Hybrid VRF

FAQ Document

www.hybridvrf.co.uk

MITSUBISHI ELECTRIC

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Q. Does the Hybrid VRF system have its own dedicated outdoor unit?

A. The Hybrid VRF system uses the latest City Multi YLM model as its outdoor unit.

The same YLM model is also used in VRF systems and is available in both Standard (P) and High Efficiency (EP).

Q. Is the outdoor unit only available in the air-source range?

A. The YLM outdoor unit is available both in air-source and water-source.

Q. What capacity can the outdoor unit provide?

A. The YLM air-sourced outdoor unit and water-sourced outdoor unit can provide a capacity ranging from 22 kW to 56 kW per system.

Q. What types of indoor unit are available in the Hybrid VRF range? How are they different from the VRF range?

A. The Indoor Units are available in the below types, ranging from 1.7 kW to 5kW:

- Ducted (Model Ref: PEFY-WP VMA-E)
- Slim line Ducted (Model Ref: PEFY-WP VMS1-E)
- Floor Standing (Model Ref: PFFY-WP VLRMM-E)
- 4-Way Ceiling Cassette (Model Ref: PLFY-WP VBM-E)

As Hybrid VRF indoor unit is connected by 2 water pipes, it is based on a simple design which consists of the heat exchanger, fan, return air sensor, manual air vent valve and the printed circuit board (PCB) box.

When compared to the VRF indoor unit, the Hybrid VRF Indoor Unit doesn't have an LEV valve; instead the water flow rate is controlled via the Hybrid Branch Controller Box.

The Hybrid VRF indoor unit uses the same PCB box as the VRF indoor unit and also has the same chassis, however some of the models use a larger equivalent size compared to VRF.

To see a graphical illustration on this, please see our Hybrid VRF infographic.

Q. How big is the Hybrid Branch Controller Box (HBC) and how much does it weigh?

A.

HBC	Dimension (mm)	Weight (kg) (with water)
Master HBC 8 port	300 x 1520 x 630	95
Master HBC 16 port	300 x 1800 x 630	110
Slave HBC 8 port	300 x 1520 x 630	48
Slave HBC 16 port	300 x 1520 x 630	60

Q. What type of pipes could be used in the Hybrid VRF layout?

A. Between the outdoor unit and Hybrid Branch Controller box (HBC) is refrigerant, therefore refrigerant grade copper pipe should be used. Between the HBC and indoor units is water, therefore, standard water copper pipes or barrier plastic pipe can be used in the Hybrid VRF layout.

Please use brass/plastic fittings and avoid any steel/iron fittings. Water pipes must have a minimum internal diameter of 20mm thereby allowing 60m per HBC port.

Pipe	Outer Diameter (mm)
Copper	22
Barrier Plastic	28 / 22 *

*Note: *For 22mm plastic pipe, length restriction applies as internal diameter is <20mm*

Q. As water is used between the Hybrid Branch Controller box (HBC) and indoor unit, does it require any corrosion inhibitor?

A. We do not recommend using any corrosion inhibitor.

We have thoroughly tested and trialled the Hybrid VRF system over more than 5 years and there has been no evidence of any bacterial growth and/or corrosion.

Risk of contamination is very unlikely as no other third party equipment/indoor unit is connected to the Hybrid VRF system. However we do recommend using Automatic Air Vents (AAV) at the highest point of each pipe.

The water filled in the system should match our required water quality standards, as specified in our Databook (p.h., water hardness, electrical conductivity etc.).

Annual sampling and testing is also recommended.

Q. Does the water side of the system require pumps, balancing valves, strainers or any other third party items when compared to a traditional VRF system?

A. The Hybrid VRF system makes the installation and design process easier as the pumps and control valves are all included in the HBC box. Therefore while designing the Hybrid VRF layout please adhere to the height and length limitation as specified in the Databook.

The HBC box has strainers and the Hybrid VRF indoor units do not require any external flow balancing valves as all the control strategy is defined from the HBC box.

With regards to third party items on the water side, the Hybrid VRF system requires the below field supply items listed below;

- Expansion Vessel per master-HBC box
- Two isolation valves per port (one close to the master/slave HBC and the other close to the indoor unit)
- Drain Cock Valve on the lowest point of each water pipe
- Automatic Air Vent (AAV) on the highest point of each water pipe
- Pipe insulation

Q. What is the SCOP and SEER of Hybrid VRF when compared to traditional VRF and what is the normal operational temperature for the cold and the hot water?

A. The seasonal efficiency of Hybrid VRF is typically 10% to 12% lower when compared to traditional City Multi YLM VRF.

- SEER (cooling seasonal efficiency) for Hybrid VRF system is up to 9.47
- SCOP (heating seasonal efficiency) for Hybrid VRF system is up to 5.00

The HBC box has a potential for delivering water temperatures ranging from 5°C to 60°C and the system does not control by water temperature, but by a temperature difference across each indoor unit.

Typical operational water temperatures for the HBC box are 35°C to 45°C in heating and 5°C to 15°C cooling.

Q. What type of control network does the Hybrid VRF system use?

A. The Hybrid VRF system uses M-NET (Mitsubishi Electric Control Network), which is the same network as VRF. It is a 2 core control network, where each component on the system (outdoor unit, HBC, indoor units and controllers) has an address and are connected together.

This means the Hybrid VRF system can use all the same remote controllers, centralised controllers and BMS controllers as the traditional VRF system.

For more information please see our supporting Hybrid VRF literature:

Hybrid VRF Brochure

CPD Guide: The Future of Air Conditioning Technologies

Hoare Lea Hybrid VRF Installation Case Study

Working Environments Hybrid VRF Installation Case Study

For any further questions, or if you have a project that you would like to discuss, please email hybridvrf@meuk.mee.com and a member of our sales team will get back to you.

MITSUBISHI ELECTRIC
Changes for the Better

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Note: The fuse rating is for guidance only. Please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning and heat pump systems contain fluorinated greenhouse gases R410A, R407C and R134a.

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