

COOLSIDE FC

4 – 17 kW

FULL INVERTER Air conditioners for IT Cooling with indirect Free Cooling system.
To be matched with remote moto-condensing unit.



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

- IN-ROW IN-RACK INSTALLATION
- FOR HIGH DENSITY RACK AND BLADE SERVER
- FREE-COOLING SYSTEM WITH ADDITIONAL COIL
- FULLY HERMETIC BLDC INVERTER COMPRESSORS (on outdoor moto-condensing unit)
- SINGLE REFRIGERANT CIRCUIT
- PLUG FANS WITH EC ELECTRIC MOTOR
- ELECTRONIC EXPANSION VALVE

Data Book: T_COOLSIDEFC_0219_EN

INDEX

MEHITS CERTIFICATIONS.....	3
GENERAL CHARACTERISTICS	4
INSTALLATION.....	6
PLANT TYPE.....	6
CONFIGURATIONS.....	9
PRODUCT FEATURES AND BENEFITS	10
F-GAS DIRECTIVE	10
MODEL IDENTIFICATION.....	11
WORKING LIMITS	11
STORING TEMPERATURE.....	11
MAIN COMPONENTS – INDOOR UNIT.....	12
MAIN COMPONENTS – OUTDOOR MOTO-CONDENSING UNIT	14
OPTIONAL ACCESSORIES – INDOOR UNIT	16
OPTIONAL ACCESSORIES – OUTDOOR MOTO-CONDENSING UNIT.....	17
TECHNICAL DATA – IN ROW “I” VERSION	18
TECHNICAL DATA – ENCLOSURE “E” VERSION.....	19
FREE COOLING SYSTEM	20
WATER QUALITY	22
REFRIGERANT CHARGE	23
RECOMMENDED REFRIGERANT LINES.....	23
TYPICAL INSTALLATION DIAGRAM.....	24
HYDRAULIC / REFRIGERANT DIAGRAM – INDOOR UNIT.....	25
HYDRAULIC / REFRIGERANT DIAGRAM – OUTDOOR MOTO-CONDENSING UNIT	25
ACOUSTIC DATA – INDOOR UNIT	26
ACOUSTIC DATA – OUTDOOR MOTO-CONDENSING UNIT.....	26
ELECTRICAL DATA.....	26
ELECTRICAL DATA – POWER SUPPLY 230/1/60 (OPTIONAL).....	27
ELECTRICAL DATA – POWER SUPPLY 460/3/60 (OPTIONAL).....	27
ELECTRICAL DATA – POWER SUPPLY 380/3/60 (OPTIONAL).....	27
MICROPROCESSOR CONTROL SYSTEM.....	28
WATER PUMP	29
OPTIONAL ACCESSORIES – 2-WAY OR 3-WAY MOTORIZED VALVE FOR WATER FLOW REGULATION.....	30
OPTIONAL ACCESSORIES – ELECTRIC HEATERS	30
OPTIONAL ACCESSORIES – OVERSIZED ELECTRIC HEATERS	30
OPTIONAL ACCESSORIES – MODULATING STEAM HUMIDIFIER.....	31
OPTIONAL ACCESSORIES – STANDARD CONDENSATE DRAIN PUMP	32
OPTIONAL ACCESSORIES – HUMIDIFIER AND CONDENSATE DRAIN PUMP KIT FOR HIGH WATER TEMPERATURE.....	33
OPTIONAL ACCESSORIES – 2-WAY ON/OFF VALVE	34
OPTIONAL ACCESSORIES – WATER FLOW METER	35
OPTIONAL ACCESSORIES – SMOKE SENSOR.....	36
OPTIONAL ACCESSORIES – FIRE SENSOR.....	36
OPTIONAL ACCESSORIES – FIRE / SMOKE SENSOR.....	37
OPTIONAL ACCESSORIES – NETWORK ANALYZER.....	37
OPTIONAL ACCESSORIES – DOUBLE POWER SUPPLY WITH AUTOMATIC TRANSFER SWITCH	38
OPTIONAL ACCESSORIES – ANTI-MIXING PANELS.....	38
OPTIONAL ACCESSORIES – OUTDOOR MOTO-CONDENSING UNIT - AXIAL FANS WITH “EC” ELECTRIC MOTORS	39
MACHINE DRAWINGS – INDOOR UNITS.....	40
MACHINE DRAWINGS – OUTDOOR MOTO-CONDENSING UNIT	43

MEHITS CERTIFICATIONS



SYSTEM CERTIFICATIONS

ISO 9001 CERTIFICATION – MEHITS S.p.A.
Quality Management System

ISO 14001 CERTIFICATION – MEHITS S.p.A.
Environmental Management System

BS OHSAS 18001 CERTIFICATION – MEHITS S.p.A.
Occupational Health and Safety Management System

PRODUCT CERTIFICATIONS BY COUNTRY



CE MARKING

MEHITS units are in compliance with the European Directives in force.

CCC – CQC CERTIFICATION
(People's Republic of China)

EAC CERTIFICATION
(Russian Federation, Belarus, Kazakhstan)



GENERAL CHARACTERISTICS



Modelli 0051



Modelli 0071

COOLSIDE FC: FULL INVERTER Air Conditioners for IT Cooling with indirect Free-Cooling system.

- Direct expansion, water cooled;
For matching with remote air-cooled moto-condensing unit;
- **Two independent cooling systems:**
Free-cooling chilled water coil. Direct expansion coil;
- Electronic expansion valve;
- Plug fans with EC electric motor;
- Single refrigerant circuit.

This series, for in-row, in-rack installation, is offered in 2 models available in the following version:

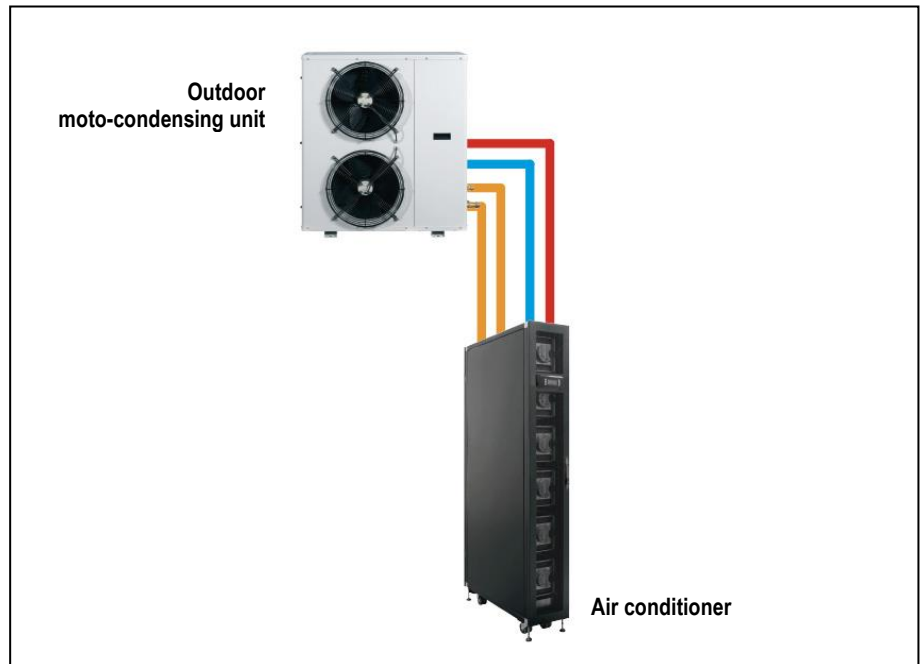
- IN ROW "I" air flow: Frontal or side air delivery, back side air suction
Cooling capacity: 4,5 ÷ 14,6 kW
- ENCLOSURE "E" air flow: Side air delivery, side air suction
Cooling capacity: 5,5 ÷ 17,4 kW

The machines are made for indoor installation.

The constructive solutions and the internal lay-out allow high application flexibility and the frontal access to the main components for the inspection and routine maintenance.

The installation requires refrigerant charge, electrical, refrigerant and hydraulic connections.

Final assembly on all machines before shipment including running test, reading and monitoring of operating parameters, alarms simulation and visual check.



SPLIT EVO INV OUT FC: Outdoor Moto-condensing units

- Hermetic BLDC inverter compressor;
- Built-in water-cooled heat-exchanger;
- Circulating pump on board.

The machines are made for outdoor installation.

The constructive solutions and the internal lay-out allow high application flexibility and the frontal access to the main components for the inspection and routine maintenance.

The installation requires refrigerant charge, electrical, refrigerant and hydraulic connections.

Final assembly on all machines before shipment including running test, reading and monitoring of operating parameters, alarms simulation and visual check.



INSTALLATION

The series is particularly suitable for installation in Data Center with hot spot for high density racks and blade server cooling. It is able to cope the high density of the thermal load in a small space, **up to and over 40kW/m² per rack**.

For installation are not required underfloor plenum, ducts or false-ceilings; the installation foresees the direct insertion within the rows of racks to cool.

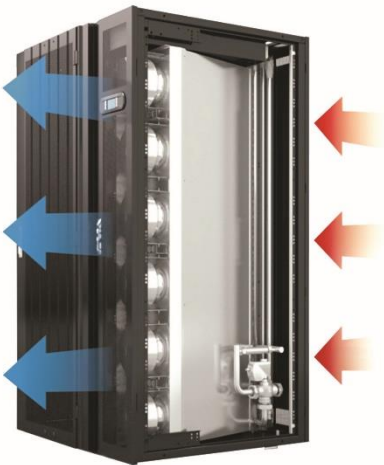
This allows to contrast the localized heat sources (hot spot) tailoring the installation to the actual situation of the plant. Another big advantage is the modularity and scalability of the system, characteristics that allow for quick adjustment and economic development of plant layout, according to the changing needs of the infrastructure.

IN ROW COOLING SYSTEM FOR ROWS OF RACKS (hot/cold aisles)

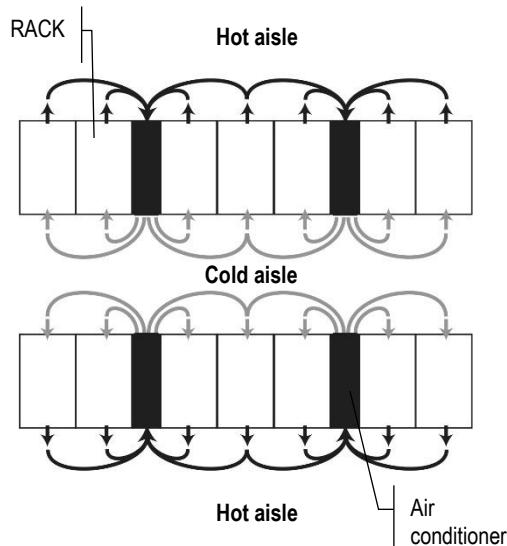
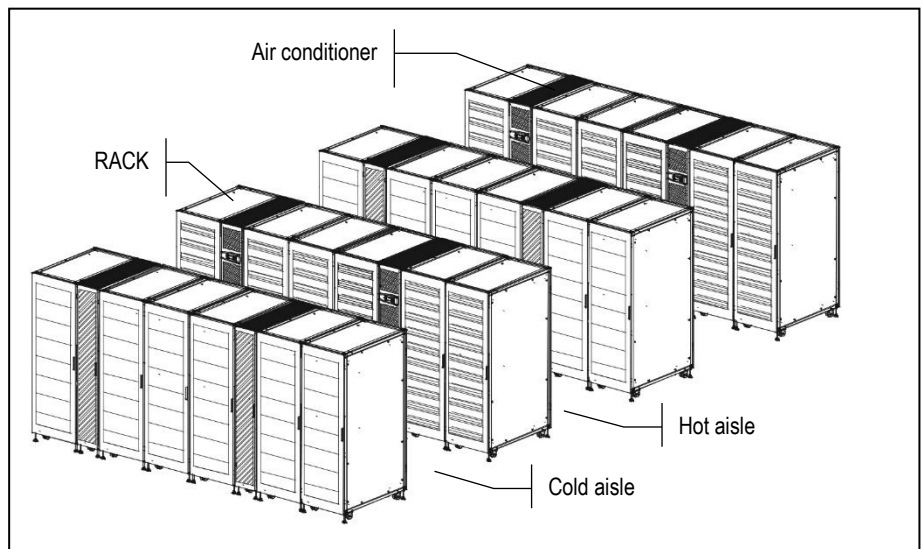
Units are placed in the rows of racks that are arranged so as to obtain alternate cold and hot aisles. Electronic equipment contained in racks independently provide to aspire the necessary air for cooling.

- In the hot aisle 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.

PLANT TYPE



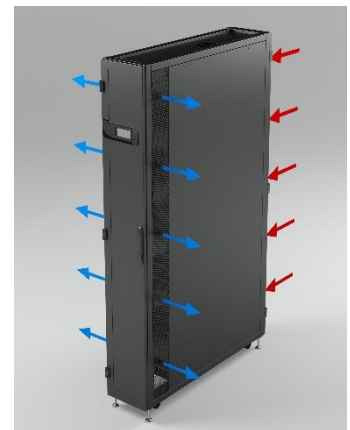
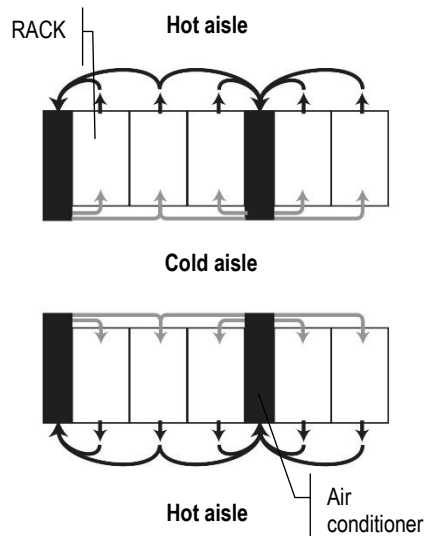
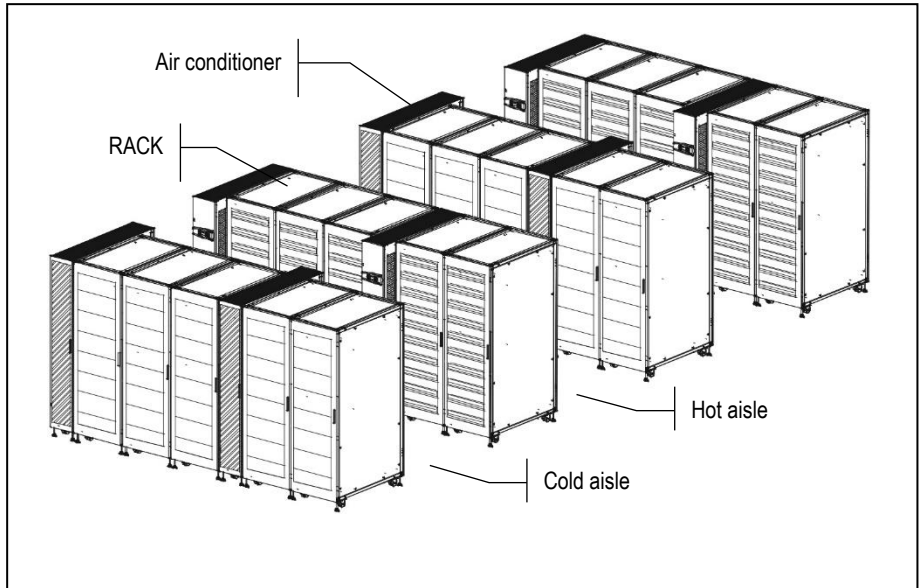
"1" VERSION - IN ROW VERSION – FRONTAL AIR DELIVERY
Frontal air delivery. Rear air suction.



Frontal air delivery
Rear air suction

"I" VERSION - INROW VERSION WITH SIDE AIR DELIVERY

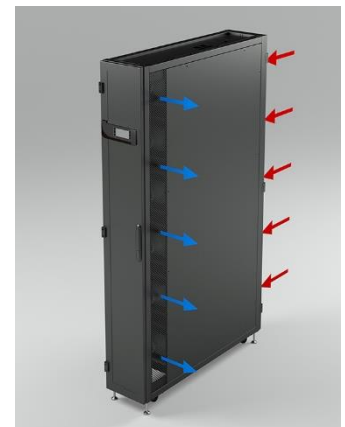
In the version with side outlet, the air is delivered directly to the front of the racks, reducing the risk of mixing between cold and hot air, and ensuring correct air distribution even when the rack cooler is installed at the start of the row.



Right + Left air delivery.
Rear air suction.



Left air delivery.
Rear air suction.



Right air delivery.
Rear air suction.

"E" VERSION - IN RACK COOLING SYSTEM FOR DIRECT COOLING OF THE RACKS

The rows of racks are arranged so as to insert an air conditioner between two racks.

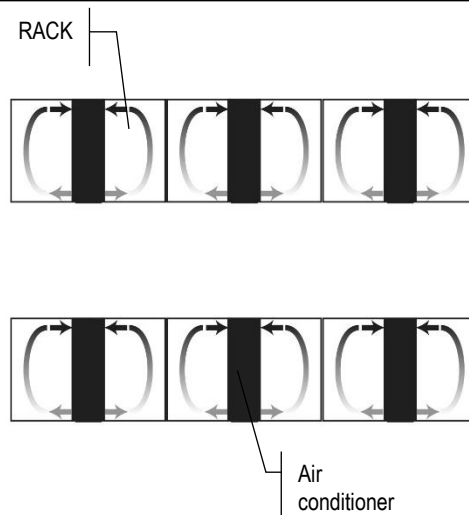
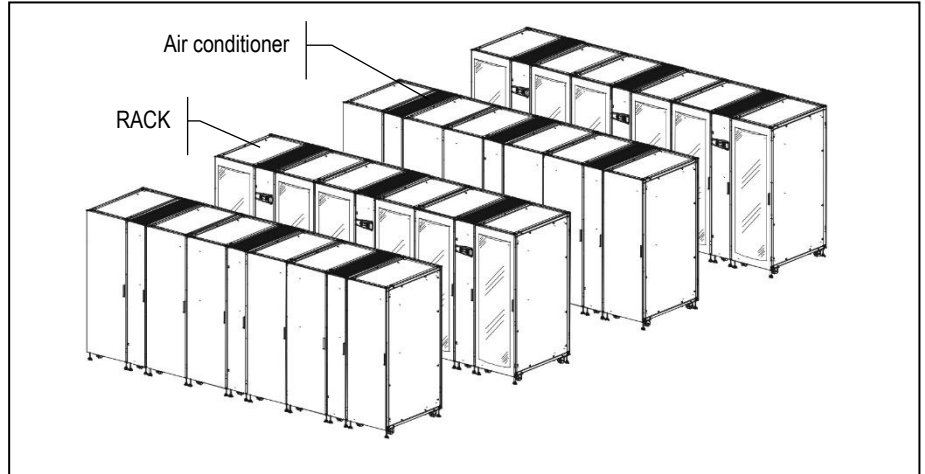
The racks are equipped with tight door for the containment of cooling air.

The air conditioner blows filtered and cooled air in the frontal side of the rack where the electronic equipment draws the cooled air.

Thanks to the "closed" cooling system the electronic equipment contained in racks do not require fans for air circulation.

In the back side of the rack, the hot air is drawn by the air conditioner that will repeat the cooling cycle.

ENCLOSURE VERSION



Right + left air outlet
Right + left air intake.



Left air outlet.
Left air intake.



Right air outlet.
Right air intake.

COOLSIDE FC

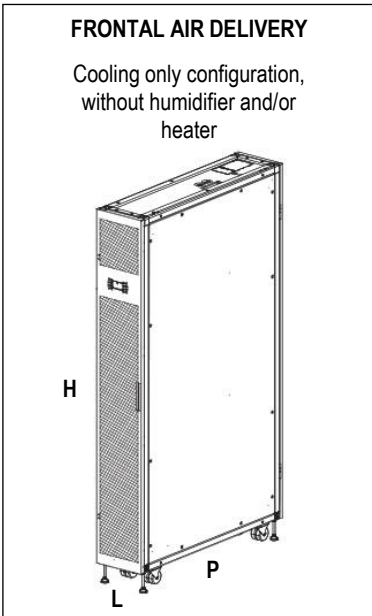
CONFIGURATIONS

The desired configuration must be selected during the order phase.

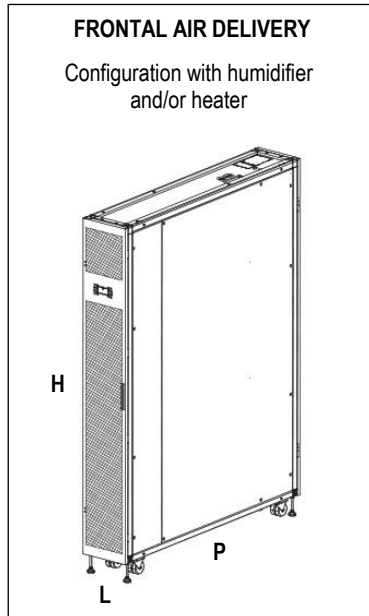
“I” VERSION

IN ROW COOLING SYSTEM (hot/cold aisle)

FRONTAL air delivery; BACK SIDE air suction

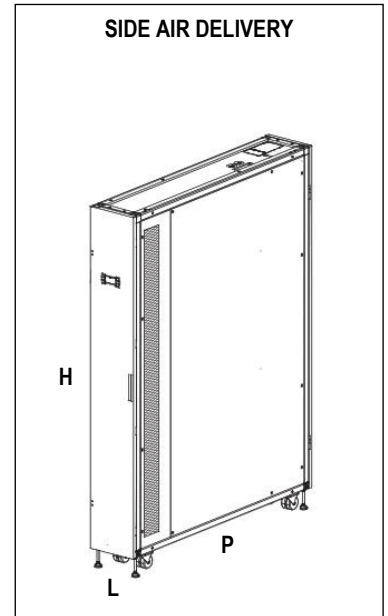


DIMENSIONS		
L (mm)	300	600
P (mm)	1000/1200(*)	
H (mm)	2085	



DIMENSIONS		
L (mm)	300	600
P (mm)	1200 (*)	1000/1200(*)
H (mm)	2085	

SIDE air delivery; BACK SIDE air suction



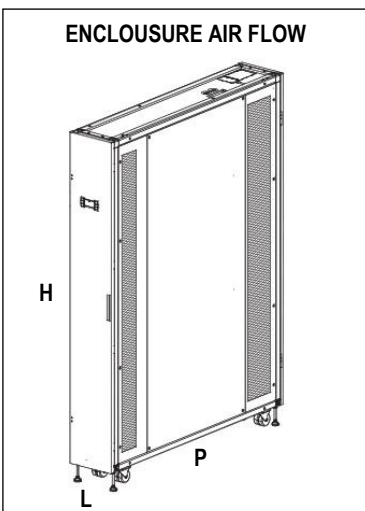
DIMENSIONS		
L (mm)	300	600
P (mm)	1200	
H (mm)	2085	

(*) Increased frame dimensions for in-row version with frontal air delivery. Optional mandatory for in-row version with frontal air delivery with Humidifier (optional) and/or electric heater (optional).

“E” VERSION

ENCLOSURE COOLING SYSTEM - IN RACK (close loop).

SIDE air delivery; SIDE air suction



DIMENSIONS		
L (mm)	300	600
P (mm)	1200	
H (mm)	2085	



PRODUCT FEATURES AND BENEFITS



ACTIVE FREE COOLING

The series units feature two different cooling systems, one direct expansion and one using chilled water, allowing, when outdoor conditions are favourable, the cooling water to be used to maintain the set indoor condition without, or only supplemented by, mechanical cooling by compressor. High density solutions with single or dual circuit allow the use of chilled water with a temperature above 15°C. This contributes to harness the full free cooling potential even in places that are normally considered too hot for such efficient systems. The outdoor moto-condensing unit is complete with the water cooling circuit for the condensing stage using the built-in dry cooler. The cooling fluid is circulated by a pump installed on-board.



EFFICIENCY

The series combines the efficiency of the use of the last EC fans generation and a direct expansion system with inverter compressor (within outdoor moto-condensing unit) and the integration of indirect Free-Cooling allowing a great EER value. Thanks to the adoption of BLDC inverter compressors, these units can reduce by 50% the consumption at partial load if compared to traditional ON/OFF compressor unit. This is made possible also thanks to the advantage of variable air flow enabled by EC fans.

FLEXIBILITY

The In-Row and Enclosure versions are both equipped with predisposition for passing refrigerant connections and power both from above and below, so as to allow a quick and easy installation in any condition, whether or not foreseen the presence of a raised floor.

IDM - INTEGRATED DYNAMIC MANAGEMENT OF TEMPERATURE

The units are supplied with a new management algorithm called IDM INTEGRAL DYNAMIC MANAGEMENT able to prevent stratification of temperature within the rack using 4 sensors (2 on the air suction and 2 on the air outlet) integrated and independent that, on the basis of the real load in the single stratified BLADE, work to optimize the ventilation only when required so as to maximize energy benefits. The IDM also provides the optimal management of the outlet treated air temperatures integrating the various resources in a DYNAMIC and INTELLIGENT way to avoid unpleasant condensation and ensuring (SHR = 1).

MODULARITY

The units, with their characteristics of dimensional standardization based on the rack, are ideal for all those Data Centers where SCALABILITY of the system is a strategic factor.



COMPARTIZATION

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

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

- **Indirect Free-Cooling System:** Two independent cooling systems: Free-Cooling chilled water coil; Direct expansion coil
- High cooling density, **up to and over 40kW/m² per rack.**
- Single BLDC scroll inverter compressor (within outdoor moto-condensing unit) in order to provide always the best efficiency;
- New plug fans with EC electric motors and impeller in composite material, which guarantees a reduction of power consumption;
- New fans electric motor that do not require maintenance;
- Total modulating, FULL INVERTER;
- Improvement of the control software with advanced control logic;
- Single refrigerant circuit;
- Total frontal access and lateral panels fully removable to facilitate the operations of extraordinary maintenance;

F-GAS DIRECTIVE

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

MODEL IDENTIFICATION

FULL INVERTER Direct expansion air conditioners for IT Cooling
model: COOLSIDE FC I 0051 BASIC

COOLSIDE FC	Series
I	IN-RROW air flow
E	ENCLOSURE air flow
0051	Model
BASIC	Single refrigerant circuit

Outdoor motocondensing units
model: SPLIT EVO INV OUT FC 0051

SPLIT EVO INV OUT FC	Series
	With BLDC inverter compressor
0051	Modello

WORKING LIMITS

ROOM AIR CONDITIONS

Room air temperature:

IN-RROW air flow: 23°C / 53% U.R. ÷ 40°C / 20% U.R.

ENCLOSURE air flow: 30°C / 35% U.R ÷ 50°C / 12% U.R.

AMBIENT AIR TEMPERATURE

With FREE-COOLING outdoor moto-condensing unit

+45°C Maximum ambient air temperature

-35°C Minimum ambient air temperature

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

- Working conditions;
- Thermal load;
- Set of the microprocessor control.

POWER SUPPLY

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

± 2% Maximum unbalancing of the phases.

STORING TEMPERATURE

If the machine is not installed on receipt and is stored for a long time, store it in a protected place, at temperatures ranging between -30°C and 50°C in absence of superficial condensation and direct sun light.

MAIN COMPONENTS – INDOOR UNIT



FRAMEWORK

- Framework in galvanized steel sheet externally painted with epoxy powders.
- Panel coated with a double layer of plastic and internally insulated with noise absorption material.
- Access doors. The doors are equipped with handle with security lock.
- Holders for unit height adjusting.
- Colour RAL 9005.
- Air flow:
 - IN ROW cooling system (for rows of racks) "I" VERSION:
 - Air intake from the back side and frontal or side air delivery through honeycomb type grilles.
 - IN RACK cooling system (direct cooling of racks) "E" VERSION:
 - Air intake from side and air delivery from side through honeycomb type grilles.

FILTER SECTION

Models 0051, 0071:

- 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.

COOLING SECTION – DIRECT EXPANSION AND CHILLED WATER FREE-COOLING COIL

- Heat exchanger with direct expansion circuit and chilled water circuit, with copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Finned pack with hydrophilic treatment that assure the condensate water drop, high thermal conductivity and does not favour the growth of micro-organisms.
- 3-way motorized valve for water flow regulation with 3-point control and emergency manual control.
- Hydraulic connections arranged for connection from upper and bottom side of the unit.
- Temperature probe on chilled water inlet.
- Condensate tray with connection (internal diameter Ø16) for a discharge tube or for a pump for condensate drain (option).

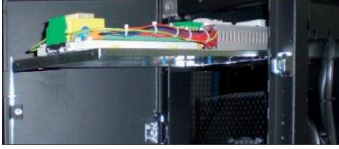
FANS SECTION

- Centrifugal fans with backward curved blades, single suction and 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) that manage the motor according to the 0÷10V proportional signal coming from the microprocessor control.
- Fans quick installation system for a fast replacement.
- N+1 dynamic management of EC fans. Allows operation at reduced flow-rate to optimise power consumption. Moreover, in the event of a fault on one fan, the other fans are operated at maximum speed to ensure the same cooling performance.
- Nr.2 temperature sensors on air delivery.
- Nr.2 temperature sensors on air intake.
- Current detector for loss of air flow 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 suction line for coupling to remote moto-condensing unit.
- Predisposition for refrigerant connections from the bottom or from the top of the unit.



ELECTRICAL PANEL

Extractable electrical panel in accordance with EN60204-1 norms, complete with:

- Magnetothermic switches for supply fans.
- Terminals for smoke/fire alarm and LAN connection.
- Power supply: 230/1/50

CONTROL SYSTEM

- Microprocessor system with graphic display for control and monitor of operating and alarms status. The system includes:
 - Built-in memory for the storing of the intervened events (up to 100 events recorded);
 - Predisposition for connectivity board housing (RS485, LON, Ethernet. The electronic cards are optional accessories;
 - Non-volatile "Flash" memory for data storage in case of power supply faulty;
 - Menu with protection password;
 - LAN connection (max 10 units).

MAIN COMPONENTS – OUTDOOR MOTO-CONDENSING UNIT



OUTDOOR MOTO-CONDENSING UNIT FRAMEWORK

- Frame and panels in galvanized steel sheet and painted with epoxy powders. Colour RAL 9010;
- Non-flammable closed cell polyethylene foam thermal insulation and soundproofing on the inside
- Screwed panels.
- Total front access for routine maintenance.
- Compartment for electrical panel on unit front for direct access to control and regulation devices;
- Packing unit on pallet with carton.

FREE-COOLING SECTION

- Heat exchanger coil with copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Coil protection net.
- Frame in galvanized steel or peralluman.
- Expansion valve.

COOLING FAN SECTION

- Axial fans with sickle-shaped blades, fan guard and optimized for low noise levels.
- AC electric motor
- Condensing control system with variation of fan speed through phase-cut electronic regulator directly driven by the condensing pressure proportional signal.
- Ambient air temperature probe.
- IP54 enclosure class.
- Rubber support

CONDENSER

- AISI 316 stainless steel plates type, vacuum brazed using copper as brazing material. Hydraulic and refrigerant connections in AISI 316 stainless steel:
- 3-way motorized by-pass valve for condensing control with 0÷10 VDC control actuator and emergency manual control.

CIRCULATION PUMP

- Circulation pump with electronic control of the speed.

COMPRESSOR SECTION

Model 0051:

- Rotary BLDC inverter compressors optimized for R410A refrigerant:
- Synchronous brushless inverter driven motor.
- Inverter for modulating capacity control.
- Reactance for the reduction of electromagnetic noise and interference.
- Crankcase heater.
- Oil separator on refrigerant discharge
- Rubber supports.

Model 0071:

- Scroll BLDC inverter compressors with spiral profile optimized for R410A refrigerant:
- Synchronous brushless inverter driven motor.
- Inverter for modulating capacity control.
- Reactance for the reduction of electromagnetic noise and interference.
- Crankcase heater.
- Oil separator on refrigerant discharge
- Rubber supports.

REFRIGERANT CIRCUIT

The moto-condensing unit is supplied with a minimum R410A refrigerant charge.

- Sight glass.
- Filter dryer on liquid line.
- High pressure safety switch with manual reset.
- High pressure transducer for condensing control:
- Condenser fan with AC motor:
 - Condensing control with variation of fan speed through phase-cut electronic regulator.
- Liquid receiver
- Liquid separator on compressor suction line (only model 0071)
- Check valve on condenser inlet
- Lubricant oil charge
- External refrigerant connections with valves.



ELECTRICAL PANEL

In accordance with EN60204-1 norms, suitable for indoor installation, complete with:

- Main switch with door lock safety on frontal panel.
- Magnetothermic switches for fan and compressor.
- Contactors for each load.
- Phase sequence relay for compressor with three-phase power supply
- Transformer for auxiliary circuit and microprocessor supply.
- Terminals for inlets / outlets.
- Power supply: 230/1/50 or 400/3+N/50 according to the model (see TECHNICAL DATA).
The power supply is independent from the outdoor condensing unit.

OPTIONAL ACCESSORIES – INDOOR UNIT

The descriptions of these additional components can be found in Chapter OPTIONAL ACCESSORIES.

- 2-way motorized valve for water-flow control:
 - with 3-point control and emergency manual control;
 - with 0-10VDC control and emergency manual control;
 - with 0-10VDC control, spring return and emergency manual control.
- 3-way motorized valve for water-flow control:
 - with 0-10VDC control and emergency manual control;
 - with 0-10VDC control, spring return and emergency manual control.
- Electric heating system with steel tubular and fins, three-stage control and safety thermostat.
The optional accessory requires increased frame dimensions (optional) for in-row version with frontal air delivery.
- Oversized electric heating system with steel tubular and fins, three stage control and safety thermostat.
The optional accessory requires increased frame dimensions (optional) for in-row version with frontal air delivery.
- Modulating steam humidifier with immersed electrodes with electronic control.
The optional accessory requires increased frame dimensions (optional) for in-row version with frontal air delivery.
- Standard condensate drain pump. Installed on the unit. For low temperature water.
- Humidifier and condensate drain pump kit. For high water temperature. Supplied in mounting kit.
- Shut-off on/off water valve. The on-off valve shuts off water flow into the unit in the event of a flood alarm.
- Water flow meter: measures and displays the volume of fluid transiting the unit.
- Smoke sensor.
- Fire sensor.
- Smoke / fire sensor.
- Network analyzer: multifunction utility for calculating and displaying the machine electrical measurements.
- Double power supply with automatic change-over. Supplied in mounting kit.
- Anti-mixing frontal/back panel. Not compatible with optional "floor brackets fixing kit".
- Anti-mixing side panel.

OTHER ACCESSORIES

- Increased frame dimensions for in-row version with frontal air delivery:
 - 42U 300x1200 for models 0051, 0071;The optional accessory is mandatory for in-row version with frontal air delivery with Humidifier (optional) and/or Electric heating (optional).
- 60Hz Power Supply:
 - 230/1/60 (for model 0051);
 - 460/3/60;
 - 380/3/60.
- Combined Temperature / Humidity sensor on in-room air.
- Dehumidification system. The optional foresee the combined Temperature / Humidity sensor on in-room air.
- Modulating steam humidifier with immersed electrodes with electronic control and Dehumidification system. The optional foresee the combined Temperature / Humidity sensor on return air.
The optional accessory requires increased frame dimensions (optional) for in-row version with frontal air delivery.
- Differential pressure switch on the air side for clogged filters alarm signal.
- Under floor water alarm through sensor to be placed on the floor.
- Floor brackets fixing kit
- Unit packing in wooden crate.
- Microprocessor control accessories:
 - Remote terminal for connecting and managing multiple units connected in LAN.
 - Serial card MBUS RS485.
 - Serial card LON.
 - Serial card Ethernet

WARNING

The manufacturer reserves the right to accept the matching of the optional installed on the machine.

OPTIONAL ACCESSORIES – OUTDOOR MOTO-CONDENSING UNIT

The descriptions of these additional components can be found in Chapter OPTIONAL ACCESSORIES.

- Axial fans with sickle-shaped blades, fan guard and optimized for low noise levels.
 - EC electric motor
 - IP54 enclosure class.
- Network analyser.
- Double power supply with ATS system.

OTHER ACCESSORIES

- Condensing coil in special execution:
 - Cu/Cu version
 - Epoxy painted protection
 - Electro-phoresic paint protection (cataphoresis)
- 60Hz Power Supply:
 - 230/1/60 (only for model 0051);
 - 460/3/60 (only for model 0071);
 - 380/3/60 (only for model 0071).
- Compressor soundproof cap for a sound level reduction of 2 dB(A).
- Rubber support.
- Unit packing in wooden crate.

WARNING

The manufacturer reserves the right to accept the matching of the optional installed on the machine.

TECHNICAL DATA – In Row “I” Version

INDOOR UNIT									
MODEL		0051				0071			
COOLING CAPACITY (1)		100%	80%	60%	45%	100%	80%	60%	50%
Total	kW	11,10	8,88	6,66	4,68	14,60	11,70	8,76	7,23
Sensible	kW	10,30	8,29	6,11	4,68	14,60	11,70	8,32	7,23
SHR (2)		0,93	0,93	0,92	1,00	1,00	1,00	0,95	1,00
SUPPLY FAN	n.	2				4			
Fan type		Plug Fan EC				Plug Fan EC			
Air flow	m³/h	1500	1223	947	700	3360	2623	1886	1500
Fans power input (3)	kW	0,32	0,19	0,10	0,05	0,69	0,37	0,18	0,10
Nominal external static pressure	Pa	20				20			
AIR FILTERS	n.	1				1			
Efficiency		COARSE 40%				COARSE 40%			
REFRIGERANT		R410A				R410A			
Gas circuit	n	1				1			
POWER SUPPLY	V/Ph/Hz	230/1/50				230/1/50			
DIMENSIONS INDOOR UNIT									
Width	mm	300				300			
Length with frontal air delivery (4)	mm	1000				1000			
Length with side air delivery	mm	1200				1200			
Height	mm	2085				2085			
NET WEIGHT	kg	175				190			
REFRIGERANT CONNECTIONS									
Liquid line	Ø mm	12				16			
Suction line	Ø mm	18				22			
HYDRAULIC CONNECTIONS									
CONDENSATE DISCHARGE									
Rubber pipe – internal diameter	Ø mm	16				16			
OUTDOOR MOTO-CONDENSING UNIT									
MODEL		0051				0071			
COOLING CAPACITY		100%	80%	60%	45%	100%	80%	60%	50%
BLDC INVERTER COMPRESSOR		Rotary				Scroll			
Quantity	n.	1				1			
Power input	kW	2,55	1,67	1,13	0,69	3,11	2,09	1,60	1,06
CONDENSER FAN	n.	1				2			
Fan type		Axial AC				Axial AC			
Air flow	m³/h	8640				15768			
Power input (3)	kW	0,69				1,38			
WATER COOLED CONDENSER									
Condenser water flow rate	m³/h	2,38				3,06			
Pressure drop (Condenser + valve)	kPa	26				22			
Unit water content	l	16,4				24,4			
REFRIGERANT		R410A				R410A			
Refrigerant circuit	n	1				1			
POWER SUPPLY	V/Ph/Hz	230/1/50				400/3+N/50			
OUTDOOR UNIT DIMENSIONS									
Length	mm	1450				1450			
Width	mm	550				550			
Height	mm	1200				1700			
NET WEIGHT	kg	182				247			
REFRIGERANT CONNECTIONS									
Liquid line	Ø mm	1/2" SAE - 12				5/8" SAE - 16			
Suction line	Ø mm	3/4" SAE - 18				7/8" SAE - 22			
HYDRAULIC CONNECTION									
Condenser water inlet / outlet	F Ø	1 1/4"				1 1/4"			

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

1. Gross Value. Characteristics referred to entering air at 35°C with 27%RH and ambient air temperature 28°C. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.
3. Corresponding to the nominal external static pressure.
4. Unit in standard configuration, without optional accessories.

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

NOTE:

Below the indicated minimum cooling capacity, the inverter compressor enters the "cycling" area in which the compressor operates with ON / OFF cycles below the minimum modulation frequency (operation only for short periods).

SELECT THE UNIT IN THE MODULATION FIELD.



TECHNICAL DATA – Enclosure “E” Version

INDOOR UNIT		0051				0071			
MODEL									
COOLING CAPACITY (1)		100%	80%	60%	45%	100%	80%	60%	40%
Total	kW	12,80	10,20	7,68	5,52	17,40	13,90	10,40	7,16
Sensible	kW	12,80	10,20	7,34	5,52	17,40	13,90	10,40	7,16
SHR (2)		1,00	1,00	0,96	1,00	1,00	1,00	1,00	1,00
SUPPLY FAN	n.	2				4			
Fan type		Plug Fan EC				Plug Fan EC			
Air flow	m³/h	1500	1219	937	700	3360	2983	2605	1500
Fans power input (3)	kW	0,33	0,20	0,10	0,05	0,69	0,53	0,36	0,10
Nominal external static pressure	Pa	20				20			
AIR FILTERS	n.	1				1			
Efficiency		COARSE 40%				COARSE 40%			
REFRIGERANT		R410A				R410A			
Gas circuit	n	1				1			
POWER SUPPLY	V/Ph/Hz	230/1/50				230/1/50			
DIMENSIONS INDOOR UNIT									
Width	mm	300				300			
Length	mm	1200				1200			
Height	mm	2085				2085			
NET WEIGHT	kg	185				200			
REFRIGERANT CONNECTIONS									
Liquid line	Ø	12				16			
Suction line	Ø	18				22			
HYDRAULIC CONNECTIONS									
CONDENSATE DISCHARGE									
Rubber pipe – internal diameter	Ø mm	16				16			

OUTDOOR MOTO-CONDENSING UNIT		0051				0071			
MODEL									
COOLING CAPACITY		100%	80%	60%	45%	100%	80%	60%	40%
BLDC INVERTER COMPRESSOR		Rotary				Scroll			
Quantity	n.	1				1			
Power input	kW	2,70	1,73	1,32	0,64	3,19	2,04	1,58	1,06
CONDENSER FAN	n.	1				2			
Fan type		Axial AC				Axial AC			
Air flow	m³/h	8640				15768			
Power input (3)	kW	0,69				1,38			
WATER COOLED CONDENSER									
Condenser water flow rate	m³/h	2,7				3,6			
Pressure drop (Condenser + valve)	kPa	32				30			
Unit water content	l	16,4				24,4			
REFRIGERANT		R410A				R410A			
Refrigerant circuit	n	1				1			
POWER SUPPLY	V/Ph/Hz	230/1/50				400/3+N/50			
DIMENSIONS OUTDOOR UNIT									
Length	mm	1450				1450			
Width	mm	550				550			
Height	mm	1200				1700			
NET WEIGHT	kg	182				247			
REFRIGERANT CONNECTIONS									
Liquid line	Ø mm	1/2" SAE - 12				5/8" SAE - 16			
Suction line	Ø mm	3/4" SAE - 18				7/8" SAE - 22			
HYDRAULIC CONNECTION									
Condenser water inlet / outlet	F Ø	1 1/4"				1 1/4"			

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

1. Gross Value. Characteristics referred to entering air at 46°C with 16%RH and ambient air temperature 28°C. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.
3. Corresponding to the nominal external static pressure.

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

NOTE:

Below the indicated minimum cooling capacity, the inverter compressor enters the "cycling" area in which the compressor operates with ON / OFF cycles below the minimum modulation frequency (operation only for short periods).
SELECT THE UNIT IN THE MODULATION FIELD.



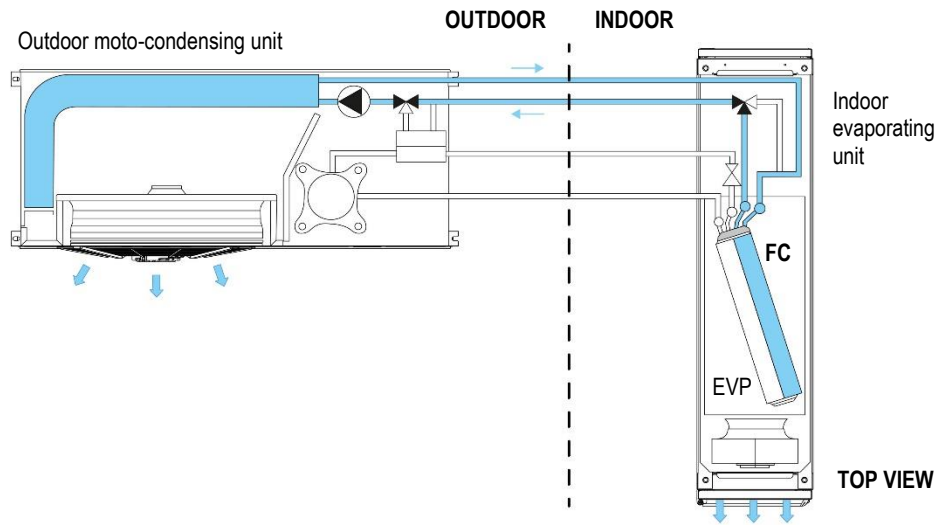
FREE COOLING SYSTEM

FREE COOLING system on the machine allows to obtain two independent cooling systems:

- Free-Cooling chilled water coil;
- Direct expansion coil;

TOTAL FREE-COOLING

When outdoor air conditions are favourable, free-cooling is activated.

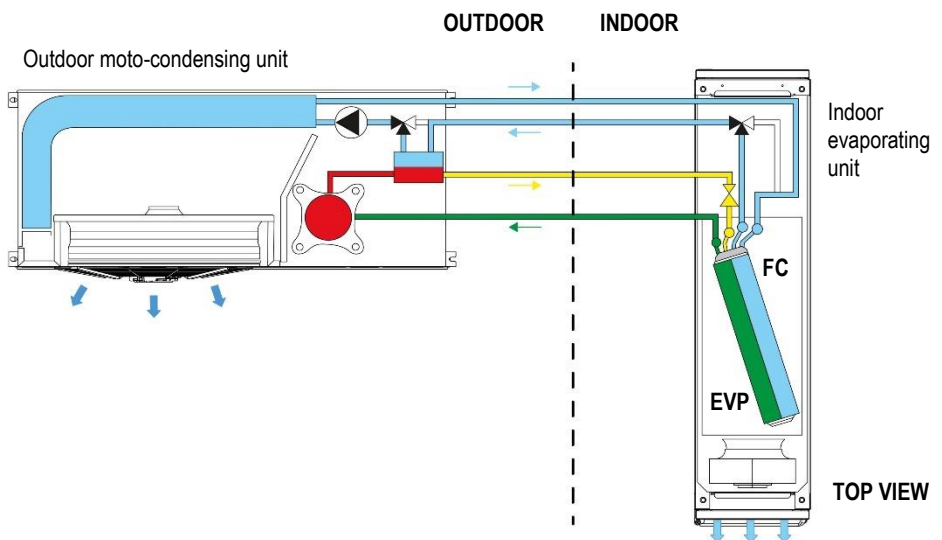


LEGENDA

FC Free-Cooling coil
EVP Evaporator. Direct expansion coil

PARTIAL FREE-COOLING + MECHANICAL COOLING

If the free-cooling alone is not capable to satisfy the demand, the direct expansion circuit is also activated.

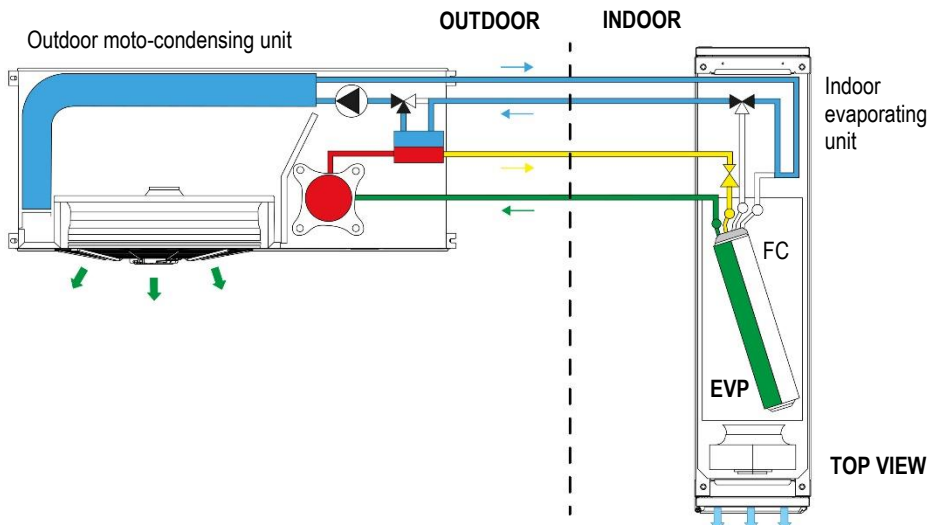


LEGENDA

FC Free-Cooling coil
EVP Evaporator. Direct expansion coil

MECHANICAL COOLING

If the water temperature in the free-cooling coil is not low enough, only the direct expansion cooling is activated.



LEGENDA

FC Free-Cooling coil
EVP Evaporator. Direct expansion coil

COOLSIDE FC

TECHNICAL DATA – FREE-COOLING SYSTEM – FREE-COOLING CHILLED WATER COIL – In Row “I” Version

INDOOR UNIT			
SIZE		0051	0071
COOLING CAPACITY (1)			
Total	kW	9,8	17,7
Sensible	kW	9,8	17,7
SHR (2)		1,00	1,00
COOLING COIL			
Water flow rate (1)	m ³ /h	2,4	3,1
dP coil + valve (1)	kPa	29,2	40,4
Water volume	l	7,6	7,6
HYDRAULIC CONNECTIONS			
WATER INLET / OUTLET	F Ø	1"	1"

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

1. Characteristics referred to entering air at 35°C-27%RH with free-cooling coil inlet water temperature 10°C - 0% glycol. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.

TECHNICAL DATA – FREE-COOLING SYSTEM – FREE-COOLING CHILLED WATER COIL –Enclosure “E” Version

INDOOR UNIT			
SIZE		0051	0071
COOLING CAPACITY (1)			
Total	kW	12,5	22,8
Sensible	kW	12,5	22,8
SHR (2)		1,00	1,00
COOLING COIL			
Water flow rate (1)	m ³ /h	2,7	3,6
dP coil + valve (1)	kPa	36,0	53,2
Water volume	l	7,6	7,6
HYDRAULIC CONNECTIONS			
WATER INLET / OUTLET	F Ø	1"	1"

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

1. Characteristics referred to entering air at 46°C-16%RH with free-cooling coil inlet water temperature 14°C - 0% glycol. ESP=20Pa
2. SHR = Sensible cooling capacity / Total cooling capacity.

WATER QUALITY

For a correct and optimal functioning of the hydraulic circuits a water quality must be guaranteed as indicated in the table below. The values shown in the table must be guaranteed during the entire life cycle of the machine.

	Description	Symbol	Range
1	Hydrogen ions	pH	7.5 ÷ 9
2	Presence of calcium (Ca) and magnesium (Mg)	Hardness	4 ÷ 8.5 °D
3	Chlorine ions	Cl ⁻	< 150 ppm
4	Iron ions	Fe ³⁺	< 0.5 ppm
5	Manganese ions	Mn ²⁺	< 0.05 ppm
6	Carbon dioxide	CO ₂	< 10 ppm
7	Hydrogen sulphide	H ₂ S	< 50 ppb
8	Oxygen	O ₂	< 0.1 ppm
9	Chlorine	Cl ₂	< 0.5 ppm
10	Ammonia	NH ₃	< 0.5 ppm
11	Ratio between carbonates and sulphates	HCO ₃ ⁻ /SO ₄ ²⁻	> 1
12	Sulphate ions	SO ₄ ⁻	< 100 ppm
13	Phosphate ions	PO ₄ ³⁻	< 2.0 ppm

where: 1/1.78°D = 1°Fr with 1°Fr = 10 gr CaCO₃ / m³

ppm = parts for millions

ppb = part for billion

Explanatory notes:

- ref.1: A greater concentration of hydrogen ions (pH) than 9 implies a high risk of deposits, whereas a lower pH than 7 implies a high risk of corrosion.
- ref.2: The hardness measures the amount of Ca and Mg carbonate dissolved in the water with a temperature lower than 100°C (temporary hardness). A high hardness implies a high risk of deposits.
- ref.3: The concentration of chloride ions with higher values than those indicated causes corrosion.
- ref. 4 - 5 - 8: The presence of iron and manganese ions and oxygen leads to corrosion.
- ref.6 - 7: Carbon dioxide and hydrogen sulphide are impurities that promote corrosion.
- ref.9: Usually in water from the waterworks it is a value of between 0.2 and 0.3 ppm. High values cause corrosion.
- ref.10: The presence of ammonia reinforces the oxidising power of oxygen
- ref.11: Below the value shown in the table, there is a risk of corrosion due to the trigger of galvanic currents between copper and other less noble metals.
- ref.12: The presence of sulphates ions triggers corrosion phenomenon.
- ref.13: The presence of phosphates ions triggers corrosion phenomenon.

It is necessary to carry out periodic checks, with withdrawals at different points of the hydraulic system.

During the first year of operation, checks are recommended every 4 months which can be reduced every 6 months starting from the second year of operation.

WARNING:

It is necessary that, in the presence of dirty and / or aggressive waters, an intermediate heat exchanger is installed upstream of the heat exchangers

REFRIGERANT CHARGE

The indoor unit is supplied with seal charge. The moto-condensing unit is supplied with a minimum R410A refrigerant charge. **Refrigerant must be charged.** The following table shows the refrigerant charge that must be introduced, it's enough for connection of the moto-condensing unit to the corresponding indoor unit and for a maximum pipe length of 5m.

OUTDOOR MOTOCONDENSING UNIT – BASIC VERSION

MODEL		0051	0071
SIZE		BASIC	BASIC
REFRIGERANT		R410A	R410A
Refrigerant circuits x Refrigerant charge	n x kg	1 x 4,7	1 x 4,9
HFC R410A - F Gas - CO ₂ equivalent	t	9,81	10,23

RECOMMENDED REFRIGERANT LINES

Hereafter the recommended refrigerant lines diameters for each cooling circuit.

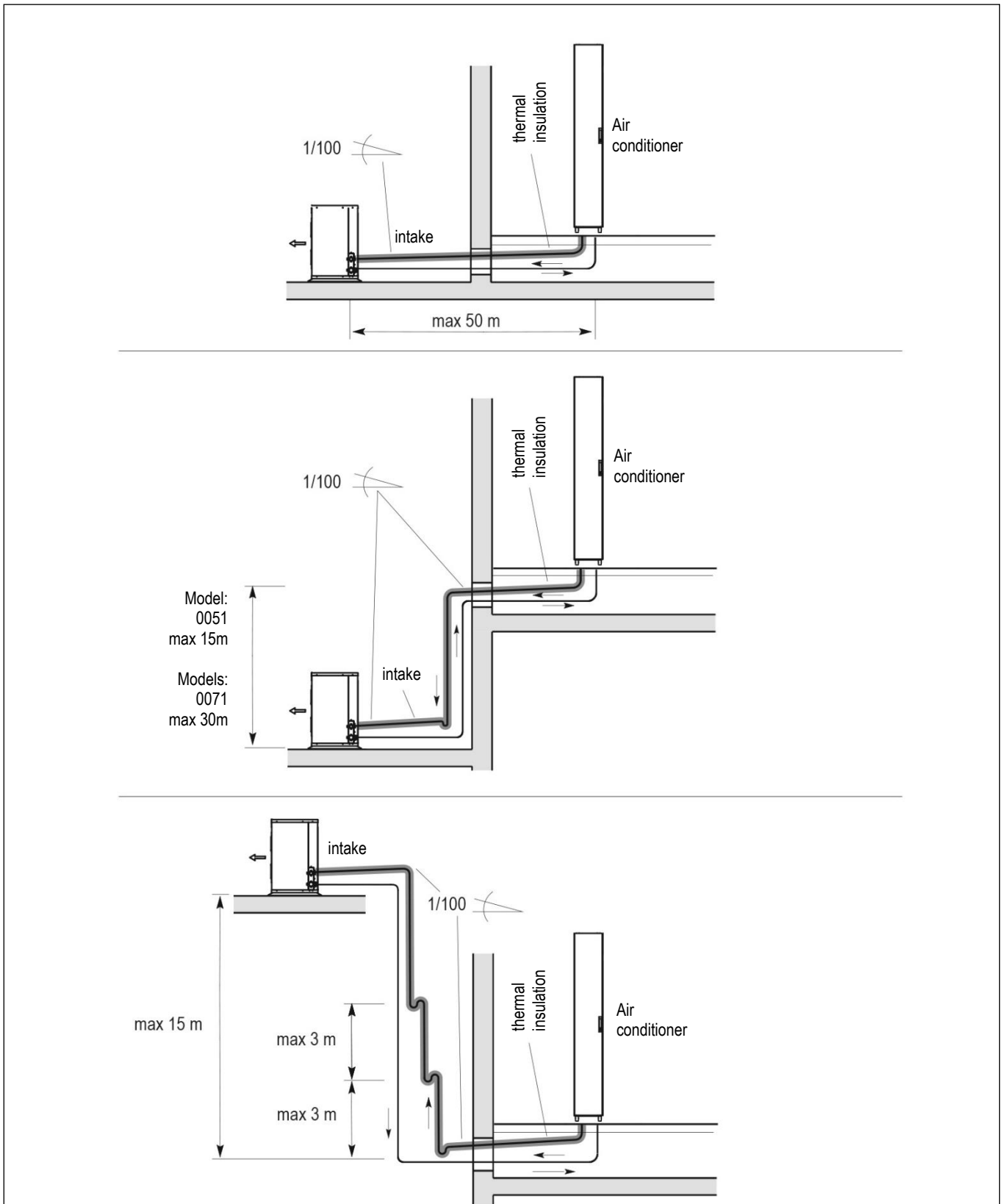
Values are referred to "EQUIVALENT LENGTH" of the piping.

You are kindly requested to always refer to the "TYPICAL INSTALLATION DIAGRAM" to properly select all necessary components

MODEL	Nominal capacity of circuit [kW]	Line	Ø nominal [mm]	EQUIVALENT LENGHT [m]									
				5	10	15	20	25	30	35	40	45	50
0051	10,9	Suction	16	16 mm									
		Liquid	9,52	9,52 mm									
0071	14,0	Suction	18	18 mm									
		Liquid	9,52	9,52 mm					12 mm				

For equivalent lengths over 50m, please contact the Manufacturer's Sales Office.

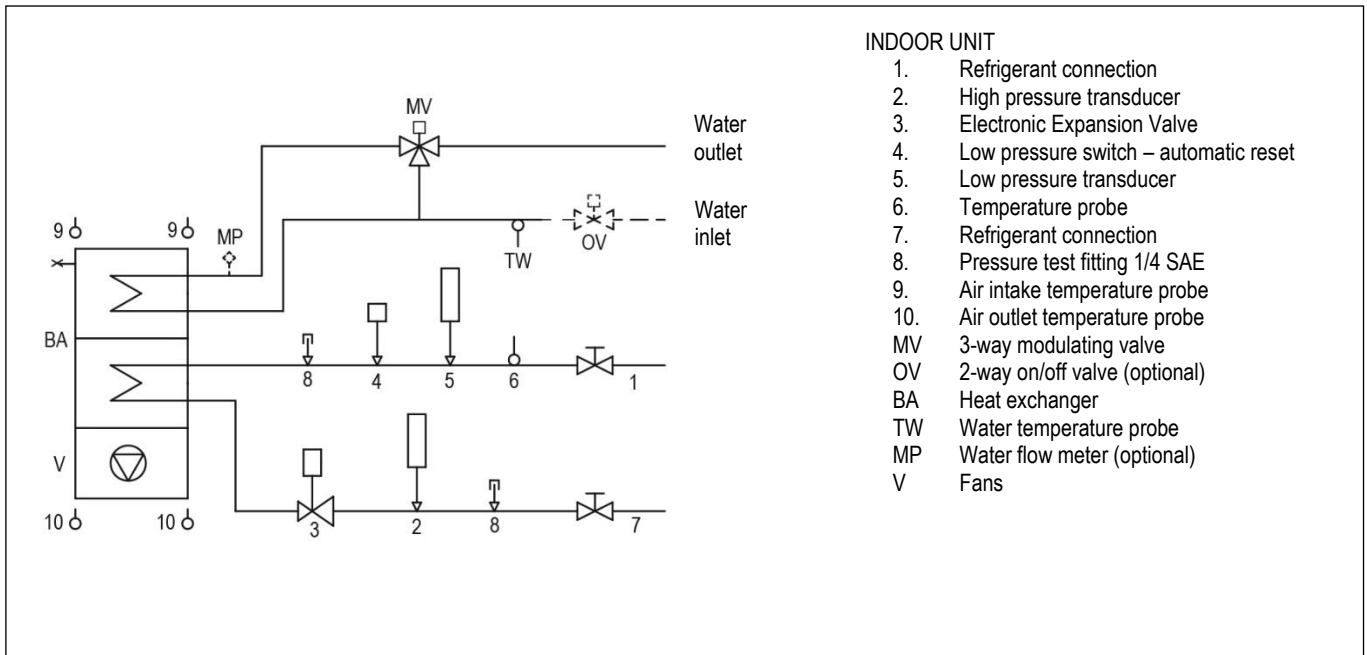
TYPICAL INSTALLATION DIAGRAM



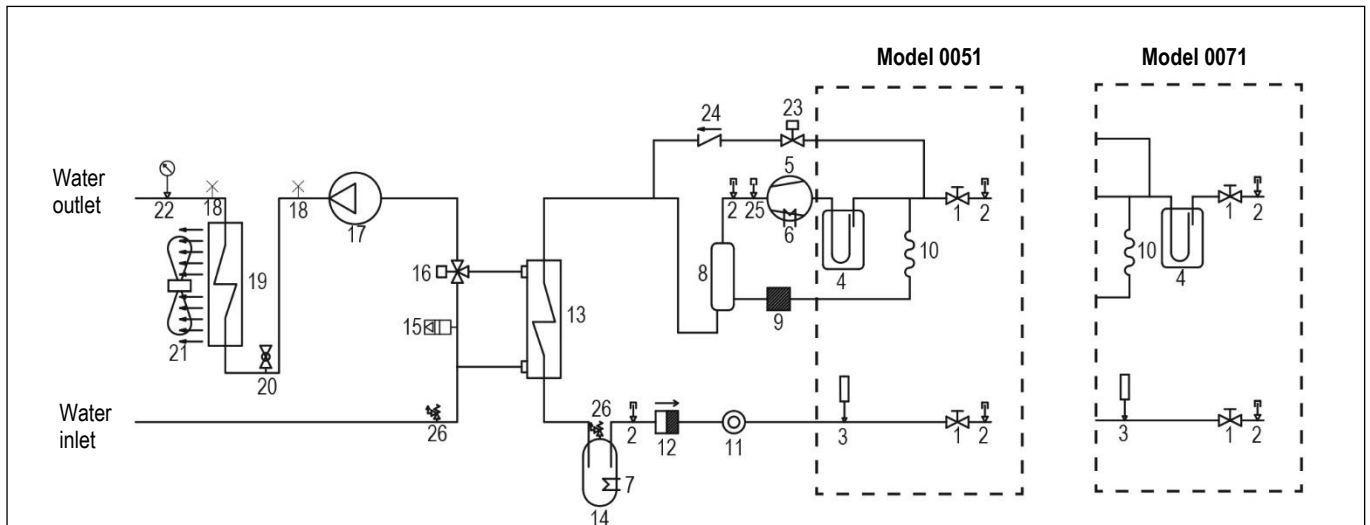
WARNING

It is necessary to provide the refrigerant and lubricant oil charge for the connection pipes when exceeding an equivalent length of 5 metres. Create traps as shown in the figure, making sure to fill them with oil when commissioning the system. The liquid pipes must be protected against sunlight.

HYDRAULIC / REFRIGERANT DIAGRAM – INDOOR UNIT



HYDRAULIC / REFRIGERANT DIAGRAM – OUTDOOR MOTO-CONDENSING UNIT



OUTDOOR UNIT

- | | | | | | |
|---|-----------------------------------|-----|-------------------------------|-----|----------------------|
| 1 | Refrigerant connection | 10. | Capillary tube | 20. | Fill/Drain valve |
| 2 | Pressure test fitting | 11. | Liquid and moisture indicator | 21. | Fan |
| 3 | Transducer | 12. | Filter-drier | 22. | Pressure gauge |
| 4 | Liquid separator (for model 0071) | 13. | Condenser | 23. | Solenoid valve |
| 5 | Compressor | 14. | Liquid receiver | 24. | Non-return valve |
| 6 | Sump oil heater | 15. | Expansion vessel | 25. | High pressure switch |
| 7 | Liquid receiver heater | 16. | 3-way electronic valve | 26. | Safety valve |
| 8 | Oil separator | 17. | Pump | | |
| 9 | Mesh filter | 18. | Vent | | |
| | | 19. | Dry Cooler/ Free Cooling | | |

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 listener 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. In fact, the sound pressure level generated by the source, must be added to the one reflected from the room. Also, the shape of the room affects the sound.

MODEL		0051	0071
SOUND LEVEL ISO 3744 (1)			
On air delivery	dB(A)	63	68

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

ACOUSTIC DATA – OUTDOOR MOTO-CONDENSING UNIT

Acoustic data of the standard machine at full load working conditions

MODELLO		0051	0071
SOUND LEVEL ISO 3744 (1)			
On air delivery	dB(A)	61	63

1. Livello di pressione sonora a 1 metro in campo libero – ISO 3744

ELECTRICAL DATA

Indoor unit

MODEL		0051	0071
POWER SUPPLY			
		230/1/50	230/1/50
STANDARD UNIT			
Max power input (FLI)	kW	0,34	0,68
Max current input (FLA)	A	2,90	5,80
Power input (OI)	kW	0,32	0,69

Outdoor moto-condensing unit

MODEL		0051	0071
POWER SUPPLY			
		230/1/50	400/3+N/50
STANDARD UNIT			
Max power input (FLI)	kW	6,60	11,80
Max current input (FLA)	A	21,60	22,80
Power input (OI)	kW	3,24	4,49

WARNING:

The electric data indicated refer only to the standard units, without optional accessories.

Optional accessory electric data are included within the dedicated chapters and must be added.

Please refer to ELCA WORLD selection program to calculate the electrical data of the air conditioner according to the requested optional accessories.



ELECTRICAL DATA – POWER SUPPLY 230/1/60 (OPTIONAL)

Indoor unit

MODEL		0051	0071
POWER SUPPLY		230/1/60	-
STANDARD UNIT			
Max power input (FLI)	kW	0,34	-
Max current input (FLA)	A	2,90	-

Outdoor moto-condensing unit

MODEL		0051	0071
POWER SUPPLY		230/1/60	-
STANDARD UNIT			
Max power input (FLI)	kW	6,68	-
Max current input (FLA)	A	22,09	-

ELECTRICAL DATA – POWER SUPPLY 460/3/60 (OPTIONAL)

Indoor unit

MODEL		0051	0071
POWER SUPPLY		-	460/3/60
STANDARD UNIT			
Max power input (FLI)	kW	-	0,68
Max current input (FLA)	A	-	5,80

Outdoor moto-condensing unit

MODEL		0051	0071
POWER SUPPLY		-	460/3/60
STANDARD UNIT			
Max power input (FLI)	kW	-	11,93
Max current input (FLA)	A	-	21,31

ELECTRICAL DATA – POWER SUPPLY 380/3/60 (OPTIONAL)

Indoor unit

MODEL		0051	0071
POWER SUPPLY		-	380/3/60
STANDARD UNIT			
Max power input (FLI)	kW	-	0,68
Max current input (FLA)	A	-	5,80

Outdoor moto-condensing unit

MODEL		0051	0071
POWER SUPPLY		-	380/3/60
STANDARD UNIT			
Max power input (FLI)	kW	-	11,84
Max current input (FLA)	A	-	27,84

WARNING:

The electric data indicated refer only to the standard units, without optional accessories.




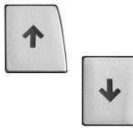

MICROPROCESSOR CONTROL SYSTEM



The microprocessor control system is equipped with 6 keys terminal and back lighted 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, Back - red light active – alarm presence, push to deactivate and have alarm description. If more than one alarm(s) occurred, the others can be scrolled by Key UP / DOWN
	PRG	Menu list, scrolled by key UP/DOWN: Use the ENTER key to execute the mode.
	ESC	Home. Used to come back to the previous menu level or to the main screen.
	UP DOWN	Used to change the pages and values of sets. When display is in main screen (HOME), pressing one of them (UP/DOWN) will display the synoptic of the main controls.
	ENTER	Moving the cursor on adjustable Program(s) fields, press the key to confirm the changes, press the key to get out of the fields.

CONNECTIVITY

Through the optional serial port, the microprocessor control enables communication with the modern buildings 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: Asks to Service: Allowing to reach and modify MAINTENANCE parameters.

Level 3: Asks to Service: Allowing to reach and modify MANUFACTURER parameters.

LAN NETWORK

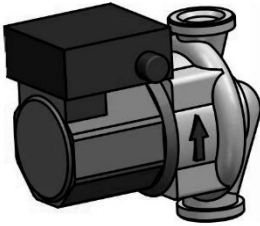
The LAN is part of the control software and it is possible to connect 10 units.

This type of connection allows to control the units in coherent way, moreover the units can be controlled and managed from a shared remote terminal.

LAN ADDRESS LIST

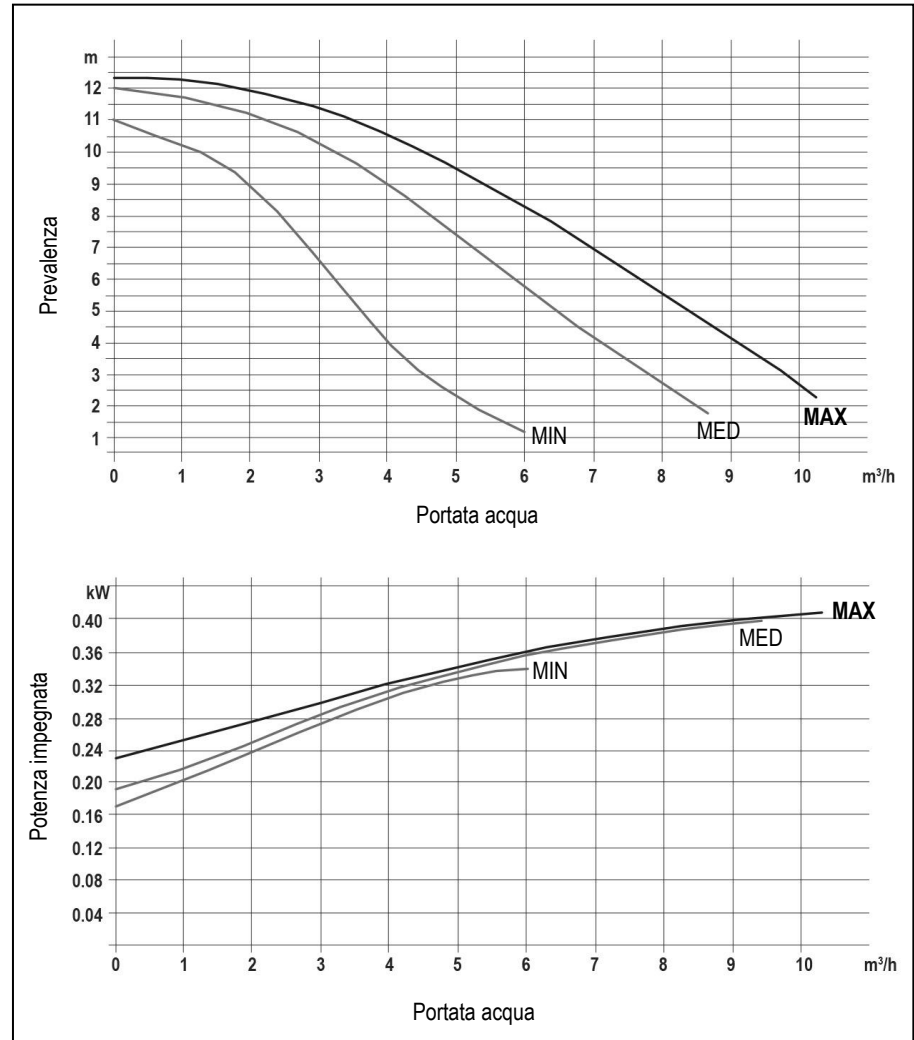
Unit #	1	2	3	4	5	6	7	8	9	10	Remote Terminal
Terminal address	11	12	13	14	15	16	17	18	19	20	32
Mother board address	1	2	3	4	5	6	7	8	9	10	-

WATER PUMP



Three speeds water pump on plant delivery side.
Assembled in factory within the moto-condensing outdoor unit, doesn't modify its dimensions.

PUMP PERFORMANCE



TECHNICAL DATA – Water pump

MODEL	0051	0071
POWER SUPPLY	230/1/50	400/3+N/50
STANDARD UNIT		
Max current input (FLA)	A	1,37
Power input (OI)	kW	0,31

OPTIONAL ACCESSORIES – 2-WAY OR 3-WAY MOTORIZED VALVE FOR WATER FLOW REGULATION



2-way or 3 way motorized valve with 3 points or modulating 0-10V control actuator for water flow regulation in the finned coil.

- 2-way motorized valve for water-flow control:
 - with 3-point control and emergency manual control;
 - with 0-10VDC control and emergency manual control;
 - with 0-10VDC control, spring return and emergency manual control.
- 3-way motorized valve for water-flow control:
 - with 0-10VDC control and emergency manual control;
 - with 0-10VDC control, spring return and emergency manual control.

The rotative actuator is controlled by a signal from the microprocessor controller. The actuator is equipped with an emergency button for manual operation and is maintenance-free.

OPTIONAL ACCESSORIES – ELECTRIC HEATERS



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.

Components:

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

TECHNICAL DATA

MODEL		0051	0071
POWER SUPPLY		230/1/50	230/1/50
THERMAL CAPACITY	kW	2,4	2,4
Absorbed current (OA)	A	10,43	10,43
Capacity steps	n	3	3

Optional accessory modifies the weight of the standard unit.

OPTIONAL ACCESSORIES – OVERSIZED ELECTRIC HEATERS

The components are the same as for the standard accessory.

The optional accessory requires increased frame dimensions (optional) for in-row version with frontal air delivery.

TECHNICAL DATA

MODEL		0051	0071
POWER SUPPLY		230/1/50	230/1/50
THERMAL CAPACITY	kW	3,6	3,6
Absorbed current (OA)	A	15,65	15,65
Capacity steps	n	3	3

Optional accessory modifies the weight of the standard unit.

OPTIONAL ACCESSORIES – MODULATING STEAM HUMIDIFIER



Modulating steam humidifier with immersed electrodes fitted with safety and running accessories. The accessory is factory installed and requires water filling connection. The optional accessory requires increased frame dimensions (optional) for in-row version with frontal air delivery.

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 that works as an electrical resistance and overheats. The steam so produced is distributed with dedicated distributors and used for ambient humidification or for industrial processes.

CHARACTERISTICS OF THE SUPPLY WATER

The quality of the used water influences the evaporation process, so the humidifier can be fed with **not-treated water, only when potable and non-demineralised**.

LIMIT VALUES

LIMIT VALUES FOR IMMERSSED ELECTRODE HUMIDIFIER FEED WATER			Normal water		Water with low salt content	
			Min	Max	Min	Max
Mains pressure	bar		1	8	1	8
Hydrogen ions	pH		7	8,5	7	8,5
Specific conductivity at 20°C	$\sigma_{R, 20^\circ C}$	$\mu S/cm$	350	1250	75	350
Total dissolved solids	TDS	mg/l	(1)	(1)	(1)	(1)
Dry residue at 180°C	R ₁₈₀	mg/l	(1)	(1)	(1)	(1)
Total hardness	TH	mg/l CaCO ₃	100 (2)	400	50 (2)	160
Temporary hardness		mg/l CaCO ₃	60 (3)	300	30 (3)	100
Iron + Manganese		mg/l Fe + Mn	0	0,2	0	0,2
Chlorides		ppm Cl	0	30	0	20
Silica		mg/l SiO ₂	0	20	0	20
Residual chlorine		mg/l Cl ⁻	0	0,2	0	0,2
Calcium sulphate		mg/l CaSO ₄	0	100	0	60
Metallic impurities		mg/l	0	0	0	0
Solvents, diluents, soaps, lubricants		mg/l	0	0	0	0

- (1) Values depending on specific conductivity; in general: TDS \cong 0,93 * $\sigma_{R, 20^\circ C}$; R₁₈₀ \cong 0,65 * $\sigma_{R, 20^\circ C}$
 (2) Not lower than 200% of the chloride content in mg/l di Cl⁻
 (3) Not lower than 300% of the chloride content in mg/l di Cl⁻

CYLINDER CONDUCTIVITY Function	LOW CONDUCTIVITY CILINDER		MEDIUM CONDUCTIVITY CILINDER		HIGH CONDUCTIVITY CILINDER	
	Min	Max	Min	Max	Min	Max
Specific conductivity at 20°C ($\sigma_{R, 20^\circ C}$)	75	350	350	750	750	1250

WARNING:

- No relation can be demonstrated between water hardness and 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 water, as these substances are potentially irritant.
- 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.**



COOLSIDE FC

TECHNICAL DATA

MODEL		0051	0071
POWER SUPPLY		230/1/50	230/1/50
STEAM PRODUCTION	kg/h	3	3
Power input	kW	2,25	2,25
Max absorbed current (FLA)	A	9,8	9,8
Water content	l	3,9	3,9
HYDRAULIC CONNECTION			
WATER INLET - ISO 228/1 – G M (1)	Ø	3/4"	3/4"
WATER OUTLET - internal diameter	Ø mm	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 modifies the weight of the standard unit. Consider the weight of the water content.

OPTIONAL ACCESSORIES – STANDARD CONDENSATE DRAIN PUMP



Optional accessory installed within the indoor unit.
A plastic case contains the pump motor, the thermal protection with automatic reset, the float with the trigger threshold and alarm threshold overflow and hydraulic and electric connection.
The condensate discharge pump operation is fully automatic.

TECHNICAL SPECIFICATION

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)

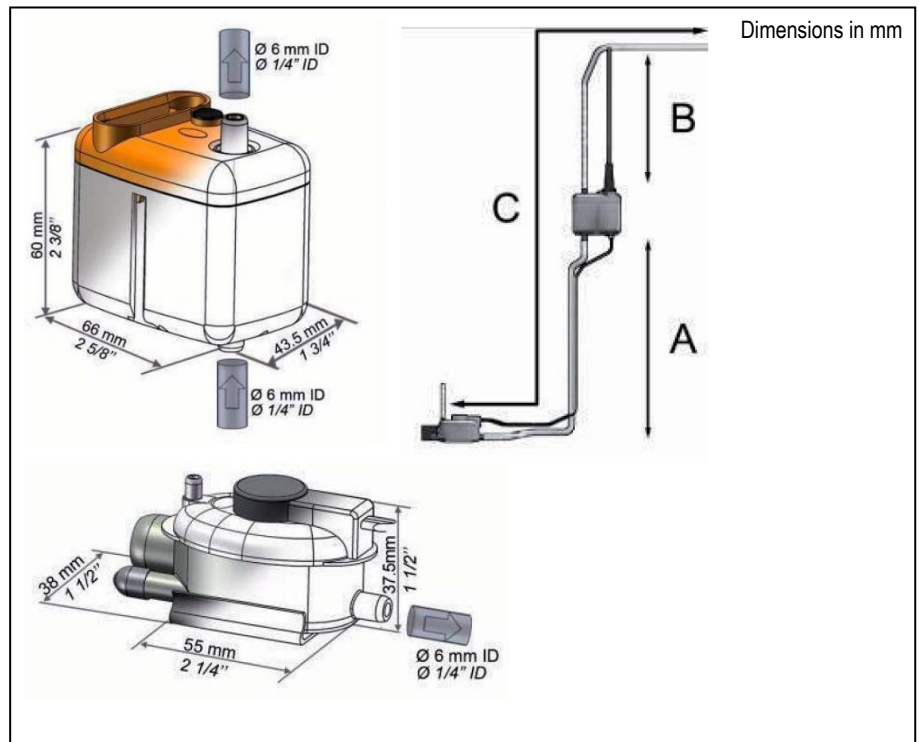
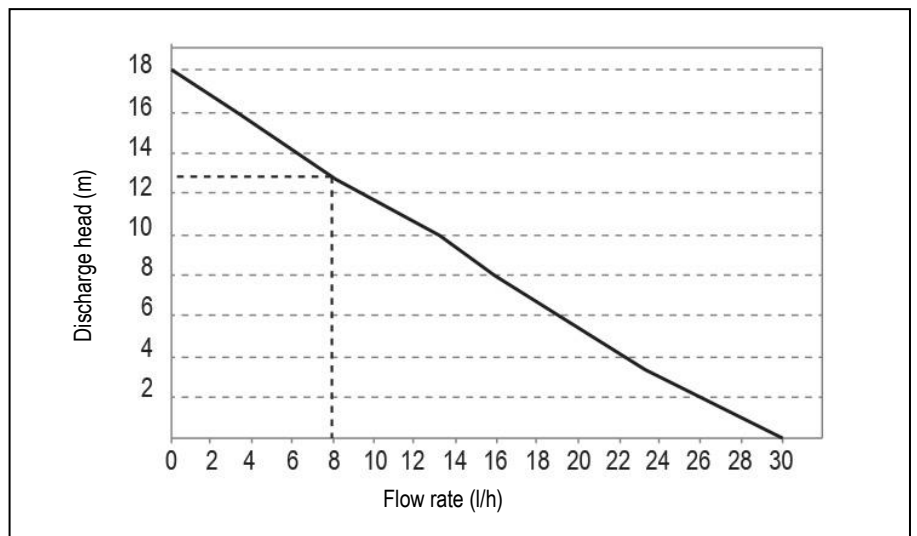
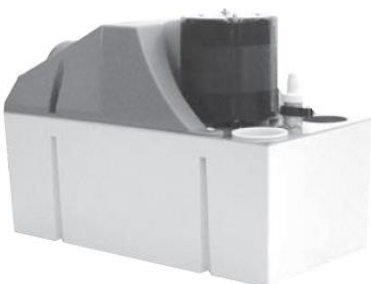


TABLE OF EFFECTIVE FLOW RATES (l/h)					
Total pipe length with 6mm ID pipe (C)					
Suction (A)	Discharge (B)	5 m	10 m	20 m	30m
0 m	0 m	30	27	26	25
	2 m	26	24	23	22
	4 m	22	21	20	19
	6 m	-	18	17	16
	8 m	-	15	14	13
	10 m	-	12	11	10
	12 m	-	-	8	7
1 m	0 m	24	23	22	21
	2 m	20	19	18	17
	4 m	17	16	15	14
	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 – HUMIDIFIER AND CONDENSATE DRAIN PUMP KIT FOR HIGH WATER TEMPERATURE.



Optional accessory supplied in mounting kit to be installed outside of the indoor unit. These pumps are designed to collect the hot water produced by the humidifier drain cycles, as well as the condensate produced. These pump has mechanical features capable to resist to the high temperatures of the water exiting the steam cylinder.

The pump body is made from Cycology, a heat-resistant material, the pre-wired safety float is a low voltage switch used to stop the drain cycle in the unlikely event where the pump malfunctions.



TECHNICAL SPECIFICATIONS

Tank capacity	4 litres
Recommended maximum head	6 m
Maximum water flow-rate	900 l/h with zero head
Rated power	0.6 A, 230 VAC
Power cable	(2 m long)
Safety switch	max 4 A
Power supply voltage	220/240 VAC
Current draw	0.7 A
Power consumption	175 W

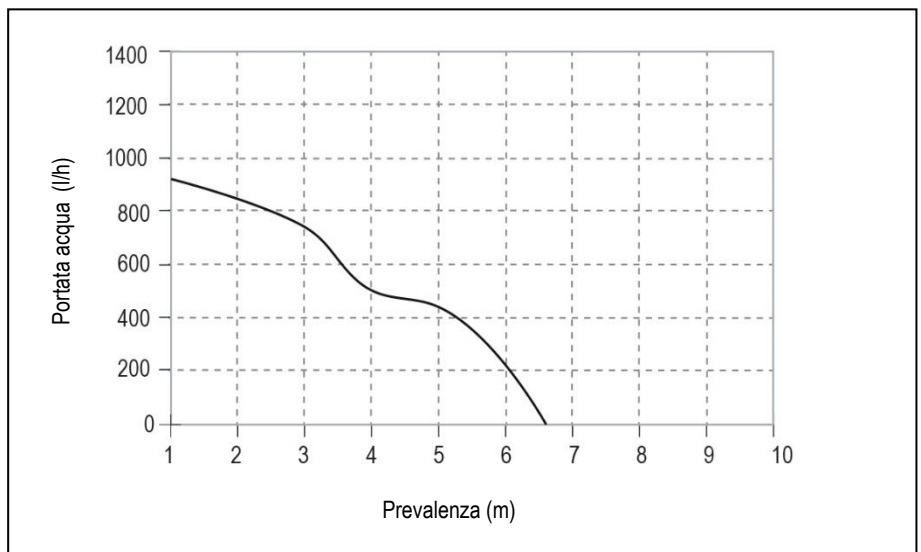
Dimensions

Height	205 mm
Width	300 mm
Depth	150 mm
Weight	3.6 kg

Electrical connections

Brown	Line
Blue	Neutral
Green/yellow	Earth
2 x black	Safety switch

PERFORMANCE OF HUMIDIFIER AND CONDENSATE DRAIN PUMP KIT



OPTIONAL ACCESSORIES – 2-WAY ON/OFF VALVE



The on-off valve shuts off water flow into the unit in the event of a flood alarm.

Components:

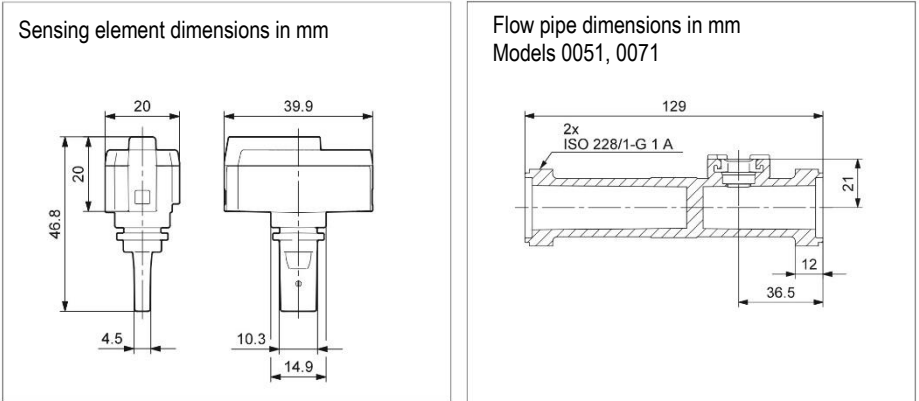
- Valve body
- 24 VAC electric servo control with limit switch
- Nr.2 x 3-piece joint

OPTIONAL ACCESSORIES – WATER FLOW METER



The flow meter directly measures and displays the volume of fluid transiting the unit, simplifying unit configuration during commissioning, as well as displaying the cooling capacity delivered if combined with the modulating water valve kit.

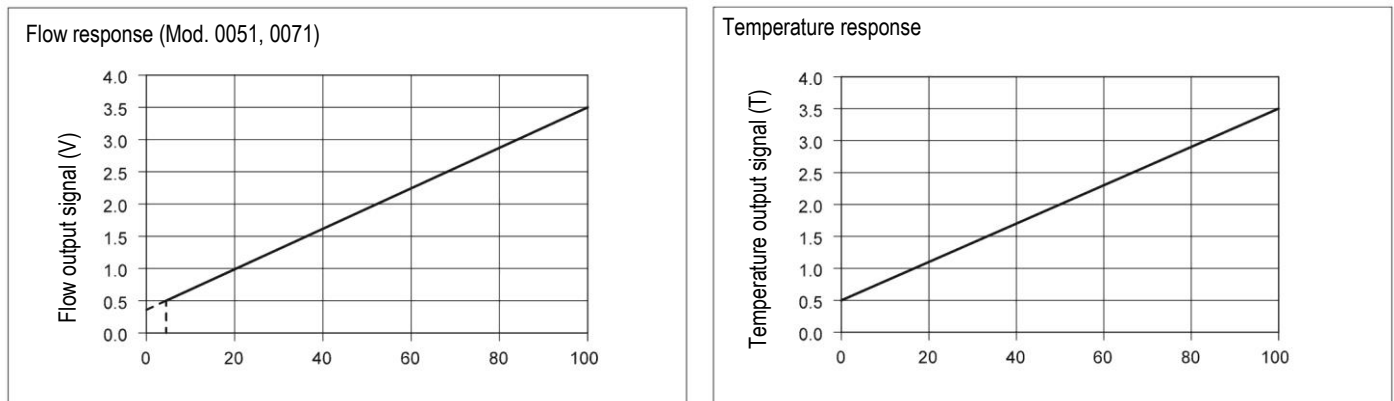
The vortex flow meter exploits the sequence of vortices produced by the fluid that comes into contact perpendicularly with a bluff body. The frequency of such vortices is proportional to the flow rate of the fluid. A special detector converts this frequency into an electrical signal for determining the fluid flow-rate.



TECHNICAL DATA

Flow	Mod. 0051, 0071
Measuring range	5 to 100 l/min
Accuracy ($\pm 1\sigma$), 0 to 100°C	$\pm 1.5\%$ FS
Resolution	0.5 l/min
Temperature	
Measuring range	0 to 100 °C
Accuracy ($\pm 1\sigma$), 25 to 80°C	± 1 °C
Accuracy ($\pm 1\sigma$), 0 to 100°C	± 2 °C
Resolution	0.5 °C
Media and environment	
Media types	The sensor is compatible with liquids (kinematic viscosity $\leq 2 \text{ mm}^2/\text{s}$)
Media temperature (operation)	0 to 100°C
Media temperature (peak)	-25 to 120°C, non-freezing
Ambient air temp. (operation)	-25 to 60°C
Ambient air temp. (peak)	-55 to 90°C
Humidity	0 – 95% (relative), non-condensing
System burst pressure	> 16 bar

Sensor output signals



OPTIONAL ACCESSORIES – SMOKE SENSOR



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).

Technical features:

Light source	GaAlAs infrared emitting diode
Operating voltage	20 Vdc (-15%, +10%)
Average power consumption (normal condition)	65 η A @ 20Vdc
Average power consumption (alarm condition)	23 mA @ 20Vdc
Three colours LED	Red steady: alarm condition Green slow blinking (2s): normal condition Yellow blinking (2s) normal condition, it needs maintenance. Green flash and yellow 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 Φ 90 x 31mm height
Weight	70g
Enclosure material	ABS V0

OPTIONAL ACCESSORIES – FIRE SENSOR



The heat detector has been designed to identify temperatures at which fires may start. When the temperature exceeds the set threshold the relay is activated to signal an alarm.

Technical features:

Operating voltage	20 Vdc (-15%, +10%)
Average power consumption (normal condition)	40 η A @ 20Vdc
Average power consumption (alarm condition)	23 mA @ 20Vdc
Static alarm treshold	58°C ± 5%
Three colours LED	Red steady: alarm condition Green slow blinking (2s): normal condition Green flash and yellow 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 Φ 90 x 40mm height
Weight	70g
Enclosure material	ABS V0

OPTIONAL ACCESSORIES – FIRE / SMOKE SENSOR



The combined smoke/fire detector senses the presence of combustion by-products (visible smoke) and/or the temperatures at which fires may start and activates an alarm. The smoke detection principle is based on the light scattering technique (Tyndall effect). The heat detector has been designed to identify temperatures at which fires may start. When the temperature exceeds the set threshold in temperature, the relay is activated to signal an alarm.

Technical features:

Light source	GaAlAs infrared emitting diode
Operating voltage	20 Vdc (-15%, +10%)
Average power consumption (normal condition)	65 η A @ 20Vdc
Average power consumption (alarm condition)	23 mA @ 20Vdc
Static alarm treshold	58°C \pm 5%
Three colours LED	Red steady: alarm condition Green slow blinking (2s): normal condition Yellow blinking (2s) normal condition, it needs maintenance. Green flash and yellow sequence: fault condition
Minimum reset time	300mS
Operating temperature	-10° \div 55°C \pm 2°C
Relative humidity	93% \pm 2%, non-condensing
Storage/shipping temperature	-30 \div 70°C
Dimensions	Diameter Φ 90 x 40mm height
Weight	70g
Enclosure material	ABS V0

OPTIONAL ACCESSORIES – NETWORK ANALYZER



The optional is available both for indoor unit and for outdoor moto-condensing unit.

Outdoor moto-condensing unit, models 0051, 0071:

The optional is installed outside the unit within an external box and includes:

- Network transducer;
- Current transformers, one for each power supply phase cable.

Indoor unit:

The optional is installed within the electrical box downstream the main switch with door safety lock and includes:

- Network transducer;
- Current transformers, one for each power supply phase cable

This device provides continuous measurement of power consumption, monitoring current, voltage and power. These values are sent to unit microprocessor via 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 counts

OPTIONAL ACCESSORIES – DOUBLE POWER SUPPLY WITH AUTOMATIC TRANSFER SWITCH



The optional is available both for indoor unit and for outdoor moto-condensing unit.

The motorised changeover switches automatically manage changeover under load between two mono-phase or three-phase power supplies, or manually for emergency operations.

These transfer switching (TSE) devices are suitable for low voltage systems with interruption of the 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.

ATS INSTALLATION – INDOOR UNIT

Frame	Power Supply	ATS Installation
0051	230/1/50	EXTERNAL, supplied in kit
0071	230/1/50	EXTERNAL, supplied in kit

ATS INSTALLATION – OUTDOOR MOTO-CONDENSING UNIT

Frame	Power Supply	ATS Installation
0051	230/1/50	EXTERNAL, supplied mounted
0071	230/1/50	EXTERNAL, supplied mounted

The optional is available on request for the following power supply:

- 380/3/60Hz (power supply available as optional accessory);
- 460/3/60Hz (power supply available as optional accessory).

OPTIONAL ACCESSORIES – ANTI-MIXING PANELS



Optional accessory supplied in mounting kit :

- Anti-mixing frontal/back panel. Not compatible with optional “floor brackets fixing kit”.
- Anti-mixing side panel.

Anti-mixing panels in galvanized steel sheet externally painted with epoxy powders. Colour RAL 9005.

They close the lower part of the unit hiding the holders for height adjusting.

The optional is useful to avoid the by-pass between cold-aisle and hot-aisle below the air conditioners and the server racks.

OPTIONAL ACCESSORIES – OUTDOOR MOTO-CONDENSING UNIT - AXIAL FANS WITH “EC” ELECTRIC MOTORS



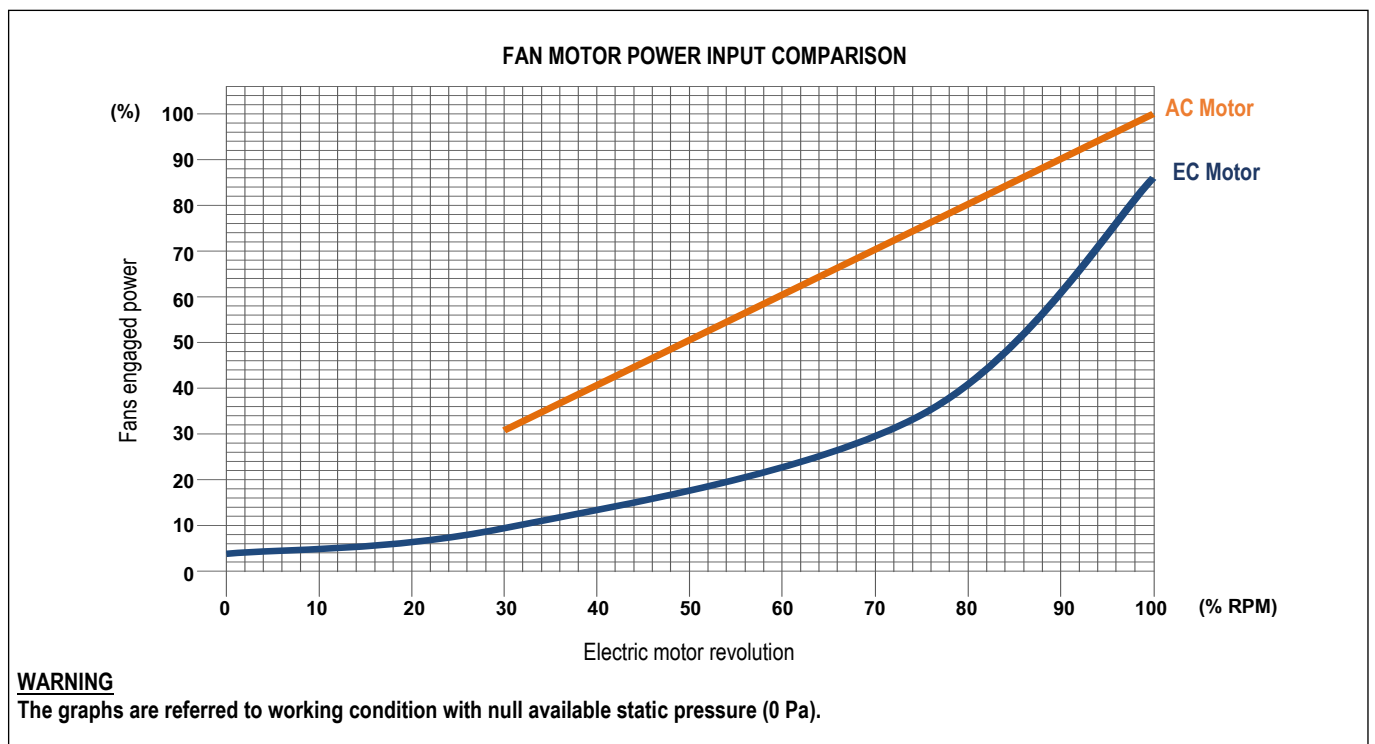
The “EC” axial fans are equipped with a brushless type synchronous motor with integrated electronic commutated system.

The motor rotation control is obtained with the EC system (Electronic Commutation) that manage the motor according to the 0÷10V proportional signal coming from the microprocessor control.

Characteristics of “EC” motors:

- no electromagnetic noise;
- efficiency 83÷86%;
- minimum power input.

Characteristics comparison between an “AC” asynchronous electric motor with phase-cut control (voltage controller) and “EC” brushless type synchronous motor.

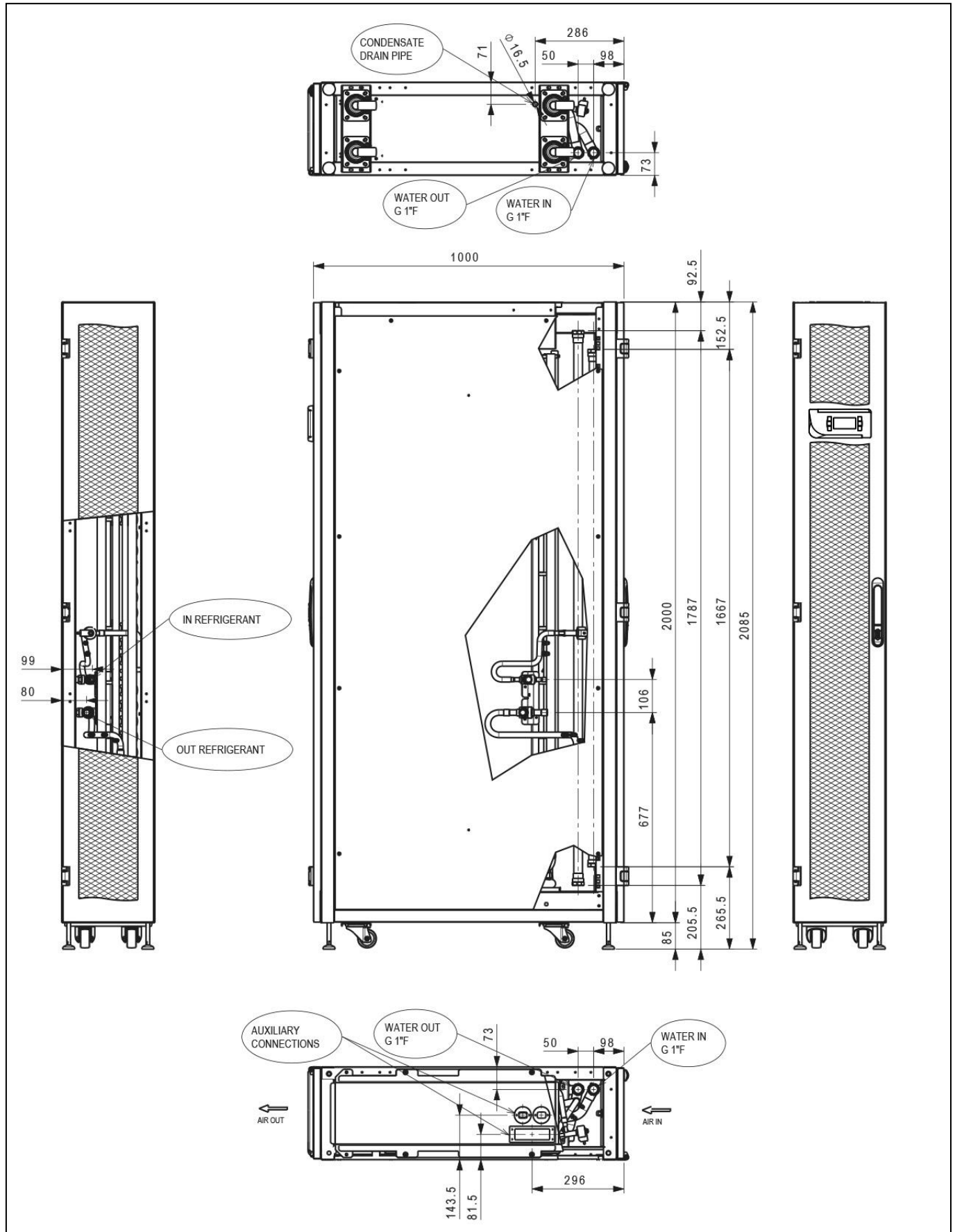


TECHNICAL DATA

OUTDOOR MOTO-CONDENSING UNIT			
MODEL		0051	0071
COOLING CAPACITY		MAX	MAX
CONDENSER FAN	n.	2	1
Fan type		Assiale EC	Assiale EC
Max power input (FLI)	kW	0,72	0,72
Max current input (FLA)	A	3,2	3,2
POWER SUPPLY	V/Ph/Hz	230/1/50	400/3+N/50

MACHINE DRAWINGS – INDOOR UNITS

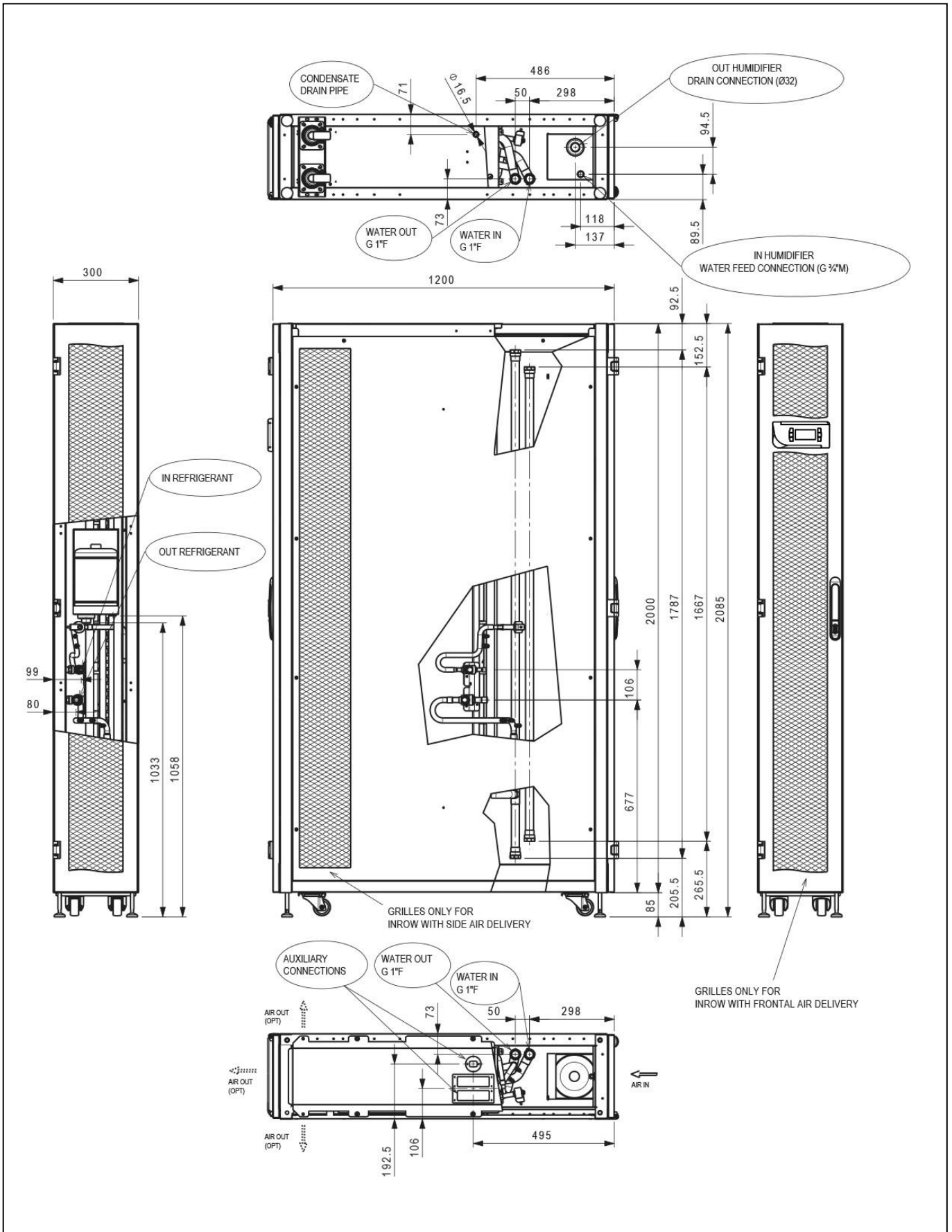
Dimensions in mm – In-Row “I” Version – 0051, 0071 (300 x 1000 x 42U FRAME)



COOLSIDE FC

MACHINE DRAWINGS

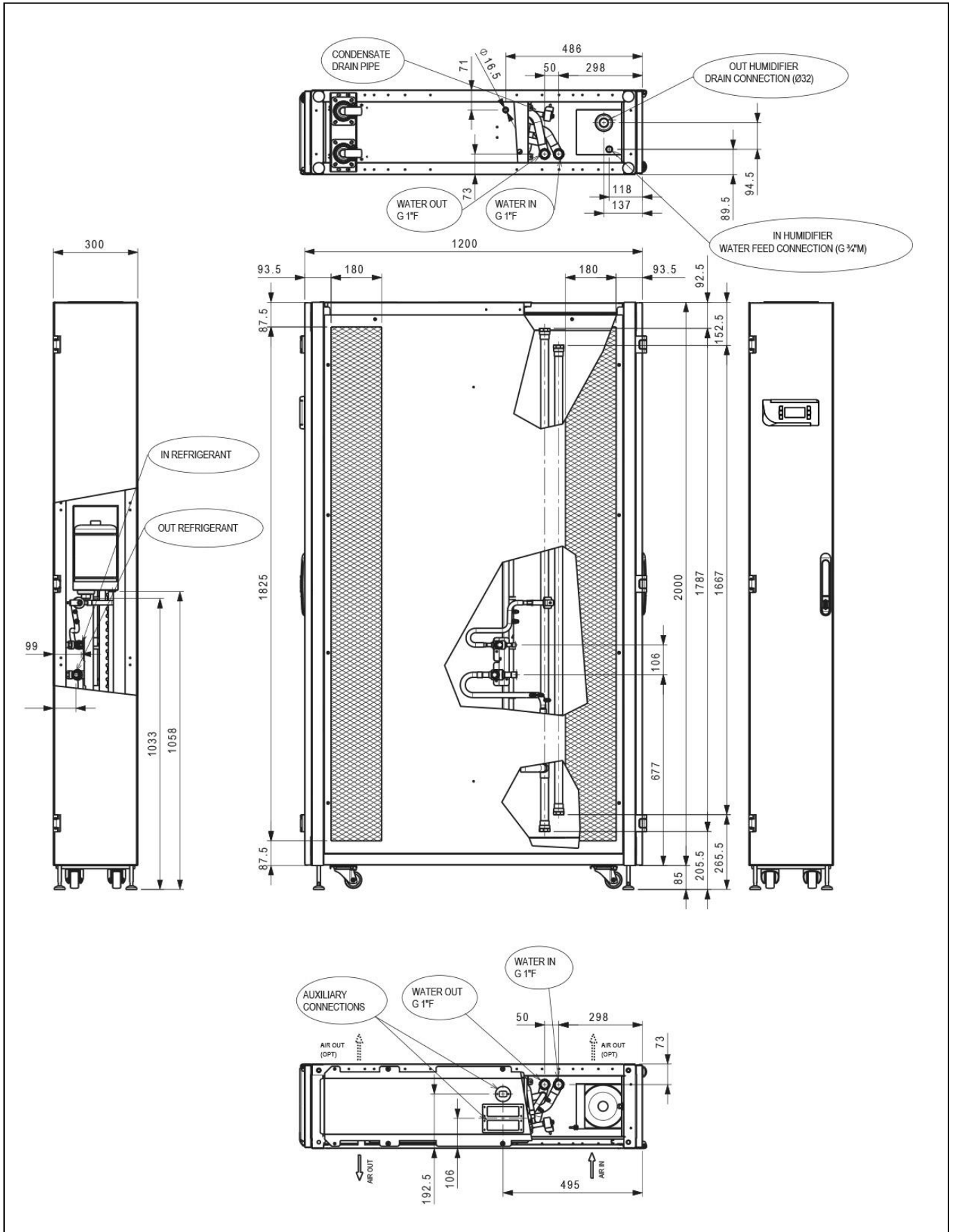
Dimensions in mm – In-Row “I” Version – 0051, 0071 (300 x 1200 x 42U FRAME)



COOLSIDE FC

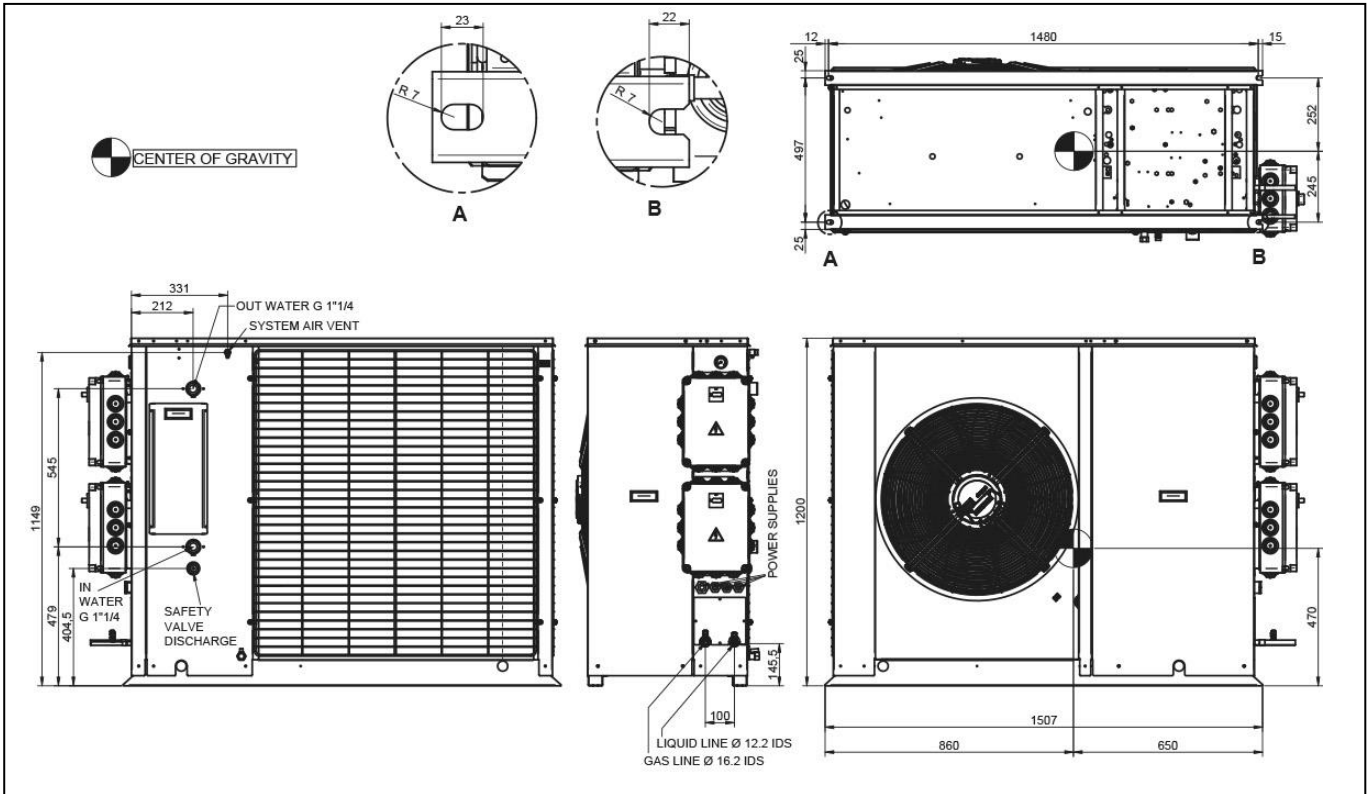
MACHINE DRAWINGS

Dimensions in mm – Enclosure “E” Version – 0051, 0071 (300 x 1200 x 42U FRAME)



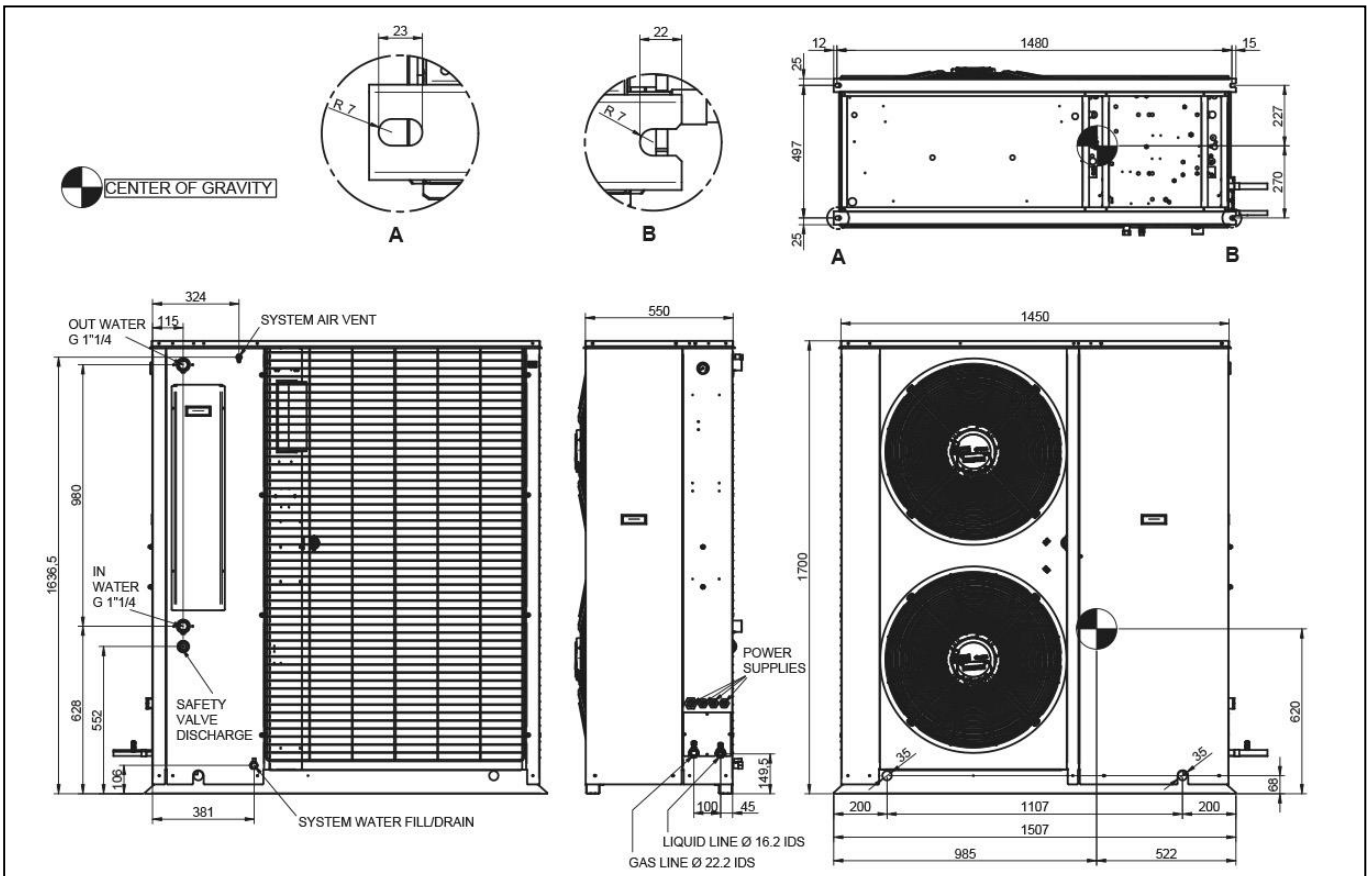
MACHINE DRAWINGS – OUTDOOR MOTO-CONDENSING UNIT

Dimensions in mm – Model 0051



MACHINE DRAWINGS

Dimensions in mm – Model 0071





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.



MITSUBISHI ELECTRIC HYDRONICS & IT COOLING SYSTEMS S.p.A.

Via Caduti di Cefalonia, 1 - 36061 Bassano del Grappa (VI) Italy
Ph. (+39) 0424 509 500 • Fax (+39) 0424 509 509
www.melcohit.com