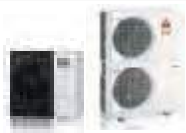
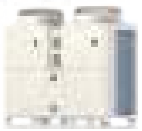
Heating

Hydronic heat pumps

Hybrid systems

Packaged systems

			Capacity			
			Heating kW	Cooling kW	Domestic hot water	Hot water heating
Split						
ecodan	HYDROTANK HYDROBOX		4.5 5.5 8.0 11.2 16.0 22.0 25.0	3.8 5.0 7.1 10.0 14.0 18.0 22.0	•	•
	PUHZ-SW					
ZUBADAN	HYDROTANK HYDROBOX		8.0 11.2 14.0 23.0	7.1 10.0 12.5 20.0	•	•
	PUHZ-SHW					
Hybrid systems						
Mr.SLIM+	PUHZ-FRP		8.0	7.1	•	•
ecodan MULTI	-		12.5 12.5 12.5	12.5 14.0 15.5	•	•
HWS	VRF HWS (Hot Water Supply)		12.5	-	•	•
ATW	VRF ATW (Air To Water)		12.5	11.2		•
Packaged systems						
PACKAGED	PUHZ-W/HW		5.0 9.0 11.2 14.0	4.5 7.5 10.0 12.5	•	•
CAHV	HWHP (Hot Water Heat Pump)		45.0	-	•	•
CRHV	HWHP (Hot Water Heat Pump)		60.0	-	•	•
QAHV	HWHP (Hot Water Heat Pump)		40.0	-	•	•

Supply				Functions		Applications and solutions
	Water cooling	Air heating	Air cooling	Heat recovery	Cascade systems automatic control	
	•				• (Hydrobox only)	AUTONOMOUS SOLUTIONS • Residential (villas, appartments) • Offices • Shops/Bars CENTRALIZED SOLUTIONS with cascade systems
	•				• (Hydrobox only)	AUTONOMOUS SOLUTIONS • Residential (villas, appartments) • Offices • Shops/Bars CENTRALIZED SOLUTIONS with cascade systems
		•	•	•	-	AUTONOMOUS SOLUTIONS • Residential (villas, appartments) • Offices • Shops/Bars SPA/GYMS
		•	•			
		•	•	•		CENTRALIZED SOLUTIONS • Residential (villas, appartments) • Offices • Hotel INDUSTRY SHOPPING CENTER SPA/GYM
	•	•	•	•		
	•				•	AUTONOMOUS SOLUTIONS • Residential (villas, appartments) • Offices • Shops/Bars CENTRALIZED SOLUTIONS with cascade systems
					•	CENTRALIZED SOLUTIONS • Residential (condons) • Offices • Hotel INDUSTRY SHOPPING CENTER SPA/GYM
					•	
					•	

VRF HWS & ATW

HYBRID SYSTEM - Heating/Cooling/Domestic hot water

CITY MULTI

The scalability, flexibility and modularity of the Ecodan® – VRF HWS & ATW system represents the state of the art in Mitsubishi Electric technology. This solution makes it possible to use a single producer – the VRF outdoor unit – to deliver heating water, cooling water and domestic hot water simultaneously.

Hydronic modules for VRF CITY MULTI systems.

Ecodan® heat pump technology has been used in conjunction with hydronic modules to create systems for the production of domestic hot water (HWS) and heating water for radiator panels (ATW) which are perfectly compatible with the inclusion of both thermal and photovoltaic solar panels in the installation. Systems with electric heat pumps may be used all year round, as their use is not restricted by legislation.
The added comfort of being able to use the air conditioning system in spring and autumn is yet another advantage of these VRF systems. The indoor units of the VRF CITY MULTI system gently cool and dehumidify the interior space in spring, cool and dehumidify in summer, transferring the extracted heat to both the HWS and ATW hydronic modules, and heat the interior gently at cooler times of day in autumns.
HWS hydronic modules are ideal for the production of domestic hot water all year round. They make use of the energy drawn from indoor spaces by the VRF indoor units, as well as supplementary energy provided by solar panels in summer and spring.
ATW hydronic modules provide hot water for radiant panel heating in winter and deliver warm water to heat a pool in summer, contributing to maintaining comfortable temperature conditions and making use of the energy drawn from the indoor space by the VRF indoor units supplemented by heat supplied by thermal solar panels.
In systems with this capability, ATW hydronic modules may also be used to deliver refrigerated water to radiant panels in summer.

TYPICAL APPLICATIONS: HOTEL (ROOMS)

TYPICAL APPLICATIONS: CENTRALIZED RESIDENTIAL SYSTEMS

SOLUTION FOR CLIMATIZATION, HEATING AND DOMESTIC HOT WATER PRODUCTION

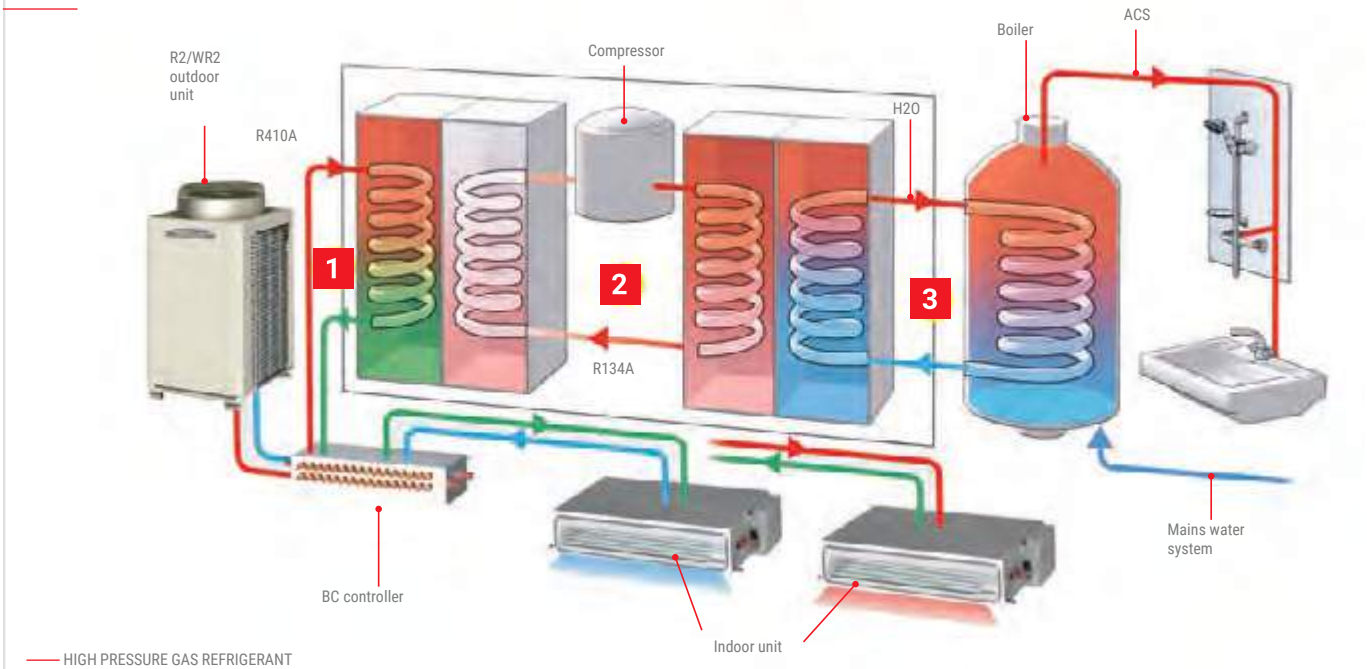
1	R2 Outdoor Units
2	Photovoltaic solar panels
3	BC controller
4	HWS Hydronic Module
5	ATW Hydronic Module
6	Domestic hot water accumulator tank fed from HWS
7	Hot water inertial accumulator tank fed by ATW

GREEN REFRIGERANT CIRCUIT
RED DOMESTIC HOT WATER CIRCUIT
ORANGE HEATING HOT WATER CIRCUIT
BLACK POWER CIRCUIT

HWS hydronic module – Hot water supply

Mitsubishi Electric was the first to introduce VRF systems for the production of high temperature hot water (up to 70°C), usable for domestic hot water production. The HWS hydronic module represents a significant, innovative technological breakthrough that uses the most advanced refrigeration technology, and has been conceived to be easily integrable with R2/WR2 series VRF CITY MULTI simultaneous cooling / heating systems.
Heat recovery plays a crucial role in these systems, as the HWS hydronic module may be used to extract heat from rooms where cooling is required, which would otherwise be vented into the outdoor atmosphere, and then use this heat to contribute to hot water production, adding only the supplementary heat necessary to reach the desired temperature.
The HWS hydronic module can produce hot water at temperatures up to 70°C in the return line, with a heating capacity of up to 12.5 kW per module which, however, is scalable in relation to internal demand.

HWS HYDRONIC MODULE – HOT WATER SUPPLY



HIGH PRESSURE GAS REFRIGERANT
HIGH PRESSURE FLUID REFRIGERANT TWO-PHASE
HIGH PRESSURE LIQUID REFRIGERANT
LOW PRESSURE GAS REFRIGERANT

Operating principle of two-stage technology

The HWS hydronic module employs a variant of the two-stage compression principle – a principle that has been known and used for many years, but which, until now, has only been applied in refrigeration systems to reach very low temperatures (as low as -60°C). Mitsubishi Electric has redesigned the two-stage circuit to achieve the opposite effect, for units intended to produce heating power at medium to high temperatures, from 30°C to 70°C. This solution combines superior energy efficiency with high hot water temperatures that are not attainable with the conventional heat pumps currently on the market. As illustrated previously, the HWS hydronic module uses the "free" heat extracted from the air conditioned interior by the heat recovery circuit of the CITY MULTI R2 outdoor units and raises the temperature to the desired value to deliver usable hot water. This double process recovers energy from the system, increasing its overall efficiency, and raises the temperature of the water with minimal energy expenditure.

Advantages of two-stage technology

The two-stage technology employed in the HWS hydronic module offers a number of significant advantages:

- R134a refrigerant in high temperature stage. R134a is a pure HFC refrigerant which is harmless for the stratospheric ozone layer and contributes only marginally to the greenhouse effect. This refrigerant is particularly suitable for high temperature applications.
- R410A refrigerant in low temperature stage. This is also an HFC refrigerant that is harmless to stratospheric ozone, which offers extraordinary efficiency in air conditioning applications.
- Minimal external energy demand, even when the system is operating in air conditioning mode. The heat drawn from the air is used to heat water.
- When the system functions predominantly in air conditioning mode – in summer, for example – hot water is produced with extremely low energy consumption. This makes it possible for the system to attain very high COP values.
- Continuously variable heating power in relation to demand, made possible by the inverter motor scroll compressor, which reduces energy consumption proportionally.
- Compact dimensions and very light weight. These modules may be mounted on walls, even in intermediate positions. Practically zero floor space usage.
- Individual thermal energy consumption billing with field devices.

TWO-STAGE TECHNOLOGY

Hybrid systems

The HWS hydronic module may be used to create hybrid systems, with both hydronic modules and VRF direct expansion units. For instance, this makes it possible for the system to produce domestic hot water and heat or cool the air in the indoor space using the most suitable indoor units of the Mitsubishi Electric range (cassette units, ceiling-suspended units, ducted units etc.).
As well as superior energy efficiency, a hybrid system also offers the extraordinary flexibility needed to cater for very diverse situations, which a conventional air conditioner system simply does not.

Control and adjustment system

The HWS hydronic module can be configured for the following operating modes and hot water temperatures:

OPERATING MODE	TEMPERATURE RANGE
Hot water	30 - 70°C
Heating	30 - 50°C
ECO heating	30 - 45°C
Antifreeze	10 - 45°C

HWS HYDRONIC MODULE

Technical specifications HWS HYDRONIC MODULE

MODEL			PWFY-P100VM-E-BU
Power			Single-phase, 220-230-240V, 50 Hz/60Hz
Heating power output (nominal)		kW *1	12,5
		kcal/h *1	10,800
		Btu/h *1	42,700
	Power absorption	kW	2,48
	Current consumption	A	11,63 - 11,12 - 10,66
Temp. range in heating mode	PURY Series	Outdoor temp. DB	-20~32°C
	PQRY Series	Water temp. in circuit	10~45°C
	PQRY Series	Temp. in water/glycol circuit (for geothermal applications)	-5~45°C
	PWFY-P VM-E1-BU	Return line water temp.	10~70°C
Connectable outdoor units	Total capacity		50-100% of external unit capacity
	Series		R2 (E)P, WR2
Sound pressure in anechoic chamber	dB <A>		44
Refrigerant circuit piping diameter	Liquid	mm (inches)	ø 9,52 (ø 3/8") brazed
	Gas	mm (inches)	ø 15,88 (ø 5/8") brazed
Water piping diameter	Inlet	mm (inches)	ø 19,05 (R 3/4") screw-on connection
	Delivery	mm (inches)	ø 19,05 (R 3/4") screw-on connection
Drain pipe diameter		mm (inches)	ø 32 (1-1/4")
External finish			Galvanised sheet steel
External dimensions HxLxW		mm	800 (785 without feet) x 450 x 300
Dry weight		kg	60
Compressor	Type		Hermetic scroll compressor with inverter
	Manufacturer		MITSUBISHI ELECTRIC CORPORATION
	Starter method		Inverter
	Power	kW	1
	Lubricant		NEO22
Water in circuit	Nominal	m^3/h	0,6 ~ 2,15
	(entire operating volume)		
Internal circuit protection (R134a)	Overpressure protection		Overpressure sensor, pressure switch calibrated to 3.60 Mpa (601 psi)
	Inverter circuit (COMP)		Overcurrent protection, overheat protection
	Compressor		Outlet temperature protection, overheat protection
Refrigerant	Type / original charge		R134a x1.1kg (0,50lb)
	Controller		LEV
Rated pressure	R410a	MPa	4,15
	R134A	MPa	3,60
	Water	MPa	1
Standard equipment	Manuals		Installation manual, Instruction manuals
	Accessory		Water filter, insulating material

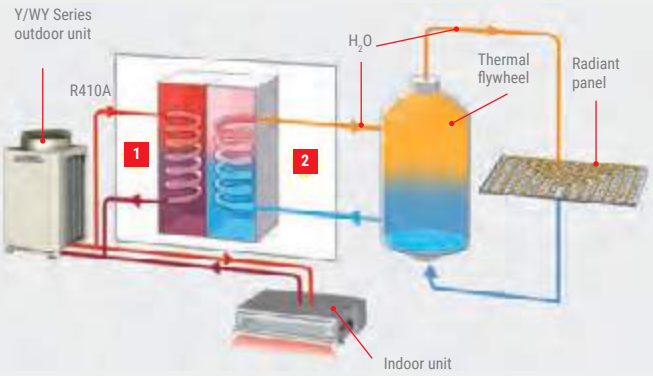
Note:
* Nominal conditions *1 are subject to EN14511-2:2004(E)
* Install the module in an environment with a wet bulb temperature not exceeding 32°C
* Due to continuous improvements made to these products, the specifications given above are subject to modification without prior notification.

* The module is not designed to be installed outdoors.
*1 Nominal heating conditions Outdoor temp.: 7°C DB/6°C WB
Nominal heating conditions Outdoor temp.: 7°C DB/6°C WB (45°F DB/43°F WB)
Pipe Length 7.5 m (24-9/16 feet) – Vertical difference: 0 m (0 feet)

ATW hydronic module – Air to water

Mitsubishi Electric has developed the ATW reversible air-water heat pump hydronic module specifically for hydronic heating and air conditioning systems. The refrigeration side of the module may be connected to VRF CITY MULTI SMALL Y and Y Series outdoor heat pump units, or to R2 heat recovery units. The hydronic side of the module may feed heated underfloor systems or other similar utilities, to provide heating in winter in heat pump mode, or cooling in summer in conditioning mode.
Connecting these modules to R2 Series VRF CITY MULTI heat recovery outdoor units offers extraordinarily levels of efficiency, especially in spring and autumn, with extremely high COP values. The HWS hydronic module can produce hot water at temperatures up to 40°C in the return line (45°C in delivery line), with a heating capacity of up to 12.5 kW per module which, however, is scalable in relation to internal demand.

ATW HYDRONIC MODULE – AIR TO WATER



TYPICAL APPLICATIONS: HOTEL (COMMON AREAS)

TYPICAL APPLICATIONS: CENTRALIZED RESIDENTIAL SYSTEMS (RADIANT PANEL HEATING)

Hybrid systems

Like the HWS module, the ATW hydronic module may be used to create hybrid systems, with both hydronic modules and VRF direct expansion units. For instance, this makes it possible to create a system that can heat certain rooms with radiant panels (a heating solution that is now very popular, as it offers uniform temperatures and quietness) and heat other rooms using appropriate Mitsubishi Electric indoor units (cassette units, wall-mounted units, ducted units etc.). Similarly, conditioning in summer may be performed with a heated underfloor system in rooms where this is installed, and with cooled air in other rooms, via standard VRF indoor units. This makes it possible to use the most effective treatment solution possible for each interior space, catering for both the requisites of the specific application and the preferences of the user. As well as superior energy efficiency, a hybrid system also offers the extraordinary flexibility needed to cater for very diverse situations, which a conventional conditioning system simply does not.

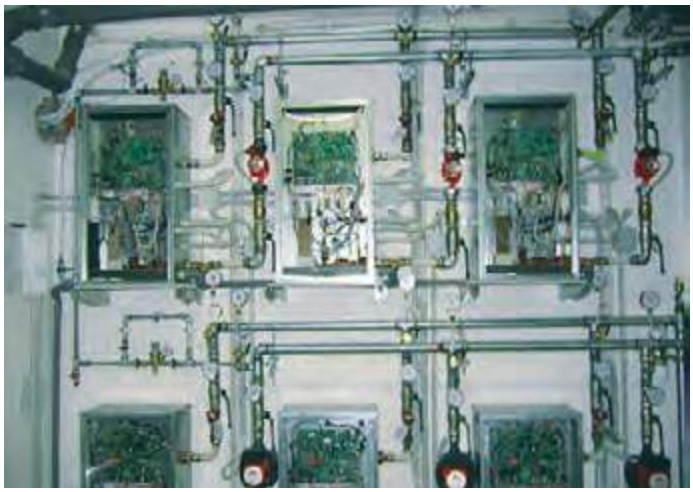
Main features

The functional characteristics of the ATW hydronic module cater for the needs of a very wide variety of different installations:

- nominal heating capacity: 12.5 kW;
- nominal cooling capacity: 11.2 kW;
- outdoor operating temperature range, heating mode: -20°C to +32°C (R2 heat recovery series); -20 to +15.5°C (Y heat pump series);
- outdoor operating temperature range, conditioning mode: -5°C to +46°C (R2 and Y series);
- return hot water temperature range: 10°C to 40°C;
- mains power: single-phase, 230V AC;
- individual thermal energy consumption billing with field devices.

Operating principle

The ATW reversible heat pump hydronic module consists essentially of a brazed plate stainless steel refrigerant-water heat exchanger connected to the VRF CITY MULTI outdoor unit on the refrigeration side, and to the hydronic circuit of the system (radiant panels, radiator units etc.) on the water side. The module is equipped with an electronic expansion valve which modulates the flow of refrigerant in the heat exchanger in response to heating or cooling demand and the demand required by the electronic management and control circuit. The entire system is encased in a housing with compact dimensions and very limited weight comparable to a wall-mounted boiler. The high COP value attained by the ATW hydronic module means that it delivers superior comfort with minimal operating costs, contributing to reducing the CO2 emissions produced for energy production at the power plant. This offers a two-sided advantage as emissions are not only reduced, but also delocalised away from populated areas.



Control and adjustment system

Like the HWS module, the ATW hydronic module is equipped with a sophisticated control system offering a wide choice of functions, selectable in relation to the needs of the installation and the preferences of the user.
The ATW module may be associated with its own independent remote controller (PAR-W21MAA), allowing the user to configure all operating settings, including water temperature, which may be displayed either for the delivery circuit or for the return circuit.
The water temperature reading displayed depends on the type of installation and on the auxiliary controller devices used. The return circuit reading configuration is the most widely used of the two, and allows precise control over the water temperature in the inertial accumulator tank (which is recommended) as a means to balance flows. Once the set temperature is reached, the ATW continues to operate to maintain a constant value.
Note that with this configuration, the delivery temperature is normally higher (max. 45°C) than the set temperature until the set temperature itself is reached.
In installations operating in summer, the ATW produces cold water at a temperature regulated with the same method, based on the primary delivery circuit reading or the return circuit reading.
As the cooling action of the radiant panels only reduces the sensible heat of the interior space, suitable dehumidification systems may also be included in the installation.
The ATW hydronic module can be configured for the following operating modes and hot water temperatures:

MODE	TEMPERATURE RANGE
Heating	30 - 45°C
ECO heating	30 - 45°C
Antifreeze	10 - 45°C
Cooling	10 - 30°C

Technical specifications HWS HYDRONIC MODULE

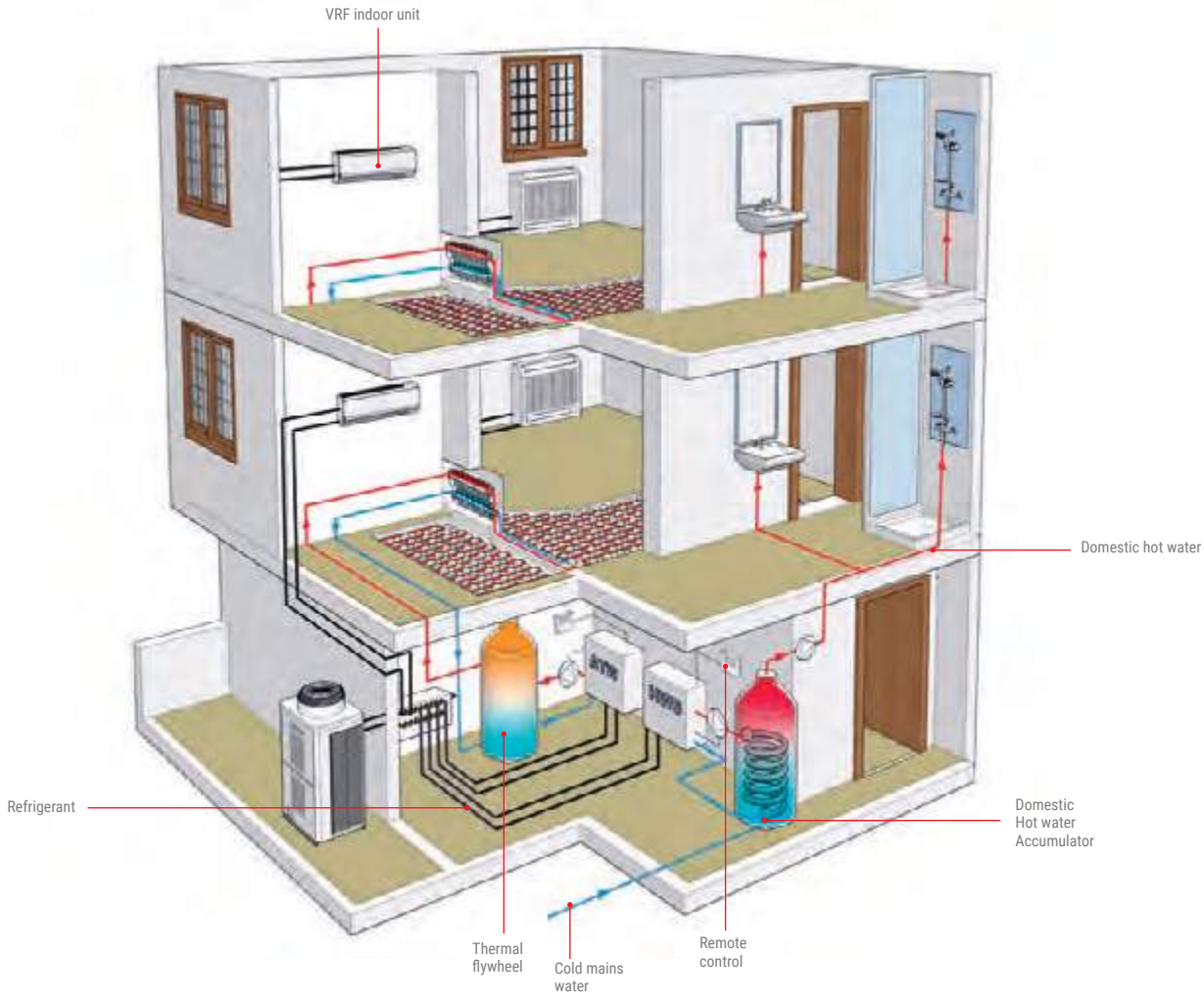
MODEL			PWFY-EP100VM-E2-AU
Power			Single-phase, 220-230-240V 50/60Hz
Heating power output (nominal)		kW *1	12,5
		kcal/h *1	10,800
		Btu/h *1	42,700
	Power absorption	kW	0,025
	Current consumption	A	0,138
Temp. range in heating mode	Serie PUMY	Outdoor temp. DB	-
	Serie PUHY	Outdoor temp. DB	-20~15,5°C
	Serie PURY	Outdoor temp. DB	-20~32°C
	Serie PQHY - PQRY	Water temp. in circuit	10~45°C
	Serie PQHY - PQRY	Temp. in water/glycol circuit	-5~45°C
		(for geothermal applications)	
		Return line water temp	10~40°C
Cooling output (nominal)		kW *2	11,2
		kcal/h *2	9,600
		Btu/h *2	38,200
	Power absorption	kW	0,025
	Current consumption	A	0,138
Temp. range in cooling mode	PUMY Series	Outdoor temp. B.S.	-
	PUHY Series	Outdoor temp. B.S.	-5~46°C
	PURY Series	Outdoor temp. B.S.	-5~46°C
	PQHY - PQRY Series	Water temp. in circuit	10~45°C
	PQHY - PQRY Series	Temp. in water/glycol circuit	-5~45°C
		(for geothermal applications)	
		Return line water temp	10~35°C
Connectable outdoor units	Total capacity		50-100% of capacity of OU
	Series		Y (Ecostandard (P), Standard Efficiencyl (P),High Efficiency (EP)), Zubadan Y, WY, R2 (Standard Efficency (P), High Efficiency (EP)), WR2
			29
			ø 9,52 (ø 3/8") brazed
Sound pressure in anechoic chamber	dB <A>		ø 15,88 (ø 5/8") brazed
Refrigerant circuit piping diameter	Liquid	mm (inches)	ø 19,05 (R 3/4") screw-on connection
	Gas	mm (inches)	ø 19,05 (R 3/4") screw-on connection
Water piping diameter	Inlet	mm (inches)	ø 32 (1-1/4")
	Delivery	mm (inches)	Galvanised sheet steel
Drain pipe diameter		mm (inches)	800 (785 without feet) x 450 x 300
External finish			36
External dimensions HxLxW		mm	1,8-4,30
Dry weight		kg	
Water in circuit	Nominal	m^3/h	4,15
	(entire operating volume)		1
Rated pressure	R410A	MPa	Installation manual, Instruction manuals
	Water	MPa	
Standard equipment	Manuals		Water filter, insulating material, 2x external signal connectors, plumbing fittings for filter, flow regulator
	Accessory		

Note:
* Nominal conditions *1 and 2* are subject to EN14511-2:2004(E)
* Install the module in an environment with a wet bulb temperature not exceeding 32°C
* Due to continuous improvements made to these products, the specifications given above are subject to modification without prior notification.
* The module is not designed to be installed outdoors.

*1 Nominal heating conditions
Outdoor temp.: 7°C DB/6°C WB (45°F DB/43°F WB)
Pipe length: 7.5 m (24-9/16 feet)
Vertical difference: 0 m (0 feet)
Intake water temp.: 30°C
Water flow rate: 2.15 m^3/h (P100)
4.30 m^3/h (P200)

*2 Nominal cooling conditions:
External temp: 35°C DB/(95°F DB)
Pipe length 7.5 m (24-9/16 feet)
Vertical difference: 0 m (0 feet)
Intake water temp.: 23°C
Water flow rate: 1.93 m^3/h (P100)
3.86 m^3/h (P200)

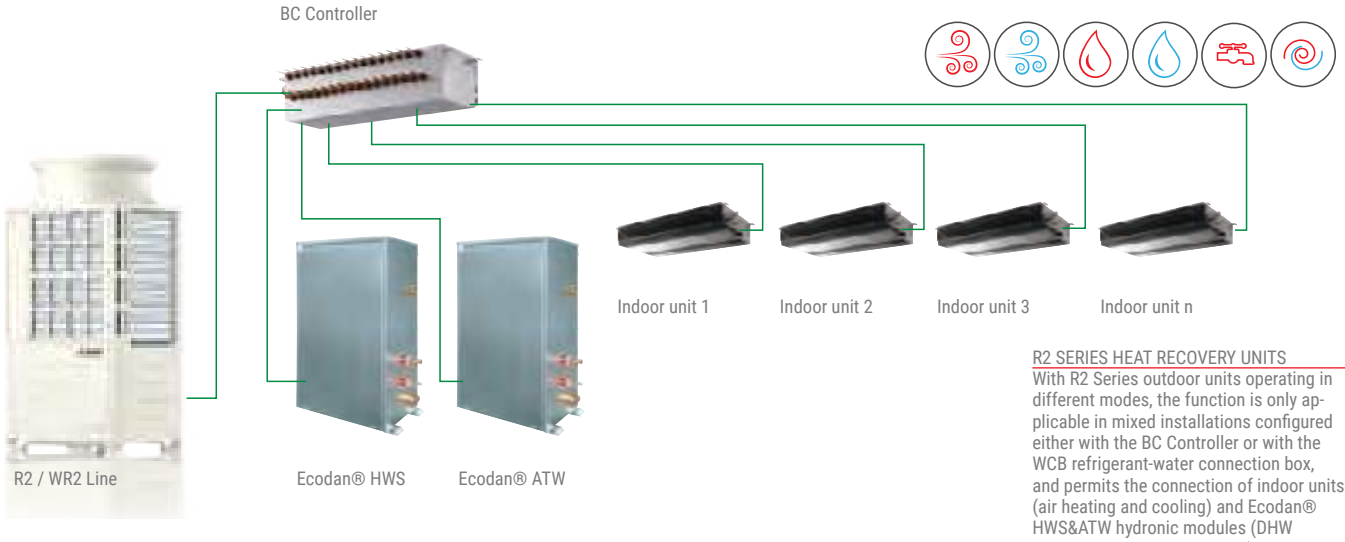
SCHEMATIC: ECODAN® VRF HWS & ATW (SIMULTANEOUS HEATING, COOLING AND DOMESTIC HOT WATER PRODUCTION)



200% EXTENDED CONNECTIVITY FUNCTION

Y SERIES HEAT PUMP UNITS

With Y Series outdoor units, this function is only applicable in mixed installations and allows the connection of indoor units (air heating or cooling) and an Ecodan® ATW hydronic module (water heating) with a total capacity index up to 200% of the capacity of the outdoor unit.*



R2 SERIES HEAT RECOVERY UNITS

With R2 Series outdoor units operating in different modes, the function is only applicable in mixed installations configured either with the BC Controller or with the WCB refrigerant-water connection box, and permits the connection of indoor units (air heating and cooling) and Ecodan® HWS&ATW hydronic modules (DHW production and water heating) with a total capacity index up to 200% of the capacity of the outdoor unit.*

*For detailed informations, please contact your representative


EXIT

PACKAGED HWHP

PACKAGED - AIR TO WATER / CAHV - Domestic hot water

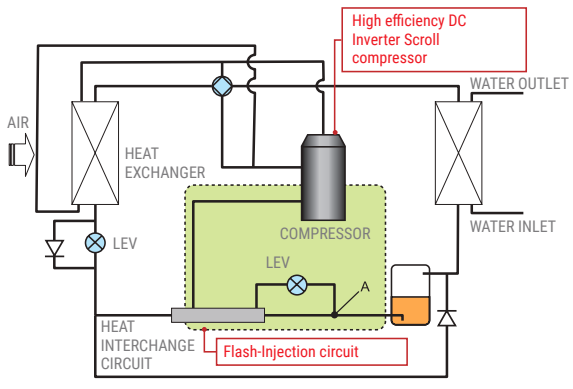
ErP A++
FOR MEDIUM TEMPERATURE APPLICATIONS

The Ecodan® - Packaged HWHP (Hot Water Heat Pump) system consists of a monoblock air condensing outdoor unit which produces very high volumes of high temperature hot water.

Technology

COP Over 4*

The "Flash-Injection Circuit" developed for the VRF CITY MULTI ZUBADAN Y system (a heat pump system for very cold climates) is installed in the new CAHV packaged Hot Water Heat Pump system. By using this advanced injection system and highly efficient compressors, the CAHV packaged system can deliver high temperature hot water at up to 70°C, and ensures less performance and capacity loss at very low outdoor temperatures.



* COP 4.13 – Outdoor temperature 7°C DB/ 6°C WB. Outlet water temperature 35°C.

Packaged AtW heat pumps for hot water

Mitsubishi Electric has been designing and manufacturing packaged heat pumps for hot water for the commercial sector since 1970. Mitsubishi Electric was one of the first manufacturers in Japan to use heat pump technology to produce hot water. Mitsubishi Electric was also the first manufacturer to develop a range of solutions operating with R407C. Even the first of these units were already capable of producing high temperature hot water at up to 70°C, which is high enough to instantaneously neutralise legionella bacteria.
Our products are still used today in industrial processes requiring high volumes of high temperature water.
Our Hot Water Heat Pump systems are used in commercial applications such as hotels and in hospitals and clinics, testifying to their superior reliability.
As the leading manufacturer of domestic hot water production systems, we are proud to present the efficient "Air to Water" packaged heat pump system.

Class beating heating capacity

The CAHV packaged system offers unrivalled flexibility with 2 operating modes to cater for every possible need: "Efficiency Mode (COP)" and "Capacity Mode". The system is capable of delivering a maximum capacity exceeding 70 kW in Capacity mode, while Efficiency mode (COP) is extremely effective for maximising energy efficiency in all operating conditions and, as a consequence, reducing CO_2 emissions.

Efficiency mode (COP)

Outlet water temperature 35°C.	Outdoor temperature	°C DB	-20	-10	0	7	20
	Capacity	kW	31.9	40.3	42.7	45.0	45.0

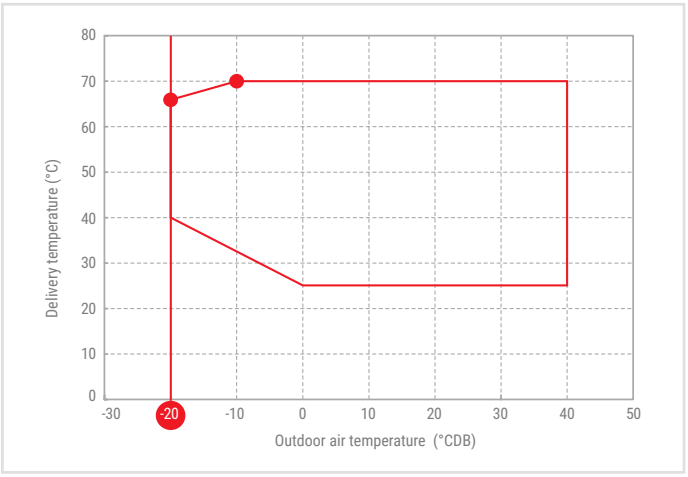
Capacity Mode

Outlet water temperature 35°C.	Outdoor temperature	°C DB	-20	-10	0	7	20
	Capacity	kW	31.9	40.3	42.7	63.4	73.9

Operation guaranteed at temperatures as low as -20 °C

The CAHV packaged system is capable of operating at outdoor temperatures from -20°C to 40°C. The system produces high temperature hot water (65°C), even on the coldest days of the year.

In the defrost cycle, the two compressors of the system operate in alternation to limit the drop in delivery temperature.



Backup function and rotation Function

Backup Function
Rotation Function

The "Backup*" function of the CAHV packaged system ensures superior reliability. If one of the two DC Scroll Inverter compressors equipping the individual system fails, the other compressor continues to operate to prevent the discomfort caused by the system shutting down completely. In this state, however, the thermal capacity of the system is obviously halved.

The "Rotation" function is another key solution ensuring uniform operation and maximising the life span of all the compressors in CAHV packaged systems in multiple configurations. In an installation with two or more systems, the individual systems operate in alternation if the thermal demand does not require the systems to function simultaneously.

Cascade systems

For applications with demands for very large volumes of hot water production, a flexible, modular thermal power installation may be created with up to 16 CAHV packaged systems, for a maximum output of up to 720 kW. This installation solution offers superlative modulability, as each individual system is equipped with two DC Scroll Inverter compressors, ensuring that the thermal power is adjusted progressively and with extreme precision in relation to the effective demand for hot water. This optimises the operation of the entire installation, with only a portion of the CAHV packaged installation operating in mid-load conditions and during spring and autumn.
A malfunction of one or more CAHV packaged systems does not compromise the operation of the other systems in the installation, ensuring safety and uninterrupted operativity.

High overpressure fans

60 Pa External static pressure

The new fan technology employed in the CAHV packaged system means that it can also be used to create ducted installations, further increasing the installation flexibility of the system. The static external pressure of the fans is settable from 0 Pa to 60 Pa.

Remote control via external contacts

Wide variety of external input/output

The wide choice of analogue and digital inputs and digital outputs available on the electronic board of the system makes it possible to control the system remotely from a BMS, a timer or external contacts.

The following are just some of the available input signals:

- Operating mode and hot water production temperature setpoint selection, choosing between "Heating Mode" and "ECO Heating Mode". The latter of these two modes is particularly advanced, as it uses the outdoor air compensation curve to automatically determine the water delivery setpoint.
- Operating mode and hot water production temperature setpoint selection, choosing between "Domestic Hot Water Mode" and "Heating Mode". This means that two different water temperature setpoints are settable: a higher value for domestic hot water production and lower value for heating. This improves performance at partial loads, as DHW is only produced when requested.
- Select between "Efficiency Mode (COP)" and "Capacity Mode" for the unit. The operation of the system may be optimised in relation to demand, increasing power or performance depending on the specific case.
- Select ON/OFF state in relation to signals received from flow regulator switch and circulation pump, for increased protection of the hydronic circuit and to ensure that the system functions correctly.

The following are just some of the available output signals:

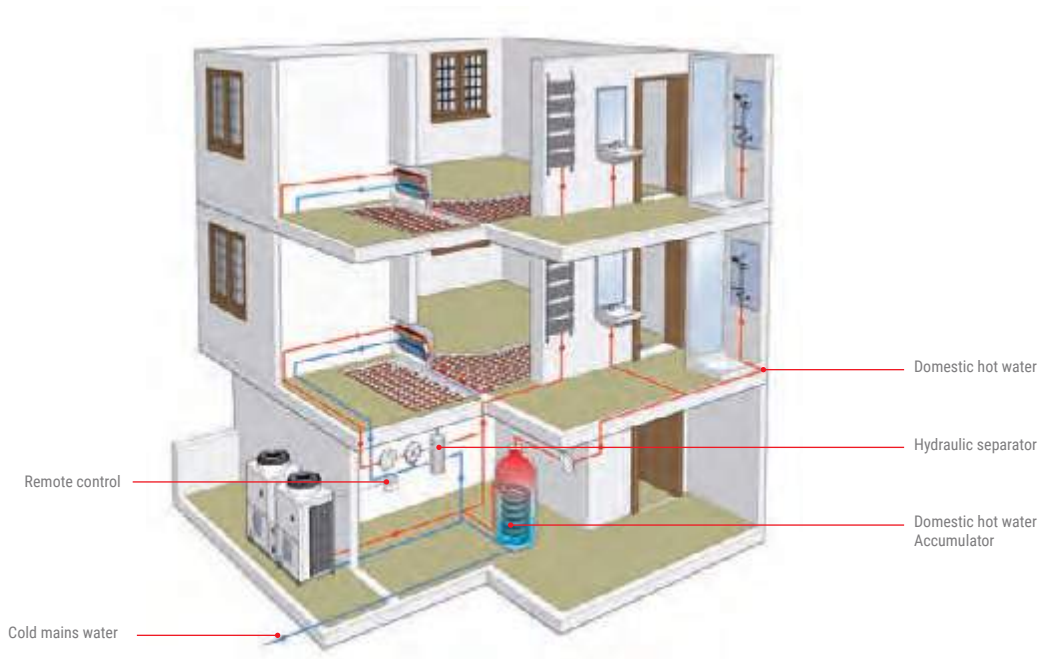
- A digital output may be activated at a selectable minimum water temperature to start a thermal power generator (boiler, thermal solar panel etc.) to substitute the system when the system is in OFF state.
- Unit defrost signal.

The result is extraordinary control flexibility either locally, using the dedicated PAR-W21MAA remote controller, or remotely, using external contacts.

Control and monitoring functionality with centralized WEB Server controllers

The CAHV packaged system is capable of interfacing via the M-Net data transmission bus with the **WEB Server 3D Touch** and **3D Blind Controller** centralized controllers of the VRF CITY MULTI control system range.
Depending on the application, the CAHV packaged system may be interfaced with a VRF CITY MULTI system to optimise operation when catering for hot water, heating and air conditioning demands, or, alternatively, to manage, monitor and supervise the system in stand-alone configuration for applications requiring solely the production of large volumes of hot water.
In both cases, the system may be controlled either from the 10.4" backlit, touch screen colour display of the 3DT controller, or via the internet using the Web pages of either centralized controller.

SCHEMATIC: ECODAN® PACKAGED HWHP CAHV (LOW AND HIGH TEMPERATURE HEATING + DHW)



Technical specifications DOMESTIC HOT WATER

MODEL			CAHV-P500YA-HPB (-BS)
Power			A 3-phase e 4 cables 380-400-415V 50/60Hz
Nominal heating nominal*1		kW	45
	Power absorption	kW	12.9
	Current consumption	A	21.78-20.69-19.94
	COP		3.49
Nominal heating nominal*2		kW	45
	Power absorption	kW	10.9
	Current consumption	A	10.6
	COP		4.13
Nominal heating nominale*3		kW	45
	Power absorption	kW	25.6
	Current consumption	A	43.17-41.01-39.53
	COP		1.76
Temperature range	Delivery water temperature		25 ~ 70°C
	Outdoor air temperature	°CBS	-20 ~ 40°C
Water pressure loss			12.9kPa
Volume of water in circuit			7.5 m3/h – 15.0 m3/h
Water piping diameters	Return	mm	38.1 (Rc 1 ½") threaded
	Delivery	mm	38.1 (Rc 1 ½") threadedx
Sound pressure *1 a 1 m		dBA	59
Sound pressure *1 a 10 m		dBA	51
External dimensions	HxLxP	mm	1710 x 1978 x 759
Dry weight		kg	526
R407C refrigerant charge quantity		kg	5.5 x 2

Note:
*1 Nominal heating conditions: outdoor temperature 7°C DB/6°C WB; delivery water temperature 45°C; return water temperature 40°C.
*2 Nominal heating conditions: outdoor temperature 7°C DB/6°C WB; delivery water temperature 35°C; return water temperature 30°C.
*3 Nominal heating conditions: outdoor temperature 7°C DB/6°C WB; delivery water temperature 70°C.
* The water circuit must be a closed circuit.
* Install the unit in a location where the outdoor wet bulb temperature does not exceed 32°C.

PACKAGED HWHP

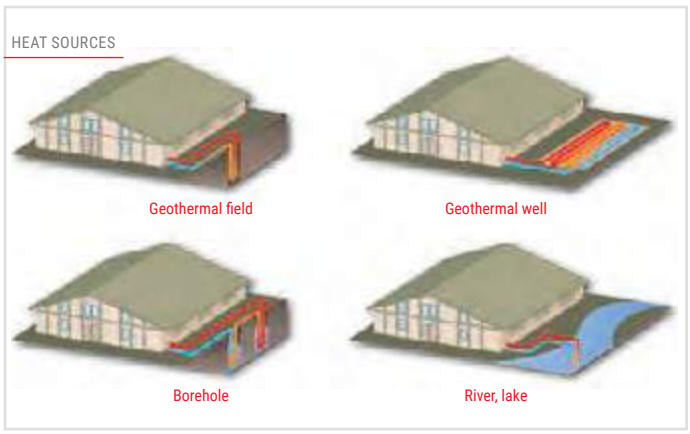
PACKAGED - WATER TO WATER / CRHV - Domestic hot water

ErP A++
FOR MEDIUM TEMPERATURE APPLICATIONS

The Ecodan® - Packaged HWHP (Hot Water Heat Pump) system consists of a monoblock water condensing outdoor unit which produces very high volumes of high temperature hot water.

Packaged WtW heat pumps for hot water

The new Hot Water Heat Pump Packaged Water to Water CRHV completes the Mitsubishi Electric range of heat pumps for hot water production, confirming its leadership in the production of these systems. Equipped with two compressors using R410A refrigerant delivering a nominal capacity up to 60kW and drawing energy from the ground, the CRHV packaged system is the ideal solution for geothermal applications and applications using borehole, river or lake water as a heat source to produce hot water for heating or domestic hot water up to 65°C. The Hot Water Heat Pump CRHV offers class beating innovation and efficiency.

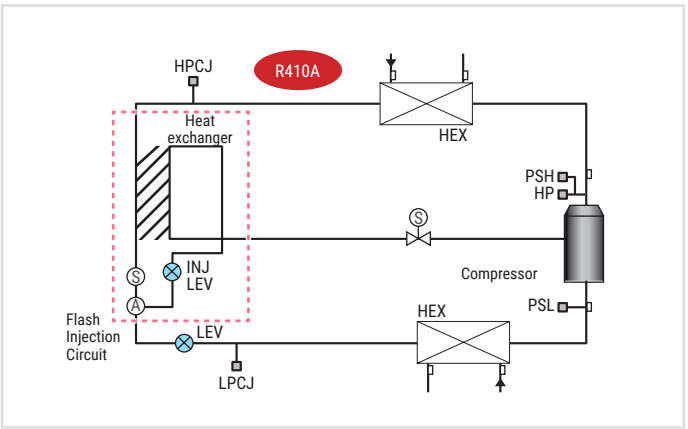


Technology

SCOP Over 4*

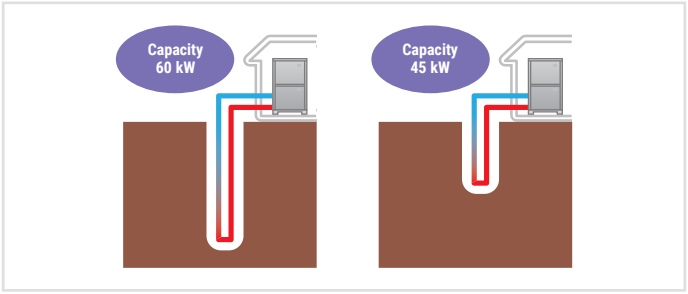
The new CRHV packaged system is also equipped with "Flash-Injection Circuit" developed for the VRF CITY MULTI ZUBADAN Y system (a heat pump system for very cold climates). By using this advanced injection system and highly efficient compressors, the CRHV packaged system can deliver high temperature hot water at up to 65°C, ensuring superior performance and capacity even at very cold outdoor temperatures.

* SCOP 4.33 – Outlet water/glycol temperature -3°C. Outlet water temperature 35°C.



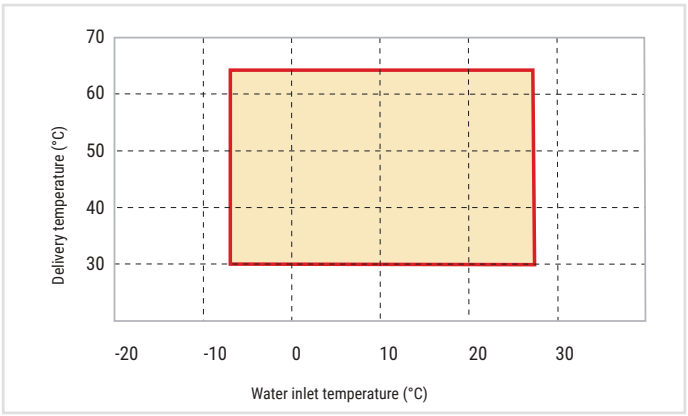
Upgrading existing systems

The new CRHV packaged system can reuse existing geothermal probes or wells, adapting to their effective thermal capacity.
The inverter-driven CRHV packaged system is capable of adjusting its thermal capacity between 45kW and 60kW in relation to the effective amount of heat deliverable by the existing geothermal well.



Operating temperatures

The new CRHV packaged system is capable of operating at incoming source water temperatures between -8°C and 27°C with a counterflow configuration, while the incoming source water temperature range may be extended to up to 45°C using a parallel flow configuration.
The water delivery temperature range is from 30°C and 65°C (in parallel flow configuration, the maximum water delivery temperature is 60°C at incoming water temperatures above 27°C).
The CRHV packaged system is also suitable for indoor installation.



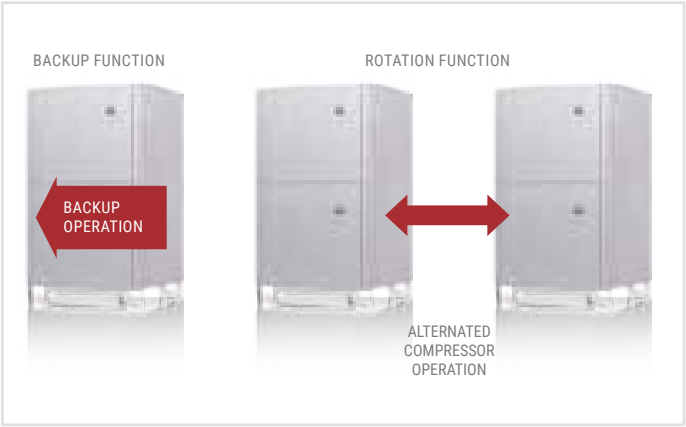
Finish treatment

The module can also be ordered with an optional special protective treatment for installation in particularly harsh or corrosive environments.

Backup function and rotation function

Backup Function
Rotation Function

The "Backup*" function of the CRHV packaged system ensures superior reliability. If one of the two DC Scroll Inverter compressors equipping the individual system fails, the other compressor continues to operate to prevent the discomfort caused by the system shutting down completely. In this state, however, the thermal capacity of the system is obviously halved.
The "Rotation" function is another key solution ensuring uniform operation and maximising the life span of all the compressors in CRHV packaged systems in multiple configurations. In an installation with two or more systems, the individual systems operate in alternation if the thermal demand does not require the systems to function simultaneously.



Cascade systems

For applications with demands for very large volumes of hot water production, a flexible, modular thermal power installation may be created with up to 16 CRHV packaged systems, for a maximum output of up to 960 kW, with integrated cascade control. This installation solution offers superlative modulability, as each individual system is equipped with two DC Scroll Inverter compressors, ensuring that the thermal power is adjusted progressively and with extreme precision in relation to the effective demand for hot water.
This optimises the operation of the entire installation, with only a portion of the CRHV packaged installation operating in mid-load conditions and during spring and autumn.
A malfunction of one or more CRHV packaged systems does not compromise the operation of the other systems in the installation, ensuring safety and uninterrupted operativity.

Remote control via external contacts

Wide variety of external input/output

The wide choice of analogue and digital inputs and digital outputs available on the electronic board of the system makes it possible to control the system remotely from a BMS, a timer or external contacts.
The following are just some of the available input signals:

- Operating mode and hot water production temperature setpoint selection, choosing between "Heating Mode" and "ECO Heating Mode". The latter of these two modes is particularly advanced, as it uses the outdoor air compensation curve to automatically determine the water delivery setpoint.
- Operating mode and hot water production temperature setpoint selection, choosing between "Domestic Hot Water Mode" and "Heating Mode". This means that two different water temperature setpoints are settable: a higher value for domestic hot water production and lower value for heating. This improves performance at partial loads, as DHW is only produced when requested.
- Select between "Efficiency Mode (COP)" and "Capacity Mode" for the unit. The operation of the system may be optimised in relation to demand, increasing power or performance depending on the specific case.
- Select ON/OFF state in relation to signals received from flow regulator switch and circulation pump, for increased protection of the hydronic circuit and to ensure that the system functions correctly.

The following are just some of the available output signals:

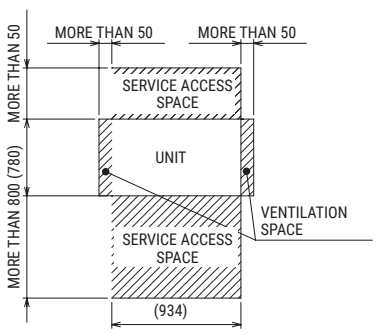
- A digital output may be activated at a selectable minimum water temperature to start a thermal power generator (boiler, thermal solar panel etc.) to substitute the system in certain conditions when the system is in OFF state.
- Manage 3-way valve in relation to domestic hot water or heating water demand.
- Manage pumps on circuit hot water side and heat source side (ON/OFF).

The result is extraordinary control flexibility either locally, using the dedicated PAR-W21MAA remote controller, or remotely, using external contacts.

Compact dimensions

The compact footprint of the units has been made possible by a new, highly efficient, low pressure loss heat exchanger. Installation footprint 0.73 m²*

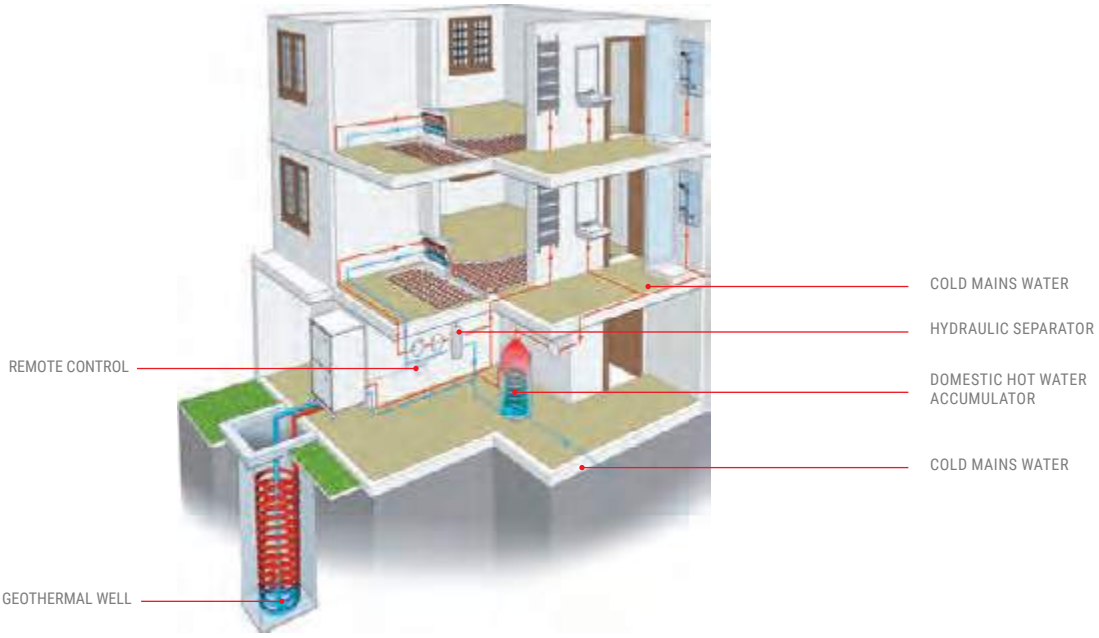
*footprint of one unit, not including service access space for maintenance.



Control and monitoring functionality with centralized WEB Server controllers

The CRHV packaged system is capable of interfacing via the M-Net data transmission bus with the **WEB Server 3D Touch** and **3D Blind Controller** centralized controllers of the VRF CITY MULTI control system range. Depending on the application, the CRHV packaged system may be interfaced with a VRF CITY MULTI system to optimise operation when catering for hot water, heating and air conditioning demands, or, alternatively, to manage, monitor and supervise the system in stand-alone configuration for applications requiring solely the production of large volumes of hot water. In both cases, the system may be controlled either from the 10.4" backlit, touch screen colour display of the 3DT controller, or via the internet using the Web pages of either centralized controller.

SCHEMATIC: ECODAN® PACKAGED HWHP CRHV (LOW AND HIGH TEMPERATURE HEATING + DHW)



Technical specifications DOMESTIC HOT WATER

MODEL			CRHV-P600YA-HPB
Power			A 3-phase and 4 cables 380-400-415V 50/60Hz
SCOP (power 60 kW) EN14825 Ave. climate conditions	Heat source water/glycol 0/-3°C, Hot water 30/35°C		4.33
	Heat source water/glycol 0/-3°C, Hot water 47/55°C		2.86
Nominal heating capacity 1 *1		kW	60
	Power absorption	kW	14.2
	Current consumption 380-400-415V	A	24.0 - 22.8 - 22.0
	COP		4.23
	Flow rate of water in circuit	m^3/h	10.3
	Flow rate of heat source water/glycol	m^3/h	14.7
Nominal heating capacity 2 *1		kW	45.0
	Power absorption	kW	10.2
	Current consumption 380-400-415V	A	17.2 - 16.4 - 15.8
	COP		4.41
	Flow rate of water in circuit	m^3/h	7.7
	Flow rate of heat source water/glycol	m^3/h	11.2
Heat source liquid			Ethylene glycol 35 WT% (freezing point -18°C)
Water pressure loss	Hot water side*3	kPa	14
	Heat source water/glycol side*3	kPa	38
Temperature range	Hot water side	°C	Hot water delivery 30 ~ 65
	Heat source water/glycol side	°C	(at inlet from source) -8 ~ 27
Hot water/heat source piping diameter	Return	mm (int)	50.8 (Rc 2") threaded
	Delivery	mm (int)	50.8 (Rc 2") threaded
Flow rate of water in circuit	Hot water side	m3/h	3.2 – 15.0
	Heat source water/glycol side	m3/h	4.5 – 16.0
AInstallation environment *4			indoor
Sound pressure (measured in anechoic chamber) at 1 m *3			50
Sound pressure (measured in anechoic chamber) *3			66
Dimensions	HxLxW		1561x934x780
Dry weight			395
R410A refrigerant charge quantity			4.5 x 2
Net weight		kg	
Ref. Charge R407C*4/CO_2 Eq		kg/Tons	9/18.79

Note:
*1 Nominal heating conditions: Hot water delivery temperature 35°C; water/glycol outlet temperature -3°C; hot water return temperature 30°C; water/glycol inlet temperature 0°C.
*2 Includes power absorption of pump in accordance with EN14511.
*3 Nominal heating conditions: Hot water delivery temperature 35°C; water/glycol outlet temperature -3°C; hot water return temperature 30°C; water/glycol inlet temperature 0°C. Power 60 kW, hot water flow rate 10.3 m^3; water/glycol flow rate 14.7 m^3.
*4 The unit is for indoor installation only. Do not install outdoors.

PACKAGED HWHP

PACKAGED - AIR TO WATER / QAHV - Domestic hot water

ErP A++
FOR MEDIUM TEMPERATURE APPLICATIONS

Ecodan QAHV is a packaged air condensed outdoor unit for massive hot water production at high temperature.

Technical specifications

- Water temperature: up to 90°C
- DC Scoll Inverter compressor
- Operating field: -25/+46°C
- CO_2 Natural Refrigerant
- GWP (global warming potential)=1
- ODP (ozone depletion potential)=0
- HIGH COP
- Power 40kW
- Cascade system up to 640kW
- M-Net compatible

Hot water production system

Econdan QAHV is the innovative solution by Mitsubishi Electric for high temperature hot water production, using CO2 as refrigerant gas. This allows to supply hot water at high temperatures, up tp 90°C and 40kW capacity. QAHV finds his application in those contexts which need continuous and stady hot water supply, such as hotels, nursing homes, wellness center and schools.

CO_2 as refrigerant gas

CO_2 can be found in nature, it is not toxic or harmful to the environment. It does not contributes to ozone depletion (ODP=0) and its contribution to global warming is negligible (GWP=1).

Operating filed extended to -25°C

Thanks to "Flash-Injection Circuit" (same as VRF CITY MULTI ZUBADAN Y) Packaged unit QAHV can operate between -25°C and +43°C. Moreover, the unit is able to supply hot water at 90°C and 40kW capacity down to -3°C.

High efficiency

New Packaged QAHV grants and high COP when meeting certain conditions. Water temperature difference between supply and return is fondamental for high performances.

Technical specifications DOMESTIC HOT WATER

MODEL			QAHV-N560YA-HPB
Power supply			3-phase 380-400-415V 50/60Hz
Nominal heating capacity *1		kW	40
	Power input	kW	10,31
	Current	A	17,8-16,9-16,3
	COP		3,88
Nominal heating capacity*2		kW	40
	Power input	kW	10,97
	Current	A	20,0-19,0-18,3
	COP		3,65
Nominal heating capacity *3		kW	40
	Power input	kW	11,6
	Current	A	20,4-19,4-18,7
	COP		3,44
Temperature range*4	Supply	°C	55~90°C
	Outdoor	°C	-25 ~ +43
Energy efficiency heating rank in warm climate*5	Rank		A
Energy efficiency for heating in warm climate*5	ηwh		103%
Circulation pump			included
Circulation pump pressure		kPa (l/min)	77 kPa (17 l/min)
Water piping diameter		mm	19,05 (3/4")
		mm	19,05 (3/4")
Sound pressure level at 1 m		dB(A)	56
External dimentions		mm	1837 (1777 not including legs)x1220x760
Net weight		kg	400
Water pressure		Mpa	1
Ref. Charge R744*6/Eq CO_2		kg/Tons	6,5/0,0065

Nota:
*1 Heating nominal conditions: outdoor temperature 16°CBS/12°CBU; supply water temperature 65°C; inlet water temperature 40°C
*2 Heating nominal conditions: outdoor temperature 7°CBS/6°CBU; supply water temperature 65°C; inlet water temperature 9°C
*3 Heating nominal conditions: outdoor temperature 7°CBS/6°CBU; supply water temperature 65°C; inlet water temperature 15°C
*4 Refer to installation and instruction manual.
*5 Warm conditions: solar radiation and outdoor temperature condition of Strasburg.
*6 GWP of R744 equals to 1 according to regulation 517 / 2014
* Do not install where wet bulb temperature exceeds 32°C
* Comply with water quality specification as reported in technical documentation.

Ventilation

All fresh air (AFA)

Lossnay enthalpy heat recovery (LGH)

Floor standing Lossnay (LGF)

Outdoor air treatment indoor units (GUF)

TYPE	MODEL NAME	MODEL	Air flow (mc/h)				
			500	600	800	1000	
All fresh air (AFA)	PEFY-P125VMHS-E-F PEFY-P200VMHS-E-F PEFY-P250VMHS-E-F	NEW 					
						•	
Lossnay Enthalpy heat recovery (LGH)	LGH-50RVX-E LGH-65RVX-E LGH-80RVX-E LGH-100RVX-E						
			•	•	•	•	
	LGH-150RVX-E LGH-200RVX-E						
	LGH-150RVXT-E LGH-200RVXT-E LGH-250RVXT-E						
Floor standing lossnay (LGF)	LGF-100GX-E						
						•	
Outdoor air treatment indoor units (GUF)	GUF-50RD(H)4 GUF-100RD(H)4						
			•			•	
Outdoor air treatment units	WZDX 3000 WZDX 5000 WZDX 7500 WZDX 10000 WZDX 12500 WZDX 15000 WZDX 20000						

	Air flow (mc/h)									
	1500	2000	2500	3000	5000	7500	10000	12500	15000	20000
	•	•								
	•	•								
	•	•	•							
				•	•	•	•	•	•	•

PEFY-P VMHS-E-F NEW

OUTDOOR FRESH AIR INTAKE UNIT (AFA)

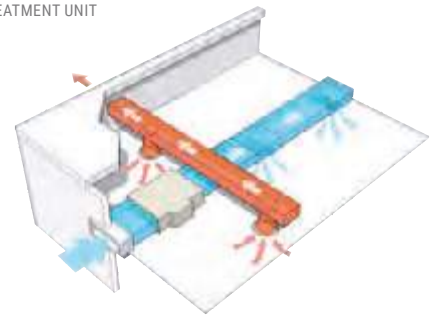
Ideal for...

...feeding temperature-controlled fresh outdoor air into building. The ideal solution for offices, large stores and restaurants.

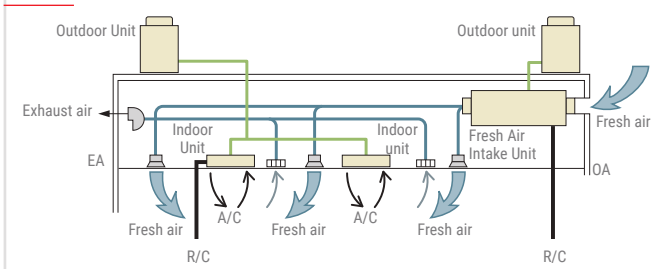
Enables intake of outside air

The indoor purified air delivery unit may be installed anywhere. The purified air delivery unit may be used to feed fresh, purified outdoor air into any building, in any place and at any time.

INSTALLATION OF INDOOR FRESH OUTDOOR AIR TREATMENT UNIT



OPERATING SCHEME - EXAMPLE



Controllable outlet air temperature

With new PEFY-P VMHS-E-F is possible to operate **Supply Air** temperature control.

OPERATION MODE	TEMPERATURE RANGE SETTABLE
COOL mode	14°C - 30°C
HEAT mode	17°C - 28°C
AUTO mode (single set point)	17°C - 28°C
FAN	Not settable

* In some cases the temperature of the air introduced into the ambient may be subject to fluctuations due to the conditions of the external air and to the operating conditions of the system.

Equipped with new DC fan motor

Fan motor has been changed to higher efficiency DC motor. Power source has been changed from three-phase power supply to **single-phase** power supply for all sizes.

Maximum connectable indoor units capacity to outdoor unit

Max. 110% of outdoor unit capacity (100% in case of heating below -5°C).

Flexible air-flow setting

4 levels of external static pressure to choose. External static pressure can be set also by remote controller (PAR-33/40MAA, PAR-U02MEDA and PAR-CT01MA).

MODEL	P125	P200	P250
External Static Pressure (Pa)	<100>-<150>-200-<250>		

* The factory setting of external static pressure is shown without chevrons "< >,".

Two types of air-flow modes are available, each of which has three air-flow rates to choose from:
- Normal Airflow rate
- High Airflow rate

Air-flow rates are accesible from the remote controller (PAR-33/40MAA, PAR-U02MEDA and PAR-CT01MA).

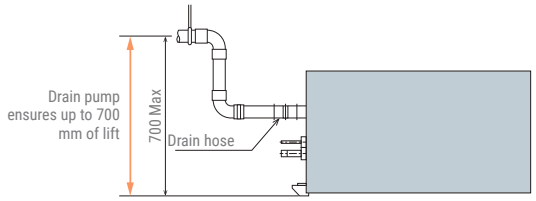
Mode	Normal-airflow rate	High-airflow rate
Air-flow rate	Low-Medium-High	Low-Medium-High

Drain pump (optional)

Greater design flexibility made possible by the increased head height (700 mm max).

UNIT MODEL	DRAIN PUMP MODEL
PEFY-P125 VMHS-E-F	PAC-DRP10DP-E2
PEFY-P200 VMHS-E-F	PAC-KE06DM-F
PEFY-P250 VMHS-E-F	PAC-KE06DM-F

DRAIN PUMP (OPTIONAL)



Specifications

MODEL			PEFY-P125VMHS-E-F		PEFY-P200VMHS-E-F		PEFY-P250VMHS-E-F	
Power source	V/phase/Hz		1 phase, 220-230-240V 50/60 Hz					
Cooling capacity *1		kW	14.0		22.4		28.0	
		Btu/h	47,800		76,400		95,500	
Heating capacity *2		kW	8.9		13.9		17.4	
		Btu/h	30,400		47,400		59,400	
Temperature range	Cooling		17°C D.B./15.5°C W.B. ÷ 43°C D.B./35°C W.B. Thermo-off (FAN-mode) automatically starts if the outdoor temperature is lower than 17°CD.B.					
	Heating		'-10°C D.B. ÷ 20°C D.B. Thermo-off (FAN-mode) automatically starts if the outdoor temperature is higher than 20°CD.B.					
Power input *3	Cooling	kW	0.220		0.260		0.350	
	Heating	kW	0.230		0.270		0.360	
Current input *3	Cooling	A	1.43		1.66		2.16	
	Heating	A	1.52		1.85		2.38	
External finish			Galvanized					
External dimension HxWxD		mm	380x1195x900		470x1250x1120		470x1250x1120	
Net weight		kg	49		78		81	
Heat exchanger			Cross fin (aluminum fin and copper tube)					
Motor	Type		DC Motor					
	Output	kW	0.244		0.375		0.375	
Refrigerant piping diameter	Gas (brazed)	mm	15.88		19.05		22.22	
	Liquid (brazed)	mm	9.52		9.52		9.52	
Field drain pipe size		mm	O.D. 32		O.D. 32		O.D. 32	
Fan	Type x Quantity		Sirocco fan x 1		Sirocco fan x 2		Sirocco fan x 2	
	External static press.*4	Pa	<100> - <150> - 200 - <250>					
	Air flow rate *5		Normal Airflow rate mode	High Airflow	Normal Airflow	High Airflow	Normal Airflow	High Airflow
		m^3/min	14.0 - 15.5 - 18.0	15.5 - 18.0 - 20.0	22.5 - 25.0 - 28.0	25.0 - 28.0 - 32.0	28.0 - 31.0 - 35.0	31.0 - 35.0 - 40.0
		L/s	233 - 258 - 300	258 - 300 - 333	375 - 417 - 467	417 - 467 - 533	467 - 517 - 583	517 - 583 - 667
		cfm	494 - 547 - 636	547 - 636 - 706	794 - 883 - 898	883 - 989 - 1,130	989 - 1,095 - 1,236	1,095 - 1,236 - 1,412
Sound pressure level *2 (Low-Mid-High)			Normal Airflow	High Airflow	Normal Airflow	High Airflow	Normal Airflow	High Airflow
		dB(A)	34-37-41	36-40-42	35-38-41	36-39-42	38-40-44	38-41-45

*1 Cooling capacity indicates the maximum value at operation under the following condition. Cooling: Indoor 33°CDB/28°CWB, Outdoor 33°CDB. The set temperature of the remote controller is 18°C.
*2 Heating capacity indicates the maximum value at operation under the following condition. Heating: Indoor 0°CDB/-2.9°CWB, Outdoor 0°CDB/-2.9°CWB. The set temperature of the remote controller is 25°C.
*3 The value are measured at the factory setting of airflow mode and external static pressure.
*4 The factory setting of airflow mode and external static pressure mode is shown without < >. Refer to "Fan characteristics curves", according to the external static pressure, in DATA BOOK for the usable range of air flow rate.
*5 If the airflow rate is over the usable range, dew drop can be caused from the air outlet and the air flow rate is changed automatically because of the output down by the fan motor control. If the air flow rate is less than the usable range, condensation from the unit surface can be caused.

- The combination of fresh air intake type indoor units with other types of indoor units to handle internal thermal load which may cause the conflict of operation mode. It is not recommended when fresh air intake type indoor unit is connected to the Y or WY series.
- Depending on the air conditioning load, outside temperature, and due to the activation of protection functions, the desired preset temperature may not always be achieved and the discharge temperature may swing. Note that untreated outside air may be delivered directly into the room upon the activation of protection functions.
- Fresh air intake type indoor units cannot be connected to PUMY and cannot be connected to an outdoor unit together with PWFY series.
- The maximum connectable indoor units to 1 outdoor unit are 110% (100% in case of heating below -5°C).
- When fresh air intake type indoor units connect to an outdoor unit together with other types of indoor unit, the total capacity of fresh air intake type indoor units needs to be 30% or less of the connected outdoor unit capacity.
- The AUTO mode on the local remote controller is available only when fresh air intake type indoor unit is connected to the R2 or WR2 series of outdoor unit.
- The system changeover function is available only when all the connected indoor units are fresh air intake type indoor units.
- The fan temporary stops during defrost.
- The cooling and heating capacities are the maximum capacities that were obtained by operating in the above air conditions and with a refrigerant pipe of about 7.5 m and a level difference of 0 m.
- The actual capacity characteristics vary with the combination of indoor and outdoor units. See the technical information in DATA BOOK for the details.
- Thermo off (Fan) operation automatically starts either when temperature is lower than 17°CDB in cooling mode or when the temperature exceeds 20°CDB in heating mode.
- Dry mode is not available.
- When this unit is used as sole A/C system, be careful about the dew in air outlet grilles in cooling mode.
- Un-conditioned outdoor air such as humid air or cold air blows to the indoor during thermo off operation. Please be careful when positioning indoor unit air outlet grilles, ie take the necessary precautions for cold air, and also insulate rooms for dew condensation prevention as required.
- Air filter must be installed in the air intake side. The filter should be attached where easy maintenance is possible in case of usage of field supply filters.

LGH-RVX(T)

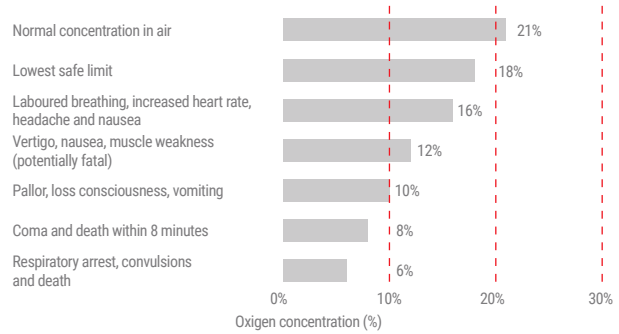
LOSSNAY - Heat recovery ventilation unit

Lossnay – Heat recovery ventilation units

The importance of adequate air exchange

Air quality is a primary parameter for comfort.Poor air quality in the office or at home has been proven to have a significantly detrimental influence on productivity and on the healthiness of the environment, and contribute to fatigue. This is due to increasing concentrations of CO2 caused by inadequate air exchange. To live comfortably, **every individual needs 40Ol of fresh air per hour.**Ensuring **adequate ventilation** in residential and commercial buildings is necessary **to offer a healthy, comfortable environment for all occupants.**

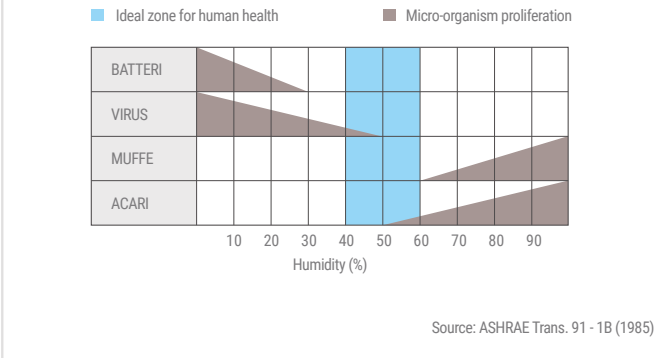
OXYGEN CONCENTRATIONS AND THE EFFECTS OF INADEQUATE OXYGEN LEVELS



The importance of correctly controlled humidity

A dry environment offers the ideal conditions for the proliferation of **bacteria and viruses**, and the survival rate of these micro-organisms drops rapidly at relative humidity levels above 50%. **Excessively humid environments**, on the other hand, encourage the proliferation of **mould and mites**. Precise humidity control is therefore an important factor in maintaining ideal, healthy conditions.

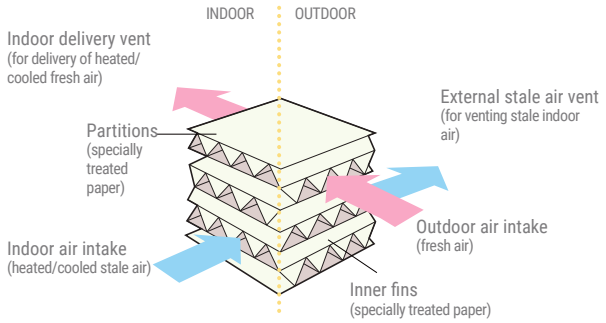
ACTIVITY OF MICRO-ORGANISMS IN RELATION TO HUMIDITY



Source: ASHRAE Trans. 91 - 1B (1985)

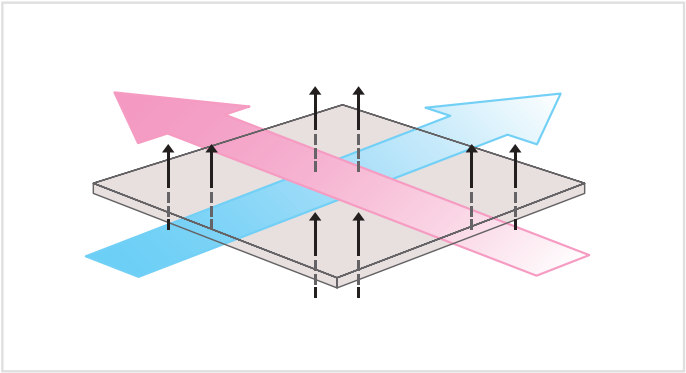
Simple construction

As shown in the figure, the Lossnay exchanger consists of a structure in special treated paper allowing two different air flows to cross one another and exchange thermal energy. Partitions separating the inlet and outlet channels prevent incoming fresh air from ever mixing with outgoing air.



Operating principle

The Lossnay exchanger performs a highly effective total exchange action for both temperature (sensible heat) and humidity (latent heat) – the system uses moisture permeable partitions in specially treated paper to allow stale air to be vented externally and fresh outdoor air to be fed to the indoor space with absolutely no mixing between the two air flows.



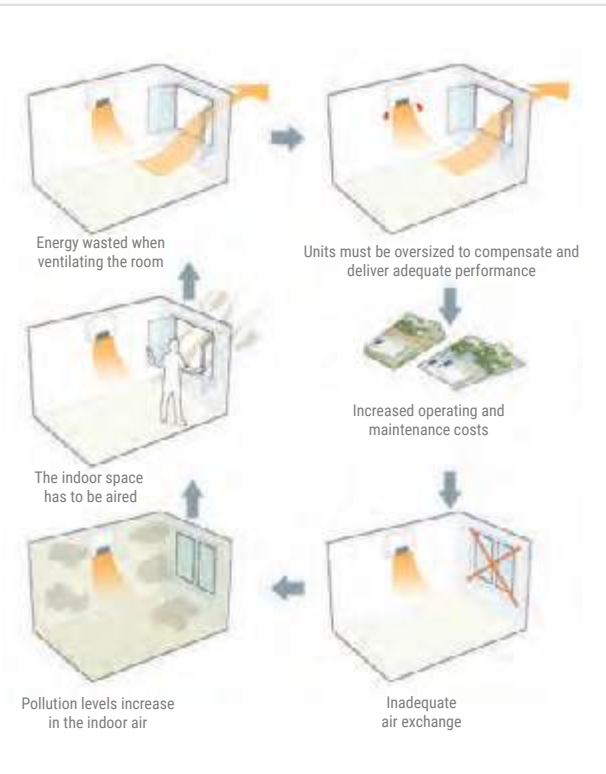
Energy recovery

Comfort and energy savings

With universally recognised efficiency, Lossnay heat exchanger ventilation units use energy recovery to offer significant energy savings.

A conventional ventilation system vents treated indoor air into the outdoor environment and replaces this air with outdoor air, causing the room to lose heat in winter and heat up in summer. This loss of heated/cooled air means that energy must be expended to restore comfortable temperature conditions in the indoor space. The result of this is notably higher air conditioning costs. To solve this problem while still ensuring the necessary air exchange, Mitsubishi Electric offers a range of thermal energy recovery ventilation systems, which minimise air conditioning costs.

All Lossnay units are equipped with class "G3" air filter. LGH models may also be equipped with a class "F7" high efficiency filter.



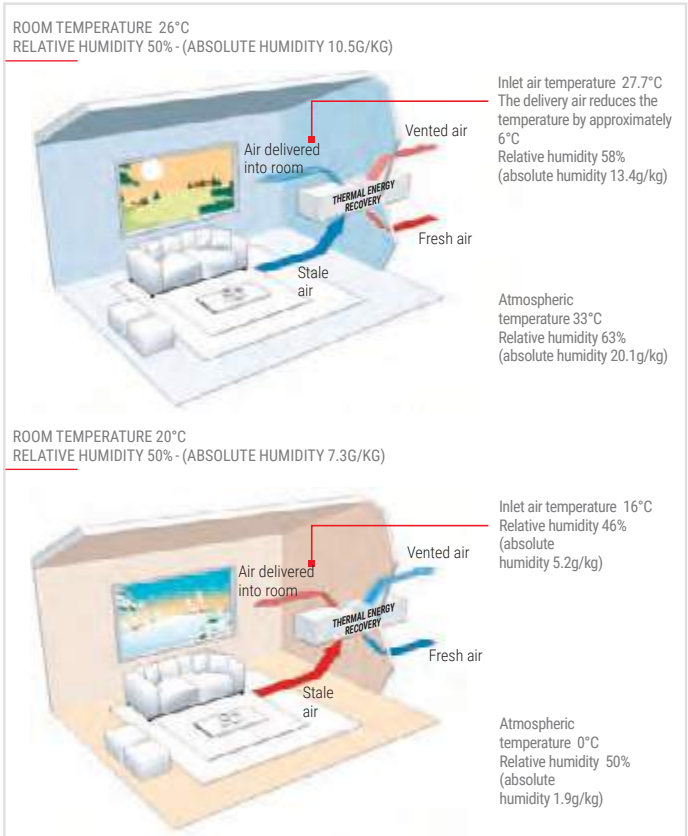
Comfortable air exchange action, in either cold or hot outdoor conditions

Summer - Difference in temperature between new fresh air and air already in room of only 1.7°C.

- Incoming fresh air is brought to the same conditions as the cooled (and dehumidified) air in the room.

Winter - 4 kg/h humidity recovered

- Incoming fresh air is brought to the same conditions as the warmed (and humidified) air in the room.



Low noise

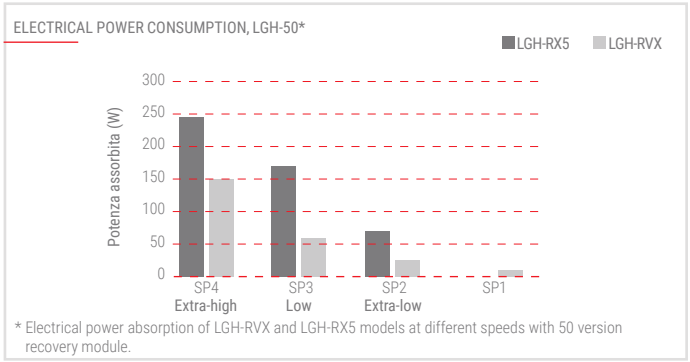
Precise control over the flow of treated air significantly reduces the sound pressure values of the LOSSNAY unit by up to 18 dB(A). All LGH-RVX units ensure ideal acoustic comfort, including for residential applications, libraries, offices etc.

Lossnay for energy savings

New DC FAN Motor

The new **DC motor** used throughout the new LGH-RVX series offers a number of advantages:

- **Very low electric power consumption**, especially at low speeds
- Lower noise emissions
- Increased flexibility and fine air flow adjustment from remote control.



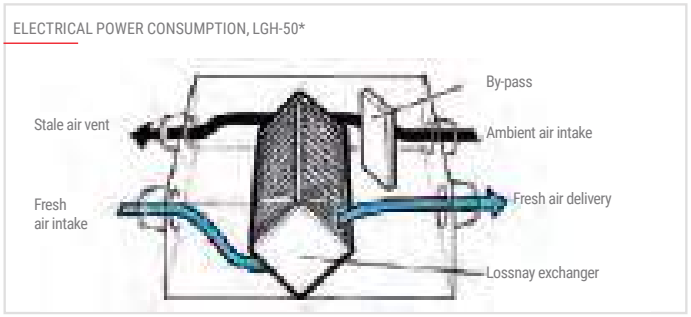
* Electrical power absorption of LGH-RVX and LGH-RX5 models at different speeds with 50 version recovery module.

Bypass shutter

The LGH-RVX series is equipped with a bypass shutter:

When the shutter is open, fresh air is fed to the interior space with no heat recovery, passing through the filter only.

The bypass shutter may be activated manually from the remote control, or automatically in specific thermal conditions (Free-Cooling).



New PZ-61DR-E dedicated remote control

The new wired remote control unit specifically for LGH-RVX heat recovery units boasts a fresh new look and new features.

- Possibility of managing a group of up to 15 units
- Simple and intuitive
- Backlit LCD screen
- Internal weekly timer
- Custom ventilation strategies for mode switching (Auto/recovery/bypass)
- Night purge function for active night-time ventilation in summer.

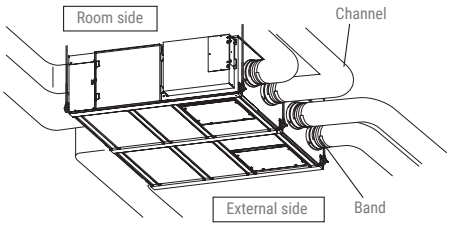
Easy installation

High air volumes and low height.

Three new models with important innovations have supplemented the LGH enthalpic recuperators line.

The RVXT models treat high volumes of air (up to 250m3/h) and are extremely low in height (only 500mm), a feature that makes them exceptionally flexible during installation, especially where the height of the false ceiling does not allow the use of RVX models.

The RVXT models are also equipped with an enthalpy exchange package in treated paper and are fitted with G3 filters as standard.



Compliant with ErP Directive, Lot 11

EU Regulation 327/2011, effective from 1 January 2015, implements the conditions specified in Directive ErP 2009/125 to encourage the design and manufacture of environmentally compatible energy consuming products with the goal of reducing CO2 emissions and energy consumption by 20% by 2020. All fans and ventilation units with electric motors with a rated power absorption between 125 W and 500 W fall within the scope of application of this regulation. The Mitsubishi Electric LGH-RVX-E Lossnay enthalpic recovery unit is compliant with this directive.

20% less consumption of primary energy sources

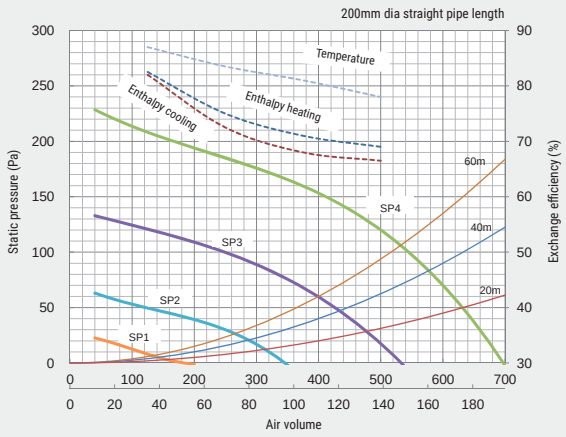
20% increase in renewable energy sources

20% iless CO_2 emissions

The European Union has set a series of very challenging environmental targets which must be attained by 2020. These targets are grouped together and described with the general title "20/20/20 Package", indicating an increase of 20% in the use of renewable energy sources over 1990 together with a reduction of 20% in primary energy source consumption and CO2 emissions.

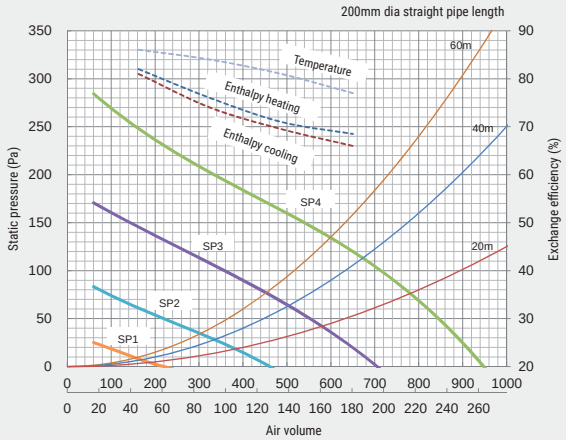
Technical specifications

MODEL			LGH-50RVX-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	1.15	0.59	0.26-0.27	0.13
Power input		W	165-173	78-81	32-35	12-14
Air volume		m³/h	500	375	250	125
		L/s	138.9	104.2	69.4	34.7
External static pressure		mmH_2O	12.24	6.93	3.06	0.82
		Pa	120	68	30	8
Temp. heat exch. Efficiency		%	78.0	81.0	83.5	87.0
Total heat exch. Efficiency	Cooling	%	66.5	68.0	72.5	82.0
	Heating	%	69.0	71.0	75.0	82.5
Sound pressure level		dB(A)	34-35	28-29	19-20	18
Duct qty x diameter		mm	4 x 200	4 x 200	4 x 200	4 x 200
Wheight		kg	33	33	33	33
Dimensions	HxLxD	mm	331x1016 x888	331x1016 x888	331x1016 x888	331x1016 x888
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



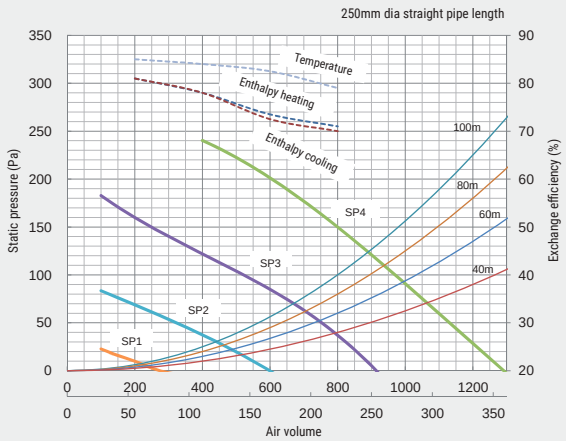
Technical specifications

MODEL			LGH-65RVX-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	.65-1.72	0.90-0.86	0.39-0.38	0.15-0.16
Power input		W	252-262	131	49-47	15-17
Air volume		m³/h	650	488	325	163
		L/s	180.6	135.4	90.3	45.1
External static pressure		mmH_2O	12.24	6.93	3.06	0.82
		Pa	120	68	30	8
Temp. heat exch. Efficiency		%	77.0	81.0	84.0	86.0
Total heat exch. Efficiency	Cooling	%	66.0	69.5	74.0	81.0
	Heating	%	68.5	71.0	76.0	82.0
Sound pressure level		dB(A)	34.5-35.5	29	22	18
Duct qty x diameter		mm	4 x 200	4 x 200	4 x 200	4 x 200
Wheight		kg	38	38	38	38
Dimensions	HxLxD	mm	404x954 x908	404x954 x908	404x954 x908	404x954 x908
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



Technical specifications

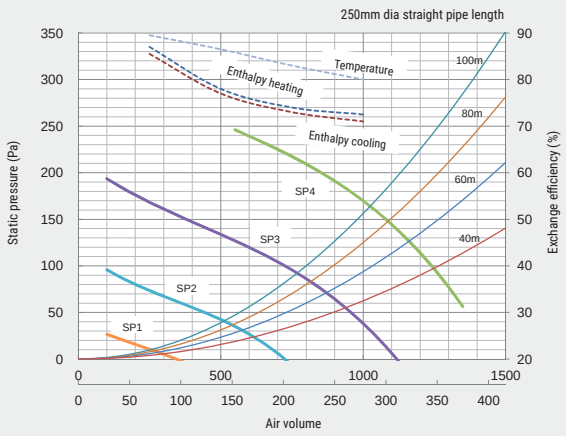
MODEL			LGH-80RVX-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	1.82-1.97	0.83-0.86	0.36-0.40	0.15-0.16
Power input		W	335-340	151	60-64	18-20
Air volume		m³/h	800	600	400	200
		L/s	222.2	166.7	111.1	55.6
External static pressure		mmH_2O	15.30	8.67	3.82	1.02
		Pa	150	85	37.5	10
Temp. heat exch. Efficiency		%	79.0	82.5	84.0	85.0
Total heat exch. Efficiency	Cooling	%	70.0	72.5	78.0	81.0
	Heating	%	71.0	73.5	78.0	81.0
Sound pressure level		dB(A)	34.5-36.0	30.0	23	18
Duct qty x diameter		mm	4 x 250	4 x 250	4 x 250	4 x 250
Wheight		kg	48	48	48	48
Dimensions	HxLxD	mm	404x1004 x1144	404x1004 x1144	404x1004 x1144	404x1004 x1144
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



* In case of temperature < -10°C fan will work discontinuously. Lossnay controlled heat generator is recommanded in this condition.

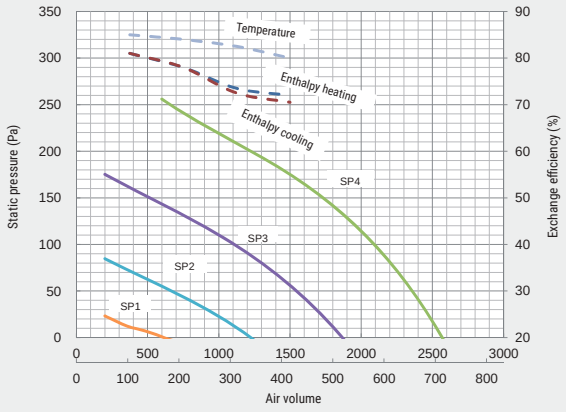
Technical specifications

MODEL			LGH-100RVX-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	2.50	1.20	0.50-0.51	0.17-0.19
Power input		W	420	200	75	21
Air volume		m^3/h	1000	750	500	250
		L/s	277.8	208.3	138.9	69.4
External static pressure		mmH_2O	17.34	9.75	4.33	1.08
		Pa	170	95.6	42.5	10.6
Temp. heat exch. Efficiency		%	80.0	83.0	86.5	89.5
Total heat exch. Efficiency	Cooling	%	71.0	73.0	77.0	85.5
	Heating	%	72.5	74.0	78.0	87.0
Sound pressure level		dB(A)	37-38	31-32	23-24	18
Duct qty x diameter		mm	4 x 250	4 x 250	4 x 250	4 x 250
Wheight		kg	54	54	54	54
Dimensions	HxLxD	mm	404x1231 x1144	404x1231 x1144	404x1231 x1144	404x1231 x1144
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



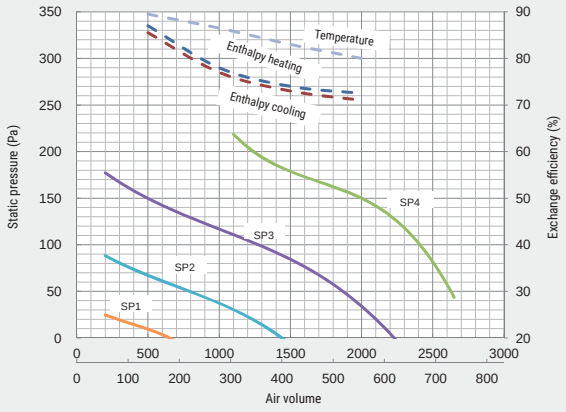
Technical specifications

MODEL			LGH-150RVX-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	3.71-3.85	1.75-1.78	0.70-0.78	0.29-0.30
Power input		W	670-698	311	123-124	38-44
Air volume		m^3/h	1500	1125	750	375
		L/s	416.7	312.5	208.3	104.2
External static pressure		mmH_2O	17.85	10.03	4.47	1.11
		Pa	175	98.4	43.8	10.9
Temp. heat exch. Efficiency		%	80.0	82.5	84.0	85.0
Total heat exch. Efficiency	Cooling	%	70.5	72.5	78.0	81.0
	Heating	%	72.0	73.5	78.0	81.0
Sound pressure level		dB(A)	39.0-40.5	32-33	24-26	18
Duct qty x diameter		mm	4 x 250 / 2 x (270x700)	4 x 250 / 2 x (270x700)	4 x 250 / 2 x (270x700)	4 x 250 / 2 x (270x700)
Wheight		kg	98	98	98	98
Dimensions	HxLxD	mm	808x1004x 1144	808x1004x 1144	808x1004x 1144	808x1004x 1144
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



Technical specifications

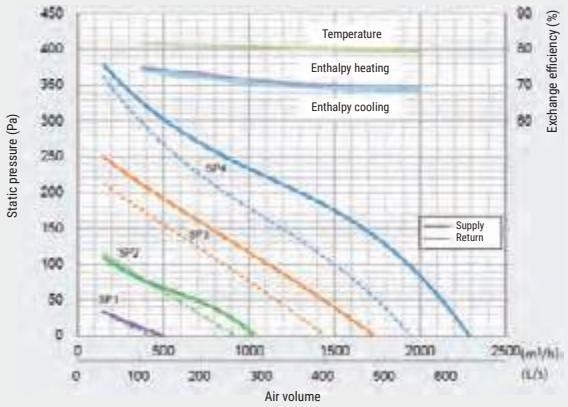
MODEL			LGH-200RVX-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	4.88-4.54	2.20-2.06	0.88-0.87	0.33-0.35
Power input		W	850-853	400-372	153-150	42-49
Air volume		m^3/h	2000	1500	1000	500
		L/s	555.6	416.7	277.8	138.9
External static pressure		mmH_2O	15.30	8.61	3.82	0.97
		Pa	150	84.4	37.5	9.5
Temp. heat exch. Efficiency		%	80.0	83.0	86.5	89.5
Total heat exch. Efficiency	Cooling	%	71.0	73.0	77.0	85.5
	Heating	%	72.5	74.0	78.0	87.0
Sound pressure level		dB(A)	40-41	40-41	40-41	40-41
Duct qty x diameter		mm	4 x 250 / 2 x (270x700)	4 x 250 / 2 x (270x700)	4 x 250 / 2 x (270x700)	4 x 250 / 2 x (270x700)
Wheight		kg	110	110	110	110
Dimensions	HxLxD	mm	808x1231 x1144	808x1231 x1144	808x1231 x1144	808x1231 x1144
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



* In case of temperature < -10°C fan will work discontinuously. Lossnay controlled heat generator is recommanded in this condition.

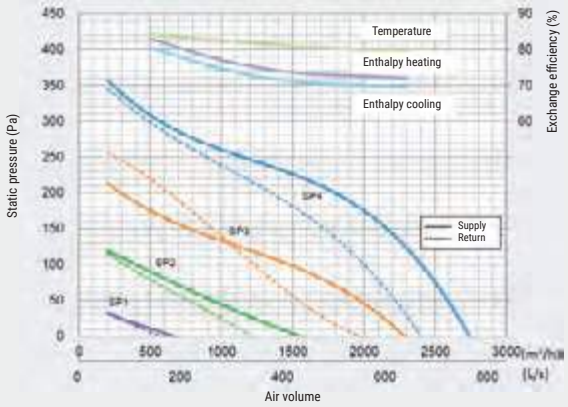
Technical specifications

MODEL			LGH-150RVXT-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	4.30 - 3.40	2.40 - 1.80	1.10 - 0.77	0.36 - 0.31
Power input		W	792 - 625	421 - 334	176 - 134	48 - 37
Air volume		m^3/h	1500	1125	750	375
		L/s	417	313	208	104
External static pressure		mmH_2O	175	98	44	11
		Pa	100	56	25	6
Temp. heat exch. Efficiency		%	80.0	80.5	81.0	81.5
Total heat exch. Efficiency	Cooling	%	69.0	70.0	72.0	74.0
	Heating	%	70.0	71.0	73.0	75.0
Sound pressure level		dB(A)	39.5	35.5	29.5	22.0
Duct qty x diameter		mm	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)
Wheight		kg	156	156	156	156
Dimensions	HxLxD	mm	500 x 1980 x 1500	500 x 1980 x 1500	500 x 1980 x 1500	500 x 1980 x 1500
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



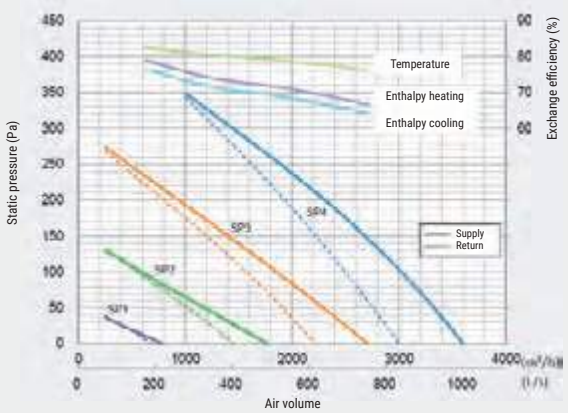
Technical specifications

MODEL			LGH-200RVXT-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	5.40 - 5.00	2.70 - 2.20	1.10 - 0.85	0.39 - 0.34
Power input		W	1000 - 916	494 - 407	197 - 150	56 - 45
Air volume		m^3/h	2000	1500	1000	500
		L/s	556	417	278	139
External static pressure		mmH_2O	175	98	44	11
		Pa	100	56	25	6
Temp. heat exch. Efficiency		%	80.0	81.0	82.5	84.0
Total heat exch. Efficiency	Cooling	%	70.0	71.0	74.5	80.5
	Heating	%	72.5	73.5	77.0	83.0
Sound pressure level		dB(A)	39.5	35.5	28.0	22.0
Duct qty x diameter		mm	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)
Wheight		kg	159	159	159	159
Dimensions	HxLxD	mm	500 x 1980 x 1500	500 x 1980 x 1500	500 x 1980 x 1500	500 x 1980 x 1500
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



Technical specifications

MODEL			LGH-250RVXT-E			
Power supply		V/Phase/Hz	220-240 / 1-phase /50			
Speed			SP4	SP3	SP2	SP1
Current		A	7.60 - 6.90	3.60 - 3.10	1.40 - 1.30	0.57 - 0.49
Power input		W	1446 - 1298	687 - 587	244 - 212	82 - 69
Air volume		m^3/h	2500	1875	1250	625
		L/s	694	521	347	174
External static pressure		mmH_2O	175	98	44	11
		Pa	100	56	25	6
Temp. heat exch. Efficiency		%	77.0	79.0	80.5	82.5
Total heat exch. Efficiency	Cooling	%	65.5	69.0	71.5	76.5
	Heating	%	68.0	71.5	74.0	79.0
Sound pressure level		dB(A)	43.0	39.0	32.0	24.0
Duct qty x diameter		mm	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)	4 x 250 / 2 x (250x750)
Wheight		kg	198	198	198	198
Dimensions	HxLxD	mm	500 x 1980 x 1500	500 x 1980 x 1500	500 x 1980 x 1500	500 x 1980 x 1500
Operating field*	Outdoor temp.	°C	-10 ~ +40	-10 ~ +40	-10 ~ +40	-10 ~ +40
	Max outdoor RH	%	80	80	80	80
	Max indoor temp	°C	40	40	40	40
	Max indoor RH	%	80	80	80	80



* In case of temperature < -10°C fan will work discontinuously. Lossnay controlled heat generator is recommanded in this condition.

LGF-100GX-E

LOSSNAY ENTHALPIC HEAT RECOVERY UNIT FOR BASEMENT INSTALLATIONS

The **new Mitsubishi Electric LGF-100GX-E Lossnay enthalpic heat recovery unit** for basement installations delivers up to 1000 m³/h of fresh air and offers extraordinary installation and operational flexibility, complying with the most stringent air hygiene standards and with the latest regulations regarding air exchange in non-residential environments.

Easy installation and maintenance

The LGF-100GX-E is installed in a dedicated service area in the basement, allowing inspection without disturbing the occupants of the treated indoor space and eliminating undesirable noise. All air passage sections are easily accessible for maintenance and cleaning by simply removing all the main components and partition trays. This, combined with the potent filtration capacity, has made it possible to attain German VDI (Verein Deutscher Ingenieure) 6022 certification – one of the most stringent qualifications for industrial hygiene.

LGF-1000GX-E – Front view

Removing front panels

Removing filters and Lossnay recovery module

Cleaning partitions

Cleaning partitions

Removing ventilation section

Lossnay technology

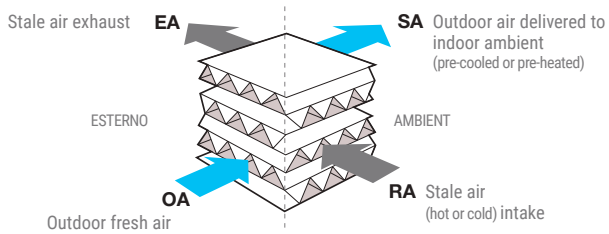
The Lossnay total heat recovery module has a cross-flow plate fin structure and heat transfer diaphragms in special treated paper. The excellent thermal transfer properties and permeability to moisture of this special paper ensure the highly efficient **exchange of both sensible and latent heat** between the two air flows passing through the recovery core. The result is a ventilation system with outstanding characteristics ensuring extremely high levels of comfort and wellbeing in the environment treated, which can also cut operating costs substantially.

The diaphragm pores, which were already microscopic in previous generations, have been further reduced in size to reduce the possibility of the passage of waterborne soluble gases such as ammonia and hydrogen from the exhausted stale air to the fresh air delivered to the indoor space.

To increase heat and moisture exchange, a special treatment is applied to the paper used for the diaphragms.

These improvements have increased moisture permeability while reducing permeability to harmful gases, resulting in an overall increase in recovery efficiency and a more effective barrier action against the transfer of these gases.

CONSTRUCTION AND OPERATING PRINCIPLE OF LOSSNAY UNIT



Total management

The LGF-100GX Lossnay unit may be managed from the dedicated PZ-60DR-E remote controller, which lets the user control a number of different parameters, choose between 3 operating modes (Heat recovery, Bypass and Automatic), and offers access to numerous functions devised for maximum comfort and energy savings (daily and weekly timer, night purge function). The LGF-100GX Lossnay unit may also be integrated **into the architecture of a Mitsubishi Electric VRF CITY MULTI system**, interlocked with the VRF indoor units of the system.

Bypass shutter

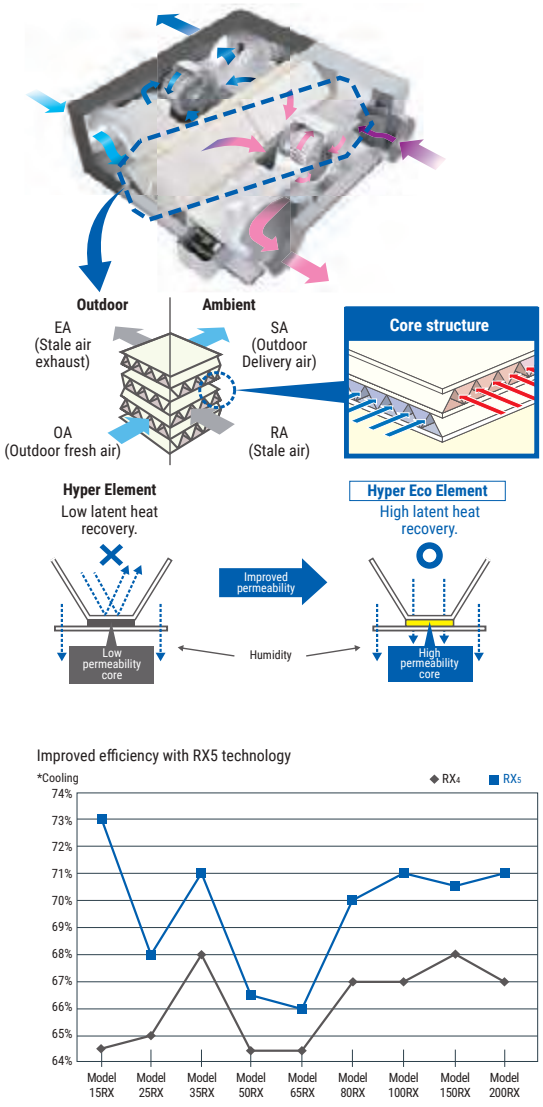
The bypass shutter diverts the inlet air flow from the indoor space directly to the outdoor vent and allows suitably filtered fresh outdoor air directly into the indoor space.

In addition to operation in automatic or manual mode, the bypass may also be operated remotely via an external contact, controlled in turn by a temperature sensor, a hygrometer sensor or a timer.

Superior performance

Increased energy savings due to greater thermal exchange efficiency

HYPER ECO ELEMENT



The Mitsubishi Electric enthalpic heat recovery unit offers unparalleled thermal exchange efficiency. The significant energy savings offered are due to the extraordinarily efficient latent and sensible heat recovery.

High effective static pressure

Selecting the "Extra high" fan speed setting makes it possible to produce effective static pressure values up to **200 Pa** for applications requiring long air duct lengths.

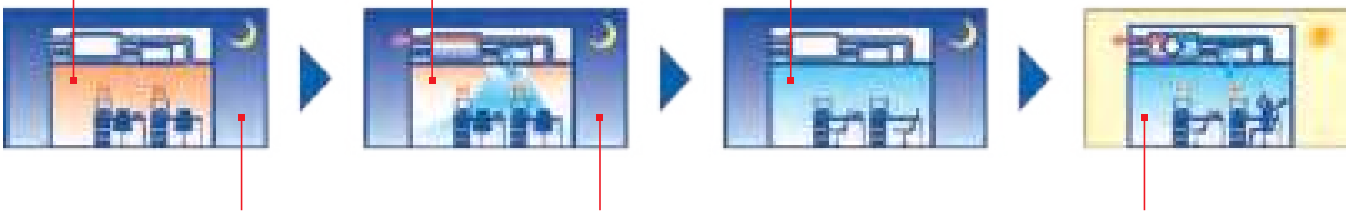
Night purge function

The bypass shutter is also used to implement the "Night Purge" energy saving function. This function is activated at night-time in summer, and uses the free thermal power of the cooler outdoor air to reduce the thermal load of the indoor space.

When the air conditioning and ventilation system is switched off, the internal ambient temperature increases as a result of the heat accumulated by the outer shell of the building and of the residual heat emitted by electrical devices.

When the external air temperature is lower than the internal ambient temperature, the Night Purge function activates the LGF in automatic ventilation mode.

Once the external air temperature and internal ambient temperature are equal, the Night Purge function of the LGF is deactivated, stopping ventilation.



At night, the external air temperature drops significantly.

The accumulated heat is transferred out of the interior by this ventilation action.

The following day, the heat load of the internal ambience that must be neutralised to attain the required setpoint is drastically reduced, which in turn reduces the energy consumption of the VRF system.

"Multi-ventilation" mode

The PZ-60DR remote control unit may be used to select 9 different delivery air and intake air fan speed combinations to cater for different needs and ambient thermal loads.

MULTI-VENTILATION MODE	DELIVERY AIR	INTAKE AIR
Balanced flows	Extra High	Extra High
	High	High
Energy saving ventilation	Low	Low
	Extra High	High
Positive pressure	Extra High	Low
	High	Low
	High	Extra High
Negative pressure	Low	Extra High
	Low	High

Note: the default setting is with balanced flows in High / High configuration.

High performance filtration

Equipped with two high efficiency **F7** filters – with one installed on the outdoor intake and one on the indoor air intake – the LGF-100GX-E may be used in all the building types specified in the latest regulations concerning ventilation and air exchange.

Compliant with ErP Directive, Lot 11

EU Regulation 327/2011, effective from 01.01.15, implements the conditions specified in Directive ErP 2009/125 to encourage the design and manufacture of environmentally compatible energy consuming products with the goal of reducing CO2 emissions and energy consumption by 20% by 2020.

All fans and ventilation units with electric motors with a rated power absorption **between 125 W and 500 W** fall within the scope of application of this regulation. The Mitsubishi Electric **LGF-100GX-E** Lossnay enthalpic recovery unit is compliant with this directive.

20% less consumption of primary energy sources

20% increase in renewable energy sources

20% less CO_2 emissions

The European Union has set a series of very challenging environmental targets which must be attained by 2020.
These targets are grouped together and described with the general title "20/20/20 Package", indicating an increase of 20% in the use of renewable energy sources over 1990 together with a reduction of 20% in primary energy source consumption and CO2 emissions.

Technical specifications

MODEL			LGF-100GX-E		
Speed			Extra High	High	Low
Air flow		m^3/h	995	995	890
Static pressure		Pa	200	150	119
Temp. Exchange Effic.		%	80	80	81
Enthalpic exchange efficiency	Heating	%	72.5	72.5	74
	Cooling	%	71	71	72
Sound pressure		dB(A)	49	47	44
Weight		kg	164		
Power			A single-phase 220-240VAC 50Hz		
Power absorption		W	922	790	785
Dimension	HxLxW	mm	1095x1760x674		

GUF-RD(H)4

MONOBLOCK INDOOR UNIT WITH FRESH AIR INTAKE FAN

Lossnay

Monoblock indoor unit with fresh air intake fan, stale air exhaust fan, filtration system, Lossnay total heat recovery module, bypass shutter, permeable film humidifier (only for RDH4 version) and direct expansion coil.

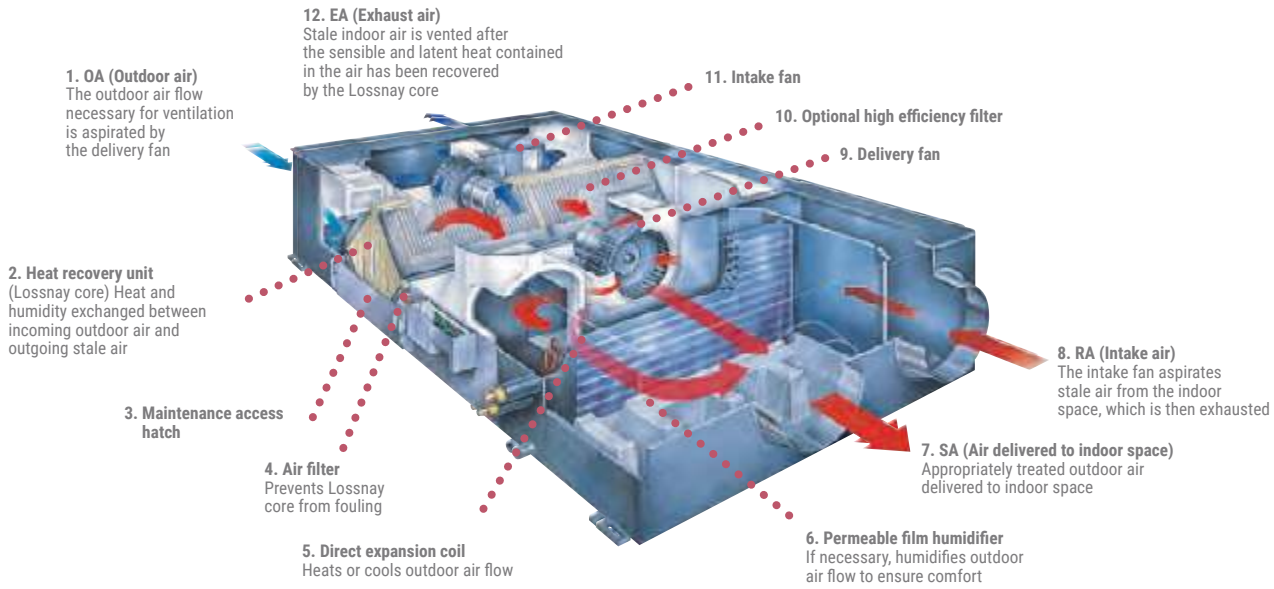
Serie RD(H)4

GUF-50RD(H)4

Cooling capacity 5.57 (DX coil: 3.63, Lossnay core: 1.94) kW Heating capacity 6.18 (DX coil: 6.21, Lossnay core: 2.04) kW 500 m³/h 220-240V 50Hz single-phase

GUF-100RD(H)4

Cooling capacity 11.44 (DX coil: 3.63, Lossnay core: 3.85) kW Heating capacity 12.56 (DX coil: 8.30, Lossnay core: 4.26) kW 500 m³/h 220-240V 50Hz single-phase



Lossnay technology

The Lossnay total heat recovery module has a cross-flow plate fin structure and heat transfer diaphragms in special treated paper. The excellent thermal transfer properties and permeability to moisture of this special paper ensure the highly efficient exchange of **both sensible and latent heat** between the two air flows passing through the recovery core. The result is a ventilation system with outstanding characteristics ensuring extremely high levels of comfort and wellbeing in the environment treated, which can also cut operating costs substantially.

The incoming fresh air and outgoing stale air cannot mix within the core. The diaphragm pores, which were already microscopic in previous generations, have been further reduced in size to reduce the possibility of the passage of waterborne soluble gases such as ammonia and hydrogen. To increase heat and moisture exchange, a special treatment is applied to the paper used for the diaphragms. These improvements have increased moisture permeability while reducing permeability to harmful gases, resulting in an overall increase in recovery efficiency and a more effective barrier action against the transfer of these gases.

IN GENERAL
GUF – For optimum indoor air quality
GUF = (Lossnay) + (heating & cooling)

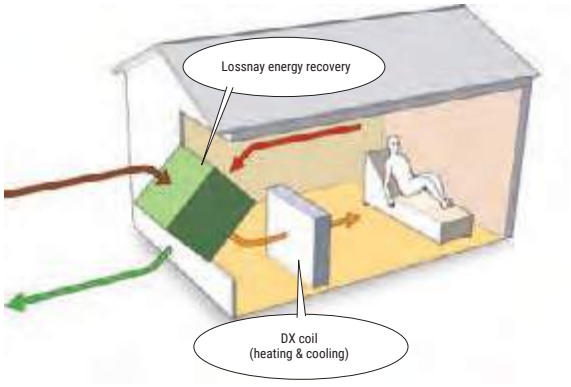
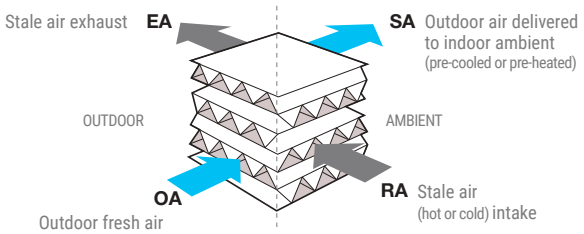


IMAGE OF GUF MODEL

CONSTRUCTION AND OPERATING PRINCIPLE OF LOSSNAY UNIT



Heat exchanger

A direct expansion coil incorporated in the unit makes it possible to cover approximately 25% of the load of the system with the **GUF** unit. This also means that the terminal units installed in the indoor space can be smaller. Moreover, as the **GUF** unit covers the entire thermal load attributable to ventilation, this means that this load and the ambient load can be managed completely separately, simplifying the design process of the installation. The treated air heats the humidifier as it passes through it, further increasing humidification efficiency.

Total comfort

Maintaining the correct humidity levels in an indoor space ensures the ideal conditions for comfort and prevents the unpleasant side-effects typical of an environment with insufficient humidity such as dry eyes and throat.

The evaporation surface area is approximately 8.5 times larger than in a comparably sized natural evaporation humidifier, while performance is 6 times greater.

Humidification - RDH4 version

The innovative permeable film humidification system, which uses a natural evaporation process, is a particularly intelligent solution.

The efficiency with which the air is humidified has been significantly increased by reducing the resistance of the material used. A three-layer film ensures that only the necessary moisture is transferred to the air without any limescale dust release – a problem of certain conventional humidifiers.

Maintaining the correct humidity levels in an indoor space ensures the ideal conditions for comfort and prevents the unpleasant side-effects typical of an environment with insufficient humidity such as dry eyes and throat.

The evaporation surface area is approximately 8.5 times larger than in a comparably sized natural evaporation humidifier, while performance is 6 times greater.

Note: Use a demineraliser if residual total salt levels exceed 100 mg/l.

Increased efficiency of humidification process - RDH4 version

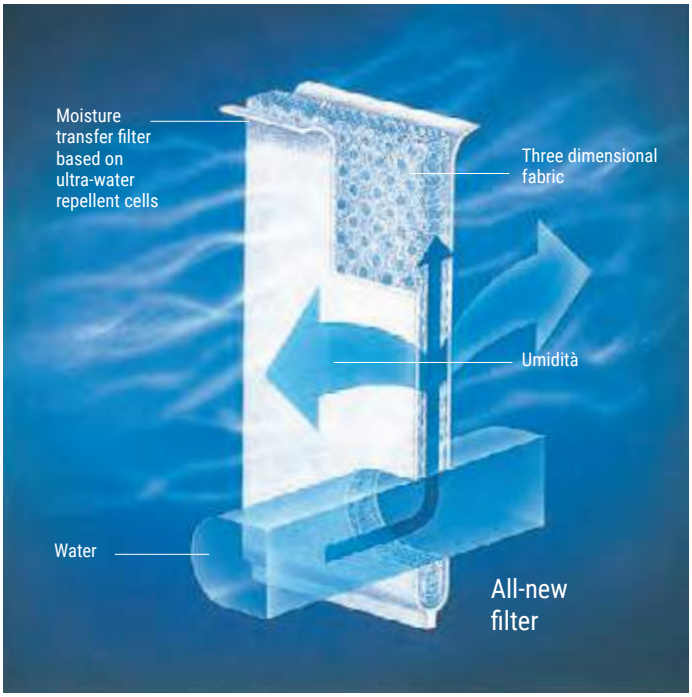
Optimised air flows within the unit together with a water injection system have significantly increased the efficiency of the humidification process. The system also controls the humidity in the outgoing stale air to effectively improve the air quality of the outdoor environment as well. This solution prevents limescale and silica dust from being carried in the air, so purer, less dusty air is vented into the outdoor environment.

Automatic free cooling

When the air conditioning is operating in cooling mode and the outdoor temperature is lower than the indoor ambient temperature (as normally occurs at night-time in summer), the **GUF** indoor unit recognises this condition and automatically bypasses the recovery core. The cooler outdoor air fed into the indoor space contributes to reducing the cooling demand sustained by the system.

Dust suppression

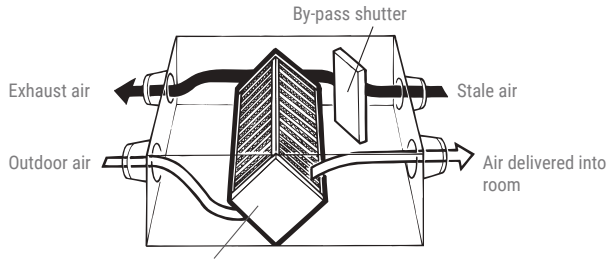
An optional high efficiency filter may be used for up to 3,000 hours while maintaining a filtration efficiency (evaluated with colorimetric testing) of over 65%. The filter may also be fitted in the **GUF** unit after initial installation and takes up no additional precious space.



Automatic regulation

GUF ventilation and recovery units may be integrated into a **Melans** control and regulation system for Mitsubishi Electric air conditioner installations, as they use the same bus used for connecting indoor units.

BY-PASS

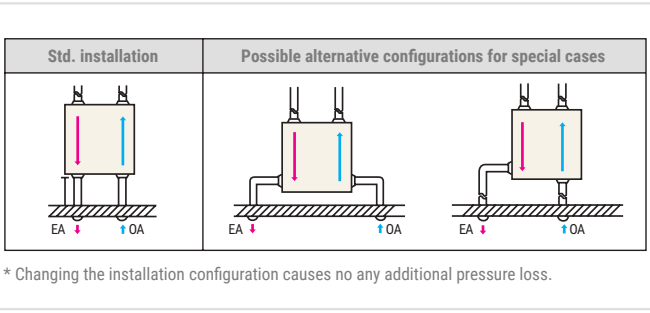


Advantages

- Reduced energy consumption
- Reduced thermal power necessary to treat outdoor air, equating to lower rated power
- Healthier environment
- Quieter operation (noise baffles in inlet and outlet)
- Free Cooling function using exclusively external air
- Humidification with film permeable to water vapour only
- Total air treatment (neutral air returned to outdoor environment)
- Custom temperature and humidity control
- Compact dimensions
- Installable in double ceilings with limited vertical space.

Flexible installation

The positions of air duct connections may be changed as needed to cater for different installation requirements.



* Changing the installation configuration causes no any additional pressure loss.

Compliant with ErP Directive, Lot 11

EU Regulation 327/2011, effective from 01.01.15, implements the conditions specified in Directive ErP 2009/125 to encourage the design and manufacture of environmentally compatible energy consuming products with the goal of reducing CO2 emissions and energy consumption by 20% by 2020. All fans and ventilation units with electric motors with a rated power absorption **between 125 W and 500 W** fall within the scope of application of this regulation. Mitsubishi Electric **GUF-50RDH4 and GUF-100RDH4** outdoor air treatment units are compliant with this directive.

20% less consumption of primary energy sources

20% increase in renewable energy sources

20% less CO_2 emissions

The European Union has set a series of very challenging environmental targets which must be attained by 2020.
These targets are grouped together and described with the general title "20/20/20 Package", indicating an increase of 20% in the use of renewable energy sources over 1990 together with a reduction of 20% in primary energy source consumption and CO2 emissions.

Technical specifications

MODEL			GUF-50RDH4	GUF-100RDH4	GUF-50RD4	GUF-100RD4
Power supply			1-phase 220-240V 50Hz			
Comunication system			In serie tramite rete M-NET: Mitsubishi Electric Air Conditioners Network System			
Lossnay	Mode		Air to Air Total heat recovery system			
	Material		Partition, Cross-flow structure, Special preserved paper-plate.			
Cooling capacity*1		kW	5,57 (1,94)	11,4 (4,12)	5,57 (1,94)	11,44 (4,12)
	Power input	W	235-265	480-505	235-265	480-505
	Curren	A	1,15	2,2	1,15	2,2
Heating capacity*1		kW	6,21 (2,04)	12,56 (4,26)	6,21 (2,04)	12,56 (4,26)
	Power input	W	235-265	480-505	235-265	480-505
	Current	A	1,15	2,2	1,15	2,2
Temperature heat recovery efficiency		%	77,5/80	79,5/81,5	77,5/80	79,5/81,5
Total heat recovery efficiency*2	Heating	%	68/71	71/74	68/71	71/74
	Cooling	%	65/67	69/71	65/67	69/71
Capacity index			P32	P63	P32	P63
Humidifier capacity		kg/h	2,7	5,4	-	-
Fan	Type x qty		SA: Centrifugal fan (Sirocco FAN) x 1 - EA: Centrifugal fan (Sirocco FAN) x 1			
	Static pressure	Pa	125	135	140	140
		mmH_2	12,7	13,8	14,3	14,3
	Motor		Totally enclosed capacitor permanent split-phase induction motor, 4 poles, 2 units			
	Flow rate (High speed)	m^3/h	500	1000	500	1000
		L/s	139	278	139	278
SPL (Low-High)		dB(A)	33,5-34,5	38-39	33,5-34,5	38-39
Ref. Piping diameter	Liquid	mm(in.)	Ø6,35(Ø1/4)	Ø9,52(Ø3/8)	Ø6,35(Ø1/4)	Ø9,52(Ø3/8)
	Gas	mm(in.)	Ø12,7(Ø1/2)	Ø15,88(Ø5/8)	Ø12,7(Ø1/2)	Ø15,88(Ø5/8)

*1 () value from Lossnay heat recovery.
*2 High/Low speed values.

Control Systems

Remote control

Wireless remote control

Remote control

Centralized control

Interface for hotel simplified application

Remote monitoring and control system

External signal integration

Control Systems

PAC-YT52CRA

DESIGN REMOTE CONTROL

PAR-FL32MA
PAR-SL100A-E

WIRELESS REMOTE CONTROL

PAR-40MAA NEW

DELUXE REMOTE CONTROL

PAR-W21MAA
PAR-W31MAA

ECODAN REMOTE CONTROL

PAR-CT01MA

PRISMA REMOTE CONTROL

PZ-61DR

LOSSNAY REMOTE CONTROL

PAR-U02MEDA

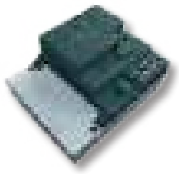
ADVANCED REMOTE CONTROL

AT-50B

SYSTEM CENTRALIZED CONTROL

AE-200E

3D TOUCH Controller
WEB SERVER CENTRALIZED CONTROL



EW-50

3D BLIND Controller
WEB SERVER CENTRALIZED CONTROL

3D TABLET CONTROLLER

WI-FI REMOTE MANAGEMENT SYSTEM

MELCloud® CITY MULTI

MELCloud CITY MULTI

CLOUD REMOTE MANAGEMENT SYSTEM

MELCOTEL NEW

INTERFACE FOR HOTEL SIMPLIFIED APPLICATION

REMOTE MONITORING INTERFACE
Available on the App Store
ANDROID APP ON Google play

RMI

Remote Monitoring Interface
CLOUD REMOTE MANAGEMENT SYSTEM

M-NET-AHC-24VDC

INTEGRATION OF EXTERNAL SIGNALS

B.M.S. INTERFACE

B.M.S. INTEGRATION

PAC-YT52CRA

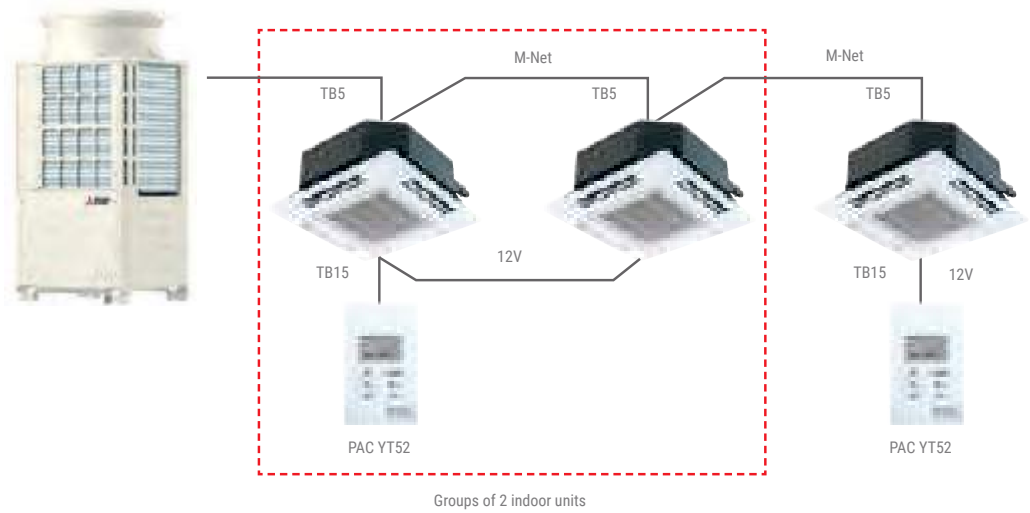
DESIGN REMOTE CONTROL

PAC-YT52CRA Design remote control

- Display with white backlighting.
- Simple wall-mounted installation.
- Easy and intuitive with icon-based interface.
- Operating mode selection function.
- Vane position selection function (for compatible indoor units).
- Usable to manage 1 group of up to 16 indoor units.
- Simple connection with single non-polarised two-core wire.
- **MA** self-addressing technology.
- Suitable for all types of indoor unit.
- Recommended for hotels and public spaces, as ambient air temperature display can be disabled.
- Integrated temperature sensor usable instead of indoor unit sensor.
- Configurable temperature range settable from local keypad.

Key Technologies

dual Setpoint				



Groups of 2 indoor units

PAR-40MAA NEW

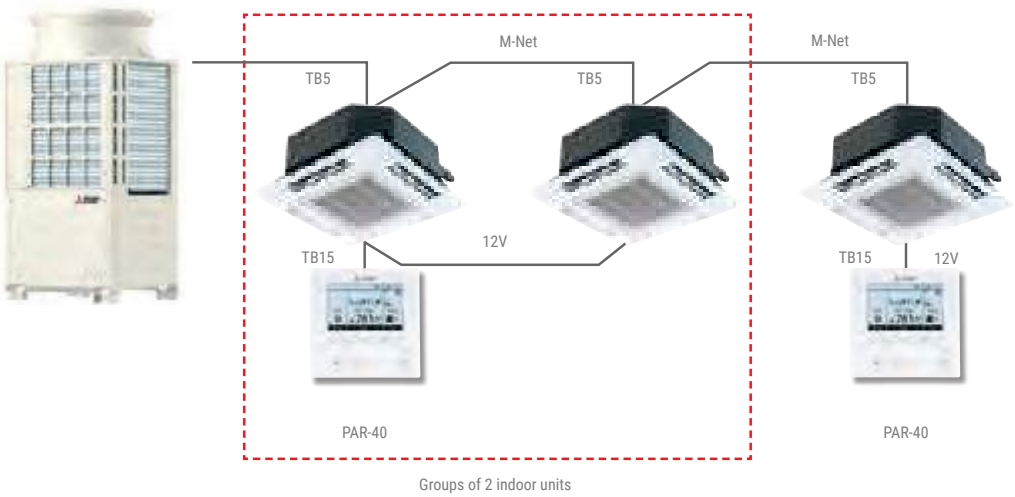
DELUXE REMOTE CONTROL UNIT

PAR-40MAA Deluxe remote control unit

- Compared to the previous version (PAR-33MA) is slimmer by 4.5mm (depth), allowing for more flexible installation.
- Display with white (factory setting) or black backlighting and adjustable contrast.
- Simple wall-mounted installation.
- Night Set-back function for setting minimum winter temperature or maximum summer temperature in temperature maintenance mode.
- Effective static overpressure selection function for ducted indoor units (PEFY-P VMHS only).
- Internal weekly timer function and simplified internal timers (Auto-off, etc.).
- Usable to manage 1 group of up to 16 indoor units.
- Easy and intuitive, with icon based graphic interface, direct control buttons and function buttons.
- Simple connection with single non-polarised two-core wire.
- **MA** self-addressing technology.
- Suitable for all types of indoor unit, including GUF.
- Integrated temperature sensor usable instead of indoor unit sensor.
- Configurable temperature range settable from local keypad.
- **View and set setpoint temperatures in 0.5°C increments.**
- Supports 3D i-see sensor functions
- **14 languages available** (English, French, Spanish, German, Italian, Dutch, Portuguese, Greek, Russian, Czech, Turkish, Polish, Hungarian, Swedish)

Key Technologies

dual Setpoint				



PAR-CT01MA

PRISMA REMOTE CONTROL

PAR-CT01MAA-SB

PAR-CT01MAA-PB

PAR-CT01MA prisma remote control

- Full color touch panel display
- 180 color patterns can be selected for control parameters or background on the display
- Easy wall mounted installation
- Night Set-back function for setting minimum winter temperature or maximum summer temperature in temperature maintenance mode.
- Effective static overpressure selection function for ducted indoor units (PEFY-P VMHS only).
- Internal weekly timer function and simplified internal timers (Auto-off, etc.).
- Usable to manage 1 group of up to 16 indoor units.
- Easy and intuitive, with icon based graphic interface, direct control buttons and function buttons.
- Simple connection with single non-polarised two-core wire.
- MA self-addressing technology.
- Suitable for all types of indoor unit, including GUF.
- Recommended for groups with only one indoor unit.
- Integrated temperature sensor usable instead of indoor unit sensor.
- Configurable temperature range settable from local keypad.
- **View and set setpoint temperatures in 0.5°C increments.**
- **Supports 3D i-see sensor functions for 60 x 60 PLFY-P VFM-E1 cassette and 90 x 90 PLFY-P VEM-E cassette**

Key Technologies

dual Setpoint				

Multiple color pattern

180 MULTIPLE COLOR PATTERNS

Multilingual support

The smartphone app can be displayed in the language that the guest's smartphone is set to.

Large color backlit touch display

New PRISMA remote control is equipped by 3.5 inch/HVGA Full Color LCD Touch screen,

TOUCH PANEL

3,5 Inch/HVGA Full Color LCD

OPERATION PANEL

Temperature setting

Operation mode

Fan speed

Vane control

Ventilation

Louver control

Display customization

Customized display, color on parameter and background, editable parameter, logo image on the initial display.

Hotel setting

Simple operation panel is liked by users, especially in hotels. It is available to display only ON/OFF, set temp., fan speed.

Bluetooth connection

PAR-CT01MA remote control is equipped with Low Energy Bluetooth connection. Thanks to two dedicated Apps (one for installers and one for users) it is possible to connect your smartphone or tablet the the remote control. User App allows to control the air conditioning system connected to PAR-CT, with a simple and intuitive interface.

Installer App allows to easily configure the remote control during maintenance and commissioning. Thanks to this App it is possible to save a settings pattern on mobile device and easily transfer it to the remote control, shortening service and commissioning timing.

APP SCREEN IMAGE

* The Bluetooth® word mark is trademark of Bluetooth SIG, Inc, USA.
* Contact the sales company for information on "Bluetooth function.

Setting App

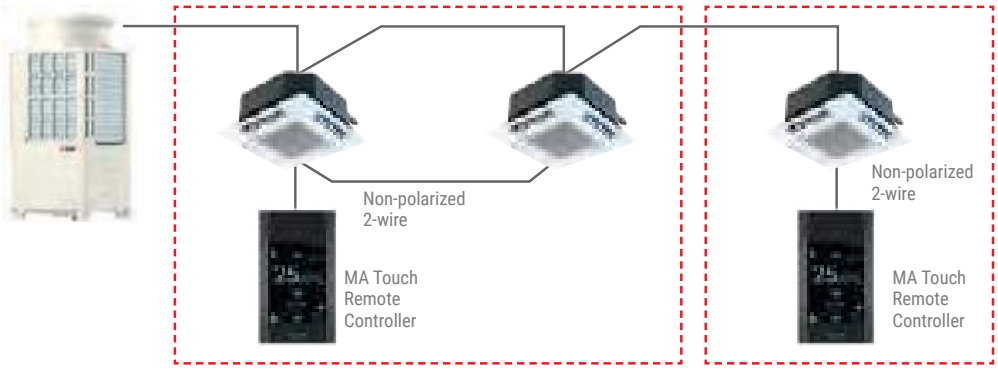
User App

Logo image customization

Logo image can be displayed on the initial screen.

LOGO IMAGE CUSTOMIZATION

SYSTEM EXAMPLE



*When a PAR-CT01MAA is connected to a group, no other MA remote controllers can be connected to the same group.

PAR-U02MEDA

ADVANCED REMOTE CONTROL

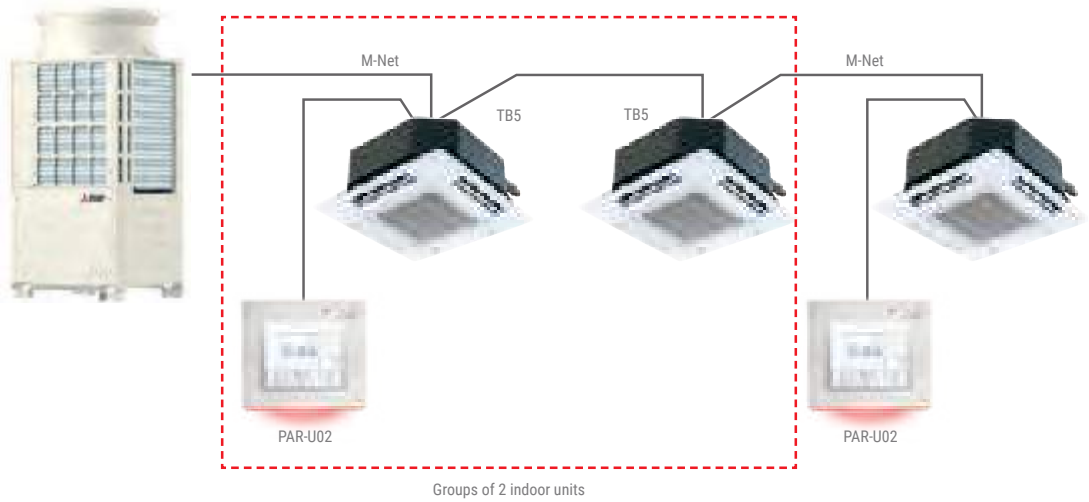
PAR-U02MEDA advanced remote control

The Mitsubishi Electric Advanced remote control may be used to control up to 16 indoor units. While advanced, this controller also offers basic functions such as monitoring and controlling the status of the units in the system, and a weekly hour timer. Four integrated sensors (temperature, humidity, occupancy and light) allow a series of advanced adjustment and control functions. For example, the occupancy sensor can be used to save energy by configuring different modes based on the occupied/vacant status of each room.

- Large monochrome LCD touch screen display with white backlighting.
- Usable to manage 1 group of up to 16 indoor units.
- **Integrated temperature, humidity, occupancy and light sensors.**
- SMART energy saving and comfort functions.
- Contextual colour LED indicating operating status of indoor units.
- **View and set setpoint temperatures in 0.5°C increments**
- **Dual Setpoint** function.
- Internal weekly timer.
- **ME M-Net** addressing technology.
- Extended setting ranges for setpoints (Cool: 19-35°C; Heat: 5-28°C).
- New functions for use in conjunction with AHC Programmable Controller (PLC M-Net), for creating operating strategies with generic devices.

Key Technologies

dual Setpoint				



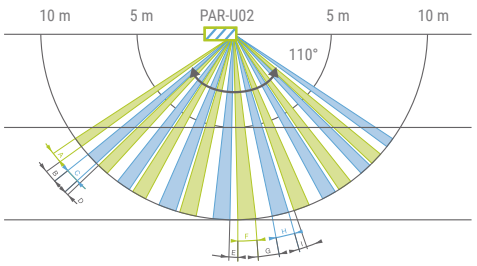
Groups of 2 indoor units

Occupancy sensor

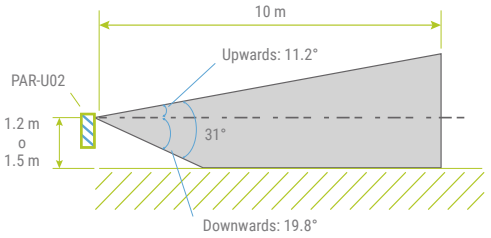
The occupancy sensor detects if a room is vacant and enables automatic control of the indoor units to implement energy saving strategies based on the effective occupancy of each room. The occupancy sensor enables the following energy saving functions:

- Switch indoor units ON/OFF based on occupied/vacant state of room;
- Fan speed control;
- Switch indoor unit from Thermo ON to Thermo OFF state;
- Configure temperature deviation based on occupied/vacant status.

RADIAL MEASUREMENT UP TO 10 M



EXTENDED SPATIAL MEASUREMENT



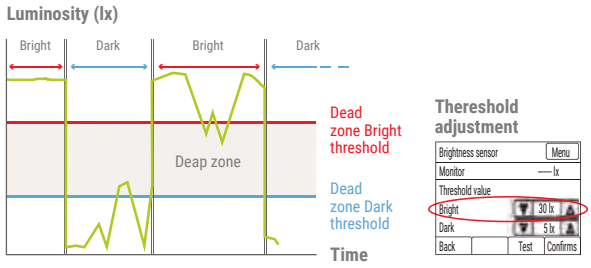
Light sensor

The light sensor measures the light levels in the conditioned room and adjusts the brightness of the remote control display accordingly.

Bright/dark thresholds may be set directly from the remote control over an extended luminosity range (1 to 65535 lx).

The light sensor is also used in low light conditions to confirm the occupied/vacant status of the room.

LIGHT SENSOR



Temperature and humidity sensor

The integrated temperature and humidity sensor may be used to increase perceived comfort levels,

while the ability to adjust the temperature with a precision of 0.5°C gives the user an even greater sense of control. The relative humidity sensor, combined with the ability to interlock the remote control with a programmable AHC controller, makes it possible to control humidity with external devices connected to the system via the AHC.

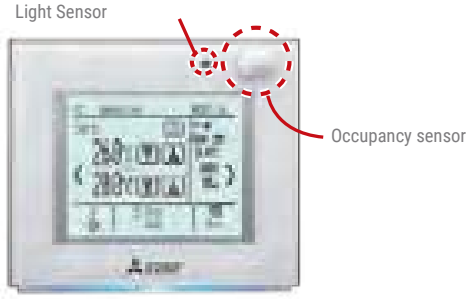
LED status indicator

The LED status indicator indicates the status of active functions on the remote control. Each colour is associated with a status or function:

e.g. Red=Heating, Blue=Cooling etc.

The LED indicator may be temporarily or permanently disabled.

LED STATUS INDICATOR



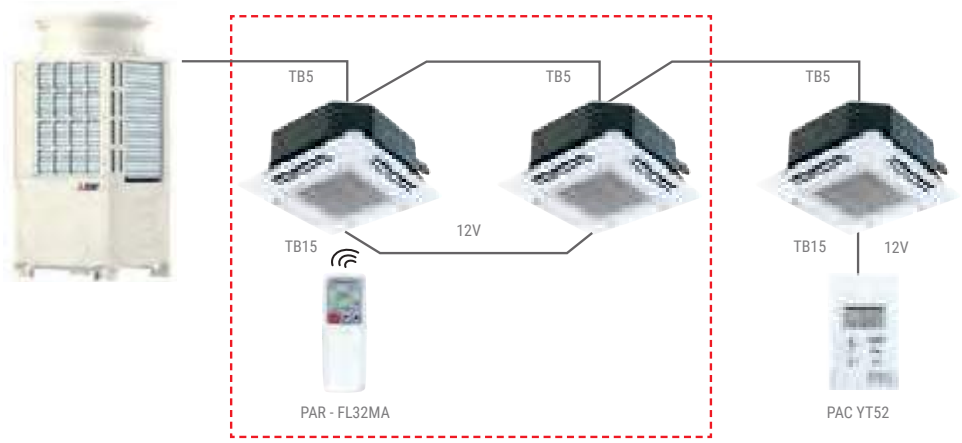
PAR-FL32MA

WIRELESS REMOTE CONTROL

PAR-FL32MA PAR-FA32MA PAR-SE9FA

PAR-FL32MA wireless remote control

- Usable to manage 1 group of up to 16 indoor units.
- Easy and intuitive with icon-based interface.
- Receiver connected simply with single non-polarised two-core wire.
- **MA** self-addressing technology.
- Suitable for all types of indoor unit.
- Recommended for groups with only one indoor unit.
- Generic receiver for all indoor unit types: PAR-FA32MA.
- Specific corner receiver for 4-way PLFY-P VEM cassette units: PAR-SE9FA.



Groups of 2 indoor units

Compatibility table		
	Wireless signal receiver	Wireless remote control
PMFY-P*VBM PLFY-P*VLMD PFFY-P*VKM PEFY-P*VMR-E/R/VMH PFFY-P*VLEM/VKM/VLRM/VLRMM PEFY-P*VMS1(L) PEFY-P*VMA(L) PCFY-P*VKM	PAR-FA32MA	PAR-FL32MA

Compatibility table		
	Wireless signal receiver	Wireless remote control
PKFY-P*VBM-E PKFY-P*VHM/VKM	Built in	PAR-FL32MA

PAR-SL100

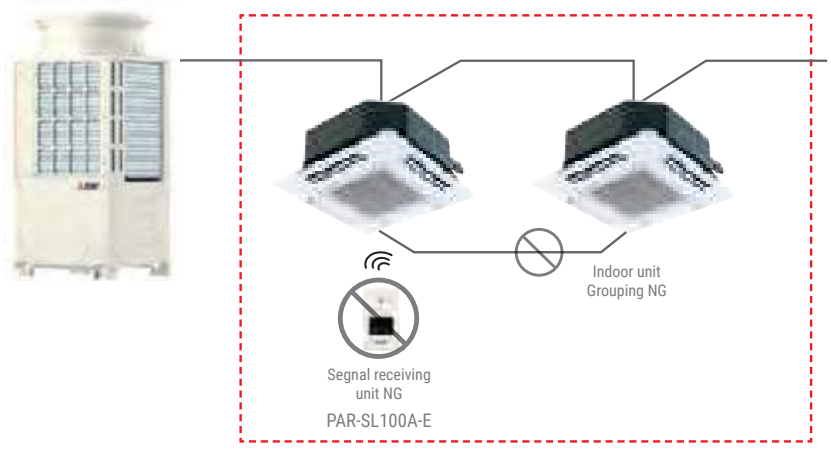
WIRELESS REMOTE CONTROL

Wireless remote control PAR-SL100

- Compatible with PLFY-VFM and PLFY-VEM
- **Backlighting**
- Group with up to 16 units
- **Direct/Indirect function** with corner PAC-SF1ME-E (3D i-see sensor)
- **Single vane control**
- Temperature view and setting 0,5°C
- **3D i-see sensor compatible**

Key Technologies

dual Setpoint				



Compatibility table		
	Wireless signal receiver	Wireless remote control
PLFY-P*VEM-E	PAR-SE9FA-E	PAR-SL100A-E
PLFY-P*VFM-E1	SLP-2FAL	

PAR-W21MAA / PAR-W31MAA

ECODAN REMOTE CONTROL

PAR-W21MAA / PAR-W31MAA remote control for hydronic modules and HWHP units

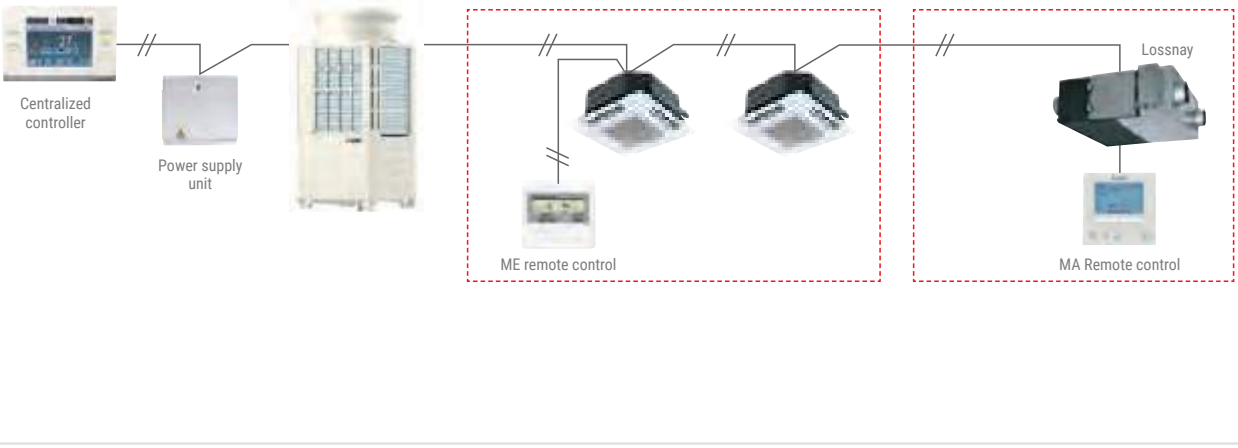
- Remote control for hydronic modules, HWS and ATW units and Hot Water Heat Pump package systems (HWHP) CAHV&CRHV.
- Usable to manage 1 group of up to 16 indoor units.
- Easy and intuitive with icon-based interface.
- Simple connection with single non-polarised two-core wire.
- MA self-addressing technology.
- Operating mode selection (Heating, Heating ECO, Hot water, etc.).
- Internal weekly timer.
- Customisable water temperature ranges for switching operating mode from local keypad.
- On-display service messages.
- PAR-W31MAA specific for QAHV

PZ-61DR

LOSSNAY REMOTE CONTROL

PZ-61DR remote control for Lossnay

- Specific remote control for Lossnay heat recovery units.
- Usable to manage one group of up to 15 Lossnay units.
- Easy and intuitive with icon-based interface.
- Simple connection with single non-polarised two-core wire.
- Internal weekly timer.
- Custom ventilation strategies for mode switching (Auto/recovery/bypass).
- Night purge function for active night-time ventilation in summer.
- On-display service messages.
- Backlit LCD screen.
- Energy management.



*Not compatible with LGF

AT-50B

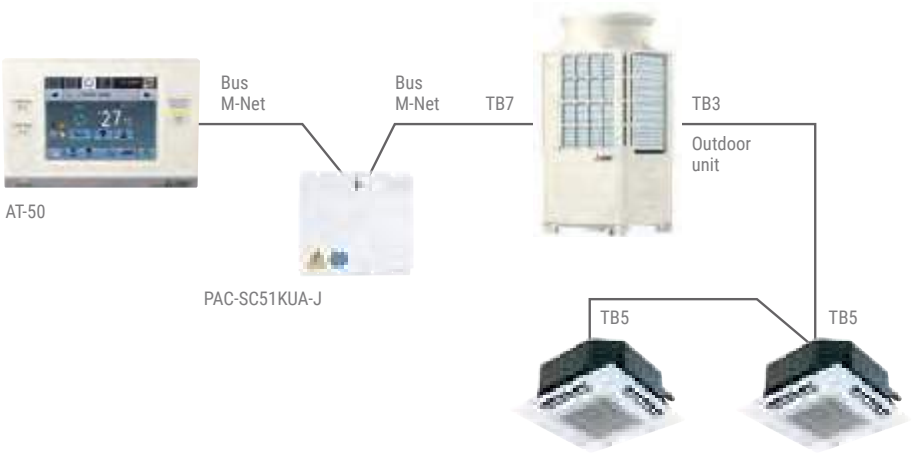
SYSTEM CONTROLLER

AT-50B system controller

- **5”** backlit **LCD touch screen.**
- Usable to manage 50 groups of up to 50 indoor units.
- Individual or collective group control, with groups displayed in grid, list or group format.
- **Dual-Setpoint** function.
- **View and set setpoint temperatures in 0.5°C increments.**
- Two weekly timers (for seasonal switching) and one daily timer.
- Simple connection with single non-polarised two-core wire.
- ME M-Net addressing technology.
- Two function buttons programmable to access any of a choice of functions (Night Set-back, weekly hour timer setting, switch operating mode, adjustable temperature range restriction, local restrictions).
- Recommended for controlling a single system.

Key Technologies

dual Setpoint				



AE-200E

WEB SERVER CENTRALIZED CONTROLLER

3D TOUCH controller

- Generously sized backlit 10.4" SVGA touch screen with graphic layout display function.
- Built-in 240 V AC 50 / 60 Hz power supply.
- Standalone configuration: management of up to 50 indoor units.
- Extended configuration: management of up to 200 indoor units (with 3 expansion controllers EW-50).
- Individual or collective control of groups, blocks or zones.
- Ethernet interface for connection to BMS supervisor systems.
- Integrated WEB server software for management using Internet Explorer®.
- Integrated 2 GB SD memory card for storing system data.
- Direct management of 4 impulse meters with no external interface.
- Power consumption data for billing downloadable via internet connection.
- Complete support for all advanced RMI platform functions for energy consumption monitoring and for multi-installation and multi-user management.
- Temperature setpoints settable and viewable with a precision of 0.5°C.
- Energy saving functions: Maintenance temperature, Sliding temperature, Optimised start, Dual Setpoint.
- M-Net interfacing with Ecodan package Hot Water Heat Pump systems (CAHV and CRHV).
- **Allows direct connection to BMS BACnet NEW**

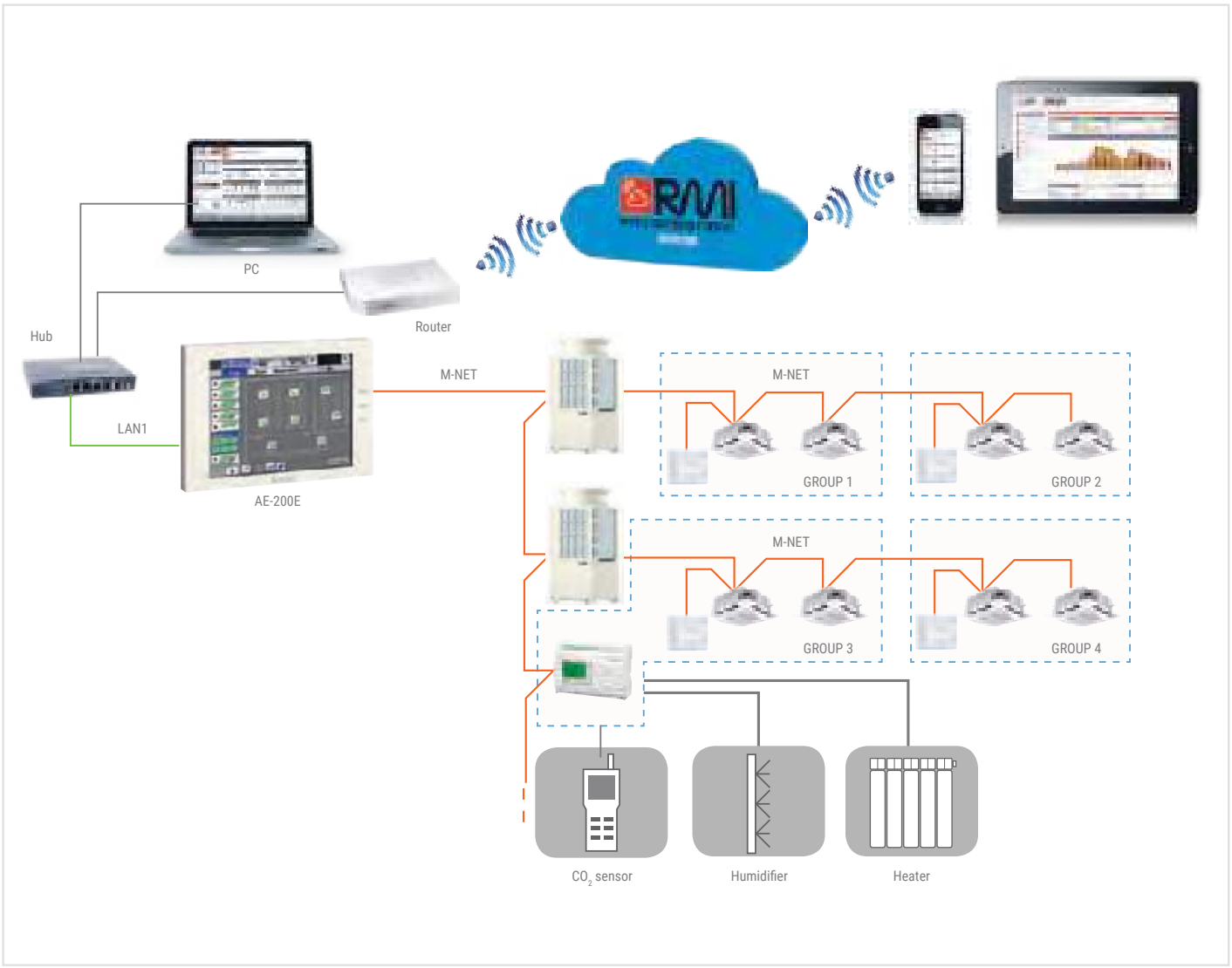
Key Technologies

dual Setpoint				

Superior management, functional and monitoring capabilities with new Mitsubishi Electric controller systems

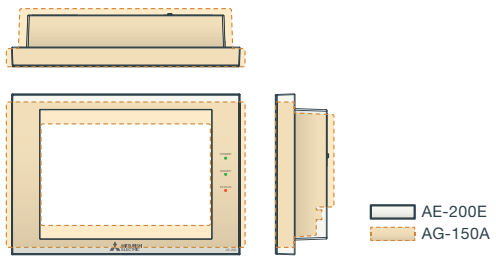
The 3D TOUCH Controller supports the management, operational and monitoring capabilities of all the new functions offered by the new **ADVANCED remote control.**

Information concerning **occupancy, light levels**, relative humidity in the **indoor space and dual setpoints** is accessible directly from the display and via the WEB.



Power and flexibility in a compact device

While measuring practically the same as the previous AG-150, the new 3D TOUCH Controller WEB Server centralized controller offers a larger screen area, greater processing power and expandable flexibility for future applications.



RMI Ready

The **3D TOUCH Controller** WEB Server centralized controller performs the crucial role of acquiring and monitoring data via the M-Net data transmission bus linking all the components of the VRF CITY MULTI, Mr. Slim or Residential system.

A router (available as wired ADSL or 3G Mobile versions) creates a secure, protected communication channel with the RMI Server. The modular flexibility of the RMI Server makes it possible to store enormous volumes of data, which is acquired, processed and archived for access from portable devices.

This infrastructural complexity, combined with superior processing, management and security capabilities, is encapsulated in an extremely user friendly concept, to help users optimise the energy usage of their systems.

EW-50

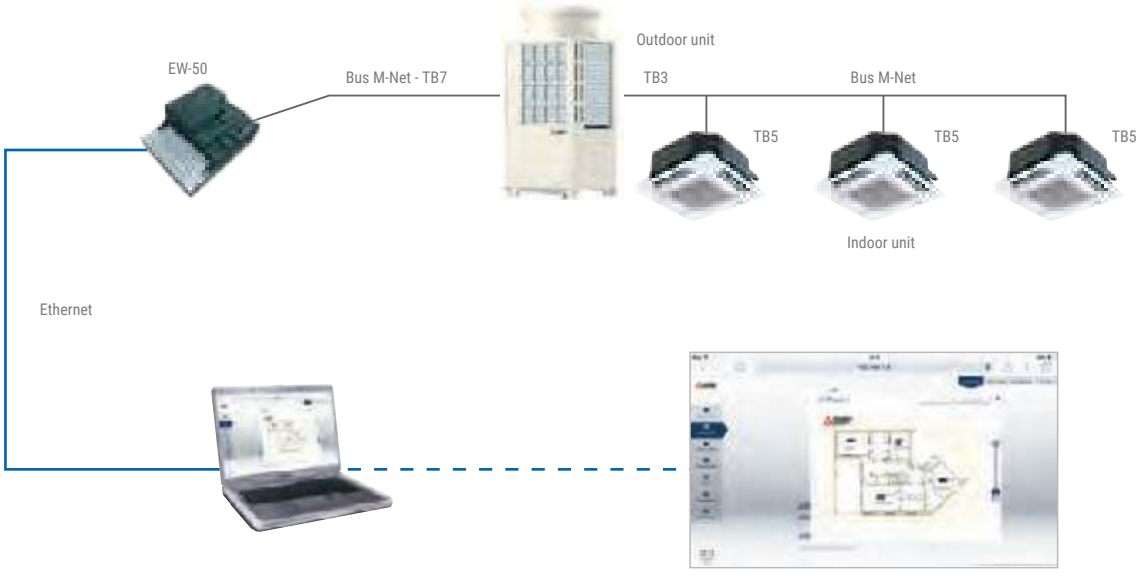
WEB SERVER CENTRALIZED CONTROLLER

3D blind controller

- "Black Box" version (no display).
- Compact dimensions (external 230V AC power supply).
- Usable to manage 50 groups for a total of up to 50 indoor units.
- Individual or collective group control.
- Ethernet interface for connection to supervisor systems.
- Integrated WEB server software for management using Internet Explorer®.
- Simplified connection, with single non-polarised two-core wire, using ME technology.
- Integrated 2 GB SD memory card for storing system data.
- Direct management of 4 impulse meters with no external interface.
- Status indicator LED indicating data transmission status and/or errors.
- Consumption data for billing downloadable via internet connection.
- A wide choice of energy saving functions offered as standard, with additional optional functions accessible with PIN code licenses.
- Complete support for all advanced RMI platform functions for energy consumption monitoring and for multi-installation and multi-user management.
- **Expansion controller for AE-200.**
- Allows direct connection to BMS BACnet NEW

Key Technologies

dual Setpoint				



CHARGE

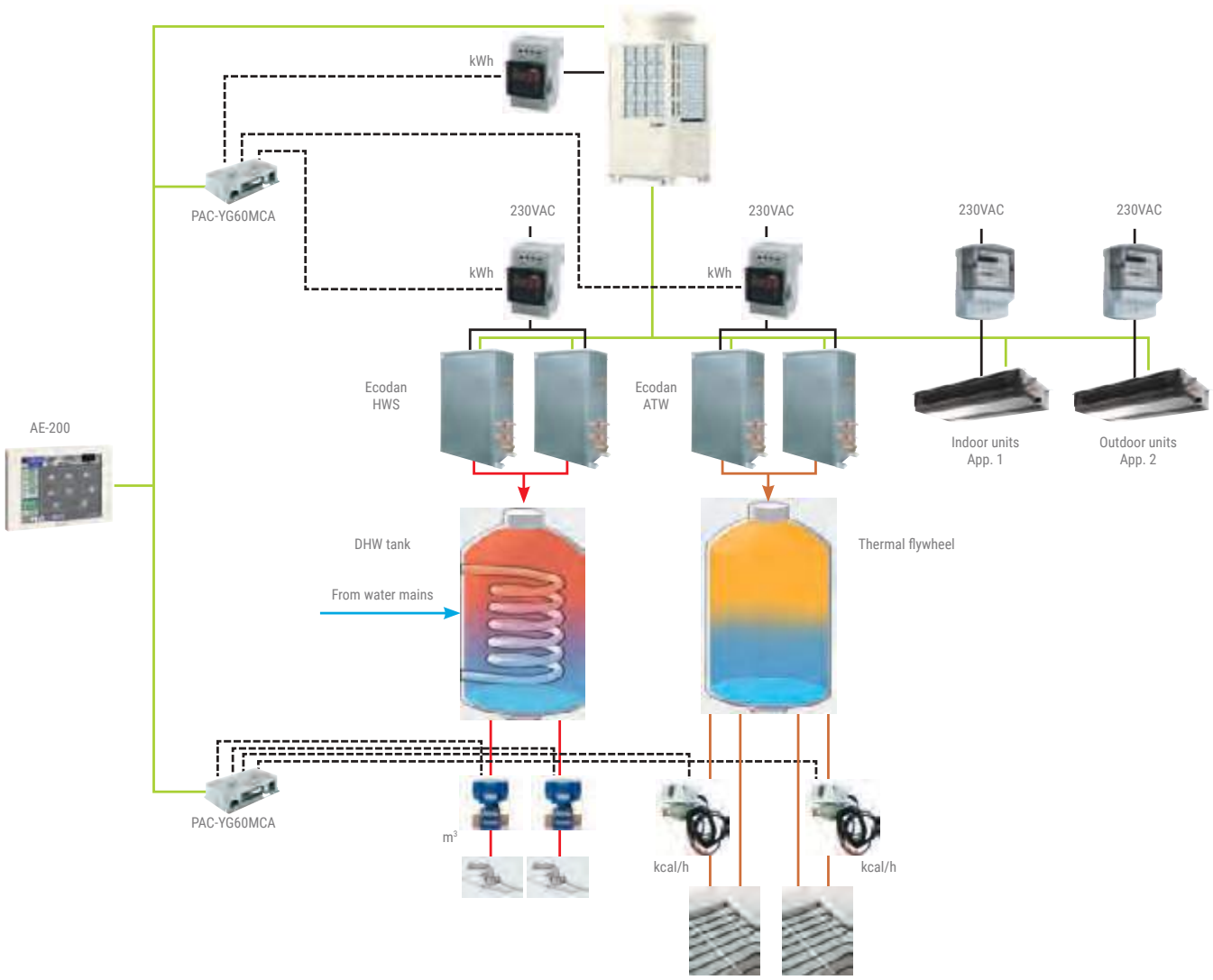
"CHARGE" SYSTEM FOR CENTRALIZED WEB SERVER CONTROLS

Apportioning system by web server centralized controllers

The Charge consumption monitoring and apportioning system may be used to meter the consumption of electric power, thermal power and water for air conditioning, air and/or water heating and domestic hot water production with a Mitsubishi Electric VRF CITY MULTI system, and calculate individual usage values.

The AE-200 and EW-50 CHARGE systems use proprietary Mitsubishi Electric calculation and apportioning methods. This consumption apportioning method indicates the consumption parameters of each user as percentages of the total consumption of the system. Consumption values, as percentages and kWh, may be calculated separately for:

- Outdoor Units
- Indoor Units
- Ecodan HWS Hydronic Modules
- Ecodan ATW Hydronic Modules



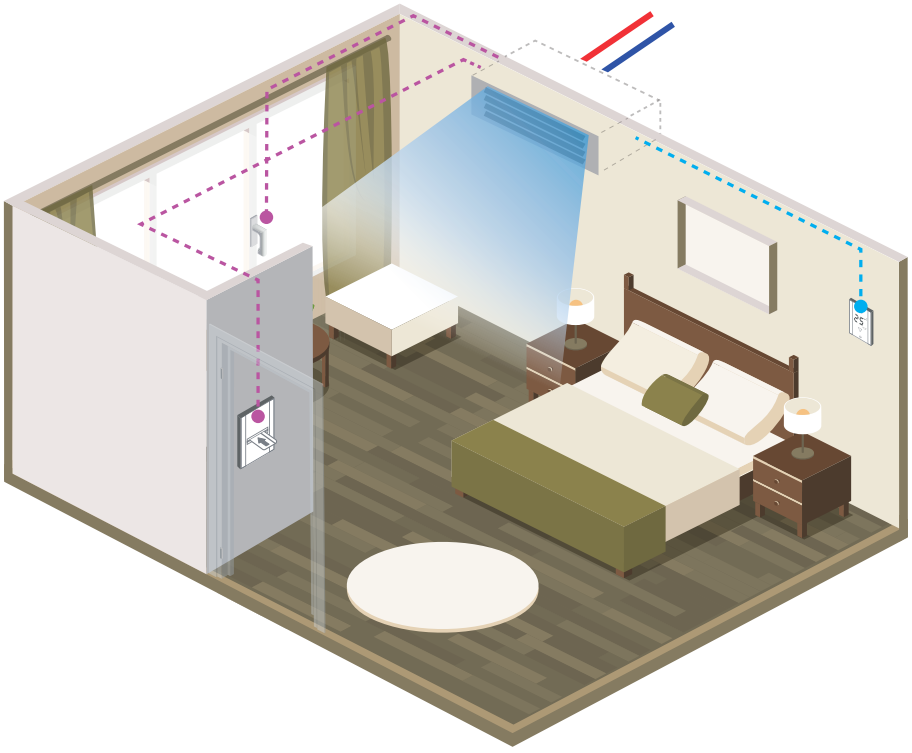
MELCOTEL NEW

INTERFACE FOR HOTEL SIMPLIFIED APPLICATION

MELCOTEL

- Integrated solution interface for small-medium hotels;
- **Centralized solution**;
- Higher level of control and therefore greater energy saving and a substantial reduction in running costs;
- **Key Card contact** and **Window contact** management (1 PAC-SE55RA for each indoor unit is required)
- It works in combination with 1 AE-200 and up to 3 more Web Server Centralized Controllers AE-200/EW-50 (up to **200 Indoor Units**).

HOTEL ROOM MANAGEMENT

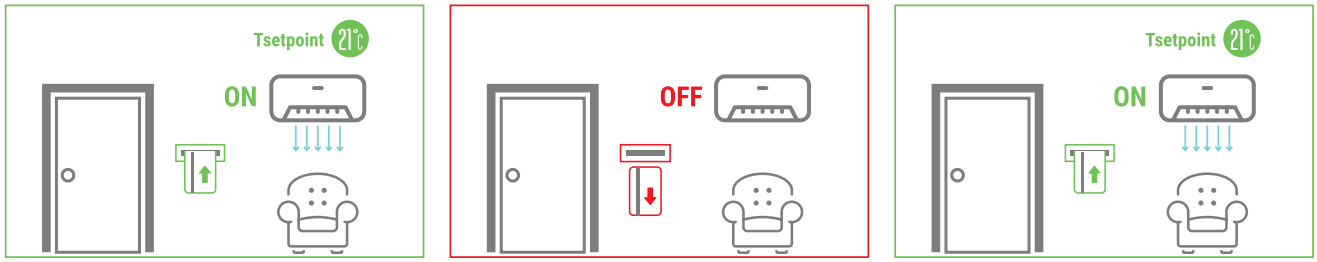


Key card contact and window contact management

The Melcotel Interface allows a hotel to have more accurate control over its air conditioning and can be used to control and monitor up to 200 bedrooms.

KEY CARD CONTACT MANAGEMENT

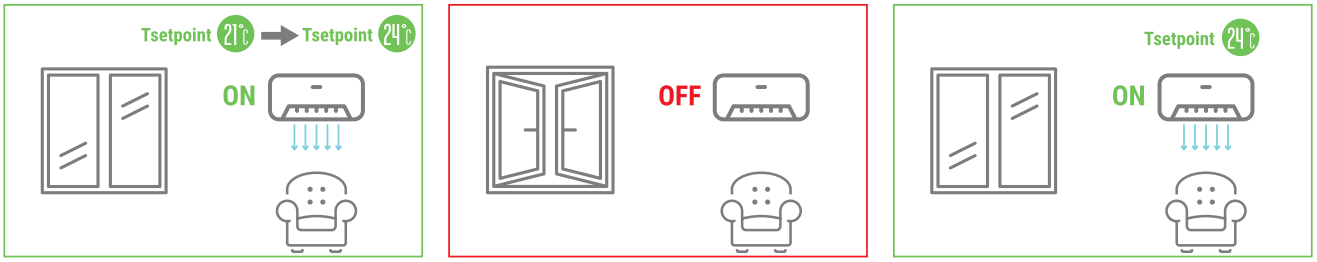
It allows the resetting of the status (Setpoint Temperature) set by Melcotel when key card is reinserted



Application example:
When key card is inserted, the indoor unit switches on with the setpoint temperature set by MELCOTEL, for example 21°C. The chamber customer changes the setpoint to 24°C. When key card is removed the indoor unit switches off and remote control is disabled. When key card is reinserted, the indoor unit switches to ON with the setpoint of 21 °C, the one set by MELCOTEL, in order to guarantee energy savings.

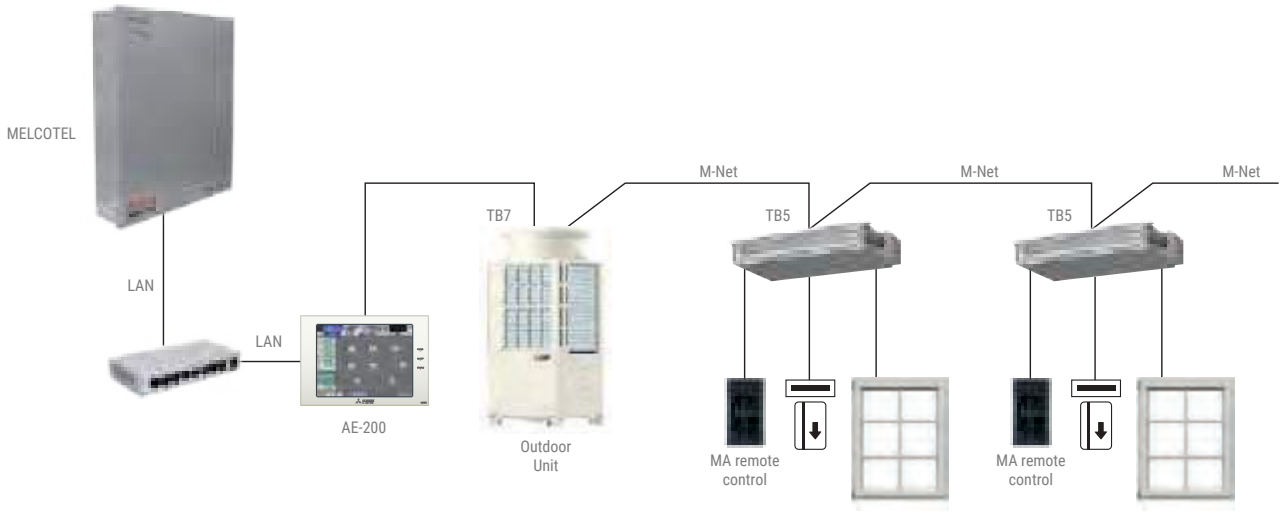
WINDOW CONTACT MANAGEMENT

It allows restoring the previous state (ON / OFF status, Setpoint Temperature) when the window is reclosed;



Application Example:
The indoor unit is on and with a setpoint temperature equal to that set by MELCOTEL, for example 21°C. The chamber customer changes the setpoint to 24°C. When the window is opened, the indoor unit switches off and remote control is disabled in order to avoid energy waste. When the window is reclosed, the state prior to opening is restored, i.e. the indoor unit returns to ON and to the setpoint previously set by the customer chamber, i.e. 24 ° C.

ARCHITECTURE



First Centralized Controller HAVE to be necessarily AE-200;
In order to implement the window and/or key card contact system it is necessary to provide one PAC-SE55RA for each indoor unit.

Remote monitoring and control system

3D Tablet Controller

3D Tablet Controller is the new solution by Mitsubishi Electric allowing portable system management from Smartphone and Tablet **inside the building**. User configuration, with restrictions and privileges, makes it the ideal solution in those application serving different environments, such as offices or appartments. Thanks to its simple and intuitive interface the user is able to control and monitor **air conditioning** and **hot water production** units on **mobile device**, just as easily as he would on a traditional remote control.
This is possible thanks to WEB Server 3D centralized control installed on site, connected to the building Wi-Fi router*[1].

*1 Not supplied by Mitsubishi Electric.

INSIDE THE BUILDING

MELCloud

MELCloud® CITY MULTI

- Cloud remote **monitoring and control** system.
- Born for residential aplications, it's now being expanded to VRF CITY MULTI.
- **Complete and intuitive** solution with all main control and monitoring functions.
- Does not require WEB Server 3D centralized control (AE-200, EW-50).

RMI

REMOTE MONITORING INTERFACE

- Cloud remote monitoring and control system **for professional use.**
- Allows all main remote control and monitoring functions.
- **Advanced energy monitoring** features are available, such as hourly cunsumption view, custom charts and data collection and display.
- Geo-localized **multi-site** management.
- **Multi-user** management for centralized systems.
- Energy **consumption apportioning**[*2].

	3D TABLET CONTROLLER	MELCloud® CITY MULTI	RMI REMOTE MONITORING INTERFACE
Group/Individual simplified management[*2]	•	•	•
Available for Smartphone and Tablet	•	•	•
Dedicated App		•	•
User restrictions	•	•	•
Outside the building (Cloud)		•	•
Internet connection needed		•	•
WEB Server centralized control needed	•		•
Advanced energy monitoring			•
Monthly/Custom charts and reports			•
Multi-site management			•
Energy consumption apportioning			•

[*2] For compatible product lines please refer to catalogues or contact headoffice

OUTSIDE THE BUILDING

3D TABLET CONTROLLER

WI-FI REMOTE MANAGEMENT SYSTEM

New Wi-Fi management system by Mitsubishi Electric

3D Tablet Controller allows system management and control through Smartphone and Tablet under LAN Wi-Fi coverage.

Access and components

WEB Server centralized control connected to Wi-Fi router is needed.
3D Tablet Controller is compatible with all Smartphone and Tablets, thank to access through internet browser.

The user can login at the address:

http://[AE-200/EW-50 IP address]/mobile

Simple and intuitive interface

Thanks to its simple and intuitive interface the user is able to freely control air conditioning and water production units from mobile device, inside the building.
This interface has been designed to have the look&feel of a typical App for Smartphone, with immediate feedback from units and fast setting of operating parameters.

Mobile interface

The web interface has been designed following the modern style of App for Smartphone and Tablet, maximizing easy of use and intuitiveness for mobile use.

Advantages

- Compatible with all Smartphone and Tablet mobile devices, regardless of the brand and operating system.
- No need for internet connection, communication is direct between device, router and centralized controller.
- Possibility to replace the wired remote controls
- Possibility of configuring different users with privileges/restrictions on the available functions

REMOTE MONITORING INTERFACE

CLOUD REMOTE MANAGEMENT SYSTEM

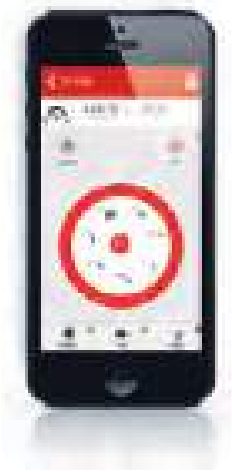
The Cloud system by Mitsubishi Electric for large installations

The RMI system lets you control your air conditioning, heating and domestic hot water production system remotely from a smartphone, tablet or PC. The system may be used to monitor the performance of your appliances, programme functions, check consumption and view operating states to optimise the efficiency of the system.

Your perfect climate in an App!

Control your air conditioner, adjust temperature and air flow settings, view and manage hot and cold water production status and check for system faults.

ALL FROM AN APP ON YOUR SMARTPHONE OR TABLET.



Simplified control for all of your systems

Set weekly programmes and special events, and view and analyse the operating parameters of your system remotely from a mobile device with a graphic interface that lets you change settings instantaneously when needed.

Manage your systems with detailed information and analytical functions

Manage multiple installations with different sizes and architectures conveniently from the application on your PC, view function parameters in a summarised dashboard interface, and analyse specifically created reports to make your installation work even more efficiently.
RMI is also the ideal solution for the centralized management and supervision of multiple installations in different locations.

System architecture

The 3D TOUCH Controller WEB Server centralized controller performs the crucial role of acquiring and monitoring data via the M-Net data transmission bus linking all the components of the VRF CITY MULTI, Mr. Slim or Residential system.
A router (available as wired ADSL or 3G Mobile versions) creates a secure, protected communication channel with the RMI Server. The modular flexibility of the RMI Server makes it possible to store enormous volumes of data, which is acquired, processed and archived for access from portable devices. This infrastructural complexity, combined with superior processing, management and security capabilities, is encapsulated in an extremely user friendly concept, to help users optimise the energy usage of their systems.

The project

The RMI project is the result of a forward thinking idea by Mitsubishi Electric to offer its customers the capability of managing their installations from portable devices, adding a significant new advantage offered by these systems. The all-new **RMI** system is the FIRST system of its kind based on **Cloud Computing** technology, which lets you interface with your system via a simple yet secure internet connection. RMI makes it possible to manage Mitsubishi Electric air conditioning solutions, with **energy consumption monitoring and maintenance functions**, from **smartphone** and **tablet** apps for the iOS and **Android** operating systems, and via a private **WEB Client** area **from a PC**. The RMI system is based on a dedicated infrastructure (RMI Server), which may be described as a container for installation data that is collected and made accessible **simply and intuitively**, and filtered and represented appropriately for the type of user analysing and using the data.
The project was designed from the start with security in mind, to protect the installation and the client against unauthorised access with a secure VPN connection (Virtual Private Network).

Who can use RMI?

Because of its many different functions, the RMI system is suitable for all types of installation, from centralized residential systems to commercial applications and large scale installations.
The remote management and monitoring functions are intended for end users (e.g. tenants), owners, administrators, energy/building managers, global service providers and installing and maintenance technicians.

RMI Service packages

RMI can also be applied to an existing VRF CITY MULTI system, by interfacing through the installation's existing WEB Server centralized controllers. Contact head office to check compatibility between hardware and available functions

See DEMO RMI at:

http://demo-it.rmi.cloud

RMI IS AVAILABLE IN THE FOLLOWING PACKAGES

RMI SMART
REMOTE MONITORING INTERFACE

RMI ADVANCED
REMOTE MONITORING INTERFACE

RMI MULTI-TENANT
REMOTE MONITORING INTERFACE

RMI PLAN
REMOTE MONITORING INTERFACE

RMI CHARGE
REMOTE MONITORING INTERFACE

ADVANCED HVAC CONTROLLER

EXTERNAL SIGNAL INTEGRATION

AHC – Advanced HVAC controller

- Solution consists of an ALPHA2 PLC and an M-Net interface, both by Mitsubishi Electric.
- Intuitive object-based graphic programming function.
- Create control strategies using either physical signals (inputs and outputs) or logical signals (via M-Net data transmission bus).
- Receive signals from 2 Groups for a total of up to 32 indoor units for each PLC.
- Programme synchronised energy saving strategies between power consuming utilities (such as lighting) and the air conditioning system.
- 15 inputs and 9 outputs.
- Number of physical inputs and outputs may be increased with dedicated expansion modules.
- Large backlit LCD display for programming functions and viewing graphics, text and values.
- Direct programming with 8 function keys on front control panel without using auxiliary devices.
- Superior installation flexibility with integrated DIN rail adapter.
- System may be password-protected.
- Possibilità di proteggere il sistema mediante password.

Total integration

The AHC programmable controller uses Mitsubishi Electric know-how acquired in industrial automation applications to integrate air conditioning, heating and domestic hot water production systems with third party systems, such as access control, security, lighting control systems etc., allowing communication between the systems via the M-Net data communication bus.
This makes it possible, for example, to use data acquired via the M-Net communication bus to control external devices instead of interlocking the operation of air conditioner units and external systems connected to the AHC Programmable Controller, or using other similar measures.

Flexible programming…

Up to 200 function blocks can be used in a single application (Set/Reset, Timer, Service messages etc.), offering extraordinary scope for controlling the entire installation.

… and safe data!

The application is stored permanently in an EEPROM memory module. This means that active data (such as meter counts) are backed up without requiring power.

Extensive operating temperature range

Designed to operate in a temperature range from 25°C to 55°C and with an IP20 protection rating, these devices are ideal for both indoor and outdoor installation.

Digital and analogue expansion modules

Dedicated expansion modules offer the possibility of increasing the number of both analogue and digital inputs and outputs.

Digital

AL2-4EX:

offers 4 digital inputs

AL2-4EYT:

offers 4 digital outputs

Analogue

AL2-2PT-ADP:

offers 2 analogue inputs

AL2-2DA:

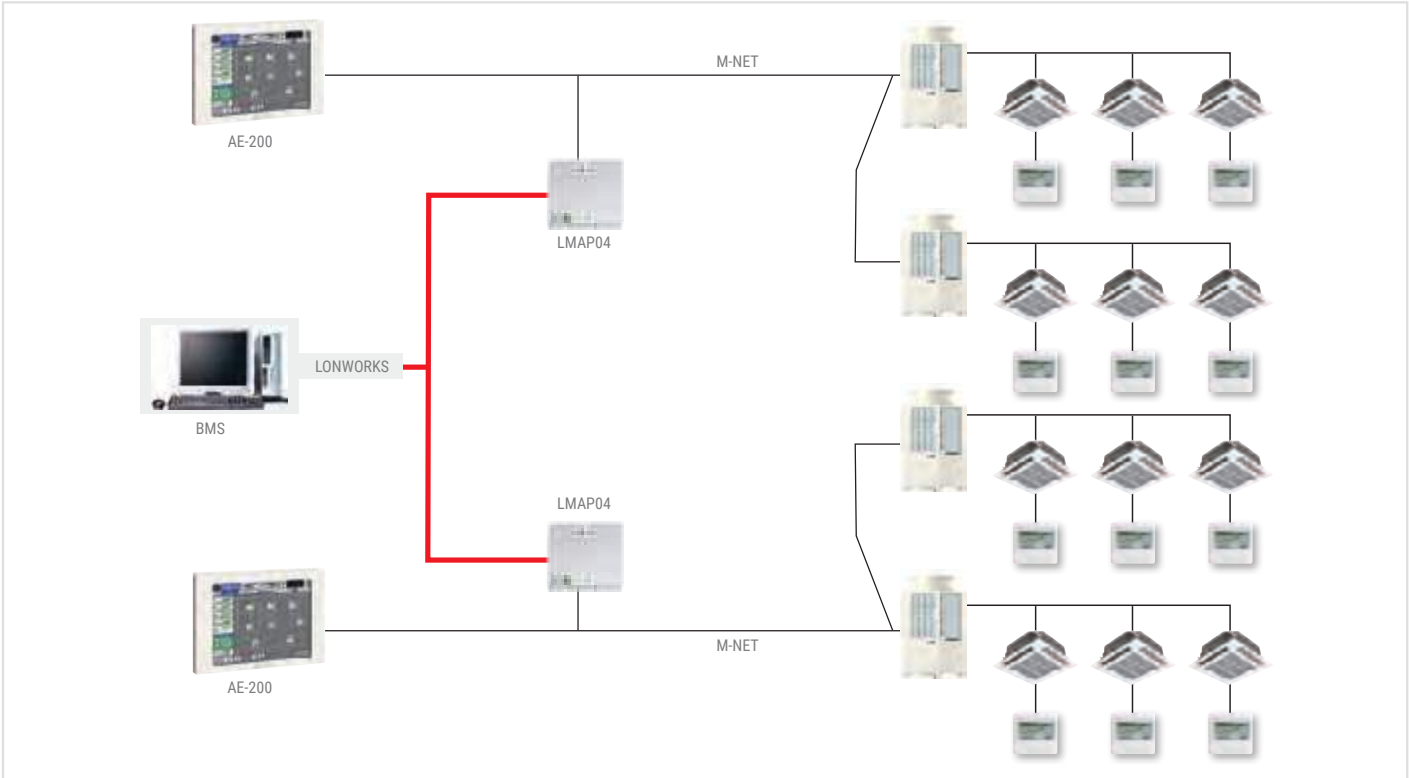
offers 2 analogue outputs

LMAP04

LMAP04 BMS INTERFACE FOR LONWORKS® NETWORKS

LMAP04 BMS interface for LonWorks® networks

The LMAP04 interface allows Mitsubishi Electric air conditioners to communicate with third party BMS supervisor and management systems through the LonWorks® network system. The hardware of the interface consists of an electronic board with software integrated in the board itself which needs no configuration.
The LMAP04 interface may be installed with any remote control or centralized controller of the Mitsubishi Electric range. The LMAP04 interface can also be used in a mixed system, which also includes the TG-2000A supervisor. Each LMAP04 interface can control up to 50 indoor units, each with its own unique address. In installations with AE-200E or EW-50 WEB Server centralized controllers, the LMAP04 interface offers the same modularity as the controllers themselves. In these cases, a separate interface must be installed for each centralized controller.



XML

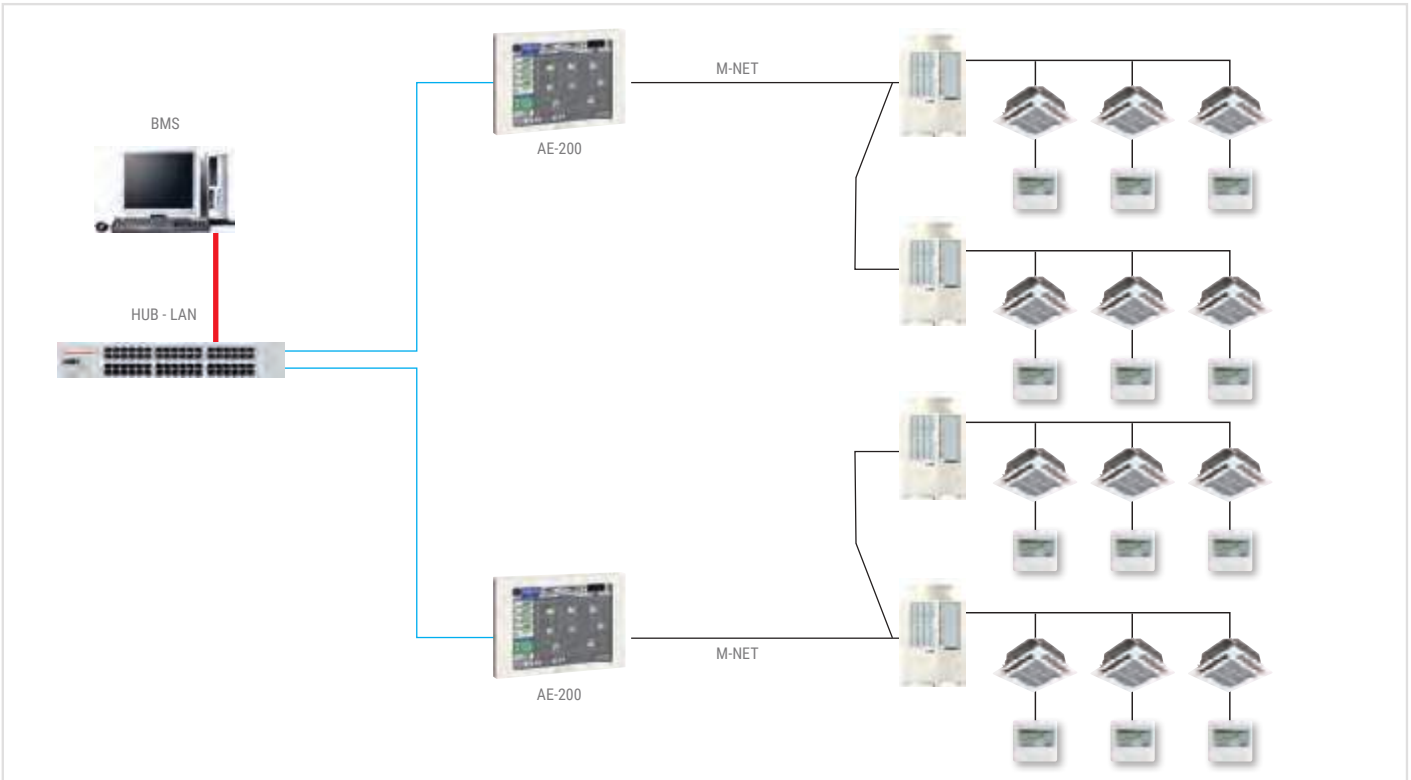
BMS INTERFACE FOR ETHERNET NETWORKS

AE-200

EW-50

XML BMS interface for ethernet networks

XML is an innovative new communication system developed specifically for exchanging data over the web. XML makes it possible to create custom software extremely simply, which can even be used with a standard internet browser. The XML protocol makes it possible to integrate with a BMS system using the AE-200E or EW-50 WEB Server centralized controllers, with no additional dedicated hardware interfaces. As all the information necessary for the BMS system is available in XML format directly over the Ethernet communication port of the AE-200E / EW-50 controller, all that needs to be done is to connect both the AE-200E / EW-50 WEB Server centralized controllers and the BMS computer system to the same network. Connecting to a BMS system with the XML protocol is extremely simple, as the Ethernet network platform is used. No dedicated conversion or interface hardware is needed, as shown in the typical layout schematic.



ME-AC-MBS-100

BMS INTERFACE FOR MODBUS® NETWORKS

ME-AC-MBS-100 – BMS interface for Modbus® networks

The Modbus communication protocol was initially used for PLC networks. Mitsubishi Electric offers an interface capable of controlling up to 100 indoor units (ME-AC-MBS-100) for managing a VRF CITY MULTI installation with a BMS system.

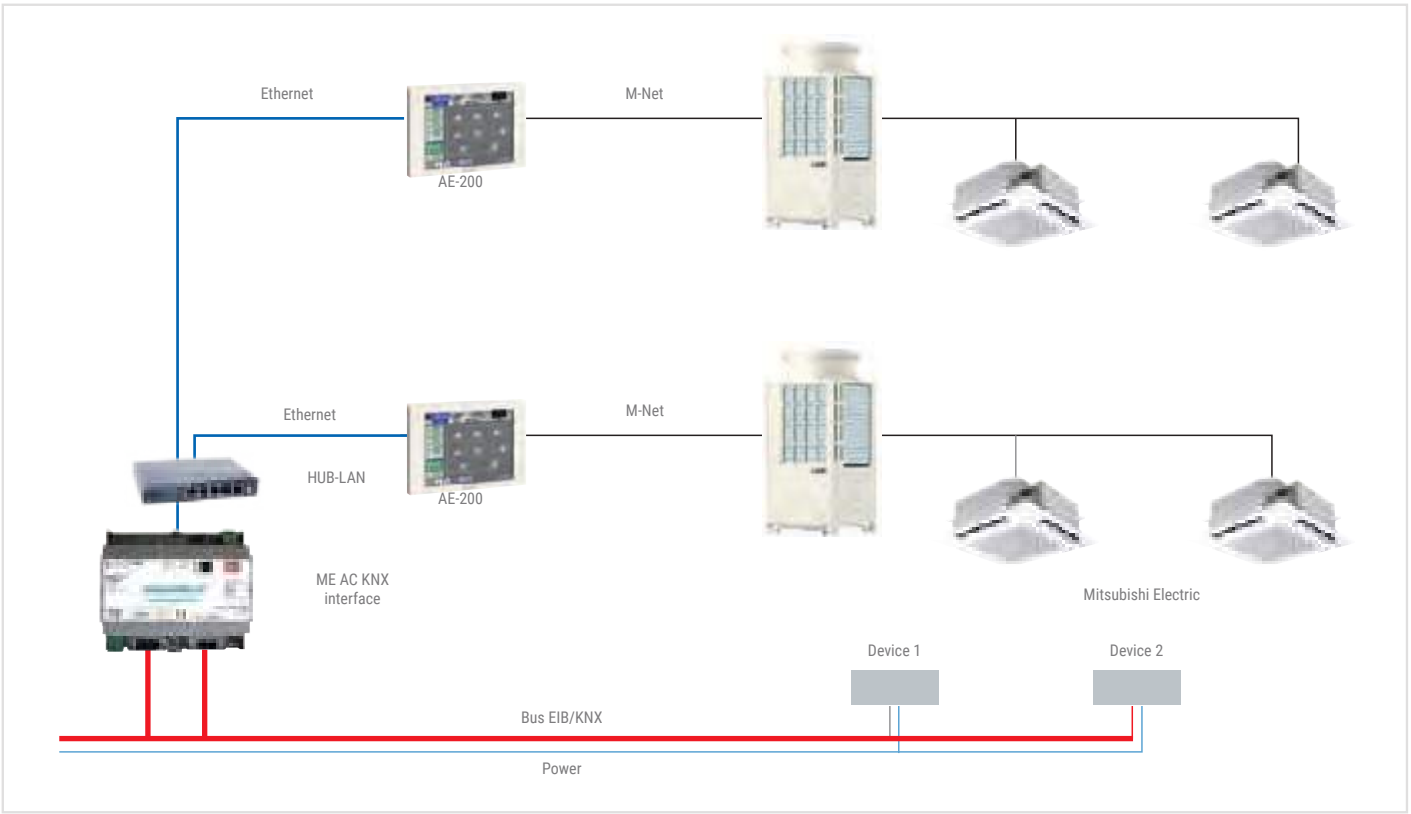
The interface is connected to the Modbus supervisor system either by an RS232/RS485 serial connection or a TCP/IP over Ethernet connection, and is connected to the Mitsubishi Electric VRF CITY MULTI installation by Ethernet.

ME-AC-KNX-100

BMS INTERFACE FOR KNX® NETWORKS

ME-AC-KNX-100 – BMS interface for KNX® networks

KNX is one of the global standards for automated household and building control. This open protocol ensures cross-compatibility between products from different manufacturers.
Mitsubishi Electric offers an interface capable of controlling up to 100 indoor units (ME AC KNX – 100) for managing a VRF CITY MULTI installation with a BMS system.
The interface is connected directly to the EIB bus linked to the KNX network, and to the Mitsubishi Electric VRF CITY MULTI installation by Ethernet.



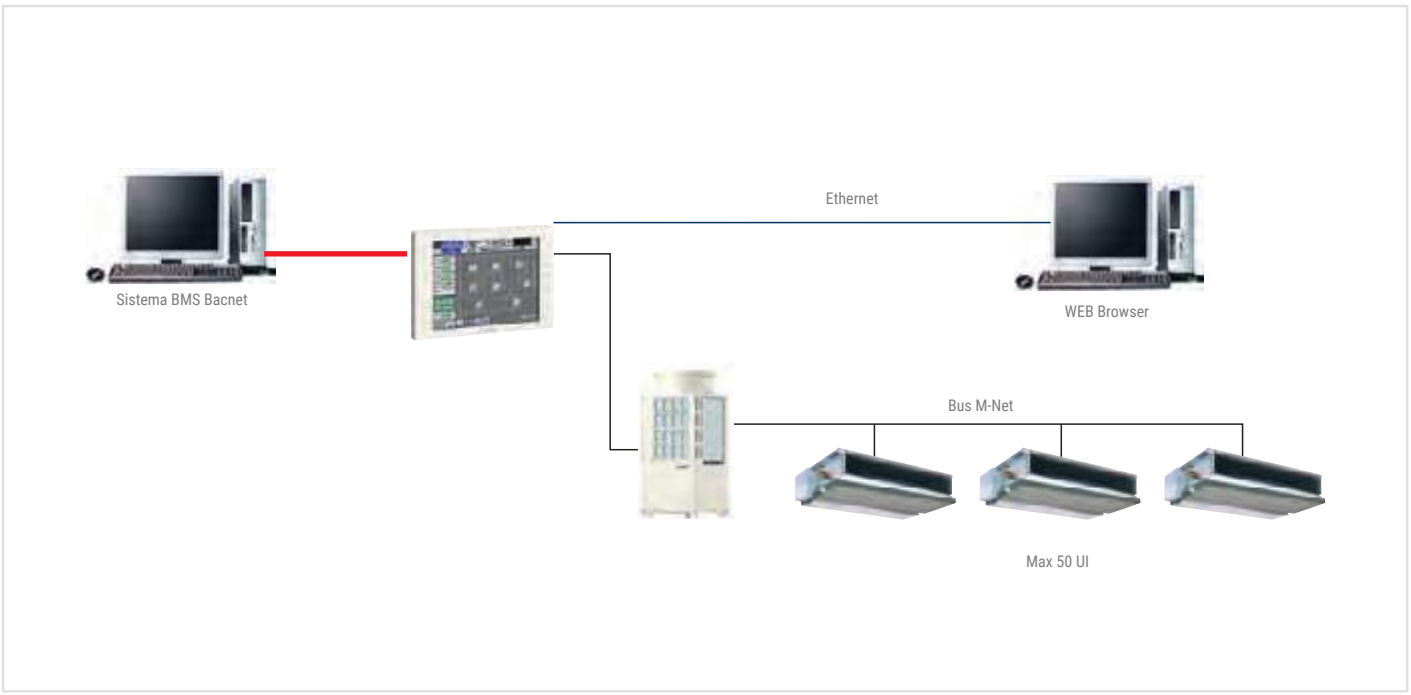
BACnet® PIN CODE

BMS INTERFACE FOR BACNET® NETWORKS

BACnet® PIN code

The BACnet® protocol was originally developed by ASHRAE in North America specifically for HVAC applications (Heat, Ventilation, Air Conditioning). It was subsequently also adopted in Europe as one of the standard communication solutions for air conditioning systems, together with LonWorks® and other protocols. One of the greatest advantages of this protocol is the extraordinary degree of cross-compatibility it offers, allowing systems from different manufacturers to be integrated with each other. New BACnet PIN code allows communication between Mitsubishi Electric system and BACnet BMS network with the same monitoring information and settings which were available with BAC-HD150. **BACnet**

PIN code is available only for WEB Server 3D centralized controls (AE-200, EW-50). Physical connection is via Ethernet cable through a dedicated port on centralized control. Thanks to new BACnet PIN code it is possible to remove one hardware component (BAC-HD150) from the system, simplifying its structure and removing one potential source of malfunction. Each centralized control equipped with BACnet PIN code is able to handle up to 50 indoor units and 50 groups.



MITSUBISHI ELECTRIC

LIVING ENVIRONMENTAL SYSTEMS

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eco Changes **for a greener tomorrow**

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

The equipment described in this catalogue contain fluorinated gasses such as HFC-410A (GWP 2088), HFC-134A (GWP 1430) e HFC-407C (GWP 1774). Installation of those equipment must be executed by professional installer based on EU reg. 303/2008 and 517/2014

CITY MULTI
FULL PRODUCT LINEUP CATALOGUE 2019
E-1906205(15891) replace E-1804205 (15161)
Specifications are subject to change without notice

E-1906205