

Independent Heat Pump System

Client: The Occupier | Design intent: Vaillant heat pump system | Prepared by: Darren, UK Heat Pump Help

Design objective	Keep the system hydraulically simple, maintain reliable heat-pump flow, and run each emitter circuit at the lowest practical weather-compensated temperature. The client does not want that much heat on the top floor at all.
Radiator circuit	Separate weather-compensated circuit, initial heating curve 0.8 .
UFH circuit	Vaillant VDM electronic mixing group, initial heating curve 0.4 ; remove individual UFH zoning.
Hydraulic volume	Stackable buffer used only as a volumiser , installed in the return-flow arrangement.

1. Controls and overall strategy

The system should be controlled through the **Vaillant sensoCOMFORT**, with the radiator and underfloor-heating circuits treated as separate weather-compensated heating circuits.

The intention is to avoid fixed high flow temperatures and allow both circuits to reduce their target temperature automatically as outdoor temperature rises.

Important controls note: The additional Vaillant system wiring centre should be a **VR 71**. The **VR 92F** is the wireless remote/room control for the additional heating zone.

2. Radiator circuit

Set the radiator circuit to an initial **heating curve of 0.8**. This is intended to provide approximately **45°C flow around 0°C outdoor temperature**, subject to final Vaillant commissioning settings and the actual building response.

Use a **Vaillant VR 92F** on the radiator circuit, located on the lower-ground floor. The lower-ground-floor radiators are the controlling emitters for this circuit.

The top-floor radiators should only receive heat while the lower-ground-floor radiator circuit is calling, with the upstairs room temperatures controlled using the existing TRVs.

Commissioning condition radiators:

- UFH off + all upstairs radiators closed
- Lower-ground-floor radiators only
- **Absolute minimum flow: 7 L/min**
- **Preferred target: approximately 11 L/min**

The installer should prove this flow rate during commissioning with the UFH isolated and the upstairs radiators/TRVs closed.

If the required flow cannot be achieved, the hydraulic arrangement should be corrected with an **auto bypass**, but this would not be preferable.

3. Underfloor-heating circuit

Use a **Vaillant VDM electronic mixing pump group** for the UFH circuit.

Set an initial **heating curve of 0.4**, giving the UFH its own lower weather-compensated flow temperature.

Remove the existing **room-by-room UFH zoning, actuator heads and existing UFH wiring centres**.

The floor should operate as one open circuit whenever there is a UFH heating demand. A **two-port valve** should provide circuit isolation/control as required by the final Vaillant hydraulic and control configuration.

Circuit	Initial curve	Design intent
Radiators	0.8	Approx. 45°C flow at 0°C outside; optimise downward after commissioning
UFH via VDM	0.4	Approx. 35°C flow at 0°C outside; optimise downward after commissioning

4. Cylinder and volumiser

Replace the existing hot-water cylinder with the proposed **Vaillant 250 litre heat-pump cylinder**.

Use the compatible **stackable buffer below the cylinder**, but connect it as a **volumiser only** - not as a buffer/low-loss header that hydraulically separates the heat pump from the heating circuits.

The preferred arrangement is the **return-flow series configuration shown in Vaillant diagram 4.6**.

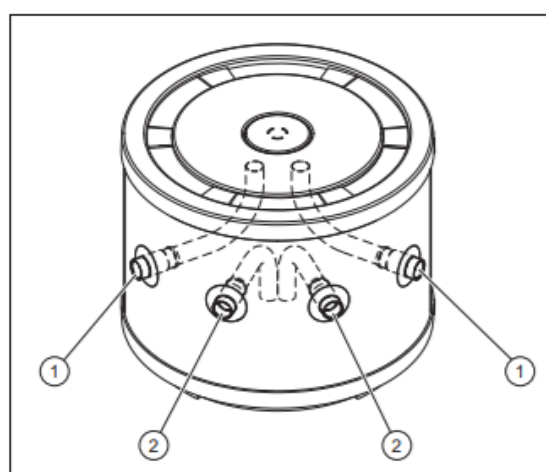
Placing the stackable volumiser below the cylinder also helps avoid unwanted heat transfer from the domestic-hot-water cylinder into the heating-side vessel when in cooling mode.

4.6 Connections when used as a return flow series cylinder



Note

Two of the connections are not used and must be sealed tightly.



1 Heat generator return 2 Heating circuit return

Figure 1. Vaillant diagram 4.6 - connections when used as a return-flow series cylinder. Connection 1 is the heat-generator return and connection 2 is the heating-circuit return. Final pipe sizing, vessel size and connection details must be confirmed against the selected heat pump and Vaillant installation instructions.

5. Cooling through the UFH

Active cooling can be enabled on the compatible Vaillant heat-pump system using the **Vaillant active-cooling coding resistor 0020269259**. The control can then be commissioned for cooling operation.

Set the system's **minimum permitted cooling flow temperature to 16°C**, but this should not be treated as the normal operating target.

For this property I would initially operate the UFH cooling nearer **18°C flow** and only reduce it if conditions allow.

Condensation protection: UFH cooling must be commissioned with consideration of indoor humidity and dew point. Floor/surface temperatures must remain safely above dew point, particularly during hot and humid weather.

If the selected Vaillant control arrangement does not provide adequate condensation protection for the installation, appropriate dew-point/humidity protection should be added.

6. Installer commissioning requirements

1. Confirm heat-pump model and hydraulic compatibility before final component selection.
2. Verify **VR 71 / VR 92F** addressing and configuration against the selected sensoCOMFORT schematic.
3. Prove lower-ground-floor radiator flow with all other heating circuits closed: **minimum 7 L/min, target approximately 10 L/min**.
4. Balance the radiator circuit so the lower-ground floor remains the dependable minimum-flow path.
5. Commission both heating curves at **0.8 (radiators)** and **0.4 (UFH)**, then reduce each independently to the lowest practical setting.
6. Confirm volumiser water volume is sufficient for the selected heat pump's minimum system-volume/defrost requirements.
7. Commission cooling carefully, checking floor temperatures, humidity and condensation risk before reducing below the initial **18°C operating target**.

Design conclusion

This arrangement keeps the system simple while retaining two genuinely different emitter temperatures.

The heat pump remains weather compensated, the UFH receives a lower mixed temperature through the VDM, and the radiator circuit retains independent control from the lower ground floor.

The return-flow volumiser provides additional system volume without introducing unnecessary hydraulic separation.

Design note: This document sets out the recommended design intent. Final component compatibility, electrical connections, pipe sizing, safety controls and manufacturer commissioning parameters must be confirmed by the installing engineer against the exact Vaillant heat-pump model and current manufacturer instructions.

Manufacturer references checked: Vaillant sensoCOMFORT / VR 71 controls guidance; Vaillant VDM mixing module guidance; Vaillant aroTHERM installer guidance for active-cooling coding resistor 0020269259; Vaillant buffer-cylinder installation diagram 4.6.