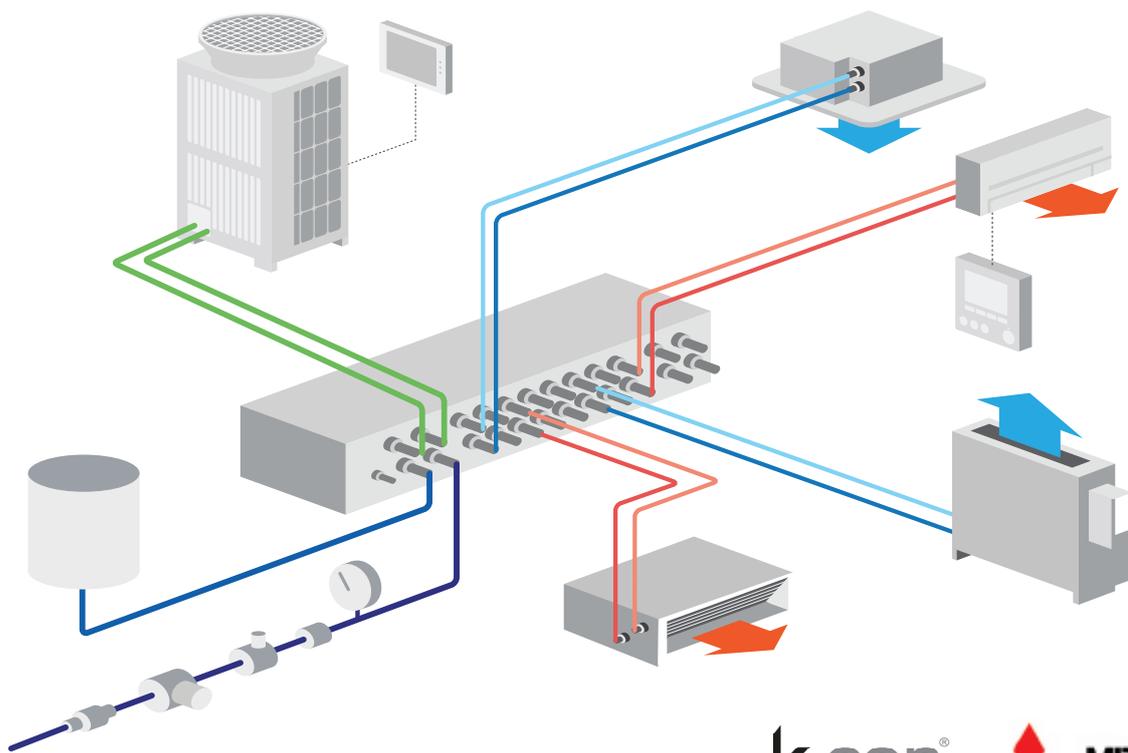


# GUIDE TO HYBRID-VRF AIR CONDITIONING

**kooltech**



KG\_HVRF\_0625v1

[www.kooltech.co.uk](http://www.kooltech.co.uk)

**k-con**<sup>®</sup>  
Kooltech Bespoke Solutions

**MITSUBISHI  
ELECTRIC**

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- EUROPEAN F-GAS REGULATION AND FUTURE-PROOFING HVAC SAFETY STANDARDS
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K-con bespoke solutions: Mitsubishi Modification

# DEFINING FUTURE HVAC

Defining future product direction and development in the Heating, Ventilation and Air Conditioning (HVAC) industry is centred around a holistic approach. Moving beyond temperature requirements alone, HVAC equipment needs to be sustainable and provide a healthy comfortable environment for a range of applications, from education buildings, to retail and hospitality and commercial office space.

Driven by guidance and regulations and looking towards a Net Zero and low-carbon future, HVAC solutions need to significantly reduce life-cycle emissions (embodied carbons included) consume less energy in operation while being simple, flexible and intuitive to operate. Safety and ease for future service also needs to be considered for maintenance and repairs while catering to refurbish projects and new builds.

With the increasing awareness of the need for sustainability in the build environment, designer, contractors and installers are looking for HVAC technologies that deliver energy efficient, low-carbon climate control solutions.



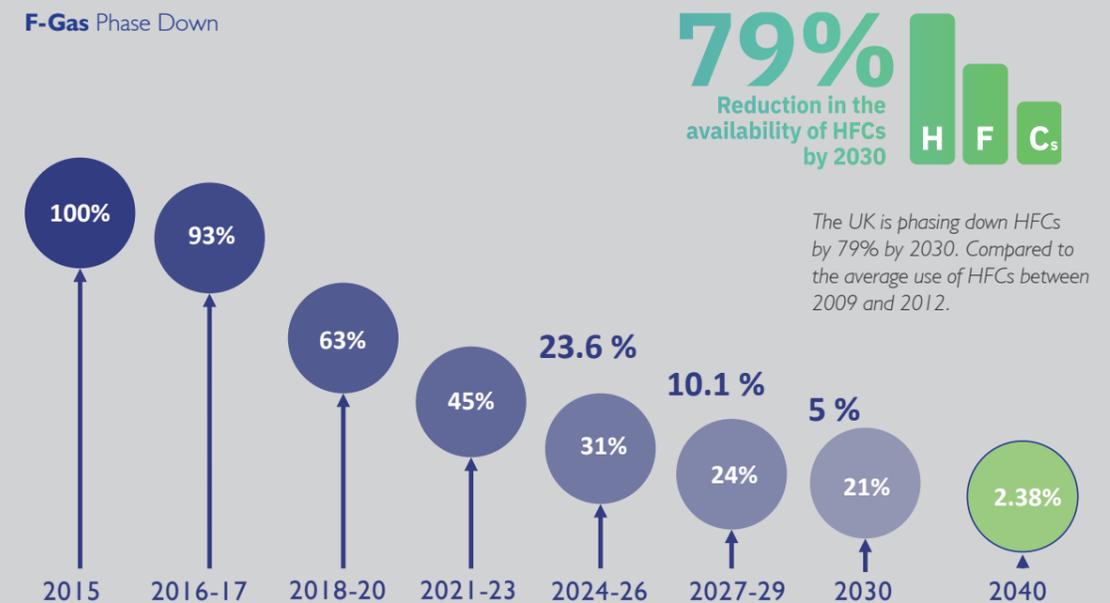
In the UK, buildings account for over **40%** of our carbon emissions.

**Nearly 90%** of this is generated from heating and cooling systems.



Legislation such as **F-Gas** and **Part L** Building Regulations are driving the Heating and Cooling market towards low-carbon decarbonisation.

## F-Gas Phase Down



# EUROPEAN F-GAS REGULATION BANS

## Split air conditioning and heat pump equipment - Ban 9

A 'split system' in the Regulation refers to a system consisting of a number of refrigerant piped units that form a separate but interconnected unit. These require the installation and connection of refrigerant circuit components at the point of use. Global Warming Potential (GWP) means the climatic warming potential of a greenhouse gas relative to that of carbon dioxide (CO<sub>2</sub>), calculated in terms of the 100-year GWP.

### Split Air-to-Water

X <= 12kW at 150 GWP	1 <sup>st</sup> January 2027
X <= 12kW full F-Gas prohibition	1 <sup>st</sup> January 2035
X >= 12kW at 750 GWP	1 <sup>st</sup> January 2029
X >= 12kW at 150 GWP	1 <sup>st</sup> January 2033

### Split Air-to-Air

X <= 12kW at 150 GWP	1 <sup>st</sup> January 2029
X <= 12kW full F-Gas prohibition	1 <sup>st</sup> January 2035
X >= 12kW at 750 GWP	1 <sup>st</sup> January 2029
X >= 12kW at 150 GWP	1 <sup>st</sup> January 2033

➔ Changing regulations on refrigerants in HVAC systems mean that new, low GWP refrigerants are being introduced into the market.

➔ These new generation of refrigerants offer many benefits and it is vital to be aware of the regulations and standards around their use in products and systems.

Maintenance is also covered (Article 13 Control of use) with a ban on the use of F- Gases with a GWP of 2500 or more to service or maintain refrigeration equipment with a charge size of 40 tonnes of CO<sub>2</sub> equivalent or more (in force from 1<sup>st</sup> January 2025).

Reclaimed and recycled F-Gases above the GWP threshold can be used until 1<sup>st</sup> January 2030 providing, they have been correctly labelled. And they may only be used by the organisation which carried out the recovery as part of maintenance or servicing. In addition, from 1<sup>st</sup> January 2026, the use of F-Gases with a GWP of more than 2500 and listed in Annex I of the document, is banned for the servicing and maintenance of air conditioning and heat pump equipment. Reclaimed and recycled F-Gases above the GWP threshold can be used until 1<sup>st</sup> January 2032.

Although the UK is not an EU member state, the impact of updated F-Gas regulations will be considerable. They will affect the availability of HVAC equipment and the price of refrigerants since most are imported via the EU.

# FUTURE-PROOFING HVAC

With F-Gas future phase downs on the horizon, the market has seen significant fluctuations in refrigerant pricing. This can impact the installation and maintenance cost and should raise questions about the longevity of system installations. As a result, HVAC system upgrades may affect property value or the costs associated with Cat A to Cat B fit outs, for example.

Flexibility is an increasingly important feature for future buildings. Changing office layouts can require complex air conditioning system re-fits, including changing copper pipe runs to suit different refrigerants. Here a system like Hybrid VRF can be helpful, or chillers using low GWP R32 or R290 can be useful since only the outdoor unit is changed and indoor pipes carrying water can be re-used.

➔ In the UK, non-domestic building stock accounts for 23% of overall operational carbon emissions in the built environment. And with around 70% of these were constructed before the year 2000. Thousands of buildings will need to undergo some form of retrofit to improve energy efficiency before 2050.

<https://ww3.rics.org/uk/en/modus/built-environment/commercial-real-estate/retrofitting-commercial-property.html>

Refrigerant	GWP
R1234ze	7
R1234yf	4
R513A	631
R454b	466
R32	675



# SAFETY STANDARDS

BS EN 378 is a safety standard that minimises possible hazards to persons, property, and the environment from refrigerating systems and refrigerants. BS EN 378 consists of four parts, intended for different roles/groups.

	Part 1	Part 2	Part 3	Part 4
<b>People Interested</b>				
Plant / Equipment Designer	■	■	■	■
Plant / Equipment Manufacturer	■	■	■	■
Plant / Equipment Installer	■	■	■	■
Service / Maintenance Personnel	■	■	■	■
Building / Plant Owner / Operator / Manager	■	■	■	■
Building Designer	■	■	■	■

BS EN378-1	BS EN378-2	BS EN378-3	BS EN378-4
<b>Part 1: Basic requirements, definitions, classification and selection criteria</b>	<b>Part 2: Design, construction, testing, marking and documentation</b>	<b>Part 3: Installation site and personal protection</b>	<b>Part 4: Operation, maintenance, repair and recovery</b>
<p>Defines systems and refrigerants.</p> <p>Advises which formula to use to calculate the practical refrigerant limit of that system based on toxicity and flammability.</p> <p>Points to additional safety requirements if this limit is exceeded. For example, the system may require safety features such as leak detection, alarms, provision of natural or mechanical ventilation, safety shut-off valves.</p> <p><b>Product standard EN 60335-2-40, 60335-2-24, 60335-2-89 is mentioned in Part 1.</b></p>	<p>Mainly related to the safety of the components used in constructing the system.</p> <p>Covers relevant standards for compressors, heat exchangers, pumps, oil separator, pressure relief devices, valves etc.</p> <p>Covers testing procedures for mechanical and electrical strengths, internal wiring, connection joints, insulation, noise, transportation test etc.</p> <p>This section also covers commissioning, tightness test, vacuum and filling of the system, checking for leaks, marking, information in the manual and logbook requirements.</p> <p><b>Product standard EN 60335-2-40, 60335-2-24, 60335-2-89 is also mentioned in Part 2.</b></p>	<p>Provides site-specific safety requirements and how to implement them.</p> <p>Electrical Installation.</p> <p>Covers the installation requirements of the refrigeration system, whether positioned in open air (externally to the building) or in a plant room or in an occupied space.</p> <p>Addresses ventilation rates for spaces including at what concentration an alarm or leak detection should trigger, or how a safety shut-off valve should operate.</p> <p>Highlights the need for annual equipment checks and how safety measures must be installed &amp; respond in that space or property.</p> <p>Instruction manual &amp; notices.</p> <p>Maintenance of the site.</p> <p>Visual inspection of the site.</p> <p>Covers the requirement of PPE and first aid during routine or emergencies.</p>	<p>Addresses the installer/end user and their ability to operate the system and its safety mechanisms/processes.</p> <p>Covers system maintenance and repair, including safety requirements during oil or refrigerant changes.</p> <p>Provides procedures to follow during servicing, recovery, reuse and disposal.</p> <p>In service inspection.</p> <p>Guidelines for repairing equipment with flammable refrigerant.</p> <p>Addresses safe handling and storage of refrigerant containers.</p> <p>Training requirements for skilled personnel handling refrigerant based systems.</p>

Part 1 does not cover installation.

It is important to note that BS EN 378 references other relevant standards within its text, including BS EN IEC 60335. For example, BS EN 378-1 states:

**“Product family standards dealing with the safety of refrigerating systems take precedence over horizontal and generic standards covering the same subject.”**

As a result, BS EN IEC 60335 could be applied in relation to charge limits, alternative formulas or types of safety measure that can be considered. BS EN 378-1 notes:

**“Where product standards exist for particular types of systems and where these product standards refer to refrigerant quantities limits, such quantities shall overrule the requirements of the standard.”**

The BS EN 378-3 (Part 3) leak detection system installation recommendations are:

- Locate the detectors where leaking refrigerant can stagnate or concentrate. It should also take into consideration
- Local air patterns from louvres or ventilation systems.
- If alarms are employed to warn of a leak, then the power source of the alarm system should be independent of the mechanical ventilation or other refrigerating systems which the alarm system is protecting.

**“An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.”**

By contrast, the EN 60335-2-40 leak detection system installed recommendations for manufactures, provide a choice of three locations for leak detectors:

- Within the unit
- Or 100 mm or less directly below the unit
- Or 300 mm above the floor on a wall within the room the unit is installed in.

# SAFETY STANDARDS



**Engineering Guidance**

**CIBSE Guides**

**Technical Memoranda**

**Applications Manuals**

**Commissioning Codes**

**Codes of Practice**

**Digital Engineering Series**

**Knowledge Series**

**Top Tips**

**SLL Lighting Publications**

- **Guide A: Environmental design (2015)**
- **Guide B: Heating, Ventilating, Air Conditioning and Refrigeration (2016):**
  - **Guide B0: Applications and Activities**
  - **Guide B1: Heating**
  - **Guide B2: Ventilation and ductwork**
  - **Guide B3: Air conditioning and refrigeration**
  - **Guide B4: Noise and vibration control for building services systems**
  - **Guide B: Combined Index**
- **Guide C: Reference data (2007)**
- **Guide D: Transportation systems in buildings (2020)**
- **Guide E: Fire safety engineering (2019)**
- **Guide F: Energy efficiency (2012)**
- **Guide G: Public health and plumbing engineering (2014)**
- **Guide H: Building control systems (2009)**
- **Guide J: Weather, Solar and Illuminance Data (withdrawn in 2015)**
- **Guide K: Electricity in buildings (2004)**
- **Guide L: Sustainability (2020)**
- **Guide M: Maintenance engineering and management (2023)**

<https://www.cibse.org/knowledge-research/knowledge-resources/engineering-guidance/cibse-guides>

**IOR.org.uk**

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Safety Code of Practice Flammable Lower Toxicity Refrigerants (Groups A2L, A2 and A3) HFO & Hydrocarbon

Non-member price: £48.00  
Member price: Free

This publication provides essential industry guidance for owners, designers, installers and operators of vapour compression refrigerating systems that use flammable refrigerants. This includes Group A2, A2L, or A3 – otherwise known as hydrocarbon and HFO refrigerants.

It covers properties of refrigerants, decommissioning, testing and maintenance as well as design issues with useful appendices such as typical schedules for inspection and maintenance, system tag-out details, machinery rooms, definitions and an updated list of relevant standards. The Code has been prepared by the IOR Technical Committee as a reference source and guide to interpretation of current safety standards such as BS EN378:2006 and legal requirements such as PFD, PDR and PDRS.

The IOR publishes four Safety Codes of Practice specific to refrigerant type:

- Non-Flammable Lower Toxicity Refrigerants Group A1
- Flammable Lower Toxicity Refrigerants Group A2L, A2 and A3
- Carbon Dioxide R744
- Ammonia R717

This Code is supplied as a 114 page PDF.

Updates:

- Amendments added May 2019 - Section 11: CLP and OSEAR
- August 2019 - Minor text changes to Appendix F, section 4.1

<https://ior.org.uk/technical/rachp-publications?state=b&id=149>

**FETA**

**Tech Guide**

**A2L Refrigerants:**

**Concept and Application Guide**

**for Refrigeration Systems in the**

**Scope of EN 378**

July 2021  
Version 2

<https://feta.co.uk/client/files/FETA/FETA%20A2L%20EN%20378%20Tech%20Guide%20July%202021.pdf>

**REFCOM**

WORKING WITH LOWER FLAMMABILITY REFRIGERANTS

Advice and guidance on the changes to working practices

We want to make sure that our REFCOM members are fully up to date on the changes to working practices needed when working with the next generation of A2L refrigerants. These replace the higher GWP HFC gases that are currently the industry norm.

A2L is a new safety classification from ASHRAE denoting lower flammability, sometimes referred to as ' mildly flammable'. They generally have a much lower GWP (Global Warming Potential) than current common HFC gases.

**Background**

Refrigerant	ASHRAE Class	Classification
R410A	A1	Non-flammable, non-toxic
R32	A2L	Mildly flammable, non-toxic
R454B	A2L	Mildly flammable, non-toxic
R454C	A2L	Mildly flammable, non-toxic
R454E	A2L	Mildly flammable, non-toxic
R454F	A2L	Mildly flammable, non-toxic
R454G	A2L	Mildly flammable, non-toxic
R454H	A2L	Mildly flammable, non-toxic
R454J	A2L	Mildly flammable, non-toxic
R454K	A2L	Mildly flammable, non-toxic
R454L	A2L	Mildly flammable, non-toxic
R454M	A2L	Mildly flammable, non-toxic
R454N	A2L	Mildly flammable, non-toxic
R454P	A2L	Mildly flammable, non-toxic
R454Q	A2L	Mildly flammable, non-toxic
R454R	A2L	Mildly flammable, non-toxic
R454S	A2L	Mildly flammable, non-toxic
R454T	A2L	Mildly flammable, non-toxic
R454U	A2L	Mildly flammable, non-toxic
R454V	A2L	Mildly flammable, non-toxic
R454W	A2L	Mildly flammable, non-toxic
R454X	A2L	Mildly flammable, non-toxic
R454Y	A2L	Mildly flammable, non-toxic
R454Z	A2L	Mildly flammable, non-toxic

The flammable greenhouse gases regulation (EC/2006), commonly referred to as the F-Gas Regulation, has introduced a prohibition of high-GWP gases by limiting the amount of gas that can be placed on the market – that limit being expressed in terms of CO<sub>2</sub> tonnes equivalent. The table above gives an overview of the current A2L alternatives in use or under discussion with an indication of what sector of the market they are applied to. The prohibition to lowering the GWP of a gas tends to be the measure of flammability based on other safety related issues. Many of the alternatives for current common HFCs are mildly flammable and have reached the new ASHRAE classification A2L – meaning that the gas is flammable but of a lower flammability level than a class 2 gas. In particular the lower flammability tend to be hard to ignite, and have a slow burning velocity of a 20 cm/s under test conditions. As such, they are considered to be safe for use in approved systems and can be considered safe for general handling with certain caveats.

<https://www.refcom.org.uk/guidance/working-with-lower-flammability-refrigerants>

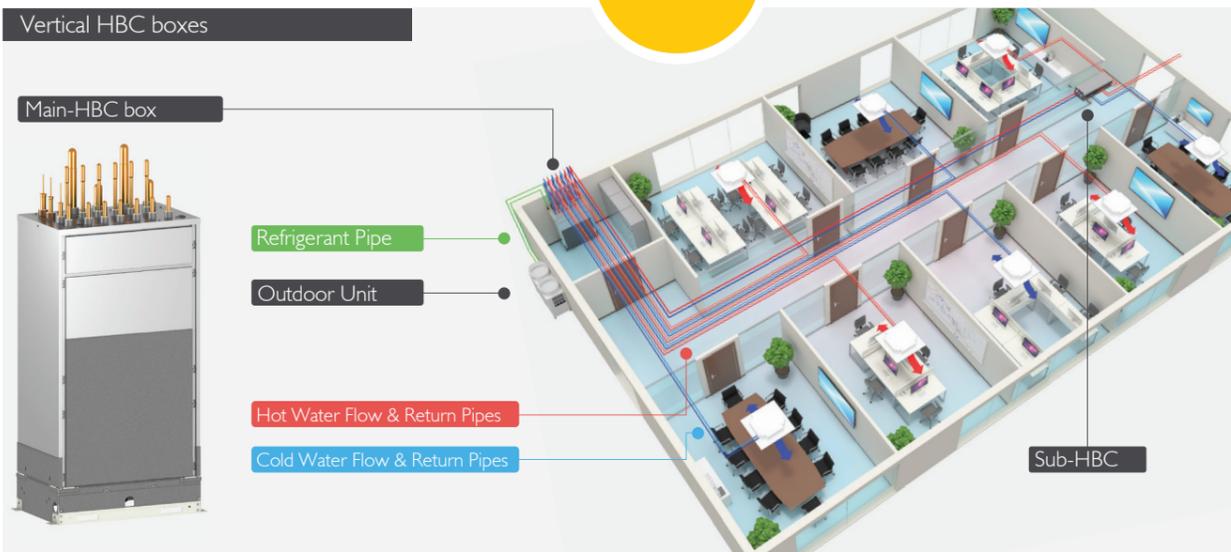
# WHAT IS HYBRID-VRF?

## R32 | HybridVRF

Hybrid-VRF a unique 2-pipe heat recovery system to supply simultaneous heating and cooling offers the flexibility of a standard VRF system and comfort of a chiller system.

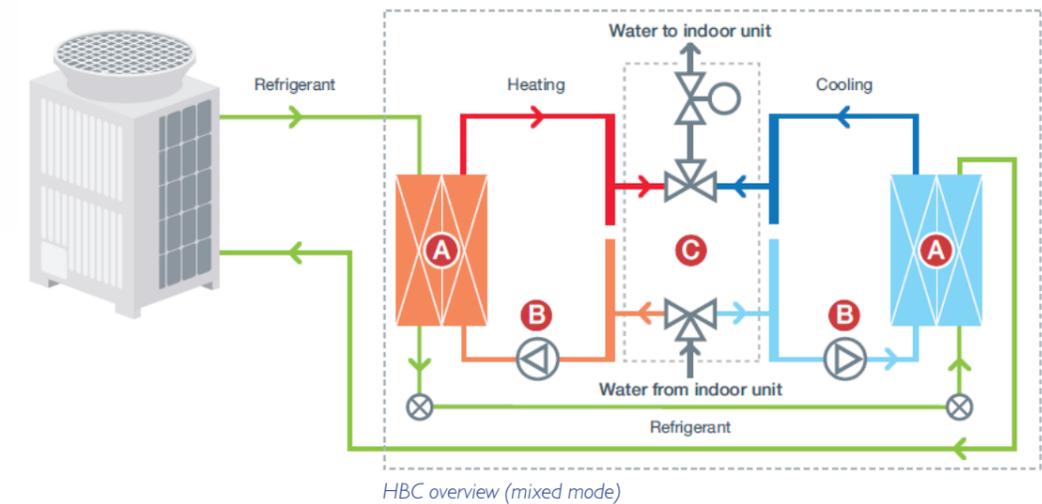
At the heart of both Air Source and Water Source system layout, the Hybrid Branch Controller (HBC) makes simultaneous heating and cooling possible, with improved system efficiency as energy is transferred intelligently around the building. The Horizontal and Vertical HBC boxes are available as a 6, 8 or 16 port model. Valves, pumps, and the heat exchanger are all contained within the Main-HBC allowing for phased, manageable installation - ideal for Cat A to Cat B applications.

An overall system can be expanded using additional horizontal Sub-HBC's allowing up to 50 indoor units to be supplied by one outdoor condenser.



# HYBRID BRANCH CONTROLLERS

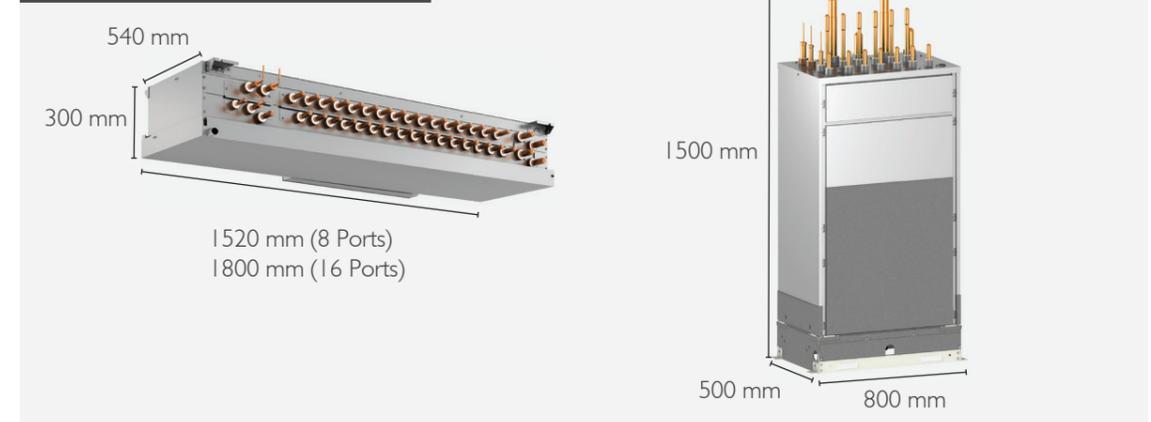
## HOW DO THEY WORK?



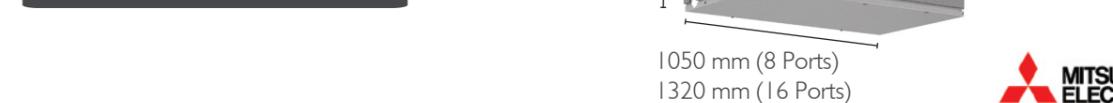
The outdoor unit is connected to the Main-HBC. The Main-HBC has two water plate heat exchangers, each plate heat exchanger has its own water circuit that has a pump and the headers for flow and return. During simultaneous heating and cooling demand, one plate heat exchanger becomes the cooling plate and the other one becomes the heating plate. Each indoor unit ports has a valve block associated with it. Depending on the indoor unit's mode, the valve block can tap into the cold water or hot water header, and depending on the capacity demand of the room, the valve block can control the flow rate of water going into the indoor unit.

When the vertical HBC box is used more indoor units can be connected by adding the Sub-HBC box, which relies on 4 pipe water connection from the vertical main. During simultaneous heating and cooling, heating flow and return header and cooling flow and return header go to the Sub-HBC box. There are not any additional components in the Sub-HBC making it around 50% lighter than the horizontal Main-HBC and quieter due to the lack of major mechanical parts.

## Main-HBC box dimensions



## Sub-HBC box dimensions



# MYTH-BUSTING

**MYTH:**

HVRF systems struggle to deal with a wide range of simultaneous temperature requirements.

**BUSTED:**

This perception seems based on anecdotal feedback, and no published evidence. On the contrary, there are many published case studies which have demonstrated that HVRF can be the ideal and most responsible solution in buildings where varied internal temperatures are required.

**MYTH:**

HVRF systems do not have the same safety measures as VRF systems.

**BUSTED:**

The Mitsubishi Electric HVRF range is compliant with the safety requirements of the following organisations: BREEAM, CIBSE, FETA, IOR and REFCOM.

**MYTH:**

HVRF is a new, untested technology.

**BUSTED:**

Mitsubishi Electric launched HVRF in 2015 and is an established part of their range. We are regularly serving high value projects throughout the UK, ranging from £000's to £m's!

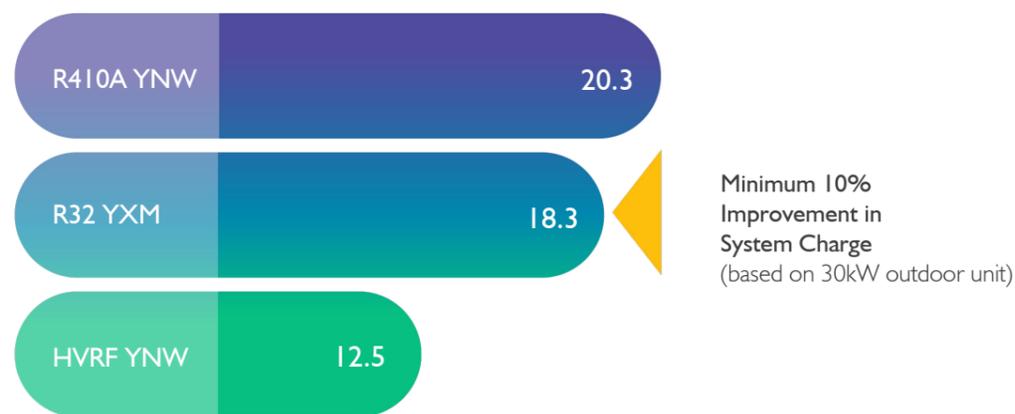
**MYTH:**

HVRF systems use more refrigerant than standard VRF systems.

**BUSTED:**

Mitsubishi Electric HVRF systems use up to 28% less refrigerant to achieve a full charge than the next leading brand.

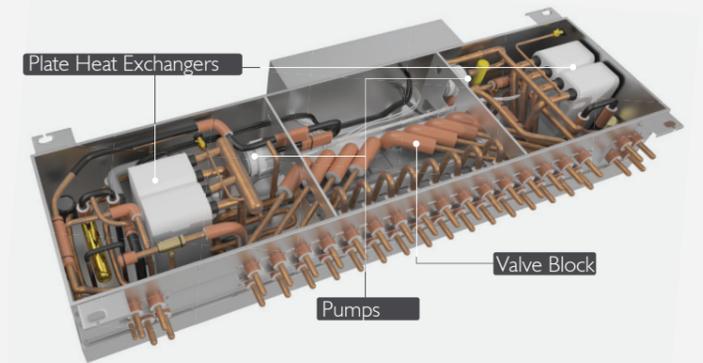
## LOW REFRIGERANT CHARGE



HVRF provides the ideal solution for customers looking to future-proof their air conditioning in line with the next stage of the F-Gas regulations. By combining R32 refrigerant with the merits of a Hybrid system, more than an 80% reduction in CO<sub>2</sub> equivalent can be achieved as it uses up to 40% less refrigerant, when compared to an R410a VRF system.

## FEATURE AND BENEFITS OF HVRF

### R32 | HybridVRF



#### Horizontal-HBC boxes

The Horizontal HBC unit is a unique combination of 2-pipe technology and water to provide simultaneous heating and cooling with heat recovery.

- Main-HBC in choice of 8 or 16 ports
- Valves, pumps and heat exchangers contained within the HBC
- Ideal for installation within a ceiling void
- Manageable phased installation through modular system design
- Intuitive load adjusting flow control valves and water pumps are optimised for variable flow control and heat recovery for maximum efficiency.

#### Vertical-HBC boxes

Designed with flexibility in mind, the Vertical-HBC unit is a floor standing solution with all key components accessible from the front. The installation of additional water-side ancillaries such as expansion vessel, water filling loop and isolation valves is easier at when they are located at floor level during commissioning and service.

- Main-HBC with 6 ports (Sub-HBC can be added for additional indoor units up to total 50 IDU)
- Compact footprint, floor level installation
- Simple to design install commission and maintain
- Low noise solution
- Flexible installation, adaptable for layout configuration for Cat A or Cat B applications
- Intuitive load adjusting flow control valves and water pumps are optimised for variable flow control and heat recovery for maximum efficiency.

#### Sub-HBC boxes

Additional indoor units can be connected to the Main-HBC by using an 8 or 16 port Sub-HBC. Simultaneous heating and cooling is achieved by having a four-pipe connection between the Main and Sub-HBC. The layout is then further simplified by having a two-pipe connection between the Sub-HBC and indoor units.

- Light and compact Sub-HBC units that require less service space during installation
- Contains no noise sensitive elements, giving more flexibility to location including in occupied spaces
- No requirement for addition water ancillaries such as expansion vessel and water-filling loop connection, simplifying design and installation layout.

Mitsubishi Electric's City Multi HVRF systems are highly versatile and can be used within a retrofit application as well as phased installations.

ODU: 22.4kW, 28.0kW, 33.5kW, 33.5kW (X2 HBC), 40.0kW, 40.0kW (X2 HBC), 45.0kW, 50.0kW, 56.0kW



Energy, Environment, Efficiency...it's all under control We understand that our customers have different requirements for their projects. That's why we've developed the K-con range of bespoke solutions. K-con solutions can be anything from Mitsubishi Electric air conditioning/heat pump modifications to tailor-made ancillary or accessory items to work with and enhance your system.

Kooltech are uniquely positioned to offer this.

## INNOVATION

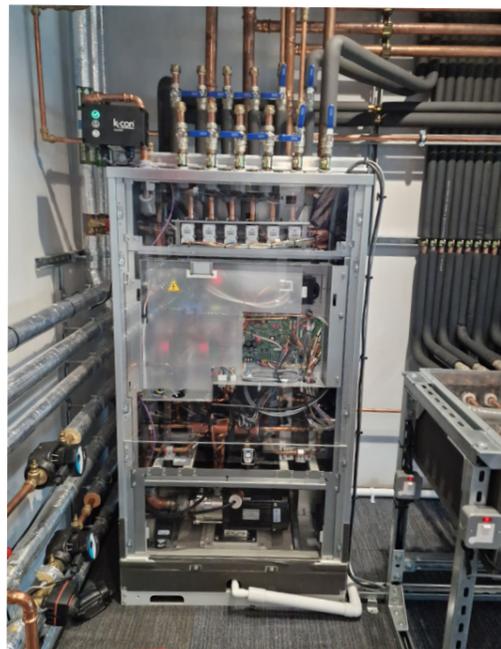
Our project sales team, applications engineers and the K-con factory are always up for a challenge. They see it as an opportunity to innovate, offer solutions, and add real value to the mechanics of a building. We work closely with our customers to understand their needs and project requirements. We have a variety of projects and unusual applications where our K-con solutions have overcome strict barriers. Ranging from applying K-con products to meet EN378 or BREEAM requirements, to looking ahead to future extension plans of a building or providing weather-proof housing for equipment where internal space is limited.

## OUR PRODUCTS

We are constantly researching and developing new solutions. Our K-con solutions are an ever-growing range. Many of our K-con products are unique and include but are not limited to the modified Mitsubishi Electric Branch Controller box with port isolation that allows engineers to service individual indoor units without shutting down the entire VRF system. Valve kits, fitted in a controlled factory environment and tested to 3 bar, ensuring quality and consistency.

These K-con modifications are approved by Mitsubishi Electric and are backed by warranty.

Our engineers and the K-con bespoke products work alongside the Mitsubishi Electric HVAC product range to maximise the potential of the installation and to save time on site.



## K-CON HBC CONNECTION



At the K-con factory all valves are tested to 3 bar and each HBC and Indoor unit with valve is fully certified.



# K-CON BESPOKE SOLUTIONS



## K-CON MLC PIPE

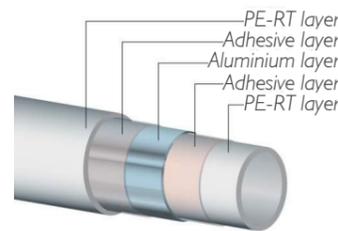
Kooltech offer a full range of Multi-layer composite pipe-work specifically for use with the Mitsubishi Electric Hybrid VRF product range. The use of press-fit connections removes the need for hot works and reduces the risk of system contamination from brazing and pipe sealants other solutions may introduce.

The MLCP is to BS EN ISO 21003 Multilayer piping systems for hot and cold water installations inside buildings - Pipes standard, and can support both hot and cold water to pressures and temperatures far in excess of those required by the Mitsubishi Electric specification.

The use of MLCP as the piping solution can save both time and expense on a Project whilst offering a flexible and easy method of connecting the Hybrid Branch Controller to all indoor units sizes and styles.



- 50m coils reducing the number of joints and improving productivity
- Press-fit, no hot works or brazing required
- Pre-insulated pipe offering
- Inspection windows on fittings for visual check to ensure correct application
- 100% oxygen barrier - Aluminium barrier safeguards oxygen penetration
- Light weight for easy transportation
- Form-stable pipework, holds its shape once bent
- Low heat expansion (up to 10x less than plastic pipes)
- 25 year guarantee (50 years on application)
- Full training with certification can be arranged
- Note: Press tool jaws must be approved for use with the pipe manufacturer.



14



Press fit copper adapter

# ABOUT KOOLTECH

At Kooltech, we specify, modify, engineer, design, support and supply HVAC+R equipment, components, refrigerant and tools. Built around our customers, we challenge the status quo in the HVAC+R industry, by thinking outside the box. We can do this, as we have the in-house expertise and facilities, with our K-con R&D division and factory and our Kooltech Applied department specialising in decarbonisation and sustainability heat pump projects, domestic, commercial and industrial.

We have a long-standing partnership with Mitsubishi Electric spanning over three decades, which provides us with unparalleled access to industry-leading products. As the UK's only exclusive Mitsubishi Electric distributor we bring exceptional technical expertise across their entire product range.

## Beyond distribution

We enhance Mitsubishi Electric HVAC systems through our K-con modifications and bespoke solutions, ensuring seamless integration and optimised efficiency. All designed and manufactured to meet stringent CE and UK CA certification and ISO standards, guaranteeing quality and compliance.



# kooltech

Est 1979



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National projects team, 7 branches and warehouses across the UK.



#KEEPITKOOLTECH



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THANK YOU FOR JOINING US  
AT UILE BHEIST



# ABOUT KOOLTECH

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- HYBRID BRANCH CONTROLLERS
- BUSTING THE MYTHS
- FEATURES AND BENEFITS OF HYBRID-VRF
- K-CON BESPOKE SOLUTIONS
- MAINCOR PIPE
- ABOUT KOOLTECH

At Kooltech, we specify, modify, engineer, design, support and supply HVAC+R equipment, components, refrigerant and tools. Built around our customers, we challenge the status quo in the HVAC+R industry, by thinking outside the box. We can do this, as we have the in-house expertise and facilities, with our K-con R&D division and factory and our Kooltech Applied department specialising in decarbonisation and sustainability heat pump projects, domestic, commercial and industrial.

We have a long-standing partnership with Mitsubishi Electric spanning over three decades, which provides us with unparalleled access to industry-leading products. As the UK's only exclusive Mitsubishi Electric distributor we bring exceptional technical expertise across their entire product range.

### Beyond distribution

We enhance Mitsubishi Electric HVAC systems through our K-con modifications and bespoke solutions, ensuring seamless integration and optimised efficiency. All designed and manufactured to meet stringent CE and UK CA certification and ISO standards, guaranteeing quality and compliance.

THANK YOU FOR JOINING US  
MULLE BHEIST

