

# Ventilation Solutions



Heating and Cooling





## ERVs IN CANADIAN CLIMATES

For over 20 years, Mitsubishi Electric has been a pioneer in providing ERV solutions for high profile commercial and residential projects all across Canada. Meeting the high and strict demand of performance and efficiency, Mitsubishi Electric continues to be a major player in the ERV ventilation industry in the Canadian market.

## FRESH NEW INNOVATION FROM MITSUBISHI ELECTRIC

Mitsubishi Electric's advanced line of Energy Recovery Ventilators (ERVs) will help position your building to meet the growing demands for improved indoor air quality (IAQ), energy efficiency, and ultimately aid in the fulfilment of green initiatives and stringent LEED standards. Our range of ERVs and Dedicated Outdoor Air Systems, including Lossnay®, RenewAire®, PremiSys®, and PremiSys® Fusion, recover up to 80 percent of sensible and latent energy from conditioned air. Stale indoor air is then exhausted while simultaneously removing dangerous gases and impurities to improve IAQ. Whatever your project's needs, there's a Mitsubishi Electric ERV that will meet or exceed them.



# MITSUBISHI ELECTRIC

## Heating and Cooling

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## ERV VS HRV

Natural Resource Canada (NRC) studies show that the benefits of ERVs compared to HRVs are quite evident in climate zones like that of Canada which have cold dry winters and hot humid summers.

Three main benefits of ERVs over HRVs include: added comfort, a more efficient defrost, and the exclusion of drains.

Comfort is achieved by allowing the transfer of moisture between two membranes. Moisture control is a key benefit for comfort.

The defrosting process for an HRV typically freezes once the temperature drops below 0°C, requiring defrost modes such as preheaters or face and bypass dampers. ERVs are more catering to cold climates because they require defrost mode at a much lower temperature of around -10°C. The lower frost point threshold requires less energy for defrosting, resulting in cost savings.

Finally, ERVs do not require drain pans due to the ability to transfer moisture between the two air streams. HRVs use non-permeable cores, therefore, preventing moisture from getting transferred between the two airstreams. Because of this, the HRV system requires a drain pan inside the unit, adding to installation considerations and costs. In contrast, an ERV uses a heat exchanger to not only transfer sensible heat but also latent heat. The core material for ERVs is permeable to enable the transfer of moisture, while keeping other pollutants such as nitrogen oxide and carbon dioxide, out. The benefit of this is flexibility of unit installation by reducing space required for the drain pan and drain pipe.



Lossnay® is the optimal ventilation solution to maximize energy recovery and minimize sound pollution. Featuring full communication to VRF systems through M-NET® controls, its unique core slides out for easy maintenance and is built with an ultra thin chemically treated paper for superior sensible and latent energy recovery. Perfectly suited as noise control equipment for buildings near airports, railways or highways, the Lossnay® core transmits little air vibration and absorbs sound to deliver excellent sound attenuation from outside noise. What's more, Lossnay® was specifically engineered to maintain maximum efficiency, boasting a high static pressure Sirocco fan capable of withstanding high-pressure drops in ductwork. Ultimately, this increases the flexibility of system installation.



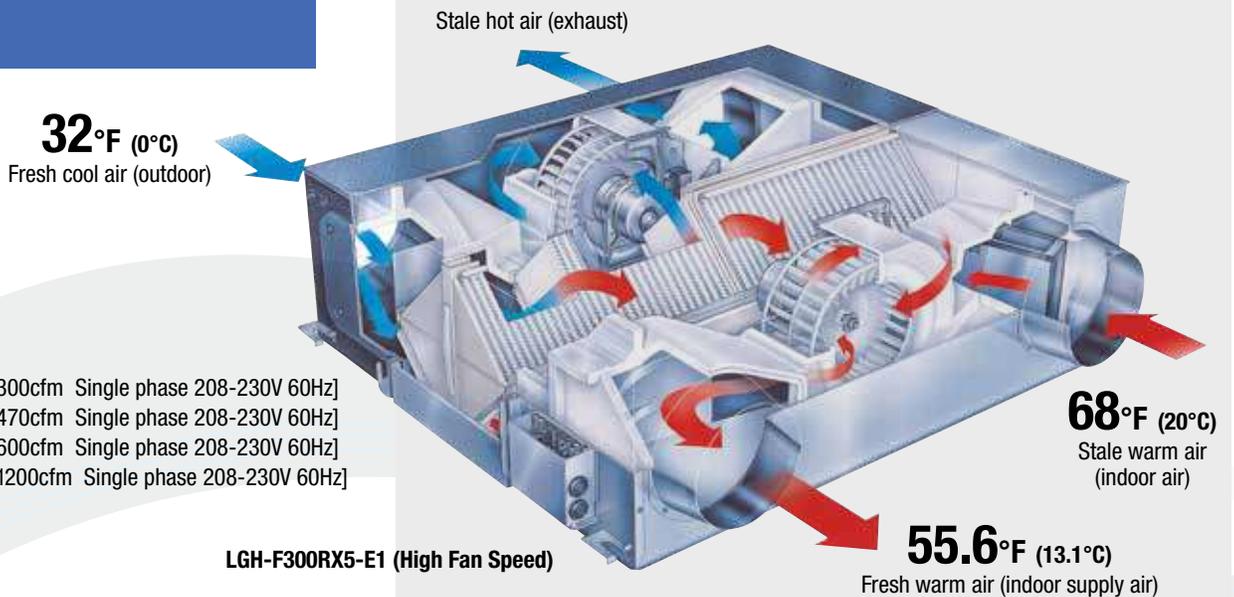
## THE VENTILATION SYSTEM FOR ENHANCED AIR QUALITY – LOSSNAY®

Put the Lossnay® Ventilation System to work for advanced control of enhanced air quality with excellent design flexibility.

### HEAT-EXCHANGE EFFICIENCY

The secret to the unmatched comfort provided by Lossnay® core is the cross-flow, plate-fin structure of the heat-exchange unit. A diaphragm made of a specially processed paper fully separates inducted and exhausted air supplies, ensuring that there is no cross contamination between the two airstreams.

The superior heat-transfer and moisture permeability of the special paper assure highly effective total heat exchange (temperature and humidity) when inducted and exhausted air supplies cross in the Lossnay® core.



- LGH-F300RX5-E1** [300cfm Single phase 208-230V 60Hz]
- LGH-F470RX5-E1** [470cfm Single phase 208-230V 60Hz]
- LGH-F600RX5-E1** [600cfm Single phase 208-230V 60Hz]
- LGH-F1200RX5-E1** [1200cfm Single phase 208-230V 60Hz]



## OUTSIDE AIR MAKES ALL THE DIFFERENCE!

People need outside air for their health and comfort. Unconditioned outdoor air rarely meets their needs: it's usually too hot and humid in the summer and too cold and dry in the winter. To provide the benefit of ventilation, the air must be preconditioned before being introduced into the occupied space.

Heated or cooled indoor air soon grows stale and must be exhausted to rid the building of toxins, odours, viruses, bacteria, and other potentially harmful contaminants. Exhausting that air and replacing it with outside air, is critical to a healthy and productive environment, but it is a process that can be both costly and inefficient.

If your system utilizes an energy recovery ventilator (ERV), these costs are greatly minimized. An ERV helps improve the efficiency of air conditioning systems by preheating or precooling incoming outside air with the available energy in the stale exhaust air.

Furthermore, ERVs save money by decreasing the load on your air-conditioning units while also removing noxious indoor pollutants, such as formaldehyde, pollen, cigarette smoke, dust, and carbon dioxide; and help to equalize humidity levels.

### ENERGY RECOVERY VENTILATORS

- Maintain an adequate supply of ventilation air while reducing energy costs.
- Recover **up to 80 percent** of sensible and latent energy from conditioned air as it is exhausted.
- Reduce extremes in humidity that can encourage mould growth.
- Remove dangerous gases, bacteria, and other airborne impurities from conditioned air.

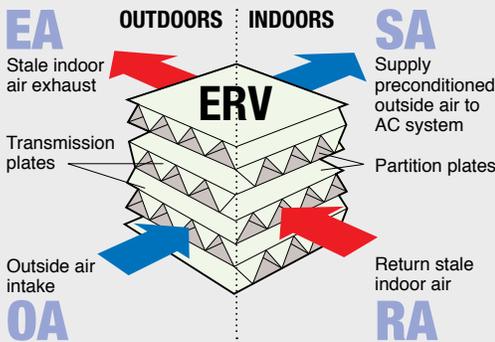
### MITSUBISHI ELECTRIC'S LOSSNAY® ENERGY RECOVERY VENTILATORS OFFER:

- Unprecedented energy transfer in a fixed-plate component with no moving parts.
- Reasonable paybacks and reduced peak demand.
- Superior part-load performance, reducing latent load even at mild outdoor temperatures.
- No wheels to stop turning so outside air is always preconditioned and available.

## HOW DOES THE LOSSNAY® CORE WORK?

At the heart of each Mitsubishi Electric's Lossnay® energy recovery ventilator is a low-maintenance cross-flow energy exchange core constructed of a specially treated cellulose fibre membrane.

The low-maintenance ERV core works by extracting stale air from inside the building to remove excess moisture, bacteria, odours and gases. This air is then replaced with allergen reduced fresh air from outside. To put it simply, energy recovery occurs by utilizing the energy from the stale air using it to pre-cool in the summer or pre-heat in the winter. Therefore, it warms the fresh air in the wintertime and cools it in the summertime.

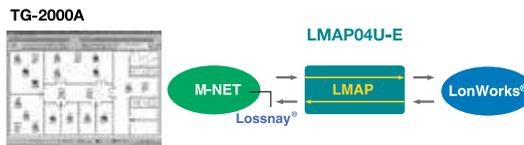


## FEATURES

### SYSTEM COMPATIBILITY

Mitsubishi Electric has responded to the growing need for total, integrated management of building HVAC and indoor air quality by making it easier to interlock and control Lossnay® energy recovery ventilators with our air-conditioning systems.

Lossnay® is fully compatible with our AE-200A, AE-50A and EW-50A Centralized Controllers and works with the TG-2000A software, LonWorks® interface, and BACnet® interface, further increasing the scope of total system management.



### MULTIFUNCTION LCD REMOTE CONTROL

The PZ-43SMF-E Remote Controller and the PZ-60DR-E M-NET Controller are compact and user friendly. In addition to controls for ON/OFF and Ventilation Mode, the schedule for filter maintenance is also displayed. The liquid crystal display has been designed for easy visibility.

### HIGH-STATIC PRESSURE BLADES

By developing blower blades that are thinner, more widely spaced, and possessing a larger diameter of curvature, static pressure has been boosted and sound reduced while ensuring an optimal airflow.

Higher static pressure means that Lossnay® can accommodate the pressure loss required to meet the specifications of ductwork and terminal devices, increasing the flexibility of system installation.



High-static pressure blades      Conventional blades



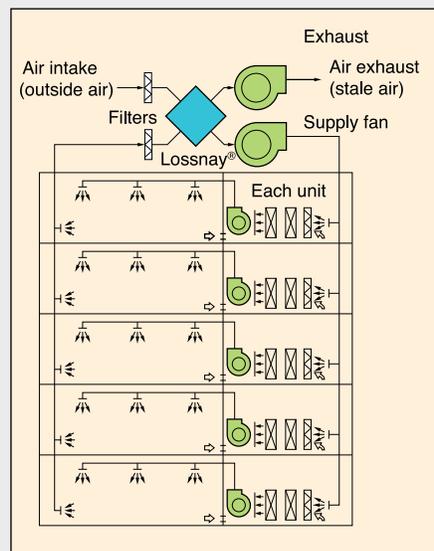


## COMPARISON OF PRIMARY BUILDING VENTILATION METHODS

There are two main ventilation methods:

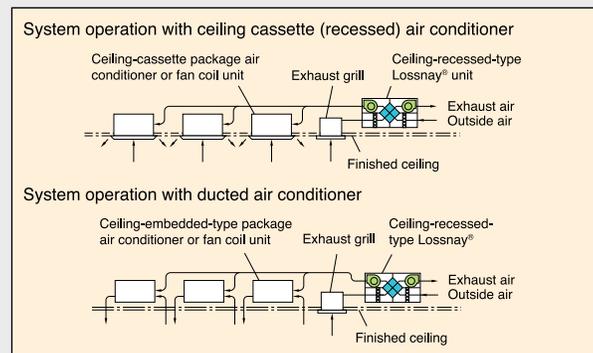
### CENTRALIZED VENTILATION METHOD

This is mainly used in large buildings, with the outside air intake being installed in one machine room. For this method, primary treatment of the outdoor air, such as heat recovery to the intake air and dust removal, is performed before distribution to the building duct system.



### INDEPENDENT ZONED VENTILATION METHOD

This is mainly used in small to medium-sized buildings, with areas being ventilated using outside air intakes from independent ventilation devices. The rate of use of this method has recently increased as zone conditioning and independent control are becoming more feasible.



### VENTILATION MODES

With conventional ERVs, “by-pass” or auto ventilation was impossible without attaching an additional damper and adapter. However, with the LGH-F-RX5 series, these modes are available without using any other parts. Auto mode is the fixed setting when Lossnay® is interlocked with air conditioners. When using Lossnay® independently with a PZ-43SMF-E remote control (sold separately), Lossnay® ventilation, bypass ventilation, or auto mode can be selected.

### NIGHT PURGE

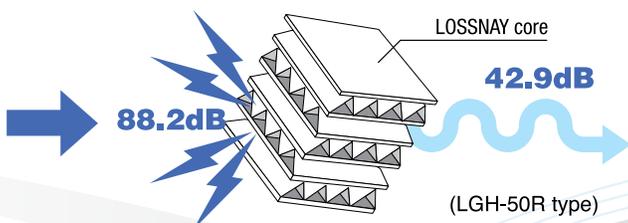
“Bypass” ventilation can be used to release hot air from inside the building that has accumulated during a hot summer day.

### OFFICE EQUIPMENT ROOM COOLING

During the cold season, outdoor air can be drawn in to cool rooms where the temperature has risen due to the use of office equipment. (Only when interlocked with CITY MULTI® and/or M and P-Series indoor unit)

### EXCELLENT SOUND INSULATION

The structure of the Lossnay® core transmits little air vibration and absorbs sound. Lossnay® is approved as noise control equipment for houses in noisy areas near airports, and is also used in areas near railroads and highways.





With a wide range of models and airflows, **RenewAire®** features all the excellent sound attenuation and energy recovery of the innovative Lossnay® core with the flexibility of a multitude of configurations and installations. With the option of outdoor or indoor models, horizontal or vertical orientations, and a variety of supply, return, exhaust, and outside air combinations, **RenewAire®** can adapt to suit any project. Built for maximum efficiency, this exceptional ERV features an EC motor or variable frequency drive, on select models, for superior speed control compared to a standard PSC motor. With **RenewAire®**, your project will benefit from cleaner, healthier air, with the convenience of an integrated DDC controller for **BMS®** and **BACnet®** communication.

## RENEWAIRE® ERVS ACHIEVE SUSTAINABLE IAQ

**RenewAire®** is A PIONEER IN ENHANCING IAQ while maximizing sustainability through enthalpic-core, static-plate ERVs. This OPTIMIZES ENERGY EFFICIENCY, lowers costs by REDUCING HVAC LOADS and therefore reduces the environmental footprint. This ERV technology preconditions incoming air with the otherwise-wasted sensible and latent energy (heat and humidity) of the exhaust air going out. At the same time, the airstreams are kept physically separate as certified by the Air Conditioning, Heating and Refrigeration Institute (AHRI) for zero exhaust air transfer at normal balanced operating conditions. As the pioneer of static-plate core technology in North America, **RenewAire®** is the largest ERV producer in the USA.

### HIGHEST-QUALITY INDOOR AIR

Stale indoor air is replaced with fresh, conditioned and filtered outdoor air, resulting in enhanced IAQ by removing harmful contaminants from the indoor air. Airstreams do not mix and pollutants are not transferred across partition plates.



### OPTIMIZING ENERGY EFFICIENCY

Energy efficiency is optimized by preconditioning the outside air coming in with the otherwise-wasted sensible and latent energy of the exhaust air going out. This exchange of energy moderates temperatures and moisture, decreases HVAC equipment needs, drives operational efficiencies and conserves energy.



### REDUCING HVAC LOADS

**RenewAire®** technology reduces HVAC loads during both winter and summer. The size of the HVAC equipment (heat pumps, furnaces or air conditioners) can be decreased. This ensures efficient operation and keeps both energy use and operating costs low while maintaining high-level IAQ.

## THE RENEWAIRE® DIFFERENCE

For over 30 years, **RenewAire®** has been a leader in enhancing IAQ in commercial and residential buildings. The ERVs are competitively priced, simple and easy to use and maintain, have a quick payback, return on investment. Due to unparalleled reliability derived from innovative design practices, expert workmanship and Quick Response Manufacturing (QRM), they provide an industry-leading warranty. In 2010, **RenewAire®** joined the Soler & Palau (S&P) Ventilation Group, providing access to the latest in energy-efficient air-moving technologies.



# VENTILATION SOLUTIONS FOR EVERY APPLICATION

RenewAire® ERVs can be applied everywhere across all commercial and residential buildings, and everything in between. The technology excels in every geographic region, every climate and every size project.



## SL SERIES

- Residential ERVs – four-duct design
- Indoor with low profile cabinet
- 51-76 CFM continuous mode
- 76-95 CFM boost mode



## BR SERIES

- Residential ERVs—two-duct design
- Indoor
- 40-140 CFM



## EV SERIES

- Residential and light commercial
- ERVs—four-duct design
- Indoor (EV450 also available as Outdoor)
- 40-540 CFM



## HE SERIES

- Commercial ERVs—packaged solutions
- Indoor/outdoor
- 250-7,950 CFM



## LE SERIES

- Commercial ERVs—large capacity
- Indoor/outdoor
- 1,500-11,000 CFM



## CA SERIES

- Applied ERVs—modular cabinets
- Indoor/outdoor
- 500-4,400 CFM
- Stackable to 20,000 CFM



## RD SERIES

- Commercial—Dedicated Outdoor Air System (DOAS)
- Indoor/outdoor
- 500-4,250 CFM



## DN SERIES

- Commercial – Dedicated Outdoor Air System (DOAS)
- Indoor/outdoor
- Integrated heating & cooling
- 375-4,950 CFM



## PA SERIES

- Applied ERVs—modular panels
- Indoor
- 1500-unlimited CFM

The Mitsubishi Premisys® Dedicated Outdoor Air System (DOAS) is an ideal fully packaged heating and air conditioning solution for commercial buildings. Both the Premisys® MP (without energy recovery) and MPE (with energy recovery) models feature a gas fired high turndown furnace (up to 16:1 turndown ratio) with inverter duty or digital scroll compressors. Also, with an EC motor on the lead condenser fan, improved head pressure control and better modulation on the condenser re-heat coil are achievable. In addition, ultra-quiet condenser fans are used to greatly reduce sound levels down 8-10 dB. The PremiSys DOAS operates seamlessly via microprocessor controls for stand-alone functionality or communication through Mitsubishi Electric's M-NET®, BACnet®, LonWorks® or Modbus® protocols.



## MODEL MP(E) FEATURES

- Direct-drive plenum fans with factory-mounted variable frequency drives (VFD) to handle up to 13,500 CFM and 3-inch wg external static pressure
- 2-inch double-wall construction
- Downturn intake hood with 2-inch aluminum mesh filters
- Microprocessor controls for stand-alone functionality or communication through Mitsubishi Electric's M-Net®, BACnet®, LonWorks®, or Modbus® protocols
- Multiple filter options including MERV 8, MERV 13, or a combination MERV 8/13
- Optional accessories include: Exterior cabinet coatings, smoke detectors, and condenser hail guards (furnace and air conditioner) can be decreased. This ensures efficient operation and keeps both energy use and operating costs low while maintaining high-level IAQ.



## HEATING OPTIONS

### INDIRECT GAS-FIRED FURNACE

- 409 stainless steel heat exchanger construction
- Modulating turndown control
- Power-vented

### ELECTRIC HEATING

- SCR capacity control
- Optional single-point power connection

### HOT WATER COIL

### AIR-SOURCED HEAT PUMP



## COOLING OPTIONS

### INTEGRAL AIR-COOLED PACKAGED DX

- R410a refrigerant
- Modulating hot gas reheat
- Variable capacity compressors
- 5-43 tons of cooling capacity
- Service/charging valves
- Liquid line dryer
- Sight glass
- Air-Sourced Heat Pump option



# PremiSys® DEDICATED OUTDOOR AIR SYSTEM



UNIT SIZE	NOMINAL TONNAGE (TONS)	HEIGHT	WIDTH	LENGTH	INTAKE	CONDENSING SECTION	NOMINAL WEIGHT (LBS)	OUTDOOR INTAKE DISCHARGE	SUPPLY DISCHARGE	EXHAUST DISCHARGE
MP-1	5 – 15	59	53	99	22	30	2,700	END	BOTTOM OR SIDE	NA
MP-2	15 – 30	73	68	109	27	30	4,500			
MP-4	20 – 43	90	68	156	22/27	30	6,400			
MPE-1	5 – 15	59	53	150	22	30	3,400	END	BOTTOM OR SIDE	SIDE
MPE-2	15 – 30	73	68	163	27	30	5,100			
MPE-4	20 – 43	90	68	224	22/27	30	8,300			

## PremiSys® Fusion Dedicated Outdoor Air System (DOAS)

is a split-system comprised of a Variable Refrigerant Flow (VRF) outdoor unit and an air handler, offering an energy-efficiency improvement of up to 20 percent over a traditional DOAS. Featuring the industry leading CITY MULTI® condensing unit, PremiSys® Fusion is best suited to meet stringent compliance with LEED standards, as the inverter duty compressors deliver better modulation, increased efficiency and quieter operation than digital scroll compressors. With the PremiSys® DOAS, your project will benefit from the advantages of ultra-quiet indoor operation as low as 22dB(A) and seamless communication with Mitsubishi Electric's M-NET® controllers.



## FEATURES

- Direct-drive plenum fans with factory-mounted variable frequency drives (VFD) to handle a nominal air flow of 7500 CFM and 3 in. wg external static pressure.
- Pre-painted cabinet with 2-inch double-wall construction.
- Downturn intake hood with aluminum mesh filters.
- Microprocessor controls for stand-alone functionality or communication through Mitsubishi Electric's M-Net®. Additional components are required for communication via other protocols, such as BACnet®, LonWorks®, or Modbus®.
- Multiple filter options including MERV 8 (standard), MERV 13 (optional), or a combination MERV 8/13.

## HEATING OPTIONS



## COOLING OPTIONS

### INDIRECT GAS-FIRED FURNACE

- 409 stainless steel heat exchanger construction
- Modulating turndown control
- Power-vented

### ELECTRIC HEATING

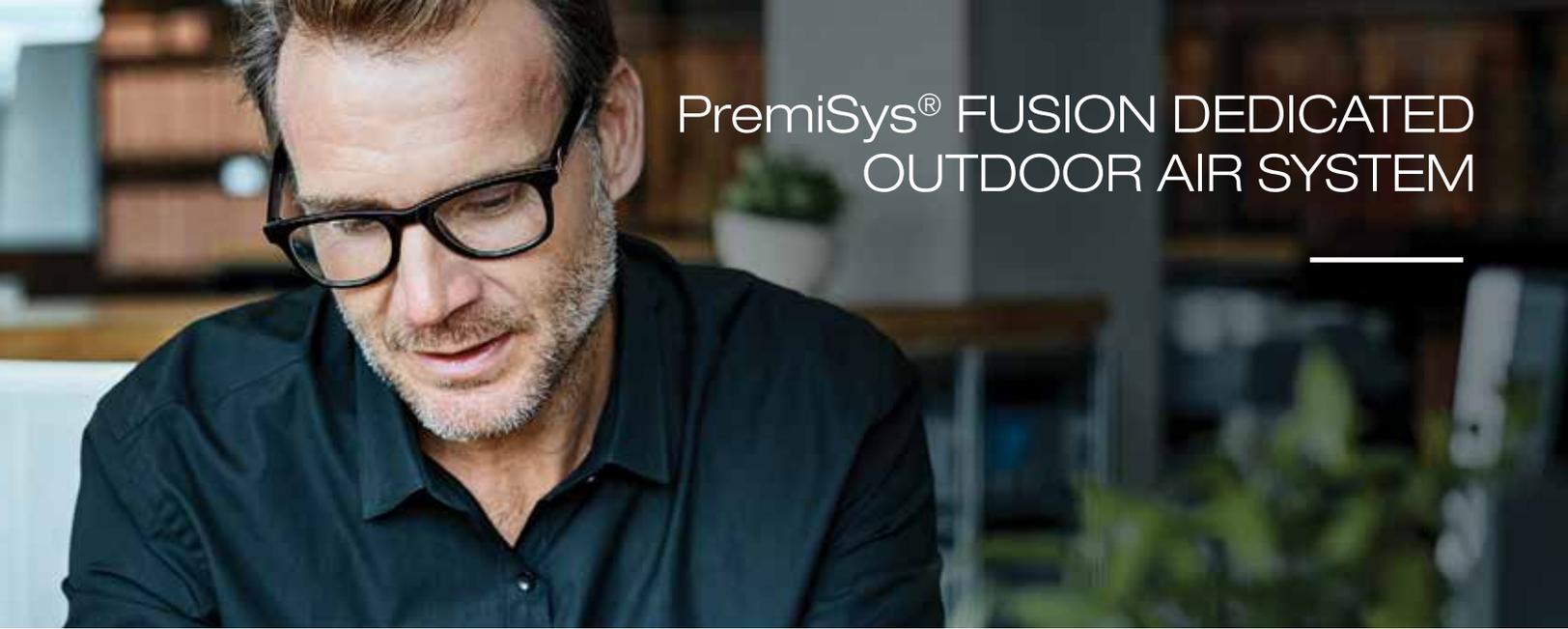
- SCR capacity control
- Optional single-point power connection

### HOT WATER COIL

### SPLIT SYSTEM DX

- INVERTER-driven compressors
- 5 to 20 tons of cooling capacity
- Up to 50' of separation between outdoor unit and DOAS unit
- Modulating hot gas reheat
- R410a refrigerant
- Energy wheel

# PremiSys® FUSION DEDICATED OUTDOOR AIR SYSTEM



UNIT SIZE	NOMINAL TONNAGE (TONS)	HEIGHT	WIDTH	LENGTH	INTAKE	NOMINAL WEIGHT (LBS)	OUTDOOR INTAKE DISCHARGE	SUPPLY DISCHARGE	EXHAUST DISCHARGE
MPF-1	5 – 12	58	53	148	22	2,200	END	BOTTOM OR SIDE	SIDE
MPF-2	10 – 20	71	64	163	22	2,800			



## CASE STUDY

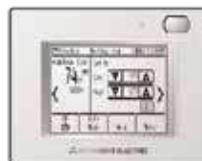
The MODELLO stands tall as a beacon for luxury living in Burnaby's Central Park Community in British Columbia. This stunning 37-storey residential building is equipped with the **Mitsubishi Electric City-Multi VRF system** to provide a cutting-edge combination of **efficient heating and cooling, energy recovery, and ventilation** for its 1, 2, and 3 bedroom suites – each with individual thermal metering. With Lossnay® ERVs, MODELLO **recovers up to 80 percent** of sensible and latent energy from conditioned air, while the structure of the Lossnay® cores transmit little air vibration and absorb sound, providing excellent sound attenuation and isolating all 170 suites from outside noise. What's more, the Lossnay® ERVs **deliver superior indoor air quality** by removing noxious indoor pollutants and equalizing humidity levels, ensuring every resident of this state-of-the-art development lives in the most comfortable environment possible.



## CITY-MULTI GEOTHERMAL WATER-SOURCE VRF HEAT RECOVERY SYSTEM

### LIST OF EQUIPMENT:

- 28 Energy Recovery Ventilators (ERVs) (LGH-F-RX5-E1)
- 42 VRF Systems
- 41 Water-source condensing units with heat recovery (PQRY-P-SKMU-A)
- 41 Branch Controllers (CMB-P-NU-GA)
- 316 Fan coil units (PEFY-P-NMAU-E3)
- 460 wall mounted controllers (PARU01MEDU-J)
- 3 AG-150A Central Controllers with expansion modules





## GEOHERMAL/VRF HEATING AND COOLING

State-of-the-art geothermal heating and cooling will provide the perfect temperature all year round with individual thermal metering of each home's heating and cooling for utility cost control.

- 125 tons, 128 boreholes, 225 ft. deep, 15 ft. ctrs.
- 28,800 ft. total geo-exchange pipe length
- Geotility completed the drilling and tie-ins prior to the construction start of the tower
- 8 boreholes per circuit, 8 circuits per vault, 2 vaults





Heating and Cooling

# Ventilation Solutions

