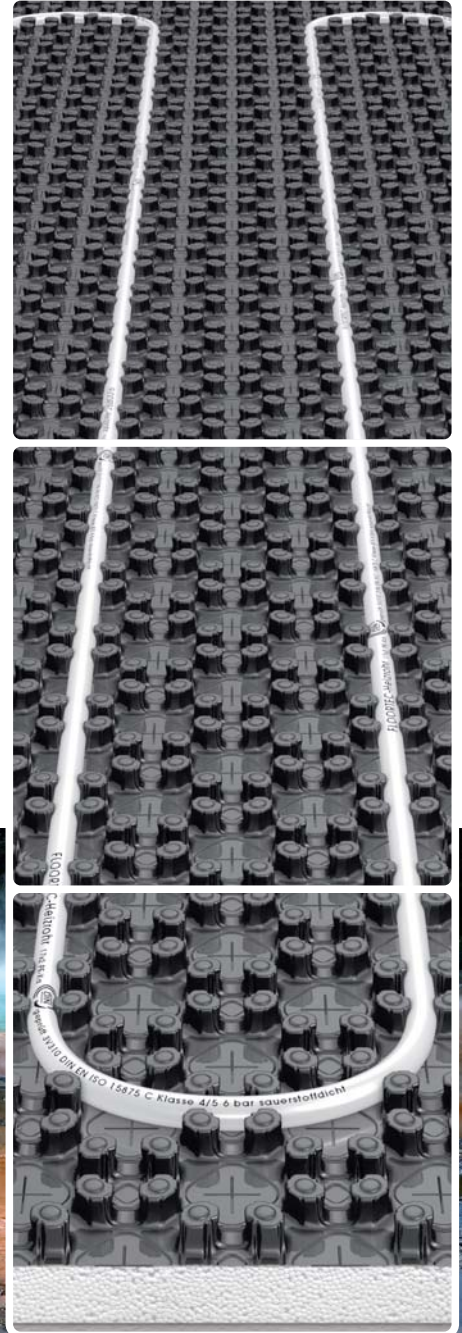


FLOORTEC
 UNDERFLOOR HEATING.
 BROCHURE & TECHNICAL GUIDE
 APRIL 2013

NEW products added



heatingthroughinnovation.



UHMA



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In accordance with our policy of continual product improvement we reserve the right to amend the specification of these products or discontinue products without prior notification. We have compiled the content of this literature to the best of our knowledge. Any typographical, clerical or other error or omission in any literature issued by us will be subject to correction without liability being incurred by us. All rights reserved. No part of this document may be reproduced by any means without prior written consent.

Please note: due to print restrictions exact colour match is not always possible, however every effort has been made to ensure as much accuracy as possible.



INTRODUCTION.

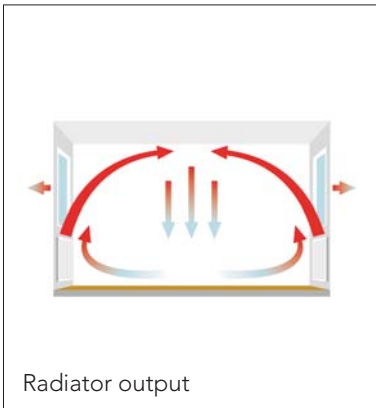
More design. More flexibility.

In recent years underfloor heating has been widely acknowledged as one of the most effective methods of heating. It has become the fastest growing market for both domestic and commercial heating sectors. As one of Europe's leading names in heating technology, **MYSON FLOORTEC** is at the forefront of the underfloor revolution. In addition to our manufacturing and technical expertise, we provide full planning, design and supply services to help you achieve your perfect home.

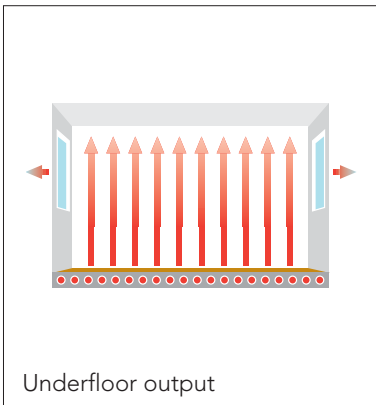
heatingthrough**innovation.**



A BETTER KIND
OF HEAT.



Radiator output



Underfloor output

Underfloor heating works by circulating warm water through a series of continuous pipe loops fitted underneath your floor. The pipework creates a large radiant surface which heats your home from the floor upwards. This radiant form of heating is very different to the convected heat provided by radiators. Radiators work by drawing cold air across your floor, heating it and then convecting it upwards towards the ceiling.

The use of radiant heat rather than convected heat will provide you with a number of significant benefits.

Natural, comfortable warmth.

The main advantage of underfloor heating is its high level of performance. Radiant heat means that the warmth is concentrated where you need it most. Room temperatures higher up are usually around 2°C lower than at floor level. So it's perfect for human comfort - you won't get cold feet and you will keep a cool head!

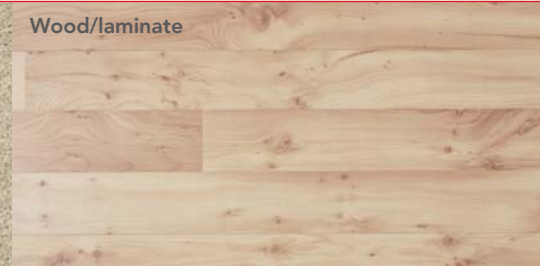
It's highly controllable heat too. You can make each room a separate zone, varying heat output according to the time of day and location. You'll enjoy uniform heat even in the largest rooms, with no cold spots and no draughts caused by air circulation. It's even good for furniture, with its gentler, more even heat and smaller variations in humidity.

MORE BENEFITS.
MORE FLEXIBILITY.

Carpet



Wood/laminate



Tile



Slate/stone



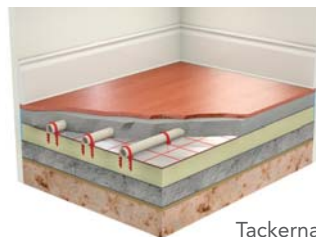
Plated Floor

Suspended floor systems include joisted floors with conventional joists supported on end walls of sleeper walls, as well as solid floors with battens fixed to the floor.

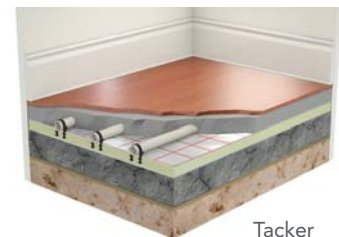


Screeded Floor

Solid floor underfloor heating systems have the underfloor heating pipework embedded in concrete or screed. They include concrete screeded floors and block and beam floors with a screeded finish.



Tackernail



Tacker



Cliprail

Floating Floor

Floating floors reduce the overall loading on the building, reducing the weight of the floor compared to other floor systems. Floating floors also exhibit very good acoustic properties, reducing sound transmission between floors of a building.



Underfloor heating is also extremely discrete. With nothing showing above floor level, it does not interfere with either your living space or your décor. This leaves you free to make the most of every square foot of your floor and wall space.

It is also a cost effective option. Although installation costs are generally higher than traditional heating methods, underfloor heating's superior efficiency means that your running costs will be significantly lowered so the ongoing savings on your energy bills quickly outweigh your higher initial outlay.

Underfloor heating is even a practical option. It can be used with most types of floors and floor coverings. It is also suitable for use with all sorts of wet central heating systems. It is easy to install and gives you a number of usage options. It can be installed throughout your house, on one level only or in individual rooms. It can be used alone or combined with radiators or other heating systems elsewhere in your home.

MORE SERVICE.
MORE CONFIDENCE.

MYSON FLOORTEC has introduced a Complete System Guarantee that promotes the advantages of both tried and tested component compatibility and correct system design. We are confident that, when installed correctly, our systems will perform to the highest standards, so eliminating unnecessary problems.



If you decide to buy individual components from different manufacturers, unfortunately there is no overall responsibility for your underfloor heating system, should things go wrong. Buy a bespoke system from **MYSON** and our Complete System Guarantee means you will benefit from complete peace of mind.

In addition, you also benefit from our Service Plus technical support, training and reputation.

Once your system is installed, all you have to do is sit back and enjoy the performance, efficiency and design freedom that **MYSON FLOORTEC** underfloor heating provides.

Call **0845 402 3434** for more details.



1.0 General Heating Description

All underfloor heating systems must be designed, installed and commissioned in accordance with the CIBSE Underfloor Heating Design and Installation Guide 2012.

MYSON FLOORTEC underfloor heating is suitable for use with all types of wet central heating systems, including gas, oil or solid fuels and conventional, combination or condensing boilers. It is also ideal for mixed systems with, for example, underfloor heating on the ground floor and radiators on the first floor. Due to its lower flow temperatures, underfloor heating works especially well with condensing boilers and renewable energy heat sources, such as heat pumps taking full advantage of the high efficiencies available.

Underfloor heating can be fitted under screed, floating or timber joist floors, and whether your preference is for fitted carpets, vinyls, wood block, ceramic or stone floors, it will provide a warm and comfortable surface underfoot.

The choice of floor covering will of course affect the output of the underfloor circuit and this should be taken into account at the design stage.

To work effectively, underfloor heating requires water temperatures of between 35°C and 55°C. These are easily obtained by blending flow water and return water from the underfloor by means of the thermostatic mixing facility.

Heat Pumps

Heat pumps save energy by extracting heat from an outside source and delivering it within the building. Heat pumps are ideally supplied for use with underfloor heating due to the lower running temperatures required.

When to use underfloor heating

Underfloor heating is suitable for:

- Most housing applications
- Buildings or areas with low heat loss
- Buildings or areas that are continually or frequently used
- Buildings or areas with high ceilings.

Underfloor heating is not suitable for:

- Buildings or areas that are used intermittently or infrequently
- Buildings or areas that have high, or sudden heat losses
- Applications where large amounts of equipment or fittings will be fixed into the floor, eg. racking or shelving
- Buildings where future partitioning or internal wall changes may occur.



2.0 General Specification: Screeded Floor Systems

Description

Solid Floors

Solid floor underfloor heating systems have the underfloor heating pipework embedded in screed or concrete. They include concrete screeded floors and block and beam floors with a screeded finish. **MYSON FLOORTEC** underfloor heating systems are available for all of these constructions.

The design and installation of the concrete or screeded floor must conform to the appropriate British Standards and Codes of Practice including BS 8204-1:2003 screeds, bases and in situ floorings. Concrete bases and cement sand levelling screeds to receive floorings. BS 8000-9:2003 Workmanship on building sites. Cementitious levelling screeds and wearing screeds.

MYSON FLOORTEC underfloor heating can offer a solution for all types of screeded and concrete floor constructions with few constraints.

Underfloor Heating in Screeded Floors

Screeded floors are laid onto a sub-base which can be of concrete or beam and block construction. A damp proof membrane should be included within, or on top of, the sub-base. Typical screeded floor sections are detailed on pages 10 & 11, showing the **MYSON FLOORTEC** underfloor heating pipework in the structure. The composition of the floor above the sub-base shall be identical in both cases.

A layer of insulation, which must meet the requirements of the Building Regulations, is laid directly on to the sub-floor. To avoid damage to this insulation, from the screed, a protection layer, which is normally a polyethylene sheet of at least 0.15mm thick, must be included.

MYSON FLOORTEC insulation products have this protection layer bonded to their upper surface. This layer is not however a damp proof membrane or vapour barrier which, if required, must be included elsewhere in the floor construction.

2.0 General Specification: Screeded Floor Systems (cont...)

MYSON FLOORTEC underfloor heating pipework is then laid, held in place with one of the five primary anchoring systems, detailed below.

MYSON FLOORTEC underfloor heating can be used with many differing screed constructions, ranging from a traditional sand and cement screed to an anhydrite system. **MYSON FLOORTEC** recommend that the thickness of a typical sand and cement screed shall be between 75mm and 150mm. All screeds must comply with the requirements of BS 8204 and particular attention should be given to bay sizes, which should not exceed 40m² in area, or 8m in any linear dimension. Expansion joints must be used, as required by BS 8204. The screed must not contain any insulating materials.

Underfloor Heating in Concrete Floors

A typical concrete floor section is shown on page 11, giving the common elements of the floor structure and showing the **MYSON FLOORTEC** underfloor heating pipework within the structure.

The sub-base is usually made up of several layers, starting with a compacted or consolidated hard-core.

A blinding layer is added on top of this and a damp proof membrane should be included at this level. A layer of insulation, which must meet the requirements of the Building Regulations, is laid directly on to the sub-floor. To avoid damage to this insulation, from the concrete, a protection layer, which is normally a polythene sheet of at least 0.15mm thick, must be included.

MYSON FLOORTEC insulation products have this protection layer bonded to their upper surface. This layer is not, however a damp proof membrane or vapour barrier which, if required, must be included elsewhere in the structure.

MYSON FLOORTEC underfloor heating pipework is then laid, held in place with one of the five primary anchoring systems, detailed below.

MYSON FLOORTEC underfloor heating can be used with many differing designs of concrete floor. The make up and thickness of the floor shall depend upon its structural requirements, and detailed advice on floor construction should be sought from a structural engineer, however the floor thickness should not exceed 150mm. The concrete must not contain any insulation materials.

Pipework Anchorage Systems

With solid floor constructions the underfloor heating pipework must be held in place prior to the screed or concrete being laid. **MYSON FLOORTEC** underfloor heating has five primary anchorage systems to meet all possible installation situations. These anchorage systems are cliprail, tacker, tackernail, preformed plate (naked and with 11mm insulation) and mesh.

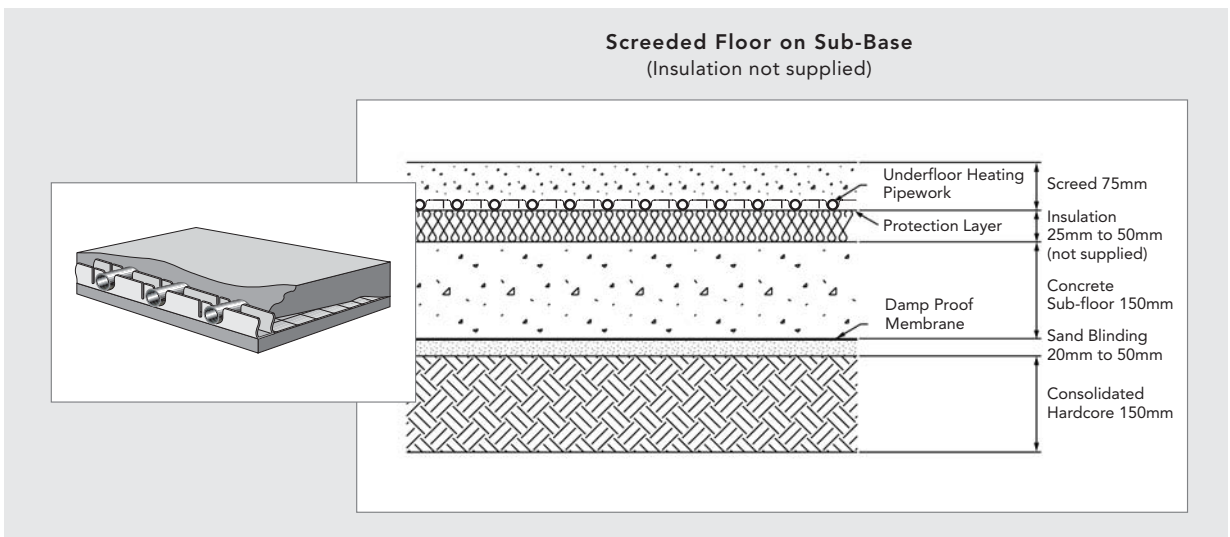
Transitional Pipe Runs

Areas of high density transitional pipe, such as areas adjacent to the manifold, must be insulated to avoid overheating of the floor.

2.1 Cliprail

Cliprail systems are designed to attach the underfloor heating pipework to floor insulation that is supplied by others. **MYSON FLOORTEC** do not supply any insulation with cliprail

systems, however, we do supply perimeter insulation to cater for the floor's expansion and contraction.



Please note: For additional fixing, anchor clips are available. Suitable for 16 and 17mm pipework.

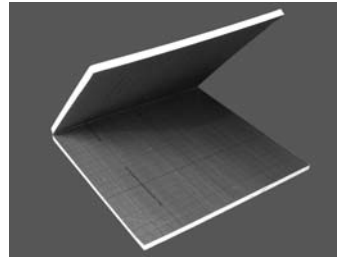
2.2 Tacker

Tacker Insulation

MYSON FLOORTEC underfloor heating insulation is a PS20 Expanded Polystyrene (EPS100) with a webbing foil bonded to the top surface. This webbing foil acts as the protection layer and, after laying, all joints must be taped to maintain integrity. A 50mm grid is marked onto the foil to assist in the positioning of the MYSON FLOORTEC underfloor heating pipework.

Note: MYSON FLOORTEC PS20 insulation is part of the underfloor heating pipe fixing method and is not designed to comply with the requirements of the Building Regulations. Additional insulation, by others, may therefore be required.

Please note: For additional fixing, anchor clips are available. Suitable for 16 and 17mm pipework.



Flatpack Insulation

PS20 (EPS100)

| mm | Quantity | Thermal Conductivity |
|----|------------------|----------------------|
| 25 | 10m ² | 0.040 W/mK |
| 50 | 10m ² | 0.040 W/mK |

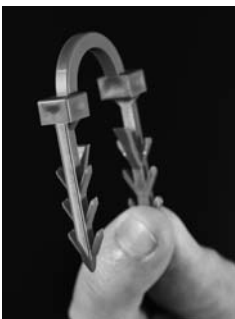
2.3 Tackernail

NEW Tackernail Fixing System

The pipe is positioned in place and then a barbed Tackernail (available in 38, 42 and 58mm lengths) is fixed over the pipe by means of a MYSON FLOORTEC Tackertool. The barbs snag on the webbing material holding the pipe until the screed or concrete is laid. The Tackertool may be either purchased or hired from MYSON FLOORTEC. Perimeter insulation is also supplied to cater for the floor's expansion and contraction.

This is a fast and effective method of anchoring the MYSON FLOORTEC underfloor heating pipework and is very flexible allowing both spiral and serpentine laying patterns. 40 and 60mm 'U' Clips are also available.

Please note: For additional fixing, anchor clips are available. Suitable for 16 and 17mm pipework.



Tackernails

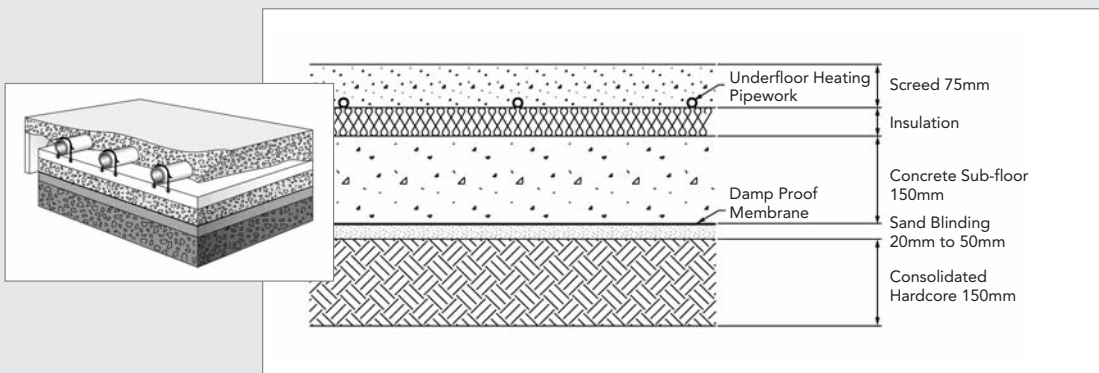


Tackertool

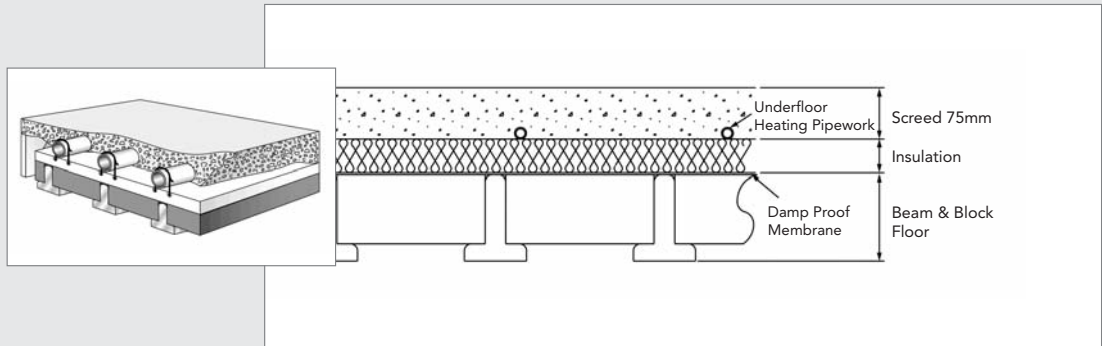


Tackernails in use

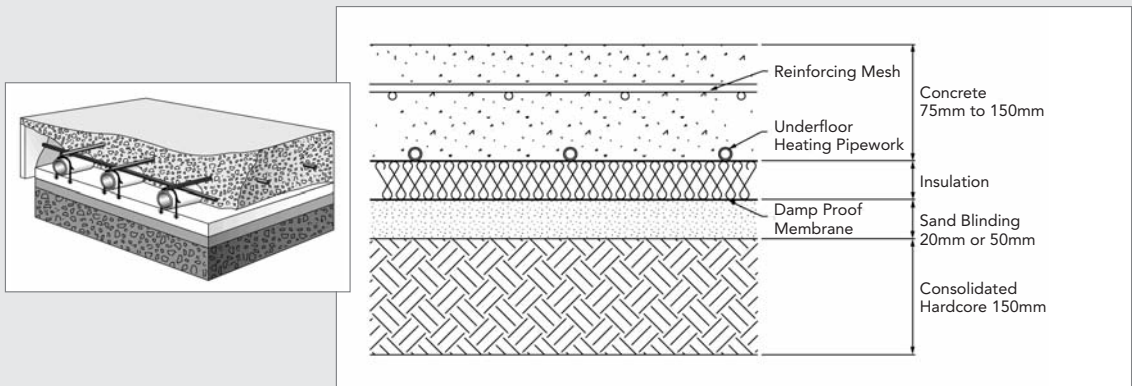
2.4 Screeded Floor on Sub-Base (Tacker System Shown)



2.5 Screeded Floor on Block and Beam Base (Tacker System Shown)



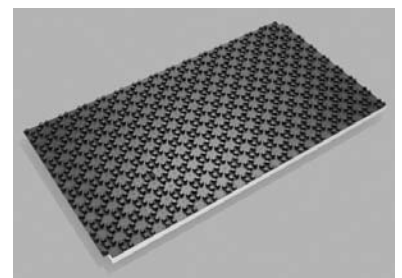
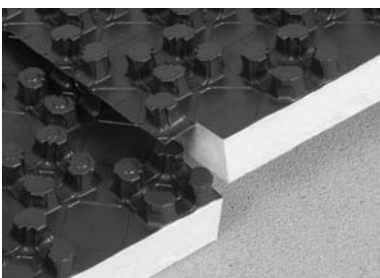
2.6 Concrete Floor Structure (Tacker System Shown with Reinforcing Mesh)



2.7 Preformed Plate (Suitable for 14 - 17mm pipework)

The preformed plate underfloor heating system is ideal for a single person installation and utilises 14 - 17mm pipework. A castellated fixing system comprises of an 11mm expanded polystyrene base with raised burls designed to firmly grip the pipework. Preformed plate is laid over the concrete sub-floor

and is covered with floor screed, as with the other systems. The preformed plate system is also supplied with a foam perimeter tube which helps prevent the screed from travelling under the plates.



2.8 Naked Preformed Plate

The naked preformed plate system is designed as a more cost effective, streamlined version of the preformed plate system when space is at a premium. The castellated fixing system comprises of raised burls designed to firmly grip the **MYSON FLOORTEC** heating pipe. The naked preformed plate is laid over a concrete sub-floor or insulation and is covered with floor screed, as with the other systems.



2.9 Mesh

This type of system is equally suitable for screeded and concrete floors.

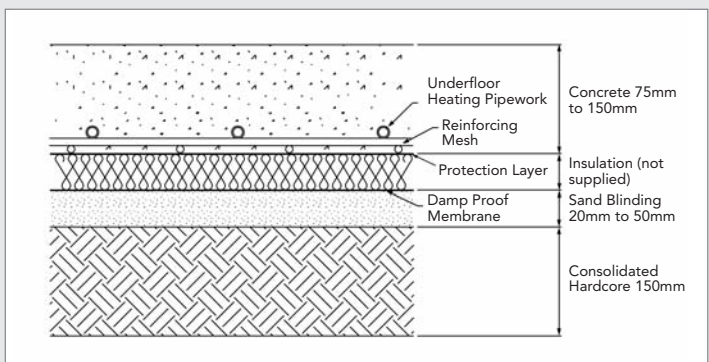
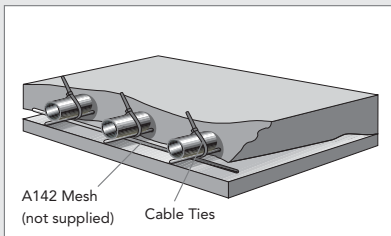
Mesh systems consist of **MYSON FLOORTEC** underfloor heating pipework being attached to a steel reinforcing mesh (generally A142), which itself is laid over the floor insulation. Cable ties are the normal method of connection between the underfloor heating pipe and the mesh.

The insulation, which must meet the requirements of the Building Regulations, is laid directly on to the sub-floor. To avoid

damage to this insulation, from the screed, concrete or mesh, a protection layer which is normally a polyethylene sheet of at least 0.15mm thick, must be laid directly above the insulation.

Should a mesh system be used with a liquid screed, the mesh must be securely fixed in place prior to the installation of the screed.

Mesh System
(Concrete floor structure shown)



3.0 General Specification: Floating Floor (suitable for 16mm multilayer pipe only)

Description

A floating floor underfloor heating system has been developed by **MYSON FLOORTEC** to meet the increasing demand for this type of flooring structure. Floating floor systems have a low thermal mass and consequently have a swift response time to changes in temperature. Floating floors also reduce the overall loading on the building, minimising the weight of the floor compared to other floor systems. Suitable for 16mm multilayer pipework only.

Installation Outline

- Extruded Polystyrene panels are pre-grooved with grooves on 200mm centres.
 - 30mm thick made from XPS Extruded Polystyrene
 - 40mm thick made from XPS Extruded Polystyrene
 - 50mm thick made from XPS Extruded Polystyrene
 - Panel dimensions - 2400mm x 1200mm
- A U-shaped groove is provided at one end of each panel to allow for turning of the pipework at the end of a run.
- The grooves are dimensioned to accept aluminium diffusion plates, which spread the heat from the underfloor heating pipework to the floor.
- Panels are laid with the U-shape at each end of the room, with the sheets butt jointed and cut to size.
- Once the panels are laid aluminium diffusion plates are fitted onto the sheets with the grooves in the plates fitting into the grooves in the polystyrene panel.
- To allow for transitional pipework, the floating floor panels may be grooved using a proprietary heat gun.
- After installing the pipework, transitional pipe runs and pipe returns must be covered with **MYSON FLOORTEC** flat plates. These areas are covered with flat aluminium plates to assist with heat distribution.

- Underfloor heating pipework is walked into the grooves in the plate and, after pressure testing, the floor decking is floated onto the floor.
- **MYSON FLOORTEC** recommend that areas of high density transitional pipe must be insulated.
- The decking will conventionally be a tongue and grooved flooring material with the panels glued together along the tongue and groove.
- Adhesive should be applied to both sides for the joint to ensure a sound fixing.
- The floor decking is left 10mm short of the walls of the room to allow for expansion of the decking and is held in place at the edges, usually by the skirting board.



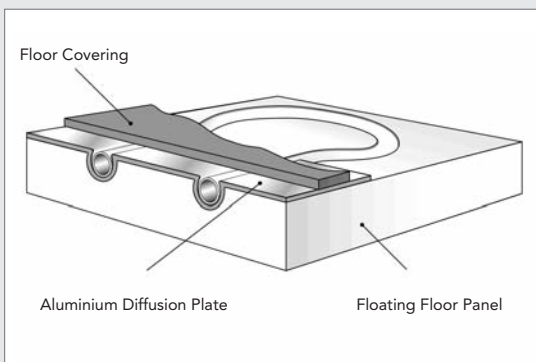
Flat Floor Plate



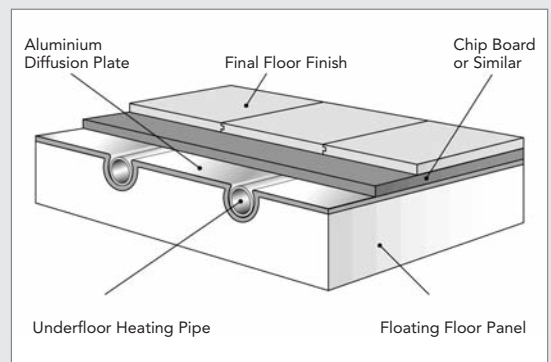
Floating Floor Panel

3.1 Floating Floor

Floating Floor
(without chip board layer)



Floating Floor
(with chip board layer)



3.1 Floating Floor

Performance

Compression Resistance

All materials are compressed under load. Insulation materials used in floors should be capable of accommodating the applied loads with the minimum of compression. They are highly resistant to compression and withstand both occasional and long term static loads. A factor of safety for design loads of 3 (5 for long term static loads) is applied to the compressive strength of the product as outlined in the product data table.

Floating Floor Product Data

| | | | | |
|---------------|--------------------------------------|------------|------------|------------|
| | Thickness (mm) | 30 | 40 | 50 |
| | Length (mm) | 2400 | 2400 | 2400 |
| | Width (mm) | 1200 | 1200 | 1200 |
| | Nominal Density (Kg/m ²) | 30 | 30 | 30 |
| | Thermal Conductivity (W/mK) | 0.029 | 0.029 | 0.029 |
| | Minimum Compressive Strength (kPa) | 200 | 200 | 200 |
| Design Loads* | Long Term Static Load (kPa) | 40 | 40 | 40 |
| Design Loads* | Occasional Loading (kPa) | 66 | 66 | 66 |
| | Water Vapour Resistance (MNs/gm) | 480 | 480 | 480 |
| | Moisture Absorption (by vol.) | 0.3% | 0.3% | 0.3% |
| | Continuous Service Temp Limits °C | -50 to +75 | -50 to +75 | -50 to +75 |

*Design loads by calculated methods (BBA).

Materials

Our floating floor panel products are HCFC and CFC free, are 100% ozone friendly, and are manufactured in accordance with European Directive EC 3093/94 and EC Regulation 2037/2000.

Outputs

MYSON FLOORTEC underfloor floating floor systems have an effective output up to 70W/m².

4.0 General Specification: Plated Floor

The CIBSE Underfloor Heating Design and Installation Guide 2004, section 7.2.4 states: Thermal expansion of plastic pipes above ground is considerable, and 10mm per linear metre must be expected with water at 60°C. However expansion of pipes embedded in solid concrete is prevented and results in a microscopic bore reduction. **MYSON FLOORTEC** therefore recommend ample provision for pipe expansion is provided in all systems where the heating pipe is not buried in screed or concrete. This may be accommodated by regular changes of pipe direction.

Description

Suspended floor systems include joisted floors with conventional joists supported on end walls of sleeper walls, as well as solid floors with battens fixed to the floor. The underfloor heating system consists of aluminium diffusion plates fitted between the joists or battens. We can supply plates for 17mm pipework.

If the floor structure contains engineered joists, then a floating floor should be considered.

Installation Outline

For **MYSON FLOORTEC** underfloor heating to function effectively the heat from the underfloor heating pipework must be distributed as evenly as possible across the floor. In solid floor constructions the screed accomplishes this. With timber suspended floors an aluminium plate is used to conduct the heat from the pipework and distribute it across the floor. Aluminium is used for its excellent thermal conduction as well as its low weight.

With all plated systems, it is extremely important that the floor covering **MUST** be in direct contact with the diffuser plates to ensure efficient heat conduction and optimum heat output from the floor.

Plates are manufactured from aluminium sheet and are available in two sizes (see table). Grooves pressed into the plate are sized to accept 17mm pipework, holding it firmly in place without damage to the pipe or external oxygen diffusion barrier.

The floor void must be insulated with either loose fill insulation, such as vermiculite, or mineral wool insulation, such as Rockwool (both not supplied by **MYSON FLOORTEC**). It is essential that air movement in this void is reduced to a minimum otherwise excess heatloss will occur.

Following installation of the insulation material the aluminium diffusion plates are fitted in place and are secured either by nails or double-sided adhesive tape. An area of 300mm to 350mm at the end of each joist run is left clear of plates to allow for the pipe turns.

Gaps of 75mm to 150mm are also left between plates to allow for movement of the plate and pipework without risk of damage. This is necessary as plastic pipe has a high coefficient of thermal expansion and some movement of the pipework and plates can be expected.

Once the plates have been fitted, the underfloor heating pipework is installed into the grooves in the plates. The underfloor heating pipework must be wrapped with insulation whenever it passes through a joist notch. All joist notching should be in accordance with Building Regulations. As with all

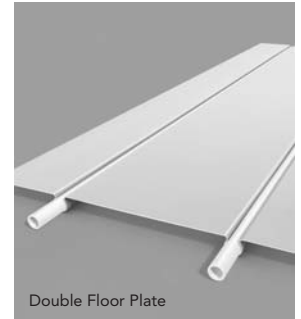
4.0 General Specification: Plated Floor (cont...)

other systems, **MYSON FLOORTEC** recommend areas of high density transitional pipe must be insulated. Finally, after pressure testing, the floor finish is laid.

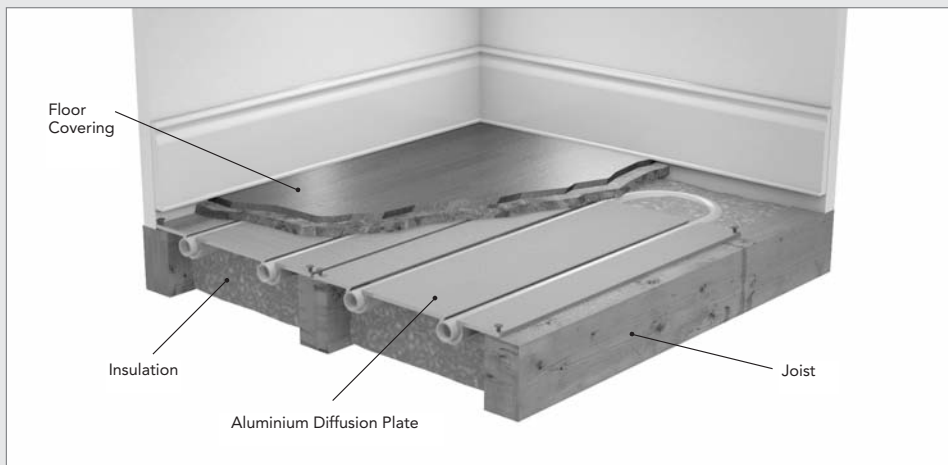
Aluminium Diffusion Plates for 17mm pipework

All 1000mm Long / 0.6mm Thick

| Plate Width (mm) | Joist Centres (mm) | Pipe Centres (mm) |
|------------------|--------------------|-------------------|
| 388 | 400 | 200 |
| 588 | 600 | 200 |



Plated Floor



4.1 Special Floor Structures

The plated underfloor heating system can be easily adapted to accommodate a number of special floor details including sprung floors, acoustic pads and cross battens.

Sprung Floor

With battens loose laid on to blocks supported on a solid base, the underfloor heating is fitted in the normal manner but using double sided tape to hold the plates in position. This avoids dislodging the battens when fixing the plates.

Acoustic Pads

To reduce sound transmission from the floor an acoustic pad may be included in the floor make up. This pad should be fitted to the top of the joist or batten with the diffusion plate fixed to the pad with double sided tape. Fixings must not penetrate the pad as this will lead to acoustic bridging. Please note that these pads cannot be supplied by **MYSON FLOORTEC**.

Cross Battens

If joist centres are not suitable for placing of the diffusion plate or cannot be notched for structural reasons, the floor can be cross battened with the battens set at 400mm centres. The underfloor heating can then be laid onto the cross battens. Insulation must, however, still be installed directly under the diffusion plates. Alternatively, a floating floor system may be installed over the floor.

Performance

Outputs

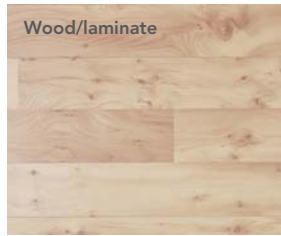
Outputs from plated underfloor heating systems are limited to 70W/m². Floor loadings are unaffected by the underfloor heating and will be dependent upon the floor construction.

5.0 Floor Finishes

When considering the output for a mean water temperature and pipe centre combination, the floor finish must also be taken into account. Floor finishes with greater thermal resistance reduce the output from the underfloor heating.

There are four basic floor finish types which should be considered: ceramic, which includes natural stone and manufactured stone materials such as flag stones; plastic or vinyl floor coverings; timber and timber products; and carpet.

Typical floor finishes and their corresponding resistance to heat transfer are detailed in the table opposite. Ceramic finishes have the least thermal resistance with carpets having the greatest. When selecting carpet and underlay combinations the combined thermal resistance should not exceed a value of approximately 0.15m²K/W (or a 1.5 tog rating).



Suspended and Floating Floor Systems

With floating and suspended floor systems it is possible to vary the mean water temperature but the pipe spacing will be fixed by the system type. All suspended and floating floor systems have 200mm pipe centres. Due to the system characteristics the maximum output from both suspended and floating floor systems is 70W/m².

Ceramic Floor Finishes

Ceramic flooring products, such as tiles have a low thermal resistance, typically 0.02m²K/W, and will function very well with MYSON FLOORTEC underfloor heating systems. This

Typical Output

| Floor Finish | Typical Thermal Resistance m ² K/W | Typical Tog Rating | Output Watts/m ² |
|-------------------------|---|--------------------|-----------------------------|
| Screed / Ceramic Tile | 0.020 | 0.20 | 112 |
| Vinyl | 0.075 | 0.75 | 87 |
| Carpet - Standard | 0.10 | 1.00 | 73 |
| Timber / Carpet - Thick | 0.15 | 1.50 | 62 |

Note: Thermal outputs above are calculated in accordance with BS EN 1264. Should a floor heat output exceed the maximum surface temperature of 29°C for occupied zones, it is represented in red.

low thermal resistance is the reason for this type of floor finish feeling cold to the touch (without the benefit of underfloor heating).

Temperature constraints do not apply to ceramic type floor finishes and these can be run at the maximum design floor surface temperatures, 29°C in general areas and 35°C in bathroom, perimeter and wet areas.

Differential thermal expansion between the ceramic floor finish and the screed must be taken into account during the floor design. This differential expansion limits the areas that can be laid without the inclusion of a thermal expansion joint. Underfloor heating standard BS EN 1264-4:2009 limits this area to 40m² with a maximum length of 8m, after which the area should be split using a flexible expansion material. Specific advice must be sought from the tile supplier.

Another important consideration is the propagation of cracks within the screed and the potential for the cracks to extend into the floor finish. All screeds will crack and it is the limiting of the propagation of these cracks that must be considered. Two possible solutions are available:

- The inclusion of a reinforcing mesh approximately 25mm from the upper surface of the screed.
- The use of a fibre-bonded screed to help limit crack propagation. In this type of screed small fibres are added to the screed mix, which provide bridging across any developing crack.

Performance

Outputs

Outputs are based on a flow water temperature of 50°C, a return water temperature of 40°C, pipe centres of 200mm and a room temperature of 20°C.

Plastic or Single Floor Coverings

In general vinyl and plastic type floor finishes have a low thermal resistance, 0.07m²K/W and will function well with MYSON FLOORTEC underfloor heating. There are a small number of specialist plastic floor finishes that can be classified as plastic but these will have higher thermal resistance. Some sports hall floor coverings are made from a 'foamed' plastic and the thermal resistance of such coverings should be checked before their use with MYSON FLOORTEC underfloor heating. A resistance of up to 0.15m²K/W to 0.20m²K/W will function satisfactorily with MYSON FLOORTEC underfloor heating but above this value the design of the system must be checked.

5.0 Floor Finishes (cont...)

Vinyl and plastic floor coverings are flexible in nature and therefore differential expansion will not cause any problems to the stability of the floor structure. The floor covering manufacturer must be contacted for specific advice as most vinyl and plastic floors must not be subjected to temperatures in excess of 27°C.

A vinyl covering will seal the surface of the screed and therefore the curing and drying of the screed must be carried out before the floor covering is laid. If this is not done, damage to the screed or the floor covering could result with moisture being trapped between the screed and the floor covering. This may result in the floor covering failing. The screed must be allowed to cure for a minimum of 21 days and then heated by the **MYSON FLOORTEC** underfloor heating until the moisture has been removed. Starting with the flow temperature set to approximately 30°C and then elevated by 2°C to 3°C per day until the operating temperature is reached and then held at this temperature for 5 days. After this period the heating is turned off and the floor covering can be laid. The requirement for preconditioning of screeds is detailed in EN 1264:Pt4 and must be followed.

A limit thermostat can be fitted to the floor to ensure its surface does not exceed any maximum temperature specified by the floor covering manufacturer.

Timber and Timber Products

Timber products present their own problems with regards to use with **MYSON FLOORTEC** underfloor heating which relate to the moisture content of the timber and screed. Thermal resistances of timber products usually fall within the acceptable range for use with **MYSON FLOORTEC** underfloor heating (0.15m²K/W, 1.5 tog).

Timber is a natural material and in its raw state will have high moisture contents. If this were laid onto a **MYSON FLOORTEC** underfloor heating system without due consideration the timber would shrink when heated, causing excessive gaps between

'planks' as well as the possibility of warping. To avoid these problems the timber product moisture content must be no greater than 10% with kiln dried timber being most widely used. Where older 'well seasoned' timber is to be used this should be stacked in the heated room for a minimum of two weeks with the heating running at its operating temperature, which will ensure that the moisture within the timber is removed.

As the floor is heated the residual moisture in the timber will be removed and the timber will shrink. This shrinkage is minimal as long as the timber used has a low moisture content and the maximum surface temperature is limited to 27°C.

When laid onto a screed it is essential that the moisture within the screed be removed before the timber is laid otherwise the moisture will penetrate the timber resulting in warping. The same process is used to dry the screed allowing it to fully cure for a minimum of 21 days. The **MYSON FLOORTEC** underfloor heating should be set at a flow temperature of 30°C and elevate the flow temperature by 3°C per day until the operating temperature is reached. Operating temperatures must be held for a minimum of 5 days before the **MYSON FLOORTEC** underfloor heating is turned off and the flooring is laid.

The requirement for preconditioning of screeds is detailed in EN 1264:Pt4 and must be followed.

Carpets

Although care in selection of carpets and their associated underlay must be taken to avoid excessive thermal resistance they present few problems to **MYSON FLOORTEC** underfloor heating. The thermal resistance of the carpet and underlay combination should not exceed 0.15m²K/W (1.5 tog).

Carpet is flexible and therefore does not present any differential expansion problems, it is also permeable to moisture transfer and therefore will allow moisture to be expelled from the screed during the drying process.

6.0 Control Systems

Control Systems

Underfloor heating requires water flow temperatures of approximately 35°C to 55°C dependent upon the design, heat loading and type of the system used. The system should be balanced to achieve an approximate temperature differential of between 8°C and 10°C measured between the flow and return pipes.

Constant Temperature Systems

The **MYSON FLOORTEC** underfloor heating system mixes return water from the underfloor heating with flow water from the primary pipework. The mixed temperature is controlled at a constant temperature and the proportions of flow and return water are varied accordingly. Mixing is undertaken in a three port mixing valve, incorporating a thermo-electrical valve controller.

Programming

All **MYSON FLOORTEC** underfloor heating systems are supplied with the comprehensive timing options. This ranges

from the traditional MEP1C programmer to the sophisticated MPRT or **MYSON TOUCH** with touch screen technology or wifi.

Smart Start Technology

This varies the start up times of the underfloor heating system on a room by room basis to ensure that each room in the building achieves the desired temperature by the required time.

The Smart Start system is continually learning the temperature rise requirement of each room, delaying the start up of the system, therefore saving energy during milder weather. Smart Start technology is available via our programmable room thermostats, such as the **MYSON FLOORTEC** MPRT, MPRT RF and **MYSON TOUCH** with touch screen technology or wifi.

Night Set Back Temperatures

Thick screed floor heating systems (>65mm) should have facilities for automatic set back of room temperature to a lower level at night or during unoccupied periods. Depending on the specific requirements of the User, it may be preferable to operate the system with a night or unoccupied set back

6.0 Control Systems (cont...)

temperature. This allows each room to maintain an individually programmed minimum background level of heat during an 'OFF' period. This facility is available with the **MYSON FLOORTEC** MPRT, MPRT RF and **MYSON TOUCH** programmable room thermostats.

Set back has two distinct advantages when used with underfloor heating. It maintains the building fabric at a temperature, avoiding large swings in temperature and freezing, and it reduces the heat up period when the system is started after an off period.

Set back temperatures will normally be approximately 15°C dependent upon the building usage and occupants requirements.

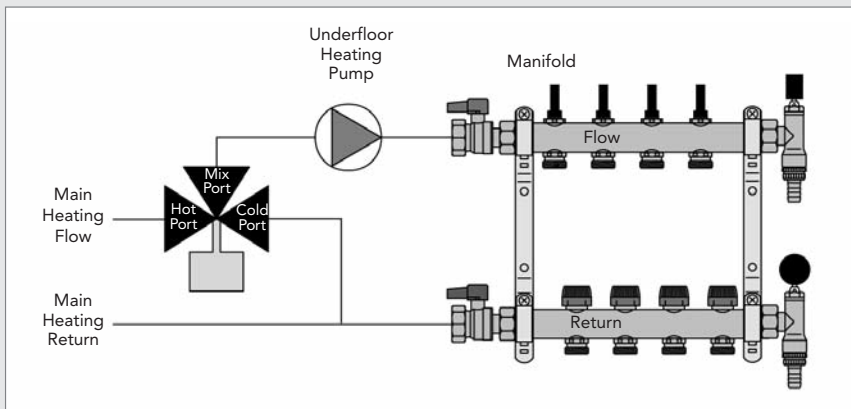
Individual Room Control

Individual rooms fed from the same manifold are controlled by means of room thermostats and **MYSON FLOORTEC**

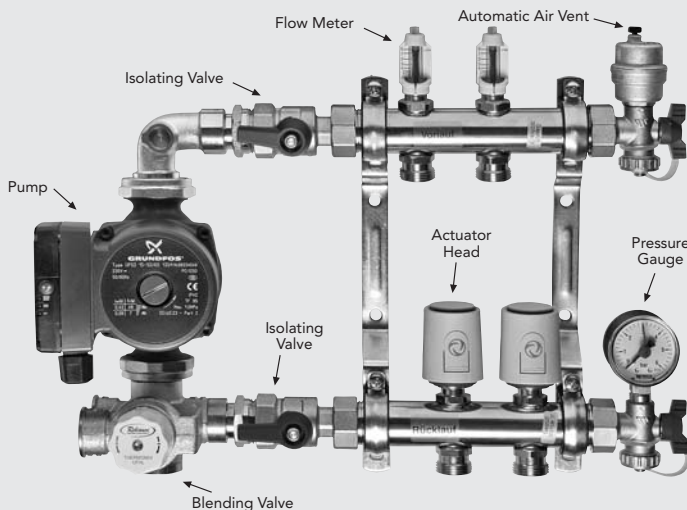
thermoelectric actuators. **MYSON FLOORTEC** thermoelectric actuators can be supplied in 230 volt and 24 volt options and are designed for simple snap fitting to the regulating valves on the return header of the manifold. They operate by means of wax filled bellows with a heating element. When there is a call for heat the heating element is energised, heating the wax, which expands, causing the valve to open.

- **Wired** - The room thermostats are normally wired through a **MYSON FLOORTEC** wiring centre. This has the advantage of providing a boiler and pump demand as well as connections for time channel input.
- **Wireless** - If it is impractical to install hard wired thermostats, **MYSON FLOORTEC** offer a range of wireless thermostats that use a radio frequency (RF) signal to communicate between the room thermostat and the wiring centre. Basic analogue (wireless) or digital programmable (MPRT RF) units are available.

6.1 Mixed Circuit Flow Diagram



6.2 Manifold and Manifold Control Centre



6.3 Low Voltage Controls

Wiring Centre

- 24V Supply
- 24V to room stats and actuators
- Can control up to 10 heating thermostats
- Can control up to 20 actuators.



MRTE - Electronic Room Thermostat

- Upmarket electronic thermostat
- Attractive slimline design
- Clear, accurate LCD display
- Displays actual temperature
- No neutral, two wire connection
- One thermostat can control several loops
- 24V connection to hard wired wiring centre.



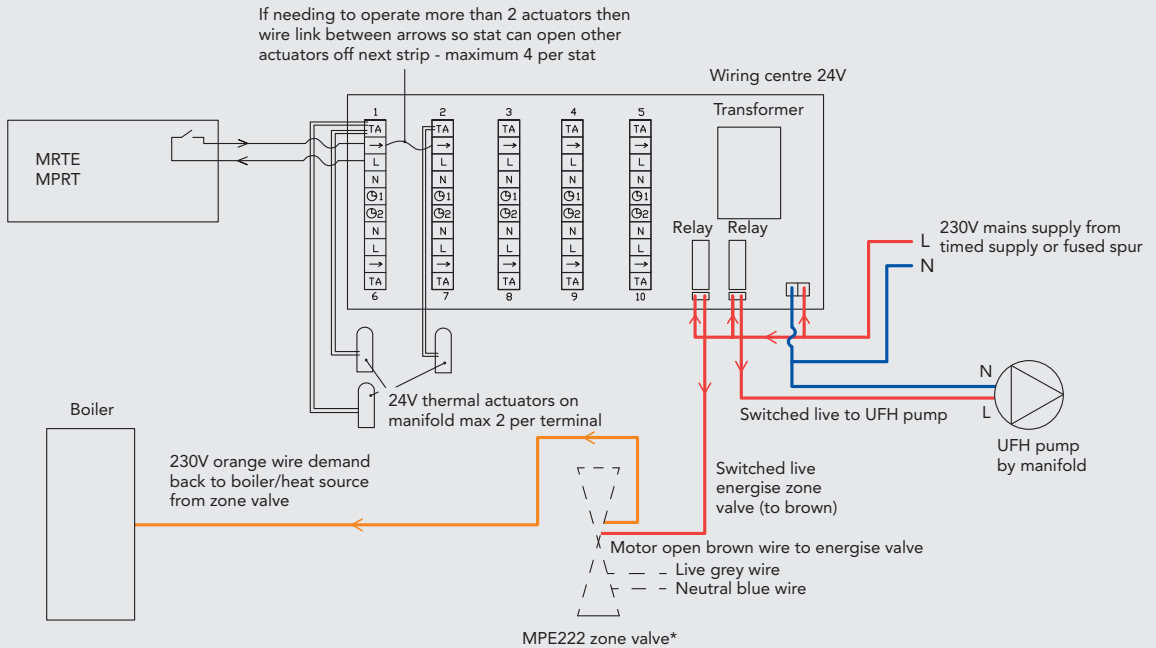
MPRT and MPRT RF - Programmable Room Thermostat

- Available with 24V hard wired or wireless options
- Easy to use slimline multifunctional thermostat
- 7 day programming
- 3 temperature settings - comfort, economy (set back) and frost
- 4 programmes (3 preset, 1 adjustable) with manual override
- Clear, accurate LCD display
- Vacation delay setting from 1 hour - 50 days
- Installer optional adjustments (differential, calibration, heat, frost setting, high and low limit adjustment settings, password protection)
- No neutral, two wire connection
- MPRT is suitable to be classified as a "Delayed Start" thermostat as defined in SAP 2005
- One thermostat can control several loops
- Load Compensation technology (saves fuel by delaying heating 'start up' on warm days).
- Also available in Chrome or Black.



6.3 Low Voltage Controls (cont...)

Hard wired diagram showing one MPRT stat operating 3 actuators (3 circuits in room) and switching to zone valve and UFH pump



*Optional zone valve.
The boiler relay on the wiring centre can be used to energise the heat generator directly if required.

6.4 230V Voltage Controls

MYSON TOUCH Programmable Touch Screen Room Thermostat

- Smart Start technology
- Clear, easy to use touch screen display
- 24hr programming, 5/2 day programming or 7 day programming
- Up to 4 time and temperature settings per day
- Remote sensor model available
- 230V Supply
- MYSON TOUCH is suitable to be classified as a "Delayed Start" thermostat as defined in SAP 2005
- Load Compensation technology (saves fuel by delaying heating 'start up' on warm days).



6.5 Wireless Controls

Thermostat

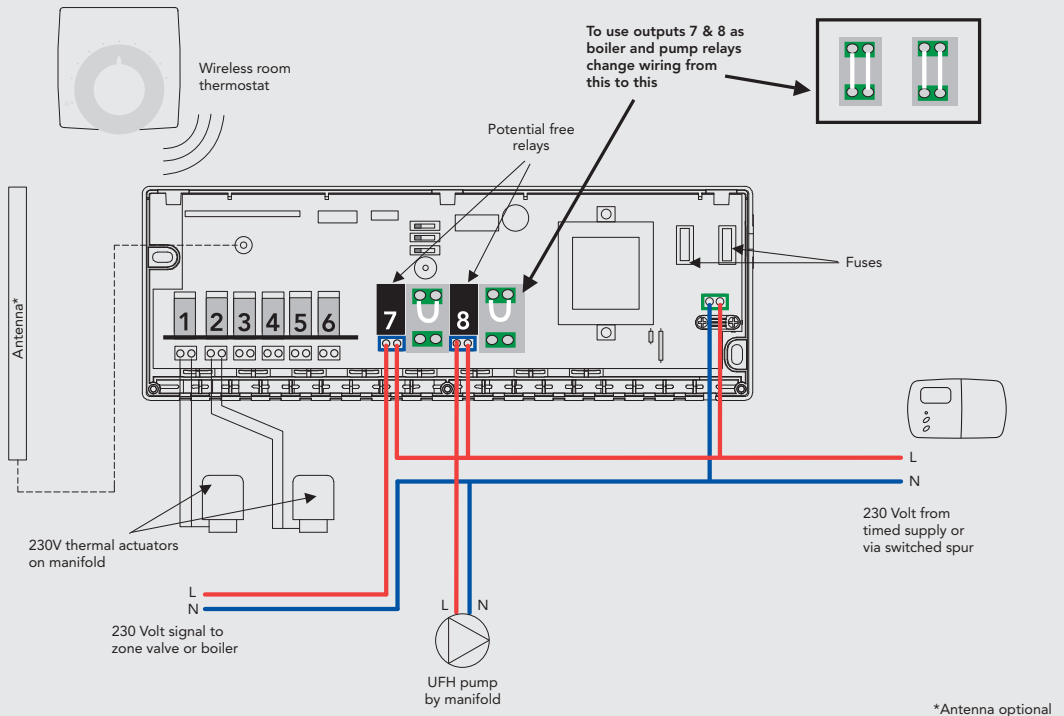
- No external wiring connections
- 30 metre spherical transmission range
- Ambient temperature 0 - 50°C
- One thermostat can control several loops
- Temperature scale 10-30°C +/- 2K
- Battery service life - minimum 5 years.

Base Unit

- 230V supply
- Can control up to 12 actuators and 6 room thermostats
- Units can be joined for larger applications.



Wireless Diagram



6.6 Programmer

MEP1C - Programmer

- Can be set for 24hr, 5/2 day or 7 day operation
- Easy to read, backlit screen
- Pre-set clock
- Automatic summer/winter time change
- Memory saver - programmer and clock will not require resetting in the event of power loss
- Advanced and up to 3 hour extend features
- Time switches are ideal for combination boilers and control of additional zones etc (volt free contacts).



7.0 Single Room Packs

MYSON FLOORTEC offer a wide range of underfloor heating single room packs. These systems complement **MYSON FLOORTEC's** already established underfloor range.

The underfloor heating single room packs are easy to install using a variety of our fixing methods and include a unique two port mini-manifold. There are no design requirements and the packs are competitively priced.

The single room packs are for water-based heating and are available in a range of sizes to suit various room layouts and are supplied with 17/2mm pipework*.

Plan the installation carefully, and consider the following:

- The underfloor heating must be connected to a traditional two pipe heating system
- Carefully consider the manifold position so it is both near the area(s) to be heated, and also easily connected to the heating pipework
- We recommend that the underfloor heating be connected as a separate timed heating zone
- This may require an additional timer and zone valve, which are not supplied. Should it be connected into an existing heating zone, consideration must be given to the response time of the heating system
- If you are unsure of any of the above points, contact your heating engineer.

*Other pipe options available upon request.

The single room packs consist of a **MYSON FLOORTEC** compact underfloor heating control unit that takes heat from a normal heating system and distributes it into a screeded floor, via manifolds and 17/2 pipe. The installation instructions for the **MYSON FLOORTEC** compact underfloor heating control unit are supplied in its box, and are not covered in detail here.



| Flow Temperature °C | Floor Covering | Outputs Watts/sq.m |
|---------------------|----------------|--------------------|
| 40 | ceramic | 71 |
| | carpet / wood | 46 |
| | thick carpet | 39 |
| 45 | ceramic | 94 |
| | carpet / wood | 61 |
| | thick carpet | 52 |
| 50 | ceramic | 117 |
| | carpet / wood | 76 |
| | thick carpet | 65 |
| 55 | ceramic | 140 |
| | carpet / wood | 91 |
| | thick carpet | 78 |

Important Notes

Care must be taken when using underfloor heating with floor coverings, which may be affected by heat, such as wood or vinyl products. Consult the flooring manufacturer for guidance.

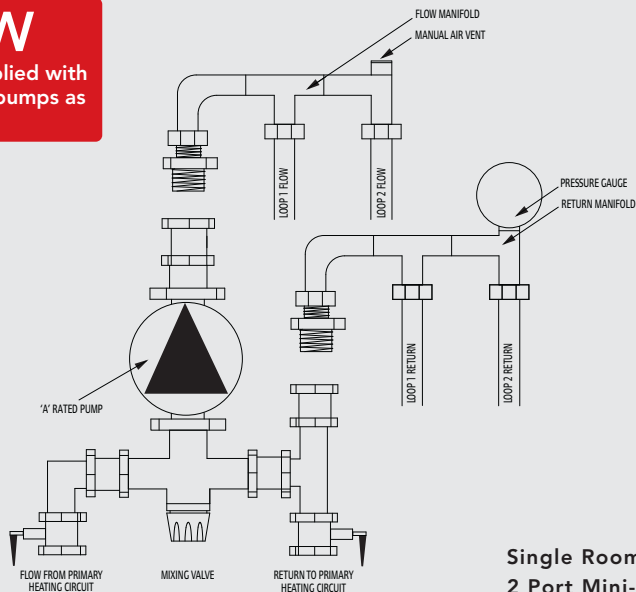
The underfloor heating installer must ensure the heat requirement of the area to be heated is within the potential outputs detailed above. Supplementary heating may be required if the heat requirement is in excess of the above outputs, if the system is to be operated intermittently, or a swift response time is required. **MYSON FLOORTEC** is not responsible for providing any form of temperature guarantee.

These figures assume 200mm pipe spacings, a 75mm deep screed, 8°C difference between the 17/2 underfloor heating flow and return and an air temperature of 20°C. Calculated in accordance with BS EN 1264-5:2008.

7.0 Single Room Packs (cont...)

NEW

Now supplied with 'A' rated pumps as standard



Single Room Pack with 2 Port Mini-Manifold

Ask about our NEW Tackernail fixing system



U Clips

FOR SCREEDED FLOORS

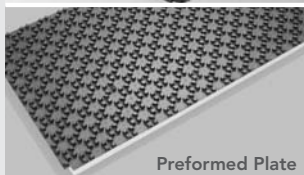
PRODUCT CODE

- U CLIPS 20 A
- U CLIPS 40 A



Cliprail

- CLIPRAIL 12 A
- CLIPRAIL 15 A
- CLIPRAIL 20 A
- CLIPRAIL 30 A
- CLIPRAIL 40 A



Preformed Plate

- PREFORMED PLATE 12 A
- PREFORMED PLATE 15 A
- PREFORMED PLATE 20 A
- PREFORMED PLATE 25 A
- PREFORMED PLATE 30 A
- PREFORMED PLATE 40 A

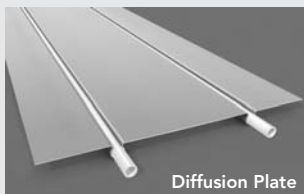


Naked Preformed Plate

- NAKED PREFORMED PLATE 12 A
- NAKED PREFORMED PLATE 15 A
- NAKED PREFORMED PLATE 20 A
- NAKED PREFORMED PLATE 25 A
- NAKED PREFORMED PLATE 30 A
- NAKED PREFORMED PLATE 40 A

FOR JOISTED FLOORS

PRODUCT CODE



Diffusion Plate

- PLATED 12 A
- PLATED 15 A
- PLATED 20 A
- PLATED 30 A
- PLATED 40 A



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