

## Product and installation manual

# Hep<sub>2</sub>O

## Underfloor Heating Composite Manifold



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# Underfloor Heating



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# Introduction

# Underfloor Heating

Thank you for purchasing our Composite Manifold. Please read through this guide before beginning any installation and operation work.

It is important that the Composite Manifold is checked upon delivery, and that any damaged or missing items are reported immediately.

Each Starter Pack (15UH510) contains:

- ⌚ 2 x Combined Inlets
- ⌚ 2 x End Caps
- ⌚ 2 x Brackets and Spacers
- ⌚ 1 x Installation Kit
- ⌚ 1 x Flow Temperature Gauge
- ⌚ 1 x Combined Pressure and Return Temperature Gauge

Each 1 Port Pack (15UH511) contains:

- ⌚ 1 Port Flow Module
- ⌚ 1 Port Return Module

Each 3 Port Pack (15UH513) contains:

- ⌚ 3 Port Flow Module
- ⌚ 3 Port Return Module

**Only competent persons with certification recognized under Building Regulations – Part P should carry out electrical installation or servicing work. Other persons are not permitted to open the Control Centre cover and/or make any modifications.**

Each Control Pack (15UH512) contains:

- ⌚ 1" 3-Port Mixing Unit
- ⌚ Grundfos UPS2 25/60 Pump
- ⌚ Thermostatic Actuator
- ⌚ Bracket and Spacer
- ⌚ Installation Kit

Ancillary components available for the Composite Manifold include:

- ⌚ 22mm Isolation Valves (pair) (15UH211)
- ⌚ 230V 2 Wire Actuator (15UH402)
- ⌚ 24V 2 Wire Actuator (15UH302)
- ⌚ Pipe Clips – Screw (pack of 50) (HX85/15W)
- ⌚ Cold Forming Bend Fixture (pack of 5) (HX75/15 GR)

**Installers: Please complete this guide and pass to the end user or leave with the UFH manifold after installation**

Hep<sub>2</sub>O Project Reference Number: .....

## Plumber

Name: .....

Company: .....

Address: .....

.....

Postcode: .....

Tel: .....

Email: .....

## Electrician

Name: .....

Company: .....

Address: .....

.....

Postcode: .....

Tel: .....

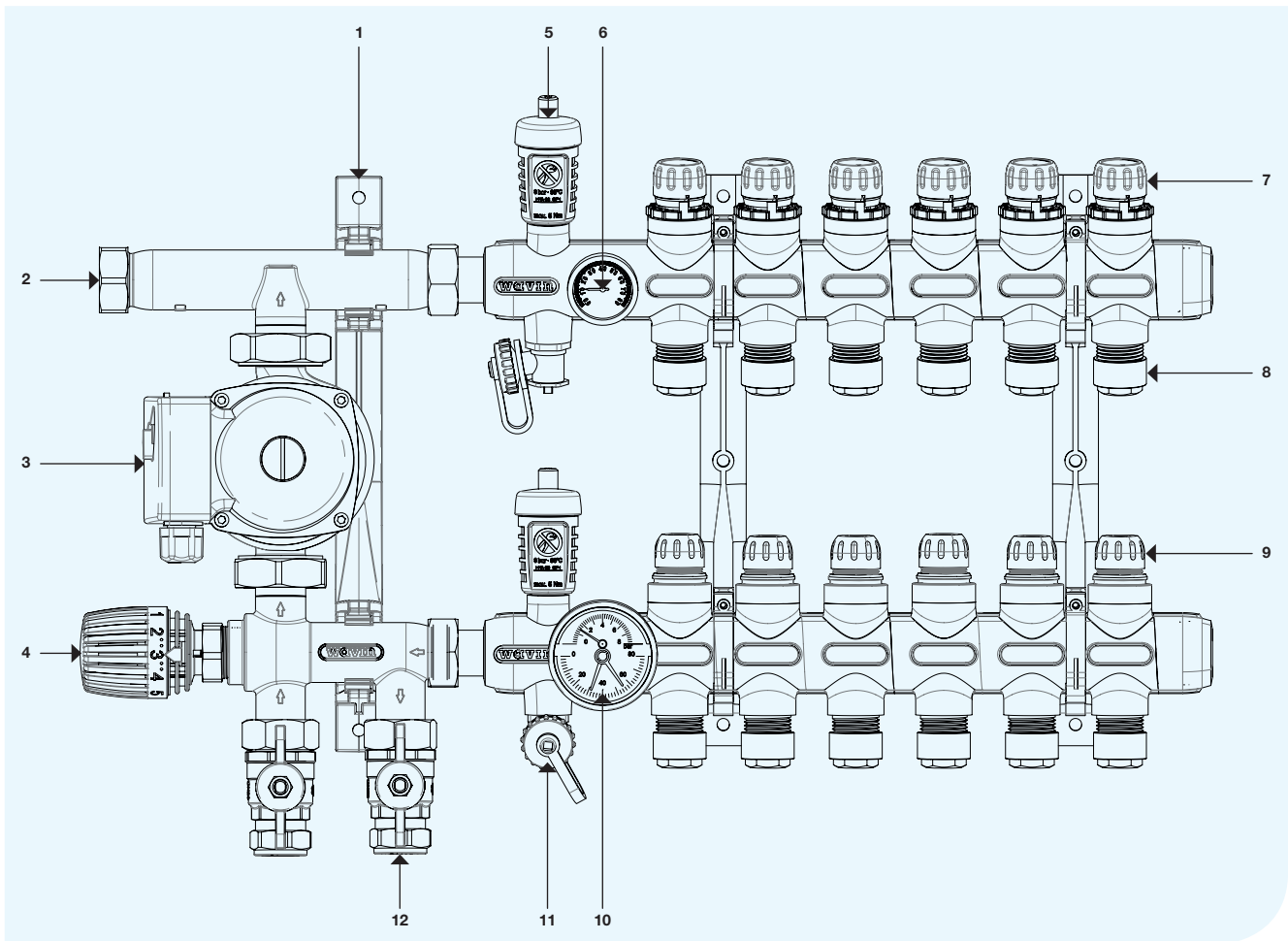
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## Manifold Overview Underfloor Heating

### Manifold Design

1. Bracket + Bracket Spacer
2. Flow Water Temperature Sensor
3. Circulator Pump (Grundfos UPS2 25/60)
4. Thermostatic Actuator
5. Automatic Air Vent
6. Flow Temperature Gauge
7. Balancing Knob and Memory Ring
8. 16mm Pipe Connector
9. Isolation Cap/Thermoelectric Actuator Mount
10. Combined Pressure & Return Temperature Gauge
11. Fill/Drain Valve
12. 22mm Isolation Valves

Figure 1: Manifold design



### Manifold Dimensions

Manifold Type	Height	Depth*	Width in mm / No. of Ports														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Exc Control Pack	390	120	260	310	360	410	460	510	560	610	660	710	760	810	860	910	960
Inc Control Pack	430	160	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100

Note: Dimensions include Wavin isolation valves. \*Where required, the depth of the manifold can be reduced by 15mm if the bracket spacers are not installed.



# Manifold Installation Underfloor Heating

## Pack Requirements

### Starter Pack



### 1 Port Pack



### 3 Port Pack



Number of Ports	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Starter Packs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 Port Packs	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0
3 Port Packs	0	0	1	1	1	2	2	2	3	3	3	4	4	4	5

Note: A Composite Manifold Control Pack will be required for systems designed to have water temperature regulation through the manifold.

## Required Tools

Depending on the specific project you will need some or all of the following tools to assemble and mount the Composite Manifold:

- ⌚ Pen/Pencil
- ⌚ Spirit Level
- ⌚ Tape Measure/Rule
- ⌚ 10mm Masonry Drill Bit
- ⌚ 3mm Twist or Lip & Spur Drill Bit
- ⌚ 10mm Socket/Open-End Wrench
- ⌚ 22, 26, 32 and 38mm Open-End Wrenches
- ⌚ Large Flat Bladed Screwdriver
- ⌚ Fill and Drain pipes with 3/4" female connection
- ⌚ Hydraulic Pressure Tester with 3/4" female connection

For tools required to complete the electrical installation please refer to the appropriate control installation manual.

Note: Over tightening connections may damage the manifold and will void warranty.

## General Installation Instructions

Care should be taken by the installer throughout the installation process to ensure the safety of the installer and others.

### Site Preparation

1. Store the packaged manifolds inside a building, sheltered from rain and sunlight. Do not place other materials on top of the packaging.
2. Clean the floor from other materials before starting work.

### Do

- ⌚ Use appropriate pipe cutters to cut the pipes clean and square
- ⌚ Support connecting pipework parallel to and centred with the manifold connections
- ⌚ Wear protective gloves to minimise risk of receiving cuts

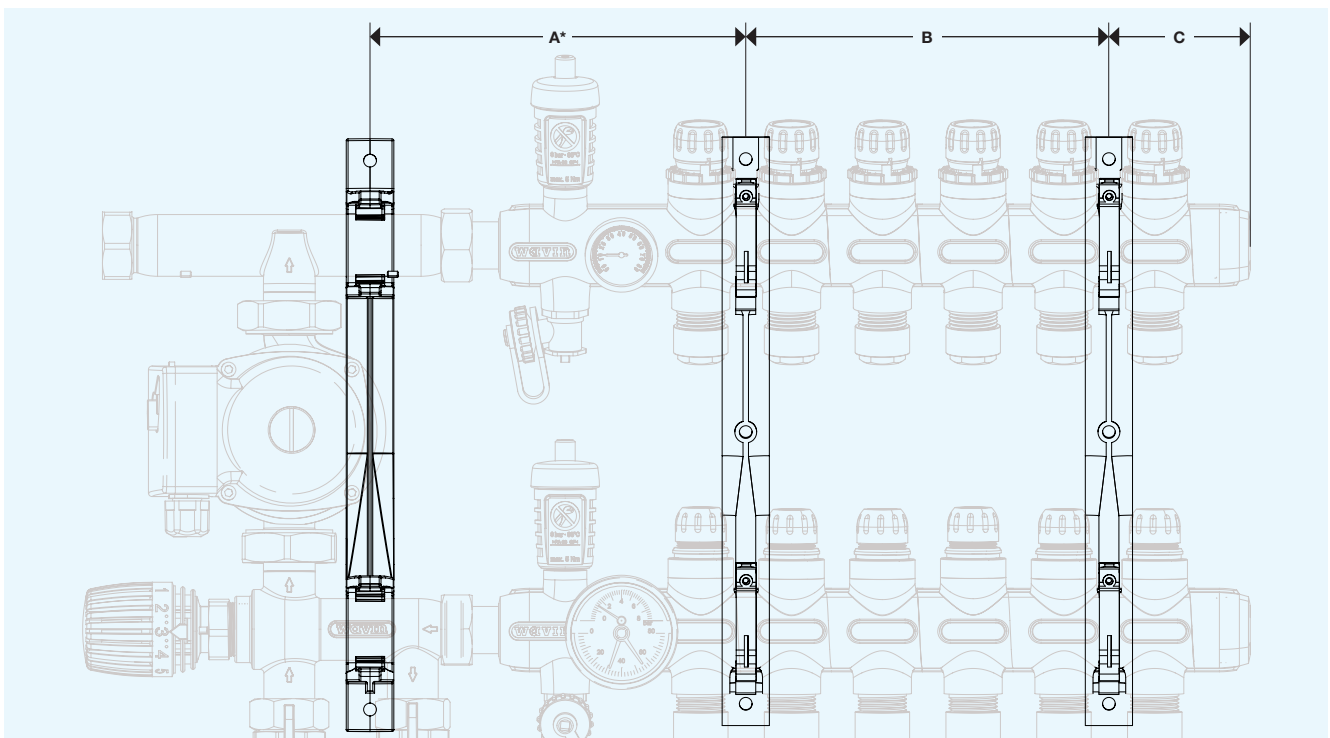
### Do Not

- ⌚ Do not use the air vent bottles to brace the manifold while tightening connections
- ⌚ Do not exceed specifications – failure to do so will void the warranty
- ⌚ Do not allow corrosive substances to come into contact with the manifold and its accessories e.g. flux

## Mounting Brackets

- Identify a suitable location to mount the manifold
- Refer to (Figure 2) and the table below for bracket spacing
- Manifold should be mounted at least 300mm from pipe level
- Accurately measure and mark fixing locations ensuring they are level and square
- Accounting for the wall construction, drill suitably sized holes (Masonry – 10mm Dia, Timber – 3mm Dia)
- Clip brackets on to bracket spacers (Figure 3)
- Screw brackets to wall using a 10mm Socket/Open-End Wrench, being careful not to over tighten and ensuring the ends marked “TOP” are correctly positioned

Figure 2: Bracket spacing



Bracket Spacing	Distance in mm / No. of Ports														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A*	90	90	90	210	210	210	210	210	210	210	210	260	260	260	260
B	120	120	170	100	150	200	250	300	350	400	400	400	450	450	500
C	30	80	80	80	80	80	80	80	80	80	130	130	130	180	180

*\*Only applicable when control pack is being installed*

**Note:** The figure above and the rest of this installation guide assumes the manifold will be assembled in and installed in a left handed configuration.

If it is preferential to assemble and install the manifold in a right handed configuration please mirror the figure above.

Figure 3: Clipping brackets



# Manifold Installation

## Underfloor Heating

### Assembling and Mounting Arms

1. Starting with the Combined Inlet, add 3 Port modules followed by 1 Port modules as required.
  - ⌚ If the ports are required to point downwards, screw the manifold together with the Combined Inlet upright in your left hand and the top of the Port modules towards you (Figure 4)
  - ⌚ If the ports are required to point upwards, screw the manifold together with the Combined Inlet upright in your left hand and the top of the Port modules away from you.
2. Screw the end cap on to the manifold arm (Figure 5).
3. Repeat the process for the other manifold arm.
4. To mount the manifold arms on the brackets, locate the ridge along the bottom of the manifold arm into the grooves on the brackets and rotate so that the top clicks in place (Figure 6).
- ⌚ Flow arm (Red Caps) should be mounted in the top position (Figure 7).
- ⌚ Return arm (Black Caps) should be mounted in the bottom position (Figure 7).

**Note:** The return arm can be mounted vertically or at an inclined angle. It is suggested that it is mounted vertically when the manifold is installed close to the pipe level and inclined when it is intended to secure the pipe to the wall with suitable clamps.

### Extending an Existing Manifold

1. Isolate the manifold from the primary heating circuit.
2. Isolate the heating circuits on the flow and return manifold arms.
3. Carefully depressurise and then drain the manifold using the fill/drain valves, taking care to collect all of the water in a suitable container.
4. Disconnect the manifold arms from isolation valves or control pack depending on configuration.
5. Remove the manifold arms from the brackets.
6. Unscrew end caps.
7. Continue installation according to this guide, repositioning brackets as required.
8. Dispose of collected water in compliance with National Health & Safety Regulations.

Figure 4: Assembling arms

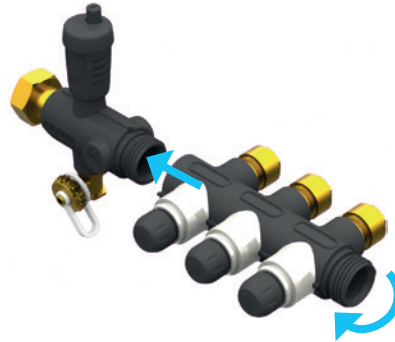


Figure 5: Assembling arms

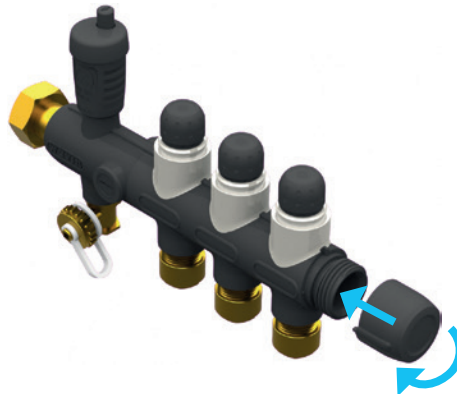
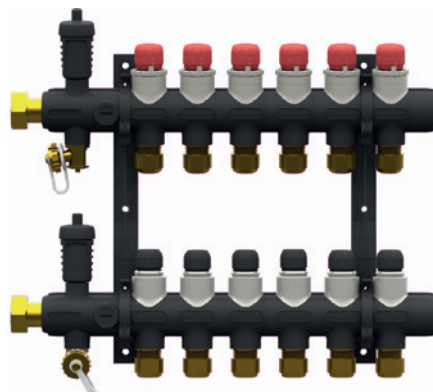


Figure 6: Mounting arms



Figure 7: Mounting arms



## Installing Gauges

1. Remove plugs from the front of the combined inlets using a large flat bladed screwdriver (Figures 8 & 9).
2. Insert the temperature gauges mount into the combined inlet on the flow arm and lightly tighten using a 22mm open-end wrench (Figure 10).
3. Push the temperature gauge into its mount (Figure 10).
4. Insert the combined pressure and temperature gauge into the second combined inlet on the return arm and lightly tighten using a 22mm open-end wrench (Figure 11).

**Note:** Care should be taken not to cross thread or over tighten the gauges as they are installed.

Figure 8: Remove plugs on flow arm



Figure 9: Remove plugs on return arm



Figure 10: Insert temperature gauge



Figure 11: Insert combined pressure and temperature gauge



## Modifying Control Pack\*

For right handed manifold assemblies it is necessary to modify the control pack, allowing it to be fitted to the right hand side.

1. Remove Flow Water Temperature Sensor from its housing (Figure 12).
2. Remove the Flow Water Temperature Sensor Housing using a 38mm open-end wrench and install it on the opposite end of the control packs flow arm (Figure 13).
3. Loosen the connection between pump and the mixing body of the control pack, rotate the mixing body through 180° and re-tighten connection (Figure 14).
4. Insert the Flow Water Temperature Sensor back into its housing (Figure 15).

**Note:** \*Only applies to installations requiring a control pack.

Figure 12: Remove flow water temperature sensor



Figure 13: Remove flow water temperature sensor housing

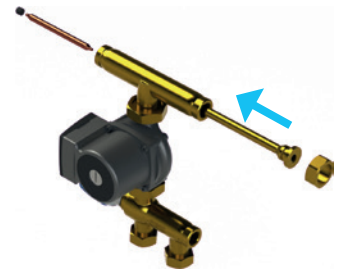


Figure 14: Loosen the connection



Figure 15: Insert the flow water temperature sensor





# Manifold Installation

## Underfloor Heating

### Connecting Control Pack\*

1. Ensure bracket adaptors are positively located on the control packs bracket and that the bottom adaptor is aligned to the bottom arm of the manifold (Figure 16).
2. Clip the control pack into the bracket (Figure 17).
3. Insert the 1" fibre washers supplied as part of the installation kit and hand tighten the connections between the control pack and the manifold (Figure 18).
4. Using 26 and 38mm open-end wrenches, place one on the nut and one on the adjacent brass section of the combined inlets, and tighten until sealed.

**Note:** Air vent bottles should not be used as a lever to restrain the manifold while tightening the union connections between the control pack or isolation valves

\*Only applies to installations requiring a control pack

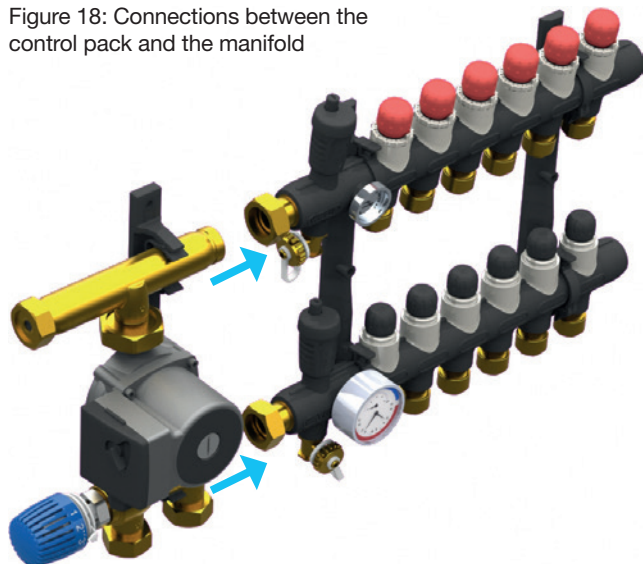
Figure 16: Bracket adaptors



Figure 17: Clip the control pack into the bracket



Figure 18: Connections between the control pack and the manifold



### Circuit Connection

1. Cleanly cut the heating circuit tails to the correct length (level with the interface between the port on the manifold arm and the inserted pipe adaptor) using a suitable pipe cutter.
2. Slide the pipe adaptors nut over the end of the pipe, followed by the split olive (Figure 19).
3. Fully insert the spigot of the pipe adaptor into the end of the pipe (Figure 19).
4. Hand tighten the nut, ensuring the (Figure 20) spigot remains fully inserted into pipe.
5. Using a 22mm open-end wrench fully tighten the pipe adaptor.
6. Affix the circuit labels provided to the manifold arms (Figure 21).
7. Record the circuit lengths in the Commissioning Record (see page 17 of this guide).

Figure 19: Spigot pipe adaptor

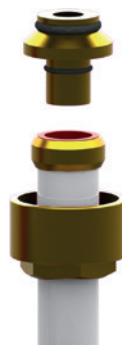


Figure 20: Hand tighten the nut

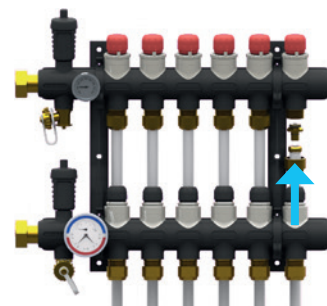


Figure 21: Circuit labels



## Connection to Primary Pipework

1. Insert the 1" fibre washers supplied as part of the installation kit and tighten the connections between the assembled manifold and the isolation valves (Figure 22).
2. Support connecting pipework parallel to and centred with the isolation valves to prevent leaks (Figure 23).

**Note:** An automatic bypass or alternative device capable of sustaining primary flow when the manifold is operating at part load, should be installed as part of the primary system. Please refer to the heat sources installation instructions.

Figure 22: Connections between manifold and the isolation valves



Figure 23: Support connecting pipework



# Commissioning Underfloor Heating

## Circuit Balancing

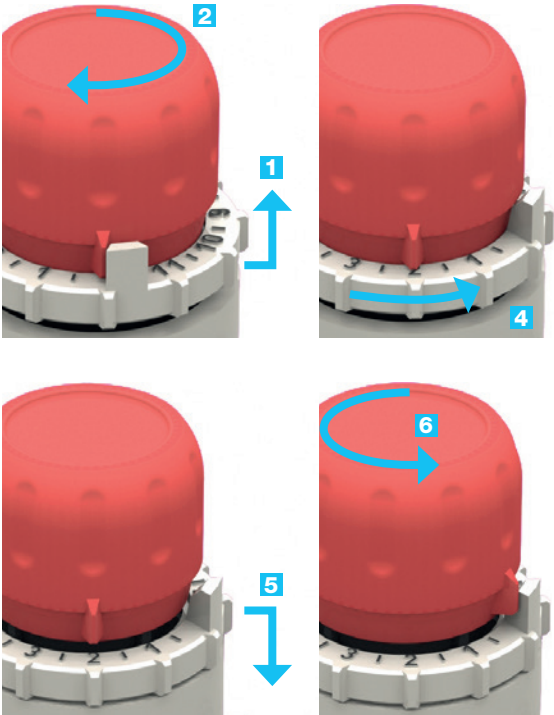
The Wavin Composite Manifold uses the unique Memory Ring to enable quick and easy balancing.

1. Lift the Memory Ring so that it rotates freely.
2. Rotate the balancing knob clockwise until the valve is closed.
3. Refer to the Memory Ring setting on the installation drawings or read its setting from the table below.
4. Rotate memory ring anti-clockwise until the correct value is aligned with pointer on balancing cap.
5. Push memory ring down into position.
6. Open the balancing valve to its balanced position by rotating the balancing cap anti-clockwise until the pointer reaches the stop on the memory ring.

Example:  
 Length of circuit to be balanced = 100m  
 Memory ring setting = 6.5

Note: From this point the circuit can be isolated and rebalanced simply by turning the balancing knob between its closed and its balanced position marked by the memory ring.

Figure 24: Balancing the circuits



Circuit Length	120m	110m	100m	90m	80m	70m	60m	50m	40m	30m	20m	10m
Setting	11	8	6.5	5.5	5	4.5	4	3.5	3.25	3	2.75	2.5

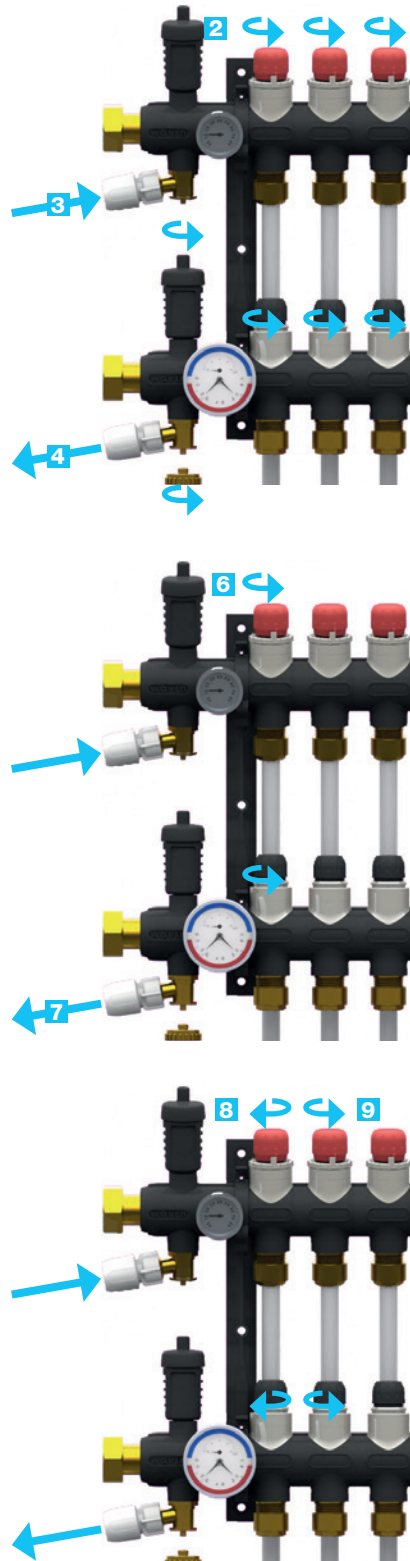
## Flushing and Filling

The underfloor heating (UFH) system can be filled via the primary flow connection (setting the Thermostatic Actuator to 6 if a control pack is installed), however it is recommended that the first flush and fill is conducted by connecting a mains pressure feed to the fill/drain ports. This will ensure that any debris or contaminants are not flushed into other components on the heating system.

1. Ensure all isolation, fill/drain, balancing and return isolation valves are closed.
2. Open the caps on the automatic air vents.
3. Attach a filling pipe to the fill/drain port on the flow side of the manifold.
4. Attach a drain pipe to the fill/drain port on the return side of the manifold.
5. Open the valves to the filling/drain pipes.
6. Open the first circuit (both the flow and return sides).
7. Flush until the discharge water is clear and free of air.
8. Close the circuits return valve, followed by its flow valve.
9. Repeat steps 6 to 8 for all other circuits.

**Note:** Maximum permissible pressure during flushing and filling is 8 bar.

Figure 25: Flushing and filling





# Commissioning Underfloor Heating

## Hydraulic Pressure Testing

1. Close isolation valves on the primary connection to the manifold.
2. Open all circuit valves on flow and return arms.
3. Connect a hydraulic pressure tester to one fill/drain port.
4. Raise the pressure to 1bar. Hold this pressure for 45 minutes and inspect system for leaks. If fittings are present within the system it is recommended that they are flexed during this inspection.
5. Increase the pressure to 6 bar. Hold this pressure for 15 minutes and continue to inspect.
6. Reduce the pressure to 2 bar. Hold this pressure for 45 minutes and continue to inspect.
7. Safely depressurise the system.
8. Record test results in the Commissioning Record.
9. Dispose of the discharged water in compliance with National Health & Safety Regulations.

If there is a danger of freezing, suitable measures (such as the addition of anti-freeze additives or building conditioning) must be taken.

**Note:** Repairs to circuits must be kept accessible with their precise location recorded in the Commissioning Record.

### If a Pressure Loss Is Observed

- Pressurise the system to its previous test pressure and isolate all circuits
- Observe for a continued pressure drop over the same test period

If a further drop occurs there is a leak from the manifold

- Identify the leak and call Technical Support (0844 856 5154)

If the pressure drop ceases, there is a leak from a circuit

- Open and close each circuit in turn, observing the pressure gauge for an instant pressure drop

If a leak is identified

- Safely depressurise the system
- Isolate the leaking circuit
- Locate and repair the leak
- Repeat the pressure test

## Electrical Installation

Mounting the actuators:

1. Unscrew the black isolation caps from the thermoelectric actuator mounts (Figure 26).
2. Push the head of the actuators onto the adaptor until they click (Figure 27).
3. Electrical connections to the circulating pump, flow watch thermostat and actuators should be made in accordance with the instructions supplied with the control centre used.

**Note:** To make mounting easier, Wavin actuators are supplied in an open position and will not close the valve until after their first activation.

Figure 26: Unscrew the black isolation caps



Figure 27: Push in actuators



## Temperature and Pump Settings\*

Initial heating should commence with the flow water temperature between 20°C and 25°C. This temperature should be maintained for at least 3 days. The flow water temperature should then be increased to the systems design temperature. This temperature should be maintained until the moisture-content of the floor and air are both stable (minimum 4 days).

For Screed Floors the maximum recommended flow temperature is 55°C. A standard sand/cement screed should be allowed to cure for 21 days after being laid before commencing the initial heating procedure. Under no circumstances should the underfloor heating be used to speed up the curing process. For other coverings please refer to the manufacturers instructions.

For Timber Floors the maximum recommended flow temperature is 60°C. Before laying timber flooring, it should be acclimatised to the room with the UFH system at design temperature until such time that its moisture content is stable, typically around 10%.

Heated floor surfaces should not exceed 9°C above the design room temperature (15°C for peripheral areas).

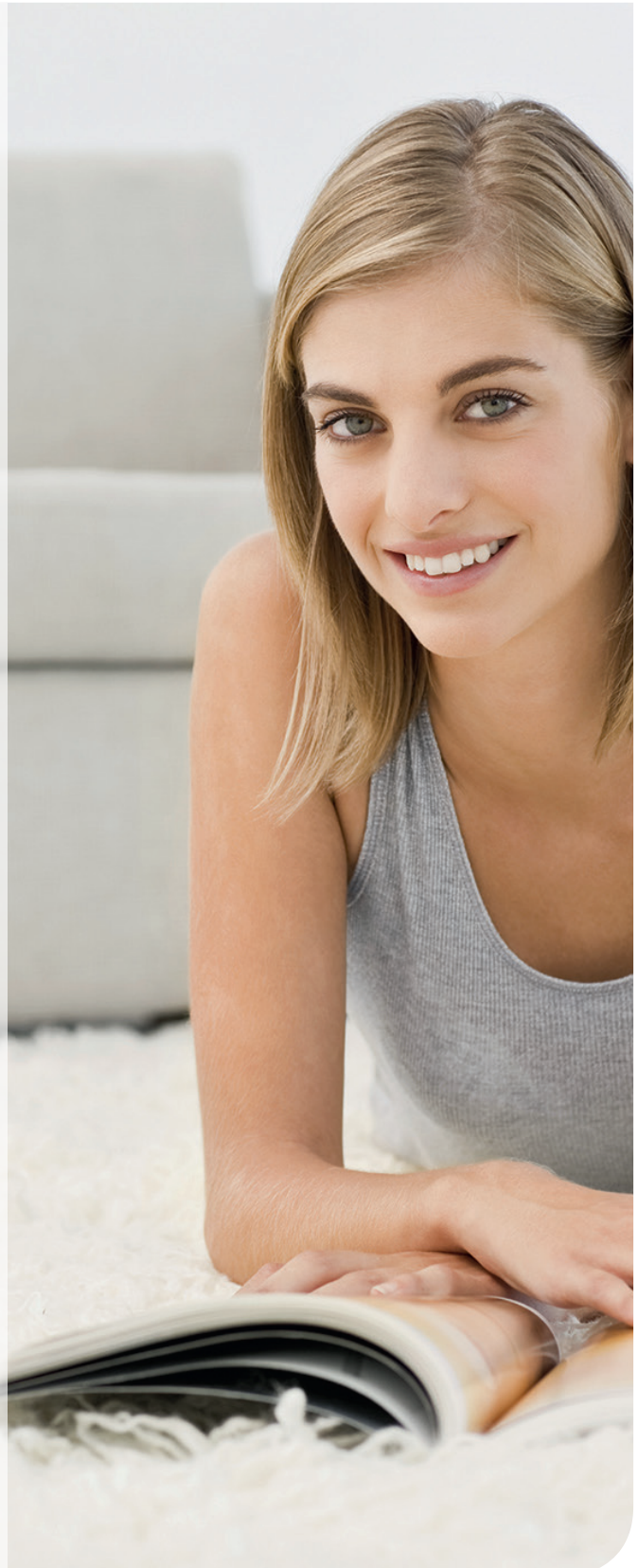
**Note: \*Only applies to installations requiring a control pack**

Products with restricted operating temperatures should not be installed without first ensuring they are suitable for use and will not adversely restrict the system performance.

1. Commission the Grundfos circulator in accordance with the manufacturers instructions and set it to speed III.
2. Adjust the flow water temperature by turning the thermostatic actuator. Refer to the table below and/or the temperature gauge on the flow arm of the manifold to achieve the correct setting.
3. Disengage the discrete white lock ring around the base of the blue thermostatic actuator and reposition it to prevent overheating due to tampering.
4. Where applicable, set the Flow Watch thermostat 10°C higher than the setting of the thermostatic actuator.

**Note:** Some heat sources will have an operational requirement for the difference in flow and return temperatures to be greater than a specific value. As a result it may be necessary to reduce the pump speed in order to increase the temperature drop.

Position	1	2	3	4	5	6
Temp (°C)	10	20	30	40	50	60



# Maintenance and Troubleshooting Underfloor Heating

## Checking System Performance

Once the system is fully commissioned, thermostats should be re-checked to ensure they are operating the correct thermoelectric actuator.

If the heated property is newly constructed or if it has had substantial work carried out on it, the moisture in the air and fabric of the property will significantly increase the heat losses. As a result it may not be possible to achieve the desired temperatures until the moisture content has normalised.

The underfloor heating should typically exhibit a surface temperature of up to 29°C. Modern buildings will often only require the floor to be 3 - 4°C warmer than the air temperature.

Wavin programmable thermostats incorporate optimised start, calculating the correct time to turn the underfloor heating on in each zone.

For example, when setting a zone to be at 20°C at 7:00am, if the thermostat calculates the room will take 45 minutes to reach 20°C from its current temperature, the heating would be turned on at 6:15am.

Warm up times for underfloor heating systems vary according to the following factors:

- ⌚ External temperature
- ⌚ Target internal temperature
- ⌚ Level of insulation
- ⌚ Ventilation rate
- ⌚ Mean water temperature
- ⌚ Floor construction
- ⌚ Floor covering

## Care and Cleaning

- ⌚ During all construction activities cover the manifold with a polyethylene sheet or an enclosure to prevent damage
- ⌚ Clean the manifold with a soft cloth
- ⌚ Periodically inspect the system for leaks and erosion of brass and plastic components
- ⌚ Follow the heat source recommendations with regards to flushing and additives

**Note: DO NOT use detergents to clean the manifold**

## Troubleshooting

Symptom	Problem	Solution
No heat in any zone	<p>UFH system not turning on</p> <p>Heat source/UFH pump not running</p> <p>Valves closed</p>	<p>Ensure the UFH controls are programmed correctly, and the heat source is available to provide hot water for the programmed period</p> <p>Ensure at least one thermostat is calling for heat and that the switched lives to the boiler and the circulators become live according to demand</p> <p>Check the isolation valves are open, the balancing valves are in their balanced positions and that the thermoelectric actuators are opening on demand (a white band will be visible on the raised cap)</p>
UFH keeps switching off	Flow Watch Thermostat is activating	<p>Check the flow temperature from the manifold is correct and that limit thermostat is set 10°C higher. If flow temperature is not responding correctly check thermostatic actuator for fault</p>
Some zones do not become warm	<p>Air trapped within pipework</p> <p>Manifold incorrectly balanced</p> <p>Primary flow and return pipes crossed</p>	<p>Set the UFH pump to speed setting III, open the balancing valve fully for the problem zone ensuring all other zones are isolated. Air should automatically vent from the system</p> <p>Refer to section 4.1 Circuit Balancing</p> <p>Check the flow and return pipes from the heat source are correctly connected to the manifold and that they are controlled by the correct thermostat</p>
Zone takes a long time to warm up	<p>Manifold incorrectly balanced</p> <p>Flow temperature set too low</p> <p>High heat losses</p> <p>Thermally resistive floor finish</p>	<p>Refer to page 10 Circuit Balancing</p> <p>Check the blending valve is set correctly and that the primary flow temperature into the mixing valve is equal to or warmer than the required secondary flow water temperature</p> <p>Some rooms will have higher heat losses than others, such as a conservatory. The effects can be compensated for by setting the heating to come on for longer in these zones</p> <p>Some floor constructions work more efficiently with underfloor heating. For example stone or tiled floors have a greater heat output than carpeted ones (check floor manufacturers details)</p>
A “Chattering” noise can be heard coming from the Control Pack	Primary pressure difference is too high	<p>Fit an automatic bypass or equivalent device to the primary circuit to prevent excessive pressure difference across manifold as it reaches temperature and reduces its primary intake</p>



# Technical Specification

## Underfloor Heating

Composite Manifold		
Material	Manifold Body Manifold Seals Control Pack / Connections	PA6.6 – Glass Filled EPDM Brass
Connections	Primary Secondary Fill / Drain	1" G Flat Faced Female Union Pipe Adapters for 16mm x 1.8mm Polybutylene Pipe ¾" G Flat Faced Male
Medium	Water, Glycol Solutions Max Percentage of Glycol	30%
Pressure	Maximum Testing Pressure Maximum Operating Pressure Maximum Pressure Differential	8 bar 4 bar 80 kPa
Temperature	Maximum Temperature Maximum Operating Temperature Minimum Temperature Controlled Temperature Range*	100°C 70°C 4°C 10 – 60°C
Maximum Flow Rate	Primary Secondary	60 l/min (30 l/min)* 8 l/min
Manifold Size	Maximum Number of Ports	15
Standards	BS EN ISO 15876-1 : 2003, BS EN ISO 15876-3 : 2003 and BS EN ISO 15876-5 : 2003, application class 4, for a lifetime of 25 years and a design pressure of 4 bar	
BBA Certificate	92/2823	

\*Only applies to installations requiring a control pack



Although this product does not contain any harmful materials we recommend that the product be returned to the dealer or directly to the manufacturer after use.

## Commissioning Record Underfloor Heating

Manifold Number	Temperature Setting	Pump Setting	Flushed and Filled	Pressure Test Completed	Fully Operational

Circuit Number	Room Served	Zone Number	Circuit Length	Memory Ring Setting	Passed Pressure Test?
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Location of Leak	Action Taken	Location of Fitting if Repaired	Passed Pressure Test?
			Yes / No
			Yes / No
			Yes / No
			Yes / No

Name.....

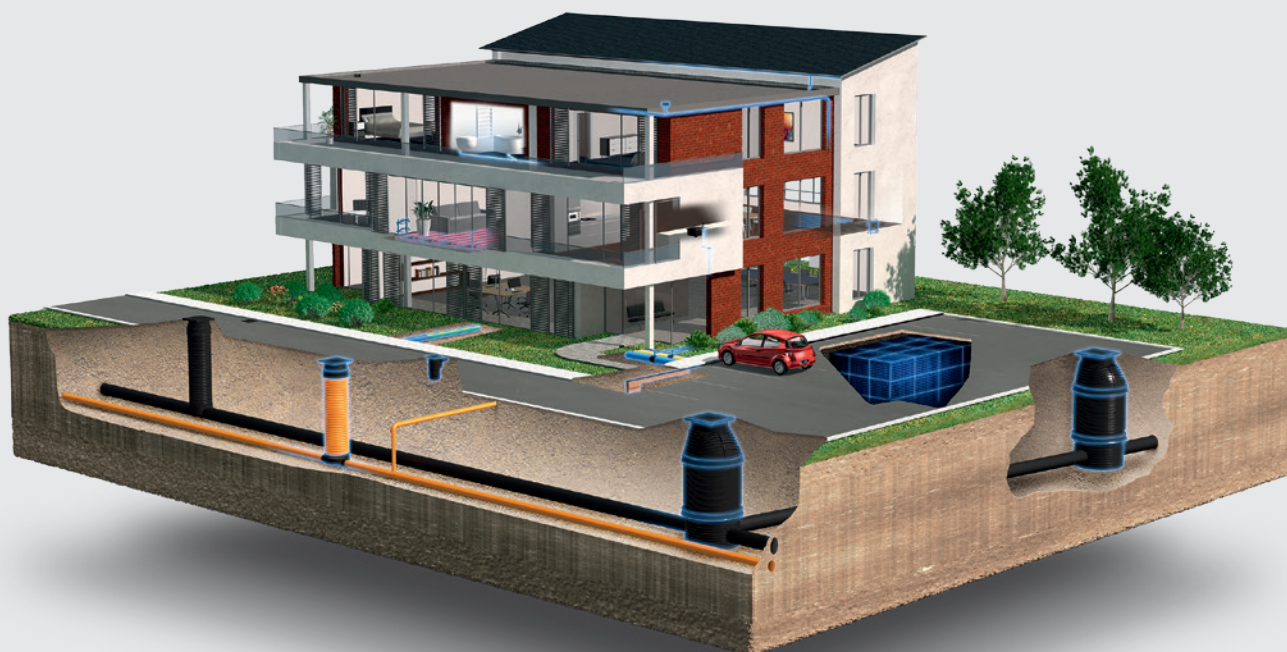
Note: Failure to present this commissioning record (accurately completed with the declaration signed), when required, will void system warranty

Company.....

hereby declare that the UFH system is fully commissioned in accordance with the guidelines set out within this installation guide.

Signed: .....

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