to a pressure of 72 PSI and left for half an hour in this state. Secondly, the pressure is raised once more to 72 PSI and left in this state for an hour. It should be continuously monitored. It is possible that, during the pressure test, a 10 K line wall temperature change may occur which, as a consequence, will alter the test pressure by about 7–14 PSI. Following this second step, the system pressure should only change a little (provided that the line wall temperature remains the same).

Details as to scope of delivery, appearance, performance, and weights correspond to those which were known at the time of going to print. We reserve the right to make amendments where necessary.



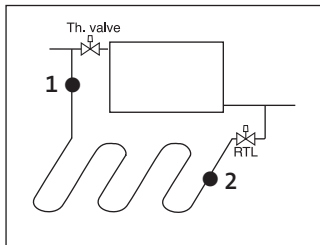
- 2.7 Finally, the laying of the heating element on the floor is carried out with the system maintained at the operating pressure > 22 PSI to < 43 PSI) and the mats covered over with an elastic filler suitable for underfloor heating systems (flexible adhesive, tile cement, or other such materials as described in DIN 18156.2 and DIN 18560) and thus fixed to the floor. During the laying of the heating elements, care should be taken to ensure that walking on them is kept to an absolute minimum and only occurs when measures have been taken to prevent mechanical damage (e.g. by wearing rubber-soled shoes). Equipment required to apply the screed mortar is to be placed or moved on suitable surfaces. For wall heating, the system should also be at the operating pressure and, when applying the covering layer (as a rule normally a single layer with a thickness of 9/16" – 11/16"), an alkali resistant, woven reinforcing material (mesh width: approx. 5/16") should be incorporated that completely covers the heating element. This should be positioned with an overlap of at least 7 1/8" onto the adjacent unheated areas. The reinforcing improves the tensile strength and reduces the risk of tearing. Before applying the plaster, the suitability of the original wall surface (e.g. blockwork) for such applications should be taken into account.
- 2.8 Where floor laying is concerned, once the applied adhesive has dried out, a flexible tile adhesive (suitable for ceramic overlays), or a flexible mortar (suitable for textiles, synthetics or parquet laying) with a minimum thickness of 3/16" is applied to provide mechanical protection before the overlay can be laid. When laying ceramic tiles, these can be embedded directly into the adhesive. After allowing for the manufacturer's hardening times, the joints can be filled with an appropriate flexible joint filler.
- 2.9 Expansion joints, located at the edges of all the insulated heating mats (at the base of the walls, etc.) are filled using an elastic filler (silicon filler) to ensure that no direct contact with the walls exists and to avoid the risk of cracking occurring.
- 3.0 The junction ends of the heating mat have been worked into the matting. They can be removed from the matting as required. The matting can be adapted to suit the floor surface. When handling, always ensure that the plastic pipe is not damaged. Depending on the pipe system or the length of the inlets, it may be necessary to add a heating circuit pump for the heating mats.

**Important:** Please always follow the instructions of the manufacturer for all materials used. Use only materials that are recommended for each stage in the laying and installation. We assume no liability with respect to the application of filling and fixing or similar materials. Care must be taken at all times when applying these materials. Avoid mechanical and physical damage to the heating mats.

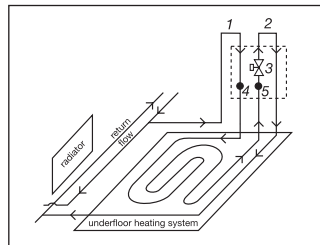
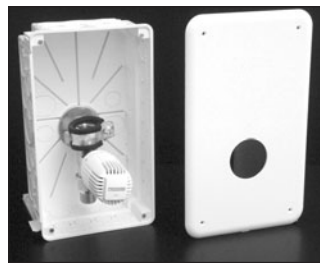
## Examples of Installation

### Connection and regulation for up to 162 sq. ft.

- with an return flow temperature limiter

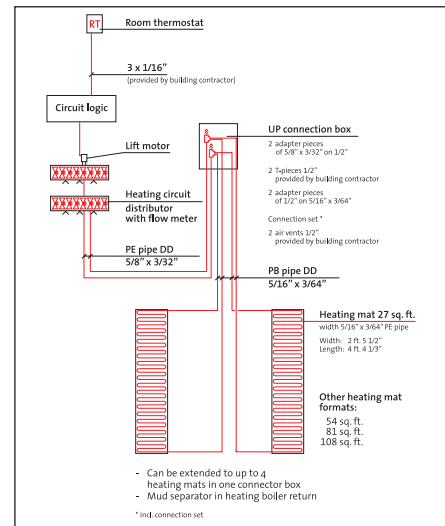


- with a flush-mounted return flow temperature limiter built into a wall box



### Connection and regulation for over 162 sq. ft.

- with heating circuit distributor, flow meter, room thermostat

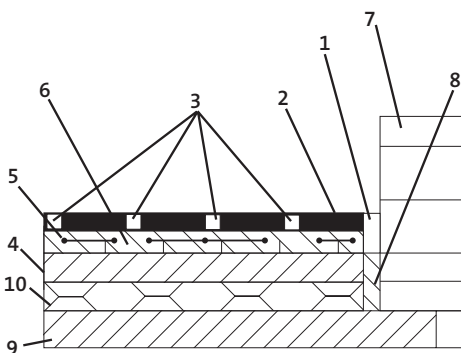


**Accessories:** • 1 • 2 connection set for 1 to 4 heating mats, including adapter pieces for 1/2" threads

**Recommendation:** Couple the heating mats in one built-in wall unit (→ accessibility)

*Note: A detailed description as well as assembly instructions relating to the return temperature clipper is enclosed in the packaging.*

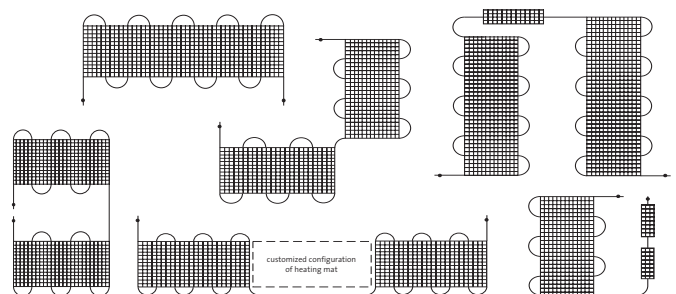
## Construction



- 1 = Expansion joints filled with silicon filler
- 2 = Floor tiles
- 3 = Joints filled with flexible or tinted filler
- 4 = Screed
- 5 = Heating mat
- 6 = Flexible filler
- 7 = Surrounding components and partitions, e.g. walls
- 8 = Insulated trim
- 9 = Concrete floor
- 10 = Insulation

## Laying Examples

Type of delivery: 1 heating mat

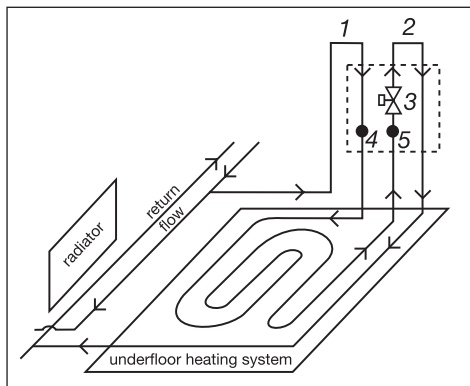


**Important:** Spacing between the U-bends 3 1/8".



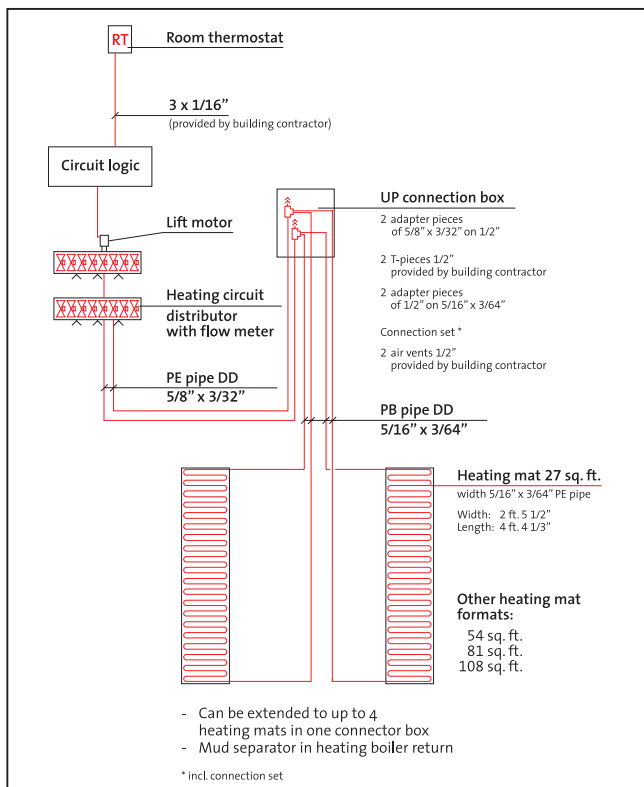
## Installation diagram for heating surfaces up to 162 sq. ft.

Return temperature clipper with / without built-in wall unit



- 1 = Flow supply 1/2" – from building contractor
- 2 = Return 1/2" – from the building contractor
- 3 = Return temperature clipper (RTL valve) 1/2" on the surface or sub-surface, with built-in wall unit
- 4 = Connection elements of the flow supply with the heating mat flow(s)
  - 1 reduction sleeve 1/2" internal thread on to 1/4" internal thread
  - 1 manifold (1-, 2-, 3- or 4-fold) 1/4" outer thread on 5/16"
- 5 = Connection elements for the return temperature clipper with heating mat return(s)
  - 1 reduction piece 1/2" outer thread on 1/4" internal thread
  - 1 manifold (1-, 2-, 3- or 4-fold) 1/4" outer thread on 5/16"

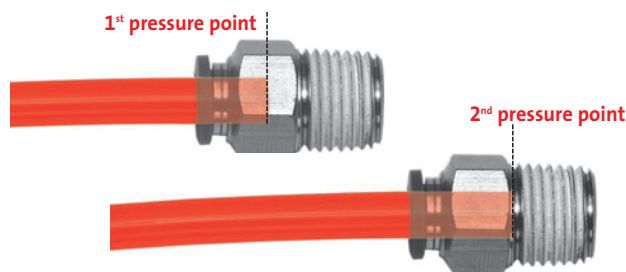
## Installation diagram for heating surfaces over 162 sq. ft.



## Installation instructions

### Connection elements

- a. **Sealing of the outer threads** (manifold, reduction piece, RTL valve, etc.) to be done with sealing agents (Teflon tape, hemp).
- b. Screw together the connection elements (please note the flow direction or pointing arrows on the return temperature clipper).
- c. **The heating pipe (5/6" x 3/64") must be cut with a sharp knife. The heating pipe must not be "squashed" on the cutting edge (do not use pliers of any sort!).**
- d. **The heating pipe must be pushed into the manifold as far as it will go. In doing so, two pressure points will need to be over-come (the heating pipe hits resistance twice).**
- e. For sub-surface assembly of the connecting elements in the mortar, these must be protected with sheathing.
- f. Usage up to 140° F and 43 PSI of pressure (for detailed description: see heating mat leaflet "Assembly notes on warm-water underfloor heating systems set in thin mortar.")



When connecting the low profile floor heating system, it is recommended that the following points be observed:

1. Before initiating operation, the lines should be flushed. (Note: For heating systems which may have a problem with pipe scale build-up either an oxygen binding agent/corrosion inhibitor should be added to the heating water or a scale remover should be added to the boiler return flow.)
2. Connecting cables for the heating circuit distributor at least 3/4" (depending on the volume of water or the heating surface area).
3. Only equal-sized heating elements may be connected to one another.