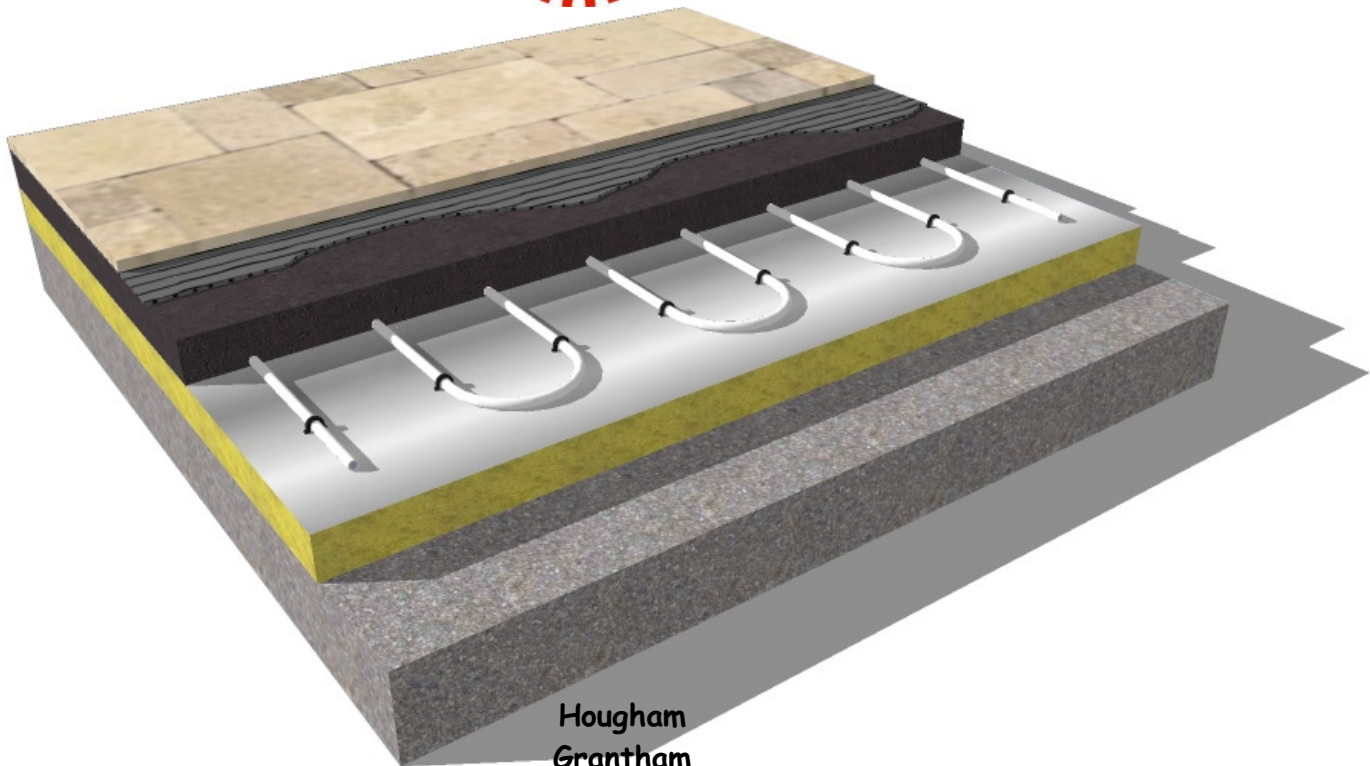


# **Radiant Heating Solutions**

## Warm Water Underfloor Heating

### Installation And Operating Instructions



Hougham  
Grantham  
Lincolnshire  
NG32 2HZ  
Phone 01400 250572  
Fax 01400 251264  
Email [info@underfloor.biz](mailto:info@underfloor.biz)

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## INTRODUCTION

The following pages are a guide to all that's involved with the installation of our Warm Water Underfloor Heating System. Starting at the very beginning with all the necessary preparation work from the floor slab up to the filling of the system. You should read these instructions and take notice of the pictures before starting your installation.

### Floor Insulation

#### Solid Floors

By this we mean either a Block and Beam configuration or a standard concrete base on to which a screeded finish would be laid.

#### DPM

In accordance with normal building regulations, a damp proof membrane should be installed below the slab. Alternatively a liquid applied waterproof material can be applied to the top surface of the slab. The DPM should provide continuity with DPCs' installed within the surrounding walls.

On Block and Beam floors the DPM should be laid directly below the insulation layer.

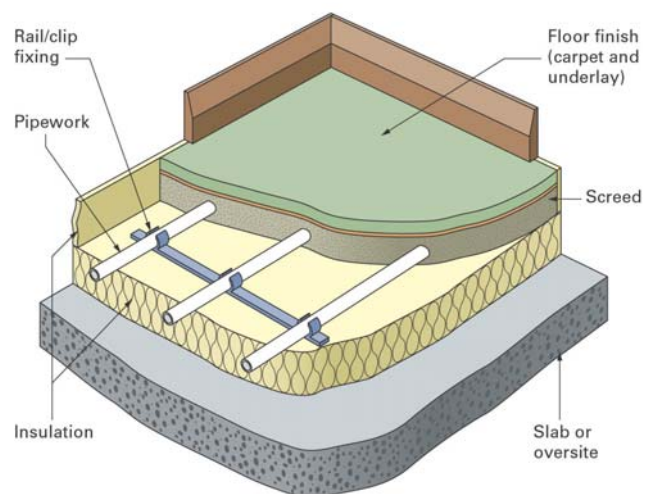
#### Slab Preparation

The surface of the slab should be smooth and free of projections; a rough tamped slab should be levelled using a thin layer of sand blinding to ensure that insulation boards are continuously supported. The interface between slab and wall should also be free of debris to ensure a good right-angled surface for both floor insulation and wall up stand.

### Laying The Insulation Board on Ground Floors

#### 1 Solid Floors

Rolls of border insulation may have been provided for the wall up stand insulation. Alternatively, 15mm polyurethane (PU) insulation board can be used for this purpose. If using the 15mm PU then it is cut into 150mm wide strips. Either material must be fitted against **all masonry walls both internal and external before the floor**



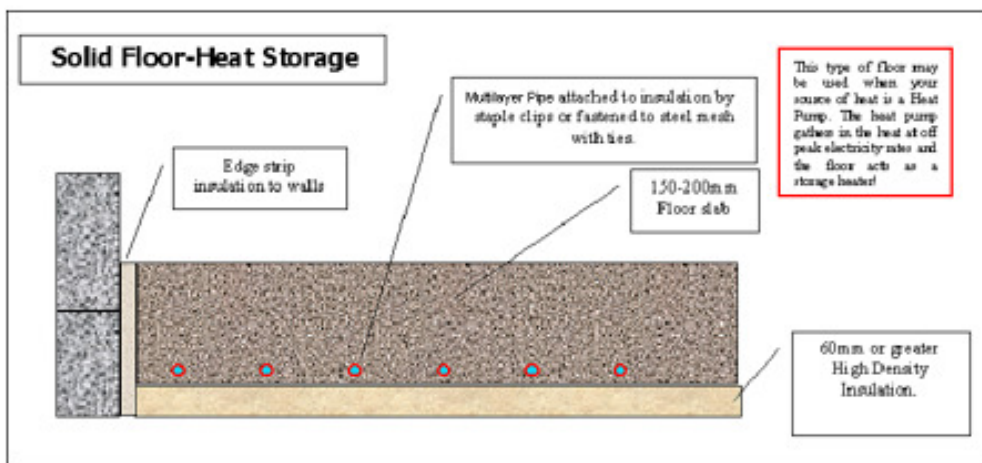
**insulation is laid.** This border insulation prevents heat migration from the floor screed into the surrounding walls.

It is not necessary to use border insulation against timber constructed walls or where other insulation already exists.

50 - 75mm Polyurethane (PU) boards are then laid directly onto the prepared slab, ensuring butt tight joints. These boards are normally 2.4M x 1.2M in size and all have a foil faced finish to both sides. The use of a straight edge and a serrated type (bread) knife are ideal tools to cut the boards where necessary. Once the insulation boards have been laid, **all joints, including the vertical edge joints should be taped over with 50mm wide tape.** This is essential when using pumped liquid screeds. The reason for this is to prevent any screed material 'bridging' the insulation. On solid intermediate floors (first floor) that have heating below, the insulation need only be 25mm thick.

### Note

If your underfloor system is to be run from a ground source heat pump (geothermal device) then the heat storage floor method can be used. This greater depth of floor slab will take longer to initially heat up but will provide a higher thermal mass.



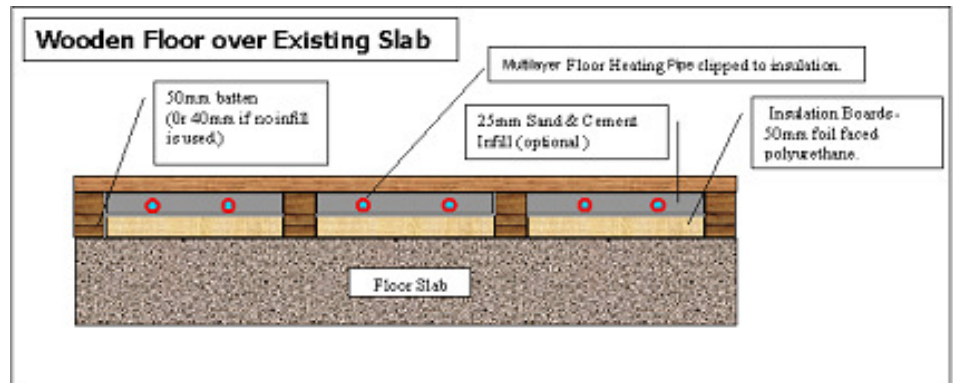
Please be careful when using Polystyrene (Jablite or equivalent) for the following reasons.

1. The insulation value is much lower than for PU
2. Pipe fixing clips do not grip well in a softer material
3. Site traffic damages the insulation
4. Screeds may require reinforcement

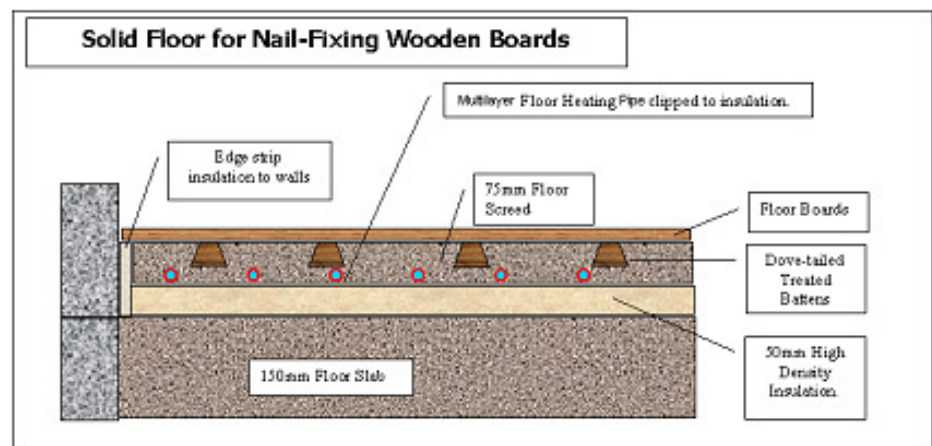
## 2 Non Suspended Timber Floors (over a screed or slab)

Where butt jointed 'oak' type floor boards are to be nailed or screwed down onto 75mm x 50mm battens, which in turn are directly fixed down onto concrete, then 40mm - 60mm PU

boards\* are cut up and fixed between the battens following the same principles as outlined above. When the pipe is laid the gap to the top of the battens would be filled with screed.



For an alternative design use this floor type, 'Solid floor for nail-fixing wooden boards'. This method allows for easier and quicker installation of the underfloor pipes as there are no battens to cross over.



### Laminate Floors

Where proprietary, laminated, 19mm tongue and grooved, polished wood floors are to be fitted; such a floor is best laid directly upon a quality screed. Follow the manufacturers instructions for this but do not exceed 3mm of underlay.

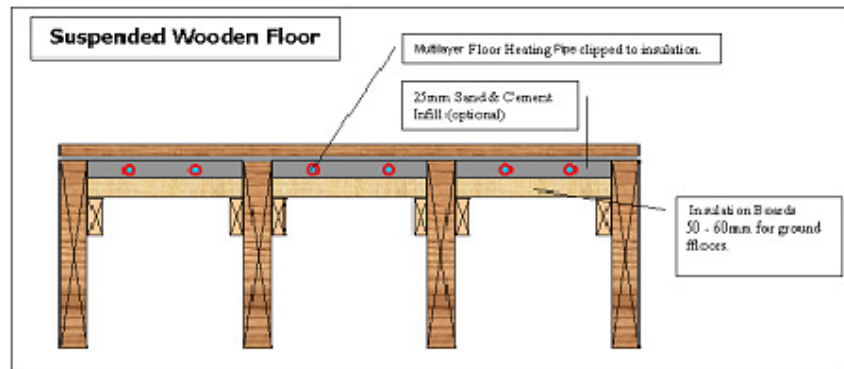
\* The thickness of this insulation may be higher if the building structure requires a higher level.

### 3 Suspended Timber Floors - (ground and first floors)

All suspended timber ground floors must be insulated to satisfy building regulations. Again the use of 50 - 60mm PU boards are recommended. These boards are fitted between each of the joists. Tile lathe is fixed down the sides of each joist, allowing 20 - 25mm space at the top of the boards. The PU boards are then cut to fit between the joists, ensuring a tight fit. Any brickwork / blockwork at the end of each bay should be insulated with an up stand of insulation. Any holes in the brickwork / blockwork **must** be sealed as floor heating bays between the joists **must be draught free**. The joists are notched at the end in an alternate opposite end pattern to allow the pipes to cross from one joist bay to the next.

#### Note

For traditional build houses we recommend that the space between the top of the insulation and the underside of the floor be filled with a weak cement mix. For Timber Frame houses, this mix can be omitted.



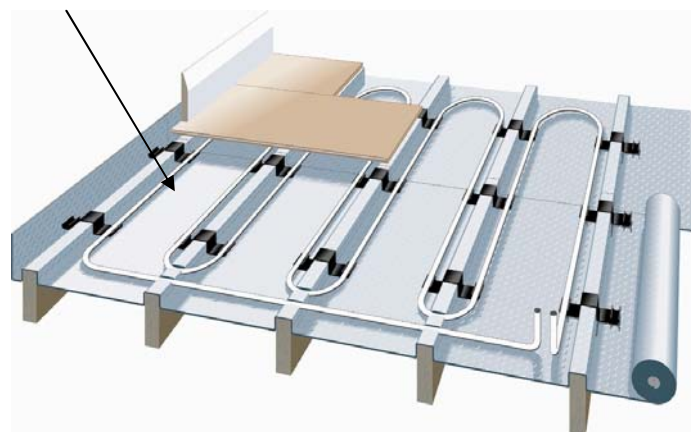
However, for improved output we recommend this weak cement mix. Where the joist centres are 600mm a support of 6mm plywood should be used below the insulation boards, adjust the tile lathe position accordingly.

On **first floors** and all other intermediate floors that have heating below, use the innovative **Unifoil** system for speed and performance.

Follow the instructions supplied with the **Unifoil** insulation.

In simple terms, the foil is rolled out across the joists. Allow the foil to fold down the sides of each joist to a depth of 50mm. The special joist clip is then fitted over the joist, holding the foil in place and creating a foil 'tray' across the joist span.

Note, this joist clip is designed for joist widths of 50mm. Joists that are wider than this will require the joist clip to be cut in half. Each half of the clip is then nailed in place. All clips should be spaced at 1 metre intervals along the joist. At the joist ends the clips should be



positioned 300mm in from the wall. This will allow the pipe to be curved round yet still give support to the bend.

Remember

Check to see where each joist is to be notched to allow the pipe to pass from one joist bay to the next. These notches must be done before the foil is fitted.

The Unifoil system is based on the joist centres being 400mm. Each bay would therefore have two runs of pipe in it. In some instances the joist spacing may be 600mm. If this is the case then there will be three runs of pipe in the bay. As the special joist clip is designed for joist spacing of 400mm, an additional pipe support will be required for the central (third) pipe in the bay. The most practical way to achieve this is to fix a batten across the joist bay below the foil. This batten will then allow you to hold the third pipe in place with a simple nail clip.

The growing trend for using timber 'I' beams has created a problem for the installation of floor heating pipes. This is because these beams cannot be notched in the same way as a traditional beam or joist can.

There are two ways to install underfloor when using 'I' beams. The first is to 'thread' the pipes through the pre-cut holes in the web of the beam. This method is very labour intensive and time consuming.

The second way is to 'cross batten' the beams and then lay the pipe over the top.



This will add height to the floor structure and this must be calculated into the design.

## Timber Frame Houses

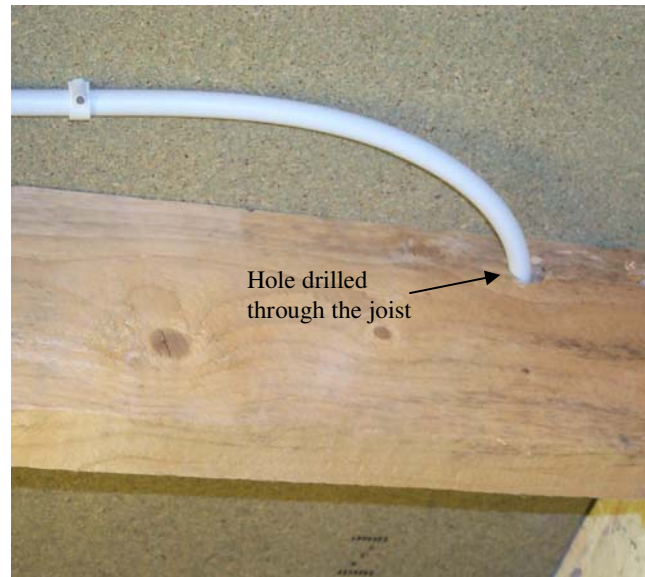
The construction of a timber frame house requires the first floor decking to be fixed in place as the structure is erected.

This creates the situation where the floor heating pipes have to be installed from below.

If the timber frame company have had sufficient notice that floor heating is to be used then they can prepare the pipe access holes in the joists.

However, If this is not the case then it will be necessary to drill these holes. Before doing this, check to see where the pipes pass from one joist bay to the next. Mark these joists and then check the timber frame specification to ensure that any drilled hole complies with the timber frame companies requirements. Once you are certain that you can drill holes in the required places you can begin.

Always drill the largest hole permitted to give the pipe as much room as possible. This will make installing a little easier. Take great care to ensure that the pipe is carefully curved (bent) through the drilled holes. It is very easy to kink the pipe during this part of the installation so take extra care.



## Fixing the pipe



Use plastic nail clips to hold the pipe up against the underside of the floor deck. The pipe should be fitted into the furthest bay from the manifold first. The pipe is then pulled through the joists and down each bay taking care not to damage or kink it. Once a joist bay has been completed, the pipe fixing clips are positioned over the pipe at 1 metre intervals. The bends at each end of the joist bay require at least two clips. Continue in this way until the coil of pipe has been completed.

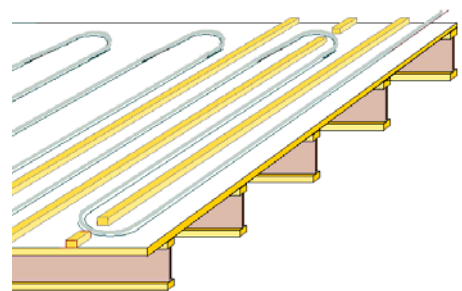
## Fixing the insulation



Once all the pipe is in place the foil insulation can be fitted. The foil needs to be cut into manageable strips and fitted across the joists. Use a staple gun for this and make sure that there is sufficient foil to do this. The same rules apply when fitting this foil in this way. ie, make sure that each section overlaps the previous one by 100mm. Also make sure that at the ends of the joist bay that the foil is fitted (stapled) up to the underside of the deck. This avoids any free air movement into the heated space between foil and deck.

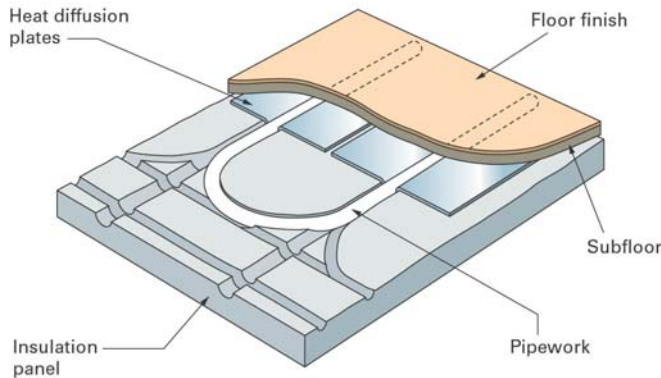
An alternative way to fit the underfloor heating pipes is to fit cross battens over the floor and create a new deck above that. Although this method increases the height of the floor structure, it does make the installation much quicker and simpler.

For this method the foil is simply rolled out over the original decking (like a carpet) and tacked in place with a staple gun. The pipe is then laid over the foil and held in place with a plastic nail clip. Once all the pipe is fitted the battens (20mm x 25mm) can be fixed down between the pipes.



## Floating Timber Floor

For a conventional chip board type of floating floor the use of profiled insulation boards both support the floor and contain the pipe. For this purpose we use the Unipipe Lightweight System (LT25) complete with heat diffusion plates.



This system has a total depth of 25mm of high density Polystyrene. For ground floor applications these boards should be laid upon a minimum of 35mm polyurethane or 50mm Polystyrene. Insulation is laid as per the installation for solid floors above. For first floor applications where the LT25 boards are to be laid upon a flat deck of either plywood across the joists, or

directly onto a block and beam floor, further insulation could be omitted if the space below is also heated.

## SOLID / SCREEDED FLOORS.

### FIRST FIXING OF SOME ESSENTIAL COPPER PIPEWORK

Where possible avoid running any copper pipework below the insulation of underfloor systems.

However there are some necessary exceptions. Copper pipe work to gas appliances, and often the 22mm copper safety discharge pipe from a mains pressure hot water cylinder are such examples. Both should be tested as to soundness, and wrapped in a protective covering such as Denso tape.

**Useful tips.** Lay the pipe in straight lines, as this makes it easier to cut out the groove in the underside of the insulation. After cutting the overall size of the insulation board, press it down upon the pipe beneath to make an impression in the board. On both sides of the impression, cut through the insulation, but not right through the far skin, fold it back on itself then cut away the excess to form a channel to the required depth. Refit it over the pipes.

**Note** Any joints in this pipework *must* be accessible as per the building regulations. Only continuous lengths of pipe can avoid this.

## SOLID / SCREEDED FLOORS.

**FIRST FIXING OF PLASTIC PIPE INVOLVING:** - System feeder pipework - Domestic Services - Radiator or Towel Rail Circuits - Domestic Hot Water Secondary circulation return pipes.

Before the actual underfloor pipework is laid, it is often necessary to lay other plastic pipework within the insulation. This involves establishing which of the different circuits as outlined above have to be installed, and the best routes for such to run. Where such pipework is minimal, it is better to cut out the grooves with a knife, however for larger jobs try to use an electric router (fig 1).

**Useful tips.** Rout out the shortest route, making holes through walls if necessary. Always start with the larger diameter pipes first. Undersize the routing bit as this ensures a tight fit for the pipe. It is much easier to clean out the groove first, then fit the pipe, and then 'back-fill' with debris and tape over.

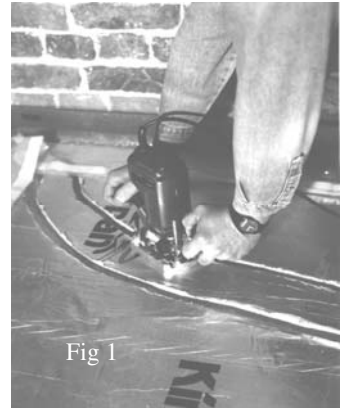
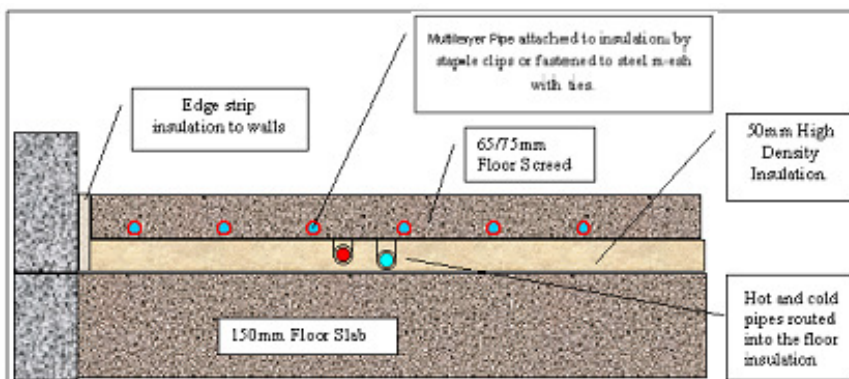


Fig 1



Pipework carrying other than mixed down water for the underfloor system should be insulated from the screed by routing the grooves to a good depth and covering over with a thin layer of insulation. The debris from the router is ideal for this. These 'insulated' pipes should then be taped over (Fig 2).

### Tip

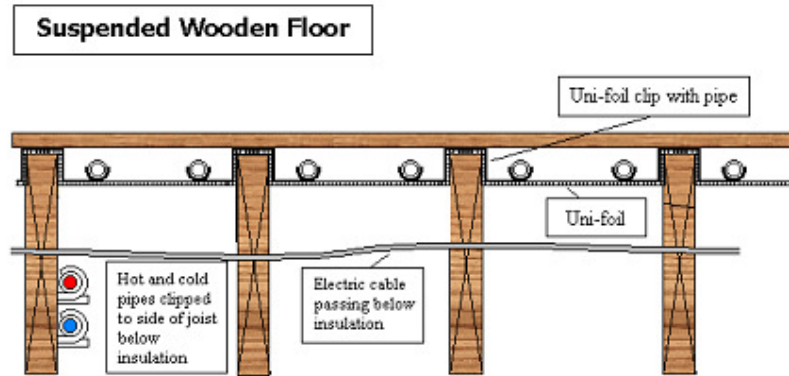
Make sure that cold water pipes are laid at a much deeper depth than hot pipes.

## SUSPENDED TIMBER FLOORS.

### FIRST FIXING OF PLASTIC PIPE INVOLVING:-

System feeder pipework, Domestic Services, Radiator or Towel Rail Circuits.  
DHW Secondary circulation return pipes.

Where an underfloor system is to be fitted in a suspended timber floor, all other pipework (as well as electric cables) must be fitted within the joists below the insulation.



Note. It is virtually

impossible to use copper pipe under these circumstances, however if a mains pressure cylinder is to be fitted, then the 22mm copper (or 25mm Multi-layered pipe) safety discharge pipe must safely exit the building as per the building regulations. So any plastic pipework, that has to come up through the floor, has to pass directly through the insulation, and be fitted before the underfloor pipe and the insulation are in position. It is important that all trades people involved in the building work understand what is happening.

**Note;** Domestic hot and cold pipes should always be insulated.

## MANIFOLDS

Once all the insulation is in place the next job is to fix the manifold/s (Fig 3) to the wall. The position of the manifolds should be central to the area. The manifold is supplied in a fully assembled form\*.

The height of the manifold should be sufficient to allow the floor-heating coils and supply feeder pipes to bend up from the floor to the vertical.

A good guide for the manifold height would be 400mm from the insulation to the bottom manifold fittings. All floor-heating coils that are laid normally use 16mm pipe.

A typical 5 Port Manifold shown with a BCP140 directly connected.

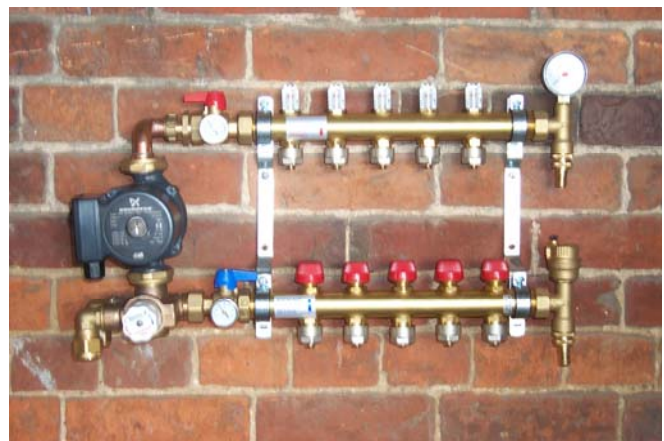


Fig 3

The positions of these manifolds have been carefully considered to allow for even distribution to all heated areas. The floor-heating coil lengths should be worked out to give the desired pipe space. For very well insulated buildings the pipe spacing can be 250mm. For standard levels of insulation the pipe spacing should be 200mm. Maximum pipe length to be 120 metre (85 metre for heat pump systems).

When the coils are connected to the manifold ports, it is essential that each port be clearly labelled up as to the area that it serves and the pipe length that has been used. Please use the ufh test sheet provided at the back of this manual. Thought should be given as to future access of the manifolds. Ensure that any 'boxing in' of the manifold/s is removable for annual inspection.

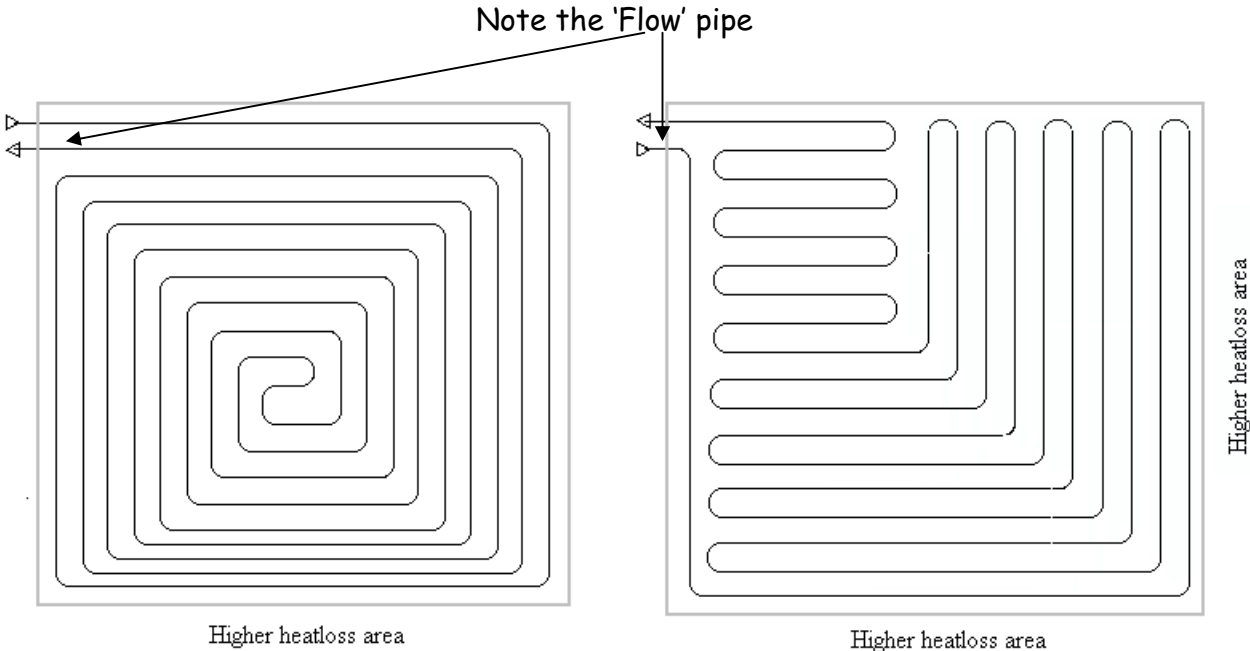
\*The Pump and Mixing Pack (e.g. BCP140) can only be close coupled to the manifold.

## **PIPE and Laying Styles**

The feeder pipes between boiler and manifold are to be in place before any floor heating coils are laid. This also applies to any of the domestic pipework such as Kitchen or Cloak room supplies (see above - first fixing of pipework for solid floors).

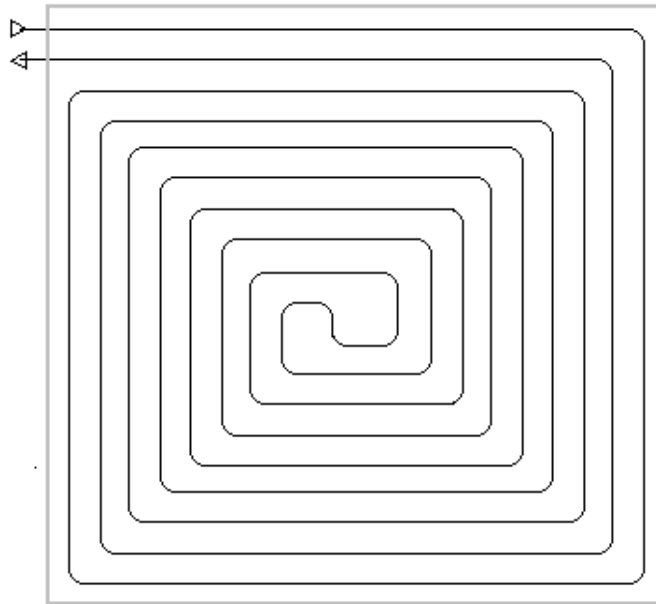
You can purchase a CAD design if required, email [info@viridity.co.uk](mailto:info@viridity.co.uk) for costs. The CAD would show coil lengths, order of laying, manifold position and pipe spacing. Some rooms or areas will require more than one coil. Each of the coils will have its length labelled and the order in which the coils are to be laid will be shown on the CAD layout. This is to avoid having to cross over any previously laid pipe. An allowance of additional pipe is incorporated in each coil for the supply between the room/area and the manifold. The CAD layout will show the route of these supply pipes. Once into the room/area to be heated, the pipe is laid according to the design style and pipe spacing. The design style will be either in a rectangular spiral (bifilar) or in a serpentine (meander). The pipe spacing will depend somewhat on the floor type but more to the structural design of the building.

In some rooms where there is a higher heatloss around the perimeter then a greater concentration of pipe should be used. This may result in some different laying styles and the direction of the 'flow' must be followed at all times.



For solid/beam & block floors the pipe coils are fixed in place on the insulation boards by either clamp track as shown here or by simple 'push in' staple clips. (Fig 3)



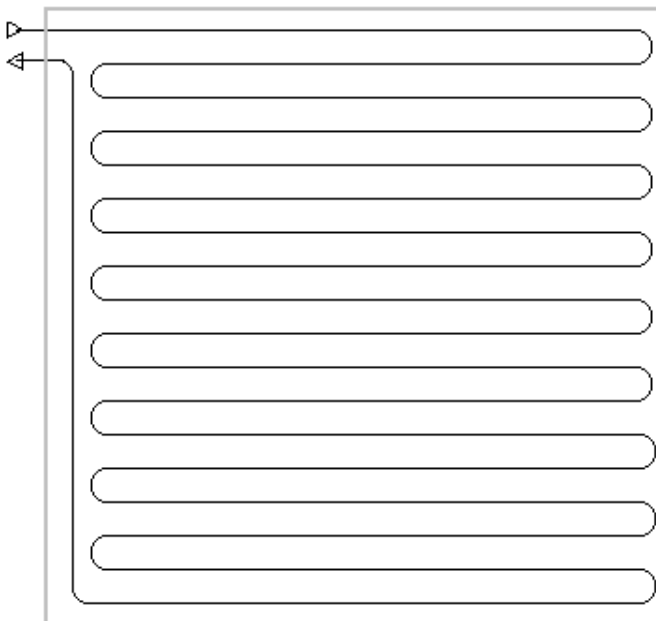


**BIFILAR INSTALLATION**

This snail-shaped structure is one of the common styles of single pipe UFH. The well balanced installation of flow and return lines results in a very even heat distribution.

Note that the flow pipe is laid around the edge of the room first.

When laying the structure, a space is left for the return pipe so that the circuit can be rolled out in one continuous operation.



**MEANDER-SHAPED INSTALLATION**

The alternative pattern for the floor system is this Snail-shaped structure. This is ideally suited for installing between the joists of a suspended timber floor.

Simple variations can be applied to this design which allows the installer to achieve the required performance.

The main benefit of this design is that the beginning of the of the circuit is warmer. The warmer end can therefore be placed to the outside of the building to off set the heat loss.

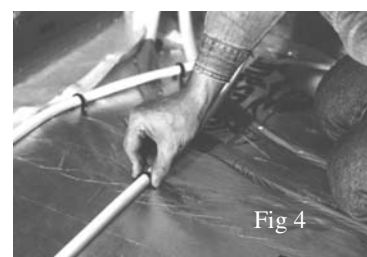


Fig 4

## The Installation of your Underfloor Heating System

### Floor Preparation

Before any pipe is laid the floor must be made ready and the insulation put in place. The floor area should be cleaned and any uneven spots such as cement drops removed.



Remove everything from the room so that you have a completely free area to work in.

For a screeded floor you will need to put edge (perimeter) insulation around all the walls (note - this is not required with timber frame buildings). There is sometimes a self-adhesive strip on the back of the border insulation to help hold it in place.

Starting from the corner of the room lay the insulation boards. Make sure that they are pushed up tight against the edge insulation and butt fitted against each other. It is good working practice to tape all the joints and you should use gaffer tape for this purpose. Please also note that the edge insulation has a clear plastic 'apron' that must be laid on top of the insulation boards and fixed down with tape.



### Laying the pipe and fixing the manifold

The first thing is to fix the manifold/s to the wall.

The manifold should be fixed at a height of 400mm from the floor insulation to the bottom (return) manifold.



Starting from the manifold, the pipe is run out to the room/area where it is laid according to the design specification. The pipe is held in place on the insulation board either by lengths of clamp track or with a simple push in staple clip (Fig 5). The pipe fixing should be at approximately 1 to 1.2 metre spacing and at either side of a bend. On returning to the manifold, any surplus pipe is cut off. We show you how to do this on the next page.



Fig 5

Start by connecting the first pipe (flow) to the top manifold port as shown. Feed this pipe up behind the bottom manifold as shown in fig 6. Remove the nut and clamp ring from the manifold port.



Mark the pipe level with the shoulder of the insert (fig 6). Cut the pipe to the correct length (Fig & 7). The nut and clamp ring is then slid over the end onto the pipe (Fig 8).

Using the bevelling tool (Fig 9), the pipe is prepared for the insert. Push the bevelling tool fully into the end of the pipe and pushing with light pressure, turn the tool two or three revolutions to put a chamfer (or bevel) onto the inside edge of the pipe. Remove the tool and then push the insert fully into the end of the pipe (Fig 10).

The assembly is then connected to the manifold and fully tightened with a suitable



spanner (fig 11 & 12).





Fig 13

The pipe should now be carefully straightened to create a neat and tidy appearance (Fig 13). Care should be taken to ensure that the pipe is not 'kinked' where it is bent up off the floor prior to connecting it to the manifold.

The pipes should be arranged neatly with those connected to the top (flow) manifold passing behind the bottom (return) manifold (Fig 14).



Fig 14

Follow the same procedure for the remaining manifold ports. (Fig 15)

The same procedure is used for the connection of the feeder pipes to the manifolds (if you are using our plastic pipe). Greater care is required when forming a bend with the larger diameter pipes (See Figs 2).



Fig 15

## FILLING THE UNDERFLOOR SYSTEM

Once all the floor coils are connected to the manifolds the system can be filled with water. Each floor coil is filled separately to ensure that there are no air pockets with in the pipe.



Fig 16

Start by closing the main isolating valves to each manifold, the flow (red fig 16) and the return (blue fig 17).



Fig 17

Close all but the first individual valves on the return manifold (check supplied manifold for flow/return (Fig 18).



Connect a hose to the drain valve on the flow manifold and if possible (if you have two hoses) connect a second hose to the drain valve on the return manifold (Fig 19).



The hose connected to the flow manifold should be connected to the mains water supply and when ready, the manifold drain valve opened and the supply water turned on. The hose connected to the return manifold should be taken to a suitable drain off point. If you do not have a second hose then simply use a bucket to catch the water from the return manifold drain valve. Open the drain valve on

the return manifold and leave open throughout this procedure. You are now ready to fill the floor system.

Opening the drain valve of the flow manifold allows mains water to flow through the first open floor coil and out of the drain valve on the return manifold. Let the water run out of the return manifold drain valve until it runs clear and with no surges or air bubbles. As soon as the water runs clear you can open the second individual valve on the return manifold *but you must then close off the previous individual valve.*

Repeat the above for the second coil and so on until all floor coils are full of water. Once all the floor coils are full then turn off the drain valve on the flow manifold and the return manifold and disconnect the hose from the latter.



### Recommendation

If you wish to leave the system under pressure at this point, then open *all* the individual valves on the return manifold and turn on again the drain valve on the flow manifold. The mains water pressure from the hosepipe will raise the pressure on the manifold pressure gauge. (Set the red marker needle to 3 bar)

A recommended pressure for the testing of the system is 3 bar or 45 psi (Fig 20). Fill in the test sheet section accordingly (found at the back of this manual).

At this point the floor system is full and under pressure and it can be left in this way until the heating system as a whole is ready to be commissioned. It is recommended to leave the system at pressure during the laying of floor screeds or floor boards.

**Note;** There may be small fluctuations in the pressure due to temperature variations.

### SCREEDING and INFILLS

Screed finished floors can now be laid in the normal manner. The nominal depth of the screed is 65 - 75mm. The addition of 'chicken wire' to the floor before the screed is laid would provide reinforcement if required. This however is not essential. An alternative is to use a poly-fibre reinforced cement or liquid a screed.

*When an infill for suspended timber floors is required this should be either a 10:1 sand/cement or 8:1 'Lyttag' lightweight aggregate/cement mix with enough water to hold the mix together. The additional load imposed on the floor by the infill is approximately 18kg/m<sup>2</sup> for sand/cement. The infill is not intended as load bearing, merely as a heat transference medium.*

The floor heating should not be turned on until the floor screed has completely dried out. This would normally be three to five weeks depending on site conditions etc. The industry guide lines for the drying of the floor is one day per millimetre of screed thickness. The heating should not be run for at least the first fourteen days. After this time it may be run at its lowest temperature setting to aid floor drying. After the screed is dry the heating should be gradually turned up over a period of one week to its operating level.

**This is critical when fitting hardwood floors over a screed. Such hardwood floors should not be laid until the entire building has completely dried out. Remember, it's not underfloor heating that damages (warps) wooden floors, it's the moisture in the screed!**

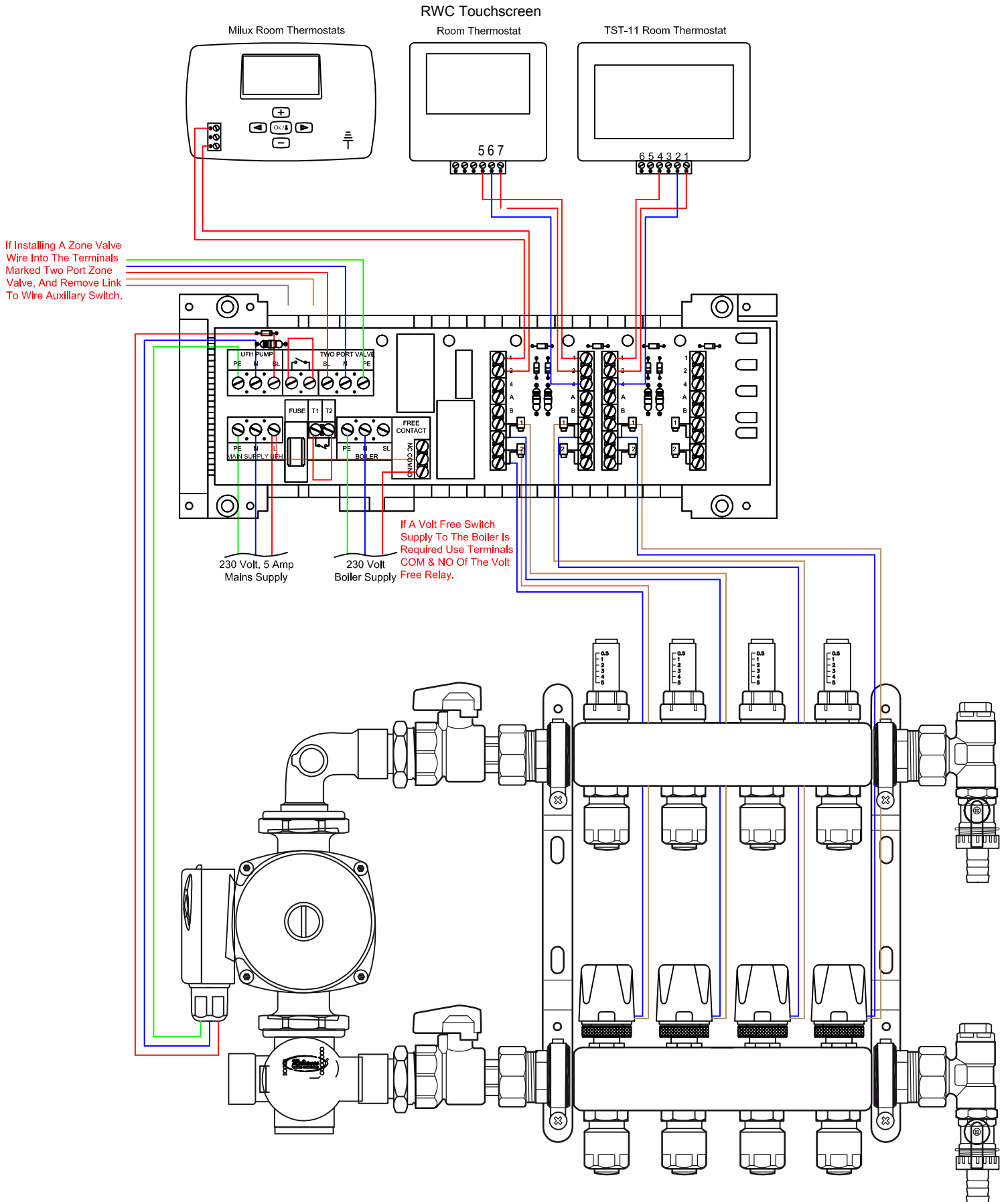
## **BALANCING THE SYSTEM**

If you have purchased a CAD layout then this will give the approximate settings for the manifold valves (number of turns 'open'). These may however need to be fine-tuned to give the correct heat levels per room. The adjustments are made to the return valves (bottom manifold).

Floor areas that are too warm require the return valve (bottom manifold) for that circuit to be turned down (clockwise). The effect of this will be seen on the flow gauges as you turn the black ring at the bottom of the flow gauge (remove red locking collar first).

Floor areas that are too cool require the return valve (bottom manifold) for that circuit to be turned up (anti-clockwise).

# UFWCM Electrical Supply



## OPERATING INSTRUCTIONS & TROUBLESHOOTING

The normal 'on' temperature for the heating system would be 20°C and a reduced or 'set back' temperature of 17°C. It should be noted that a maximum of 3°C should be observed between normal and set back temperatures. This is to ensure an adequate response time for the heating. Therefore, if the temperature is turned up or down, this 3°C difference should be maintained.

The time period for normal heating must be continuous for at least 12 hours. An ideal time setting would be from 06:00 through till 22:00.

The reason for this is that floor heating has a slower (longer) response time than normal radiators. If the heating is off more than it is on, the energy required to heat the building would be far greater than if the system is left running. Once the floor system is up to temperature it requires very little energy to maintain the performance. *Please refer to your instruction leaflet supplied with your room thermostats for operating information.*

The operating pressure of the system should be checked every few days for a period of two weeks. This is because air that may still be within the system will 'vent' at the automatic air vents. When this happens, the overall pressure of the system will fall. The system operating pressure should be kept to a minimum of 1 bar and a maximum of 2 bar when running at normal temperature. If the pressure has dropped then add more water via the 'filling loop' on the expansion vessel.

Pump and Mixing Valve (Basic Control Packs).



Your Underfloor Heating should have a pump and mixing valve (BCP) to operate it. You will need to set up the operating conditions for your system. That is to say, you will have set the water flow temperature (*this would also be shown on a CAD layout*) and 'balanced' the underfloor circuits. This is sometimes done by a commissioning engineer.

Please note that the reference to a commissioning engineer means the person who installs the system and sets it running. If required, we can supply this service for a nominal fee. Please contact our office for details.

### **1.) What should the settings be on the thermostat?**

The normal operating temperature should be set to your desired comfort level. This would typically be 20°C.

The 'set back' or reduced temperature should be set to *no more* than 3°C *lower* than the normal (sun) temperature. This allows the underfloor system to 'cool' down by only 3°C. Any more than this and the system may take too long to heat up at the next 'on' period.

The time period for the normal temperature should be from 06:00 until 22:00 for the ground floor system. Bedroom areas can be run for less hours, however you may wish to experiment with this. Remember that an underfloor heating system will operate more efficiently if it is allowed to run for longer periods of time. This is because more energy is used 'warming up' the floor system than in keeping it going when it's up to temperature. It will also take some time to warm up the rooms to their normal operating temperature. We would recommend that the start of the heating period be set forward by one hour before you need the heat. Again, you may wish to experiment with this.

### **2.) What should I do if some rooms are warmer than others?**

The underfloor system should be 'balanced' in such a way as to allow all the rooms to heat to the same level. If a room is too warm then its respective valve (or valves) on the manifold will need adjusting. The valve in question is the 'return' valve (bottom row) and to make the adjustment you need to remove the red 'locking' cover.

Turn the black ring at the bottom of the flow gauge clockwise until you see a reduction on the corresponding flow gauge. You should allow at least 24 hours to pass before making any further adjustments. The floor heating system is quite slow to respond and so all adjustments should be made in stages. What you are in effect doing is closing the valve and thereby slowing down the rate at which the water flows through the pipe. This will have the effect of reducing the amount of heat from the floor and thus allowing the room to reduce in temperature.

### 3.) What should I do if some rooms are cooler than others?

The procedure for adjusting the room temperature is virtually the reverse of the above procedure. By turning the return valve anti-clockwise, you will increase the flow of water through the pipe. The more water that flows, the more heat it will produce.

#### Note

If the flow valve is fully open then you will have to increase the overall water temperature for the floor system, (see next section).

Having increased the overall water temperature you may now have to reduce the flow for the rooms that were functioning correctly, (see section 2 above) in order to now reduce their temperature.

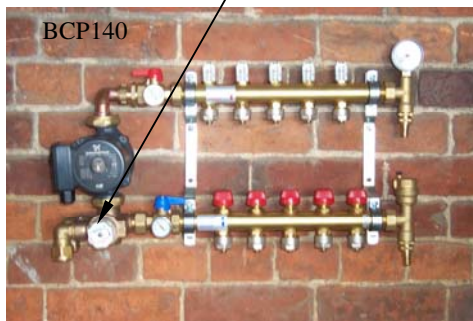
### 4.) How do I adjust the water temperature for the floor heating?

The temperature of the water entering the floor system is set on the 'three port' thermostatic mixing valve. This mixing valve forms part of the 'Pump and Mixing (BCP)' for your system. Your installer and the commissioning engineer will have shown you where this valve is situated in your house. It may be attached to the manifold or sited close to the boiler. To adjust the water temperature you simply turn the knob on the mixing valve which has the temperature range clearly marked.

BCP140 Thermostatic Valve

Min - 35°C

Max - 65°C



BCP28 Thermostatic Valve, variable from ambient to a maximum of 65°C as shown on the red adjustable cap.

Only make small adjustments at a time and take care not to 'over heat' any of the floor areas.

### E.M.S. CONTROLLER (Energy Management System)

For systems fitted with an EMS device, either on the boiler or as a 'stand alone' unit, the operation of the system differs slightly from that mentioned previously.

The time and temperature settings for the heating are laid out in the operation instructions for the EMS and these must be read first. If your EMS is a 'stand-alone' wall mounted unit then the instructions will be at the back of this manual. If your EMS is fitted to your boiler (a T230E for example) then the instructions will be found in the boiler manual.

Note If you have an email address then we will send you a pdf file of the EMS controllers operational manual. References to pdf page and 'line' numbers will be included in the following text.

For heating systems that only have one or two circuits from the EMS (heating circuit one and two), then the only adjustments to be made are the 'balancing' of the circuits as set out in previous section. To further adjust or balance the system, refer to sections 2 and 3 above.

## PROBLEMS?

Q. What do I do if some rooms are cooler than others?

A. First of all, try altering the balance as described in section 3 above. If this fails or if the valve is already at its maximum then the system will need re-adjusting. What you have to do is 'turn up' the water temperature level for that floor heating circuit. The Heating Engineers Parameters need to be accessed to carry out this function. Go to page 26 of the pdf file and adjust 'line' 107 (Maximum limitation of flow temperature setpoint). This should be set at 55°C and should be increased by 5°C. At least 24 hours should elapse before making any further adjustments.

Having increased the overall temperature for the system it may now be necessary to turn down some of the areas.

Q. What do I do if some rooms are warmer than others?

First of all, try altering the balance as described previously in section 2 above. Try one half turn at a time and allow 24 hours to monitor the result.

- Q.** Why does my house take too long to get up to the selected temperature?
- A.** Underfloor heating has a much slower warm up time than Radiator heating. It is therefore most important to allow for this when setting the program times. Also, the difference in selected normal (daytime) temperature and that of the reduced (night-time) temperature should be no more than 3°C. Underfloor heating should be left 'on' for at least 12 hours per day and preferably 16 hours. This will allow the mass of the floor to fully warm through which will keep running costs down.
- Q.** Why have I no heat in one of my rooms?
- A.** If all the other rooms are functioning correctly, then check the following
- a). Is the flow gauge (top manifold) indicating a flow of water?
  - b). Is the return valve (bottom manifold) open?
  - c). If an individual room thermostat is fitted, is it calling for heat (turned up)?
  - d). If an individual room thermostat is fitted, is the motorised head on the manifold functioning correctly (if the small window shows red then the valve is closed. If it is black then the valve is open)?
  - e). Is any heat from the manifold flowing into the floor. If it is and the return pipe back to the manifold is cold then the floor coil will have an air lock. To clear this repeat the section 'Filling the Underfloor System' for that floor coil only.

**Q.** My heating is not working, what do I do?

**A.** If the heating system is not working then check the following.

- a). Is the power on for all parts of the heating system. Check fuses and switches are all correct and that power is available.
- b). Is the Underfloor pump working. Has it got power to it, if so then it may have jammed. To check this, remove the large silver screw in the centre of the pump face. With a small screwdriver inserted into the hole, rotate the shaft of the pump. This should spin freely and the pump should now operate. If the pump fails to operate then replace the pump.
- c). Is the pressure in the system at least 1 bar. Check the system pressure both at the manifold and also at the expansion vessel. If it is low then add more water to the system via the expansion vessel filling loop.
- d). Is the programmer/timer/room stat calling for heat. Check that the programmer is working and that it is set for a heating 'on' period. Check that power is available from the output side of the programmer. Replace if defective.
- e). Are all the valves open. Check that any valve, manual or motorised, is not shut and therefore blocking the flow of water.
- f). Is the Boiler working. Check that the boiler has power to it and that it has not 'locked' out. Refer to the boiler manufacturers handbook for further advice.

Test records and UFH pipe coil details						Pressure Testing.
Project Quote Number ...../.....						Start time
Client Name .....						End time
Manifold 1, Number of Ports .....						Duration of test
Port	Area	Pipe Size	Pipe Length	Valve Turns	Checked	Pressure at start of test ..... bar
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Manifold 2, Number of Ports .....						After 1 Hr. .... bar
Port	Area	Pipe Size	Pipe Length	Valve Turns	Checked	After 2 Hr. .... bar
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Manifold 3, Number of Ports .....						System tested by
Port	Area	Pipe Size	Pipe Length	Valve Turns	Checked	.....
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Manifold 4, Number of Ports .....						Verified by
Port	Area	Pipe Size	Pipe Length	Valve Turns	Checked	.....
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Manifold 5, Number of Ports .....						Signed by customer or their agent
Port	Area	Pipe Size	Pipe Length	Valve Turns	Checked	.....
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Manifold 6, Number of Ports .....						Date ...../...../.....
Port	Area	Pipe Size	Pipe Length	Valve Turns	Checked	Comments.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Manifold 7, Number of Ports .....						
Port	Area	Pipe Size	Pipe Length	Valve Turns	Checked	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

UFHtestsheet

## Notes