The Renewable Solutions Provider

Making a World of Difference

Hybrid VRF Systems

Airtech
Air Conditioning & Climate Control

MITSUBISHI ELECTRIC

Air Conditioning | Heating
Ventilation | Controls

It's time to talk **Hybrid VRF**

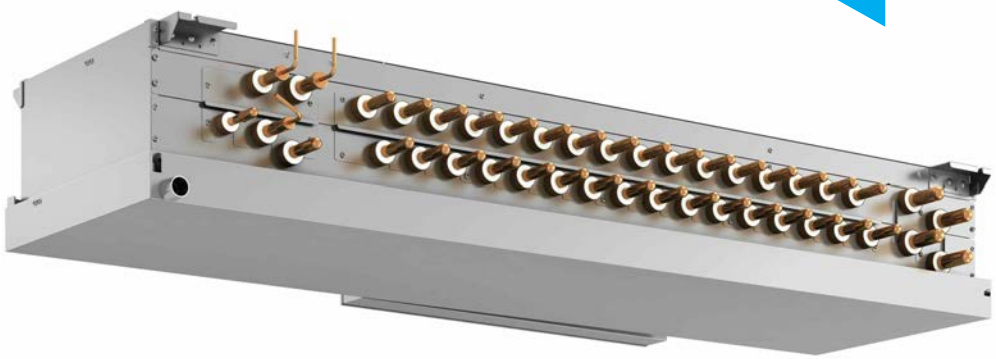
Today's buildings face tough legislation which means that traditional HVAC technologies may not always be the best solution.

If only there was a way of combining the best elements of VRF technology and Chiller systems to offer even more choice.

This is where the Hybrid VRF system can make a real difference - by offering a truly integrated solution both now and into the future.

The best of **VRF** with

the best of **Chillers**



What is Hybrid VRF

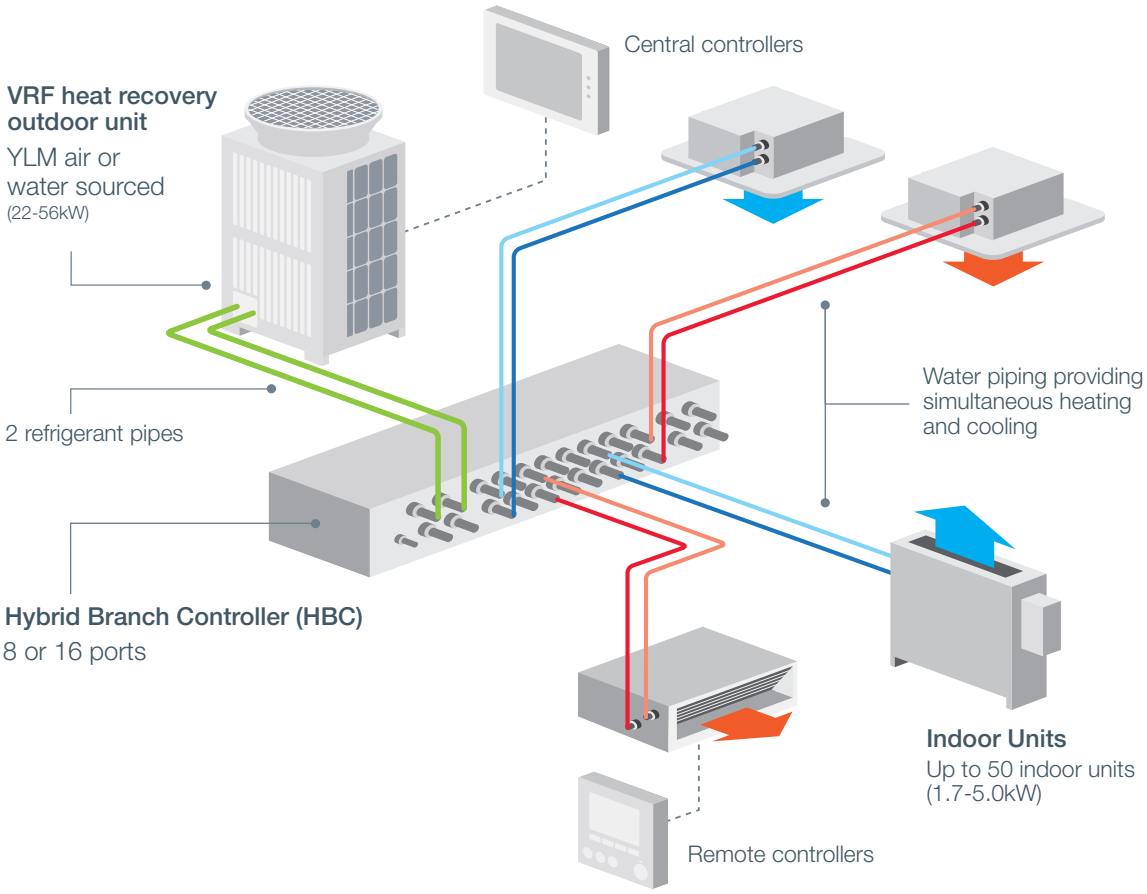
Hybrid VRF is the latest addition to our City Multi family (our VRF range of air conditioning units for large scale applications). Built and assembled in the same factory as our VRF units thereby carrying its distinctive DNA in terms of technology, efficiency and reliability.

Put simply, Hybrid VRF is a 2-pipe heat recovery VRF with water between the Hybrid Branch Controller (HBC) and indoor units. You can install and design it as VRF whilst enjoying the features of a Chiller system. Providing a complete modern solution for office buildings, hotels, medical centres, schools, high rise buildings, shopping centres and other commercial premises.

Hybrid VRF is quick, easy & flexible to design and install using the same control and network as VRF systems. Furthermore the decentralised system means phased installation is possible with the same high levels of seasonal efficiency expected with VRF.

With water at the indoor units, Hybrid VRF provides comfortable and stable air temperature control with no refrigerant in occupied spaces, meaning simple compliance to BS EN378 and removing the need for leak detection.

Hybrid VRF System Example



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Hybrid Branch Controller (HBC)

At the heart of Hybrid VRF

A. Plate Heat Exchangers

This is the point where the refrigerant circuit transfers its energy to the sealed water system.

There are two sets of plate heat exchangers, both placed at opposite ends in the HBC box.

Both sets provide hot water in heating mode or cold water in cooling mode.

During mixed mode, one set provides hot water while the other provides cold water to it's respective flow header.

B. Pumps

Each set of plate heat exchangers has a DC inverter driven water pump.

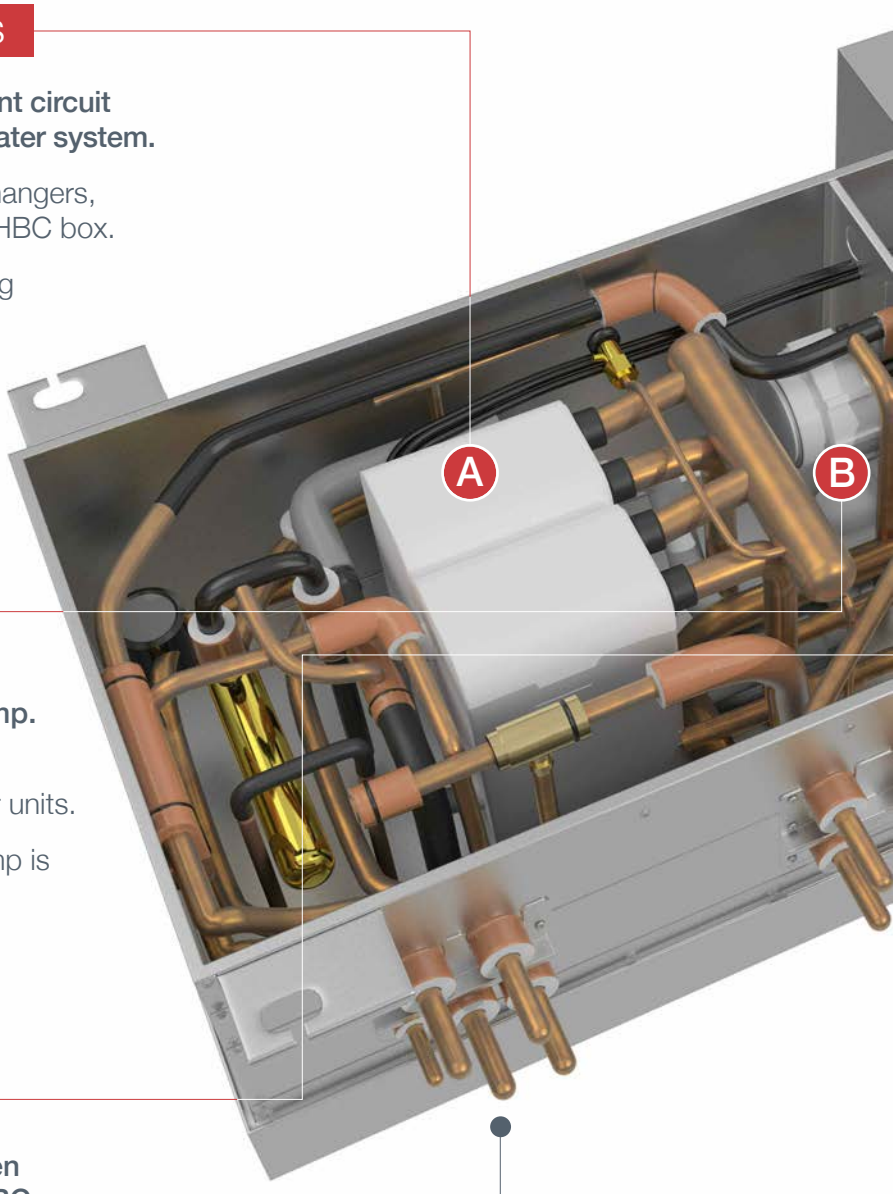
This circulates the closed loop water system between the HBC and indoor units.

The discharge flow rate from the pump is controlled by the valve block.

C. Valve Block

A valve block is connected between each flow and return port of the HBC.

This valve block has two features; firstly it has the choice of selecting between the two flow headers and secondly it controls the flow of the water sent to the indoor unit, defining the capacity.



Refrigerant pipes to outdoor unit, expansion tank (field supplied) **and water filling loop** (field supplied)

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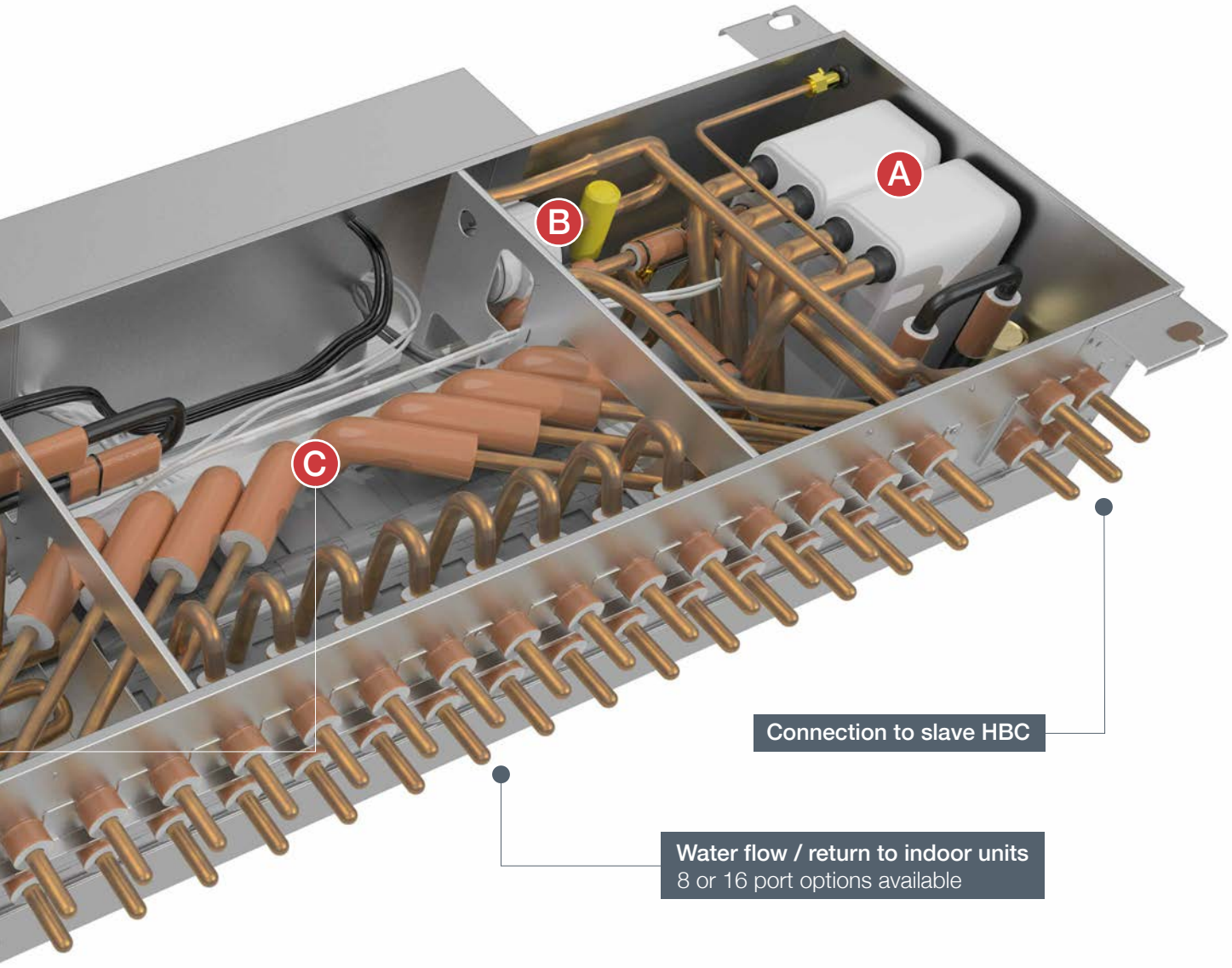
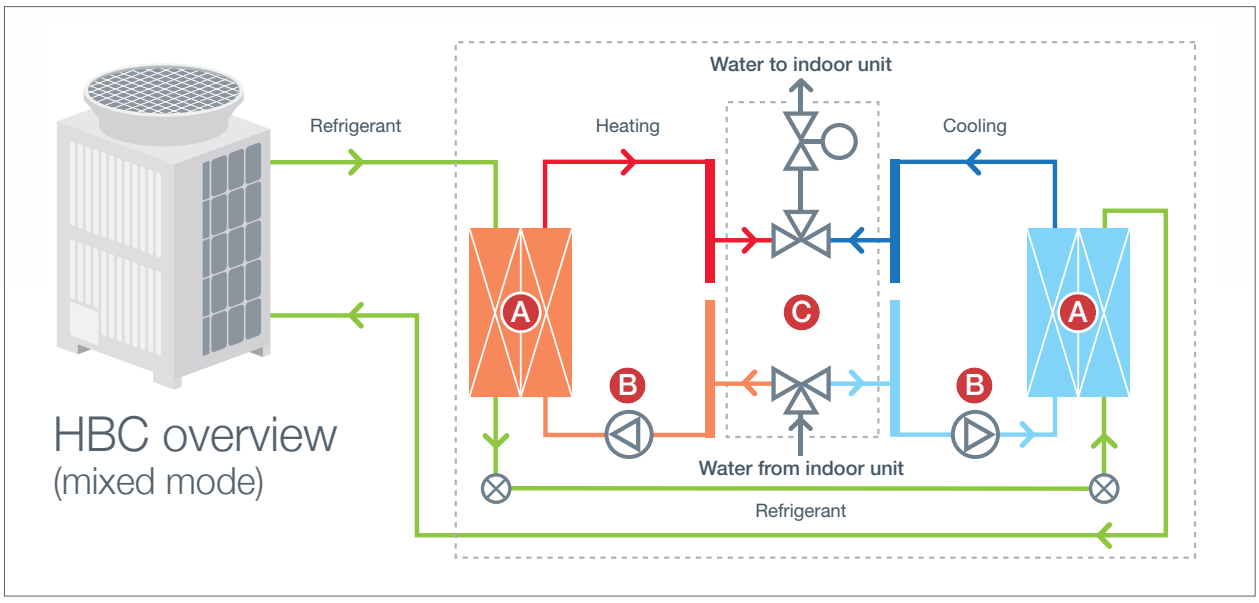
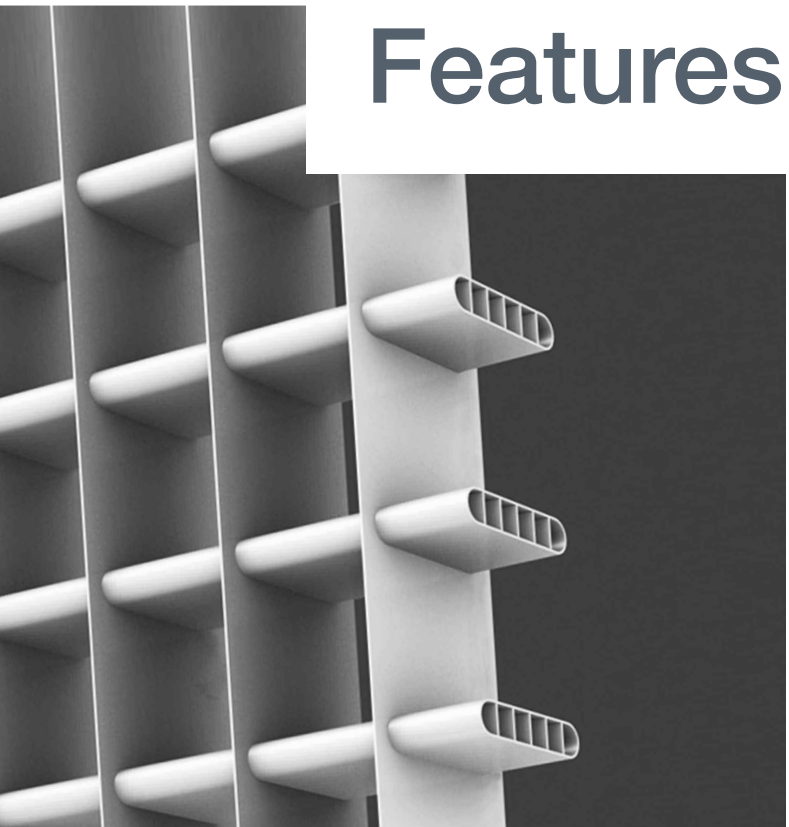
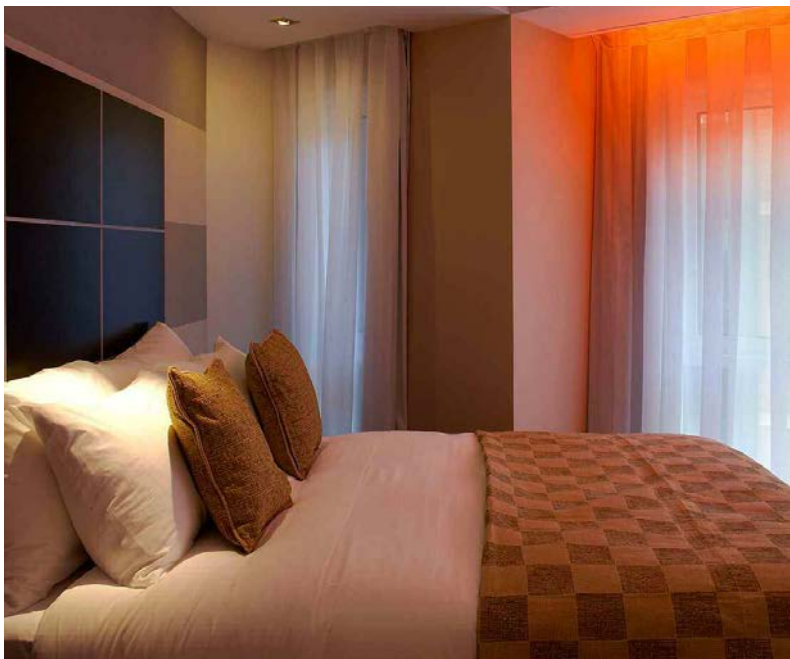




HBC overview
(mixed mode)

Hybrid VRF
Features and Benefits





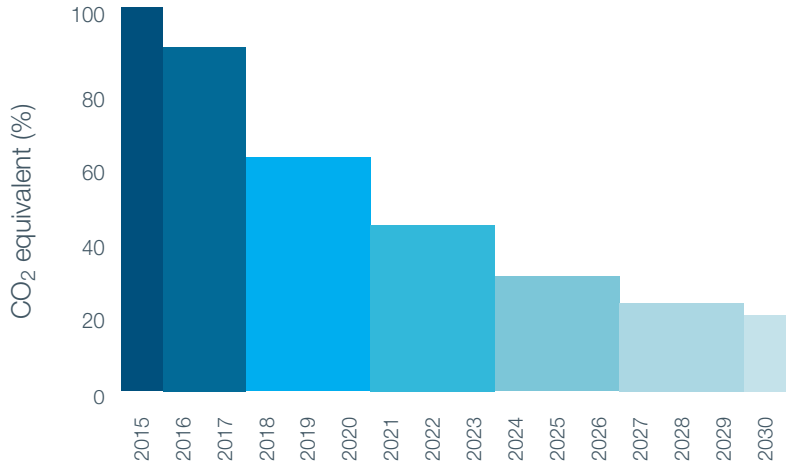
Flexible application options

- **Air Source YLM** (22-56kW) - using the latest City Multi VRF YLM technology including an **aluminium heat exchanger**, reduced weight and improved seasonal efficiency
- **New Water Source YLM** (22-56kW) - ideal where outdoor space is limited, building heat recovery and efficiency is demanded and a water loop is available

Meeting future requirements

- Energy and refrigerant legislation
- F-Gas phase down - adding a third viable option

F-Gas - HFC phase down programme:*



It is the requirement of manufacturers to reduce the CO_2 equivalent with options of:

- **Decreased kW on the market**
- **Lower the GWP of refrigerant**
- **Reduce amount of GWP** refrigerant**

Hybrid VRF gives the potential for both reducing refrigerant and options for changing to a lower GWP refrigerant in the future.

Fully packaged solution

- Valves, pumps and heat exchangers all contained within the HBC
- Commissioning is simple, pipe sizes are all defined with minor third party items required
- Uses the same controls and M-NET network as VRF

No refrigerant in occupied spaces

- No need for leak detection according to BS EN378 refrigerant safety guidance
- Ideal for hotel bedrooms, hospitals, nursing homes, meeting rooms and living spaces where leak detection may traditionally be required

* F-Gas 2015 phase down programme
** Global Warming Potential (GWP)

High sensible cooling and stable room temperatures

- Typically 10% increase in sensible cooling vs VRF
- Providing superior levels of comfort

Manageable phased installation

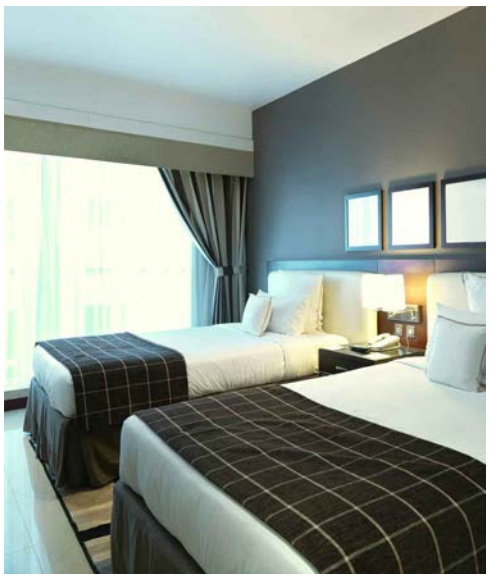
- Modular, smaller footprint and low weight outdoor units
- Flexible range of VRF options

Cat A to Cat B is simple

- Ideal for office fit outs
- Water piping between HBC and indoor units
- Easier to isolate and decommission, reducing install cost

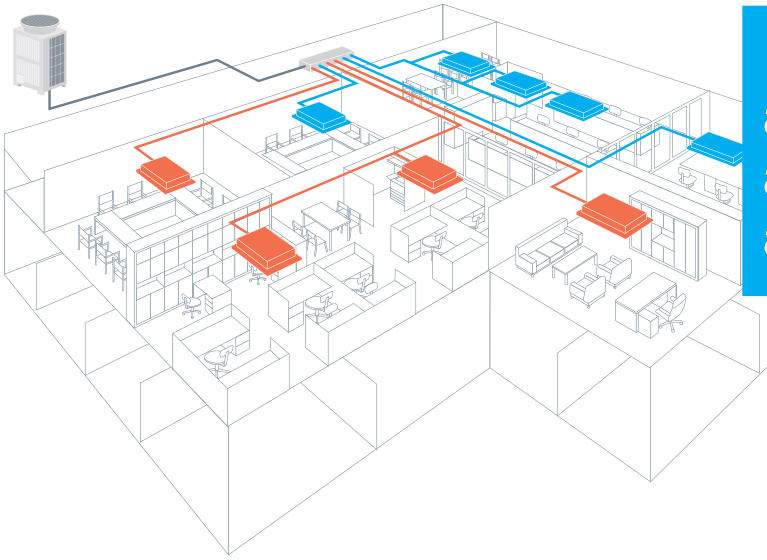
Simplified 2-pipe design and installation

- 2-pipes throughout system - no complex 4-pipe design
- Flexible design using up to 50 fan coils per system over 4 HBCs
- Copper or plastic pipe on water side



Simultaneous heating and cooling with full heat recovery

- Between fan coils and building zones
- Optimise flexibility, operability, comfort and efficiency



Ideal for a huge array of applications

Heat recovery defrost method

- Typical defrost times of 5 minutes with immediate return to heating
- Improving comfort throughout the heating season, ideal for office applications
- No defrost on Water Source VRF models

Intuitive load adjusting

- The latest YLM VRF refrigerant control plus water side optimisation: flow control valves, inverter driven pumps and heat recovery
- Providing only the capacity needed, improving efficiency and comfort
- SEER up to 9.47, SCOP up to 5.37

Quiet operation

- Water based fan coils: ducted, cassette and floor mount chassis units - based on Mitsubishi Electric VRF indoor units
- Low noise levels, variable air flow

Where can Hybrid VRF be applied

Buildings around the UK have a high priority when it comes to energy efficiency, internal comfort and an easy control solution. We believe there is no limitation with Hybrid VRF and the possibilities are endless.

Hotel

Customer comfort is paramount with legislation focusing attention on energy use and seeking to limit the use of refrigerant in occupied spaces. Hybrid VRF removes the need for leak detection thereby reducing the total cost of the system and on-going maintenance of the leak detection systems itself.

Office

Modern offices and commercial buildings need air conditioning systems that provide the highest levels of comfort and freshness, as energy efficiently as possible. Furthermore an office can simply be transformed from a CAT A to a CAT B fit out as water pipes can easily be isolated from the Hybrid Branch Controller box making building layout changes simple.

Hospital

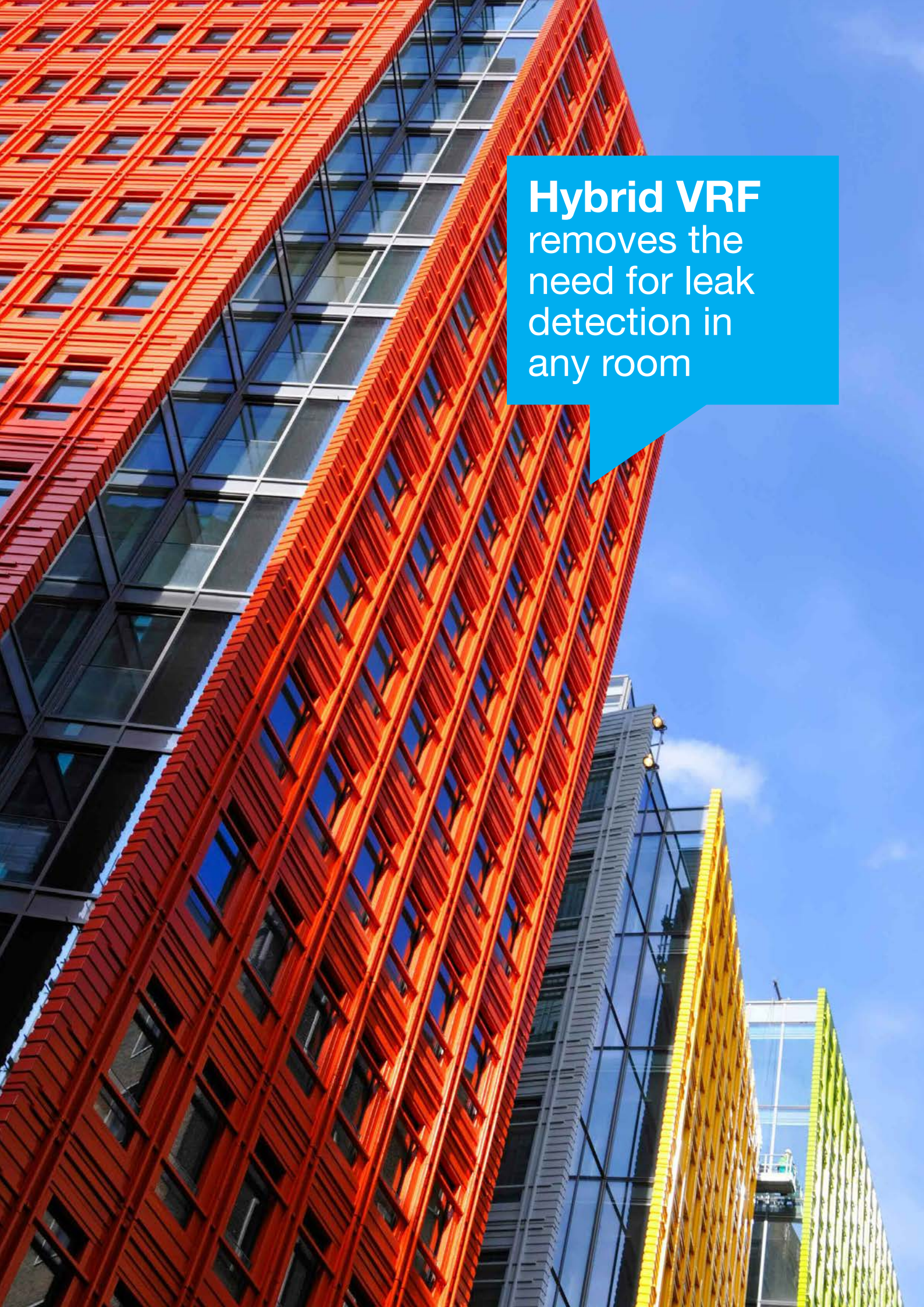
With regards to patient's health and safety, this system has no refrigerant in the indoor units and at the same time it can deliver mild off-coil temperatures through the water based Hybrid VRF indoor units.

Mixed use buildings

As we look for ways to balance population growth in crowded city centres, more mixed use properties are being developed, often combining retail, office, leisure and living spaces in the same building. Hybrid VRF provides a fully adaptable solution benefitting from air or water source options using an extensive range of controls to ensure optimum performance.

Education

Providing comfort through temperature stability, removal of refrigerant from the occupied space and reduced noise - **Hybrid VRF provides a truly integrated solution.**


Hybrid VRF
removes the
need for leak
detection in
any room

Hotel application - Cost analysis

Hotel customers have high demands when it comes to comfort and control whilst hotel owners have strict legislation to adhere to and costs to minimise.

Mitsubishi Electric City Multi VRF is an ideal solution for hotel applications due to its efficiencies - simultaneous heating and cooling with heat recovery, flexible control solutions, high seasonal efficiency and its modular design and installation.

Hotel application - 17 storey, 250 bedrooms

Option 1: **VRF**

The height and size of the building makes it difficult and costly to achieve BS EN378 compliance.

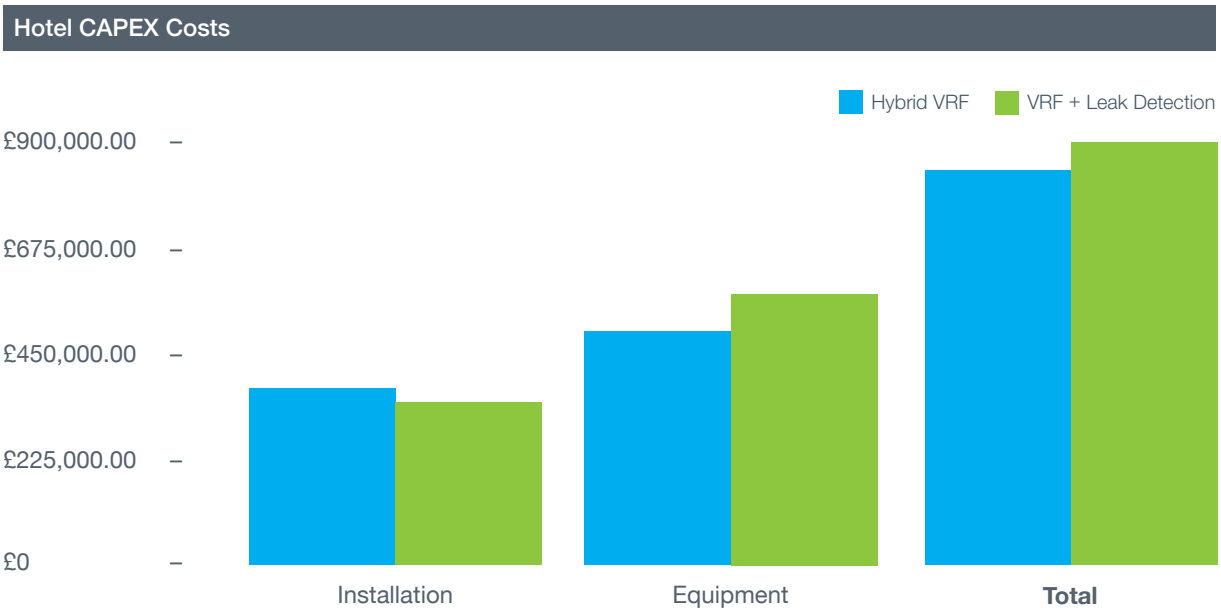
Option 2: **VRF + leak detection**

Adding leak detection means applying VRF is more cost effective, but the upshot is total equipment and installation costs increase by 10% vs VRF.

Option 3: **Hybrid VRF**

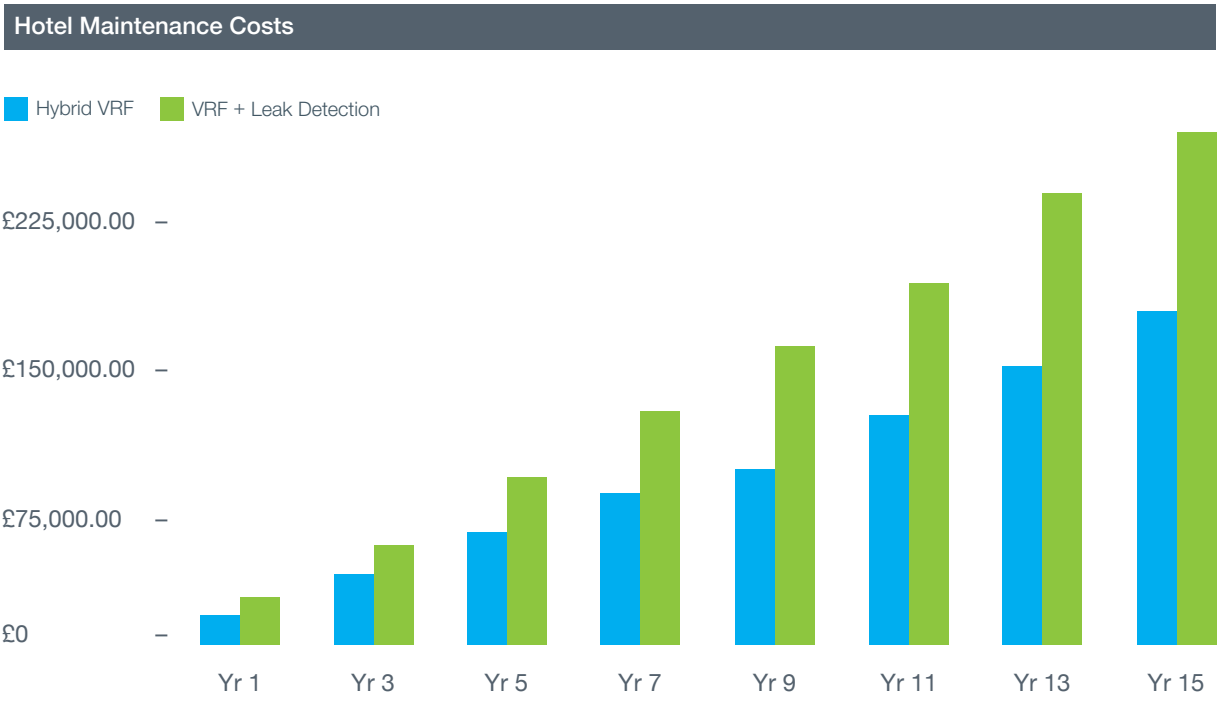
No leak detection required and Hybrid VRF design can be maximised, minimising CAPEX costs.

Hybrid VRF offers a 5% decrease in CAPEX costs compared to the VRF + leak detection option.



Notes: Based on a real project, using costs from a Mitsubishi Electric Business Solutions Partner. Equipment is at list price to allow supply chain margin

Considering operational costs throughout the systems lifetime, annual testing and recalibration of leak detection sensors aren't required with Hybrid VRF, making nearly **£100,000 maintenance saving (30%)** over 15 years on this 250 bed hotel.



Notes: Based on a real project, using costs from a Mitsubishi Electric Business Solutions Partner

Consultants use offices as test bed for Hybrid air conditioning system

When leading edge consultancy Hoare Lea wanted to refurbish a 12-year-old building for its Cardiff offices, the company was looking for a comfortable, energy efficient and stylish environment that complied with both existing and future legislation.

“We keep abreast of what’s going on so we can know what best suits our clients and when we heard about the Hybrid VRF system, we thought we should investigate its potential”, explains Wynne Harris, Managing Partner for Hoare Lea Cardiff.

With an inquisitive bunch of engineers, Harris was also convinced that using the site as a test bed would help evaluate the system and combine that with the technical experience of seeing how it actually operated in practice in a working environment.

“Mitsubishi Electric obviously believes in its own product because it is no easy feat to put a system into a consulting engineers’ office, but it also means we will be able to provide some really valuable feedback to them”.

> **“The Hybrid VRF is an amazing concept with a system which helps us blend in with the mechanical contractors so it’s not just a pure AC orientated system, it also has a wet side to it as well. I think it's got great potential to really take on the market and especially against four pipe systems”**
>
> explains Tony Williams Director of installation company Cool Solution Ltd.

“The fact that this Hybrid system removes refrigerant completely from occupied spaces within the building now offers a tremendous financial incentive not just on the CAPEX side, but also in terms of operating costs”, adds Tony Williams.

“At the same time because of the way Mitsubishi Electric has engineered the system, it's very similar in terms of control and design flexibility”.

Headquarters becomes a centre of excellence with water-based air conditioning

When Working Environments was looking to bring together three different company locations into one, the decision was taken to modernise their existing headquarters at Monza House in Southampton to accommodate the integration.

The building now uses a Hybrid VRF system which was selected because it operates without using refrigerant in occupied spaces, for its ability to deliver simultaneous heating and cooling in a simplified 2-pipe design and also its delivery of high sensible cooling and stable room temperatures for maximum comfort.

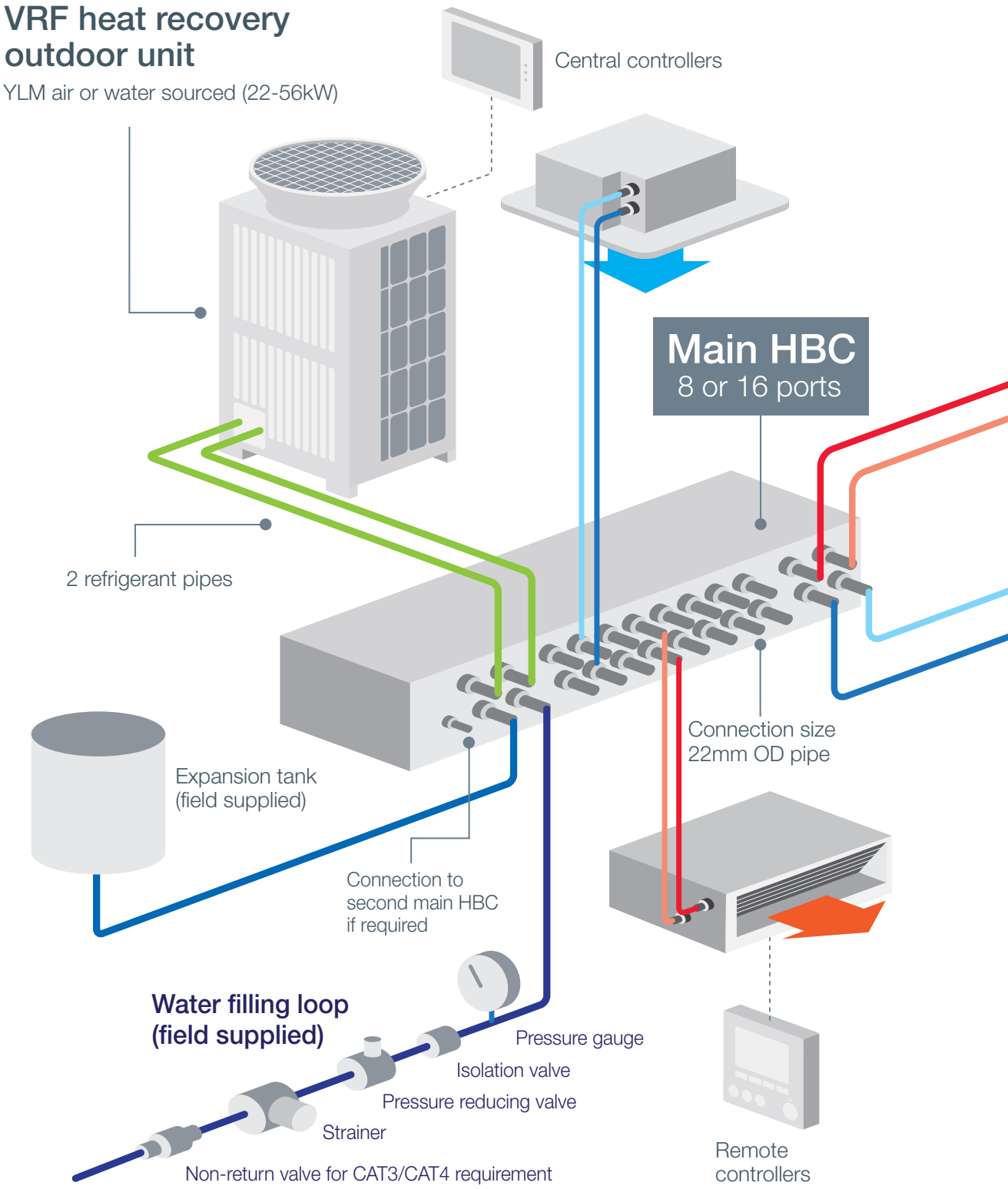
As a Business Solutions Partner for Mitsubishi Electric, Working Environments has a very close relationship with the manufacturer and when Special Projects Director, Mike Jenkins first heard of the innovative new air conditioning system, he wanted to be one of the first to check out its capabilities.

The company's executive management objective was to provide a modern, comfortable environment for staff and customers and turn the interior of the building into a 'Centre of Excellence' that could act as a showcase for Working Environment's expertise and services.

Work on installing the Hybrid VRF system into Monza House was split into several phases through 2013. Phase two saw the modifying of the existing ground floor offices and corridors to provide access to the new office area and completely modernise the space. Two Hybrid VRF systems were installed in the first floor offices.

> **"Feedback from staff has been fantastic, with everyone noticing how fresher and more balanced the internal temperatures have been"**
>
> said Mike Jenkins.

Technical Overview



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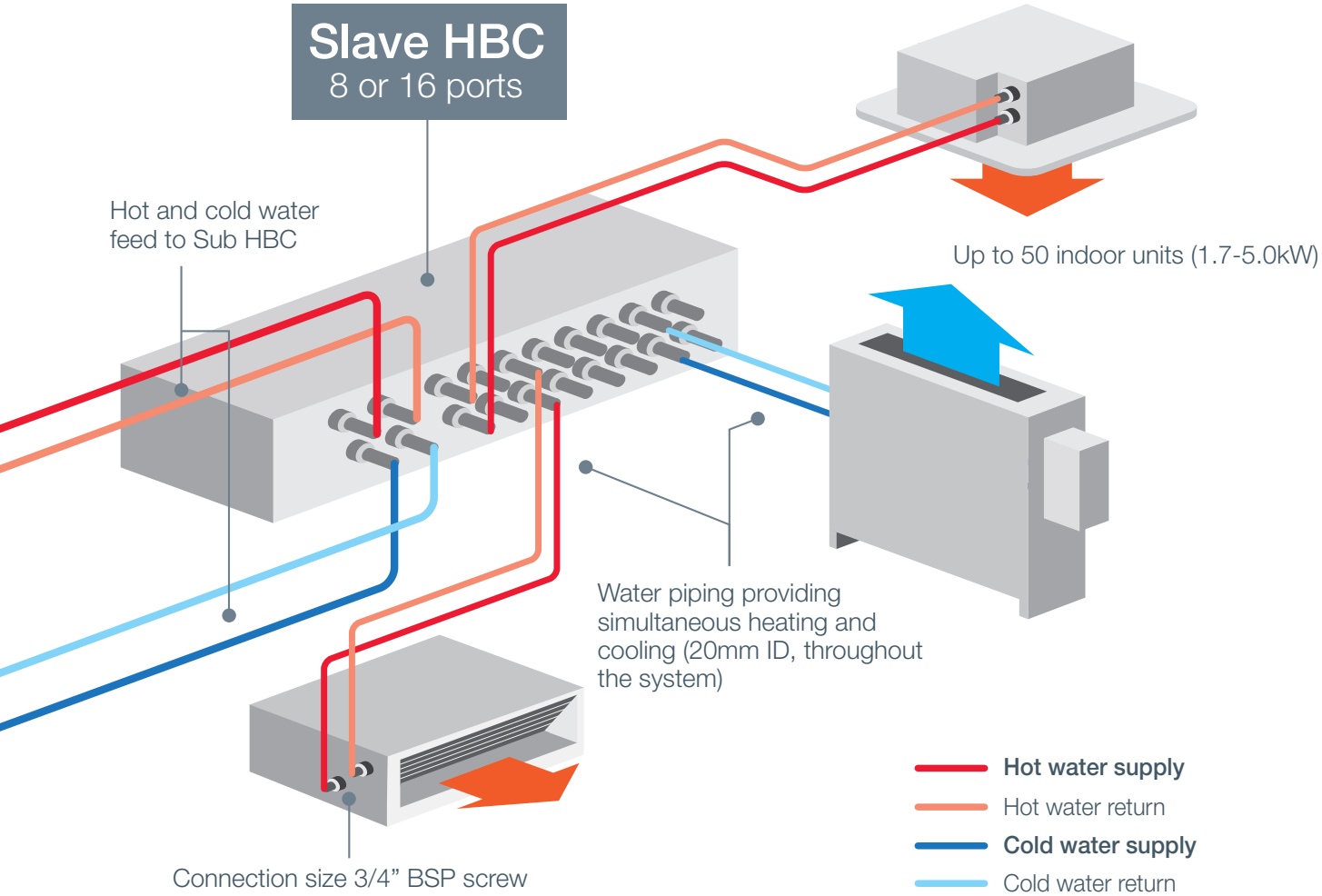


Additional items required:

- Isolation valves
- Automatic air vents at high points
- Drain cocks at low points

Configuration Setup

Outdoor Unit PURY/PQRY YLM	1st Main HBC	1st Slave HBC	2nd Main HBC	2nd Slave HBC
P200	✓	✓ (Optional)	X	X
P250	✓	✓ (Optional)	X	X
P300	✓	✓ (Optional)	✓ (Optional)	✓ (Optional)
P350	✓	✓ (Optional)	✓ (Optional)	✓ (Optional)
P400	✓	✓ (Optional)	✓	✓ (Optional)
P450	✓	✓ (Optional)	✓	✓ (Optional)
P500	✓	✓ (Optional)	✓	✓ (Optional)

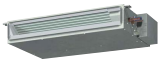
Hybrid VRF Product Range

H-VRF Outdoor Units

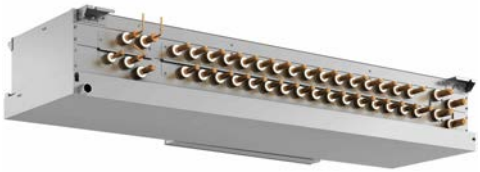
MODEL	RANGE		P200 22kW	P250 28kW	P300 34kW	P350 40kW	P400 45kW	P450 50kW	P500 56kW
Air Cooled	Standard PURY-P		■	■	■	■	■	■	■
	High Efficiency PURY-EP		■	■	■	■	■	■	■
Water Cooled	WR2 Series PQRY-P		■	■	■	■	■	■	■

Notes: PQRY-P YLM available summer 2016. Specifications available on request.

H-VRF Indoor Units

MODEL	RANGE		P15 1.7kW	P20 2.2kW	P25 2.8kW	P32 3.6kW	P40 4.5kW	P50 5.6kW
Ducted	Slim Ceiling PEFY-WP-VMS1-E		■	■	■	■	■	■
	Ceiling Concealed PEFY-WP-VMA-E			■	■	■	■	■
Floor	Floor Standing High Static PFFY-WP-VLRMM-E			■	■	■	■	■
Cassette	4-Way Blow PLFY-WP-VBM-E					■	■	■

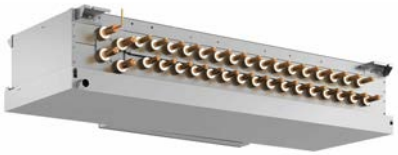
HBC Specifications



MASTER HBC CONTROLLERS

MODEL		CMB-WP108V-GA1	CMB-WP1016V-GA1
NUMBER OF CONNECTIONS (Size)		8 (22mm OD pipe)	16 (22mm OD pipe)
WEIGHT (kg) (Water)		85 (95)	97 (110)
DIMENSIONS (mm)	Width	1520	1800
	Depth	540 (630)	540 (630)
	Height	300	300
ELECTRICAL SUPPLY		220-240v, 50Hz	220-240v, 50Hz
PHASE		Single	Single
POWER INPUT (kW)		0.46	0.46
RUNNING CURRENT (A)		2.83	2.83
FUSE RATING (BS88) – HRC (A)		6	6
MAINS CABLE NO. CORES		3	3

Notes: CMB-WP-V-GA1 and CMB-WP-V-GB1 units are for use with PURY-P200-500YLM-A1, PURY-EP200-500YLM-A1, PQRY-P200-500YLM-A units and H-VRF indoor units only (PEFY-WP, PFFY-WP, PLFY-WP). One main HBC can be used on outdoor units PURY-(E)P200-350YLM-A1, PQRY-P200-350YLM-A. Two main HBC's can be used in parallel on outdoor units PURY-(E)P300-500YLM-A1, PQRY-P300-500YLM-A.



SLAVE HBC CONTROLLERS

MODEL		CMB-WP108V-GB1	CMB-WP1016V-GB1
NUMBER OF CONNECTIONS (Size)		8 (22mm OD pipe)	16 (22mm OD pipe)
WEIGHT (kg) (Water)		43 (48)	51 (60)
DIMENSIONS (mm)	Width	1520	1520
	Depth	540 (630)	540 (630)
	Height	300	300
ELECTRICAL SUPPLY		220-240v, 50Hz	220-240v, 50Hz
PHASE		Single	Single
POWER INPUT (kW)		0.01	0.01
RUNNING CURRENT (A)		0.05	0.05
FUSE RATING (BS88) – HRC (A)		6	6
MAINS CABLE NO. CORES		3	3

Notes: CMB-WP-V-GA1 and CMB-WP-V-GB1 units are for use with PURY-P200-500YLM-A1, PURY-EP200-500YLM-A1, PQRY-P200-500YLM-A units and H-VRF indoor units only (PEFY-WP, PFFY-WP, PLFY-WP).

Indoor Unit Specifications

PEFY-WP-VMS1-E
Ultra Thin Ceiling Concealed Ducted Indoor Unit (H-VRF)

INDOOR UNIT		PEFY-WP15VMS1-E	PEFY-WP20VMS1-E	PEFY-WP25VMS1-E	PEFY-WP32VMS1-E	PEFY-WP40VMS1-E	PEFY-WP50VMS1-E
CAPACITY (kW)	Heating (nominal)	1.9	2.5	3.2	4.0	5.0	6.3
	Cooling (nominal)	1.7	2.2	2.8	3.6	4.5	5.6
	UK Heating	1.9	2.5	3.2	4.0	5.0	6.3
	UK Total Cooling - Hi (Sensible)	1.50 (1.50)	2.00 (1.70)	2.50 (2.00)	3.20 (2.70)	4.00 (3.20)	5.00 (4.00)
	UK Total Cooling - Mi1	1.44	1.89	2.32	3.03	3.82	4.79
	UK Total Cooling - Lo	1.34	1.76	2.08	2.88	3.61	4.51
POWER INPUT (kW)	Heating (nominal)	0.03	0.03	0.04	0.05	0.07	0.07
	Cooling (nominal)	0.05	0.05	0.06	0.07	0.09	0.09
AIRFLOW (l/s)	Lo-Mi-Hi	83-100-117	92-108-133	92-117-150	133-150-183	158-183-217	200-233-275
EXTERNAL STATIC PRESSURE (Pa)		5-15-35-50	5-15-35-50	5-15-35-50	5-15-35-50	5-15-35-50	5-15-35-50
SOUND PRESSURE LEVEL (dBA) Lo-Mi1-Hi		22-24-28	22-25-29	23-26-30	28-30-33	30-32-35	30-33-36
WEIGHT (kg)		19	20	20	25	25	27
DIMENSIONS (mm)	Width	790	790	790	990	990	1190
	Depth	700	700	700	700	700	700
	Height	200	200	200	200	200	200
ELECTRICAL SUPPLY		220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz
PHASE		Single	Single	Single	Single	Single	Single
RUNNING CURRENT (A)	Heating / Cooling	0.33 / 0.44	0.38 / 0.49	0.40 / 0.51	0.50 / 0.61	0.62 / 0.73	0.66 / 0.77
FUSE RATING (BS88) - HRC (A)		6	6	6	6	6	6
MAINS CABLE No. Cores		3	3	3	3	3	3

Notes: H-VRF indoor units can only be configured with the CMB-WP HBC (H-VRF) and PURY-(E)P YLM-A or PQRY-P YLM outdoor units. Indoor unit water connections 3/4" BSP screw.

PEFY-WP-VMA-E
Ceiling Concealed Ducted Indoor Unit (H-VRF)

INDOOR UNIT		PEFY-WP20VMA-E	PEFY-WP25VMA-E	PEFY-WP32VMA-E	PEFY-WP40VMA-E	PEFY-WP50VMA-E
CAPACITY (kW)	Heating (nominal)	2.5	3.2	4.0	5.0	6.3
	Cooling (nominal)	2.2	2.8	3.6	4.5	5.6
	UK Heating	2.5	3.2	4.0	5.0	6.3
	UK Total Cooling - Hi (Sensible)	2.00 (1.80)	2.50 (2.50)	3.20 (3.00)	4.00 (3.80)	5.00 (4.20)
	UK Total Cooling - Mi1	1.92	2.40	3.07	3.84	4.80
	UK Total Cooling - Lo	1.79	2.24	2.85	3.53	4.41
POWER INPUT (kW)	Heating (nominal)	0.05	0.09	0.11	0.14	0.14
	Cooling (nominal)	0.07	0.09	0.11	0.14	0.14
AIRFLOW (l/s)	Lo-Mi-Hi	125-150-175	167-200-233	200-242-283	242-300-350	242-300-350
EXTERNAL STATIC PRESSURE (Pa)		35-50-70-100-150	35-50-70-100-150	35-50-70-100-150	35-50-70-100-150	35-50-70-100-150
SOUND PRESSURE LEVEL (dBA) Lo-Mi1-Hi		23-26-29	23-27-30	25-29-32	26-29-34	26-29-34
WEIGHT (kg)		21	26	26	31	31
DIMENSIONS (mm)	Width	700	900	900	1100	1100
	Depth	732	732	732	732	732
	Height	250	250	250	250	250
ELECTRICAL SUPPLY		220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz
PHASE		Single	Single	Single	Single	Single
RUNNING CURRENT (A)	Heating / Cooling	0.44 / 0.55	0.53 / 0.64	0.63 / 0.74	1.04 / 1.15	1.15 / 1.15
FUSE RATING (BS88) - HRC (A)		6	6	6	6	6
MAINS CABLE No. Cores		3	3	3	3	3

Notes: H-VRF indoor units can only be configured with the CMB-WP HBC (H-VRF) and PURY-(E)P YLM-A or PQRY-P YLM outdoor units. Indoor unit water connections 3/4" BSP screw.

PLFY-WP-VBM-E
4-Way Blow Ceiling Cassette Indoor Unit (H-VRF)

INDOOR UNIT			PLFY-WP32VBM-E	PLFY-WP40VBM-E	PLFY-WP50VBM-E
CAPACITY (kW)	Heating (nominal)		4.0	5.0	6.3
	Cooling (nominal)		3.6	4.5	5.6
	UK Heating		4.0	5.0	6.3
	UK Total cooling - Hi (Sensible)		3.20 (3.20)	4.00 (3.60)	5.00 (4.20)
	UK Total cooling - Mi2		3.16	3.95	4.87
	UK Total cooling - Mi1		3.09	3.87	4.66
	UK Total cooling - Lo		3.02	3.77	4.39
POWER INPUT (kW)		Heating (nominal)	0.03	0.03	0.04
		Cooling (nominal)	0.04	0.04	0.05
AIRFLOW (l/s)	Lo-Mi1-Mi2-Hi		217-233-250-267	217-233-250-267	217-250-283-317
SOUND PRESSURE LEVEL (dBA)	Lo-Mi1-Mi2-Hi		27-29-30-31	27-29-30-31	27-30-32-34
WEIGHT (kg)			22	22	22
DIMENSIONS (mm)		Width	840	840	840
		Depth	840	840	840
		Height	258	258	258
ELECTRICAL SUPPLY			220-240v, 50/60Hz	220-240v, 50/60Hz	220-240v, 50/60Hz
PHASE			Single	Single	Single
RUNNING CURRENT (A)		Heating / Cooling	0.28 / 0.35	0.28 / 0.35	0.38 / 0.45
FUSE RATING (BS88) - HRC (A)			6	6	6
MAINS CABLE No. Cores			3	3	3
GRILLE MODEL REFERENCE			PLP-6BA	PLP-6BA	PLP-6BA

Notes: H-VRF indoor units can only be configured with the CMB-WP HBC (H-VRF) and PURY-(E)P YLM-A or PQRY-P YLM outdoor units. Indoor unit water connections 3/4" BSP screw.

PFFY-WP-VLRMM-E
Floor Standing Concealed Indoor Unit (H-VRF)

INDOOR UNIT			PFFY-WP20VLRMM-E	PFFY-WP25VLRMM-E	PFFY-WP32VLRMM-E	PFFY-WP40VLRMM-E	PFFY-WP50VLRMM-E
CAPACITY (kW)	Heating (nominal)		2.5	3.2	4.0	5.0	6.3
	Cooling (nominal)		2.2	2.8	3.6	4.5	5.6
	UK Heating		2.5	3.2	4.0	5.0	6.3
	UK Total Cooling - Hi (Sensible)		2.00 (1.50)	2.50 (2.00)	3.20 (2.50)	4.00 (3.10)	5.00 (3.90)
	UK Total Cooling - Mi1		1.96	2.42	3.07	3.86	4.82
	UK Total Cooling - Lo		1.83	2.29	2.86	3.53	4.43
POWER INPUT (kW)		Heating (nominal)	0.04	0.04	0.05	0.05	0.07
		Cooling (nominal)	0.04	0.04	0.05	0.05	0.07
AIRFLOW (l/s)	Lo-Mi-Hi		75-83-100	100-117-133	125-150-175	133-167-192	175-217-250
EXTERNAL STATIC PRESSURE (Pa)			20-40-60	20-40-60	20-40-60	20-40-60	20-40-60
SOUND PRESSURE LEVEL (dBA)	Lo-Mi1-Hi		31-33-38	31-33-38	31-35-38	34-37-40	37-42-45
WEIGHT (kg)			22	25	25	29	29
DIMENSIONS (mm)		Width	886	1006	1006	1246	1246
		Depth	220	220	220	220	220
		Height	639	639	639	639	639
ELECTRICAL SUPPLY			220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz
PHASE			Single	Single	Single	Single	Single
RUNNING CURRENT (A)		Heating / Cooling	0.35 / 0.35	0.35 / 0.35	0.47 / 0.47	0.47 / 0.47	0.65 / 0.65
FUSE RATING (BS88) - HRC (A)			6	6	6	6	6
MAINS CABLE No. Cores			3	3	3	3	3

Notes: H-VRF indoor units can only be configured with the CMB-WP HBC (H-VRF) and PURY-(E)P YLM-A or PQRY-P YLM outdoor units. Indoor unit water connections 3/4" BSP screw.

Outdoor Unit Specifications

PURY-P200-500YLM-A1
Heat Recovery Outdoor Unit

OUTDOOR UNIT			PURY-P200YLM-A1	PURY-P250YLM-A1	PURY-P300YLM-A1	PURY-P300YLM-A1 X2 HBC	PURY-P350YLM-A1	PURY-P350YLM-A1 X2 HBC
CAPACITY (kW)	Heating (nominal)		25.0	31.5	37.5	37.5	45.0	45.0
	Cooling (nominal)		22.4	28.0	33.5	33.5	40.0	40.0
	High Performance Heating (UK)		25.0	31.5	35.6	35.6	42.8	42.8
	COP Priority Heating (UK)		22.8	28.7	32.3	32.3	38.7	38.7
	Cooling (UK)		20.0	25.0	29.8	29.8	35.6	35.6
POWER INPUT (kW)	Heating (nominal)		7.08	10.06	12.71	11.94	15.51	14.35
	Cooling (nominal)		7.00	9.90	13.34	11.31	17.93	14.59
	High Performance Heating (UK)		8.92	12.67	16.97	15.94	20.70	19.15
	COP Priority Heating (UK)		7.04	10.01	12.40	11.65	15.12	13.99
	Cooling (UK)		4.06	5.74	8.61	7.30	11.57	9.42
COP / EER (nominal)			3.53 / 3.20	3.13 / 2.82	3.14 / 2.96	3.14 / 2.96	3.13 / 2.74	3.13 / 2.74
SCOP / SEER			5.08 / 8.50	4.51 / 7.53	4.70 / 6.90	5.00 / 8.13	4.67 / 6.14	5.04 / 7.54
MAX No. OF CONNECTABLE INDOOR UNITS			20	25	30	30	35	35
MAX CONNECTABLE CAPACITY			50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity
AIRFLOW (m^3/min)		High	185	185	230	230	230	230
PIPE SIZE mm (in)		Gas	19.05 (3/4")	22.2 (7/8")	22.2 (7/8")	22.2 (7/8")	28.58 (1-1/8")	28.58 (1-1/8")
		Liquid	15.88 (5/8")	19.05 (3/4")	19.05 (3/4")	19.05 (3/4")	19.05 (3/4")	19.05 (3/4")
SOUND PRESSURE LEVEL (dBA)			59	60	62.5	62.5	62.5	62.5
SOUND POWER LEVEL (dBA)			82.5	83.5	86	86	86	86
WEIGHT (kg)			205	205	248	248	248	248
DIMENSIONS (mm)		Width	920	920	1220	1220	1220	1220
		Depth	740	740	740	740	740	740
(1650mm without legs)		Height	1710	1710	1710	1710	1710	1710
ELECTRICAL SUPPLY			380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz
PHASE			Three	Three	Three	Three	Three	Three
STARTING CURRENT (A)			8	8	8	8	8	8
NOMINAL SYSTEM RUNNING CURRENT (A)	Heating / Cooling [MAX]		10.9 / 10.8 [16.1]	15.5 / 15.3 [17.3]	19.6 / 20.6 [22.2]	18.4 / 17.4 [22.2]	23.9 / 27.7 [27.8]	22.2 / 22.5 [27.8]
GUARANTEED OPERATING RANGE (°C)	Heating / Cooling		-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46
FUSE RATING (MCB sizes BS EN 60947-2) - (A)			1 x 20	1 x 20	1 x 25	1 x 25	1 x 32	1 x 32
MAINS CABLE No. Cores			4 + earth	4 + earth	4 + earth	4 + earth	4 + earth	4 + earth

OUTDOOR UNIT			PURY-P400YLM-A1	PURY-P450YLM-A1	PURY-P500YLM-A1
CAPACITY (kW)	Heating (nominal)		45.0	56.0	58.0
	Cooling (nominal)		45.0	50.0	56.0
	High Performance Heating (UK)		47.5	50.7	57.0
	COP Priority Heating (UK)		43.0	48.7	54.8
	Cooling (UK)		40.1	44.4	49.7
POWER INPUT (kW)	Heating (nominal)		13.39	17.39	17.53
	Cooling (nominal)		16.65	17.92	22.67
	High Performance Heating (UK)		17.88	19.91	20.07
	COP Priority Heating (UK)		13.05	16.00	16.13
	Cooling (UK)		10.74	11.29	14.29
COP / EER (nominal)			3.36 / 2.70	3.22 / 2.79	3.30 / 2.47
SCOP / SEER			4.66 / 6.08	4.50 / 6.34	4.63 / 5.62
MAX No. OF CONNECTABLE INDOOR UNITS			40	45	50
MAX CONNECTABLE CAPACITY			50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity
AIRFLOW (m^3/min)		High	230	320	380
PIPE SIZE mm (in)		Gas	28.58 (1-1/8")	28.58 (1-1/8")	28.58 (1-1/8")
		Liquid	22.2 (7/8")	22.2 (7/8")	22.2 (7/8")
SOUND PRESSURE LEVEL (dBA)			62.5	62.5	63.5
SOUND POWER LEVEL (dBA)			86	86	87
WEIGHT (kg)			246	321	321
DIMENSIONS (mm)		Width	1220	1750	1750
		Depth	740	740	740
(1650mm without legs)		Height	1710	1710	1710
ELECTRICAL SUPPLY			380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz
PHASE			Three	Three	Three
STARTING CURRENT (A)			8	8	8 / 8
NOMINAL SYSTEM RUNNING CURRENT (A)	Heating / Cooling [MAX]		20.6 / 25.7 [32.4]	26.8 / 27.7 [35.9]	27.0 / 35.0 [41.9]
GUARANTEED OPERATING RANGE (°C)	Heating / Cooling		-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46
FUSE RATING (MCB sizes BS EN 60947-2) - (A)			1 x 40	1 x 40	1 x 50
MAINS CABLE No. Cores			4 + earth	4 + earth	4 + earth

PQRY-P YLM (Water Cooled VRF) models available summer 2016.

Specifications available on request.

PURY-EP200-500YLM-A1

Heat Recovery Outdoor Unit

OUTDOOR UNIT		PURY-EP200YLM-A1	PURY-EP250YLM-A1	PURY-EP300YLM-A1	PURY-EP300YLM-A1 X2 HBC	PURY-EP350YLM-A1	PURY-EP350YLM-A1 X2 HBC
CAPACITY (kW)	Heating (nominal)	25.0	31.5	37.5	37.5	45.0	45.0
	Cooling (nominal)	22.4	28.0	33.5	33.5	40.0	40.0
	High Performance Heating (UK)	25.0	31.5	35.6	35.6	42.8	42.8
	COP Priority Heating (UK)	22.8	28.7	32.3	32.3	38.7	38.7
	Cooling (UK)	20.0	25.0	29.8	29.8	35.6	35.6
POWER INPUT (kW)	Heating (nominal)	6.92	9.84	11.71	11.12	15.38	14.28
	Cooling (nominal)	6.27	8.77	12.05	10.24	17.16	13.98
	High Performance Heating (UK)	8.67	12.32	15.62	14.83	20.52	19.05
	COP Priority Heating (UK)	6.88	9.78	11.37	10.80	14.94	13.87
	Cooling (UK)	2.77	3.76	6.06	5.15	8.11	6.61
COP / EER (nominal)		3.61 / 3.57	3.20 / 3.19	3.76 / 3.74	3.76 / 3.74	3.15 / 2.86	3.15 / 2.86
SCOP / SEER		5.19 / 9.47	4.61 / 8.51	5.10 / 7.63	5.37 / 8.96	4.70 / 6.42	5.06 / 7.86
MAX No. OF CONNECTABLE INDOOR UNITS		20	25	30	30	35	35
MAX CONNECTABLE CAPACITY		50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity
AIRFLOW (m^3/min)	High	185	185	230	230	230	230
PIPE SIZE mm (in)	Gas	19.05 (3/4")	22.2 (7/8")	22.2 (7/8")	22.2 (7/8")	28.58 (1-1/8")	28.58 (1-1/8")
	Liquid	15.88 (5/8")	19.05 (3/4")	19.05 (3/4")	19.05 (3/4")	19.05 (3/4")	19.05 (3/4")
SOUND PRESSURE LEVEL (dBA)		59	60	62.5	62.5	62.5	62.5
SOUND POWER LEVEL (dBA)		82.5	83.5	86	86	86	86
WEIGHT (kg)		202	202	244	244	244	244
DIMENSIONS (mm)	Width	920	920	1220	1220	1220	1220
	Depth	740	740	740	740	740	740
(1650mm without legs)	Height	1710	1710	1710	1710	1710	1710
ELECTRICAL SUPPLY		380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz
PHASE		Three	Three	Three	Three	Three	Three
STARTING CURRENT (A)		8	8	8	8	8	8
NOMINAL SYSTEM RUNNING CURRENT (A) Heating / Cooling [MAX]		10.6 / 9.6 [16.1]	15.2 / 13.5 [19.9]	18.1 / 18.6 [23.6]	17.1 / 15.8 [23.6]	23.7 / 26.5 [30.6]	22.0 / 21.6 [30.6]
GUARANTEED OPERATING RANGE (°C) Heating / Cooling		-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46
FUSE RATING (MCB sizes BS EN 60947-2) - (A)		1 x 20	1 x 20	1 x 25	1 x 25	1 x 32	1 x 32
MAINS CABLE No. Cores		4	4	4	4	4	4

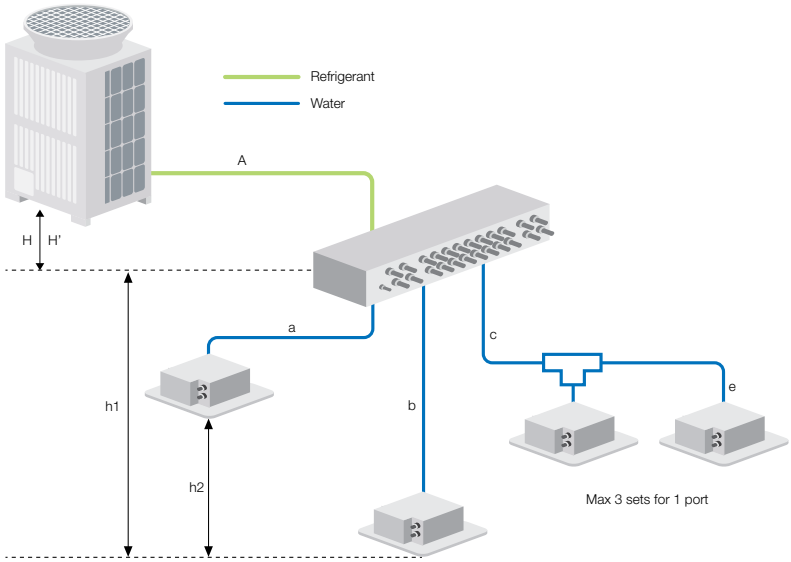
OUTDOOR UNIT		PURY-EP400YLM-A1	PURY-EP450YLM-A1	PURY-EP500YLM-A1
CAPACITY (kW)	Heating (nominal)	50.0	56.0	63.0
	Cooling (nominal)	45.0	50.0	56.0
	High Performance Heating (UK)	47.5	50.7	57.0
	COP Priority Heating (UK)	43.0	48.7	54.8
	Cooling (UK)	40.1	44.4	49.7
POWER INPUT (kW)	Heating (nominal)	14.12	16.86	21.67
	Cooling (nominal)	13.88	16.83	21.22
	High Performance Heating (UK)	18.84	19.24	24.73
	COP Priority Heating (UK)	13.71	15.41	19.81
	Cooling (UK)	6.82	7.88	9.10
COP / EER (nominal)		3.54 / 3.24	3.32 / 2.97	2.9 / 2.63
SCOP / SEER		4.92 / 7.34	4.64 / 6.75	4.77 / 6.00
MAX No. OF CONNECTABLE INDOOR UNITS		40	45	50
MAX CONNECTABLE CAPACITY		50~150% OU Capacity	50~150% OU Capacity	50~150% OU Capacity
AIRFLOW (m^3/min)	High	320	320	380
PIPE SIZE mm (in)	Gas	28.58 (1-1/8")	28.58 (1-1/8")	28.58 (1-1/8")
	Liquid	22.2 (7/8")	22.2 (7/8")	22.2 (7/8")
SOUND PRESSURE LEVEL (dBA)		62.5	62.5	63.5
SOUND POWER LEVEL (dBA)		86	86	87
WEIGHT (kg)		315	336	349
DIMENSIONS (mm)	Width	1750	1750	1750
	Depth	740	740	740
(1650mm without legs)	Height	1710	1710	1710
ELECTRICAL SUPPLY		380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz
PHASE		Three	Three	Three
STARTING CURRENT (A)		8 / 8	8 / 8	8 / 8
NOMINAL SYSTEM RUNNING CURRENT (A) Heating / Cooling [MAX]		21.8 / 21.4 [31.7]	26.0 / 26.0 [37.4]	33.4 / 32.8 [46.1]
GUARANTEED OPERATING RANGE (°C) Heating / Cooling		-20~15.5 / -5~46	-20~15.5 / -5~46	-20~15.5 / -5~46
FUSE RATING (MCB sizes BS EN 60947-2) - (A)		1 x 32	1 x 40	1 x 50
MAINS CABLE No. Cores		4	4	4

R2 Series Piping Restrictions

1 Main HBC Controller

PIPE LENGTH

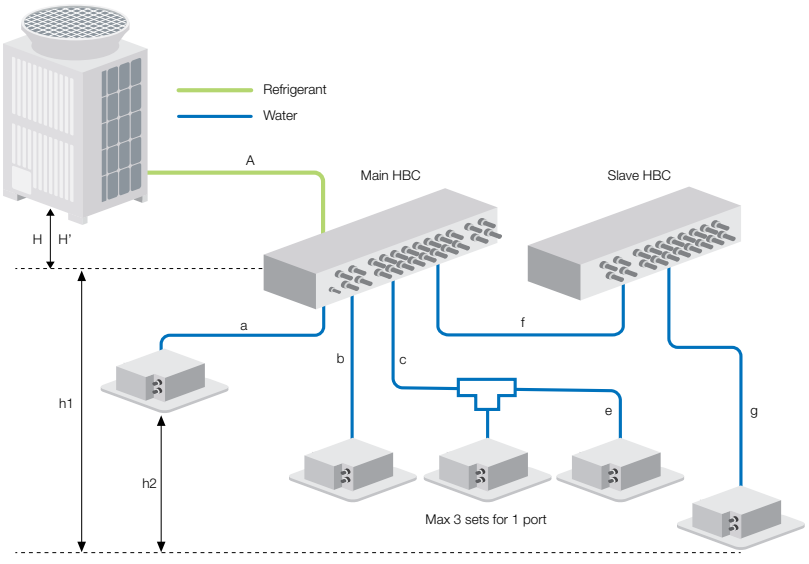
ITEMS	PIPE SECTION	MAX LENGTH (M)
Between OU and Main HBC	A	110
Length Between Furthest Indoor Unit and Main HBC	b	60
Height between OU and Main HBC (OU above Main HBC)	H	50
Height between OU and Main HBC (OU below Main HBC)	H'	40
Height Between IU and Main HBC	h1	15
Height Between IU and IU	h2	15



1 Main HBC Controller and 1 Slave HBC

PIPE LENGTH

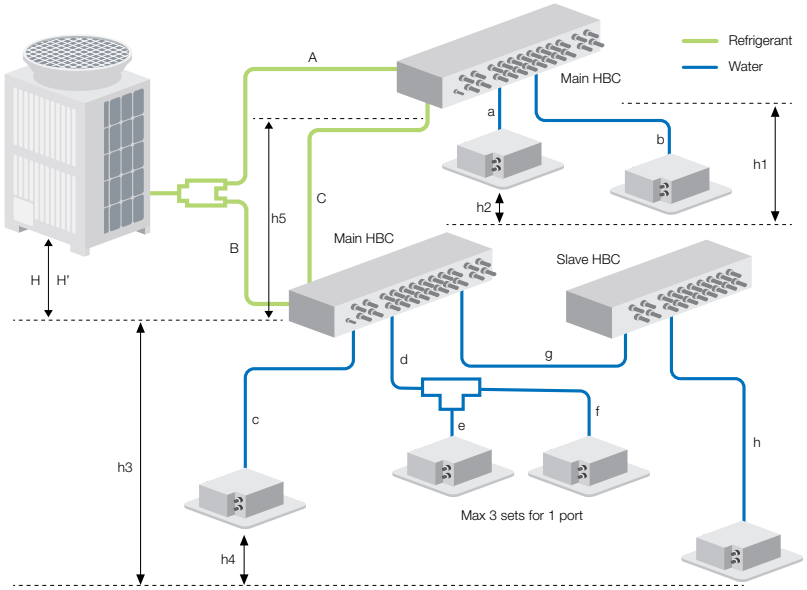
ITEMS	PIPE SECTION	MAX LENGTH (M)
Between OU and Main HBC	A	110
Length Between Furthest Indoor Unit and Main HBC	f+g	60
Height between OU and Main HBC (OU above Main HBC)	H	50
Height between OU and Main HBC (OU below Main HBC)	H'	40
Height Between IU and Main HBC	h1	15
Height Between IU and IU	h2	15

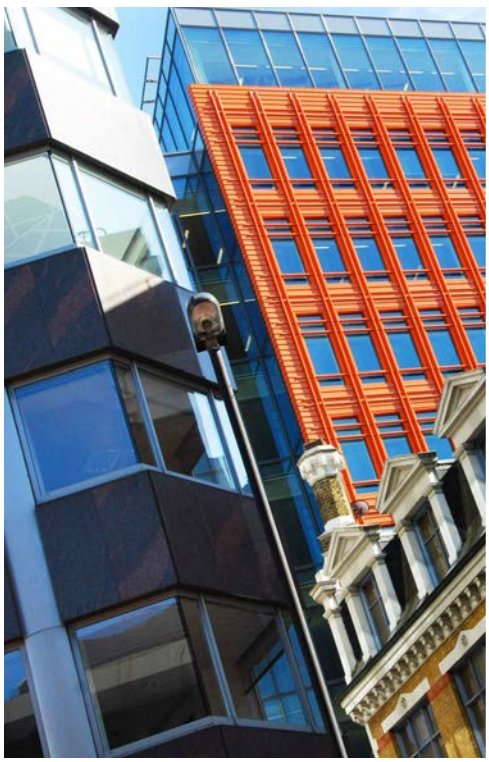


2 Main HBC Controller and 1 Slave HBC

PIPE LENGTH

ITEMS	PIPE SECTION	MAX LENGTH (M)
Between OU and Main HBC	A + B	110
Length Between Furthest Indoor Unit and Main HBC	b and g + h	60
Height between OU and Main HBC (OU above Main HBC)	H	50
Height between OU and Main HBC (OU below Main HBC)	H'	40
Height Between IU and Main HBC	h1 and h3	15
Height Between IU and IU	h2 and h4	15
Height Between Main HBC and Main HBC	h5	15
Length Between Main HBC and Main-HBC	C	40





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