MULTIDENSITY SYSTEM

FULL INVERTER VRF SYSTEM FOR IT COOLING APPLICATIONS

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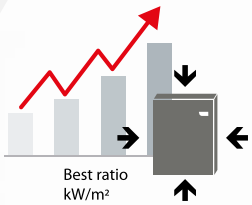
MULTIDENSITY SYSTEM

FULL INVERTER VRF SYSTEM FOR SMALL & MEDIUM SIZE IT ENVIRONMENTS WITH HOT SPOTS UP TO 50 kW.

Efficient, rational, plug & play solution for high density data rooms.

UP TO 8 INDOOR UNITS CONNECTED TO ONE CONDENSING UNIT

High density hot spots are managed by indoor units connected to condensing units working together as a unique system.

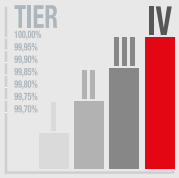


HIGHEST CAPACITY PER FOOTPRINT

Thanks to the possibility to minimise the number of outdoor units, the overall footprint of the whole system is drastically reduced.

CHOOSE YOUR SYSTEM'S RELIABILITY

A multitude of configurations are available to provide customers with their desired level of reliability (configuration N, N+1, 2N). The Multidensity system is in line with TIER III and IV design topologies, based on the configuration chosen.

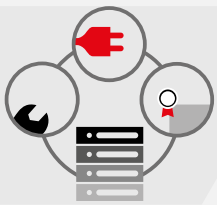


ADAPTABLE FLEXIBILITY

Match any kind of cooling requirement, from localised cooling to hot and cold aisle cooling management.

RATIONAL DESIGN FOR OPTIMISED CAPEX

The rational design of the VRF system is combined with the experience and reliability of the Mitsubishi Electric brand, which guarantees the best quality for your IT infrastructure.



PLUG AND PLAY INSTALLATION

PLUG & PLAY SOLUTIONS

No additional elements such as pumps, tanks, and valves are required. This installation simplicity results in a quicker start-up and more reliable maintenance, which are key factors for reducing installation and maintance costs.

ACTIVE REDUNDANCY

Advanced load sharing logics of the Active Redundancy function ensure that the heat loads are balanced among the units (including those units that usually remain in stand-by) according to the actual requirements of the IT infrastructure, leveraging on the multi-unit configuration of redundant systems.

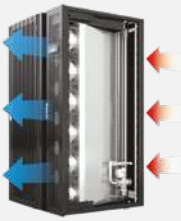
Active Redundancy

m-MROW
m-MRAC

These indoor rack cooling units, from 10 to 28 kW, are designed to be close-coupled to blade servers and manage hot spots.

- **Specifically developed to be coupled with VRF systems**
- **Reduced space occupancy (up to 0,36 m²)**
- **Cooling only where needed**
- **EC plug fans** for reducing energy consumption and noise levels
- **Electronic expansion valve** to achieve a much wider modulation capacity
- **Both In-Row and Enclosure versions available**

ENCLOSURE
Ideal for removing hot spots in stand alone systems



IN ROW
Ideal for hot/cold aisle configurations

ROOM UNITS

		m-MROW-G02-009 m-MRAC-G02-009	m-MROW-G02-015 m-MRAC-G02-015	m-MROW-G02-025 m-MRAC-G02-025
INDOOR UNIT				
UNIT SIZE		9	15	25
COOLING CAPACITY				
m-MROW				
Total (1)	kW	10.6	16.6	28.6
Sensible (1)	kW	9.6	15.7	27.4
SHR (1)		0.91	0.94	0.96
Indoor unit EER (1)	kW/kW	58.9	50.3	32.5
m-MRAC				
Total (2)	kW	10.9	22.9	32.8
Sensible (2)	kW	10.9	22.9	32.8
SHR (2)		1	1	1
Indoor unit EER (2)	kW/kW	60.5	69.3	37.2
SUPPLY FAN	**Nr.**	**2**	**4**	**5**
Air flow	m³/h	1500	2700	4200
Power input	kW	0.18	0.34	0.85
Nominal external static pressure	Pa	20	20	20
Maximum external static pressure	Pa	60	60	60
SOUND LEVEL ISO 3744				
Pressure level (3)	dB(A)	63.5	64.5	70.5
Power level	dB(A)	79.0	80.0	86.0
AIR FILTERS	**Nr.**	**2**	**2**	**2**
Extended filtering surface	m2	0.35	0.35	0.35
Efficiency (ISO EN 16890)	COARSE	40%	40%	40%
REFRIGERANT CIRCUITS	**Nr.**	**1**	**1**	**1**
POWER SUPPLY	V/Ph/Hz	230/1/50-60	230/1/50-60	230/1/50-60
DIMENSIONS				
Width	mm	300	300	300
Length	mm	1000 / 1200	1000 / 1200	1000 / 1200
Height	mm	2085	2085	2085
NET WEIGHT				
m-MROW	kg	175	190	193
m-MRAC	kg	185	200	203

1. Gross Value. Characteristics referred to room air temperature 35°C with 27%RH and external ambient air temperature 35°C. ESP=20Pa.
2. Gross Value. Characteristics referred to room air temperature 46°C with 16%RH and external ambient air temperature 35°C. ESP=20Pa.
3. Sound pressure level on air return at 1m.

m-MOCU

Air-cooled remote condensing unit for outdoor installation to be coupled with IT Cooling room units

- **Mitsubishi Electric's experience in VRF applied to IT Cooling infrastractures**
- **BLDC scroll compressors with inverter technology** to produce the exact output needed by the system
- **Bell-mouth shape designed propeller fans** with inverter control brushless DC motors
- **Modular design and reduced footprint** for any installation requirement
- **Extreme reliability**
- **Increased performance**
- **Low noise operation**
- **Suitable for long refrigerant pipe distance**

CONDENSING UNITS

OUTDOOR UNIT		1x m-MOCU-G02-050	2x m-MOCU-G02-050
COOLING CAPACITY			
Total (1)	kW	50	50
System EER (1)	kW/kW	2.96	3.24
UNIT ELECTRICAL DATA			
Power input (1)	kW	15.2	13.7
COMPRESSOR	**Nr.**	**1**	**2x 1**
Power input (1)	kW	14.3	2x 14.3
CONDENSER FANS	**Nr.**	**2**	**2x 2**
Total air flow	m3/h	19.200	2x 19.200
Power input	kW	2x 0.92	4x 0.92
External static pressure	Pa	0	0
SOUND LEVEL ISO 3744			
Pressure level (2)	dB(A)	65	68
REFRIGERANT CIRCUITS	**Nr.**	**1**	**2x 1**
Refrigerant type		R410A	R410A
Pre-charged refrigerant	kg	11.8	2x 11.8
F-GAS - CO_2 equivalent	t	24.63	2x 24.63
REFRIGERANT PIPING			
Max pipe length (from the outdoor unit to the farthest indoor unit)	m	165	165
Max height difference (outdoor unit higher than indoor units)	m	50	50
Max height difference (outdoor unit lower than indoor units)	m	40	40
POWER SUPPLY	**V/Ph/Hz**	**380-400-415 / 3+N / 50-60**	**380-400-415 / 3+N / 50-60**
DIMENSIONS			
Length	mm	1750	2x 1750
Depth	mm	740	2x 740
Height	mm	1650	2x 1650
NET WEIGHT	**kg**	**304**	**2x 304**

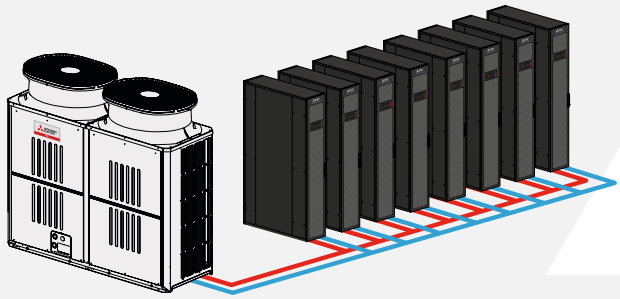
1. Gross Value. Characteristics referred to external ambient air temperature 35°C. Referred to configuration with 2x m-MROW-G02-025 indoor unit.
2. Sound pressure level on unit front at 1m.

The modular approach of MULTIDENSITY SYSTEM

Room units are connected in master-slave configuration, if the master unit becomes disconnected, the Dynamic Master logic automatically elects a new master from the other units.

Thanks to the flexible and modular approach of the MULTIDENSITY SYSTEM, it is very easy to choose the ideal solution for any data center layout.

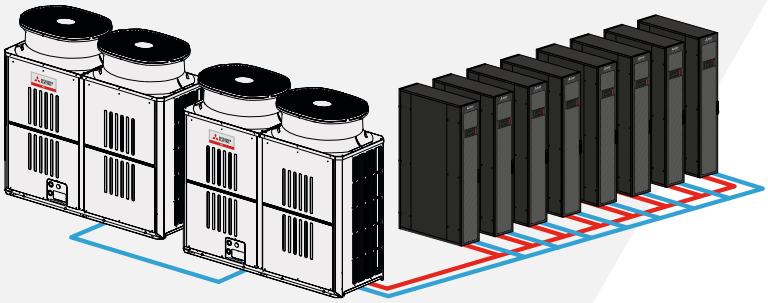
CONFIGURATION WITHOUT REDUNDANCY (N)



Ideal for small to medium IT rooms

- 1 external unit paired with up to 8 indoor units
- Average system EER is around 3.00
- Cooling capacity up to 50 kW

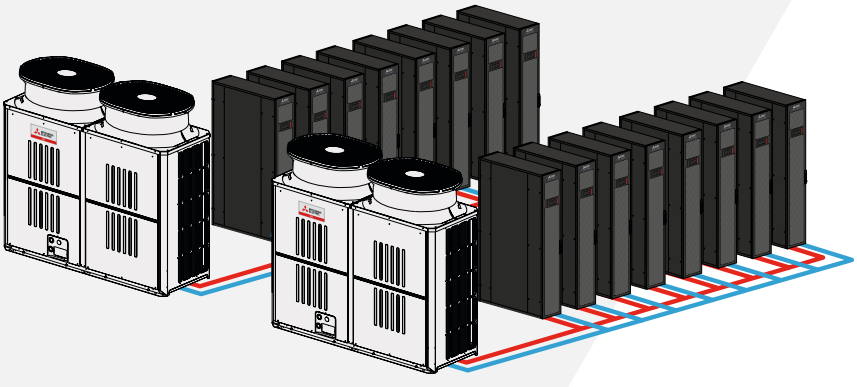
CONFIGURATION WITH REDUNDANCY (N+1)



Ideal for TIER II IT rooms

- 2 external units paired with up to 8 indoor units
- The external units operate in load sharing at partial loads for higher efficiency
- In case of failure of one of the condensing units, the second one operates at full load
- Average system EER is around 3.25
- Cooling capacity up to 50 kW

CONFIGURATION (2N)



Ideal for TIER III and TIER IV data centers

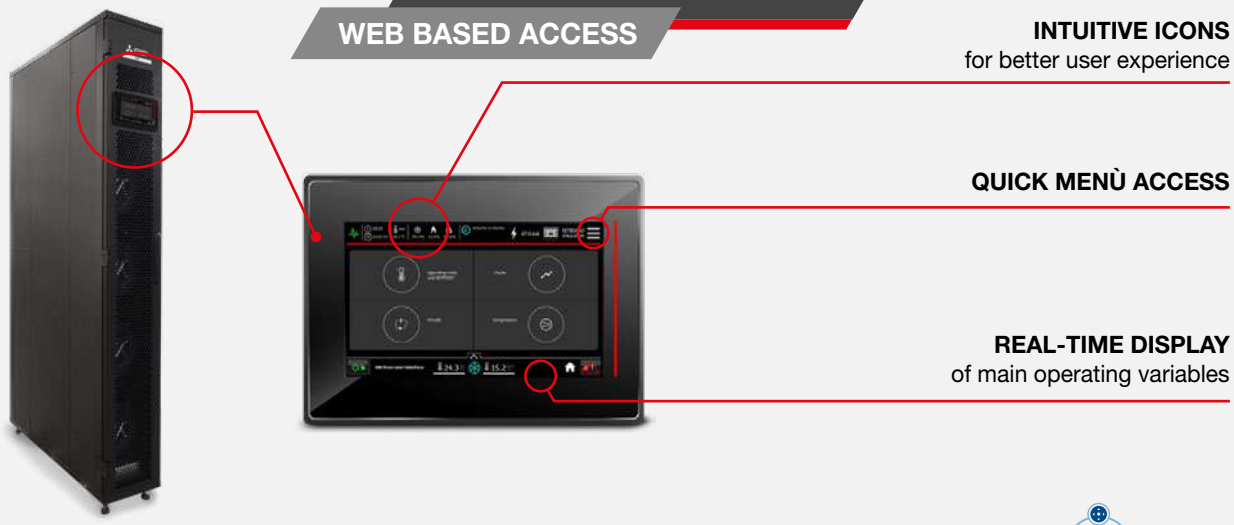
In accordance with the Uptime's Institute's classification, this configuration offers:

- A fully redundant and mirrored system with two independent distribution systems
- 1+1 external units paired with up to 8+8 indoor units

NEW EVOLUTION TOUCH DISPLAY

The evolution touch display is available for the room units m-MROW and m-MRAC.
Through simple, easy-to-read colour graphics, the innovative touch screen display (available as an option) shows the real performance of key components.

A completely redesigned interface improves the user experience. The 7" touch screen display ensures the immediate visualization of the indoor units' status thanks to dedicated screens for main operating parameter control: temperature, humidity, ventilation and then, alarms and event management.



KIPlink INNOVATIVE INTERFACE

Multidensity system is also available, as option, with KIPlink interface.
Based on WI-FI technology, **KIPlink** gets rid of the standard keyboard and allows one to operate on the unit directly from a mobile devices (**smartphone, tablet, notebook**).

Easier on-site operation

View and change all parameters with easy-to-understand screenshot and dedicated tooltips.
Get devoted "help" messages for alarm reset and trouble shooting.

Real-time graphs and trends

Monitor the immediate labour status of main components.
View the real-time graphs of the key operating variable trends.

Data logger function

View history of events and use the filter for a simple search.
Enhance diagnostics with data and graphs of 10 minutes before and after each alarm.
Download all the data for detailed analysis.

How to access the unit with KIPlink

Direct access to the control is achieved by scanning the QR-code positioned on the front side of the unit.

LED switch

The three-colour LED button positioned on the electrical board allows the user to switch the unit on/off and visualize the genaral status of the equipment without using any mobile device.

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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.