MITSUBISHI ELECTRIC

Ventilation

Leading the way in energy efficient ventilation systems

Mitsubishi Electric is the name for indoor air quality

Mitsubishi Electric was founded in 1921 and brings over 100 years of innovation and experience to the building services industry as a global market-leading environmental technologies manufacturer.

Mitsubishi Electric Living Environment Systems provides pioneering solutions that heat, cool, ventilate and control our buildings. We have been innovating advanced **ventilation technology** for over fifty years.

The inspiration for our revolutionary **Lossnay** range came in 1968 when one of Mitsubishi Electric's engineers watched his young daughter playing.

She had taken a leaflet out of a newspaper and rolled it into a cylinder. She held the opening at the top up to her mouth and breathed into the hollow structure, making warm air. The engineer, watching, realised something significant: paper has heat-conducting properties. This simple observation sparked a new idea that would lead to the creation of a groundbreaking energy recovery ventilation system.

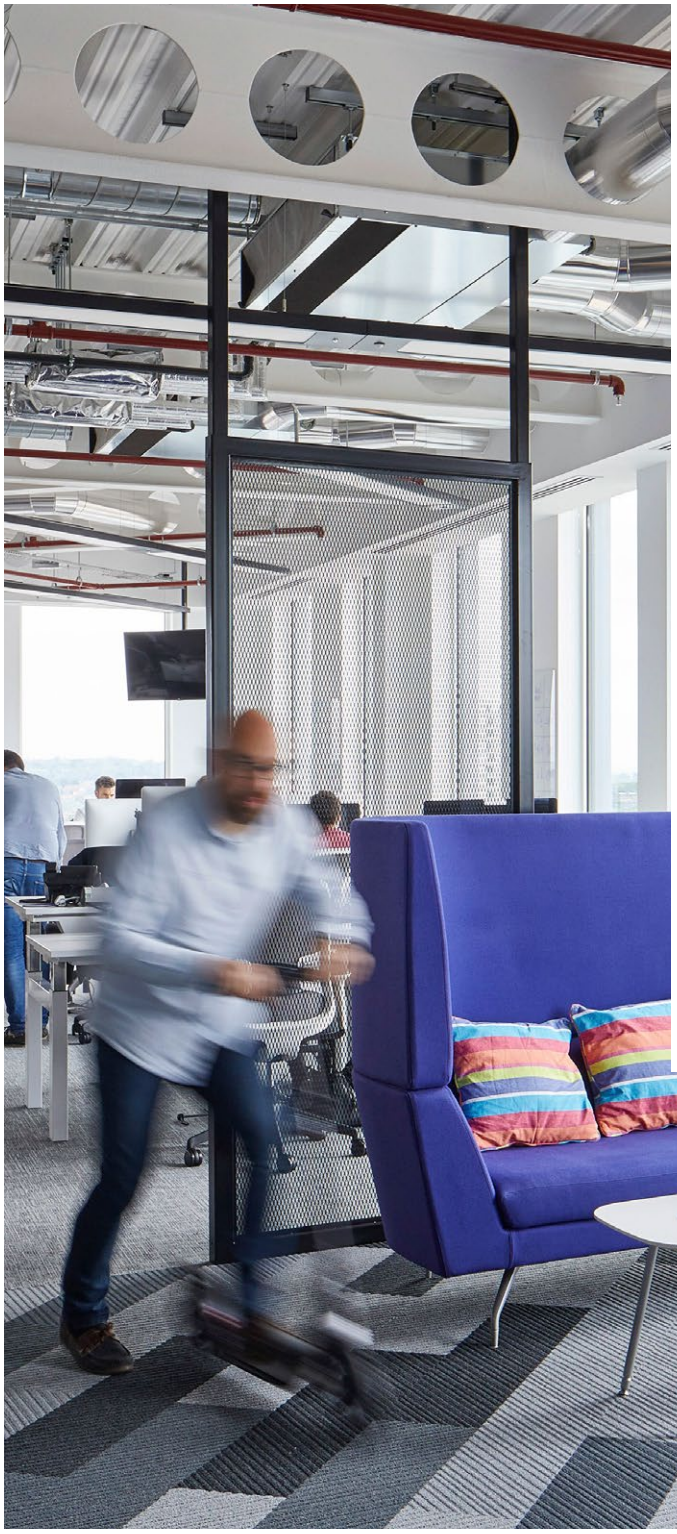
Since then, Lossnay has been developed and extended to include domestic and commercial ranges to help deliver energy efficient ventilation and improve Indoor Air Quality (IAQ) in many types of building.

Mitsubishi Electric has worked with organisations such as BESA (Building Engineering Services Association) to raise awareness of the importance of good indoor air quality for homes and other buildings.

We are also proud to have supported the award-winning **BESA Buildings as Safe Havens Campaign** with input from our technical experts.

Click here or scan the QR code to download **A Practical Guide to Buildings as Safe Havens**

Indoor air quality - the foundation of health and wellbeing



The UK government and World Health Organisation (WHO) recognise that the air we breathe significantly impacts our health. Poor indoor air quality is increasingly linked to long-term ill health and the transmission of cold and flu viruses.

Indoor air quality is an essential consideration at home or in the workplace.

Ventilation systems are vital for delivering and maintaining good indoor air quality. Ventilation removes stale air and airborne pollutants from a building by flushing them out from indoor spaces and replacing it with fresh air from outside.

The mechanics of ventilation are straightforward but there are some important considerations when specifying, designing and installing systems. The first stage of ventilation is to remove stale air from the building.

Then the air introduced into a building must be clean and free of pollutants. Outdoor air is rarely 'fresh' air. Mitsubishi Electric ventilation systems can provide ways to decontaminate incoming air with filters.

A third important step is to balance good IAQ with energy efficiency. Outdoor air can be too cold or hot. Therefore, it is essential to ensure occupant comfort while managing the energy needed to control the indoor temperature and humidity.

Mitsubishi Electric ventilation systems include highly efficient technologies, such as heat recovery, which can help to balance energy loss with the delivery of good IAQ.

Click here or scan the QR code to download our **Guide to indoor air quality**

Indoor air quality in the workplace

The growing body of research and increased public interest in the impact of air quality on occupant health are reflected in updates to UK legislation. For example, **Part F of the Building Regulations** (Volume 2) deals with ventilation in non-dwellings and in the 2021 update, several changes were introduced to boost IAQ in the workplace.

While the requirements for IAQ are addressed in Part F, designers must also meet the requirements of **Part L of the Building Regulations**, which focuses on energy efficiency in non-dwellings.

This means that the challenge of ventilation system design and installation is to balance the delivery of good IAQ with factors such as increased air tightness and reduced energy consumption in modern buildings.

Part F Ventilation (Volume 2) 2021: Buildings other than dwellings

- Requires a general supply rate of 10l/s per person in occupied spaces. Non-occupied spaces require 0.5l/s/m^2 of fresh air to be supplied (offices).
- Provides exposure limits and exposure times on indoor pollutants (Table B1), which include carbon monoxide, ozone and total volatile organic compounds (VOCs).
- Requires CO_2 monitoring of occupiable rooms, of a certain volume, in new non-dwellings, with continuous monitoring rather than 'snapshot' readings.
- Sets a maximum CO_2 concentration of 1500ppm over the occupied period. This is considered an indicator of poor ventilation, and Part F requires that action is taken to improve the situation if readings are consistently high.

For full details of Part F, **Click here** or scan the QR code to download the **Mitsubishi Electric Guide to the Building Regulations 2021**

Part L Conservation of Fuel and Power (Volume 2) 2021: Buildings other than dwellings

Part L focuses on achieving energy efficient operation of buildings, which also includes the energy performance of ventilation systems. Table 6.9 (page 51) details the maximum Specific Fan Power (SFP) in air distribution systems for new and existing buildings. The required SFP will depend on the type of air distribution equipment in use.

In addition, Part L specifies that mechanical ventilation systems must have the following:

- Separate control zones for areas of the building with different solar exposure, patterns of use and types of use
- Each control zone must allow occupants to control timing, temperature, ventilation rate and recirculation rate
- Central plant should operate only when the zone systems require it, with a default condition of 'Off'
- Ventilation systems that provide supply and extract ventilation should be fitted with a heat recovery system where technically feasible

Zone 1 **Zone 2** **Zone 3** **Zone 4** 'Off'

Indoor air quality in schools

Good indoor air quality in schools is vital.

In an article for the Times Education Supplement, leading UK ventilation expert Professor **Cath Noakes** of the University of Leeds and a member of the government's Scientific Advisory Group for Emergencies (SAGE) wrote about the impact that ventilation has in classrooms.

> "Ventilation doesn't just reduce the risk of illness. Studies have shown that it can also improve pupils' concentration, cognitive performance and productivity - in addition to reducing a range of respiratory symptoms.
>
> Schools with better-ventilated classrooms have even been shown to have higher test scores."

Building Bulletin 101 (BB101) 2018 provides the government's guidelines for ventilation, thermal comfort and IAQ in schools. BB101 guidelines state that mechanical ventilation systems in schools must adhere to a daily average of **1,000ppm (parts per million) of CO_2**. This level may rise to 1,500ppm but for no more than 20 minutes in a single day.

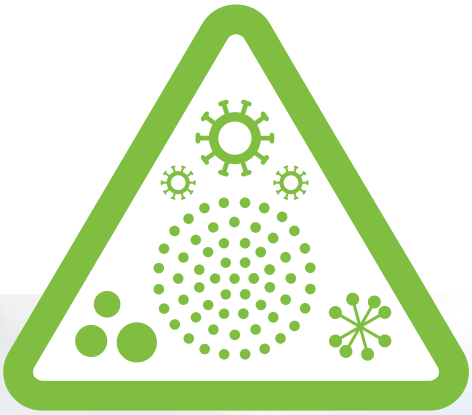
School ventilation must be balanced with other requirements for occupant comfort. For instance, noise is an important issue affecting ventilation system design and installation. Too much noise has been shown to directly impact children's learning ability as it can lead to distraction. Noisy environments can also hamper teacher communication.

Building Bulletin 93 (BB93) deals with the Acoustic Design of Schools and sets maximum permitted noise levels in classrooms in the UK. In a standard primary or secondary school classroom, **BB93 establishes an indoor ambient noise level of 35dB** when ventilation rates are 3l/s per person (8l/s per person with mechanical ventilation). There is also an allowance for the hottest 200 hours of the year, during which noise levels may increase by +5dB to allow faster-running fans.

Indoor air quality at home

At home, indoor air pollution can be 2 to 5 times higher than outdoors.

Many factors within homes can also contribute to poor indoor air quality, including humidity, fumes from cooking and heating, cleaning chemicals, dust and CO_2.



To create an environment that is healthy for both the property itself and its occupants, good ventilation is key to removing pollutants and introduce fresh clean air inside. Excess humidity is the cause of mould and can damage both the property and occupants. The World Health Organisation (WHO) highlights several sources of potentially hazardous indoor pollutants in its *2021 Global Air Quality Guidelines*.

WHO raises an essential point about indoor air quality at home: **Even low indoor pollution levels will impact health because of the amount of time we spend there**.

The UK government has updated several areas of legislation in recent years to reflect the importance of ventilation for good IAQ in homes. The most significant change was in 2021 with the introduction of a new Part F.

Indoor air quality at home

UK Building Regulations Parts F (Ventilation) and L (Conservation of Fuel and Power) were also updated in 2021, focusing on improving IAQ and occupant comfort while supporting energy efficiency in dwellings:

Part F (Volume 1) 2021: Dwellings

The updated regulations state that ventilation must minimise the entry of external pollutants. However, any means of ventilation applied in a dwelling must also:

- **Produce low levels of noise**
- **Offer easy access for maintenance**
- **Protect from cold draughts**

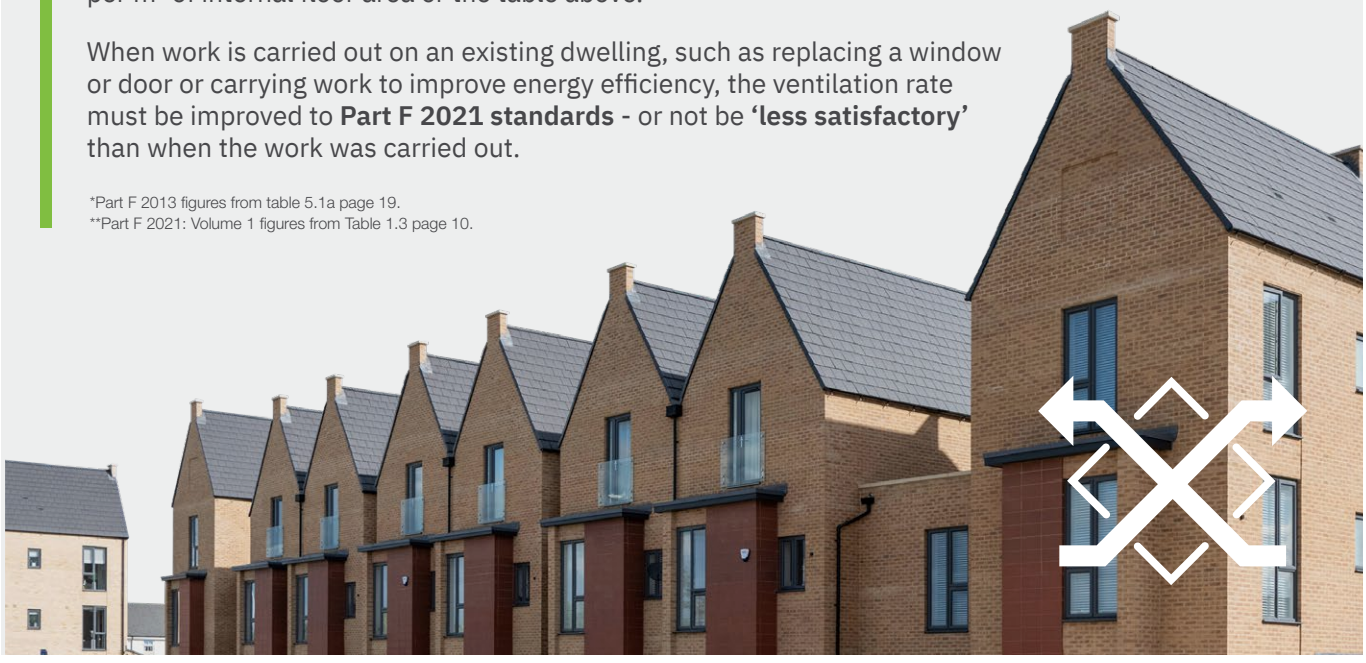
There are now higher minimum whole-dwelling background ventilation rates, depending on the number of bedrooms in a dwelling when using continuous mechanical ventilation:

Number of bedrooms	Part F 2013 - Litres per second l/s*	Part F 2021 - Litres per second l/s**
1	13	19
2	17	25
3	21	31
4	25	37
5	29	43

The minimum whole dwelling ventilation rate should be the higher of either 0.3 litres per second (l/s) per m^2 of internal floor area or the table above.

When work is carried out on an existing dwelling, such as replacing a window or door or carrying work to improve energy efficiency, the ventilation rate must be improved to **Part F 2021 standards** - or not be **'less satisfactory'** than when the work was carried out.

*Part F 2013 figures from table 5.1a page 19.
**Part F 2021: Volume 1 figures from Table 1.3 page 10.



Part L Conservation of Fuel and Power (Volume 1) 2021: Dwellings

The focus of Part L of the Building Regulations is to achieve energy efficient operation of dwellings. This touches on approaches to ventilation when considering the energy performance of mechanical ventilation systems. The main points are:

- **Ventilation systems should meet the needs of the dwelling in accordance with Part F. The system should also be designed so that it can be commissioned to suitable ventilation rates so that spaces are not significantly over-ventilated.**
- **The specific fan power (SFP) for mechanical ventilation systems should not exceed the following:**

For intermittent extract ventilation systems	0.5W/l/s
For continuous mechanical extract ventilation systems	0.7W/l/s
For continuous supply ventilation systems	0.5W/l/s
For continuous mechanical supply and extract ventilation systems	1.5W/l/s

All ventilation systems which provide both supply and extract ventilatic n within the same unit should be fitted with the following:

- **A heat recovery system with a minimum efficiency of 73%**
- **A summer bypass facility giving the ability to bypass the heat exchanger or to control its heat recovery performance**
- **A variable speed controller**

Part O: Overheating (2021 edition) Dwellings

Part O reflects the UK's changing climate and increased likelihood of heatwaves and sets out requirements to reduce excessively high indoor temperatures. This regulation requires buildings to be designed to limit unwanted solar gains in summer and to be fitted with 'adequate means of removing excess heat from the indoor environment.

The new Part O refers to the Chartered Institute of Building Services Engineers CIBSE Technical Manual 59 (Design methodology for the assessment of overheating risk in homes). In the case of mechanically ventilated dwellings, TM 59 recommends that all occupied rooms should not exceed an operative temperature of 26ºC for more than 3% of the annual occupied hours.

MVHR - the IAQ solution for today's buildings

Mitsubishi Electric's Lossnay range is centred around the principles of Mechanical Ventilation with Heat Recovery. MVHR is a highly energy efficient technology that delivers excellent indoor air quality. With quiet operation and excellent control for easy operation, Lossnay's MVHR approach is the ideal solution for today's ventilation needs in homes, offices and schools.

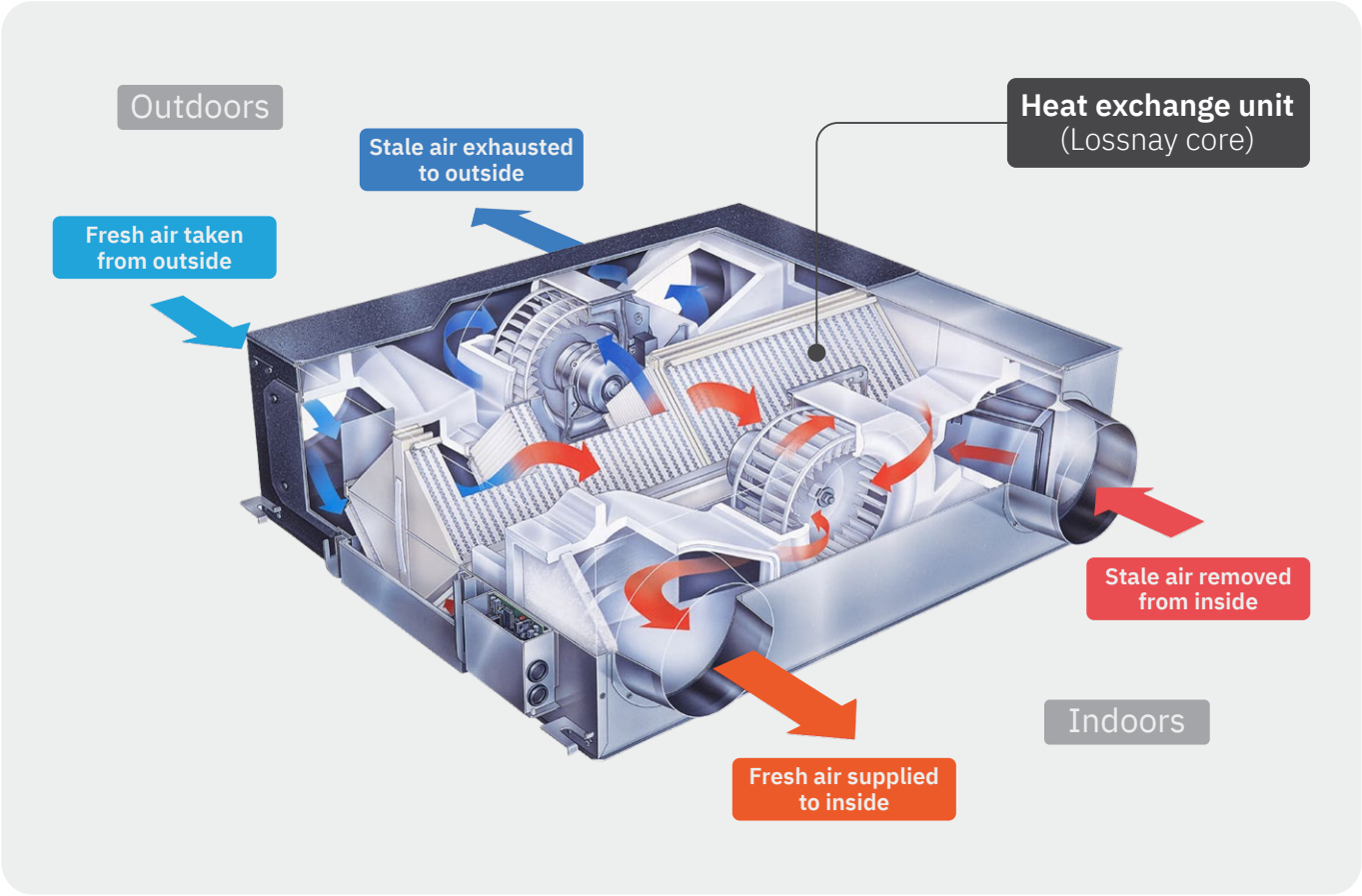
How does MVHR work?

Natural ventilation can be unreliable or sporadic - or even unavailable due to unopenable windows - as it relies on natural currents to remove, replace and supply the air. By contrast, mechanical ventilation uses fans to move the air to and from a space. The result is reliable and controllable airflow and effective ventilation to all spaces in a building.

With MVHR, there are two separate airflows. One extracts stale and polluted air from inside the building and expels it to the outside atmosphere, the second airflow introduces air from outside into the building, which can be filtered if required. In both instances Mitsubishi Electric's Lossnay system places a heat exchanger where these two airflows pass.

All MVHR systems have been designed to provide the best ventilation solution for the chosen application, by delivering the required amount of fresh air, whilst extracting the right amount of stale air, in the most energy efficient way possible.

Additionally, during summer nights, the night purge function of the Lossnay units allows cooler fresh air to be brought into the building via the bypass damper to reduce internal temperatures and cool the building fabric, therefore reducing the load on the air conditioning system the following day.



Heat exchange - technology at the heart of Lossnay

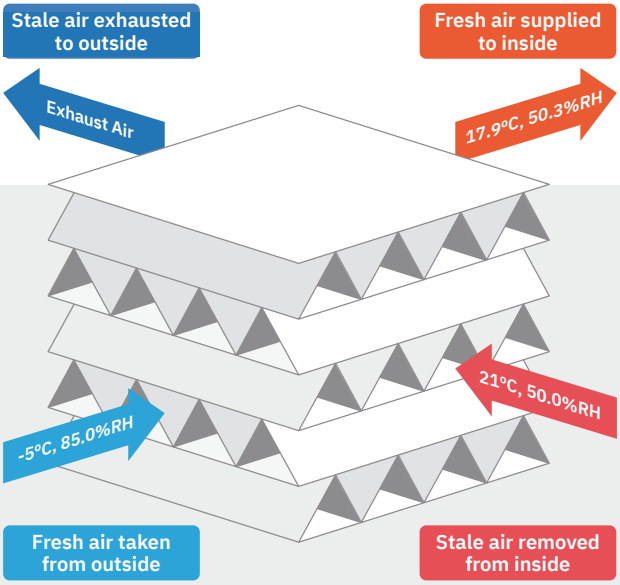
The heat exchanger is at the heart of Mitsubishi Electric's Lossnay range for residential and commercial buildings. It is the technology that transfers heat energy between incoming and outgoing air, which can be beneficial during all seasons. There are several heat exchanger options to suit the requirements of different applications.

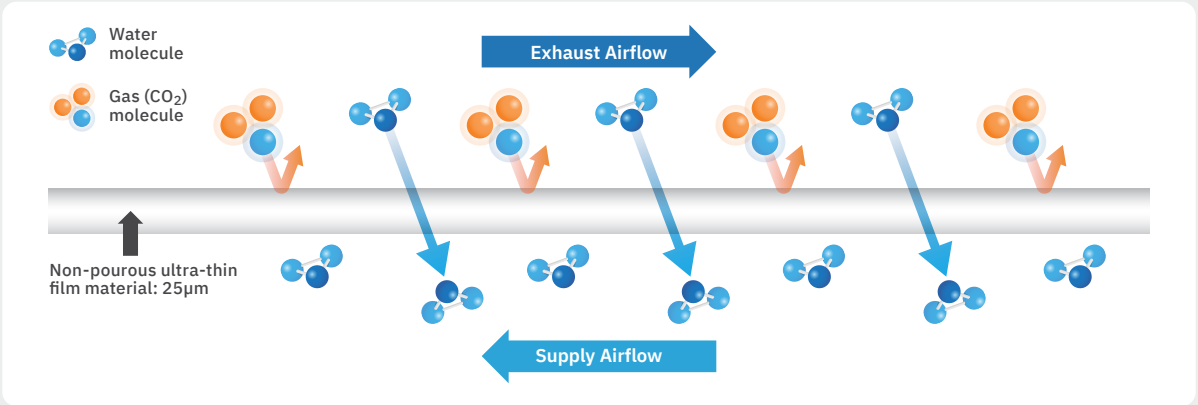
Mitsubishi Electric uses three types of plate heat exchanger and one thermal wheel: The plate heat exchangers are made of **paper**, **metal** and **plastic**.

1 Cross-flow heat exchanger - **Paper**

Developed and manufactured by Mitsubishi Electric, the Lossnay cross-flow heat exchanger is constructed from ultra-thin, treated paper that allows **the exchange of latent and sensible heat energy - enabling total heat exchange**.

In addition, since moisture holds **4.18 times as much energy as air**, the ability to transfer moisture through the paper core leads to much higher levels of heat exchange.

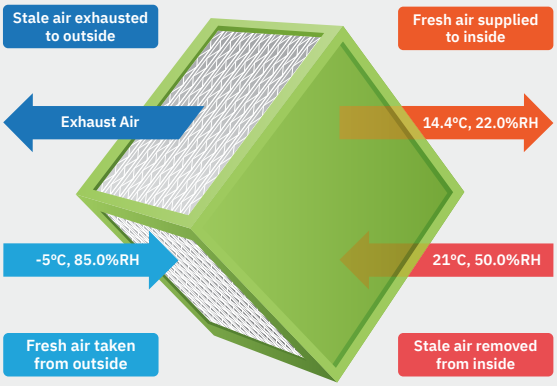




The paper cross-flow paper core is ideal for less humid extract areas such as offices,open-plan spaces and commercial buildings.

2 Cross-flow heat exchanger - **Metal**

Mitsubishi Electric utilises metal, cross-flow, plate heat exchangers that are constructed of aluminium, **to exchange sensible heat only between the incoming and outgoing air paths**. The robust construction of the metal heat exchanger makes them perfect for Air Handling Units (AHU's), which generally operate at higher air flows. Additionally, the use of aluminium ensures easy cleaning and low maintenance.

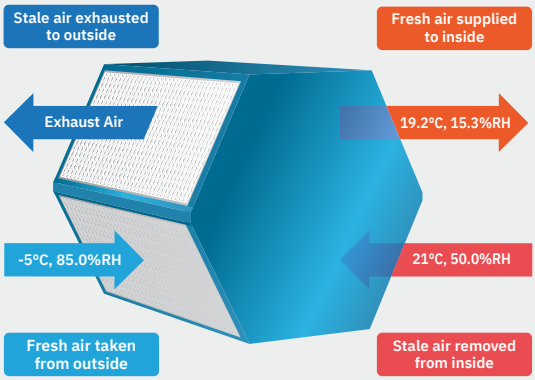


The metal core is an excellent solution for applications that require higher pressures, such as centralised AHU's supplying air to large areas of offices, shopping centres, theatres and other large, open spaces.

3 Counter flow heat exchanger - **Plastic**

Mitsubishi Electric uses a plastic, counter-flow heat exchanger that allows **only sensible heat to be exchanged**. Counter flow creates high-temperature efficiency, **up to 93%**.

The plastic heat exchanger is very lightweight, removable and maintainable.

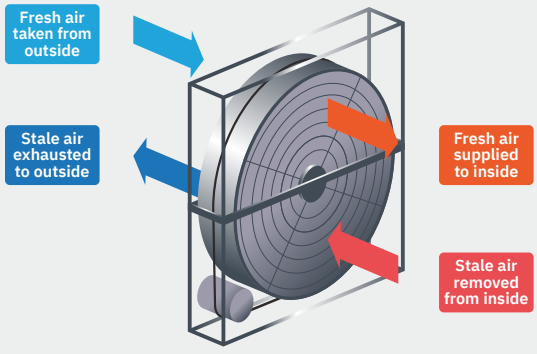


The plastic core is an excellent solution for high-humidity areas such as gyms, showers, and bathrooms. It is also ideal for residential MVHR ventilation systems as it can help to reduce the build-up of moisture that can lead to mould in kitchens and bathrooms.

4 Thermal wheel heat exchangers

Thermal wheel heat exchangers transfer heat as they rotate in the supply and exhaust air. The heat from the stale air removed from the building, transfers heat energy to the fresh air taken from outside. Made from alternatively flat and corrugated aluminium sheets, it is also available with a hygroscopic coating which absorbs water vapour - allowing both sensible and latent heat transfer, increasing the system's energy efficiency.

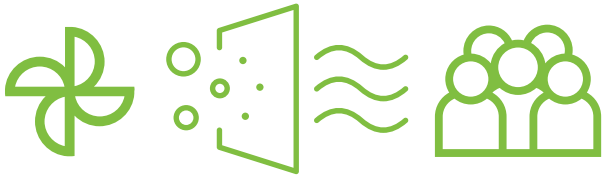
The smaller thermal wheel size means it is ideal for projects where installation space is restricted.



Air filtration for IAQ

Ventilation relies on the supply of outdoor air to indoor spaces, replacing exhausted stale air as it is removed from the building. Unfortunately, outdoor air is rarely ‘fresh’.

In cities, particulate matter (PM) or exhaust fumes can make their way into offices, schools and homes close to busy roads. Even in rural areas, chemicals such as fertilisers and pesticides can impact the IAQ in buildings.



To ensure that a ventilation system delivers healthy air, filtration is recommended, and Part F of the Building Regulations highlights the importance of using filters.

It is vital to understand how filters are categorised to select the right product for the project. ISO 16890 (Air filters for general ventilation) is the Standard used to test and classify filters.

ISO 16890 assesses filters across a range of PM sizes with an indication of their effectiveness (the percentage of particles the filter captures, shown in 5% increments). This approach provides detailed information for specifiers to select the right filter for their project.

Mitsubishi Electric can provide a range of filter options for its MVHR systems. Specifiers can select the type of filter and its position in the system - filtering the outdoor air, supply air or return air.

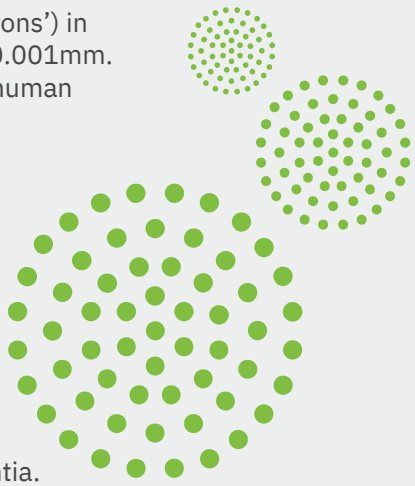
What's in the air?

Particulate Matter (PM) refers to particles in the air indoors and outdoors. The World Health Organisation identifies PM as a group of pollutants most damaging to health because they can penetrate the lungs deep into the bloodstream and organs. Particulates are categorised by size, which influences how they impact the human body.

PM10 refers to particles less than 10 micrometres (also called 'microns') in diameter. This measure is shown by the symbol µm and is equal to 0.001mm. This size of particle is referred to as 'coarse PM'. For comparison, a human hair is generally around 50 to 70 microns thick.

The smaller the particles of PM, the more harmful they are to humans because they are more easily transferred through our airways into other body parts. The size of fine particulate matter is **PM2.5** or below - increasing attention is now being focused on **PM1**.

This is particulate matter smaller than 1 micron. **PM1** is particularly harmful and includes some types of dust, bacteria and viruses. It can enter the bloodstream and cause damage to the body, even contributing to heart attacks, lung cancer and dementia.

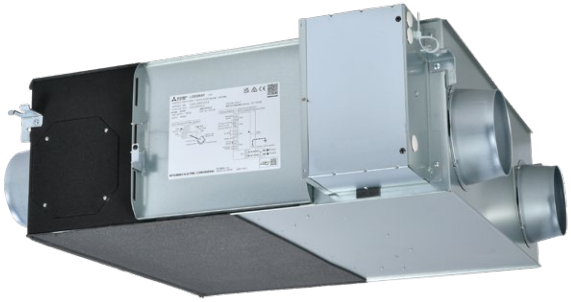


For more information on pollutants, PM and filtration, **Click here** or scan the QR code to download the **Mitsubishi Electric Beginner's Guide to Indoor Air Quality and Buildings As Safe Havens**

Ventilation solutions

Commercial Lossnay -
Ventilation in the workplace and schools

Mitsubishi Electric's Commercial Lossnay can be used virtually anywhere to deliver good indoor air quality with heat recovery to support energy efficient space heating or cooling.



Commercial Lossnay delivers several benefits for building occupants, including greater comfort and the prevention of dry eyes and throats. It can also help to lower the transmission of cold and flu infections.

The range has several options, including a paper or plastic core, to meet the needs of your project.

CO_2 monitoring for commercial buildings

CO_2 monitoring is required in non-residential buildings under Part F of the UK Building Regulations (2021). It is also required in schools.

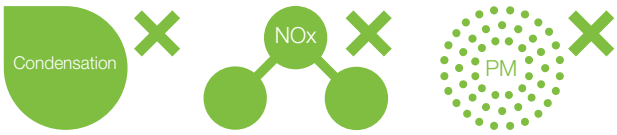
Mitsubishi Electric offers its own plug-and-play sensors for easy installation and commissioning. The Mitsubishi Electric CO_2 sensor can also help reduce installation costs by taking its power from the MVHR rather than needing a separate power supply. Seeing a simple traffic light system of CO_2 levels can offer greater assurance and awareness for building occupants and meet safety requirements - particularly for schools.

Residential Lossnay -
Ventilation for homes

Residential Lossnay MVHR is designed to extract stale air continuously, quietly and efficiently. While recovering heat energy, Lossnay also reduces condensation issues in homes. This means that the indoor environment is kept free of damp and air pollutants without the need to open windows. Even washing dries quicker.

The Lossnay MVHR also has bespoke filter pockets for ease of filter installation and maintenance, one is for a NOx (nitrogen oxide) filter and the other is for a particulate matter filter. Both pollutants are particularly harmful to people, so filtration means that buildings, even in the most polluted environments, can benefit from clean, healthy air.

A built-in automatic summer bypass allows the units to bring in outside air without recovering heat to reduce the risk of overheating. This provides the ideal solution for cooling down a home that may have overheated during the day once the outside temperature has dropped in the evening. The unit can automatically enter bypass mode using temperature sensors when it detects the space is hotter than desired and the outside air is cooler.



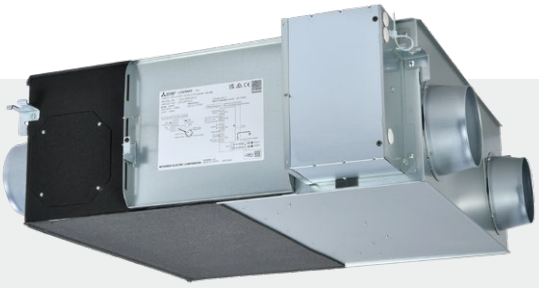
Low noise for comfort

Residential Lossnay MVHR operates continuously at ultra-low noise levels, so it is an ideal solution for homes and apartments where comfort is essential.

Commercial Lossnay -
Introducing the range

Mitsubishi Electric's Commercial Lossnay series offers exceptional ventilation for commercial applications including **schools, retail stores, offices, restaurants and hotels**.

RVX3



The Lossnay **LGH-RVX3-E** MVHR systems are designed to supply clean, fresh air into any building, whilst simultaneously extracting stale air, ensuring good indoor air quality. These units are also able to recover heat and latent energy from inside the building, maximising energy efficiency and reducing running costs.

Features & Benefits:

- **Lossnay paper core enables total heat exchange (sensible and latent) to achieve higher levels of heat recovery**
- **Flexible supply and exhaust fan commissioning in 5% increments, offering low running costs and easier compliance with Part L**
- **Optional CO_2 sensors allow automatic incremental fan control for a healthy indoor environment**
  Full airflow in bypass mode, promoting good indoor air quality during free cooling
- **Dual-Barrier coating on the fan prevents dust and grease accumulation, ensuring long-term efficient operation**
- **Lightweight structure ideal for easy ceiling installation**
- **Vertical installation available for flexibility of application**
- **Control compatibility with Mr Slim and City Multi air conditioning systems for a complete and highly effective system operation**

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RVXT

The Commercial Lossnay (LGH) MVHR systems are designed to supply clean, fresh air into commercial buildings, whilst simultaneously extracting stale air. The RVXT units offer a reduced height whilst maintaining a large airflow, allowing easy installation in ceiling voids.

Features & Benefits:

- **Mitsubishi Electric pioneered heat exchanger enables maximised latent heat exchange, resulting in cost and carbon savings**
- **Lightweight structure ideal for ceiling installation**
- **No condensate drain requirement**
- **Unit height of 500mm for ease of application**
- **Optional high efficiency filters available**
- **Compatible with Mr Slim and City Multi air conditioning systems for a complete and highly effective system operation**

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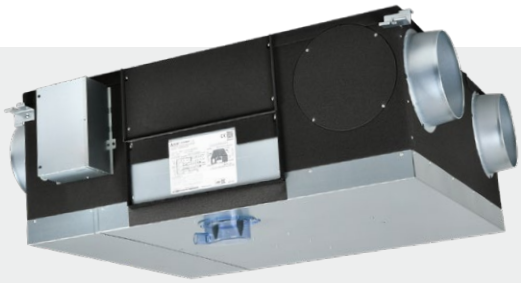
RVS



The **LGH-RVS-E** is designed to simultaneously extract stale air from a commercial building and supply fresh filtered air. Whilst doing this the Lossnay units also recover valuable heat energy for maximum efficiency.

Features & Benefits:

- **Plastic heat exchanger - perfect for higher humidity environments**
- **Optional plug and play CO_2 sensor control including power**
- **Digital commissioning of fan speed increments**
- **Easy control interlock with Mr Slim and City Multi air conditioning systems**
- **M-NET connection for centralised control**
- **Integrated bypass damper for free cooling**
- **In-built condensate drainage traps**

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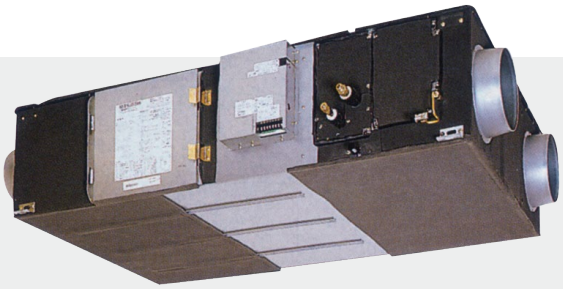
GUF



The **GUF-RD4** fresh air processing units combine a Lossnay MVHR unit with a DX coil connectable to a VRF system, to heat and cool the supply air delivered to the space.

Features & Benefits:

- **Smart combination of a Lossnay & City Multi indoor unit, integrated into one model**
- **Single unit saves on space and installation costs**
- **Uses heat recovery technology for maximum energy efficiency**
- **Heating / cooling with no recirculation of extracted air in the space**
- **Benefits from free cooling when ambient conditions allow**

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s-AIRME

The Mitsubishi Electric **s-AIRME-G07 HR-P C** Compact Air Handling Units (AHU's) utilise a frameless structure to achieve a line-up of units that are as compact as possible, maximising air tightness and improving thermal properties. The **s-AIRME-G07 HR-P C** range of AHU's utilises a combination of Mr Slim R32 Power Inverter heat pump technology, energy efficient plate heat exchanger heat recovery technology, and an integrated control system. This integration of technologies results in highly advanced, efficient systems that are easy to install and commission, making them ideal for offices, shopping centres, theatres and other large, open spaces.

Features & Benefits:

- **Mr Slim R32 Power Inverter heat pump technology enables energy efficient tempering of fresh air**
- **Plate heat exchanger for effective heat recovery**
- **Self-supporting, one-piece construction for maximum air tightness and minimal thermal bridging**
- **Constant volume EC plug fans for greater efficiency and cost savings**
- **Easy air flow commissioning with selectable target air volume control**
- **Fully integrated controls and single point power supply, regardless of accessories, for ease of installation**
- **Wide range of optional accessories, making these units a perfect solution for a variety of applications**

Plug and Play CO_2 Sensors

The Mitsubishi Electric **PZ-70CS(W)/(D)-E** CO_2 sensors have been designed to work with the LGH-RVX3 and LGH-RVS range of Lossnay units.

They allow the indoor air quality of a room to be kept safe and fresh by regularly measuring the CO_2 levels and adjusting airflows accordingly, ensuring that stale air is removed from the space and fresh air is introduced in an energy efficient manner.

Features & Benefits:

- **Plug and play solution for ease of installation**
- **Visual LED display for quick and easy indication of CO_2 levels in the space** (Only available with PZ-70CSW-E)
- **Automatic 16-step control offers seamless change across the fan range for consistent and effective ventilation, and improved indoor air quality**
- **Powered by the Lossnay unit therefore no requirement for additional power supply**
- **Digital commissioning of setpoints and thresholds for user-friendly, tailored control**

Click on the icons or Scan the QR codes to download Product Information Sheets

Residential Lossnay -
Introducing the range

Mitsubishi Electric Residential Lossnay heat recovery ventilation units remove stale air without significant heat loss. The range is ideal for, but not limited to modern homes that are well-insulated and airtight, providing excellent indoor air quality with outstanding energy efficiency.

VL-CPZVU

This compact MVHR unit achieves 90% thermal efficiency by optimising the heat exchanger position and maximising the volume. The units also offer a summer bypass to help reduce overheating in summer.

Features & Benefits:

- **Ultra-quiet noise levels ensure minimal disruption**
- **Optional filters placed within MVHR unit for particulate matter an NOx allow for improved indoor air quality**
- **Full summer bypass function with auto mode and settable temperature parameters enable customisable control**
- **Digital controller included for ease of commissioning and use**
- **Fan boost signal via live switch or volt free contact, with settable delay and overrun timers**
- **Cloud control enables remote monitoring and control**
- **Suitable for use in individual houses or in multi-residential apartment applications**

PI

VL-EU5

The **VL-100** wall mounted Lossnay supplies fresh air into a room, whilst simultaneously extracting stale air in an energy efficient manner. The recovery of both latent heat and sensible heat ensures a comfortable internal environment, minimising heat loss and saving both energy and costs.

Features & Benefits:

- **Effective fresh air ventilation for improved air quality**
- **Lossnay paper core enables total heat exchange (sensible and latent) to achieve higher levels of heat recovery, resulting in both cost and energy savings**
- **Simple and easy 2-pipe installation**
- **Optional extension pipe kit and joint available**

PI

Click on the icons or Scan the QR codes to download Product Information Sheets

Range Overview

Model		Orientation	Heat Exchanger Type (material)	Optional Filters	Supply Air Tempering
LGH-RVX3		Horizontal / Vertical	Total (Paper)	ePM1 75%	-
LGH-RVXT		Horizontal	Total (Paper)	ePM1 65% ePM10 75%	-
LGH-RVS		Horizontal	Sensible (Plastic)	ePM1 65% ePM10 80%	-
GUF		Horizontal/ Vertical	Total (Paper)	ePM1 75%	DX via City Multi
s-AIRME		Floor Standing	Sensible (Metal)	ePM1 80% ePM1 70% ePM10 75%	DX via Mr Slim
VL-CZPVU		Vertical	Sensible (Plastic)	NOx 90% ePM2.5 50%	-
VL-EU5		Wall Mounted	Total (Paper)	ePM10 70%	-

Air flow	m³/hr	100	150	250	350	500	650	800	1000	1500	2000	2500	3000	5000	7500	10000	12500	15000
	l/s	28	42	69	97	139	181	222	278	417	556	694	833	1389	2083	2778	3472	4167
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Control Solutions

Operating an air conditioning, ventilation or heating system without effective controls can be costly in more ways than one. Not only are you likely to face higher monthly energy bills, it will also lead to an increase in carbon emissions - something that will become ever more important as businesses strive to keep up with tougher environmental legislation.

The right controls take building performance to the next level. With them, building systems become more responsive, easier to automate, monitor and maintain, and less costly to operate in the long-term. The right controls can deliver a cost-effective solution that helps manage, monitor and report on the performance of all building services systems.

Control technology is now widely available for buildings of all sizes, so it is possible to access the benefits whatever the scale or scope of your project.

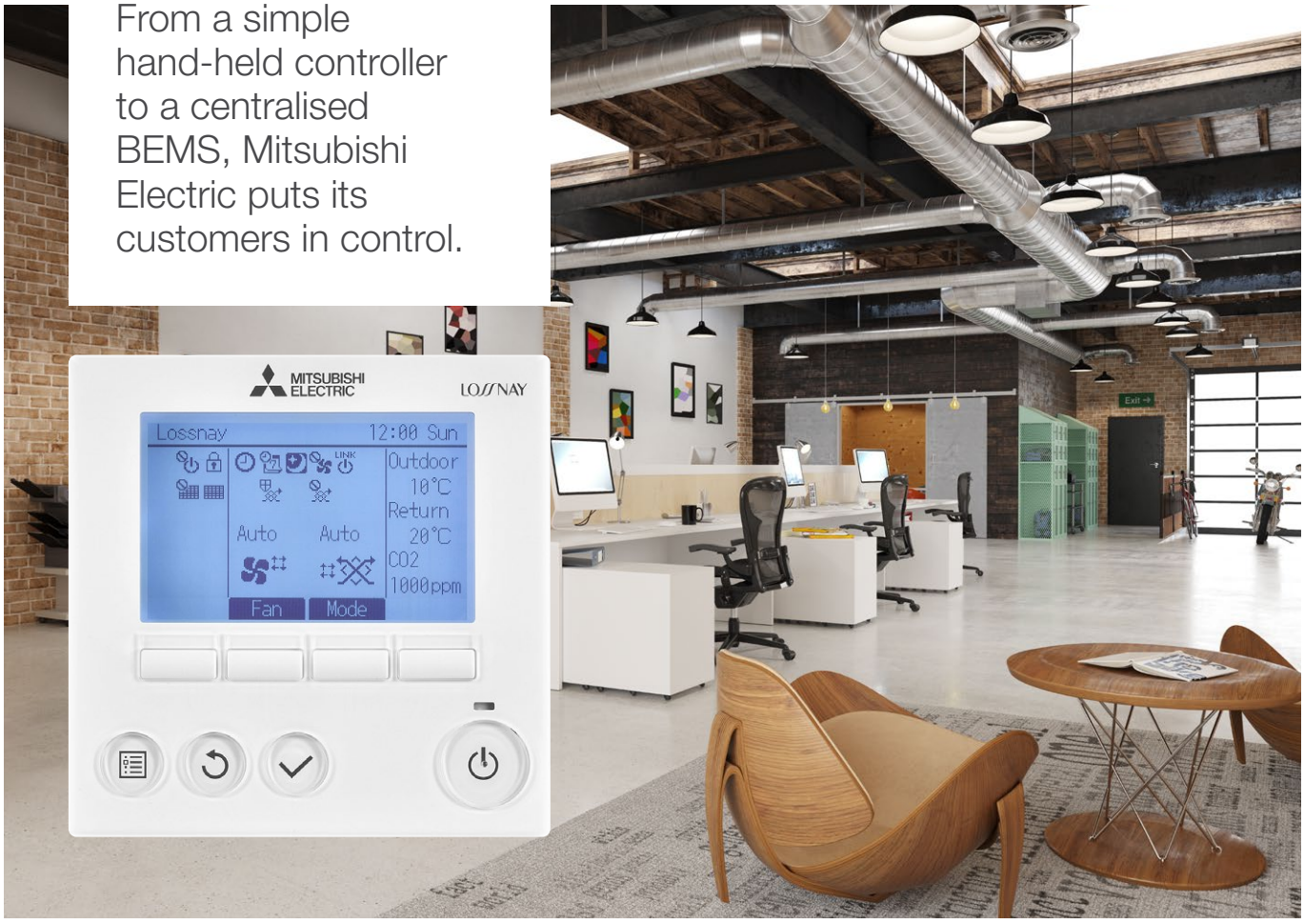
Mitsubishi Electric technology

Mitsubishi Electric has been dedicated to producing energy efficient technology for over one hundred years. Controls are an essential part of that.

Mitsubishi Electric has long heritage in factory automation where the company leads the field in providing controls that enhance productivity, efficiency and energy use.

We have taken this extensive knowledge and experience and transferred it to the heart of our building services equipment. We were also one of the first manufactures to provide an open gateway to our products to make integration easier for our customers. This enables direct connection of equipment into many common building energy management system (BEMS) platforms. Recently, Mitsubishi Electric has developed internet-based building controls that put information on building performance wherever users need it most and wireless technology that makes retro-fitting into existing buildings so much easier.

From a simple hand-held controller to a centralised BEMS, Mitsubishi Electric puts its customers in control.



Service and Maintenance

Mitsubishi Electric ventilation and heat recovery equipment is designed to deliver efficient, robust and trouble-free operation for years. However, regular servicing and maintenance are vital to ensure that a system provides optimised performance.

Our dedicated Commercial Service and Maintenance team can provide support using the latest technology for in-field reporting and diagnostics. They offer comprehensive technical support and bespoke maintenance packages throughout the entire lifecycle of your systems and equipment.

- **Optimise efficiency**
- **Reduce running costs**
- **Minimise the risk of downtime and maximise uptime**
- **Avoid wasteful energy consumption**
- **Address your carbon footprint**

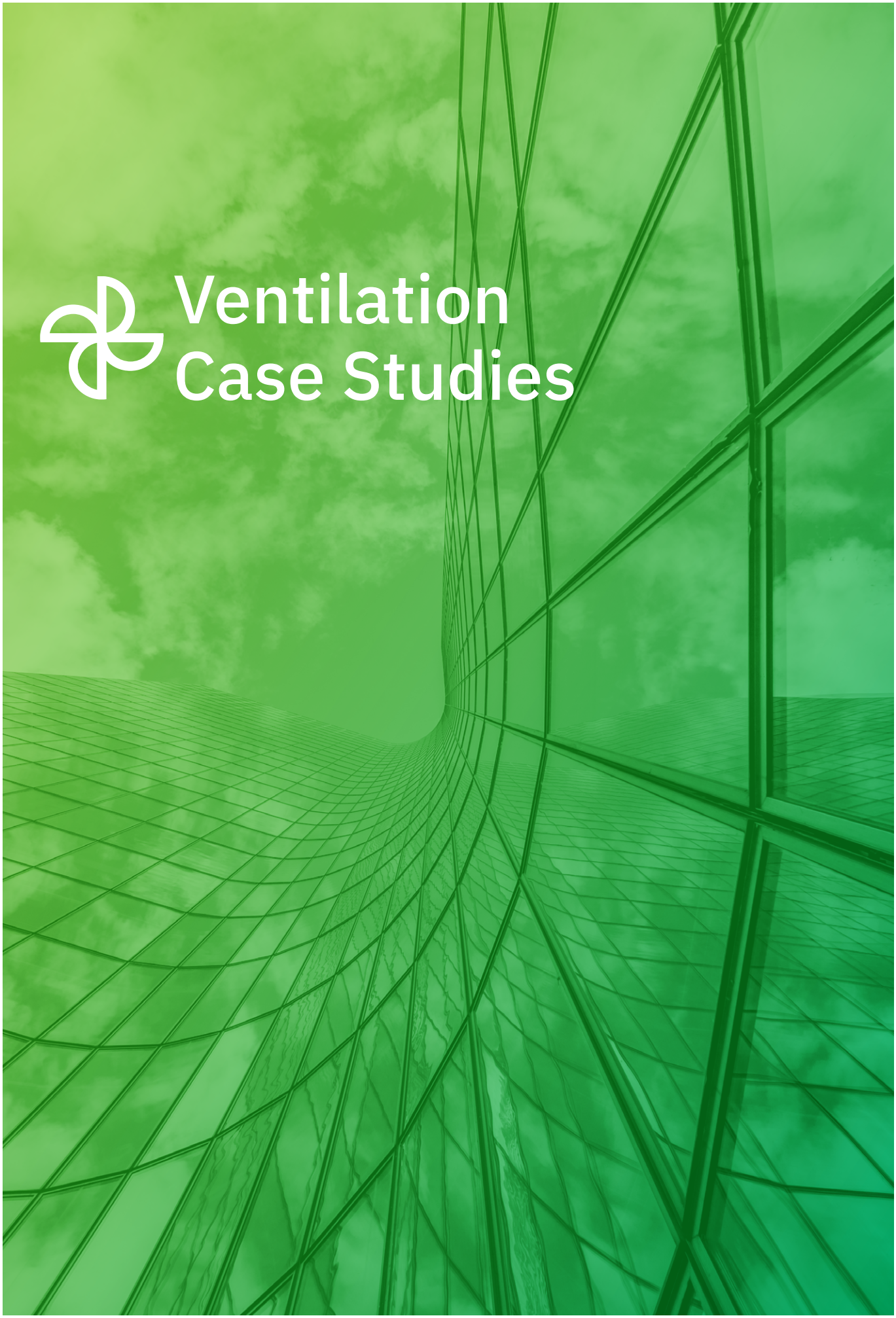
References

1. **Professor Cath Noakes on school ventilation**

Click here or scan the QR code to view

2. **BB93: Acoustic design of schools - Performance standards**

Click here or scan the QR code to view


Ventilation
Case Studies

Soho apartments offer a fresh approach to city living

Work is almost complete on the Galliard Homes development called TCRW SOHO, which sits above the new Tottenham Court Road station in London's busy Oxford Street. The station has been created for the new Elizabeth Line Crossrail network and the two blocks of apartments above, contain 92 luxury apartments, with prices starting at £1.2m.

Located in the heart of London's sought-after West End district, TCRW SOHO is made up of two main buildings which, together, present an exquisite choice of 81 studio, one, two and three apartments and 11 one, two and three bedroom penthouses.

The magnificent new scheme in London's Soho is designed to redefine luxury living in Central London and is inspired by hotel-style living. TCRW SOHO will treat its residents to a life of luxury, with each block having its own entrance and hotel-style reception foyer. Residents are also presented with an exceptional concierge service by elite residential management providers, Rhodium.

These prestige apartments in such a highly sought-after location have been designed and built by Galliard Homes to the highest standards.

The majority of apartments have their own private balcony, winter garden or terrace and, in addition to sophisticated interior design by Nicola Fontanella of Argent Design, each apartment offers a refined specification using state-of-the-art kitchen and bathrooms and a bespoke entertainment unit - fully-equipped with an OLED Smart TV.

To ensure the highest levels of comfort, each apartment also includes the latest in energy efficient, fresh air ventilation with the award-winning Residential Lossnay Mechanical Ventilation with Heat Recovery (MVHR) unit from Mitsubishi Electric.

Every home in the prestigious development has either the Lossnay VL-250 CZPVU L/R-E or VL-500 CZPVU L/R-E unit which can recover up to 92% of the heat energy from outgoing stale air. This is then used to heat up the incoming fresh air, making the whole system incredibly energy efficient, while delivering constant fresh air for the homeowners.

In the height of summer, the Lossnay units can also offer a full bypass function, which is ideal for cooling down apartments that have overheated during the day. Using temperature sensors, the unit automatically enters bypass mode when it detects the space is hotter than desired and the outside air is cool enough.

The Residential Lossnay units were chosen not only for their energy efficiency and performance but also for their super quiet performance of only 24dBA (at 38 litres / sec at 100Pa). This makes Lossnay perfect for residential homes and apartments where occupants can enjoy all the benefits of fresh air ventilation without even knowing the unit is running.

With an intelligent, internal LCD controller, homeowners have easy control and commissioning of the unit with a clear display showing normal, boost, and purge modes. Up to 4 speed settings are available to ensure constant and accurate settings.

Apartment owners are also able to download the unique MELCloud App which then allows them to control their ventilation from anywhere, increasing energy efficiency. Together, the apartment owners are treated to the highest standards of luxury and comfort with an environment of constant clean and healthy air.

New contemporary London venue uses heat recovery to maximise comfort

A new central London meeting and conference venue is using state-of-the-art ventilation and heat recovery air conditioning to deliver absolute comfort for guests. Garfield House on the bustling Edgware Road has seen its three floors undergo a total transformation into contemporary meeting and conference rooms for businesses to hire.

There are 22 separate meeting spaces of varying sizes spread across the three levels plus breakout and coffee areas. They have all been given a thoroughly modern overhaul and, in keeping with the theme, the ventilation and air conditioning services are all on show, with ductwork runs and vents all part of the look and feel of the latest offering from venue hire company, etc Venues.

Specialist installer and Mitsubishi Electric Business Solutions Partner, Cool Systems Holdings was called upon to deliver on the contemporary brief that required the creation of not only a comfortable environment for users but a system that was also a part of the ambience of the venue, which can host anything from large-scale events to training days and seminars.

CS Group Technical Design Engineer Martin Lazovy explains: “There was nothing on the third floor when we started and only a couple of split systems on the first and second. We stripped everything out and started from an empty building.

“The brief was to ensure all services were exposed in line with the contemporary design the client was going for, which meant using exposed ducted fan coil units on the ceilings on each of the floors.”

CS supplied Mitsubishi Electric Lossnay mechanical ventilation with heat recovery (MVHR) units to each floor as well as a City Multi R2 heat recovery air conditioning system. The building’s server rooms, pantry and kitchen spaces were serviced with smaller split air conditioning units.

Developed and refined over the past 30 years, the Lossnay system has perfected the recovery of waste energy whilst delivering fresh air ventilation within any building.

Especially important in schools and offices, Lossnay can work in conjunction with Mitsubishi Electric air conditioning to maintain a comfortable and fresh environment.

The units reduce overall energy costs by extracting stale air and then recovering the heating or cooling energy to either warm or cool incoming fresh air.

By utilising this energy, the Lossnay system can save up to 30 per cent on initial capital costs of heating and cooling plant.

A total of 21 Lossnay units varying from the LGH-50RX5-E to the larger LGH-100RX5-E have been deployed at Garfield House. This commercially orientated system can be utilised virtually anywhere to extract stale air and then recover the heating or cooling energy to either warm or cool incoming fresh air.

The heat recovery air conditioning is delivered by two R410A City Multi units. Many buildings require cooling in some areas and heating in others even in adjacent rooms.

The outstanding City Multi R2 system meets this requirement by distributing surplus heat from cooling operations (and vice versa) to rooms where it is needed. This efficiency can result in energy savings of up to 30 per cent over conventional systems.

The system installed at Garfield House all feeds into Mitsubishi Electric's advanced AG150 centralised controller, which can also interlock with the Lossnay ventilation system. The AG150 is a very cost effective 9 inch touch screen centralised controller. The panel can control up to 50 devices, with the functionality to monitor energy use, set daily timers and instigate night setback. In addition, set point upper and lower limits can be established and refrigerant volumes can be checked via the interface.

Remote control is also provided by standard PAR31 MAA panels throughout the building's various rooms. The clear backlit display and simple functions of daily and weekly timer control make for a very simple user interface. Remote PAC-SE41TS sensors have also been installed in areas with no remote controller.

The entire installation is also primed to be linked up to Mitsubishi Electric's forthcoming Remote Management Interface (RMI) that will enable monitoring and control from iPhone and other smart devices.

"The client is extremely happy with the end result," says Martin. "The system works well and fits in with the design values of the building.

"We are a Business Solutions Partner of Mitsubishi Electric, and have installed their equipment in several jobs previous to this. As well as being easy to install, it is reliable, efficient and delivers the level of performance these clients demand, so we wouldn't use anything else."

Mitsubishi Electric is a market leader in providing solutions to cool, heat, ventilate and control our buildings

As a major manufacturer of these pivotal technologies, we hold the UK's energy challenges close to our heart.

We want to help the nation achieve its climate goals; we want to help individuals and businesses reduce the energy consumption of their buildings, whilst also helping to reduce their annual running costs.

For more information visit:

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Note: Refer to 'Installation Manual' and 'Instruction Book' for further 'Technical Information'. 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), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

Effective as of October 2023

Green Gateway
www.greengateway.mitsubishielectric.co.uk
Mitsubishi Electric UK's commitment to the environment

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