Nu-Heat
UNDERFLOOR & RENEWABLES

Underfloor heating

installation manual

UNDERFLOOR HEATING
HEAT PUMPS
SOLAR THERMAL

working with you before, during & after your project

Nu-Heat Know-How

Contents

System Ref: _____

Installation manual for Nu-Heat warm water underfloor heating with Fastflo™ tubing and Optiflo control.

Used with a combination boiler, user-supplied cylinder or EnergyPro cylinder. Applicable to S-plan in new build developments and S, W and Y-plan configuration in renovations and retrofit projects.

It is a condition of the warranty that the *Commissioning Checklist* is completed and left in the *Handover Pack*, and the online *Warranty Application* is completed once the system is fully commissioned.

This set of manuals gives all the information needed to install your Nu-Heat warm water underfloor heating system. In order for the process to be achieved quickly and easily the principle of underfloor heating should be understood.

This manual should be read in conjunction with the relevant *Floor Construction* installation instructions, the *A3 System Illustration and Manifolds*, and *A3 Manifold & Zone Information* provided by the Nu-Heat designer and available in the *Handover Pack*.

System specification and electrical wiring details are supplied in the separate A3 drawings in the *Handover Pack*.

The following pages have comprehensive diagrams showing the purpose of each system component and its position in the overall scheme. Parts shown in colour are supplied by Nu-Heat and those shown in outline are generally supplied by others; for example if a traditional radiator system is fitted alongside the underfloor heating, control of the radiators is via a programmable room thermostat or timeclock with individual thermostatic radiator valves as required. These parts are not supplied by Nu-Heat.

The boiler heat requirement for your underfloor heating system is noted on the system design supplied, together with the number and lengths of tubing coils and their spacings for each individual room zone. The boiler should be chosen to match the total load for the property.

Attention to the advice given in this manual will help to ensure a trouble -free and effective installation. The requirements of the relevant British Standards, Water Bye-laws and other regulations should always be met.

If there is any aspect of the installation that you do not understand, please contact Nu-Heat Technical Support for advice quoting your system reference number.

In line with the company policy of product development, Nu-Heat reserves the right to supply different components to those shown.

Checklist

Floor heights
Check that the height of the sub-floor is correct for the depth of construction needed to incorporate the underfloor heating. This is especially important if more than one construction type or different floor finishes are used on the same floor. Information on your specific *Floor Constructions* is provided as part of the *Handover Pack*.

Timber frame buildings
Check that the sole-plate depth will accommodate the appropriate Nu-Heat floor construction. If the tubing is to be fitted from below in a suspended timber first floor, any cross-blocking (noggins) must be reduced in height by 30mm to allow the tubing to pass through and, where possible, any joist notching/service holes must be drilled before laying the deck.

Floor insulation materials for new build/renovation projects
Ground floor insulation must meet Building Regulations Part L. Advice on this should be sought from your architect, builder or local authority planning department. For floating floors Nu-Heat supplies EHDN grade polystyrene tracked to accept the heat transfer plates and Fastflo™ tubing but this is not intended to meet Part L requirements for ground floors. All other insulation materials are readily available from builders' merchants. Always read the floor construction information in the *Handover Pack* before starting the tube installation. It is the responsibility of the customer to make sure that insulation levels conform to the relevant British Standard and any other applicable building code.

Floor insulation materials for retrofit applications
Nu-Heat recommends using mineral wool for suspended timber ground floors installed from above or below.

Mains water supply
Check that the performance of the mains supply matches the requirements of the household.

Fastflo™ tubing
The number and lengths of tubing coils and their spacings and flow rates for each individual room zone are detailed on the *A3 Tube Layout* sheets.

Avoiding damage to the tubing
If it is necessary to store the tubing, keep it dry, out of direct sunlight and away from sharp objects or possible chemical spillage. Avoid any soldering near Fastflo™ tubing as overheating may result in failure. Tubing that may become frozen before or during installation or while the screed dries should have anti-freeze added and be thoroughly flushed afterwards. Do not kink the tube by over bending.

Boiler
The heat loading for your underfloor heating system is indicated on the *A3 System Illustration and Manifolds*. Please refer to the boiler manufacturer's recommendations for installing and commissioning the boiler. Check the boiler installation requirements with the manufacturer, as in some cases a by-pass valve may be recommended between flow and return pipework. Cooker-boilers may also have additional requirements; always refer to manufacturer's information. See your *A3 System Illustration and Manifolds* for advice on expansion vessel sizing.

Insulation of pipework
The sensible use of insulation is recommended on the flow and return pipework between the boiler, cylinder and Optiflo manifolds. Domestic hot water pipework should also be insulated, particularly on a pumped loop. Ensure that the incoming cold main is separated from any hot pipework to prevent heat transfer.

Taking delivery
Please check your delivery against the delivery note and report any discrepancies within 7 days of receipt.

Warranty
It is a condition of the warranty that the *Commissioning Checklist* is completed and left in the *Handover Pack*, and the online *Warranty Application* is completed once the system is fully commissioned.

Recommended installation sequence

The general sequence of installation is as shown in this manual.

Before starting check the positions of the main components such as Optiflo manifolds and pump modules as agreed at the system design stage and noted on the plans. Make sure that room dimensions and joist spacings have not changed, as this could affect the amounts of tube required. Full dimensions of the components supplied are given in this manual, and suggested positions for components can be found in the *A3 System Illustration and Manifolds* and *A3 Manifold & Zone Information*.

1 First-fix the main wiring. The positioning of the boiler, cylinder (if used), circulation pump(s), thermostats and Optiflo wiring centres should be agreed between the customer or architect, and the Nu-Heat designer. Please refer to the *A3 System Illustration and Manifolds* and *A3 Manifold & Zone Information* for exact component locations – this can only be confirmed once the initial design work is complete. Please refer to *A3 Electrical Wiring Sheet* set for detailed wiring diagrams.

Note 1: A 2-port zone valve is not needed on the UFH circuit.

Note 2: For optimal room temperature reading, install the thermostat 1.5m up the wall, out of direct sunlight and away from secondary heat sources.

2 First fix the domestic services if they are to run beneath the floor insulation or LoPro™ floor components

3 Fit the primary flow and return pipework between the boiler, cylinder (if used), circulation pump(s), and the Optiflo manifolds. Follow the *A3 System Illustration and Manifolds*. Fit the boiler and cylinder if not done earlier.

4 Fix the Optiflo manifolds and circulation pump(s) in position. See pages 10 and 13 for fixing instructions. See *A3 System Illustration and Manifolds* for locations. The manifolds are reversible to allow right- or left-handed pipe connection.

5 Fit floor insulation between ground floor joists (if specified).

6 If necessary, ensure the uniformity of the sub-floor using a self-levelling compound.

7 Lay floor insulation and acoustic layer on top of the sub-floor (if specified).

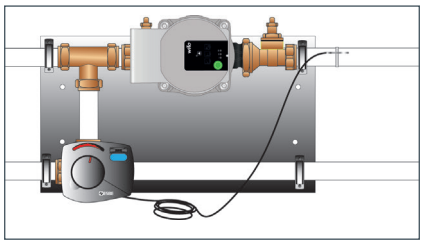
8 Install and pressure test the underfloor heating tube. If connecting to an existing heating system it is important that it is cleansed and flushed prior to filling and flushing the new UFH system.

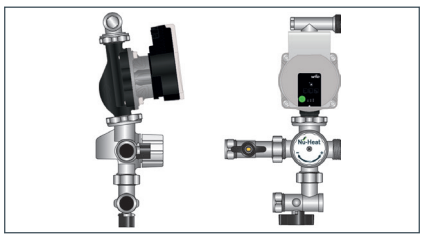
9 For LoPro™ systems, fill the castellated panel with self-levelling compound.

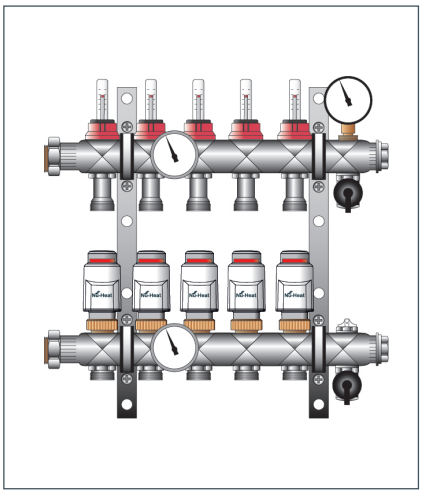
10 Fit the remaining hot and cold domestic water pipework. If an EnergyPro hot water loop has been specified, refer to the diagrams on pages 29–30 for details.

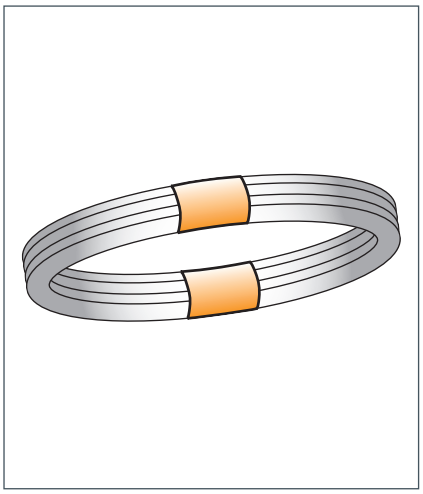
11 Commissioning can only take place after all electrical installation has been completed and checked by an electrician (see *A3 electrical wiring* sheet set).

System components









Pump module

This comprises the pump and temperature blending valve. Depending on the system design there may be **Direct Mounted Pump Modules** connected directly to the manifolds, or centrally located **Remote Mounted Pump Modules** feeding multiple manifolds, or a combination of these. Project-specific detail is contained in the *A3 System Illustration and Manifolds*.

The floor heating pump circulates the hot water from the boiler to the Optiflo manifold(s) and around the floor heating tube. The temperature blending valve mixes hot boiler water with the colder water returning from the underfloor heating to achieve the design temperature, as set on the valve head.

Both assemblies can be connected left or right handed, see pages 11–16 for further details.

Note: Nu-Heat UFH systems do NOT require a 2-port zone valve before the manifold.

Optiflo manifold

May be connected either left or right-handed

The Optiflo manifolds are fed from the **Pump and Blending Valve Module**. When hot water is required by the underfloor heating system, a valve on the manifold opens and hot water is pumped through to the tubing in the floor. The flow rate of the water is shown on a flow gauge on each port. When the air temperature of each room reaches the required level, the wall thermostat switches off its corresponding valve actuator on the manifold. Manifolds are available with up to 12 ports.

It is important to label each length of pipe correctly with its zone number and room name when it is connected to the manifold, as they must be clearly identified in order for the wiring to be successfully completed. See page 20.

10mm, 14mm and 17mm Fastflo™ floor tube

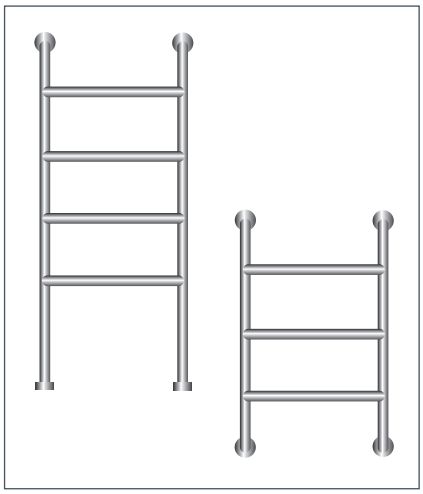
The floor heating tube is connected to the flow and return ports on the Optiflo manifold. The number of coils of tube and the spacing used in each zone are noted on the *A3 Tube Layout*. Detailed instructions on how to lay the tubing in different *Floor Constructions* are included in the *Handover Pack*.

UFH floor fixing components

Alternative methods are used to secure the Fastflo™ tubing in place on the floor. These include Cliptrack, Clippaplate™, LoPro™10, heat diffuser panels and staple clips. The tubing is held at the correct spacings to ensure the room reaches its set temperature efficiently; these spacings are detailed on the *A3 Tube Layout* drawings, and may vary from room to room.

System components will vary dependant on the type and design of the chosen system, specific details are included in the *Floor Constructions*.

Optional plumbing components



ENERGYPRO SECONDARY HOT WATER LOOP

Hot water pump and timer

The hot water pump is connected to the return of the domestic hot water loop. It has a separate timer to allow it to operate independently.

For instructions on installing the Nu-Heat EnergyPro hot water loop, please see the *Cylinder Installation Manual*.

For further details talk to our Sales Team on 01404 549770

OPTIONAL HEATED TOWEL RAILS

Heated towel rails

Heated towel rails can be installed on the hot water loop for both EnergyPro and user-supplied cylinders. This has the advantage of not having to run a separate circuit from the heating system. To prevent corrosion by the mains water, any towel rail fitted must be manufactured from rust-free material. They can operate all year round whether the heating is in use or not, as they are entirely independent of the heating system.

A comprehensive range of suitable heated towel rails is available through Nu-Heat. For further details talk to our Sales Team on 01404 549770 or visit www.towelrails.co.uk.

Alternative method of towel rail installation for retrofit underfloor heating systems

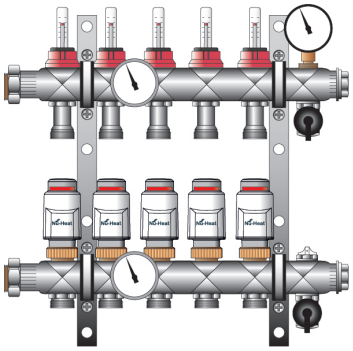
Existing system controls should be taken into consideration when adding towel rails. If an S-Plan configuration has been adopted the towel rail circuit can be installed directly onto the boiler flow and return as a separate time controlled zone. Alternatively, for W or Y-Plan configuration, heated towel rails can be added as an extension to an existing radiator circuit.

Note: **For independent zone and timed towel rail circuits the system must be changed to S-Plan.**

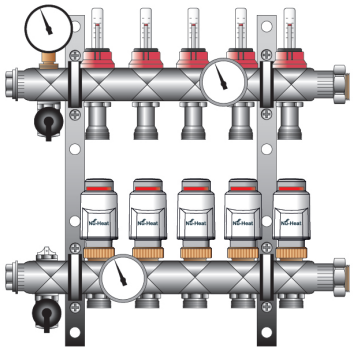
Optiflo manifolds

Optiflo manifolds are supplied boxed and ready assembled, except for the temperature gauges which must be pushed into the pocket on each manifold rail. However you may require to change the handing of the manifold, or orientate the outlets upwards.

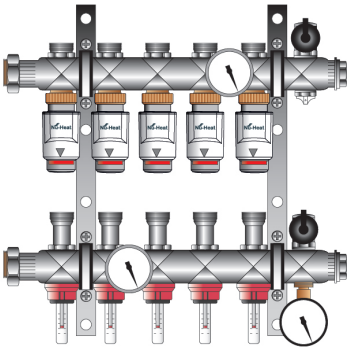
Orientate manifold to suit installation – left-handed...



Right-handed...



Upside down.



1 Unscrew the manifold-rail mounting clamps, turn the manifold to the correct orientation and re-fit the mounting clamps.

Note: The manifold brackets are designed such that one rail is offset for the pipes to pass behind it – the brackets should be orientated to take account of the direction of the pipes. The supply (flow) manifold must be the rail with the flow gauges.

2 Remove the temperature gauges (these are a press fit), unscrew the boss and the blanking screw on the reverse.

3 Refit the boss on the front of the rail and the blanking screw on the back. Refit the temperature gauges.

Important safety note: If the manifold is to be fitted upside down please contact Nu-Heat to obtain actuators with a higher IP rating.

If the manifold is to be fed from a **Direct Mounted Pump Module** then this is connected to the captive nuts using the fibre washers supplied to give a watertight seal. A proprietary sealing compound can be used in addition. With a **Direct Mounted Pump Module** the shut-off valves are connected in the flow and return pipes on the boiler side of the pump module.

If the manifold(s) are to be fed from a **Remote Mounted Pump Module** then shut-off valves should be connected directly to the captive nuts on the manifold, using the fibre washers supplied to give a watertight seal. A proprietary sealant may be used in addition to this. The other end of the valve is a 28mm compression fitting.

The threaded connection and the compression fitting should be made using either a proprietary sealing compound or PTFE tape.

Connection valves and fittings are supplied in a separate kit.

Note: Nu-Heat UFH systems do NOT require a 2-port zone valve before the manifold.

Optiflo manifolds continued

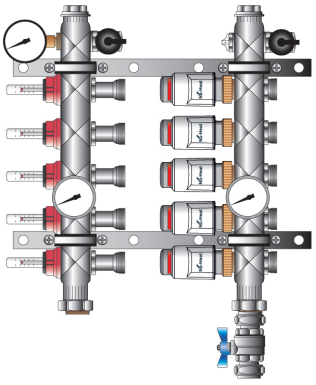
Positioning

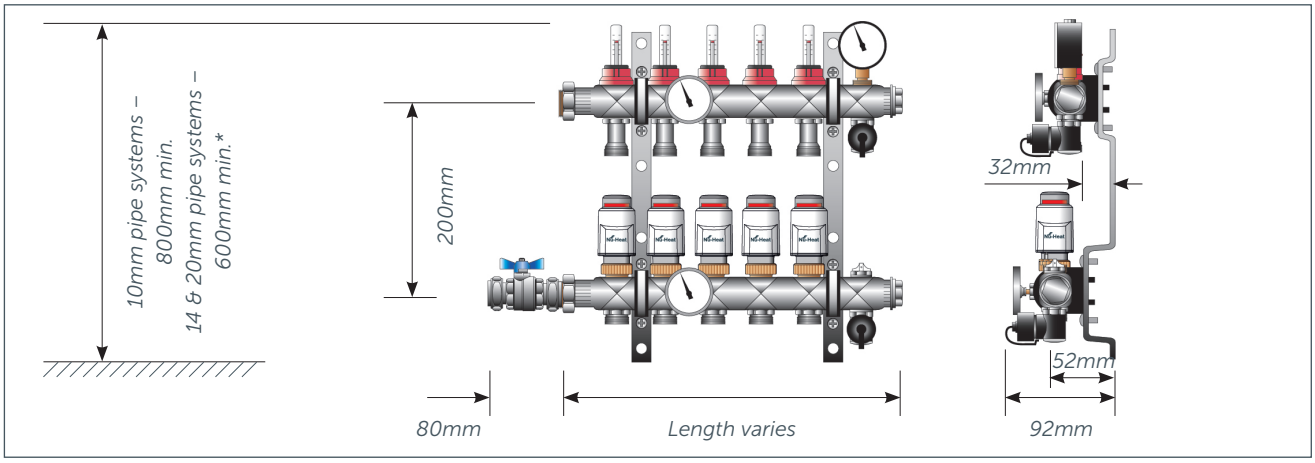
Place manifolds where they are easily accessible, as settings may need to be changed. The size of manifolds varies depending on the number of room zones being connected and the cupboard or casing needs to be big enough to cater for this. See the *A3 System Information and Manifolds* for location details.

Installation

1 Screw the manifold assembly firmly to the wall by the fixing brackets. Position top of bracket a minimum of 600mm from floor.

Note: If necessary, remove the lower manifold to make access easier when fitting the pipe to the upper manifold. Where the manifold is fitted at 90˚ with vertical rails, pipe connection points should be positioned at the bottom.



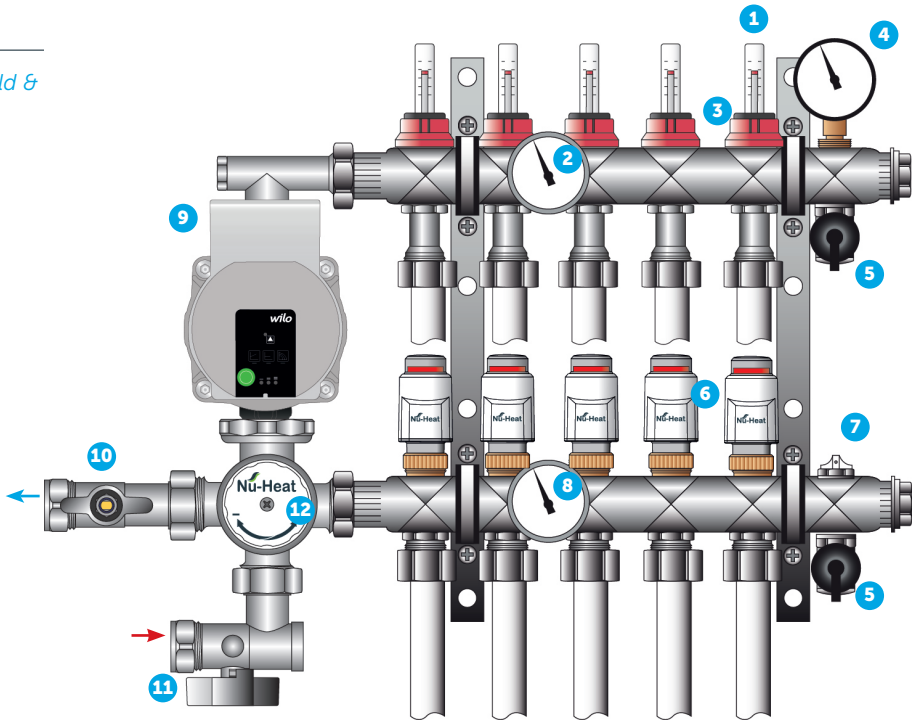


*Please inform your designer if the manifold is to be placed higher than the figures stated, as this will affect tube lengths.

NUMBER OF PORTS	1	2	3	4	5	6	7	8	9	10	11	12
LENGTH IN MM (excluding pump)	160	212	242	292	342	392	442	492	542	592	642	692

MANIFOLD COMPONENTS

1. Flow gauges (see the *A3 manifold & zone information*)
2. Flow temperature gauge
3. Flow adjustment
4. Pressure gauge
5. Filling/drain off valve
6. Actuators
7. Manual air vent
8. Return temperature gauge
9. Floor heating pump *(direct mounted)*
10. Main isolating valve *(return)*
11. Main isolating valve *(flow)*
12. Temperature blending valve



Note: For remote mounted pumps, see page 13.

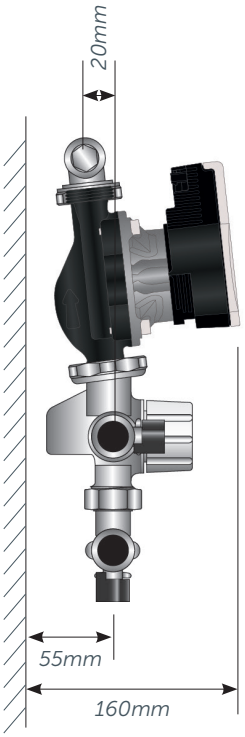
Direct mounted pump modules

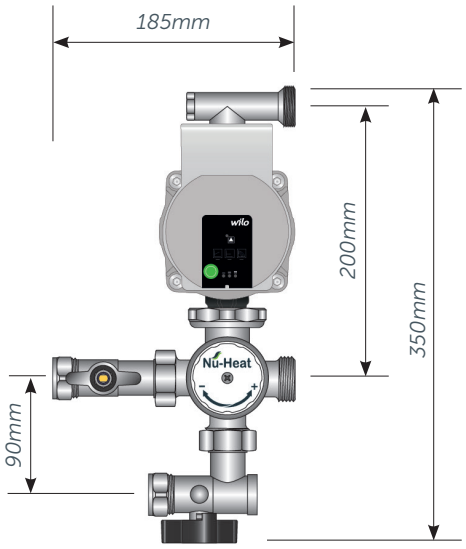
Depending on the design of the system there may be *Direct Mounted Pump Modules* connected directly to the manifolds or a centrally located *Remote Mounted Pump Module* feeding multiple manifolds, or a combination of these.

Refer to the *A3 System Illustration and Manifolds* for system specific information.

The **Direct Mounted Pump Module** connects straight onto the manifold. Refer to the *A3 System Information* for manifold and pump module positions.

Note: Nu-Heat UFH systems do NOT require a 2-port zone valve before the manifold.

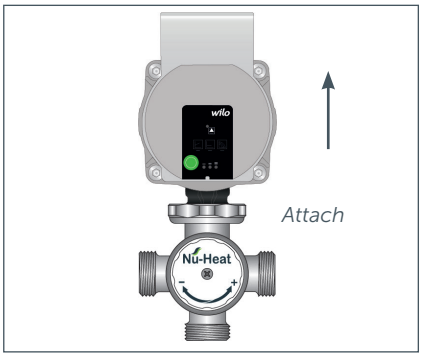




ASSEMBLING THE PUMP MODULE (left- or right-handed)

The pump module is supplied unassembled. The first steps in the assembly of the pump module are independent of manifold orientation.

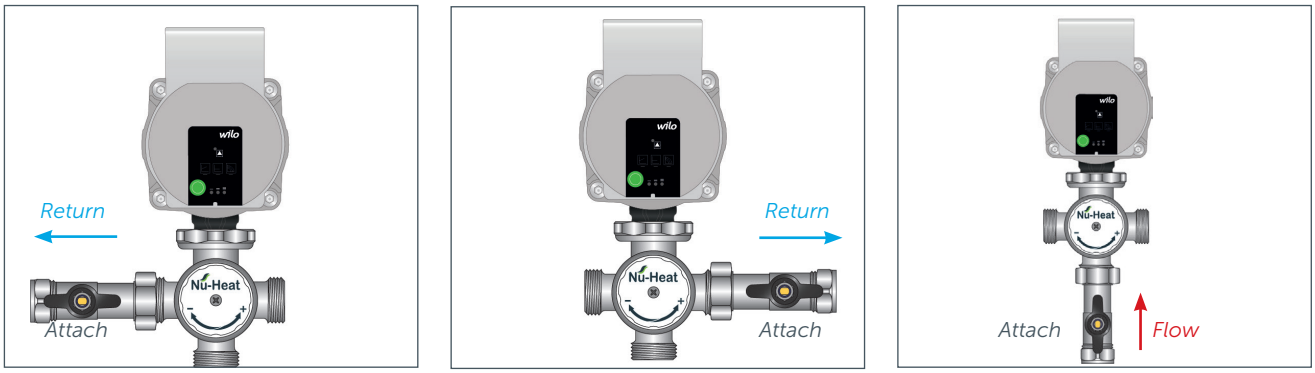
1. Remove the pump from the packaging and note the direction of flow, indicated by an arrow on the cast body of the pump.
2. Attach the temperature blending valve to the input of the circulation pump using the valve's integral captive nut and the rubber washer supplied.



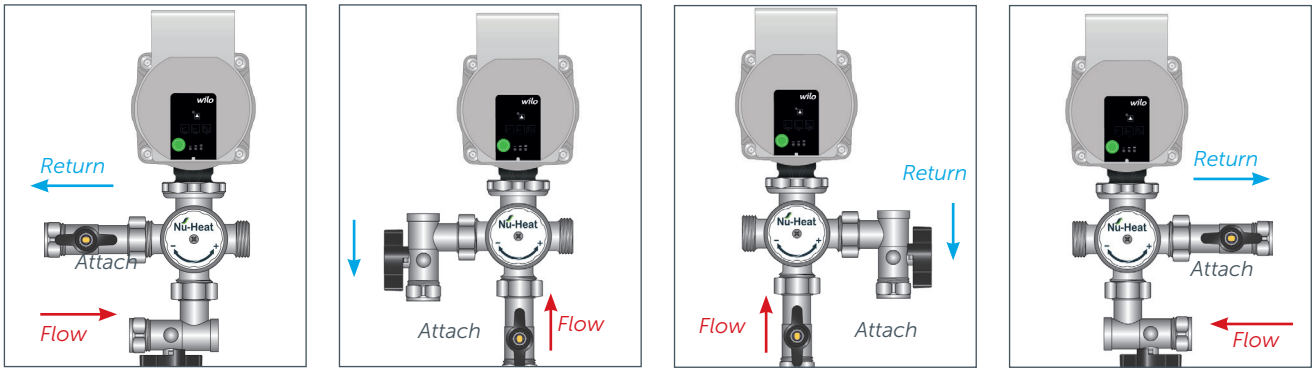
Direct mounted pump modules continued

To assemble the pump module for connection to the left- or the right-hand side of the manifold:

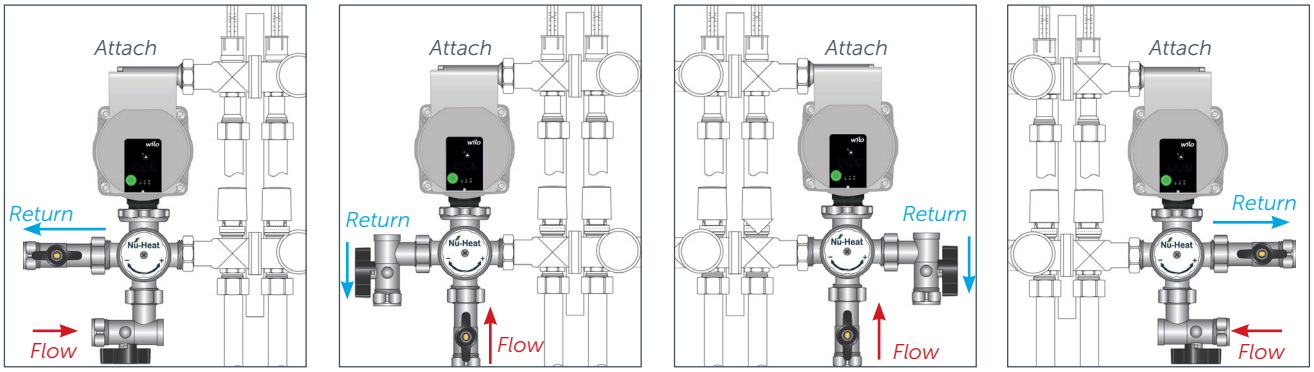
Alternative connection options for pipework



3 Take the straight isolating valve and attach to the left-hand side, right-hand side or bottom of the blending valve as required.



4 Attach the other isolating valve to the bottom of the temperature blending valve using the attached captive nut and rubber washer provided. The two valves must be pointing in the same direction.



5 Take the elbowed pump connector and attach this to the top of the pump with the free end pointing in the opposite direction to the isolating valves.

The orientation of the pump head can be changed to give more space for working at the manifold if required.

When attaching the manifold to the pump module make sure that the supplied washers are fitted. A proprietary sealant may be used in addition to this.

The isolation valves terminate in 22mm compression fittings to connect the flow and return pipes from the heat source.

Remote mounted pump and UFH blending valve

Installation and operation of Nu-Heat's PM range of pump and motorized water temperature control blending valve assemblies

Nu-Heat's PM range of pump and motorized blending valve assemblies are supplied to suit the size and heat loss of the project. The assembly provides temperature- controlled heating water from the boiler to each remote UFH manifold.

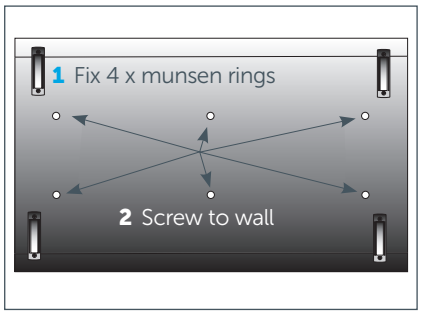
The UFH design flow temperature is calculated using the heatloss of the building, the chosen floor construction and the final floor finish. The blending valve must be set to the flow temperature shown on the *A3 Manifold & Zone Information* sheet supplied in the *Handover Pack*.

The **Remote Mounted Pump & Blending Valve Module** is fitted in a different location to the manifold(s). Refer to the *A3 System Illustration and Manifolds* for manifold and pump module positions.

For flexibility when positioning in a boiler/plant room, Nu-Heat's commercial PM4, PM5 and PM6 modules are supplied without the backplate and should be mounted using suitable munsen rings on a fixing rail/unistrut.

Assembly and mounting instructions for PM2 & PM3 modules

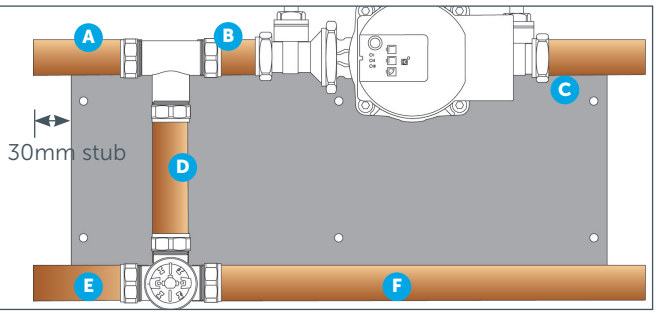
Fitting the backplate



Copper pipe cutting chart

Pipe lengths

- A = 85mm
- B = 55mm
- C = 82mm
- D = 145mm
- E = 90mm
- F = 355mm



The **Remote Mounted Pump & Valve Module** should be screwed to the wall using the holes provided in the backplate.

1. Fix the four munsen rings to the backplate using the top and bottom outer holes.
2. Fix the backplate to the wall using 6 x M6" screws.

To assemble:

3. Cut six lengths of copper pipe as per diagram above.

Note: pipe lengths A, C, E and F can be cut to suit site conditions and reduce the number of straight joiners if preferred.

4. Fix pump valves to pump and make sure it is open.
5. Fix pipe B in place as shown.
6. Fit 28mm compression T.
7. Fit pipes A , C and D (pipe lengths A and C can be cut to suit as required).
8. Fit blending valve T.
9. Fit pipes E and F (lengths can be cut to suit as required).
10. Refer to *Filling and Flushing* procedure on page 23.

Recommended pipe sizing to and from the pump module is given on the *A3 System Illustration and Manifolds*.

Default pump and mixing valve assembly

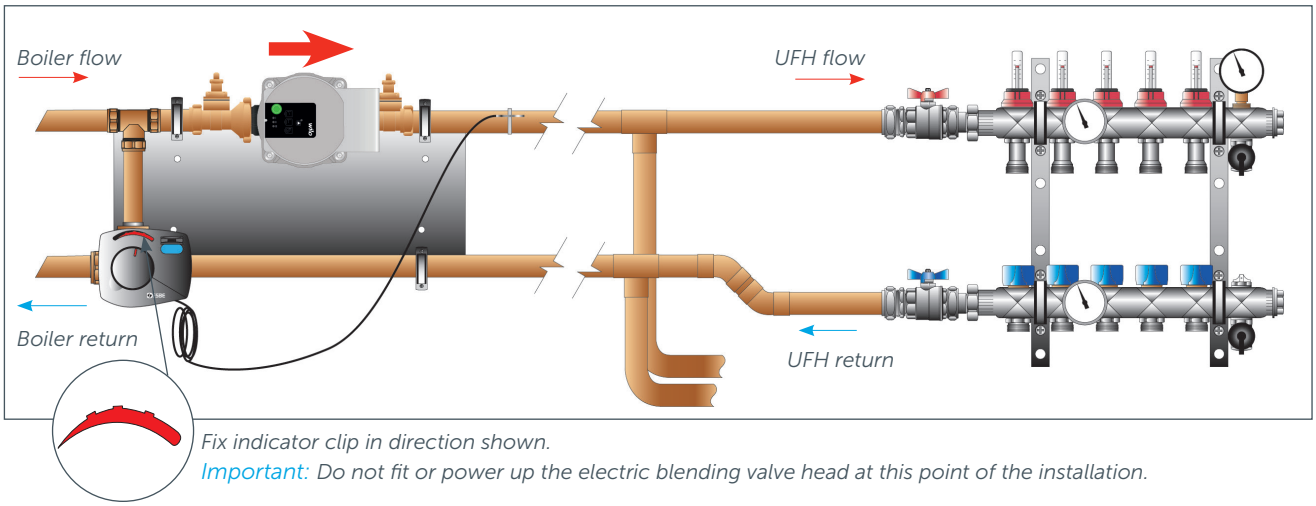
For PM2, PM3, PM4, PM5 & PM6 pump and blending valve modules

UFH MANIFOLD FITTED TO RIGHT OF PUMP & BLENDING VALVE ASSEMBLY

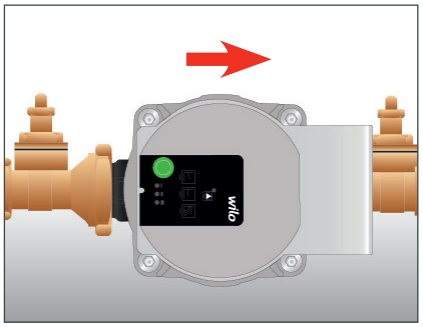
To reduce wear and increase service life, the Wilo Yonos PARA must be positioned so that the shaft is horizontal. The electrical control box can be mounted in any position but does not need to be changed from its default position unless necessary for easier access on site.

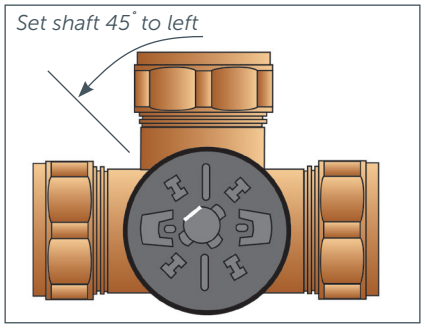
Install the pump with the power switched off. Arrows on the pump housing indicate the direction of the flow.

UFH manifold on right of pump assembly



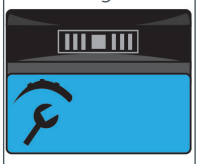
Fix indicator clip in direction shown.
Important: Do not fit or power up the electric blending valve head at this point of the installation.





Indicates flat face of valve shaft

Commissioning stage



Indicates correct direction of actuator head

Pump head position does not change

The pump head will remain in its default position.

Adjust the flat face of the shaft on the blending valve to the position shown

Use the plastic knob provided to turn the valve position such that the flat face with the arrow faces at **45° to the left** (see diagram). The shaft must be set to the correct position prior to fixing the electric actuator motor.

The flat face of the valve shaft is denoted by an arrow.

The direction of the electric valve actuator must be set to the direction shown above (see page 17 for instructions). The default setting for the electric actuator is set as above in the factory but this should be checked at the commissioning stage. **Do not for or power up the electrical actuator at this stage.**

Incorrect setting of the actuator direction will result in uncontrolled UFH temperature and valve port positioning.

For commissioning of the blending valve please refer to page 18.

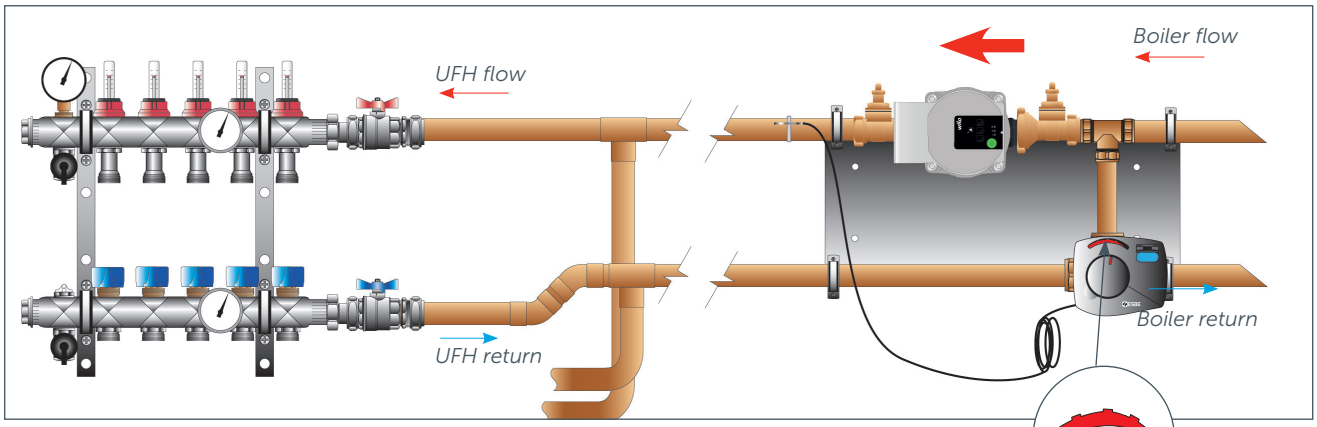
Changing the orientation of the pump and blending valve

UFH MANIFOLD FITTED TO LEFT OF PUMP & BLENDING VALVE ASSEMBLY

To reduce wear and increase service life, the Wilo Yonos PARA must be positioned so that the shaft is horizontal. The electrical control box can be mounted in any position but does not need to be changed from its default position unless necessary for easier access on site.

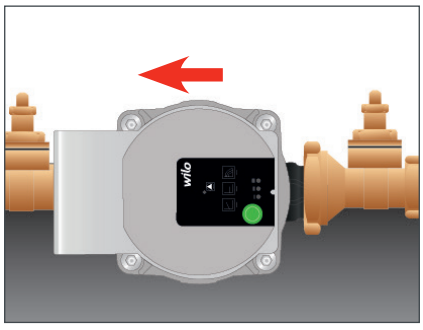
Install the pump with the power switched off. Arrows on the pump housing indicate the direction of the flow.

UFH manifold on left of pump assembly



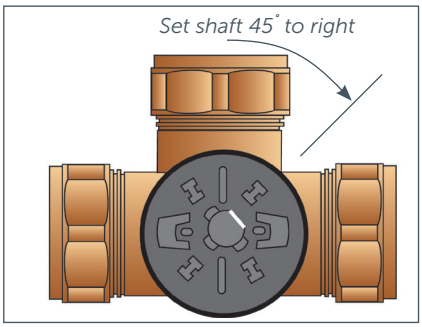
Fix indicator clip in direction shown.

Important: Do not fit or power up the electric blending valve head at this point of the installation.



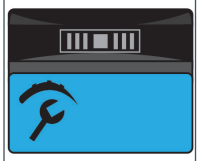
Pump head position does not change

The pump head will remain in its default position.



Indicates flat face of valve shaft

Commissioning stage



Indicates correct direction of actuator head

Adjust the flat face of the shaft on the blending valve to the position shown

Use the plastic knob provided to turn the valve position such that the flat face with the arrow faces at **45° to the right** (see diagram). The shaft must be set to the correct position prior to fixing the electric actuator motor.

The flat face of the valve shaft is denoted by an arrow.

The direction of the electric valve actuator must be changed to the direction shown above (see page 17 for instructions).

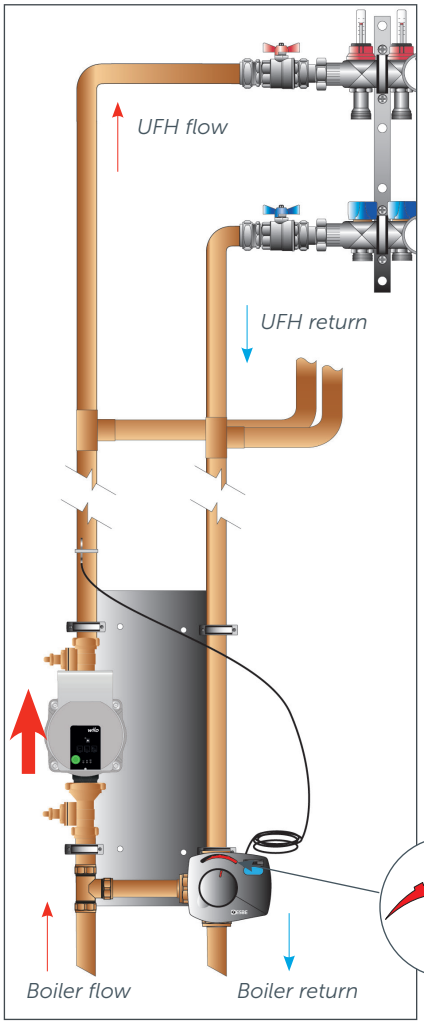
Incorrect setting of the actuator direction will result in uncontrolled UFH temperature and valve port positioning. **Do not for or power up the electrical actuator at this stage.**

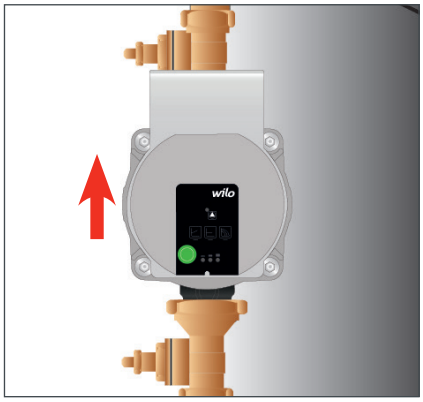
For commissioning of the blending valve please refer to page 18.

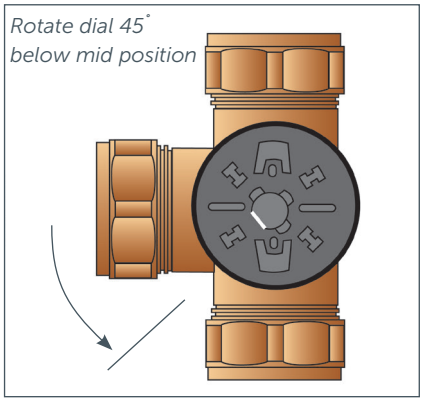
UFH MANIFOLD FITTED ABOVE PUMP & BLENDING VALVE ASSEMBLY

Vertical orientation

The module can be fitted in a vertical orientation but **the pump must always pump upwards**.







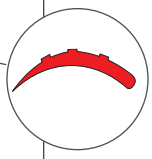
Use the plastic knob provided to turn the valve position such that the flat face with the arrow faces at **45° below the mid position** (see diagram). The shaft must be set to the correct position prior to fixing the electric actuator motor.

The flat face of the valve shaft is denoted by an arrow.

The direction of the electric valve actuator must be set to the direction shown above (see page 17 for instructions). The default setting for the electric actuator is set as above in the factory but this should be checked at the commissioning stage. **Do not for or power up the electrical actuator at this stage.**

Incorrect setting of the actuator direction will result in uncontrolled UFH temperature and valve port positioning.

For commissioning of the blending valve please refer to page 18.

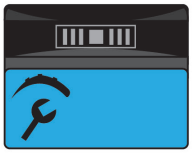


Fix indicator clip in direction shown.

Important: Do not fit or power up the electric blending valve head at this point of the installation.

Indicates flat face of valve shaft

Commissioning stage



Indicates correct direction of actuator head

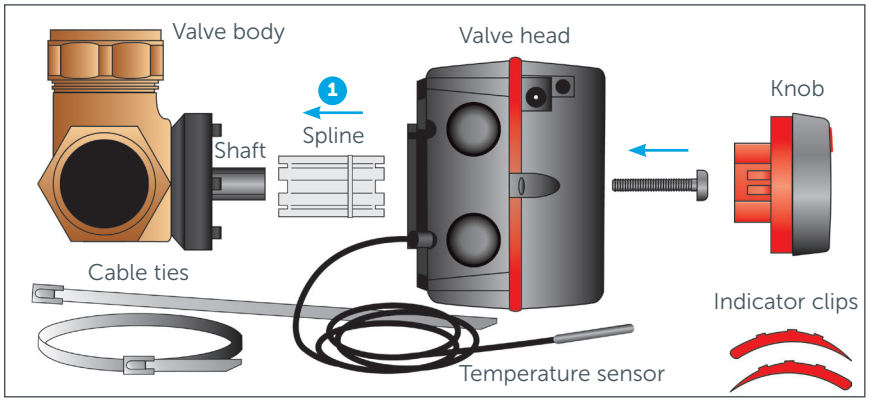
Pump head position does not change

The pump head will remain in its default position.

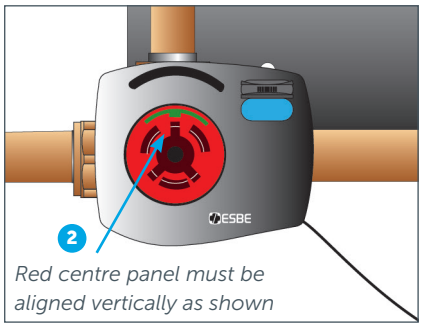
Attaching the valve actuator motor

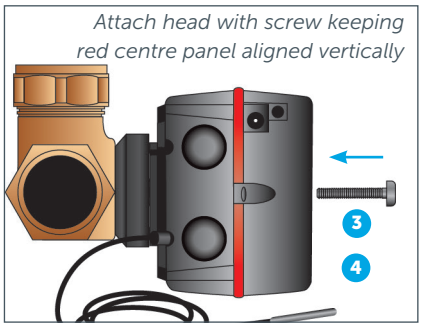
TO ATTACH THE ACTUATOR MOTOR

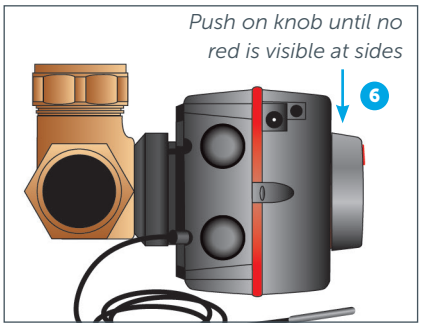
Important: Ensure the valve shaft is in the correct position before attaching the valve actuator motor (see pages 14–16). **Do not power up the valve actuator head until it has been fitted to the valve body as described below or recalibration will be required.**



Note: Two versions of the red indicator clip are supplied to indicate whether the valve is fully open or fully closed to the boiler flow.







1. Fit the spline onto the centre shaft making sure you align the groove on the spline with the flat face of the shaft.
2. The red centre panel of the valve head must be pointing to the top of the valve as shown above – exactly 12 o'clock (ignore the green tab).
3. Align the head to ensure it engages properly with the spline and the display reads from left to right.
4. Use the screw provided to connect the valve actuating motor and spline to the valve body – **make sure the red centre panel remains pointing directly to the top of the valve head**.
5. Insert indicator clip to match the direction of flow for your installation (see pages 14–16).

6. Push-fit the knob with its red line pointing to the top of the valve head. It can only be fitted in one orientation. The knob must be pushed on fully, so that none of the red plastic is visible at the sides.
7. Fit the temperature sensor to the UFH flow pipe using the cable ties provided.

VALVE ELECTRICAL CONNECTION

Important: **Do not put power into the blending valve head unless it is connected to the valve body as described above.**

The valve actuator motor is supplied with a standard 3-pin transformer with 1m of cable that should be plugged into a nearby socket. When switched on, the LED display will be visible in the window and the actuator head will be operational.

If the head has been powered up whilst not connected to the valve it must be reset and re-fitted as described on page 19. Failure to reset the valve will give incorrect operation of the blending valve and flow temperature regulation to the UFH system.

Commissioning – Setting the direction and UFH flow temperature on the valve actuating motor

Factory pre-set default settings:

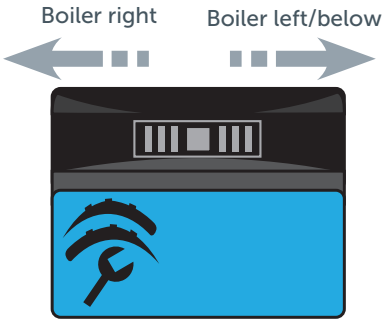
- Direction of increasing temperature = clockwise
- Min/Max temp. settings = 30–60 °C
- Factory pre-set temperature = 55 °C

Indicator clip

SETTING & ALTERING THE DIRECTION OF THE VALVE ACTUATING MOTOR

Refer to your chosen valve position for correct choice of direction icon (p. 14–16).

1. Plug in the Esbe 3-pin plug and switch on at the socket.
2. Take hold of the other end of the lead but do not insert it into the valve head yet.
3. Press and hold the button at the top of the valve head display left or right in the opposite direction of the boiler (right if the boiler is below).
4. Now insert the lead into the valve head whilst continuing to hold down the display button. It will power up.
5. Let go of the button. The valve should now be set in the correct direction.



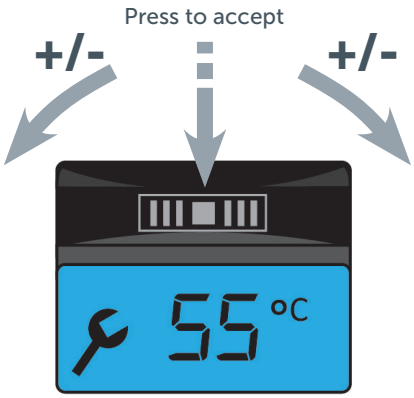
Press left or right in the opposite direction of boiler and hold down

SETTING THE UFH FLOW TEMPERATURE ON THE VALVE ACTUATING MOTOR (factory default = 55 °C)

IMPORTANT: when commissioning, the flow temperature must be set to 30 °C for the first 72 hours, then set to the UFH design temperature.

To set the system design flow temperature as indicated on the *A3 Manifold & Zone Information* sheet:

1. Push the button above the illuminated display in and across to the right to scroll to the temperature menu.
2. Adjust the temperature to match the setting indicated on the *A3 Manifold & Zone Information* sheet by pushing the button to the left or right.
3. Press the button again to confirm the change.



Note: Do not put power into the valve actuating motor unless it is connected to the body and the valve position is in the correct position to suit your installation.

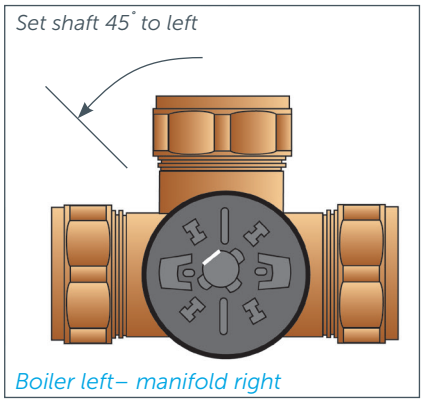
Recalibrating the Esbe valve

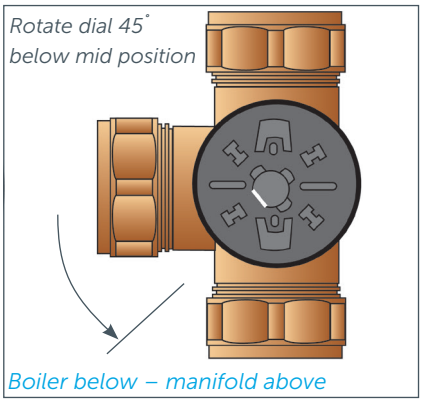
Orientating the shaft on the blending valve and recalibrating the electric actuator head to achieve correct operation.

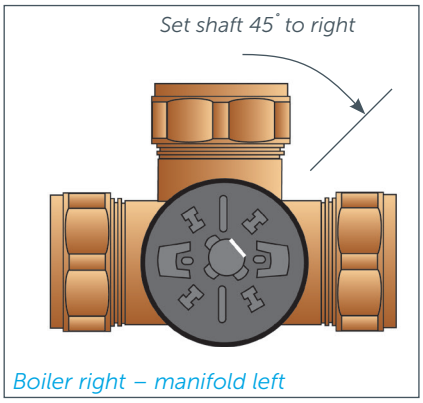
If power has been put into the blending valve actuator head when it was not connected to the valve body or the orientation has been set up in the wrong direction, the blending valve must be recalibrated.

To recalibrate the blending valve:

1 Remove the valve actuator head and spline.

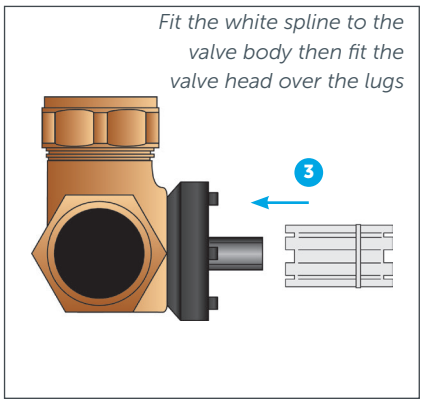


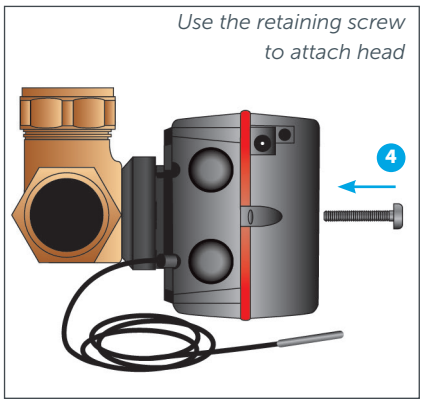


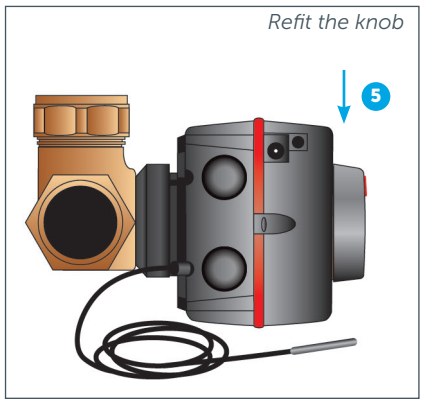


2 Determine orientation of valve (see pages 14, 15 and 16) and set valve shaft to the mid position to suit the orientation.

3 With the valve actuator head removed from the valve body, partially insert the position dial (do not insert all of the way). The knob should be 5mm off the valve head with its red ring showing – this is the manual override mode. In this manual mode, move the dial to the 12 o'clock position.







4 Fit the white spline coupling to the valve body and fit the valve actuator head over the lugs, be careful not to move the valve shaft or the knob from the mid position

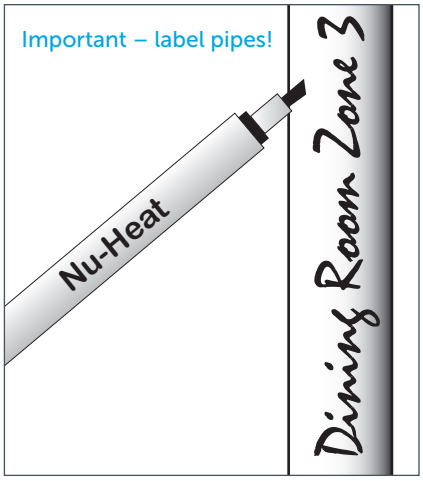
5 With the valve head located on the four retaining lugs of the valve body, remove the knob and fit the retaining screw.

6 Refit the knob. The valve position can now be aligned with the valve body motor by turning the knob clockwise or anti-clockwise with a slight downward force.

When the knob's position and valve head coincide the knob will drop down and no red ring will be apparent.

7 Follow the instructions on page 18.

Connecting to the Optiflo Manifold

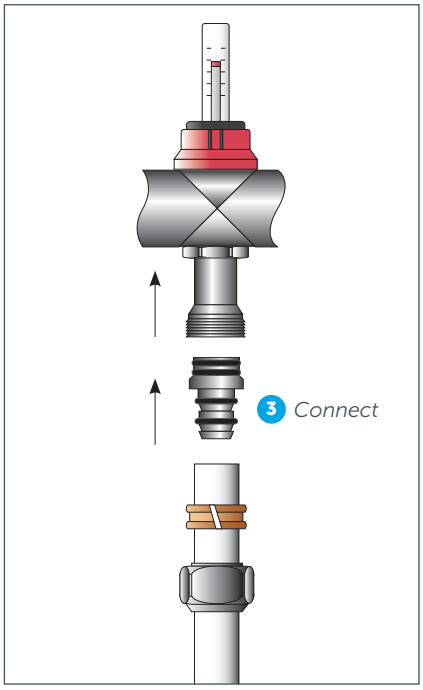


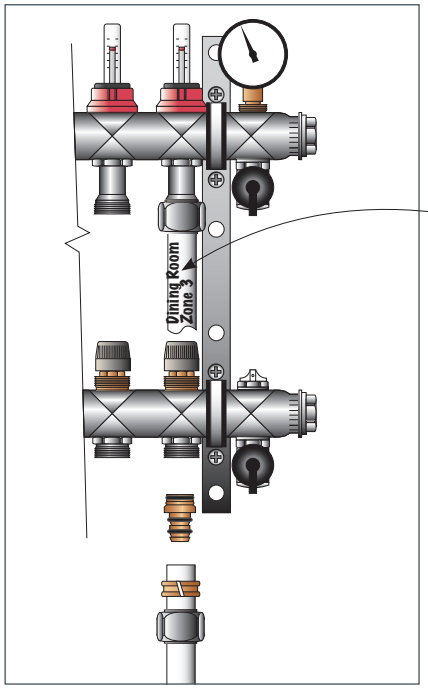
Notes:
Important: It is critical to clearly mark each pipe with its correct zone number and room name with the marker pen provided. The electrician will need this information to wire the system correctly. See the *A3 Manifold & Zone Information* for more information.

Guide curves are supplied to aid the transition of the pipe from the manifold to the floor.

Connecting 14mm and 17mm Fastflo™ to Optiflo Manifolds

Pipe is connected to the manifold using eurokonus fittings.





1 Connect the flow pipe to the ports on the upper manifold with the fittings supplied – the lower manifold may be removed to make this easier.

It is important to make sure that the pipe is securely located. To check that the fitting has grasped properly, pull on the pipe.

2 Re-attach the lower manifold to the fixing brackets (if removed).

3 Connect the return pipe to the correct ports in the same way.

Note: For systems using only plastic pipe, if this is to be routed through a stud wall then a metallic tape should be located along the same route to make the pipe traceable. The tape is best attached to the wall behind the pipe, rather than to the pipe itself, as some adhesives affect the material properties of the pipe.

Connecting 10mm Fastflo™ to Optiflo Manifolds

LoPro™Max & LoPro™10 systems.

There are two ways of connecting Fastflo™ to the Optiflo manifold:

- A single pipe per port, connected directly using a 10mm 'eurokonus' fitting,

  Or

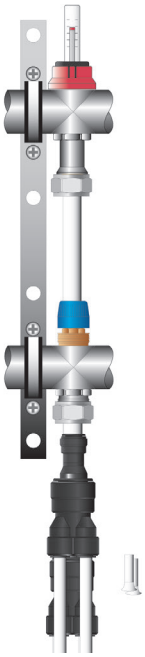
- Up to four pipes per port, connected to port splitters.

Details of port allocation can be found on the *A3 Manifold & Zone Information*. Each zone may consist of either a single pipe connection, up to four pipes connected to a port splitter, or a combination of these.

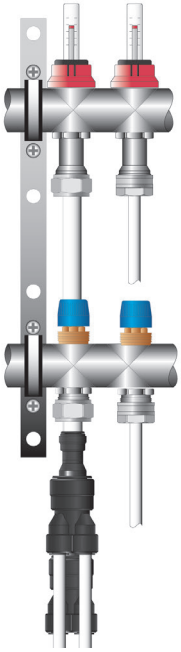
Note: Pipe inserts are not required for 10mm systems.

Zone with 1 pipe

Zone with 2-4 pipes



Zone with 5 pipes



Port splitters are supplied for assembly on site. There are two lengths; the longer for the flow manifold, and the shorter for the return manifold.

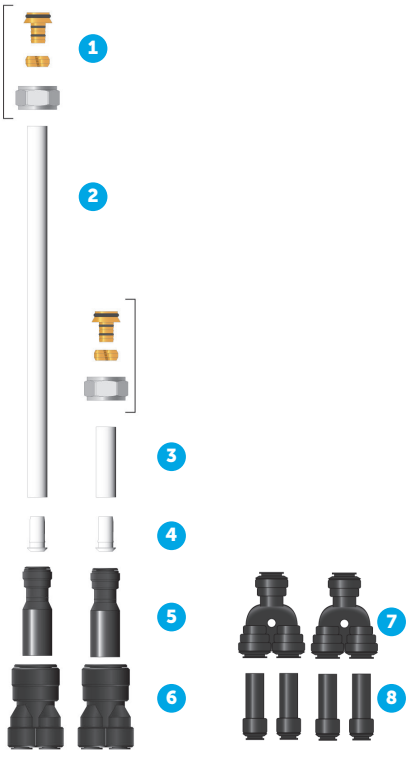
Multiple pipes per port, using a port splitter

Each port splitter consists of a larger 'eurokonus' fitting for the manifold, and a 4-way or 2-way 10mm connector.

Refer to the *A3 Manifold & Zone Information* for details of which ports require a port splitter.

PORT SPLITTER ASSEMBLIES PS4/10-A & PS2/10-A

1. 15mm eurokonus fitting
2. 15mm pipe 280mm long
3. 15mm pipe 53mm long
4. 15mm pipe insert
5. 22mm x 15mm adaptor
6. Port splitter (4-way) 22mm x 10mm — PS4/10-A
7. Port splitter (2-way) 15mm x 15mm
8. 15mm x 10mm adaptor — PS2/10-A



Multiple 10mm pipes per port, using a port splitter

1 Connect the splitter with the longer connection to the flow (top) manifold port, and the shorter one to the return manifold port.

Note: **the 'eurokonus' nut must be done up tightly in order to create a proper seal and grip the pipe.**

2 The pipe must be cut squarely, and must be free from scratches and blemishes on the outside. The seal is made by an 'o'-ring on the outside of the pipe; any defect may cause water to leak by.

3 The Fastflo™ pipe is then pushed into the ports of the splitter. It is essential to make sure that the pipe is fully inserted into the connection; you will feel the pipe push past the grab ring and meet the 'o'-ring. The pipe must be pushed past the 'o'-ring, up to the stop.

Note: **Always use pipe cutters to cut the pipe, never use a hacksaw.**

Inserts are not required with Fastflo™ pipe.

Silicon lubricant may be used on the pipe, but is not necessary. Petroleum based lubricants must not be used.

4 Care must be taken when connecting pipes to ensure that the flow end of the pipe connects to the flow manifold, and the return end connects to the return manifold – if both ends are connected to the same port the tube will be unheated.

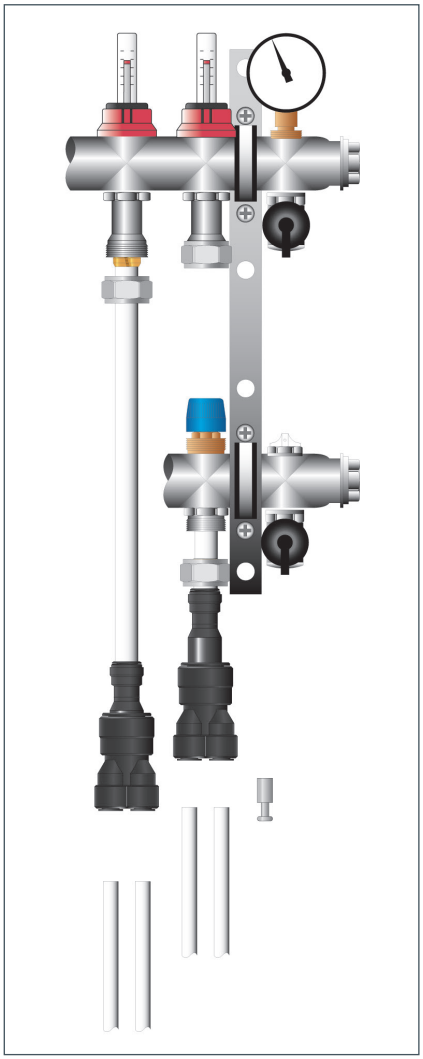
5 Any unused connections will require a blanking plug to be fitted. This inserts in the same way as the pipe.

6 If it is necessary to remove a pipe from the splitter, there is a collar around the pipe where it meets the fitting, which must be pushed in towards the fitting, thereby releasing the grab ring, and the pipe can be pulled out.

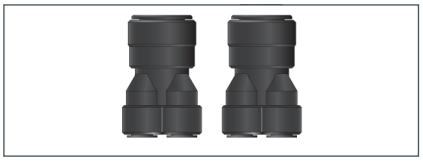
Before refitting, make sure that the pipe surface is free from scratches.

Important: It is critical to clearly mark each pipe with its correct zone number and room name on the pipe with the marker pen provided. The electrician will need this information to wire the system correctly. See the *A3 Manifold & Zone Information* for more information.

Guide curves are supplied to aid the transition of the pipe from the manifold to the floor.



2 x 2-port splitters



2 x 4-port splitters

Floor installation details

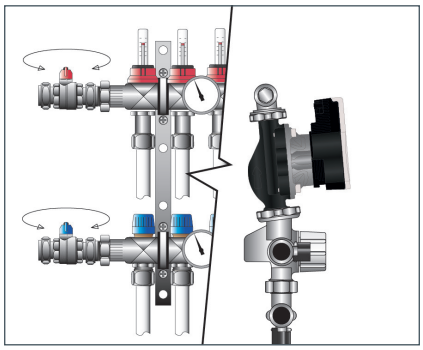
For installation details referring to the specific floor types and underfloor heating tube layouts within your property, please refer to the *A3 Tube Layouts* and *Floor Constructions* supplied in the *Handover Pack*.

Filling, flushing and pressure testing room zones

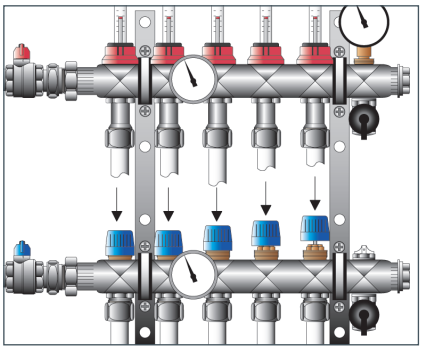
Zones must be pressure tested prior to screeding or covering the tube. Follow the full procedure for each zone and for each manifold assembly.

Note: Any unused ports on the Optiflo manifold can be isolated for future use by using the blue cap to close the return and then screwing down the flow adjustment on the supply manifold.

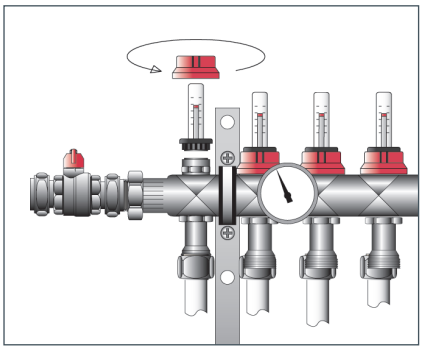
Filling, flushing and pressure testing



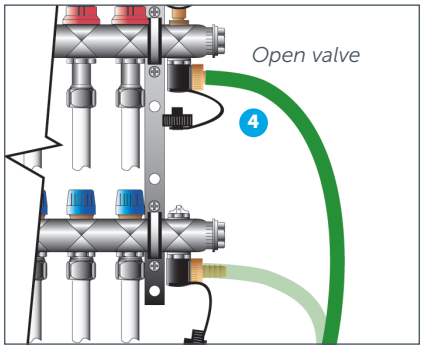
1 Close the isolating ball valves that are either connected directly to the manifold, or connected just before the **Direct Mounted Pump Module**.



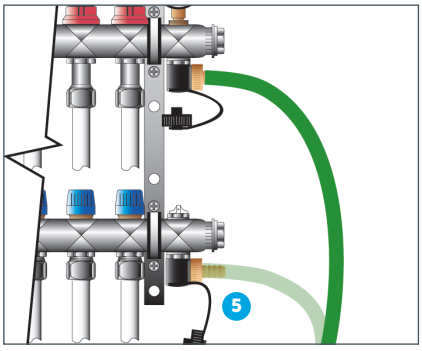
2 Isolate all zones by screwing down all the blue protection caps hand tight.



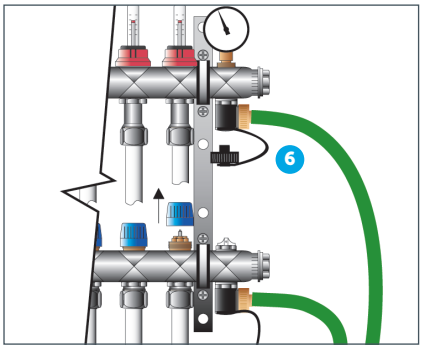
3 Fully open all the flow adjusters on the supply (top) manifold by lifting and inverting the red locking collar which may then be used to turn the black collar fully anti-clockwise.



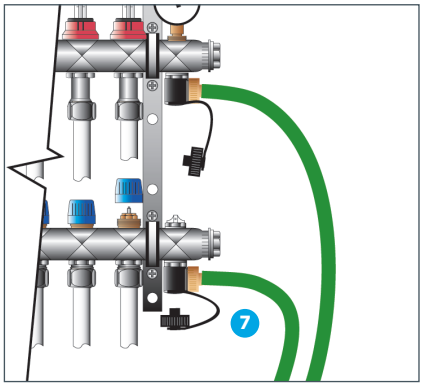
4 Remove the blanking cap from the filling valve on the flow (upper) manifold. Fit the hose connection nozzle (from the *Tools and Accessories Pack*), and connect a suitable hose from the mains water supply. Open the filling valve using the key on the blanking cap.



5 Similarly fix a suitable hose to the drain valve on the return (lower) manifold.

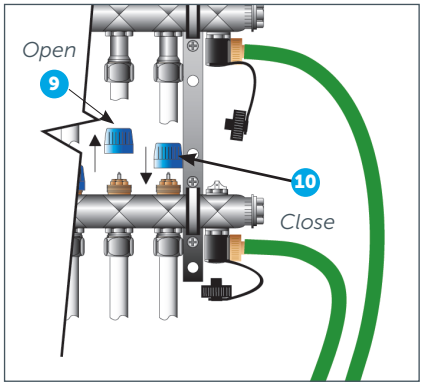


6 Fully loosen the protection cap from the first zone to be filled.



7 Open the tap on the mains water supply and open the drain valve on the return (lower) manifold using the key on the blanking cap.

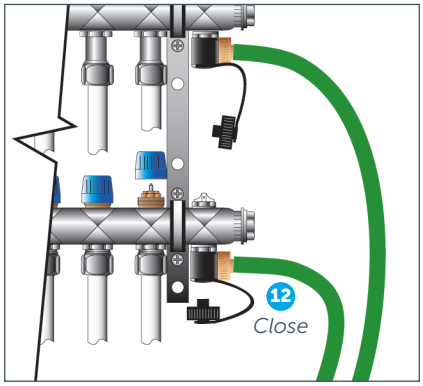
8 Run the water until all air is expelled from the pipe. This will take approx. 5 minutes.



Tip: **If the outflow is run into a bucket then air bubbles will be detectable.**

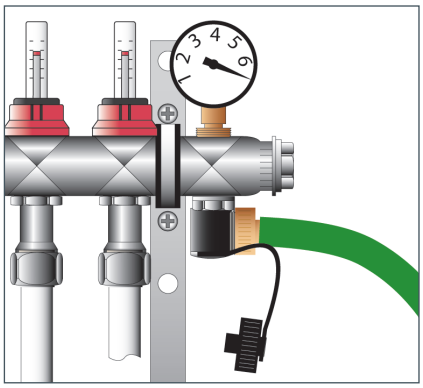
9 Open the next zone.

10 Close the flushed zone.



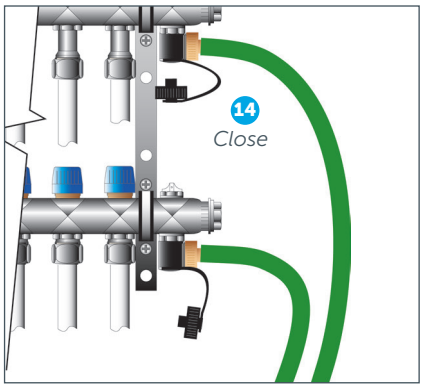
11 Repeat steps 8 to 10 for all zones on each manifold.

12 Close the drain valve on the return (lower) manifold. Unscrew all the blue protection caps.



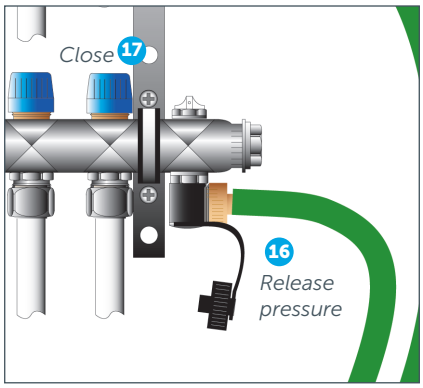
13 Allow the pressure to rise to a maximum of 3 bar.

Note: **Do not pressure test the system over 6 Bar.**



14 When the correct pressure is reached, close the filling valve.

15 All zones are now fully pressurised and should be left for at least 8 hours. Due to expansion and air temperature variations, a pressure drop of up to approximately 0.5 bar may occur. If greater pressure drops are experienced, thoroughly check all pipes and joints for evidence of water loss. If none is found, there may still be air in the system and the filling and flushing procedure should be repeated.



16 After testing, reduce the pressure to 1 bar-static by releasing the water from the drain valve on the return (lower) manifold.

Note: **The floor heating tube must be left under pressure whilst floors are screeded or completed. 1 bar is sufficient.**

17 Close the blue protection caps to prevent air getting in to the system.

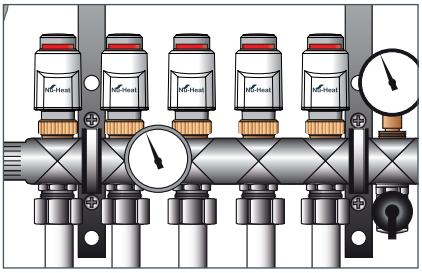
Filling the boiler and heating system pipework

Pump module mounted on manifold

Filling the boiler

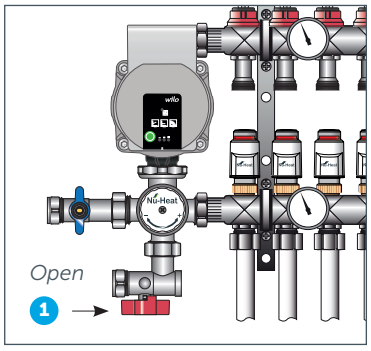
Fill the boiler via the boiler filling loop whilst venting the system and following the boiler manufacturer's instructions. The system should be cleansed and flushed in accordance with BS7593:1992 to remove all flux residue and other debris. If connecting to an existing heating system it is important that this is cleansed and flushed to the same standard.

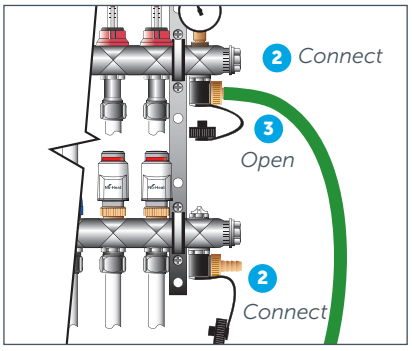
Important: remember to add inhibitor to the system when filling.

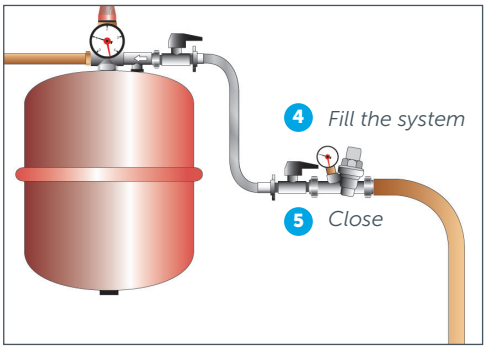


At this stage the blue protection caps can be replaced with actuator heads on each manifold port.

Filling the heating system pipework with a direct mounted pump module







At the first manifold:

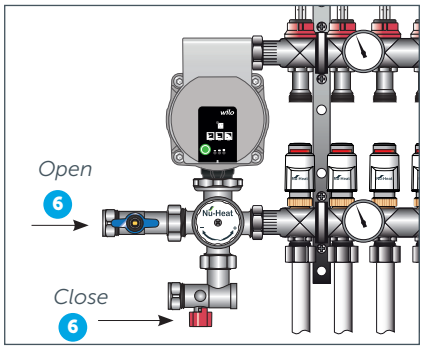
1 Open the flow isolation valve.

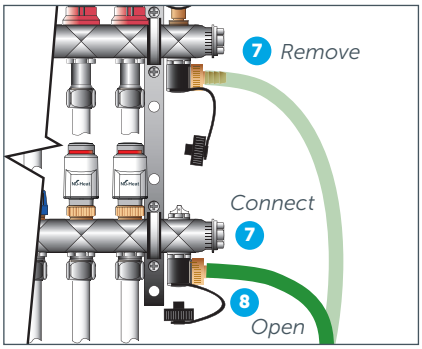
2 Find the hose tails from the *tools and accessories pack* and connect to the fill and flush hoses.

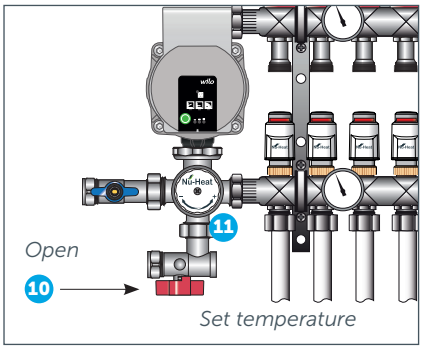
3 Use the cap end to open the drain cock on the flow (upper) manifold.

4 Fill the system via the boiler filling loop and run water through until the flow from the drain hose is free from air bubbles.

5 Close the boiler filling loop and drain cock.







6 Shut the flow isolation valve and open the return valve.

7 Remove the hose from the upper drain cock and connect it to the return (lower) drain cock.

8 Use the cap end to open the drain cock on the return (lower) manifold.

9 Repeat steps 4 and 5.

10 Open the flow isolation valve.

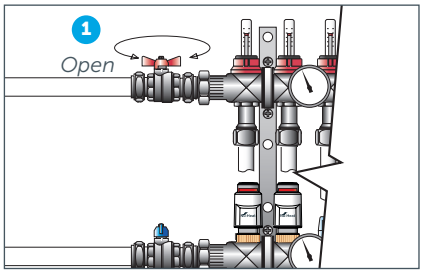
11 The temperature control valve on the pump module should be set to minimum.

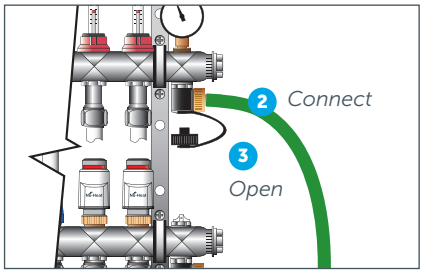
12 Repeat steps 1 to 11 at each manifold that is fitted with a Direct Mounted Pump Module.

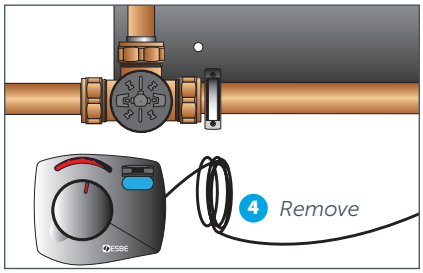
Note: The system cold working pressure is 1.0 bar. When the system pressure has been set, isolate the filling loop and disconnect in accordance with water authority regulations.

Filling the heating system pipework

Remote pump module







Important: remember to add inhibitor to the system when filling.

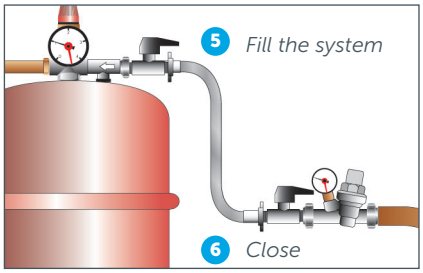
At the first manifold:

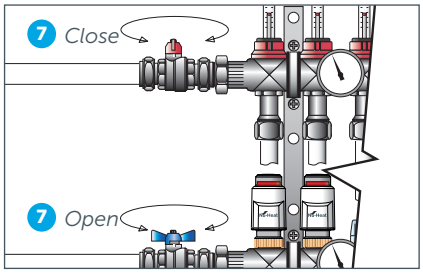
1 Open the flow isolation valve.

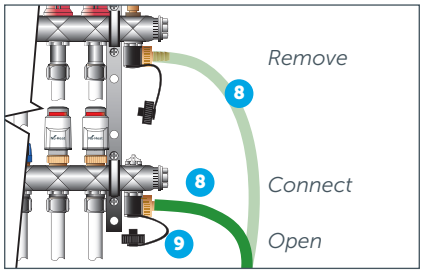
2 Find the hose tails from the *tools and accessories pack* and connect to the fill and flush hoses.

3 Use the cap end to open the drain cock on the flow (upper) manifold.

4 Remove the head from the blending valve on the pump module if fitted. Ensure the valve shaft and actuator motor are positioned correctly when re-assembling (see p.14–17).







5 Fill the system via the boiler filling loop and run water through until the flow from the drain hose is free from air bubbles.

6 Close the boiler filling loop and drain cock.

7 Shut the flow isolation valve and open the return valve.

8 Remove the hose from the upper drain cock and connect it to the return (lower) drain cock.

9 Repeat steps 4 and 5.

10 Open the drain cock on the return (lower) manifold.

11 Repeat steps 1 to 10 for all other manifolds.

Note: **The system cold working pressure is 1.0 bar. When the system pressure has been set, isolate the filling loop and disconnect in accordance with water authority regulations.**

12 Open all flow valves to their maximum when filling is complete.

Setting flow rates & commissioning

Before starting check that:

1 The heating and hot water system is fully operational and the boiler has been commissioned.

2 Screed floors have been left to thoroughly dry out. The floor heating should not be used to accelerate the drying process.

For renovation projects using LoPro™10 or LoPro™Max, the self-levelling compound has been left to thoroughly dry out. The floor heating should not be used to accelerate the drying process.

3 All underfloor zones served by the manifold have been filled, flushed and pressure tested. See pages 23–24.

4 The boiler and primary flow and return have been filled, flushed, cleansed and vented. See pages 25–26.

5 All electrical work associated with the heating system is complete and actuator heads are fitted (where appropriate – see *A3 Manifold & Zone Information* for specific information).

6 The system static pressure is set at 1 bar when cold or approximately 1.5 bar when hot.

7 The main manifold isolating valves are open.

8 All pipes entering the manifold assembly have been clearly marked with their zone number and name as detailed on the system design.

9 All actuators cables have been similarly labelled.

10 The pump has been wired.

11 The temperature blending valve has been plugged in and switched on.

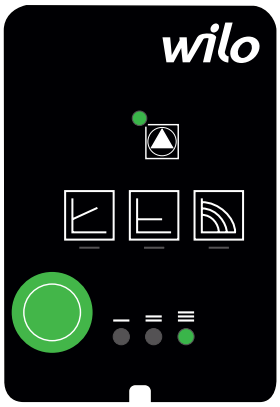
Commissioning the pump

Commissioning must be carried out by a qualified installer.

Press button to cycle through to Constant Pressure 3. This corresponds to a 7m head

Electrical connection

The pump is supplied with a separate, pre-terminated, 1-metre, 3-core lead ready for connection to the Optiflo UFH wiring centre. Ensure that the pump is filled and vented, use the controls to call for heat and then select the correct pump setting.



Setting the control mode

To select the control mode and set the desired delivery head/constant speed, press the button to cycle through the 9 options:

Variable differential pressure (Δp-v): DO NOT USE

Constant differential pressure (Δp-c): USE THIS SETTING, CURVE III

Constant speed (I, II, III): DO NOT USE

Reset to factory settings (Constant speed 3) by holding the button and removing power, release button and the next operation of the pump will be in factory default setting.

NOTE: All settings are retained if the mains supply is interrupted.

Variable pressure
DO NOT USE

Constant pressure
USE THIS SETTING

Constant speed III
DO NOT USE

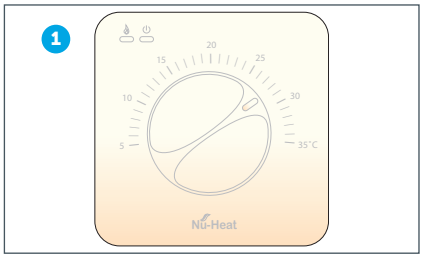
The LED indicator light.

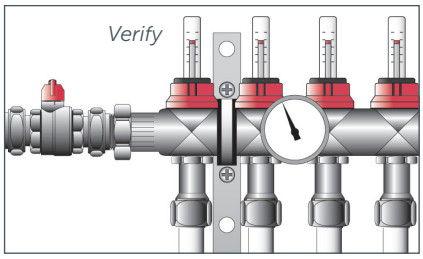
LED	Fault	Cause	Remedy
Lights up red	Blocking	Rotor blocked	Activate manual restart or contact Nu-Heat Technical Support.
	Contacting/winding	Defective winding	
Flashes red	Under/over-voltage	Mains power supply too low/high	Check mains voltage and operating conditions and contact Nu-Heat Technical Support.
	Pump overheating	Pump interior too warm	
	Short-circuit	Motor current too high	
Flashes red/green	Generator operation	Water is flowing through the pump hydraulics but there is no mains voltage at the pump.	Check the mains voltage, water quantity/pressure and the ambient conditions.
	Dry run	Air in the pump	
	Overload	Sluggish motor, pump is operated outside of its specification)e.g. high pump temperature). The speed is lower than during normal operation.	

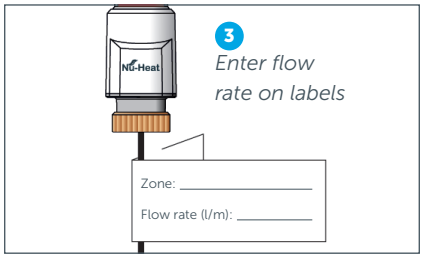
Venting

Press and hold the green button for 3 seconds to purge air from the pump, the pump returns to normal operation after 10 minutes and the purge program can be cancelled by pressing the button for 3 seconds.

Setting flow rates & commissioning continued







To set the flow rates:

1 Start by turning up all the room thermostats (where fitted). Make sure all zones are flowing. When there is water circulation the flow marker drops to indicate flow in the flow gauge and the indicator on top of the actuator head (if fitted to thermostat zones) stands proud. There is a three minute delay before the actuators open fully.

2 Each zone has a specific flow rate which is detailed on the *A3 Manifold & Zone Information*.

Starting with the zone needing the least flow, adjust the flow gauge until the specified flow rate is indicated by the position of the top of the red float against the scale.

Note: **Flow rates detailed on the *A3 Manifold and Zone Information* sheet are a minimum. The flow setting should be set as close to this level as possible, or slightly above.**

To adjust flow rates on the flow gauge (see diagrams below):

- **a** Remove red collar
- **b** Undo the black locking nut
- **c** Adjust the flow rate as required, by turning the gauge with the red 'key'
- **d** Re-tighten the black locking nut
- **e** Replace red collar
- **f** Zone can be isolated by winding flow gauge all the way down
- **g** Re-open zone by winding flow gauge up until stopped by the locking nut

Flow will now return to the rate set at step **c**.

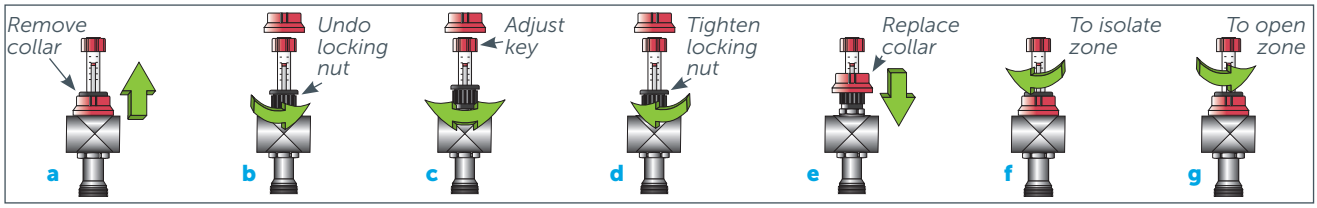
To increase flow rate from that set, repeat steps **a** to **e**.

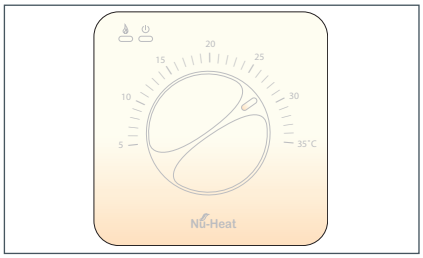
After filling the boiler and heating system pipework the flow gauges should have been left in the fully open position with the isolating valves beneath them also fully opened. Check that this is the case.

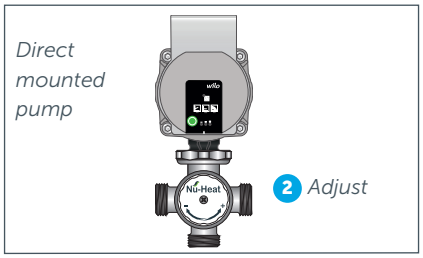
Increasing the flow to one zone may slightly decrease the flow to the others and small adjustments may be necessary.

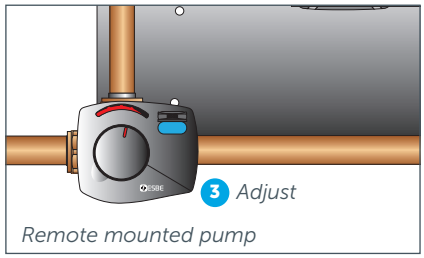
3 Record the flow rates on the labels provided.

It is essential that actuators and zone pipes are correctly labelled. The room thermostat must control the actuator on the pipe serving that zone.









To set the flow temperature(s):

1 Turn all the room thermostats up to a high temperature. This will open all the zone isolating actuator valves.

2 Adjust the floor heating water temperature control valves (found either next to the manifold, or on to the **Remote Mounted Pump Module**) to give the correct flow temperature as detailed on the *A3 Manifold & Zone Information*. This temperature can be verified on the gauge on the flow (top) rail of the manifold(s) – it will take several hours to stabilise as the UFH reaches temperature.

3 See page 18 for instructions on how to set the UFH flow temperature on the valve actuator motor.

Notes:

Final adjustments may be necessary when the system is up to operating temperature.

For screed floors set the water temperature at 30˚C for the first three days, and then increase to the UFH design temperature.

Commissioning

COMMISSIONING

The system must now be thoroughly checked in accordance with the *Commissioning Checklist* in the *Handover Pack*. Once completed the online *Warranty Application* (found at www.nu-heat.co.uk/online-warranty) should be submitted.

No warranty can be issued without completion of the online application.

INSTALLING THE INHIBITOR

It is important that an inhibitor recommended by the boiler manufacturer is introduced into the heating system. Failure to do so may result in discolouration of the UFH manifold flow gauges causing problems when making future adjustments to the UFH flow rates. For continued long-term protection, the system inhibitor levels should be checked annually.

UFH service checklist

UFH SERVICE CHECKLIST

1. Release the pressure in the expansion vessel.
2. Test the system water for inhibitor and top up to the correct level if required.
3. Re-pressurise the expansion vessel to 1 bar.
4. Check that the system pressure is 1-bar when cold (approximately 1.5 bar when hot).
5. Check all pipe connections for signs of excess residue; clean up and seal if necessary.
6. Check that all thermostats are set correctly. Adjust if necessary.
7. Check that the actuators on the manifold are working correctly by turning each room thermsotat on and off.
8. Check that the pump(s) is set to the correct speed and that there is no excess noise.
9. Check that the flow rates indicated by the flow gauges on the manifold match or exceed those shown on the CAD drawing (this should be in the Nu-Heat *Handover Pack*).
10. Check the boiler temperature is set correctly.
11. Check that the flow temperature on the manifold is as specified on the CAD drawing (this should be in the Nu-Heat *Handover Pack*). Adjust the UFH water temperature control mixing valve to the required flow temperature.
12. Cylinder servicing requirements are detailed in the *User Guide* supplied in the Nu-Heat *Handover Pack*.

DISCOLOURED FLOW GAUGES

In some areas the quality of the local water can discolour flow gauges making them difficult to read when servicing.

To clean gauges:

1. Isolate the manifold from the primary circuit and, where necessary, also isolate the pump.
2. Remove the red flow gauge handle.
3. Holding the black section of the flow gauge with pipe grips, use an adjustable spanner on the top octagonal section to turn the flow gauge itself anti-clockwise

   A small amount of water will be released; this is just the pressure being released from the system.
4. Clean the flow gauge or replace the assembly as required.
5. Refit the red flow gauge handle.
6. Open the isolators, monitor for leaks and re-pressurise the system if required.
7. Adjust flow rates as per the original CAD drawings.

If gauges cannot be cleaned please contact Nu-Heat to purchase replacement assemblies.

Problem solving

UNDERFLOOR HEATING

Electrical components not operating
Please refer to the *A3 Underfloor Heating Control Systems* documents to confirm the system and system components are wired correctly.

If the component still fails to work it should be replaced.

No flow rate at the Optiflo manifold
Are the actuators open?

Yes – Check the pump (see specific trouble shooting details for the pump opposite) and replace if faulty.

Note: **Before commencing work on the pump, ensure that the electricity supply has been switched off and cannot be accidentally switched on.**

The pumped liquid may be hot and under high pressure. Before any removal or dismantling of the pump, the system must be drained or isolating valves on either side of the pump must be closed.

The UFH tubes may be air-locked – fill and flush the system again.

Check flow regulating valves have been opened.

The UFH tubes may be wrongly connected, i.e, flow to flow and return to return with no circulation – reconnect correctly.

The UFH tube may be kinked – investigate and correct.

No – Check the actuator lead is properly connected to the Optiflo wiring board.

Low flow rate on the Optiflo manifold
Check the pump is set to constant pressure (see *Setting Flow Rates and Commissioning* on page 26) and is circulating in the correct direction as per pages 12–16.

Check the UFH tube for air locks, wrong connections or kinks as above.

Following adjustment, are the design flow rates correct for the majority of zones?

No – Please contact Nu-Heat Technical.

Yes – Turn off all the zones, turn on one low flow zone.

Can the correct flow be set?

No – The UFH tube is air locked, kinked or wrongly connected.

Yes – Try each zone singularly in turn and re-balance all the flow rates. If all the design flow rates are still unachievable consult Nu-Heat Technical.

Low water temperature on the Optiflo manifold
After more than 48 hours of system operation – by adjusting the water temperature control valve, is the design flow temperature achieved?

No – Check the boiler is set to maximum.

Check that the boiler auto bypass valve is set correctly to 0.5 bar.

If the design flow temperature is not achieved consult your installer as the boiler is not providing sufficient heat to the underfloor heating system.

Yes – If there is more than 15˚C difference between the design flow temperature and the return temperature, allow more time for warm up, or later increase the flow rates.

No heat to one zone, too much heat to another zone
Is hot water flowing to the zone?

- Check the electrics, flow rates and flow temperatures as detailed above.
- The zone actuator heads may be fitted to the wrong zones.

To check connections are correct:

- Turn all room thermostats down to 5˚C
- Check one zone at a time (all other zones must be off)
- Turn the thermostat in the zone up high
- If another zone is getting warm it indicates that the actuator controlled by the thermostat is probably fitted to the wrong zone valve,
- Continue to test all other zones and move actuators to their correct positions
- Re-label actuator heads when you are happy that they are correctly connected.

Low heat to one/several zones
Is the flow rate and temperature correct?

No – Check the flow rates and flow temperatures as detailed above.

Yes – Are the actuators open?

No – Check the actuator lead is properly connected to the Optiflo wiring board.

Check the room thermostat is active.

Yes – Increase the flow rate to the maximum possible. If the room(s) have a high heat loss, i.e. a lot of external walls and windows, the timeclock settings may be insufficient to allow for extended warm-up times.

Set the timeclock to turn on earlier.

If the problem persists increase the flow temperature – do this gradually as sudden temperature increase or excessive temperature may damage natural flooring and tiles.

ESBE TEMPERATURE BLENDING VALVE

Temperature does not settle to the desired set temperature

Potential causes:
Valve is calibrated incorrectly – re-calibrate valve following the instructions on page 19.

Temperature too high; matches boiler temperature

Potential causes:
Valve is set in the wrong orientation – change the direction of the valve motor following the instructions on page 19.

No display on the valve actuating body

Potential causes:
Power supply is faulty – check the power supply unit is plugged in and switched on

Check the jack on the power supply unit is properly plugged into the head.

Check for power at the socket.

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