HI-TECH PUR 4.0 CEILING-MOUNTED DUCTED ENTHALPIC HEAT RECOVERY UNIT

- ACD300002 - Enthalpic heat recovery unit HI-TECH PUR 4.0 250m³/h
- ACD300003 - Enthalpic heat recovery unit HI-TECH PUR 4.0 500m³/h
- ACD300004 - Enthalpic heat recovery unit HI-TECH PUR 4.0 800m³/h
- ACD300005 - Enthalpic heat recovery unit HI-TECH PUR 4.0 1000m³/h
- ACD300006 - Enthalpic heat recovery unit HI-TECH PUR 4.0 1300m³/h

Hi-Tech pur 4.0

Apply.co® Mechanical Controlled Ventilation

by Tecnosystemi® group

Tecnosystemi S.p.A. - Società Benefit
www.tecnosystemi.com

via dell'Industria, 2/4 - Z.I. San Giacomo di Veglia
31029 Vittorio Veneto (Treviso) - Italy
Phone +39 0438.500044 Fax +39 0438.501516

Numero Verde 800 904474 (only for Italy)
email: info@tecnosystemi.com
C.F. - P. IVA - R.I.TV IT02535780247 | Cap. Soc. € 5.000.000,00 i.v.

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1_GENERAL WARNINGS

The product is not intended to be used by persons (including children) whose physical, sensory or mental abilities are reduced, or who lack experience or knowledge, unless they have been able to benefit, through the intermediary of a person responsible for their safety, from surveillance or instructions regarding the use of the product.

Children must be supervised to ensure that they do not play with the appliance.

Any product installation and/or maintenance operation must be performed exclusively by professionally qualified and authorised personnel.

TECNOSYSTEMI S.p.A. a Benefit Company declines all responsibility for any damage caused by incorrect installation and improper use or tampering with the control.

During installation, maintenance and repairs, for safety reasons, the following are necessary:

- Always use work gloves;
- Do not expose the product to flammable gas;
- Do not install in an explosive or corrosive atmosphere, in humid places, outdoors or in environments with a significant quantity of dust.
- Do not carry out any type of operation or maintenance and do not remove any protective element without first disconnecting the product from the power supply.
- Do not operate the unit unless its electrical components have been connected to the building's earthing system;
- Do not operate the unit without the fan inlet and outlet connections having been connected to a duct;
- Do not use the unit as a support for other machinery;
- Do not use the unit as a boardwalk;
- Do not use the unit for equipment storage;
- Do not open the inspection panels with the fan running, especially in the pressurised sections;
- Do not leave the inspection panels partially closed; make sure that all the handles or knobs are perfectly closed;
- Wear personal protection equipment before working on the unit;
- Before accessing the unit, make sure that all the electrical utilities have been cut off. In particular, before opening the inspection panels, make sure that the fan is off and that it cannot be turned on again without the knowledge of whoever is working on the unit;
- Before starting the fan, always reassemble the protective casing or the closing panel of the fan section;
- Be careful when lifting the unit whose centre of gravity may also be very unbalanced;
- Be careful when locking the lifting ropes/hooks;
- Pay attention to the sheet metal edges inside the unit;
- Pay attention to the sheet metal edges on the outside of the unit;

Make the electrical connections according to the laws and national standards in force.
Do not twist, detach or pull the electrical cables coming out of the product even if it is not connected to the electrical supply.
Make sure that the electrical system is suitable for supplying not only the required operating current but also the current needed to power household appliances and equipment already in use.
Do not remove the product safety labels.
In case of illegibility, request a replacement.
It is dangerous to touch the product with wet body parts and bare feet.
Do not throw or spray water onto the product.

The Company reserves the right to introduce, at any time, the modifications necessary to improve the product.

The machine is equipped with a series of prevention and safety devices described in detail in the accompanying documentation. The installer must connect and activate all these assembled components, verifying their functionality.

The non-activation, or the removal or inhibition of the active safety systems, as well as the removal of the passive safety systems, exempt Tecnosystemi S.p.A. Benefit Company from any liability regarding any accidents or damage, direct or indirect, to persons and/or property, attributable to your machine.

Transportation, handling, installation and subsequent operation must take place in full compliance with the provisions of this preface, in the subsequent indications of the manual and in the accompanying documentation.

2_DESCRIPTION

2.1 INTRODUCTION

A heat recovery unit is an essential component of residential controlled mechanical ventilation systems. These systems represent the most efficient solution from an energy point of view to guarantee adequate ventilation of the internal environments.

The functioning of a heat recovery unit, with a crossed flow exchange pack, is based on the use of a dedicated heat exchanger which allows recovery of the thermal energy of the extracted air which, otherwise, would be dispersed outside.

In this way, energy consumption for space heating or cooling is significantly reduced, while ensuring a high level of indoor air quality.

The exhaust air of the internal environments is expelled from the building, while the fresh and clean air from the outside is filtered and introduced inside the building. This process ensures adequate ventilation of the internal environments, while reducing heat dispersion.

This manual contains a detailed description of the technical specifications of the HI-TECH PUR 4.0 recovery units, the instructions for its operation, installation and assembly, as well as the technical data.

It is advisable to carefully follow all the instructions provided in this manual to ensure:
• the reduction or elimination of any unforeseen faults;
• an improvement in the performance of the components, with consequent energy savings;
• an increase in the durability of the constituent elements and of the entire unit;
• a reduction in maintenance costs.

2.2 GENERAL INDICATIONS

This manual was created to ensure correct installation, set-up and maintenance of the machine. The company assumes no contractual or non-contractual responsibility for damage to persons, animals or goods caused by installation, adjustment, maintenance or improper use errors. Any use other than that specified does not commit the manufacturer in any way.

It should be noted that this documentation is provided for informational purposes only and does not constitute a binding contract for third parties. The company undertakes to continuously improve and develop its products and reserves the right to make changes to specifications, fittings and documentation at any time, without notice and without the obligation to update the versions already delivered.

These instructions for use and installation of the product can be downloaded from and are available on the website www.tecnosystemi.com or can be requested at the e-mail address assistenza@tecnosystemi.com, indicating the model and serial number of the device.

2.3 PURPOSE AND CONTENT OF THE INSTRUCTIONS

These instructions provide essential information for installing, using, testing and maintaining the machine. They have been drawn up in compliance with the European Union regulations and with the technical standards in force at the time of their publication.
Please observe the local safety regulations during installation. These instructions include indications to prevent improper use of the machine in a reasonably foreseeable manner.

2.4 STORAGE OF THE INSTRUCTIONS

The current manual and the wiring diagram of the unit must be carefully stored in a suitable place, protected from dust and humidity, and easily accessible to users and operators for any future consultation. The instructions must always be supplied with the machine for its entire life cycle and, consequently, must be passed on to any subsequent potential user.

2.5 UPDATED INSTRUCTIONS

We always recommend checking that the instructions are updated to the latest revision available. Any updates sent to the customer should be attached to this manual.
Our company is available to provide any information regarding the use of our products.

2.6 HOW TO USE THESE INSTRUCTIONS

The instructions are an integral part of the machine.

Before any operation on the machine, users or operators are required to consult the instructions and to do so also in the event of uncertainty regarding transportation, handling, installation, maintenance, use and dismantling of the machine.

To guarantee maximum safety during operations, these instructions contain graphic symbols which draw the attention of operators and users to specific procedures to be performed in a safe manner, as described in the following paragraphs.

2.7 RESIDUAL RISKS

Residual risk identifies all the dangers that cannot be fully reduced through design and protection techniques, or potential danger that is not evident.
This manual indicates every operation that can generate a risk situation in addition to the precautionary measures to be observed on a case-by-case basis

- All the units are equipped with pictograms with danger warnings.
- The units are safe machines, provided that the safety protections are not tampered with or removed.
- Technical preparation and observance of the procedures illustrated in this manual and of the signs affixed to the critical points of the unit in any case allow safe operation.
- During installation, commissioning, use and maintenance of the control units, the following safety standards must be observed:

ATTENTION

This manual indicates every operation that can generate a risk situation in addition to the precautionary measures to be observed on a case-by-case basis.

- Do not operate the unit without it and its electrical components having been connected to the building's earthing system;
- Do not operate the unit without the fan mouth having been connected to a duct or protected with an accident prevention mesh;
- Do not use the unit as a prop for other machinery;
- Do not use the unit as a walkway;
- Do not use the unit for equipment storage;
- Do not open the inspection panels with the fan running, especially in the pressurised sections;
- Do not leave the inspection panels partially closed; make sure that all the handles or knobs are perfectly closed;

- Wear personal protection equipment before working on the unit;

- Before accessing the unit, make sure that all the electrical utilities have been cut off. In particular, before opening the inspection panels, make sure that the fan is off and that it cannot be turned on again without the knowledge of whoever is working on the unit;

- Before starting the fan, always reassemble the protective casing or the closing panel of the fan section;

- Be careful when lifting the unit whose centre of gravity may also be very unbalanced;
- Be careful when locking the lifting ropes/hooks;
- Pay attention to the sheet metal edges inside the unit;
- Pay attention to the sheet metal edges on the outside of the unit;
- Pay attention to possible burns deriving from heating coils;

The machine has been designed in such a way as to minimise risks to the safety of persons who will be interacting with it. During the project it was not technically possible to completely eliminate the causes of risk. Therefore it is absolutely necessary to refer to the following instructions and symbols.

COMPONENTS CONSIDERED (if present)	RESIDUAL RISK	INJURY METHOD	PREVENTION AND PROTECTION
Mixing chamber with shutters and servo commands	Crushing	Contact	Remove voltage before any operation
Recovery unit	Small cut injuries, crushing	Contact	Avoid contact, use protective gloves
Fans	Injuries	Insertion of objects while the fans are in operation	Do not insert objects of any kind into the ventilating sections
Unit exterior: area surrounding the unit	Intoxications, severe burns	Fire due to short circuit or overheating of the power line upstream of the unit's electrical panel	Section of the cables and protection system of the power supply line complying with the standards in force.
Inside the unit: electrical cables and metal parts	Electrocution, severe burns	Insulation defect of power cables, live metal parts	Adequate electrical protection of power lines; utmost care in carrying out the earth connection of the metal parts

2.8 GENERAL INFORMATION ON SAFETY SYMBOLS

Individual safety symbols according to the ISO 3864-2 standard:

PROHIBITION
A black symbol inserted in a red circle with a red diagonal indicates an action that must not be performed.

WARNING
A black graphic symbol inserted in a yellow triangle with black borders indicates a danger.

COMPULSORY ACTION
A white symbol inserted in a blue circle indicates an action that must be performed to avoid a risk.

2.9 SAFETY SYMBOLS USED
READ AND UNDERSTAND THE MACHINE INSTRUCTIONS BEFORE CARRYING OUT ANY OPERATION

GENERAL DANGER
Strictly observe all the indications next to the pictogram.
Failure to follow the instructions can generate risk situations with possible consequent damage to the health of the operator and of the user in general.

ELECTRICAL HAZARD
Strictly observe all the indications next to the pictogram.
The symbol indicates machine components or, in this manual, identifies actions that could generate electrical hazards.

MOVING PARTS
The symbol indicates moving machine components that could generate risks.

CUTTING SURFACES
The symbol indicates components or parts of the machine that could cause cutting injuries upon contact.

EARTHING CONNECTION
The symbol identifies the point of the machine for grounding.

RECOVERABLE OR RECYCLABLE MATERIAL

2.10 LIMITS OF USE AND NON-PERMITTED USES

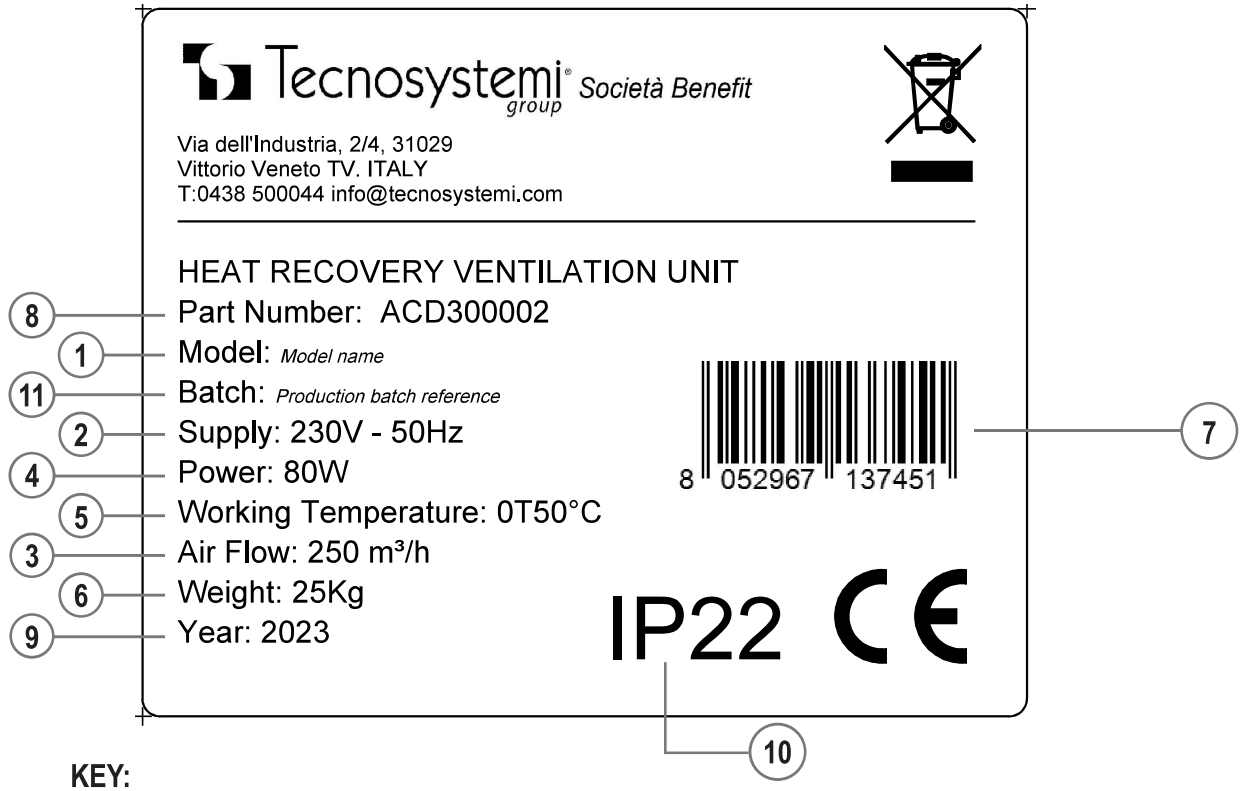
The machine was designed and built exclusively for the uses described in the technical manual.
Any other use is prohibited as it could generate risks for the health of operators and users.

However, the unit is not suitable to be operated in environments:
- where there are vibrations;
- where electromagnetic fields are present;
- in which aggressive atmospheres are present.

THIS UNIT IS NOT SUITABLE FOR OPERATION IN EXPLOSIVE ATMOSPHERES.

2.11 IDENTIFICATION OF THE UNIT

Each unit is equipped with a plate fixed to the outside of the same, which shows the identification data of the machine and the main technical characteristics. For electrical information not present on the label, refer to the wiring diagram. Check that the characteristics of the electrical network comply with the data shown on the identification plate. A FAC-SIMILE of the plate is shown below with the relative legend of the data reported on it:



KEY:

(1) Model
(2) Electrical power supply characteristics
(3) Nominal air flow
(4) Electrical power absorbed
(5) Max electric current absorbed
(6) Weight of the basic unit
(7) EAN code
(8) Unit item code
(9) Year of manufacture
(10) IP Rating
(11) Production batch

The identification label must never be removed from the unit.

3_TECHNICAL CHARACTERISTICS

3.1 PLATE DATA

ELECTRICAL AND PERFORMANCE DATA						
		ACD300002	ACD300003	ACD300004	ACD300005	ACD300006
Airflow (m3/h)		250	500	800	1000	1300
Airflow (l/s)		70	139	222	278	361
External pressure (Pa)		100	120	150	150	90
ENTH. EFF. (%)	COOLING	62-71	60-74	63-71	60-70	56-68
	HEATING	65-73	63-78	65-75	62-72	59-70
TEMP. EFF (%)		73	76	76	76	73
NOISE DB(A)		34.5	39	42	43	43
POWER SUPPLY		220-240V - 50Hz - 1Ph				
INPUT POWER (W)		80	230	368	409	424
POWER CABLE		3 x 1.5 mm2				
CONTROL CABLE		2 x 0.5 mm2				
CONTROL	STANDARD	Yes (7-Day Time-clock)				
	(BMS) MODBUS	Yes				
FAN TYPE		BLDC Fan Motors				
FAN SPEEDS		10 Speed Fan Control				
SUMMER BYPASS		Yes (Automatic with adjustable range)				
FAN BOOST CONTACTS		Yes (1x available connections to Volt-Free contacts: Close= boost to High Speed)				
FIRE SHUTDOWN		Yes (1x available connection to Volt-Free contacts: Closed = Shutdown)				
WEIGHT (kg)		25	34	61	71	71
DUCT SIZE (mm)		144	194	242	242	242

3.2 RECOVERY UNIT TECHNICAL AND ECOCOMPATIBLE CHARACTERISTICS

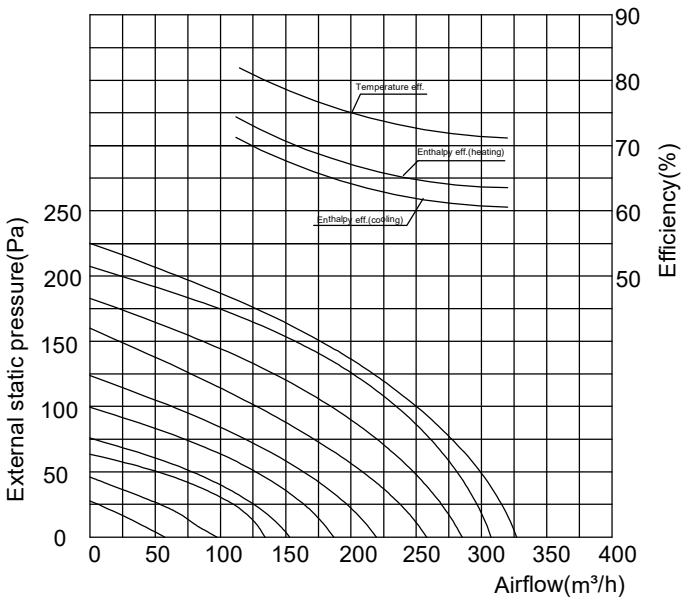
According to Commission Regulation (EU) No 1253/2014 implementing Directive 2009/125/EC.

a) Brand		Tecnosystemi				
b) Model		**ACD300002**	**ACD300003**	**ACD300004**	**ACD300005**	**ACD300006**
c) Typology		NRVU, BVU - Non-Residential Ventilation Unit, Bidirectional				
d) Type of drive		10 speed				
e) type of HRS		Recuperative				
f) thermal efficiency of heat recovery	%	73.0	76.0	76.0	76.0	83.0
g) nominal NRVU flow rate	m3/s	0.069	0.139	0.222	0.278	0.361
h) electric power input	kW	0.08	0.23	0.368	0.409	0.424
i) SFPint	W/(m3/s)	152	191	166	184	212
j) face velocity at design flow rate	m/s	1.22	1.50	1.26	1.42	1.70
k) nominal external pressure (Δps, ext)	Pa	100	120	150	150	90
l) internal pressure drop of ventilation components (Δps,int)	Pa	88	111	93	107	110
n) static efficiency of fans used in accordance with Regulation (EU) No 327/2011	%	58	58	56	58	58
o) maximum external leakage rate	%	3	3	3	3	3
o) maximum internal leakage rate	%	7.8	7.7	7.8	7.8	7.8
p) energy classification of the filters		C	C	C	C	C
q) description of visual filter warning		Pressure control				
r) casing sound power level (LWA)	dB(A)	34.5	39	42	43	43
s) internet address		www.tecnosystemi.com				

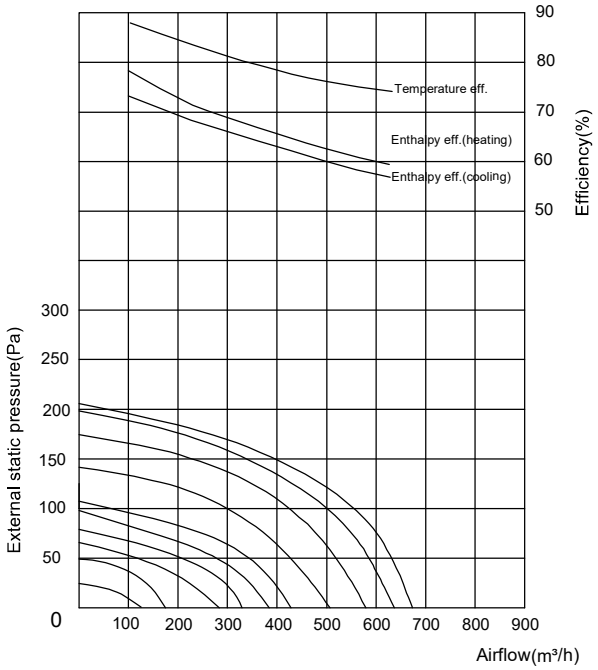
3.3 FLOW RATE AND AIRFLOW GRAPHS

The graphs below indicate the operating limits of the EC fans installed on the units.
The reported static head must be considered useful for the ducts.

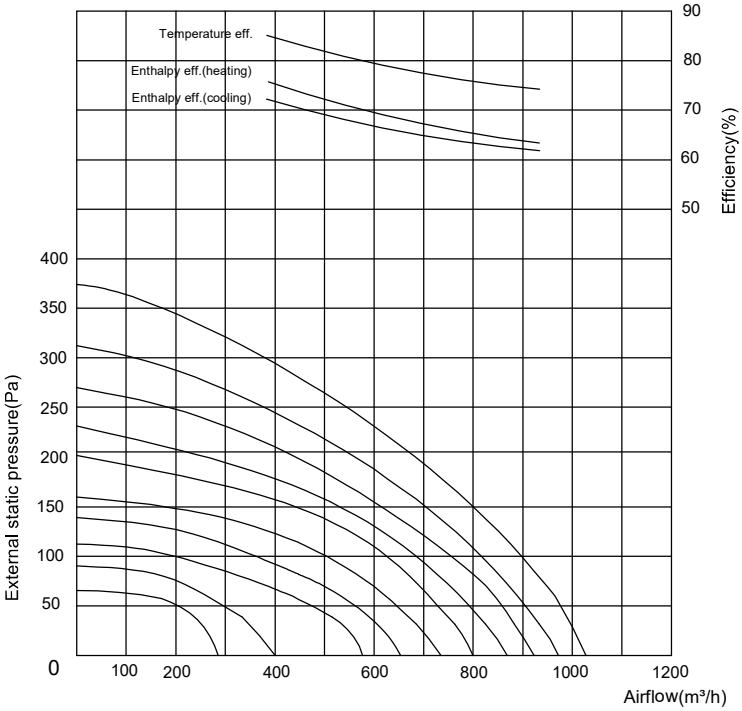
Performance Chart ACD300002



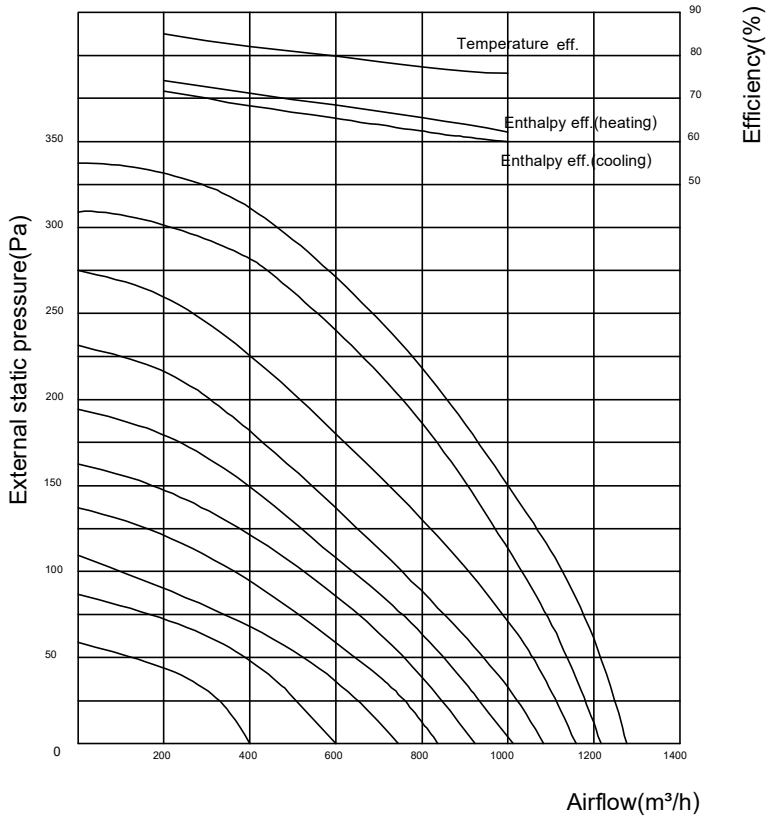
Performance Chart ACD300003



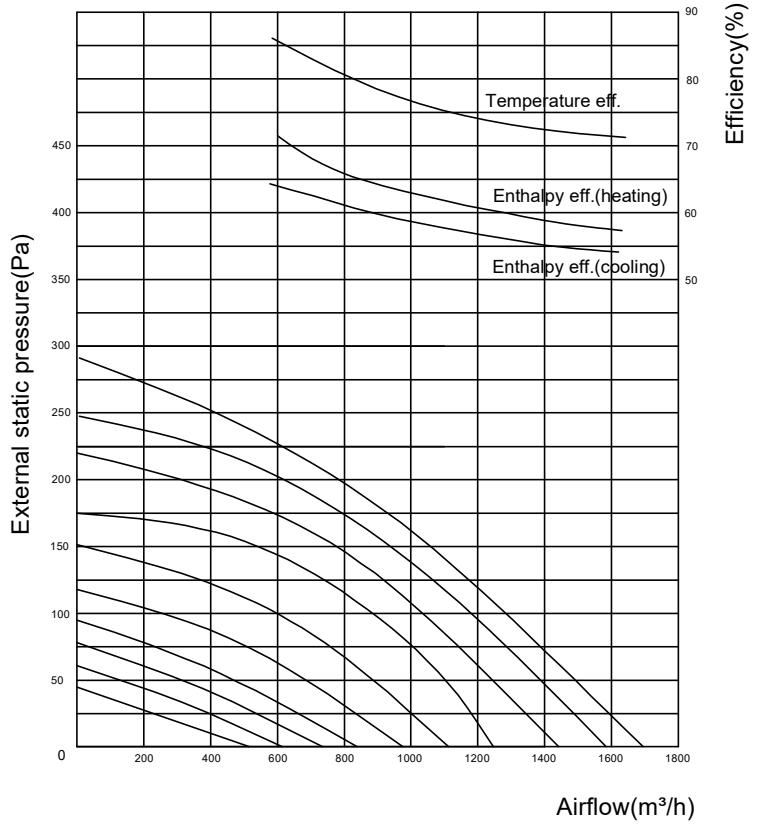
Performance Chart ACD300004



Performance Chart ACD300005



Performance Chart ACD300006



4_INSTALLATION

GENERAL WARNINGS AND USE OF SYMBOLS

All operations performed on the machine must be carried out by qualified personnel in compliance with the national legislation in force in the destination country.

The installation and maintenance of the machine must be performed according to the national or local regulations in force.

Do not approach or insert any object into moving parts.

HEALTH & SAFETY OF WORKERS

The operator's workplace must be kept clean, tidy and free from objects that could restrict free movement. The workplace must be adequately lit for the intended operations. Insufficient or excessive lighting can cause risks.

Ensure that excellent ventilation of the work rooms is always guaranteed and that the extraction systems are always functional, in an excellent condition and in compliance with the provisions of the law.

PERSONAL PROTECTIVE EQUIPMENT

The operators who carry out the installation and maintenance of the machine must wear the personal protection equipment required by law listed below.

Protective footwear.

Eye protection.

Protection gloves.

4.1 RECEIPT AND INSPECTION

When installing or servicing the unit, the rules indicated in this manual must be complied with, together with those on board the unit and, in any case, all necessary precautions must be taken. Failure to comply with these regulations may cause dangerous situations. On receiving the unit, check for any damage: the machine left the factory in perfect conditions; immediately report any signs of damage to the carrier and note them on the transport document before signing it.
The Customer must complete a written report in the event of significant damage.
Before accepting delivery, check:

- that the machine has not been damaged during transportation;
- that the delivered material corresponds to what is indicated in the transport document.

In case of damage or anomalies:

- immediately note the damage on the transport document;
- promptly inform the supplier.

4.2 STORAGE

If necessary, store the unit packed indoors. If the device has already been unpacked for some reason, follow the instructions below to prevent damage, corrosion or deterioration:

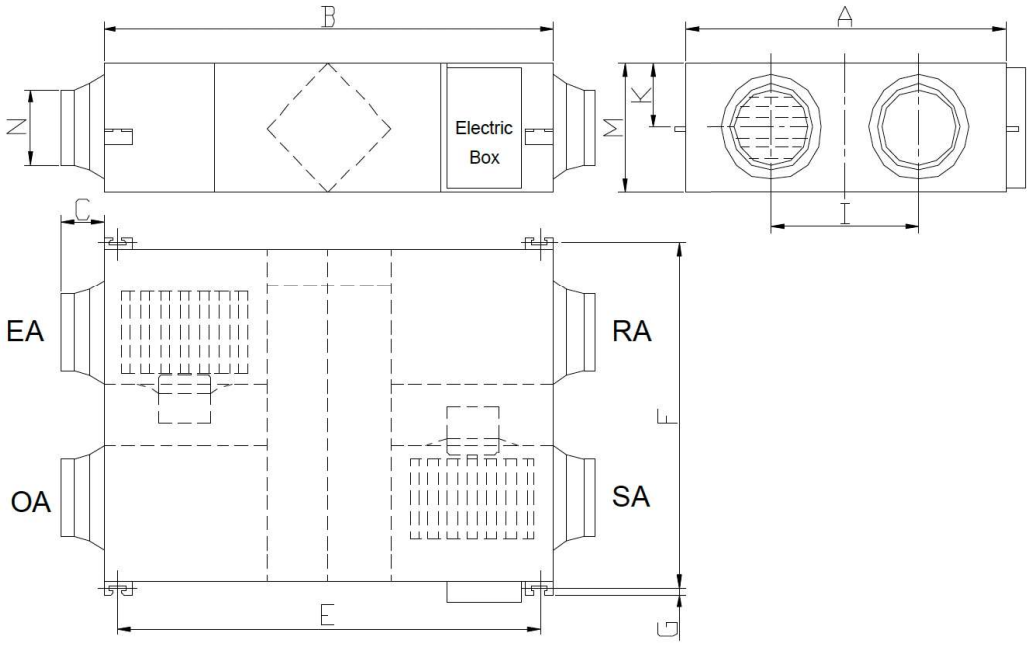
- ensure that all the openings are plugged or sealed properly;
- do not use steam or other cleaners to clean the unit as they could cause damage;

4.3 UNPACKING

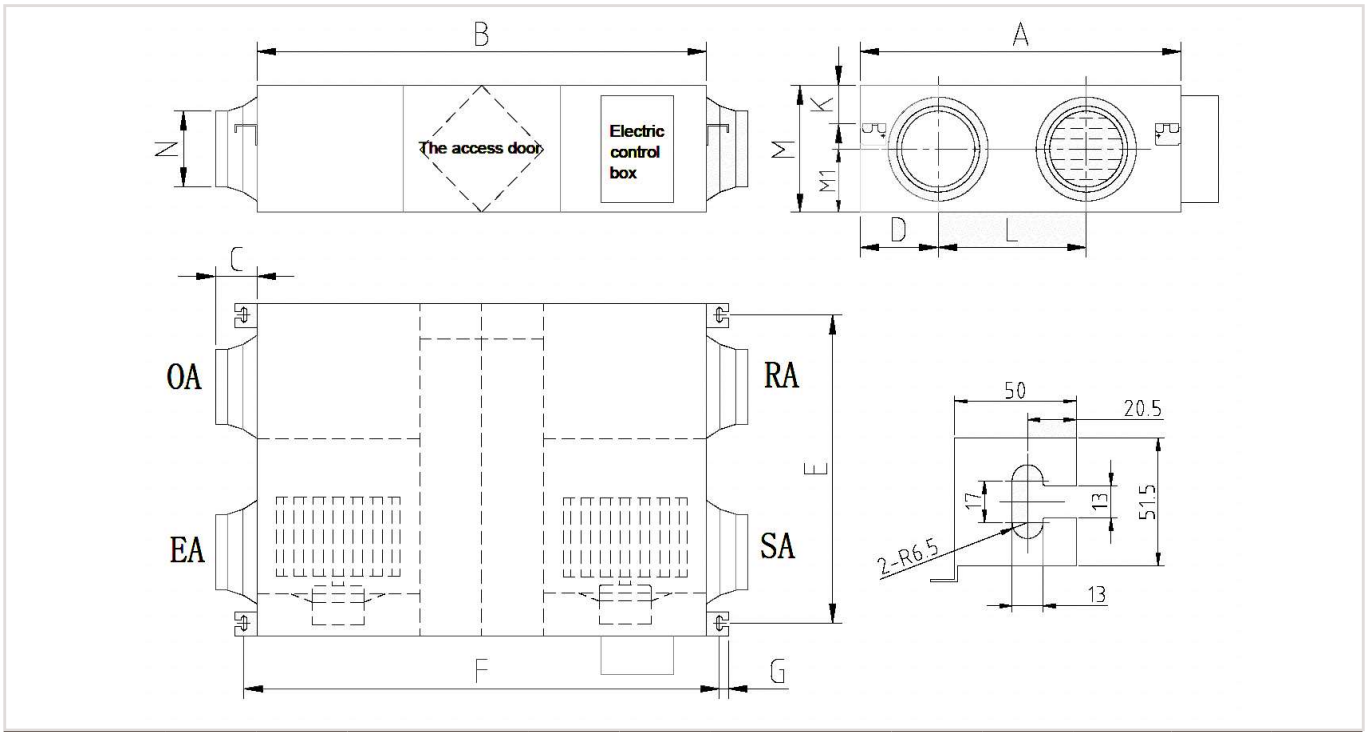
It is advisable to leave the units packed during handling and to remove the packaging only at the time of installation.
The unit's packaging must be removed carefully to avoid damaging the machine.
The materials that compose the packaging can be of a mixed nature (wood, cardboard, nylon, etc.).
It is advisable to remove the protective film from the panels (if present) after installing the unit.

The packaging materials must be stored separately and delivered for disposal or possible recycling to the companies assigned to this purpose, thus reducing the environmental impact.

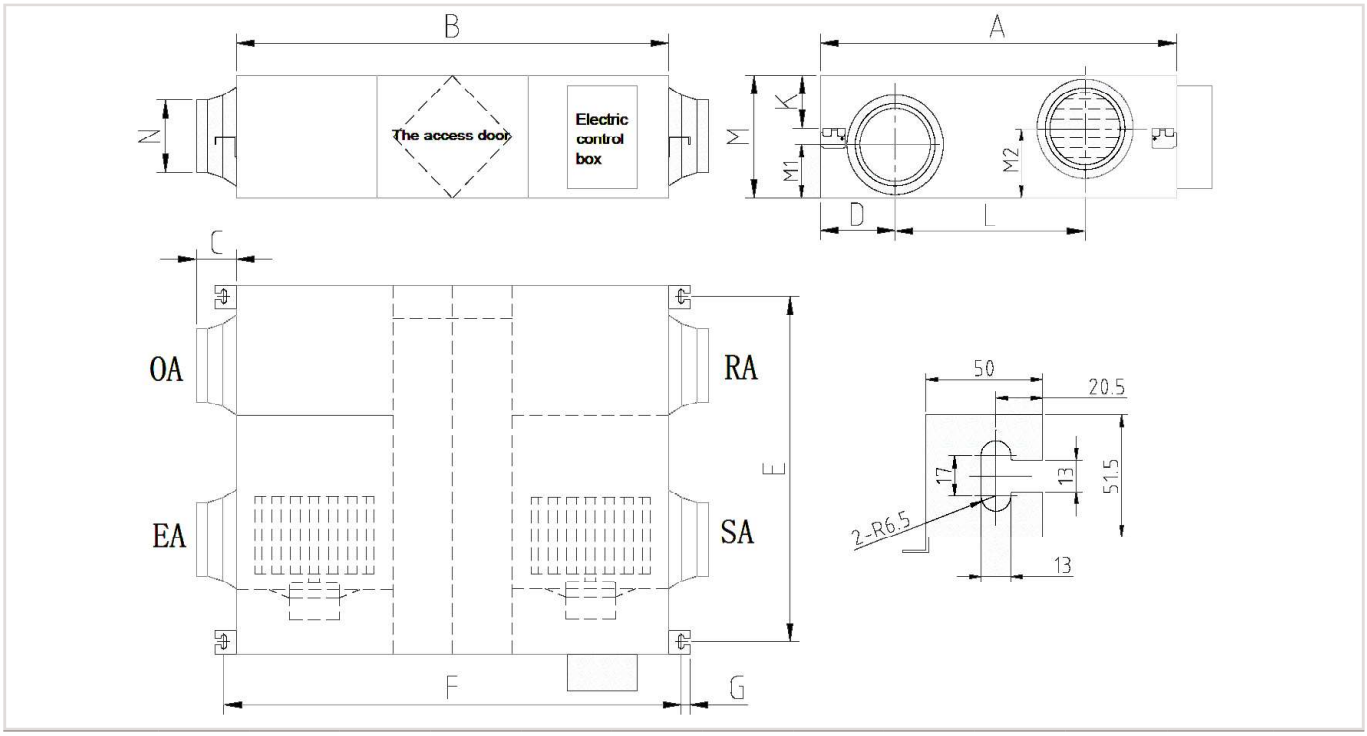
4.4 DIMENSIONS



MODEL	A [mm]	B [mm]	C [mm]	E [mm]	F [mm]	G [mm]	I [mm]	K [mm]	M [mm]	N [mm]
ACD300002	599	814	100	745	657	19	315	111	270	Φ144



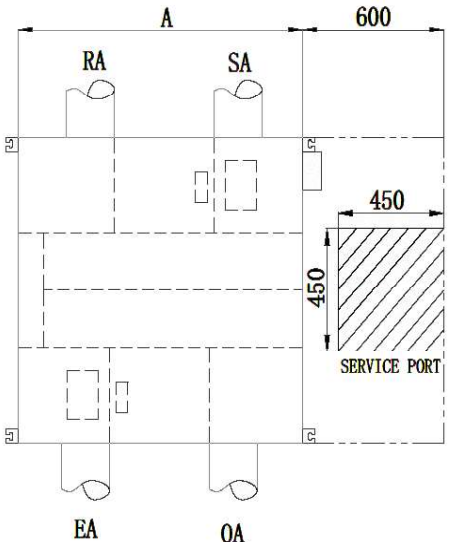
MODEL	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	L [mm]	K [mm]	M [mm]	M1 [mm]	M2 [mm]	N [mm]
ACD300003	902	867	107	197	833.5	922	20.5	451.5	115.5	280	139.5	-	Φ194
ACD300004	1134	1134	85	202	1068	1189	20.5	628	128	388	194	-	Φ242



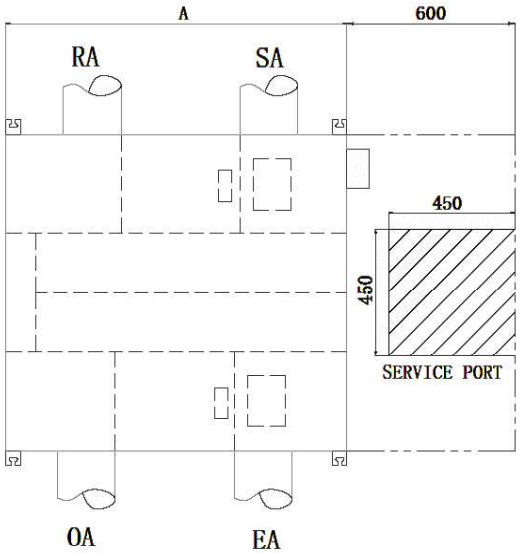
MODEL	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	L [mm]	K [mm]	M [mm]	M1 [mm]	M2 [mm]	N [mm]
ACD300005 ACD300006	1243	1193	85	241	1173	1248	20.5	629.5	133	388	191	241	Φ242

4.5 CEILING INSTALLATION

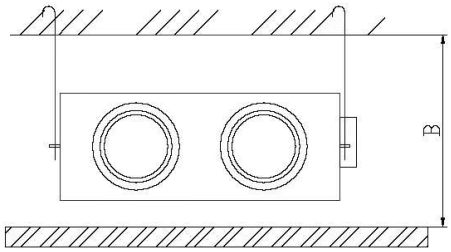
Installation and maintenance must only be performed by qualified personnel. During all installation procedures, make sure that the equipment is not connected to the mains. Installation must only be performed inside buildings. In the case of sloping or irregular ceilings be sure to position the machine on the ceiling with an inclination of 2% (approximately 2 cm every 1 m) towards the condensate drain.
IMPORTANT: make sure that the minimum constraints of the machine are respected: min 50 cm on the long side on the control unit side, min 10 cm on the opposite long side, min 40 cm on the short sides with conduit connections, no constraints on the side adjacent to the ceiling. For positioning:
1. Mark the correct position of the four holes to be applied on the ceiling.
2. Drill the ceiling.
3. Attach the machine to the ceiling following the reported sequence.
N.B. Use a fastening system suitable to support the expected load.



ACD300002

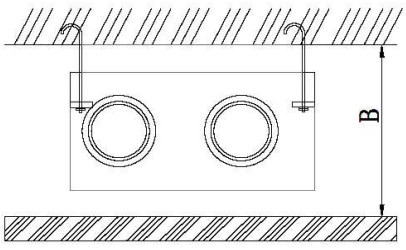


ACD300003, ACD300004, ACD300005, ACD300006



ACD300002

MODEL	A [mm]	Inner ceiling height B [mm]
ACD300003	902	330
ACD300004	1134	450
ACD300005 ACD300006	1243	450



ACD300003, ACD300004, ACD300005, ACD300006

MODEL	A [mm]	Inner ceiling height B [mm]
ACD300002	599	320

The machine is designed to be installed in a false ceiling, with the possibility of ducting of the air to be treated or that has been treated. It is usually positioned in technical rooms or corridors, with the preferred delivery ducts for the distribution of the treated air in the various rooms. The equipment is fixed by means of an anchoring bracket, supplied together with the recovery unit, which is used to anchor the machine to the slab or floor. The bracket has 4 ends designed to receive the threaded bars that attach the machine. It is the responsibility of the installer to ensure the sealing capacity of the anchoring surface.

Each machine is equipped with 4 collars, 2 for intake and 2 for expulsion, which are used for the ducted pipes of the ventilation system. If the position of the pipes is exposed to splashes or jets of water, adequate protection must be provided to prevent the water from wetting the internal electric motor and affecting its insulation. The clean air to be introduced into the environment is taken directly from the outside, creating an opening on the perimeter wall of the building, while the stale air coming from the internal rooms is expelled outside through a second opening.

It is important to leave sufficient space to allow opening of the inspection panel (for the filters and the exchange pack) and of the box for the electrical connection. The ducted pipes must be fixed to the plenums of the heat recovery unit using metal clamps to guarantee a perfect seal. Finally, the main power cable must be connected to a general, omnipolar, approved switch and with an opening distance of the contacts greater than 3 mm.

ATTENTION: in the case of false ceiling or concealed installation, it is necessary to provide an inspection hatch near the machine for maintenance work.

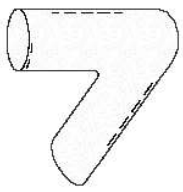
INSTALLATION CONSIDERATIONS

1.Protect the unit to avoid dust or other obstructions entering the unit and accessories during installation, or whilst in storage on site. Service ports should be installed to allow access for filter maintenance.

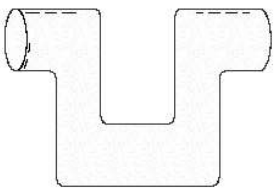
2. Be sure the ceiling height is no less than the Figures in above table B column.

3. Unit must not be installed close to boiler flues.

4. Following phenomenon should be avoided in the ducting installation.



Serve bends



Multiple direction changes

Multiple reducers / crimped duct

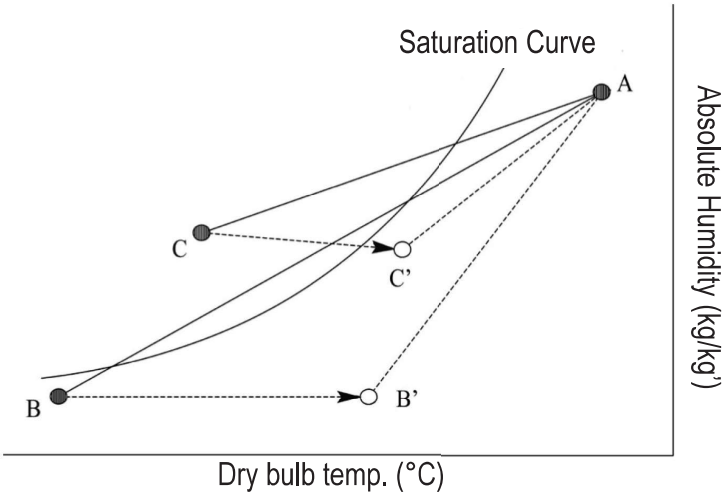
5. Exessive use of flex-duct and long flex-duct runs should be avoided.

6. Fire dampers must be fitted as per national and local fire regulations.

7. Unit must not be exposed to ambient temperature above 40°C and should not face an open fire.

8. Take action to avoid dew and frost.

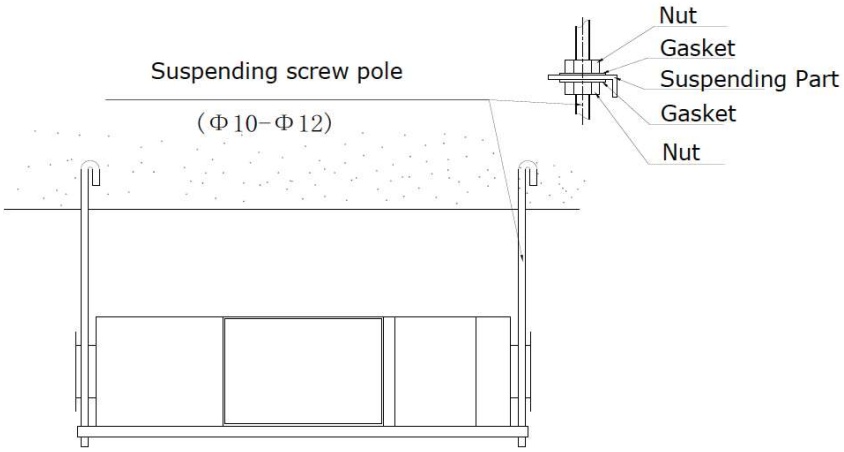
As shown by drawing below, unit will produce dew or frost when saturation curve is formed from A to C. Use pre-heater to ensure conditions are kept to right of the curve (B to B',to move C to C) to prevent condensation or frost formation.



9. To avoid the outdoor exhaust air cycling back to indoor, the distance between the two vents installed on the outside wall should be over 1000mm.
10.If heater is equipped to the unit, operation of heater should be synchronous with the unit, so that the heater starts to work only when unit starts.
11.Duct muffler may be considered if user wants indoor noise to be minimized.

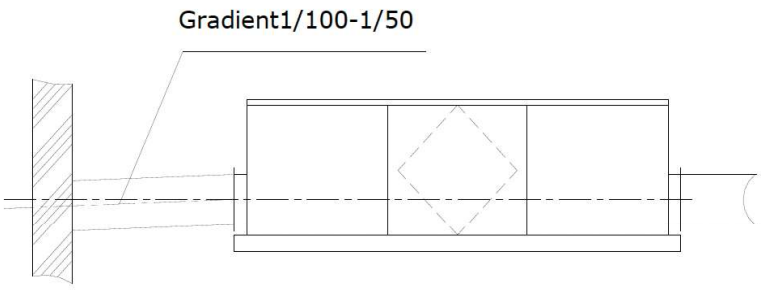
PHYSICAL INSTALLATION

1.Installer to prepare suitable threaded hangers with adjustable nuts and gaskets.
2.Install as shown by the image above. Installation must be level and securely fastened.
3.Failure to observe proper fixing could result in injury, equipment damage and excessive vibration.
Uneven installation will also effect damper operation.
4.Notes for reverse installation of the unit, Reverse labeling shows the unit is upside down.



DUCTING

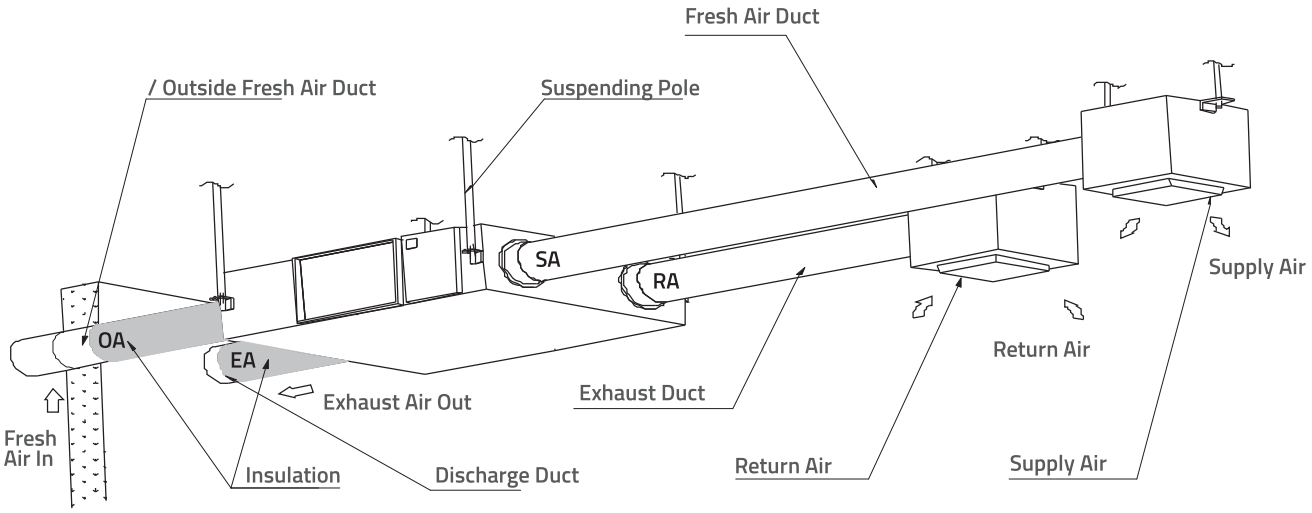
1. Connection of unit vents and ducts should be taped or sealed to prevent air leakage, and should comply to relevant guidelines and regulations.
2. The two outdoor vents should face downward toward the outside to prevent any rain water ingress. (angle 1/100 1/50).
3. Insulation must be with the two ducts outside to prevent condensation.
Material: glass cotton, Thickness: 25mm



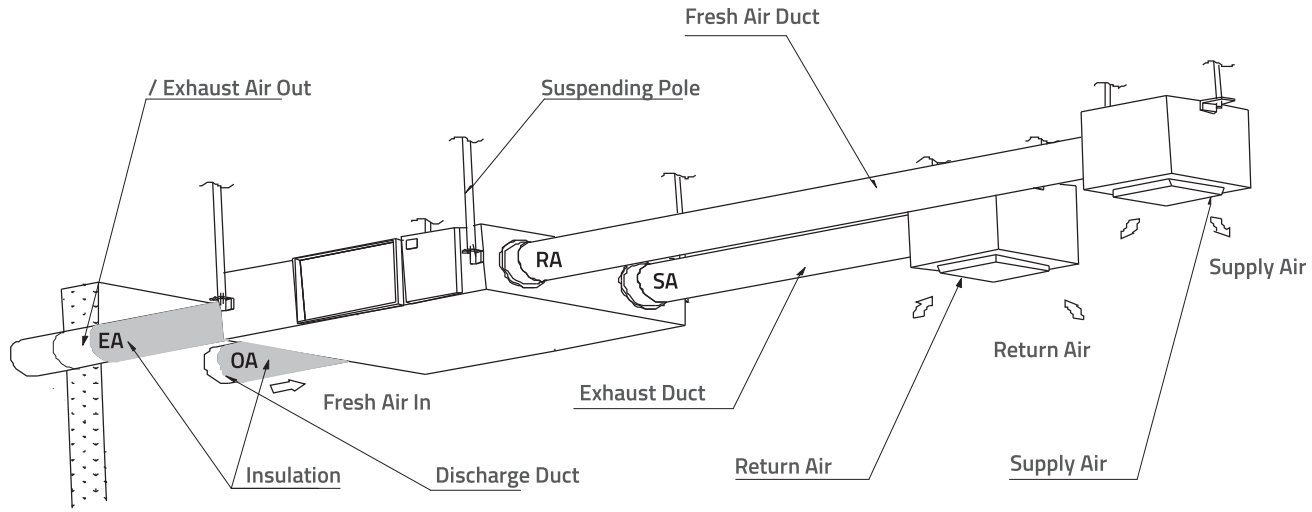
4.6 AERAULICS

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

FOR MODEL: ACD300002

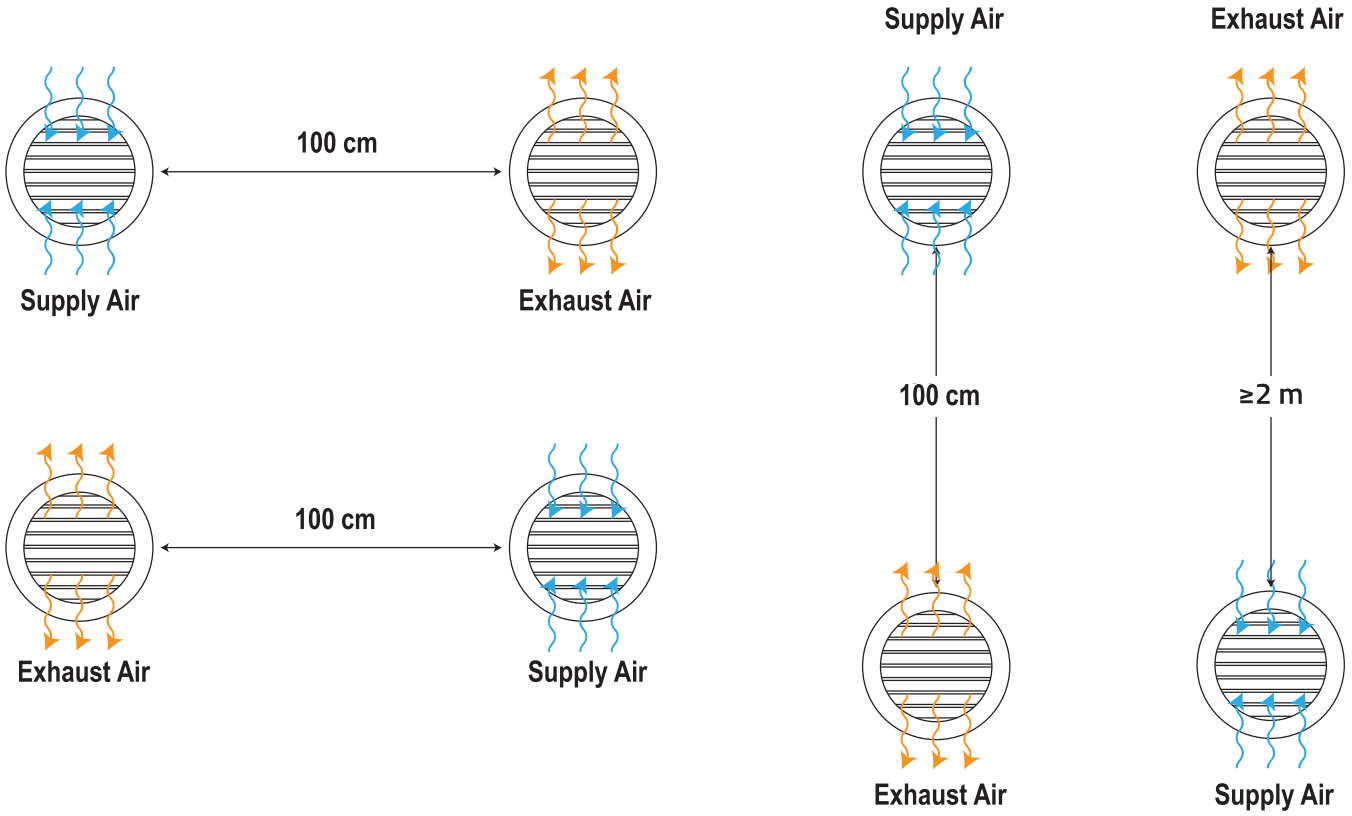


FOR MODEL: ACD300003, ACD300004, ACD300005, ACD300006



It is important that the fresh air is drawn in from outside the building and that the exhaust air is expelled outside. Furthermore, it is advisable to install protective grilles for the pipes on the outside. When making the first connection of the ventilation system, it is necessary to refer to the electrical panel on the machine. nsulation must be with the two ducts outside to prevent condensation.

Positioning indications of the external inlet and outlet nozzles:



4.8 ELECTRICS (Electrical connections)
Preliminary safety information

The electrical connection must be made according to the wiring diagram attached to the unit and in compliance with local and international regulations.

Make sure that the power supply line of the unit is sectioned upstream of it.
Make sure that the disconnecting device is padlocked or that a dedicated warning sign is applied to the operating handle.

Check that the power supply corresponds to the nominal data of the machine (voltage, phases, frequency) shown on the wiring diagram and on the plate applied to the unit.

The power cables must be protected upstream against the effects of short circuits and overload by a suitable device complying with the standards and laws in force.

The section of the cables must be suitable for the calibration of the protection system upstream and must take into account all the factors that could influence it (temperature, type of insulation, length, etc.)

The power supply must comply with the stated limits: otherwise the warranty will be immediately voided.

Performed all the ground connections required by the regulations and legislation in force.

Before starting any operation make sure that the power supply is disconnected.

4.9 PRELIMINARY CHECKS

Before starting up the machine, it is necessary to carry out preliminary checks on the electrical and hydraulic parts.

Commissioning operations must be performed in compliance with all the provisions of the preceding paragraphs.

Malfunctions or damage may also result from the lack of proper care during shipping and installation. It is good practice to check before installation or commissioning that there is no damage due to tampering, vibrations during transportation or mistreatment suffered on site.

- Check that the machine is installed to a professional standard and in compliance with the indications of this manual.
- Check the electrical connection and the correct fastening of all the terminals.
- Check that the voltage is the one shown on the unit data plate.
- Check that the machine is connected to the earthing system.
- Check that the hydraulic connections have been installed correctly and that all the indications on the plates are respected.
- Before starting ignition, check that all the closing panels are in their position and are fastened

Do not modify the electrical connections of the unit, otherwise the warranty will immediately expire.

4.10 ELECTRICAL INSTALLATION - ELECTRICAL CONNECTIONS

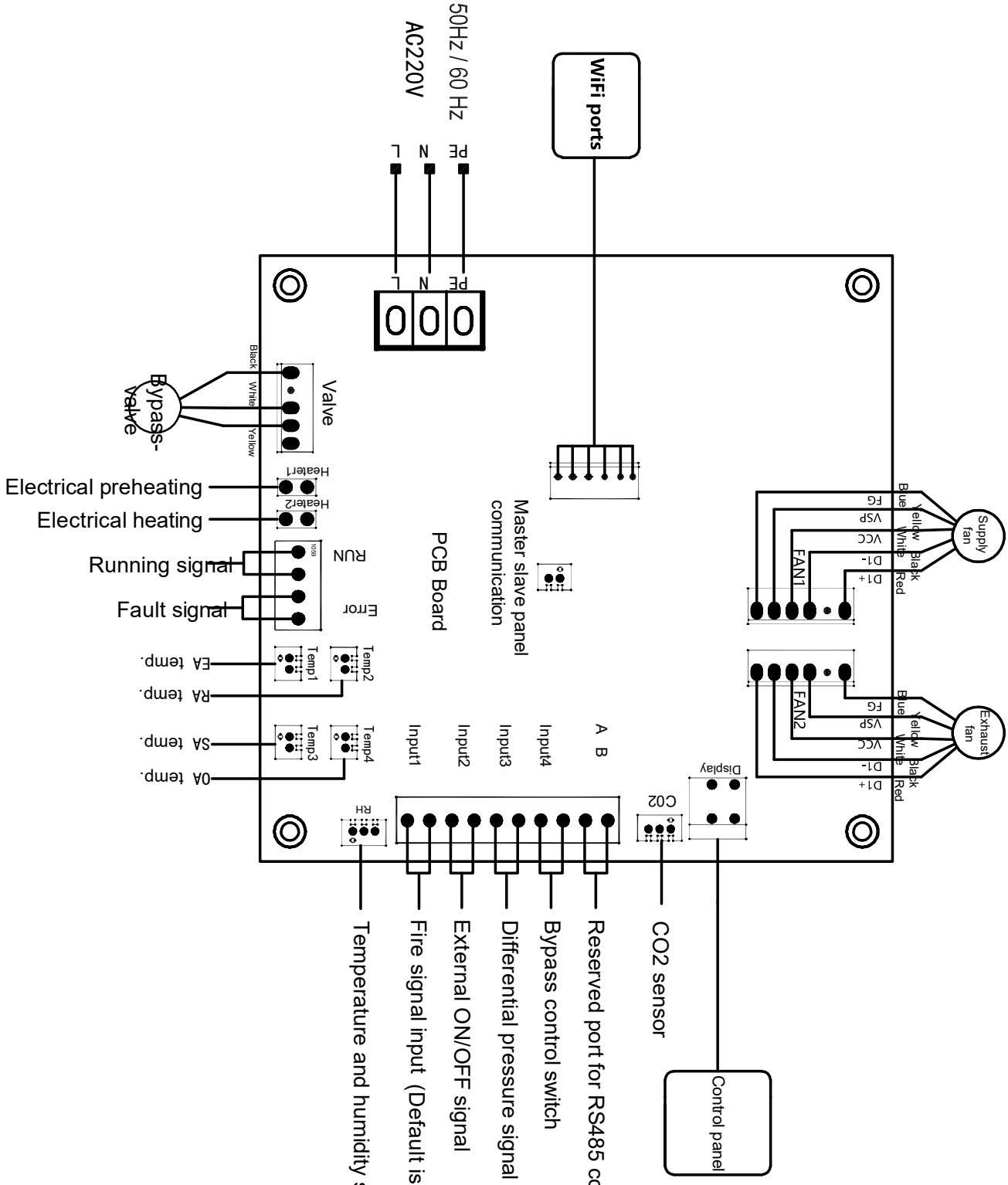
The installation and electrical connection of the device must be carried out by qualified personnel and in compliance with the laws in force in the country in which the installation is performed.

The installation and electrical connection of the device must be performed by qualified personnel and in compliance with the laws in force in the country in which the installation takes place.

Connection to the mains:

- The product must be connected to the mains to supply the power necessary for its correct operation.
- The cable sections must be adapted to the local regulations in force.
- The power line must be equipped with a circuit breaker.
- Before making any connections or working on the device, make sure that the power supply is disconnected. Disconnect the power before removing the product from its assembly support.

4.11 WIRING DIAGRAM



Connections to the main:
The product must be connected to the mains to supply the power necessary for its correct operation.

Modbus connections:
The console must be connected to the recovery unit via a 2-wire double-insulated cable for the exchange of information on the RS-485 network. The use of AWG 22/24 cables is prescribed.

Cable	Colour	Function
"Power supply 3G1.5 H05VV-F"	Brown	Line
	Blue	Neutral
	Yellow / Green	Earth
Remote panel interconnection data	- -	+ RX TX
	- -	- RX TX

4.12 SERIAL PORTS CONNECTION - BMS AND CONTROL

For serial connections (BMS) it is essential to use cables suitable for the recuperator.
Baud rate 9600bps,
Even/Odd No,
Date bit 8,
Stop bit 1,
communication interval > 200ms.
Support function code: 0x03, 0x06

Register address	readable	writable	range of value	function description	remarks
0(0x0000)	√	√	0-1	on-off state 0 - off 1 - on	
1(0x0001)	√	√	1-10	Supply fan speed	
2(0x0002)	√	√	1-10	Exhaust fan speed	
3(0x0003)	√	√	15-30	Setting temperature	
4(0x0004)	√		0-100	Humidity %	
5(0x0005)	√		0-2000	CO2 ppm	
6(0x0006)	√		0-120	Fresh air temperature	Positive temperature, When reading value equal to or over 20, then actual temperature is “reading temperature minus 20” Negative temperature, When reading value less than 20, then actual temperature is “20 minus reading temperature”
7(0x0007)	√		0-120	Exhaust air temperature	
8(0x0008)	√		0-120	Supply air temperature	
9(0x0009)	√		0-120	Return air temperature	
10 (0x000a)	√		0	--	
11 (0x000b)	√		0-255	Bit0 fire alarm protection Bit1 OA temperature sensor error Bit2 EA temperature sensor error Bit3 RA temperature sensor error Bit4 SA temperature sensor error Bit5 humidity sensor error Bit6 CO2 sensor error Bit7 filter alarm	

Register address	readable	writable	range of value	function description	remarks
12(0x000c)	√		0-1	Bypass switch, 1=on 0=off	
13(0x000d)	√		0-1	P-heating state 1=on 0=off	
14	√		0-1	R-Heating state 1=on 0=off	
15	√		0	0	
16	√		0	0	
17	√		0	0	
18	√		0	0	
19	√		0	0	
20	√		0	0	
21	√		0	0	
22	√	√	0-23	System time: hour	
23	√	√	0-59	System time: minute	
24	√	√	1-7	System time: Week	
25	√	√	1-99	IP address	

4.13 COMMISSIONING

Once the machine has been installed as per the previous paragraphs, proceed with commissioning as follows:

1. Check the wiring;
2. Power up and proceed with the first start-up by turning on the appliance according to the instructions on the control terminal (see chapter 6);
3. Check the correct functioning of the fans and the by-pass (see chapter 6). The fans will stop for more than 10 seconds when the by-pass valve is operated;
4. **IMPORTANT: check that the maximum speed of the fans corresponds to the nominal air flow of the recuperator.** To this end, check parameter 16 from the list in paragraph 6.4 SETTING PARAMETERS of this manual. If the preset value is different from the expected one, adjust it according to the model type.

5_USER INTERFACE

5.1 WALL CONTROL INSTALLATION AND FUNCTIONALITY

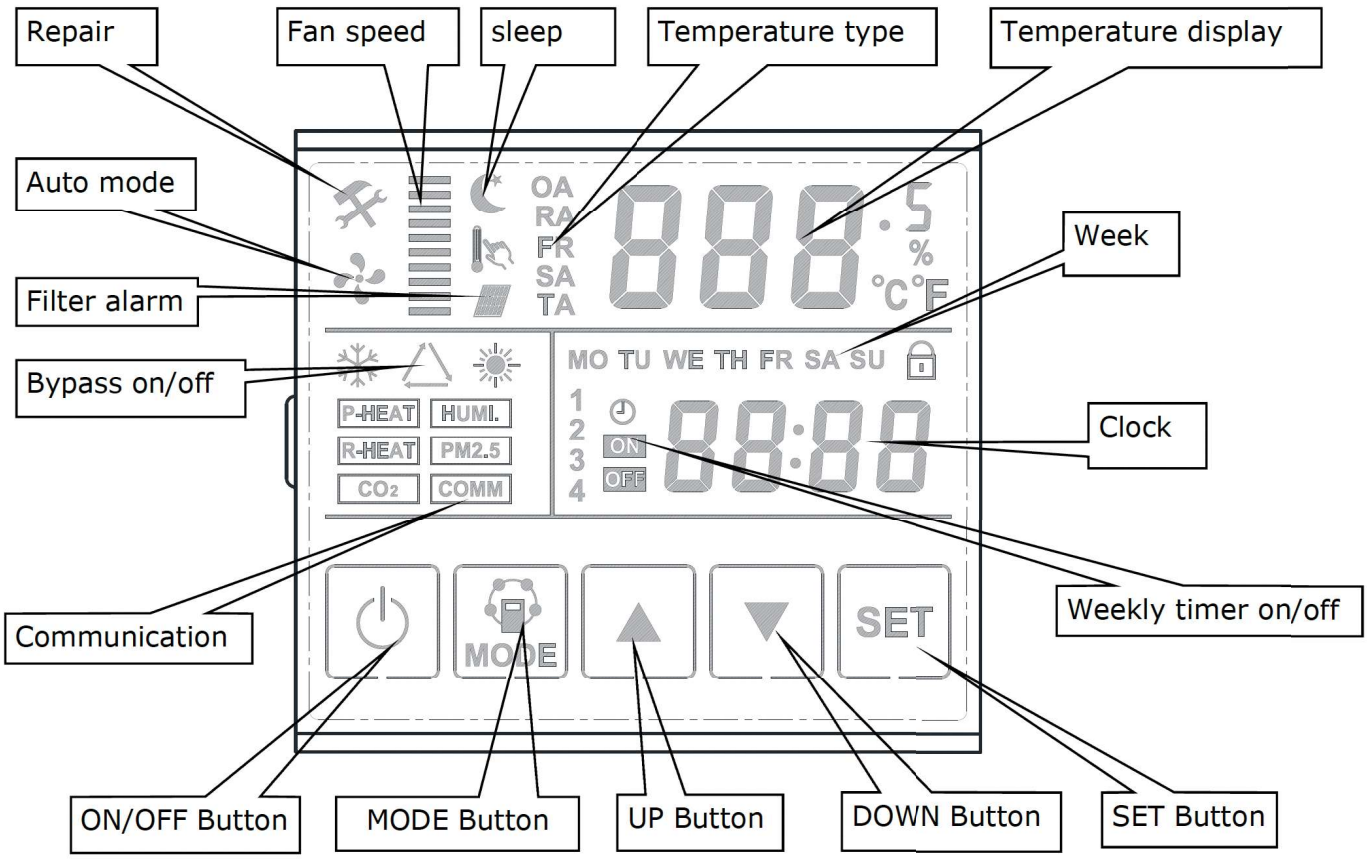
Room terminal which, combined with the programmable control, allows the user to adjust the residential room comfort, equipped with a temperature probe.

5.2 INSTALLATION WARNINGS

• These terminals have been designed for flush assembly, with a box compliant with the current regulations;
• Before performing any operation on the terminal, remove power from the device. Then remove the front part of the terminal and then the rear one to make the electrical connections;
• For the serial connection use a three-pole shielded cable, AWG 20-22. The length of the network should not exceed 500m.
For very large networks, add a 120 Ohm resistor between RX/TX+ and RX/TX- of the first and last device to avoid possible communication problems.

6_FUNCTIONS

6.1 DISPLAY SCREEN AND BUTTONS

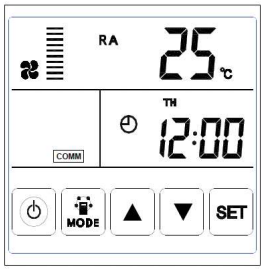


6.2 OPERATION INSTRUCTIONS

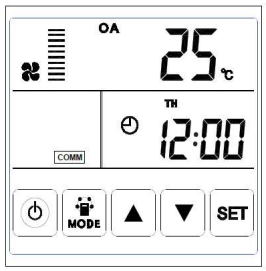
Switching on and off
ON/OFF button: turns the equipment on or off. When turned on, the display backlight screen will be on, and it will turn off if no operation is performed within 30 seconds; With the device turned on, when the backlighting is off, press any button and it will turn on again;
When the equipment is turned off, the display screen turns off.

Screen lock
To avoid accidental touches, the display can be locked: press the ON/OFF button for more than 6 seconds to lock the screen and press it again for more than 6 seconds to unlock it. The lit padlock symbol above the watch indicates that the screen is locked

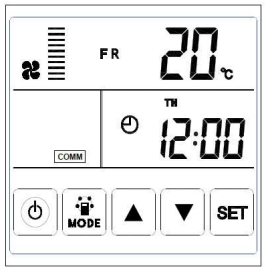
Data display and operating mode
By pressing the MODE button you can scroll through the following screens in sequence:



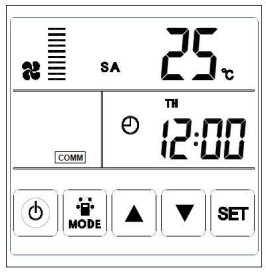
- Internal temperature, **"RA"** interface



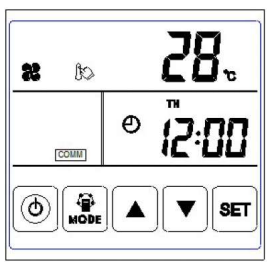
- External temperature, **"OA"** interface



- Exhaust air temperature, **"FR"** interface

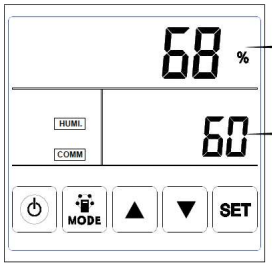


- Supply temperature, "SA" interface

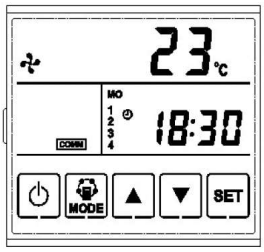


- Supply temperature setting mode (visible only with electric heater function enabled, see chapter 6.4 SETTING PARAMETERS)

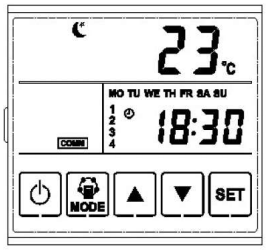
- CO2 setting mode (visible only if the function is enabled, see chapter 6.4 SETTING PARAMETERS)



- Humidity setting mode (visible only if the function is enabled, see chapter 6.4 SETTING PARAMETERS)



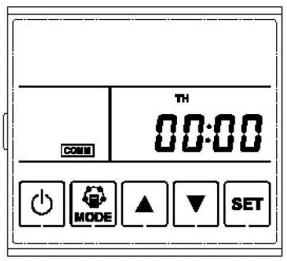
- Timer mode (see “timer setting” paragraph below)



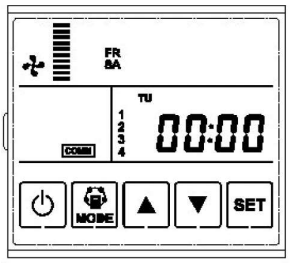
- “Sleep” mode (operation of the motors at reduced speed limiting noise emission)

SETTING THE FAN SPEED

Manual setting. In the SA or FR temperature interface, press the arrow keys “△” and “▽” to set the fan speed. The exhaust fan speed can be set in the “FR” interface, while the supply fan speed can be set in the “SA” interface.
Automatic setting via timer. You can set 4 periods per day, 7 days a week. In each period user can set a fan speed. See paragraph below “timer setting”.



Time setting
Using MODE button enter the timer mode (see paragraph above “Data display and operating mode”). Long press SET button until the time flashes “hour” flashes. Press the UP and DOWN buttons to adjust the hours, short press the SET button again to set the minutes and day of the week in the same way, then press MODE button or ON/OFF button to save and exit the setting.



Timer setting
Using MODE button enter the timer mode (see paragraph above “Data display and operating mode”). Short press SET button. The days of the week will flash. By pressing the UP and DOWN buttons you can select the day of the week. Short press SET to move in succession to setting the hours, minutes, supply fan speed (SA) and exhaust fan speed (EA). Adjust the values with the UP and DOWN buttons.
After setting the first period, the system automatically switches to setting the second period. After setting 4 periods, the system returns to the week setting. Press MODE or ON/OFF to save exit the setting.
Note: if you do not press any button, after 10 seconds the system exits the setting.

Temperature setting
Note: this function is applicable only when electric heaters (not supplied) are connected and is activated by changing the setting of parameter 5 from 0 (default) to 1 (see chapter 6.4 SETTING PARAMETERS).
Using MODE button, enter the input temperature setting mode. Set the temperature using the UP/DOWN buttons. It is possible to select a temperature in the range 15÷30°C. If the supply air temperature is higher than the set temperature, the electric heater will turn off and the “P-HEAT” and “R-HEAT” icons will turn off. If the supply air temperature is equal to or lower than the set one (difference within 5°C), the first stage of the electric heater will turn on and the “P-HEAT” icon will light up. If the temperature difference is greater than 5°C, the second stage of the electric heater will also turn on, and “R-HEAT” will also turn on, to turn off when the intake air reaches 2°C from the set temperature. When the inlet temperature reaches a value equal to the set temperature, the first heater will also turn off.

6.3 BY-PASS OPERATION AND SETTING

The electronic bypass installed inside the heat recovery unit is a device which allows the air flow to be diverted to prevent it from passing through the heat recovery unit.
In this way, it is possible to avoid exchanging heat between the internal and external air of the building when the external conditions are not favourable for free cooling or free heating.

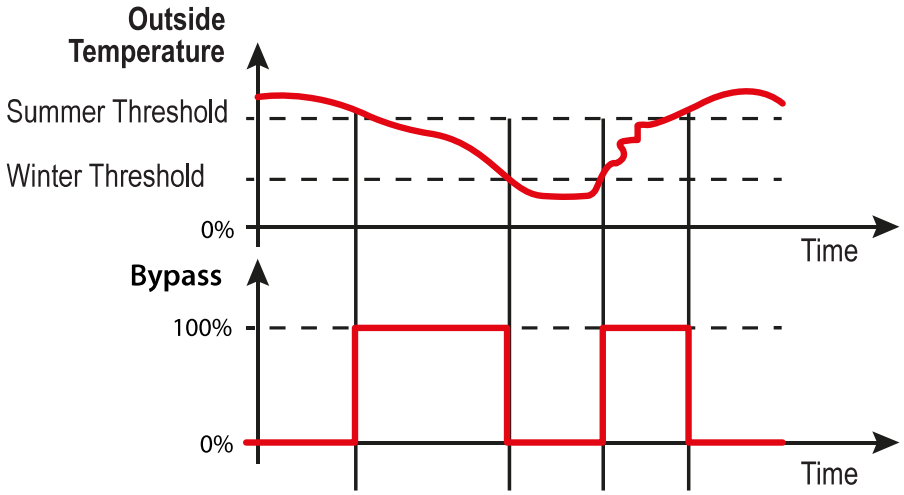
Free cooling and free heating are techniques used to reduce the air conditioning energy costs of buildings.
In particular, free cooling exploits the lower external temperatures with respect to those inside the building to cool the internal air while free heating exploits the higher external temperatures to heat the internal air.

The bypass is activated automatically by the control system according to pre-established thresholds and to the room temperature, delivery temperature, external temperature and setpoint parameters.

By-pass setting
The by-pass can be operated manually (default setting) or automatically.

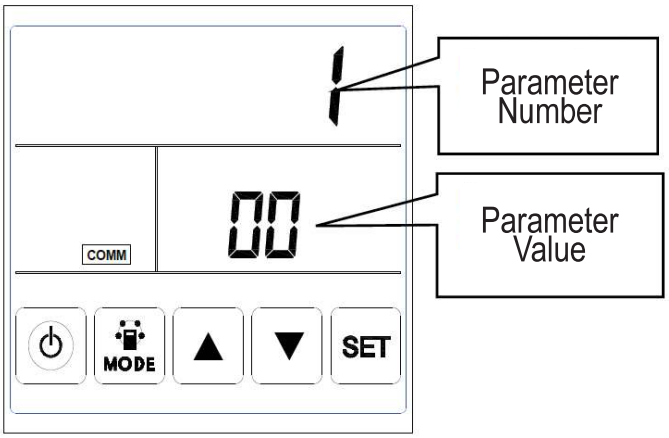
Manual operation. In the OA temperature interface, press UP for 6 second
s until the bypass icon appears (= bypass open). Press DOWN for 6 seconds until the bypass icon turns off (= bypass closed).

Automatic operation. Set parameter number 2 (see paragraph 6.4 SETTING PARAMETERS) to 1, and set the bypass opening temperature X (parameter 3) and the Y temperature (parameter 4) equal to the bypass operating range. If the outside air temperature is between X and X+Y, then the bypass is open. If the outside air temperature is lower than X or higher than X+Y then the bypass closes.
For example, by setting X = 19 and Y = 3, then the bypass opens with an external air temperature between 19°C and 22°C, while it closes with a temperature below 19°C or above 22°C.



6.4 SETTING PARAMETERS:

Press MODE button for more than 6 seconds to enter the parameter setting interface:



Scroll through the parameter list moving from one parameter to another by shortly pressing SET button.
At the desired parameter number, press UP/DOWN arrow buttons to adjust the parameter value.
Attention: after setting the parameter value, the system needs approximately 15 seconds to record the data. During this interval, do not turn off the power supply to the appliance.

The following table lists the parameters and valid values:

No.	Contents	Range	Default	Unit
1	Restart after blackout	0 - disabled, 1 - enabled	1	
2	Automatic bypass function	0 - disabled, 1 - enabled	0	
3	Bypass opening temperature X	5-30	19	°C
4	Bypass opening temperature range Y	2-15	3	°C
5	Electric heating setting	0 - disabled, 1 - enabled	0	
6	Conventional defrosting [A]	0 - disabled, 1 - enabled	1	
7	Defrost interval [A]	15-99	30	Minutes
8	Defrost temperature [A]	-9 ÷ +5	- 1	°C
9	Defrosting duration time [A]	2-20	10	Minute
10	CO2 function display [B]	0 - disabled, 1 - enabled	0	
11	CO2 function display [B]	800-2000	1500	ppm
12	Humidity display [C]	0 - disabled, 1 - enabled	0	
13	Humidity function - humidity setting [C]	50 - 100	70	% r.h.
14	IP address	1-66	1	
15	Fan speed control	1=3 speeds(AC, not applicable) 2=10 speeds (DC)	2	
16	Selection of maximum flow rate. **ATTENTION: only select the value corresponding to the model**	150 - DO NOT USE **250 - ACD300002 / 250 m³/h** 350 - DO NOT USE 200 - DO NOT USE 300 - DO NOT USE 400 - DO NOT USE **600 - ACD300003 / 500 m³/h** **800 - ACD300004 / 800 m³/h** **1000 - ACD300005 / 1000 m³/h** **1300 - ACD300006 / 1300 m³/h**	-	-
17	Filter alarm	0 useless 1 clear filter alarm, and recount time	0	
18	Filter alarm setting	45 days 60 days 90 days 180 days	45	days
19	Differential pressure switch function	0 - disabled, 1 - enabled		
20	Reserve			

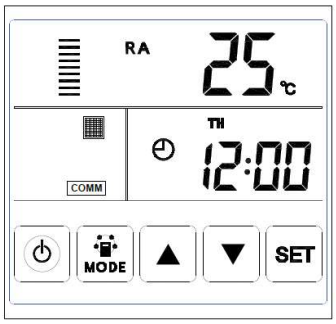
A. Parameters 6, 7, 8, 9 – **Conventional defrosting.** When the temperature of the exhaust air (FR/EA) remains lower than the set defrost temperature (parameter 8) for at least 1 minute, and at least a minimum amount of time has passed since the previous defrosting cycle (parameter 7), then the supply fan stops while the exhaust fan works at maximum speed until an exhaust air temperature of 15°C is reached for one minute or until the maximum time of the defrosting cycle (parameter 9).

B. Parameters 10, 11 – **CO2 function** (function that can only be activated with a CO2 probe connected, not supplied). When the CO2 sensor detects a concentration higher than the set value (parameter 11) for more than 5 seconds, the fan will go to maximum speed. When the CO2 concentration read returns to a lower value than the one set for at least 5 seconds, the fan will return to the previous working condition.

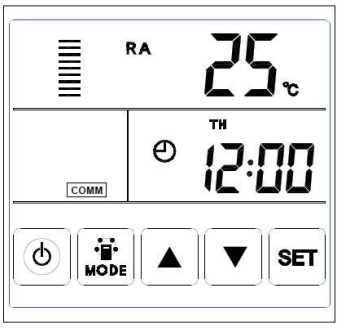
C. Parameters 12, 13 – **Humidity function** (function that can only be activated with a humidity probe connected, not supplied). When the humidity sensor detects a concentration higher than the set value (parameter 13) for more than 5 seconds, the fan will go to maximum speed. When the humidity concentration read returns to a lower value than the one set for at least 5 seconds, the fan will return to the previous working condition.

6.5 FILTER ALARM:

Parameter 18 to set the filter alarm time. When the operation time of the ventilator exceeds the setting time, the filter icon will flashes to remind user clean the filter. After cleaning, set Parameter 17 to be 1 to recount the time.



Filter alarm On



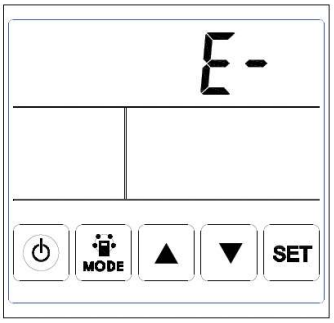
Filter alarm Off

6.6 RESTORE FACTORY SETTING:

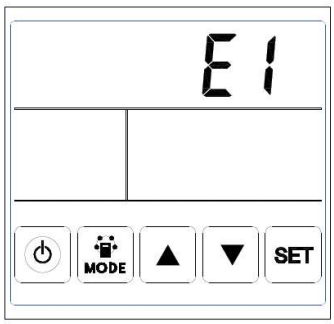
In the power on state, press the buttons of "△" and "▽" simultaneously for more than 6 seconds to restore the product parameters to the factory default, ventilator will turn off after restore to factory default.

6.7 ERROR CODE CHECKING:

From the main interface (i.e. in RA mode "Internal temperature display"), short press SET button to check the error code. Press the UP or DOWN buttons to exit.



No Error



Error alarm

Code	Error
E1	OA temperature sensor error
E2	Memory error
E3	RA temperature sensor error
E4	EA temperature sensor error
E5	communication error
E6	SA temperature sensor error
E7	Fire alarm error

7_ORDINARY MAINTENANCE

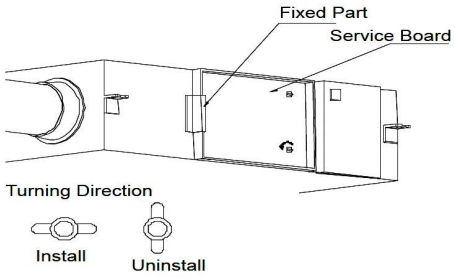
WARNING:

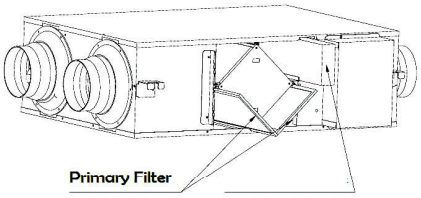
Power must be isolated before installation and maintenance to avoid injury or electricsshock. Supply power cables, main circuit breaker and earth leakage protection, must comply with national regulations. Failure to observe could cause unit failure, electric shock or fire.

Standard filtration is supplied with this unit and must be used. Dust and dirt can accumulate in the heat exchanger if filters are removed. (This can lead to failure or decreased performance). To ensure efficient operation, regular cleaning or replacement of filters is required. Filter maintenance frequency will depend on working environment and unit running time.

7.1 CLEANING THE FILTER

1. Open the access door
2. Remove the filters (from the side of the unit)
3. Vacuum the primary filters to get rid of the dust and dirt. For bad conditions dip it into water with soft wash to clean.
4. Push the filters to the positions after they get dried naturally, close the access door.
5. Change the F9 filters if they are badly affected with dust and dirt or if they are broken. Note: F9 filters are not washable.

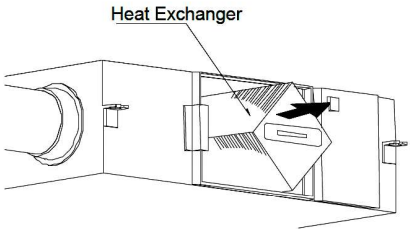




7.2 MAINTENANCE OF HEAT EXCHANGER

1. Pull off the filters first
2. Draw out the exchanger from the unit
3. Establish a cleaner schedule to clean the dust and dirt on the exchanger.
4. Install the exchanger and filters to their positions and close the access door.

Remarks: It is recommended maintenance of the exchanger is made every 3 years.



8_EXTRAORDINARY MAINTENANCE

Commissioning operations must be performed in compliance with all the provisions of the preceding paragraphs. All operations performed on the machine must be carried out by qualified personnel in compliance with the national legislation in force in the destination country.
It is good practice to perform periodic checks to verify the correct functioning of the unit, of the control and safety devices.

- Check that the electrical terminals inside the electrical panel are securely fixed.
- Check that there are no water leaks in the hydraulic circuit.
- Check the fastening and balancing of the fans.

9_DISASSEMBLY AND DISPOSAL

All the decommissioning operations must be performed by qualified personnel in compliance with the national legislation in force in the destination country.
The structure and the various components, if unusable, must be demolished and divided according to their nature.
All the materials must be recovered or disposed of in compliance with the relevant national regulations.

10_WEEE

Do not disassemble or dispose of the product yourself. Disassembly, demolition and disposal of the product are extraordinary maintenance operations and must therefore be performed by qualified personnel. Pursuant to the local legislation and Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE)".

The crossed-out wheeled bin symbol shown on the appliance or on the packaging indicates that the product at the end of its useful life must be collected separately from other waste to allow adequate treatment and recycling. Adequate differentiated collection for subsequent sending of the decommissioned equipment to environmentally compatible recycling, treatment and disposal helps to avoid possible negative effects on the environment and on health and promotes the re-use and/or recycling of the materials of which the equipment is composed.

Illegal disposal of the product by the user involves application of the sanctions provided for by current legislation.

11_DIAGNOSIS AND TROUBLESHOOTING

All the decommissioning operations must be performed by qualified personnel in compliance with the national legislation in force in the destination country.
The structure and the various components, if unusable, must be demolished and divided according to their nature.
All the materials must be recovered or disposed of in compliance with the relevant national regulations.

PROBLEM	CAUSES	SOLUTIONS
Machine off	No power supply	Check the connection to the mains
	Remote control connection interrupted	Check and correctly connect the panel to the unit
Difficulty starting	Low power supply voltage	Check that the power supply voltage is consistent with that indicated on the unit identification label
Poor or no air flow	Filters clogged	Replace the filters
	Fan dirty	Clean the fan
	Fan ducts clogged	Clean the ventilation ducts
	Insufficient fan speed	Check the power supply voltage
High noise level	Noise from the unit	Check for cracks and/or air leaks from the unit panels Check the siphon connection Check if the motors are turning correctly (bearings)
High vibrations	Vibrating panels	Check the integrity of the panels and profiles of the unit Check that the lid of the unit and the panels that block access to the filters are closed correctly Check that there is no direct contact between the unit and the walls which could transmit vibrations to the walls / floor / false ceilings
	Unbalanced fan blades	Check the integrity of the blades Clean the fans
Loss of condensation	Condensate drain clogged	Clean the condensate drain
	Condensatedoesnotflowfromtheexhaustduct	Check that the unit is perfectly level Check that the condensate drain connections are not blocked
Decline in performance over time	Leaks in the aeraulic channels	Check and restore the tightness of the channels
Pulsation in the air flow	Fans working in almost zero flow conditions	Check power supply voltage Increase the minimum speed of the fans
	Check power supply voltage Increase the minimum speed of the fans	Check or modify the suction ducts

12_WARRANTY

1. This warranty applies exclusively to the Customer (legal person) and not to the end consumer (natural person) to whom the Customer has supplied the Product.

2. The warranty is valid for 2 (two) years starting from the delivery date indicated on the Transport Document (delivery note).

3. The warranty covers manufacturing and material defects of the Products. The warranty shall not, therefore, cover any defects attributable to, for example:
- unsuitable transport;
- negligent or improper use of an individual Product and, therefore, use which does not conform to that specified in the instructions and/or in the installation, use or maintenance manuals, where applicable;
- failure to comply with the Product's technical specifications;
- repairs or modifications made by the Customer, or by a third party, without the Supplier's prior, written authorisation;
- anomalies caused by and/or connected to parts assembled/added directly by the Customer;
- lack of or inappropriate maintenance;
- anything else not attributable to original defects in the material or manufacture.

4. For the Products covered by the warranty, the Supplier shall replace or repair the Product, or the parts of it found to be faulty or defective, subject to a discretionary assessment of the alleged fault of defect.

5. The Product which is the object of a dispute must always be made available to the Supplier's personnel or its appointed parties for verification; furthermore, the Product may be returned in the manner and within the terms indicated by the Supplier in its authorisation to return the Product due to fault or defect.

6. The obligations assumed by the Supplier under point 12.3 above, (to repair or return Products in the cases and under the conditions established herein) override and replace the warranties and liabilities provided for by law. It is, therefore, agreed, that, except in the case of wilful misconduct or grave negligence on the part of the Supplier, any other liability it may have (whether contractual or extra-contractual), however arising from the Products supplied and/or their resale (for example, compensation for damages, loss of earnings, etc.), is expressly excluded. In any case, the Supplier's liability towards the Customer cannot exceed the value of the purchase price of the Product which gave rise to the Supplier's liability.

7. Any disputes regarding a single delivery do not exempt the Customer from the obligation to collect the remaining quantity of Products envisaged by the specific Order, or by other Orders distinct from the one in question.

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Tecnosystemi® group

Tecnosystemi S.p.A. Società Benefit
www.tecnosystemi.com
via dell'Industria, 2/4 - Z.I. San Giacomo di Veglia
31029 Vittorio Veneto (Treviso) - Italia
Tel +39 0438.500044 - Fax +39 0438.501516
email: info@tecnosystemi.com

Numero Verde
800 904474
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