



 **Thermolay**

Underfloor Heating Systems

Installation & Operating Instructions

1. Introduction

Thermolay is an underfloor electric heating system which is installed immediately under the finished surface of tiles or stone slabs. It renders the floor surface warm to the touch and supplements other heating in the same room.

Thermolay Comes In Three Forms:

- Cable** Gives the best flexibility of layout and W/m^2 (heating power per unit area), but requires additional work when laying. Three kit sizes cover areas from $1.2m^2$ to $6.4m^2$.
- Mat** Requires less work when laying than cable, but gives a fixed W/m^2 of 160. Six kit sizes cover sizes from $1.0m^2$ to $5.0m^2$. Comes with self adhesive tape runs pre-attached for initially fixing mat to floor.
- Flexi-Mat** This can be stretched lengthwise by 50% giving 110 to $160 W/m^2$. It requires the least work when laying with the same flexibility of layout as the Mat. Five kit sizes cover areas from $1.0m^2$ to $9.0m^2$.

It is important that the correct size of mat/cable is used since the heating cable must not be cut. You will need to plan the layout carefully (see section 4) prior to purchase and get the right size mat/cable for the installation. It is possible to use more than one mat/cable for an installation by parallel connection but no cable in the system is allowed to cross over or under any other.

2. What You Will Need

a. Electric cable/mat (one or more as required):

Cable Kits - 100 to 200 W/m^2

Part No	Length	Coverage	W	Ω
UFHC24	24m	1.2 to $2.4m^2$	240W,	220 Ω .
UFHC32	32m	1.6 to $3.2m^2$	320W,	165 Ω
UFHC64	64m	3.2 to $6.4m^2$	640W,	83 Ω

Supplied with a reel of securing tape.

Mat Kits (Mat Width 0.5m) – 160W/ m^2

Part No	Length	Coverage	W	Ω
UFHM2	2m	$1.0m^2$	160W,	330 Ω
UFHM3	3m	$1.5m^2$	240W,	220 Ω
UFHM4	4m	$2.0m^2$	320W,	165 Ω
UFHM6	6m	$3.0m^2$	480W,	110 Ω
UFHM8	8m	$4.0m^2$	640W,	83 Ω
UFHM10	10m	$5.0m^2$,	800W,	66 Ω

Securing tape built into webbing.

Flexi-Mat Kits – 110 to 160W/ m^2

(Mat Width 0.4m, length can be stretched to 150% of figures quoted) – 110 to 160W/ m^2

Part No	Length	Coverage	W	Ω
UFHFM25	2.5m	1.0 to $1.5m^2$	160W,	330 Ω
UFHFM40	4.0m	1.6 to $2.4m^2$	260W,	207 Ω
UFHFM60	6.0m	2.4 to $3.6m^2$	380W,	138 Ω
UFHFM100	10.0m	4.0 to $6.0m^2$	640W,	83 Ω
UFHFM150	15.0m	6.0 to $9.0m^2$	960W,	55 Ω

Supplied with fixing pegs.

b. Controller

Installations without temperature control could give a floor temperature of around $55^\circ C$ which is not dangerously hot but is wasteful of energy.

There are three controllers (temperature probe included) in the Thermolay range, which, as well as regulating floor temperature by means of an inclusive remote temperature probe, two of three will define the time periods when the system is active. These are:-

RAM714A

A basic temperature controller with an ON/OFF switch to control the heating periods.

UFPT24/UFPT7

A temperature controller with analogue adjustment and either a 7 day (UFPT7) or 24 hour (UFPT24) digital time control. Both incorporate a fall-back control of $5^\circ C$ during OFF periods.

RAM818TOP

Control of temperature and 24 hour or 7 day time periods on a digital basis. Fall-back control of 6 to $10^\circ C$ (adjustable) is incorporated.

c. RCD Protection

This is essential to give the highest level of electrical safety protection. **The 10 year guarantee cover of mats and cables as components is not effective unless the installation is protected by an RCD.** This could be covering the total house supply but a better solution would be to use the RCD10WL from the Thermolay range.

d. Screed

This is used to cover cable or mat and provide a bedding to locate and restrain tiles/stone slabs. The required screed is self levelling or latex and it is possible to use standard flooring grade tile adhesive. A different grade is usually recommended for wood and concrete/screed floors respectively. Suitable products are manufactured by Ardex, Bal, Evostick and F.W. Ball amongst others. Please consult your local tile stockist or DIY store, who would also be able to recommend a suitable flexible additive which is **essential** to be mixed with the adhesive and a suitable primer for the floor surface.

e. Duct Tape

For the Mat and Flexi-Mat systems you will need a reel of duct tape (e.g. Duck) to fix the cold cable and probe with flying lead.



RAM714A



UFPT24/UFPT7



RAM818TOP



RCD10WL

Underfloor Heating Systems

3. Preparation of Surface

Wood Floor

This will generally be either floorboards or chipboard panels. With floorboards any loose boards will need to be firmly fixed and it will be necessary to cover the complete floor with 20mm plywood sheeting fixed at 200mm centres. With chipboard panels ensure they are all firmly fixed and cover with plywood as above. The use of a primer recommended by your screed/adhesive supplier is essential. This must be applied to the complete floor surface to be tiled.

Grooves will need to be made to accommodate the cable/mat flying lead (cold cable) and the temperature probe with its flying lead as these are thicker than the heating cables (mat or cable).

Concrete/Screed Floor

Repair any fissures or patches with a cement sand mixture with PVA added to improve adhesion. The use of a primer recommended by your screed/adhesive supplier is essential. This must be applied to the complete floor surface to be tiled.

Grooves will need to be made to accommodate the cable/mat flying lead (cold cable) and the temperature probe with its flying lead as these are thicker than the heating cables (mat or cable).

4. Planning Mat/Cable Layout

Cable Layout

The layout and installation of mat/cable must be carried out in accordance with these instructions. If there is any doubt about how to proceed please contact the Helpline on 020 8450 0515 or a competent professional person.

For wood floors the gap between the cable runs should be 82mm (see figure 1). This gives 120W/m². For concrete/screed floors the gap between cable runs should be 62mm. This gives 160W/m².

Initially decide on a location for the RCD and controller* then plan the run of the cold cable to the start of the heating cable and the run of the temperature probe flying lead, remembering that no cable should cross over or under any other or the temperature probe which should be positioned as in figure 3. The cold cable and probe flying lead are 4m long and may be shortened if necessary.

Cables should be run backwards and forwards between walls or obstructions (see the example given in figure 2). Cables should not be run under permanent fixtures. The cables should not get closer to the tiling edge than 50mm and should clear permanent fixtures by the same amount.

If the largest cable in the range is not long enough a second cable can be used with the two cold cables connected to the controller – black to black to controller live output and blue to blue to controller neutral output.

* These should not be located in a bathroom or near a sink or cooking facilities in a kitchen.

Figure 1

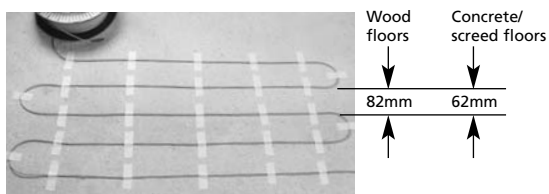


Figure 2

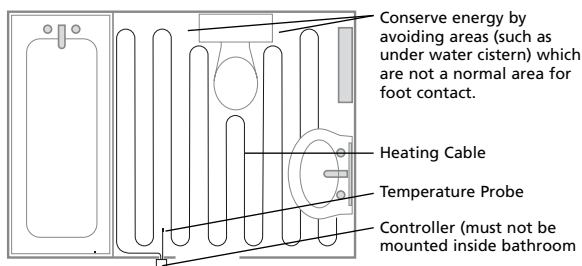
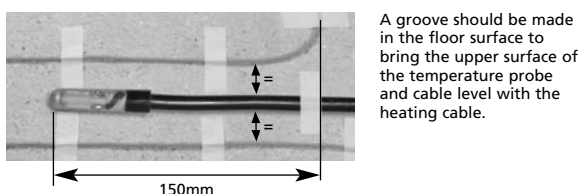


Figure 3



Mat Layout

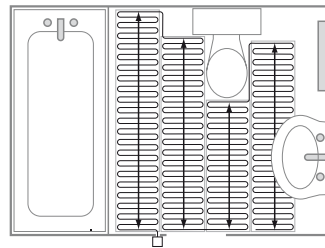
These have a fixed output of 160W/m² and are suitable for concrete/screed floors.

Initially decide on a location for the RCD and controller* then plan the run of the cold cable to the start of the heating mat and the run of the temperature probe flying lead remembering that no cable should run under or over any other or the temperature probe which should be positioned as in figure 3. The cold cable and probe flying lead (both 4m in length) may be shortened as necessary.

Mats should run backwards and forwards between walls or obstructions. The techniques shown in figures 4 and 5 may prove useful. When cutting the mat webbing to give direction changes or bypassing of obstacles take care not to cut or damage the heating cable. Mat runs should be separated by at least 30mm and should not be run under permanent fixtures. The cables within the mats should not get closer to the tiling edge than 50mm and should clear permanent fixtures by the same amount. If the longest mat in the range is not long enough to cover the required area a second mat or cable can be used with the two cold cables connected to the controller controller – black to black to controller live output and blue to blue to controller neutral output.

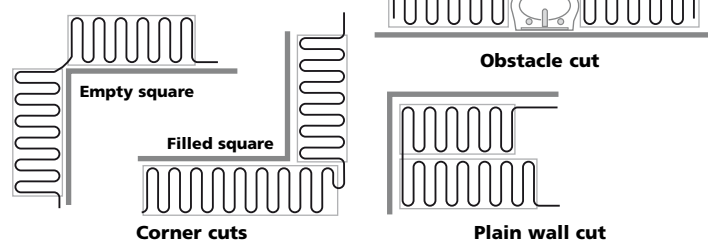
* These should not be located in a bathroom or near a sink or cooking facilities in a kitchen.

Figure 4



When cutting the mat webbing to give direction changes or the bypassing of obstacles take care not to cut or damage the heating cable.

Figure 5



Flexi-Mat Layout

These give an output of between 110 and 160W/m² depending on the degree of stretch (maximum stretch gives 110W/m²).

Initially decide on a location for the RCD and controller* then plan the run of the cold cable to the start of the heating mat and the run of the temperature probe flying lead remembering that no cable should run under or over any other or the temperature probe which should be positioned as in figure 3. The cold cable and probe flying lead (both 4m in length) may be shortened as necessary.

Mats should run backwards and forwards between walls or obstructions. Generally it will be sufficient to pin the mat at the start and finish of each run if there is a degree of stretch in the mat. The techniques shown in figures 4 and 5 may prove useful. When cutting the mat webbing to give direction changes or bypassing of obstacles take care not to cut or damage the heating cable. Mat runs should be separated by at least 30mm and should not be run under permanent fixtures. The cables within the mats should not get closer to the tiling edge than 50mm and should clear permanent fixtures by the same amount. If the longest flexi-mat in the range is not long enough to cover the required area at the required W/m² a second flexi-mat or cable can be used with the two cold cables connected to the controller – black to black to controller live output and blue to blue to controller neutral output.

* These should not be located in a bathroom or near a sink or cooking facilities in a kitchen.

5. Installation of Cable or Mat

Wood Floor

Initially remove any dust and debris from the floor surface and follow the notes on preparing the surface in section 3. Then check the flexi-mat or cable resistance against the figures given in section 2, also check the temperature probe resistance (approx 110k Ω at 20°C, decreasing with increasing temperature). If the readings are okay proceed with laying the flexi-mat or cable:-

a. Cable.

During the installation wear soft soled shoes and avoid treading on the probe or any of the cables. Working to the planned layout make grooves for the cold cable and the probe with flying lead to give the same overall height above floor level as the heating cable then remove debris. Tape the temperature probe and flying lead as well as the cold cable into their respective grooves using the tape provided. When positioning the heating cable ensure that it is well clear of the temperature probe (see figure 3). Tape the cable to the floor according to the plan developed in section 4 with an 82mm cable spacing as shown in figure 1. The cable should be taped at every bend and also five times along the runs between bends as shown in figure 6. Check the cable and probe resistance and then coat the cables and adjacent floor with a thin layer of adhesive with the essential flexible additive.

The cable and probe resistance should be checked again after the adhesive has set.

If the cable and probe resistance is okay the adhesive with the essential flexible additive should now be spread evenly over a section of the floor until the cable is completely covered, then slab laying or tiling is carried out over this section. The process is repeated section by section until the floor is completed.

When grouting it is essential to use a flexible additive mixed with the grout. The cable and probe resistance should be checked again on completion of the grouting.

NOW ALLOW 10 DAYS FOR THE SCREED TO COMPLETELY SET AT A NORMAL ROOM TEMPERATURE BEFORE COMMISSIONING.

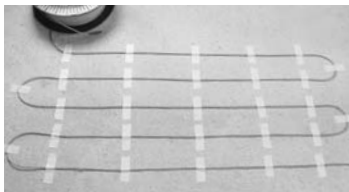


Figure 6

b. Flexi-mat

During the installation wear soft soled shoes and avoid treading on the probe or any of the cables. Working to the planned layout make grooves for the cold cable and the probe with flying lead to give the same overall height above floor level as the heating cable then remove debris. Tape the temperature probe and flying lead as well as the cold cable into their respective grooves using duct tape. When positioning the flexi-mat ensure that the heating cable is well clear of the temperature probe (see figure 3). Drill two holes 6mm dia. at least 17mm deep close to the ends of each run of flexi-mat. These are to locate the push-fit plugs supplied. They should engage with each of the two outer runs of webbing within the flexi-mat (not the cable). The start of each run of flexi-mat should be placed in position smooth side down and the plugs pushed home hard trapping the webbing under the heads of the plugs. The mat should be stretched to close to its maximum length to give 120W/m² and two more plugs pushed home into the pre-drilled holes at the end of the run. Cut the webbing (avoiding damage to the heating cable) to reverse direction or avoid obstacles using the techniques shown in figures 4 and 5 whilst continuing to fix further runs of the flexi-mat. When reaching the last two or three runs the stretch can be adjusted to use up the complete cable (count the cable loops on one side of the remaining mat length to do this).

Check the cable and probe resistance and then coat the cables and adjacent floor with a thin layer of adhesive with the essential flexible additive.

The cable and probe resistance should be checked again after the adhesive has set.

If the cable and probe resistance are okay the adhesive with the essential flexible additive should now be spread evenly over a section of the floor until the flexi-mat is completely covered, then slab laying or tiling is carried out over this section. The process is repeated section by section until the floor is completed.

When grouting it is essential to use a flexible additive mixed with the grout. The cable and probe resistance should be checked again on completion of the grouting.

NOW ALLOW 10 DAYS FOR THE SCREED TO COMPLETELY SET AT A NORMAL ROOM TEMPERATURE BEFORE COMMISSIONING.

Concrete or Screed Floor

Initially remove any dust and debris from the floor surface and follow the notes on preparing the surface in section 3. Then check the flexi-mat, mat or cable resistance against the figures given in section 2, also check the temperature probe resistance (approx 110k Ω at 20°C, decreasing with increasing temperature). If the readings are okay proceed with laying the flexi-mat or cable:-

a. Cable

Proceed as for wood floor (a) except use a cable spacing of 62mm (see figure 1).

b. Mat

During the installation wear soft soled shoes and avoid treading on the probe or any of the cables. Working to the planned layout make grooves for the cold cable and the probe with flying lead to give the same overall height above floor level as the heating cable then remove debris. Tape the temperature probe and flying lead as well as the cold cable into their respective grooves using duct tape. When positioning the mat ensure that the heating cable is well clear of the temperature probe (see figure 3). Fix the matting smooth side down using the three runs of adhesive tape already fixed to it. This is best achieved by removing the backing on this tape over a short length then fixing the mat down before moving to the next section. Cut the webbing (avoiding damage to the heating cable) to reverse direction or to avoid obstacles using the techniques shown in figures 4 and 5.

Check the cable and probe resistance and then coat the cables and adjacent floor with a thin layer of adhesive with the essential flexible additive.

The cable and probe resistance should be checked again after the adhesive has set.

If these are both okay the adhesive with the essential flexible additive should now be spread evenly over a section of the floor until the mat is completely covered then slab laying or tiling is carried out over this section. This process is repeated section by section until the floor is completed.

When grouting it is essential to use a flexible additive mixed with the grout. The cable and probe resistance should be checked again on completion of the grouting.

NOW ALLOW 10 DAYS FOR THE SCREED TO COMPLETELY SET AT A NORMAL ROOM TEMPERATURE BEFORE COMMISSIONING.

c. Flexi-mat

Proceed as for wood floor (b) except the degree of stretch is low to give 160W/M².

6. Installation of Controller & RCD

Note: The 10 year guarantee cover of mats and cables as components is not effective unless the installation is protected by an RCD.

The installation of the Controller and RCD must be carried out according to their respective instructions and the installation must comply with the current I.E.E. Wiring Regulations. If there is any doubt about how to proceed please contact the Helpline on 020 8450 0515 or a competent professional person.

Fix the controller and RCD in the required positions. We suggest the controller is mounted around head height for ease of programming. Terminate the incoming supply leads to the RCD in accordance with its instructions. Connect the RCD output to the incoming supply terminals of the controller in accordance with its instructions. After measuring and recording the overall cable resistance the cold cable may now be connected to the output terminals of the controller, shortening the cold cable as necessary. After measuring and recording the temperature probe resistance and the approximate room temperature the probe flying lead may now be connected to the probe terminals on the controller, shortening the flying lead as necessary.

7. Commissioning

Referring to the appropriate instructions turn the RCD on and set the controller to the maximum temperature in continuous operation. There should be a noticeable change in the floor surface temperature after one hour with a wood floor and up to five hours with a concrete floor.

The controller should now be adjusted to a temperature giving the required comfort and the timing (if incorporated) set as required.

We recommend a temperature setting of 28°C

8. Do's and Do Not's

- Do not** cut the heating cable.
- Do not** leave surplus matting or cable rolled up under units or fixtures – use the right size.
- Do not** cross any cables.
- Do not** switch mat or cable on until 10 days after fitting.
- Do not** cut or prepare tiles etc on top of the finished area.

- Do** consult the Helpline or a competent professional person if you are unsure how to proceed.
- Do** use an approved flexible additive mixed with screed/adhesive.
- Do** use an approved flexible additive mixed with the grout.
- Do** cover the area where mats or cables have been laid for protection.
- Do** keep a record of cable and probe resistance for later referral.
- Do** keep a drawing of where the mat/cable was laid to enable any future structural work to proceed without damage.
- Do** fit an RCD if the installation is not protected by one already. Timeguard does not guarantee cables or mats where the installation is not RCD protected.

9. Guarantees

Heating Cables, Mats, Flexi-Mats, Temperature Probes (including flying leads).

It is necessary to retain proof of purchase to validate the guarantee.

In the unlikely event of any of these products becoming faulty due to defective material or manufacture within **10 years** of the date of purchase please contact Timeguard and it will be replaced free of charge.

This guarantee is subject to the following conditions:-

- a. The cable/mat/flexi-mat has been installed and used in full compliance with the installation instructions 1-8 above.
- b. The cable/mat/flexi-mat has been earthed and protected by an RCD at all times.
- c. The cable/mat/flexi-mat has been used with a controller supplied by Timeguard.
- d. Proof of purchase will be required so keep an invoice detailing the cable/mat/flexi-mat(s) and controller purchased.
- e. Accidental damage to the cable/mat/flexi-mat during or after installation is not covered.

The guarantee covers the above components ONLY but NOT installations and associated floor covering products.

There is no other guarantee, express or implied. No claim can be brought against the manufacturer or its agents for any consequential damages whatsoever.

Controllers and RCD's.

It is necessary to retain proof of purchase to validate the guarantee.

In the unlikely event of any of these products becoming faulty due to defective material or manufacture within **3 years** of the date of purchase please return it to your supplier with proof of purchase and it will be replaced free of charge.

There is no other guarantee, express or implied. No claim can be brought against the manufacturer or its agents for any consequential damages whatsoever.



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