

Mitsubishi Electric Guide to Hybrid Technologies for Lower-Carbon Buildings



Information Guide

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Mitsubishi Electric Guide to Hybrid Technologies for Lower-Carbon Buildings



This is an independent guide produced by Mitsubishi Electric to enhance the knowledge of its customers and provide a view of the key issues facing our industry today.

This guide accompanies a series of seminars, all of which are CPD certified.

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The changing air conditioning landscape - preparing for the future

Like all technologies, air conditioning has undergone significant changes in the past decade, and these developments continue at pace in response to environmental concerns, customer demand and regulation.

Designers, installers and building owners must be continually aware of the latest air conditioning technology options, not only to specify the best solutions, but also to ensure their buildings are future-proofed in this evolving landscape.

Whether a project is new-build or refurbishment, understanding the latest developments and upcoming requirements is key to making the right choice. This guide looks at some of the main drivers for change, and offers insights into flexible, adaptable solutions that answer many of today's HVAC challenges.



Refrigerant regulation

One of the most significant drivers for change in the HVAC sector has been the regulation of refrigerants. This has seen some removed from the market and others set for phase down across the EU in the coming years, leading to greater adoption of new refrigerants and the evolution of equipment to make use of these new formulas.

The most important changes have been driven by the European Union's F Gas Regulations¹. First introduced in 2006, these rules aim to reduce the use of fluorinated (F) gases across the EU, particularly the most common type of F gas, hydrofluorocarbons, or HFCs.

Under the Regulations, each HFC is allocated a global warming potential (GWP) number to reflect its impact on the environment. GWP indicates how much heat is trapped by a mass of the HFC compared to a similar amount of carbon dioxide. The higher the GWP, the greater its potentially damaging impact on the environment.

Since the initial introduction of F Gas, the EU has continued to set steeper phase downs for higher-GWP refrigerants, reducing the amount of each refrigerant permitted into the EU market. The target is to phase out consumption of HFCs by 2050.

The latest targets are shown in **Table 1**. The percentages shown represent the proportion of HFCs allowed onto the market against the 'reference average' (calculated as the average volume on the market between 2009 - 2012). For example, between 2024 and 2026 the Regulations limit the total amount of HFCs on the market to 23.6% of the average amount on the market between 2009-2012.

Table 1 EU F Gas phase down programme

Time period	EU phase down programme adopted in February 2024
2024-2026	▼ 23.6%
2027-2029	▼ 10.1%
2030	▼ 5%
2048	▼ 2.38%



The changing air conditioning landscape - preparing for the future

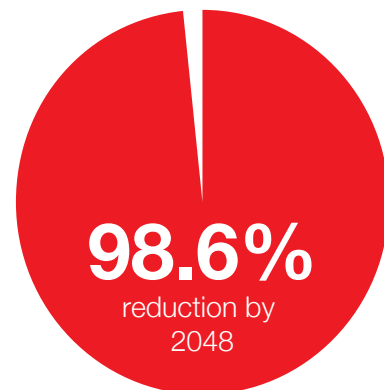
In addition to the overall phase-down schedule, the updated EU F Gas regulation text introduces a full ban on placing several categories of products containing HFCs on the market. These include HVAC equipment such as certain sizes of chillers and heat pumps.

The UK is currently in an unusual position, since it left the EU in 2020 and is no longer subject to EU F Gas Regulations. However, in October 2025 DEFRA (the Department for Environment Food and Rural Affairs)², which operates the scheme here, opened a consultation on proposed phase downs.

Time period	Proposed GB phase down	EU phase down
2024 - 2026		
2027 - 2029	▼ 16.2%	▼ 10.1%
2030 - 2032	▼ 10.3%	▼ 5.2%
2033 - 2035	▼ 6.7%	▼ 4.8%
2036 - 2038	▼ 4.8%	▼ 3.8%
2039 - 2041	▼ 3.2%	▼ 3.5%
2042 - 2044	▼ 2.1%	▼ 3.1%
2045 - 2047	▼ 1.6%	▼ 2.7%
2048 - 2050	▼ 1.4%	▼ 2.4% (0% by 2050)

DEFRA notes that the proposals mean adjusting existing figures to include further phase-down steps than are currently included between 2030 and 2050. This means revising the target end date of the phase down, replacing the 79% reduction by 2030 target with a 98.6% reduction by 2048.

It is important to note that, whatever the outcome of the UK consultation, the EU regulations will have an impact on the systems available to be specified and installed in the UK, and the effects can already be seen in the new products and refrigerants coming onto the market.



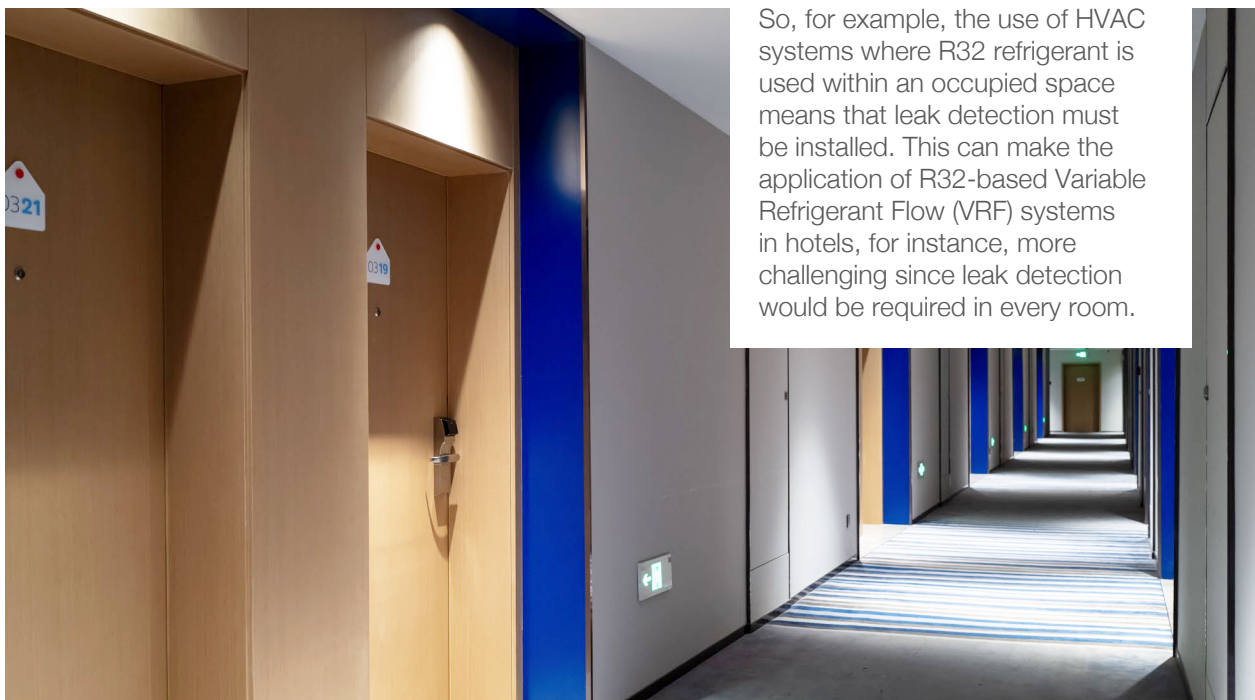
Refrigerant evolution - using lower GWP refrigerants

The F Gas Regulations have resulted in the adoption of lower-GWP refrigerants in HVAC systems. These deliver benefits such as lower environmental impact and a smaller embodied carbon footprint for HVAC systems. However, there are implications for the design, installation and operation of systems using some of these new-generation refrigerants.

For example, one of the most popular lower GWP refrigerants is R32, with a GWP of 675. It's a general characteristic that, as the GWP of a refrigerant reduces, its flammability rises, and R32 is designated as Safety Class (ISO 817) A2L or 'mildly flammable'. This indicates that the refrigerant is difficult to ignite, has a relatively low energy release and a low flame spread.

Even though the risk is low, safety requirements are in place. All refrigerant-using projects must have a DSEAR (Dangerous Substances and Explosive Atmosphere Regulations) risk assessment carried out at an early stage by a qualified person. Where a refrigerant is designated A2L, leak detection in occupied spaces is required.

Leak detection requirements are set out in the Standard *BS EN378: Refrigerating systems and heat pumps*³. The Standard relates the size of an occupied space with the amount of refrigerant allowed within that space. This is dependent not only on the volume of the space, but also the type of refrigerant being used.



So, for example, the use of HVAC systems where R32 refrigerant is used within an occupied space means that leak detection must be installed. This can make the application of R32-based Variable Refrigerant Flow (VRF) systems in hotels, for instance, more challenging since leak detection would be required in every room.



The bigger picture for buildings - energy and carbon

HVAC systems are a vital part of the wider built environment, and their impact on energy use and carbon emissions means that careful consideration must be given to these issues when designing and installing.

The two key points to consider are energy efficiency and carbon emissions. Finding a balance between these two criteria is key for making the right choice of HVAC system for your project.

Energy efficiency

Energy efficiency is high on the agenda for building owners and their tenants. Energy Performance Certificates (EPCs) are a legal requirement and it is currently illegal to let a commercial property with an EPC lower than E. This applies to both new and existing leases.

These Minimum Energy Efficiency Standards (MEES)⁴ are set to change in the next few years. The UK government has proposed a raise in the minimum required EPC rating for commercial buildings from E to C and then to a B by 2030. The trajectory of change is one that could leave many commercial buildings such as offices and hotels as stranded assets if they cannot meet the new energy efficiency requirements.



The MEES requirements have already affected the commercial property market, making F and G ratings almost non-existent, as shown in **Table 2**. But future targets will have a significant impact on the building stock. Government statistics from April to June 2025 show that in England, 21% of non-domestic buildings hold a D or E rating, which indicates that a significant number of commercial buildings must improve their energy performance when the targets are raised.

Table 2 MEES Requirements

Rating	Percentage of non-domestic EPCs (Figures for England)
A+/A	9%
B	33%
C	35%
D	15%
E	6%
F	0.6%
G	0.8%

Source: Ministry of housing, Communities & Local Government April to June 2025

Property consultants Knight Frank⁵ highlighted this as a key concern for the office market, with 56% of leases on London offices rated EPC C or below due for renewal prior to 2030. The report points out that this equates to 33 million sq. ft of office space in the capital which represents around £2.5 billion in rental value.

Although building EPCs must achieve minimum targets whether leases are renewed or not, that can be a trigger point for building owners to put refurbishment plans in place. Energy efficiency is therefore high on the agenda for landlords looking to improve the EPC rating of their building. Since HVAC systems are such significant energy users, it often makes sense to include those in early refurbishment plans.

Another important reason that energy efficiency is a top priority for building owners is its impact on the whole life carbon of their properties.



The bigger picture for buildings - energy and carbon

Whole life carbon

Whole life carbon (WLC) is an increasingly important concept in the built environment. It refers to a building's carbon emissions from design all the way through construction, occupation and demolition. There are two categories of carbon: **operational** and **embodied**.

Operational carbon refers to direct and indirect emissions produced when the building is occupied and in-use. Direct operational emissions can include the use of on-site fossil fuels, for example in gas or oil boilers. Indirect emissions are the result of electricity use in the building, including by HVAC systems.

The UK Green Building Council's 's Net Zero Roadmap⁶ states that **71% of the UK's built environment emissions are created from the energy used to heat, cool and power buildings**. Operational carbon emissions are therefore linked to a building's overall energy efficiency, making the specification and operation of heating and cooling systems even more critical.



Embodied carbon includes the carbon impact of emissions arising from the manufacture, transportation and installation of materials and equipment used in a building. Emissions from maintenance, repair and replacement are also measured as 'embodied.' This category of carbon can be challenging to calculate, particularly in complex building services systems which are made up from so many components.

To assist with this process, many products now carry an EPD (Environmental Product Declaration)⁷ which is a third-party verification of the environmental impact of a product throughout its lifecycle, from raw material to disposal. Manufacturers like Mitsubishi Electric can provide EPDs for many of their products and are developing them for others, in order to help specifiers calculate WLC for systems.

However, EPDs may not always be available, so CIBSE has developed a tool which can be used to calculate embodied carbon in building services and HVAC systems (*TM65: Embodied carbon in building services a calculation methodology 2021*⁸).

This document highlights a key point about the carbon impact of HVAC. In new build projects, the embodied carbon of MEP (mechanical, electrical, plumbing) systems could account for 2% to 27% of embodied carbon, depending on the type of project.





The bigger picture for buildings - energy and carbon

The UK Net Zero Carbon Buildings Standard

The UK's Net Zero Carbon 2050 target is the key driver behind this focus on a building's whole life carbon. However, there is also a strong push from commercial building owners and tenants with their own corporate targets for carbon reduction, and this includes the buildings they own and occupy. Equally, the public sector is looking closely at WLC in its buildings to help achieve the national carbon reduction target.

Until recently, it was challenging to find a definition of what a 'net zero' whole life carbon building might look like, making it harder to plot a path to achieving that aim. To address this problem, in 2024 the UK Net Zero Carbon Building Standard (UK NZCBS) was introduced in a pilot scheme, and this is helping to provide clarity and transparency in this field.

The UK NZCBS was developed by leading organisations across the built environment, including CIBSE, RIBA, RICS, BRE, the UK Green Building Council and others including Mitsubishi Electric.

The Standard is voluntary and as of 2025 is in its pilot version. But the significant interest it has generated from built environment professionals demonstrates the growing interest in a unified definition of 'net zero carbon' buildings and clear pathway to achieving them in construction and operation. Buildings that meet the requirements of the UK NZCBS will be designated as Net Zero Carbon Aligned Buildings.



The UK NZCBS is understandably complex, but it has been designed to be applicable to a wide range of buildings. Its requirements fall into three categories: **Limits, Targets and Reporting Requirements:**

Limit/Target	Pass/fail metrics	Reporting requirements
Embodied carbon	Upfront carbon limits	<ul style="list-style-type: none"> ■ Life cycle embodied carbon ■ Upfront carbon with generic material specifications (i.e. the standard permits use of TM65 in the absence of Environmental Product Declarations (EPDs))
Operational energy	Energy Use Intensity (EUI) limits	<ul style="list-style-type: none"> ■ Annual operational carbon emissions intensity
On-site renewable electricity generation target	Annual on-site renewable electricity generation targets	<ul style="list-style-type: none"> ■ Total annual on-site renewable electricity generation ■ Annual on-site renewable electricity generation that is used on site ■ Annual on-site renewable electricity generation that is exported ■ On-site renewable electricity generation capacity
Operational water use	n/a	<ul style="list-style-type: none"> ■ Annual operational water use ■ Annual operational water carbon emissions
Fossil fuel free	Confirmation that no fossil fuel is used on site, except under allowed exemptions	n/a
Electricity demand management	n/a	<ul style="list-style-type: none"> ■ Date/time and electricity demand in certain percentiles of energy demand
District heating and cooling networks	Carbon content for heating/cooling supplied	<ul style="list-style-type: none"> ■ Energy used by the district energy scheme ■ Carbon emissions associated with heating/cooling supplied
Heating and cooling delivered to the building	<ul style="list-style-type: none"> ■ Annual space heating/cooling delivered to the building limit ■ Peak energy delivered for space heating/cooling limits 	
Refrigerants	<ul style="list-style-type: none"> ■ Annual carbon impact limit of refrigerant gases - Kyoto products only ■ GWP limit of refrigerants 	<ul style="list-style-type: none"> ■ Annual carbon impact of refrigerant gases - non-Kyoto products ■ Annual carbon impact of refrigerant
OPTIONAL: Carbon offsetting		

The table shows several requirements which impact the specification and design of HVAC systems through the lens of whole life carbon. Not least is the GWP limit on refrigerants which is a pass/fail metric for the UK NZCBS.

In addition, the requirement that no fossil fuels are used on-site is key for decisions around electrification and removal of gas boilers, for example. The Standard also measures the peak energy delivered for heating and cooling in the building, which is another incentive to focus on energy efficiency.

It is expected that the first official version of the UK NZCBS will be launched in Winter 2025/26.



The bigger picture for buildings - energy and carbon

Finding the balance between energy efficiency and carbon emissions

The challenge for HVAC system specifiers who are trying to balance considerations of energy efficiency and embodied carbon were illustrated in a 2022 study in the CIBSE Journal⁹.

In their report, engineers from consultant Hoare Lea examined the potential impacts on whole life carbon (over a sixty year period) of selecting one of three heating and cooling systems for a project: R410A VRF, R32 Hybrid VRF (HVRF) and an R32 air source heat pump.

While the VRF system demonstrated the best operational energy efficiency when only energy consumption was considered, the key finding was that the refrigerant leakage and the higher Global Warming Potential of the R410A refrigerant used in the VRF system significantly increased its WLC, making it the worst performer over the sixty years.

Conversely, the ASHP system had the lowest WLC overall, with the HVRF system a close second, and the authors conclude that minimising refrigerant volume, specifying low-GWP refrigerants, and reducing leakage rates are crucial for lowering carbon emissions in heating and cooling systems.

This study also highlights the importance of refrigerant choice in HVAC systems. Using lower-GWP refrigerants where possible can make significant difference to the carbon footprint. For example, a system using a lower GWP refrigerant such as R32 could have **50% less embodied carbon** compared to an identical system using a higher GWP refrigerant such as R410A.



Hybrid VRF: Balancing the challenge of HVAC system design

With energy efficiency and embodied carbon to consider, finding a modern solution that balances these criteria while delivering good indoor environments for building occupants is a challenge.

Hybrid VRF (HVRF) is a modern approach that has been specifically designed to overcome these issues, while delivering robust performance and a flexible system that lends itself to retrofitting as well as new-build across a variety of sectors, from offices to hotels.

The principles of HVRF are based on the familiar VRF which is already one of the most widely-used approaches to heating and cooling indoor spaces. It also uses a smaller amount (compared to traditional VRF) of lower-GWP refrigerant, while harnessing heat pump technology to give it a smaller embodied carbon footprint and excellent energy performance.



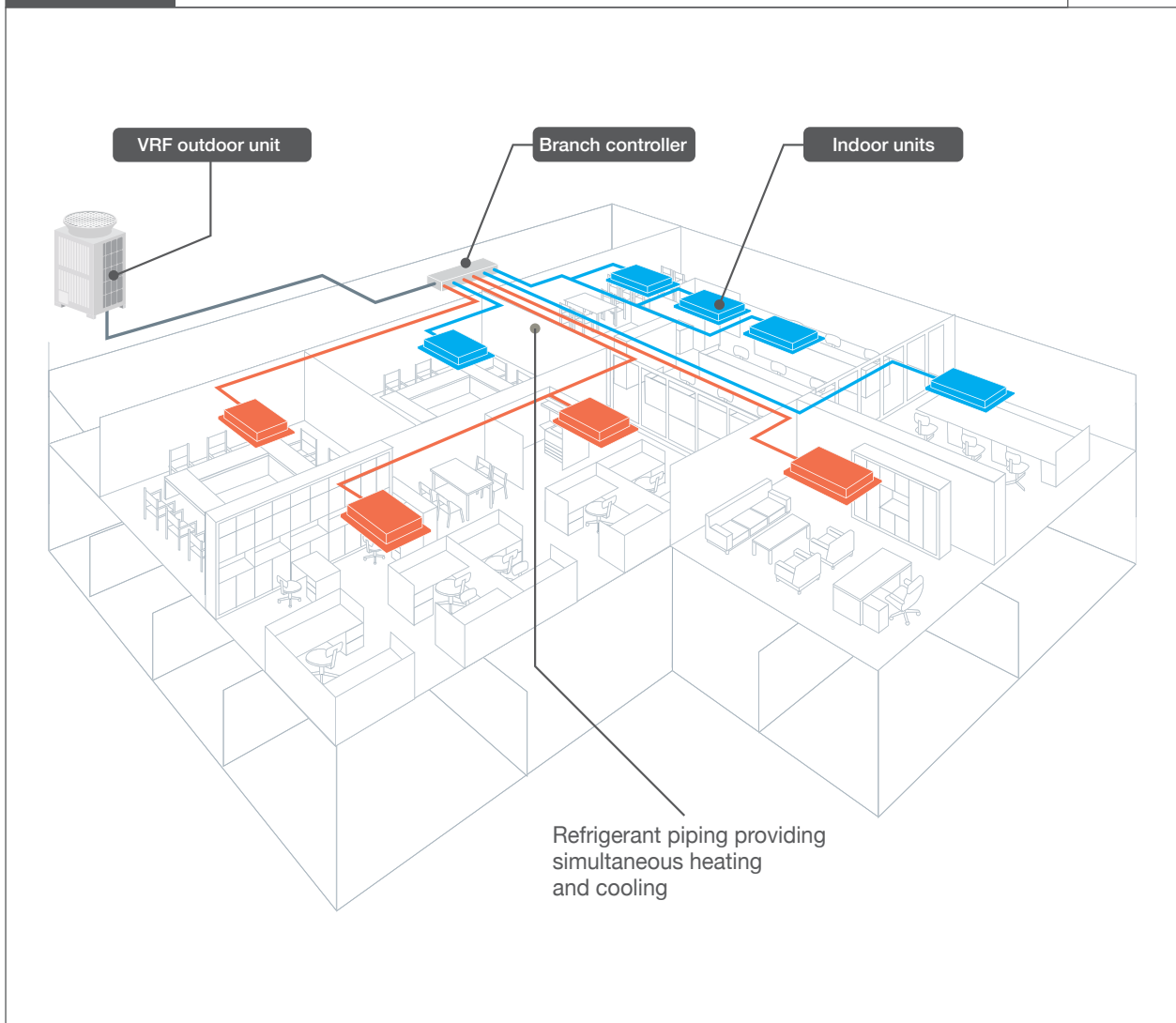


Hybrid VRF: Balancing the challenge of HVAC system design

How does HVRF work?

The traditional VRF system (shown in **Diagram 1**) works by recycling refrigerant from an outdoor unit to indoor air handlers where hot or cold air is distributed. One of the main benefits of VRF is that it can deliver simultaneous heating and cooling in different spaces around the building. This enables heat recovery from one area into another, optimising system efficiencies.

Diagram 1 A traditional VRF system delivering simultaneous heating and cooling.



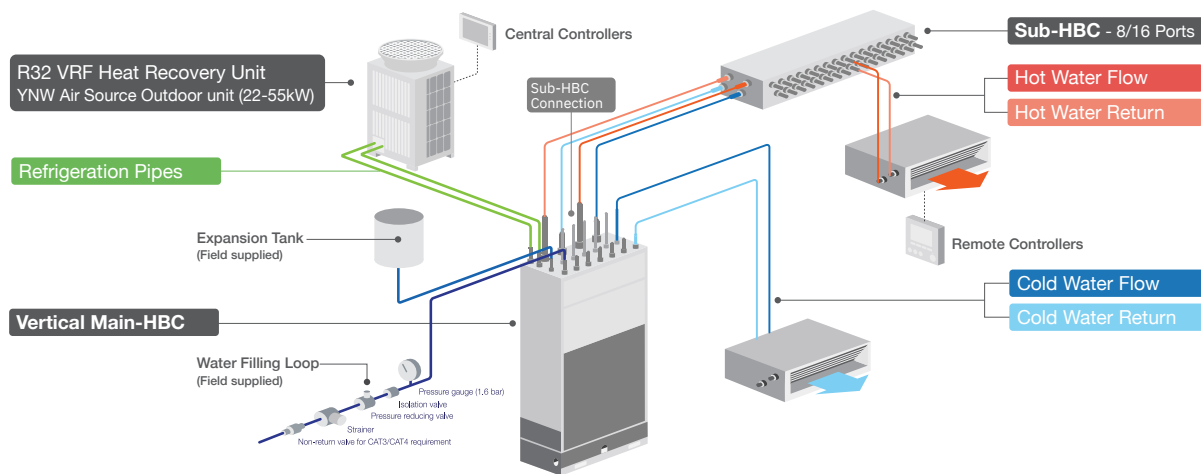
Hybrid VRF follows these principles, but with some important differences, shown in **Diagram 2**.

R32 | HybridVRF

Diagram 2

The Main Hybrid Branch Controller (HBC) (which can be a standard horizontal version, or vertical as shown) is at the heart of the Hybrid VRF system allowing it to deliver simultaneous heating and cooling with no refrigerant in occupied spaces.

Vertical Main-HBC layout



At the heart of the system is a Hybrid Branch Controller (HBC). This box is connected to an outdoor unit via traditional refrigerant piping.

The HBC acts as a gatekeeper. It allows refrigerant to enter from the outdoor unit and ensures that only water exits to service the indoor units in occupied spaces.

The HBC also houses a plate heat exchanger which receives a mixture of liquid and hot gaseous refrigerant from the outdoor unit. This mixture passes through the plate heat exchanger and heats the water by condensing the gaseous refrigerant. Liquid refrigerant then passes to a second plate heat exchanger to provide cooling.



Hybrid VRF: Balancing the challenge of HVAC system design

In this way, the outdoor unit contains all the refrigerant in the system, while passing heating and cooling energy via the HBC into the occupied spaces via a water-based system.

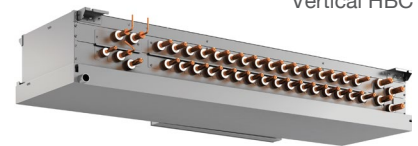
To help with easier installation, the Hybrid Branch Controller can be horizontal or vertical, and available as 6, 8 or 16 port models (6 port is exclusive to the Vertical HBC).

Each port consists of a pair of flow and return connections to fan coil units. Each circuit can independently deliver heated or chilled water via an arrangement of 3-port valves to connect to one of the plate heat exchangers. The HBC includes a speed-controlled pump to do this, and a valve on each circuit controls flow rate.

Between the HBC and indoor fan coils, the system uses barrier plastic pipe or copper water piping but still offers high sensible cooling and stable room temperatures for maximum comfort. An overall system can be expanded using additional horizontal sub-HBC's, allowing up to 50 indoor units to be supplied by one heat recovery outdoor unit.



Mitsubishi Electric
Vertical HBC



Mitsubishi Electric Horizontal HBC



HVRF: benefits for today's building challenges

HVRF is a system that builds on the excellent performance of VRF systems, with features that also meet the requirements of low-carbon, energy efficient new buildings and retrofit projects.

HVRF uses R32 refrigerant, providing lower-GWP credentials. Furthermore, the HVRF system uses less refrigerant overall, significantly reducing system embodied carbon. With 40% less refrigerant in the system and an 87% reduction in CO₂ equivalent, when compared to an R410A VRF system, this has the combined effect of **lowering embodied carbon by 70%**.



The hybrid approach also avoids the requirement for leak detection in occupied spaces since all refrigerant is outside the building. This is a significant installation cost and time saving, particularly in projects such as hotels where leak detection would otherwise be required in every room.

Most importantly, HVRF lends itself to refurbishment projects and to buildings where future expansion or changing layouts are increasingly likely. Water-based indoor connections make expansion of the system straightforward, allowing for phased introduction (e.g. floor-by-floor HVAC refurbishment) or alteration of floor layouts for changing tenant needs.

Load capacity control is achieved with inverter driven pumps and flow control valves which are built into the Hybrid Branch Controller. Heat exchange and inverter technologies mean that HVRF is a highly energy efficient system.



The retrofit advantage

A growing proportion of commercial building owners are undertaking retrofits and many of these are focused on meeting legislative requirements for buildings around energy use and carbon emissions.

Unless landlords can keep pace with changes, they risk seeing their assets lose value. In the case of changing refrigerant regulation, HVAC systems can also become more expensive to maintain as refrigerants are phased down, with prices rising for those who have not updated to lower-GWP options.

Because HVAC systems impact on both the whole life carbon and energy efficiency of a building, they can make an excellent point of focus for retrofitting either as part of a wider building upgrade or as a standalone project.

The decision on how to approach retrofitting can be influenced by the main objective of the upgrade, but retrofitting does not have to be complex or time-consuming to achieve significant energy and carbon savings.





For example, the UK Green Building Council's report on Retrofitting Office Buildings¹⁰ says that it is possible to achieve a **26% reduction in energy use intensity (EUI)** through optimisation alone. EUI measures energy use per square metre (kWh/m²/yr). Optimisation covers two main steps: Reducing tenant loads and upgrading the BMS (building management system).

If optimisation is combined with what the UKGBC terms a 'light retrofit,' then EUI savings reach 37%. Light retrofit refers to the basic remodelling, replacement or adaptation of existing building elements. However, where optimisation and a deep retrofit are combined, EUI reductions from baseline can reach 60% to 65%.

These definitions can vary, depending on how they are approached. For example, upgrading a building heating and cooling system could be categorised as a 'deep' retrofit. However, this could be carried out in a phased approach of several 'light' retrofits.

HVRF lends itself to this stepped approach since the system uses water to transport heating and cooling and is therefore easier to extend. An overall system can also be expanded by using additional 'sub-HBCs,' which allows up to fifty indoor units to be supplied by one heat recovery unit. What's more, since all R32 refrigerant is retained outside occupied spaces, there is no need for the cost or time considerations of installing leak detection.



Monitoring, controls and performance

As the UKGBC highlights, optimising system performance and the use of controls can make significant contributions to long-term energy efficiency.

Today's control technologies can help facilities teams ensure that HVAC systems perform as they are designed and help to spot potential problems before they become breakdowns.



The ability to integrate systems wirelessly and connect to the internet means that it's possible to continuously monitor an HVRF system to support energy efficiency. Remote monitoring allows facilities teams or energy managers to understand building energy use and measure this against other factors such as occupation patterns.

Advances in remote monitoring also allow facilities managers to track equipment performance, pinpoint potential issues, and schedule maintenance tasks from a centralised platform. This approach also allows for data collection, which provides insights for building managers, allowing them to track energy performance.

Data can support faster decision making, as well as helping to meet the data collection requirements of voluntary certifications such as the UK Net Zero Carbon Building Standard. Having that information also means that investments in energy-saving equipment can be tracked to show financial returns in terms of costs, and operational carbon emissions, saved.

One example of this is Mitsubishi Electric's MELCloud Commercial which is a connected system for air conditioning and ventilation systems. It not only provides robust data tracking and system monitoring but also presents live data to users wherever they are. This is particularly useful for large estates, showing the status of each building in a portfolio.

Leveraging IT, connectivity and data analysis in this way can provide major benefits as designers and building operators navigate an increasing number of performance factors for buildings.

Having data readily available and presented in a useable format can keep a building on track to meet a range of targets, and allow us to potentially reduce the performance gap between the theoretical project and the real-life project.





Hybrid VRF - long-term energy and carbon savings in buildings

In 2025, Mitsubishi Electric marked ten years of its unique HVRF system in the UK.

Here, we look back at two examples where buildings have benefitted from HVRF for a decade.



Case Study 1

Strand Palace Hotel - a decade of HVRF

Ten years ago, London's Strand Palace Hotel selected Mitsubishi Electric's HVRF when it decided to add air conditioning to the building for the first time.





Built in 1909, the hotel provided designers and installers with a few challenges. These included the need to keep the hotel operational as the HVRF was added. This meant work could only proceed on one or two floors at a time.

A primary driver for choosing the HVRF system was the cost-saving element. By removing the need for leak detection, the hotel saved on both the initial installation cost and the ongoing maintenance costs associated with those systems.

In addition, HVRF uses Multi-Layer Composite Pipes (MLCP) with crimped connections. This eliminates the need for hot works, such as brazing copper pipes. This made the installation process quicker. The installation team worked around the challenge of having no existing risers by placing the system's HBC boxes in existing laundry cupboards, allowing them to commission half a floor at a time.

A significant benefit is the system's ability to recover and share heat across the building's four different aspects. It can move heat from sunny parts of the hotel to cooler parts, an efficiency that is not possible with a traditional four-pipe fan system.

In the long-term, the use of water pipes allows the hotel's own engineers to work on the system, reducing the reliance on specialist contractors for servicing. The system has proved to be a successful and effective solution, leading to a strong recommendation for its use in other hotels in the group.



Hybrid VRF - long-term energy and carbon savings in buildings

Case Study 2 Aspect Court HVRF - ten years on

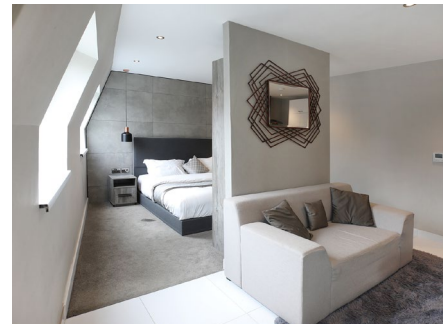
Aspect Court in Leeds is a former office building that was converted into 49 apartments about ten years ago. The HVRF installation was undertaken by AB Air Conditioning, and it was one of the first projects of this kind in the UK.



The HVRF system, which had only recently been released in the UK at the time, was considered the ideal solution to meet these needs. The HVRF system also offered the design flexibility of a VRF system combined with the comfort of a chilled water unit, and it could provide simultaneous heating and cooling across the apartments.

During the installation, one challenge was finding space for the HBC box. To maximise space within the apartments, the box was placed above the ceiling in the corridor. This solution successfully accommodated the box, its extra ancillaries, and the required service access, leading to a smooth commissioning process.

A decade after installation, the system has experienced very few problems and has required nothing more than annual maintenance. It continues to operate efficiently and smoothly and has received positive feedback from both the client and the tenants from the beginning.





The future of Hybrid VRF

The benefits of HVRF make it an increasingly important choice for designers, installers and building owners. Its use of lower-GWP refrigerant, and less overall volume of refrigerant, make it an invaluable solution for users looking to future-proof their buildings against changing regulations.

It is a system that can be applied in a range of sectors from offices to hotels, student accommodation and apartment buildings. Where refurbishment is being planned, the ability to introduce HVRF in a phased manner provide an affordable and less disruptive approach to updating heating and cooling systems – replacing those with higher-GWP refrigerants or helping to decarbonise heating in older buildings.

By combining the well-known performance of VRF with heat pump technology, HVRF provides a bridge between the two technologies that is unique in the HVAC sector. You can install and design the system as HVRF in the same way as other VRF systems, whilst enjoying the comfort levels normally associated with a heat pump system.

Mitsubishi Electric remains committed to developing its range of products to help designers and installers deliver systems that meet regulatory and client requirements. By staying ahead of environmental drivers, regulatory updates and client needs Mitsubishi Electric will continue to provide solutions that can answer tomorrow's challenges today.



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To receive a CPD seminar on 'Hybrid Technologies for Lower-Carbon Buildings', you can call your Mitsubishi Electric Regional Sales Office to arrange an in-house presentation of this information.

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Note: The fuse rating is for guidance only and 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 equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R515B (GWP:292), R454C (GWP:148), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a hydrocarbon, R290 (GWP:0.02). **These GWP values are based on IPCC 6th edition.

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