

INSTALLATION, USE AND MAINTENANCE MANUAL



**HIGH EFFICIENCY HEAT RECOVERY UNIT WITH INTEGRATED AIR
TREATMENT WITH INVERTER COMPRESSOR**

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1 GENERALITY

1.1.1 INTRODUCTION

This manual was conceived with the aim of making installation and management of your system as simple as possible.

By reading and applying the suggestions in this manual, you will be able to obtain the best performance from the purchased product.

We would like to thank you for the choice you made by purchasing our product.

Read this booklet carefully before carrying out any operation on the unit.

The unit must not be installed or performed on it in any way unless this manual has been carefully read and understood beforehand. all its parts. In particular, all the precautions listed in the manual must be taken.

The documentation supplied with the unit must be handed over to the system manager so that he can keep it carefully (at least 10 years) for any future assistance, maintenance and repairs.

The installation of the unit must take into account both the purely technical requirements for correct operation and any local legislation in force and specific provisions.

Make sure that when the unit is delivered, there are no obvious signs of transport damage. In this case, indicate it on the delivery note.

This manual reflects the state of the art at the time the machine was marketed and cannot be considered inadequate because it is subsequently updated on the basis of new experiences. The Manufacturer reserves the right to update the production and the manuals, without the obligation to update the previous ones, except in exceptional cases.

Contact the Manufacturer's Sales Department to receive further information or updates to the technical documentation and for any improvement proposal to this manual. All reports received will be rigorously screened.

1.1.2 BASIC SAFETY RULES






We remind you that the use of products that use electricity and water implies the observance of some basic safety rules:

- Use of the appliance by disabled and unassisted persons is prohibited
- It is forbidden to touch the appliance with bare feet and with wet or damp parts of the body
- Any cleaning operation is prohibited before having disconnected the appliance from the mains power supply by setting the main system switch to off
- It is forbidden to modify the safety or adjustment devices without the authorization and indications of the appliance manufacturer
- It is forbidden to pull, disconnect or twist the electric cables coming out of the appliance, even if this is disconnected from the mains power supply.
- It is forbidden to introduce objects and substances through the air intake and delivery grilles.
- It is forbidden to open the access doors to the internal parts of the appliance without having first turned the main switch of the system to off.
- It is forbidden to disperse and leave the packaging material within the reach of children as it can be a potential source of danger.
- Respect the safety distances between the machine and other equipment or structures to guarantee sufficient access space to the unit for maintenance and assistance operations as indicated in this booklet.
- The power supply of the unit must take place with electric cables having a section suitable for the power of the unit. The voltage and frequency values must correspond to those indicated for the respective machines; all machines must be earthed as per current legislation in the various countries.
- Do not release R134A into the atmosphere: R134A is a fluorinated greenhouse gas, referred to in the Kyoto protocol, with a global warming potential (GWP)=1975.






1.1.3 SYMBOLOGY







The symbols shown in the following file allow you to quickly provide the information necessary for correct use of the unit.

Safety related symbols

	ATTENTION Authorized personnel only	Warns that the operations indicated are important for the safe operation of the machines
	DANGER Risk of electric shock	Warns that failure to observe the instructions involves a risk of electric shock.
	DANGER	Warns that failure to observe the instructions involves a risk of harm to exposed persons.
	WARNING	It warns that failure to observe the instructions involves a risk of damage to the unit or the system.
	DANGER	Warns that there is the presence of moving parts and involves a risk of harm to exposed persons

1.1.4 WARNINGS

	The installation of the unit must be carried out by qualified and authorized personnel according to the regulations in force in the various countries. If the installation is not performed it could become a dangerous situation
	Avoid installing the unit in very humid rooms or with the presence of large heat sources.
	On the electrical side, to prevent any risk of electrocution, it is essential to disconnect the main switch before making electrical connections and carrying out any maintenance operation.
	In the event of water leaks inside the unit, turn the main switch of the system to "Off", close the water taps and contact the technical service
	It is recommended to use a dedicated power circuit; Never use a power supply in common with other appliances.

	It is recommended to install an earth leakage breaker; failure to install this device could result in electric shock.
	For the connection, use a cable long enough to cover the entire distance, without any connection; do not use extension cords and do not apply other loads on the power supply but use a dedicated power circuit.
	After connecting the electrical cables, make sure that the cables are arranged so as not to exert excessive forces on the covers or electrical panels; any incomplete connection of the covers may cause overheating of the terminals.
	Make sure that the earth connection is made; do not earth the appliance on distribution pipes. High intensity surge currents could damage the unit
	Installations carried out outside the warnings of this manual or use outside the operating limits immediately void the guarantee.
	Make sure that the first start-up is carried out by personnel authorized by the company (see first start-up request form)

1.1.5 COMPLIANCE

The CE marking (present on each machine) certifies compliance with the following EU standards:

- Low Voltage Directive 2014/35/EC
- Electromagnetic Compatibility Directive 2014/30/EC
- Ecodesign 2009/125/EC
- RoHS2 2011/65/EU
- WEEE 2012/19/EC

1.1.6 RANGE

	-1-	-2-	-3-	-4-
HRD+ 3+2	30/15	h	AND	A.D

1) Defines the Total flow rate and the fresh air flow rate

Models from 300/150 m³/h to 600/300 m³/h

2) Type of installation

H: Horizontal

3) Electronic typology

K: K electronics

4) Construction typology

DC: Version for dehumidification and integration in cold and hot

1.1.7 IDENTIFICATION



- The unit can be identified by the plate placed on the lower front panel of the same.
- On the packaging there will be an additional identification plate with the unit model and shipping references.
- The plate on the packaging has no value for the traceability of the product in the years following the sale.

The removal, deterioration and illegibility of the plate placed on the unit, involves major problems in identifying the machine, in finding spare parts and therefore in any future maintenance.

1.1.8 CONSTRUCTION FEATURES

SELF-ADAPTIVE ALGORITHM

Inside the unit there is an algorithm which, through some measured parameters, continuously defines and calculates the operating frequency of the BLDC compressor; In this way, according to the temperature and humidity of the incoming air, the unit automatically manages the dehumidification power so as to constantly have high output air that is useful for the room;

QUIET OPERATION

The unit differs from the rest of the market as it can also dehumidify at reduced flow rates, for example night-time operating flow rates or CMV only; Compared to traditional systems, the volume of air treated can be considerably reduced, increasing the comfort of the occupants and respecting the philosophies of radiant systems which must have as little convective motion as possible;

AUTO OPERATION - BOOSTER

If necessary, the unit with the self-adaptive logic carries out a power increase to restore the ambient conditions following an event that brings the system up to speed or a situation with a heavy thermal load.

SELF PROTECTION

The unit prevents phenomena such as lack of water or reduced inlet water flow by monitoring the working temperature of the compressor.

COOLING COMFORT

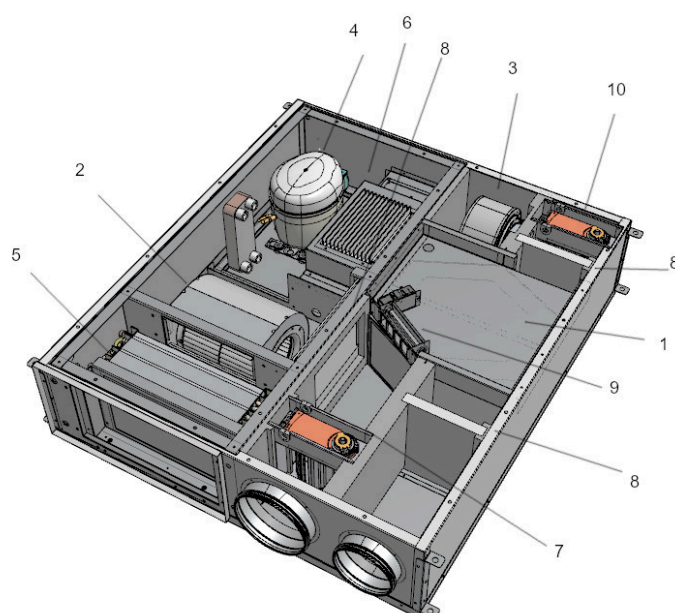
The inverter compressor in the integration phase controls the cooling capacity by monitoring the ambient temperature; The air will therefore always be treated but when the comfort conditions are reached, the air delivery will be less cold and more comfortable.

REDUCED REFRIGERANT CHARGE:

The particular refrigerant circuit allows a reduced refrigerant charge and avoids the double condenser present on this type of unit; the cooling circuit is thus more efficient in respect of the environment;

FLOWING WATER TEMPERATURE

Compared to traditional units, the water temperature is not essential for the dehumidification capacity; Even in the phases of full operation or where the water temperature should rise following a particular thermal request, the cooling circuit does not lose its capacity; By working with unconstrained water temperatures, the central generator becomes more efficient;

MAIN COMPONENTS OF THE UNIT


1. Heat recovery unit

2. Supply fan

3. Exhaust fan

4. Compressor and refrigerant circuit compartment

5. Finned coils

6. Electrical panel

7. Recirculation air damper

8. Air filters

9. Free cooling damper

10 Optional outside air damper

1.1.9 PACKING AND TRANSPORT

The units are supplied for transport fixed on a wooden pallet and inserted in cardboard boxes. To facilitate movement, the units are equipped with a wooden pallet and hooks on the base which allow them to be lifted and positioned on the installation site. The unit can be stored in a place protected from atmospheric agents with temperatures not lower than 0°C, up to a maximum of 40°C.

1.1.10 RECEPTION, CONTROL AND HANDLING

The unit is shipped completely preloaded with refrigerant gas in the circuits and with non-freezing oil in the compressors. Under no circumstances can water be present in the hydraulic circuits, since after testing the unit is carefully emptied.

Upon arrival, the customer is required to inspect the unit also in the internal areas to verify that it has not been damaged during transport; the unit left the factory in perfect condition. Otherwise, it is necessary to take immediate recourse against the carrier, reporting the extent of the damage in detail on the document, producing photographic evidence of the apparent damage and notifying any apparent damage to the shipper by registered mail. The manufacturer assumes no responsibility for damage due to transport, even in if he did the shipping himself. Great care must be taken in handling the units during unloading and positioning on site, in order to avoid damage to the casing and to the more delicate internal components such as compressors, exchangers, etc. In any case, keep the unit horizontal without tilting it. All the indications regarding the precautions necessary to ensure that no damage is done to the unit and the indication of the weight of the same are given on the packaging. The materials that make up the packaging can be of various kinds such as wood, cardboard or polyethylene (plastic). It is good practice to send them for disposal or recycling through specialized companies to reduce their environmental impact.

1.1.11 DISASSEMBLY AND DISPOSAL

Do not disassemble or dispose of the product yourself. The disassembly, demolition, disposal of the product must be carried out by authorized personnel in accordance with local regulations.



2 INSTALLATION

2.1.1 INSTALLATION CONDITIONS



The unit must be installed according to the national and local standards governing the use of electrical devices and according to the following indications:

- install the unit inside residential buildings with an ambient temperature between 0°C and 45°C;
- avoid areas near sources of heat, steam, flammable and/or explosive gases and particularly dusty areas;
- install the unit in a place not subject to frost (the condensed water must be discharged not frozen, at a certain angle, using a siphon);
- do not install the unit in areas with a high relative humidity (such as the bathroom or toilet) to avoid condensation on the external surface;
- choose an installation site where there is sufficient space around the unit for the connections of the air ducts and to be able to carry out maintenance operations;
- check the consistency of the ceiling/wall/floor where the unit will be installed so that it is suitable for the weight of the unit and does not cause vibrations.

In the environment chosen for installation there must be:

- air duct connections;
- 230V single-phase electrical connection
- connection for the condensate drain
- hydraulic connection

2.1.2 UNIT PLACEMENT

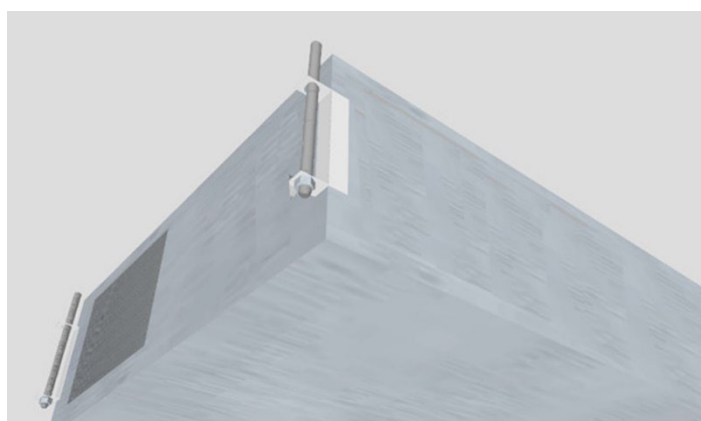


Ceiling mount

To mount the unit on the ceiling you will need:

- Position 4 threaded rods inside the brackets provided on the 4 corners of the unit;
- Fix the unit to the ceiling, using the brackets, using suitable anchoring systems (dowels, chains...) and check its leveling using a spirit level.
- Ensure sufficient space for carrying out maintenance activities: the opening of the cover of the unit (from below) must be guaranteed.

Do not mount the unit with the sides in direct contact with the walls to avoid possible contact noise, insert rubber or neoprene strips in this case.



Ceiling mount

Floor mounted

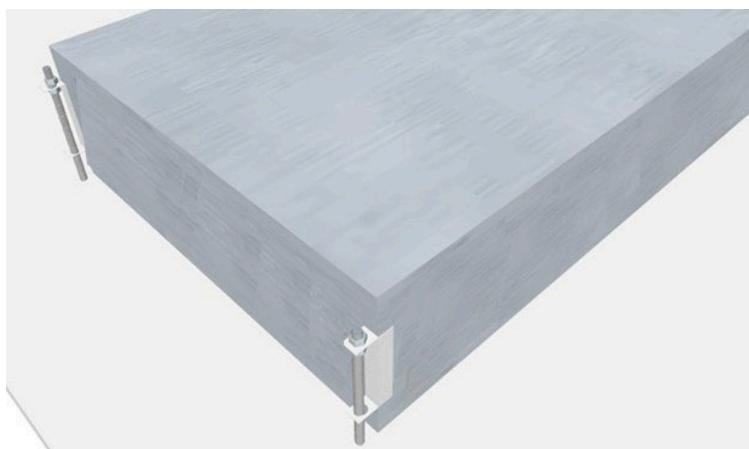
To mount the unit on the floor you need:

Position 4 threaded rods inside the brackets provided on the 4 corners of the unit;

Fix the unit to the floor using the brackets, using suitable anchoring systems (dowels, chains...) and check its leveling using a spirit level.

Ensure sufficient space for carrying out maintenance activities: the opening of the cover of the unit (from below) must be guaranteed.

Do not mount the unit with the sides in direct contact with the walls to avoid possible contact noise, insert rubber or neoprene strips in this case.



Floor mounted

2.1.3 CONDENSATE DRAIN CONNECTION

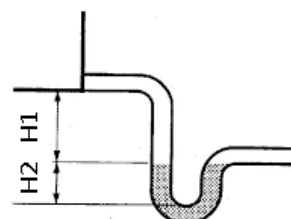
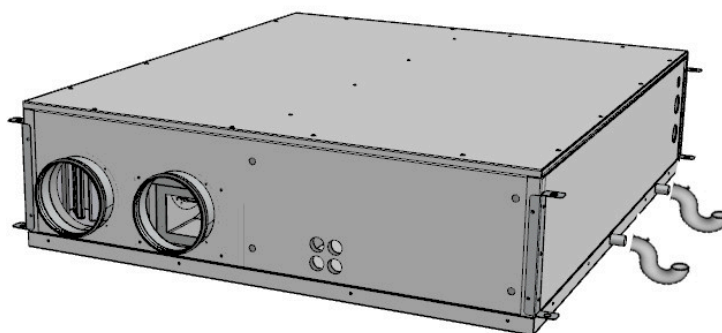
Due to the heat recovery system (the hot expelled air is cooled by the incoming air inside the heat exchanger), and the dehumidification coils, the humidity contained in the internal air condenses inside the 'unit'.

For the correct functioning of the heat recovery unit, it is therefore necessary to connect two condensate drains to the plumbing system (drain) of the house. Furthermore, to allow the correct outflow of the condensate water and avoid air suction, the condensate drains must be equipped with special siphons to be supplied and installed by the installer;

For the installation of the condensate drain, comply with the following standards:

- give the drain pipe a slope of at least 2%;
- provide for the possibility of disconnecting the drain pipe for any maintenance (particularly in the case of ceiling installation);
- make sure that the discharge end of the hose is at least below the water level of the siphon;
- make sure that the siphon complies with the following rules and is always full of water:

$$H1 > 40\text{mm} \quad H2 > 40\text{mm}$$



Condensate drain connection

3 AREA CONNECTIONS

3.1.1 AREAUAL ORIENTATIONS



The unit is equipped with 4 male circular rear connections of different Ø and with a front rectangular mouth depending on the size; For the correct connection of the air ducts, refer to the following diagram and the stickers placed on the unit.

Table of unit aeraulic connection diameters

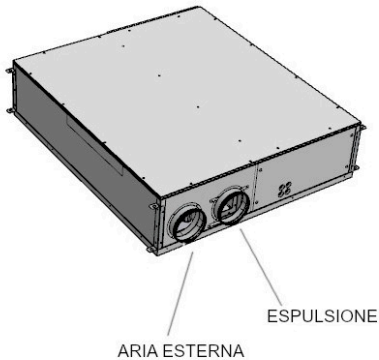
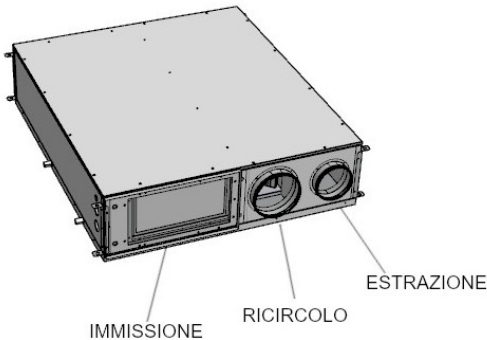
SIZE	30/15	50/25
Ø Recirculation mm	160	200
Stale air Ø mm	160	160
External air Ø mm		
Ø Ejection mm	350x180	490x255
Inlet section mm		

We recommend the installation of at least 500mm of flexible piping to avoid the dragging of vibrations and annoying noises due to the installation.

Depending on the system in which the unit is to be installed, it will be possible to suitably orient the four aeraulic connections.

Here is the configuration:

STANDARD VERSION CONFIGURATIONS

	
Rear connections	Front connections

4 HYDRAULIC CONNECTIONS

4.1.1 GENERALITY



- The units are equipped with hydronic coils with water/air exchange;
- The connections on the units, even in the different applications and versions, are always common to all units.
- Make sure to respect the flows indicated on the plates: inlet (water entering the unit), outlet (water leaving the unit)
- Make sure that the weight of the pipes does not weigh on the connections provided
- Provide shut-off valves on the delivery and return pipes to the system
- All the chilled water pipes must be insulated to minimize unwanted heat exchanges and the formation of condensate.
- Before filling the pipes, make sure they do not contain foreign materials: such as sand, stones, rust flakes, welding drops, slag, etc. Otherwise, wash the hydraulic circuit by-passing the unit.
- Absolutely avoid pump cavitation and the consequent presence of air in the hydraulic circuit.

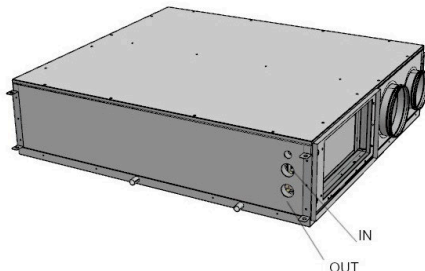
Chemical-physical characteristics of water

Incompatible chemical-physical characteristics could jeopardize the integrity of the hydraulic parts of the unit.

Check the characteristics of the water;

DESCRIPTION	Limit value
Hardness	< 10°F
PH value	7.5 / 9
Oxygen	< 2mg/l
conductivity	< 500uS/cm
Iron	< 2 mg/l
Manganese	< 1 mg/l
Nitrate	< 70 mg/l
Sulphate	< 70 mg/l
Chlorine compounds	< 300 mg/l
Carbon dioxide free radical	< 10 mg/l
Ammonium	< 20 mg/l

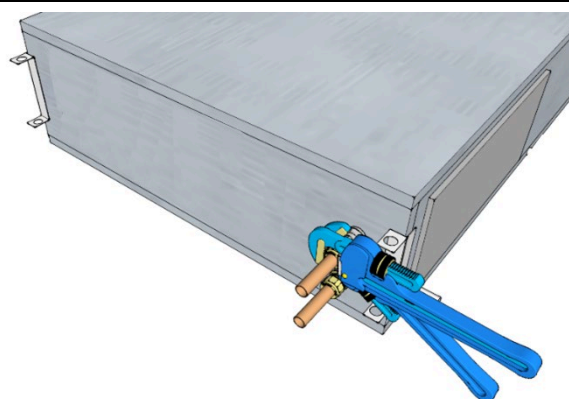
4.1.2 CONNECTION PLACEMENT AND PROCEDURES

<p>The hydraulic connections are positioned on the side of the unit;</p> <p>The connections are with female thread;</p> <p>Respect IN as water inlet to the unit and OUT as water outlet from the unit</p>	
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Connect the pipes with a threaded male fitting, and tighten it with dedicated tools;

Be careful not to rotate or twist the pipes coming from inside the unit;

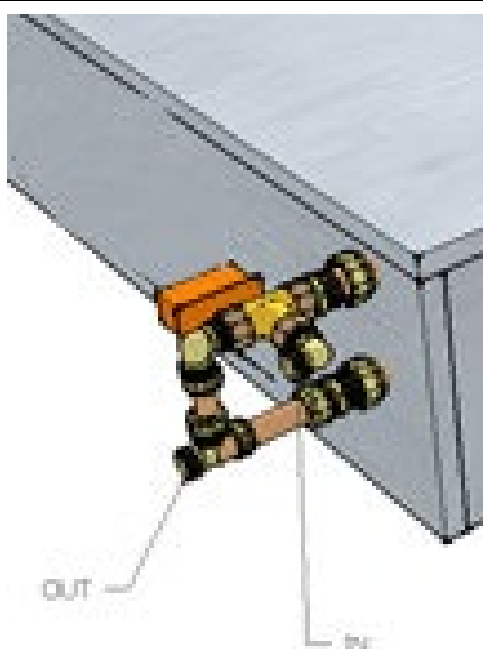
By rotating the pipes during connection, the connections inside the unit could be damaged and water leaks during operation;



4.1.3 2-3 WAY VALVE CONNECTION

The connections of the optional 2 / 3-way valves are to be made as indicated;

Be careful to respect the indications placed on the valve!



4.1.4 RECOMMENDED CONNECTION DIAGRAMS

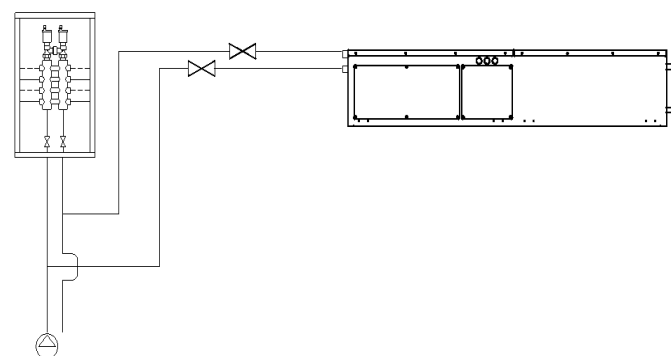
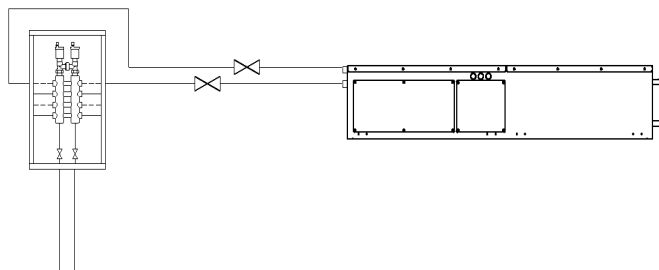
-CONNECTION TO THE RADIANT SYSTEM MANIFOLD: The unit is powered by a collector circuit of the radiant system. Make sure there is the necessary flow rate on the circuit.

NB: With this type of installation it is necessary to guarantee the machine the nominal flow rate described in the technical data sheet;

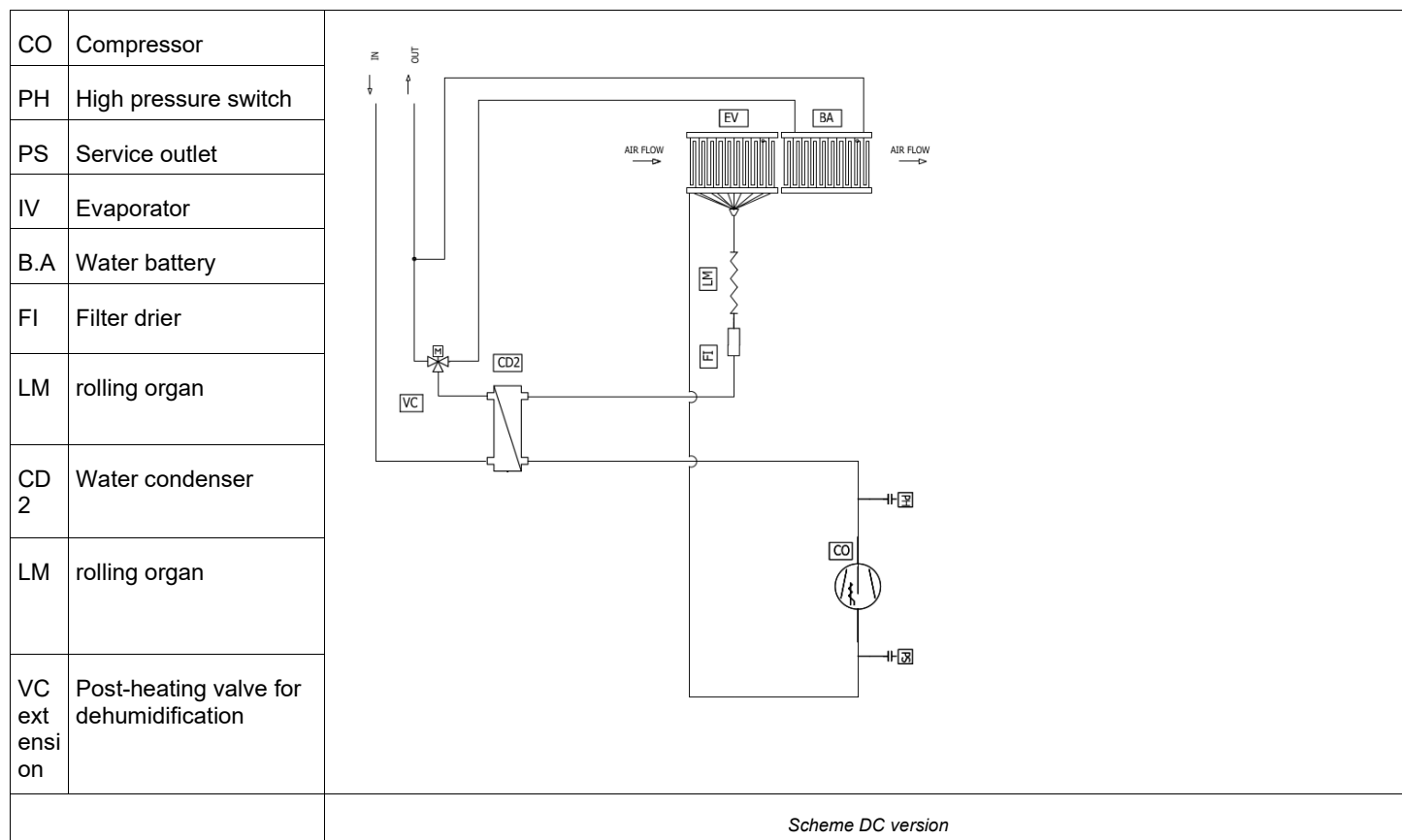
CONNECTION BEFORE THE RADIANT SYSTEM MANIFOLD:

_The unit is fed in parallel to the radiant system manifold, thus guaranteeing the water flow required for correct operation.

NB: In both cases, the failure of the nominal water flow rate of the unit causes the blocking of the unit.



4.1.5 REFRIGERATOR SCHEMES



5 ELECTRICAL CONNECTIONS

5.1.1 GENERALITY



- Before starting any operation to make the electrical connections, make sure that the unit is not electrically powered
- Make the necessary electrical connections by consulting only the electrical diagram attached to this manual.
- Install a suitable interrupting and differential protection device for the exclusive service of the unit.
- It is essential that the unit is connected to an earth socket.
- Check that the electrical components chosen for installation (main switch, circuit breakers, cable section and terminals) are suitable for the electrical power of the installed unit and that they take into account the compressor peak currents as well as the maximum load that can be reached. The relative data are indicated on the attached wiring diagram and on the unit identification plate.
- It is forbidden to enter the unit with electric cables unless specified in this booklet.
- Use cables and electrical conductors with adequate sections and compliant with the regulations in force in the various countries.
- Absolutely avoid running the electrical cables in direct contact with pipes or components inside the unit
- After the first moments of operation, check the tightness of the screws of the power supply terminals

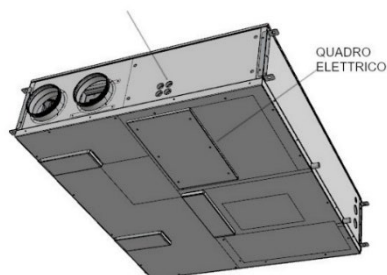
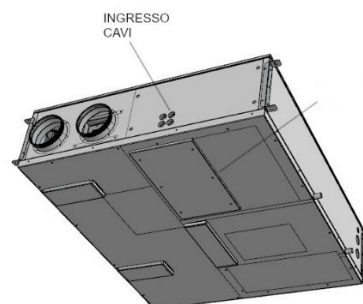
Power line sizing table

CUT		30/15	50/25
Diet	V/Ph/Hz	230/1/50	
Max absorbed current	TO	7.3	7.9

5.1.2 CONNECTION PLACEMENT AND PROCEDURES

The electrical cable entry is located on the side of the unit;

Four passages dn 20 mm are arranged;



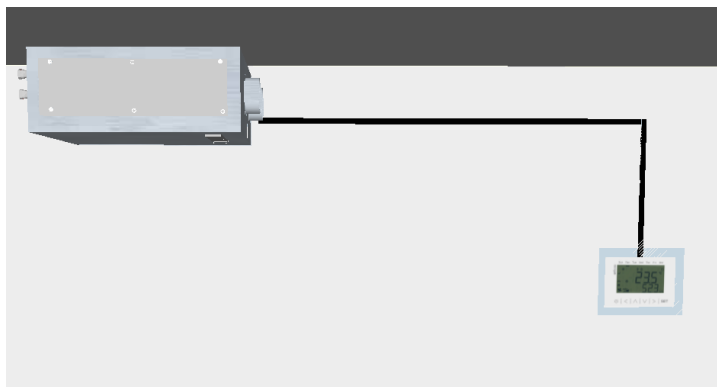
LINKS PROVIDED BY THE CUSTOMER		
L – PE - No	Unit power supply	230/1/50
V3V (L1) – V3V (N) – V3V (L2)	2-point valve control	L1-N Fixed voltage L2 – Command
PM – PM	Pump command	230/1/50 Max (2A)
OFF - OFF	Remote On Off command	Closed contact unit ON
E/I – E/I	Summer / winter command	Contact closed / summer
DEU – DEU	Dehumidification command	Contact closed / function active
INT – INT	Integration command	Contact closed / function active
FAN - FAN+	Air flow regulation	0-10vdc input signal
ANNEX - ANNEX	Generic alarm signal of the unit or high humidity	Contact closed unit in alarm
0 – 24 – Y - GND	Modulating outside air damper control	24Vac power supply - 0-10vdc signal
RS485	Modbus RTU	RS485 RTU connection
12 – 0 – A+ B-	Remote display connection (optional)	12-0 Power supply A+ B- Communication

5.1.4 POSSIBLE OPERATING MODES AND CONFIGURATIONS FOR THE UNIT

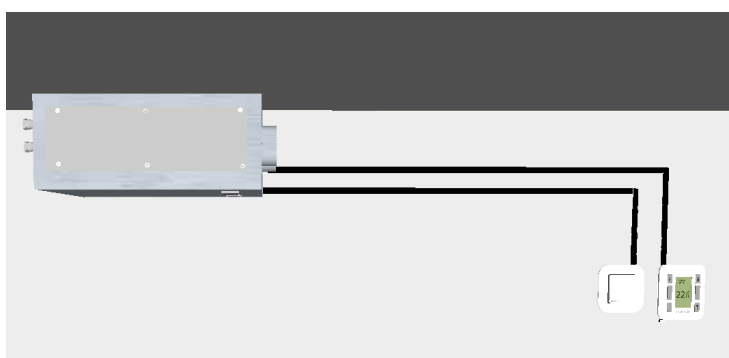
The unit has been designed to be managed with three operating modes;

1 OPERATION WITH STAND ALONE REMOTE PANEL

The unit operates via the temperature / humidity control panel (OPTIONAL) where it is possible to select the set point, fan speed, activation, time slots and all the unit parameters



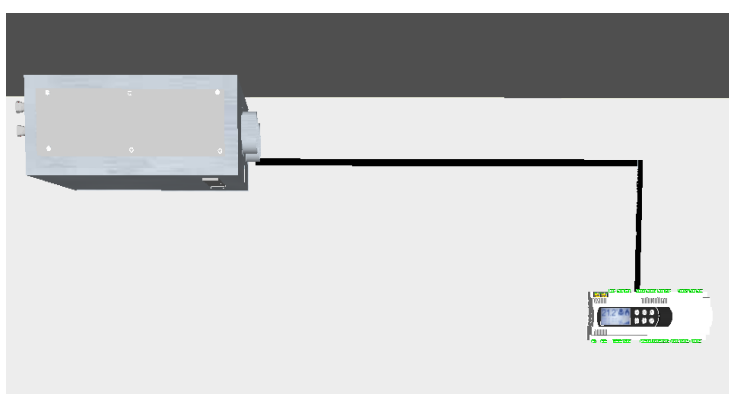
2 OPERATION WITH COMMANDS Like a classic dehumidifier, the unit is managed via digital commands; It is possible to activate the ON OFF, SUMMER/WINTER, DEHUMIDIFICATION, INTEGRATION functions, receive an ALARM signal, and regulate the speed of the fans via the 0-10 v dc signal; The inputs can also be activated by the classic wall thermostats/humidistats;



3 OPERATION WITH MODBUS RS485 RTU

The unit can also be controlled via Modbus RS485 which is always present on the unit;

Through serial communication from an external Master device it will be possible to activate and modify all the functions of the unit;



5.1.5 VERSION ELECTRICAL CONNECTIONS



CNU TERMINAL ELECTRONIC CARD CONNECTION

The electronics installed on the unit include a semi-graphic remote terminal with capacitive keys and an internal temperature / humidity sensor;

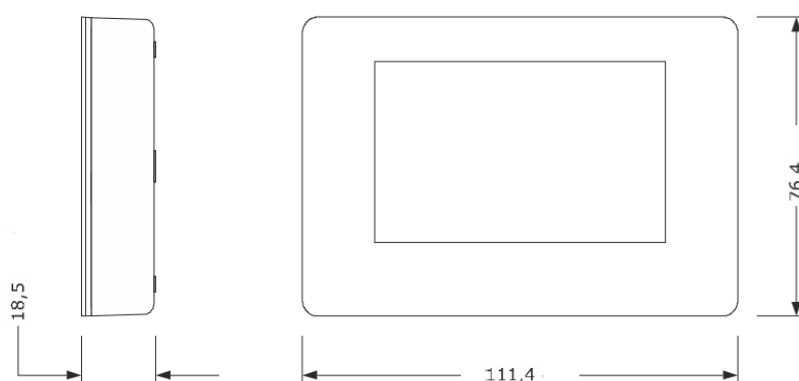
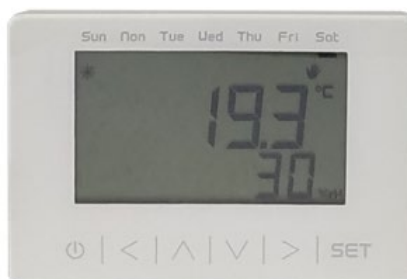
The graphic terminal can be mounted on the wall or outside the 503 box;

The terminal is always supplied, in the configuration for wall mounting or on a 503 box, which protrudes with respect to the wall;

For the connection, use a shielded/braided cable (min. 1mm) with a maximum distance of 15m between the remote terminal and the board on the unit.

- 12 - Feeding
- 0 - Power
- A+ - Communication
- B- - Communication

Check the type of connection according to the installation distance in the following diagrams:



Dimensions in mm

CNU display connection

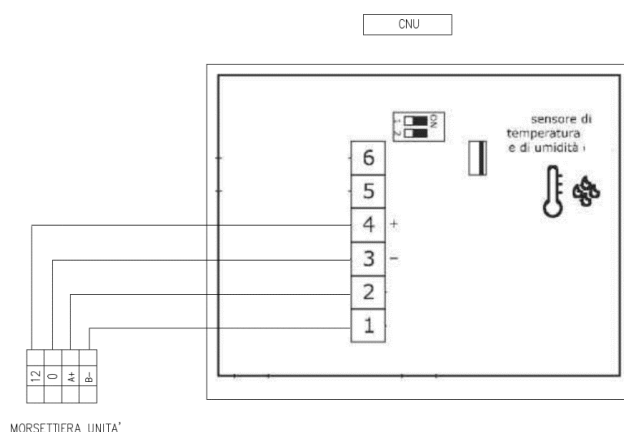
CONNECTION UP TO 15MT WITH DIRECT POWER SUPPLY FROM THE UNIT

The display can be connected directly to the unit up to distances of 15mt;

This connection provides both the power supply and the communication signal to the display;

NB Do not reverse the connections on the display;

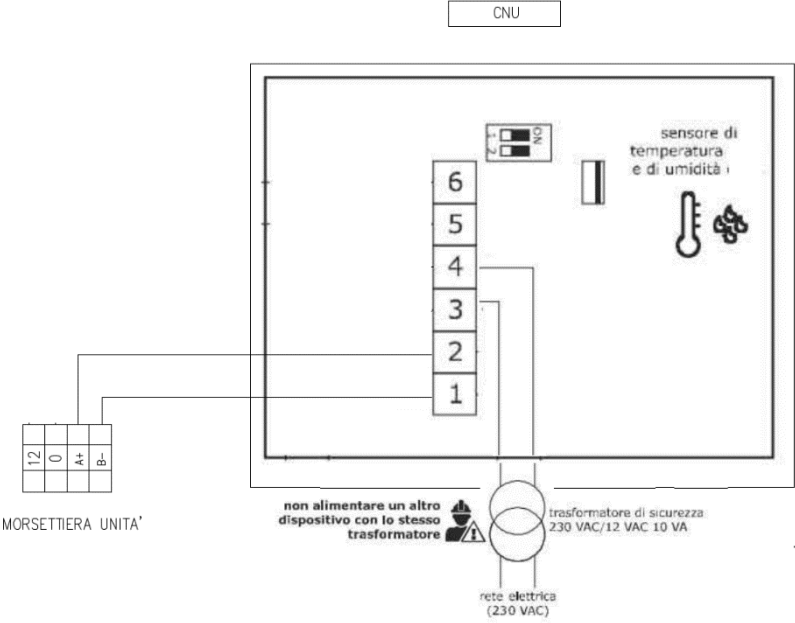
This could cause damage to both the display and the unit;



Recommended wire = 4 x 0.75mm

Display connection (up to 15mt)

CONNECTION BEYOND 15 M UP TO 100 M WITH EXTERNAL POWER SUPPLY

<p>If the connection distance is greater than 15mt, it becomes necessary to power the display from an external power supply to be supplied by the installer;</p> <p>The power supply must be:</p> <p>Voltage = 12 vdc</p> <p>Power = 10VA</p> <p>This connection is only the two-wire signal connection between unit and display;</p> <p>NB Do not reverse the connections on the display; This could cause damage to both the display and the unit;</p>	<div data-bbox="603 309 1401 929">  </div> <p>Recommended wire 2 x 0.75mm</p> <p>Display connection with external power supply (above 15mt)</p>
--	---

Auxiliary Connections

Some auxiliary functions have been implemented in the card which can be connected through the following descriptions:

CONNECTION ON / OFF UNIT REMOTELY

<p>The unit can be connected via a dry contact to a device for remotely switching the unit on/off such as a switch or a timer.</p> <p>With closed contact, the unit will be ON, with open contact, the unit will be forced to remote OFF.</p>	<div data-bbox="555 1305 834 1496">  <p>OFF OFF</p> </div> <p>Screw terminals</p>	<div data-bbox="1121 1317 1249 1529">  </div> <p>Recommended wire = 2x0.5mm / 2 x 0.75mm</p> <p>Remote on off command</p>
---	--	--

SUMMER / WINTER CONNECTION

<p>The unit can be connected via a clean contact to a device for selecting the operating season;</p> <p>With closed contact, the unit will be in summer mode, with open contact, the unit will be forced to winter mode;</p> <p>Through the remote control it will be possible to enable or disable this function;</p>	 E/I/E/I	
	Screw terminals	Recommended wire = 2x0.5mm / 2 x 0.75mm
	Contact summer winter	

DEHUMIDIFICATION REQUEST CONNECTION

<p>A humidistat or dehumidification control can be connected to the unit which forces the unit into dehumidification mode;</p> <p>A contact is foreseen through a standard thermostat with clean output contact;</p> <p>Contact Closed: unit in dehumidification</p> <p>Through the remote control, it will be possible to enable or disable this function;</p>	 DEU DEU	
	Screw terminals	Recommended wire = 2x0.5mm / 2 x 0.75mm
	Temperature request contact	

TEMPERATURE REQUEST CONNECTION

<p>It is possible to connect a thermostat to the unit which forces the unit into integration mode;</p> <p>A contact is foreseen through a standard thermostat with clean output contact;</p> <p>Contact Closed: unit in integration</p> <p>Through the remote control, it will be possible to enable or disable this function;</p>	 INT INT	
	Screw terminals	Recommended wire = 2x0.5mm / 2 x 0.75mm
	Temperature request contact	



FAN+ / FAN - CONNECTION

<p>The unit can be managed through a 0-10vdc signal to increase and decrease the speed of the fans;</p> <p>Each phase of the unit, ventilation, dehumidification and integration have a minimum and a maximum;</p> <p>The input signal is linear and goes from:</p> <p>Minimum fans = 10%</p> <p>Max fans = 100%</p>	 FAN-FAN+	
	Screw terminals	Recommended wire = 2x0.5mm / 2 x 0.75mm
	Fan regulation contact	

GENERIC ALARM SIGNALING CONNECTION

<p>The unit can signal a machine alarm through the generic alarm contact; the contact is a clean contact;</p> <p>Contact closed, alarm signal active;</p>	 <p>ALL ALL</p>	
	Screw terminals	Recommended wire = 2x0.5mm / 2 x 0.75mm
	External alarm contact	

PUMP / GENERATOR CONTROL

<p>The unit provides for the command of a generator or post battery, a 230 V command on the terminal block;</p> <p>Contact closed, presence of 230 v, with active request;</p>	 <p>PM PM</p>	
	Screw terminals	Recommended wire = 2x0.5mm / 2 x 0.75mm
	Pump / generator control	

2/3 POINT VALVE COMMAND

<p>The unit provides for the command of a 2/3-point On-off or 3-point modulating valve/coil, via the commands provided on the terminal board;</p> <ul style="list-style-type: none"> V3V (N) - Neutral V3V (L1) – Fixed power supply V3V (L2) – Opening command 	 <p>V3V V3V V3V</p>	
	Screw terminals	Recommended wire = 3x0.75mm / 3 x 1mm
	Water Valve Connection	

MODULATING FRESH AIR DAMPER CONTROL

The unit provides for the command and management of a modulating damper to be installed on the outside air with a 0-10v command signal, through the commands provided on the terminal board;

- 0 – Power
- 24 – Nutrition
- Y – 0-10vdc signal
- Gnd – Reference signal for 4-wire dampers



The damper has the function of choking the external air according to the relative humidity in summer to allow greater dehumidification;



0 24 Y GND



Screw terminals

Recommended wire = 3 x 0.75mm or 4 x 0.75mm
Shielded

Modulating damper connection

6 COMMISSIONING AND METHOD OF USE

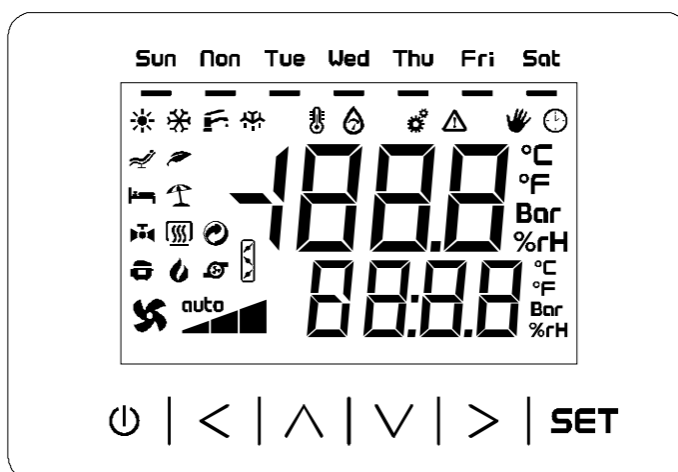
6.1.1 OPERATION VERSION -K- CNU REMOTE PANEL









6.1.1.1 CONTROL PANEL - KEY DESCRIPTION AND FUNCTION

The control panel of the units is a graphic keyboard with a screen resolution of 82x156 mm and IP65 front protection. The interface is structured through masks, in which there are writings, graphic symbols and numbers. The keys are located on the black bar at the bottom of the display. From the main screen, the day of the week can be displayed in the upper part, the ambient temperature in the upper line and the ambient humidity in the lower line. There are also status LEDs, which indicate the current operation of the unit according to the table described below.

The keyboard is equipped with 6 navigation keys and value editing keys with the following functions (black background for the commands of the built-in display while white background for the commands of the LCD display):

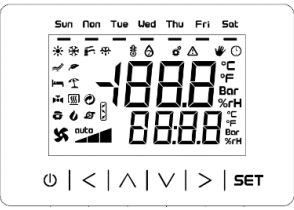
When alarm pages are displayed, if pressed, the ENTER key scrolls through all active alarms.























	allows you to change parameters or otherwise move the cursor		displays the pages on the same level in succession
	confirm the value or otherwise send commands associated with the text on which the cursor is positioned.		If pressed and held for about 2 seconds, it allows access to the main menu.
	If held down while an alarm page is displayed, this key will reset the alarm.		clear the value or otherwise request the default page which may be associated with the current page
	If pressed and held for about 2 seconds, the ESC key turns the machine on or off.		If pressed when in the main page, the key allows access to the list of active alarms

Mainstage

6.1.1.2 GRAPHIC ICON VIEWS


<p>-The unit can be enabled and disabled in two different ways.</p> <p>1) Through a clean contact connected to a device for remotely switching the unit on/off, such as a switch or a timer. With the contact closed, the unit will perform the actions indicated in point 2, while with the contact open, the machine will remain off and will display the "OFF Di" status.</p>	
	<p>Graphic icon display</p>

LED s	Meaning	LEDs	Meaning
	- If on, the machine is in summer mode.		- If off, the water valve is closed. - If on, the water valve is open.
	- - If on, the machine is in winter operation.		- If off, defrosting is not active. - If flashing, the dripping phase is active. - If on, the defrost is active.
	- If off, there are no active alarms. - If flashing, there are new alarms not yet displayed. - If on, at least one alarm is active.		- If flashing, it indicates which day the time slots are being modified. - If on, it indicates the day of the week.
	- If off, you are in the main display. - If on, you have entered the setup menus.		-If on, the comfort band is active.
	- If off, the time slots are active. - If on, the machine is in manual operation.		- If flashing, the Economy digital input is active. - If on, the economy band is active.
	- If off, the machine is in manual operation. - If on, the time slots are active.		If turned on, the night band is active.
	- If off, there is no dehumidification request. - If on, there is a dehumidification request.		If turned on, the holiday is active.
	- If off, the fans are off. - If flashing, the supply or return fan is waiting to be switched on or off according to the safety times. - If on, at least one fan is active.		- If off, there is no effective request for heat integration. - If on, there is an actual request for heat backup.
	- If off, the compressor is off. - If flashing slowly, the compressor is waiting to be switched on or off according to the safety times. - If flashing quickly, the compressor is in manual operation. - If on, the compressor is active.		Current speed of the supply fan. - No step on, the fan speed is less than 33%. - First step on, fan speed is 33% higher - Second step on, fan speed is 67% higher. - Third step on, the fan speed is equal to 100%.
	- If off, the recuperator is off. - If on, the recuperator is active.		- If off, the shutters are closed. - If on, at least one damper is open (outside air or recirculation).

6.1.1.3 TURNING THE UNIT ON AND OFF

The unit can be enabled and disabled in two different ways:

1) Through a clean contact connected to a device for remotely switching the unit on/off, such as a switch or a timer. With the contact closed, the unit will perform the actions indicated in point 2, while with the contact open, the machine will remain off and will display the "OFF Di" status.

2) Through the key  in the main screen of the display. If the contact described in point 1 is closed, the message "OFF KEY" will be displayed. By pressing the key for about 2 seconds, the machine will turn on; pressing the button again will turn it off



On off

6.1.1.4 GENERAL MENU

The general menu has no level and is the access point for all the other system menus.

To access, press and hold the key  for 2 seconds from each point of the interface. The menus available are the following

USER (USEr)

TIME BANDS (tb)

MAINTENANCE TECHNICIAN (MAIn)

INSTALLER (InSt)

MANUFACTURER (COOnS)

RTC (rtc)




ALARMS (ALAr)

HISTORICAL (HISt)

SAVE PARAMETERS (SAvE)

RESET PARAMETERS (rESt)

INFO (Info)

From this menu you can choose the menu you want to display by pressing the keys  , followed by the key  to confirm.



General menu

6.1.1.1 SEASONAL CHANGE

-The unit with remote panel connected provides for the seasonal change through the same remote panel; If the remote panel is not present, the seasonal change takes place via digital input (unit closed contact in summer)

- Press the button **SET** for 2 seconds to access the USER menu;

- Press the button **SET** to enter the user menu;

- The MODE parameter and the operating season between HEAT (winter) and COOL (summer) will be shown on the display

-To change the season, press the key **SET**, then press the keys **▽** **△** to select the season and confirm with the key **SET**;

To exit the menu, press the key **⏻**



Seasonal change

6.1.1.2 SET-POINT SETTING

-If the panel is present, the temperature and humidity will be detected by the internal sensors of the CNU; However, the forcing dehumidification and integration functions from digital inputs on the terminal board will also remain active; The settings of the various set points are therefore possible; - Press the

button **SET** for 2 seconds to access the USER menu; - Press the button **SET** to enter the user menu; - The MODE parameter will appear on the display, then press the keys **▽** **△** to select the set points to modify ;

The following will be displayed in sequence:

STC = Summer temperature set point

STH = Winter temperature set point

UO1 = Humidity set point




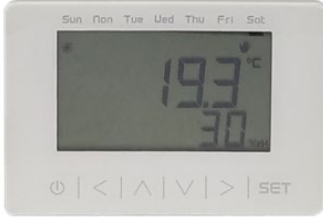
To change the sets, press the key **SET** on the desired parameter, then press the keys **▽** **△** to select the desired value and confirm with the key **SET**;

To exit the menu, press the key **⏻**















Set point setting

6.1.1.3 FAN SPEED SETTING

<p>-Inside the units there are (except in the version without recirculation) EC fans with modulating brushless motors; The minimum and maximum speeds are already configured in the factory but through the 0-10vdc input, or through the CNU command if present, it will be possible to select the most suitable speed with respect to the system ducts to obtain the best performance / noise ratio;</p> <p>- press the key for 2 seconds  to decrease the speed while the key  to increase speed;</p> <p>The bar with 3 segments indicated  reports the indications as described below:</p> <ul style="list-style-type: none"> - No step on, the fan speed is less than 33%. - First step on, fan speed is 33% higher - Second step on, fan speed is 67% higher. - Third step on, the fan speed is equal to 100%. 	 <p><i>Fan speed setting</i></p>
---	---

6.1.1.4 CLOCK SET (RTC)

<p>This menu contains the functions of the RTC (Real Time Clock) system. When the controller remains without voltage for a few days, the RTC system clock loses the active time. When restarting it is necessary to reset the current date and time. In this case, when the machine is switched on, the pages for setting the time shown on the side are presented.</p> <p>To configure the clock:</p> <ul style="list-style-type: none"> - Press the button  for 2 seconds to access the USER menu; - Then press the keys   to select the rtc menu - Press the key  to enter the Rtc menu -Set RTC will be shown on the display, then press the keys   to select the day, month, year, hour and minutes to modify; <p>To change the values, press the key  on the desired parameter, then press the keys   to select the desired value and confirm with the key  ;</p> <p>Once the clock has been configured, press the ENTER key on "SAVE". If the "AL26 – RTC alarm" alarm does not disappear, remove and re-apply voltage and repeat the procedure.</p> <p>To exit the menu, press the key </p>	 <p><i>Clock setting (RTC)</i></p>
--	---

6.1.1.5 USER MENU

This section contains the parameters visible and modifiable by the user, listed on the side.

- Press the button **SET** for 2 seconds to access the USER menu;

- Press the button **SET** to enter the user menu;

- The MODE parameter will appear on the display, then press the keys **▽** **△** to select and display the user menu parameters;

- To modify the parameters, press the key **SET** on the desired parameter, then press the keys **▽** **△** to select the desired value and confirm with the key **SET**;

To exit the menu, press the key **⏻**



(MOD)	summer/winter operation	(STC)	Set point for summer operation
(STH)	Set point for winter operation	(UO1)	Room humidity set point
(SCC)	Comfort range cold set point	(SCH)	Comfort band hot set point
(OEC)	economy band cold offset	(OEH)	economy band hot offset
(ONC)	cold offset night band	(ONH)	warm offset band night
(SDC)	Cooling set point forcing from DI	(SDH)	Hot set point forcing from DI
(FSC)	Comfort range fans set point	(ESF)	Economy band fans set point
(FSN)	Night band fan set point	(BYN)	backlight display mode
(BYU)	display backlight percentage	(BYT)	display backlight timeout
(BYU)	Cooling set point forcing from DI	(BYT)	Hot set point forcing from DI
(PS1)	user password		

User menu parameters

6.1.1.6 VIEW STATUS PAGES

con unit in ON, by pressing the keys \triangleright \triangleleft , you can view the status pages of each family. In each page / family of states, the information can be displayed by pressing the keys ∇ \wedge .

The screens available are:

SETdisplay of time slots and release of the current slot In these screens you can:

- enable time band regulation via "Etb".
- view the current time band using "tb" ("---" = no band active, "OFF" = band OFF active, "COMF" = comfort band active, "ECO" = economy band active, "nIGH" = night band active, "H" = holiday band active),
- view and modify the set currently in use using "SEt". With time band regulation, the modification of the current set will be valid only for the band currently in progress.

FAN fans status display

In these screens you can view:

- the status ("---" = fan disabled, "OFF" = fan off, "tOn" = fan waiting for ignition, "On" = fan on, "tOFF" = fan waiting for switching off)
- the status and speed of the supply fan indicated with "SUP" and of the expulsion fan indicated with the label "rEt".

CMP compressor status display

In these screens it is possible to view whether or not there is:

- the dehumidification request "dEH"
- the humidity set point "SEt"
- compressor status "StS" ("----" = compressor disabled, "ALrM" = compressor in alarm, "MAnU" = compressor in manual operation, "tOn" = compressor waiting for ignition, "On" = compressor on, "tOFF" = compressor waiting for shutdown, "OFF" = compressor off)
- the status of the on/off compressor digital output,
- the status of the air condensing valve "Air" and the status of the water condensing valve "H2O".

H2O water valve status display

In these screens it is possible to view the status of the water valve ("----" = valve disabled, "OFF" = valve closed, "On" = valve open).

DAMP dampers status display

In these screens it is possible to view: the status of the recirculation damper "rEC" and the status of the external air damper "StS" ("---" = damper disabled, "OFF" = damper closed, "tOFF" = damper closing, "On" = damper open)

- the opening percentage of the "AO" modulating outside air damper

RECO heat recovery status display

In this screen you can view:

- the value of the "EFC" efficiency
- the status of the recovery unit "StS" ("---" = recovery unit disabled, "OFF" = recovery unit off, "OFFd" = recovery unit off for defrost, "OFCH" = recovery unit off for free-cooling/heating, "On" = recuperator active)
- the status of the digital output "dO".

PROB probe status display



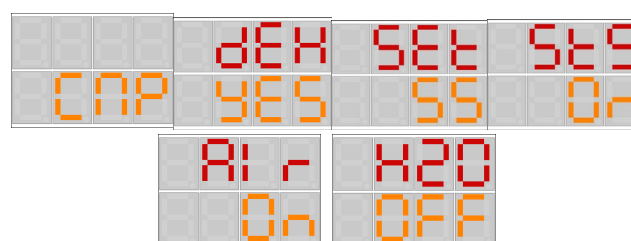
Time slots screen



Ventilators screen



Compressor screen



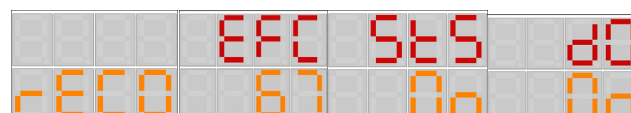
Water valve screen



Shutters screen



Recovery screen




Sensor status screen

In these screens it is possible to view the status of the sensors indicated with the following wording: "trE" = ambient/return T., "tOd" = external T., "tUA" = water T., "tEH" = expulsion T., "HUM" = Room humidity, "FAn" = Fan remote potentiometer input value.





6.1.1.7 ALARMS MENU

Pressing the key  in the main display screen, it allows access to the alarm menu; the writing ALM PAGE will be displayed. By pressing the SET key it is possible to view the alarms in progress. Two types of text will be displayed:

-No ALAr: No alarm present


-ALM Alxx: Indicates the presence of an alarm, where xx indicates the error code. For further information, refer to the Alarm Table section.

There are two types of alarms, those with manual reset and those with automatic reset, and both will be displayed in the alarm menu. Once the conditions for which the alarm occurred are restored, if the alarm has automatic reset the alarm will reset without the user having to intervene; in the event of manual reset, to reset, proceed as follows:

- Position yourself with the keys   on the page of the alarm to be reset

-press and hold the key  for about 2 seconds

At this point, if there are no other alarms, the message "No ALAr" will be displayed; the alarm icon will go off and the machine will return to its regular operation, or the page relating to the next active alarm will be displayed.

To exit the menu, press the key 



Display menu display and information

6.1.1.8 ALARM HISTORY MENU

This section contains the history of the alarms memorized by the controller:

Press the button **SET** for 2 seconds to access the USER menu;

- then press the keys **↓** **↑** to select the HIST menu and press **SET** to access it ;

This menu allows you to view the alarm history.

The ALARM HISTORY page shows the last alarm. To view previous alarms, press the key **SET**. By repeating this procedure, all the elements of the history are scrolled until the first alarm is displayed. The history display is circular.

To exit the menu, press the key **⏻**





Visualization of alarm history menu



6.1.1.9 MAINTENANCE / INSTALLER / MANUFACTURER MENU


In this section it is possible to access the menus reserved for MAINTENANCE / INSTALLER / MANUFACTURER level settings:

- Press the button **SET** for 2 seconds to access the USER menu;

- then press the keys   to select the desired menu and press **SET** to access it;

This menu is protected by a password which is requested before accessing it;

Press the button **SET**, then press the keys   to select the password and confirm with **SET**

To exit the menu, press the key 

ATTENTION: Modifications of these parameters involve an unapproved and dangerous modification for the operation of the unit; Contact authorized personnel only!



Maintenance / installer / builder menu

7 MAINTENANCE

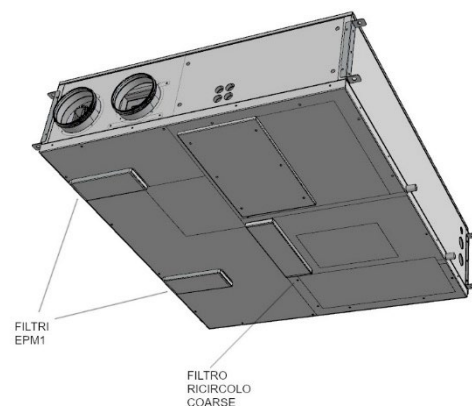
To always guarantee the correct and optimal functioning of the unit, it is necessary to carry out all the maintenance interventions periodically.

7.1.1 CLEANING

To replace the filters, or clean them, proceed as follows:

- remove power to the unit;
- open the lids of the filters through
- take out the dirty filters;
- gently insert the new filters;
- close the lid with the dedicated knobs;

If the conditions of the filters allow it, they can be cleaned using a vacuum cleaner or a low pressure compressor.



View for filter extraction

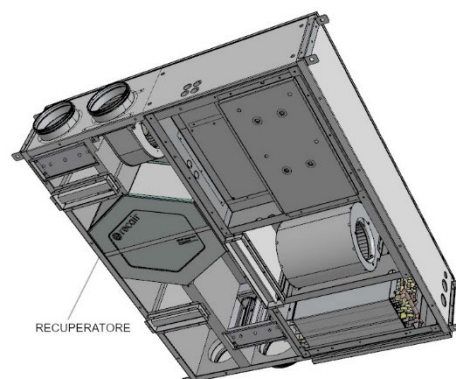
7.1.2 CLEANING THE HEAT EXCHANGER

It is advisable to check the condition of the heat exchanger each time you clean/change the filters and to clean it if deemed appropriate. This operation must only be carried out by qualified personnel (installer).

To clean the heat exchanger proceed as follows:

- remove power to the unit
- in case of ceiling installation, disconnect the condensate drain pipe;
- open the cover of the unit by releasing the fastening hooks and removing the screws;
- extract the heat exchanger using the specific green clamp/straps;
- proceed with cleaning very delicately using a vacuum cleaner or a low pressure compressor (to prevent dirt from entering the heat exchanger, clean in the opposite direction to that of the air flow);
- put the exchanger back in place;
- close the cover locking it in position by blocking the fixing hooks and inserting the screws;

Attention! Never touch the fins of the exchanger, handle the exchanger keeping it only on the closed sides.



View for exchanger extraction

7.1.3 GENERAL CLEANING OF THE UNIT

It is advisable to occasionally check and, if necessary, clean the fans, the condensate drain and the internal walls of the unit. These operations must only be carried out by qualified personnel (installer).

To carry out the above operations, proceed as follows:

remove power to the unit

in case of ceiling installation, disconnect the condensate drain pipe;

open the cover of the unit by releasing the fixing hooks on it;

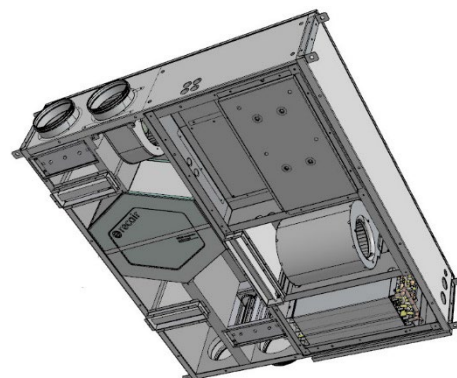
check and if necessary clean the fans, the condensate drain and the walls;

close the cover locking it with the fixing hooks on the unit

connect the power cord and turn on the unit from the switch on the side panel.

For cleaning it is possible to use a vacuum cleaner, a cloth slightly moistened with water, a soft bristle brush or a low pressure compressor.

Attention! On the blades there are small metal clips for balancing the blades themselves, DO NOT remove them.



Unit views for general cleaning

8 ALARMS

8.1.1 GENERALITY

In the event of problems or failures, take note of any error code that has appeared on the display of the electronic control unit or of the remote control, take note of the model and serial number of the unit you have (present on the identification plate attached to the side of the unit) and contact the installer.

8.1.2 PROBLEMS WITHOUT ERROR INDICATION ON THE DISPLAY

Problem	Causes	Remedies
Display off	No power (illuminated switch off)	Check the connection to the electrical network.
Little or no air flow The premises remain humid	Clogged filters	Replace filters
	Clogged exchanger	Clean the exchanger
	Ice cream exchanger	Take the exchanger to a warm place and wait for it to defrost, do not heat with direct heat sources.
	Dirty fan	Clean the fan
	Clogged fan ducts	Clean the ventilation ducts
	Outside temperature below 0 °C	The unit may be in anti-freeze mode, wait until the outside temperature rises or install an electric heater for pre-heating.
High noise	Noise coming from the unit	Check for cracks and/or air leaks from the unit panels Check the siphon connection Check if the motors turn correctly (bearings)
	Noise coming from the ducts	Check for cracks on the intake / intake / exhaust ducts
Vibrations Elevate	Panels that vibrate	Verify the integrity of the unit panels and profiles Check that the cover of the unit and the panel covering the electronic board are closed correctly Check that there are no walls that can transmit vibrations to the wall / floor / false ceilings
	Fan blades out of balance	Check the integrity of the blades Clean the fans Check that the small metal clips for balancing the blades are still present on the fans
Condensate leak	Clogged condensate drain	Clean the condensate drain
	Condensate does not flow from the drain duct into the collection tray	Verify that the unit is perfectly level Check that the condensate drain connections are not blocked

8.1.3 TABLE OF ALARMS INDICATED BY THE DISPLAY

Below is a list of all the alarms managed by the application.

The order of presentation is the same as the order in which alarms appear when active. The alarms can all be viewed even when the machine is off.

CODE	ALARM DESCRIPTION	RESET	CONSEQUENCE
AL01	High humidity warning	Automatic Manual after PA22 events/hour	Stops the return fan External air damper closed if digital External air damper partialization if analogical
AL02	High humidity alarm	Manual	View only
AL03	High water temperature in summer	Automatic	Heat integration inhibition Dehumidification inhibition if PU03=0
AL04	Low water temperature in winter	Automatic	Heat integration inhibition
AL12	Compressor high pressure switch.	Automatic Manual after PA35 events/hour	Stop the compressor
AL16	Antifreeze	Automatic	Stop the fans
AL17	Water flow switch	Automatic Manual after PA11 events/hour	Heat integration inhibition Dehumidification inhibition if (PU04=0) Closing the water valve
AL18	Generic alarm	Auto/Manu	Turn off all devices
AL19	Generic warning	Auto/Manu	Reporting only
AL22	Dirty filters alarm	Manual	Reporting only
AL25	I/O configuration error	Automatic	Turn off all devices
AL26	RTC clock faulty or disconnected	Auto/Manu	Time band management inhibition
AL28	Ambient/return temperature probe faulty or disconnected	Automatic	Inhibition of regulation dependent on it
AL29	External temperature probe faulty or disconnected	Automatic	Inhibition of regulation dependent on it
AL30	Water temperature probe faulty or disconnected	Automatic	Inhibition of regulation dependent on it
AL31	Faulty or disconnected exhaust temperature probe	Automatic	Inhibition of regulation dependent on it
AL34	Ambient/return humidity probe faulty or disconnected	Automatic	Inhibition of regulation dependent on it

AL35	Air quality probe faulty or disconnected	Automatic	Inhibition of regulation dependent on it
AL36	Fan remote potentiometer faulty or disconnected	Automatic	Inhibition of regulation dependent on it

9 **NOTES AND MAINTENANCE INFORMATION**

NOTE

03-2023-01

Technical Assistance Center

The data contained in this manual may be changed by the manufacturer without notice.