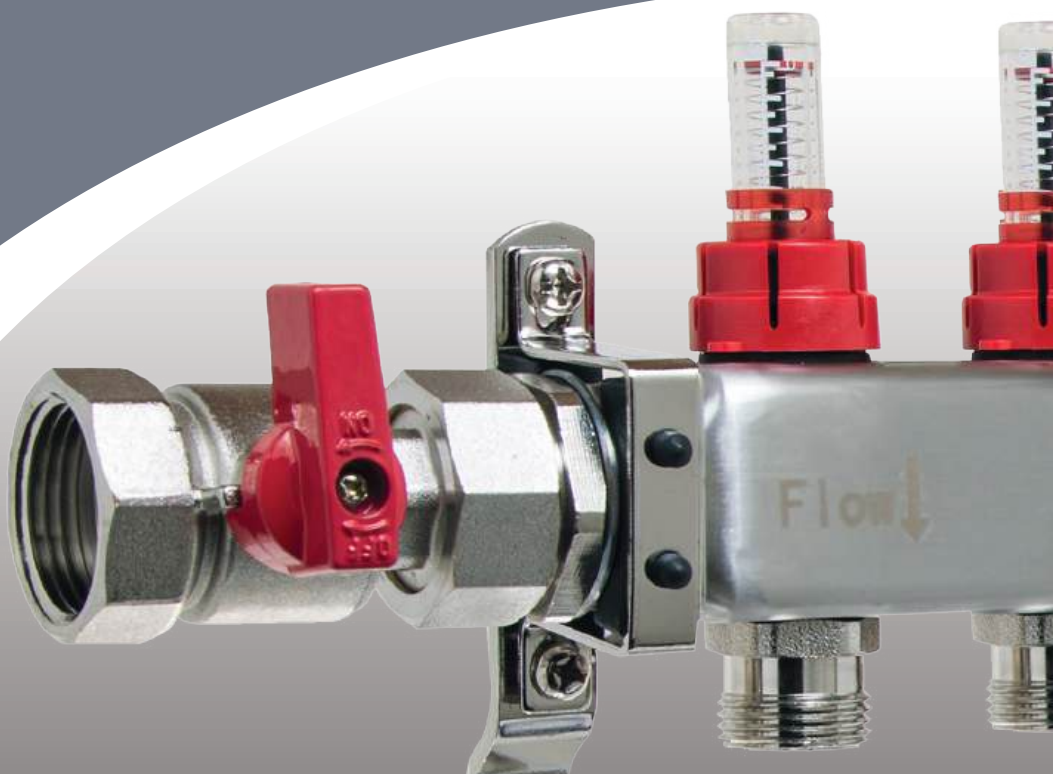


Underfloor heating



Installation guide

Contents

1	Install wiring	4
2	Install the manifold & pump	4
3	Install pipework	4
4	Connect UFH pipes to the manifold	8
5	Fill UFH Pipes	8
6	Pressure Test	11
7	Starting-up the UFH System	12

.....

IMPORTANT NOTES:

Check your invoice and delivery note before installation to make sure that all the materials and the quantities are correct.

Before installation:

Make sure that the sub-floor is clean, level and the room is empty. Then you can lay down floor insulation (not supplied).

Ground floor insulation must meet Building Regulations 2006 Part L.

A minimum requirement for ground floors is 75mm Polyurethane insulation (Celotex, Kingspan, Ecotherm, Xtratherm), or 110mm of EPS (Jablite, etc.).

Please note that we do not supply the insulation. Any builders merchant will have insulation in stock.

It is the responsibility of the customer to make sure that insulation levels conform to relevant British Standard and any other applicable building code.

Please ensure that your underfloor heating system operates occasionally every month to ensure that mechanical parts such as the pump do not seize.

Please note

1 Install wiring

All wiring should be undertaken by a qualified electrician. Uheat cannot be held responsible for damage to components, fixtures, fittings or injury caused by incorrect or faulty wiring. (please refer to instructions/diagrams supplied with controls)

2 Install the manifold & pump

The control unit (manifold + pump) should be always located near or in the room it is serving, or if there's more than one zone the whole unit needs to be positioned strategically and as central as possible, in order to reduce the length of pipe and uncontrolled energy from pipes passing through the heated areas.

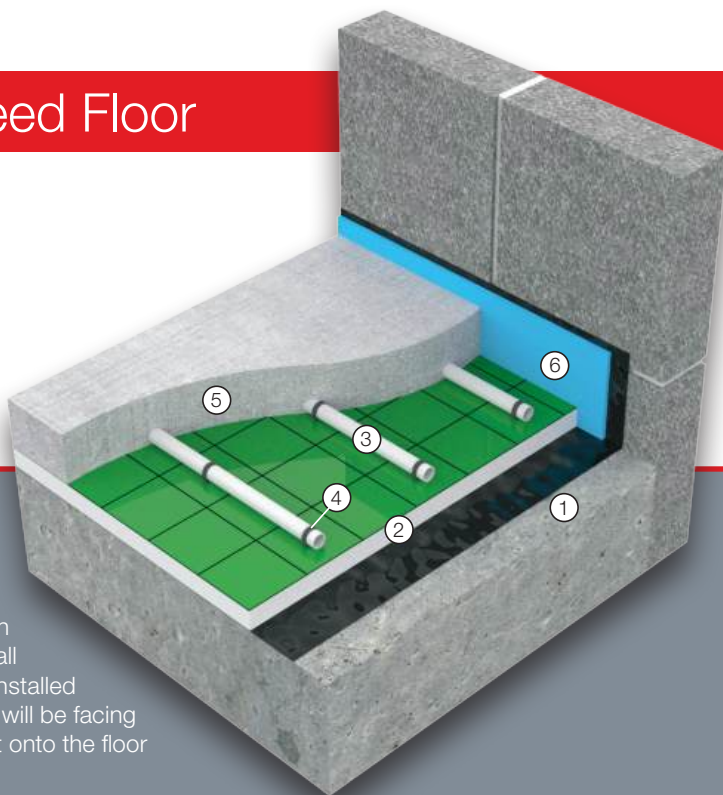
- ▶ Although the control unit has a built-in pump with a low noise level we advise not to install the unit close to a bed.
- ▶ Typical locations include under stairs cupboard, utility rooms, airing cupboards and cloak cupboards.
- ▶ We suggest you select the Control Unit position at the beginning of the design process.
- ▶ The manifold should be fixed level and approximately 400-600mm above the finish floor to enable easy connection of the UFH Pipework and to be accessible for maintenance and servicing in the future.

3 Install pipework

When laying UFH loops/circuits, the first pipe end should be connected to the manifold before loop is laid.

Solid Screed Floor

- ① Sub-Floor
- ② Insulation
- ③ Adept Pipe
- ④ Adept Pipe Clip
- ⑤ Screed
- ⑥ Edge Insulation



Wall/Edging insulation:

Fix the edge insulation continuously around all internal walls. When installed correctly the PE-skirt will be facing out. Tape the PE-skirt onto the floor insulation.

Once the screed has dried and cured, the edging insulation can be trimmed down.

Remember the following:

- Maximum circuit length is 100m. If your area requires more than 100m divide it in half and fit two circuits of similar length. For example: Room area 30m² with pipe centres 200mm require 150m of pipe. Fix with 2 circuits of 75m.
- Pipe connections must not be made in the area to be screeded.
- Don't forget to allow for connection lengths back to the manifold in overall circuit design and length.

Pipe centres:

Pipe should be spaced 100mm away from the wall. Always go with flow to the coldest part of the room first e.g. under windows, along outside walls.

In solid screed floors and areas of average to low heat loss UFH pipe is generally laid at standard centres of 200mm, unless otherwise specified.

There are the two most common ways to install the pipe into the floor insulation: pipe clips or using the rail system.

***Pipe Clips Fixing**

Pipe is being fixed with clips provided. We recommend two people to fit the pipe, one person to hold the coil and another person to clip the pipe into the insulation. You need approximately 2 clips per metre of pipe.

***Rail System Fixing**

With this type of installation lay the rail across the floor to create a matrix for pipe. Rails have the self adhesive backing so you can easily stick them to the insulation. Set them with a maximum of 500mm from two opposite wall edges and a maximum of 1000mm spacing between clip rails. Make sure that the rail is at 90° angle to the coldest external wall.

Once you are happy with the clip rail layout fix them permanently to the insulation using additional pipe clips. Also make sure that the pipe turns are secured with additional pipe clips.

Try to use all the pipework supplied. The pipe is marked every metre so you know when it's time to go back to the control unit.

Pipe isn't normally laid under fixed furniture such as kitchen and utility units.

Screed:

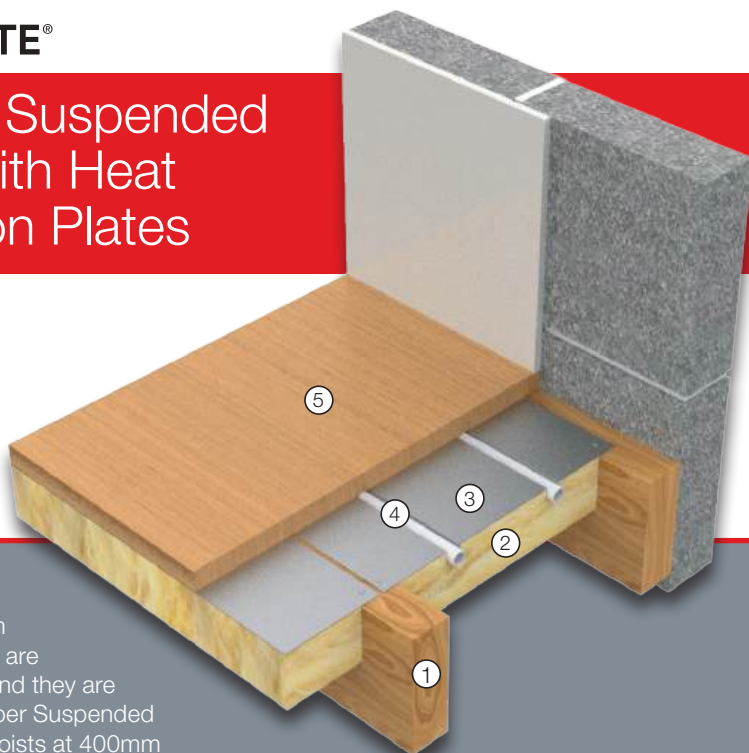
We recommend 65mm of screed on top of the insulation (Building Regulations requirements)

The screed must be allowed to dry before heating is operated. The general rule is to allow 1 day per 1 mm of screed.

As the system is used for the first time, the mixing valve must be set to the minimum setting to let the moisture in the screed to dry out. The temperature should be increased by 2 degrees every day until the mixing valve is set at 45°C.

Timber Suspended Floor with Heat Emission Plates

- ① Joist
- ② Insulation
- ③ Adept Alu Plate
- ④ Adept Pipe
- ⑤ Floorboard



Adept Aluminum Spreader Plates are 1000x390mm and they are suitable for Timber Suspended Floor with floor joists at 400mm centres.

It's essential that insulation is installed between the joists, as close as to the underside of the plates as possible. Usually a minimum of 100mm of mineral wool insulation is used, however, where relevant, the insulation used must comply with current Part L and Part E of the Building Regulations.

Plates normally cover approximately 80% of the floor area and are only laid under straight runs of pipe.

Ensure all insulation and battening work is installed and complete before laying the plates down.

Lay the plates down without fixing. Plates should never touch each other, as they expand when heated so ensure that you leave a gap between ends and sides of each plate. Check to ensure proper number of plates are evenly spread out across the heated area before fixing.

Leave a minimum 300mm gap from the wall to enable the pipe to bend 180° around.

When required area is covered with plates fix them down with a staple gun or tacks and lay down the pipe into the grooves in the plates.

With this system the flow temperature on the mixing valve should be set up for 55°C.

Timber Suspended Floor with Drymix fill

- ① Joist
- ② Insulation
- ③ Dry Screed
- ④ Adept Pipe
- ⑤ Floorboard
- ⑥ Noggin / Batten
- ⑦ Plywood



Drymix – 8:1 damp sand/cement biscuit mix, 20-25mm thick.

The Drymix is needed for Ground Floor, older buildings and if concrete floor and timber suspended floor are on the same floor.

Always check if your floor can take an extra load of the Drymix (20kg/m²).

Drymix infill system:

- Doesn't increase floor height but joist notches are required for pipe to pass from bay to bay.
- Min 50mm of insulation (Kingspan or Celotex-refer to building regulations) must be installed between the joists.
- When joists centres are 400mm, pipe is clipped into insulation at 200mm centres (unless other specified) with pipe clips.

Concrete or Timber floor with grooved gypsum fibre panels

- ① Base Floor
- ② AD-Slim (18mm)
- ③ Adept Pipe
- ④ Floor Finish



AD-Slim

Planning the AD-Slim system beforehand will save time during installation and minimise product waste. Ensure the surface is levelled and clean. We do recommend to prime the floor before boards are laid down.

Boards need to be secured to concrete base with Retrobond low expansion fixing foam (please refer to instructions on the Retrobond adhesive) or flexible tile adhesive or screwed down.

Panels can be cut using angle grinder with diamond coated blade or hand saw or jig saw set at low speed.

Once all of the boards are installed you are ready to start installing the pipe.

Starting from your manifold position and allowing enough pipe for connection lay the pipe into grooves of the AD-Slim panel.

Extra grooves can be routed if needed using router with 12mm bit.

Any unused grooves need to be filled with flexible tile adhesive.

Tiles and engineered wood can be laid directly over AD-Slim boards, any other floor finish requires over-boarding with 6mm plywood or screed board.

Timber suspended floor with tongue and groove chipboard

- ① Sub-Floor
- ② AD-Chipboard Lite (22mm)
- ③ 6mm Plywood
- ④ Floor Finish



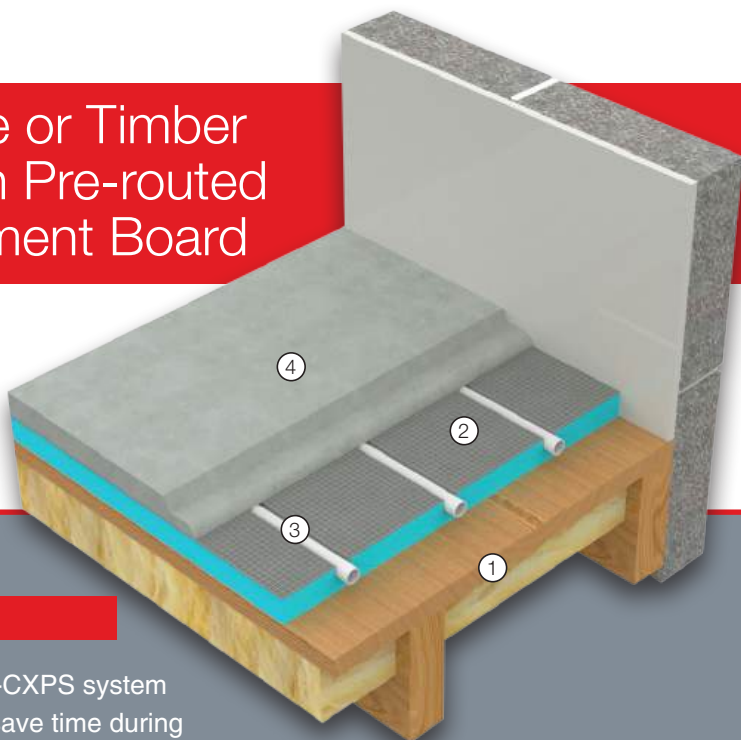
AD-CHIPBOARD

Planning the AD-Chipboard system beforehand will save time during installation and minimise product waste. Ensure all joist/battening work is completed before laying the AD-Chipboard boards. AD-Chipboard needs to be screwed down into the existing joists. Once all of the boards are installed you are ready to start installing the pipe. Starting from your manifold position

and allowing enough pipe for connection, lay the pipe into grooves of the AD-Chipboard. AD-Chipboard should be used in conjunction with 6mm overlay plywood before installing your final floor finish.

Concrete or Timber floor with Pre-routed XPS Cement Board

- ① Base Floor
- ② AD-CXPS
- ③ Adept Pipe
- ④ Floor Finish



AD-CXPS

Planning the AD-CXPS system beforehand will save time during installation and minimise product waste. Ensure the surface is levelled and clean. Lay the panels according to the plan. You can cut them with a sharp knife.

AD-CXPS boards need to be secured to your concrete base with flexible tile adhesive or screws and washers.

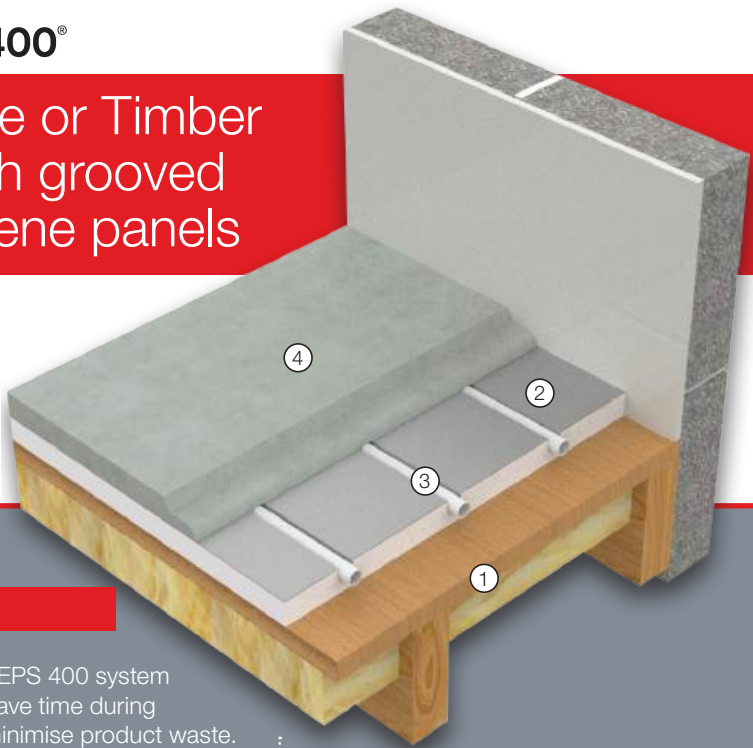
Starting from your manifold position and allowing enough pipe for

connection, lay the pipe into the grooves of the AD-CXPS panel. Once you have finished laying the pipe, use aluminium tape to secure the panels and pipe, running across all the joints.

Tiles can be laid directly over AD-CXPS boards, any other floor finish requires 5mm of latex, before installing the final floor finish.

Concrete or Timber floor with grooved polystyrene panels

- ① Base-Floor
- ② EPS 400 (20mm)
- ③ Adept Pipe
- ④ Floor Finish



AD-EPS 400

Planning the AD-EPS 400 system beforehand will save time during installation and minimise product waste. Ensure the surface is levelled and clean. Lay the panels according to the plan. You can cut them with sharp knife.

Use self adhesive aluminium foil along the long panel joints to securely fix the panels together.

Starting from your manifold position and allowing enough pipe for connection lay the pipe into grooves of the AD-EPS 400 panel.

Once you have finished laying the pipe use aluminium tape to secure the panels and pipe, running across all the panel joints.

Laminate and engineered wood can be laid directly over AD-EPS 400 boards, any other floor finish require over-boarding with 6mm plywood or screed board

Concrete Floor with Castellated Tray

- ① Sub-Floor
- ② Insulation
- ③ AD TRAY
- ④ Adept Pipe
- ⑤ Floor Finish
- ⑥ Edge Insulation



AD-TRAY

Adept Castellated Tray's are 1220mm x 820mm x 15mm at 50mm pipe centres and they're suitable for Solid / Screed floors or Beam & Block floors. Where relevant – the insulation you use must comply with current Part L and Part E of the Building regulations. Some insulation / screed combinations require a vapour barrier to be installed directly on the insulation before you install the pipe and lay the screed.

Ensure all insulation is installed and complete before laying and fixing the

trays down.

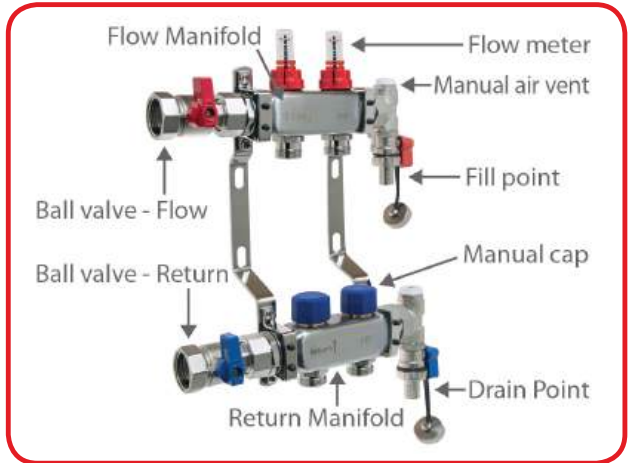
Starting from your manifold position and allowing enough pipe for connection, lay the pipe into grooves of the AD-Tray.

To comply with building regulations, you should use a minimum 65mm sand / cement screed or 50mm pumped screed.

UFH Manifold

4 Connect UFH pipes to the manifold

To connect the pipe to the manifold, cut the pipe squarely using the pipe cutter. Re-round the pipe (always clockwise) with the beveling / calibration tool, place the nut over the pipe, then the olive and finally push in the insert into the pipe.



Once this stage is complete push the pipe into adaptor fitting on the manifold (flow first) and then tighten the adaptor using an appropriate spanner.

5 Fill UFH Pipes

The UFH System must be filled with water and fully vented of air.

Filling the loops:

- Ensure the valves on fill/drain ports are open while filling the system.
- Make sure both of the isolating ball valves on the main flow/return pipes to the manifold are closed.
- Close all UFH loop flow and return valves on the manifold.
- Fit the hose to the lower manifold hose union and the other end of the hose to a suitable drain point.
- Connect a hose to the upper manifold hose union and connect the other end of the hose to mains water tap.
- Individual loops need to be purged of air. Ensure that all caps on the return manifold are closed (remove thermal actuators if fitted and replace with the plastic manual caps).

DO NOT FILL FROM BOILER

Open the first plastic cap on the lower manifold, then open the corresponding topmeter on the upper manifold. To fully open the topmeter, remove the plastic locking ring and turn the topmeter 3 full turns from the closed position. Turn on the water tap.



- As the first loop fills with water, air will discharge through the hose to the drain. Once the air stops and there is a steady flow of water, close both ports (white cap and flowmeter) and do the same for the next loop. Continue the process until all the loops are fully vented of all the air.
- Close the valves on fill/drain ports, remove the hose union and put the end caps on.

6 Pressure Test

The system should be pressure tested using a hydraulic pressure test kit before laying the screed or covering with the chosen floor covering.

- Shut both of the isolate ball valves.
- All flow and return valves to the UFH loops must be open.
- Connect a pressure pump to the hose union.
- Using the pressure tester, pressurise the system to 2 Bar for 10 minutes and then 6 Bar for 10 minutes for 16mm pipe or 4 Bar for 10 minutes if using 12mm pipe.
- After testing, the system should remain pressurised at 6 Bar throughout the screeding and curing process. This is in accordance with BS EN1264 Part 4.

7 Starting-up the UFH System

When the system has been connected to the heat source, all pumps, controls fitted, system has been filled, vented, pressure tested and the screed is cured you can start up your UFH.

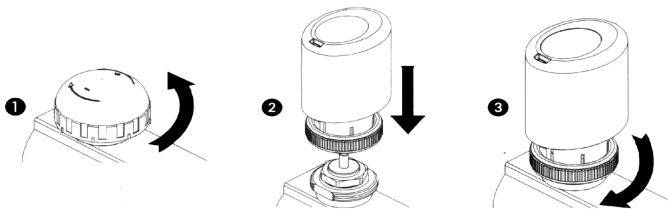
Loop balancing procedure:

- All topmeters should be fully closed at this stage.
- Return valves must be fully closed as well (remove thermal actuators if fitted and replace with the plastic manual caps).
- Open the first manual cap and adjust the setting of the corresponding topmeter until the desired flow rate is reached, by turning the topmeter anticlockwise from fully closed position.

To calculate the flow rate for individual loops, divide the loop length by 40. For example, 100m loop divided by 40 equals a flow rate of 2.5l/m

It's important that the system and UFH Pump are running.

- Repeat the process for each loop, then go back and carry out last adjustments, because each loop will have a mutual effect on the others. When the topmeter is fully open and desired flow rate is not achieved you might have to adjust the pump speed.
- If removed, refit all thermal actuators.



- Set the room thermostats 5°C above the current room temperature so that they call for heat
- Thermal actuators take some time to be fully open (about 2-4 minutes)
- Once you have completed all the procedures on the previous page, turn all thermostats down to make sure that the system will stop running.

- Once it stops, turn up one of the thermostats and wait for the system to start.
- That will confirm that the correct loop actuator is open for that particular room. Once the actuator will open turn the thermostat down.
- Repeat that process “room by room”. This will confirm that every actuator is controlled by the correct thermostat in each room.

As the system is used for first time, the mixing valve must be set to minimum setting to let the moisture in the screed to dry out. The temperature should be increased by 2 degrees every day until the mixing valve is set at 45°C.

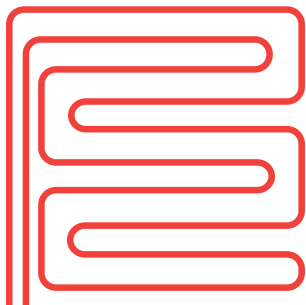
Once the mixing valve is set to:

- 45°C for Screed Floor/UltraSlim
- 55°C for Timber Suspended Floor with Aluminum Spreader Plates/AD-Slim

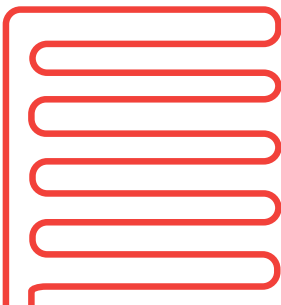
Set the room thermostats to required levels and program the system controls to run as required.

Typical Pipe Layouts

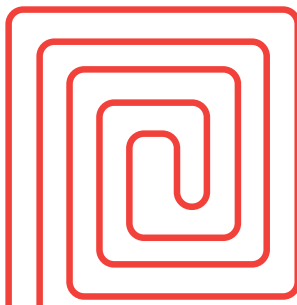
Double meander pattern



Meander pattern



Biflar pattern



General Guide

The following guide illustrates how Uheat warm water underfloor heating systems can be coupled together with the majority of central heating plumbing and control systems.

The majority of modern central heating systems make use of motorised valves, often called Zone valves, to divide different heating systems and hot water generation ie. Radiators, Under Floor Heating and Hot water cylinder.

Systems using combination boilers will also need zone valves if separate systems of heating require different times and temperatures.

Quite often ground and first floors are controlled separately as they may have different uses. The zone valve acts like a relay, meaning any system can call the boiler/ heat source without other areas being activated.

If the underfloor system is being incorporated alongside a radiator system it is even more important that these areas are controlled independently as 'heat up' and 'cooling off' times are different. We recommend the 'S' plan layout is adopted as this allows for more variety in zoning, and should be very familiar to qualified plumber/ electricians. The schematics show

typical S-plan heating systems with under floor heating incorporated.

NOTE:

An Auto By-Pass valve (ABV) should be incorporated in all systems.

NOTE:

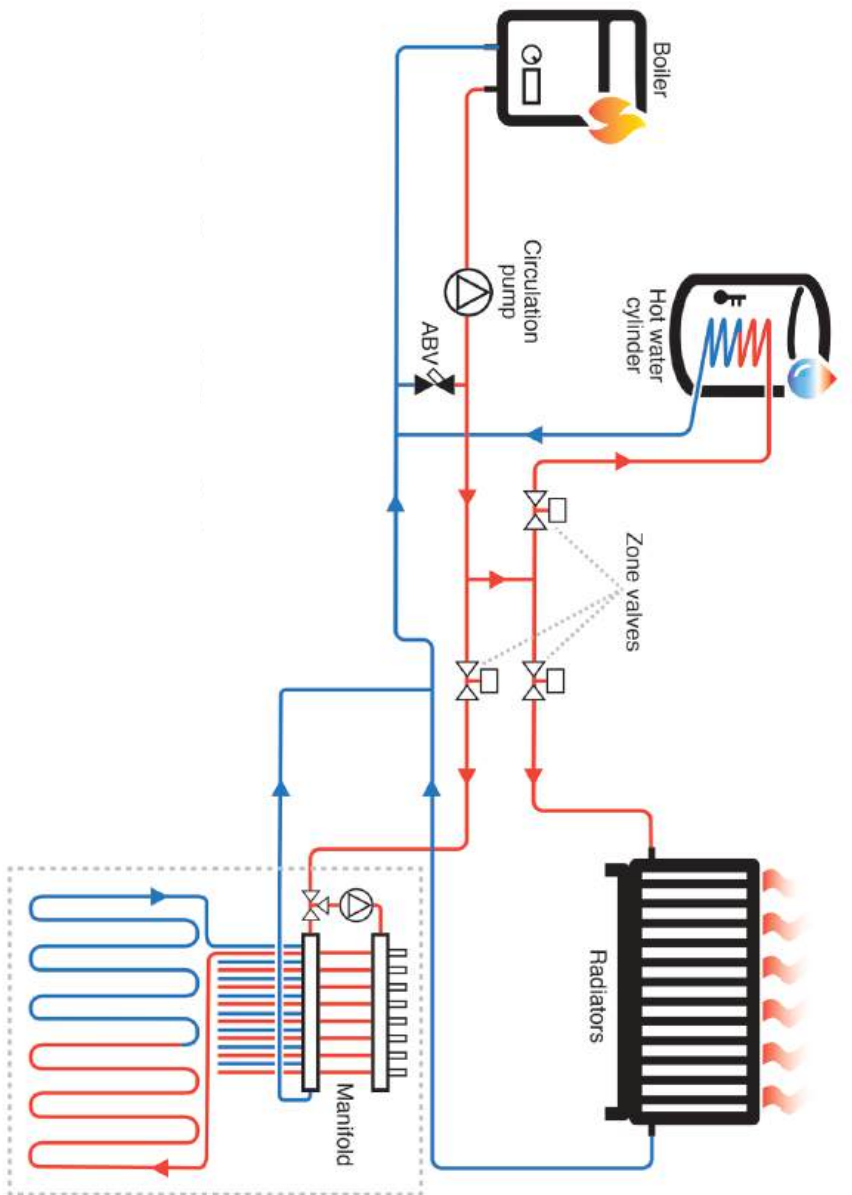
If a Heat pump manifold has been supplied then there will be no pump on the manifold. Therefore the relay on the H-Box wiring centre is used to switch on a shunt pump which will send primary water from a buffer tank or the heatpump itself to the manifolds.

Uheat does not supply:

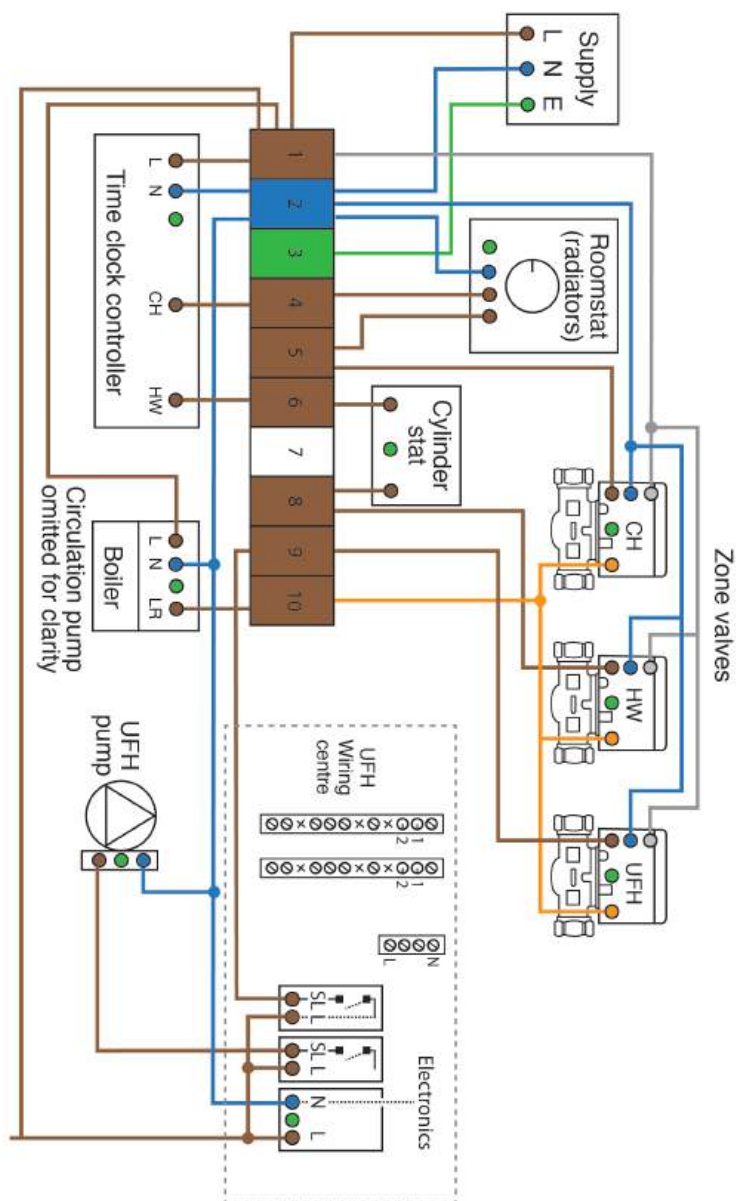
- 'S' plan wiring centre
- Cylinder thermostat
- Hot water time clock
- Auto bypass valve

Motorised / Zone valves and Pipe stats are available if requested.

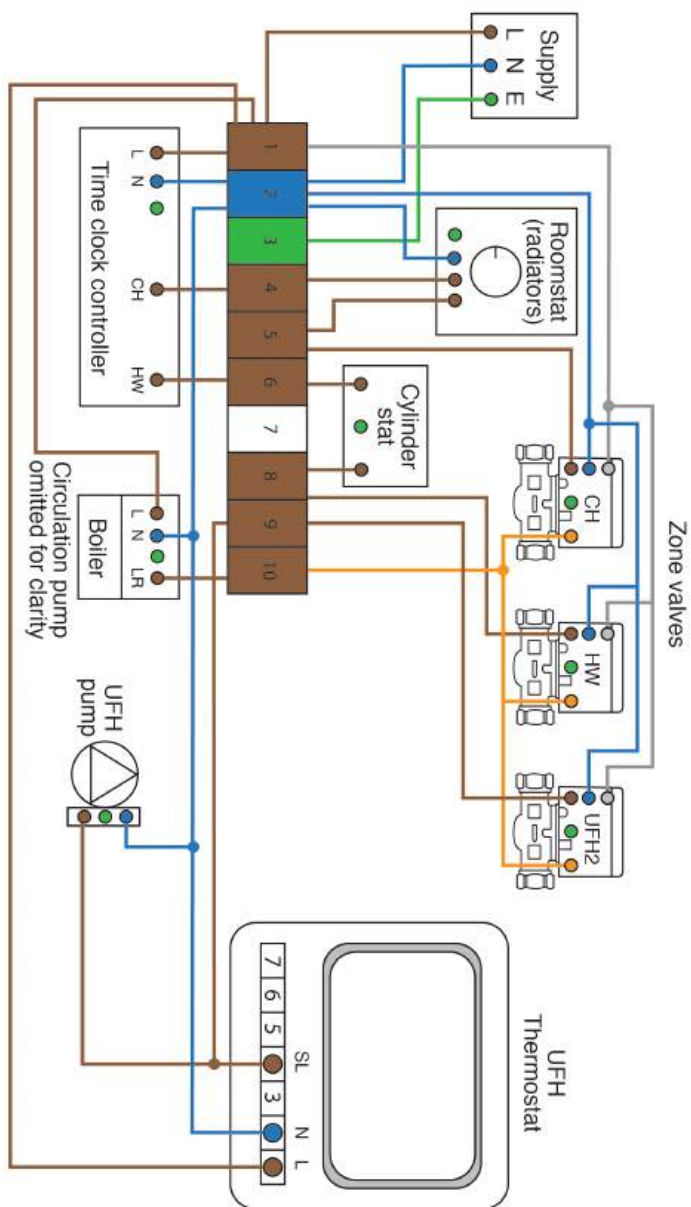
Schematic - System Boiler with hot water cylinder, radiators & UFH



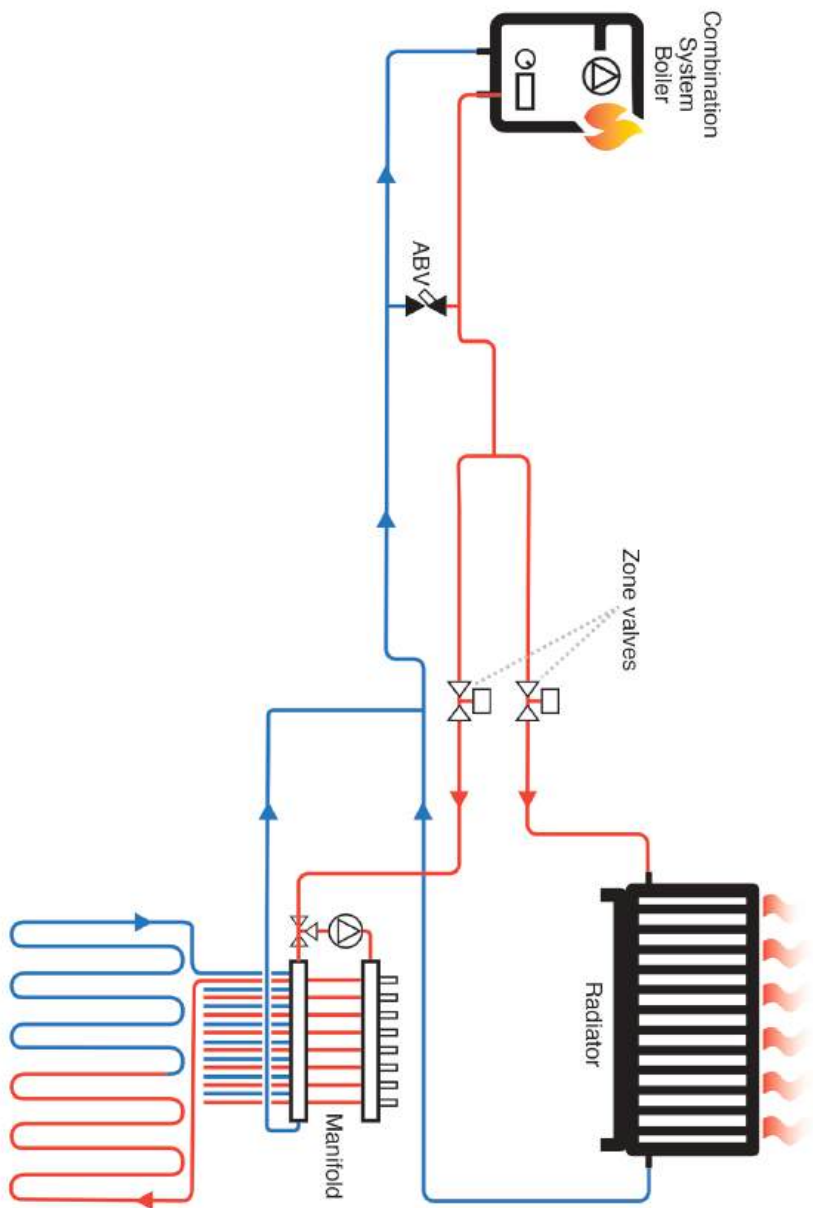
Typical Wiring diagram for UFH integrating with S-Plan & system boiler (multizone)



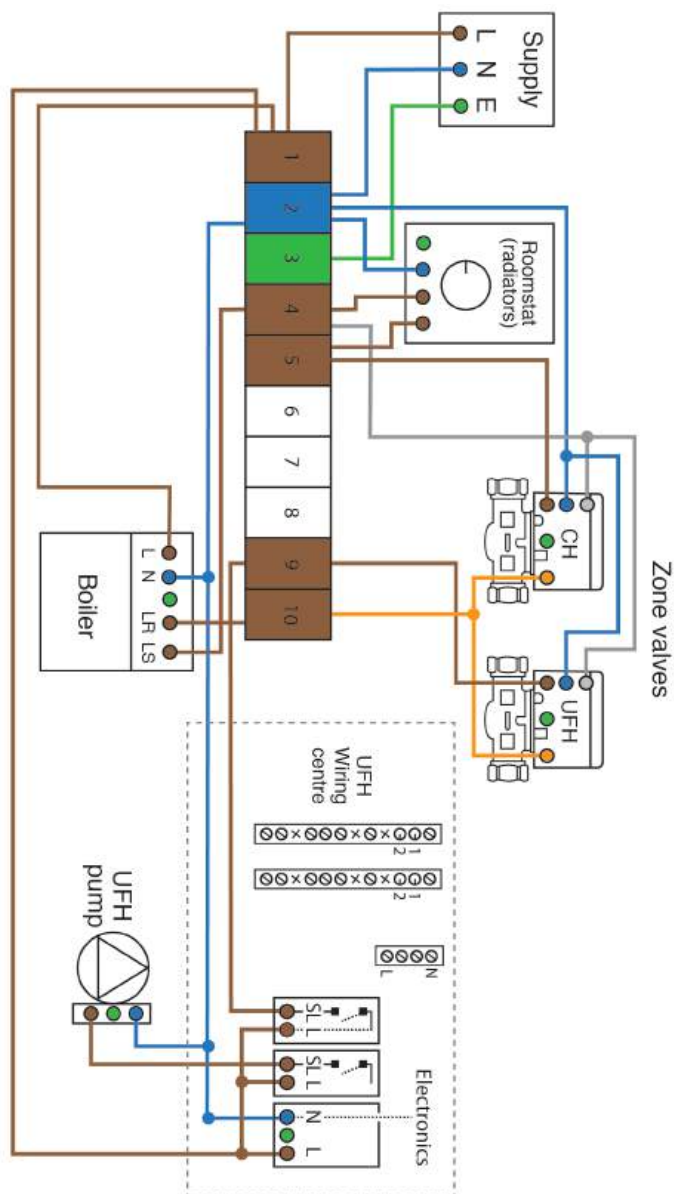
Typical Wiring diagram for UFH integrating with S-Plan & system boiler (singlezone)



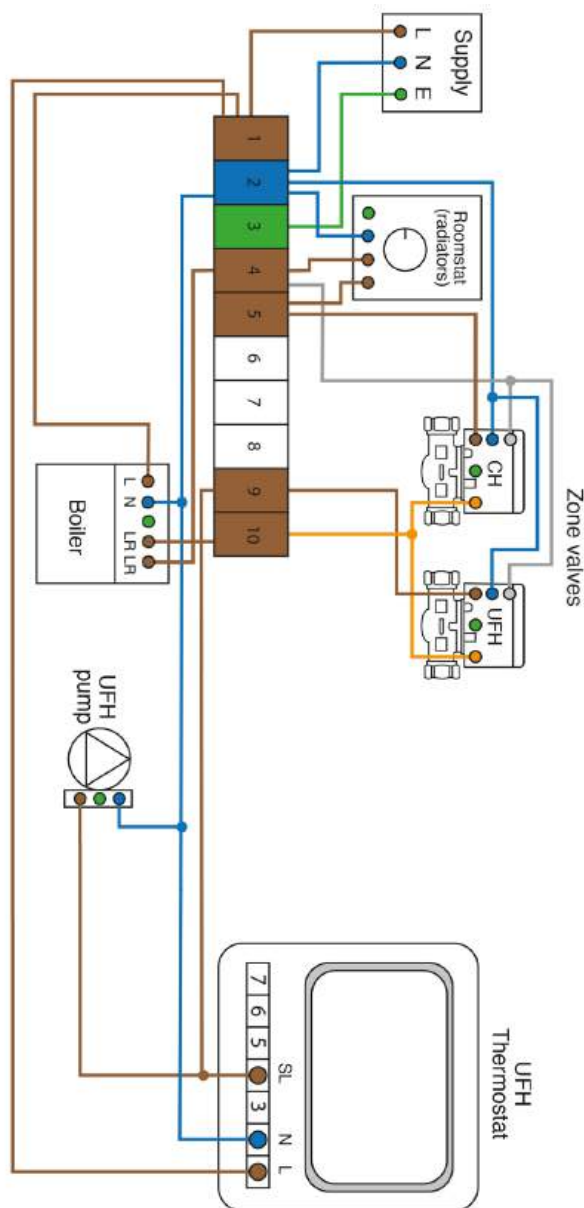
Schematic - Combination Boiler with radiators & UFH



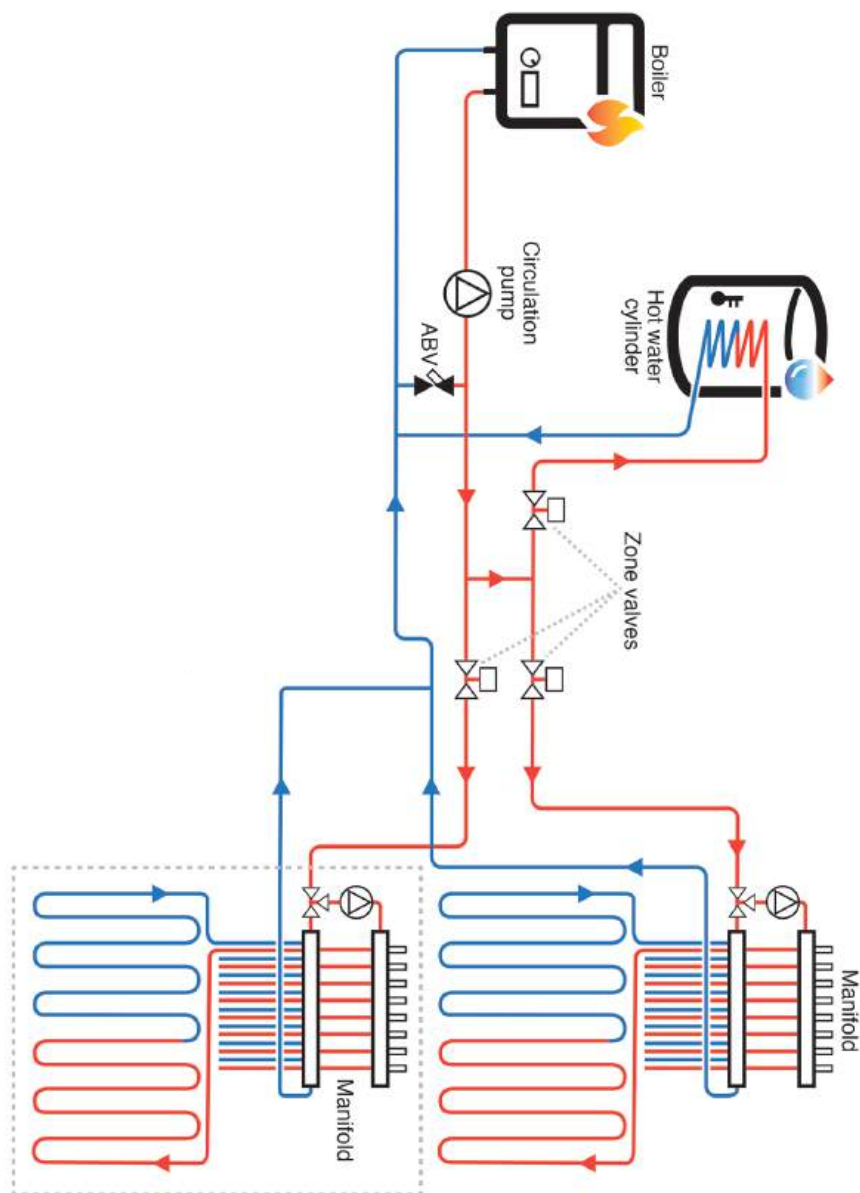
Typical Wiring diagram for UFH integrating with S-Plan & combi boiler (multizone)



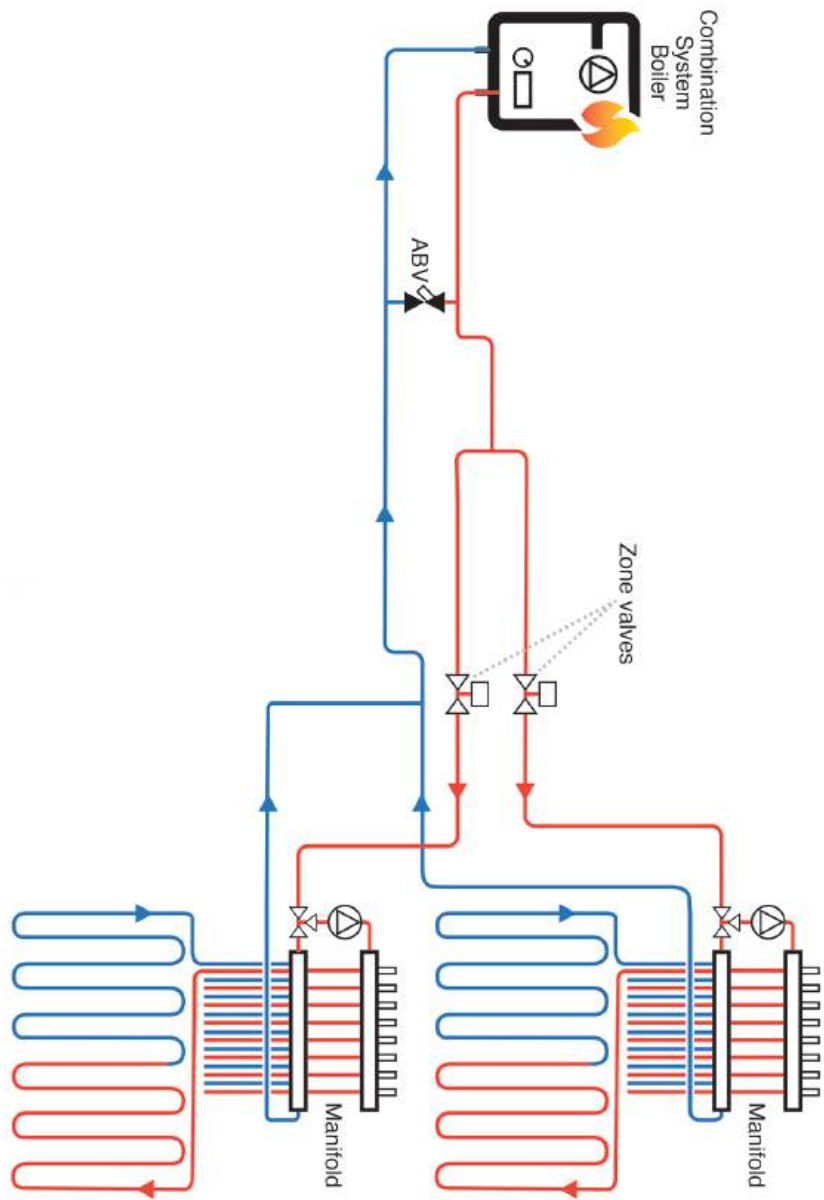
Typical Wiring diagram for UFH integrating with S-Plan & combi boiler (singlezone)



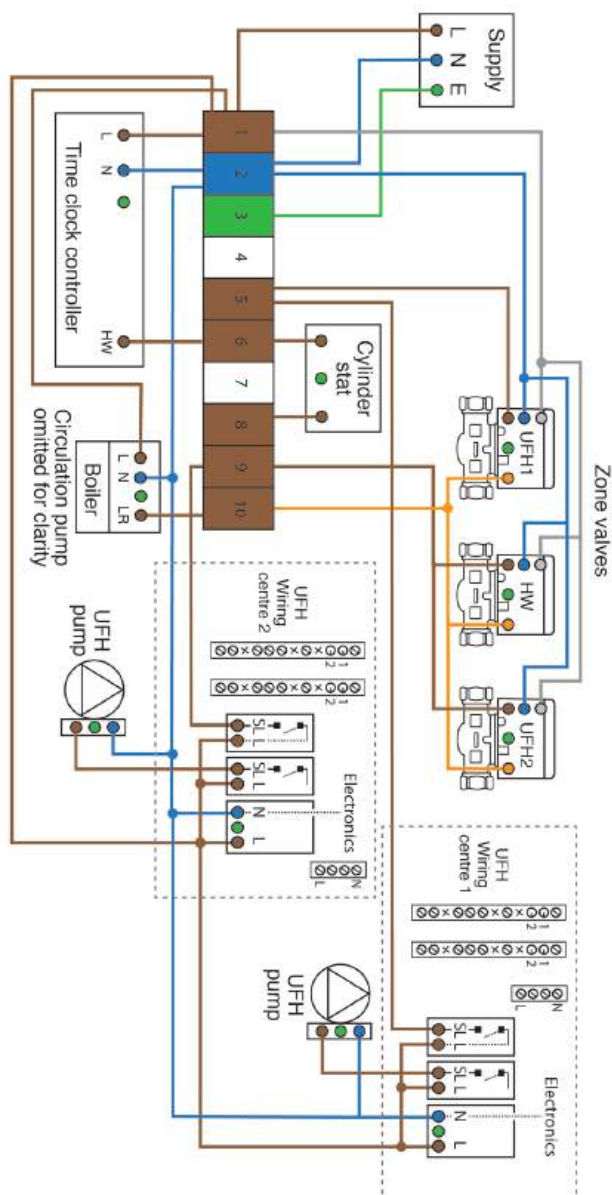
Schematic - System Boiler with hot water cylinder
& UFH with two manifolds



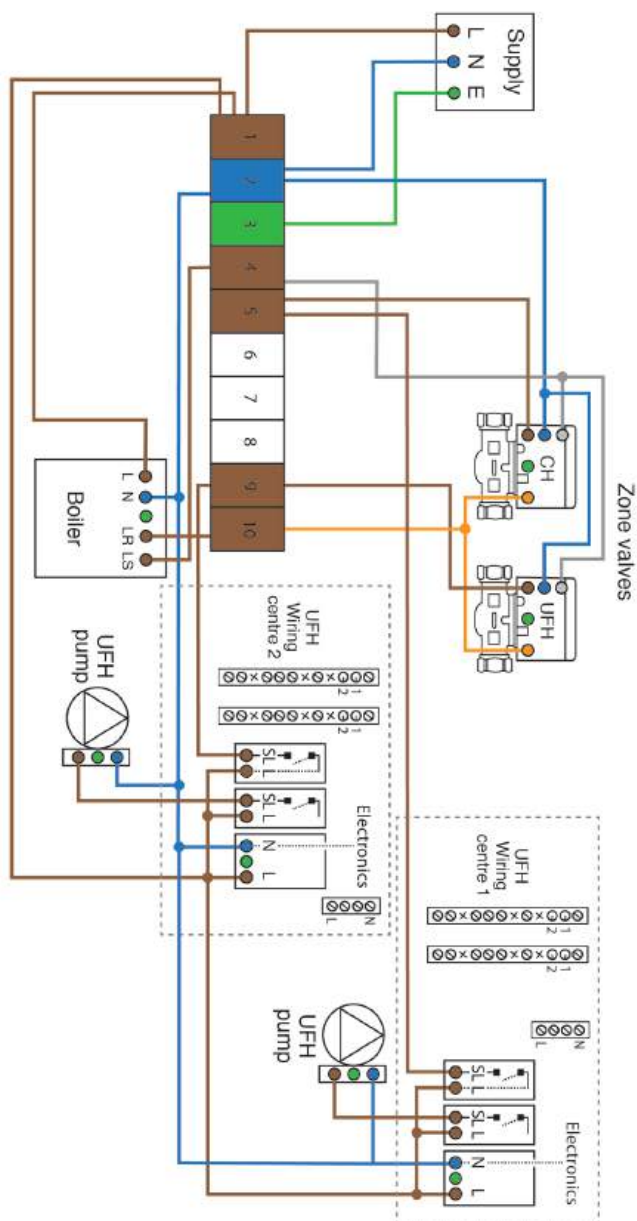
Schematic - Combination boiler with UFH and two manifolds



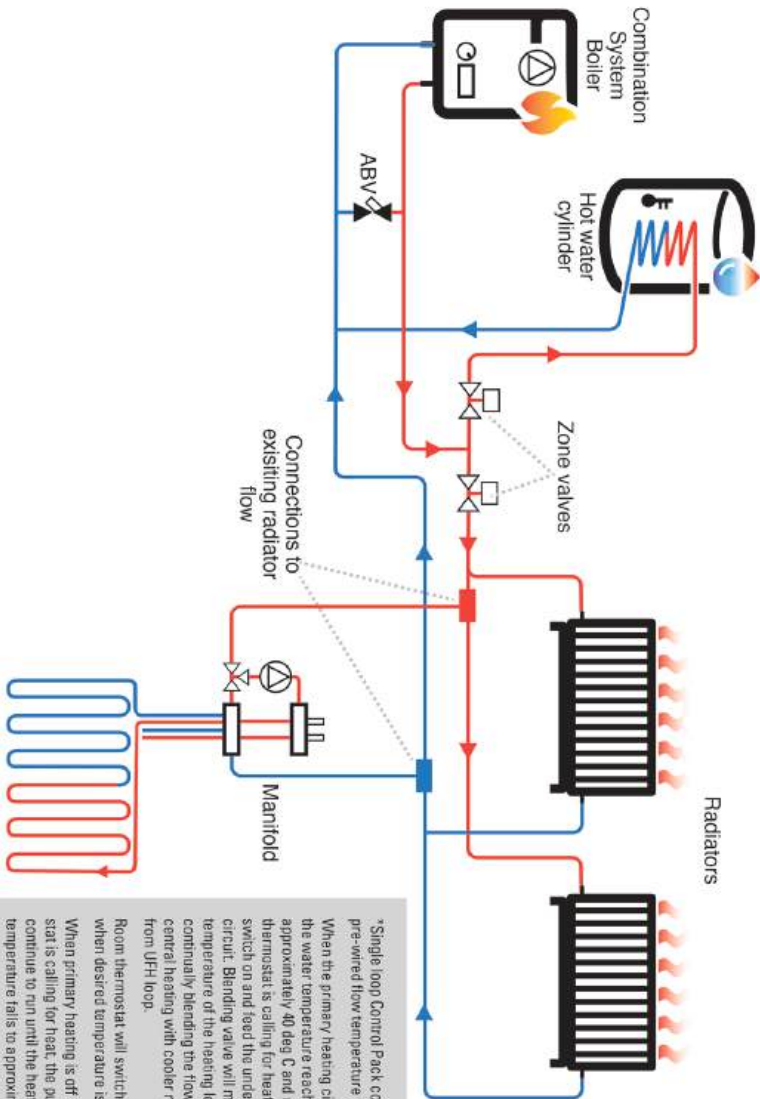
Typical Wiring diagram for UFH with two manifolds & system boiler (multizone)



Typical Wiring diagram for UFH integrating with two manifolds & combi boiler (multizone)



Schematic - Adding single area UFH to an existing radiator system



*Single loop Control Pack comes with pre-wired flow temperature thermostat. When the primary heating circuit is on and the water temperature reaches approximately 40 deg C and room thermostat is calling for heat pump will switch on and feed the underfloor heating circuit. Blending valve will maintain the temperature of the heating loop by continually blending the flow from the central heating with cooler return water from UFH loop.

Room thermostat will switch the pump off when desired temperature is reached. When primary heating is off and UFH room stat is calling for heat, the pump will continue to run until the heating loop temperature falls to approximately 30 deg before switching off the pump.

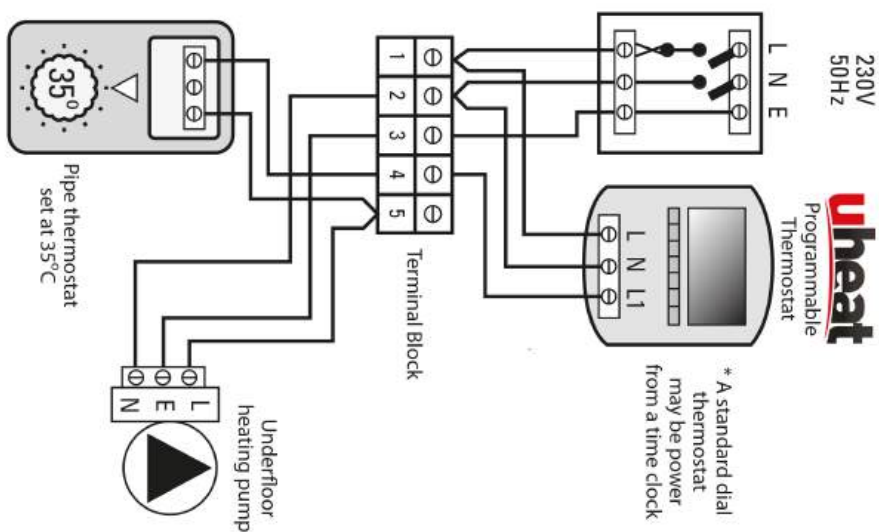
Wiring schematic for single zone kit added to radiator system

This is when a single zone underfloor heating kit is connected to an existing radiator system without an individual zone valve for the UFH and therefore unable to call the boiler/heat source independently for heat.

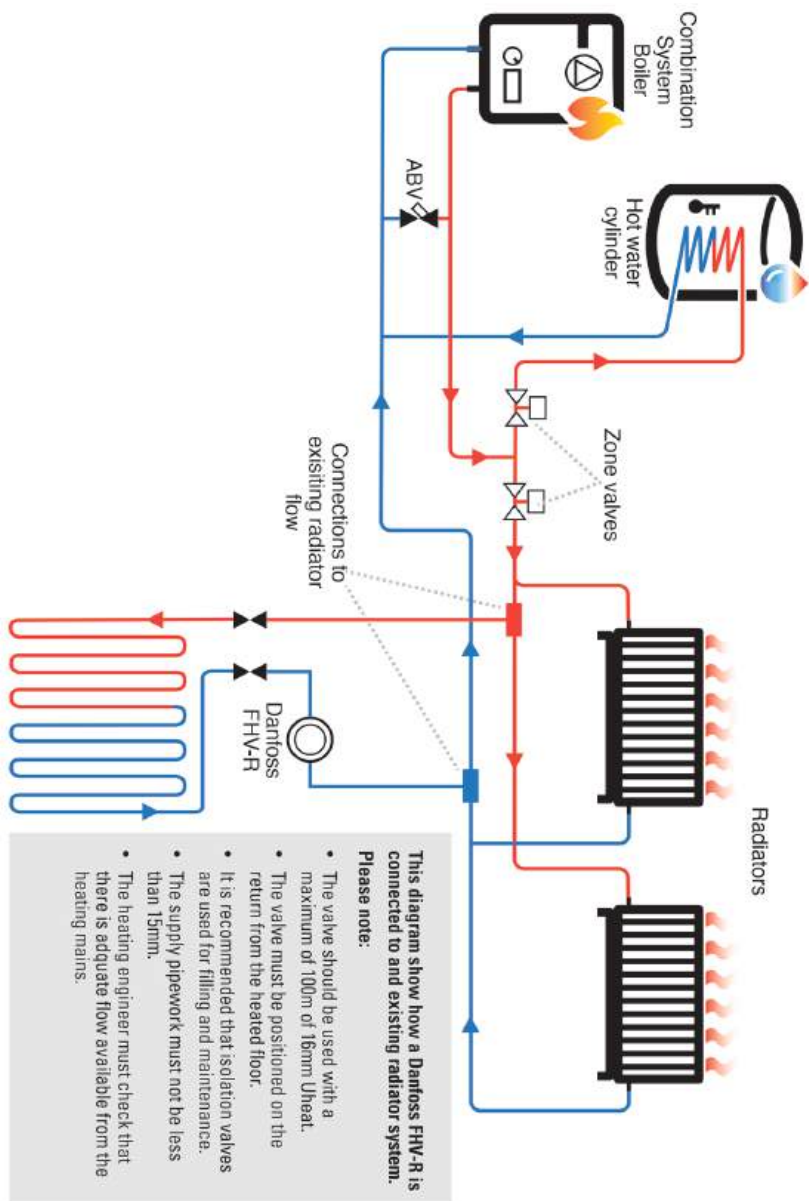
Although a room thermostat or programmable thermostat can be used to control air temperature, this area can only be ON when the existing heating system is ON.

When this is the case, a pipe thermostat can be attached to the heating mains flow, so that the new area of the underfloor knows when hot water is available and therefore stops the pump running when no heat is available.

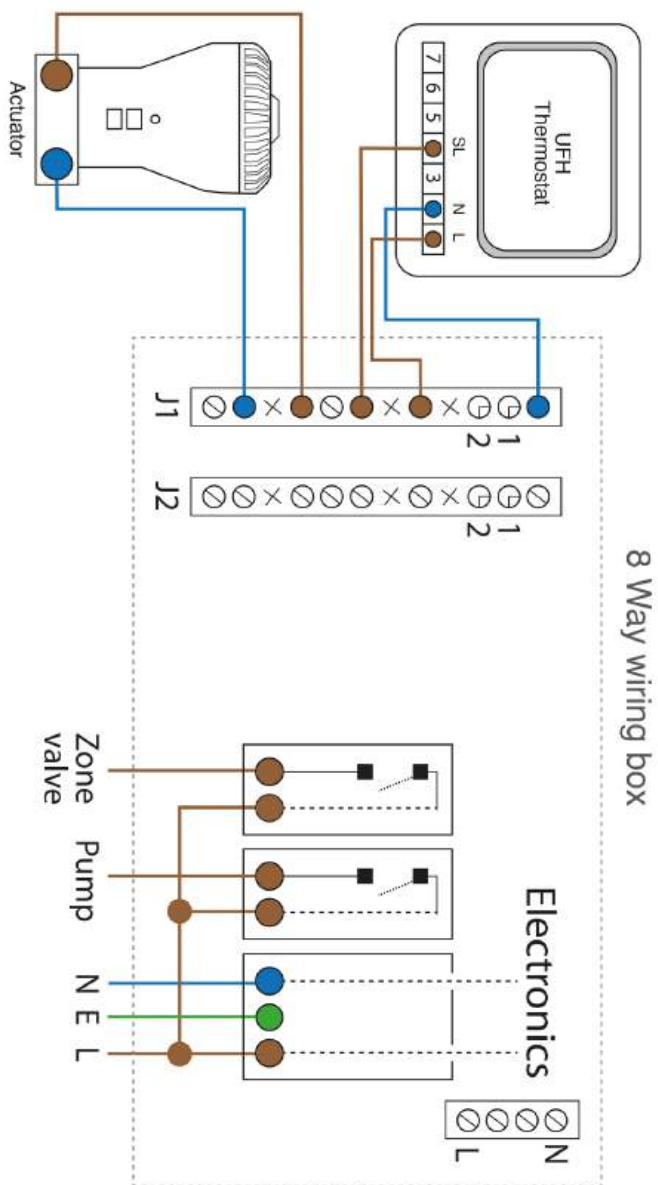
- This drawing is for **guidance** only.
- All installations should be undertaken by a qualified person only.



Schematic - Danfoss FHV-R Kit to an existing radiator system



Typical Wiring diagram for programmable thermostats



Installing Wet Room Thermostats

Unit can be used as a floor temperature sensor or an air temperature sensor.



Thermostat



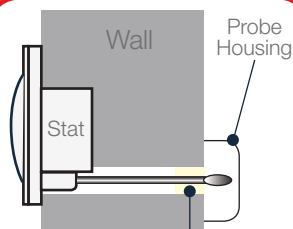
Probe



Probe Housing

Bathroom thermostat
on outside of a wet
room wall

Probe housing on inside
of a wet room wall



Ensure hole is sealed
between wall space and
probe housing so that
only the wet room air
temperature is detected

For floor temperature sensing,
place probe midway between pipe
circuit runs to monitor average floor
temperature.

For air temperature, place unit on
outside wall of wet room in desired
location at height of 1500 mm from
floor level.

Check distance between
thermostat's terminal block and

probe casing location of wet room's
interior wall is no more than 3 metres.

Do not trim probe sensor to length to
ensure the probe wire is long enough
to span the distance between the
unit's terminal block, to go through
prepared hole through wall and exit
into supplied probe housing fixed onto
interior wall of wet room at 1500 mm
from wet room floor level.

Pressure test certificate

Site details

Site name Date

Address Invoice no.

..... Floor level

..... Pipe type

..... Manifold location

..... No. of loops

Please tick the appropriate boxes

☐ Installation	☐ Re-pressurise	☐ Repair
Test method Hydraulic (Water) ☐	Period of test	Min 30 mins ☐
Test method ☐	Test pressure	Min 4 bar ☐
Sufficient room to attach pumpset (minimum 250mm required)	☐ Yes	☐ N/A
Have the loops been labelled	☐ Yes	☐ No

Description	Yes	No	Comments
System left drained	☐	☐	
System left full of water	☐	☐	
System left under pressure	☐	☐	

Signature

of tester Print name Date

If more copies required for additional manifolds visit www.uheat.co.uk or copy this page

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