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thermoboard

Underfloor heating & cooling solutions by Wavin

SystemFlo Manifold

Installation and Operation Guide

FOR RESIDENTIAL AND LIGHT COMMERCIAL APPLICATIONS

wavin

Wavin Manifolds

Versatility, Consistency and Reliability

Thank you for your purchase of the SystemFlo Manifold. Please read through this installation and operation guide before beginning any works involving this Manifold.

Only competent persons with certification recognised under Building Regulations - Part P should carry out electrical installation or servicing work. Other persons are not permitted to make any electrical modifications.

It is important that the manifold is checked upon delivery, and that any damaged or missing items are reported immediately. Any claims registered more than 72 hours after delivery will not be accepted.

Each manifold box should contain the following items;

- Pre-assembled manifold
- Flow Watch thermostat in a box marked, DO NOT DISCARD
- Grundfos Alpha+ connection plug
- Spanner to connect the heating circuits to the manifold ports

Installers: Please pass this guide to the end user or leave it with the UFH manifold after installation.

Thermoboard Project Reference Number: _____

Plumber

Name: _____
Company: _____
Address: _____
_____
Postcode: _____

Tel: _____

Electrician

Name: _____
Company: _____
Address: _____
_____
Postcode: _____

Tel: _____

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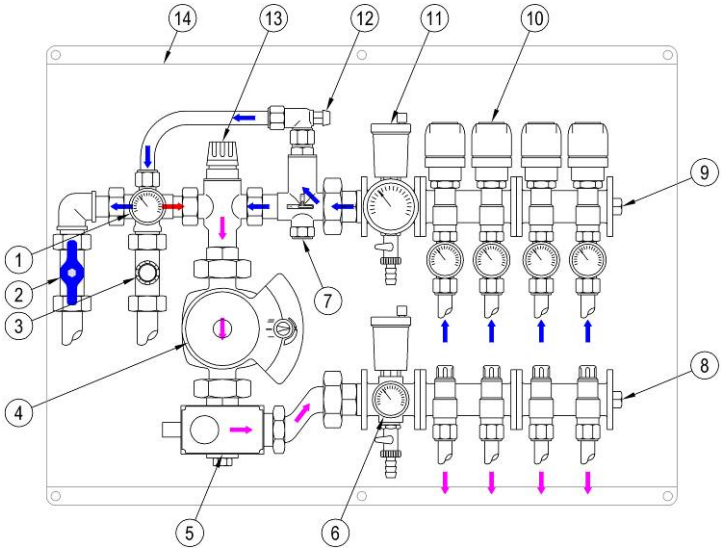
Contents

1 Manifold Design

The SystemFlo manifold has been specially engineered to provide total control over a Thermoboard heating system.

It has been designed for connection to primary flow and return pipework, with a secondary circulator to effectively distribute water at reduced set temperature. Temperature is controlled by means of a thermostatic mixer, which blends water from the return circuit with hot water coming direct from the heat source.

The manifold is supplied pressure tested and pre-assembled, ready for wall mounting straight from the box.



1. Diverter connection complete with fixed by-pass, allowing for the return of unused hot water to the heat source and return water from heating loops that is not required for mixing. The unit also has a thermometer for reading the temperature of water entering the mixing valve.
2. Isolation ball valve for the return pipeline connection.
3. Lockshield valve for the delivery pipeline connection. Allows for separate manifold balancing where more than one manifold is required, or where radiator or other heating circuits are installed.
4. Grundfos Alpha+ automatic and fixed speed domestic circulator.
5. Flow Watch protection thermostat with immersion probe and adjustable temperature from 0 to 90°C. Should any damage be caused to the manifold, this thermostat shuts the underfloor heating system down, preventing over heated water from entering the floor and alerting the user to the fault.
6. Automatic air vent valve; drain cock and bimetallic thermometer with scale from 0 to 80°C for the reading of mixed flow water to the underfloor heating circuits.
7. Return connection with built-in non-return valve for the fluid distribution to the mixing valve and to the return pipeline back to the heat source.
8. The flow water distribution arm. Pre-assembled chrome-plated flanged 1” brass manifolds with built in micrometric lockshield valves for system balancing.
9. The return water manifold arm. Pre-assembled chrome-plated flanged 1” brass manifolds with built-in valves suitable for actuator operation. Each return circuit incorporates a temperature gauge to allow for easy visual system balancing.
10. Thermoelectric actuators for opening/closing circuits as dictated by the connected room thermostat.
11. Automatic air vent valve; drain cock and pressure gauge with scale from 0-4 bar.
12. Elbow with manual air vent.
13. Thermostatic mixing valve to maintain set flow temperature into the UFH pipe circuits, adjustable on different temperature levels from 25-70°C.
14. Galvanised steel backplate with pre-drilled holes for fixing.

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2 Preparation For Installation

All underfloor heating pipework **MUST** be pressure tested in accordance with the Thermoboard Pressure Testing Procedure, and the results recorded in the table accompanying it. Where applicable ask the site manager to witness and counter sign the record. It is recommended that a copy of the completed pressure test record is kept as part of the home owners pack along with this installation guide.

The following tools are required to install the manifold:

- Power drill, rawl plugs and screws
- Pipe clips and pipe lagging
- Philips and flat-head screw drivers
- Pipe cutters
- 5mm Allan key, or suitably sized flat head screw driver, to adjust balancing ports
- 32mm spanner or equivalent to tighten primary pipework connections

The manifold should be installed in accordance with local regulations by a competent, suitably qualified plumber and electrician.

It will require 22mm primary flow and return pipework from the heat source to the manifold position. All flow and return pipework should be insulated following connection.

3 Manifold Fixing And Connection

The manifold is designed to be installed straight from the box with no assembly required; there are pre-drilled holes on the top and bottom edges of the galvanised back plate to fix the manifold to a suitable wall.

Line up the manifold, so that when mounted the tails from the heating circuits will emerge from the floor directly below the manifold ports. The manifold should be at least 350mm above the finished floor height, this will allow enough flex in the heating circuits to ensure connecting them to the manifold ports is easy.

3A

The manifold is heavy, it will require two people to hold and mark its position for mounting (see 3A). The manifold must be mounted vertically for the automatic air vents and pump to operate efficiently. Once marked, drill and insert suitable fixings into the wall before lifting it back in position and fastening it in place (see 3B).

3B

3 Manifold Fixing And Connection *continued*

With the manifold mounted in position connect the 22mm primary pipework from the heat source to the manifold. When using plastic primary pipe ensure bore supports are used as required (see 3C). It should not be necessary to remove the primary fittings, however if it is beneficial, take care to reassemble the fittings with the olives in the correct sequence and orientation (see 3D).

3C

3D

If not already done, the underfloor heating circuits should be installed, ensuring that there is enough pipe exposed to reach the relevant port on the manifold (see 3E). Fit the supplied curved pipe supports around the pipes at the base of the wall to bring the pipes up vertically to the manifold. Clip the pipe clamps together and mount them 200mm beneath the manifold, but do not secure the pipe until it is connected to the manifold. This will allow the pipe to be pushed over the brass spigot easily.

3E

It is important that the circuits are correctly identified and paired according to the installation drawings (see 3F). Failure to do so could lead to circuits being controlled by a thermostat located in another zone. In the event that both ends of a circuit are connected to the same arm of the manifold, no water will flow through the circuit and remedial work will require fittings to be added to extend pipework to the correct arms.

3F

Disconnect the nut and olives from the manifold ports. Cut the pipes cleanly using a pipe cutter. They should line up with the top of the brass spigot fitted into the ports when the pipe is clamped in place (see 3G). Care must be taken to ensure they are not cut short. The flow end of the heating circuit will need to line up with the balancing arm on the manifold, and return end of the circuit will need to line up with the actuator arm.

3G

Place the nuts over the ends of the pipes and push the grip rings on (see 3H). The pipes can then be pushed onto the spigots, and the nuts tightened using the spanner provided (see 3I) Finally, secure the pipes in the relevant pipe clamps, previously fixed beneath the manifold (see 3J).

Once connected all exposed pipework should be lagged to minimise heat loss.

3H

3I

3J

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4 System Filling

Where the system is being filled through the primary loop, the thermostatic water mixing valve should be set to the MAX position (see 4A) in order to have the maximum inlet opening. Alternatively it is possible to fill the manifold by connecting a feed to the drain spigot of the flow arm (see 4B).

If the actuators have been activated previously, it is necessary to unclip them from their collars on the manifold arm (see 4C).

Unscrew the dust caps on the automatic air vents located on each arm, to allow the air they collect to escape easily (see 4D). The drain spigot on the return arm of the manifold, which has the actuators mounted on it, should also be opened to allow air to escape the system (see 4E). It is recommended that a suitable length of pipe/hose is fitted on the spigot to expel the water into a bucket/drain.

To ensure air is removed from each individual circuit, it is necessary to purge them. Remove the covers from the balancing valves on the flow arm of the manifold (see 4F). Open each one in turn until clear water with no bubbles is expelled before closing it and proceeding to the next circuit (see 4G).

After purging the individual circuits the drain spigot should be closed and the actuators reattached if they were previously removed. Depending on the method used there may be a small amount of air in the return pipe located above the water mixing valve. This can be expelled by opening the bleed valve on the elbow (see 4H). Care should be taken to ensure that water being expelled form this valve is safely collected.

The system must be flushed clean and filled with a suitable corrosion inhibitor in accordance with the heat source manufactures instructions. This is to avoid the impurities that might obstruct water passage or damage regulating parts within the heating system.

Once the system has been filled any excess air will be discharged through the automatic air vents on the manifold arms. When the system is in operation the dust caps on the automatic air vents should be left ½-turn open to allow for the release of air that has been carried into the system by the flowing water.

5 Temperature And Pump Setting

Initial heating should commence with the flow water temperature at no more than 25°C. This temperature should be maintained for at least 3 days. The flow water temperature should then be increased by 5°C per day until it has reached the design temperature. This temperature should be maintained until the moisture-content of the floor, and the relative humidity of the room, are both stable and in line with the floor finish manufactures requirements.

For **Screed Floors** the maximum recommended flow temperature is **60°C**. A standard 65mm sand and cement screed should be allowed to cure for 21 days after being laid before turning the underfloor heating on. Under no circumstances should the underfloor heating be used to speed up the screed drying time in excess of this schedule. In the event of any conflicts, the screed manufacturer's instructions should be followed.

For **Timber Floors** the maximum recommended flow temperature is **65°C**.

Some specialist floor constructions incorporate products which require lower or allow higher water temperatures. If in doubt please refer to manufacturers recommendations.

For manifolds that are serving multiple floor constructions the flow temperature must be set to suit the floor construction with the lowest, maximum temperature.

Position	MIN	1	2	3	4	5	MAX
Temp [°C]	25 ±2	30 ±2	40 ±2	50 ±2	60 ±2	65 ±2	70 ±2

The water mixing valve located directly above the pump needs to be set to generate the required flow temperature for the floor. This is easily done by turning the dial to the appropriate setting (see 5A). Once the system is running the temperature setting can be fine tuned by monitoring actual flow temperature, as displayed by the dial thermostat which is located on the flow arm of the manifold (see 5B).

5A

5B

5C

5D

The Grundfos Alpha+ pump should be used in the fixed Speed III mode (see 5C) during manifold commissioning; and then set to the max position in constant pressure operation for daily operation. Please refer to Grundfos instructions supplied with manifold for guidance where required.

Most systems are designed with a temperature drop of 10°C between the flow and return. If the observed temperature drop under steady state running is greater than the designed temperature drop, the flow rate should be increased by increasing the setting on the pump. Conversely if the water is returning hotter that expected the pump setting can be decreased.

Note:

The Flow Watch thermostat located beneath the pump should be set to a temperature 10°C higher than the required flow temperature to prevent the system from shutting down during normal operation (see 5D).

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6 Balancing The System

6A

It is advisable to check for any accumulated air in the cold water return pipe and bleed it if necessary prior to balancing the system (see 6A).

Remove the chrome plated valve caps on the flow side of the manifold and ensure that all of the lockshield valves are fully open by turning them anticlockwise.

6B

Set the programmer to all day and/or set all thermostats to call for heat. The actuator heads can take up to 2 minutes to respond, you can tell at a glance if the valve is opening as a distinctive blue band appears on the actuator head (see 6B).

The green indicator light on the pump should be on, confirming that it is switched on. The pump may be noisy when first switched on, due to air remaining in the chamber. This noise should cease after a few minutes running as the air is vented from the system.

6C

With all balancing valves fully open, check that the flow temperature is correct and constant, adjust water-mixing valve as necessary to reach the correct working temperature.

Ensure water is circulating by referring to the indicated temperatures on the return port thermometers (see 6C). If any of the returns are not heating or if sections of the floor remain cold repeat the procedure in section 4 to purge the air from the system. Once purged ensure all of the balancing valves are re opened.

6D

Allow the system to run for a period of 3 hours, making sure that the green valves on the air vents are open. Small amounts of air that may have been carried into the UFH system by high velocity water whilst filling will be released.

Identify the circuit with the coldest return temperature. This is the datum circuit, to ensure it is kept fully open and not accidentally adjusted replace the chrome plated cap (see 6D).

6E

The system is balanced by throttling back the circuits with higher return temperatures, using the lockshield valves (see 6E), to match the temperature of the datum circuit. The response times between adjusting the flow rate and observing a change in the return temperature will vary depending on the floor construction. Typically this is in the region of 15 to 20 minutes.

As an initial guide the valves should be closed 2 full turns, plus an additional half a turn per degree which that circuit is above the datum circuits return temperature. For example if the datum circuits return temperature is 57°C to adjust a circuit down from 61°C would require 2 + 1.5 = 3.5 turns. This is for initial guidance only. The actual response should be observed and used for further adjustments as every system will vary slightly.

When all the return temperature gauges are reading the same value the manifold is balanced and the caps can be replaced.

For systems which contain multiple manifolds it may be necessary to balance them against each other. This is done in a similar method to balancing the circuits. Ensure the secondary circulator pumps on all manifolds are set in their normal running mode (maximum constant pressure setting). Throttle back any manifolds in the system, which have a hotter return temperature than the 'coldest' manifold, using the lockshield valve on each manifolds primary flow connections. As with the circuits, the 'coldest' manifold should not be throttled back.

7 Checking System Performance

Once the system is fully commissioned, thermostats should be rechecked to ensure they are operating the correct actuator head(s).

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.

An Infra red thermometer can be used to check the floor temperature (see 7A). The underfloor heating should typically exhibit a surface temperature of 26-29°C, and the ambient air temperature should be pleasantly warm, about 20-21°C.

For systems using optimised thermostats, such as Osma Underfloor Heating's Low Voltage Network Thermostats, they can be programmed with the time and temperature combinations as required. For example, if a temperature of 20°C is required at 7:00am, this time and temperature is what would be set on the thermostat. The thermostat itself will then calculate what time it should turn the heating on each morning to be at 20°C for 7:00am.

Where standard thermostats are used, it is recommend that from a cold start the system should be programmed to start its heating cycle 1-2 hours before the set room temperature is required.

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

- External temperature
- Internal temperature and heat losses
- Floor construction
- Heated floor mass
- Flow temperature
- Floor coverings
- Level of insulation

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8 Maintenance And Troubleshooting

The UFH system requires no specific servicing, although it is recommended that the manifold is inspected at the beginning of each heating season to ensure the system is functioning correctly. Follow the heat source recommendations with regards to flushing and additives.

Symptom	Problem	Solution
No heat in any zone	UFH system not turning on	Ensure the UFH system is programmed correctly, and the heat source is available to provide hot water for this period.
	Heat source/UFH pump not running	Ensure at least one thermostat is calling for heat and the relevant actuators are open (a blue band will be visible on a raised cap)
		Check the wiring centre fuses.
UFH keeps switching off	Heat source/UFH timer(s) set incorrectly	Ensure the UFH system is programmed correctly, and the heat source is available to provide hot water for this period.
	Limit thermostat is activating	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 water mixing valve for blockages.
Some zones do not become warm	Air trapped within pipework	Set the UFH pump to speed setting III, open the balancing valve fully for the problem zone ensuring all other zones are switched off. Air should automatically vent from the system.
	Manifold incorrectly balanced	Leave the system to run with all zones calling for heat, and then adjust the balancing valves so that all the return gauges read a similar temperature.
	Thermostat incorrectly wired	Turn each thermostat on in turn with all other thermostats turned off. Ensure that the thermostat is activating the correct actuator(s) on the manifold.
Incorrect zone becomes warm	Thermostat incorrectly associated	Turn each thermostat on in turn with all other thermostats turned off. Ensure that the thermostat is activating the correct actuator(s) on the manifold and check which floor areas are heating up.
Some zones become warmer than others	Manifold incorrectly balanced	Leave the system to run with all zones calling for heat, and then adjust the balancing valves so that all the return gauges read a similar temperature.
	Different floor constructions/finishes	Some floor constructions provide more efficient underfloor heating. For example stone or tiled floors have a greater heat output than carpeted ones.
	High Heat losses	Some rooms with 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.
Zone takes a long time to warm up	Manifold incorrectly balanced	Leave the system to run with all zones calling for heat, and then adjust the balancing valves so that all the return gauges read a similar temperature.
	Flow temperature set too low	Check the blending valve is set correctly and that the primary flow temperature into the mixing valve is 10°C warmer than the required secondary flow water temperature.
	High Heat losses	Some rooms with 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.

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ISO 9001:2000

Wavin is a member of the Underfloor Heating Manufacturers Association

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