

Data Book

T_CRCD_0521_EN

CRCD

4-17 kW

FULL INVERTER split-system air conditioners for IT Cooling with Dual Fluid system.
To be matched with outdoor unit.



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



- In-row / enclosure installation
- For high density rack and blade server
- Fully hermetic BLDC inverter compressors (on outdoor unit)
- Plug fans with EC electric motor
- DUAL FLUID system with additional coil
- Single refrigerant circuit
- Electronic expansion valve

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CERTIFICATIONS



ISO 9001 CERTIFICATION
Quality Management System



ISO 14001 CERTIFICATION
Environmental Management System



BS OHSAS 18001 CERTIFICATION
Occupational Health and Safety Management System



CE MARKING



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



EAC CERTIFICATION
(Russian Federation, Belarus, Kazakhstan)

GENERAL CHARACTERISTICS



FULL INVERTER split-system air conditioners for IT Cooling with DUAL FLUID system

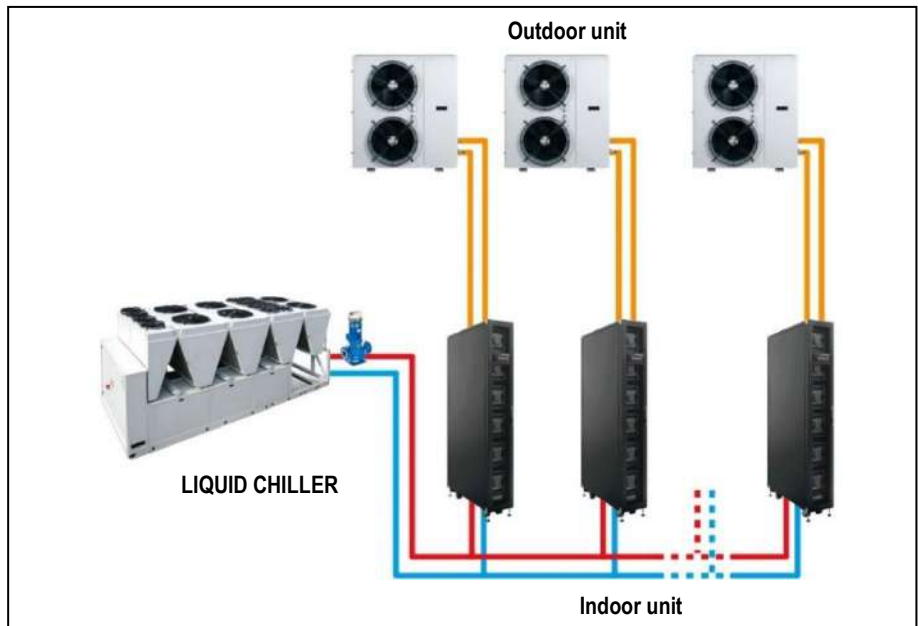
- Direct expansion
- Air cooled;
- **Two independent cooling systems:**
 - Chilled water coil.
 - Direct expansion coil;
- Electronic expansion valve;
- Plug fans with EC electric motor;
- Single refrigerant circuit.

This series 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 kW
- ENCLOSURE "E" air flow: Side air delivery, side air suction
Cooling capacity: 5,4 ÷ 17 kW

Indoor unit

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.



Outdoor units

- Hermetic BLDC inverter compressor

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 and refrigerant 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.

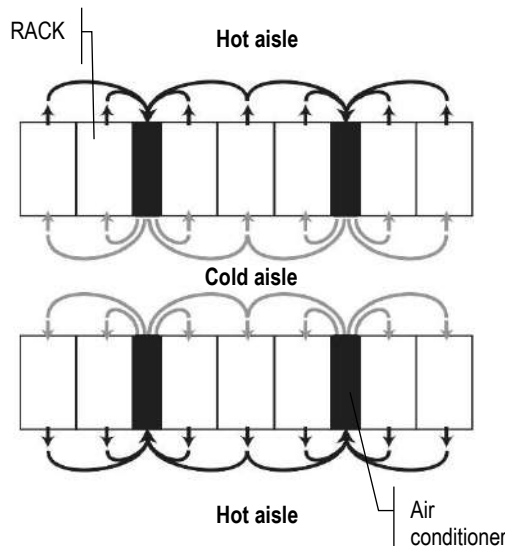
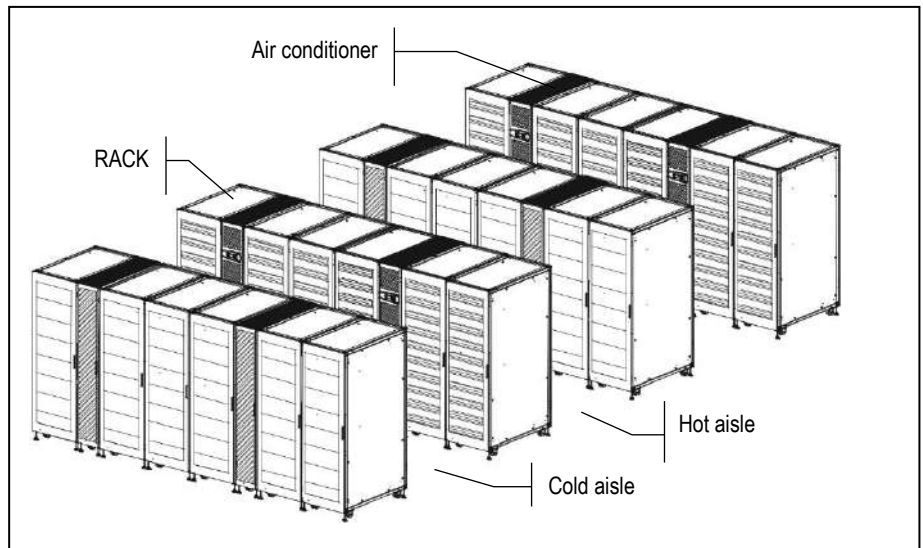
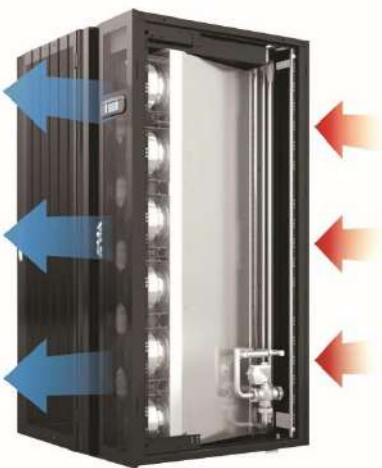
Electronic equipment contained in racks independently provide to aspire the necessary air for cooling.

- 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

"I" VERSION - IN ROW VERSION – FRONTAL AIR DELIVERY

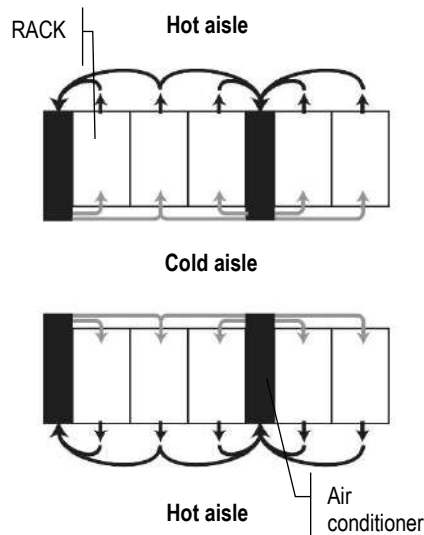
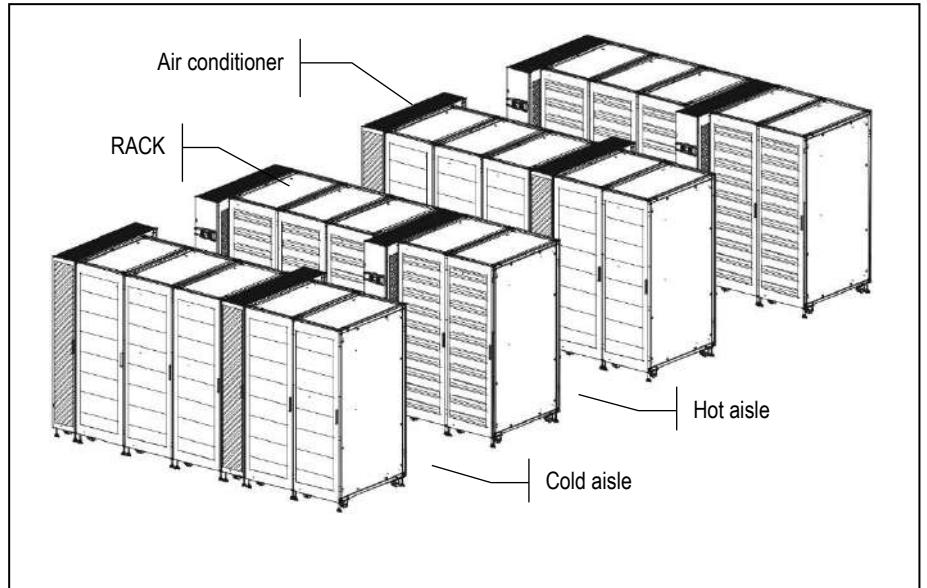
Frontal air delivery. Rear air suction.



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 - ENCLOSURE COOLING SYSTEM FOR DIRECT COOLING OF THE RACKS

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

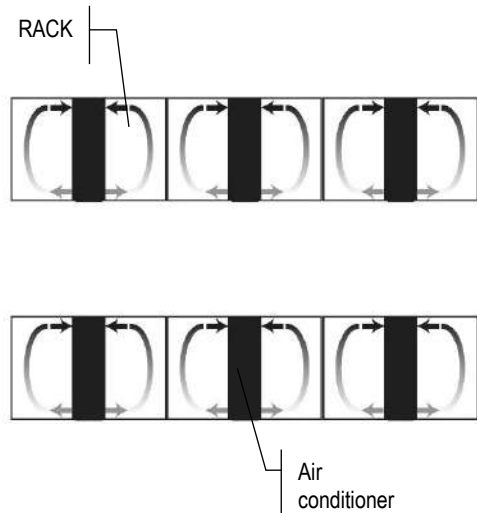
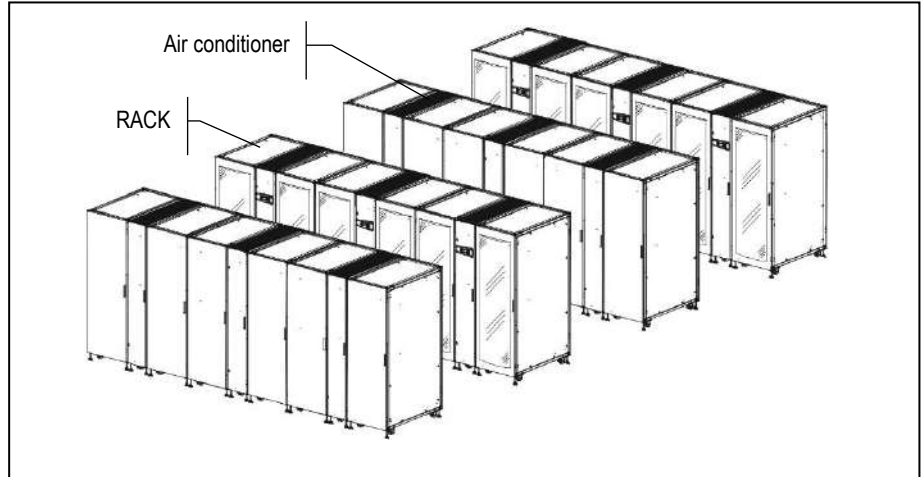
The racks are equipped with tight door for the containment of cooling air.

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.

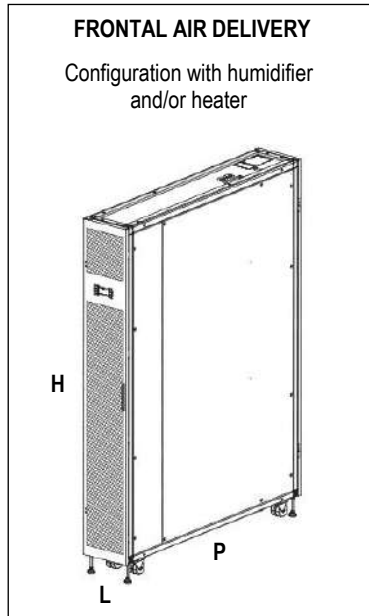
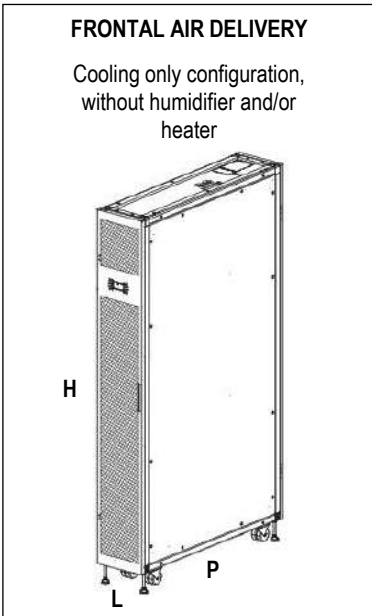
CONFIGURATIONS

The desired configuration must be selected during the order phase.

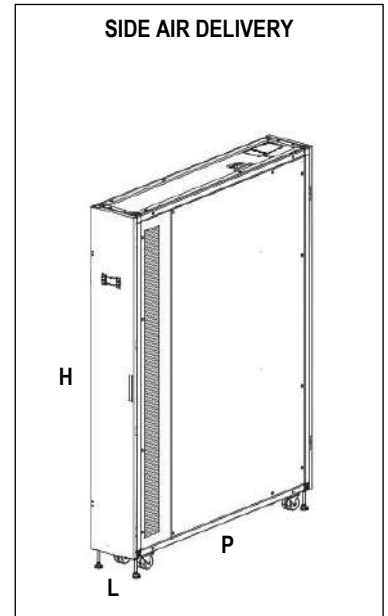
“I” VERSION

IN ROW COOLING SYSTEM (hot/cold aisle)

FRONTAL air delivery; BACK SIDE air suction



SIDE air delivery; BACK SIDE air suction



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

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

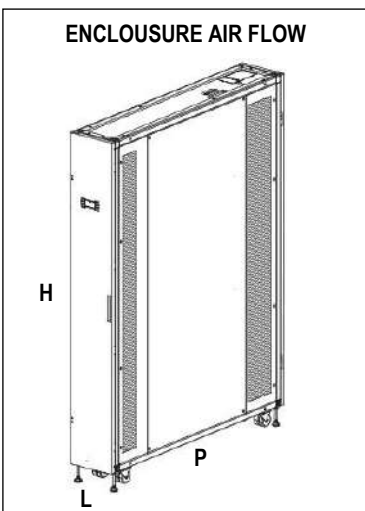
DIMENSIONS	
L (mm)	300
P (mm)	1200
H (mm)	2085

(*) 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
P (mm)	1200
H (mm)	2085

PRODUCT FEATURES AND BENEFITS



EFFICIENCY

The unit combines the efficiency of the use of the last EC fans generation and a direct expansion system with inverter compressor (within outdoor unit) 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.

COMPARTMENT

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.

- **Dual Fluid System:** Two independent cooling systems: Chilled water coil; Direct expansion coil
- EER up to 5,14, direct expansion operating mode at partial conditions.
- High cooling density, **up to and over 40kW/m² per rack.**
- Single BLDC scroll inverter compressor (within outdoor 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

CRCO I 0051 BASIC	
CRCO	Series
I	IN-ROW air flow
E	ENCLOSURE air flow
0051	Model
BASIC	Single refrigerant circuit
Outdoor units	
iHCAT LT 0051	
iHCAT	Series
	With BLDC inverter compressor
LT	Version
	BASIC: standard version
	LT version for low outdoor temperature
0051	Model

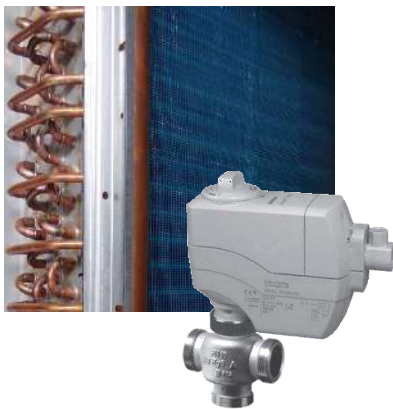
WORKING LIMITS

ROOM AIR CONDITIONS	
Room air temperature:	
IN-ROW 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 outdoor unit, BASIC version	
+45°C	Maximum ambient air temperature
-20°C	Minimum ambient air temperature
With outdoor unit, LT version	
+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:	
<ul style="list-style-type: none">• 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.

TRANSPORT AND STORAGE TEMPERATURE

During transport and if the machine is not installed at the reception, do not remove the packaging and place the machine in an enclosed, dry and protected from sunlight site at temperatures ranging between -30°C and 50°C in absence of superficial condensation.

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

- 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 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.
 - Maximum closing pressure (Close-off) $\Delta P_s=175\text{kPa}$
- 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 $\varnothing 16$) 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 outdoor 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 UNIT



BASIC version and LT version for low outdoor temperature 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.

CONDENSING 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.

CONDENSER 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

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 with safety valve (see refrigerant circuit)
- Liquid separator on compressor suction line (mod. 0071)
- Check valve on condenser inlet
- Solenoid valve for bypass on compressor discharge / suction
- Check valve on liquid receiver inlet/outlet (LT version)
- 3-way pressostatic valve (LT version)
- 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.
- 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

- B031**..... **Frame dimensions 42U 300 x 1200**. The optional accessory is mandatory for In-Row version with frontal air delivery with Humidifier (optional) and/or Electric heating (optional).
- A903**..... **Enclosure version with air supply L + R**.
- A906**..... **InRow version with air supply L + R**. It is mandatory to use a frame with a depth of 1200mm.
- A557**..... **460/3/60 power supply** for model 0071.
- A558**..... **380/3/60 power supply** for model 0071.
- A559**..... **230/1/60 power supply** for model 0051.
- 383**..... **Numbered wirings + UK requests**;
- A662**..... **2-way modulating water valve with 3-point control** and emergency manual control.
- A663**..... **3-way modulating water valve with 0-10Vdc control** and emergency manual control.
- A664**..... **2-way modulating water valve with 0-10Vdc control** and emergency manual control.
- A665**..... **3-way modulating water valve with 0-10Vdc control with spring return** and emergency manual control.
- A666**..... **2-way modulating water valve with 0-10Vdc control with spring return** and emergency manual control.
- A431**..... **Electric heater**: Electric heating system.
- A432**..... **Enhanced electric heater**: Enhanced electric heating system.
- A801**..... **Temperature/Humidity sensor only**: Combined room temperature / humidity probe. Only visualization of room humidity.
- A802**..... **Humidifier**: Modulating steam humidifier with immersed electrodes with electronic control. The optional foresee the "Temperature / Humidity sensor on air intake" and control board
- A803**..... **Dehumidification**. The optional foresee the "Temperature / Humidity sensor on air intake".
- A804**..... **Humidifier + Dehumidification**: Modulating steam humidifier with immersed electrodes with electronic control and dehumidification system. The optional foresee the "Temperature / Humidity sensor on air intake" and control board.
- A381**..... **Standard condensate drain pump**. Installed on the unit. For low temperature water.
- A471 / A473 / A474** **Serial card**:
 - A471 – RS485 serial card;
 - A473 – Ethernet card;
 - A474 – LON card;
- A501**..... **Clogged filter sensor**. Differential pressure switch on the air side for clogged filters alarm signal.
- A521**..... **Fire detector**.
- A511**..... **Smoke detector**.
- A491**..... **Water leakage detector**. Under floor water alarm through sensor to be placed on the floor. Supplied in mounting kit.
- A842**..... **Network analyzer**: multifunction utility for calculating and displaying the machine electrical measurements.
- A850**..... **Water flow meter**: measures and displays the volume of fluid transiting the unit.
- A862**..... **Shut-off on/off water valve**. The on-off valve shuts off water flow into the unit in the event of a flood alarm.
- A872**..... **Double power supply** with automatic change-over. Supplied in mounting kit.
- A882**..... **Clamping kits floor**: Floor brackets fixing kit
- 7387062800** **H.T. condensate drain pump kit** : Humidifier and condensate drain pump kit. For high water temperature. Supplied in mounting kit.
- 7387012600** **Remote terminal display**. for wall mounting
- 5587172400** **Anti-mixing frontal/back panel L300mm**. Not compatible with optional "floor brackets fixing kit".
- 5587172800** **Anti-mixing side panel W1000mm**
- 5587172900** **Anti-mixing side panel W1200mm**
- 9973** **Wooden cage packing**: Unit packing in wooden cage

WARNING

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

OPTIONAL ACCESSORIES – OUTDOOR UNIT

A557.....	460/3/60 power supply for model 0071.
A558.....	380/3/60 power supply for model 0071.
A559.....	230/1/60 power supply for model 0051.
A932.....	EC fan with UPS VDC: Axial fans with sickle-shaped blades, fan guard and optimized for low noise levels. <ul style="list-style-type: none"> - EC type electric motor with external rotor - Integrated motor thermal protection - Protection grid on the fan air supply.
881	Copper/Copper external coil: Condensing coil Cu/Cu execution
893	Epoxy coated external coil: Condensing coil with epoxy paint protection
896	Cataphoresis coated external coil: Condensing coil with cataphoresis paint protection.
A181.....	Soundproof jacket: Compressor soundproof cap for a sound level reduction of 2 dB(A). Only for Basic unit.
A842.....	Network analyzer: multifunction utility for calculating and displaying the machine electrical measurements.
A872.....	Dual power supply with automatic switch. Double power supply with automatic change-over .
7378005800	Rubber insulators kit: Rubber holders for installation on floor (for model 0051)
7378005900	Rubber insulators kit: Rubber holders for installation on floor (for model 0071)
9973	Wooden cage packing: Unit packing in wooden cage

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%	40%	100%	80%	60%	50%	
Total	kW	10,9	8,72	6,54	4,55	14,0	11,2	8,40	6,93
Sensible	kW	10,2	8,21	6,04	4,55	14,0	11,2	8,22	6,93
SHR (2)		0,94	0,94	0,92	1,00	1,00	1,00	0,98	1,00
SUPPLY FAN	n.	2			4				
Fan type		Plug Fan EC			Plug Fan EC				
Air flow	m³/h	1500	1225	951	700	3360	2623	1887	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				
ENERGY EFFICIENCY INDEX (1) (4)									
EER Energy Efficiency Ratio	kW/kW	3,39	3,82	4,01	4,21	2,87	3,39	3,56	3,71
DIMENSIONS INDOOR UNIT									
Width	mm	300			300				
Length with frontal air delivery (5)	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 UNIT									
MODEL	0051					0071			
COOLING CAPACITY	100%	80%	60%	40%	100%	80%	60%	50%	
BLDC INVERTER COMPRESSOR		Rotary			Scroll				
Quantity	n.	1			1				
Power input	kW	2,64	1,82	1,27	0,77	3,58	2,33	1,58	1,17
CONDENSER FAN	n.	2			1				
Fan type		Axial AC			Axial AC				
Air flow	m³/h	6400			8640				
Power input (3)	kW	0,26			0,6				
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	900			1450				
Width	mm	420			550				
Height	mm	1240			1200				
NET WEIGHT	kg	108			182				
REFRIGERANT CONNECTIONS									
Liquid line	Ø	1/2" SAE – 12mm			5/8" SAE – 16mm				
Suction line	Ø	3/4" SAE – 18mm			7/8" SAE – 22mm				

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 35°C. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.
3. Corresponding to the nominal external static pressure.
4. The Energy Efficiency Index consider the matched outdoor unit.
5. 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									
MODEL	0051					0071			
COOLING CAPACITY (1)	100%	80%	60%	45%	100%	80%	60%	50%	
Total	kW	12,7	10,2	7,62	5,40	16,7	13,4	10,0	8,41
Sensible	kW	12,7	10,1	7,42	5,40	16,7	13,4	10,0	8,41
SHR (2)		1,00	0,99	0,97	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	1222	943	700	3360	2611	1861	1500
Fans power input (3)	kW	0,33	0,20	0,10	0,05	0,69	0,36	0,17	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				
ENERGY EFFICIENCY INDEX (1) (4)									
EER Energy Efficiency Ratio	kW/kW	3,85	4,38	4,65	5,14	3,38	4,00	3,97	4,55
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 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	2,71	1,87	1,28	0,73	3,65	2,39	1,74	1,15
CONDENSER FAN	n.	2			1				
Fan type		Axial AC			Axial AC				
Air flow	m³/h	6400			8640				
Power input (3)	kW	0,26			0,6				
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	900			1450				
Width	mm	420			550				
Height	mm	1240			1200				
NET WEIGHT	kg	108			182				
REFRIGERANT CONNECTIONS									
Liquid line	Ø	1/2" SAE – 12mm			5/8" SAE – 16mm				
Suction line	Ø	3/4" SAE – 18mm			7/8" SAE – 22mm				

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 35°C. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.
3. Corresponding to the nominal external static pressure.
4. The Energy Efficiency Index consider the matched outdoor unit.

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

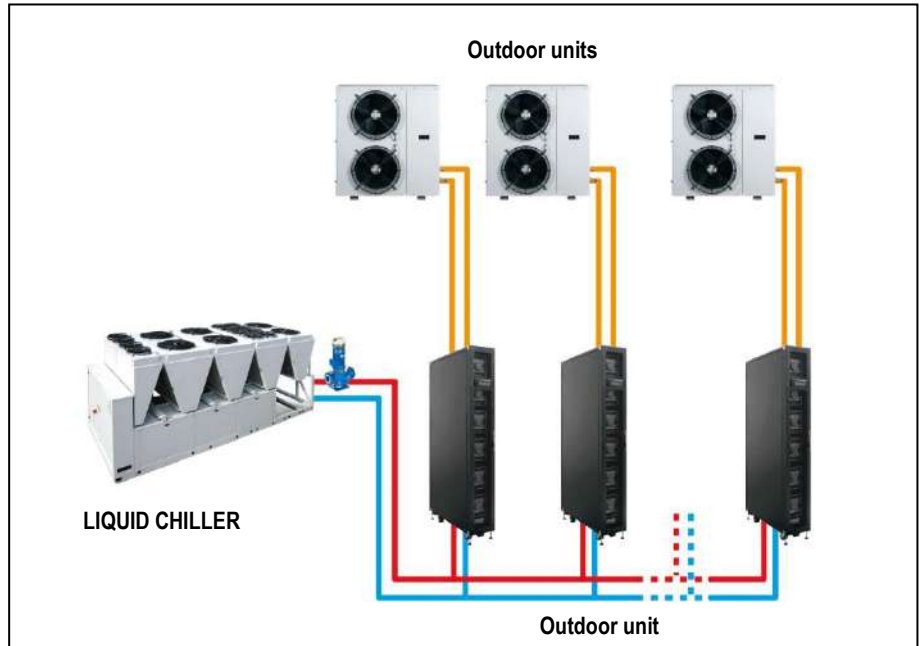
NOTE:

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.

DUAL FLUID SYSTEM

DUAL FLUID system on the machine allows to obtain two independent cooling systems:

- Chilled water coil
- Direct expansion coil



TECHNICAL DATA – DUAL FLUID SYSTEM - CHILLED WATER COIL – In Row “I” Version

INDOOR UNIT		0051	0071
SIZE			
COOLING CAPACITY (1)			
Total	kW	9,53	17,7
Sensible	kW	9,53	17,7
SHR (2)		1,00	1,00
COOLING COIL			
Water flow rate (1)	m ³ /h	1,64	3,05
dP coil + valve (1)	kPa	12,1	36,0
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 chilled water temperature 10-15°C - 0% glycol. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.

TECHNICAL DATA – DUAL FLUID SYSTEM - CHILLED WATER COIL – Enclosure “E” Version

MODEL		0051	0071
SIZE			
COOLING CAPACITY (1)			
Total	kW	12,1	22,6
Sensible	kW	12,1	22,6
SHR (2)		1,00	1,00
COOLING COIL			
Water flow rate (1)	m ³ /h	1,74	3,25
dP coil + valve (1)	kPa	13,4	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 46°C-16%RH with chilled water temperature 14-20°C - 0% glycol. ESP=20Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.

WATER QUALITY OF THE HYDRAULIC CIRCUITS

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:

Values of the parameters outside the indicated ranges can lead to the formation of deposits and limescale and/or favour corrosive phenomena within the plant. For operating fluids other than water (mixtures of ethylene and propylene glycol) it is recommended to use specific inhibitors, designed to offer thermal stability within the operating temperature range and protection against corrosion. It is necessary that, in the presence of dirty and / or aggressive waters, an intermediate heat exchanger is installed upstream of the heat exchangers.

ANTIFREEZE MIXTURES

In plants that are not adequately protected by heating cables, protect the hydraulic circuit with an anti-freeze mixture when the ambient air temperature can drop below 5°C.

Minimum ambient air temperature	°C	5	0	-5	-10	-15	-20	-25	-30
ETHYLENE GLYCOL (suggested % in weight)	%	0	12	20	30	35	40	45	50

Minimum ambient air temperature	°C	5	2	-3	-9	-13	-17	-23	-29
PROPYLENE GLYCOL (suggested % in weight)	%	0	10	20	30	35	40	45	50

The values are indicative and may significantly vary depending on the glycol manufacturer. Refer to your glycol supplier for detail.

The values consider a precautionary difference of 5°C between the minimum ambient air temperature and the freezing temperature of the mixture.

In the hydraulic circuit do not send fluids other than water or mixtures with ethylene / propylene glycol.

If other products are provided, in addition to mixtures of water and ethylene or propylene glycol, contact the Manufacturer to check the compatibility with the machine components.

REFRIGERANT CHARGE

The indoor unit is supplied with seal charge. The outdoor 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 outdoor unit to the corresponding indoor unit and for a maximum pipe length of 5m.

OUTDOOR UNIT – BASIC VERSION

MODEL		0051	0071
SIZE		BASIC	BASIC
REFRIGERANT		R410A	R410A
Refrigerant circuits x Refrigerant charge	n x kg	1 x 5,8	1 x 5,7
HFC R410A - F Gas - CO ₂ equivalent	t	12,11	11,90

OUTDOOR UNIT – LT VERSION, FOR LOW AMBIENT AIR TEMPERATURE

MODEL		0051	0071
SIZE		LT	LT
REFRIGERANT		R410A	R410A
Refrigerant circuits x Refrigerant charge	n x kg	1 x 7,7	1 x 11,6
HFC R410A - F Gas - CO ₂ equivalent	t	16,08	24,22

RECOMMENDED REFRIGERANT LINES

Please always refer to the "INSTALLATION DIAGRAM" to properly select all necessary components. Verify the need to use pressure limiting devices (safety valves) where not already provided for by Directive 2014/68 / EU.

Nominal diameter: Refrigerant connection of the indoor unit. In some cases, the diameter of the refrigerant lines may not correspond with the nominal diameter. This is completely normal. It is enough to provide a reduction fitting to adjust the diameter.

"SI" INTERNATIONAL SYSTEM PIPES DIAMETERS

SI system	Diameter	mm	6	8	10	12	16	18	22	28	35
	Thickness	mm	1	1	1	1	1	1	1	1	1,5

INVERTER COMPRESSORS

Model	Line	Nominal diameter Ø	EQUIVALENT LENGHT [m] FOR INVERTER COMPRESSORS R410A																			
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
0051	Gas	18mm	18	18	18	18	18	18	18	22	22	22	22	22	22	22	22	22	22	22	22	22
	Liquid	12mm	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
0071	Gas	22mm	18	18	18	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
	Liquid	16mm	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16

For equivalent lengths over 100m, please contact the Manufacturer's Sales Office.

"IMPERIAL" SYSTEM PIPES DIAMETERS

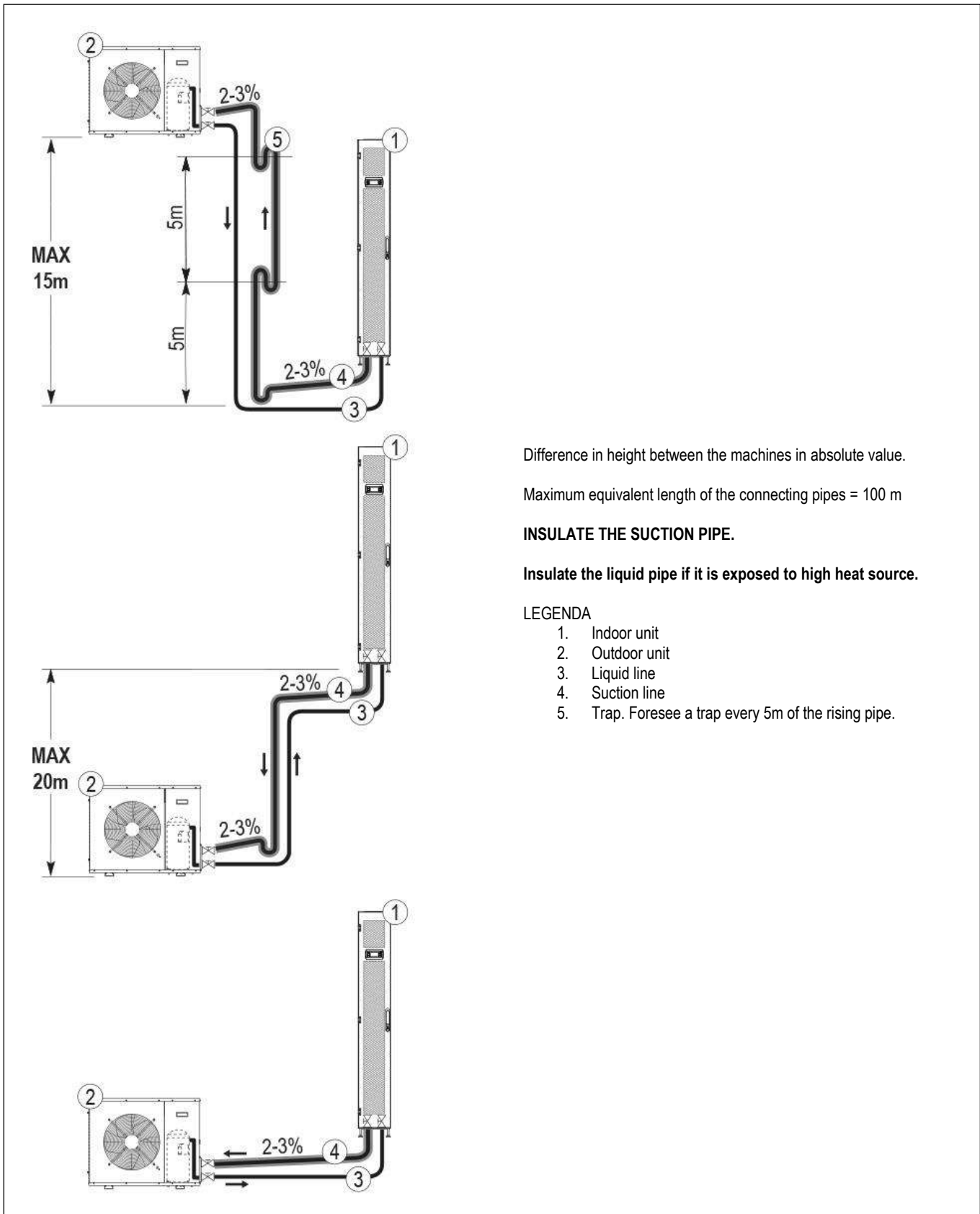
IMPERIAL system	Diameter	inch	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 3/8"
	mm	6,35	9,52	12,7	15,87	19,05	22,22	25,4	28,57	34,92	
	Thickness	mm	1	1	1	1	1	1	1	1,25	1,25

INVERTER COMPRESSORS

Model	Line	Nominal diameter Ø	EQUIVALENT LENGHT [ft] FOR INVERTER COMPRESSORS R410A																			
			15	35	50	65	80	100	115	130	150	165	180	195	215	230	245	260	280	295	310	330
0051	Gas	18mm	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"
	Liquid	12mm	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
0071	Gas	22mm	3/4"	3/4"	3/4"	3/4"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"
	Liquid	16mm	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"

For equivalent lengths over 330ft please contact the Manufacturer's Sales Office.

INSTALLATION DIAGRAM



Difference in height between the machines in absolute value.

Maximum equivalent length of the connecting pipes = 100 m

INSULATE THE SUCTION PIPE.

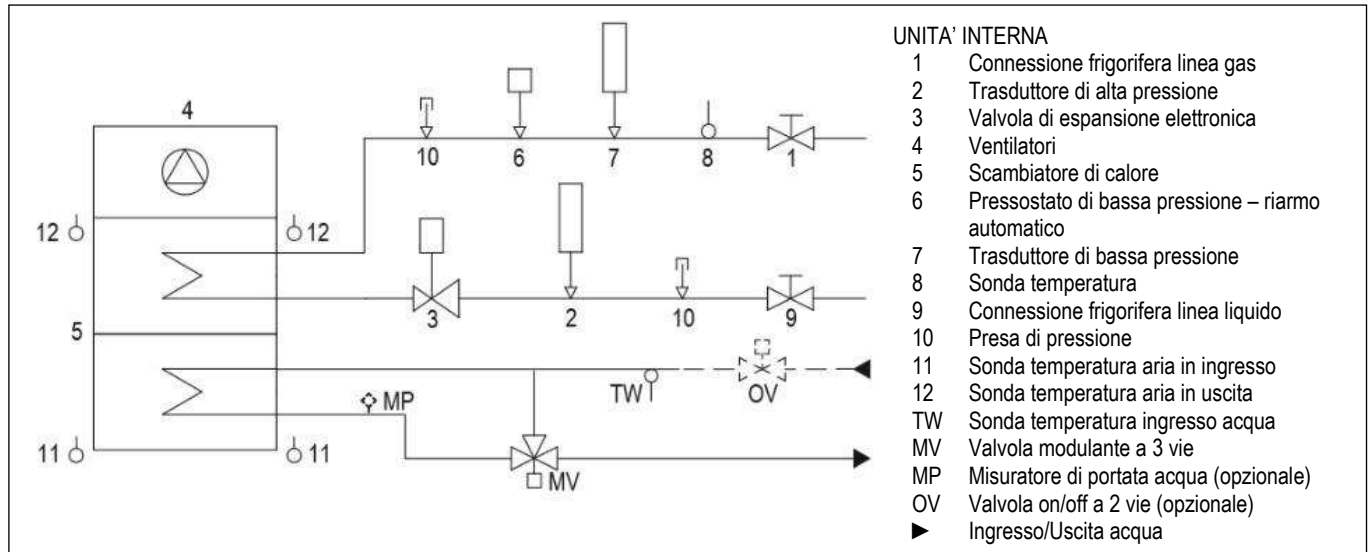
Insulate the liquid pipe if it is exposed to high heat source.

LEGENDA

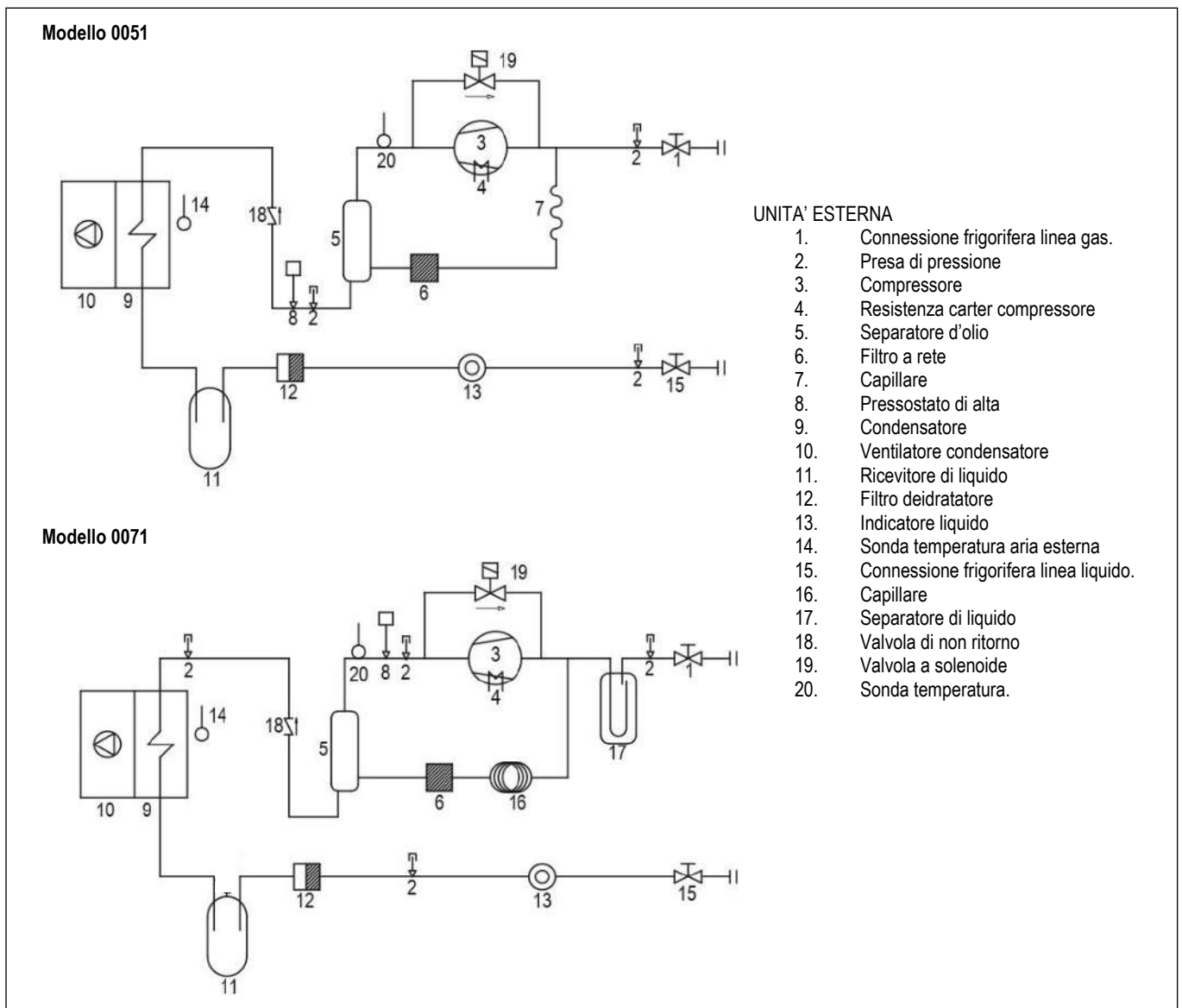
- 1. Indoor unit
- 2. Outdoor unit
- 3. Liquid line
- 4. Suction line
- 5. Trap. Foresee a trap every 5m of the rising pipe.

WARNING - FOR THE CONNECTION PIPES WHEN EXCEEDING AN EQUIVALENT LENGTH OF 5 METRES
 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



REFRIGERANT DIAGRAM – BASIC OUTDOOR UNIT



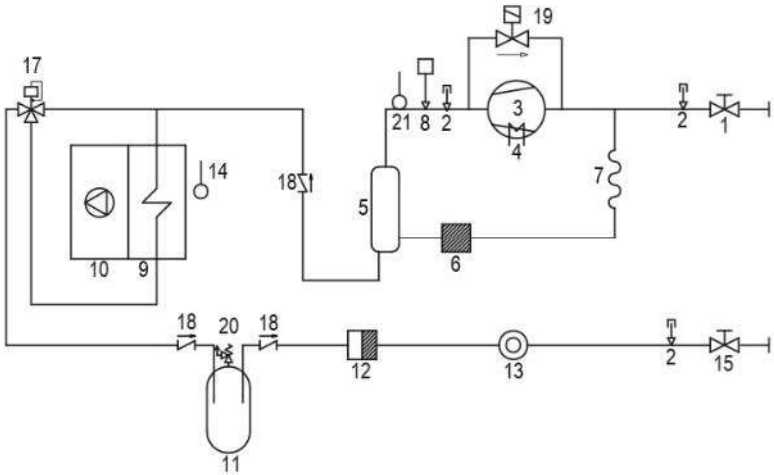
REFRIGERANT DIAGRAM – LT VERSION OUTDOOR UNIT FOR OPERATION WITH AMBIENT AIR TEMPERATURE DOWN TO -35°C.

The system is necessary for the correct machine start up and operation with very low ambient air temperatures: between -20°C and -35°C.

Components:

- Pressure regulating valve (17)
- Non-return valve upstream and downstream of the liquid receiver (18)

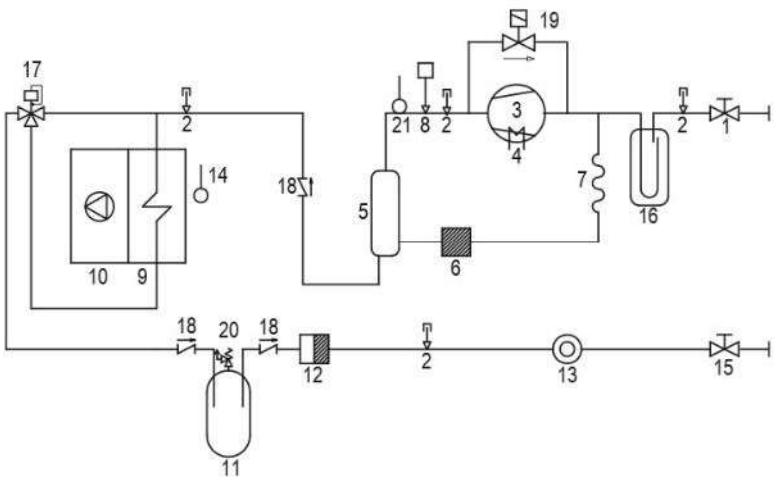
Modello 0051



OUTDOOR UNIT

1. Refrigerant connection – gas line
2. Pressure test fitting
3. Compressor.
4. Sump oil heater.
5. Oil separator.
6. Mesh filter.
7. Capillary tube.
8. High pressure switch
9. Condenser.
10. Fan.
11. Liquid receiver
12. Filter drier.
13. Liquid and moisture indicator.
14. Outside air temperature probe.
15. Refrigerant connection – liquid line
16. Liquid separator.
17. Pressure regulating valve.
18. Non return valve.
19. Solenoid valve.
20. Safety valve.
21. Temperature probe

Modelli 0071



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)			
Sound pressure	dB(A)	62	68
Sound power	dB(A)	78	84

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

MODELLO		0051	0071
SOUND LEVEL ISO 3744 (1)			
Sound pressure	dB(A)	54	61
Sound power	dB(A)	69	76

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 UNIT

MODEL		0051	0071
POWER SUPPLY		230/1/50	400/3+N/50
STANDARD UNIT			
Max power input (FLI)	kW	5,86	10,7
Max current input (FLA)	A	18,3	18,0
Power input (OI)	kW	2,90	4,18

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.

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	-

OPTIONAL ACCESSORIES: B031 – FRAME 42U 300x1200

Optional for INROW version.
 Frontal air delivery.
 Frame 1200 mm depth.
 Mandatory for units equipped with Humidifier and / or Electric Heaters accessories.
The configuration must be selected when ordering.

OPTIONAL ACCESSORIES: A903 – ENCLOSURE VERSION AIR DELIVERY RIGHT + LEFT

Optional for ENCLOSURE version.
 Air delivery on Right and Left.
 Frame 1000/1200 mm depth.

OPTIONAL ACCESSORIES: A906 – INROW VERSION AIR DELIVERY RIGHT + LEFT

Optional for INROW version.
 Air delivery on Right and Left.

OPTIONAL ACCESSORIES: A557 – POWER SUPPLY 460/3/60

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

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

OPTIONAL ACCESSORIES: A558 – POWER SUPPLY 380/3/60

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

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

OPTIONAL ACCESSORIES: A559 – POWER SUPPLY 230/1/60

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	-

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

OPTIONAL ACCESSORIES: 383 – NUMBERED WIRINGS + UK REQUESTS

The machine's electrical cables are all numbered for easy identification. For the power section it is possible to change the colour for the UK market.

CABLE	383 – COLOUR FOR UK
EARTH	YELLOW / GREEN
NEUTRAL	BLUE SKY
PHASE 1 (L1)	BROWN
PHASE 2 (L2)	BLACK
PHASE 3 (L3)	GREY
AUXILIARIES	RED

OPTIONAL ACCESSORIES: A662 / A663 / A664 / A665 / A666 – 2-WAY OR 3-WAY MOTORIZED VALVE



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:
 - Maximum closing pressure (Close off) $\Delta P_s = 175\text{kPa}$
 - A662: with 3-point control and emergency manual control;
 - A664: with 0-10VDC control and emergency manual control;
 - A666: with 0-10VDC control, spring return and emergency manual control;
- 3-way motorized valve for water-flow control:
 - Maximum closing pressure $\Delta P_{max} = 175\text{kPa}$
 - A663: with 0-10VDC control and emergency manual control;
 - A665: 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: A431 – 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.

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

Optional accessory modifies the weight of the standard unit.

OPTIONAL ACCESSORIES: A432 – ENHANCED 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.

MODEL		0051	0071
POWER SUPPLY		230/1/50	230/1/50
THERMAL CAPACITY	kW	3,6	3,6
Absorbed current (OA)	A	15,7	15,7
Capacity steps	n	3	3

Optional accessory modifies the weight of the standard unit.

OPTIONAL ACCESSORIES: A801 – HUMIDITY SENSOR ONLY

Temperature and humidity probe. Display only the ambient humidity value.

OPTIONAL ACCESSORIES: A802 – 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 FOR 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		MEDIUM CONDUCTIVITY		HIGH CONDUCTIVITY	
	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.**

TECHNICAL DATA

MODEL	0051	0071
POWER SUPPLY	230/1/50	230/1/50
STEAM PRODUCTION	kg/h	3
Power input	kW	2,25
Max absorbed current (FLA)	A	9,8
Water content	l	3,9
HYDRAULIC CONNECTION		
WATER INLET - ISO 228/1 – G M (1)	Ø	3/4"
WATER OUTLET - internal diameter	Ø mm	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: A803 – DEHUMIDIFICATION ONLY (SENSOR INCLUDED)

The system controls the ambient humidity value allowing dehumidification.

Component:

- T / rH probe on air return.

OPTIONAL ACCESSORIES: A804 – HUMIDIFIER & DEHUMIDIFICATION

Combination of the two accessories A802+A833

The system controls the ambient humidity value allowing humidification and dehumidification.

OPTIONAL ACCESSORIES: A381 – STANDARD DRAIN PUMP



Optional accessory installed within the internal 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.

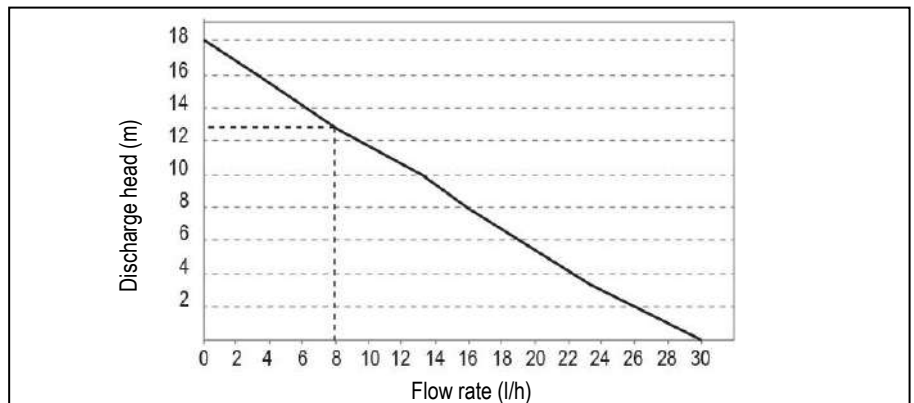
TECHNICAL SPECIFICATION

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
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
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: A471 – SERIAL CARD RS485



The card is factory installed.
Consult the Interface Manual for all technical information.

OPTIONAL ACCESSORIES: A473 - CARD ETHERNET



The card is factory installed.
Consult the Interface Manual for all technical information.

OPTIONAL ACCESSORIES: A474 – SERIAL CARD LON



The card is factory installed. The manufacturer will supply the serial card and .NXE file and a .XIF files necessary for LonWorks technicians to configure the network.
The board is programmed by the technician in charge of the integration.
Consult the Interface Manual for all technical information.

OPTIONAL ACCESSORIES: A501 – CLOGGED FILTER SENSOR



The system includes a differential pressure switch installed in the electrical panel or in the front of the indoor unit 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)

OPTIONAL ACCESSORIES: A521 – FIRE DETECTOR



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 μ A @ 20Vdc
Average power consumption (alarm condition)	23 mA @ 20Vdc
Static alarm threshold	58°C \pm 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° \div 50°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: A511 – SMOKE DETECTOR



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 μ 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: A491 – FLOOD SENSOR



The system includes an electronic relay installed in the electrical panel of the machine and a water detector.

The electrical connections for the probe and the alarm contact are present in the machine's terminal board.

Sensor is supplied to be connected and installed at customer care.

OPTIONAL ACCESSORIES: A842 – NETWORK ANALYZER



The accessory is available for both the outdoor unit and the outdoor condensing unit.

The accessory includes:

- A network transducer;
- One current transformer for each power phase cable.

The system allows the continuous detection of electrical consumptions, split into current, voltage and power. The values are made available to the microprocessor of the unit through an RS485 serial line cable connection, as indicated in the wiring diagram on board of the machine.

On the indoor units models 51, 71, 121, the component is supplied in a 300x220x120mm box, to be mounted externally to the unit.

The displayed variables are:

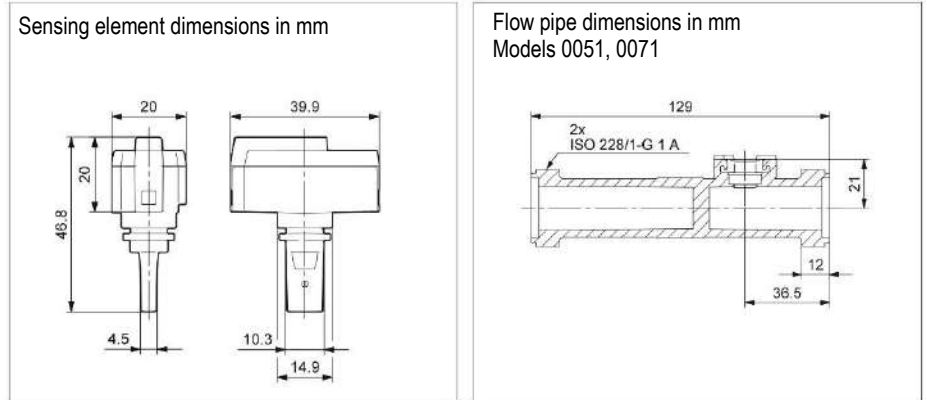
- Phase to phase voltage, only for three-phase units;
- Phase voltage (phase-neutral);
- Phase current;
- Neutral current only for three-phase units;
- Active phase power, only for three-phase units;
- Total active power;
- Active energy;
- Hour counts.

OPTIONAL ACCESSORIES: A852 – 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.

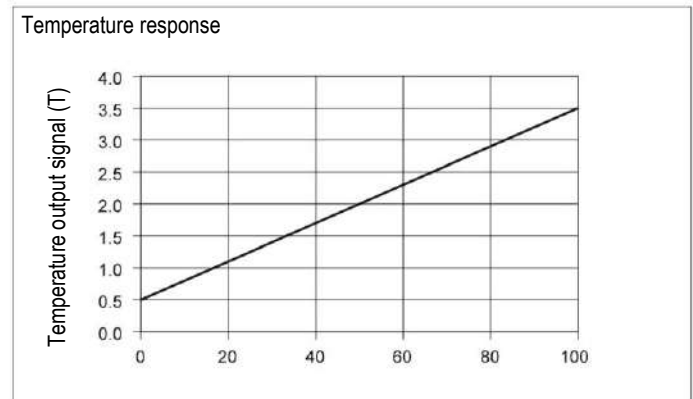
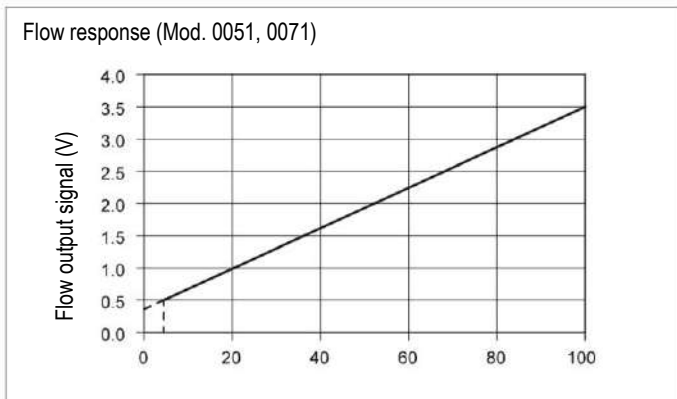


Flow	Mod. 0051, 0071
Measuring range	5 to 100 l/min
Accuracy ($\pm 1\sigma$), 0 to 100°C	$\pm 1.5\%$ FS
Resolution	0.5 l/min

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: A862 – SHUT OFF WATER VALVE



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

Components:

- Valve body
 - Maximum closing pressure (Close off) $\Delta P_s = 500\text{kPa}$
- 24 VAC electric servo control
- Nr.2 x 3-piece joint

OPTIONAL ACCESSORIES: A872 – DUAL POWER SUPPLY WITH AUTOMATIC TRANSFER SWITCH



The accessory is available for both the indoor unit and the outdoor condensing unit.

The system consists of two timers, relays and contactors. In case of main line power failure, the system switches to the secondary line.

When the main line is reconnected, the system returns to its initial state.

During the switch, the power supply is interrupted for 5 seconds.

The system is installed inside the cabinet or externally in a separate box, depending on the size of the unit and the presence of accessories: electric heater and/or proportional steam humidifier.

The sizes of the external kit box are as follows: 300x220x120mm.

ATS INSTALLATION - INTERNAL UNIT

Model	Power Supply	Base unit	Presence if humidifier accessories and/or
51	230/1/50	internal	external kit
71	230/1/50	internal	external kit
121	230/1/50	internal	external kit
151	400/3+N/50	internal	internal
251	400/3+N/50	internal	internal

OPTIONAL ACCESSORIES: A882 – FLOOR BRACKETS FIXING KIT

Not compatible with 5587172400 / 5587172500 – Anti-mixing Frontal / Back panels
Kit for fixing the machine to the floor.

OPTIONAL ACCESSORIES: 7387062800 – HIGH TEMPERATURE CONDENSATE DRAIN PUMP



Optional accessory supplied in mounting kit to be installed outside of the indoor unit.

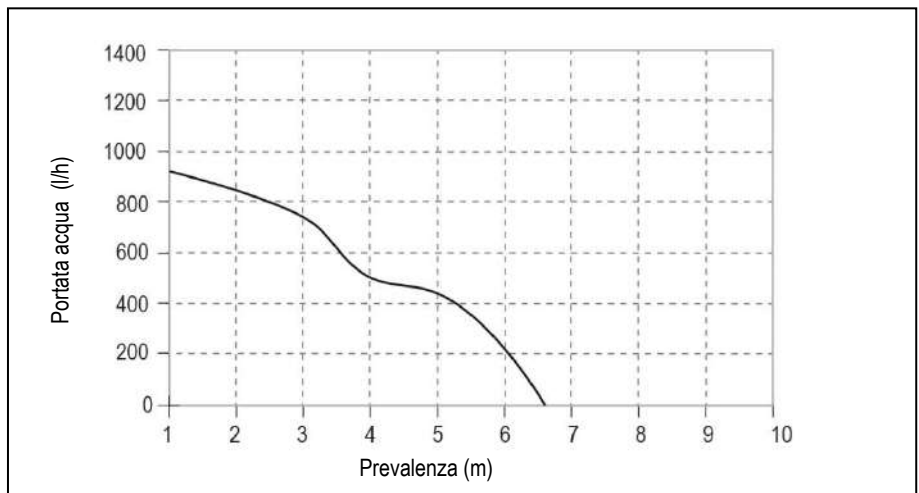
These pumps are designed to collect the hot water produced by the humidifier drain cycles, as well as the condensate produced. These pump has mechanical features capable to resist to the high temperatures of the water exiting the steam cylinder.

The pump body is made from Cycoloy, 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

TECHNICAL SPECIFICATIONS	
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: 7387012600 – DISPLAY

Remote terminal prepared for wall installation - supplied in assembly kit.

OPTIONAL ACCESSORIES: 5587172400 – ANTI-MIXING PANELS



Optional accessory supplied in mounting kit.
 Not compatible with optional "floor brackets fixing kit".
 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.

- 5587172400: Anti-mixing frontal/back panel L 300mm.

OPTIONAL ACCESSORIES: 5587172800 / 5587172900 – ANTI-MIXING PANELS



Optional accessory supplied in mounting kit.
Not compatible with optional “floor brackets fixing kit”.
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.

- 5587172800: Anti-mixing side panel L 1000mm
- 5587172900: Anti-mixing side panel L 1200mm

OPTIONAL ACCESSORIES: A557 – POWER SUPPLY 460/3/60

OUTDOOR UNIT

MODEL	0051	0071
POWER SUPPLY	--	460/3/60
STANDARD UNIT		
Max power input (FLI)	--	10,9
Max current input (FLA)	--	16,4

WARNING:

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

OPTIONAL ACCESSORIES: A558 – POWER SUPPLY 380/3/60

OUTDOOR UNIT

MODEL	0051	0071
POWER SUPPLY	--	380/3/60
STANDARD UNIT		
Max power input (FLI)	--	10,8
Max current input (FLA)	--	22,9

WARNING:

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

OPTIONAL ACCESSORIES: A559 – POWER SUPPLY 230/1/60

OUTDOOR UNIT

MODEL	0051	0071
POWER SUPPLY	230/1/60	--
STANDARD UNIT		
Max power input (FLI)	5,86	--
Max current input (FLA)	18,3	--

WARNING:

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

OPTIONAL ACCESSORIES: A932 – AXIAL FANS WITH “EC” ELECTRIC MOTORS FOR OUTDOOR UNIT



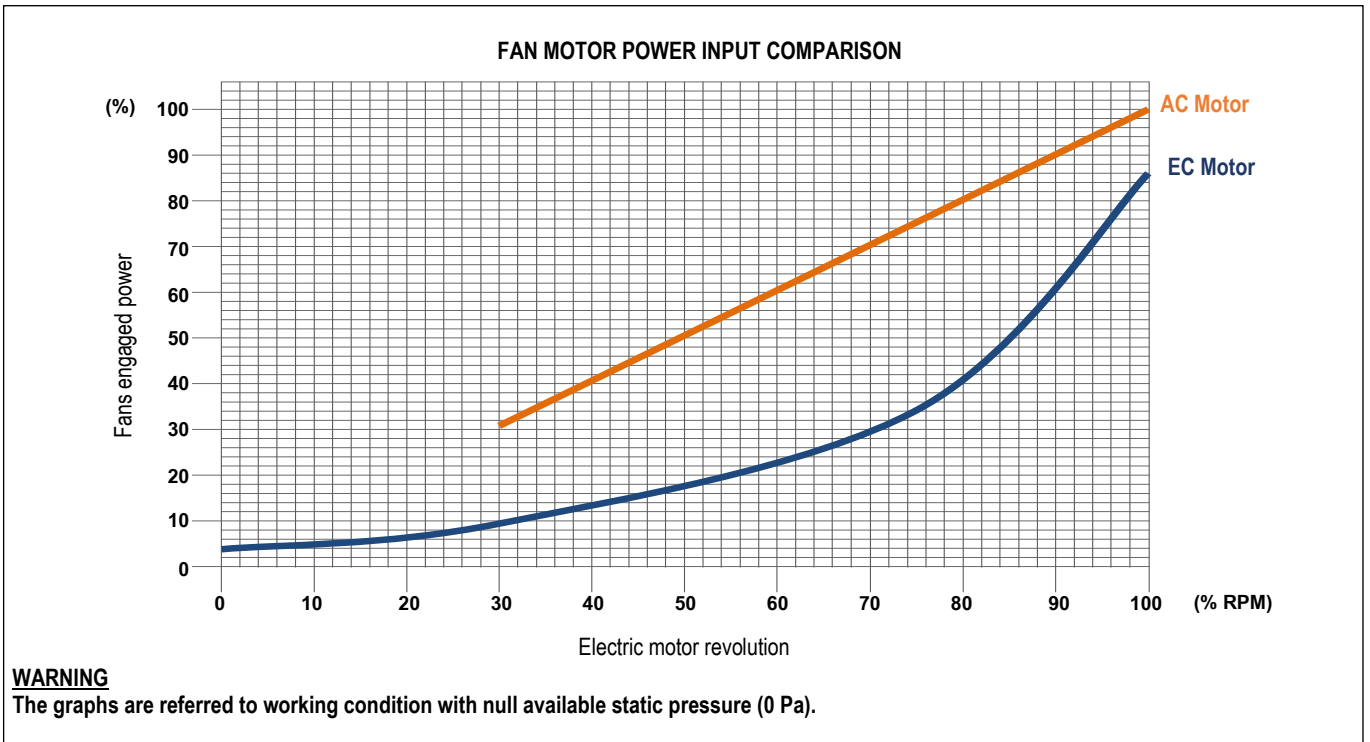
The “EC” axial fans are equipped with a brushless type synchronous motor with integrated electronic commutated system.

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		Axial EC	Axial EC
Max power input (FLI)	kW	0,2	0,72
Max current input (FLA)	A	1,6	3,2
POWER SUPPLY	V/Ph/Hz	230/1/50	400/3+N/50

OPTIONAL ACCESSORIES: 881 – CU/CU CONDENSING COIL

Finned pack and tubes made of copper.

This type of heat exchanger is free from galvanic corrosion thanks to the use of a single material used for its construction.

Advantages of the Cu/Cu heat exchanger:

- High thermal conductivity;
- High corrosion resistance;

To ensure correct machine operation and the best operating conditions, it is important to keep the exchangers clean and efficient as indicated in the Installation, Use and Maintenance manuals.

The special Cu/Cu execution does not exclude maintenance and cleaning operations of the exchangers.

OPTIONAL ACCESSORIES: 893 – EPOXY PAINTED CONDENSING COIL

Process with epoxy paint.

Advantages of the protective treatment:

- 100% coating of the exchanger;
- 1-2%; exchanger efficiency loss
- Thick protective film thickness at each point of the exchanger;
- Flexible and resistant protective film;

To ensure correct machine operation and the best operating conditions, it is important to keep the exchangers clean and efficient as indicated in the Installation, Use and Maintenance manuals.

The protective treatment does not exclude maintenance and cleaning operations of the exchangers.

OPTIONAL ACCESSORIES: 896 - CATAPHORESIS CONDENSING COIL

The coating is applied through a complete immersion in the tank, in which the coil behaves like a magnet, attracting the coating on every point of its surface.

Advantages of the protective treatment:

- 100% coating of the exchanger;
- 1-2%; exchanger efficiency loss
- Thick protective film thickness at each point of the exchanger;
- Flexible and resistant protective film;

To ensure correct machine operation and the best operating conditions, it is important to keep the exchangers clean and efficient as indicated in the Installation, Use and Maintenance manuals.

The protective treatment does not exclude maintenance and cleaning operations of the exchangers.

OPTIONAL ACCESSORIES: A181 - COMPRESSOR SOUNDPROOF JACKET



The system includes a soundproof jacket for each compressor to obtain a reduction of the sound level of the unit.

OPTIONAL ACCESSORIES: A842 – NETWORK ANALYZER



The accessory is available for both the outdoor unit and the outdoor condensing unit.

The accessory includes:

- A network transducer;
- One current transformer for each power phase cable.

The system allows the continuous detection of electrical consumptions, split into current, voltage and power. The values are made available to the microprocessor of the unit through an RS485 serial line cable connection, as indicated in the wiring diagram on board of the machine.

On the indoor units models 51, 71, 121, the component is supplied in a 300x220x120mm box, to be mounted externally to the unit.

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: A872 – DOUBLE POWER SUPPLY WITH AUTOMATIC TRANSFER SWITCH



The accessory is available for both the indoor unit and the outdoor condensing unit.

The system consists of two timers, relays and contactors. In case of main line power failure, the system switches to the secondary line.

When the main line is reconnected, the system returns to its initial state.

During the switch, the power supply is interrupted for 5 seconds.

The system is installed inside the cabinet or externally in a separate box, depending on the size of the unit and the presence of accessories: electric heater and/or proportional steam humidifier.

The sizes of the external kit box are as follows: 300x220x120mm.

ATS INSTALLATION - EXTERNAL CONDENSING UNIT

Frame	Power Supply	Base unit
51	230/1/50	Internal
71	400/3+N/50	Internal
121	400/3+N/50	Internal
151	400/3+N/50	Internal electronics ATS
251	400/3+N/50	Internal electronics ATS

Models 151 and 251 feature electronic ATS

The accessory is also available on request for the following power supplies:

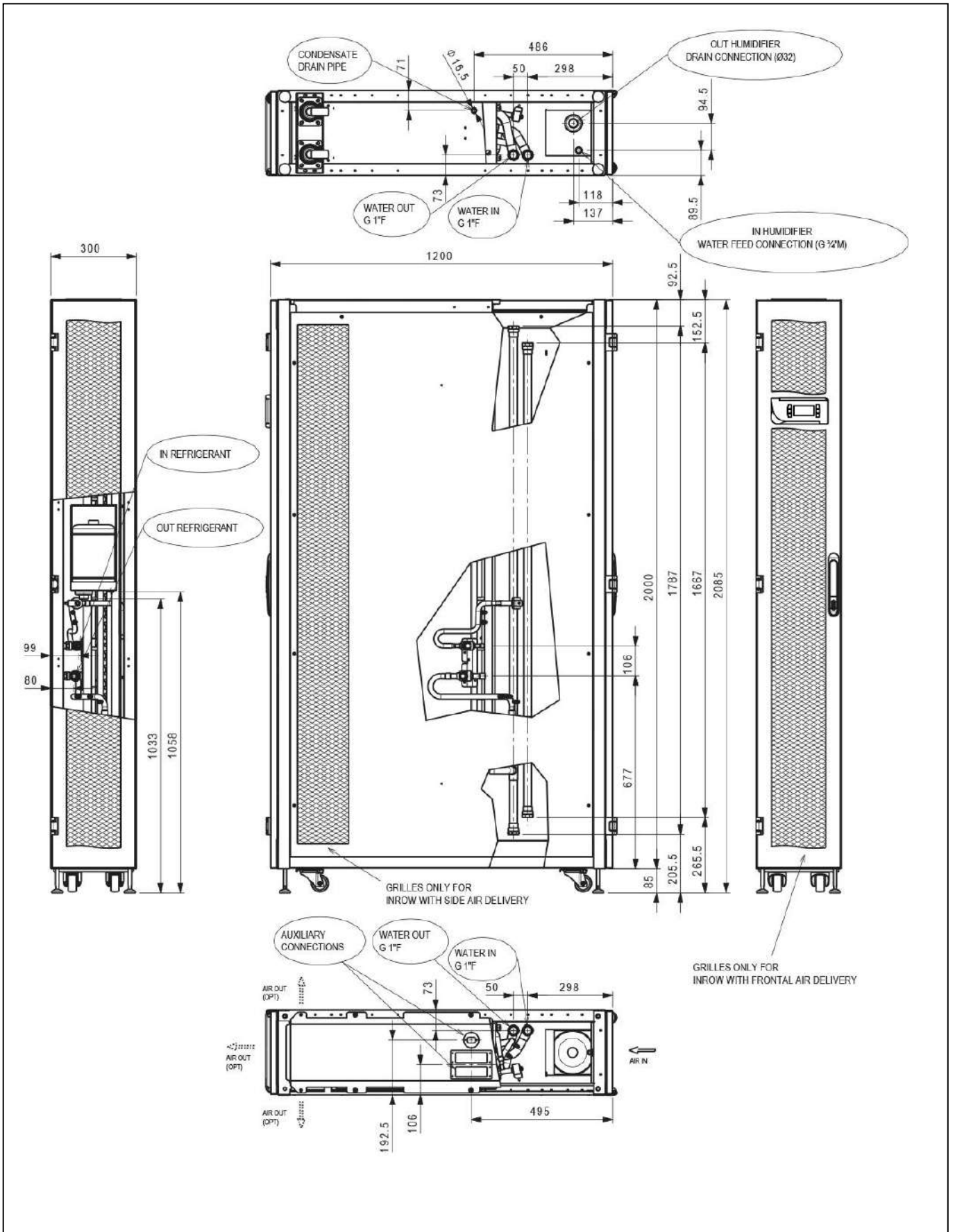
- 380/3/60Hz (power supply available as an accessory);
- 460/3/60Hz (power supply available as an accessory).

OPTIONAL ACCESSORIES: 7378005800 – FLOOR BRACKETS FIXING KIT mod. 0051

OPTIONAL ACCESSORIES: 7378005900 – FLOOR BRACKETS FIXING KIT mod. 0071

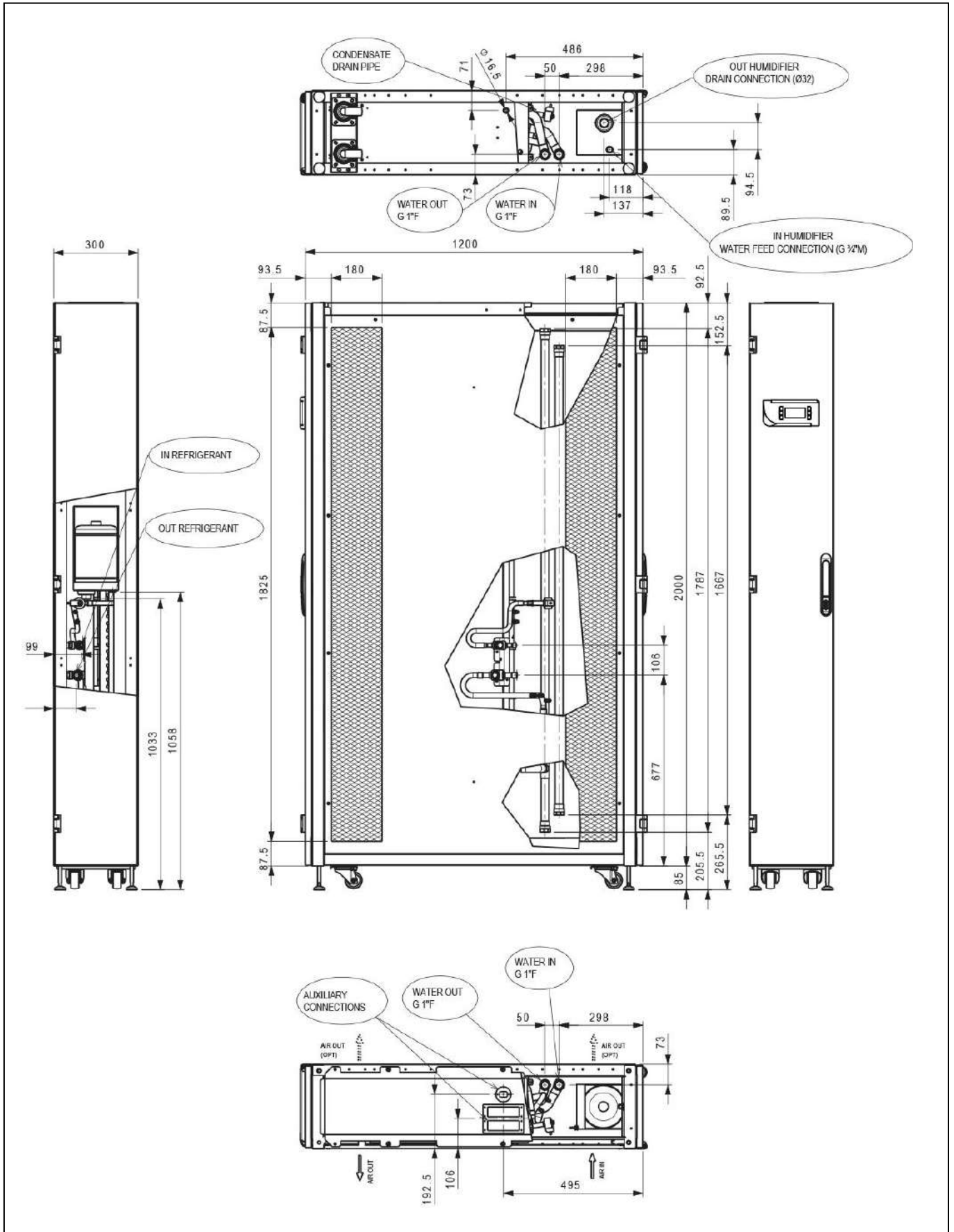
MACHINE DRAWINGS

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



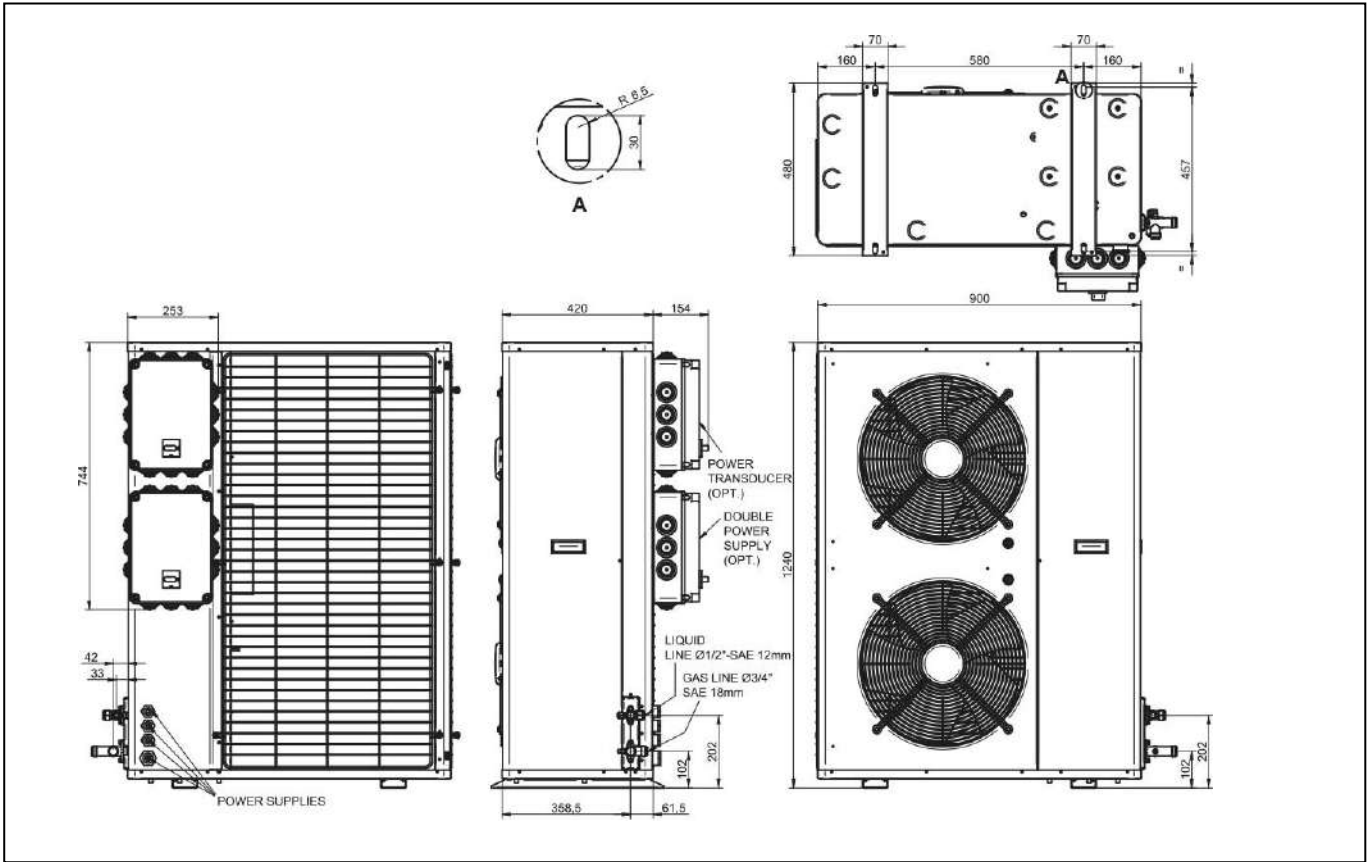
MACHINE DRAWINGS

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



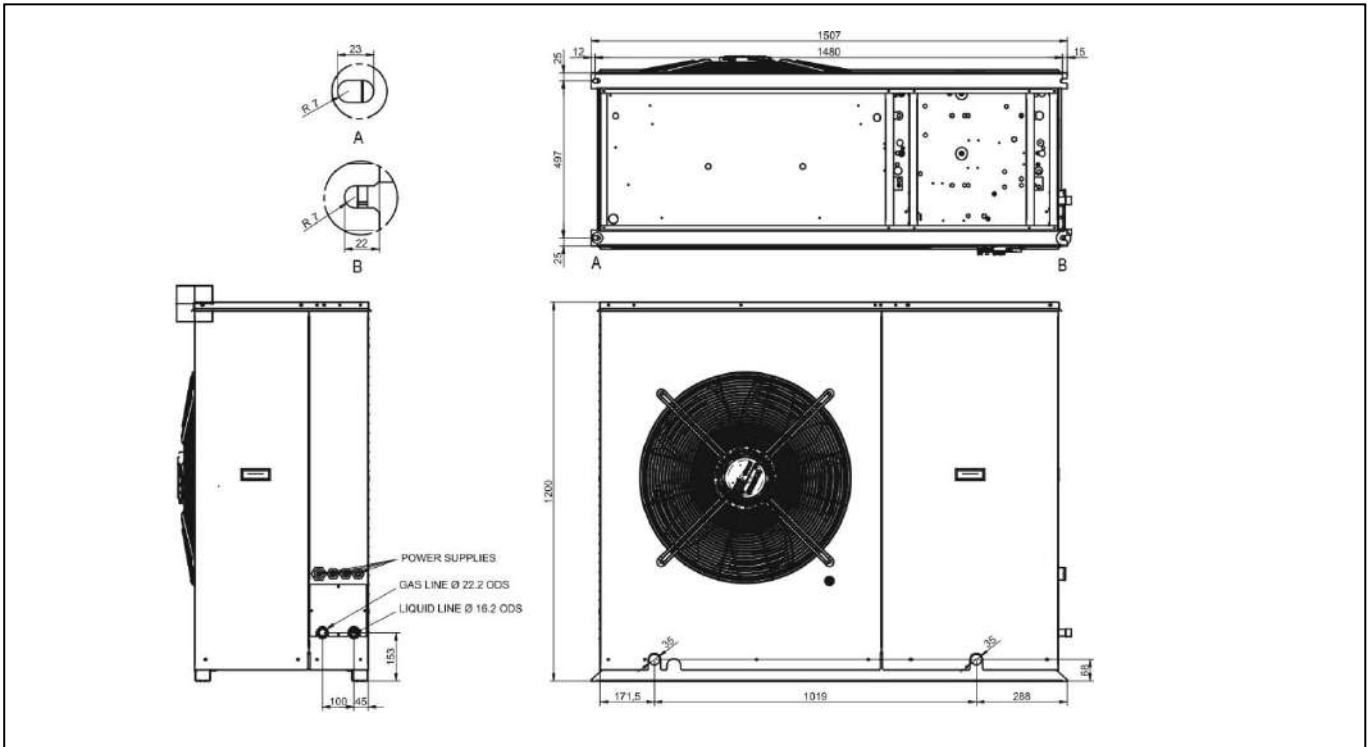
MACHINE DRAWINGS – OUTDOOR UNIT

Dimensions in mm – Model 0051



MACHINE DRAWINGS

Dimensions in mm – Model 0071



SHIPMENT: PACKING 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 shrink wrap.
 On request packing on pallet covered with shrink wrap and wooden cage.

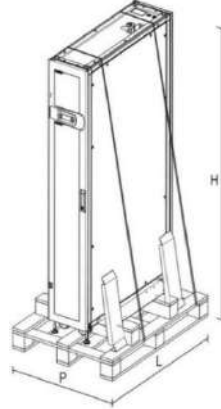
INDOOR UNIT - STANDARD PACKING

FRAME X 1000 X 42U

CRCO-I		0051	0071
L	mm	1100	1100
H	mm	2248	2248
P	mm	800	800
Weight	Kg	190	205

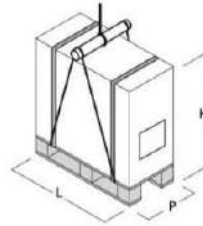
FRAME X 1200 X 42U

CRCO-I / CRCO-E		0051	0071
L	mm	1300	1300
H	mm	2248	2248
P	mm	800	800
Weight	Kg	200	215



OUTDOOR UNIT - STANDARD PACKING

Size		0051	0071
L	mm	1035	1630
P	mm	485	650
H	mm	1390	1400
Weight	Kg	123	205



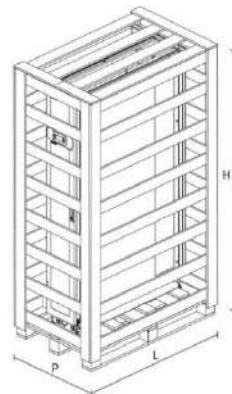
INDOOR UNIT - WOODEN CAGE PACKING (OPTIONAL)

FRAME X 1000 X 42U

CRCO-I		0051	0071
L	mm	1130	1130
H	mm	2320	2320
P	mm	830	830
Weight	Kg	235	250

FRAME X 1200 X 42U

CRCO-I / CRCO-E		0051	0071
L	mm	1330	1330
H	mm	2320	2320
P	mm	830	830
Weight	Kg	245	260





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.



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