CADB/T-HE ECOWATT

EN

INDEX

1. INTRODUCTION

Thank you for purchasing this appliance. It has been manufactured in full compliance with applicable safety regulations and EU standards.
Please read this instruction book carefully, as it contains important information for your safety during the installation, use and maintenance of this product.
Keep it at hand for future reference.
Please check that the appliance is in perfect condition when you unpack it, as all factory defects are covered by the **S&P** guarantee.

2. SAFETY REGULATIONS AND "CE" MARKING

S&P technicians are firmly committed to research and development of ever more efficient products and in compliance with current safety regulations.
The instructions and recommendations given below reflect current regulations, principally regarding safety, and therefore are based on compliance with general regulations. Therefore, we recommend all people exposed to hazards to strictly follow the safety regulations in force in your country. **S&P** will not be held liable for any possible harm or damage caused by non-compliance with the safety regulations, as well as caused by modifying the product.
The **CE** mark and the corresponding declaration of conformity are proof of the product's conformity with current EU regulations.

3. GENERAL INSTRUCTIONS

A hazard analysis of the product has been carried out as provided in the Machine Directive. This manual contains information for all personnel exposed to these hazards, with the aim of preventing possible harm or damage due to faulty handling or maintenance.
All maintenance operations (ordinary and extraordinary) must be carried out with the machine switched off and the electrical power supply disconnected.
To avoid a possible accidental start up, place a warning notice on the electrical control panel with the following text:

"Attention: control disconnected for maintenance operations"

Before connecting the power supply cable to the terminal strip, make sure the mains voltage corresponds to the voltage indicated on the specifications plate of the unit.
Regularly check the product labels. If, due to the passing of time, they are no longer legible, they must be replaced.

4. UNIT LABELLING

The machine may come with several pictograms that must not be removed. These signs are divided into:

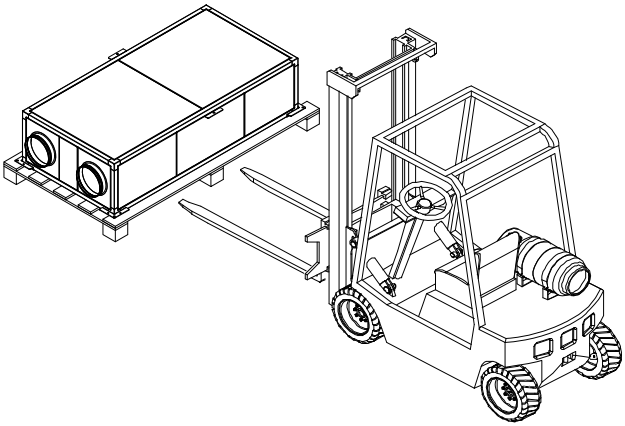
- **Prohibition signs:** Do not repair or adjust when in operation.
- **Danger signs:** Warning of the presence of live elements inside the container bearing the sign.
- **Identification signs:** CE card, indicating product information and manufacturer's address. The CE mark indicates the product's conformity with EEC standards.

Danger signs

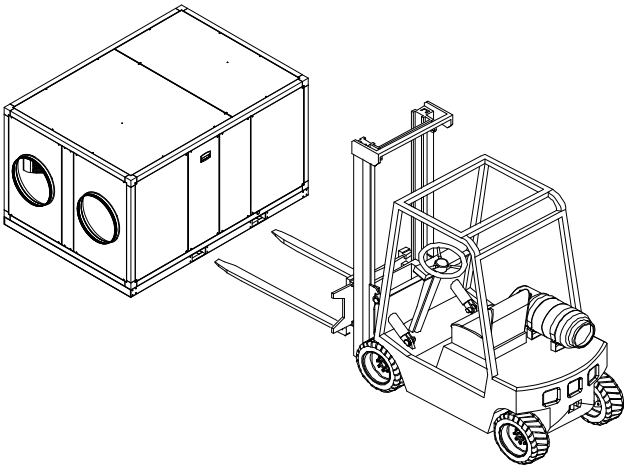
Prohibition signs

5. HANDLING

The CADB/T-HE models 04 to 33 are delivered fixed with screws to the pallets.
The models 40 and 54 are equipped with a bed, due to its weight are supplied without pallets. The unit can be handled by a pallet transporter, a forklift, or a crane.
The handling machines will be adapted to the load and the lifting conditions. In all cases, the lifting will be done at the device's base. The centre of gravity is located at the centre of the unit. The device must be carefully manipulated only in the horizontal position.



Models 04 to 33



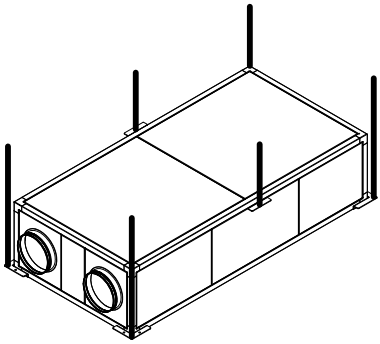
Models 40 to 54

6. INSTALLATION

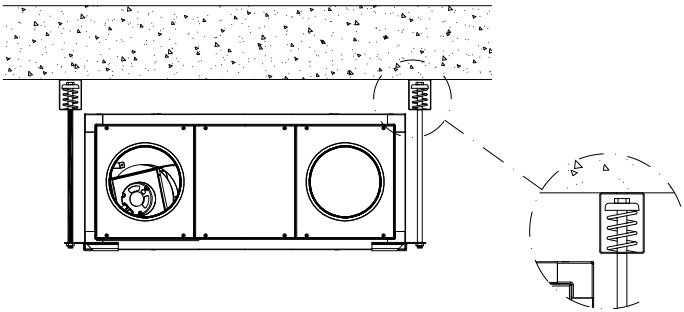
6.1. INTRODUCTION

Horizontal models size 04, 08, 12, 16, 21 and 33

These models are designed to be installed hanging from the ceiling or located behind a false ceiling. The 04, 08, 12, 16, 21 and 33 models have four metal brackets, one on each lower corner. Using studded rods (Ø 8 mm), it can be secured to the ceiling and levelled.



The installer must make sure that the ceiling structure and the securing elements can bear the weight of the device, taking into account that it is a dynamic load.
To prevent the transmission of vibrations from the unit to the rest of the installation, it is necessary that the installer use specific isolation elements, such as antivibration devices in the supports, flexible sleeves between the unit and the ducts, and flexible couplings between the water connections and the pipelines.

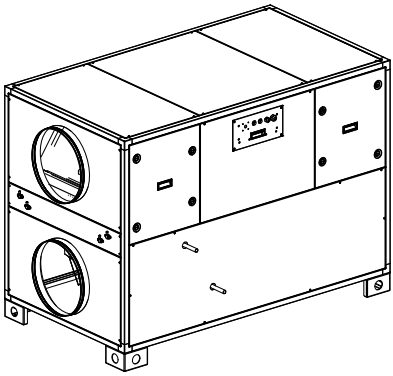


Model	Weight (kg)
4	137
8	173
12	180
16	225
21	323
33	410

Vertical models

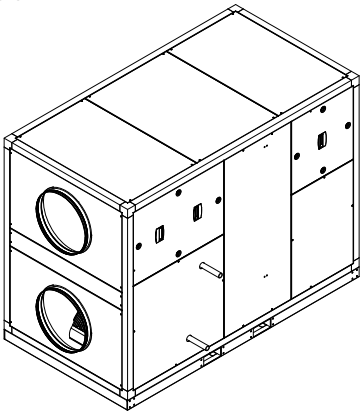
The models size 4 to 33 are supplied with support feet, while the models size 40 and 54 are supplied with a perimetral bed. This bed must be in contact with the ground or with a fl at surface. It is essential that the weight of the equipment is distributed between all points of support to prevent unit deformation.
The installer must make sure that the ceiling structure and the securing elements can bear the weight of the unit, taking into account that it is a dynamic load.

Models 04 to 33



Model	Weight (kg)
4	139
8	175
12	182
16	227
21	325
33	412

Models 40 and 54



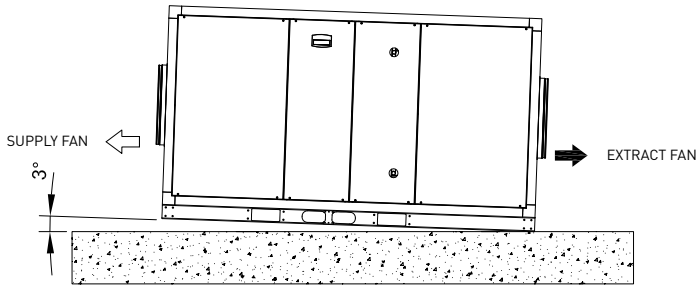
Model	Weight (kg)
40	577
54	710

Horizontal models of sizes 40 and 54

IMPORTANT!

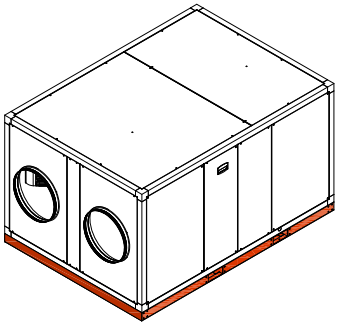
Particularities in the installation of horizontal versions LH and RH

For a correct evacuation of condensation generated into the heat exchanger, it is necessary to install the unit with a minimum slope of 3º to the side where the extraction fan is placed:



Horizontal models size 40 and 54 are supplied with a perimetral bed. This bed must be in contact with the ground or with a flat surface. It is essential that the weight of the equipment is distributed between all points of support to prevent unit deformation.

The installer must make sure that the ceiling structure and the securing elements can bear the weight of the unit, taking into account that it is a dynamic load.

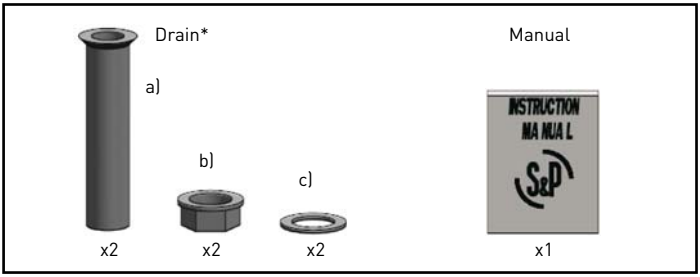


Model	Weight (kg)
40	597
54	730

For all configurations

Once secured the device in correct position, the installer have to realise the connection with air duct, connection to the electric supply, and in the case of versions with water coil, the connection with closed circuit of hot water coil.

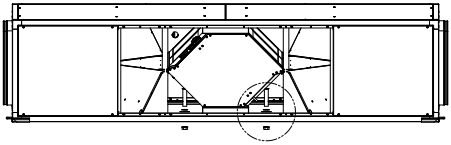
Inside of the unit are supplied the following accessories:

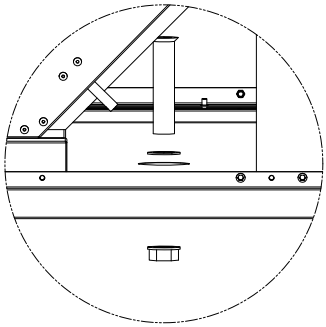


* In the models 40 and 54 the drain is installed by default in the unit.

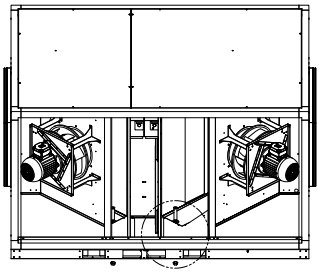
The drain is composed by 3 pieces:
a) Drainpipe
b) Female screw
c) Joint ring (posar aquesta frase a sota d'aquest punt)

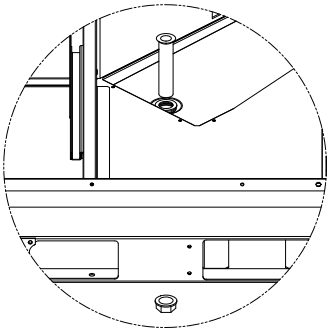
a) Horizontal versions of CADB/T HE 04 to 33



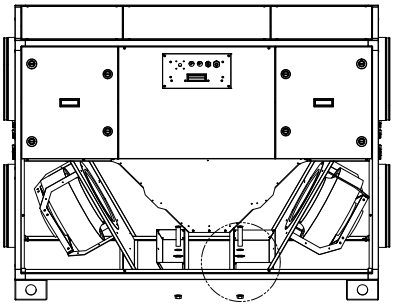


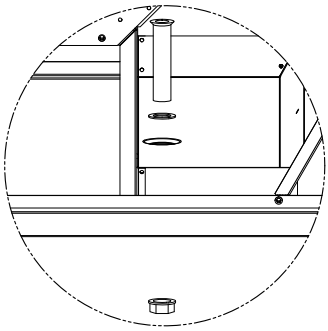
b) Horizontal versions of CADB/T HE 40 to 54



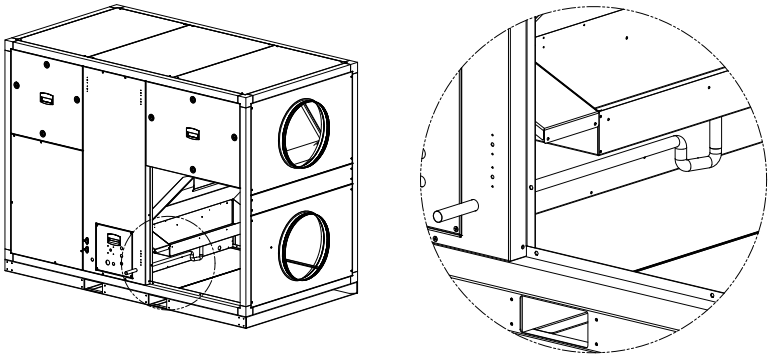


c) Vertical versions of CADB/T HE 04 to 33





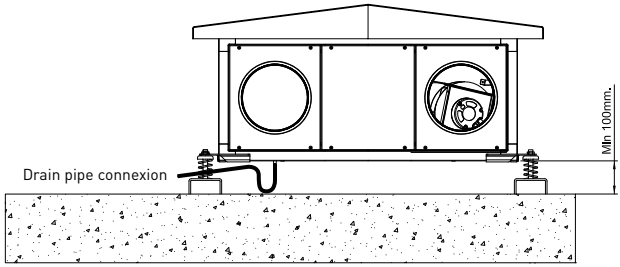
d) Vertical versions of CADB/T HE 40 to 54



In these versions, the drainpipe and the siphon are supplied mounted in the unit.

6.1.1. Outdoor installation

The CADB/T-HE ECOWATT range is designed to be mounted indoors. When it is installed outdoors, it is necessary to place the equipment under a cover which offers enough protection to prevent rain falling directly to the unit, or install the corresponding roof mounting.
In horizontal version, models 04 to 33, ensure the sufficient space below the unit, to install a siphons in the drain pipe.



Rain protection canopy available, according to the heat recovery unit model:

Heat recovery unit model	Rain protection cowl model	
	Horizontal (LH / RH)	Vertical (LV / RV)
CADB-HE D/DI/DC 04	TPP-HE-H 04	TPP-HE-V 04
CADB-HE D/DI/DC 08	TPP-HE-H 08	TPP-HE-V 08
CADB-HE D/DI/DC 12	TPP-HE-H 12	TPP-HE-V 12
CADB-HE D/DI/DC 16	TPP-HE-H 16	TPP-HE-V 16
CADB/T-HE D/DI/DC 21	TPP-HE-H 21/33	TPP-HE-V 21
CADT-HE D/DI/DC 33	TPP-HE-H 21/33	TPP-HE-V 33
CADB/T-HE D/DI/DC 40	TPP-HE-H 40	TPP-HE-V 40
CADB/T-HE D/DI/DC 54	TPP-HE-H 54	TPP-HE-V 54

Avoid condensations in electrical cabinet

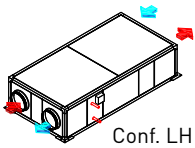
In units located in outdoor installation where the heat recovery units stop during the night or during long intervals of time, it is necessary to:

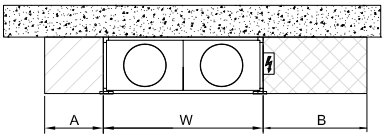
a) Install isolation dampers in air inlet and air outlet.
b) Add anticondensation devices in the electrical cabinet as: cabinet heating elements that prevent condensation formation on cabinet surfaces and electronic components.

6.2. DIMENSIONS AND FREE SPACE FOR MAINTENANCE

a) Horizontal versions of CADB/T HE 04 to 33 (False ceiling installation)

Distances for maintenance in installations with access by the lateral panels

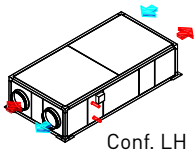


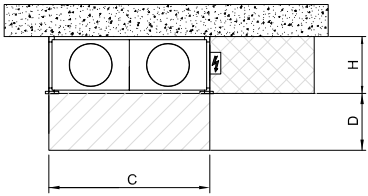


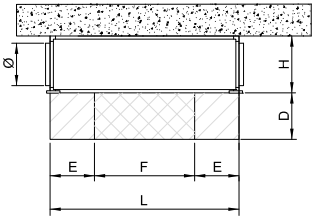
Access to filters and heat exchanger

Access to control panel, motors and coils/ battery connections (DI/DC versions)

Distances for maintenance in installations with access by the inferior panels







Access to filters and heat exchanger

Access to control panel, motors and coils/ battery connections (DI/DC versions)

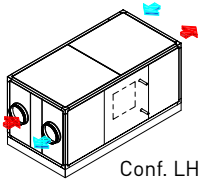
Access to filters

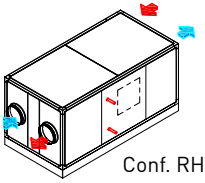
Access to heat exchanger

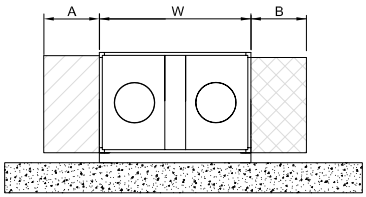
False ceiling installation

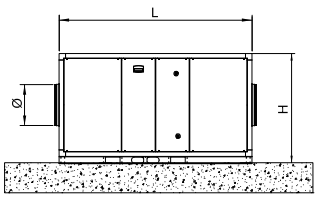
Model	W	H	L	A	B	C	D	Ø	E	F	Weight (kg)
04	760	375	1520	400	400	700	350	200	350	920	137
08	910	425	1750	450	400	860	400	250	400	950	173
12	1050	425	1700	500	400	1000	400	315	400	900	180
16	1240	450	1950	600	500	1190	425	315	400	1150	225
21	1640	550	2300	800	700	1590	525	400	500	1300	323
33	1640	650	2300	800	700	1590	325	400	500	1300	410

b) Horizontal versions of CADB/T HE 40 and 54 (Ground installation)









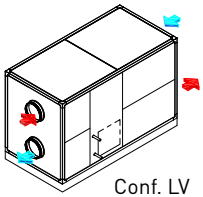
Access to filters and heat exchanger

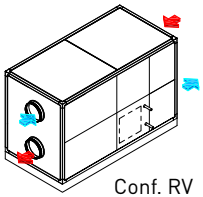
Access to control panel, motors and coils/ battery connections (DI/DC versions)

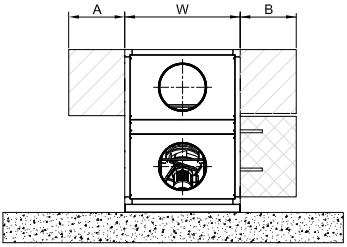
Ground installation

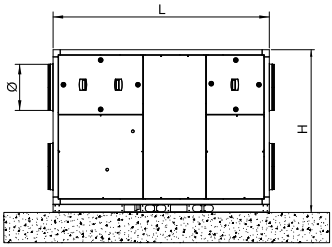
Model	W	H	L	A	B	Ø	Weight (kg)
40	1500	1200	2100	400	600	450	597
54	1550	1580	2250	400	750	500	730

c) Vertical versions









Access to filters and heat exchanger

Access to control panel, motors and coils/ battery connections (DI/DC versions)

Model	W	H	L	A	B	Ø	Weight (kg)
4	540	920	1125	400	400	200	139
8	610	1020	1275	400	400	250	175
12	770	1020	1325	400	400	315	182
16	770	1070	1475	400	400	315	227
21	970	1270	1750	400	500	400	325
33	1170	1270	1750	400	500	400	412
40	1120	1580	2100	400	600	450	577
54	1500	1630	2250	400	800	500	710

6.3. MOUNTING PROCESS OF AN ADDITIONAL SUPPLY FILTER

The heat recovery unit is supplied with the filters already installed. F7 in exhaust air and M5 in supply air. In addition, it is possible to mount a second filter in the unit (accessory).
(For more information see section "Replacing filters").

6.4. RANGE SPECIFICATIONS

D Versions: without heater battery

Model	Complete unit			Fan		
	Air connections diameter (mm)	Nominal airflow 150 Pa (m^3/h)	Efficiency* (%)	Electrical supply	Speed (r.p.m.)	Maximum current (A)
CADB-HE D 04 ECOWATT	200	450	87	1/230V, 50Hz	3700	0,95
CADB-HE D 08 ECOWATT	250	800	86,4	1/230V, 50Hz	2650	1,3
CADB-HE D 12 ECOWATT	315	1200	85,3	1/230V, 50Hz	2550	1,6
CADB-HE D 16 ECOWATT	315	1600	85,5	1/230V, 50Hz	2845	2,0
CADB-HE D 21 ECOWATT	400	2100	86,7	1/230V, 50Hz	1580	2,2
CADT-HE D 33 ECOWATT	400	3300	85,9	3/400V, 50Hz	2600	2,0
CADB-HE D 40 ECOWATT	450	4000	86,8	1/230V, 50Hz	2340	7,4
CADB-HE D 54 ECOWATT	500	5400	87,1	1/230V, 50Hz	2110	10,0

* Humid efficiency referring to nominal airfl ow, outdoor conditions (-5ºC / 80% RH) and indoor (20ºC / 50% RH).

DC Versions: with built-in hot water coil

Model	Complete unit			Fan			Hot water coil	
	Air connections diameter (mm)	Nominal airflow 150 Pa (m^3/h)	Efficiency* (%)	Electrical supply	Speed (r.p.m.)	Maximum current (A)	Heat power T_{WATER} 80/60ºC (kW)	Heat power T_{WATER} 50/45ºC (kW)
CADB-HE DC 04 ECOWATT	200	450	87	1/230V, 50Hz	3700	0,95	2,7	1,6
CADB-HE DC 08 ECOWATT	250	800	86,4	1/230V, 50Hz	2650	1,3	5,1	3,1
CADB-HE DC 12 ECOWATT	315	1200	85,3	1/230V, 50Hz	2550	1,6	7,1	4,3
CADB-HE DC 16 ECOWATT	315	1600	85,5	1/230V, 50Hz	2845	2,0	8,6	5,3
CADB-HE DC 21 ECOWATT	400	2100	86,7	1/230V, 50Hz	1580	2,2	12,6	7,8
CADT-HE DC 33 ECOWATT	400	3300	85,9	3/400V, 50Hz	2600	2,0	18,2	11,1
CADB-HE DC 40 ECOWATT	450	4000	86,8	1/230V, 50Hz	2340	7,4	23,9	14,4
CADB-HE DC 54 ECOWATT	500	5400	87,1	1/230V, 50Hz	2110	10	32,1	19,5

* Humid efficiency referring to nominal airfl ow, outdoor conditions (-5ºC / 80% RH) and indoor (20ºC / 50% RH).

DI Versions: with built-in electric battery

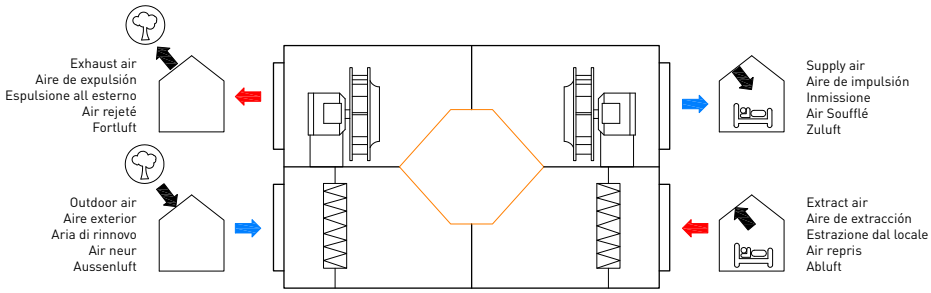
Model	Complete unit			Fan			Electrical heater battery		
	Air connections diameter (mm)	Nominal airflow 150 Pa (m^3/h)	Efficiency* (%)	Electrical supply	Speed (r.p.m.)	Maximum current (A)	Electrical supply	Power (kW)	Maximum current (A)
CADB-HE DI 04 ECOWATT	200	450	87	1/230V, 50Hz	3700	0,95	1/230V, 50Hz	1	4,5
CADB-HE DI 08 ECOWATT	250	800	86,4	1/230V, 50Hz	2650	1,3	1/230V, 50Hz	2	9,1
CADB-HE DI 12 ECOWATT	315	1200	85,3	1/230V, 50Hz	2550	1,6	1/230V, 50Hz	3	11,4
CADB-HE DI 16 ECOWATT	315	1600	85,5	1/230V, 50Hz	2845	2,0	1/230V, 50Hz	3,5	15,9
CADT-HE DI 21 ECOWATT	400	2100	86,7	1/230V, 50Hz	1580	2,2	3/400V, 50Hz	6	9,1
CADT-HE DI 33 ECOWATT	400	3300	85,9	3/400V, 50Hz	2600	2,0	3/400V, 50Hz	7,5	11,4
CADT-HE DI 40 ECOWATT	450	4000	86,8	1/230V, 50Hz	2340	7,4	3/400V, 50Hz	9	13,7
CADT-HE DI 54 ECOWATT	500	5400	87,1	1/230V, 50Hz	2110	10	3/400V, 50Hz	12	18,2

* Humid efficiency referring to nominal airfl ow, outdoor conditions (-5ºC / 80% RH) and indoor (20ºC / 50% RH).

6.5. CONNECTIONS

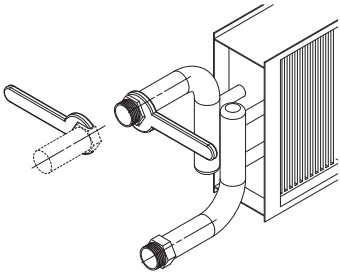
6.5.1. Connection with air duct

The fans are always blowing out with regard to the machine. Before making the connection of air lines, verify existing identification labels in each mouth of the heat recovery units.



6.5.2. Connecting the water coil piping. DC Versions

Connecting the unit to the water network
- Maximum pressure: 31.62 bar
- Maximum temperature: 150°C



• Water coils of DC versions have threaded connections. Secure the coil manifold with the appropiate tool when tightening the threads. This will prevent the force from being transmitted to the manifold, which can damage it.

• The following table indicate the size and type o thread used on water coils for DC versions:

CADB/T-HE MODEL	THREAD
04, 08, 12, 16, 21 and 33	1/2"
40 and 54	1"

• To ensure the installation on a hand, it is essential that the installation includes the following elements:
- Unit intake pre-filter that traps suspended particulate matter.
- Bleed valves should be fitted at each of the high points in the installation.
- Auto-filter valve to keep water in the hydraulic system at all times.
- Pressure to detect the lack of water pressure.
- Shut-off valves must be installed at each connection on the water line to allow the unit to be isolated if necessary (to clean filters, make repairs, replace parts, etc) and avoid the need to completely drain the water circuit.
- Anti-vibration bellows should be installed at the inlet and outlet from the unit to prevent the transmission of vibrations that could result in damage to the heat exchanger coil due to excess stress on the circuits.

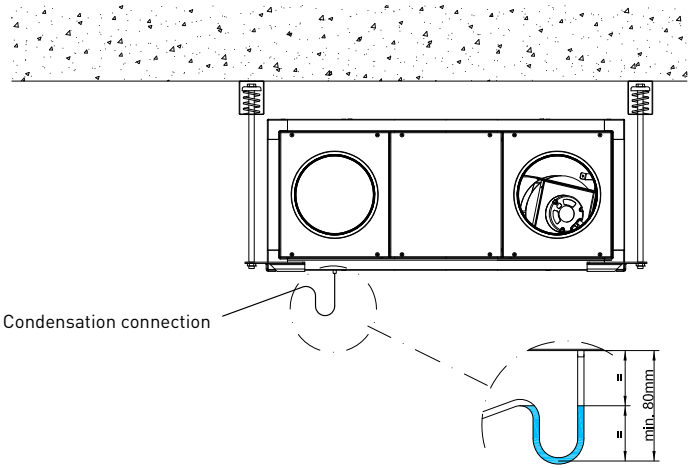
Once the installation is performed check that the heating water flow is adequate.

6.5.3. Condensate drainage

The units are supplied with 2 drains (one for each circuit). For added security it has to connect two drains to the condensate discharge pipe. This connection must be made through a pipe of 22 mm of inner diameter and a flange for secure fixation.

Drainage system

- To ensure the removal of draining condensate from the tray a siphon must be installed with pressure head difference in mmWG greater than the pressure provided by the fan.
- The horizontal sections should have a minimum slope of 2%.



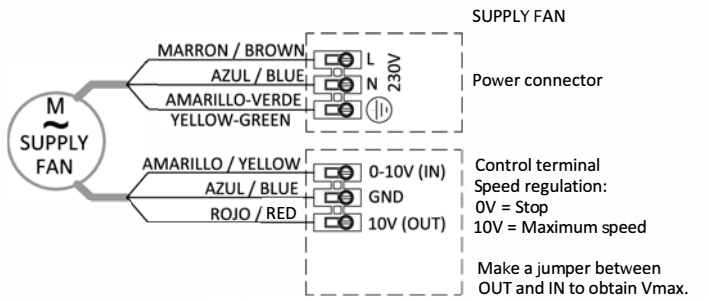
6.6. ELECTRICAL CONNECTIONS

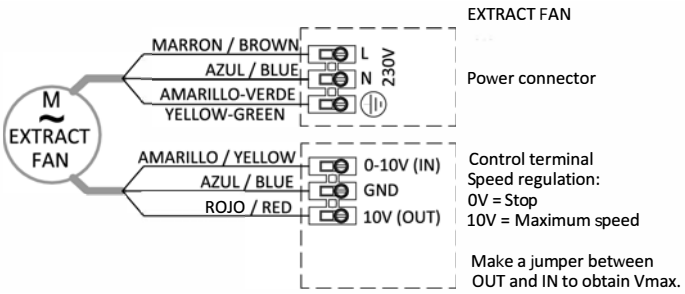
The CADB/T-HE ECOWATT range are supplied without a complete operating control integrated in the unit, however the units include the electronic to control fan speed. The electrical components included in the unit are supplied wired in a terminal box or in a terminal board located inside the unit (depending on the version).

6.6.1. Connecting the motors

CADB/T-HE 04 to 21 models

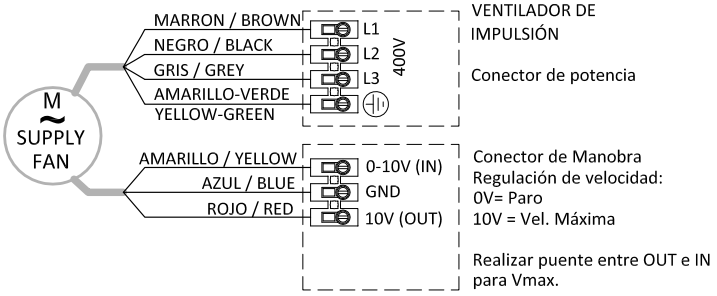
In these sizes the units have plug-fans with EC motors 230V supply voltage.

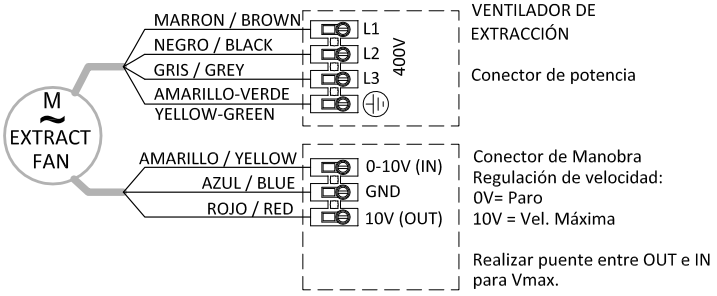




CADB/T-HE 33 model

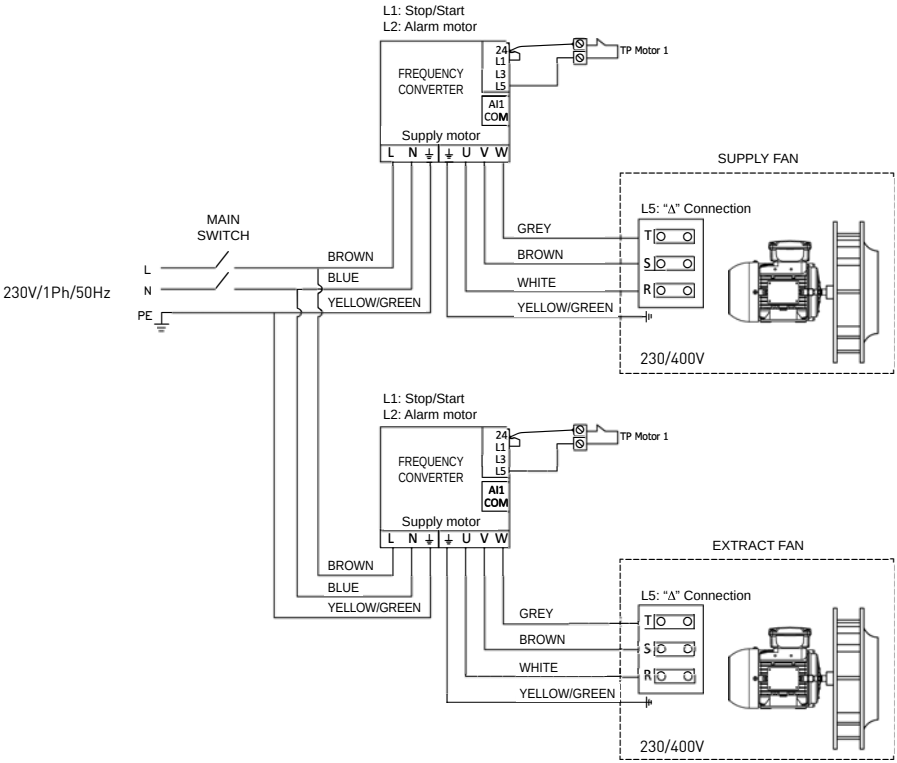
In this size the units have plug-fans equipped with AC motors with power supply to three-phase 400V.





CADB/T-HE 40 to 54 models

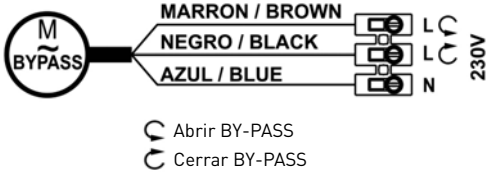
The models of sizes 40 to 54 have three phase motors AC. The motors are controlled through frequency converters included in the unit and wired. (Supply voltage: 230V/3Ph).



6.6.2. Connecting the By-pass

All heat recovery units of the CADB/T-HE ECOWATT range have an internal by-pass. The by-pass damper is supplied with its actuator mounted (Supply voltage 230V). The actuator is wired to an external terminal box or to the electrical board (depending on the version)

With the FC-REG accessory is possible to control the by-pass in free-cooling mode.



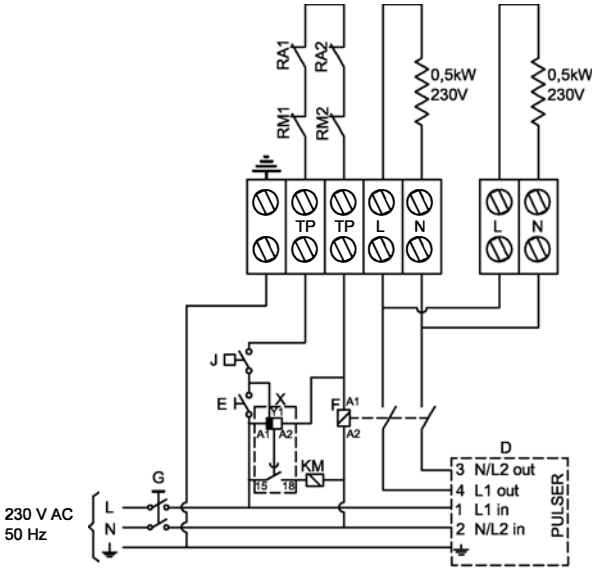
6.6.3. Connecting the electric batteries

The CADB/T-HE-DI versions are supplied with electrical batteries of postheating mounted inside the unit.

FIRE DANGER

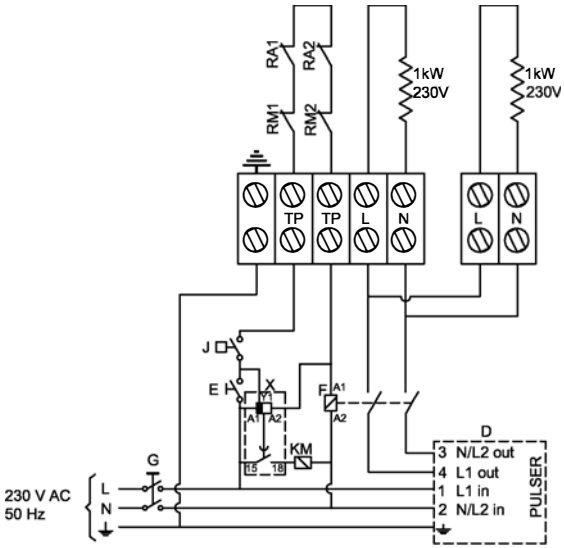
To manage the internal electrical power (-DI versions) it is necessary to perform an external electrical operation control board.
The installer is responsible for the correct operation of the electrical control, specially regarding those safety requirements to avoid fire risk due to high temperature inside the unit.

Electrical diagrams (Recommended control board)

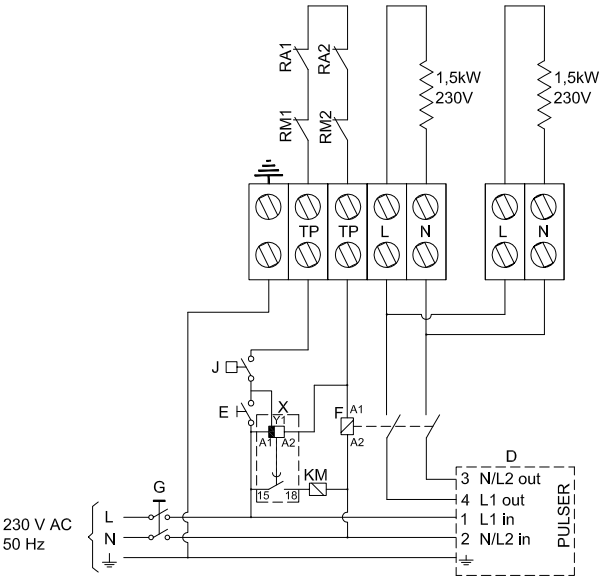


CADB-HE 04 (1kW 230V)

D: HEATER REGULATOR
E: ON/OFF SWITCH
F: RELAY
G: LINE PROTECTION
H:TEMPERATURE PROBE
J: FLOW DETECTOR
KM: FAN RELAY
X: TIMER (MCR-1)

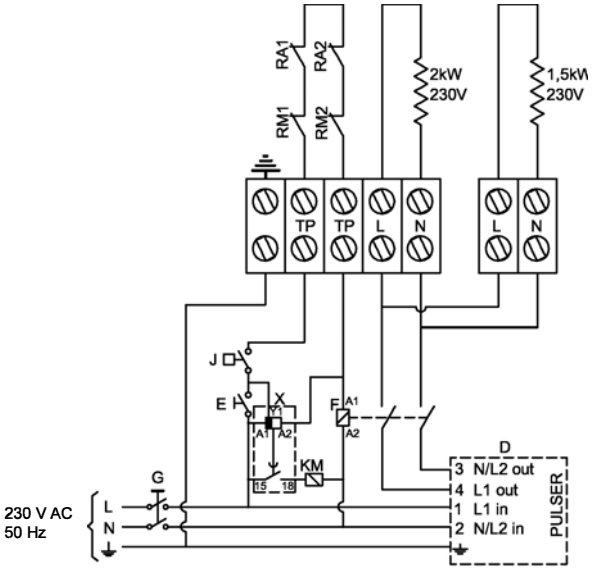


CADB-HE 08 (2kW 230V)

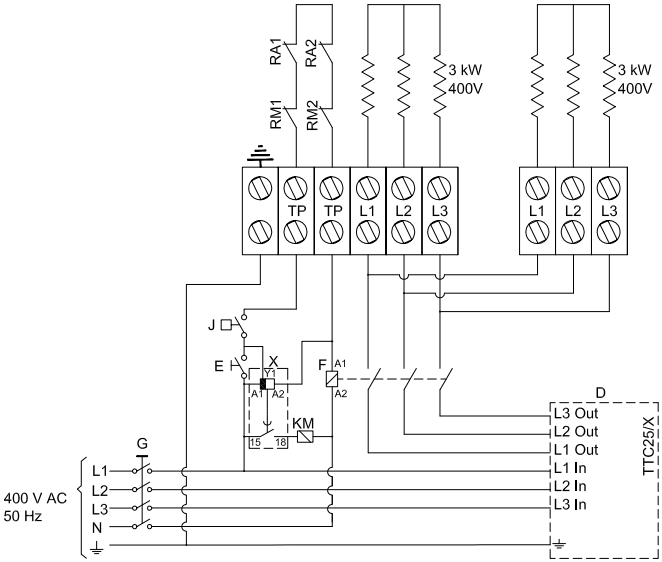


CADB-HE 12 (3kW 230V)

D: HEATER REGULATOR
E: ON/OFF SWITCH
F: RELAY
G: LINE PROTECTION
H:TEMPERATURE PROBE
J: FLOW DETECTOR
KM: FAN RELAY
X: TIMER (MCR-1)

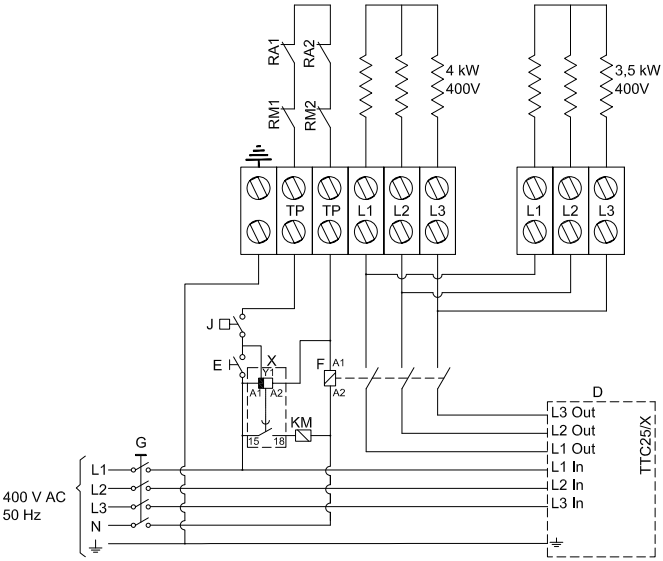


CADB-HE 16 (3,5kW 230V)

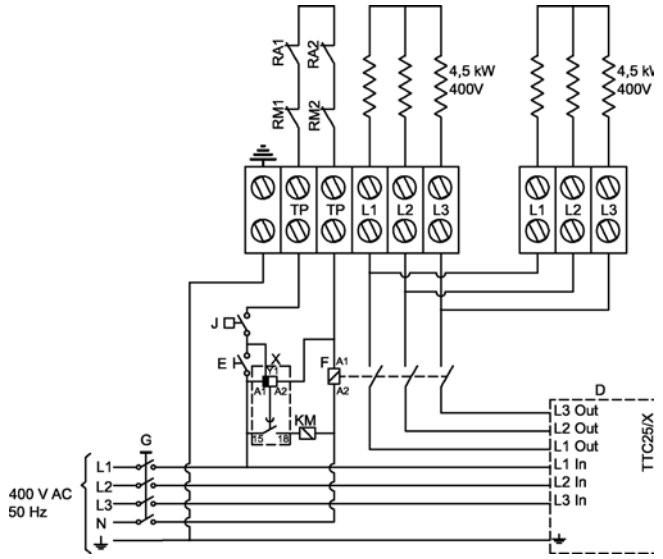


CADT-HE 21 (6kW 400V)

D: HEATER REGULATOR
E: ON/OFF SWITCH
F: RELAY
G: LINE PROTECTION
H:TEMPERATURE PROBE
J: FLOW DETECTOR
KM: FAN RELAY
X: TIMER (MCR-1)

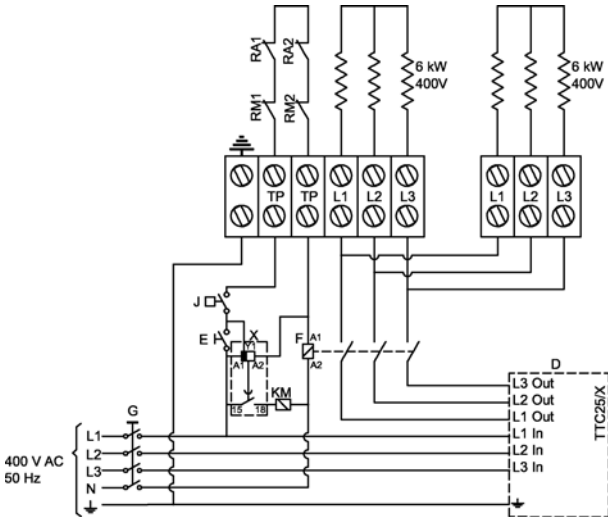


CADT-HE 33 (7,5kW 400V)



CADT-HE 40 (9kW 400V)

D: HEATER REGULATOR
E: ON/OFF SWITCH
F: RELAY
G: LINE PROTECTION
H:TEMPERATURE PROBE
J: FLOW DETECTOR
KM: FAN RELAY
X: TIMER (MCR-1)



CADT-HE 54 (12kW 400V)

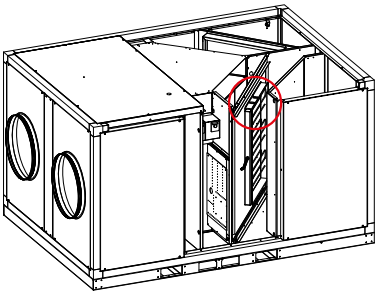
D: HEATER REGULATOR	H:TEMPERATURE PROBE
E: ON/OFF SWITCH	J: FLOW DETECTOR
F: RELAY	KM: FAN RELAY
G: LINE PROTECTION	X: TIMER (MCR-1)

Thermal protectors

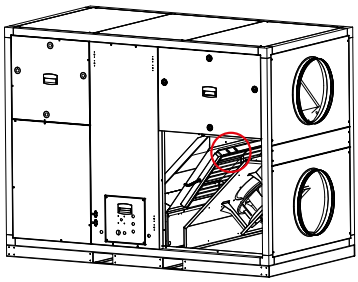
The electric heaters are equipped with two thermal protectors (automatic and manual reset). Both protectors are safety devices to be used exclusively to detect abnormal functioning of the heating system. Under no circumstances the thermal protectors can be used as thermostats to control the heating power. Before reset the manual thermal protector, ensure that the causes that produced its activation were located and corrected.

Thermal protectors position

Horizontal models:



Vertical models:



Danger of burns, there is a risk that the metal parts are at a high temperature.

6.6.4. Connecting electrical accessories

With the existing accessories is possible to perform the fans control in VAV, COP and CAV mode.

Recommended accessories depending on the unit size and the control mode:

Model	Accessories for VAV via CO_2		Accessories for COP		Accessories for CAV	
	Converter	Sensor	Converter	Probe	Electronic regulator	Frequency converter
CADB-HE D/DI/DC 04	CONTROL AERO-REG	SC02-A / SC02-AD / SC02-G	CONTROL AERO-REG**	TDP-D *	REB-ECOWATT**	-
CADB-HE D/DI/DC 08	CONTROL AERO-REG		CONTROL AERO-REG**	TDP-D *	REB-ECOWATT**	-
CADB-HE D/DI/DC 12	CONTROL AERO-REG		CONTROL AERO-REG**	TDP-D *	REB-ECOWATT**	-
CADB-HE D/DI/DC 16	CONTROL AERO-REG		CONTROL AERO-REG**	TDP-D *	REB-ECOWATT**	-
CADB/T-HE D/DI/DC 21	CONTROL AERO-REG		CONTROL AERO-REG**	TDP-D *	REB-ECOWATT**	-
CADT-HE D/DI/DC 33	CONTROL AERO-REG		CONTROL AERO-REG**	TDP-D*	REB-ECOWATT**	-
CADB/T-HE D/DI/DC 40	INCLUÍDO	SC02-A / SC02-AD / SC02-G (Modelos 40 y 54 exclusivamente con sensores 4-20mA)	INCLUÍDO	TDP-D *	-	INCLUÍDO
CADB/T-HE D/DI/DC 54	INCLUÍDO		INCLUÍDO	TDP-D *	-	INCLUÍDO

* To independently control the workpoint of each circuit, the supply and extract fans should be controlled by two specific pressure probes.

** To independently control the workpoint of each circuit, the supply and extract fans should be controlled via corresponding electronic regulator.

In the models 40 and 54 the speed controller (frequency converter) is supplied inside the unit, factory assembled and wired.

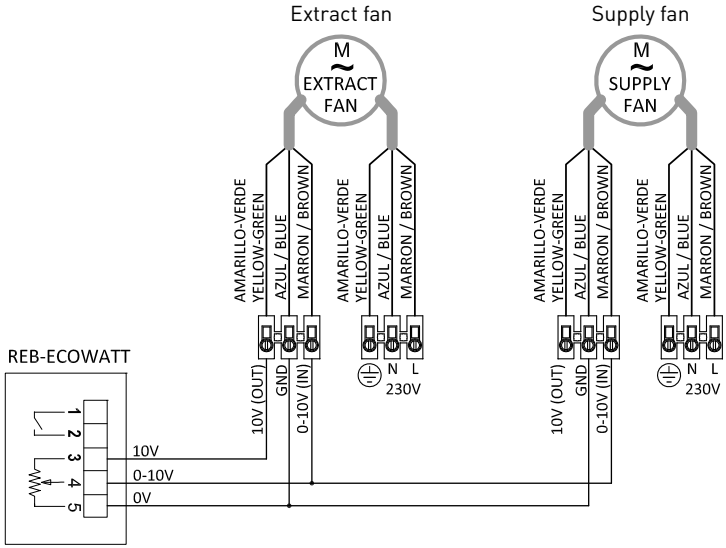
6.6.4.1. Manual VAV control (variable airflow)

It is possible to control in VAV mode manually with an external potentiometer
Manual control by external potentiometer REB-ECOWATT (accessory). Valid for CADB/T-HE 04 to 21 models.

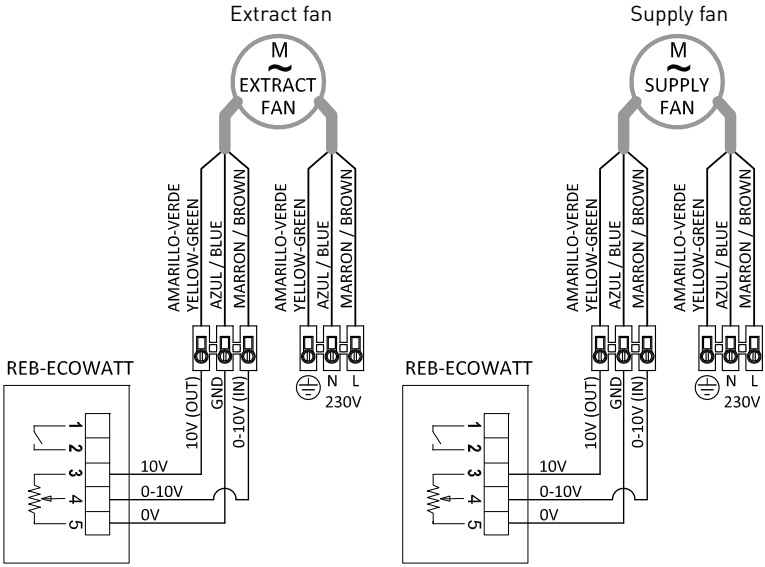
IMPORTANT: RISK OF FIRE
The manual speed control, must not be carried out in DI-versions (with electrical resistances).
The direct stop of the fans without a temporized stop would cause a high temperature rise of the resistances, and the consequent risk of fire inside the unit.

6.6.4.1.1. 04 to 21 models: Manual adjustment by REB-ECOWATT (accessory)

Simultaneous control of the supply and extract fans

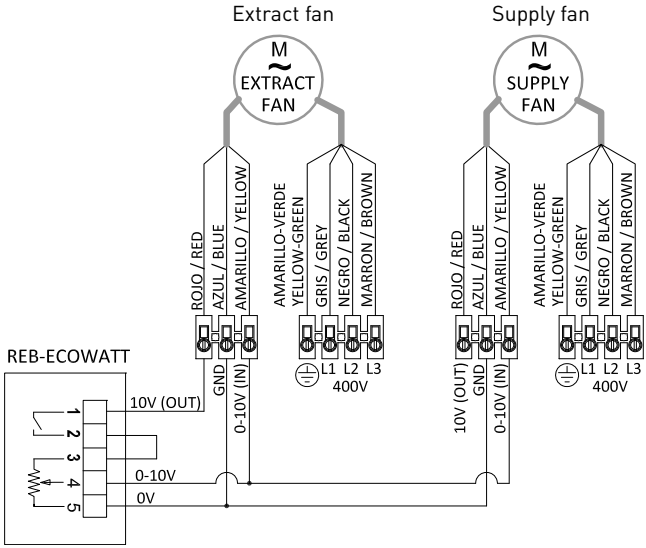


Independent control of supply and extract fans

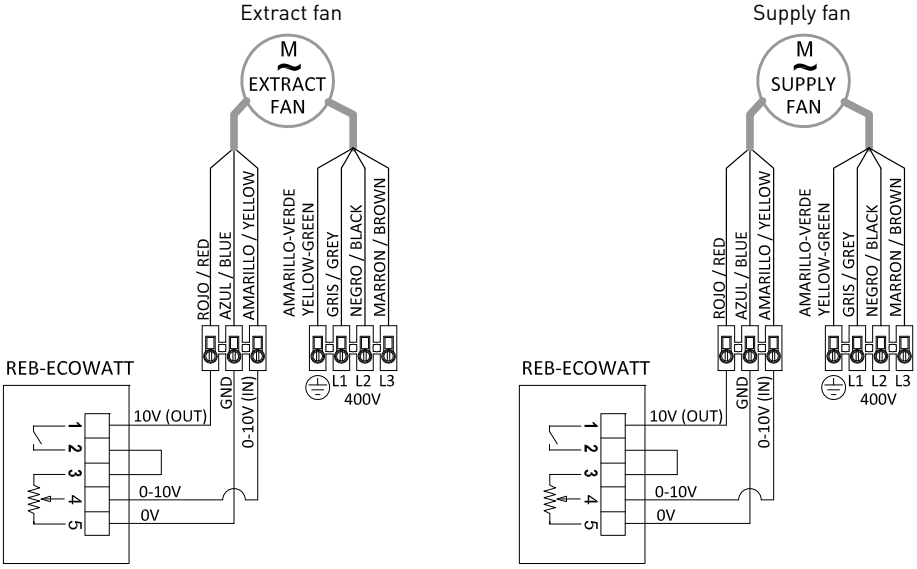


6.6.4.1.2. 33 model: Manual adjustment by REB-ECOWATT (accessory)

Simultaneous control of the supply and extract fans

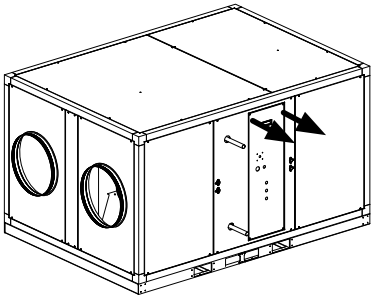


Independent control of supply and extract fans



6.6.4.1.3. 40 and 54 models: Manual adjustment by inverters included in the unit

Manual control by the internal potentiometer integrated in the frequency converters located inside the unit. Valid for CADB/T-HE 40 and 54 models

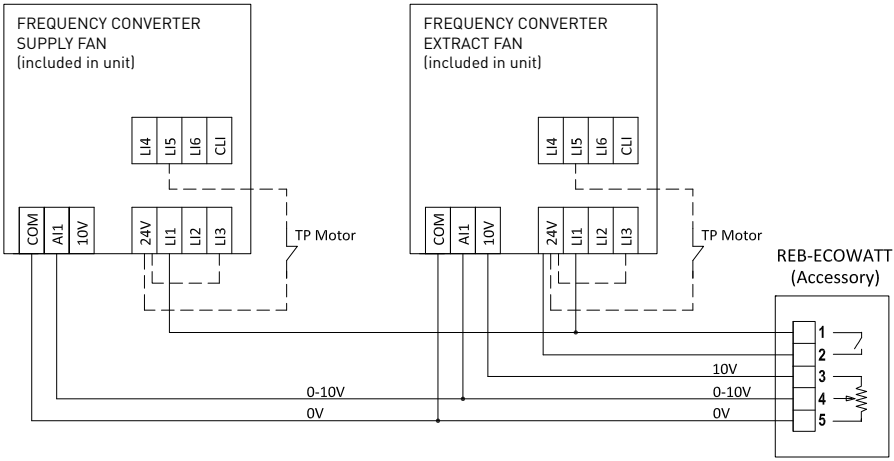


1. Remove the panel that give access to the frequency converter.
2. Modify the fan speed (frequency) by means of the external potentiometer in the frontal of the frequency converter.

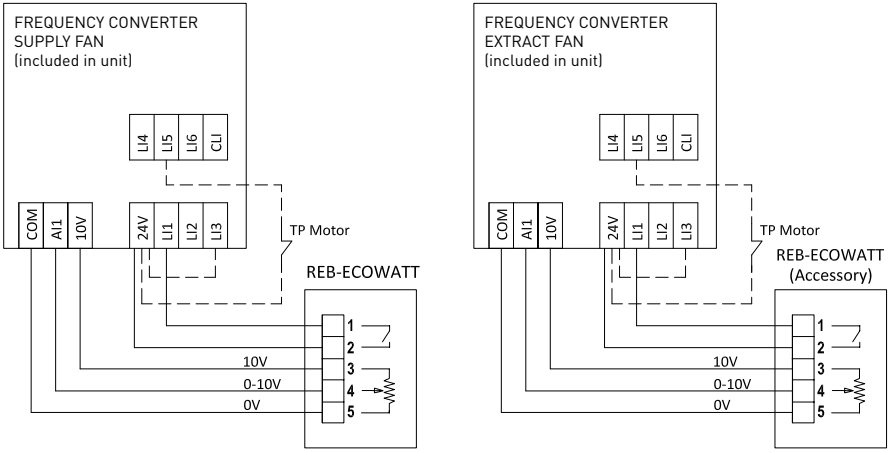
6.6.4.1.4. 40 and 54 models: Manual adjustment with REB-ECOWATT (accessory)

It is also possible to adjust the fan speed with one or two REB-ECOWATT controllers (accessory).

Joint control of supply and extract fans



Independent control of supply and extract fans



6.6.4.2. VAV Control (variable airflow), with CO_2 sensor or similar

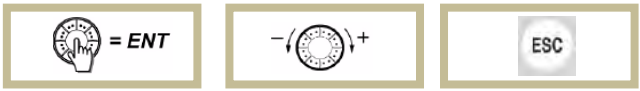
FIRE DANGER
For DI heat recovery units, equipped with electric post heating battery, the installer must ensure that the minimum airflow is enough to prevent electrical battery overheating. We recommend that minimum airflow was not less than 1/3 part of the heat recovery unit nominal airflow.

CADB/T-HE 04 to 33 models:
In these sizes the units have plug-fans with EC motors 230V (400V three phase in the 33 model) supply voltage. The motors have specific terminals for sending a regulation signal to control fan speed (0-10V). The 0V signal corresponds to the fan stop, while the signal of 10V corresponds to fan maximum speed.
To perform the speed regulation in VAV with speed control with external sensor of CO2 or similar, it is necessary to use the accessory CONTROL AERO-REG and the external sensor (see point 7.5.2.4.). In the CONTROL AERO-REG instruction booklet it is contained the necessary information to carry on the electrical connection of the different components.

40 and 54 models:
These models are equipped with two frequency converters (one per fan), throw these it is possible to regulate the fan speed depending on the CO2 concentration mesured by the CO2 sensor (accessory). Follow the next points to adjust the frequency converter parameters:

Inverter reconfiguration

Frequency converters are pre-programmed to be used via proportional control with a built-in potentiometer (FR2 with jumper between 24V and LI3) or via PI control with a 0-10V voltage input (FR1 with jumper between 24V and LI1).
For other uses, some of the parameters configured in the frequency converter must be reprogrammed. To do so, use the following inverter commands:



Step 1. Unlock the inverter

To unlock the inverter, enter the password. The sequence is as follows:

- Press ESC until "rdy" appears on the screen.
- Press ENTER and rotate the wheel anti-clockwise until "SUP-" appears on the screen.
- Press ENTER and rotate the wheel clockwise until "COd-" appears on the screen.
- Press ENTER and rotate the wheel clockwise until "1951-" appears on the screen.

The entered code flashes. At this time the inverter is unprotected.

Step 2. Enter programming mode

The inverter has 2 operating MODES, RUN and PROGRAMMING. To switch from one to the other keep ESC pressed for two seconds.

Location of the 3 Mode Leds.
Depending on how they are lit up, they indicate the selected mode:

- IN SEQUENCE → RUN MODE
- SIMULTANEOUSLY → PROGRAMMING MODE

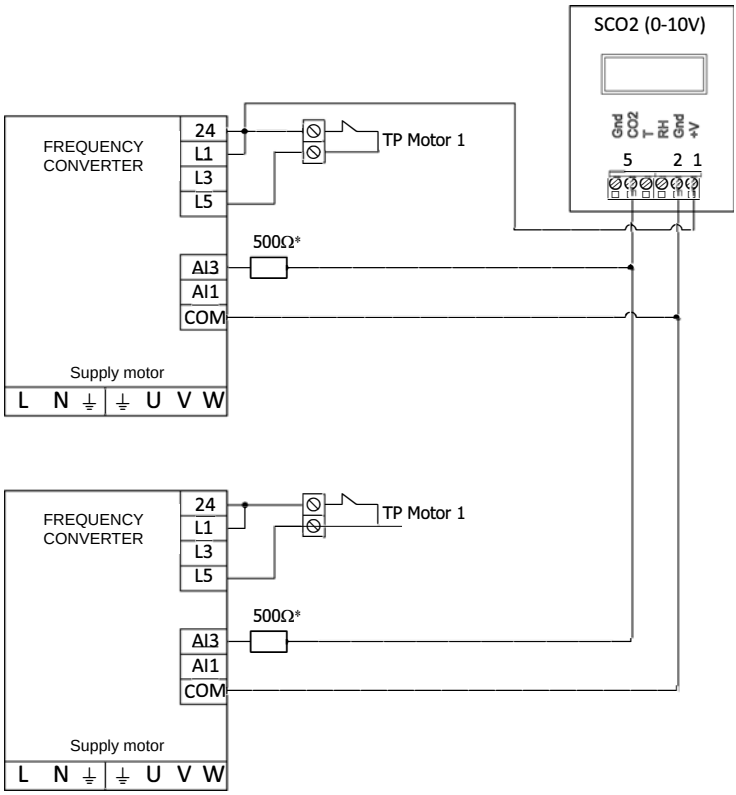
- Keep ESC pressed down for 2 seconds until the 3 mode leds light up simultaneously. At that moment they are in Programming Mode.

Enter the parameters depending on the required use.

Automatic proportional control with a 0-10v signal from an external analogue sensor (CO_2, temperature or relative humidity)

Features

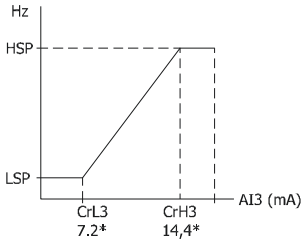
In this case, the equipment is used to regulate the air volume in accordance with the value measured by an external sensor.
The external sensor must emit a 0-10V analogue sensor.
With 0-10V input the input voltage values cannot be adjusted.



* Resistance provided inside the electrical board.

Inverter Re-programming

It is possible to change the behaviour of the proportional output by modifying the value of the LSP, HSP, CrL3 and CRH3 paramaters.



* Valores de fábrica

In this case, some of the parameters configured in the frequency converter must be re-programmed in the inverter to avoid exceeding the overpressure value established by the relevant regulations. Access the programming mode (steps 1 and 2 in section 2.2) and then perform the following configuration changes:

Master inverter

- Press ENTER and rotate the wheel anti-clockwise until "SEt-" appears on the screen.
- Press ENTER and rotate the wheel anti-clockwise until "LSP" appears on the screen.
- Press ENTER and rotate the wheel until the necessary value appears for the "Minimum frequency in Hz" parameter. Press ENTER to confirm the value entered. If this value is different to the previous one, the display should flash.
- Press ESC to exit the "LSP" parameter.
- Rotate the wheel until "HSP" appears on the screen
- Press ENTER and rotate the wheel until the necessary value appears for the "Maximum frequency in Hz" parameter. Press ENTER to confirm the value entered. If this value is different to the previous one, the display should flash.
- Press ESC to exit the "HSP" parameter.
- Press ESC to exit the "Set-" menu.
- Follow the method used to configure the two initial parameters until all of the parameters in the following table have been configured:

Menú	Parameter	Value	Comment
I_O-	CrL3	7.2	Minimum reference value (mA)
I_O-	CrH3	14.4	Maximum reference value (mA)
Ctl-	Fr2	AI3	Current type reference (mA)

- Press ESC to exit the "CtL-" menu.
- Keep ESC pressed down for 2 seconds until the 3 mode leds light up in sequence. It is now in RUN mode, available for automatic inverter operation.

Slave inverter

The slave inverter has to be configured in the same way as the master inverter.

Menú	Parameter	Value	Comment
Ctl	Fr1	AI1	Control with AI1 input

6.6.4.3. CAV control (Constant airflow)

The inverter is used to guarantee an specific constant air volume in the duct system, regardless of the filters clogging state.

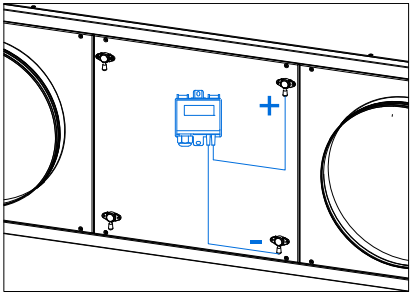
CADB/T-HE 04 to 33 models:

In these sizes the units have plug-fans with EC motors 230V (400V three phase in the 33 model) supply voltage. The motors have specific terminals for sending a regulation signal to control fan speed (0-10V).

The 0V signal corresponds to the fan stop, while the signal of 10V corresponds to fan maximum speed.

To perform the speed regulation in CAV mode, it is necessary to use the accessory CONTROL AERO-REG and the external pressure sensor TDP-D. In the CONTROL AERO-REG instruction booklet it is contained the necessary information to carry on the electrical connection of the different components.

1º Connect the pressure transmitter TDP-D (accessory) to the specific pressure taps there are in the heat recovery unit. Ensure that pressure taps " + " and " - " . Same sign in the taps of TDP-D and CADB-HE.

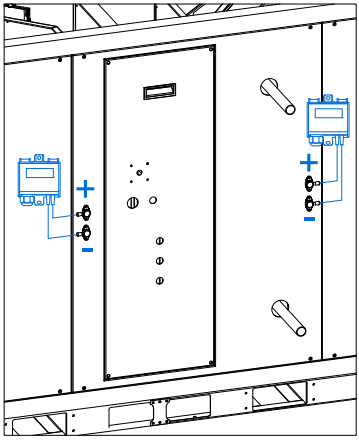


2º Perform the electrical connection and controller configuration, following the accessory instructions of AERO-REG CONTROL.

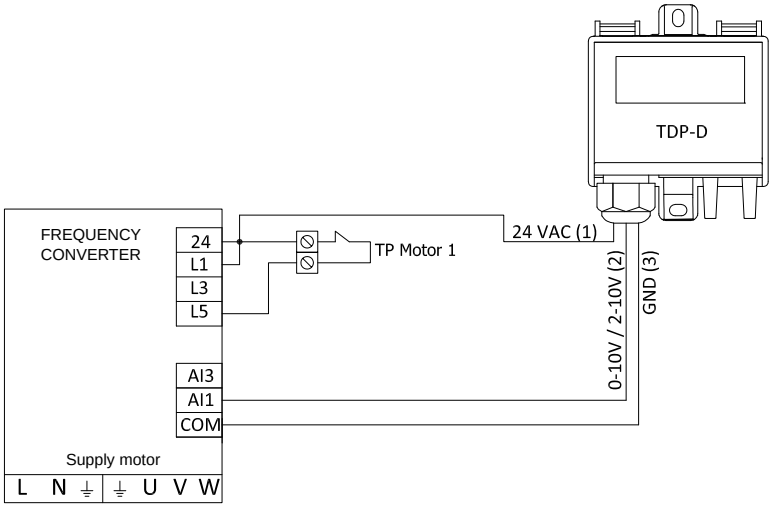
40 and 54 models:

These models are equipped with two frequency converters (one per fan), throw these it is possible to regulate the fan speed in CAV mode (Constant air flow).

1º Connect the pressure transmitter TDP-D (accessory) to the specific pressure taps there are in the heat recovery unit. Ensure that pressure taps " + " and " - " . Same sign in the taps of TDP-D and CADB-HE.



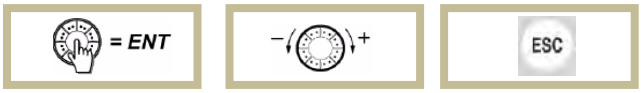
2º Perform the electrical connection and configuration of frequency converter, following these indications in the following points:



3º After performing the electrical power supply of the unit with the cut-out switch actuation on the outside of the unit, and then press the STOP key of the each inverter for stop the unit. **With the fans in operation, it is NOT possible to reconfigure the inverters.**

Converter reconfiguration

Frequency converters are pre-programmed to be used via proportional control with a built-in potentiometer (FR2 with jumper between 24V and LI3) or via PI control with a 0-10V voltage input (FR1 with jumper between 24V and LI1).
For other uses, some of the parameters configured in the frequency converter must be re-programmed. To do so, use the following inverter commands:



Step 1. Unlock the inverter
To unlock the inverter, enter the password. The sequence is as follows:
- Press ESC until "rdy" appears on the screen.
- Press ENTER and rotate the wheel anti-clockwise until "SUP-" appears on the screen.
- Press ENTER and rotate the wheel clockwise until "COd-" appears on the screen.
- Press ENTER and rotate the wheel clockwise until "1951-" appears on the screen.
- The entered code flashes. At this time the inverter is unprotected.

Step 2. Enter programming mode

The inverter has 2 operating MODES, RUN and PROGRAMMING. To switch from one to the other keep ESC pressed for two seconds.

Location of the 3 Mode Leds.
Depending on how they are lit up, they indicate the selected mode:

- IN SEQUENCE → RUN MODE
- SIMULTANEOUSLY → PROGRAMMING MODE

- Keep ESC pressed down for 2 seconds until the 3 mode leds light up simultaneously. At that moment they are in Programming Mode.

Enter the parameters depending on the required use.
Some of the parameters configured in the frequency converter must be re-programmed:

- Press ENTER and rotate the wheel until "FUn-" appears on the screen.
- Press ENTER and rotate the wheel until "PI-" appears on the screen.
- Press ENTER and rotate the wheel until "rPI" appears on the screen.
- Press ENTER and rotate the wheel until the necessary value appears for the "Pressure to be maintained" parameter. Percentage out of selected range in pressure sensor".

Continue configuring the following parameters:

Menu	Parameter		Value	Comment
Fun	PI	PIF	AI1	PI return
Fun	PI	rPG	0.2	Proportional gain (0.01-100)
Fun	PI	rIG	0.2	Integral gain (0.01-100)
Fun	PI	PII	YES	PI control
Fun	PI	rPI	*	PI controller

* The setpoint of the PI controller is a function of the pressure range set in the TPD-D and the airflow to be kept constant, and is determined by the following expression:

$$rPI = \frac{\text{Desired airflow}}{\text{Measured range TDP}} \text{ x } 100$$

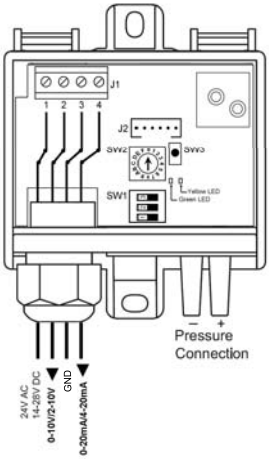
For example, if it is desired to obtain 2400 m^3/h, bearing in mind that the measuring range of the TDP is set at 5000 m^3/h, the setpoint would be:

$$rPI = \frac{2400}{5000} \text{ x } 100 = 48$$

- Press ESC successively until you reach the main menu.
- Press ESC for 2 seconds until the 3 mode indicator LEDs light sequentially. You are currently in RUN mode, available for automatic operation of the inverter.

Step 3. Reconfigure range in sensor
Select the TPD-D sensor pressure range in accordance with the values in the third column in the table above.

Adjustment to work in airflow mode:
The selection between pressure and airflow is made by the DIP3(SW1) micro switch existing inside the micro switch. Fix the micro switch in ON position.



Indicate the airflow range:
Once configured the airflow measurement, press the "OK" button to set the first digit of factor k. The value flashes and is adjusted using the buttons "▲" and "▼". when set, press the "OK" button to memorise the factor k. The actual measured value is displayed. If a airflow range is selected it is not necessary to enter a range of pressures.

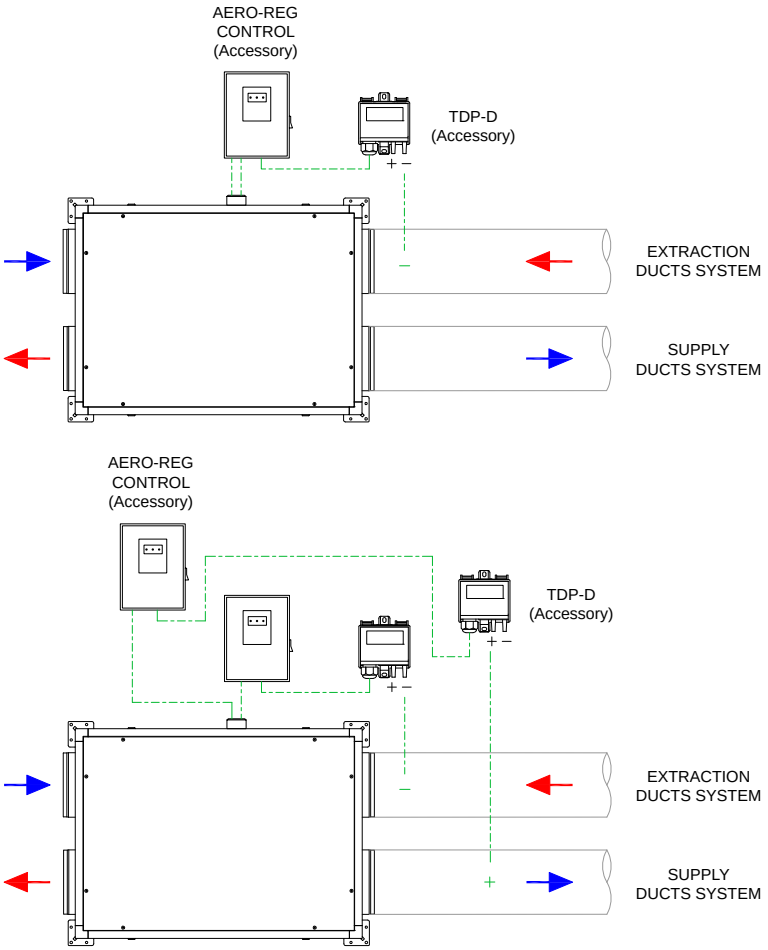
Model	K factor
CADB/T-HE 40	131
CADB/T-HE 54	166

6.6.4.4. COP Control (Constant pressure)

Constant Pressure (COP)
The inverter is used in multiroom ventilation systems to guarantee a constant air pressure value in the duct system, regardless of whether the dampers are open or closed.
In both cases, the pressure must be constant in the duct system. The value of this pressure must be determined by experimenting during the system start-up process.

CADB/T-HE 04 to 33 models:
In these sizes the units have plug-fans with EC motors 230V (400V three phase in the 33 model) supply voltage. The motors have specific terminals for sending a regulation signal to control fan speed (0-10V).
The 0V signal corresponds to the fan stop, while the signal of 10V corresponds to fan maximum speed.
To perform the speed regulation in COP mode, it is necessary to use the accessory CONTROL AERO-REG and the external pressure sensor TDP-D. In the CONTROL AERO-REG instruction booklet it is contained the necessary information to carry on the electrical connection of the different components.

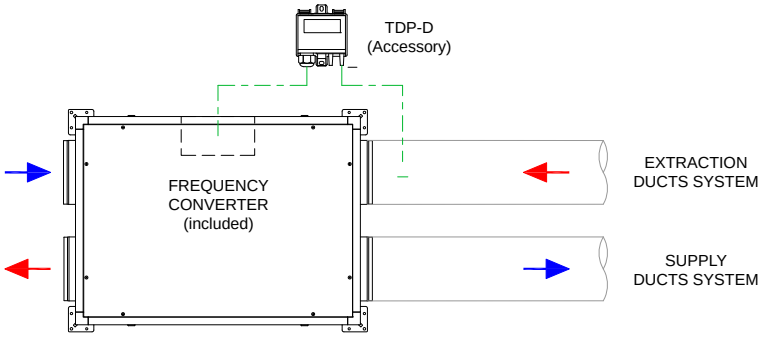
1º Connect the pressure transmitter TDP-D (accessory) to the duct system where the heat recovery unit is ducted. Ensure that pressure taps " + " and " - " are in the right position according to the following images.



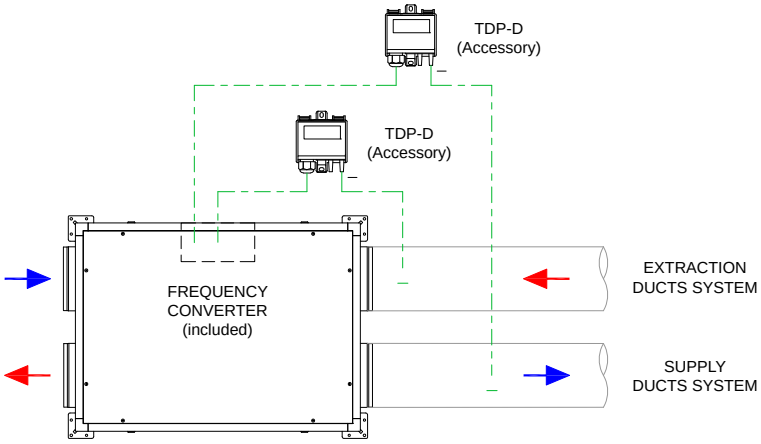
40 and 54 models:
These models are equipped with two frequency converters (one per fan), throw these it is possible to regulate the fan speed in COP mode (Constant air flow).

1º Connect the pressure transmitter TDP-D (accessory) to the duct system where the heat recovery unit is ducted. Ensure that pressure taps " + " and " - " are in the right position according to the following images.

PRESSURE CONTROL SCHEME IN EXTRACTION DUCTS SYSTEM (SLAVE SUPPLY)

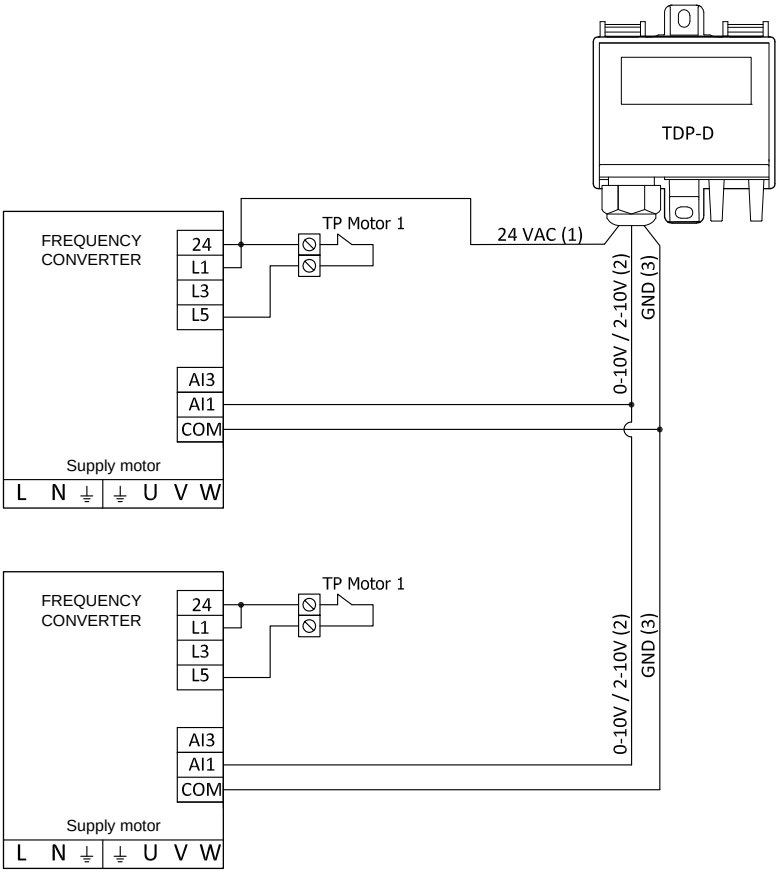


CONTROL SCHEME INDEPENDENT OF THE SUPPLY AND EXTRACT PRESSURE

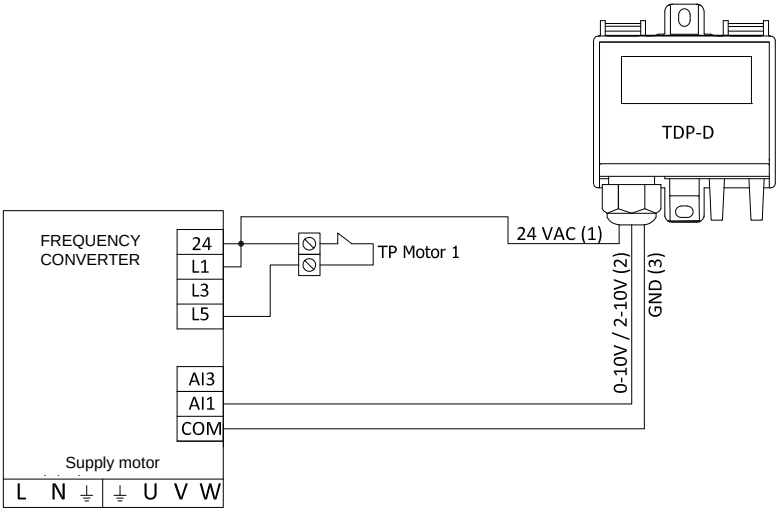


2º Perform the electrical connection and configuration of frequency converter, following these indications:

PRESSURE CONTROL SCHEME IN EXTRACTION DUCT SYSTEM (SLAVE SUPPLY)

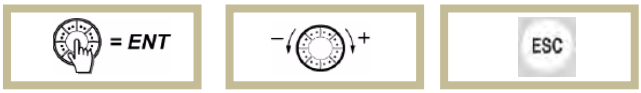


CONTROL SCHEME INDEPENDENT OF THE SUPPLY AND EXTRACT PRESSURE



3º. Switch on the unit by operating the main switch existing on the unit side panel, and then press the OFF key of each frequency converter.
While the fans are running, it is NOT POSSIBLE to reconfigure the inverters.

Frequency converter reconfiguration
The reconfiguration is realized using the following inverter commands:



Step 1. Unlock the inverter
To unlock the inverter, enter the password, following the sequece:
- Press ESC until "rdy" appears on the screen.
- Press ENTER and rotate the wheel anti-clockwise until "SUP-" appears on the screen.
- Press ENTER and rotate the wheel clockwise until "COd-" appears on the screen.
- Press ENTER and rotate the wheel clockwise until "1951-" appears on the screen.
- The entered code flashes. At this time the inverter is unprotected.

Step 2. Enter programming mode
The inverter has 2 operating MODES, RUN and PROGRAMMING. To switch from one to the other keep ESC pressed for two seconds.

Location of the 3 Mode Leds.
Depending on how they are lit up, they indicate the selected mode:

- IN SEQUENCE → RUN MODE
- SIMULTANEOUSLY → PROGRAMMING MODE

- Maintain ESC pressed down for 2 seconds until the 3 leds light up simultaneously. At that moment the unit is in Programming Mode.

Enter the parameters according to the particular requirements of the installation (airflow and fan regulated output: Proportional and integral bands) set the exact pressure setpoint by setting the frequency converter.
It is necessary to reprogram some of the parameters configured in the frequency inverter.
To do this operation, it is necessary to unlock the inverter and access the programming mode to modify as follows:
- Press ENTER and rotate the wheel until "FUN" appears on the screen.
- Press ENTER and rotate the wheel until "PI" appears on the screen.
- Press ENTER and rotate the wheel until "PIF" appears on the screen.
- Press ENTER and rotate the wheel until "AI1" appears.

Continue configuring the following parameters:

MASTER INVERTER

Menu	Parameter		Value	Comment
Fun	PI	PIF	AI1	PI return
Fun	PI	rPG	0.2	Proportional gain (0.01-100)
Fun	PI	rIG	0.2	Integral gain (0.01-100)
Fun	PI	PII	YES	PI control
Fun	PI	rPI	*	PI controller
I_O	AO1t		10U	0-10V output to slave inverter

* The setpoint of the PI controller is a function of the pressure range set in the TPD-D and the airflow to be maintain constant,and is determined by the following expression:

$$rPI = \frac{\text{Setpoint pressure}}{\text{Pressure range TDP-D}} \text{ x } 100$$

For example, if it is desired to obtain 100 Pa, considering that the measuring range of the TDP is set at 150 Pa, the setpoint would be:

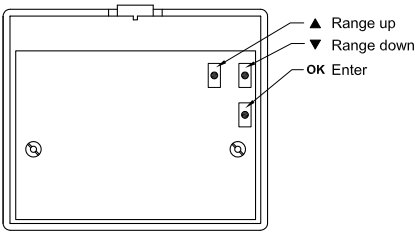
$$rPI = \frac{2400}{5000} \text{ x } 100 = 48$$

SLAVE INVERTER
In the same way as with master inverter, make the configuration of the slave inverter:

Menu	Parameter	Value	Comment
Ctl	Fr1	AI1	Control with input AI1

* The setpoint of the PI selector is in function of the pressure range established in the pressure sensor TPD-D.

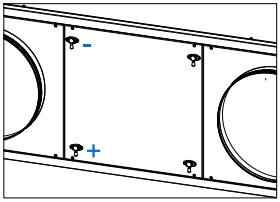
3º Reconfigure pressure sensor range
Select the TDP sensor pressure range. To display the measurement range, press the button "▲", "▼" or "OK", on the back of the cover.



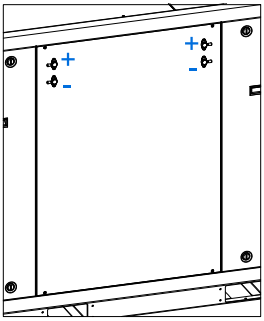
6.6.4.5. Pressure switch connection

All these range of heat recovery units have pressure tapping that allow the installation of differencial pressure switches to perform the control of polluted filters. The position of the pressure taps depends on the model:

HORIZONTAL MODELS

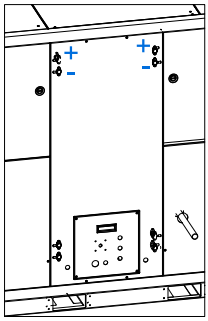


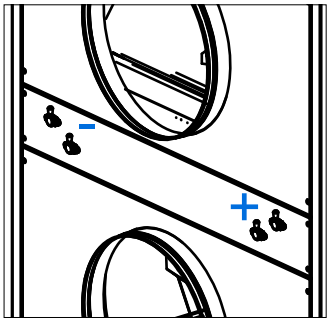
Horizontal models
CADB/T-HE 04 to 33 LH, RH
(on the side of inlet conection panel)



Horizontal models
CADB/T-HE 40 to 54 LH, RH
(on superior part of the side panel)

VERTICAL MODELS





Vertical models
CADB/T-HE 40 to 54 LV, RV
(on superior part of the side panel)

6.7. REVERSE SUPPLY AIR/ EXTRACT AIR SIDE (only -D version)

In models CADB-HE-D 04 to CADB-HE-D 33 it is possible to reverse the supply and extract air sides. To carry on this modification it is necessary to remove the by-pass chanel and mount it in opposite sense, as indicated in the image heresequence below:

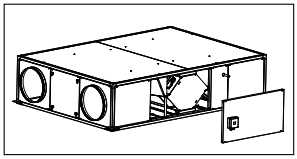


Fig. 1

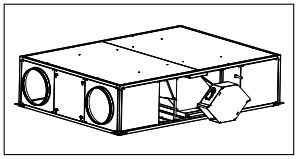


Fig. 2

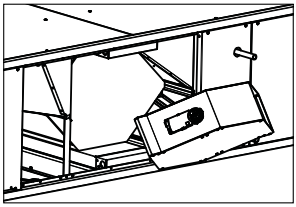


Fig. 3

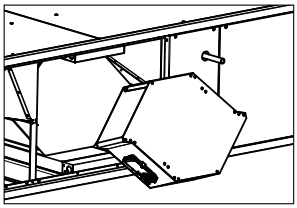


Fig. 4

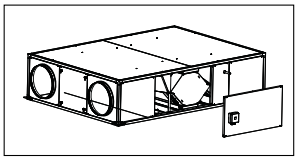


Fig. 5

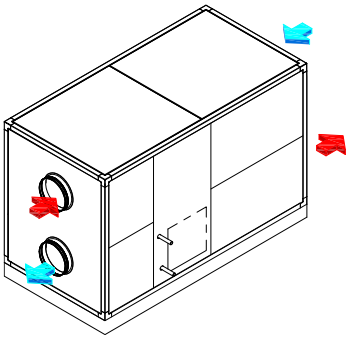
1. Disconnect the heat recovery unit.
2. Remove the side panel (fig.1).
3. Extract carefully the bypass (fig.2).
4. Disconnect the electrical connector that feeds the bypass.
5. Turn the bypass according to image (fig.3 and 4).
6. Reconnect the electrical power connector of bypass.
7. Place the bypass in its housing again (fig.5), close the panel and start up the unit.

6.8. CONFIGURATIONS

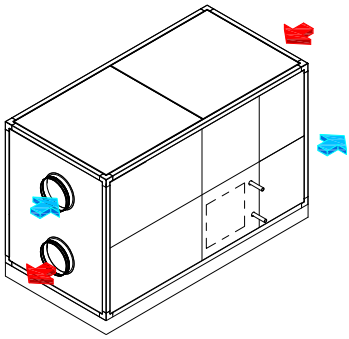
CADB/T-HE D/DI/DC ECOWATT standard configuration
From these configurations there are multiple variables that can be performed by the professional installer quickly and easily.

Panel replacement process

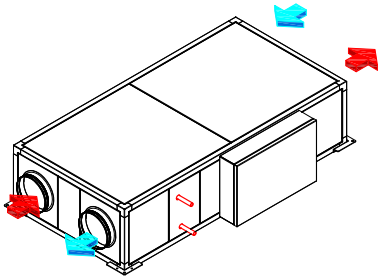
The CADB-HE heat recovery units are available in two configurations LH, RH in horizontal models and LV, RV in vertical models.



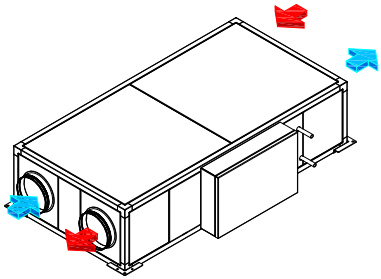
Conf. LV



Conf. RV



Conf. LH



Conf. RH

EXHAUST AIR

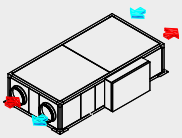
FRESH AIR

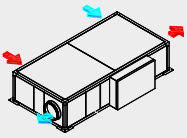
Horizontal

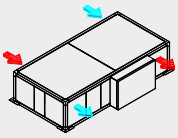
Factory configuration

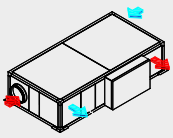
Examples of some of the configurations that is possible to obtain from factory configuration

LH

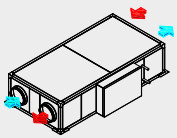


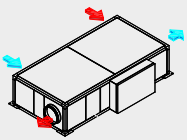


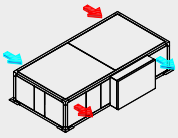


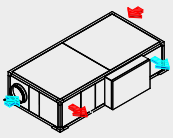


RH

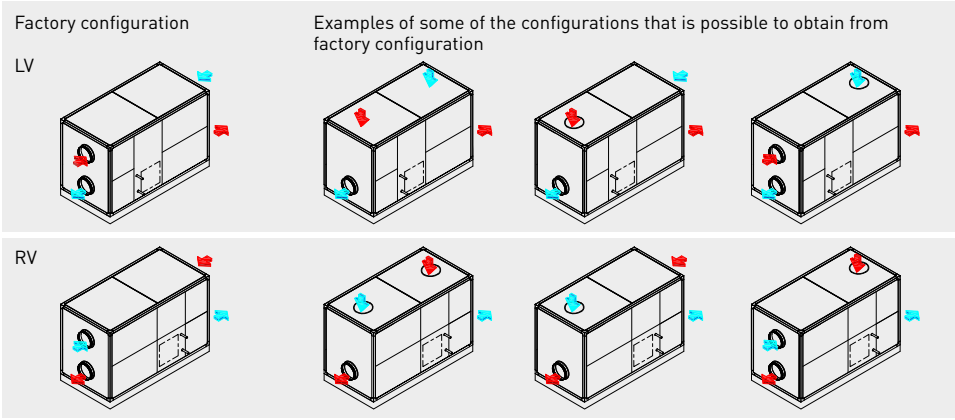








Vertical



6.9. CONTROL OF COOLING EXTERNAL BATTERIES

The heat recovery units CADB-HE are complemented by a complete range of air treatment accessories consisting of:

- Cold water battery module.
- Double battery module (cold water and hot water).
- Direct expansion battery modules.
- Exterior filtration module.
- Air purification module, specific for areas with high external pollution.

Its quick mounting system and its perfect integration with the heat recovery unit provides a considerable saving in the mounting time comparing them with the conventional accessories.

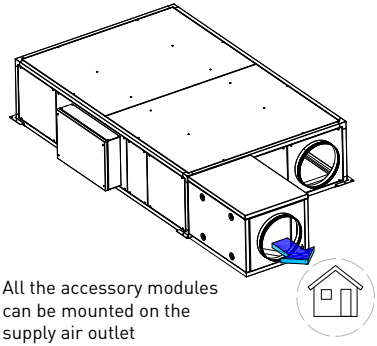
List of accessories by models:

Heat recovery unit model		Cold water battery	Direct expansion battery	Cold water battery + hot water battery (4 tubes)	Filtration module	Purification module Exterior pollution
HORIZONTAL CONFIGURATION						
CADB-HE-D/DI/DC 04	LH	BA-AF HE 04 LH	BA-DX HE 04 LH	BA-AFC HE 04 LH	FBL HE 04 H	FB-CA HE 04 H
	RH	BA-AF HE 04 RH	BA-DX HE 04 RH	BA-AFC HE 04 RH		
CADB-HE-D/DI/DC 08	LH	BA-AF HE 08 LH	BA-DX HE 08 LH	BA-AFC HE 08 LH	FBL HE 08 H	FB-CA HE 08 H
	RH	BA-AF HE 08 RH	BA-DX HE 08 RH	BA-AFC HE 08 RH		
CADB-HE-D/DI/DC 12	LH	BA-AF HE 12 LH	BA-DX HE 12 LH	BA-AFC HE 12 LH	FBL HE 12 H	FB-CA HE 12 H
	RH	BA-AF HE 12 RH	BA-DX HE 12 RH	BA-AFC HE 12 RH		
CADB-HE-D/DI/DC 16	LH	BA-AF HE 16 LH	BA-DX HE 16 LH	BA-AFC HE 16 LH	FBL HE 16 H	FB-CA HE 16 H
	RH	BA-AF HE 16 RH	BA-DX HE 16 RH	BA-AFC HE 16 RH		
CADB/T-HE-D/DI/DC 21	LH	BA-AF HE 21 LH	BA-DX HE 21 LH	BA-AFC HE 21 LH	FBL HE 21 H	FB-CA HE 21 H
	RH	BA-AF HE 21 RH	BA-DX HE 21 RH	BA-AFC HE 21 RH		
CADT-HE-D/DI/DC 33	LH	BA-AF HE 33 LH	BA-DX HE 33 LH	BA-AFC HE 33 LH	FBL HE 33 H	FB-CA HE 33 H
	RH	BA-AF HE 33 RH	BA-DX HE 33 RH	BA-AFC HE 33 RH		
CADB/T-HE-D/DI/DC 40	LH	BA-AF HE 40 LH	BA-DX HE 40 LH	BA-DX HE 40 LH	FBL HE 40 H	FB-CA HE 40 H
	RH	BA-AF HE 40 RH	BA-DX HE 40 RH	BA-DX HE 40 RH		
CADB/T-HE-D/DI/DC 54	LH	BA-AF HE 54 LH	BA-DX HE 54 LH	BA-DX HE 54 LH	FBL HE 54 H	FB-CA HE 54 H
	RH	BA-AF HE 54 RH	BA-DX HE 54 RH	BA-DX HE 54 RH		

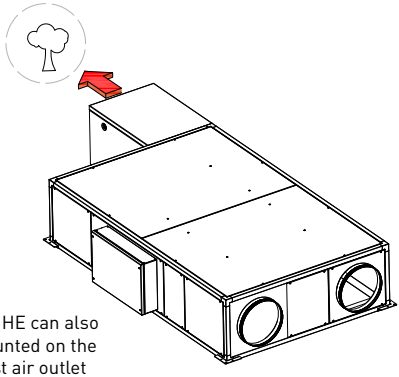
Heat recovery unit model		Cold water battery	Direct expansion battery	Cold water battery + hot water battery (4 tubes)	Filtration module	Purification module Exterior pollution
VERTICAL CONFIGURATION						
CADB-HE-D/DI/DC 04	LV	BA-AF HE 04 LV	BA-DX HE 04 LV	BA-AFC HE 04 LV	FBL HE 04 V	FB-CA HE 04 V
	RV	BA-AF HE 04 RV	BA-DX HE 04 RV	BA-AFC HE 04 RV		
CADB-HE-D/DI/DC 08	LV	BA-AF HE 08 LV	BA-DX HE 08 LV	BA-AFC HE 08 LV	FBL HE 08 V	FB-CA HE 08 V
	RV	BA-AF HE 08 RV	BA-DX HE 08 RV	BA-AFC HE 08 RV		
CADB-HE-D/DI/DC 12	LV	BA-AF HE 12 LV	BA-DX HE 12 LV	BA-AFC HE 12 LV	FBL HE 12 V	FB-CA HE 12 V
	RV	BA-AF HE 12 RV	BA-DX HE 12 RV	BA-AFC HE 12 RV		
CADB-HE-D/DI/DC 16	LV	BA-AF HE 16 LV	BA-DX HE 16 LV	BA-AFC HE 16 LV	FBL HE 16 V	FB-CA HE 16 V
	RV	BA-AF HE 16 RV	BA-DX HE 16 RV	BA-AFC HE 16 RV		
CADB/T-HE-D/DI/DC 21	LV	BA-AF HE 21 LV	BA-DX HE 21 LV	BA-AFC HE 21 LV	FBL HE 21 V	FB-CA HE 21 V
	RV	BA-AF HE 21 RV	BA-DX HE 21 RV	BA-AFC HE 21 RV		
CADT-HE-D/DI/DC 33	LV	BA-AF HE 33 LV	BA-DX HE 33 LV	BA-AFC HE 33 LV	FBL HE 33 V	FB-CA HE 33 V
	RV	BA-AF HE 33 RV	BA-DX HE 33 RV	BA-AFC HE 33 RV		
CADB/T-HE-D/DI/DC 40	LV	BA-AF HE 40 LV	BA-DX HE 40 LV	BA-DX HE 40 LV	FBL HE 40 V	FB-CA HE 40 V
	RV	BA-AF HE 40 RV	BA-DX HE 40 RV	BA-DX HE 40 RV		
CADB/T-HE-D/DI/DC 54	LV	BA-AF HE 54 LV	BA-DX HE 54 LV	BA-DX HE 54 LV	FBL HE 54 V	FB-CA HE 54 V
	RV	BA-AF HE 54 RV	BA-DX HE 54 RV	BA-DX HE 54 RV		

6.9.1. Accesssories assembly

Accessories are installed on the supply air outlet. IAQ module, FB-CA HE can also be mounted on the exhaust air oulet, for those applications in which, it will be necessary to eliminate or reduce the odor concentration in the exhaust air.



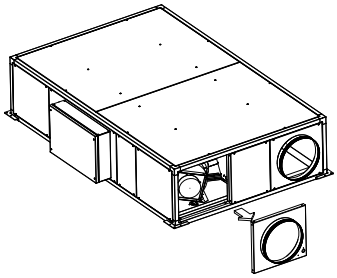
All the accessory modules can be mounted on the supply air outlet



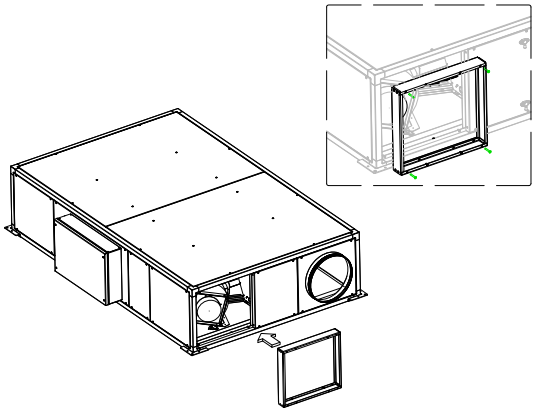
FB-CA HE can also be mounted on the exhaust air outlet

To proceed with the assembly, follow the next steps:

1. Remove the fl ange panel from the heat recovery unit, loosen the 4 screws that fix it.

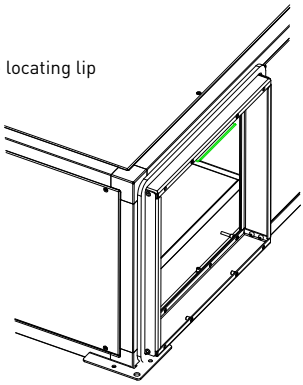


2. Mount the centering frame, by means of the 4 screws M5X12. Both centering frame and screws are delivered with the module.

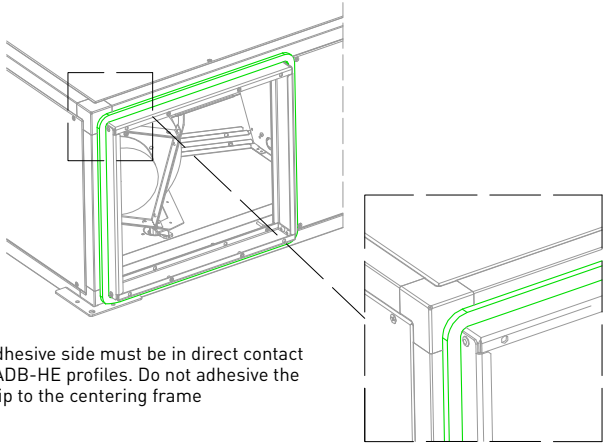


Before mounting the centering frame, verify that the locating lip in the frame is positioned in the top side.

Centering frame locating lip

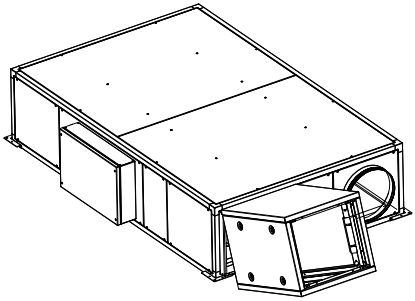


3. Put the self-adhesive sealing strip, delivered in a bag included with the module, around the centering frame.

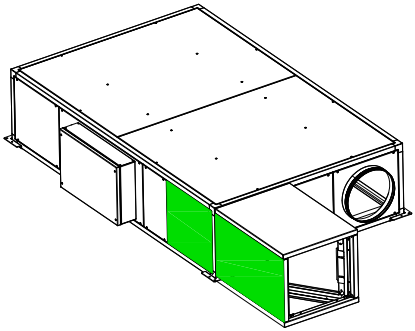


The self-adhesive side must be in direct contact with the CADB-HE profiles. Do not adhesive the sealing strip to the centering frame

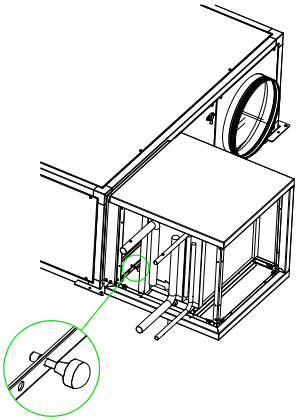
4. Hook the module onto the centering frame locating lip, and then drop it by its own weight.



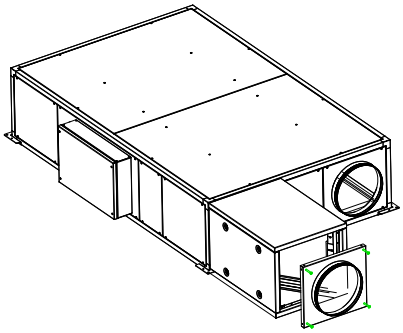
Fix the module to the heat recovery unit permanently.The access to fixing points is performed by the side of the unit, removing one of the side panes (from the CADB or from the module maintenance panel).



To carry it out, use the 4 screwed knobs delivered with the module.



5. Finally place the flange panel (that was disassembled at the first step) over the module outlet using the 4 screws that fixed the panel to the CADB-HE.



7. INSPECTION, MAINTENANCE AND CLEANING

7.1. FILTERS

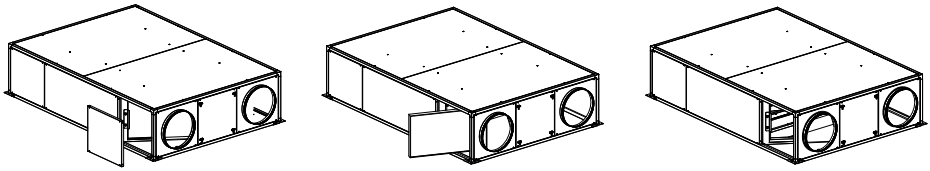
Replacement

The registers ubication for filters maintenance depends on the model and version. The exact ubication of the filters is identified by a label in the profile that indicates the type of filter and its characteristics.

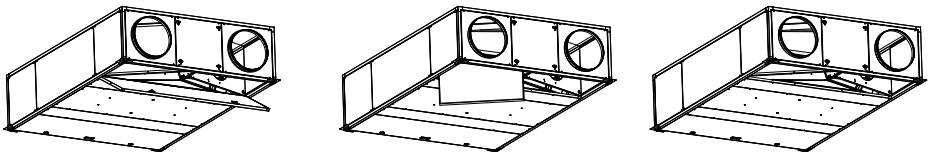
FALLING OBJECTS

By loosening the screws that hold the panels, they will be released. In units installed in ceiling, pay special attention to this operation to prevent the fall of a panel. During the maintenance signaling the area below the heat recovery unit and prevent personnel access to it.

- **Horizontal configurations of CADB/T-HE 04 to 33.** The access to filters can be done by the lateral panels and /or by the bottom panels (depending on the model):

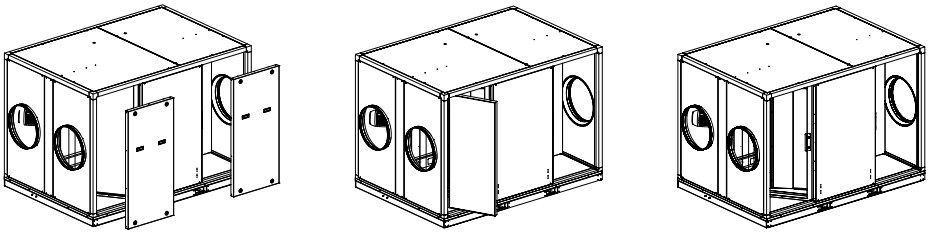


Quick access to filters from the lateral panels.

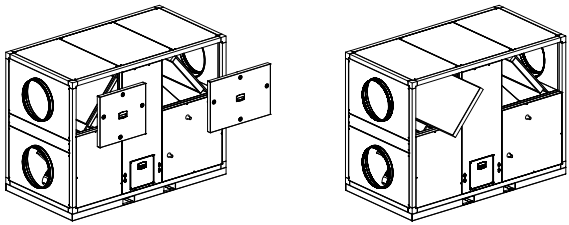


Quick access to filters from the bottom panels.

- **Horizontal configurations of CADB/T-HE 40 and 54.** The access to filters can be done by the side panels:



- **Vertical configurations of CADB/T-HE 40 and 54.** The access to filters can be done by two sides of the unit, removing the specific panels selon in the following image:



Replacement filters are delivered in a plastic bag for extra protection. Remove the bag before installing the filter into the unit.
Before installing the filter make sure that the airflow direction is correct. (indicated by an arrow in the filter).

Filters parts table

Heat recovery model	Ø (mm)	AFR-HE (Accessory filters and spare part for CADB/T-HE)			
		AFR-HE G4	AFR-HE M5	AFR-HE F7	AFR-HE F9
CADB-HE D/DI/DC 04	200	AFR-HE 200/04 G4	AFR-HE 200/04 M5	AFR-HE 200/04 F7	AFR-HE 200/04 F9
CADB-HE D/DI/DC 08	250	AFR-HE 250/08 G4	AFR-HE 250/08 M5	AFR-HE 250/08 F7	AFR-HE 250/08 F9
CADB-HE D/DI/DC 12	315	AFR-HE 315/12 G4	AFR-HE 315/12 M5	AFR-HE 315/12 F7	AFR-HE 315/12 F9
CADB-HE D/DI/DC 16	315	AFR-HE 315/16 G4	AFR-HE 315/16 M5	AFR-HE 315/16 F7	AFR-HE 315/16 F9
CADB/T-HE D/DI/DC 21	400	AFR-HE 400/21 G4	AFR-HE 400/21 M5	AFR-HE 400/21 F7	AFR-HE 400/21 F9
CADT-HE D/DI/DC 33	400	AFR-HE 400/33 G4	AFR-HE 400/33 M5	AFR-HE 400/33 F7	AFR-HE 400/33 F9
CADB/T-HE D/DI/DC 40	450	AFR-HE 450/40 G4	AFR-HE 450/40 M5	AFR-HE 450/40 F7	AFR-HE 450/40 F9
CADB/T-HE D/DI/DC 54	500	AFR-HE 500/54 G4	AFR-HE 500/54 M5	AFR-HE 500/54 F7	AFR-HE 500/54 F9

7.2. FILTER INSTALLATION

The heat recovery is supplied with mounted filters. Low pressure F7 filter for supply air and M5 for extract air. Possibility of mounting a second filter as accessory.

Installation additional filter:

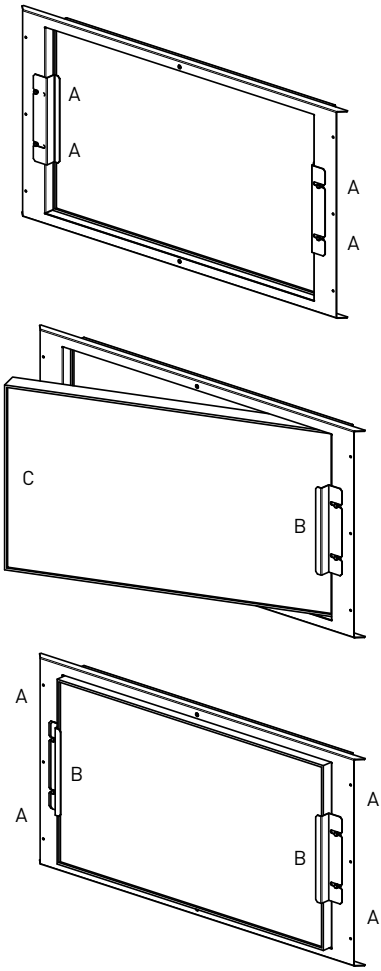
1. Loosen the two sets of filter support brackets (A).

2. Remove the filter holder (B).

3. Fit the second filter (C) ensuring that the direction of air is correct (indicated in the frame of the filter).

4. Ensure that the first filter the air passes is the lower grade of filtration.

5. Once both filters have been through fitted place the filter supports (B) symmetrically and tighten the 4 brackets (A).

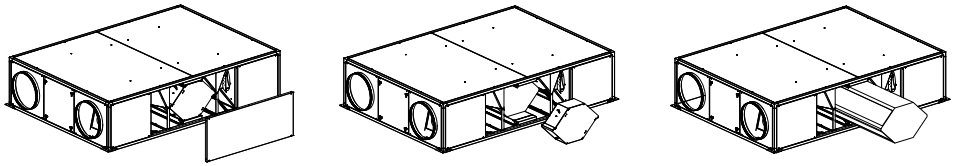


7.3. HEAT EXCHANGER

Horizontal models CADB/T HE 04 to 33

To perform the heat exchanger cleaning it is necessary to remove it from the unit. The disassembly can be easily done from the lateral panel:

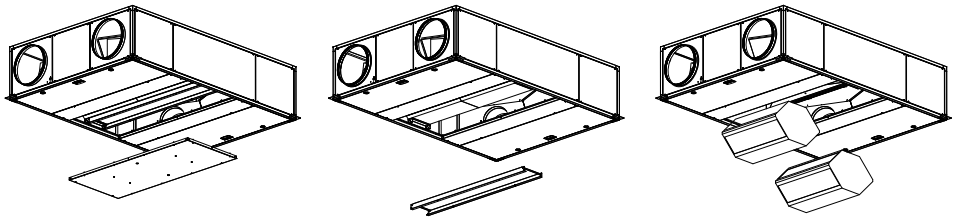
Disassembly sequence



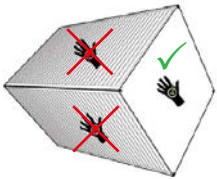
Models 04 to 33: Access to heat exchanger cleaning from lateral panels and from the bottom panels.

Alternatively, it is possible to disassemble the heat exchanger from the bottom panels. However, it is necessary to perform a major number of operations to proceed.

Access to the heat exchanger for bottom sequence



FALLING OBJECTS
By loosening the screws that hold the panels, those will be released. In units installed in ceiling, pay special attention to this operation to prevent the fall of a panel. During the maintenance, signaling the area below the heat recovery unit and prevent personnel access to it.



Not manipulate the heat exchanger for the finned area.

Horizontal models CADB/T-HE 40 and 54

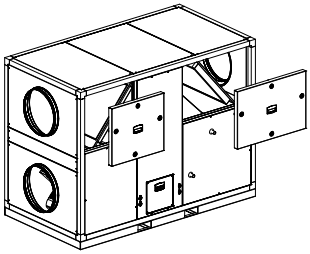
Due to the dimensions and weight of heat exchanger, the cleaning of it has to be perform in situ, without disassembly the heat exchanger.
To access to the heat exchanger, disassembly the side panels of the heat recovery unit and proceed with the cleaning by blowing with compressed air.

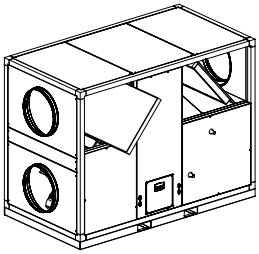
Loose the 4 closures that fix the access panel and remove the panel

Loose the screws that fix the filter and after released, remove it. Clean the heat exchanger with blowing with compressed air

Vertical models CADB/T-HE 40 and 54

Due to the dimensions and weight of heat exchanger, the cleaning of it has to be perform in situ, without disassembly the heat exchanger.
To access to the heat exchanger, disassembly the side panels of the heat recovery unit and proceed with the cleaning by blowing with compressed air.





7.4. CONDENSATION DRAINPIPE

Inspect the drainpipe regularly and make sure it is not blocked, if this is the case, remove the obstruction.
Check that the drain pipe was done according to the indication included in the point CONNECTIONS of this manual.

8. OPERATION ANOMALIES

8.1. GENERAL ANOMALIES

Anomaly	Cause	Solution
Difficult to start.	Reduced power supply voltage. Insufficient static torque of motor.	Check motor specification plate. Close the air inlets to reach the maximum speed. Change the motor is necessary. Contact the **S&P** Post-Sales service.
Insufficient airflow. Insufficient pressure.	Blocked pipes and/or inlet points closed. Fan obstructed. Filter overloaded. Insufficient rotation speed. Exchanger package blocked.	Clean inlet tubes. Clean fan. Clean or replace filter. Check power supply voltage. Clean the exchanger.
Reduction in performance after a period of acceptable operation.	Leaks in the circuit before and/or after the fan. Damaged roller.	Check the circuit and restore original conditions. Check the impeller and if necessary, replace with an original spare part. Contact the **S&P** post sales service.
New air temperature too cold.	Outside air -5º C or less. Models (CADB/T DI): Thermal protectors Support resistances open.	Insertion of post-heating resistances. Contact the **S&P** post sales service. Reset by pushing the button RESET, all the thermal protectors of the resistance.
Insufficient performance of the exchanger.	Fins dirty.	Clean the exchanger.
Formation of frost on the exchanger.	Outside air below -5ºC.	Insertion of post-heating devices (anti-ice). Contact the **S&P** Customer Advice service.
Air pulsation.	Fan working in excessively low flow conditions. Flow instability, obstruction or bad connection.	Modification of the circuit and/or replacement of the fan. Clean and/or readjust the inlet channels. Operate the electronic regulator, increasing the minimum speed (insufficient voltage). Contact the **S&P** Customer Advice service.
There is water inside the unit.	Drain clogged or wrongly dimentioned.	Check if exists a body/object obstructing the passage of water and remove it. Verify that the drain trap exists and is correctly sized according to the instructins of this manual.
	Only DC versions. Internal breakage of water coil.	Isolate the battery using the isolation valves. Repair the leak/ Replace the battery.
	Only Dc version. The water coil is being used for cooling purpose with cold water.	The CADB-HE DC heat recovery can be used just for post-heating function with hot water.

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