MITSUBISHI ELECTRIC

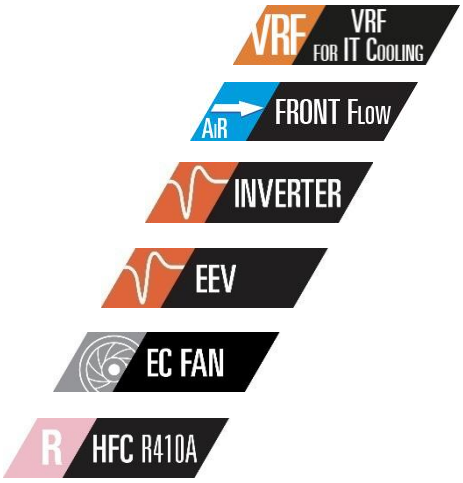
Data Book

T_MULTIDENSITY_0920_EN - HFC R410A

MULTIDENSITY

12.5 - 50 kW

IT Cooling VRF technology FULL INVERTER air conditioning system.



The picture of the unit is indicative and may vary depending on the model.

- **IT Cooling VRF technology.**
- **In-Row / Enclosure installation.**
- **For high density rack and blade server cooling.**
- **Single refrigerant circuit.**
- **Plug fans with EC electric motor.**
- **Electronic expansion valve.**
- **Fully hermetic BLDC inverter compressors (on outdoor unit).**

INDEX

CERTIFICATIONS

CE MARKING

RoHS Compliant 2011/65/EU

HIGHLIGHTS

Precision air conditioning system for applications in modern IT infrastructures, such as telephone exchanges, data banks, internet hotels and server rooms, all featuring high concentrated thermal loads (Hot-Spot).

The system applies the VRF (Variable Refrigerant Flow) concept to IT Cooling, where multiple indoor units may be connected to a single outdoor unit.
The system is a FULL INVERTER and fully modulating system. Based on the IT infrastructure thermal load, the outdoor unit modulates the cooling power flow, while the indoor units manage the cooling air distribution.
This makes the system the ideal solution for cooling small / medium IT infrastructures with part load requirements such as:

- thermal load variability
- scalability
- redundancy
- high energy efficiency

It is possible to connect two outdoor units to increase energy efficiency through power sharing management, and/or for system redundancy.

The installation entails the insertion of indoor units within the rows of racks; this allows to counteract localized heat sources (hot spot) by adapting the installation to the operating conditions.

The system can tackle high thermal loads in a small footprint: **up to 28.6 kW on 0.3 m²**.

Another big advantage is the modularity and scalability of the system, which allow for quick adjustment and economic development of the plant layout, therefore optimising the financial commitments according to the changing needs of the infrastructure.

In order to eliminate energy waste, a cold aisle containment system is recommended.

GENERAL CHARACTERISTICS

m-MROW
Indoor unit for INROW applications

m-MRAC
Indoor unit for ENCLOSURE applications

Rear view

m-MOCU
Outdoor unit

MULTIDENSITY INDOOR UNIT

Indoor unit for close control air conditioning.

The installation entails the direct insertion within the rows of racks to be cooled; raised floors, ducts or false ceilings are no longer required.

The machines are designed for indoor installation.

The construction solutions and the internal lay-out ensure high application flexibility and front access to the main components for the inspection and routine maintenance activities.

End of line testing on all machines before shipment, including running test, reading and monitoring of the operating parameters, alarm simulations and visual inspection.

The units require the refrigerant charge, and electrical, refrigerant and hydraulic connections.

The **m-M** series is available in the following versions:

m-MROW version, for in-row installation, available in 3 models with the following air flows:

- IN-ROW – FRONT DELIVERY. Front air delivery, rear air suction.
- IN-ROW – RIGHT DELIVERY. Right side air delivery, rear air suction.
- IN-ROW – LEFT DELIVERY. Left side air delivery, rear air suction.
- IN-ROW – RIGHT + LEFT DELIVERY. Left and right side air delivery, rear air suction.

m-MRAC version, for enclosure installation, available in 3 models with the following air flows:

- ENCLOSURE – RIGHT DELIVERY. Right side air delivery, right side air suction.
- ENCLOSURE – LEFT DELIVERY. Left side air delivery, left side air suction.
- ENCLOSURE – RIGHT + LEFT DELIVERY. Left and right side air delivery - left and right side air suction.

THE AIR FLOW MUST BE SELECTED WHEN ORDERING.

MULTIDENSITY OUTDOOR UNIT

Outdoor units with hermetic BLDC inverter compressor.

The machines are designed for outdoor installation.

The construction solutions and the internal lay-out ensure high application flexibility and front access to the main components for the inspection and routine maintenance activities.

End of line testing on all machines before shipment, including running test, reading and monitoring of the operating parameters, alarm simulations and visual inspection.

The m-MOCU series is only available in the cooling version.

The units require electrical and refrigerant connections.

PRODUCT FEATURES AND BENEFITS

EFFICIENCY
The system combines the efficiency of the use of the latest generation of EC fans and a direct expansion system with inverter compressor (in the outdoor unit), making it possible to obtain great EER values. Thanks to the use of BLDC inverter compressors, these units can reduce consumption at partial load by 50% when compared with traditional ON/OFF compressor units. This is also made possible thanks to the variable air flow offered by EC fans.

FLEXIBILITY
The In-Row (m-MROW) and Enclosure (m-MRAC) versions are both ready for the passage of refrigerant connections and power connections both from above and below, allowing quick and easy installation in any conditions, whether or not the presence of a raised floor is contemplated.

SCALABILITY
With their characteristics of dimensional standardization based on rack size, the units are ideal for IT infrastructures where scalability of the system is a strategic factor.

AISLE CONTAINMENT
Perfect integration with CONTAINMENT systems that minimize the mixing of air between the hot and cold aisles and enhance the efficiency of such systems.

The series represents the state of the art in IT infrastructure air conditioning, with hot spots for high density racks and blade server cooling. The modularity of the system, together with the microprocessor control adaptive logic, make it the best solution for racks, and the latest generation equipment cooling.

- VRF technology applied to IT Cooling.
- System EER up to 3.24 at nominal conditions, with two m-MOCU outdoor units and two m-MROW-G02-025 indoor units.
- High cooling density, **up to and over 28.6kW on 0.3m²**.
- Single BLDC scroll inverter compressor for utmost energy efficiency.
- New plug fans with EC electric motors and composite material impeller that guarantees power consumption reduction.
- New maintenance-free fan electric motors.
- Total modulating, FULL INVERTER.
- Improvement of the control software with advanced control logic.
- Single refrigerant circuit.
- Total front access and fully removable side panels for easier extraordinary maintenance activities.

F-GAS DIRECTIVE

F-GAS

The units discussed in this publication contain <HFC R410A [GWP_{100} 2088]> fluorinated greenhouse gases.

INROW APPLICATION – m-MROW UNITS

Application suitable for server racks with vented front and rear doors.

The indoor units are placed in the rows of racks, arranged to obtain alternate cold and hot aisles.

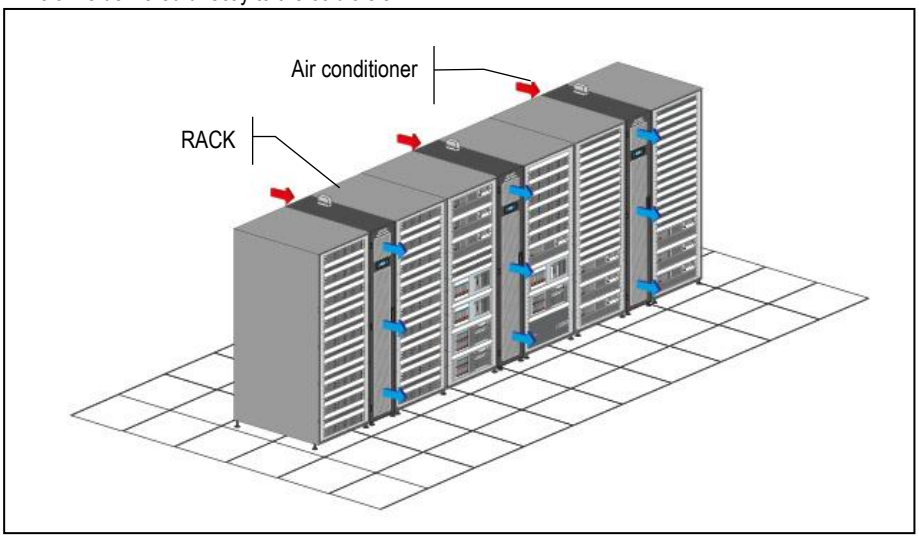
The electronic components contained in the racks independently suck the air required for their cooling.

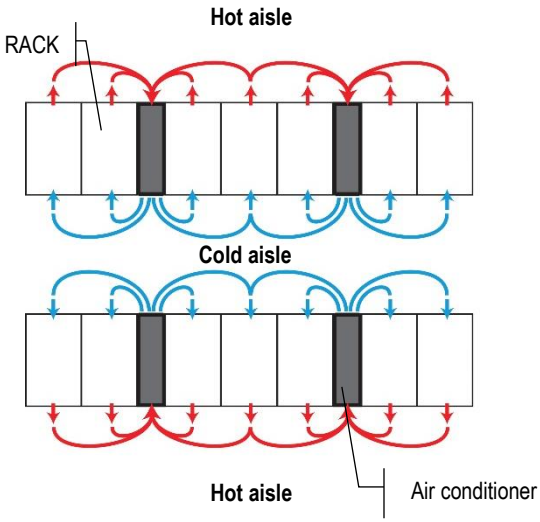
- In the hot aisle, the rack expels the hot air used to cool the electronic components while the air conditioner draws the hot air to be cooled.
- In the cold aisle, the air conditioner blows the filtered and cooled air while the rack draws cold air to cool the electronic components.

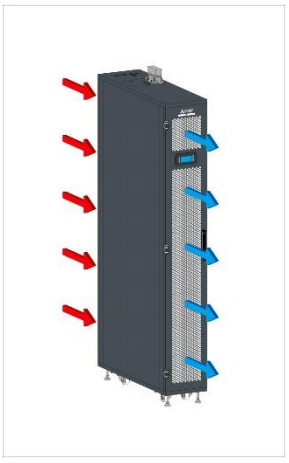
For an optimum installation, cold aisle containment is recommended.

FRONT AIR DELIVERY

Units with front air delivery and rear air suction.
The air is delivered directly to the cold aisle.



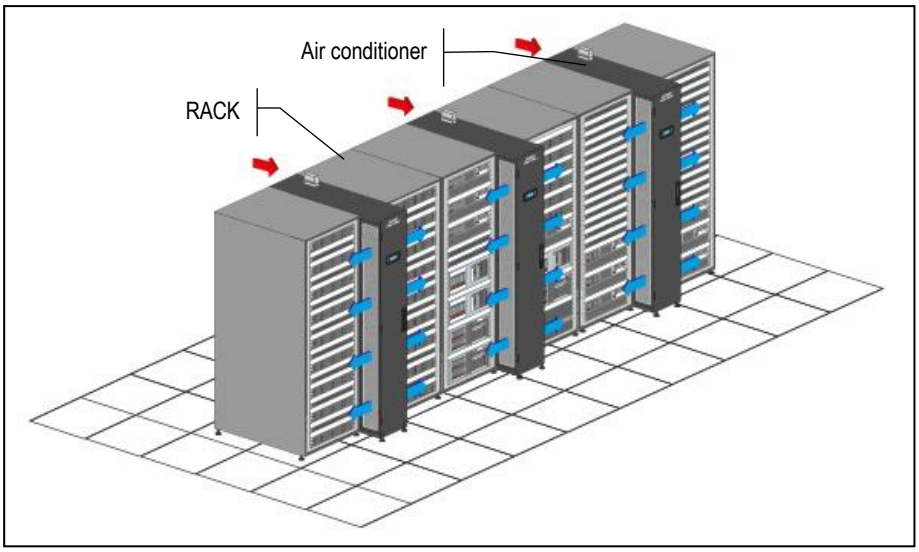


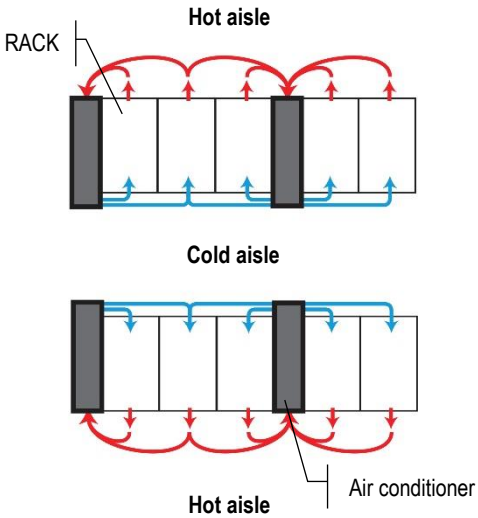


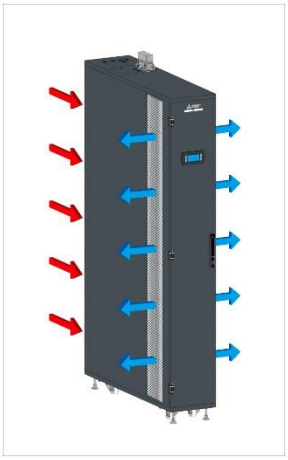
Frontal air delivery
Rear air suction

SIDE AIR DELIVERY

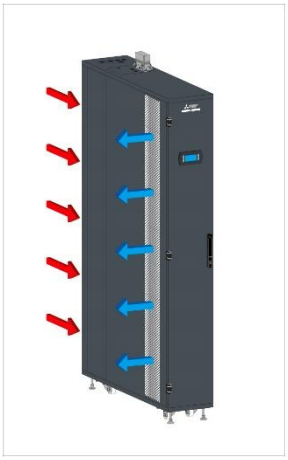
Units with side air delivery and rear air suction.
Suitable for server racks with vented front and rear doors.
The air is delivered directly to the front of the racks in the cold aisle.



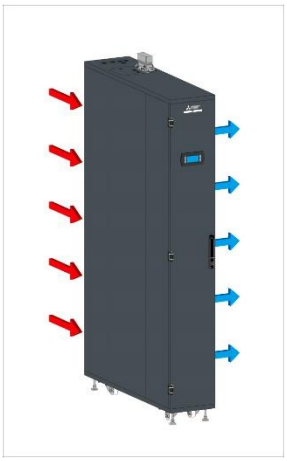




Right + Left air delivery.
Rear air suction.



Left air delivery.
Rear air suction.

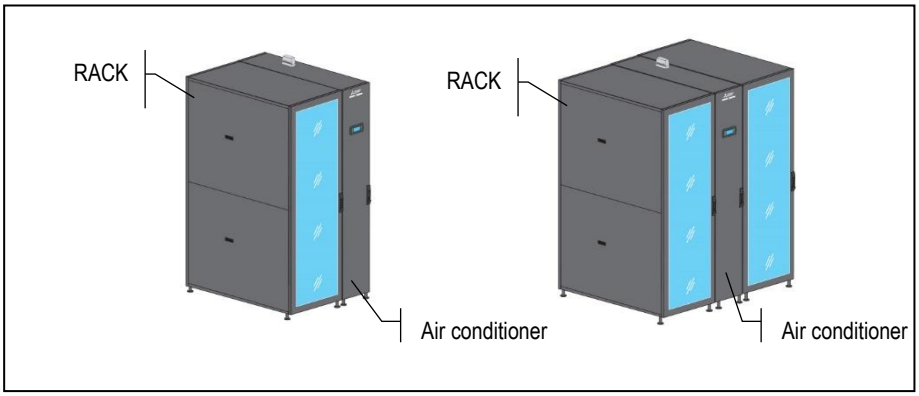


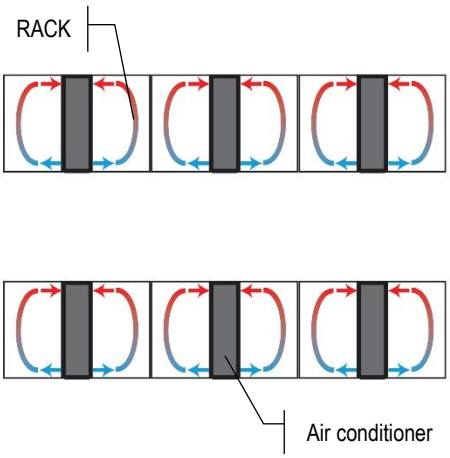
Right air delivery.
Rear air suction.

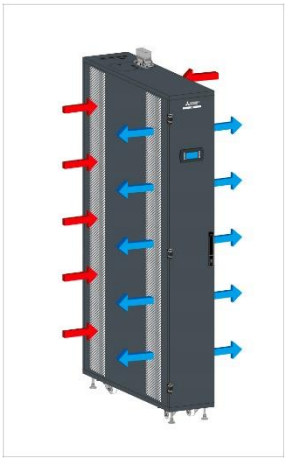
ENCLOSURE APPLICATION – m-MRAC UNITS

Suitable for server racks with solid front and rear doors; typically glass door.
Units for direct rack cooling.
The rack rows are arranged so as to insert an air conditioner between two racks.
The racks are equipped with solid doors for the containment of the cooling air.
The air conditioner blows filtered and cooled air to the front of the rack, where the electronic equipment draws the cooled air.
Thanks to the "closed" cooling system, the electronic equipment contained in the racks does not require air circulation fans.
At the rear of the rack, the hot air is drawn by the air conditioner and the cooling cycle is repeated

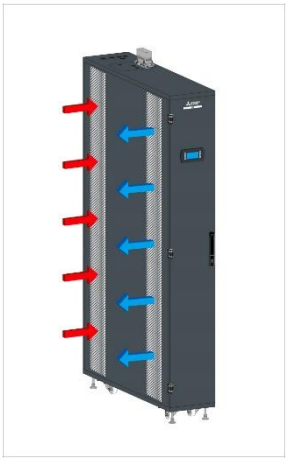
Cold aisle containment is not required.







Right + left air delivery/suction



Left air delivery/suction

Right air delivery/suction

THE SERIES

The units has been designed for a quick and easy setup.
The installation requires electrical, refrigerant and hydraulic connections.
The series is suitable for operation with R410A refrigerant.
A set of accessories allows to control the room temperature even in case of heating with electric heaters, and if necessary also humidity, by means of a modulating steam humidifier.

INDOOR UNITS

	m-MROW		m-MRAC
	IN ROW Frontal air delivery Back side air suction	IN ROW Side air delivery Back side air suction	ENCLOSURE Side air delivery Side air suction
UNIT SIZE 009 Air flow 1500 m³/h Single refrigerant circuit Nominal cooling capacity 10,6 kW			
UNIT SIZE 015 Air flow 2700 m³/h Single refrigerant circuit Nominal cooling capacity 16,6 kW			
UNIT SIZE 025 Air flow 4200 m³/h Single refrigerant circuit Nominal cooling capacity 28,6 kW			

OUTDOOR UNITS

	1x m-MOCU	2x m-MOCU
	Single outdoor unit system without redundancy Cooling capacity 50 kW	Two outdoor unit systems with redundancy (*) Total cooling capacity 50 kW
UNIT SIZE 050 Air flow 19200 m³/h Single refrigerant circuit Nominal cooling capacity 50 kW		

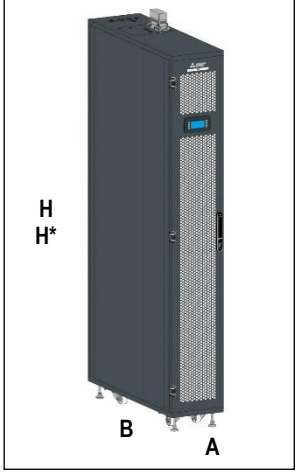
(*) The outdoor units operate in parallel at partial load for higher efficiency.
In case of failure of one outdoor unit, the other one switches to operation at full load.

INDOOR UNIT CONFIGURATION

The desired configuration must be selected when ordering.

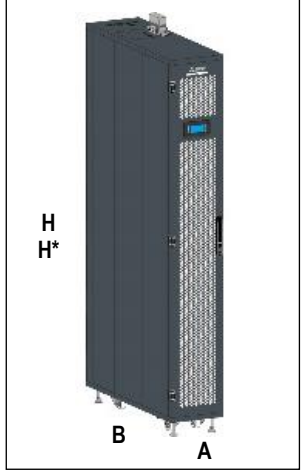
m-MROW – IN-ROW COOLING SYSTEM

FRONT AIR DELIVERY
STANDARD



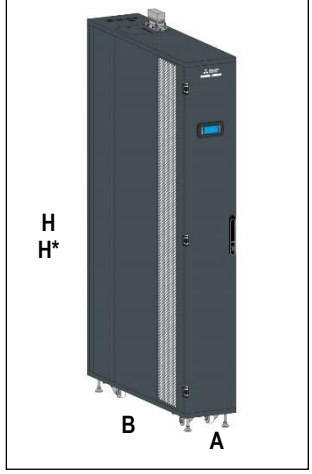
A (mm)	300
B (mm)	1000
H (mm)	2085
H* (mm)	2190

FRONT AIR DELIVERY (**)
OPTIONAL ACCESSORY



A (mm)	300
B (mm)	1200
H (mm)	2085
H* (mm)	2190

SIDE AIR DELIVERY
OPTIONAL ACCESSORY



A (mm)	300
B (mm)	1200
H (mm)	2085
H* (mm)	2190

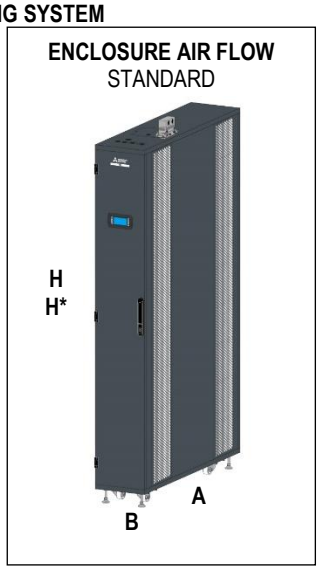
H: The height includes the height adjustment feet.
H*: The height includes the CNEM24 connector at the top of the unit.
(**) Increased frame dimensions for the In-Row version with front air delivery “B031 - Frame dimensions 42U 300 x 1200”.

The 1200mm deep frame is mandatory with:

- ENCLOSURE version (A892).
- Air flow configuration IN-ROW with side discharge (A904-A905-A906).
- With the Electric Heater option (A431-A432).
- With the Humidifier option (A802-A804).

m-MRAC - ENCLOSURE COOLING SYSTEM

ENCLOSURE AIR FLOW
STANDARD



A (mm)	300
B (mm)	1200
H (mm)	2085
H* (mm)	2190

H: The height includes the height adjustment feet.
H*: The height includes the CNEM24 connector at the top of the unit.

PLANT DESIGN AND CHOICE OF MACHINES

CONSIDERATIONS FOR PLANT DESIGN

The nominal cooling capacity of a single outdoor unit is 50 kW.

There are no restrictions on the types and sizes of indoor units that can be connected to the system. Both m-MROW units (In-Row installation) and m-MRAC units (Enclosure installation) can be installed, even if of different sizes.
The only requirement is that the sum of the "UNITS SIZES" installed is between 25 and 75. If these values are not respected, the system shows an error message and does not allow operation.

The indoor units can run at full capacity or in modulating mode according to the needs of the plant. Moreover, based on the type of plant, the indoor units can be set for stand-by or redundancy operation, and in load sharing, depending on the units installed and the load required by the system.

If the installed nominal capacity is higher than the requested cooling load, this will be shared between the operating indoor units. It will also be possible to leave some units in stand-by mode to allow for spare units in case of failure.

Table explaining which indoor units may be connected based on the cooling capacity:

Outdoor unit	m-MRAC-G02 m-MROW-G02 Indoor UNIT SIZE	Minimum installable indoor units	Sum of UNIT SIZE	Maximum installable indoor units	Sum of UNIT SIZE
m-MOCU–G02–050 Cooling Capacity 50 kW	009	3	27	8	72
	015	2	30	5	75
	025	1	25	3	75
	3x 009 + 1x 015 + 1x 025	---	---	5	67
	2x 025 + 2x 009	---	---	4	68

INDOOR UNITS IN OPERATIONS

To take the advantage of inverter modulation, the thermal load, therefore the cooling capacity of the indoor units in operation, the minimum cooling power shown in the tables below must be ensured.

Table explaining the outdoor unit cooling capacity based on the outdoor ambient temperature:

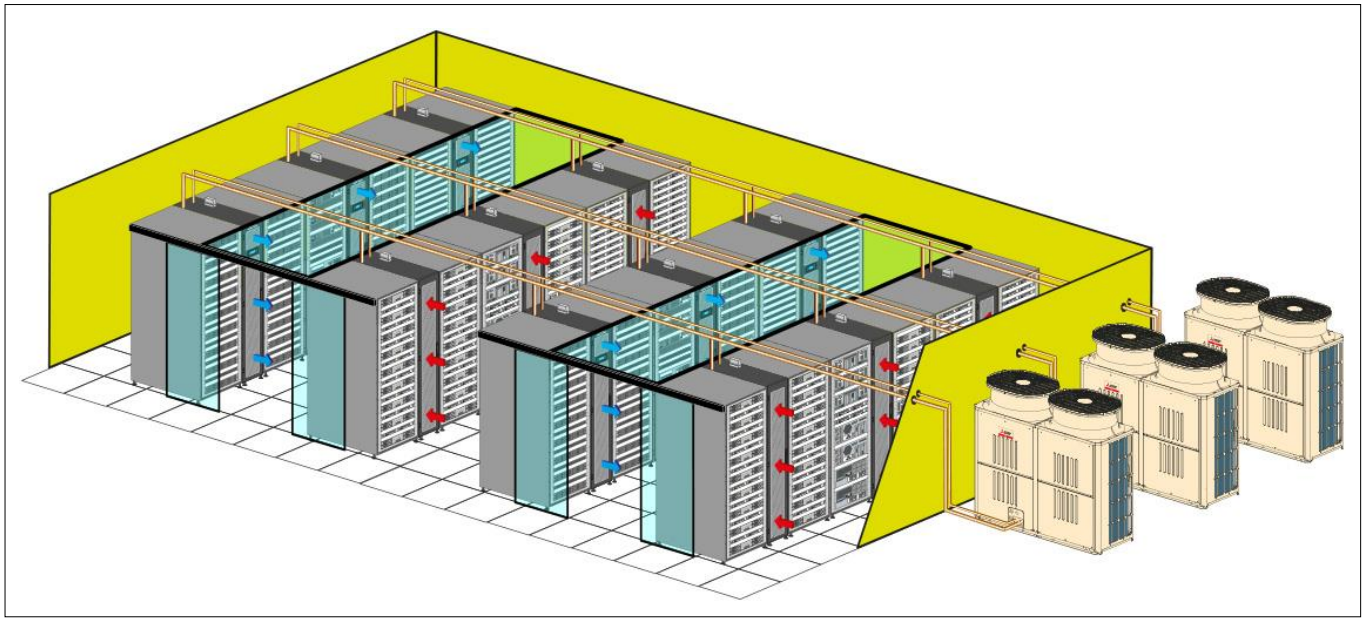
Ambient temperature	Outdoor units m-MOCU-G02-050	Outdoor unit cooling capacity	Cooling capacity of connected indoor units in operation
			Minimum
>5°C	1x	50kW	15kW
<= 5°C	1x	50kW	18kW

PLANT WITH TWO OUTDOOR UNITS IN PARALLEL

The system can be designed for redundancy with 2 outdoor units connected in parallel.
In this case, the smart outdoor unit logics manage the operation of the outdoor units to maximize the efficiency and to share the working hours.
In case of failure of an outdoor unit, the second unit increases its cooling capacity to maximum level (50kW), as required.

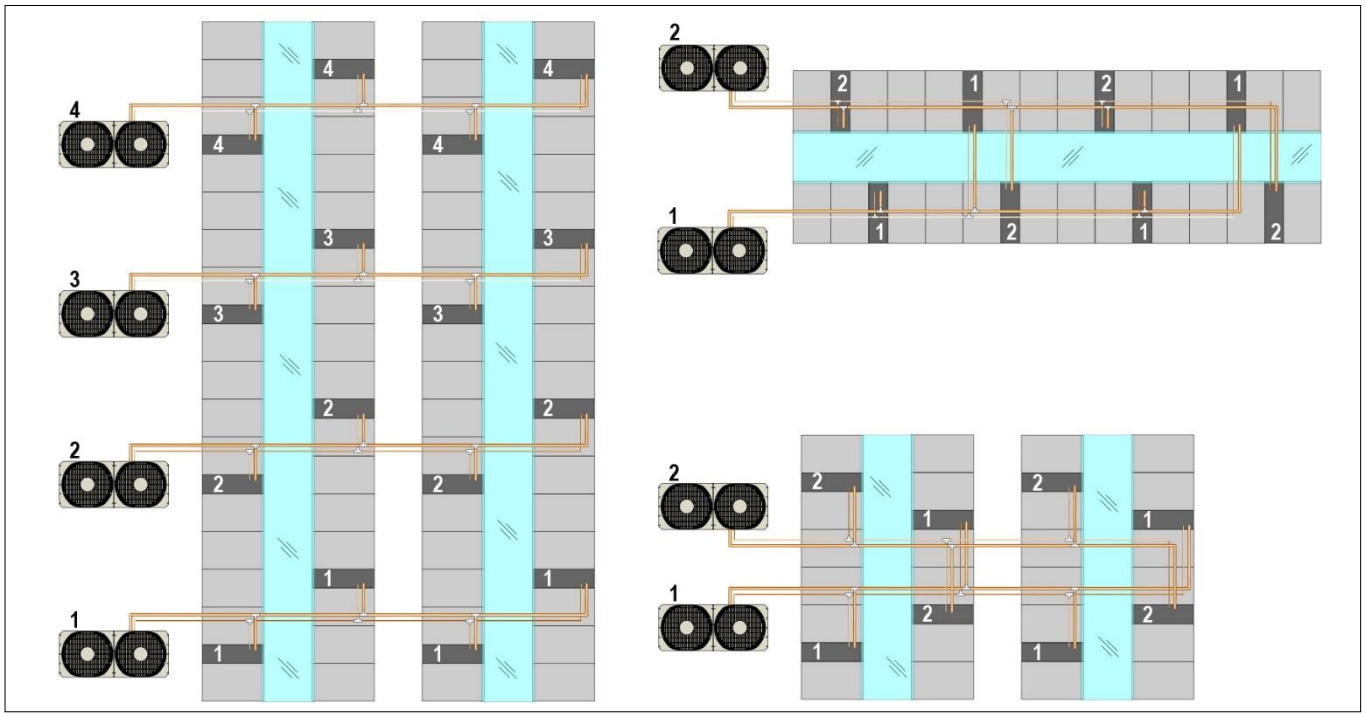
Ambient temperature	Outdoor units m-MOCU-G02-050	Outdoor unit cooling capacity	Cooling capacity of connected indoor units in operation
			Minimum
>5°C	2x	50kW	15kW
<= 5°C	2x	50kW	35kW

EXAMPLE OF INSTALLATION
The plant includes 3 MULTIDENSITY systems, which consist of a single m-MOCU outdoor unit connected to 4 m-MROW indoor units.



The cold aisle containment allows maximum energy savings and an optimum distribution of the air flow. The arrangement of the indoor units – one unit for each row of racks – ensures continuity of operation in case of failure of a system.

OTHER INSTALLATION EXAMPLES



MODEL IDENTIFICATION

m-MROW-G02-009

INDOOR UNIT:

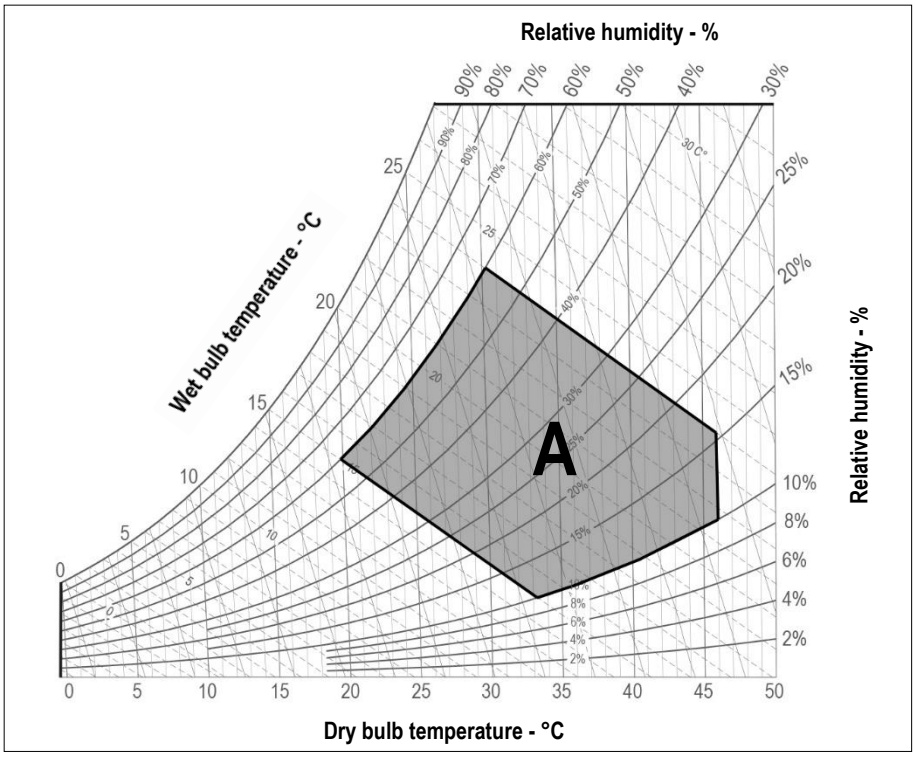
m-M	**Series** m = Multidensity system M = Mitsubishi brand
ROW	**Unit type** ROW = In-Row version RAC = Enclosure version
G02	**Refrigerant** G02 = R410A
009	**Unit Size**

m-MOCU-G02-050

OUTDOOR UNIT:

m-M	**Series** m = Multidensity system M = Mitsubishi brand
OCU	**Unit type** OCU = outdoor condensing unit
G02	**Refrigerant** G02 = R410A
050	**Unit size**

WORKING LIMITS



ROOM AIR CONDITIONS
Room air temperature:

15°C	Wet bulb minimum temperature
24°C	Wet bulb maximum temperature
20°C	Dry bulb minimum temperature
46°C	Dry bulb maximum temperature

Room air humidity:

60%RH	Maximum relative humidity
10%RH	Minimum relative humidity

AREA "A". Machine operating envelope.

AMBIENT AIR TEMPERATURE

+45°C	Maximum external ambient air temperature
-15°C	Minimum external ambient air temperature

All the values are indicative. The working temperatures are influenced by a series of variables:

- Working conditions
- Thermal load
- Setting of the microprocessor control
- Connection pipes length – distance between indoor and outdoor unit

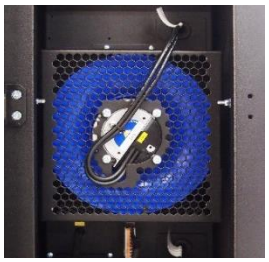
POWER SUPPLY

± 10%	Maximum tolerance of the supply voltage (V)
± 2%	Maximum unbalancing of the phases

TRANSPORT AND STORAGE TEMPERATURE

During transport, and if the machine is not installed upon receipt, do not remove the packaging and place the machine in an enclosed and dry location, protected from direct sun, at a temperature between -30°C and 50°C without surface condensation.

MAIN COMPONENTS – INDOOR UNIT



FRAMEWORK

- Framework in galvanized steel sheet externally painted with epoxy powders.
- Panel internally insulated with noise absorption material.
- Access doors. The doors are equipped with handles with security locks.
- Unit height adjustment feet and wheels for easier handling.
- Colour RAL 9005.
- Air flow:
  - IN-ROW VERSION cooling system (for rows of racks): Rear air suction and front air delivery through honeycomb grilles.
  - ENCLOSURE VERSION cooling system (direct cooling of racks): Right side air suction and delivery through honeycomb grilles.

FILTER SECTION

- Washable air filters with COARSE 40% efficiency (according to ISO EN 16890), with cells in synthetic fibre, supported by a frame with protective metal mesh. The filtering media is flame retardant.

CLOGGED FILTER SENSOR

- The system includes a differential pressure switch installed in the air delivery compartment and the plastic hoses for the relief of the pressure upstream and downstream the air filters.
  - Control range: 0,5 … 6,0 mbar (50 … 600 Pa).
  - Differential for intervention: 0,30 mbar (30 Pa).

COOLING SECTION

- Heat exchanger coil with internally corrugated copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Finned pack with hydrophilic treatment that ensures optimum condensate water drop and high thermal conductivity and prevents the growth of micro-organisms.
- Condensate tray with connection for a discharge pipe or a condensate drain pump (option A381).

FANS SECTION

- Centrifugal fans with backward curved blades and single suction, without scroll housings (Plug-fans), directly coupled to brushless type synchronous EC motor with integrated electronic commutated system and continuous variation of the rotation speed. The motor rotation control is obtained with the EC system (Electronic Commutation) which controls the motor based on the 0÷10V proportional signal from the microprocessor control.
- Fan quick installation system for a fast replacement.
- Nr.2 temperature sensors on the air delivery.
- Nr.2 temperature sensors on the air intake.
- Air flow loss alarm.

REFRIGERANT CIRCUIT

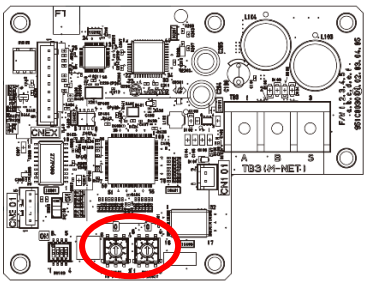
The indoor unit is supplied with seal charge.

- Electronic expansion valve. The valve allows high performance and system efficiency thanks to a timely and accurate response to changes in temperature and pressure.
- Refrigerant pressure transducer for expansion valve.
- Refrigerant temperature sensor for expansion valve.
- Low pressure safety switch with automatic reset.
- Valves on liquid and gas line for coupling to outdoor unit.
- Ready to accept refrigerant connections from the bottom or from the top of the unit.

ELECTRICAL PANEL/CONNECTIONS

MACHINE FRONT: sliding electrical panel in accordance with EN60204-1 standards, complete with:

- Transformer for auxiliary circuit feeding.
- Microprocessor controller.
- Back-up module controller. The system powers the microprocessor for a few minutes in the event of a power failure or voltage surges, preventing the reboot of the controller.
- Terminal board.



ModBus/IF rotative dipswitches

CNEM-24 connector

- ModBus/IF board for M-NET connection. The board is equipped with rotative dipswitches for M-NET addresses setup.

MACHINE BACK: terminals for the following signals/connections:

- M-NET connection.
- P-Lan connection.
- ModBus connection for Network Analyzer and/or T/H additional probe.
- Remote On/Off enabling.
- Alarm A – Configurable alarm.
- Alarm B – Configurable alarm.
- Water leakage detector.
- Smoke detector.
- Fire detector.
- Power supply for Smoke and Fire detectors.

MACHINE TOP:

- C14 type electric power supply plug 230/1/50-60. The plug is only installed on standard units without Electric Heater and Humidifier optional accessories.
- CNEF-24 female connector, which repeats the same signals/connections as the terminal box. The CNEM-24 male connector is supplied as standard with the unit. Electric connections are the responsibility of the Customer.

CONTROL SYSTEM

Microprocessor system with graphic display for control and monitoring of the operating and alarms status. The system includes:

- Built-in memory for the storing of triggered events (up to 100 events recorded).
- Connectivity board housing arrangement: (RS485, LON, Ethernet. The electronic boards are optional accessories.
- Non-volatile “Flash” memory for data storage in case of power supply faulty.
- Password-protected menu
- LAN connection.

OPTIONAL ACCESSORIES – INDOOR UNIT

B031..... **Frame dimensions 42U 300 x 1200** for m-MROW version. The optional accessory is necessary for the version with front air delivery with “A802 Humidifier” or “A804 Humidifier + Dehumidification” and/or “A431/A432 Electric heater”.
A902 (1)..... **Enclosure version with air delivery L.**
A903 (1)..... **Enclosure version with air delivery L + R.**
A904 (2)..... **In Row version with air delivery R.**
A905 (2)..... **In Row version with air delivery L.**
A906 (2)..... **In Row version with air delivery L + R.**
A559..... **230/1/60 power supply.**
5891..... **Control unit via KIPlink.** Innovative Wi-Fi interface for an easy and enhanced unit management.
383..... **Numbered wirings + UK requests.**
A431 (3)..... **Electric heater:** Electric heating system.
A432 (3)..... **Enhanced electric heater:** Enhanced electric heating system.
A801..... **Temperature/Humidity sensor only:** Combined room temperature / humidity probe. Room humidity display only.
A802 (4)..... **Humidifier**: Modulating steam humidifier with immersed electrodes with electronic control. The optional accessory requires a “Temperature / Humidity sensor on air intake” and control board.
A803..... **Dehumidification**. The optional accessory requires a “Temperature / Humidity sensor on air intake”.
A804 (4)..... **Humidifier + Dehumidification**: Modulating steam humidifier with immersed electrodes with electronic control and dehumidification system. The optional accessory requires a “Temperature / Humidity sensor on air intake” and control board.

A381..... **Standard condensate drain pump**. Installed on the unit. For low temperature water.
A35B..... **Graphic display "Evolution Touch"**.
A471 / A473 / A474 ..... **Serial card**:
A471 – RS485 serial card
A473 – Ethernet card
A474 – LON card
A521..... **Fire detector.**
A511..... **Smoke detector.**
A491..... **Water leakage detector.** Floor installation sensor floor water alarm. Supplied as a mounting kit.
A842..... **Network analyzer**: Multifunction utility for calculating and displaying the machine electrical measurements. Supplied as a mounting kit.
P111..... **Double power supply** with automatic change-over. Supplied as a mounting kit.
A882..... **Clamping kits floor:** Floor brackets fixing kit.
7387012600 ..... **Remote terminal display** for wall mounted installation.
9973 ..... **Wooden cage packing**: Unit packed in wooden cage.

Refrigerant Line Adapters Unit: Inch [mm]
C7540341..... **TEE F/F/F Ø 5/8"** [Ø 15.88]
C7540342..... **TEE F/F/F Ø 7/8"** [Ø 22.2]
C7540340..... **TEE F/F/F Ø 1"** [Ø 25.4]
C7540343..... **Adapter M/F Ø 1" > 1 1/8"** [Ø 25.4 > Ø 28.58]
C7540344..... **Adapter M/F Ø 1" > 3/4"** [Ø 25.4 > Ø 19.05]
C7540345..... **Adapter M/F Ø 1" > 7/8"** [Ø 25.4 > Ø 22.2]
C7540354..... **Adapter M/F Ø 1 3/8" > 1 1/8"** [Ø 34.93 > Ø 28.58]
C7540353..... **Adapter M/F Ø 3/4" > 5/8"** [Ø 19.05 > Ø 15.88]
C7540346..... **Adapter M/F Ø 5/8" > 1/2"** [Ø 15.88 > Ø 12.7]
C7540347..... **Adapter M/F Ø 5/8" > 3/4"** [Ø 15.88 > Ø 19.05]
C7540348..... **Adapter M/F Ø 7/8" > 1"** [Ø 22.2 > Ø 25.4]
C7540350..... **Adapter M/F Ø 7/8" > 1 1/8"** [Ø 22.2 > Ø 28.58]
C7540349..... **Adapter M/F Ø 7/8" > 1/2"** [Ø 22.2 > Ø 12.7]
C7540351..... **Adapter M/F Ø 7/8" > 3/4"** [Ø 22.2 > Ø 19.05]
C7540352..... **Adapter M/F Ø 7/8" > 5/8"** [Ø 22.2 > Ø 15.88]

WARNING
The manufacturer reserves the right of acceptance of any optional accessory combinations to be installed on the machine.

MANDATORY ACCESSORIES COMBINATIONS

1. For ENCOLUSURE version A892, A901, A902, A903, the "B031 Frame dimensions 42U 300 x 1200" is mandatory.
2. For INROW version A904, A905, A906, the "B031 Frame dimensions 42U 300 x 1200" is mandatory.
3. With optional accessories "A431 Electric Heater" and "A432 Enhanced electric Heater" the "B031 Frame dimensions 42U 300 x 1200" is mandatory.
4. With optional accessories "A802 Humidifier" and "A804 Humidifier + Dehumidification" the "B031 Frame dimensions 42U 300 x 1200" is mandatory.

MAIN COMPONENTS – OUTDOOR UNIT

FRAMEWORK

- Base and frame in pre-coated galvanized steel sheets with polyester powder coating. External finish “Munsell 3Y 7.8/1.1”.
- Inspection panels fixed with screws.
- Total front access for maintenance.
- Compartment for electrical panel on unit front for direct access to control and regulation devices.
- Air flow from the condensing coil to the fan.

BLDC INVERTER COMPRESSOR SECTION

- Low pressure shell Scroll BLDC inverter compressors with spiral profile optimized for R410A refrigerant:
  - Synchronous brushless inverter driven motor.
  - Inverter for modulating capacity control.
  - Intelligent power module (IPM) that ensures optimal inverter performances.
  - Multi-port mechanism. One delivery port and two sub discharge ports for delivery pressure optimization.
  - Reactance for the reduction of electromagnetic noise and interference.
- Crankcase induction heater (IH warmer).
- Soundproof compressor box.
- Lubricant oil charge.
- Rubber supports.

CONDENSER FAN

- Axial fans with fan guard and optimized for low noise levels.
- High efficiency EC motor.
- Bell-mouth shaped optimized air diffusor that ensures high air discharge efficiency.
- Intelligent power module (IPM) that ensures optimim fans performances.
- Protection grille.

CONDENSING COIL

- External heat exchanger coil consisting of copper tubes and high efficiency aluminium fins.
- Anti-corrosion fin treatment.
- Temperature sensor on air suction.
- Protection grille.

REFRIGERANT CIRCUIT

The outdoor unit is supplied with R410A refrigerant charge.

- Refrigerant gas accumulator.
- Oil separator on gas discharge.
- High pressure safety switch.
- Low- and high-pressure sensors.
- Thermistors for temperature control.
- 4-way valve for heat exchanger capacity control (100% or 50%).
- Subcooling coil with electronic expansion valve for subcooling control.
- Electronic expansion valve for refrigerant backflow prevention on the liquid line.
- Condensation control with continuous fan speed variation for operation with external ambient temperature down to -15°C.
- Valves on liquid / gas suction lines for coupling to remote indoor unit.
- Twinning kit CMY-Y200VBK2 for parallel connection of the second outdoor unit.
- 5/16” SAE charge valve on high- and low-pressure side. Valves complete with core and cap.

ELECTRICAL PANEL / CONTROL SYSTEM

In accordance with EN60335-1 standard, suitable for outdoor installation, complete with:

- Inverter for compressor motor control.
- EC fans control module.
- Electronic control board with protective film coating layer.
- Power supply: 380 – 400 – 415 / 3+N / 50-60.

TECHNICAL DATA: INDOOR UNIT

INDOOR UNIT				
UNIT SIZE		**009**	**015**	**025**
COOLING CAPACITY (1)				
Total	**kW**	**10.6**	**16.6**	**28.6**
Sensible	**kW**	**9.6**	**15.7**	**27.4**
SHR (2)		0.91	0.94	0.96
Indoor unit EER (3)	kW/kW	58.9	50.3	32.5
"EC" SUPPLY FAN	Nr.	2	4	5
Air flow	m³/h	1500	2700	4200
Power input (4)	kW	0.18	0.34	0.85
Max power input (FLI)	kW	0.34	0.68	0.91
Absorbed current (4)	A	0.8	1.5	4.0
Starting current (SA)	A	2.9	5.8	7.3
Plate current (FLA)	A	2.9	5.8	7.3
Nominal external static pressure	Pa	20	20	20
Maximum external static pressure	Pa	60	60	60
ELECTRIC PANEL				
Power input (5)	kW	0.02	0.02	0.02
SOUND LEVEL ISO 3744 (6)				
Pressure level	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 – version B032	mm	1000	1000	1000
Length – version B031	mm	1200	1200	1200
Height (7)	mm	2085	2085	2085
Height (8)	mm	2190	2190	2190
NET WEIGHT				
m-MROW	kg	175	190	193
m-MRAC	kg	185	200	203
CONNECTIONS				
Refrigerant pipes – Gas	Ø inch	3/4"	7/8"	1"
Refrigerant pipes - Liquid	Ø inch	1/2"	5/8"	3/4"
Condensate (9)	Ø mm	16	16	16
Power supply cable (10)	Nr. x mm²	3G1.5	3G1.5	3G1.5

THE COOLING CAPACITY DOES NOT CONSIDER THE SUPPLY FAN MOTOR THERMAL LOAD.

1. Gross Value. Characteristics referred to room air temperature 35°C with 27%RH and external ambient air temperature 35°C. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.
3. The Energy Efficiency Index does not consider the outdoor unit.
4. Corresponding to nominal useful static pressure ESP=20Pa.
5. Value to be added to the machine engaged power.
6. Sound pressure level on air return at 1m.
7. The height includes the height adjustment feet.
8. Overall height including CNEM-24 connector on the top of the machine.
9. Rubber pipe – referred to internal diameter.
10. Minimum section of the power cable for units without accessories.

The units discussed in this publication contain <HFC R410A [GWP100 2088]> fluorinated greenhouse gases.

NOTE:
Please refer to the Design Tool software for the technical data at partial load.

TECHNICAL DATA: OUTDOOR UNIT

OUTDOOR UNIT		1x m-MOCU-G02-050	2x m-MOCU-G02-050
COOLING CAPACITY (1)			
Total	**kW**	**50**	**50**
System EER	kW/kW	2.96	3.24
UNIT ELECTRICAL DATA			
Power input (1)	kW	15.2	13.7
Max absorbed current (FLA)	A	37.6	2x 37.6
Starting current (SA)	A	27.8	2x 27.8
Fuse rating (BS88) – HRC (A)	A	40	2x 40
CONDENSER FANS	Nr.	2	2
Total air flow	m^3/h	19.200	2x 19.200
Power input	kW	2x 0.92	4x 0.92
External static pressure	Pa	0	0
COMPRESSOR	Nr.	1	2x 1
Power input	kW	14.3	2x 14.3
SOUND LEVEL ISO 3744			
Pressure level (2)	dB(A)	65	68
GAS CIRCUITS	Nr.	1	1
POWER SUPPLY	V/Ph/Hz	380-400-415 / 3+N / 50-60	380-400-415 / 3+N / 50-60
DIMENSIONS			
Length	mm	1650	1650
Depth	mm	740	740
Height	mm	1750	1750
NET WEIGHT	kg	304	2x 304
CONNECTIONS			
Refrigerant pipes: Gas	Ø Inch	1 1/8“	2x 1 1/8“
Refrigerant pipes: Liquid	Ø Inch	5/8“	2x 5/8“
Twinning kit		CMY-Y200VBK2	CMY-Y200VBK2
Fitting kit	Ø Inch	3/4" > 5/8”	3/4" > 5/8”
Fitting kit	Ø Inch	1-3/8” > 1-1/8”	1-3/8” > 1-1/8”
Power supply cable (3)	Nr. x mm^2	5G6	2x 5G6
REFRIGERANT		R410A	R410A
Refrigerant charge	kg	11.8	2x 11.8
Maximum refrigerant charge (4)	kg	40.0	99.9
F GAS HFC R410A - CO_2 equivalent	t	24.63	2x 24.63

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.
3. Minimum section of the power cable for units without accessories.

These units contain <HFC R410A [GWP_{100} 2088]> fluorinated greenhouse gas.

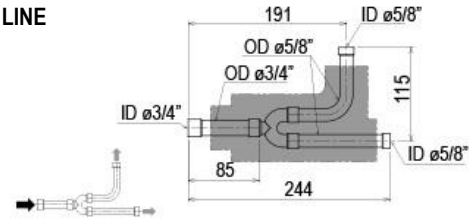
NOTE:
Please refer to the Design Tool software for the technical data at partial load.

MULTIDENSITY

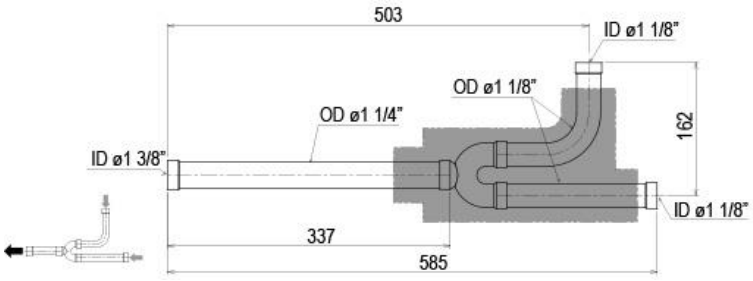
TWINNING KIT

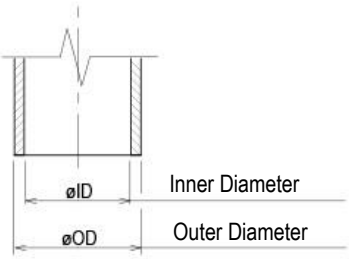
Twinning kit CMY-Y200VBK2 is supplied with the outdoor unit.
The kit allows the parallel connection of two outdoor unit.
The kit is always included in the supply, even for single machine.

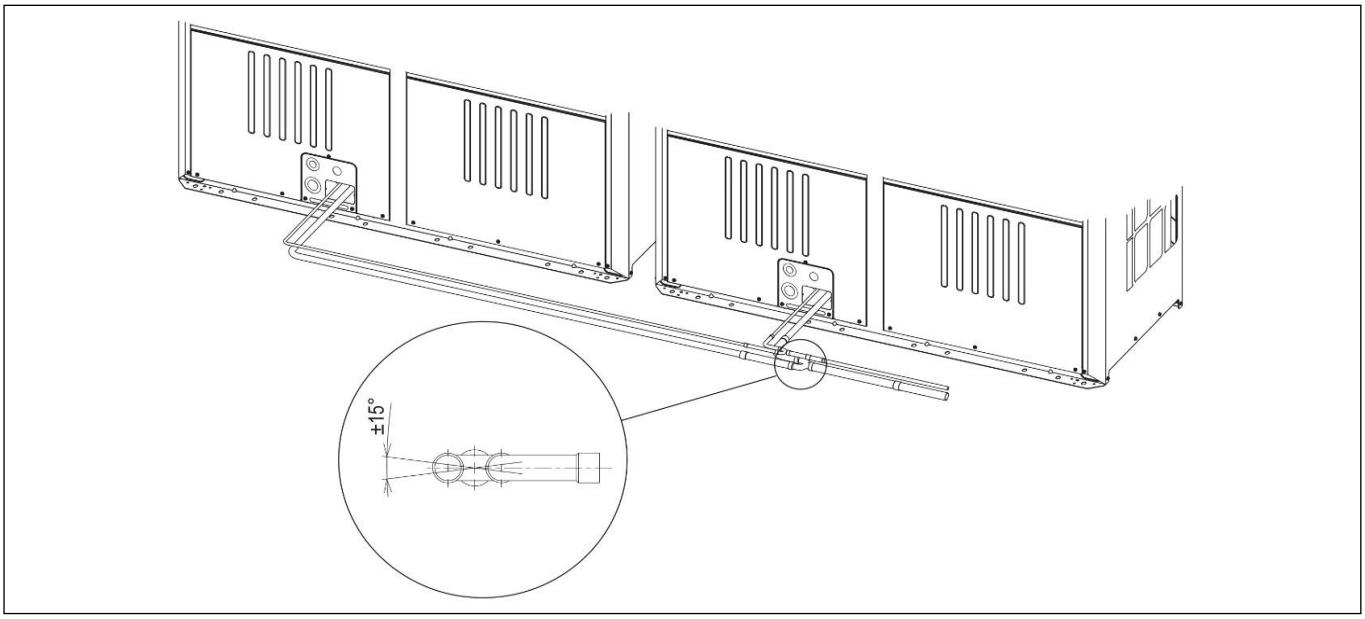
1x LIQUID LINE



1x GAS LINE





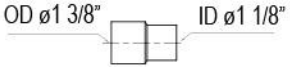


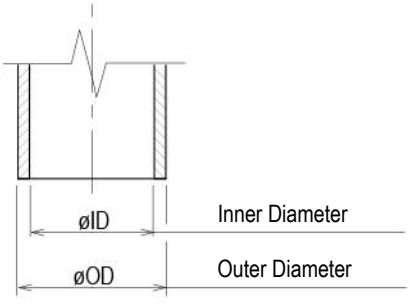
FITTING KIT

The fitting kit is supplied with the outdoor unit to connect the Twinning kit to the refrigerant line of the indoor units.
The kit is always included in the supply, even for single machine.

1x LIQUID LINE

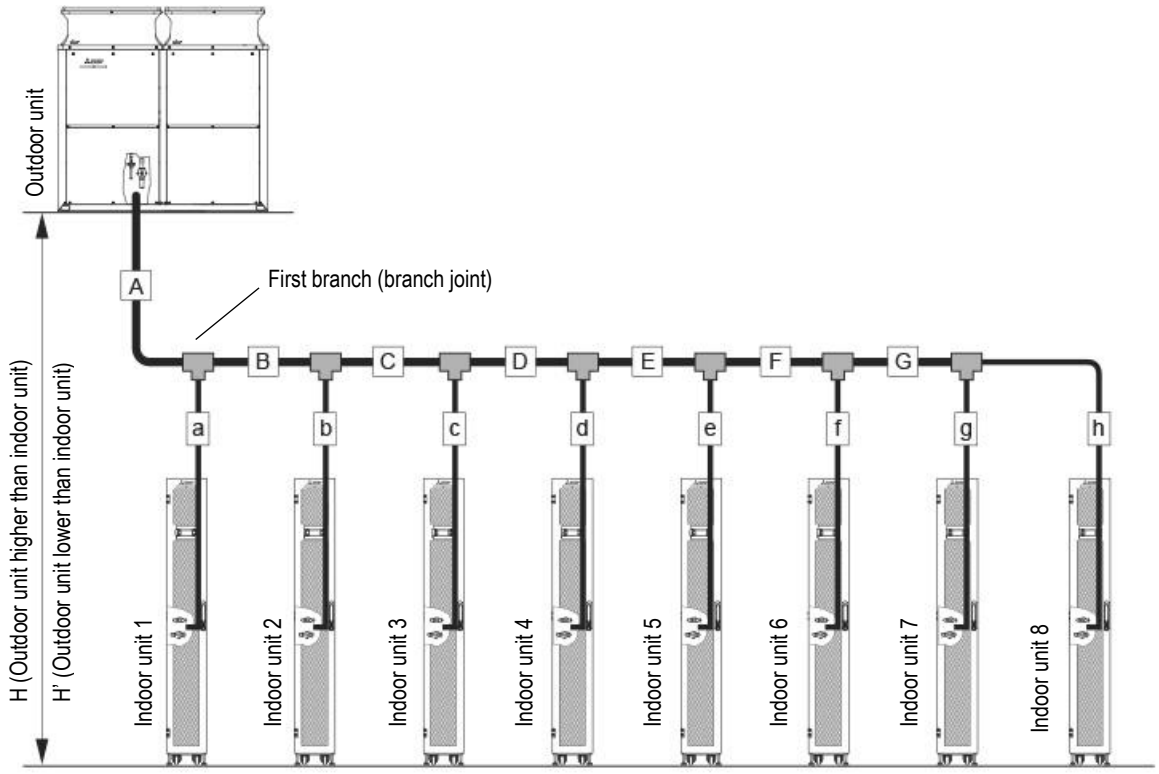
1x GAS LINE





INSTALLATION DIAGRAM

EXAMPLE “A” FOR CONNECTION BETWEEN ONE OUTDOOR UNIT AND SEVERAL INDOOR UNITS.



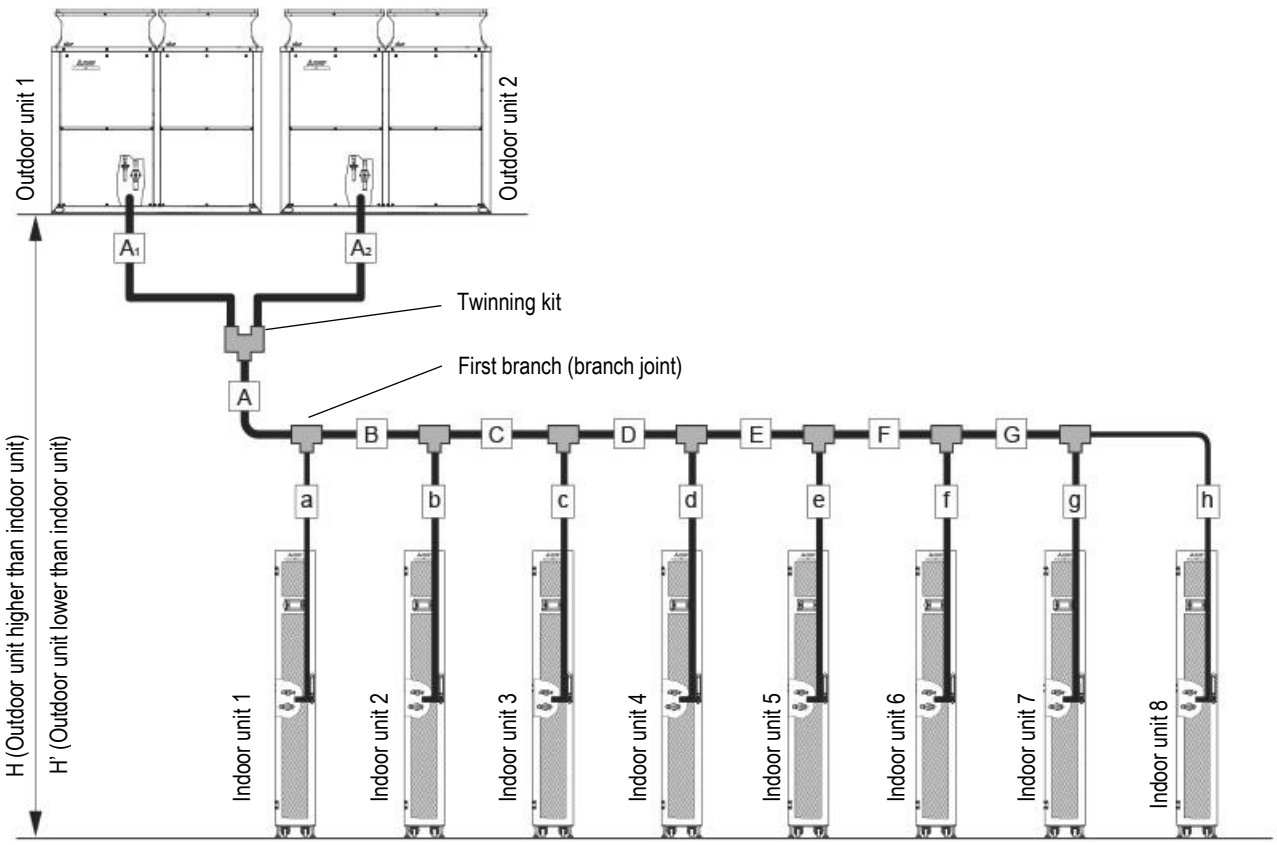
Unit: m [ft]

Operation			Pipe sections	Allowable length of pipes
Length	Total pipe length		A+B+C+D+E+F+G +a+b+c+d+e+f+g+h	1000 [3280] or less
	Total pipe length from the outdoor unit to the farthest indoor unit		A+B+C+D+E+F+G+h	165 [541] or less
	Total pipe length from the first branch to the farthest indoor unit		B+C+D+E+F+G+h	40 [131] or less
Height difference	Between indoor and outdoor units	Outdoor unit higher than indoor	H	50 [164] or less
		Outdoor unit lower than indoor	H’	40 [131] or less

NOTE: The total pipe length is the sum of the single lengths of the liquid and gas lines with the related branches.
Equivalent total pipe length (m) = Total pipe length + “M” x Quantity of bent.

MULTIDENSITY

EXAMPLE “B” FOR CONNECTION BETWEEN TWO OUTDOOR UNITS AND SEVERAL INDOOR UNITS.



Unit: m [ft]

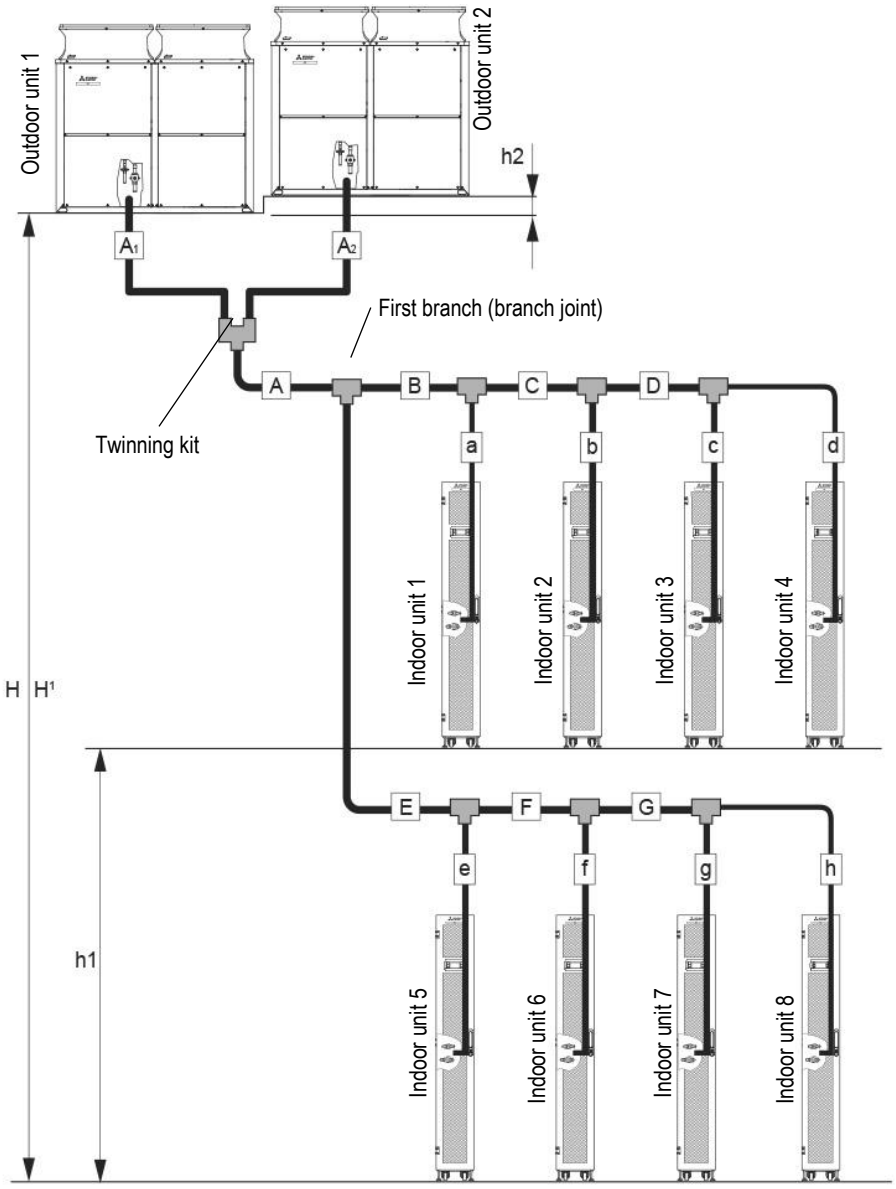
Operation			Pipe sections	Allowable length of pipes
Length	Between outdoor units		A_1+A_2	10 [32] or less
	Total pipe length		$A_1+A_2+A+B+C+D+E+F+G+a+b+c+d+e+f+g+h$	1000 [3280] or less
	Total pipe length from the outdoor unit to the farthest indoor unit		$A_1(A_2)+A+B+C+D+E+F+G+h$	165 [541] or less
	Total pipe length from the first branch to the farthest indoor unit		B+C+D+E+F+G+h	40 [131] or less
Height difference	Between indoor and outdoor units	Outdoor unit higher than indoor unit	H	50 [164] or less
		Outdoor unit lower than indoor unit	H’	40 [131] or less

NOTE: The total pipe length is the sum of the single lengths of the liquid and gas lines with the related branches.
Equivalent total pipe length (m) = Total pipe length + “M” x Quantity of bent.

NOTE: The pipe from the outdoor unit must be inclined downward to the indoor unit side.
If the length of the pipe between the twinning kit and the outdoor unit exceeds 2m (6ft) provide a trap within 2m (6ft) from the twinning kit.
The pipe from multiple outdoor units must be installed so that oil will not accumulate in the pipe under certain conditions.
Refer to the outdoor unit installation manual for details.

MULTIDENSITY

EXAMPLE "C" FOR CONNECTION BETWEEN TWO OUTDOOR UNITS AND SEVERAL INDOOR UNITS.



Unit: m [ft]

Operation			Pipe sections	Allowable length of pipes
Length	Between outdoor units		A_1+A_2	10 [32] or less
	Total pipe length		$A_1+A_2+A+B+C+D+E+F+G+a+b+c+d+e+f+g+h$	1000 [3280] or less
	Total pipe length from the outdoor unit to the farthest indoor unit		$A_1(A_2)+A+B+C+D+E+F+G+d+h$	165 [541] or less
	Total pipe length from the first branch to the farthest indoor unit		B+C+D+E+F+G+d+h	40 [131] or less
Height difference	Between indoor and outdoor units	Outdoor unit higher than indoor unit	H	50 [164] or less
		Outdoor unit lower than indoor unit	H'	40 [131] or less
	Between indoor units		h1	15 [49] or less
	Between outdoor units		h2	0,1 [4] or less

NOTE: The total pipe length is the sum of the single lengths of the liquid and gas lines with the related branches.
Equivalent total pipe length (m) = Total pipe length + "M" x Quantity of bent.

NOTE: The pipe from the outdoor unit must be inclined downward to the indoor unit side.
If the length of the pipe between the twinning kit and the outdoor unit exceeds 2m (6ft) provide a trap within 2m (6ft) from the twinning kit.
The pipe from multiple outdoor units must be installed so that oil will not accumulate in the pipe under certain conditions.
Refer to the outdoor unit installation manual for details.

RECOMMENDED REFRIGERANT LINES

EXAMPLE:
A, A1, A2 pipe sections. The pipe section letters refer to the INSTALLATION DIAGRAM.

Unit: inch [mm]

Configuration	Combinations		Pipe A		Pipe A1		Pipe A2	
	Unit 1	Unit 2	Liquid	Gas	Liquid	Gas	Liquid	Gas
Single outdoor unit system	m-MOCU-G02-050	---	Ø 5/8" [Ø 15.88]	Ø1-1/8" [Ø 28.58]	---	---	---	---
Two outdoor unit system	m-MOCU-G02-050	m-MOCU-G02-050	Ø 5/8" (1) [Ø 15.88]	Ø 1-1/8" (1) [Ø 28.58]	Ø 5/8" [Ø 15.88]	Ø 1-1/8" [Ø 28.58]	Ø 5/8" [Ø 15.88]	Ø 1-1/8" [Ø 28.58]

(1) Deformed pipe is required. Refer to the installation manual of the connected indoor unit.
Change the pipe size as follows using deformed pipe.
CMY-Y200VBK2 Gas: Ø 1-3/8 [Ø 34.93] → Ø 1-1/8" [Ø 28.58]
Liquid: Ø 3/4" [Ø 19.05] → Ø 5/8" [Ø 15.88]

If the pipe length after the first branching point exceeds 40 m [131ft] (≤ 90m [295ft]), use the one size larger liquid pipe for all pipes from indoor units to the first branch.

When the vertical separation between the indoor units exceeds 15 m [49 ft] (≤ 30 m (98 ft)), use the one size larger liquid pipe for all pipes from the lower indoor units to the first branch.

B, C, D, E, F, G pipe sections. The pipe section letters refer to the INSTALLATION DIAGRAM.

Unit: inch [mm]

Total down-stream indoor UNIT SIZE	Pipe	
	Liquid	Gas
9 ~ 14	Ø 1/2" [Ø 12.7]	Ø 3/4" [Ø 19.05]
15 ~ 21	Ø 5/8" [Ø 15.88]	Ø 7/8" [Ø 22.2]
22 ~ 32	Ø 3/4" [Ø 19.05]	Ø 1" [Ø 25.4]
33 ~ 75	Ø 3/4" [Ø 19.05]	Ø 1-1/8" [Ø 28.58]

a, b, c, d, e, f, g pipe sections. The pipe section letters refer to the INSTALLATION DIAGRAM.

Unit: inch [mm]

Indoor unit	Pipe	
	Liquid	Gas
m-MROW/m-MRAC-G02-009	Ø 1/2" [Ø 12.7]	Ø 3/4" [Ø 19.05]
m-MROW/m-MRAC-G02-015	Ø 5/8" [Ø 15.88]	Ø 7/8" [Ø 22.2]
m-MROW/m-MRAC-G02-025	Ø 3/4" [Ø 19.05]	Ø 1" [Ø 25.4]

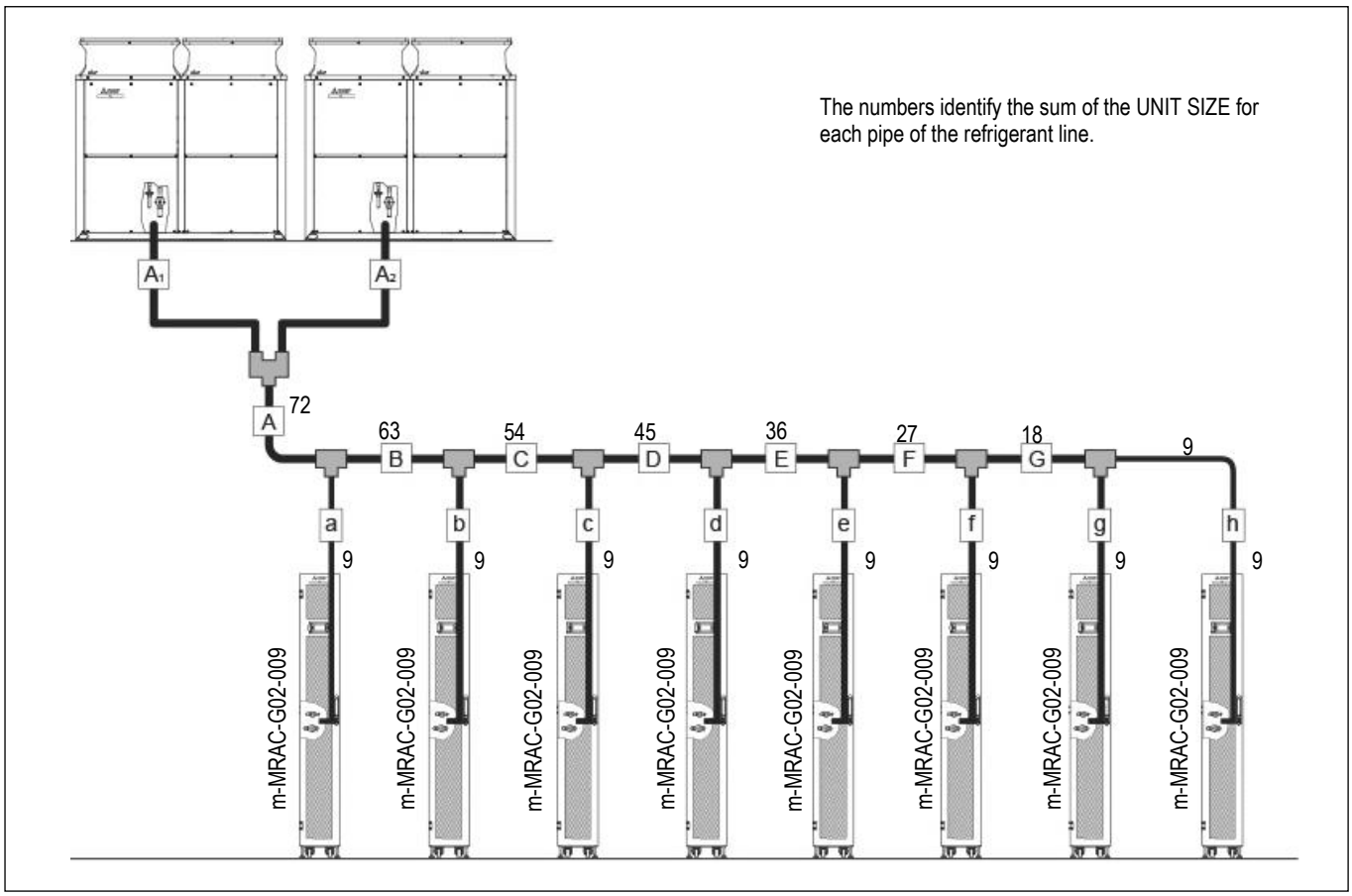
PIPING DIAMETER TABLE
Use refrigerant pipes suitable for use with R410A refrigerant systems.
Use refrigerant pipes with the thicknesses specified in the table below.

Size inch [mm]	Radial thickness mm [mil]	Type
Ø 1/4" [Ø 6.35]	0.8 (32)	Type O
Ø 3/8" [Ø 9.52]	0.8 (32)	Type O
Ø 1/2" [Ø 12.7]	0.8 (32)	Type O
Ø 5/8" [Ø 15.88]	1.0 (40)	Type O
Ø 3/4" [Ø 19.05]	1.2 (48)	Type O
	1.0 (40)	Type-1/2H or H
Ø 7/8" [Ø 22.2]	1.0 (40)	Type-1/2H or H
Ø 1" [Ø 25.4]	1.0 (40)	Type-1/2H or H
Ø 1-1/8" [Ø 28.58]	1.0 (40)	Type-1/2H or H
Ø 1-1/4" [Ø 31.75]	1.1 (44)	Type-1/2H or H
Ø 1-3/8" [Ø 34.93]	1.2 (48)	Type-1/2H or H
Ø 1-5/8" [Ø 41.28]	1.4 (56)	Type-1/2H or H

REFER TO THE DESIGN TOOL SOFTWARE TO GENERATE THE COMPONENT LIST AND THE LAYOUT FOR A SPECIFIC INSTALLATION.

EXAMPLE FOR INDOOR UNIT REFRIGERANT LINES

2x m-MOCU-G02-050 outdoor units.
8x m-MRAC-G02-009 indoor units.



PIPE SIZES
Evaluate the sum of the UNIT SIZES and determine the pipe diameter based on the table.

Unit: inch [mm]

Total down-stream indoor UNIT SIZE	Pipe		Pipes of the example
	Liquid	Gas	
9 ~ 14	Ø 1/2" [Ø 12.7]	Ø 3/4" [Ø 19.05]	a-b-c-d-e-f-g-h
15 ~ 21	Ø 5/8" [Ø 15.88]	Ø 7/8" [Ø 22.2]	G
22 ~ 32	Ø 3/4" [Ø 19.05]	Ø 1" [Ø 25.4]	F
33 ~ 75	Ø 3/4" [Ø 19.05]	Ø 1-1/8" [Ø 28.58]	B-C-D-E

Pipe A maintains the same diameter of the Twinning kit = Ø 5/8" [Ø 15.88].

TEE SIZES
Same procedure for the selection of the TEE.

Unit: inch [mm]

Total down-stream indoor UNIT SIZE	TEE (F/F/F) size e code			
	Liquid		Gas	
0 ~ 22	Ø 5/8" [Ø 15.88]	C7540341	Ø 7/8" [Ø 22.2]	C7540342
23 ~ 75	Ø 7/8" [Ø 22.2]	C7540342	Ø 1" [Ø 25.4]	C7540340

REFRIGERANT CHARGE

The indoor unit is supplied with seal charge.
The outdoor unit is supplied with a pre-charge of R410A refrigerant, as shown in the table below.

OUTDOOR UNIT – m-MOCU
The amount of refrigerant that is shown in the table below is factory charged in the outdoor units. The amount necessary for extended piping is not included and needs to be added on site.

MODEL		**050**
REFRIGERANT		R410A
Refrigerant circuits x Refrigerant charge (factory charged)	n x kg	1 x 11.8
HFC R410A - F Gas - CO_2 equivalent	t	24.3

Quantity of refrigerant to add
The amount of refrigerant that is shown in the table below is the maximum amount to be added on site.

Configuration		Max amount to be added
Single outdoor unit system	kg	40.0
Two outdoor unit system	kg	99.9

Both refrigerant overcharge and undercharge will cause problems.
Charge the system with the proper amount of refrigerant.

CALCULATION OF THE AMOUNT OF ADDITIONAL REFRIGERANT
The amount of refrigerant to be added depends on the size and the total length of the liquid piping.
Calculate the amount of refrigerant to be charged according to the formula below.
Round up the calculation results to the nearest 0.1kg.

When the piping length from the outdoor unit to the farthest indoor unit is 30.5m (100ft) or shorter.

Unit: inch [mm]

Amount of additional charge (kg)	=	Ø 3/4" [Ø 19.05] total length x 0.29 (kg/m)	+	Ø 5/8" [Ø 15.88] total length x 0.2 (kg/m)	+	Ø 1/2" [Ø 12.7] total length x 0.12 (kg/m)

+

Outdoor unit configuration	Amount (kg)
Single outdoor unit system	6.0
Two outdoor unit system	12.0

+

Total capacity of connected indoor units (kW)	Amount (kg)
25 ~ 37	3.0
38 ~ 44	3.5
45 ~ 54	4.5
55 ~ 71	5.0
71 ~ 75	6.0

When the piping length from the outdoor unit to the farthest indoor unit is longer than 30.5m (100ft).

Unit: inch [mm]

Amount of additional charge (kg)	=	Ø 3/4" [Ø 19.05] total length x 0.26 (kg/m)	+	Ø 5/8" [Ø 15.88] total length x 0.18 (kg/m)	+	Ø 1/2" [Ø 12.7] total length x 0.11 (kg/m)

.

+

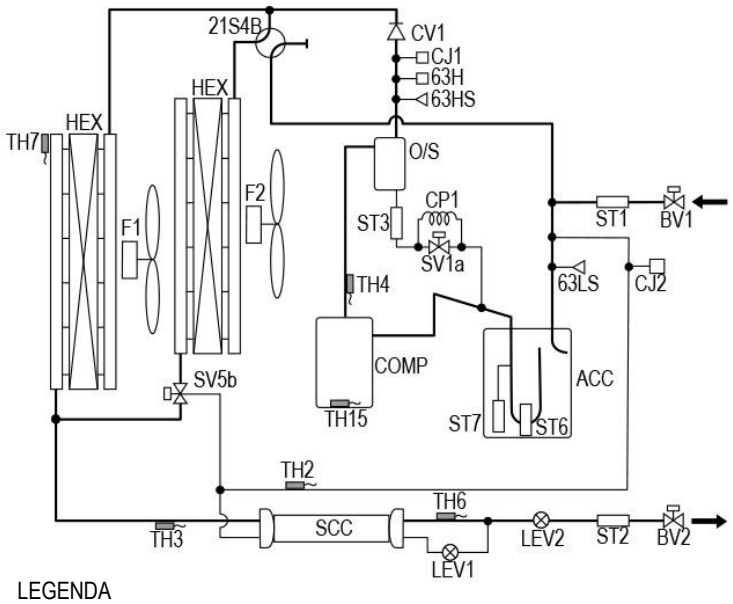
Outdoor unit configuration	Amount (kg)
Single outdoor unit system	6.0
Two outdoor unit system	12.0

+

Total capacity of connected indoor units (kW)	Amount (kg)
25 ~ 37	3.0
38 ~ 44	3.5
45 ~ 54	4.5
55 ~ 71	5.0
71 ~ 75	6.0

REFRIGERANT DIAGRAM

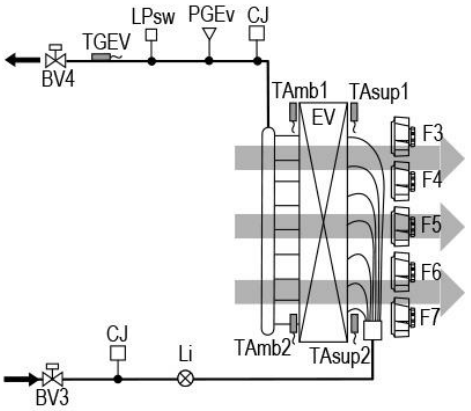
OUTDOOR UNIT



LEGENDA

COMP	BLDC inverter compressor
63HS	High pressure sensor
63LS	Low pressure sensor
63H	High pressure switch
TH	Thermistor
TH4	Discharge gas temperature
TH2, TH3, TH6	LEV1 control
TH7	External ambient temperature probe
TH15	Compressor shell bottom temperature
CP1	Capillary tube. High/low pressure by-pass
SV1a	Solenoid valve. High/low pressure by-pass
SV5b	Solenoid valve. Heat exchanger capacity control
LEV1	Linear expansion valve. Sub cooling control
LEV2	Linear expansion valve. Prevention of refrigerant backflow while the unit is stopped
21S4B	4-way valve. Heat exchanger control
F1, F2	Fan motor 1, Fan motor 2
HEX	Heat exchanger
SCC	Sub cooling exchanger
ST#...	Strainer
O/S	Oil separator
ACC	Accumulator
SV#	Stop valve with service port
CJ#	Charge plug
CV1	Non return valve
BV	Ball valve – Brazed connection

INDOOR UNIT

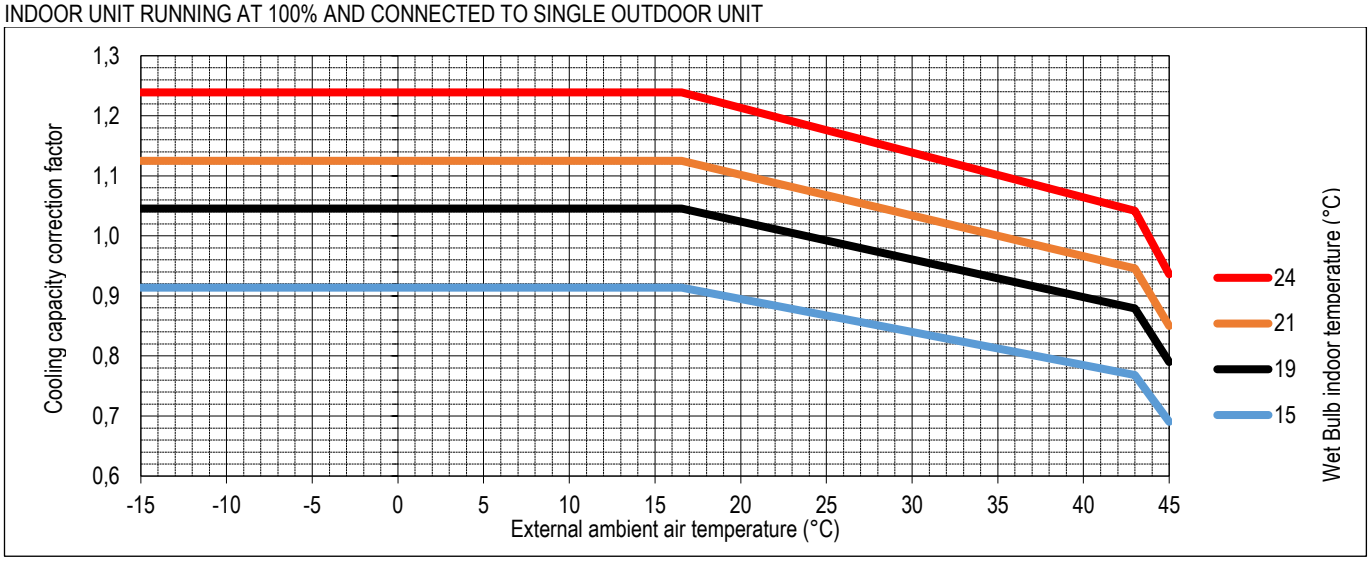


LEGENDA

PGEv	Evaporator Gas Pressure
LPsw	Low pressure switch
TAmb1, TAmb2	Air suction temperature
TAsup1, TAsup2	Air delivery temperature
TGEV	Evaporator gas temperature
Li	Electronic expansion valve
F#	Fan motor
EV	Evaporator
CJ#	Charge plug
BV	Ball valve – Brazed connection

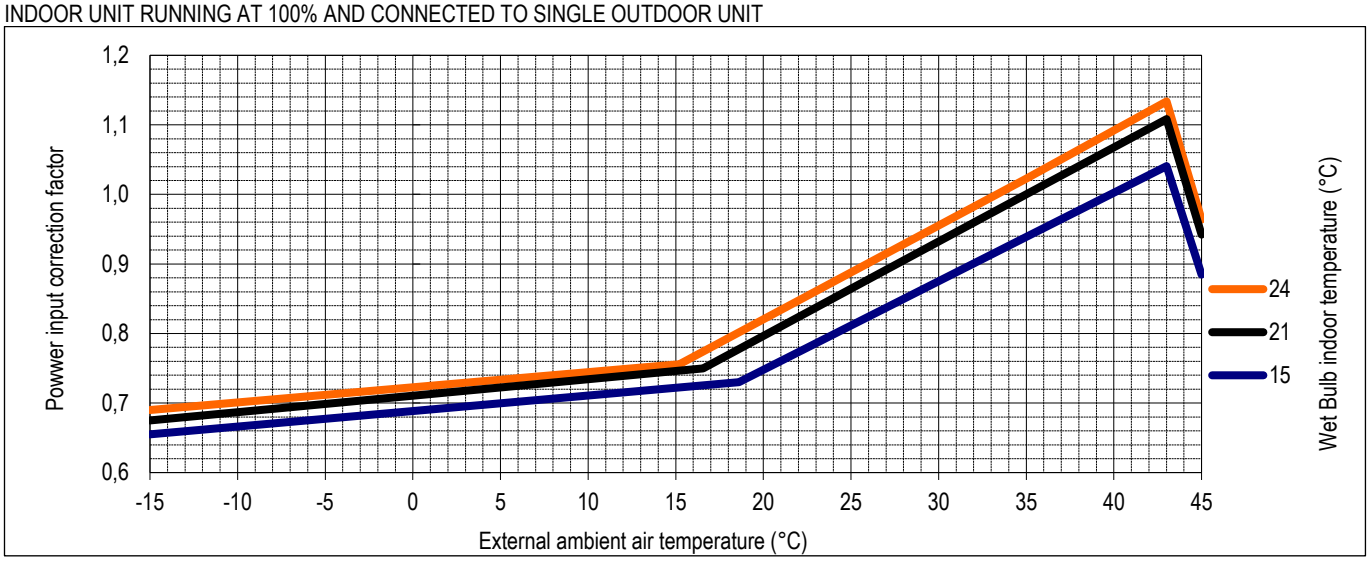
COOLING CAPACITY CORRECTION FACTOR ACCORDING TO EXTERNAL AMBIENT TEMPERATURE

INDOOR UNIT RUNNING AT 100% AND CONNECTED TO SINGLE OUTDOOR UNIT



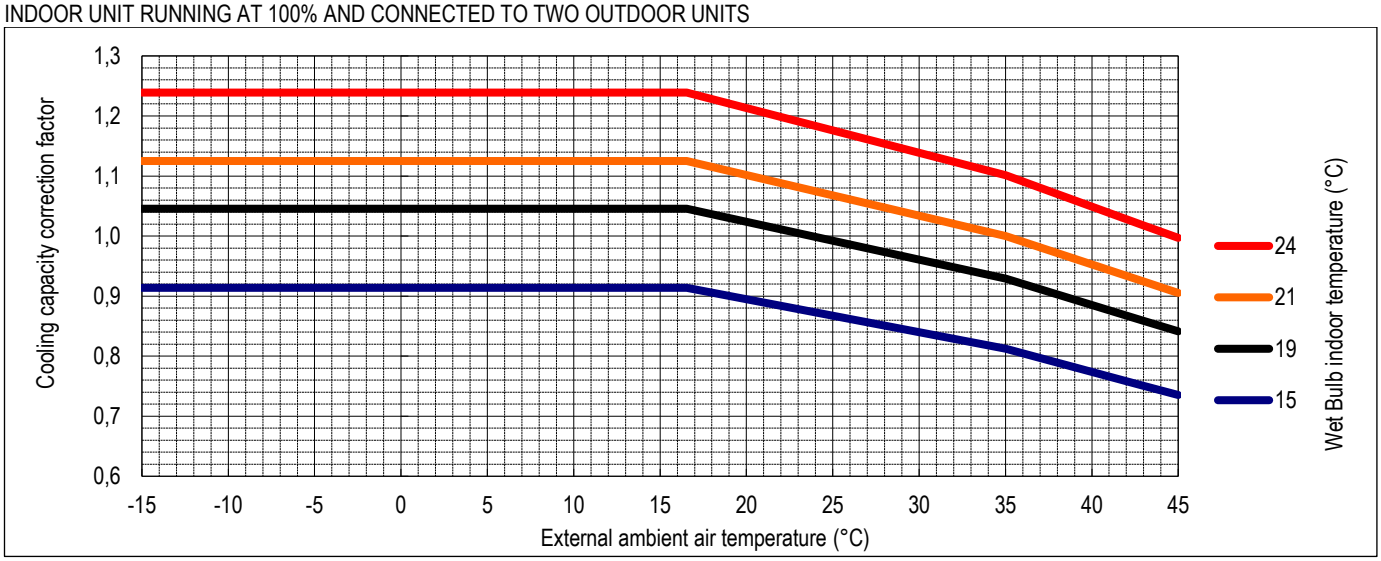
POWER INPUT CORRECTION FACTOR ACCORDING TO EXTERNAL AMBIENT TEMPERATURE

INDOOR UNIT RUNNING AT 100% AND CONNECTED TO SINGLE OUTDOOR UNIT



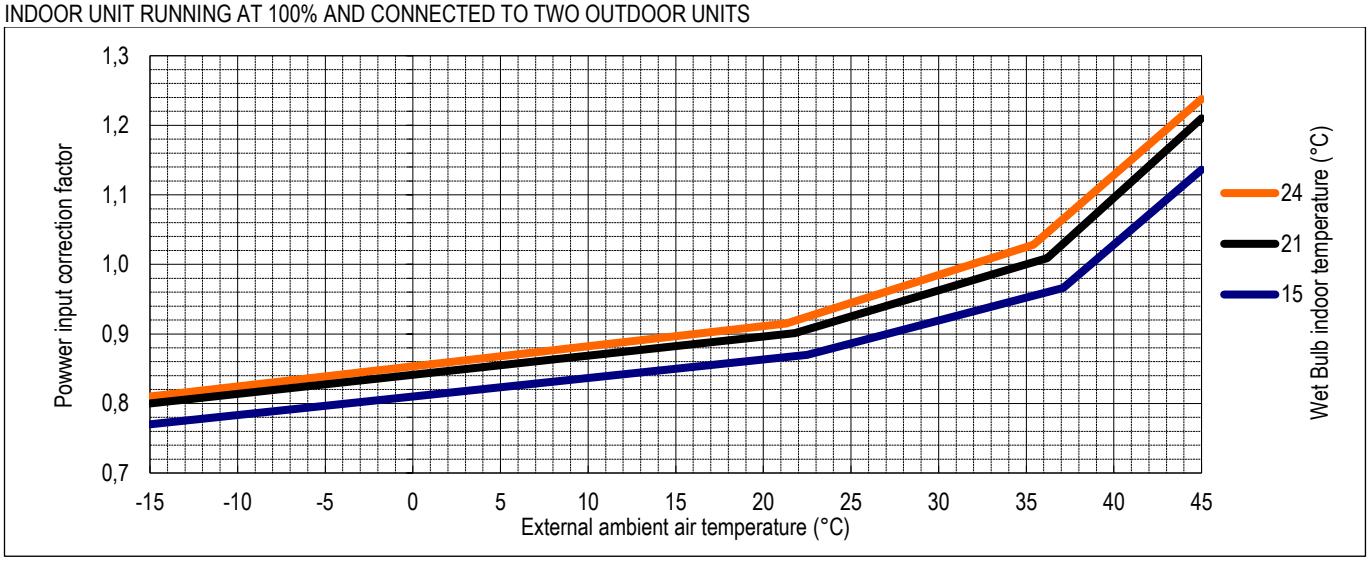
COOLING CAPACITY CORRECTION FACTOR ACCORDING TO EXTERNAL AMBIENT TEMPERATURE

INDOOR UNIT RUNNING AT 100% AND CONNECTED TO TWO OUTDOOR UNITS



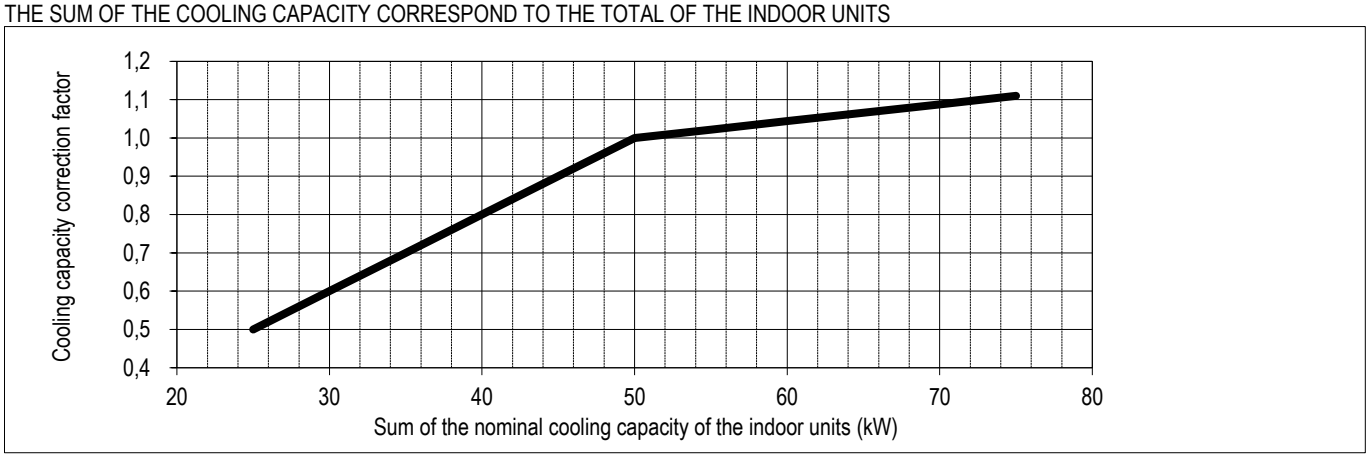
POWER INPUT CORRECTION FACTOR ACCORDING TO EXTERNAL AMBIENT TEMPERATURE

INDOOR UNIT RUNNING AT 100% AND CONNECTED TO TWO OUTDOOR UNITS



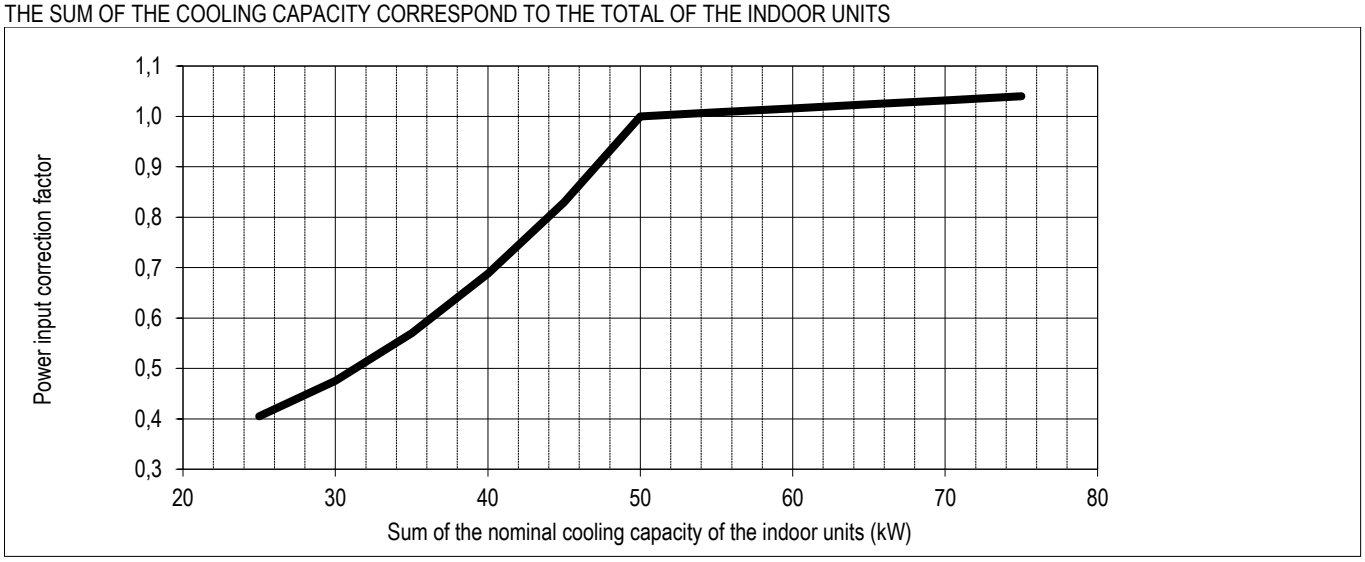
COOLING CAPACITY CORRECTION FACTOR ACCORDING TO THE SUM OF THE NOMINAL COOLING CAPACITY OF THE INDOOR UNITS

THE SUM OF THE COOLING CAPACITY CORRESPOND TO THE TOTAL OF THE INDOOR UNITS

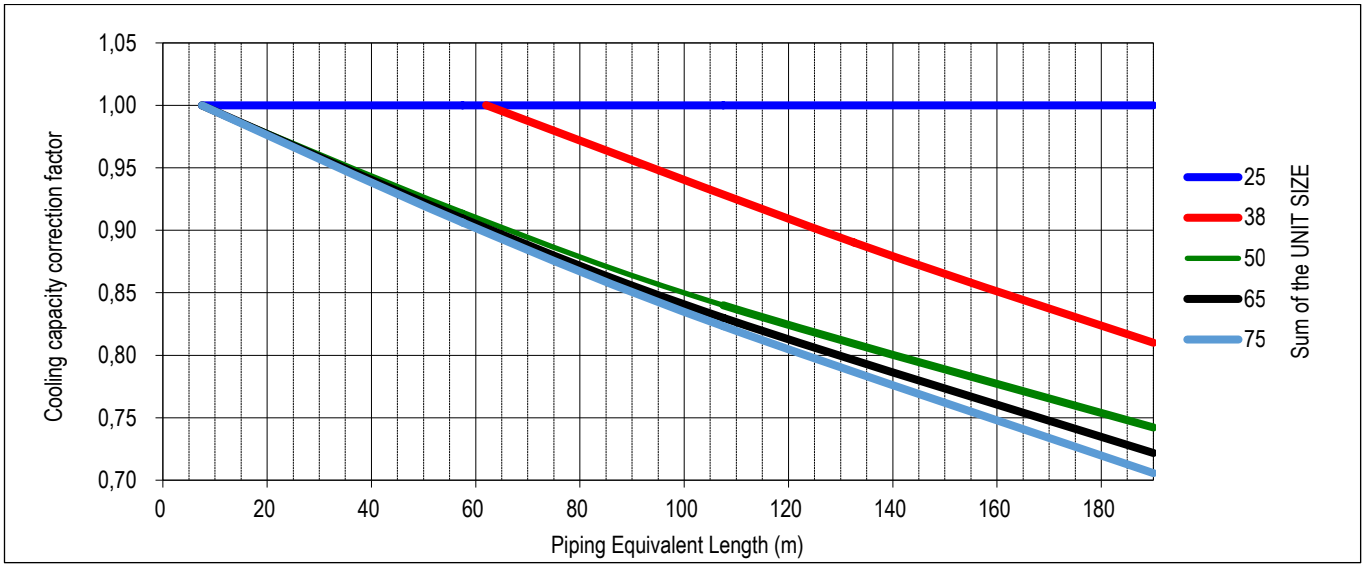


POWER INPUT CORRECTION FACTOR ACCORDING TO THE SUM OF THE NOMINAL COOLING CAPACITY OF THE INDOOR UNITS SIZE

THE SUM OF THE COOLING CAPACITY CORRESPOND TO THE TOTAL OF THE INDOOR UNITS



COOLING CAPACITY CORRECTION FACTOR ACCORDING TO THE PIPING EQUIVALENT LENGHT



Piping Equivalent length = (Actual piping length to the farthest indoor unit) + (0.50 x number of bends in the piping) m.

ACOUSTIC DATA – INDOOR UNIT

Acoustic data of the standard machine at full load working conditions.

WARNING:

In a closed room the noise produced by a sound source reaches the individual in two different ways:

- Directly.
- Reflected from the surrounding walls, floor, ceiling, from furniture.

With the same sound source, the noise produced in a closed room is greater than that produced outdoors. The sound pressure level generated by the source must in fact be added to the one reflected from the room. Also, the shape of the room affects the sound.

MODEL		009	015	025
SOUND LEVEL ISO 3744 (1)				
Sound pressure	dB(A	63.5	64.5	70.5
Sound power	dB(A	79.0	80.0	86.0

1. Noise pressure level at 1 meter in free field – ISO 3744.

ACOUSTIC DATA – OUTDOOR UNIT

Acoustic data of the standard machine at full load working conditions.

MODEL		1x 050	2x 050
SOUND LEVEL ISO 3744 (1)			
Sound pressure	dB(A)	65	68

1. Noise pressure level at 1 meter in free field – ISO 3744.

ELECTRICAL DATA

INDOOR UNIT

MODEL		009	015	025
Power supply		230/1/50-60	230/1/50-60	230/1/50-60
Starting current (SA)	A	3.0	5.9	7.4
MAX ABSORBED CURRENT (FLA)				
Only cooling	A	3.0	5.9	7.4
Cooling + Heating	A	13.4	16.3	23.1
Cooling + Humidifier	A	12.8	15.7	17.2
Cooling + Heating + Humidifier	A	23.2	26.1	32.9
Cooling + Heating oversized	A	18.7	21.6	28.3
Cooling + Heating oversized + Humidifier	A	28.5	31.4	38.1

OUTDOOR UNIT – Single unit

MODEL		m-MOCU-G2-050		
Power supply		380 V 3+N/50-60	400 V 3+N/50-60	415 V 3+N/50-60
RATED INPUT	kW	16.0	16.0	16.0
RATED CURRENT	A	27.0	25.6	24.7
MAX CURRENT	A	37.6	37.6	37.6

OUTDOOR UNIT – Two units running in parallel

MODEL		2x m-MOCU-G2-050		
Power supply		380 V 3+N/50-60	400 V 3+N/50-60	415 V 3+N/50-60
RATED INPUT	kW	13.7	13.7	13.7
RATED CURRENT	A	23.5	22.0	21.5
MAX CURRENT (for each outdoor unit)	A	37.6	37.6	37.6

Each outdoor unit must be power by a dedicated power line, sized following the electrical characteristics indicated in the “Outdoor unit – Single unit” table

Outdoor units operate in parallel at partial load for higher efficiency. In case of failure of one outdoor unit, the other one switches to operation at full load.

MICROPROCESSOR CONTROL SYSTEM

The microprocessor control system is equipped with 6-key terminal and backlit graphic display on which all information in different languages or easily identifiable symbols are displayed.
The system disposes of a "flash" memory that preserves the information even in absence of power supply. Part of memory is dedicated to the registration of intervened events - up to 100 events.

KEYBOARD FUNCTIONS

	ALARM	Alarm, red light active, press to disable and display the alarm description. In case of more than one alarm, use the UP / DOWN keys to scroll.
	PRG	Menu list: scroll using the UP/DOWN keys. Use ENTER to enter the menu.
	ESC	Home. To go back to the previous menu level or to the main screen.
	UP DOWN	Used to change the menu pages or the set value. When the display shows the main screen (HOME), pressing one of them (UP/DOWN) will take to the synoptic of the main adjustments.
	ENTER	Moves the cursor to editable program(s) fields, press to confirm the changes, press to leave the editable fields

CONNECTIVITY
Through the optional serial port, the microprocessor control enables communication with modern building BMS systems with the following protocols:

- RS485 serial card
- LON Works serial card
- Ethernet serial card

PASSWORD
Level 1: On request of the End User. Allowing to reach and modify USER parameters.
Level 2: Contact Service: Allowing to modify MAINTENANCE - SERVICE parameters.
Level 3: Contact Service: Allowing to modify MANUFACTURER - FACTORY parameters.

LAN NETWORK
The LAN is part of the control software. It is possible to set up to 15 address.
All the indoor units must be connected in the right way.
This type of connection allows to control the units in a consistent manner. Moreover, the units can be controlled and managed from a shared remote terminal.

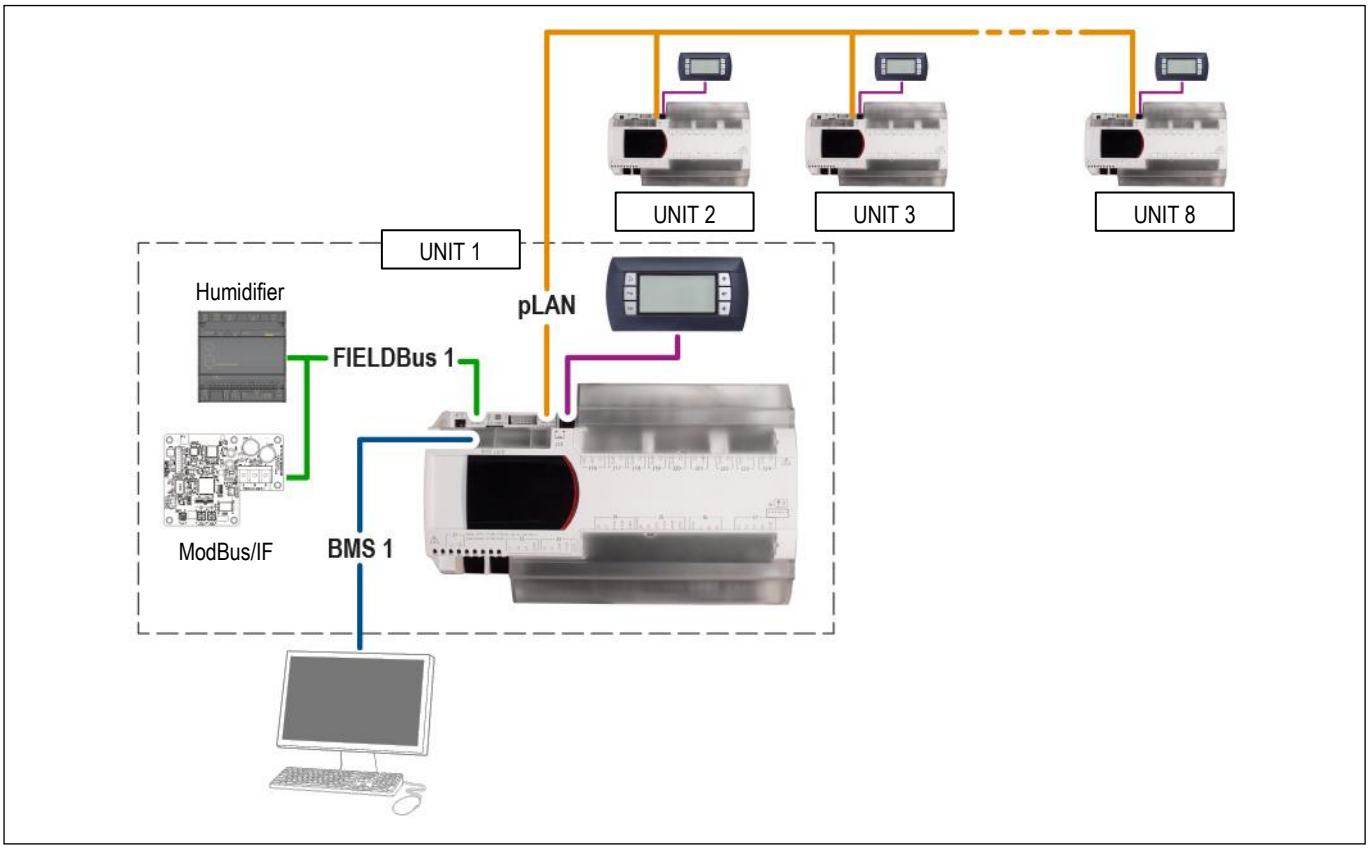
LAN ADDRESS LIST

Unit #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**Remote Terminal**
Terminal address	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	32
Mother board address	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	-
									available addresses, not used by the Multidensity system							

The unit connection to the local network (LAN) allows to perform the following functions:

- Balancing the operating hours among the different units by rotating the reserve units (Stand-by).
- Turning on the reserve units in case other units should turn off due to an alarm, maintenance or power supply interruption.
- Turning on reserve units to offset the excessive thermal loads.
- Checking up to 15 units with a single user terminal (remote terminal). The remote terminal can be connected to any unit connected to LAN network.

CONFIGURATION



pLAN connects the indoor units in master-slave configuration.
M-NET connects the indoor units between each other and to the outdoor unit.

OPERATION LOGIC

Cooling capacity control (compressor speed) based on the delivery air temperature, as a deviation from the set-point.
Air flow control (ambient unit fans speed) based on the return air temperature, as a deviation from the set point.

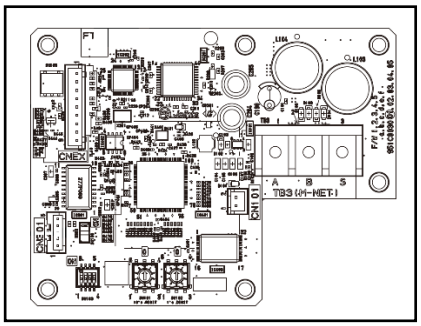
Indoor units are connected in pLAN in master-slave configuration. The master unit operates in case of failure.

The cooling demand is calculated by the indoor unit built-in microprocessor control system, based on the value of the delivery air temperature (deviation from the set point).

In case of small deviation every single indoor unit, regardless of being master or slave, is able to meet the requested cooling capacity through EEV adjustment (superheating modulation).

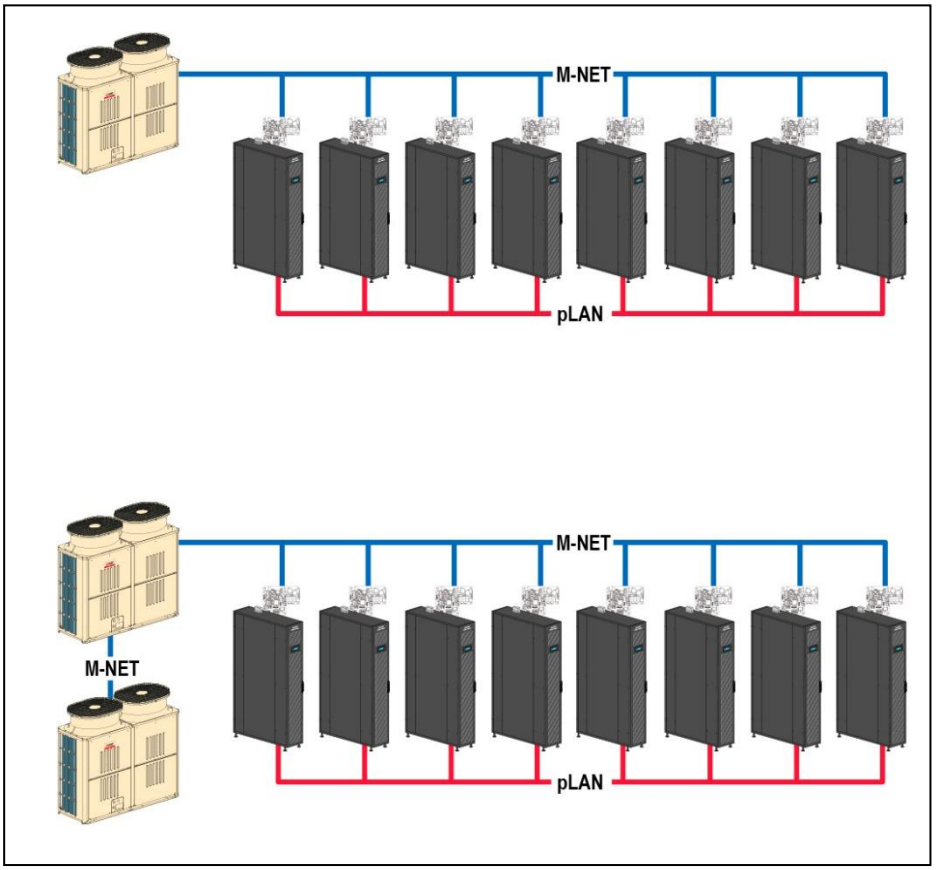
In case of larger deviation, every slave indoor unit sends a signal to the master indoor unit, the microprocessor control system of which calculates the average cooling demand and converts it into a signal to send to the outdoor unit through the M-NET card, for inverter compressor speed management. In the meantime, the indoor unit fans modulate the speed to meet the return air temperature set-point.

M-NET NETWORK



M-NET Interface board

A networked system called M-NET is used to control air conditioning operation.
Outdoor units and indoor units are connected to the M-NET system through the “outdoor/indoor” transmission line.
Maximum allowable length of M-NET control cables 200m [656 ft].



OPTIONAL ACCESSORIES FOR INDOOR UNIT: B031 – FRAME DIMENSIONS 42Ux300x1200

Optional accessory for INROW version.
Front air delivery.
1200 mm frame.
The optional accessory is required for the version with front air delivery with “A802 Humidifier” or “A804 Humidifier + Dehumidification” and/or “A431/A432 Electric heater”.
The configuration must be selected when ordering.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A902 – ENCLOSURE VERSION WITH AIR DELIVERY L

Optional accessory for ENCLOSURE version.
Air delivery on Left.
1200 mm frame.
The configuration must be selected when ordering.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A903 – ENCLOSURE VERSION WITH AIR DELIVERY R + L

Optional accessory for ENCLOSURE version.
Air delivery on Right and Left.
1200 mm frame.
The configuration must be selected when ordering.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A904 – INROW VERSION WITH AIR DELIVERY R

Optional accessory for INROW version.
Air delivery on Right.
1200 mm frame.
The configuration must be selected when ordering.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A905 – INROW VERSION WITH AIR DELIVERY L

Optional accessory for INROW version.
Air delivery on Left.
1200 mm frame.
The configuration must be selected when ordering.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A906 – INROW VERSION WITH AIR DELIVERY R + L

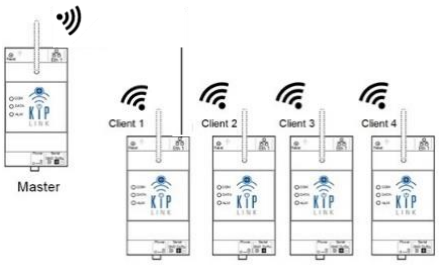
Optional accessory for INROW version.
Air delivery on Right and Left.
1200 mm frame.
The configuration must be selected when ordering.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A559 – POWER SUPPLY 230/1/60

MODEL		**009**	**015**	**025**
POWER SUPPLY		230/1/60	230/1/60	230/1/60
STANDARD UNIT				
Max power input (FLI)	kW	0,36	0,70	0,93
Max current input (FLA)	A	3,0	5,9	7,4

The electric data indicated are only for standard units, without optional accessories.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: 5891 – CONTROL UNIT VIA KIPLINK



The accessory is installed at the factory.
KIPlink is an innovative system based on Wi-Fi technology that allows to operate a unit directly from a Smartphone or Tablet via an APP.

WI-FI MODULE

- Standard: IEEE 802.11n – 802.11g.
- Frequencies: 2.4 – 2.4835 GHz.
- Output power: <20 dBm (equivalent to <100mW).
- Safety: WPA2.
- Flow: < 20m.

MEHITS APP

- Operating System: Android 5® or higher, IOS 8® or higher, Windows 10® or higher.
- Download: Google Play®, Apple Store® e Microsoft Store®.

HOW TO USE KIPLINK
KIPlink can be used in two ways:

Proximity keyboard: Approaching the machine with a Smartphone or a Tablet with the MEHITS APP installed, you can connect to the machine via Wi-Fi and control it in the same way as with the standard controller keyboard. It is possible to switch off / on the machine, change sets and reset alarms. Using the required passwords, it is possible to access the USER, SERVICE and MANUFACTURER menus.

Local Monitoring: Using a PC connected to the LAN of the building where the machine is also connected. WEB access using a browser. The system has two access profiles, READ ONLY and READ & WRITE.
READ ONLY only allows the viewing of the parameters, but it is not possible to control the unit.
READ & WRITE allows you to switch off / on the machine, change sets and reset alarms. Using the required passwords, it is possible to access the USER, SERVICE and MANUFACTURER menus.

DATA STORE
The system can store some data on a 1GB MicroSD card installed on the device. The data can be used for Service diagnostics. The card is provided as standard.

KIPLINK NETWORK
It is possible to set up mixed networks consisting of several KIPLink devices (max. 10 devices via Wi-Fi and max. 20 devices via Ethernet), to display information from different devices (called Client KIPLink) on one single device (called Master KIPLink).
The information is collected from the various Client KIPLink devices connected to EVOLUTION+ / W3000 TE/ CX-4 controllers and sent through the Wi-Fi or Ethernet network to the Master KIPLink device, which stores them and makes them available through an appropriate user interface.
The connection with the Master KIPlink can take place via Wi-Fi, via Ethernet or a combination of the two.

For complete information on the KIPlink system, please refer to the relevant technical documentation.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A431 – ELECTRIC HEATERS

Additional electrical panel

The accessory is installed at the factory.
Tubular electric heater with steel fins. The optional accessory is installed downstream the main cooling coil.
Electric heaters have a three-stage control.
The optional accessory requires increased frame dimensions (optional) for In-Row version with frontal air delivery.
Optional accessory changes the weight of the standard unit.
Components:

- Tubular electric heater with steel fins.
- Electrical control.
- Safety thermostat.

MODEL		009	015	025
POWER SUPPLY		230/1/50-60	230/1/50-60	230/1/50-60
THERMAL CAPACITY	kW	2,4	2,4	3,6
Absorbed current (OA)	A	10,4	10,4	15,7
Capacity steps	n	3	3	3

The optional accessory requires an additional electrical panel on the rear of the unit, with:

- Main switch with door lock safety.
- Thermal magnetic switch.
- Contactor.

With the additional electrical panel, the C14 type electric plug for 230/1/50-60 power supply is removed, and the power cable must be connected to the main switch with door lock safety.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A432 – ENHANCED ELECTRIC HEATERS

Additional electrical panel

The accessory is installed at the factory.
Tubular electric heater with steel fins. The optional is installed downstream the main cooling coil.
Electric heaters have a three-stage control.
The optional accessory requires increased frame dimensions (optional) for In-Row version with frontal air delivery.
Optional accessory modifies the weight of the standard unit.
Components:

- Tubular electric heater with steel fins.
- Electrical control.
- Safety thermostat

MODEL		009	015	025
POWER SUPPLY		230/1/50-60	230/1/50-60	230/1/50-60
THERMAL CAPACITY	kW	3,6	3,6	4,8
Absorbed current (OA)	A	15,7	15,7	20,9
Capacity steps	n	3	3	3

The optional accessory requires an additional electrical panel on the rear of the unit, with:

- Main switch with door lock safety.
- Thermal magnetic switch.
- Contactor.

With the additional electrical panel, the C14 type electric plug for 230/1/50-60 power supply is removed, and the power cable must be connected to the main switch with door lock safety.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A801 – HUMIDITY SENSOR ONLY

The optional accessory is installed at the factory.
The temperature and humidity probe only displays the room temperature and humidity value.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A802 – HUMIDIFIER

Humidifier control board

The optional accessory is installed at the factory.
Modulating steam humidifier with submerged electrodes fitted with electronic control and modulating steam delivery, with safety and running accessories.
The optional accessory includes the control board.
The optional accessory requires increased frame dimensions (optional) for the In-Row version with front air delivery.
The optional accessory requires water filling connection.
It is recommended to install a filter and a shut-off valve on the pipe to the water inlet.
This humidifier produces non-pressurized steam by electrodes immersed in the water inside the cylinder: they bring the electric phase in the water, which acts as an electrical resistance and overheats. The steam so produced is distributed with dedicated distributors and used for ambient humidification or for industrial processes.

REGULATIONS
Compact humidifiers equipped with:

- Plastics materials with protection index according to EN60529 - fire retardant classification (UL 94).
- "Disposable" cylinders made of fireproof plastic, class HB in compliance with UL94 for water conductivity from 350 to 1250 µS / cm.

CHARACTERISTICS OF THE SUPPLY WATER
The quality of the water used affects the evaporation process. The humidifier can be fed with not-treated water, only if this is drinking and non-demineralised water.

LIMIT VALUES FOR THE WATER SUPPLY			Min	Max
Main pressure	bar		1	8
Hydrogen ions	pH		7	8,5
Specific conductivity at 20°C	$\sigma_{R,\ 20\ °C}$	µS/cm	350	1250
Total dissolved solids	TDS	mg/l	(1)	(1)
Dry residue at 180°C	R_{180}	mg/l	(1)	(1)
Total hardness	TH	mg/l $CaCO_3$	100	400
Temporary hardness		mg/l $CaCO_3$	60	300
Iron + Manganese		mg/l Fe + Mn	0	0,2
Chlorides		ppm Cl	0	30
Silica		mg/l SiO_2	0	20
Residual chlorine		mg/l Cl^-	0	0,2
Calcium sulphate		mg/l $CaSO_4$	0	100
Metal impurities		mg/l	0	0
Solvents, thinners, soaps, lubricants		mg/l	0	0

(1) Values depending on specific conductivity; in general: TDS ≅ 0,93 * $\sigma_{R,\ 20\ °C;}$ R_{180} ≅ 0,65 * σ_R

WARNINGS:

- **Only use with drinking water.**
- **There is no reliable relationship between hardness and water conductivity.**
- **Do not treat water with softeners! This could cause corrosion of the electrodes or the formation of foam, leading to potential operating problems or failures.**
- **Do not add disinfectants or corrosion inhibitors to the water, as these substances are potentially irritant.**
- **It is absolutely forbidden to use well water, industrial water or water drawn from cooling circuits; in general, avoid using potentially contaminated water, either from a chemical or bacteriological point of view.**
- **The water exiting the steam cylinder is very hot. Operating temperature up to 100°C.**

Additional electrical panel

TECHNICAL DATA

MODEL		009	015	025
POWER SUPPLY		230/1/50-60	230/1/50-60	230/1/50-60
STEAM PRODUCTION	kg/h	3	3	3
Power input	kW	2,25	2,25	2,25
Max absorbed current (FLA)	A	9,8	9,8	9,8
Water content	l	3,9	3,9	3,9
HYDRAULIC CONNECTION				
WATER INLET - ISO 228/1 – G M (1)	Ø	3/4"	3/4"	3/4"
WATER OUTLET - internal diameter	Ø mm	32	32	32

(1) The humidifier water supply threaded male fitting is already fitted with a plastic hose, diameter 6mm, for connection to the building's water supply.

Optional accessory changes the weight of the standard unit. Consider the weight of the water content.

The optional accessory requires an additional electrical panel on the rear of the unit, with:

- Main switch with door lock safety.
- Thermal magnetic switch.
- Contactor.

With the additional electrical panel, the C14 type electric plug for 230/1/50-60 power supply is removed, and the power cable must be connected to the main switch with door lock safety.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A803 – DEHUMIDIFICATION ONLY (SENSOR INCLUDED)

The optional accessory is installed at the factory.
The system controls the ambient humidity value allowing dehumidification.
Component:

- T / rH probe on air return.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A804 – HUMIDIFIER & DEHUMIDIFICATION

The optional accessory is installed at the factory.
Combination of the two accessories A802+A833.
The system controls the ambient humidity value, allowing humidification and dehumidification.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A381 – STANDARD CONDENSATE DRAIN PUMP

The optional accessory is installed at the factory.
The system consists of the pump unit (a plastic case containing the pump motor, the thermal protection with automatic reset, the float with trigger threshold and overflow alarm threshold) and the and hydraulic and electric connections.
The condensate discharge pump operation is fully automatic.

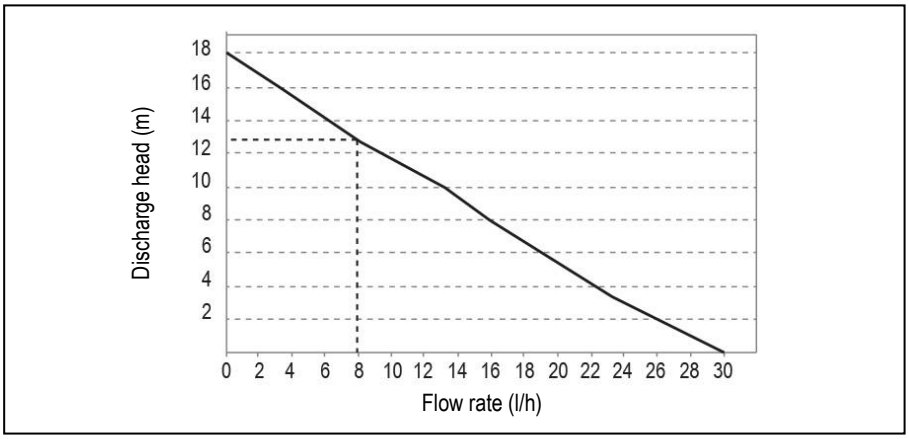
TECHNICAL SPECIFICATION

Power supply:	230V – 50/60Hz
Engaged power	21 W
Weight	0,48 kg
Protection degree	IP20
Maximum flow rate	30 l/h
Maximum suction height	4 m
Maximum discharge height	13 m (flow rate 8 l/h)
Maximum pressure	18 m (flow rate 0 l/h)

TABLE OF ACTUAL FLOW RATES (l/h)					
Suction	Discharge	Total pipe length with 6mm ID pipe			
		5 m	10 m	20 m	30m
0 m	0 m	30	27	26	25
	2 m	26	24	23	22
	4 m	22	21	20	19
	6 m	--	18	17	16
	8 m	--	15	14	13
	10 m	--	12	11	10
	12 m	--	--	8	7

TABLE OF ACTUAL FLOW RATES (l/h)					
Suction	Discharge	Total pipe length with 6mm ID pipe			
		5 m	10 m	20 m	30m
1 m	0 m	24	23	22	21
	2 m	20	19	18	17
	4 m	17	16	15	14
	6 m	--	13	12	11
	8 m	--	10	9	8
	10 m	--	--	6	5
2 m	0 m	21	20	19	18
	2 m	17	16	15	14
	4 m	14	13	12	11
	6 m	--	10	9	8
	8 m	--	7	6	5
3 m	0 m	18	17	16	15
	2 m	15	14	13	12
	4 m	--	10	9	8
	6 m	--	6	5	4

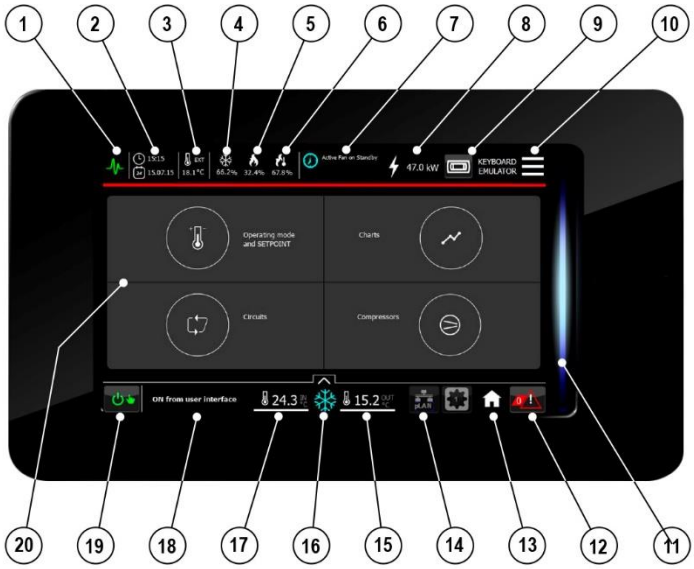
PERFORMANCE OF STANDARD CONDENSATE DRAIN PUMP



OPTIONAL ACCESSORIES FOR INDOOR UNIT: A35B – GRAPHIC DISPLAY “Evolution Touch”

The optional accessory is installed at the factory.
7” touch-screen graphic display with 16.7 million colours, for the management and monitoring of operating and alarm status.
The Display is equipped with a Micro USB 2.0 port for the service connection purposes.

The navigation bars are always present on the display to allow quick and intuitive navigation.



TOP NAVIGATION BAR

1. Controller connection status. Green: connection OK; Red: connection Error
2. Time and date
3. External temperature value by dedicated probe
4. Active percentage of Cooling
5. Active percentage of Heating
6. Active percentage of Post-Heating
7. Unit active functions
8. Power meter
9. Standard 6-key virtual keyboard
10. Quick menu access

BOTTOM NAVIGATION BAR

11. Light bar for machine status identification
12. Alarm notification and management section access
13. Home button for returning to the Homepage
14. pLAN network
15. Air delivery temperature: air temperature or relative humidity value
16. Operating mode button
17. Air inlet temperature: air temperature value
18. Unit status
19. On/Off button

DISPLAY AREA

20. Main menu:
    a. Operating mode and Set-Point
    b. Circuits
    c. Charts
    d. Compressors

For complete information on the Graphic Display system, please refer to the relevant technical documentation.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A471 – RS485 SERIAL CARD

The optional accessory is installed at the factory.
See the Interface Manual for all technical information.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A473 - ETHERNET CARD

The optional accessory is installed at the factory.
See the Interface Manual for all technical information.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A474 – LON SERIAL CARD

The optional accessory is installed at the factory.
The manufacturer will supply the necessary serial card, .NXE file and .XIF file to allow Lon Works technicians to configure the network. The card must be programmed by the technician in charge of the integration. See the Interface Manual for all technical information.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A521 – FIRE DETECTOR

The optional accessory is supplied as a mounting kit. The connection cable is not supplied.
The heat detector has been designed to identify temperatures at which fires may start. When the temperature exceeds the set threshold, an alarm is triggered.

Operating voltage	20 Vdc (-15%, +10%)
Average power consumption (normal condition)	40 ηA @ 20Vdc
Average power consumption (alarm condition)	23 mA @ 20Vdc
Static alarm threshold	58°C ± 5%
Three colour LED	Red steady: alarm condition
	Green slow blinking (2s): normal condition
	Green and yellow flashing sequence: fault condition
Minimum reset time	300mS
Operating temperature	-10° ÷ 50°C ± 2°C
Relative humidity	93% ± 2%, non-condensing
Storage/shipping temperature	-30 ÷ 70°C
Dimensions	Diameter Φ90 x 40mm height
Weight	70g
Enclosure material	ABS V0

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A511 – SMOKE DETECTOR

The optional accessory is supplied as a mounting kit. The Connection cable is not supplied.
The optical smoke detector senses the presence of combustion by-products (visible smoke) and activates an alarm. The operating principle is based on the light scattering technique (Tyndall effect).

Light source	GaAlAs Infrared emitting diode
Operating voltage	20 Vdc (-15%, +10%)
Average power consumption (normal condition)	65 mA @ 20Vdc
Average power consumption (alarm condition)	23 mA @ 20Vdc
Three colour LED	Red steady: alarm condition
	Green slow blinking (2s): normal condition
	Yellow blinking (2s) normal condition, maintenance required.
	Green and yellow flashing sequence: fault condition
Minimum reset time	300mS
Operating temperature	-10° ÷ 55°C ± 2°C
Relative humidity	93% ± 2%, non-condensing
Storage/shipping temperature	-30 ÷ 70°C
Dimensions	Diameter Φ90 x 31mm height
Weight	70g
Enclosure material	ABS V0

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A491 – WATER LEAKAGE DETECTOR

The optional accessory is installed at the factory. The connection cable is not supplied.
The system includes an electronic relay installed in the electrical panel of the machine and a water detector.
The electric connections for the sensor and the alarm contact are in the machine terminal board.
The Sensor is supplied for connection and installation by the customer.

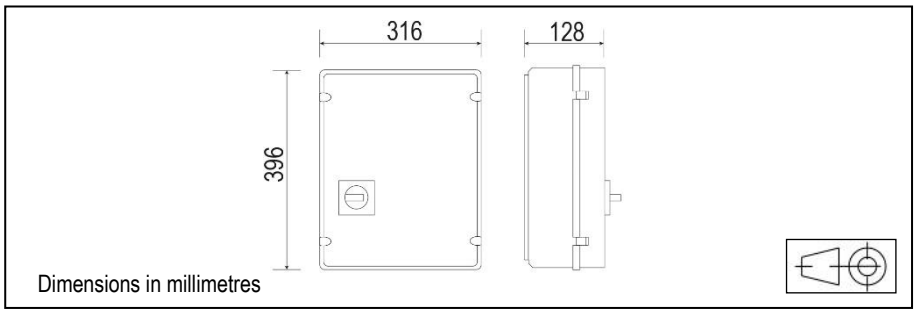
OPTIONAL ACCESSORIES FOR INDOOR UNIT: A842 – NETWORK ANALYZER

The optional accessory is supplied as a kit for installation external to the machine, and includes:

- Main switch with door lock safety.
- Fuses.
- Network transducer.
- Current transformers, one for each power supply phase cable.
- Terminal board.

This device provides continuous measurement of power consumption, monitoring current, voltage and power. These values are made available to the unit microprocessors via a RS485 serial cable, as shown on the unit wiring diagram.
The displayed variables are:

- Phase to phase voltage, only for three-phase units.
- Phase voltage (phase-neutral).
- Phase current.
- Neutral current, only for three-phase units.
- Active phase power, only for three-phase units.
- Total active power.
- Active energy.
- Hour count.



Wall-mounting fixing screws not supplied.
Weight of the system: 5 kg.
Electrical connections at Customer care.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: P111 – DOUBLE POWER SUPPLY WITH AUTOMATIC TRANSFER SWITCH

The optional accessory is supplied as a kit for installation external to the machine.
The motorised changeover switches automatically manage changeover under load between two mono-phase or three-phase power supplies, or manually for emergency operations.
These changeover switches (TSE) are suitable for low voltage systems with interruption of the power supply to the load during transfer.
The model supplied in the automatic version checks the source and switches over automatically, based on configurable parameters.
OPEN TRANSITION TYPE TRANSFER SWITCH WITH A MINIMUM INTERRUPTION OF THE SUPPLY DURING TRANSFER.

Model	Power Supply	ATS Installation
009	230/1/50	EXTERNAL, supplied as a kit
015	230/1/50	EXTERNAL, supplied as a kit
025	230/1/50	EXTERNAL, supplied as a kit

OPTIONAL ACCESSORIES FOR INDOOR UNIT: A882 – CLAMPING KIT FLOOR

The optional accessory is supplied as a mounting kit.
Kit to anchoring the machine to the floor.

OPTIONAL ACCESSORIES FOR INDOOR UNIT: 7387012600 – REMOTE TERMINAL DISPLAY

The optional accessory is supplied as a mounting kit. The connection cable is not supplied.
Remote terminal ready for wall installation.

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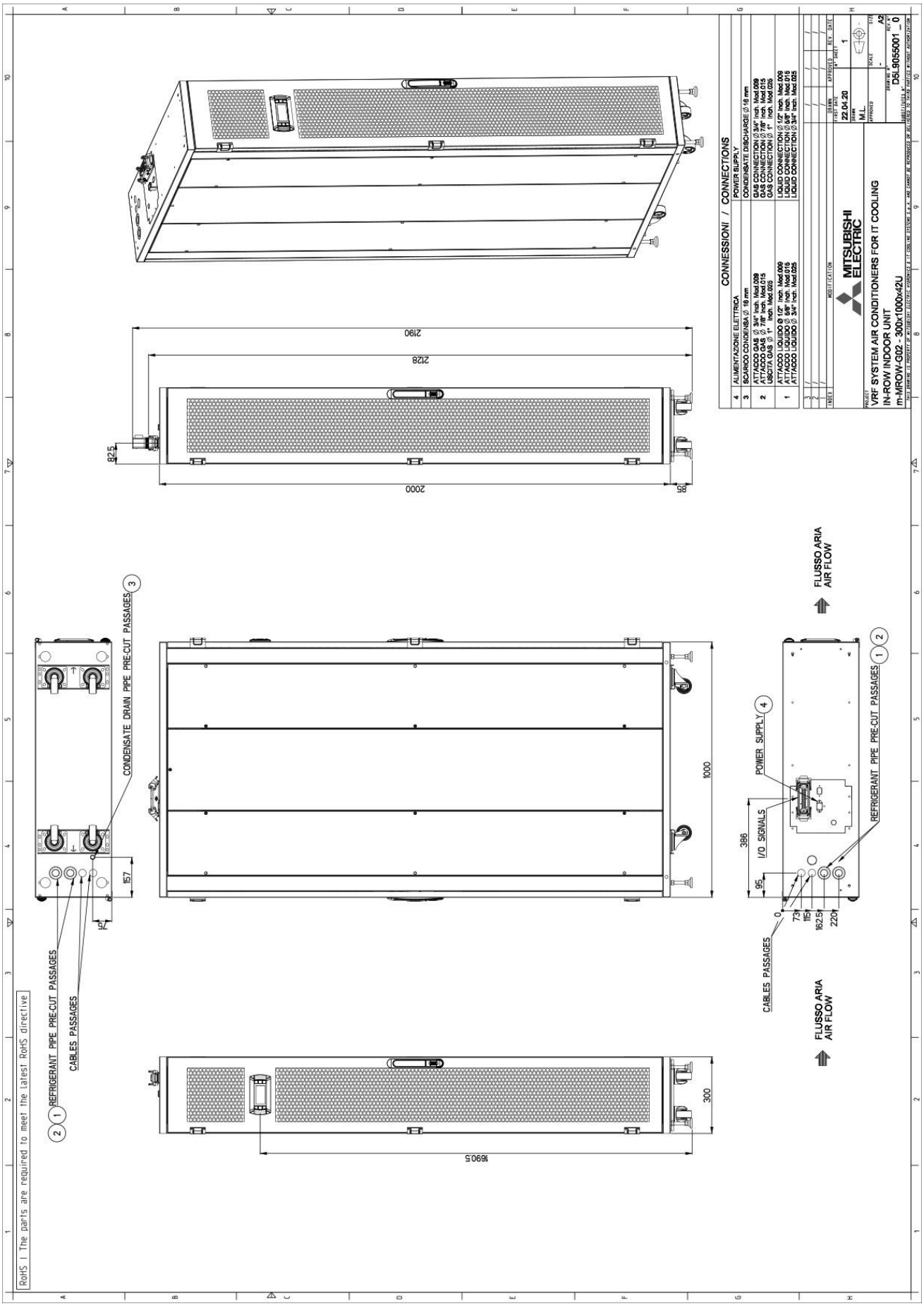
OPTIONAL ACCESSORIES FOR INDOOR UNIT: REFRIGERTANT LINE ADAPTERS

"Cu" adapters for the refrigerant line of the indoor units.
The quantity and the type of adapters is automatically calculated by the Disign Tools software.

Refrigerant Line Adapters Unit: Inch [mm]
C7540341..... **TEE F/F/F Ø 5/8"** [Ø 15.88]
C7540342..... **TEE F/F/F Ø 7/8"** [Ø 22.2]
C7540340..... **TEE F/F/F Ø 1"** [Ø 25.4]
C7540343..... **Adapter M/F Ø 1" > 1 1/8"** [Ø 25.4 > Ø 28.58]
C7540344..... **Adapter M/F Ø 1" > 3/4"** [Ø 25.4 > Ø 19.05]
C7540345..... **Adapter M/F Ø 1" > 7/8"** [Ø 25.4 > Ø 22.2]
C7540354..... **Adapter M/F Ø 1 3/8" > 1 1/8"** [Ø 34.93 > Ø 28.58]
C7540353..... **Adapter M/F Ø 3/4" > 5/8"** [Ø 19.05 > Ø 15.88]
C7540346..... **Adapter M/F Ø 5/8" > 1/2"** [Ø 15.88 > Ø 12.7]
C7540347..... **Adapter M/F Ø 5/8" > 3/4"** [Ø 15.88 > Ø 19.05]
C7540348..... **Adapter M/F Ø 7/8" > 1"** [Ø 22.2 > Ø 25.4]
C7540350..... **Adapter M/F Ø 7/8" > 1 1/8"** [Ø 22.2 > Ø 28.58]
C7540349..... **Adapter M/F Ø 7/8" > 1/2"** [Ø 22.2 > Ø 12.7]
C7540351..... **Adapter M/F Ø 7/8" > 3/4"** [Ø 22.2 > Ø 19.05]
C7540352..... **Adapter M/F Ø 7/8" > 5/8"** [Ø 22.2 > Ø 15.88]

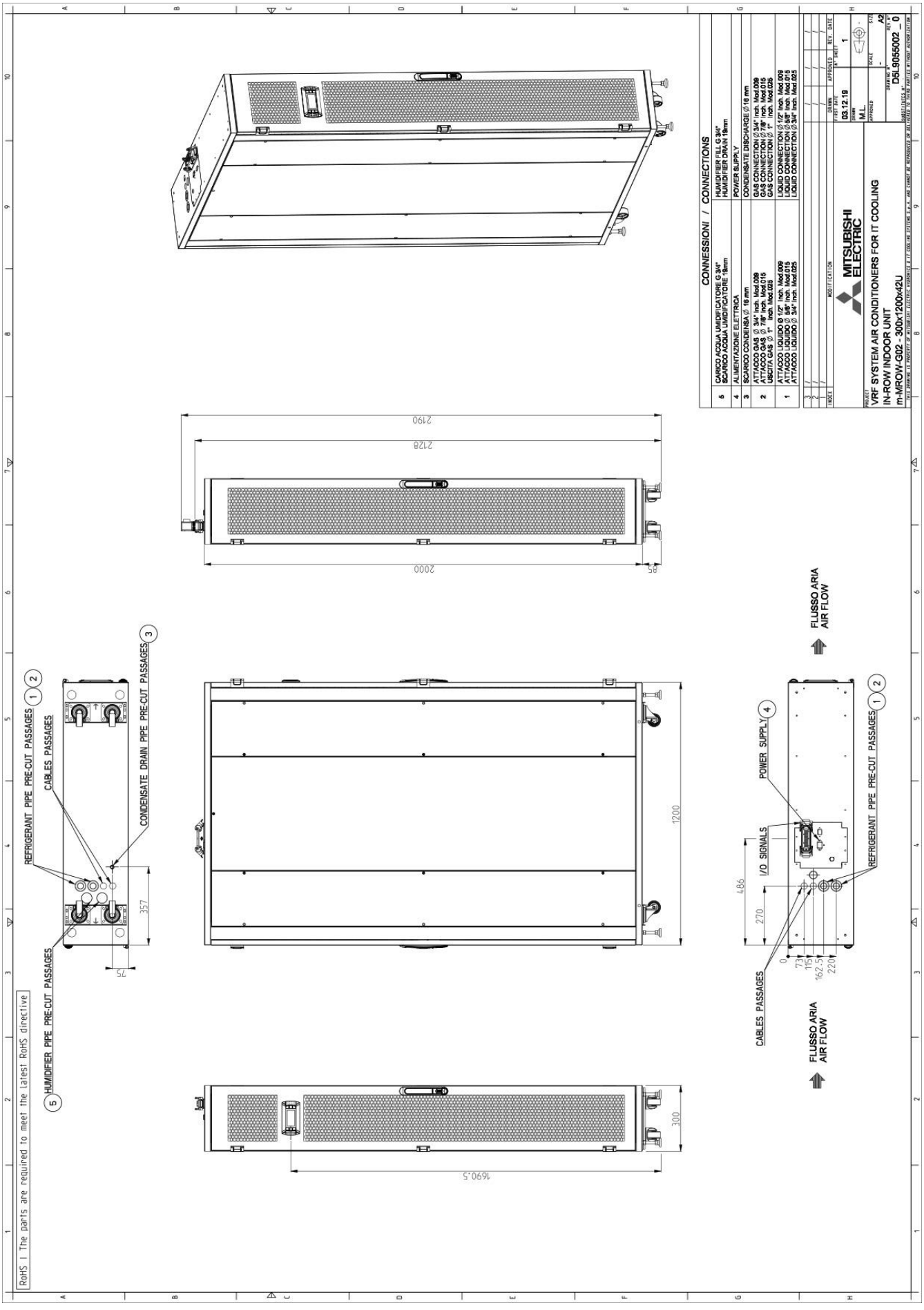
MACHINE DRAWINGS – INDOOR UNITS

Dimensions in mm – m-MROW – Rear air suction, front air delivery – (42U 300 x 1000)

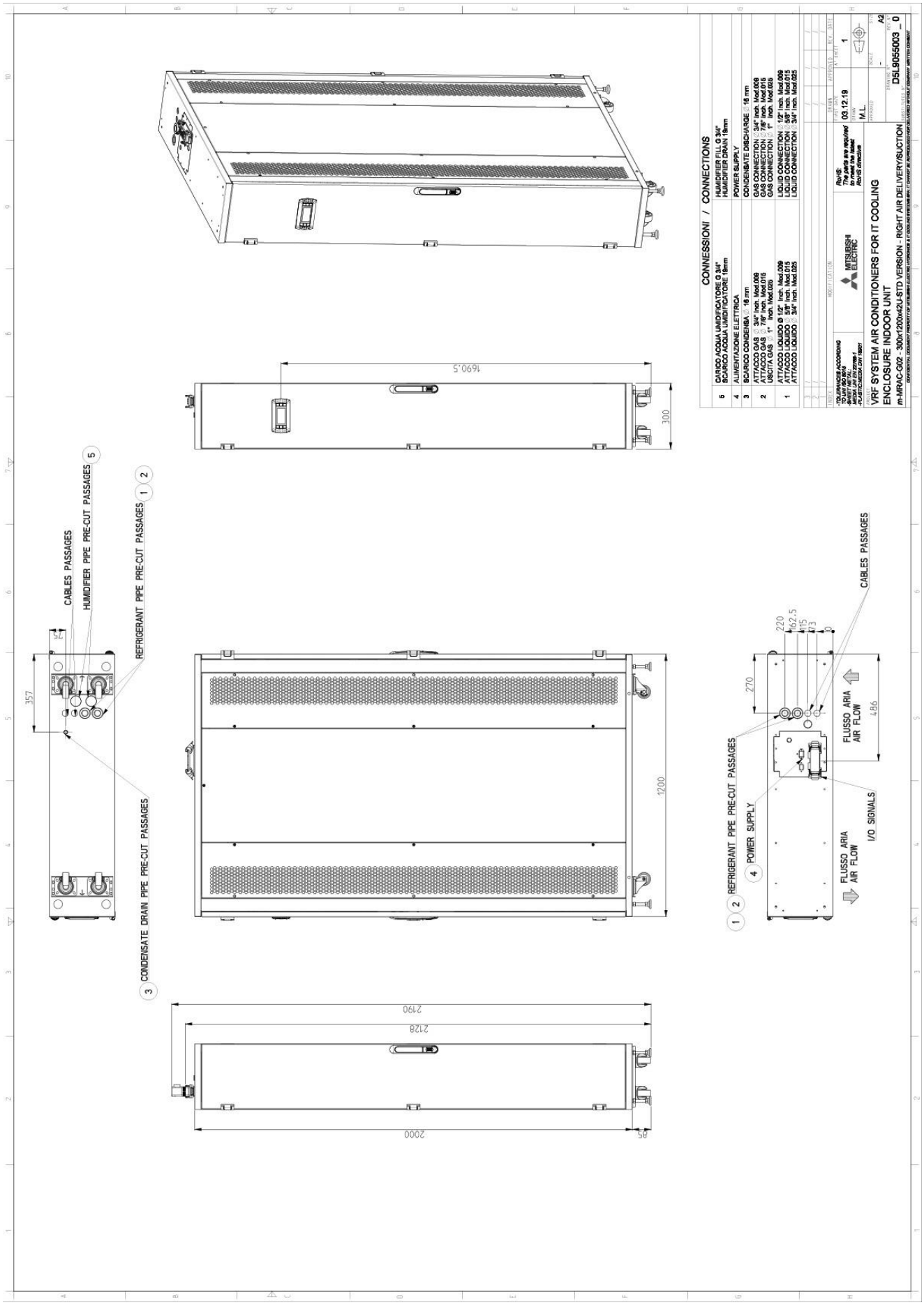


MACHINE DRAWINGS

Dimensions in mm – m-MROW – Rear air suction, front air delivery – (42U 300 x 1200)

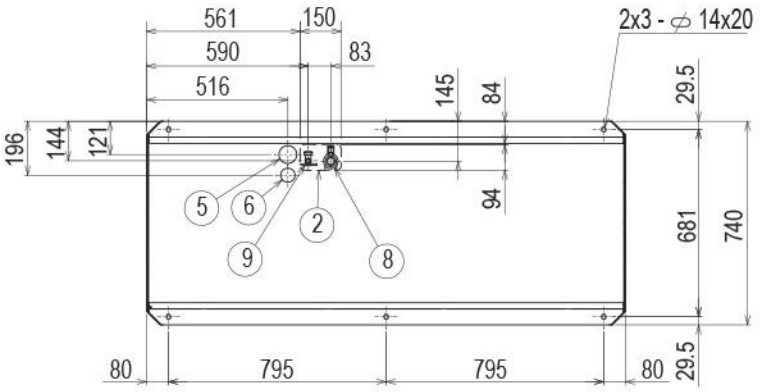


MACHINE DRAWINGS
Dimensions in mm – m-MRAC – (42U 300 x 1200)



MACHINE DRAWINGS – OUTDOOR UNITS

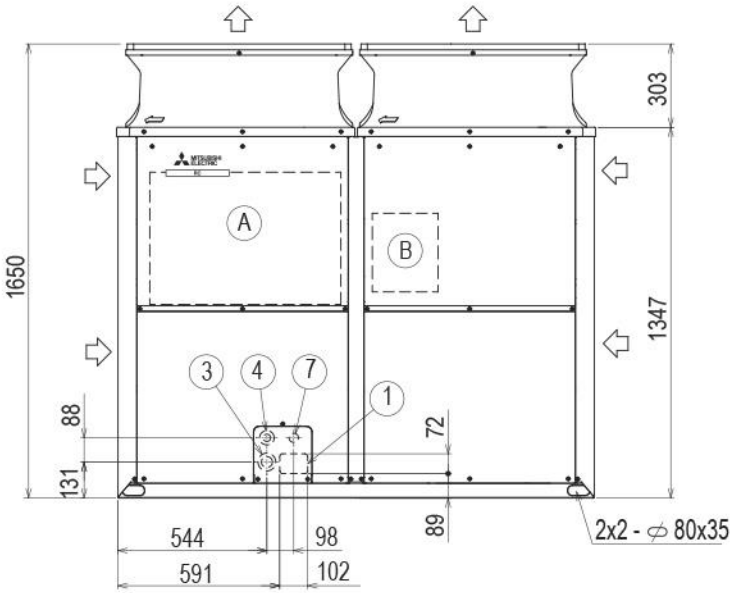
Dimensions in mm – m-MOCU - Model 050

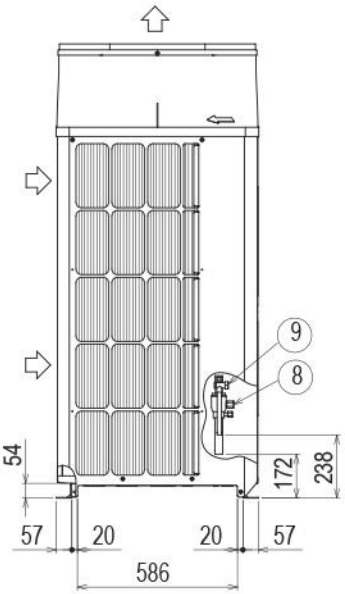


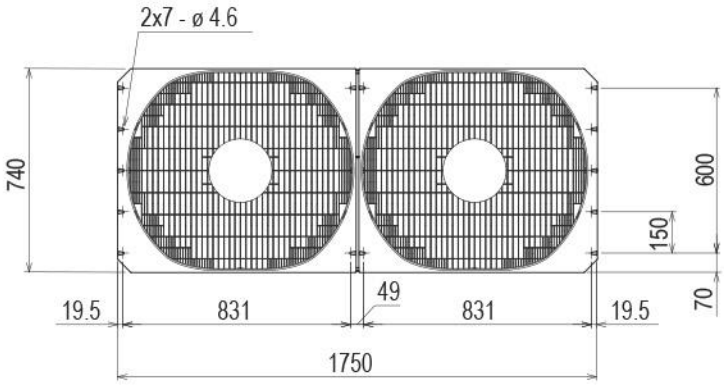
LEGENDA

Unit: [mm]

1 102x72 knockout hole. Front through hole for pipes.
2 150x94 knockout hole. Bottom through hole for pipes.
3 Ø65 or Ø40 knockout hole. Front through holes for pipes.
4 Ø52 or Ø27 knockout hole. Front through hole for wires.
5 Ø65 knockout hole. Bottom through hole for wires.
6 Ø52 knockout hole. Bottom through hole for wires.
7 Ø34 knockout hole. Front through hole for transmission cables
8 Refrigerant service valve <gas> Ø28,58
9 Refrigerant service valve <liquid> Ø15,88







SHIPMENT: PACKAGING DIMENSIONS

Values referred to basic machine. The presence of some accessories increases the weight of machine.
The machines are shipped on pallet and covered with carton box.
Packing on pallet covered with shrink wrapping and wooden cage available on request.

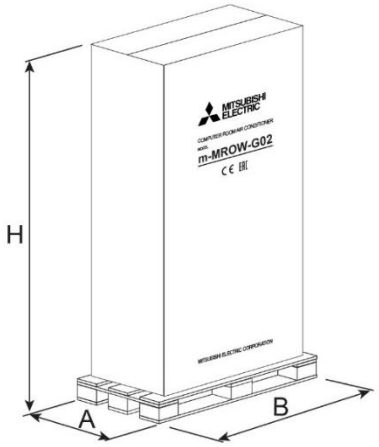
INDOOR UNIT - STANDARD PACKAGING

FRAME: 42U x 1000

m-MROW		009	015	025
A	mm	800	800	800
B	mm	1100	1100	1100
H	mm	2248	2248	2248
Weight	Kg	200	215	218

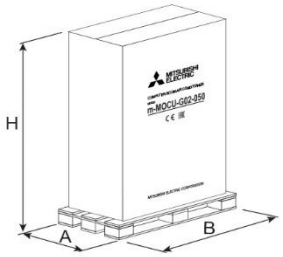
FRAME: 42U x 1200

m-MROW m-MRAC		009	015	025
A	mm	800	800	800
B	mm	1300	1300	1300
H	mm	2248	2248	2248
Weight	Kg	210	225	228



OUDOOR UNIT – STANDARD PACKAGING

m-MOCU		050
A	mm	760
B	mm	1780
H	mm	1790
Weight	Kg	327



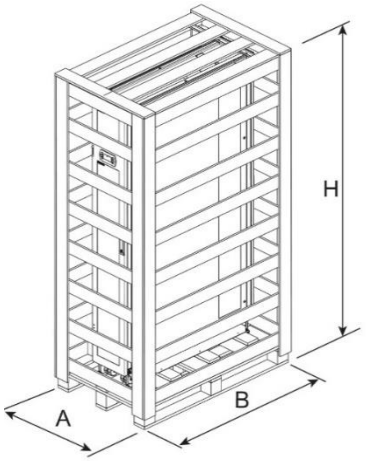
INDOOR UNIT - WOODEN CAGE (OPTIONAL)

FRAME: 42U x 1000

m-MROW		009	015	025
A	mm	830	830	830
B	mm	1130	1130	1130
H	mm	2320	2320	2320
Weight	Kg	235	250	253

FRAME: 42U x 1200

m-MROW m-MRAC		009	015	025
A	mm	830	830	830
B	mm	1330	1330	1330
H	mm	2320	2320	2320
Weight	Kg	245	260	263



WOODEN CAGE PACKAGING NOT AVAILABLE FOR OUTDOOR UNIT.

MITSUBISHI ELECTRIC

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 socety.