

# Technical Brochure

## Manifolds



# Product Details

The Tio premium stainless-steel manifold is a preassembled unit for use within either underfloor heating systems or with wall hung radiator systems. The unit is pre-assembled, complete with an auto air vent (AAV), 10 bar pressure gauge, flow metres with 0-5 l/m indicators and fill and drain valves.



Pre-assembled flow and return manifold bars to save installation time.



Compatible with various pipe sizes upto 20mm.



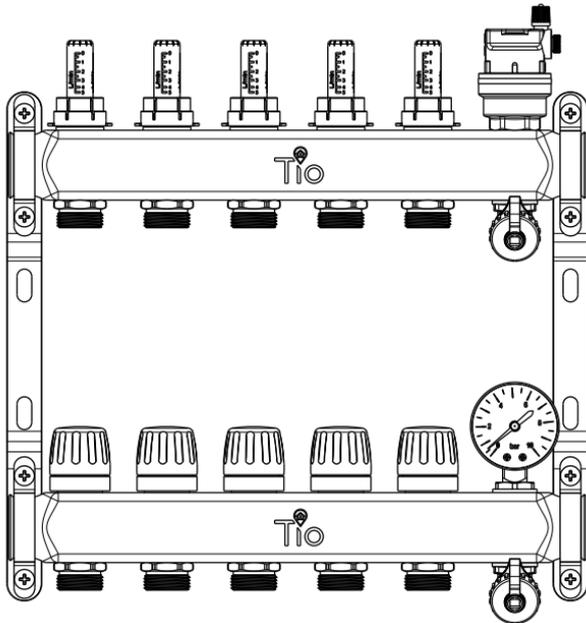
Integrated filling and drain off valves ease long term maintenance.



# Technical Information

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## Manifold Layout



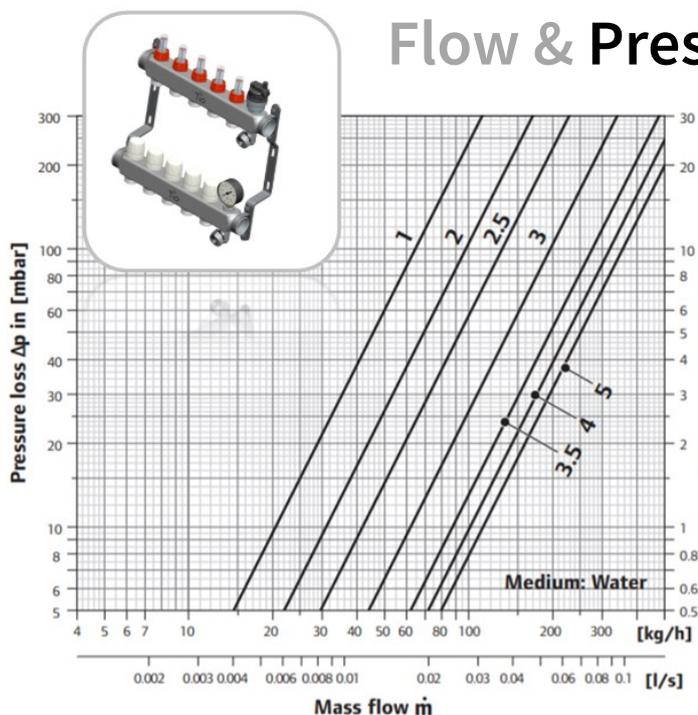
1. Flow gauge with 0—5 l/m indicators
2. 22mm outlets for pipe housing
3. 1” female threaded end
4. AAV (Auto-air vent)
5. Manifold Bracket
6. 0-10 Bar Manifold Pressure Gauge
7. Drain Valve

The Tio premium stainless-steel manifold has been preassembled to this layout to give the maximum technical benefit. This layout ensure automatic air venting within the system accompanied with precise pressure monitoring through the pre-assembled pressured gauge. The pressure is indicated by

## Specification Parameters

Maximum Operating Pressure	8 Bar
Manifold Size	1”
Manifold Connections	Eurocone 3/4” FT Thread
Primary Connections	G1”
Max Temperature	90°C

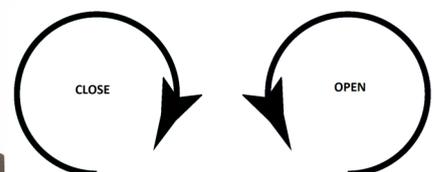
## Flow & Pressure Adjustment



Flow and pressure loss in [mbar] and associated correlating [kPa] is indicated in the attached chart.

The unit has the ability to adjust flow in accordance with professionally design project criteria.

The flow meter is adjusted using the anti-clockwise and clockwise trunich mechanism to open and close the port and increase and reduce flow respectively.



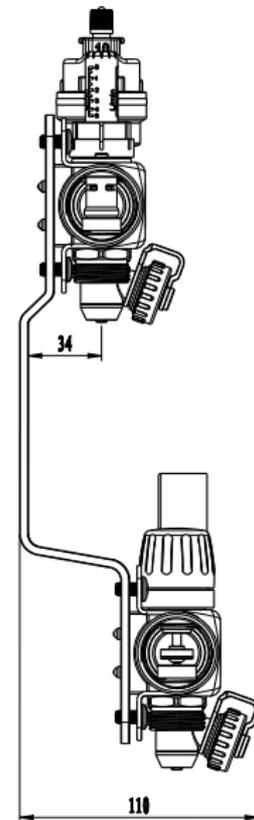
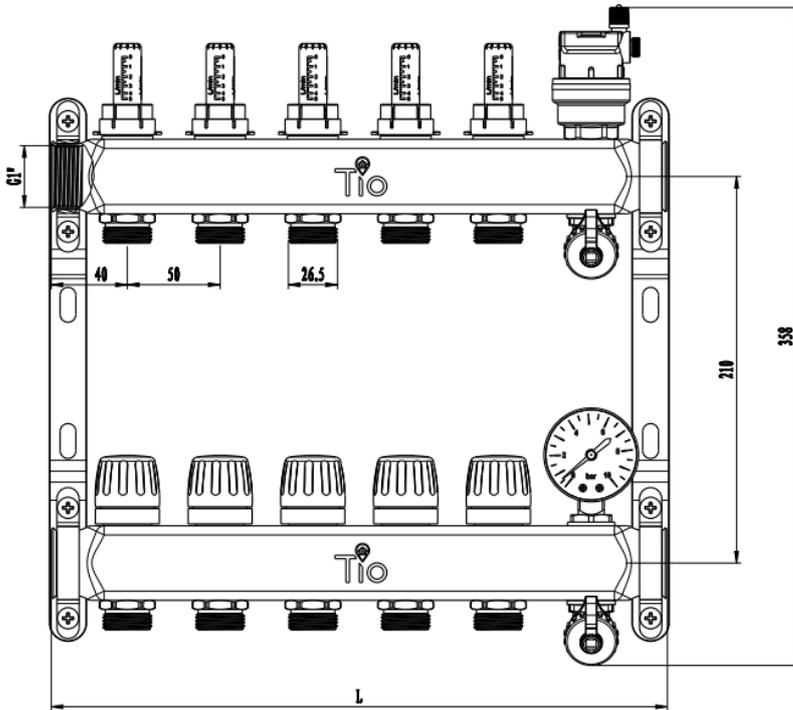
# Manifold Sizing

The Tio manifold has a standard UK distance of 210mm between the flow and return bars. This makes the unit versatile with various mixing units.

The unit has spacing of 50mm between each port from the centre point. This enables various pipe sizes and materials to be installed. For ease of installation we recommend no larger than 20mm to be installed with the Tio manifold connectors.

The unit has 1" threaded inlets to house isolation valves. We recommend when installing with the TIOMIX0003 mixing unit that a captive universal nut be used for fixing.

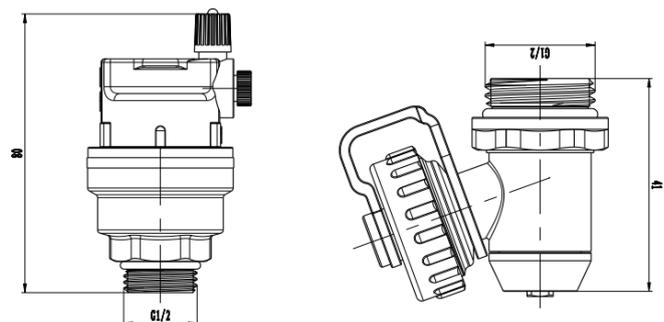
The bottom rail has a modulating pin that can be either manually adjust with the white adjusting caps, or to achieve electronic control an actuator can be installed.



Number of Ports	Length(mm)
2	130
3	180
4	230
5	280
6	330
7	380
8	430
9	480
10	530
11	580
12	630

The Tio premium stainless steel manifold can be wall mounted by using the brackets provided. Suitable wall fixings will need to be assessed.

All componentry is supplied within the box unit.



The Tio componentry included an automatic air vent with a 1/2 inch inlet and a drain/fill valve with a 1/2 inch inlet.

# Commissioning Information

## Filling

We recommend filling each circuit separately, opening the return isolation valves and double regulating valves each time and closing them again when the circuit is full as per the instructions below:

1. Isolate the manifold via the ball valves.
2. Connect a hose to the return manifold (the bottom manifold bar) via the drain point. The discharge hose should be run to a bucket or drainage point.
3. Connect mains pressure water to the flow manifold (the top manifold bar) via the fill point.
4. Close all of the return valves by turning the blue adjustable heads clockwise.
5. Open Flowmeter valve and the corresponding return isolation valves. Begin filling the first circuit.
6. Once the water flowing from the discharge hose is flowing smoothly all air has been removed from the circuit.
7. Close this circuit and fill the next circuit following the same procedure

## Testing

1. Once filled, the system should be pressure tested in accordance with EN1264-4:2009 between 4-6bar.
2. The system should be left under pressure whilst fixing a floor or laying the screed.

## Commissioning

1. In order to commission the system the heat source needs to be operating to deliver the required temperature water to the manifold and the primary and secondary pumps need to be operating.
2. To adjust the flow meters, follow the adjustment procedure above. The actual required flow will depend on the heat requirement of the room and the amount of pipe in the floor. Most modern buildings insulated to current building regulations will require around 50- 60W/m<sup>2</sup>. As a general guide, we recommend that the following flow rates are set (when using 16mm pipe at 200mm centres):
3. Replace the red locking ring once the flow meters are set.
4. The underfloor heating pipework will not corrode in any way since it's plastic, however, it is recommended that a suitable inhibitor is added to avoid the corrosion of primary pipework, the heat source and any other towel rails or radiators on the system.
5. Initial setting of the thermostatic blending valve (after the initial system start-up/screed drying period) should provide the following temperatures: - Screeded/dry screed board floors: 35-45°C - Timber/floating floors: 45-55°C Depending on Design

## System Start Up

For screed floors, ensure a minimum of 21 days have elapsed since laying the concrete screed, or seven days if an anhydrite floor screed is utilised. Wooden floors can be switched on quite early, but should not be allowed to reach too high a temperature too soon.

Wood being a natural material requires that both the floor and deck and joists must be treated with care until temperature and humidity have stabilised. Where water temperature controls are utilised, ensure they are set the minimum setting (typically 25-30oC) and that room thermostats and flow meters are set to design condition, as this will aid gradual drying of the floor and structure.

System responses will be very slow on initial start-up. After the heating has been running for the recommended time at minimum setting (3 days for solid concrete floors and 1 day for wooden suspended floors), gradually raise the water temperature to the design setting for a further 4 days.

Once running normally there should be a 7-8oC temperature drop across the circuits. Once all action are complete, turn down all thermostats so that the system stops. Now turn up one thermostat and ensure the correct actuator or actuators have opened for that particular room. After its determined that the thermostat is controlling the correct actuator, turn the thermostat down and repeat the procedure.

# Quality and Testing

We have a rigorous quality and testing procedure. Every manifold is pressure tested in the factory setting. This is then independently tested by our UK testing partner BSRIA.

Manifolds are tested to an operating pressure of 8 bar. Leak testing is then performed independently in the UK in accordance with BS EN 442-1:2014. This is a heating appliance means of leak detection test that requires a 1.3 times the testing pressure. Thus meaning an 8 bar manifold requires testing of 13.52 bar.



## Pressure Tests on UFH Manifolds

Carried out for  
Tio Climate Solutions Ltd

Report 102716/1

Compiled by Philip Stonard

21 April 2021

### Pressure Tests on UFH Manifolds

Carried out for: Tio Climate Solutions Ltd  
C/o H&H Distribution  
Unit X & Y  
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### QUALITY ASSURANCE

Issue	Date	Compiled by:	Approved by:	Signature
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Final	21-Apr-2021	P.Stonard	Mark Roper	
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Senior Engineer	Principal Test Engineer	
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PRESSURE TESTS ON UFH MANIFOLDS

TIO CLIMATE SOLUTIONS LTD

This procedure was repeated for both manifolds. The separate sub assembly of circulating pump and mixing unit was tested to 8 bar.

### 4.1 TEST INSTRUMENTATION

	BSRIA Instrument Number	Calibration Expiry Date
Standard pressure gauge	1535	15/12/21
Stopwatch	356	01/12/21
Vernier gauge	2057	22/01/22

### 5 RESULTS

Date of Test	Test reference number	Test pressure (Bar)	Did test item hold pressure for a minimum of 120 secs without rupture? Pass/Fail
16/04/21	102716A1PS (Manifold 1)	13.5	Pass - raised from 8, to 10, to 13.5 bar
16/04/21	102716A2PS (Manifold 2)	13.5	Pass - raised from 8, to 10, to 13.5 bar
16/04/21	102716A3PS (Mixing unit)	8	Pass - trial of new unit at 8bar

