VPS UNDERFLOOR HEATING

SINGLE ZONE

HYDRONIC UNDERFLOOR HEATING

INSTALLATION MANUAL

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INSTALLATION
PREPARING FOR INSTALLATION

Before proceeding with any installation works, be sure to conduct the following checks:

- The installer has taken receipt of all scheduled materials for the project;
- Where applicable, sub-floors are clean and free of debris. Sub-floor should be measured again prior to installation to ensure all depths are as per the design;
- All installation instructions have been read and understood by all relevant parties;
- The designated areas for each component have been measured and confirmed suitable to house the equipment;
- No materials are damaged or faulty.

MANIFOLD

The manifold is the central distribution point for underfloor heating. The water is sent from the primary household heating source (e.g. gas boiler), where the water is cooled to the specified UFH temperature and pumped under the floor surface. It travels under each area, transferring its heat up through the floor evenly, before arriving back at the manifold and being sent back to the boiler for reheating. Being the central point of the system, the manifold should be assembled and mounted first.

Positioning

The manifold should be positioned centrally in the property such that distribution to each heated area is efficient and involves minimal long pipe runs. It should be ensured that copper pipework to and from the boiler can reach the designated manifold location. If you have received a design and quotation from VPS engineers, the manifold location will already be chosen and agreed upon.

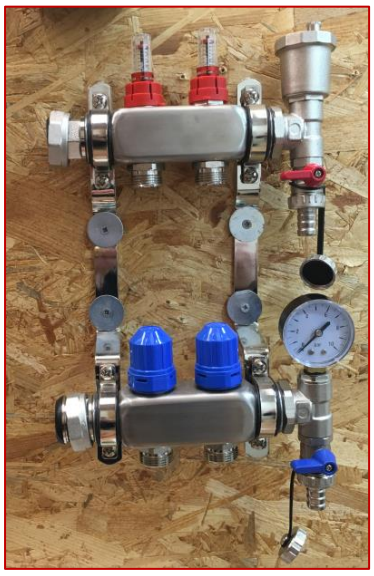
The installer should allow for the following recommended clearances when mounting the manifold on the wall:

Recommended minimum installation clearances:
200mm between finished floor level and bottom of manifold
100mm above manifold
50mm either side of manifold

Fig. 1 – Recommended installation clearances

ASSEMBLY

At your chosen/designated manifold location, mount the manifold on the wall using suitably rated fittings/rawl plugs, at the specified installation clearances.



Insert the Auto Air Vent assembly and pressure gauge assembly as shown, ensuring they are tight, properly threaded and not angled.

Fig. 2 – Manifold shown with Auto Air vent (top right) and pressure gauge assembly (bottom right) fitted on right hand side.

Connect ball valves (blue and red valves shown on left of Fig. 3) in one of the two configurations shown. This will be chosen based on the geometry of the manifold location, and which configuration will be able to meet the installation clearances.

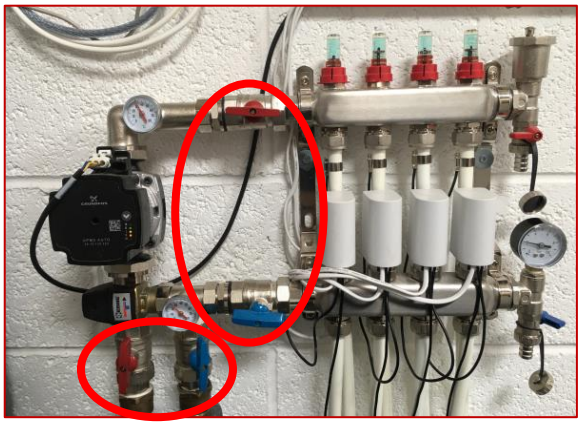
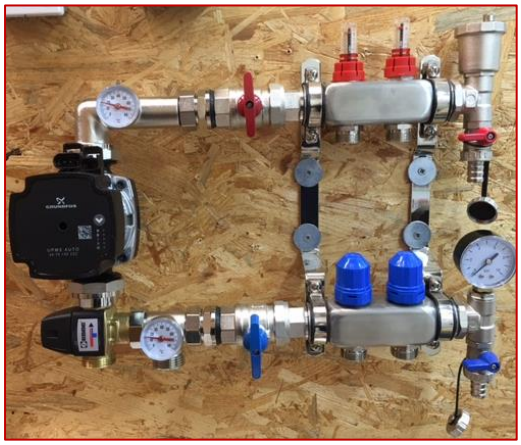


Fig. 3 – Manifold with two ball valve configurations shown (circled).



Connect and tighten the manifold control pack (where applicable). Ensure all fittings are properly threaded and tightened. Ensure that pump and blending valve are both in the correct orientation, facing upwards as denoted by arrow markings on each unit.

Fig. 4 – Manifold with control pack fitted (left; black units with temperature gauges).

PEX-AL-PEX 16MM PIPE CONNECTION

Refer to your underfloor heating layout design, provided by VPS, to find out the pipe lengths you must cut from each coil of pipe. If you have purchased a single-zone kit and do not have a pipe layout to refer to, use all available pipe and simply make cuts where necessary on the final loop.

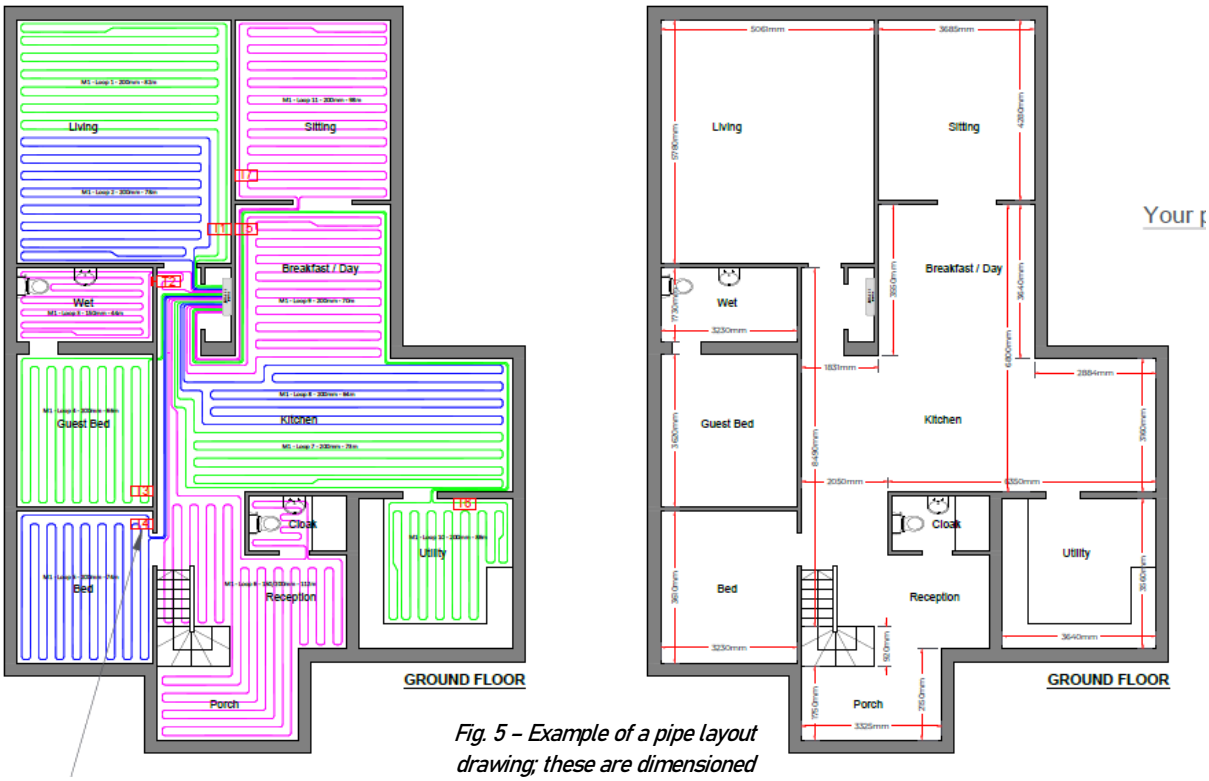
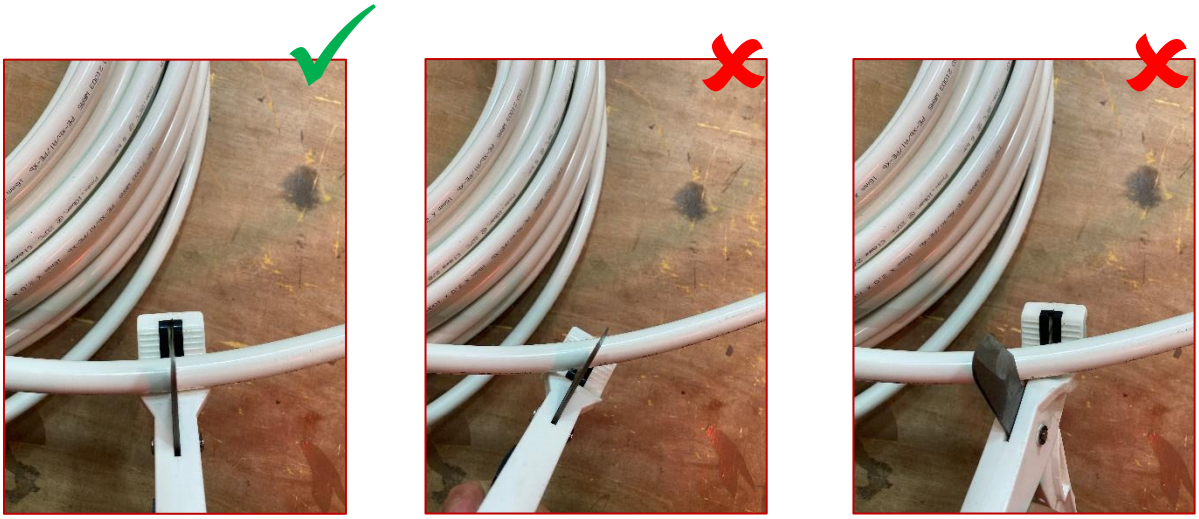


Fig. 5 – Example of a pipe layout drawing; these are dimensioned and to scale for ease of reference.



Make the designated cuts squarely and cleanly using a guillotine cutter or similar implement. Be sure to avoid angling the cutter as shown.

Fig. 6 – Demonstration of correct pipe cutting technique.

The cut end of the pipe may be flattened or warped after using the pipe cutter. Round the end off using the supplied pipe reaming tool, as shown.

Ensure the 16mm end of the reaming tool is used; forcing a larger node into the pipe will cause damage.

Fig. 7.1 – Pipe reaming tool

Fig. 7.2– Reaming tool with the correctly sized node inserted into the pipe.

Fig. 8.1 – Pipe with Eurocone nut.

Fig. 8.2 – Pipe with Eurocone nut and compression olive.

Once rounded, slide the 16mm Eurocone nut over the end of the pipe, before fitting the split compression olive to the pipe and inserting the push fitting.

Ensure the push fitting fits snugly in the end of the pipe before proceeding to connect to the manifold.

Fig. 8.3 – Pipe with Eurocone nut, compression olive and push fitting inserted.

Attach the assembled pipe end to the manifold as shown, torquing the nut to approx. 50 Nm, or one-and-a-half spanner turns after hand tightening.

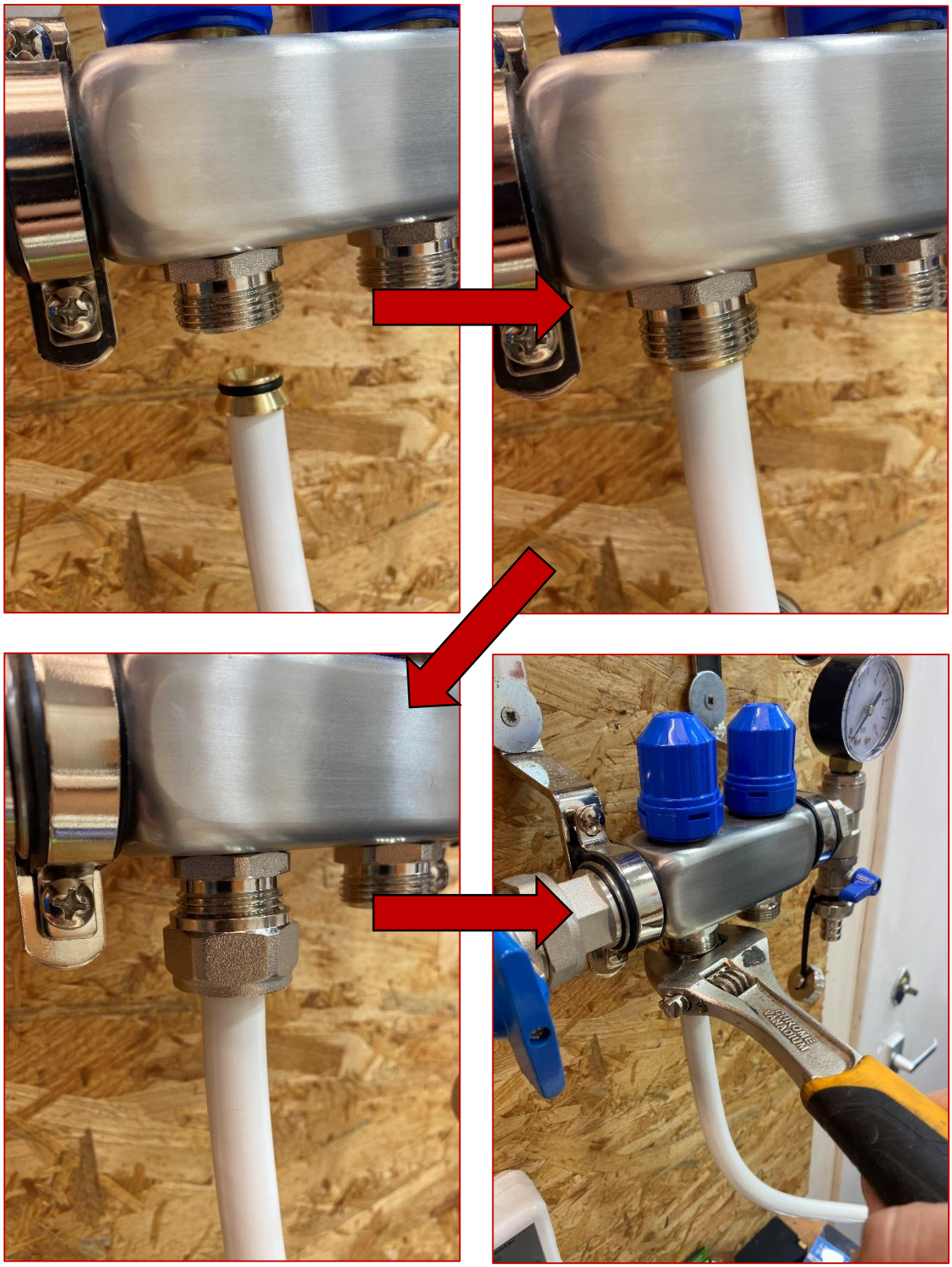


Fig. 9 – Connecting the pipe to the manifold.

LAYING THE PIPE

Ensure all working surfaces are swept clear of debris, and any uninvolved personnel are clear of the immediate working area.

If you have opted for a pipe decoiler, mount the coil of pipe to the decoiler. If not, you may need to ask someone to assist in holding the pipe while it is uncoiled.

Referring to your VPS layout design (if applicable), begin to uncoil the pipe along the floor. Fit a pipe staple to hold the pipe down to the PIR insulation every 500mm.

Be sure to maintain a 100mm perimeter from the external walls and any fitted units, and always adhere to the design pipe spacing.

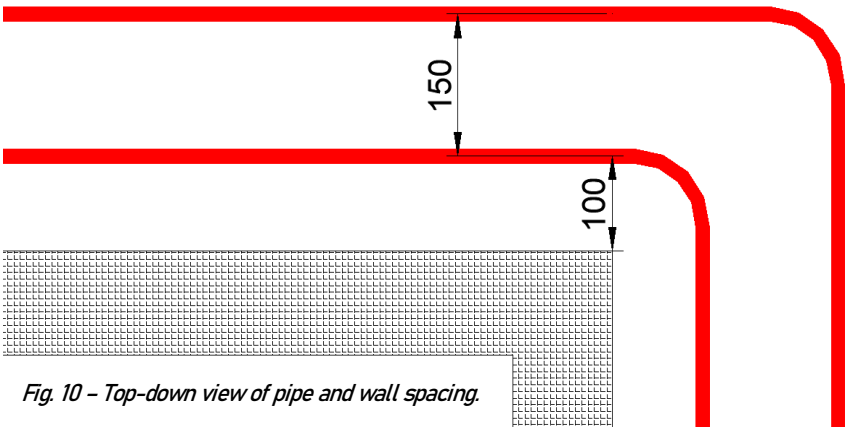
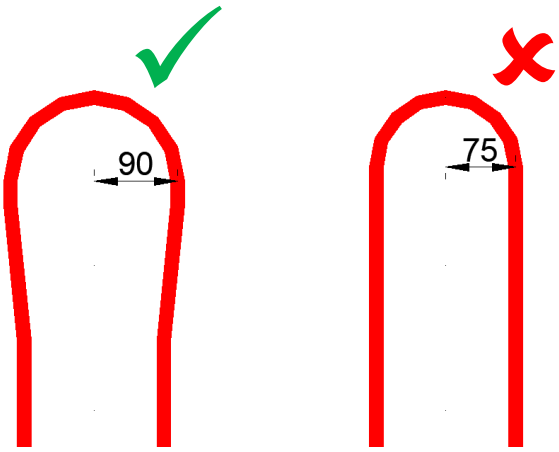


Fig. 10 – Top-down view of pipe and wall spacing.



If the pipe spacing is 150mm or tighter, ensure to leave a 'bulb' shape of a radius no smaller than 90mm at the end of each meander – this will prevent kinking of the pipe.

Fig. 10 – Top-down view of pipe radius for 150mm spaced pipes.

CONNECTION TO CENTRAL HEATING SOURCE

The underfloor heating manifold functions as a distribution node for the hot water provided by your household heating source. It takes the hot flow, blends it with the return flow such that the temperature is sufficiently low, and splits the water before sending a flow to each heated area under the floor.

If the hot supply is sufficiently cool before reaching the manifold (i.e. from a heat pump or a single-purpose boiler) then the pump and blending valve will not be required, and the heating source can be connected directly to the manifold.

Please note that VPS will not conduct design works or provide supply of the hot inlet pipework; this should be conducted by a qualified plumber or a confident DIY practitioner.

FILLING, VENTING AND PRESSURE TESTS

Once the manifold has been mounted and assembled, and all pipes have been laid and fitted, it's time to fill the system.

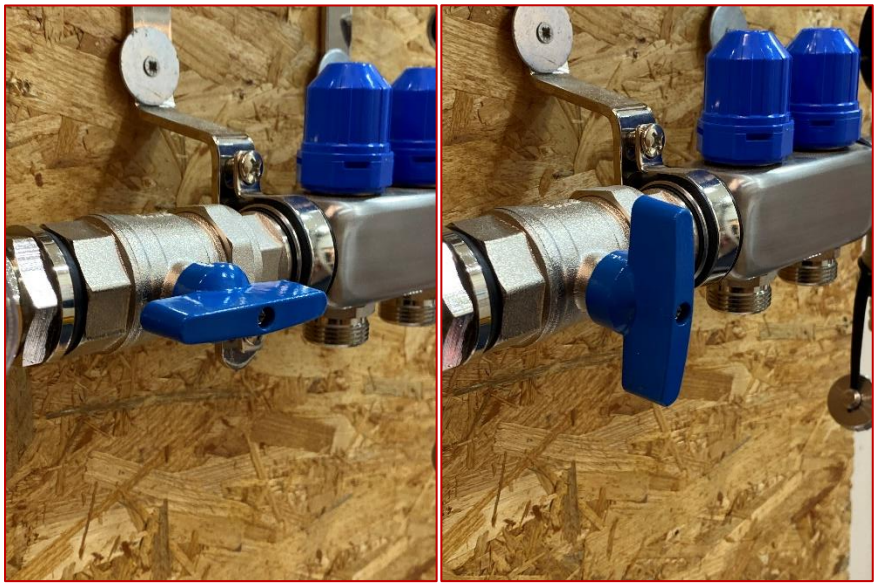


Fig. 11 – Ball valve open (left) and closed (right). Both the red and blue ball valves must be closed.

1 – Close the red and blue ball valves connected to the pump, as well as the blending valve (where applicable).

2 – Remove the end caps from the fill and drain valves and connect the ½" hose unions supplied.

Fig. 12.1 (above) – Drain and vent assemblies with end caps attached.

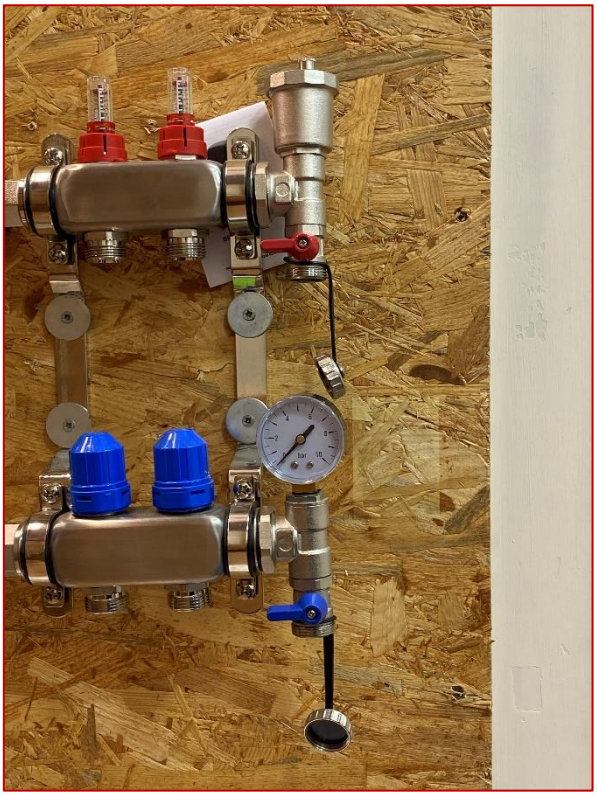
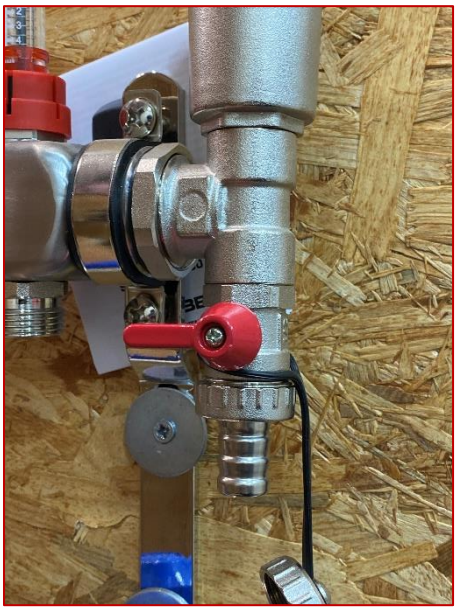


Fig. 12.2 (above) – Drain and vent assemblies with end caps removed.

Fig. 12.3 (above) – Hose union fitted in place of end caps.



3 - Open the small red and blue ball valves connected to the fill and drain points.

x2

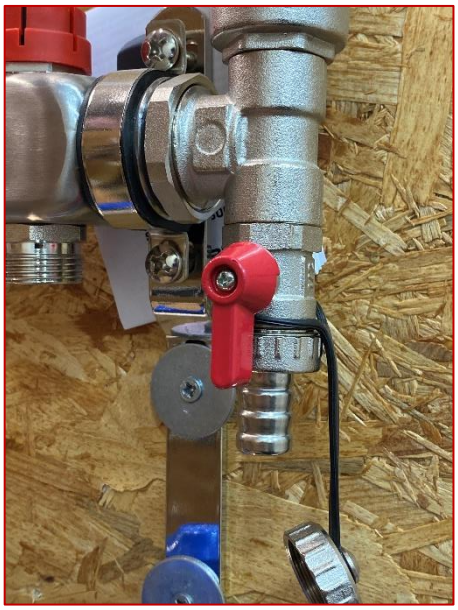


Fig. 13.1 – Valve on air vent assembly in the closed position.

Fig. 13.2 – Valve on air vent assembly in the open position.

4 – Connect a suitable hose from the mains water supply to the hose union on the flow bar (red), and connect another hose from the return bar (blue) to a suitable water collection point, e.g. a bucket.

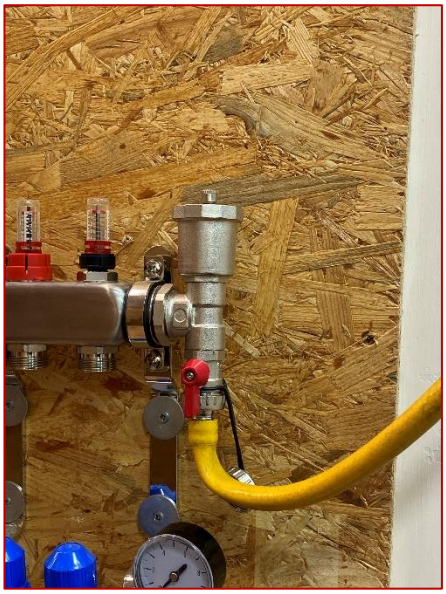


Fig. 14– Hoses connected to the flow (left) and return (right).

5 – Fully close all flow ports by removing the red cap and twisting them clockwise until they stop. Close the return ports by twisting the blue head clockwise.

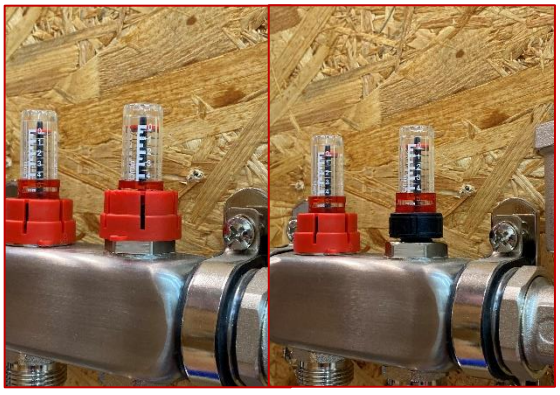


Fig. 15.1 – Flow valve (left), shown with the locking cap attached and removed. Once removed, the black part can be twisted.

Fig. 15.2 – Return valve (left). The top part of the blue cap can be twisted to open and close the valve.

6 – Open the first set of flow and return ports by twisting them anti-clockwise.

7 – Turn on the mains water supply to begin filling the first loop. Observe the relevant flow meter; the indicator should move to the bottom of the viewing glass.

8 – Watch the return flow from the hose; when it stops 'spitting' and begins to flow smoothly, the air has been purged from the loop. Another way to verify this is by submerging the end of the hose in a bucket of water and waiting until air bubbles cease to appear.

9 – Close the flow and return valves on the first loop and open the flow and return ports on the second loop, before repeating the filling process from steps 6-8. Repeat this for all loops on the manifold.

10 – Once all loops are filled and vented, open all flow and return ports.

11 – Close the blue drain valve on the right-hand side of the manifold and disconnect the hose, before removing the hose union and reinstalling the end cap as per step 2.

12 – Connect a pressure pump to the hose union on the flow bar. Open the red ball valve on the vent and ensure the blue ball valve on the drain is closed.

13 – Increase the system pressure to twice the operating pressure, up to a maximum of 6 bar. The pipes will expand, causing a slight pressure drop which will level out and cease to decrease any further. Monitor the pressure gauge to ensure constant pressure.

14 – Once the gauge reading has settled, begin to decrease the system pressure to the specified working pressure. Once this value is reached, the pipe swelling from the high pressure will subside, and the tightening pipes will increase the system pressure slightly. Wait until this stabilises, and then leave the system at working pressure for an hour. If there are any leaks, the pressure will decrease during this time. If the pressure has not decreased, the system is tight and leak-free.

15 – Ensure the system remains under pressure as the floor is being laid to prevent any compression of the pipes and ensure immediate detection of damage or leaks.