



Ultimate Renewables Supplies

Supplying your renewable future

URS Pipe Schematic

Samsung EHS Mono R290 (Gen 7) Integrated

SAMSUNG





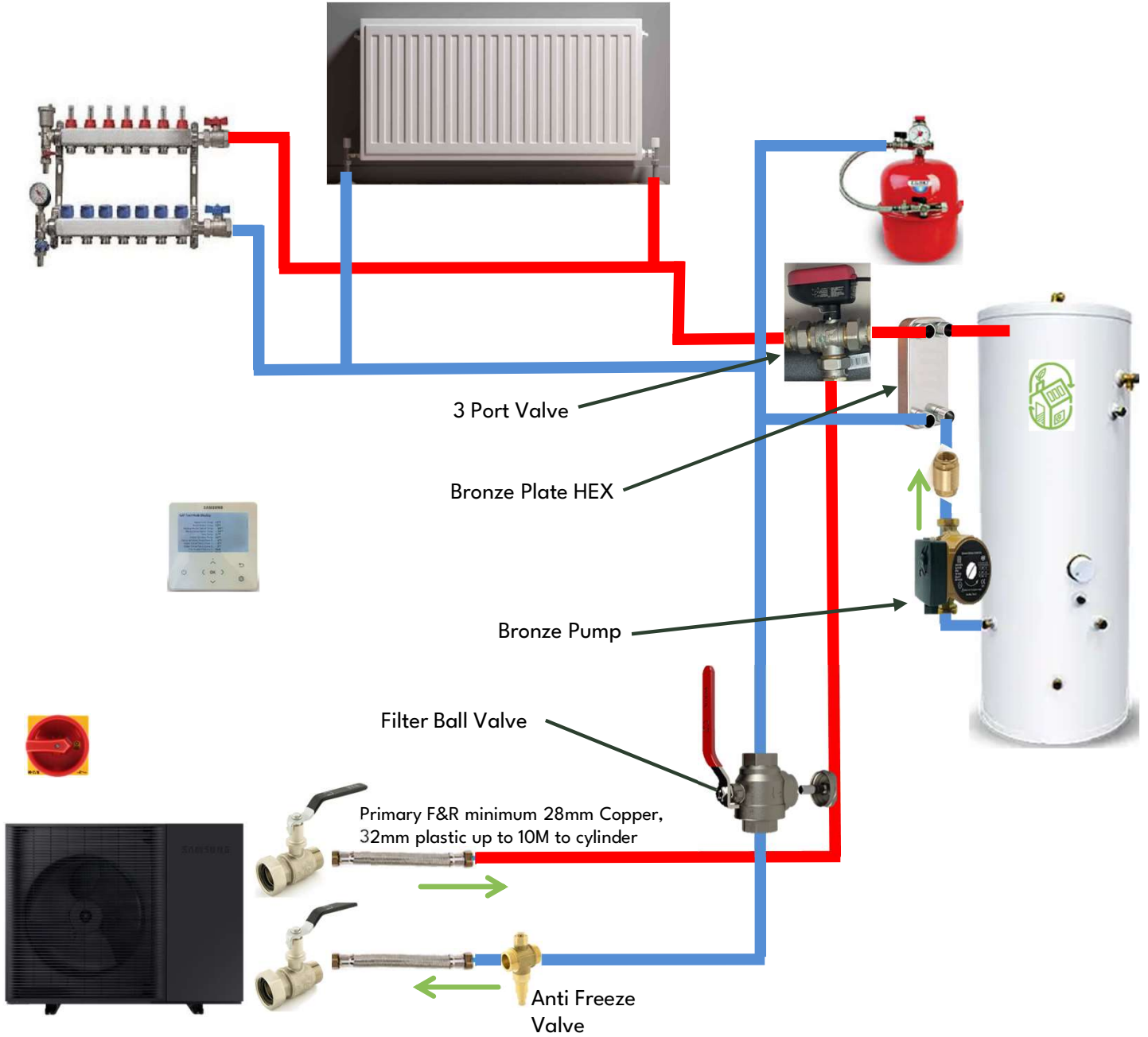
Content

System Layout	3
Piping the Plate Heat Exchanger	4
Schematic Discharge Pipe Arrangement	4
Things You MUST Check and Do	5
Best Practice Water Quality	5
Provisions for the Heat Pump Base	6
Heat Pump Clearances	6
Insulating of Pipework – External and Internal	7
Installation Of Antifreeze Valves	8
Secondary Hot Water Circuits	9

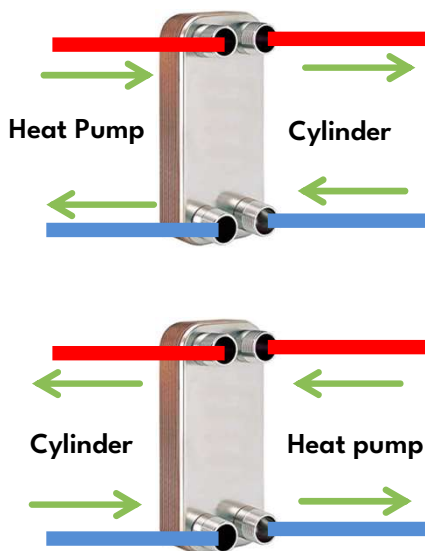


System Layout – Plate Loaded Cylinder:

Radiators and/or UFH, no zone valves are needed, TRVS in Bedrooms Only



Piping the Plate Heat Exchanger:

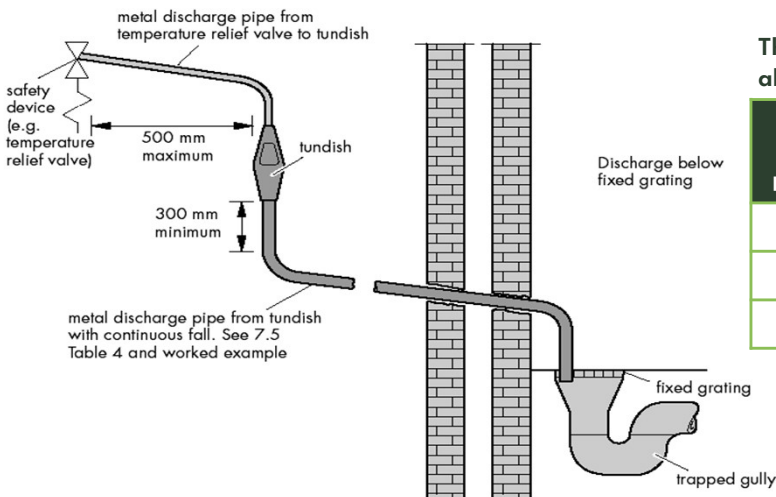


Schematic discharge pipe arrangement:

VERY IMPORTANT
You Need to be G3 Unvented Registered to install an Unvented Cylinder

The discharge pipe (D2) should be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long, i.e. for discharge pipes between 9m and 18m the equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device; between 18 and 27m at least 3 sizes larger, and so on; bends must be taken into account in calculating the flow resistance.

See Diagram 1, Table 3.1 and the worked example. Note: An alternative approach for sizing discharge pipes would be to follow Annex D, section D.2 of BS 6700:2006 + A1:2009 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.



The maximum effective length of pipe from the tundish is also specified

Minimum size of discharge pipe pipework from tundish	Maximum effective length	Effective length of each elbow or bend
22mm	9m	0.8m
28mm	18m	1.0m
35mm	27m	1.4m



Things You **MUST** Check/do:

VERY IMPORTANT
Failure to complete these tasks will result in an aborted commission visit
and chargeable revisit

- Legionella Cycle – You must ensure that the thermostat in the immersion heater is set to a minimum of 60°C (4 for a Telford cylinder).
- In cold weather the system must be powered on with the immersion heater running for at least 8 hours before trying to operate the system.
- A hot flush of at least 50°C to meet the requirements of BS7593 should be carried out before leaving the system operate in weather compensation mode.
- All pipework around the DHW cylinder and all hot water secondary pipework is to be insulated.
- The supplied bronze pump is for the potable water side of the plate heat exchanger/cylinder (plate loaded cylinders only). This must be left in speed 1 for heat pump units under 10kw.



Best Practice Water Quality:

- Please check the following before commencing start-up of the unit, as these are important conditions of the Samsung Warranty*
- Use the Ultimate supplied **Ball Valve Filter and Magnet** installed on the return to the Heat Pump inside and in a serviceable place.
- The system should be flushed, this is especially important if the system is an old gas or oil system. Flushing should be completed in accordance with **BS7593. A hot flush of at least 50°C should be carried out before leaving the system in weather compensation mode.**
- The primary pipe work diameter should be sized in relation to the length of the pipework run and, the number of fittings and components but should have an internal bore of no less than **28/35mm** copper pipework. **Be aware that plastic pipework tends to have a smaller internal bore and needs to be sized correctly.**
- The external Heat Pump should be installed on a base suitable for withstanding the weight of the unit and should be level.
- There shall be a proper means of disposal of the condensate, this should be via a drain or soak away. **NOT ON THE PATIO**
- The external Heat Pump unit should be positioned so that there is good air flow around the unit. **NOT BOXED IN**

VERY IMPORTANT

Checking the flow rate, the optimal required is

- 12l/min on the 5kW unit
- 20l/min of flow on the 8kW unit
- 30l/min on the 12kW and 16kW units





Provision For The Heat Pump Base:

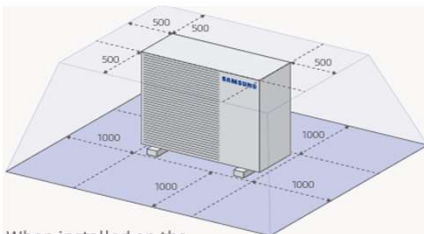
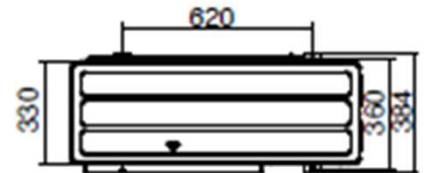
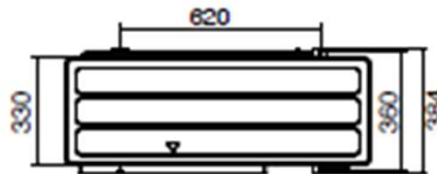
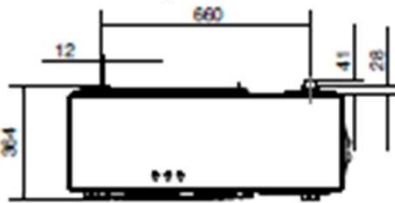
VERY IMPORTANT

All heat pumps must be installed on a firm base, with drainage provision for the defrost cycles and condensation

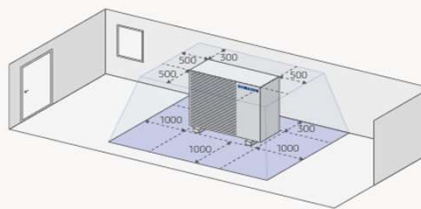
Examples of units installed. If you need any advice, please contact our office



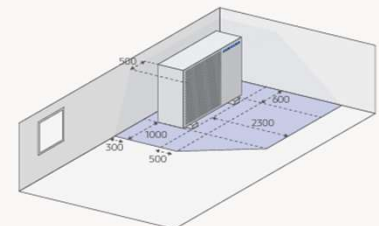
Heat Pump Clearances



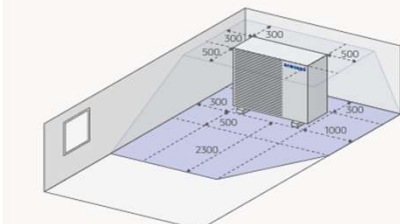
When installed on the ground when installed in a place with a flat roof



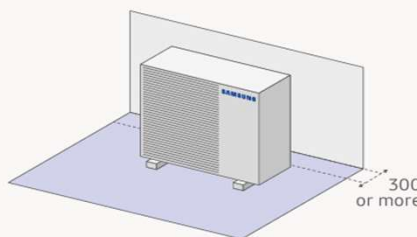
When installed on the ground on the front of the building wall



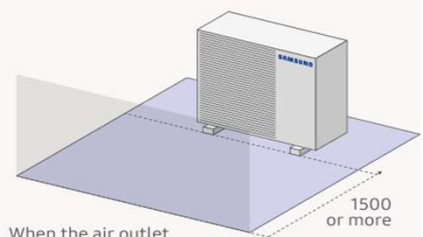
When installed at the right corner of a building



When installed at the left corner of a building



Wall on suction side



When the air outlet is towards the wall

In case of a leakage the refrigerant must not be able to enter the indoor under any circumstances.

The Safety Zone shall not have any building openings such as: Windows, Doors, Light wells, Flat roof windows, Air Inlet / Outlet of ventilation systems, etc.

- R-290 refrigerant is heavier than air and can be collected on the ground. There should be no sinking or deepening of the ground in the safety zone.
- The safety zone should not extend to intact buildings or public spaces.
- The safety zone cannot be modified later to violate the protection rules.
- The Rotary Isolator must also not be inside the zone.

There shall be a proper means of condensate disposal, this should be via a drain or soak away.

VERY IMPORTANT

Must not be left to discharge on the ground/patio/concrete slab



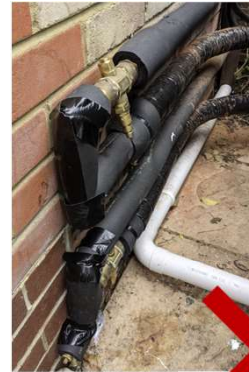
Insulating of pipework:

VERY IMPORTANT
 Well fitted lagging is one of the most important elements of a heat pump project

Below are both good and bad examples of outside insulation;

External Insulation.

Our supplied Isolators and antifreeze valves lagged with Primary Pro lagging, sealed with the supplied Primary Pro bond and seal



Non-UV rated insulation, the taped joints will soon come apart, even though these are antifreeze valves, they should also be insulated.

Internal Insulation.

An example of internal insulation.



You must ensure that plenty of bond and seal sealant is used



Installation Of Antifreeze Valves:

The antifreeze valve must only be installed in a vertical position, with the outlet facing downwards, to allow the draining water to flow out free from obstructions.

The antifreeze valve must be installed outdoors, where the lowest temperatures can be reached if the heat pump is not operating.

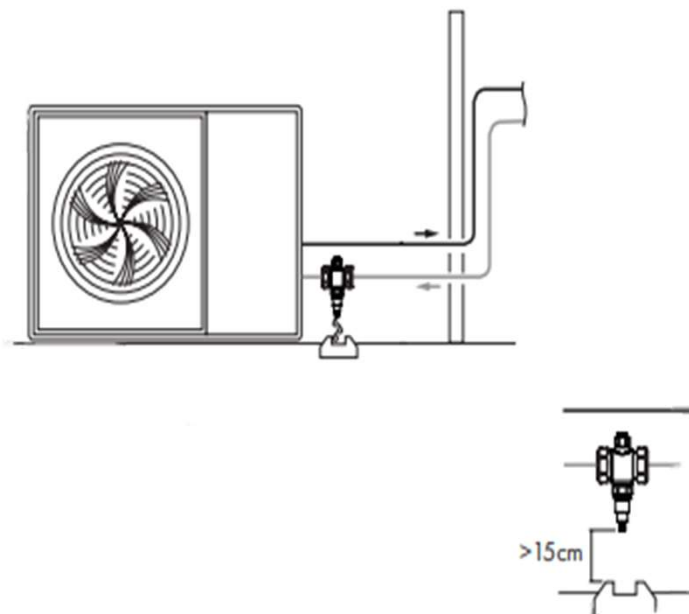
The antifreeze valve should be properly insulated and sealed to reduce heat loss. Only the vacuum breaker and discharge point should be exposed.

The valve must also not be placed close to heat sources which could interfere with their function. For the valves to work properly, always keep the system under pressure.

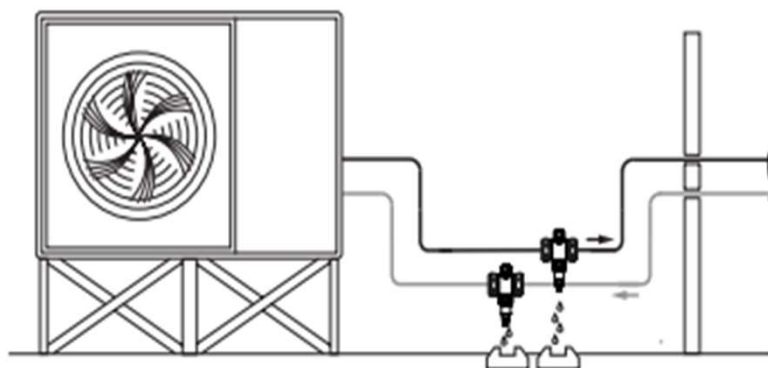
We recommend at least 15cm clearance between the valve and the ground as discharged water could freeze and hinder the operation of the valve.

The discharge from anti-freeze valves must be collected in a suitable drain and routed to a suitable collection point.

The valve must be on the lowest point of the pipework as possible before the heat pump connection.



Where the heat pump is elevated and the pipework drops down to a low point (as shown), this would then require 2 anti-freeze valves to protect the pipework and system.





Secondary Hot Water Circuits:

If an outlet is 12m or more away, its recommended to use a secondary hot water circuit to reduce water wastage.

On larger properties the use of a secondary hot water circuit is very common. This is beneficial for the end user but must be managed accordingly with any heat pump.

Insulation The secondary circuit **MUST** be fully **insulated** for the entirety of its length to and from the cylinder.

Emitters Radiators or towel rails **MUST NOT** be connected to the secondary circuit.

Controls Our recommended installation is to control the secondary bronze pump by using **PIR** sensors in every shower/bathroom/cloakroom, this means that the **PUMP** only runs when someone enters that room. Most **PIRs** have run times settings built into them.

Running times Secondary returns **MUST NOT** be left running **24/7**, this will create high running costs for the hot water system.



Secondary Bronze pump

