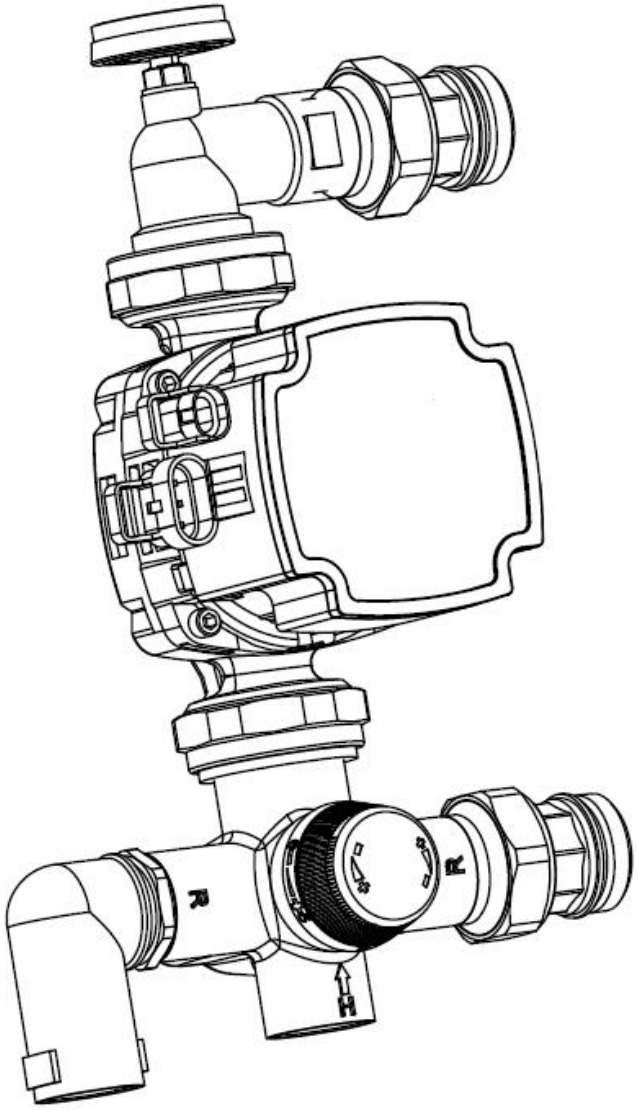
Underfloor Heating Pump Control Set with Thermostatic Mixing Valve



Installation and Commissioning Manual

Key Symbols and Safety Instructions

Symbol Definitions

Warnings

Warnings in this document are marked with a triangle symbol. Keywords indicate the nature and severity of risks if preventive actions are not taken.

Keywords used:

- **NOTICE**: Risk of property or equipment damage.
- **CAUTION**: Risk of minor or moderate injury.
- **WARNING**: Risk of serious injury or death.
- **DANGER**: Certain risk of severe injury or death.

General Safety Guidelines

Follow these rules:

- Comply with local laws, regulations, and technical standards.
- Heed all safety warnings and take necessary precautions.
- Read all installation instructions (e.g., manifolds, pumps, controls) thoroughly before starting.
- Keep records of all work done.

Electrical Safety

- Only qualified personnel should perform electrical work or maintenance.
- Disconnect electrical components from power (230V AC) and secure against accidental reconnection before servicing.

Device Use

- Cleaning and maintenance must be handled by trained and authorized individuals.

Handling Guidelines

- Exercise care when lifting, carrying, or transporting the unit.
- Always use proper techniques for handling heavy items.

Packaging

- Keep packaging intact until final installation to prevent damage.
- Dispose of packaging responsibly.

Siting and Installation

Proper placement, assembly, and installation are essential for the appliance to operate safely and efficiently.

- Only trained professionals should install the appliance and its components.
- Install the appliance only in rooms or locations that meet the manufacturer’s specifications.

Commissioning

- Commissioning must be performed by a qualified individual.
- Complete and retain commissioning reports for recordkeeping.
- Inspect all connections for leaks before starting the heating system.
- Check and tighten all fixings and fittings after installation.
- After system commissioning and inspections, complete and retain a final inspection checklist for reference by relevant parties.

Risk of Damage from Operator Errors

Operator mistakes can lead to injuries and property damage.

- Restrict access to the appliance to trained operators.
- Maintenance, inspection, and repairs must be performed by qualified personnel.
- Only use original manufacturer spare parts to avoid damage or loss of warranty. Spare parts details are included in the manual’s appendix.

Electrical Work

Electrical work must only be done by qualified electricians.

Before starting:

- Ensure the electrical supply is safely isolated and secure against accidental reconnection.
- Refer to *Health and Safety Executive Guidance HSG85* for isolation procedures.
- Use GS38-approved testing equipment to confirm disconnection.
- Follow the manufacturer's guidelines when integrating other components.

Danger of Burns and Scalds

- Hot surfaces, connections, or leaking water can cause severe burns or scalds.
- Avoid contact with hot surfaces.
- Do not touch leaking or drained water unless the temperature is known to be safe.

Leakage

If leaks occur:

- Close all isolation valves immediately.
- Have all leaks repaired by a qualified professional.

Appliance Information

General Information

Main Features

High-Quality Mixing Valve

Provides:

- Scald-safe temperature control to protect UFH (underfloor heating) pipes and floor coverings.
- Precise temperature control with a stability range of ±3℃.
- Low 20℃ flow temperature setting compliant with BS EN 1264 warm-up procedure.

Compact Design

Requires minimal installation space and clearance.

High Flow Efficiency

3.4 kvs flow characteristic ensures higher flow rates and lower pressure drops.

Integrated Features

- Temperature gauge on the mixed secondary flow as standard.
- Quick manifold attachment via integral spinning nuts.
- Built-in check valve for rapid UFH manifold filling.
- Self-sealing connections to minimize leaks.

Customizable Options

- Temperature gauge can be swapped for a high-limit flow temperature sensor.
- Fully reversible for left- or right-handed installation with top or side entry connections.

UK Support

Fully assembled, tested, and supported in the UK.

Temperature Stability

Performance guaranteed under conditions of stable cold/return water pressure, a minimum flow rate of 9 l/min, and a ΔT range of 3–10℃.

Instructing the Customer

Handover Guidance

- Teach the user how to operate the heating system and explain its operating conditions.
- Highlight any safety-critical actions they need to know.
- Emphasize that only authorized professionals should handle modifications or repairs.
- Provide the customer with the appliance documentation for future reference.

Intended Use

The Pump Pack is a pre-assembled temperature control and circulation unit designed for connection to an Underfloor Heating (UFH) Manifold, supplied by a higher temperature primary circuit. It ensures scald-safe mixed flow temperature control and circulates heated water through UFH circuits serving multiple zones, provided the flow rate and temperature stay within specified limits.

Key Components

- 4-Port mixing valve
- Circulation pump
- Check valve
- Temperature gauge
- Spinning nuts
- Optional components (depending on build): elbow fitting and high-limit sensor

Operational Requirements

- The circulation pump needs a live switch to activate during heating demand, typically controlled by a room thermostat or UFH control unit for multi-zone systems.
- Flow rate balancing is not included in the pump pack; external balancing is necessary.
- Refer to the Technical & Performance specifications for proper usage of this appliance.

Manifold Requirements

The manifold is a separate component detailed elsewhere, which must include:

- At least two stop valves and a balancing device per circuit, with independent shut-off and balancing functions.
- One circuit per heated/cooled room, allowing manual or automatic temperature control.

Note:

The balancing device ensures each circuit achieves its designed flow rate under calculated conditions (refer to ISO 11855-3). If other equipment in the system provides equivalent balancing functionality, it may replace balancing devices, provided its performance is verified by testing or calculation through an approved institute.

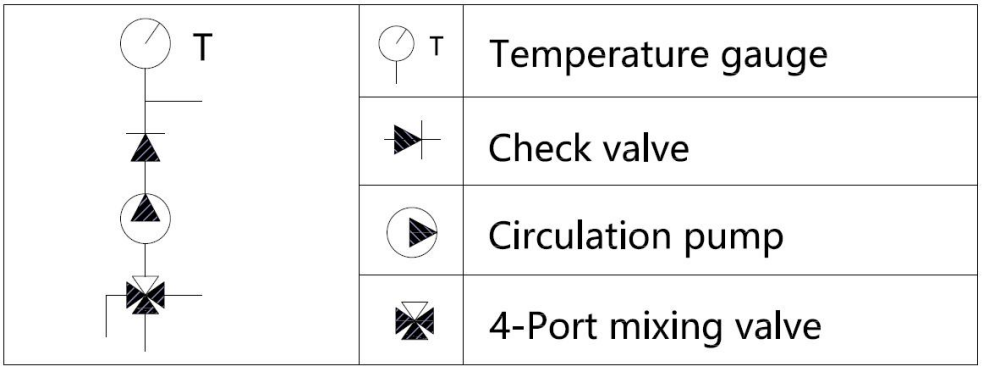
Misuse

The appliance must only be used as described in the Intended Use section. Operating it outside these parameters is considered misuse, which can result in harm to people and damage to property.
Using the appliance improperly may also void the manufacturer's warranty.

Declaration of Conformity

This product is designed and operated in compliance with European Directives and applicable national requirements. Compliance is confirmed by the CE marking.
You may request the declaration of conformity for this product by contacting the address provided on the back of the manual or reaching out to your local sales representative.

Schematic layout

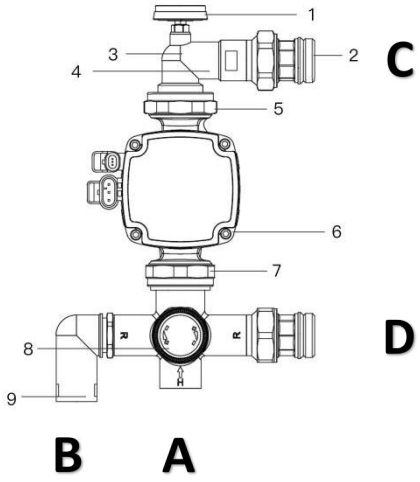


Technical & performance specification

Specification	
Medium	Heating water to VDI 2035,glycol solutions
Max.percentage of glycol	≤50%
Max.working pressure	PN10
Max.differential pressure	1bar
Min.recommended pressure	3kPa
Working temperature range	0-80℃
Adjustable temperature range	20-55℃
Factory preset temperature	55℃
Temperature stability	±3%
Minimum flow rate for stability	9 L/m(0.15L/s)
Recommended range of temperature differential	3-10℃

Assembly components/Hydraulic connections

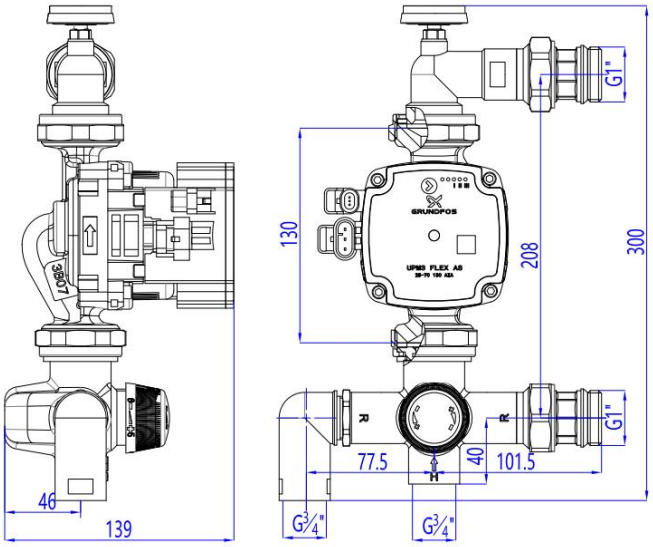
1. Temperature Gauge
2.Nickel plated self-sealing spining nut(Brass)
3.Flanged nickel plated brass T-Piece(Brass)
4.Check valve(PA66)
5.Nut(Brass)
6.Circulation Pump
7.Nut(Brass)
8.4-port mixing valve(Brass)
9.Brass elbow(Brass)



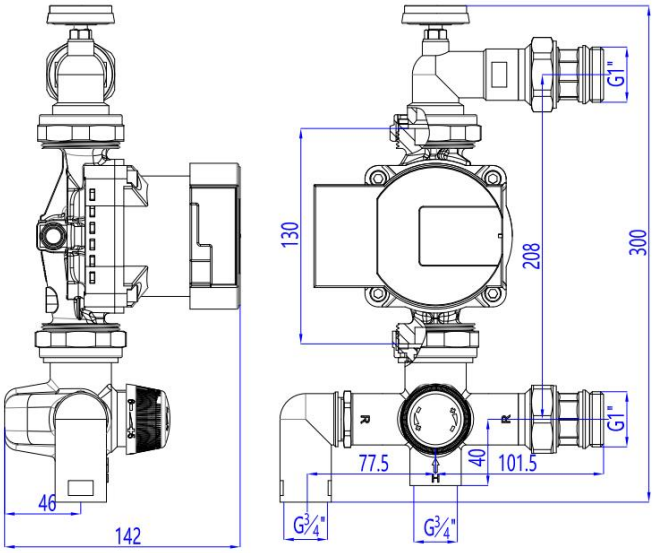
PRIMARY	3/4"xF BSP	A	Primary flow
		B	Primary return
SECONDARY	1"xM BSP	C	Manifold flow(mixed)
		D	Manifold return

Assembly Dimensions

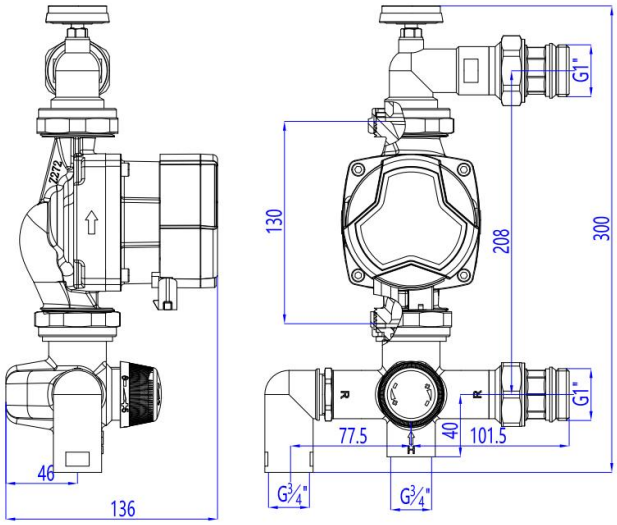
Grundfos Circulation Pump



Wilo Circulation Pump



Bastion Circulation Pump



Regulations

Installation and maintenance of the unit must be carried out by a qualified professional, following the local regulations and standards of the installation area.

Standards and Guidelines

The multi-part British Standard BS EN 1264 outlines design and installation requirements for water-based surface-embedded heating and cooling systems. Two sections of this standard apply to this appliance:

BS EN 1264 Part 5: Installation
Section 5.1.2.4.1 – Safety: "For heating systems, a safety device, independent of the control unit, shall cut off the heat supply to the floor heating circuit, even if electrical power is lost, ensuring the temperature around the heating elements does not exceed the limits specified in 5.1.2.8.2."
This safety device may be installed on the pump pack or on the UFH manifold.

Section 5.1.4 – Initial Heating Up: "Initial heating up must begin with a flow temperature between 20℃ and 25℃, maintained for at least three days. Then, the maximum design temperature should be set and maintained for at least another four days. This heating-up process should be documented."
The pump pack can be set to 20℃ to comply with this standard and document the warm-up procedure.
The purpose of this warm-up procedure is to prevent moisture from being removed too quickly from the screed, which could cause cracks and other problems.

Inspection and Maintenance

The heating system should be inspected regularly for the following reasons:

- To maintain high efficiency.
- To ensure safe operation.

According to BSRIA BG4/2011, underfloor heating manifolds should be checked annually for leaks. If leaks are found and cannot be fixed by tightening the fittings, the manifold may need to be disassembled to replace gaskets or seals. The operation of the manifold valves should also be verified, and the actual flow rates compared to the original commissioning records.
If flushing of the system is required for any reason, this can typically be done by disconnecting the loop(s) from the manifold and using potable water with sufficient mains pressure.
Water quality should be checked regularly, and strainers should be cleaned or emptied as needed. The thermostatic control valve should be isolated during the flushing process to avoid dirt and debris from blocking the valve.

Pre-Installation Requirements

System Preparation

- Plastic pipework used in the central heating system must have a polymeric oxygen barrier coating, with at least 1000mm of copper or steel pipe connected to the appliance.
- Plastic pipework for underfloor heating must be properly controlled and should not exceed the specifications provided by the underfloor heating manufacturer.
- The underfloor heating design must not exceed the hydraulic capacity of the circulation pump.
- Drain cocks should be installed at the system's lowest points.
- Air vents are required at the highest points of the system.
- To protect the underfloor circuit in case of failure, a high-limit thermostat must be installed on the flow pipe to the underfloor circuit and connected to the control unit. This will shut off the central heating pump if the temperature exceeds safe limits.

Notice:

For underfloor heating circuits:
Ensure the flow temperature does not exceed the limits specified by the underfloor heating manufacturer to avoid damage.

Cleaning the Primary System

Notice:

- Debris in the system can damage the appliance and reduce its efficiency. Failure to follow water treatment guidelines will void the appliance warranty.
- Before installation, the central heating system should be cleaned and thoroughly flushed according to the local standards and guidelines.
- The thermostatic control valve should be isolated and not flushed.
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Clearances

- Once the pump pack is attached to the manifold and the manifold is wall-mounted, a minimum of 300mm clearance should be maintained from the finished floor to the bottom of the pump pack.
- It is also recommended to leave 100mm clearance above and on either side of the manifold/pump pack for future maintenance.

Location

- Manifolds are typically placed in utility rooms, airing cupboards, cloakrooms, or understairs cupboards, and should be easily accessible for future maintenance and servicing.
- Ideally, the manifold should be centrally located within the home to allow for easy pipework layout.
- The pump pack is not suitable for external installation.

Installation

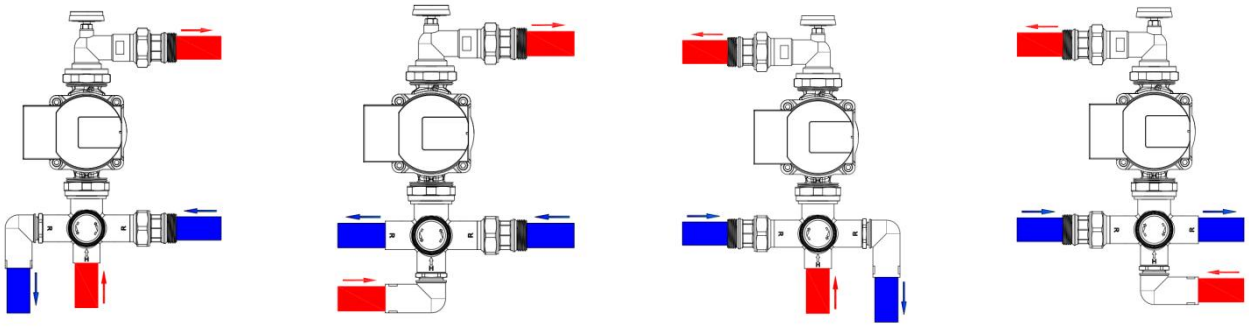
First Fix Installation

Depending on the installation location of the manifold and pump pack, the following requirements must be met:

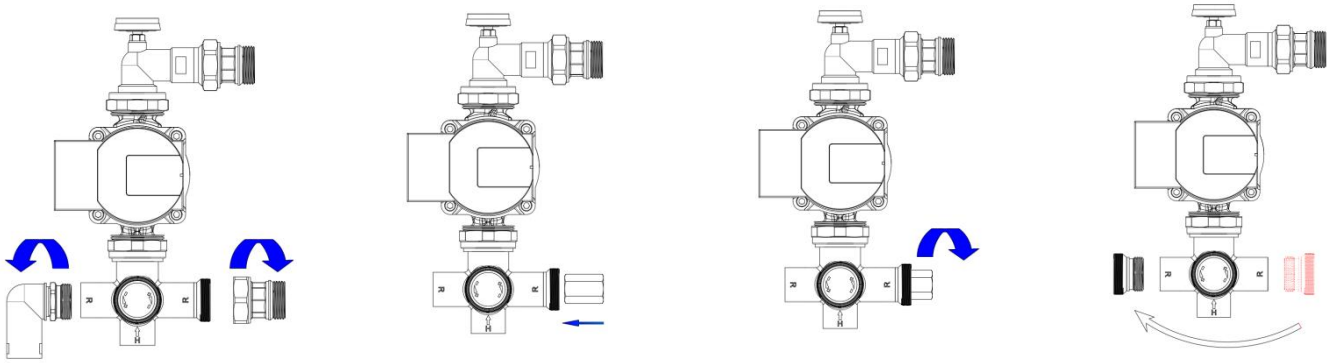
- The walls or ceilings must be structurally capable of supporting the system.
- Tolerances, levels, and datum must adhere to national standards where applicable.
- All electrical cables, ducts, or service pipes should be installed and tested before starting any heating or cooling work.

Changing the handing

LB	LS	RB	RS
Left-handed bottom entry	Left-handed side entry	Right-handed bottom entry	Right-handed side entry



- The pump pack is supplied in a left-handed orientation, with bottom pipe entry as standard (LB).
- This can be adjusted to suit the installation requirements, and we recommend making the change before fitting it to the UFH manifold.
- To switch primary connections from bottom to side entry, simply move the elbow from the outlet port to the inlet port.
- To change the manifold from left-handed to right-handed, follow these steps:

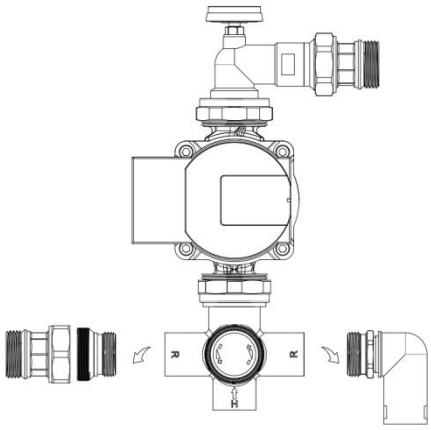


1.Remove the connectors at both ends of the mixing valve.

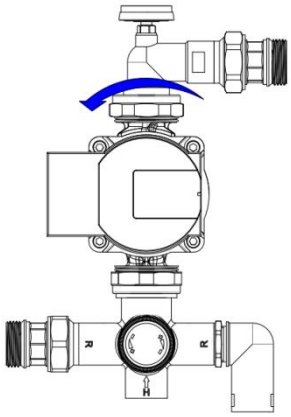
2.Use the hexagonal copper rod provided in the kit and insert it into the right-side connector.

3.Rotate the hexagonal copper rod counterclockwise with a spanner to remove the threaded connector.

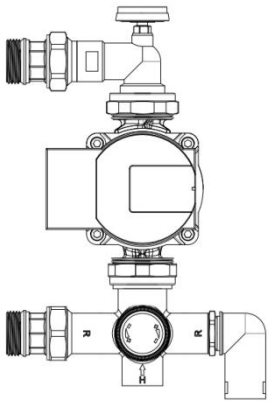
4.Install the connector on the left side and ensure it is securely tightened.



5.Swap the connector removed in step 1 to the opposite position and tighten it.



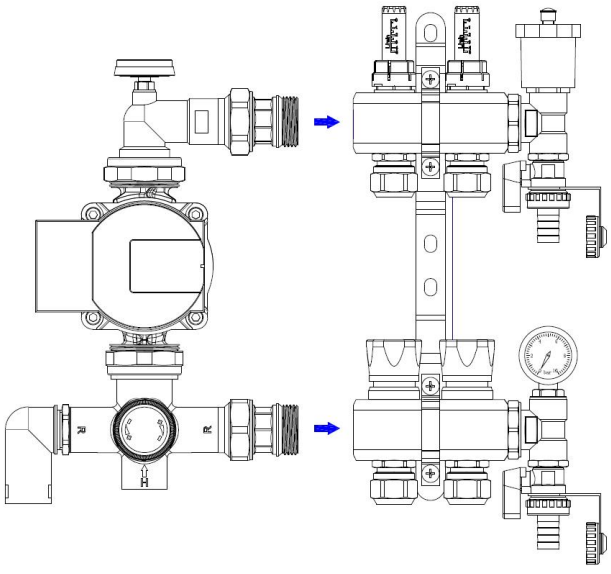
6.Use a spanner to rotate the pump’s connecting nut, allowing the outlet direction to be changed from right to left.

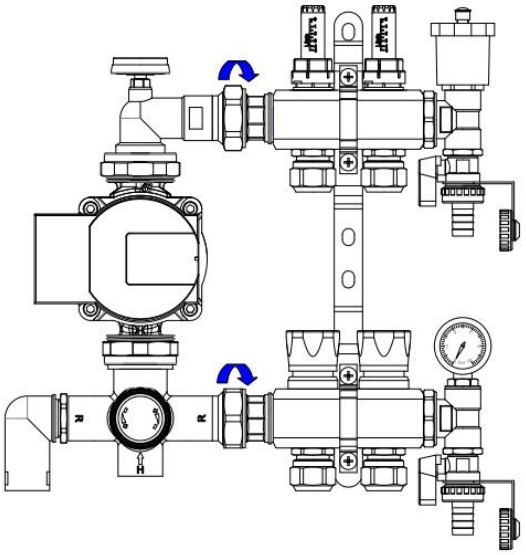


7.After completion, the manifold can be switched from a right-side connection to a left-side connection.

Mechanical Installation

The Pump Pack assembly is designed to be mounted on a distribution-type UFH manifold. The manifold and its brackets must be sufficiently load-bearing to support the weight of the appliance without any deflection or risk of detachment from the surface it's secured to. For further details, please refer to the manufacturer's instructions for the manifold.





To attach to the manifold, the assembly is first offered up to the UFH manifold to check the alignment of the pump pack connections correlate to the manifold bar connections.
This will either be to the left, or right of the manifold; depending on the chosen handing. At this stage the handing of the pump pack will have already been taken into consideration and the assembly altered as necessary.

The spinning nuts are designed for quick manifold connection and once in position can be screwed into the bars and hand tightened.
A spanner can then be used to tighten this connection as required, noting that care must be taken not to over-tighten the spinning nuts, as this can damage to the seals. The use of a 31mm AF spanner will also ensure that the connection to the pump mixer is kept tight.

Setting the Mixed Outlet Temperature

The mixed outlet temperature can be adjusted at any time. However, to ensure the mixing valve is controlling the temperature correctly, the system must be filled, electrical wiring completed, and a heating demand signal sent with the pump circulating.

1. Calculate the optimeal system design temperature required to achieve peak design load.
2. Rotate adjustment dial by hand to set design temperature.
3. Use the temperature gauge to check and verify the mixed outlet temperature is achieved