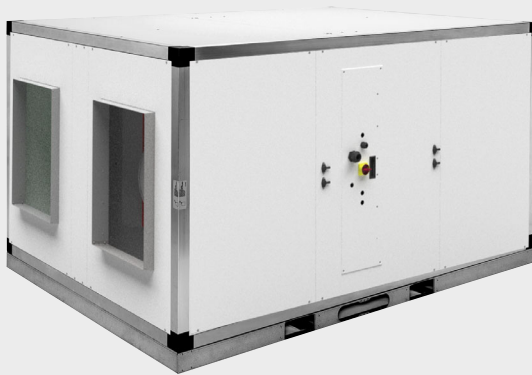




CADB/T-HE PRO-REG

Software Version 3.0



INDEX

1. INTRODUCTION	5
2. SAFETY REGULATIONS AND "CE" MARKING	5
3. GENERAL INSTRUCTIONS	5
4. UNIT LABELLING	5
5. HANDLING	6
6. LIFTING	6
6.1. Introduction	6
6.2. Recommended lifting method	7
6.2.1. Horizontal models: 04 to 33 LH/RH	7
6.2.2. Vertical models: 04 to 33 LV/RV	7
6.2.3. Horizontal and vertical models: 45 to 100	8
7. INSTALLATION	9
7.1. Introduction	9
7.1.1. Outdoor installation	13
7.2. Dimensions and free space for maintenance	15
7.3. Mounting process of an additional supply filter	17
7.4. Range specifications	17
7.5. Connections	18
7.5.1. Piping and duct connections	18
7.5.1.1. Connection with air duct	18
7.5.1.2. Connecting the water coil piping. DC Versions	18
7.5.1.3. Condensate drainage	19
7.5.2. Electrical connection	19
7.5.2.1. External Touch Display (ETD) control connection	20
7.6. Configurations	21
8. CONTROL FUNCTIONS	22
9. CONTROL SCHEMES	23
10. REMOTE CONTROL OPERATION	26
10.1. Change language	26
10.2. Simplified menus / accesses	27
10.2.1. User level	27
10.2.2. Installer level	28
10.3. Operation modes	30
10.3.1. Constant airflow operation (CAV)	31
10.3.2. Variable airflow operation (VAV)	32
10.3.3. Constant pressure operation (COP)	34
10.4. Postheater control	36
10.4.1. Constant supply air temperature maintenance	37
10.4.2. Constant ambient temperature maintenance	37
10.4.3. Temperature set point adaptation vs. outdoor temperature	37
10.4.4. Automatic control mode	37
10.5. Time programming	37
11. BOOST FUNCTION - Forced High Speed (only available in CAV and COP modes)	40
12. REMOTE STOP-START	40
13. FREE COOLING BY NIGHT	41
14. WATER HEATER FROST PROTECTION	43
15. PROTECTION OF HEAT EXCHANGER UNIT	43
16. CONTROL OF AN EXTERNAL PREHEATING BATTERY	44
17. FIRE FUNCTION (FIRE)	45

18. CONTROL OF EXTERNAL BATTERIES AND FILTERS	46
18.1. Accessories assembly.....	47
18.2. Coils characteristics	50
18.2.1. Cold water coils for 2 pipes installation	50
18.2.2. Cold water coils for for 4 pipes installation	50
18.2.3. Expansion coils for integration in DX systems	51
18.2.3.1. Management of the cold/heat demand by the control of the refrigeration unit	52
18.2.3.2. Management of the cold/heat demand by the PRO-REG control.....	52
18.2.3.3. Defrost function: Forcing slow speed	53
18.3. Wiring between accessory and PRO-REG electrical board.....	53
18.3.1. Coil module BA-AF HE, BA-AFC HE, BA-DX	53
18.3.2. Filtration modules FBL-CA HE and FBL-HE.....	54
18.4. Configuration of external modules of refrigeration / heating batteries	55
18.5. Controller reconfiguration required to manage external filter module FB-CA HE or FBL-HE	56
19. RESET THE CORRIGO CONTROLLER	57
20. CONTROLLER RECONFIGURATION.....	58
21. CENTRALIZED TECHNICAL CONTROL (GTC) CONNECTION	59
21.1. RTU modbus	59
21.2. TCP/IP bacnet	60
22. REPLACEMENT OF THE BATTERY FROM THE CORRIGO PROGRAMMABLE LOGIC CONTROLLER	60
23. INSPECTION, MAINTENANCE AND CLEANING	60
23.1. Replacement of filters	60
23.2. Filter installation	62
23.3. Heat exchanger.....	63
23.4. Condensation drainpipe.....	64
24. OPERATION ANOMALIES	65
24.1. General anomalies.....	65
25. WIRING DIAGRAMS	68
25.1. Main unit	68
25.2. Rewiring to manage external modules (accessories).....	73

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



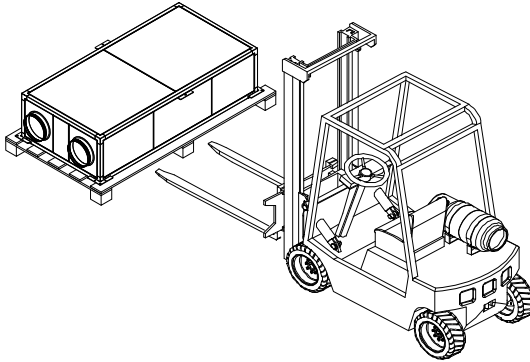
Prohibition signs

5. HANDLING

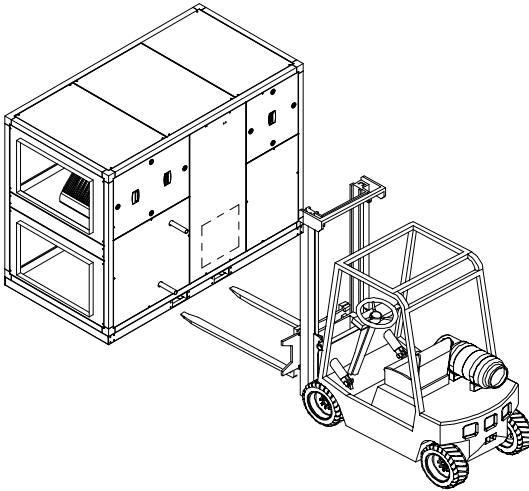
The CADB/T-HE models 04 to 33 are delivered fixed with screws to the pallets.

The models 45 to 100 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 45 to 100

6. LIFTING

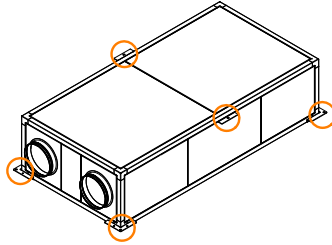
6.1. INTRODUCTION

- If the equipment has to be lifted by crane, the corresponding risk assessment must be carried out and all the necessary safety measures must be taken to avoid accidents.
- The materials and means used during the handling and lifting of the equipment must be appropriate to the shape and dimensions of the equipment.
- Ensure that the means used can support the loads to be lifted. It is recommended to oversize the weight of the equipment with a coefficient of 3 or higher.
- Unit weight: (check unit weights in next section).

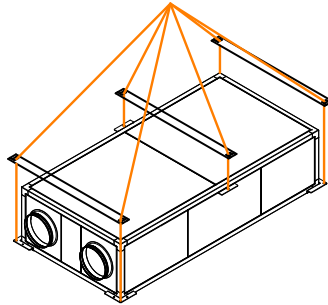
6.2. RECOMMENDED LIFTING METHOD

6.2.1. Horizontal models: 04 to 33 LH/RH

These models include 6 supports, 4 of them located in the bottom corner of the unit and 2 in the mid of the upper longitudinal profile (except size 04):

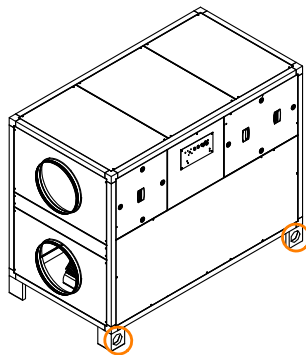


Use the 6 supports (4 in case of size 04) to lift the unit, ensuring that the weight of the unit is well distributed through the 6 cables or slings used.

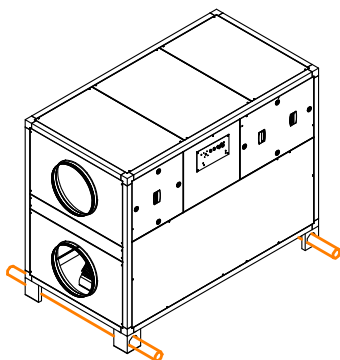


6.2.2. Vertical models: 04 to 33 LV/RV

These models include support feet. Each feet has a hole that allows to pass a lifting bar inside them:

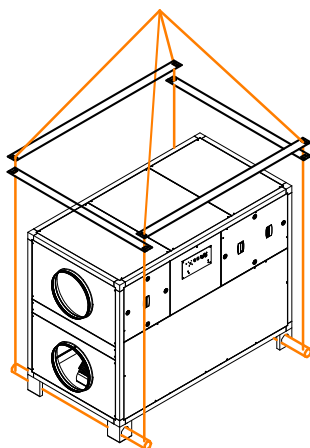


Fit 2 metallic bars across the holes of the feet as shown in the picture:



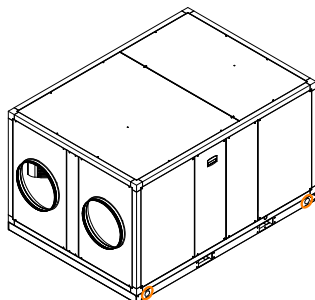
Use exclusively bars specifically designed for lifting purpose, ensuring the bars are suitable for the unit weight.

Use spacers bars to avoid cables or slings from damaging the unit.

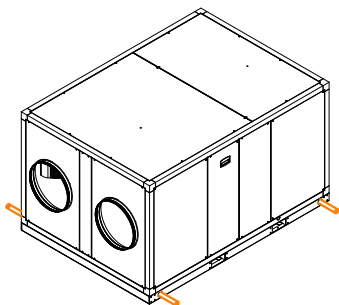


6.2.3. Horizontal and vertical models: 45 to 100

Those models include a perimetral bed support with 2 holes in the ends of the base, shown in the picture:

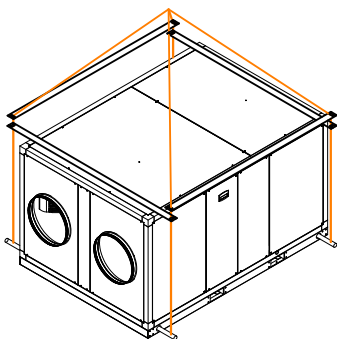


Fit 2 metallic bars across the holes in the base:



Use exclusively bars specifically designed for lifting purpose, ensuring the bars are suitable for the unit weight.

Use spacers bars to avoid cables or slings from damaging the unit.



7. INSTALLATION

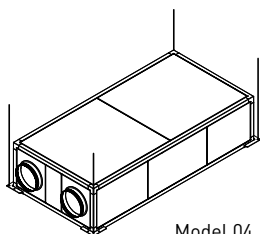
7.1. INTRODUCTION

Horizontal models size 04, 08, 12, 16, 21, 27 and 33

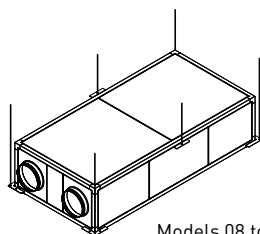
These models are designed to be installed hanging from the ceiling or located behind a false ceiling. When installing the unit, it is mandatory to distribute the unit weight between all the supports existing in the units:

- CADB-HE 04: 4 supports (one in each corner)
- CADB/T-HE 08 to 33: 6 supports (one in each corner and 2 centered in each side)

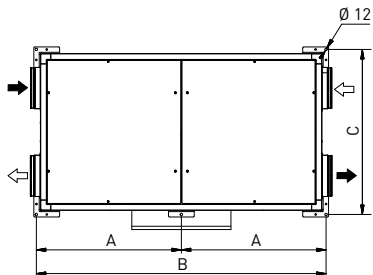
Using studded rods (\varnothing 8 mm), it can be secured to the ceiling and levelled.



Model 04



Models 08 to 33

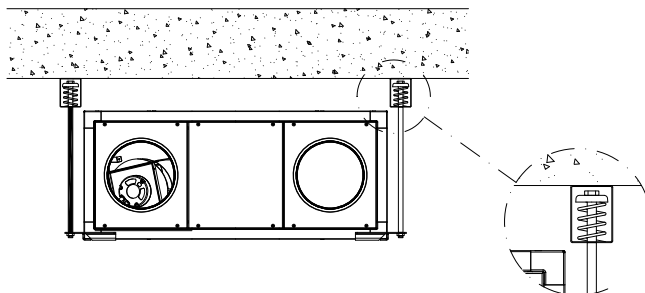


Model	A	B	C
4	-	1558	798
8	894	1788	948
12	869	1738	1088
16	994	1988	1278
21	1169	2338	1678
27	1169	2338	1678
33	1169	2338	1678

The model 04 does not have central support

The installer must ensure 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.



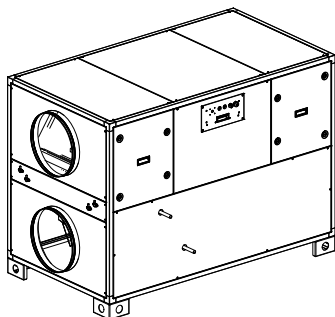
Model	Weight (kg)
4	147
8	183
12	190
16	235
21	333
27	370
33	420

Vertical models

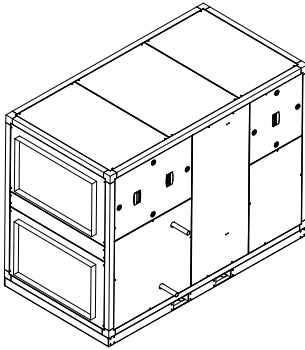
The models size 4 to 27 are supplied with support feet, while the models size 45 and 60 are supplied with a perimetral bed. This bed must be in contact with the ground or with a flat surface. It is essential that the weight of the equipment was distributed between all points of support to prevent unit 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	149
8	185
12	192
16	237
21	335
27	372
33	422



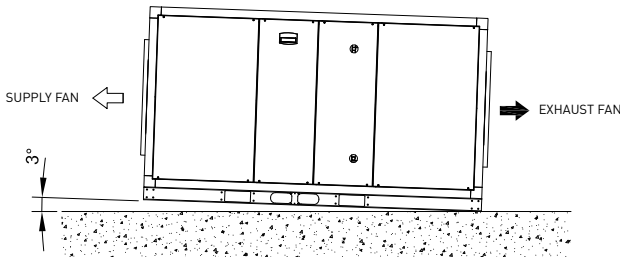
Model	Weight (kg)
45	597
60	730
100	862

Horizontal models of sizes 45 and 60

IMPORTANT!

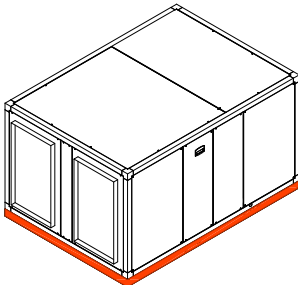
Particularities in the installation of horizontal versions LH and RH

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



Horizontal models size 45 and 60 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 was 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.

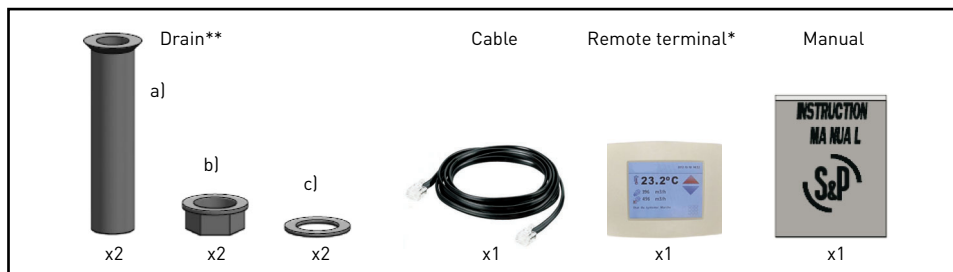


Model	Weight (kg)
45	597
60	730

For all configurations

Once secured the device in correct position, the installer have to perform the connection to the air ducting system, connection to the electric net, 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:



* The remote controller is located inside the electric cabinet.

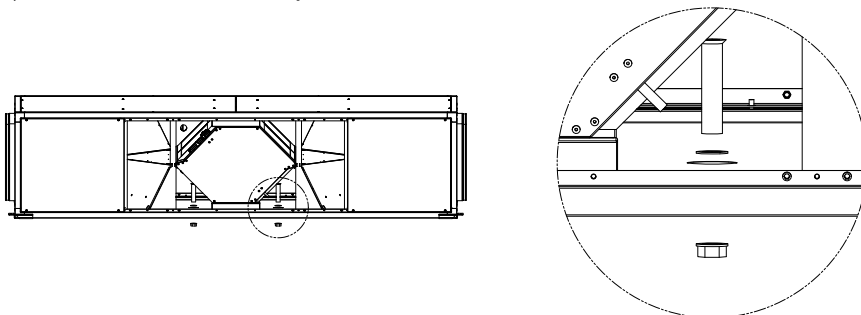
** In the models 45, 60 and 100 the drain is installed by default in the unit.

The drain is composed by 3 pieces:

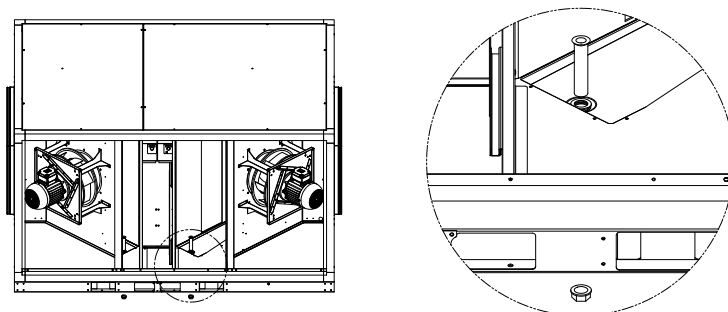
- a) Drain pipe
- b) Female screw
- c) Joint ring.

Install the two drains as indicated in the following drawing:

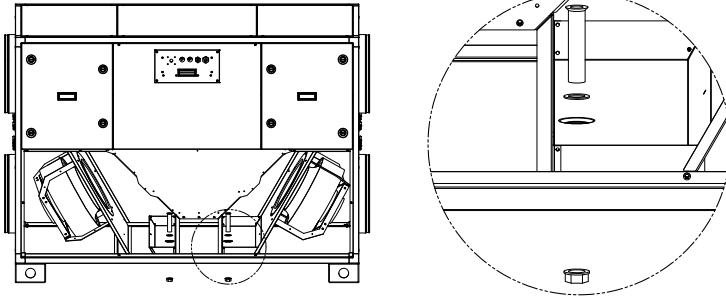
a) Horizontal versions of CADB/T HE 04 to 33



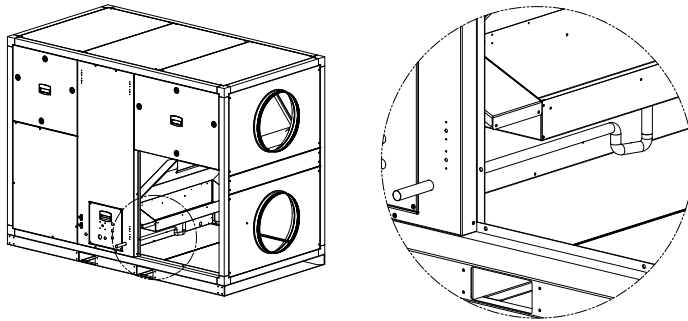
b) Horizontal versions of CADT-HE 45 and 60



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



d) Vertical versions of CADT-HE 45 to 100



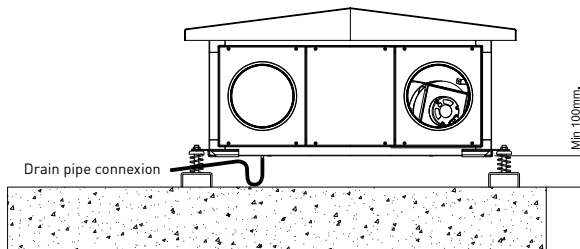
In these versions, the drainpipe and the siphon are supplied mounted in the unit.

7.1.1. Outdoor installation

Whenever possible, it is advisable to be mounted indoors. When it is installed outdoors, it is preferable to place the unit under a cover which offers enough protection to prevent rain falling directly to the unit, or install the corresponding rain canopy (TPP accessory). Due to its design and the position of its registers, it is preferable to use vertical versions (LV / RV) for outdoor installation. In addition, these versions have feet that allow direct placement on the ground.

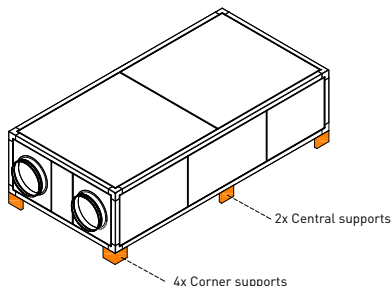
In horizontal version, models 04 to 33, ensure the sufficient space below the unit, to install a siphons in the drain pipe.

If installed on the ground, sufficient space must be guaranteed under the unit so that it is possible to install the corresponding siphons in the condensate outlets of the unit.



Connection to the condensate line

There is a Kit composed of 6 feet 5407067200 - KIT PIES CADB-HE, which facilitates the assembly on floor of these versions:



Detail of a CADB-HE 04 to 33 after the assembly of the KIT PIES CADB-HE

Both in the case that the Kit feet is used, or if the unit is based on antivibration pads, it is essential that the unit support was guaranteed on the 6 existing supporting points being all of them at a same plane.

In the case of not supporting the unit on the central supports it is possible that deformation in the structure of the unit could take place, making it impossible to disassemble the panels.

Suitable rain protection canopy, 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 21-27-33	TPP-HE-V 21-27
CADB/T-HE-D/DI/DC 27	TPP-HE-H 21-27-33	TPP-HE-V 21-27
CADT-HE D/DI/DC 33	TPP-HE-H 21-27-33	TPP-HE-V 33
CADT-HE D/DI/DC 45	TPP-HE-H 45	TPP-HE-V 45
CADT-HE D/DI/DC 60	TPP-HE-H 60	TPP-HE-V 60
CADT-HE D/DI/DC 100	-	TPP-HE-V 100

Risk of condensation inside the unit

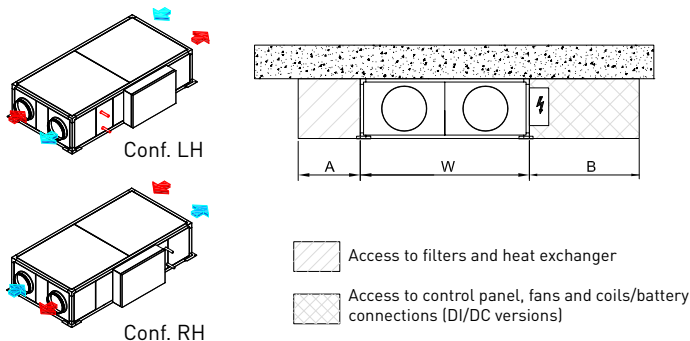
In winter, during the night or during periods of prolonged unit stoppage, it is possible that condensations appear on some internal surfaces of the unit, as well as inside the electrical cabinet.

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

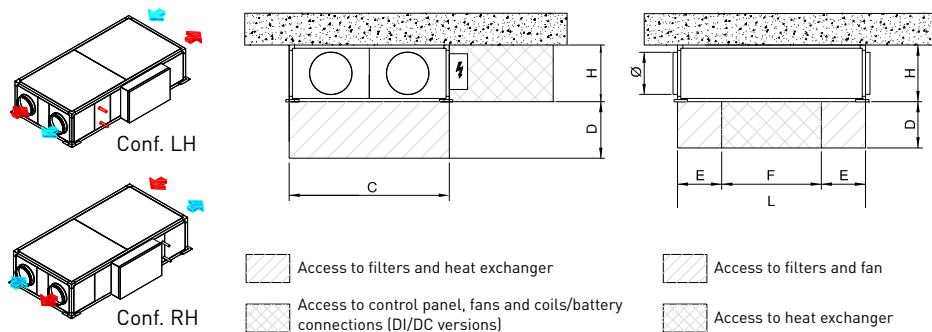
7.2. DIMENSIONS AND FREE SPACE FOR MAINTENANCE

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

Distances for maintenance in installations with access from the lateral panels:

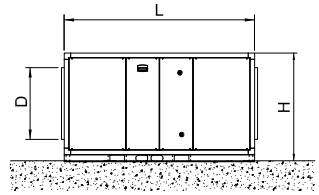
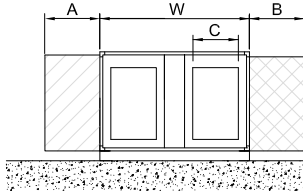
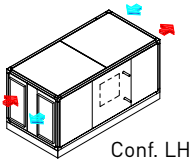


Distances for maintenance in installations with access from the inferior panels:



Model	W	H	L	A	B	C	D	Ø	E	F	Weight (kg)
04	760	375	1520	300	400	700	350	200	400	920	147
08	910	425	1750	330	400	860	400	250	400	950	183
12	1050	425	1700	500	400	1000	400	315	500	900	190
16	1240	450	1950	500	500	1190	425	315	500	1150	235
21/27	1640	550	2300	700	700	1590	525	400	700	1300	333
33	1640	650	2300	700	700	1590	625	400	700	1300	420

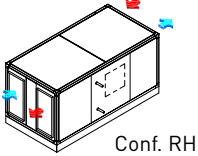
b) Horizontal versions of CADB/T HE 45 and 60 (Floor installation)



Access to filters and heat exchanger



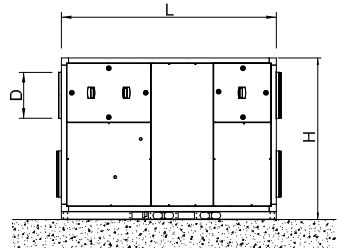
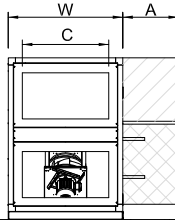
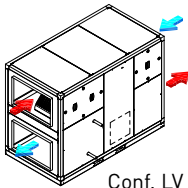
Access to control panel, motors and coils/
battery connections (DI/DC versions)



Floor installation

Model	W	H	L	A	B	C	D	Weight (kg)
45	1500	1200	2100	500	600	400	600	597
60	1550	1580	2250	500	750	500	700	730

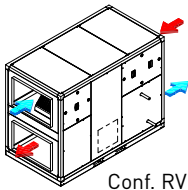
c) Vertical versions



Access to filters and heat exchanger



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



Model	W	H	L	A	Ø	C	D	Weight (kg)
4	540	920	1125	300	200	-	-	149
8	610	1020	1275	300	250	-	-	185
12	770	1020	1325	400	315	-	-	192
16	770	1070	1475	500	315	-	-	237
21/27	970	1270	1750	650	400	-	-	335
33	1170	1270	1750	650	400	-	-	412
45	1120	1580	2100	400	-	600	400	597
60	1500	1630	2250	500	-	700	500	730
100	2050	1630	2250	650	-	1100	650	862

7.3. MOUNTING PROCESS OF AN ADDITIONAL SUPPLY FILTER

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

7.4. RANGE SPECIFICATIONS

D Models: without heater battery

Model	Complete unit						Fan		Weight (kg)
	Air connections diameter (mm)	Nominal airflow (m ³ /h)	Efficiency* (%)	Electrical supply	Max. abs. power (kW)	Maximum current (A)	Speed (r.p.m.)	Maximum current (A)	
CADB-HE D 04 PRO-REG	200	450	87	1/230V, 50Hz	0,2	2,2	3700	0,95	147
CADB-HE D 08 PRO-REG	250	800	86,4	1/230V, 50Hz	0,4	2,9	2650	1,3	183
CADB-HE D 12 PRO-REG	315	1.200	85,3	1/230V, 50Hz	0,95	3,5	2550	1,6	190
CADB-HE D 16 PRO-REG	315	1.600	85,5	1/230V, 50Hz	0,95	4,3	2845	2,0	235
CADB-HE D 21 PRO-REG	400	2.100	86,7	1/230V, 50Hz	0,9	4,7	1580	2,2	333
CADB-HE D 27 PRO-REG	400	2.700	83,8	1/230V, 50Hz	1,84	7,5	2450	3,6	367
CADT-HE D 33 PRO-REG	400	3.300	85,9	3+N/400V, 50Hz	2,2	4,3	2600	2,0	420
CADT-HE D 45 PRO-REG	400x600	4.500	86,3	3+N/400V, 50Hz	4,43	6,3	2200	3,0	597
CADT-HE D 60 PRO-REG	600x700	6.100	86,7	3+N/400V, 50Hz	4,43	6,3	2200	3,0	730
CADT-HE D 100 PRO-REG	1100x650	10.000	88,9	3+N/400V, 50Hz	8,13	11,9	2160	5,8	862

* Humid efficiency referred to nominal airflow, outdoor conditions [-5°C / 80% RH] and indoor [20°C / 50% RH]

DC Models: with built-in hot water coil

Model	Complete unit						Fan		Hot water coil		Weight (kg)
	Air connections diameter (mm)	Nominal airflow (m ³ /h)	Efficiency* (%)	Electrical supply	Max. abs. power (kW)	Maximum current (A)	Speed (r.p.m.)	Maximum current (A)	Heat power T.water 80/60°C (kW)	Heat power T.water 50/45°C (kW)	
CADB-HE DC 04 PRO-REG	200	450	87,0	1/230V, 50Hz	0,2	2,2	3700	0,95	2,7	1,6	149
CADB-HE DC 08 PRO-REG	250	800	86,4	1/230V, 50Hz	0,4	2,9	2650	1,3	5,1	3,1	186
CADB-HE DC 12 PRO-REG	315	1.200	85,3	1/230V, 50Hz	0,95	3,5	2550	1,6	7,1	4,3	193
CADB-HE DC 16 PRO-REG	315	1.600	85,5	1/230V, 50Hz	0,95	4,3	2845	2,0	8,6	5,3	239
CADB-HE DC 21 PRO-REG	400	2.100	86,7	1/230V, 50Hz	0,9	4,7	1580	2,2	12,6	7,8	338
CADB-HE DC 27 PRO-REG	400	2.700	83,8	1/230V, 50Hz	1,84	7,5	2450	3,6	16,2	10,0	375
CADT-HE DC 33 PRO-REG	400	3.300	85,9	3+N/400V, 50Hz	2,2	4,3	2600	2,0	18,2	11,1	427
CADT-HE DC 45 PRO-REG	400x600	4.500	86,3	3+N/400V, 50Hz	4,43	6,3	2200	3,0	25,6	15,5	606
CADT-HE DC 60 PRO-REG	600x700	6.100	86,7	3+N/400V, 50Hz	4,43	6,3	2200	3,0	34,7	21,1	742
CADT-HE DC 100 PRO-REG	1100x650	10.000	87,9	3+N/400V, 50Hz	8,13	11,9	2160	5,8	58,9	35,4	882

* Humid efficiency referred to nominal airflow, outdoor conditions [-5°C / 80% RH] and indoor [20°C / 50% RH]

DI Models: with built-in electric heater battery

Model	Complete unit						Fan		Electrical heater battery		Weight (kg)
	Air connections diameter (mm)	Nominal airflow (m ³ /h)	Efficiency* (%)	Electrical supply	Max. abs. power (kW)	Maximum current (A)	Speed (r.p.m.)	Maximum current (A)	Power (kW)	Maximum current (A)	
CADB-HE DI 04 PRO-REG	200	450	87,0	1/230V, 50Hz	1,2	6,7	3700	0,95	1	4,5	148
CADB-HE DI 08 PRO-REG	250	800	86,4	1/230V, 50Hz	2,4	12,0	2650	1,3	2	9,1	185
CADB-HE DI 12 PRO-REG	315	1.200	85,3	1/230V, 50Hz	4,0	14,9	2550	1,6	3	11,4	192
CADB-HE DI 16 PRO-REG	315	1.600	85,5	1/230V, 50Hz	4,5	20,2	2845	2,0	3,5	15,9	237
CADB-HE DI 21 PRO-REG	400	2.100	86,7	3+N/400V, 50Hz	6,9	13,8	1580	2,2	6	9,11	336
CADT-HE DI 27 PRO-REG	400	2.700	83,8	3+N/400V, 50Hz	7,8	16,6	2450	3,6	6	9,1	373
CADT-HE DI 33 PRO-REG	400	3.300	85,9	3+N/400V, 50Hz	9,7	15,7	2600	2,0	7,5	11,4	424
CADT-HE DI 45 PRO-REG	400x600	4.500	86,3	3+N/400V, 50Hz	13,4	20	2200	3,0	9	13,7	602
CADT-HE DI 60 PRO-REG	600x700	6.100	86,7	3+N/400V, 50Hz	16,4	24,5	2200	3,0	12	18,2	737
CADT-HE DI 100 PRO-REG	1100x650	10.000	87,9	3+N/400V, 50Hz	32,13	48,3	2160	5,8	24	36,4	874

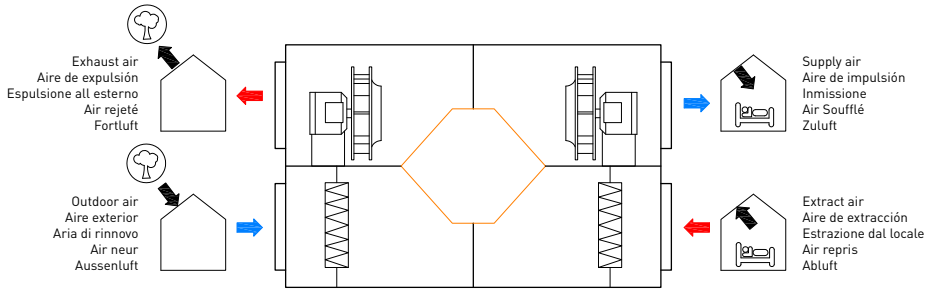
* Humid efficiency referred to nominal airflow, outdoor conditions [-5°C / 80% RH] and indoor [20°C / 50% RH]

7.5. CONNECTIONS

7.5.1. Piping and duct connections

7.5.1.1. Connection with air duct

The fans are always blowing out with regard to the machine. Before making the connection of air lines, consider the existing identification labels in each inlet/outlet of the heat recovery unit.

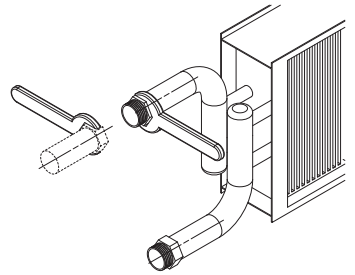


7.5.1.2. Connecting the water coil piping. DC Versions

Connecting the unit to the water network

- Maximum pressure: 10 bar
- Maximum temperature: 100°C
- Minimum water temperature: -20°C (with the addition of the corresponding antifreeze).

- Water coils of DC versions have threaded connections. Secure the coil manifold with the appropriate tool when tightening the threads. This will prevent the force from being transmitted to the manifold, damaging it.



- The following table indicates the size and type of thread used on water coils for DC versions:

CADB/T-HE MODEL	THREAD
04, 08, 16, 21, 27 and 33	1/2"
45, 60 and 100	3/4"

- To ensure the good behaviour of the installation, it is essential that the installation includes the following elements:
 - Unit intake pre-filter which traps suspended particulate matter.
 - Bleed valves should be fitted at each of the high points in the installation.
 - Self-filling valve to keep the appropriate water level.
 - Pressure switch 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 (allowing filters cleaning, reparations and maintenance tasks) the need to completely drain the water circuit.
 - Anti-vibration devices should be installed at the inlet and outlet from the unit to prevent the transmission of vibrations that could damage the heat exchanger coil due to excess stress on the circuits.

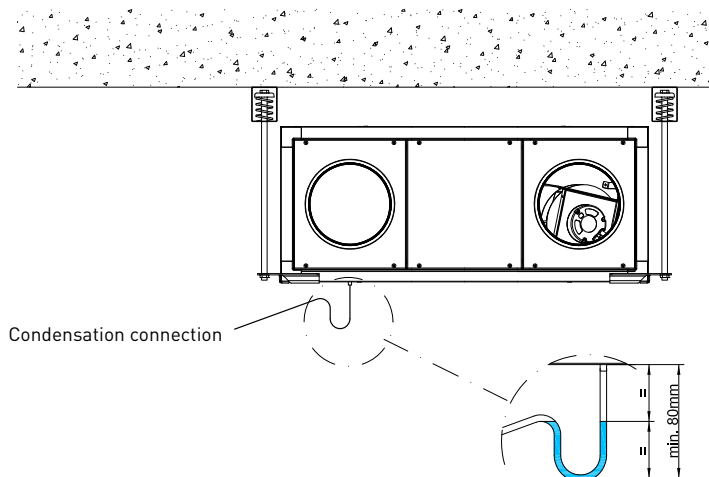
Once the installation is performed check that the heating water flow is adequate.

7.5.1.3. 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%.



The siphon should always be full of water. Check its level periodically, refilling it if necessary. An empty siphon can cause the condensate tray to overflow and water leak through the equipment enclosure.

7.5.2. Electrical connection

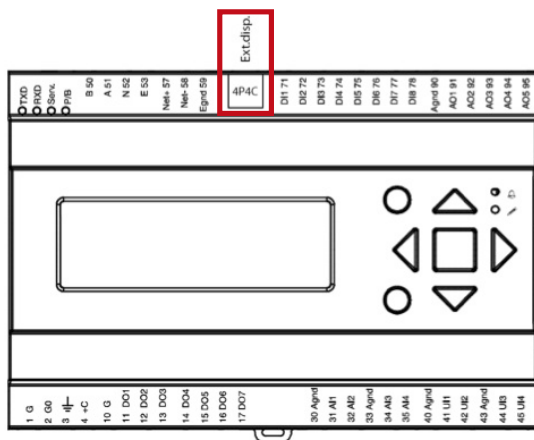
In the recovery unit PRO-REG range, all components integrated into the device, are supplied into the electrical panel (motors, pressure filters, motor pressure switches, temperature sensors, batteries and by-pass damper).

The electrical connection is limited to the connection of control terminal (10 m. of supplied cable) and possible electrical accessories as such as CO₂ sensors or control valves for water coils, and finally the connection of the power supply line.

Make electrical connection in accordance to the described in the corresponding wiring diagram, found at the end of this manual.

7.5.2.1. External Touch Display (ETD) control connection

The ETD control must be connected to the controller with a 4 wires shielded twisted-wire pair cable of 50 m max length. Delivered with the unit cable of 10 m length. 4P4C connector is reserved for ETD.

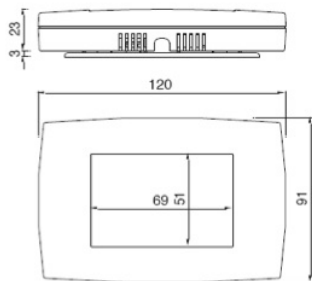


The ETD control has an electrical protection IP-20 degree, so it is valid; it is reserved exclusively for an indoor usage sheltered from moisture.

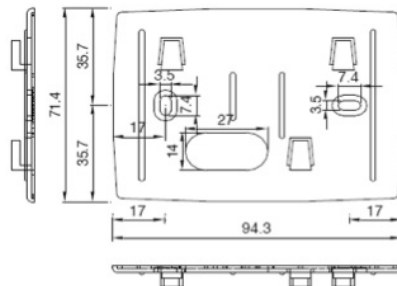
It is equipped with an internal temperature probe.

In case of an outdoor mounting of the CADB/T-HE unit OI, you can also leave it inside the housing of the electrical box. Once the parameter setting is done, the remote control can be disconnected.

Placement of the support and the remote control:



ETD remote control



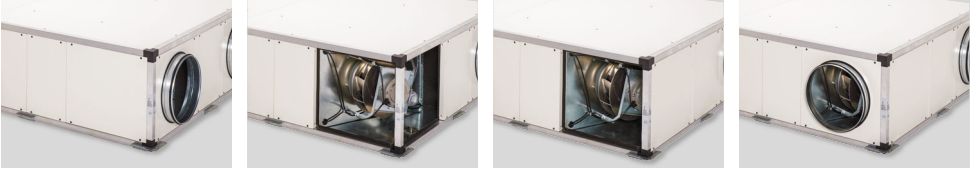
Fixation support

7.6. CONFIGURATIONS

CADB/T-HE D/DI/DC PRO-REG standard configuration

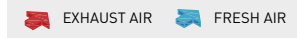
From these configurations there are multiple variables that can be performed by the professional installer quickly and easily.

Panel replacement process



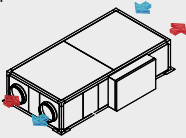
The CADB-HE heat recovery units are available in two configurations LH and RH in the horizontal models and LV, RV in vertical models.

Horizontal

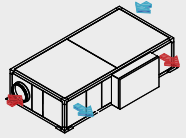
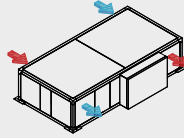
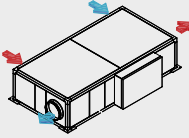


Factory configuration

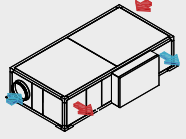
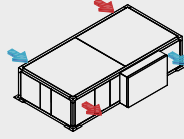
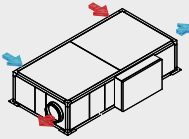
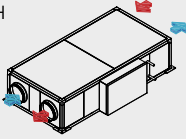
LH



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



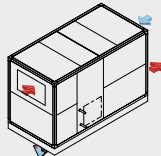
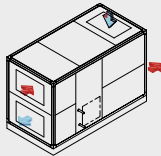
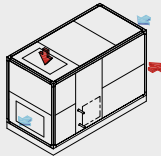
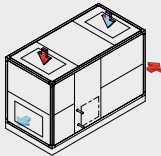
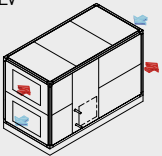
RH



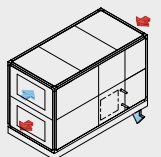
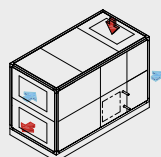
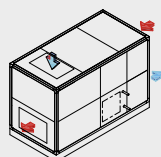
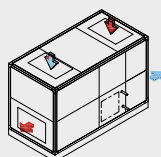
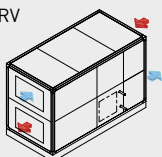
Vertical

Factory configuration

LV



RV

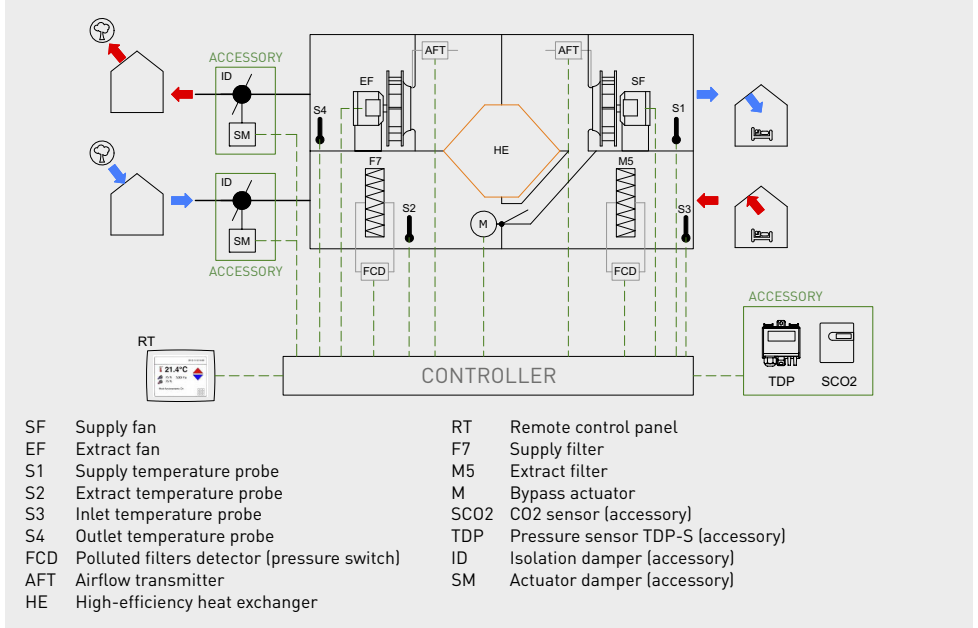


8. CONTROL FUNCTIONS

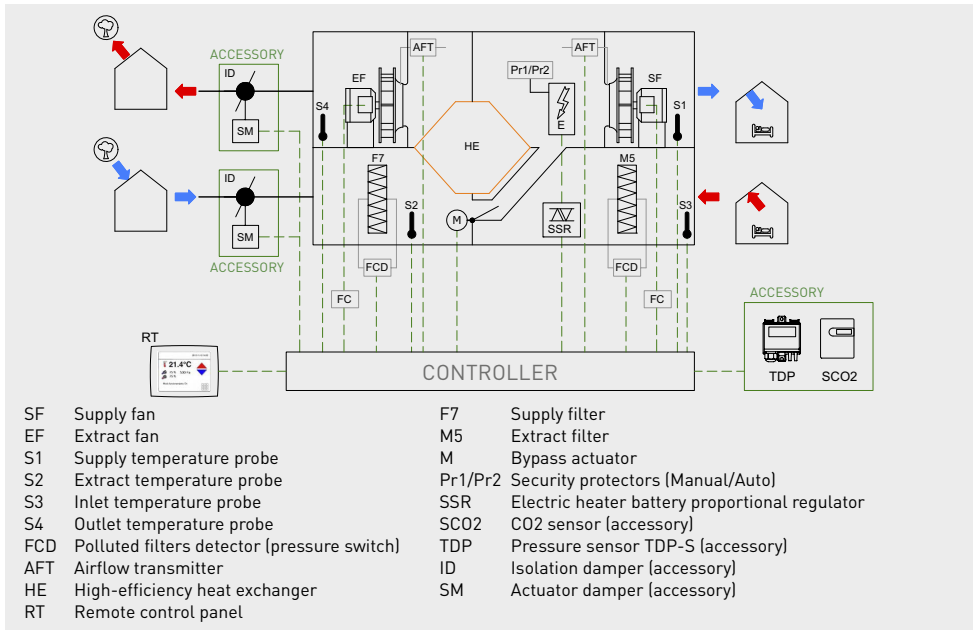
MAIN ELEMENTS
Control panel includes:
General switch
Electric box including control and wiring components, with access from side panel.
FUNCTIONS
Airflow adjustments
Display of the supply airflow and extraction in any working mode, thanks to the integrated pressure transmitters. —NEW—
Manual airflow adjustment, adjustable at any point of the fan curve.
Automatic airflow adjustment, according to time band (Through a timer, included in the controller)
Automatic airflow adjustment in VAV mode, according to external signal 0-10V (CO ₂ accessory)
Automatic speed adjustment of the fans in Constant Airflow mode (Increase of fan speed to compensate filter clogging)
Automatic speed adjustment of the fans in Constant Pressure mode (Increase of fan speed when pressure in the duct system decreases)
BOOST function (Forced speed preset via external power free contact)
ON/OFF function (Remote ON/OFF via external power free contact)
Temperature regulation
Temperature probes integrated within the unit (supply, extract, inlet and outlet)
Anti-frost probe water coil (DC-Versions)
Thermal power regulation of hot water coil
Modulating 3 points control of water valve (accessory)
Regulation of water coil thermal power: 0-10V control of the water valve (accessory)
Regulation of electric heater battery thermal power in DI versions. Proportional control via SSR
Control of the cooling and heating power in external modules of water batteries BA-AF HE. BA-AFC HE —NEW—
Integrable in VRF networks through the corresponding DX valve kit supplied by the manufacturer of the refrigeration unit. With capacity to manage the cold / heat demand of the BA-DX HE evaporator module. Allows Defrost DX function in heat pump mode —NEW—
0-10V output for the control of a preheating battery (accessory) —NEW—
Bypass adjustments
Manual actuation of bypass
Automatic actuation of bypass function free-cooling/ free-heating and heat exchanger anti-freezing protection
Night free-cooling mode (Cooling of the building at night)
SECURITY FUNCTIONS
Control of polluted filters via pressure switches (included)
Alarm display in remote control
Detailed information of alarms
Failure in temperature probes
Failure in fan via pressure switches (included)
Fire alarm indication, via activation by external contact coming from fire switchboard.
Anti-frost protection of heat exchanger via bypass activation.
COMMUNICATION
Remote wiring control
ON/OFF remote digital input via external power free contact.
Alarm digital output via power free contact.
Modbus RTU (RS-485)
Bacnet TCP/IP

9. CONTROL SCHEMES

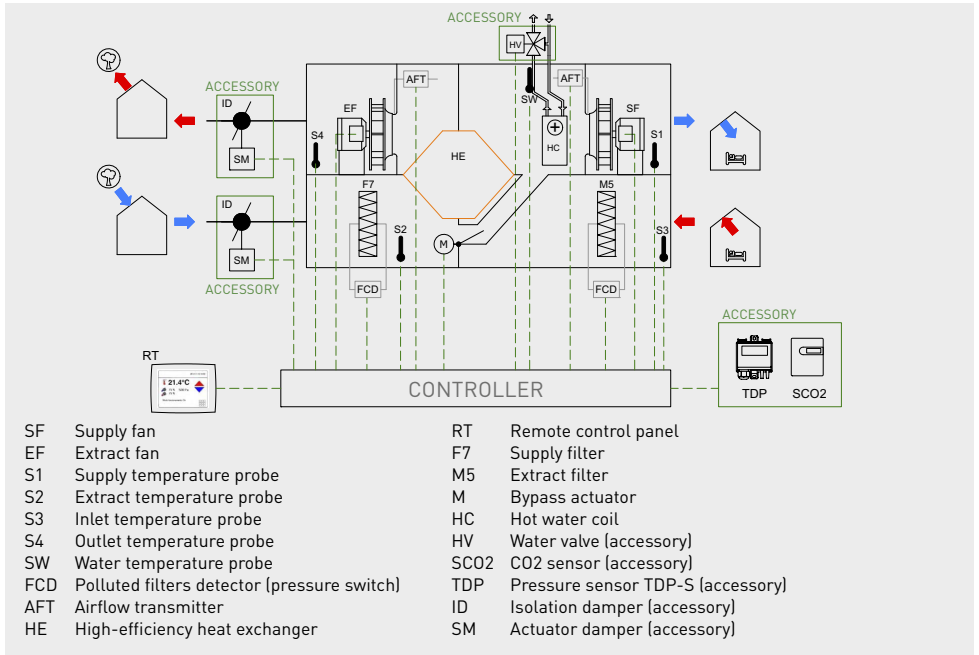
Version -D (without coils)



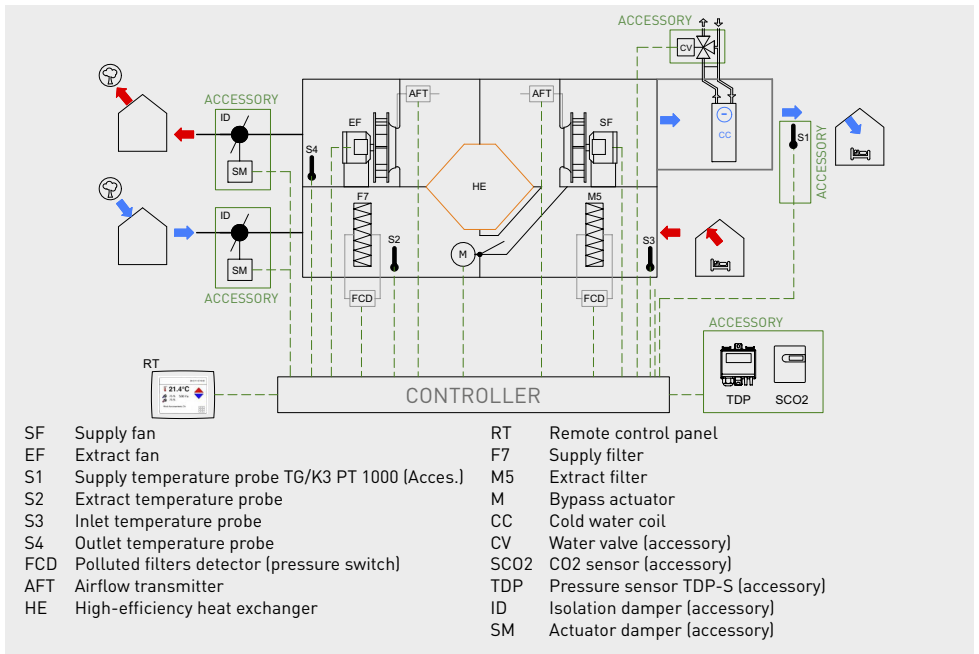
Version -DI (with integrated electric battery)



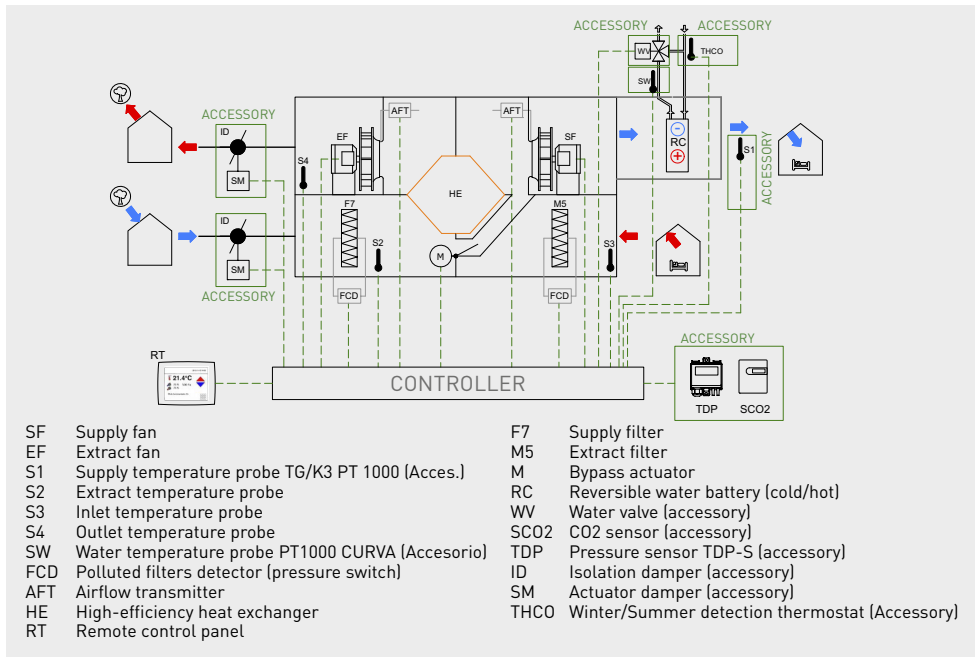
Version -DC (with integrated hot water coil)



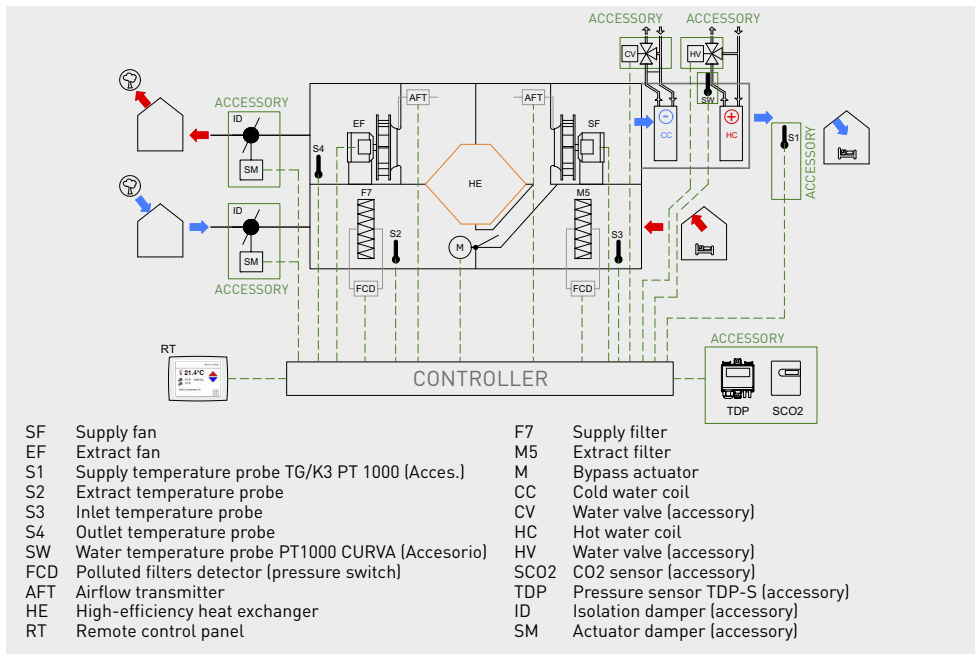
Version -D (without coils) + External module BA-AF HE (external cool water coil)



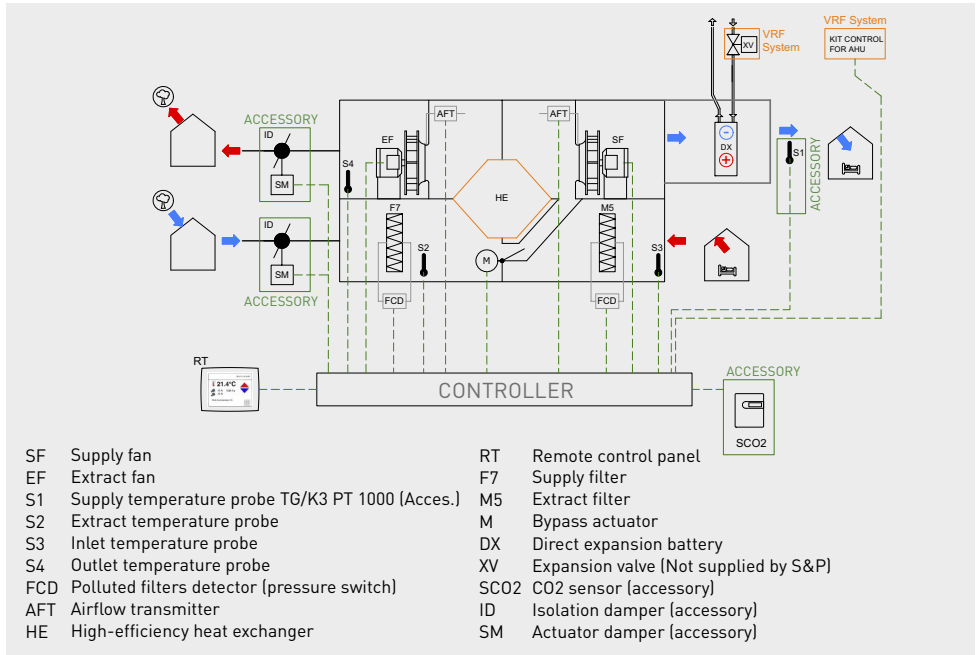
Version -D (without coils) + External module BA-AF HE (reversible hot/cold water coil)



Version -D (without coils) + External module BA-AFC HE (external cold and hot water coil)



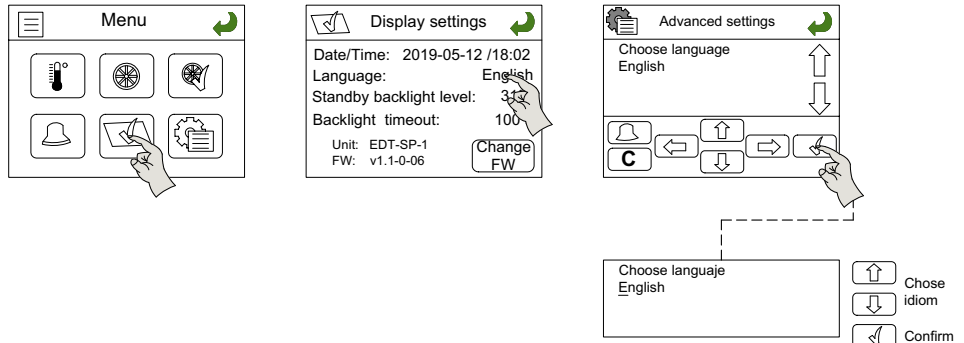
Version -D (without coils) + External module BA-DX HE (external direct expansion coil)



10. REMOTE CONTROL OPERATION

10.1. CHANGE LANGUAGE

The CADB/T-HE units can operate according to 3 modes of operation:



10.2. SIMPLIFIED MENU / ACCESSES

The unit has a quick access to the main functions.

Accesses: There are 3 access levels to the controller:

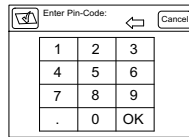
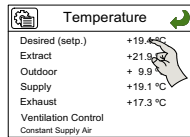
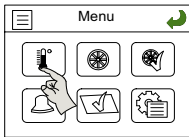
- User level (no password) – Access to the start/stop – auto or PV/GV functions and increase of the set point temperature (+/- 3°C).
- Installer level (password) – Access to read and write the adjustments and parameters, but no access to the system configuration.
- Master level (password) – Access to read and write the adjustments and parameters, as well as access to the system configuration.

10.2.1. User level

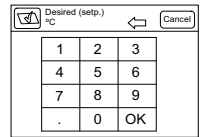
To adjust the temperature set point and the operation mode selection of the unit (use of the time program, stop the unit or speed adjustment).

These temperature and ventilation functions are accessible in two specific menus specially dedicated to this usage:

Adjustment the temperature setpoint



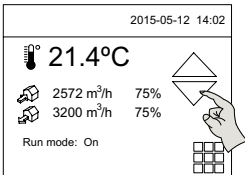
Code: 1111 OK



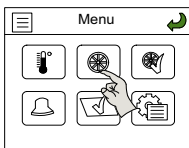
Introduce the desired temperature

To modify the temperature is necessary to enter a code.

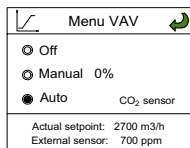
Once the setpoint temperature has been selected from the main screen, the user just can modify the value of the initial setting by +/-3°C.



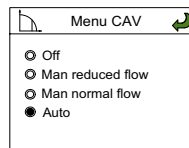
Operation mode selection



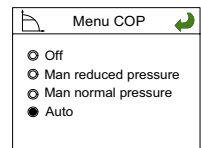
in VAV mode:



in CAV mode:



in COP mode:

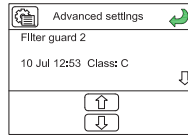
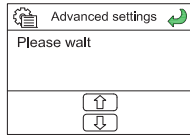
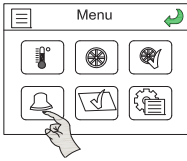


In units with electrical post-heating, if the operation mode is changed while the fans are running, the unit will stop sequentially; first switching off the electrical heater, and after 2 minutes switching off the fans, then finally the unit will re-start with at the right working mode.

10.2.2. Installer level

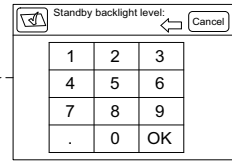
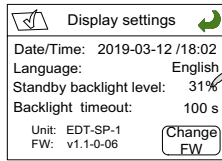
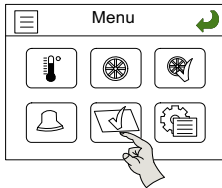
In this level is possible to adjust the operating parameters of the unit: Fan, heating, display, errors, etc.

Alarm display

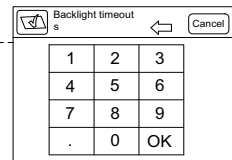


Screen display settings

Adjust the brightness and display backlight.



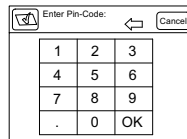
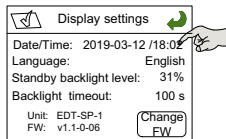
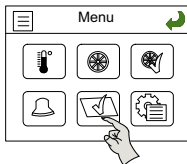
Introduce the desired backlight level



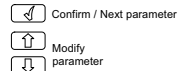
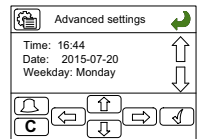
Introduce the desired time

Setting the system date/time

Allows you to set the current date and time. It is important that both are well configured to have information in the alarm history and adjust the timing.



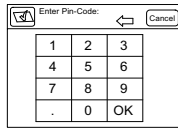
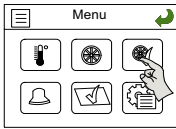
Code: 1111 OK



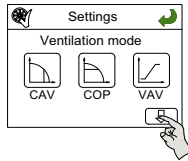
Access settings




Through "Settings" button it is possible to set up:

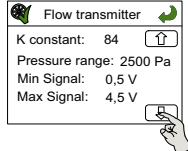
- working mode of the fans
- settings of the fan and the pressure transmitter equipped (configured at the factory)
- type of post heating unit
- the pressure transmitter used in COP mode (TDP-S accessory)
- the proportional and integral bands of regulated output to the fan
- the temperature control mode
- the type of external batteries (if it exists)



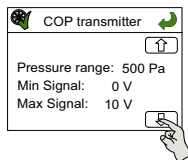
Code: 1111 OK



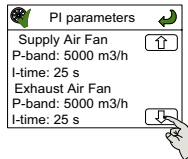
-  Constant air volume working mode (CAV)
-  Constant pressure working mode (COP)
-  Variable air volume working mode (VAV)



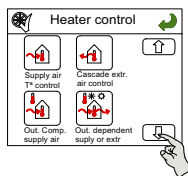
Configuration of the airflow transmitters included in the unit (Factory configured)







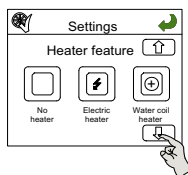
Configuration of the pressure transmitter must be connected to operate the unit in COP mode (TDP-S Accessory)






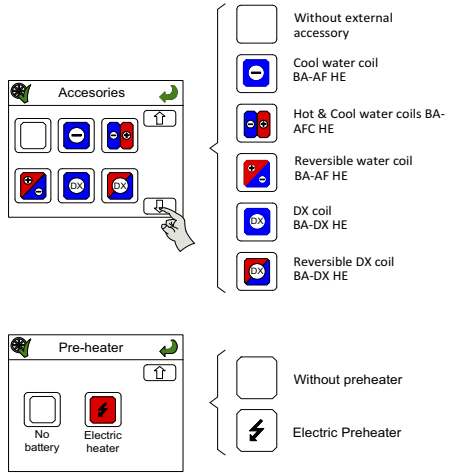
Fan regulation output configuration: Proportional and Integral bands (PI)



-  Constant supply air temperature control
-  Room temperature control
-  Constant supply air temperature control with outdoor air compensation
-  AUTO: The controller determines automatically the best operation mode for each situation. It is based on the measured temperatures



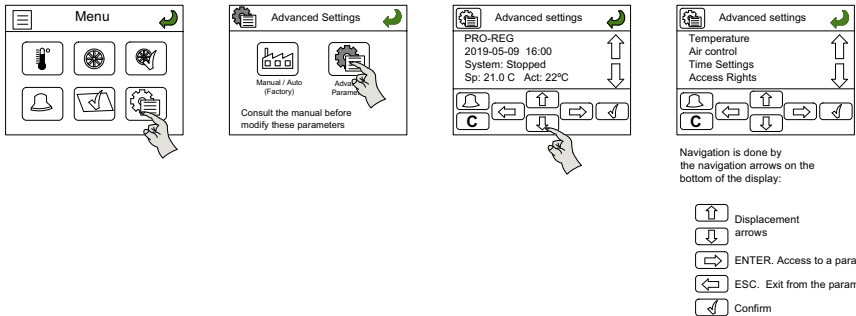
-  CADB-HE-D Versions
-  CADB-HE-DI Versions
-  CADB-HE-DC Versions



Advanced parameter setting

The access to Advance parameters allows, the following functions:

- Timer settings.
- Enable the Night freecooling function.
- Enable Modbus communication.
- Modify the Proportional and Integral regulation bands.
- Other functionalities.



Once in the advanced settings menu navigation is done by the arrows.

10.3. OPERATION MODES

The Pro-Reg units can operate in 3 operating modes:

CAV: Operation at constant flow. Airflow transmitters supplied with the unit (assembled and wired).

VAV: Operation at variable flow.

COP: Operation at constant pressure. External accessory TDP-S is required.

After a change in the selected operation mode, the fans stop and re-start in the new selected mode.

10.3.1. Constant airflow operation (CAV)

Mode recommended in installations where it is necessary to maintain a constant airflow.

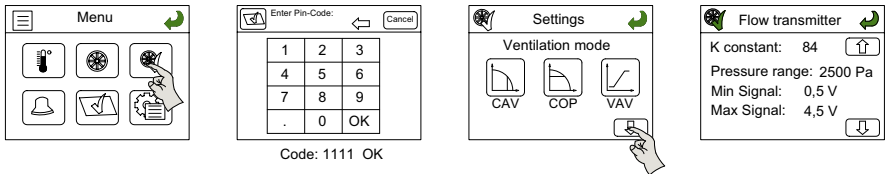
The speed of the fans is continuously regulated in order to maintain the airflow set in the hand terminal.

Independent SAF and EAF flow control: SAF and EAF are controlled each one by its respective pressure transmitter signal. The pressure transmitters are supplied from the factory, assembled and wired.

The controller performs the conversion of the signal received from the pressure transmitter to flow, using the relation $q_v = k\sqrt{\Delta P}$. This parameter K depends on the fan construction and is different for each model.

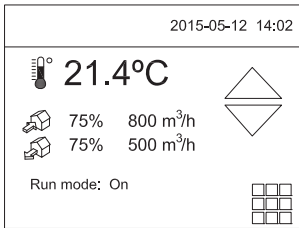
This value is already set at factory, so it should not be modified.

It is possible to display the pressure range of the airflow transmitter and the K-factor of the fan, following the sequence:



When CAV mode is selected, the main screen shows the current airflow, and a percentage of the maximum fan speed.

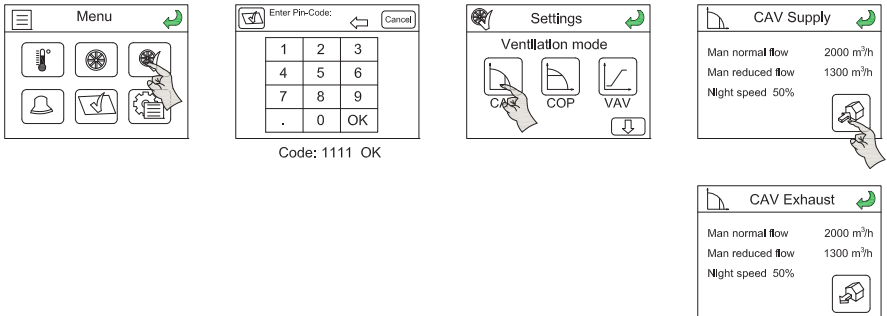
Appearance of the main screen when the unit is configured in CAV mode.



CAV control mode selection

The access to the simplified parameter setting menu (via the password 1111) allows to set:

- Normal flow and Reduced flow for each fan.
- Value of fans night speed, to be used in case of night freecooling function activation.



The choice between normal or reduced flow can be done:

- manually
- automatically by timer (see section Time programming)
- remotely, by an external digital contact (see section BOOST function)

A third set point, the “night speed”, may be entered via the control panel. The value in % corresponds to the percentage of the fan’s maximum capacity; it will be used during the night for free cooling (see corresponding function).

The selection of CAV mode in this installer menu automatically configures the screen of the user menu. The user can then change the unit’s operation airflow between min and max presetted values.



Off: stop the unit.

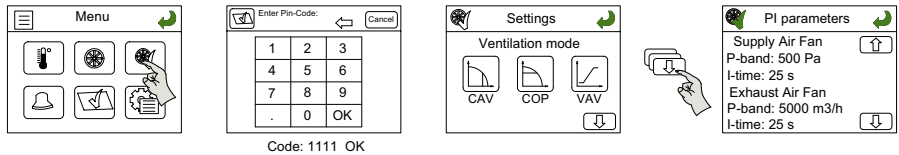
Manual Reduced flow, Manual Normal flow: Set point manually selected.

Auto: Selection of setpoint is done according to time programming.

Advanced level

Occasionally, depending on the characteristics of the duct net (length and diameter) and also depending on the regulating elements (type of dampers and opening / closing times), It may be necessary to modify the Proportional and Integral bands of the fan speed control output.

To modify the proportional and integral bands, follow the next sequence:



The procedure to follow is as follows:

Regulation problem	Behaviour	Settings
Unstable regulation	It is not possible to maintain an stable airflow and the fan increases and reduces its speed periodically	Increase P-Band Reduce Acc-I time
Slow regulation	Airflow setpoint is not achieved. Although the fans do not reach their maximum speed, the increase in its speed is low	Reduce P-Band Increase Acc-I time

10.3.2. Variable airflow operation (VAV)

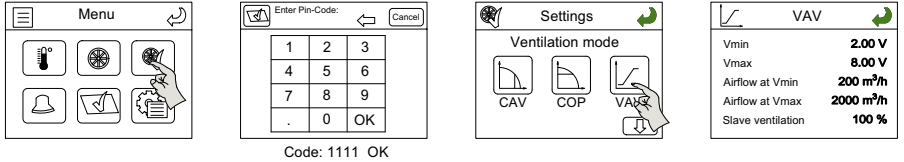
Mode recommended in single zone configuration for variable airflow applications depending on a signal type 0-10v.

The set point value depends on a signal 0-10 V from an outdoor sensor (CO₂, temperature, relative humidity, etc.) or a manual percentage. The proportion between the supply and extract airflows is introduced as a percentage.

Functional parameter setting

Access to the parameter setting menu (via the password 1111) allows:

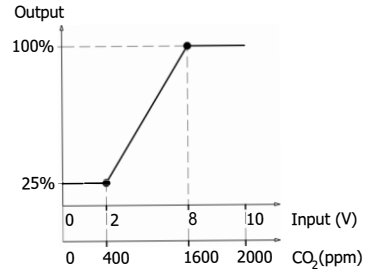
- The selection of the useful range of the signal 0-10V (see example below).
- The range of the supply and extract airflow.
- The percentage applied to the extract air flow over the supply airflow.



Examples:

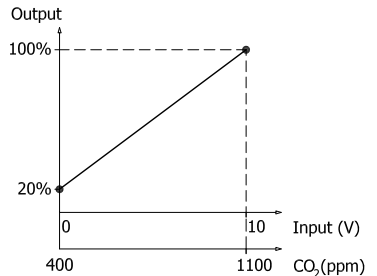
a) The proportional ramp settings of the VAV mode, depends on the range of the sensor used. Normally CO₂ sensors have a range of 0-2000ppm. However, in the market it is possible to find sensors with different ranges. Below are two examples of proportional ramp configuration with sensors 0-2000ppm and 400-1100ppm:

minimum speed = 25%
 maximum speed = 100%
 Vmin = 2 V (400ppm)
 Vmax = 8V (1600 ppm)

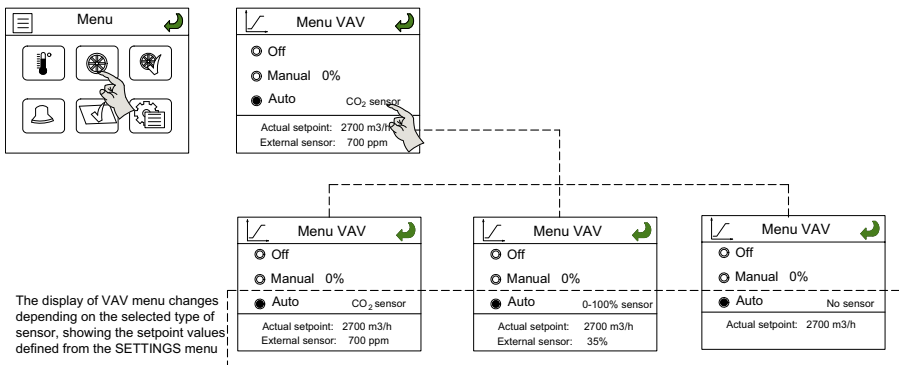


b) Control by CO₂ probe with range 400-1100ppm and output signal (0-10V)

minimum speed = 20%
 maximum speed = 100%
 Vmin = 0V (40ppm)
 Vmax= 10V (1100ppm)



The selection of VAV mode in this settings menu automatically configures the screen of the user menu, adapting it to VAV mode:



In VAV mode it will be possible to select between:

Off: Stop of the fan manual.

Manual: Manually selection of fan's speed.

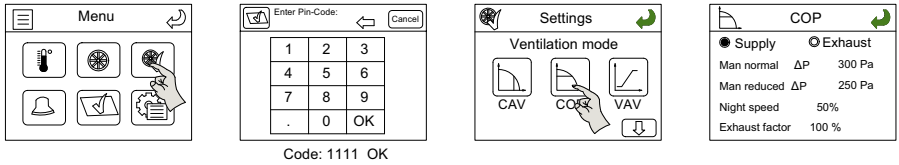
Auto: Automatic control according to external probe. Once this mode is selected it is possible to select the type of sensor used.

10.3.3. Constant pressure operation (COP)

Recommended mode in a multi-room installations, in which regulation of airflow is done through dampers in each zone/room.

Airflows automatically modulated to maintain a constant pressure value measured by a pressure transmitter installed in the duct net.

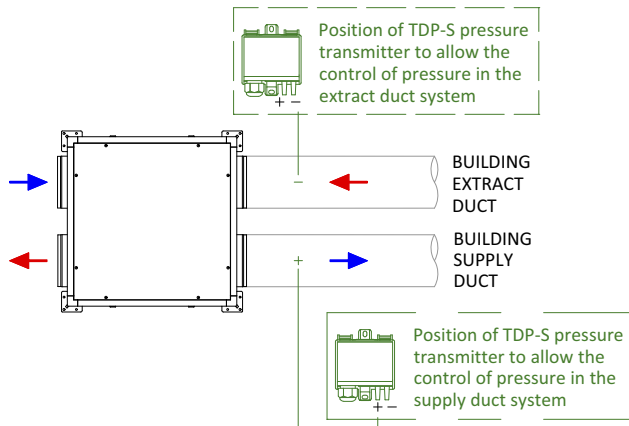
The access to the configuration menu of the COP mode is performed following the sequence:



Depending on the circuit in which the regulation elements are located, it is possible to choose among two COP control modes:

- **Pressure control in supply fan (SAF), while extract fan (EAF) works as slave:** SAF is controlled by the pressure transmitter signal and EAF follows SAF by a balance factor (parameter Exhaust factor). One pressure transmitter (accessory) is needed at supply.
- **Pressure control in extract fan (EAF), while supply fan (SAF) works as slave:** EAF is controlled by the pressure transmitter signal and SAF follows EAF by a balance factor (parameter Supply factor). One pressure transmitter (accessory) is needed at extraction.

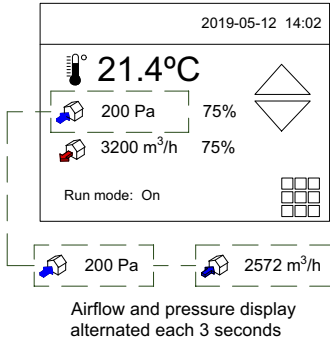
Diagram about the position of the pressure transmitter



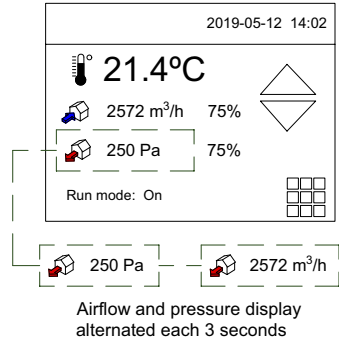
When COP mode is selected, the display shows the following information:

- Current pressure (Pa) in the duct network
- Supply and extract airflow
- Fan speed (as a percentage of the maximum fan speed)

COP Supply



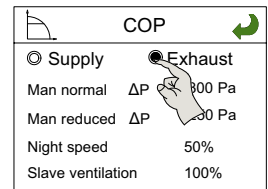
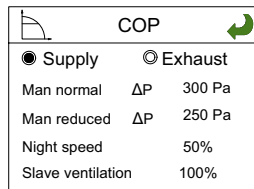
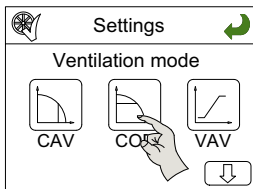
COP Extract



COP parameter settings mode

Access to the simplified parameter setting menu (via the password 1111) allows:

- The selection of Normal flow and Reduced flow of each fan.
- The unbalance factor between supply and extract fan speed.
- Define a value of fans night speed, to be used in case of night freecooling function activation.

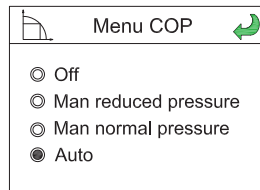
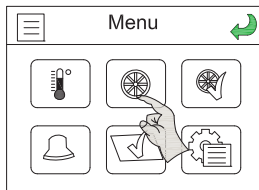


The choice between normal or reduced airflow can be performed:

- manually
- automatically with programme schedule (see section Time programming)
- remotely, by external digital contact (see section remote ON-OFF)

A third set point, the "night speed", may be entered via the control panel. The value in % corresponds to the percentage of the fan's maximum capacity; it will be used during the night for free cooling (see corresponding function).

The selection of COP mode in this installer menu automatically configures the screen of the user menu. The user can then change the unit's operation without modify the settings.



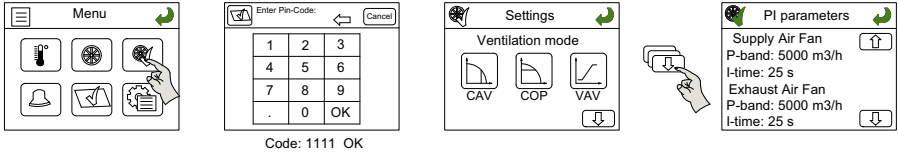
Off: stop the unit.

Manual Reduced pressure / Manual Normal pressure: Setting manually selection.

Auto: Selection of set point is done according to time programming (see Programme schedule section).

Advanced level

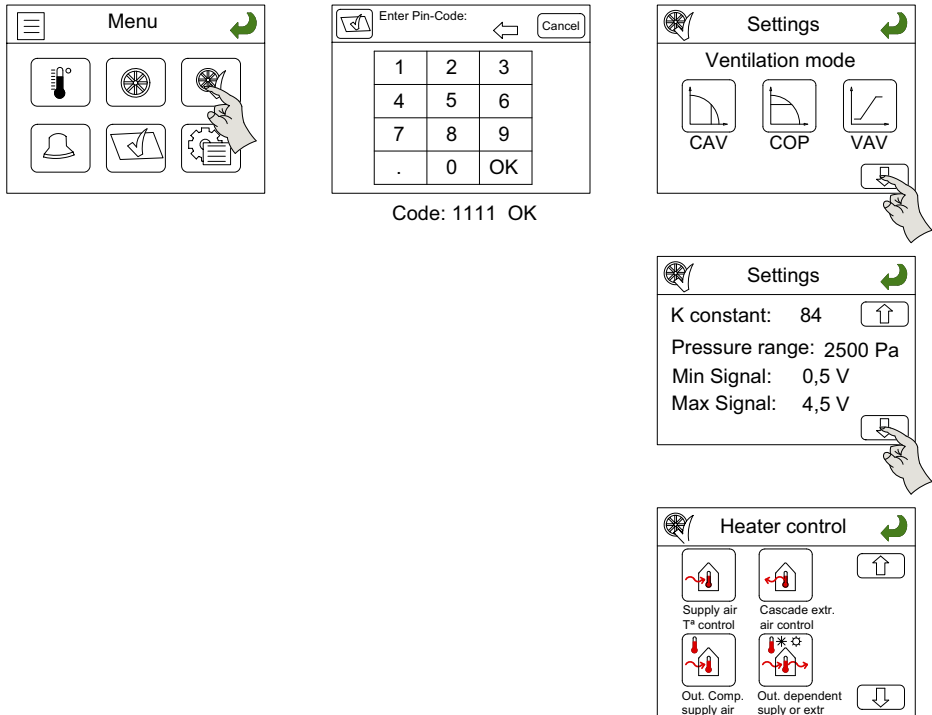
Occasionally, depending on the characteristics of the duct net (length and diameter) and also depending on regulating elements (type of dampers and opening / closing times), it may be necessary to modify the fans speed control output (Proportional and Integral bands). To modify the proportional and integral bands, follow the following sequence:



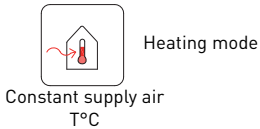
Regulation problem	Behaviour	Settings
Unstable regulation	It is not possible to maintain an stable airflow and the fan increases and reduces its speed periodically	Reduce P-Band Increase Acc-I time
Slow regulation	Airflow setpoint is not achieved. Although the fans do not reach their maximum speed, the increase in its speed is low	Increase P-Band Reduce Acc-I time

10.4. POSTHEATER CONTROL

It is possible to select between 4 different types of postheating control. To select it, follow the next sequence:

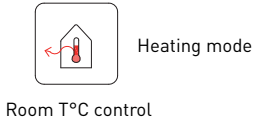


10.4.1. Constant supply air temperature maintenance



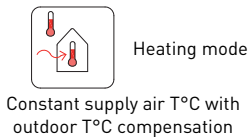
Temperature controller works comparing supply air temperature with set point defined by console.

10.4.2. Constant ambient temperature maintenance



Supply air temperature is controlled in cascade way with ambient temperature. Supply air temperature is defined depending on difference between ambient temperature and set point. In front of request, the controller tries to keep ambient temperature limiting duct temperature, which is maintained around 12 and 30°C, at same time.

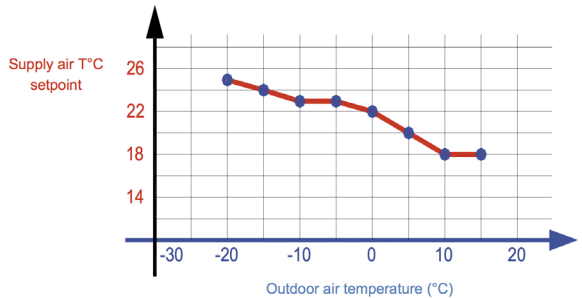
10.4.3. Temperature set point adaptation vs. outdoor temperature



Controller operation is similar to first case. In this case, main difference is defining a compensation curve defined from factory with 8 set points instead of fixing a single temperature set point.

Compensation curve

The supply set point is then adapted with respect to this curve. At any time, from the main screen you can manually change the supply temperature (range of +/-3°C).



10.4.4. Automatic control mode



Depending on the temperatures the controller select the most suitable temperature control mode, between "Supply temperature control with compensation for outdoor temperature" and "Room temperature control".

10.5. TIME PROGRAMMING

The controller has several clocks which allow the individual programming of: Normal Speed, Reduced Speed and Stop.

Speed selection is not available in VAV mode.

Normal speed: corresponding to normal pressure in COP mode and to normal flow in CAV mode.

Reduced speed: corresponding to reduced pressure in COP mode and to reduced flow in CAV mode.

Clock parameter setting:

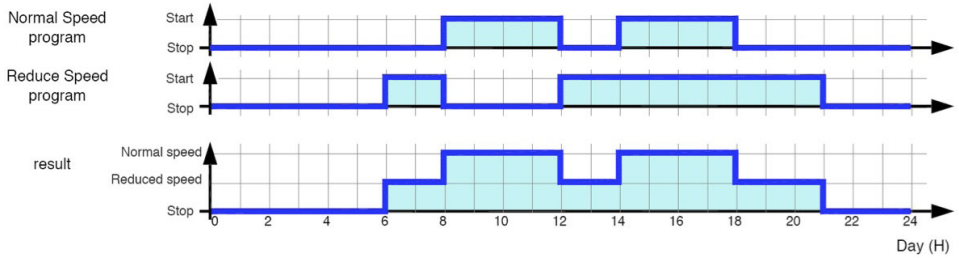
The programmer works for intervals (outside these intervals the fans are stopped). By default, the unit is supplied configured in Normal Speed 24h/day, 7 days/week. The installer can thus define two operation intervals in normal speed (only in CAV and COP modes).

It is possible define the maximum of the two intervals per day and of speed.

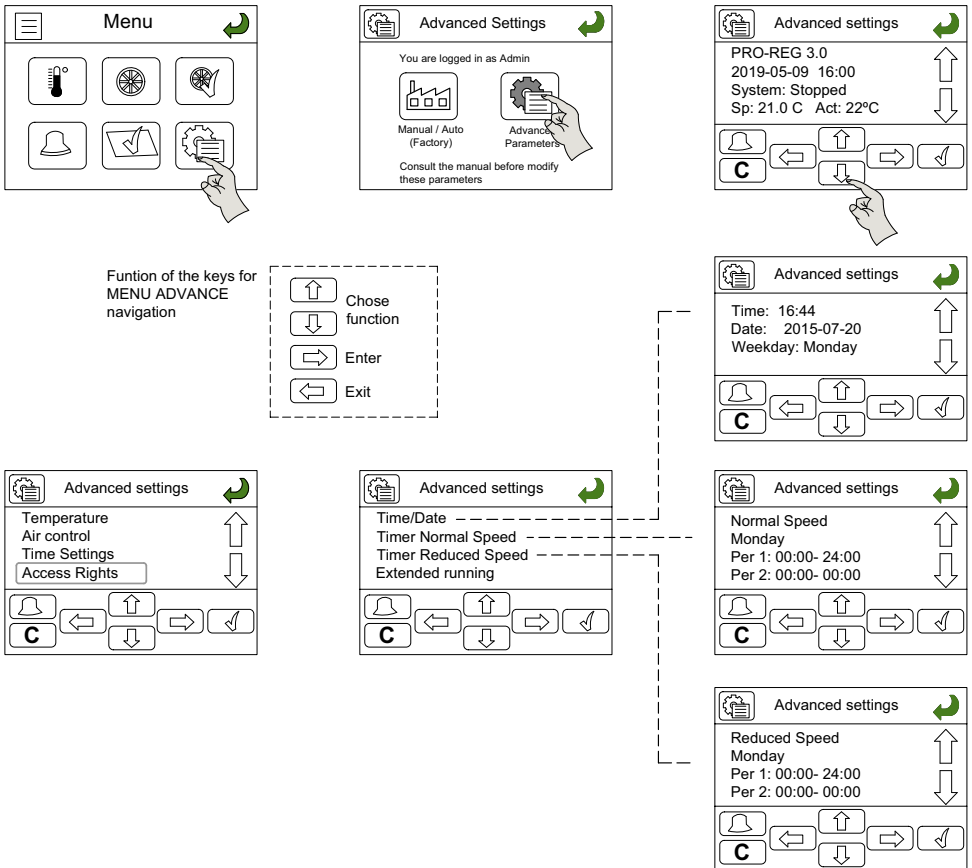
For example:

The Normal Speed can be defined from 8:00 am to 12:00 pm in period 1
 and from 2:00 pm to 6:00 pm in period 2
 and the Reduced Speed from 6:00 am to 8:00 am in period 1
 and from 12:00 pm to 9:00 pm in period 2

The PRO-REG controller will then control the fans as follows:



To access to the programme schedule, select "Time settings" in the advance parameters.



Before modify the programming it is necessary to access as "Administrator level".

Time intervals parameter setting menu:

A "reduced speed prg" menu is also visible and is made up in the same way as the "normal speed prg" menu.

Time settings	Time/date	Time: hh:mm Date: aaaa:mm:dd Weekday: dddddd	
	Timer Normal Speed	Normal Speed Monday	Normal Speed Monday->Friday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00
		Normal Speed Tuesday	
		--	
		Normal Speed Thursday	
		Normal Speed Friday	
		Normal Speed Saturday	Normal Speed Saturday->Holiday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00
		Normal Speed Sunday	
		Normal Speed Holiday	

The intervals are programmed day by day or copied by selecting either the same programming from Monday to Friday and/or the same Saturday and Sunday and Holidays.
Holiday periods are to be selected at the end of the table (24 possible periods).

Time settings (following)	Holidays	Holidays (mm:dd)
		1: 01:01 - 01:01
		2: 01:01 - 01:01
	3: 01:01 - 01:01	
	Holidays (mm:dd)	4: 01:01 - 01:01
		5: 01:01 - 01:01
6: 01:01 - 01:01		

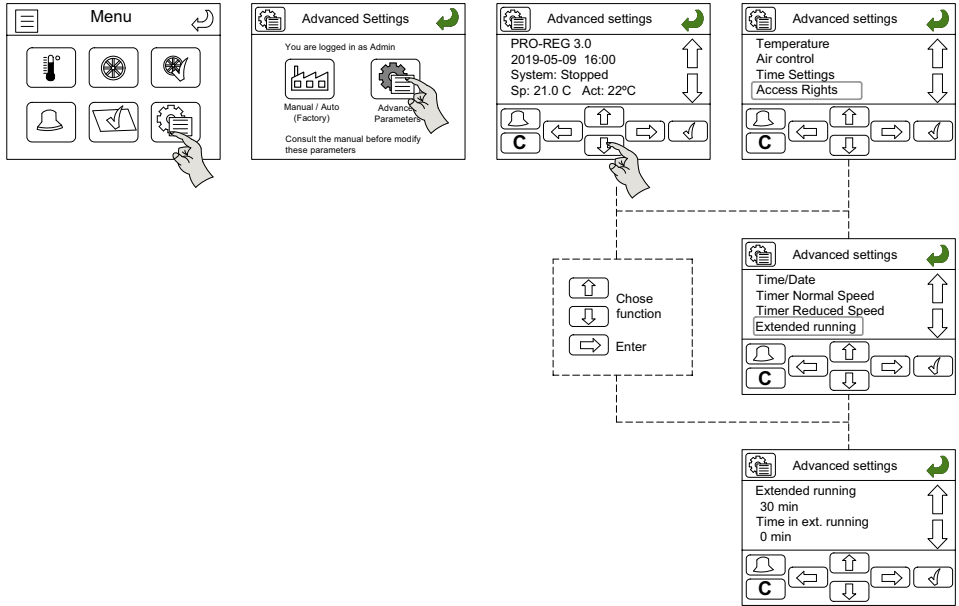
11. BOOST FUNCTION - Forced High Speed (only available in CAV and COP modes)

By closing an external digital contact, it is possible to force the fan operation at normal speed for a set time. (30 mins. by default)

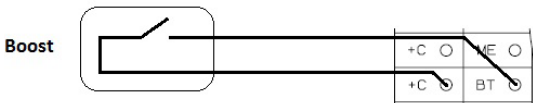
The speed corresponds to the high pressure setpoint set in COP mode or to the normal airflow specified in CAV mode.

The Boost function can be activated, only when the unit is not within a timer period of normal speed. In this case, even if boost is executed, the timer will start to count once the period of normal speed is finished (the boost order gets delayed).

This function is not available in VAV manual mode.



The activation of the Boost function has to be activated with an external switch. To activate, it is necessary to close the contact between +C and BT for 3" and then open it.



Once the Boost function has been activated, to cancel the forced normal speed period, it is necessary to do a Remote STOP-START.

12. REMOTE STOP-START

It is possible to start-stop the unit by means of an external digital contact (see electric diagrams). The contact closure between +C and ES, will produce the unit stop.



When the equipment is stopped remotely the control hand terminal displays an alarm message, warning that it is possible that the unit will be start up from remote at any time.

13. FREE COOLING BY NIGHT

By default, this feature is disabled. To enable it is necessary to access from Advance Settings. This function is used during the summer to cool off buildings during the night by using fresh outdoor air. This allows reducing the need to resort to air conditioning during the day.

To use the free cooling by night function, the information received from the outdoor probe (fresh air) and from the discharge temperature probe is used. These two probes are present and integrated in the unit at the level of the taps.

The free cooling is only active if the start-up conditions are satisfied:

Start-up conditions:

- Less than 4 days have elapsed since the last start of the installation.
- The outdoor temperature during the previous operation period exceeded the force limit of 22°C⁽¹⁾.
- It is between midnight 0:00 am⁽¹⁾ and 7:00 am⁽¹⁾ in the morning.
- The timer outputs for "normal speed", "Extended running, Normal" and "External switch" are Off.
- A time program will be activated ("Start") within the next 24 h.

If ALL the conditions are satisfied, the free cooling starts running. It runs for 3 minutes to make sure that the temperature measurements are representative [by creating a movement of air in the ducts].

After three minutes, the controller checks the stop conditions:

Stop conditions:

- The outdoor temperature is above 18°C⁽¹⁾ or below 10°C⁽¹⁾ (risk of condensation).
- The discharge temperature is less than the stop value (18°C).
- The time programs (timer) for the normal speed, normal force run and the outdoor control are set to "Stop".
- It is later than 7:00 am⁽¹⁾ in the morning.

If at least one of these conditions is satisfied after the first three minutes of operation, then the unit is again stopped.

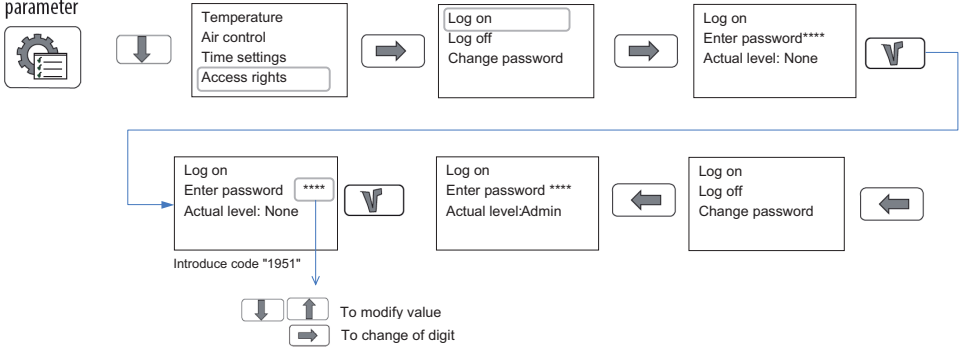
When the free cooling function is active, the fans run at maximum speed (it is possible to reduce this speed by setting the parameters); the coil and heat exchanger control outputs are switched off. The heating output remains inhibited for 60 min⁽¹⁾ after the function is stopped.

(1) default values which can be changed by a parameter setting in "expert mode".

To activate the Free Cooling Night function it is necessary to access as administrator.

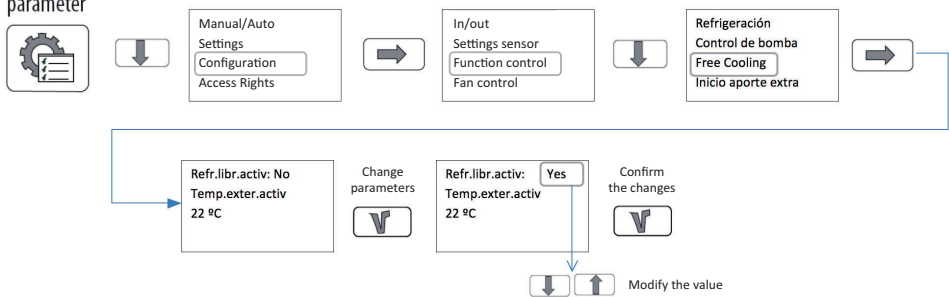
1- Access to system level

Advance parameter



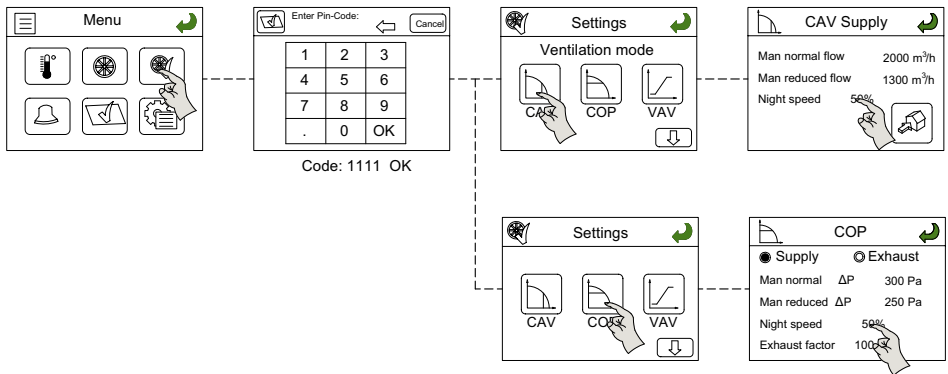
2- Activate the free cooling function and define the setpoint temperature

Advance parameter



Define the airflow during night-free cooling

The fan speed during the night free-cooling function is defined as a percentage of the normal speed configured on the unit.

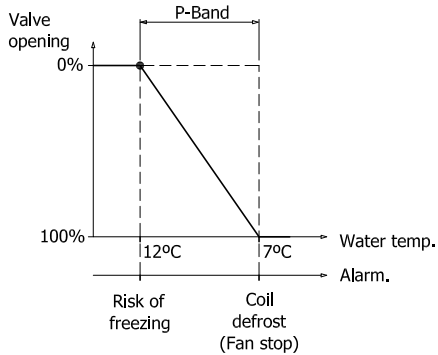


14. WATER HEATER FROST PROTECTION

In models equipped with water coil, the temperature of the water return is continually supervised by a probe, in order to prevent it from freeze.

In case water temperature drops below 12°C, the water valve starts to open (in case it was closed) and *Frost Risk* alarm is activated.

If water temperature keep going down until fall down 7°C, then fans are stopped and the alarm *Water temp too low*, is activated. Until the temperature is not over 7°C, the fans won't re-run again.



Unit in OFF mode

When the unit is OFF, antifrost protection remains active trying to maintain a constant return water temperature of 25°C.

15. PROTECTION OF HEAT EXCHANGER UNIT

This functionality prevents freezing of the condensates existing inside the heat exchanger (On the side of expulsion of air to the outside).

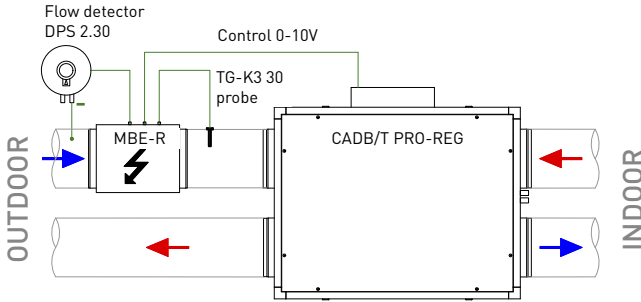
In order to protect the heat exchanger, the PRO-REG controller implemented 4 different strategies:

Function	Strategy
Preheater control	<ul style="list-style-type: none"> It is activated when the exhaust air temperature descends 6°C. In case of pre-heater battery (See chapter "Control of an external preheating battery"), the controller activates the battery, heating the external air before the heat recovery inlet.
Fans unbalancing	<ul style="list-style-type: none"> It is activated when the exhaust air temperature descends 4°C. The unit comes into Defrost mode, setting the supply fan SAF at 50% of its nominal speed, while the extract fan EAF remains at his nominal speed.
By-pass opening	<ul style="list-style-type: none"> It is activated when the exhaust air temperature descends 2°C. At that moment the by-pass damper opens, diverting the supply air directly into the building and using the exhaust air to defrost the heat exchanger. In this situation, the unit enters in Defrost mode, and the alarm "Analog deicing" is activated.
Supply air temperature supervision	<ul style="list-style-type: none"> Regardless of the protection strategies activated, if the supply air temperature falls below 11°C, after a time delay of 5 mins the unit will stop, restart again after 1 hour. These parameters are configurable.

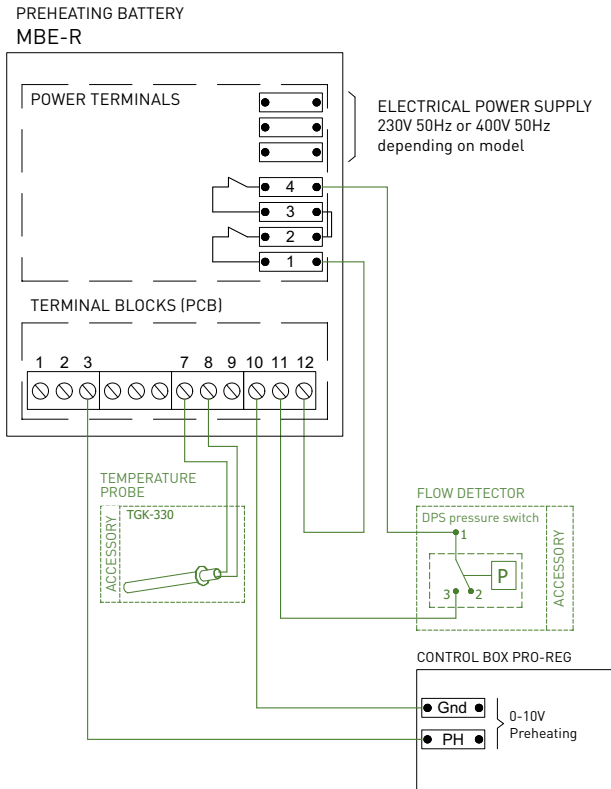
16. CONTROL OF AN EXTERNAL PREHEATING BATTERY

Indicated for ventilation installations located in cold zones where the outside temperatures are usually below -10°C.

Under that conditions, it is advisable to provide preheating electric batteries located in the outside air intake of the recuperator that increase the temperature of the outdoor air, avoiding the continued activation of the heat exchanger protection and the discomfort that this situation can cause.



The PRO-REG controller performs the battery power control by 0-10V signal, however it is necessary for the installer to perform a small electrical control to ensure that the preheating battery can not be switched on while there is no air circulation in the duct system.



17. FIRE FUNCTION (FIRE)

It is possible to assign a digital input to the FIRE function. After receiving the signal from an external fire control unit, it will be forced a predetermined behavior of the heat recovery unit fans.
 Input signal type: Potential free. It is supplied with a Bridge to avoid the appearance of the alarm (Contact open = Alarm).

It is possible to assign the following behaviors:

Fire alarm strategies:

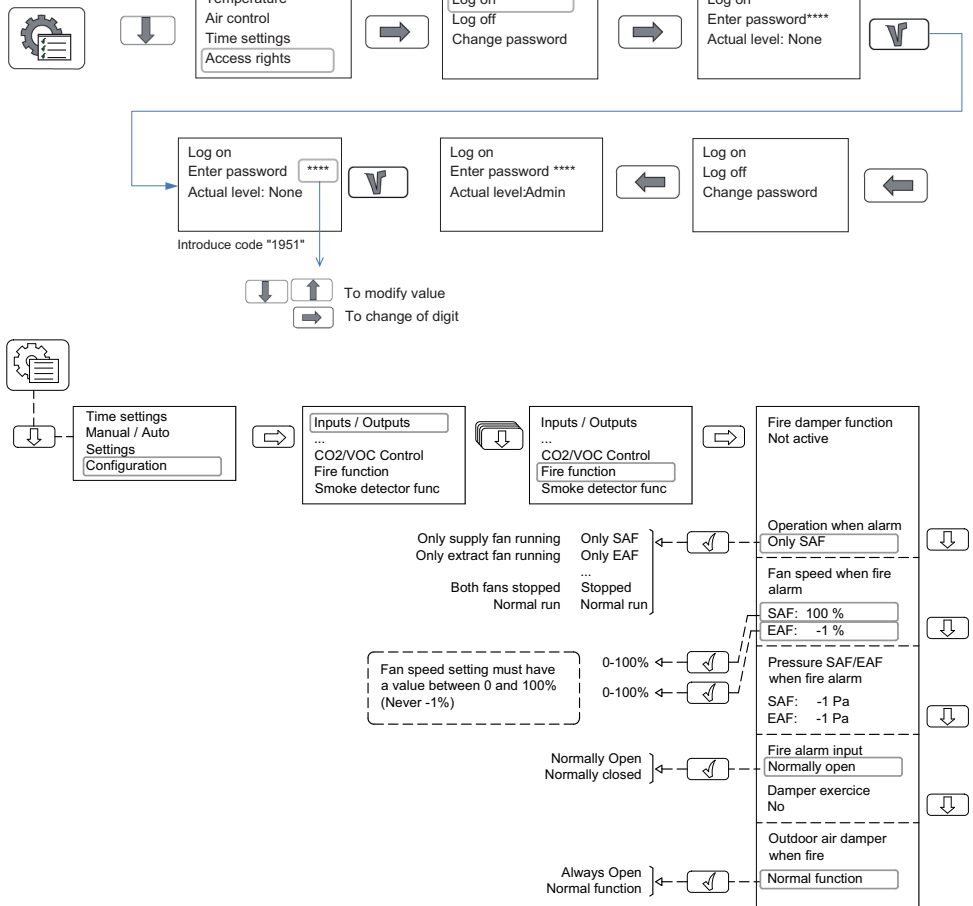
- Force the Supply fan runs (Extract fan stops).
- Force the Extract fan runs (Supply fan stops).
- Both fans running.
- Both fans stopped.

In all cases, upon activation of the alarm, the display shows ALARM message.

Here's, how to configure the unit's operation after the fire alarm has been activated:

1- Access to system level

Advance parameter



18. CONTROL OF EXTERNAL BATTERIES AND FILTERS

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.

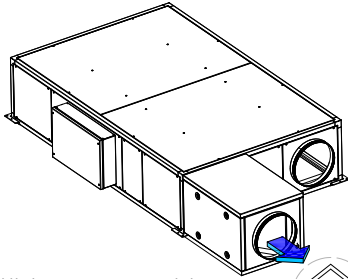
Its quick mounting system and its perfect integration with the heat recovery unit provides a considerable saving in the mounting time comparing them with the conventional accessories.

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 21/27 H	FB-CA HE 21/27 H
	RH	BA-AF HE 21 RH	BA-DX HE 21 RH	BA-AFC HE 21 RH		
CADB/T-HE-D/DI/DC 27	LH	BA-AF HE 27 LH	BA-DX HE 27 LH	BA-AFC HE 27 LH	FBL HE 21/27 H	FB-CA HE 21/27 H
	RH	BA-AF HE 27 RH	BA-DX HE 27 RH	BA-AFC HE 27 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		
CADT-HE-D/DI/DC 45	LH	BA-AF HE 45 LH	BA-DX HE 45 LH	BA-AFC HE 45 LH	FBL HE 45 H	FB-CA HE 45 H
	RH	BA-AF HE 45 RH	BA-DX HE 45 RH	BA-AFC HE 45 RH		
CADT-HE-D/DI/DC 60	LH	BA-AF HE 60 LH	BA-DX HE 60 LH	BA-AFC HE 60 LH	FBL HE 60 H	FB-CA HE 60 H
	RH	BA-AF HE 60 RH	BA-DX HE 60 RH	BA-AFC HE 60 RH		
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 21/27 V	FB-CA HE 21/27 V
	RV	BA-AF HE 21 RV	BA-DX HE 21 RV	BA-AFC HE 21 RV		
CADB/T-HE-D/DI/DC 27	LV	BA-AF HE 27 LV	BA-DX HE 27 LV	BA-AFC HE 27 LV	FBL HE 21/27 V	FB-CA HE 21/27 V
	RV	BA-AF HE 27 RV	BA-DX HE 27 RV	BA-AFC HE 27 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		
CADT-HE-D/DI/DC 45	LV	BA-AF HE 45 LV	BA-DX HE 45 LV	BA-AFC HE 45 LV	FBL HE 45 V	FB-CA HE 45 V
	RV	BA-AF HE 45 RV	BA-DX HE 45 RV	BA-AFC HE 45 RV		
CADT-HE-D/DI/DC 60	LV	BA-AF HE 60 LV	BA-DX HE 60 LV	BA-AFC HE 60 LV	FBL HE 60 V	FB-CA HE 60 V
	RV	BA-AF HE 60 RV	BA-DX HE 60 RV	BA-AFC HE 60 RV		
CADT-HE-D/DI/DC 100	LV	BA-AF HE 100 LV	BA-DX HE 100 LV	BA-AFC HE 100 LV	FBL HE 100 V	FB-CA HE 100 V
	RV	BA-AF HE 100 RV	BA-DX HE 100 RV	BA-AFC HE 100 RV		

18.1. ACCESSORIES ASSEMBLY

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



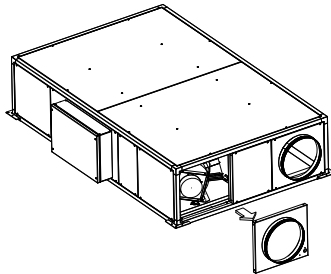
All the accessory modules can be mounted on the supply air outlet



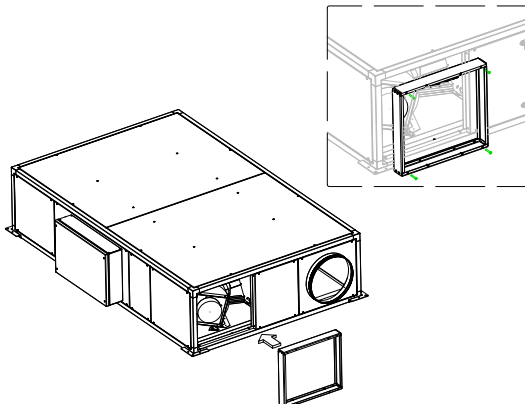
FB-CA HE can also be mounted on the exhaust air outlet

To proceed with the assembly, follow the next steps:

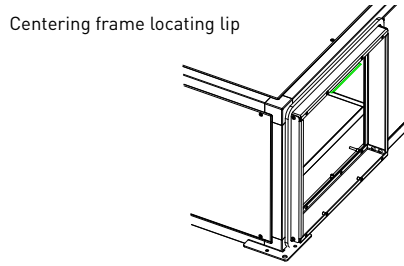
1. Remove the flange panel from the heat recovery unit, loosen the 4 screws that fix it.



2. Mount the centering frame, by means of the 4 screws M5x12. Both centering frame and screws are delivered with the module.

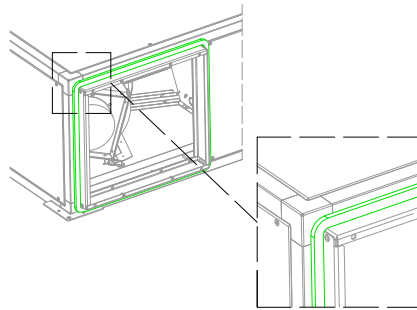


Before mounting the centering frame, verify that the locating lip in the frame is positioned in the top side.

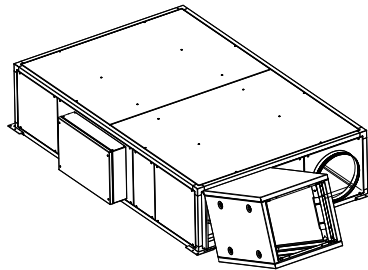


3. Put the self-adhesive sealing strip, delivered in a bag included with the module, around the centering frame.

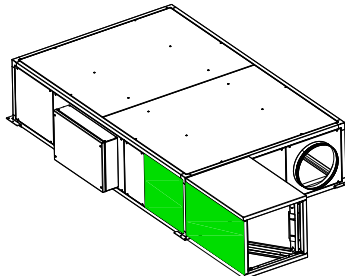
The self-adhesive side must be in direct contact with the CADB-HE profiles. Do not adhesive the sealing strip to the centering frame



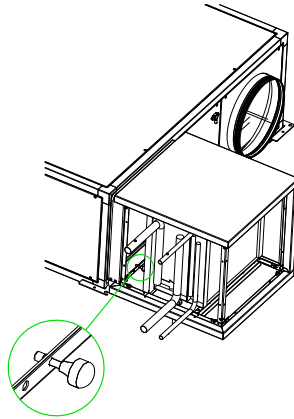
4. Hook the module onto the centering frame locating lip, and then drop it by its own weight.



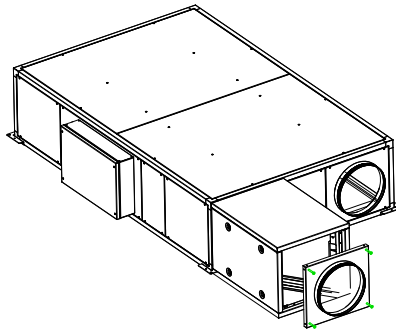
Fix the module to the heat recovery unit permanently. The access to fixing points is performed by the side of the unit, removing one of the side panes (from the CADB or from the module maintenance panel).



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



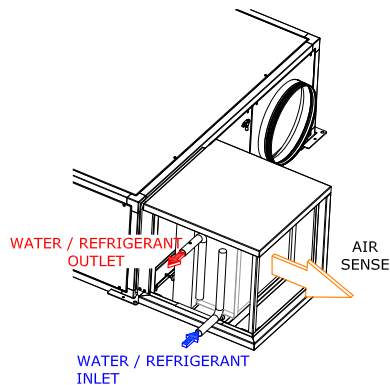
5. Finally place the flange panel (that was disassembled at the first step) over the module outlet using the 4 screws that fixed the panel to the CADB-HE.



6. Particularities of the modules with coils

In the installation of external modules (accessories) with water coil or refrigerant coil, the assembly of the module should be done in the way that:

- Air and water/refrigerant flows circulate in counterflow
- Water/Refrigerant inlet connection should be in the coil lower part



18.2. COILS CHARACTERISTICS

18.2.1. Cold water coils for 2 pipes installation

Model	Air			Fresh Air		Exhaust Air		kW	Water	
	(m³/h)	(Pa)	(m/s)	(°C)	(%)	(°C)	(%)		(l/h)	(kPa)
COLD WATER COIL (4 Rows) Water Inlet/Outlet = 7/12°C										
BA-AF HE 04	320	87	1,8	27	80	14,8	100	3,26	561	25
BA-AF HE 08	600	75	1,7					6,14	1055	38
BA-AF HE 12	900	171	2,4					9,4	1605	19
BA-AF HE 16	1.200	175	2,5					12,8	2200	42
BA-AF HE 21-27	1.600	105	2					16,5	2830	42
BA-AF HE 33 LH/RH	2.400	200	2,7					24,7	4245	26
BA-AF HE 33 LV/RV	2.400	148	2,2					25,3	4345	19
BA-AF HE 45	3.400	158	2,5					31,3	5372	13
BA-AF HE 60	4.400	151	2,4	41,5	7120	16				
COLD WATER COIL in Heat Mode (4 Rows) Water Inlet/Outlet = 50/45°C										
BA-AF HE 04	320	51	1,8	16	18	42,7	4	2,9	501	4,7
BA-AF HE 08	600	44	1,7					5,2	903	11,7
BA-AF HE 12	900	95	2,4					8,3	1427	17
BA-AF HE 16	1.200	105	2,5					11	1890	26,2
BA-AF HE 21-27	1.600	60	2					14,2	2447	25,7
BA-AF HE 33 LH/RH	2.400	111	2,7					21,8	3754	22,8
BA-AF HE 33 LV/RV	2.400	83	2,2					22	3798	16,1
BA-AF HE 45	3.400	88	2,5					29,3	5045	13,2
BA-AF HE 60	4.400	56	1,9	31	5345	10,3				

18.2.2. Cold water coils for for 4 pipes installation

Model	Air			Fresh Air		Exhaust Air		kW	Water	
	(m³/h)	(Pa)	(m/s)	(°C)	(%)	(°C)	(%)		(l/h)	(kPa)
COLD WATER COIL (4 Rows) Water inlet/outlet = 7/12°C										
BA-AFC HE 04	320	87	1,8	27	80	14,8	100	3,26	561	25
BA-AFC HE 08	600	75	1,7					6,14	1055	38
BA-AFC HE 12	900	171	2,4					9,4	1605	19
BA-AFC HE 16	1.200	175	2,5					12,8	2200	42
BA-AFC HE 21-27	1.600	105	2					16,5	2830	42
BA-AFC HE 33 LH/RH	2.400	200	2,7					24,7	4245	26
BA-AFC HE 33 LV/RV	2.400	148	2,2					25,3	4345	19
BA-AFC HE 45	3.400	158	2,5					31,3	5372	13
BA-AFC HE 60	4.400	151	2,4	41,5	7120	16				
HOT WATER COIL Water inlet/outlet = 80/60°C										
BA-AFC HE 04	320	20	2	16	18	40,5	4	2,7	115	1
BA-AFC HE 08	600	23	1,7					5,7	243	1
BA-AFC HE 12	900	37	2,4					7,7	329	2
BA-AFC HE 16	1.200	39	2,4					10,5	451	3
BA-AFC HE 21-27	1.600	24	2					13,5	580	2,3
BA-AFC HE 33 LH/RH	2.400	41	2,7					18,1	780	1
BA-AFC HE 33 LV/RV	2.400	30	2,2					18,5	798	0,6
BA-AFC HE 45	3.400	38	2,5					26,5	1139	1
BA-AFC HE 60	4.400	36	2,5	39,4	1511	2				

18.2.3. Expansion coils for integration in DX systems

Model	Air			Fresh Air		Exhaust Air		Cooling Power 7°C EVAP (kW)	R-410A Refrigerant		
	Airflow (m³/h)	Pressure drop (Pa)	Speed (m/s)	(°C)	(%)	(°C)	(%)		(l/h)	(kPa)	(dm³)

DX BATTERY - COOLING

BA-DX HE 04	320	95	1,8	27	80	14,6	100	15,2	3,15	61	6,8	0,7
BA-DX HE 08	600	80	1,7					14,5	6,26	122	32	1,2
BA-DX HE 12	900	189	2,4					14,5	9,43	175	20	1,7
BA-DX HE 16	1.200	199	2,5					14,4	12,6	245	26	1,8
BA-DX HE 21-27	1.600	107	2					14,7	16,5	321	29	2,6
BA-DX HE 33 LH/RH	2.400	233	2,7					14,6	24,9	464	15	3,9
BA-DX HE 33 LV/RV	2.400	163	2,2					14	26	484	19	3,8
BA-DX HE 45 LH/RH	3.400	198	2,5					14,8	34,5	731	12,5	5,7
BA-DX HE 45 LV/RV	3.400	198	2,5					14,4	35,7	756	20	5,6
BA-DX HE 60 LH/RH	4.400	189	2,5					14,6	45,5	950	14	7,4
BA-DX HE 60 LV/RV	4.400	196	2,5					14,4	46,5	984	18	6,7

Model	Air			Fresh Air		Exhaust Air		Heating Power T _{COND.} = 39°C (kW)	R-410A Refrigerant		
	Airflow (m³/h)	Pressure drop (Pa)	Speed (m/s)	(°C)	(%)	(°C)	(%)		(l/h)	(kPa)	(dm³)

DX BATTERY - HEATING

BA-DX HE 04	320	56	1,8	16	18	33,2	6	33,4	8	1,8	33	1,2	0,7
BA-DX HE 08	600	47	1,7					33	6	3,5	64	6,1	1,2
BA-DX HE 12	900	105	2,4					33,2	6	5,3	92	4,7	1,7
BA-DX HE 16	1.200	117	2,5					33,7	6	7,2	134	4,8	1,8
BA-DX HE 21-27	1.600	76	2					34,5	6	10,1	186	6,8	2,6
BA-DX HE 33 LH/RH	2.400	130	2,7					33,2	6	14,1	245	3,6	3,9
BA-DX HE 33 LV/RV	2.400	91	2,2					33,7	6	14,5	253	4,5	3,8
BA-DX HE 45 LH/RH	3.400	110	2,5					32,7	7	19,4	357	2,6	5,7
BA-DX HE 45 LV/RV	3.400	110	2,5					33,2	6	19,9	367	4,2	5,6
BA-DX HE 60 LH/RH	4.400	105	2,45					33	7	25,5	470	3	7,4
BA-DX HE 60 LV/RV	4.400	109	2,45					33,2	6	25,8	476	3,6	6,7

Integration in DX direct expansion systems

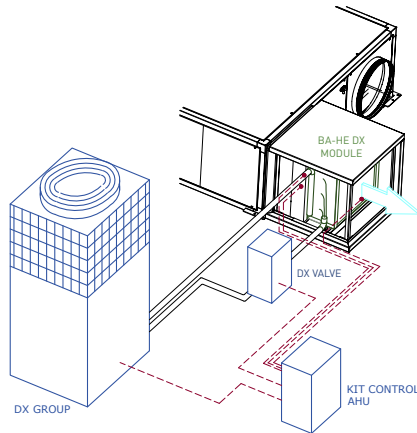
(For units equipped with BA-HE DX external coils modules)

The PRO-REG controller does not allow to control the components of the refrigeration circuit. It is essential to provide the rest of components of the refrigeration circuit (external to S&P) such as:

- Refrigeration condensing unit (compressor-condenser)
- DX direct expansion valves, "KIT DX VALVE"
- DX system control

With regard to the selection of components, verify the following:

- The condensing unit allows to obtain the required thermal capacity by the BA-HE DX coil, considering the real working conditions (Temperature and ambient relative humidity and evaporation temperature considered)
- DX coil pressure drop as well as internal coil volume are compatibles with the KIT DX VALVE and the refrigeration condensing unit.



- The necessary works for the integration of the DX module in the refrigeration circuit such as:
- Carrying out welding with high and low pressure refrigeration pipes.
 - Vacuum for the elimination of humidity content in the refrigerant circuit.
 - The assembly of the air temperature probes and evaporation probes and its integration to the DX control system.

Must be made by the installer, according to the instructions provided by the manufacturer of the refrigeration group.

Integration to the DX group Control

ATTENTION

The DX systems could be very sensitive to cooling/heating demand variations. Some DX systems manufacturers use to limit the allowable airflow regulation range. In case of no recommendation by the manufacturer, S&P recommends that the minimum airflow rate won't be less than 70% of the nominal airflow rate (considering it as the one in which the refrigerant components where selected).

For this reason, it is not advisable to use DX coils in systems which operate in COP mode (Constant Pressure) since in this mode it is not possible to apply limitations on the air flow.

DX system will always be provided with a specific DX valve control. There are two main alternatives to link both DX system control and PRO-REG controller:

- a) Cooling and/or heating demand managed by the DX group control
- b) Cooling and/or heating demand managed by the PRO-REG control

18.2.3.1. Management of the cold/heat demand by the control of the refrigeration unit

In this case, the heat recovery only manages the functions related to ventilation (fan control and its regulation, filter status and by-pass). The KIT VALVULA DX has air temperature probes that must be integrated into the ventilation ducts, by means of which it obtains the information on the cold / heat demand. See details on the possibilities of interconnection in the corresponding electrical diagram.

18.2.3.2. Management of the cold/heat demand by the PRO-REG control

In this case the PRO-REG controller through the temperature probes included in the unit, analyzes continuously the cold/heat demand, sending a 0-10V proportional signal to the external control KIT VALVULA DX.

It is also possible to reconfigure an digital output contact to inform the KIT VALVE DX if the existing demand is for cooling or heating.

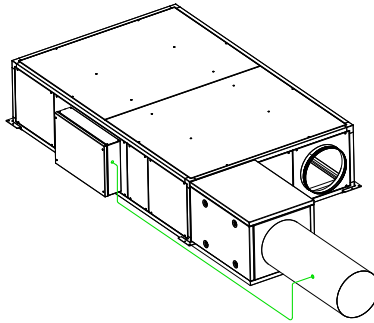
18.2.3.3. Defrost function: Forcing slow speed

In some DX systems with heat pump function, it is common that the DX system enters in defrost mode (defrosting the outdoor battery during winter). During the time in which the unit is in defrost mode, the reversal of the functions of the evaporator and the condenser occurs, as a consequence the indoor unit will drive cold air. To avoid the discomfort caused by the entry of cold air, it is advisable to reduce the airflow while the defrost function lasts. The activation of the DEFROST function is carried out by closing the DXD contact (See wiring diagram)

18.3. WIRING BETWEEN ACCESSORY AND PRO-REG ELECTRICAL BOARD

18.3.1. Coil module BA-AF HE, BA-AFC HE, BA-DX

For all the coil modules, after mount the coil module it will be necessary to replace the original temperature probe fitted in the fresh air supply side by a new one delivered as accessory 5416753100 TG/K3 PT1000. Cable length = 3 m.

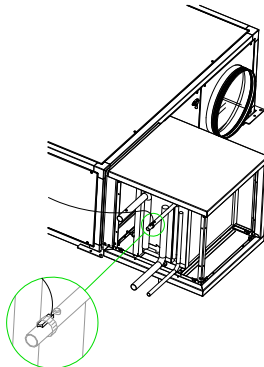


Insert the new probe downstream the coil module:

Unwire the original probe factory mounted in the electric box T_{SUP} and wire the new probe according to the indications in the Wiring diagrams attachment.

Particularities of BA-AFC modules

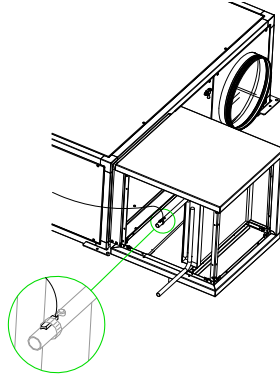
To enable water coil antifreeze protection and avoid the appearance of errors in the display, it will be necessary to install a specific temperature probe mounted directly over the hot water coil outlet collector: **5800017400 SONDA PT1000 METALICA CURVA**



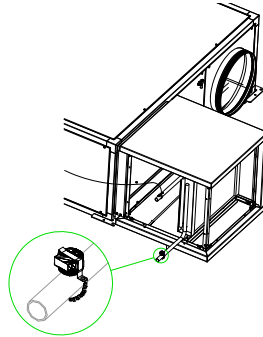
Once installed, rewire the probe to the electric cabinet, according to the indications in the electric diagrams annex.

Particularities of BA-AF reversible modules (cooling and heating)

To enable water coil antifreeze protection and avoid the appearance of errors in the display, it will be necessary to install a specific temperature probe mounted directly over the hot water coil outlet collector: **5800017400 SONDA PT1000 METALICA CURVA**



Once installed, rewire the probe to the electric cabinet, according to the indications in the electric diagrams annex.



It is possible to automatically detect the working mode (Cooling-Heating) by means of one Change-over thermostat (accessory) **5416783700 THCO**

The Change-Over thermostat must be mounted in the reversible coil inlet collector, from where it detects when the received water is cool or hot (heat pump in summer or winter mode)

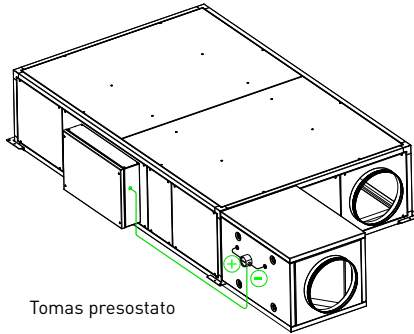
Once installed, rewire the THCO thermostat to the electric cabinet, according to the indications in the electric diagrams annex.

18.3.2. Filtration modules FBL-CA HE and FBL-HE

To supervise the filter clogging degree existing in the modules, it is necessary to install one of the following pressure switches (accessory)

Code	Reference	Pressure range
5407004100	PRESOSTATO DPS 2-30	20 – 300 Pa
5209177800	PRESOSTATO DPS 10-100	100 – 1000 Pa

Install the pressure switch, respecting the position of the (+) and (-) pressure connectors, according to the indications in the following image:



Tomas presostato

Connector + : Filtered air
 Connector - : Non filtered air

Adjust pressure setpoint according to the particularities of each installation (dust concentration in the external ambient, as well as filter replacement frequency). The adjustment is done by rotating the dial on the front of the pressure switch.

Once installed, rewire the pressure switch DPS to the electric cabinet, according to the indications in the electric diagrams annex.

18.4. CONFIGURATION OF EXTERNAL MODULES OF REFRIGERATION / HEATING BATTERIES

Once the required rewire was done, it will be necessary to reconfigure the PRO-REG controller from the SETTINGS menu.

Coil module reconfiguration is included at **Settings – Accessories** screen.

Code: 1111 OK

Ventilation mode
 CAV COP VAV

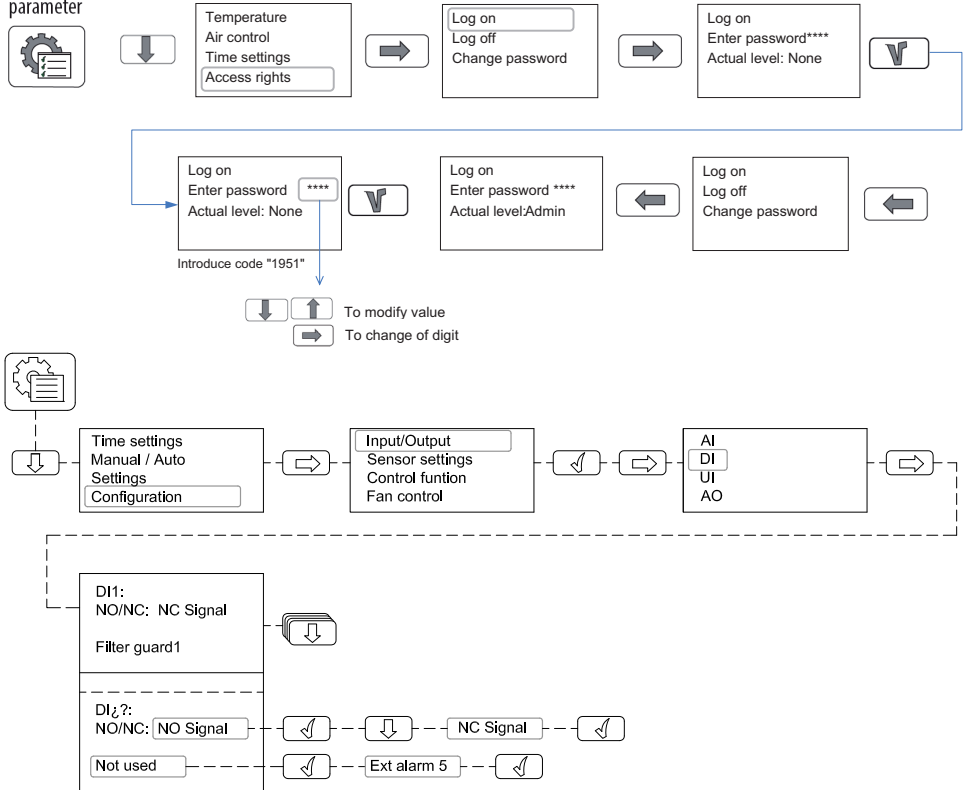
Accessories

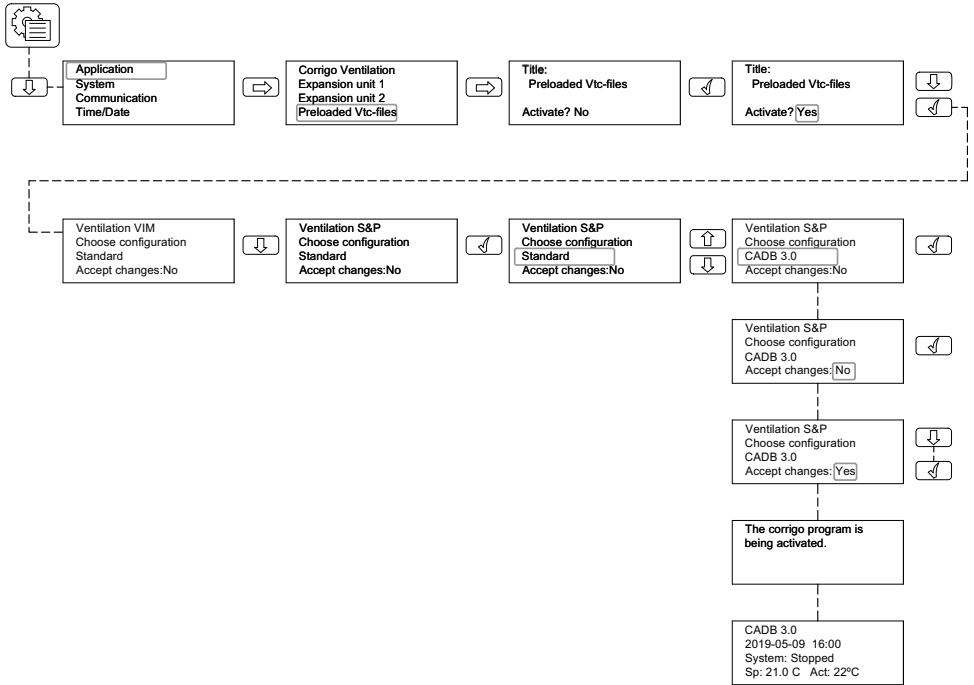
- Without external accessory
- Cool water coil
BA-AF HE
- Hot & Cool water coils
BA-AFC HE
- Reversible water coil
BA-AF HE
- DX coil
BA-DX HE
- Reversible DX coil
BA-DX HE

18.5. CONTROLLER RECONFIGURATION REQUIRED TO MANAGE EXTERNAL FILTER MODULE FB-CA HE OR FBL-HE

1- Access to system level

Advance parameter





Isolate the electrical power supply again. Re-connect all of the other cables to the Corrigo controller and finally re-energise CADB/T-HE and the reset procedure is now complete.

The run mode of the system (I.e VAV/CAV/COP) should now be re-set-up, together with ensuring that the additional parameters (K-Constant, heater type etc.) are correct.

20. CONTROLLER RECONFIGURATION

IMPORTANT

After reset the controller, it is necessary to reconfigure the unit, as the factory settings are deleted.
Necessary reconfiguration:

- Language
- Post-heating type
- Fan working mode
- K Factor.

K values corresponding to each model:

MODEL	K-FACTOR	MODEL	K-FACTOR
04	46	27	95
08	69	33	131
12	69	45	188
16	69	60	188
21	131	100	365

- Internal pressure sensor range (flow transmitter):

MODEL	RANGE	MODEL	RANGE
04	0-300	27	0-1000
08	0-300	33	0-1000
12	0-300	45	0-1000
16	0-1000	60	0-1000
21	0-300	100	0-1000

- External pressure sensor configuration:
If before to do the Reset, the unit was configured in COP mode.
- Advanced parameters:
The same way, all those advanced parameters that were configured before the reset was performed, must be reconfigured after the reset:
 - Night Free-cooling.
 - Time settings.
 - Modbus/Bacnet communication activation.
 - Fire alarm strategy.
 - Control of external cold water / DX coil.

21. CENTRALIZED TECHNICAL CONTROL (GTC) CONNECTION

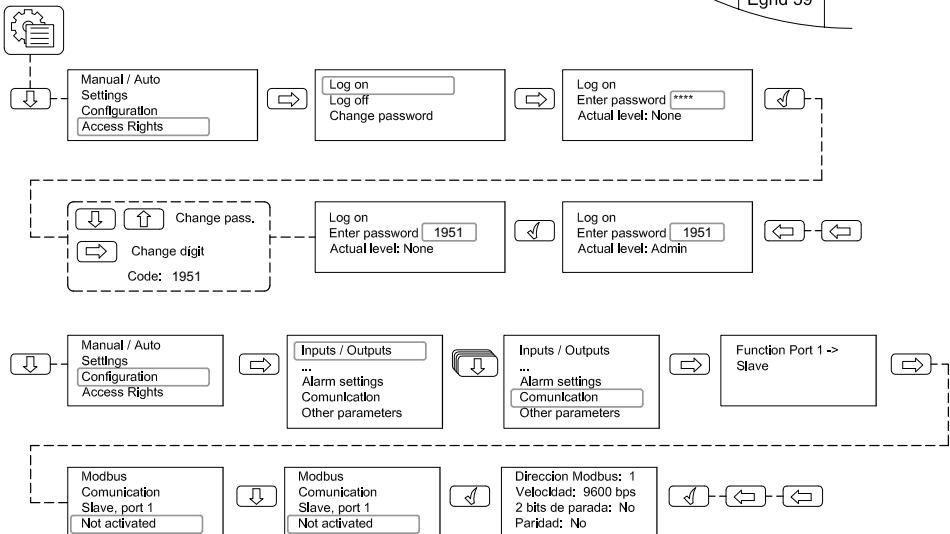
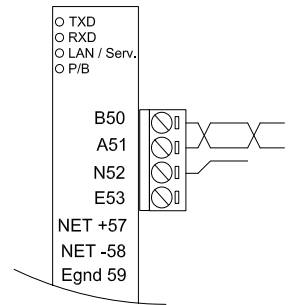
21.1. RTU MODBUS

The controller in its standard version has an integrated RS485 communication port (to be used with an STP cable).

The standard controller can communicate in Modbus RTU via its RS485 port by simply activating an internal parameter.

If you need to integrate the CADB/T-HE PRO-REG unit on a Modbus RTU system, ask for our communication manual where the Modbus technical specifications and list of available registers appear.

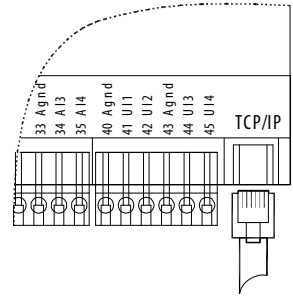
To enable Modbus communication access as administrator is required.



21.2. TCP/IP BACNET

The PRO-REG controller has a RJ45 connector that allows the connection to TCP/IP Bacnet. To enable the functionality, it is necessary to configure the IP direction of the unit and activate the BACnet IP function with the help of E-Tool program (downloaded from the following URL: http://www.regincontrols.com/Root/Documentations/42_105786/CorrigoEventilation%203.4-1-24.zip)

It is necessary to provide the names, fixed IP's, subnet mask and network interface of each unit to be connected to the same network. If you need to integrate your CADB / T-HE PRO-REG into a BACNET system, request our communication manual where appear the technical specifications and list of available records.



22. REPLACEMENT OF THE BATTERY FROM THE CORRIGO PROGRAMMABLE LOGIC CONTROLLER

When the "battery low" alarm appears and the red indicator light is lit, it means that the backup battery to save the memory and the real time clock is too low. The procedure to change the battery is described below. A capacitor allows backing up the memory and running the clock for approximately 10 minutes after the power is switched off. If the battery can be changed in less than 10 minutes, the program does not have to be reloaded and the clock will continue to run normally.

The spare battery is type CR2032.

- Using a small screwdriver, pry up the clips on each side of the case to release the cover from the base.
- Hold the base and remove the cover.
- Grasp the battery and pull up gently until the battery exits from its holder.
- Replace the battery with a new. Warning: be sure to respect the polarity when inserting the battery.



23. INSPECTION, MAINTENANCE AND CLEANING

23.1. REPLACEMENT OF FILTERS

The Pro-Reg control incorporates a function of supervision of the filters clogging.

When the filter replacement is required, the display shows an alarm message.

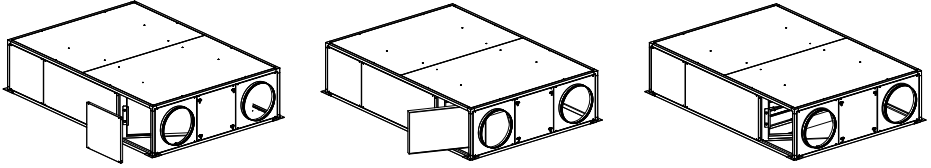
The registers ubication for filters maintenance depends on the model and version. The exact ubication of the filters is identified by a label in the profile that indicates the type of filter and its characteristics.



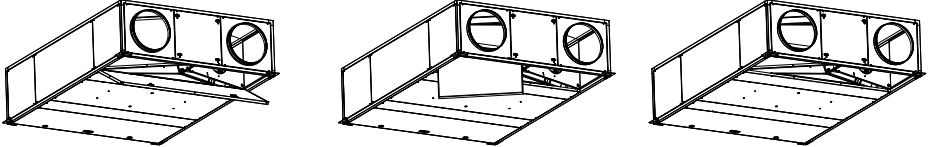
FALLING OBJECTS

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):

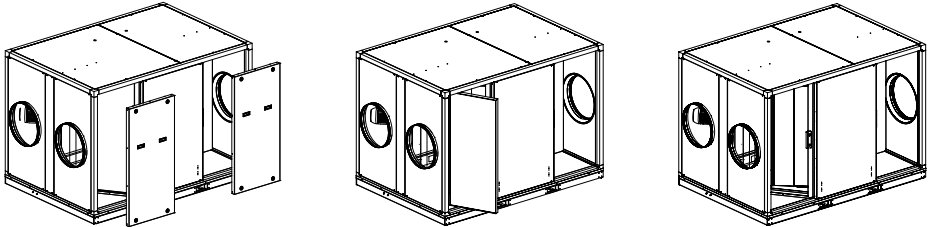


Quick access to filters from the lateral panels.

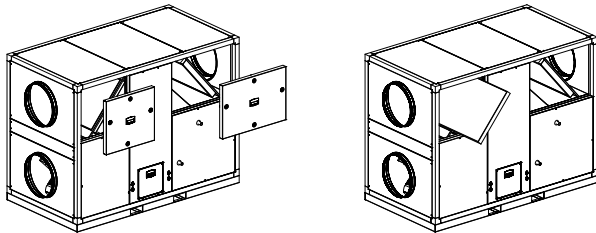


Quick access to filters from the bottom panels.

- **Horizontal configurations of CADB/T-HE 45 and 60.** The access to filters can be done by the side panels:



- **Vertical configurations of CADB/T-HE 04 to 60.** 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

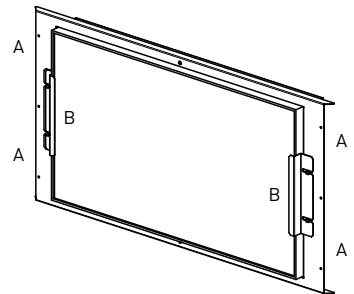
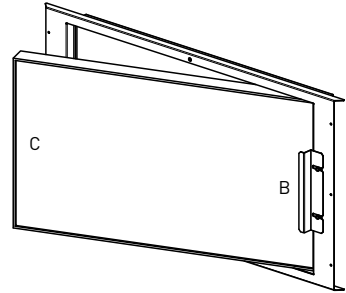
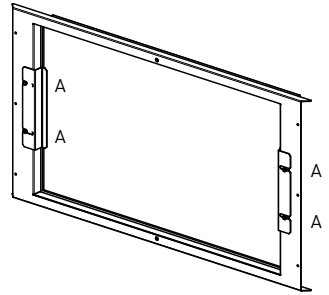
Heat recovery model	Ø (mm)	AFR-HE (Accessory filters and spare part for CADB/T-HE)			
		AFR-HE G4	AFR-HE M5	AFR-HE F7	AFR-HE F9
CADB-HE D/DI/DC 04	200	AFR-HE 200/04 G4	AFR-HE 200/04 M5	AFR-HE 200/04 F7	AFR-HE 200/04 F9
CADB-HE D/DI/DC 08	250	AFR-HE 250/08 G4	AFR-HE 250/08 M5	AFR-HE 250/08 F7	AFR-HE 250/08 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 21/27	400	AFR-HE 400/21-27 G4	AFR-HE 400/21-27 M5	AFR-HE 400/21-27 F7	AFR-HE 400/21-27 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
CADT-HE-D/DI/DC 45	600x400	AFR-HE 450/45 G4	AFR-HE 450/45 M5	AFR-HE 450/45 F7	AFR-HE 450/45 F9
CADT-HE-D/DI/DC 60	700x500	AFR-HE 500/60 G4	AFR-HE 500/60 M5	AFR-HE 500/60 F7	AFR-HE 500/60 F9

23.2. 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].

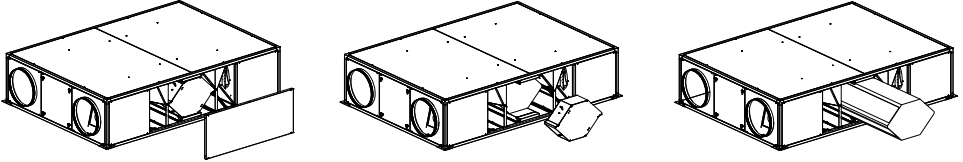


23.3. HEAT EXCHANGER

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

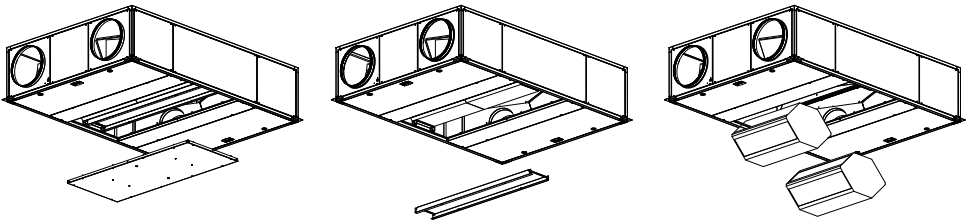


Models 04 to 33: Access to heat exchanger cleaning from lateral panels and from the bottom panels.

Need for disassembly of the heat exchanger.

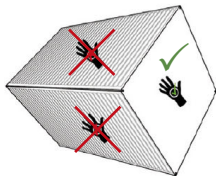
Alternatively, it is possible to disassemble the heat exchanger from the bottom panels. However, it is necessary to perform a major number of operations to proceed.

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.

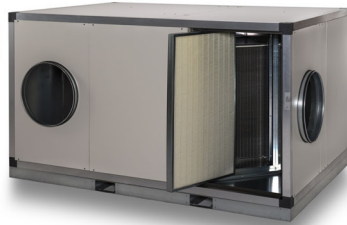
Horizontal models CADB/T-HE 45 and 60

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

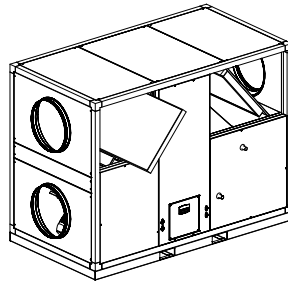
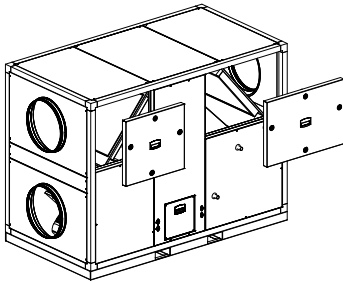


Loose the screws that fix the filter and after released, remove it. Clean the heat exchanger with blowing with compressed air

Vertical models CADB/T-HE 04 to 100

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.



23.4. 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 has been made in accordance with the "CONNECTIONS" section of this manual.

The siphon should always be full of water. Check its level periodically, refilling it if necessary. An empty siphon can cause the condensate tray to overflow and water leak through the equipment enclosure.

24. OPERATION ANOMALIES

24.1. GENERAL ANOMALIES

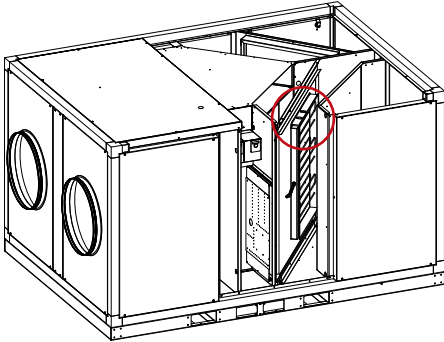
Anomaly	Cause	Solution
Difficult to start.	Reduced power supply voltage. Insufficient static torque of motor.	Check motor specification plate. Close the air inlets to reach the maximum speed. Change the motor if necessary. Contact the S&P Post-Sales service.
Insufficient airflow. Insufficient pressure.	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 -5°C or less. Models (CADB/T-HE DI): Thermal protectors Support resistances open.	Insertion of pre-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 -5°C .	Insertion of post-heating devices (anti-ice). Contact the S&P Customer Advice service.
Air pulsation.	Fan working in flow conditions almost 0. 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 dimensioned.	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 instructions 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.

Access to thermal protectors (DI versions)

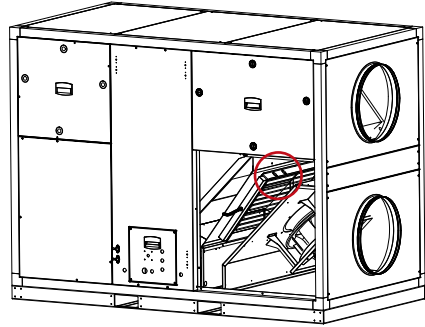
Units with internal electric batteries have a thermal protectors with automatic and manual reset. Before rearm the thermal protectors manual reset, ensure that the problem that causes its actuation has been solved.

Thermal protectors position

Horizontal models:



Vertical models:



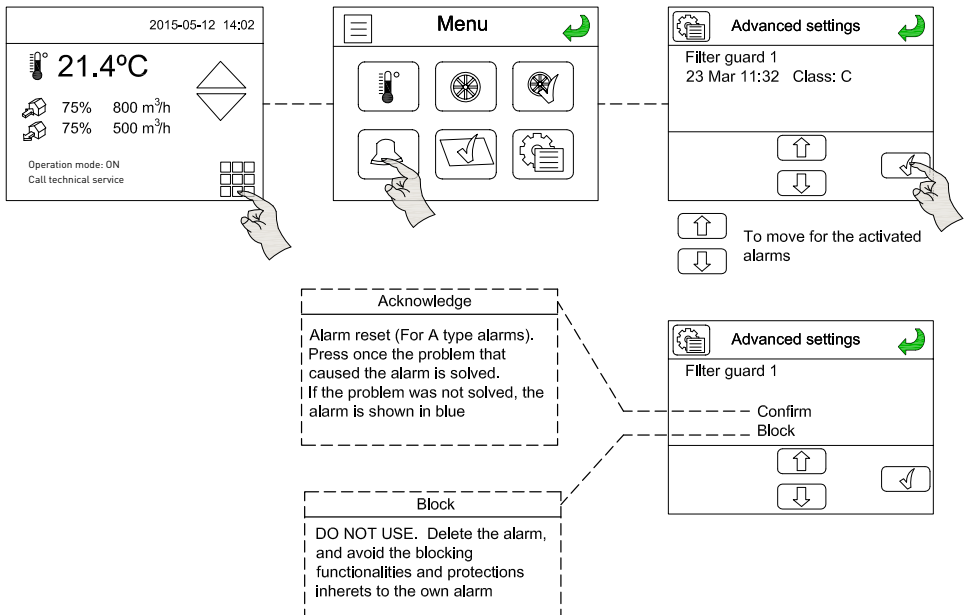
Danger of burns, there is a risk that the metal parts are at a high temperature.

24.2. FAILURE LIST

In case an alarm or a failure occurs, a "Maintenance To Do" message appears in red on the main screen. The alarm can then be consulted in the advanced menu. The error is then clearly identified on the screen. The list of error messages is given in the following subsection.

Alarms type A: they have to be acknowledged once the error has been solved to return to normal working. Alarms type C: once the error has disappear they turns automatically off (not needed to acknowledge).

Sequence to check the alarms:

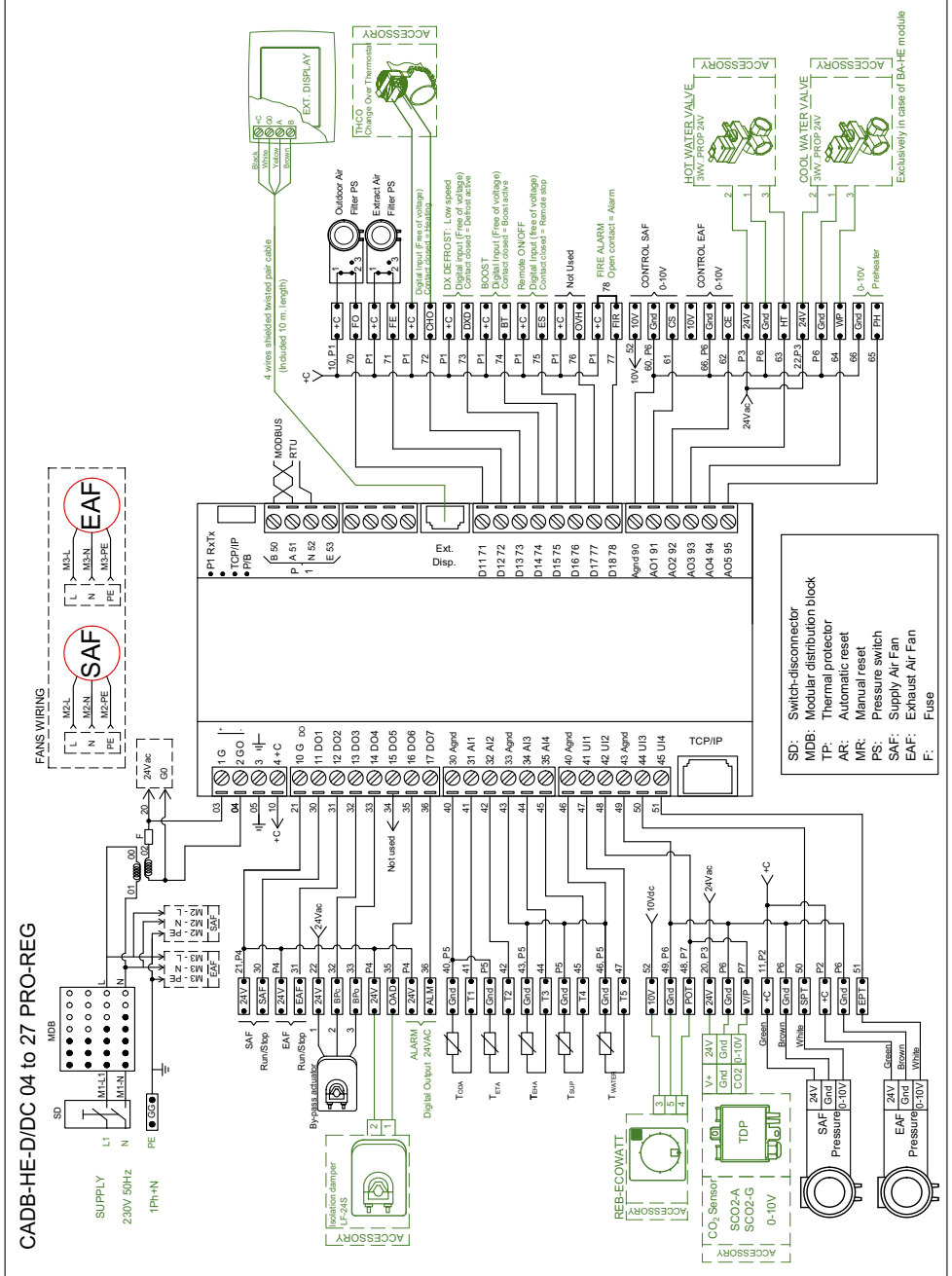


The following table shows the mode to proceed to detect and resolve any incidents shown:

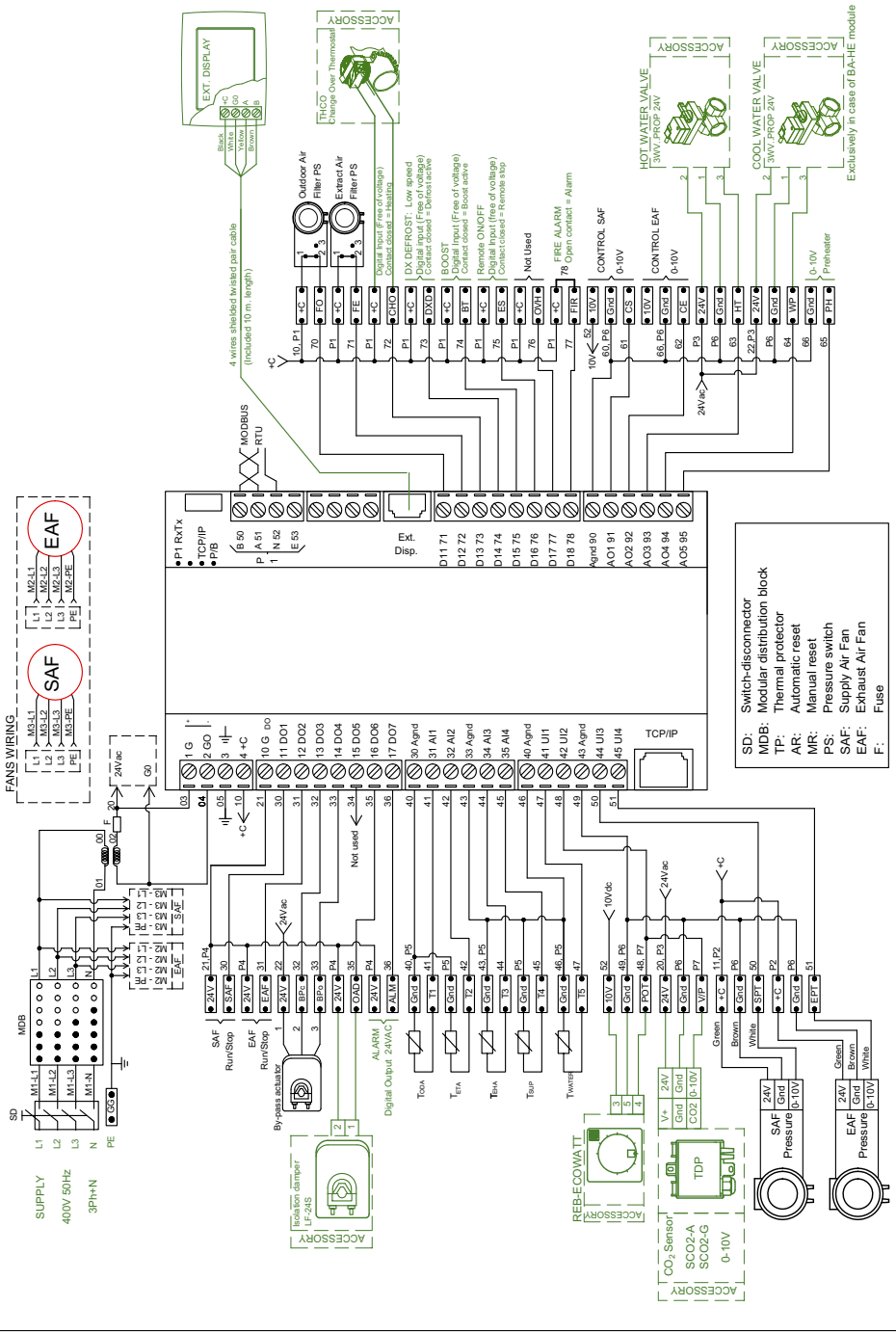
Alarm number	Alarm text	Description	Type
1	Run Error Supply Air Fan	Malfunction of supply air fan	A
2	Run Error Extract Air Fan	Malfunction of extract air fan	A
6	Change ODA Filter	Outdoor Air Filter needs replacement	C
11	Remote off active	Remote On/Off active	C
23	Electric heating is overheated	Electric Heater Thermal protectors activated	A
24	Frost risk	Frost protection function is overriding the control of the water heater output	C
25	Water temp too low, system off	Water temperature below frost limit value (<7°C)	C
27	Sensor error outdoor temp.	Malfunction of outdoor air temperature sensor	A
28	Exchanger frost risk	Exchanger deicing activated	C
41	Manual heater control	The electric heater is in manual mode	C
42	Manual heater control	The resistance is in manual mode	C
48	Internal battery error	The electric heater is in manual mode	A
49	Sensor error Supply Air temp	Malfunction of supply air temperature sensor	A
50	Sensor error Extract Air temp	Malfunction of extraction air temperature sensor	A
55	Sensor error SAF pressure	Malfunction of supply air pressure sensor	A
56	Sensor error EAF pressure	Malfunction of exhaust air pressure sensor	A
57	Sensor error Exhaust air temp	Malfunction of exhaust air temperature sensor	A
58	Sensor error Frost Protection temp	Malfunction of water temperature sensor	A
90	Change ETA Filter	Extraction Air Filter needs replacement	C

25. WIRING DIAGRAMS

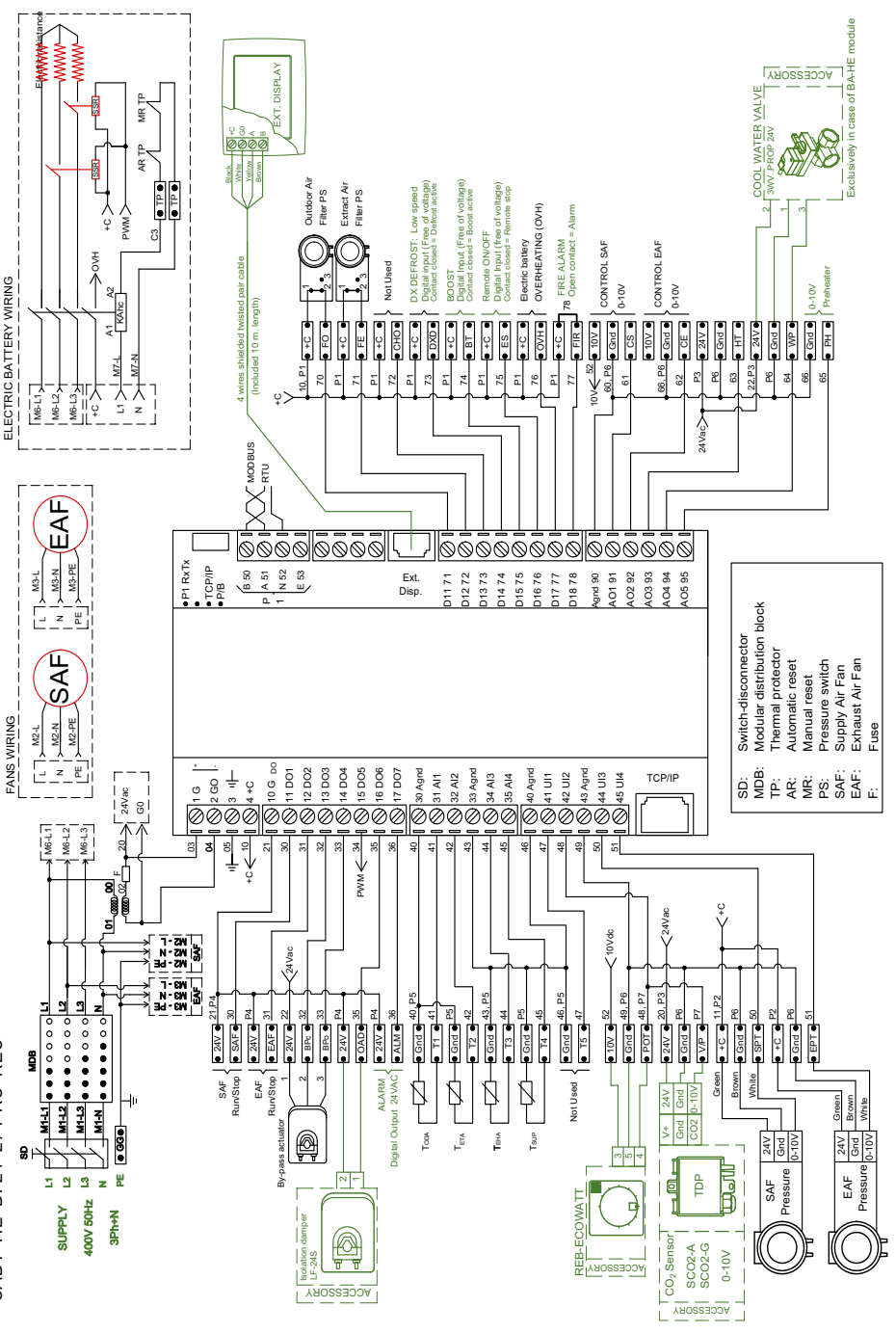
25.1. MAIN UNIT



CADT-HE-D/DC 33 to 100 PRO-REG



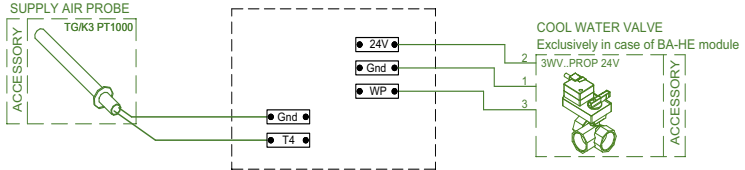
CADT-HE-DI 21-27 PRO-REG



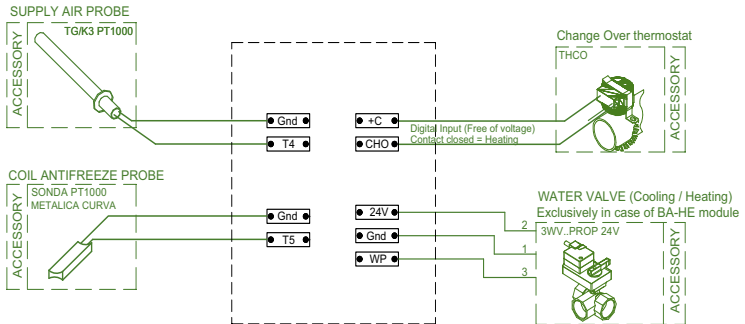
25.2. REWIRING TO MANAGE EXTERNAL MODULES (Accessories)

CADB-HE-D 04 - 100 PRO-REG

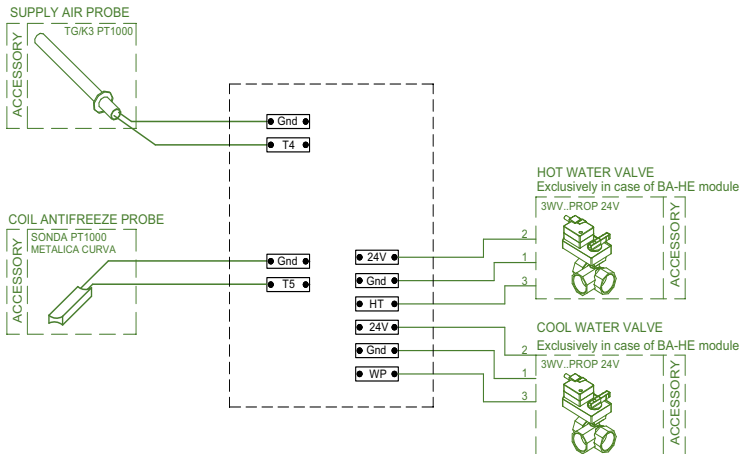
Required rewired for the control of coil module BA-AF HE accessory (Only cooling)



Required rewired for the control of coil module BA-AF HE accessory (Cooling and Heating)

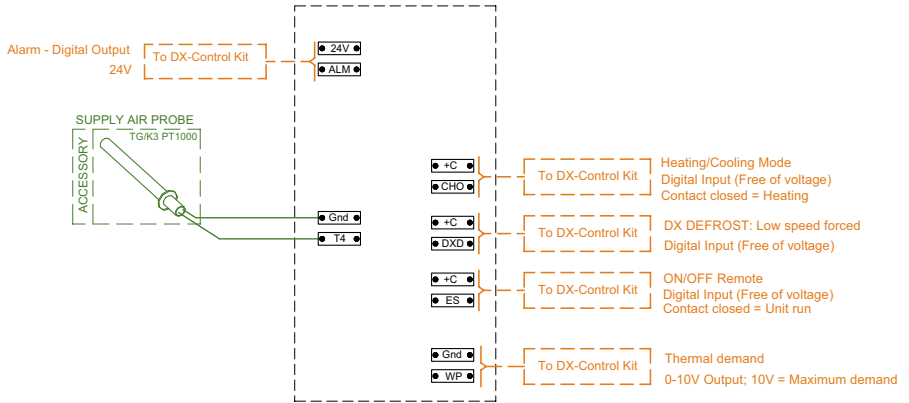


Required rewired for the control of coil module BA-AFC HE accessory (Cooling and Heating. 4 pipes)

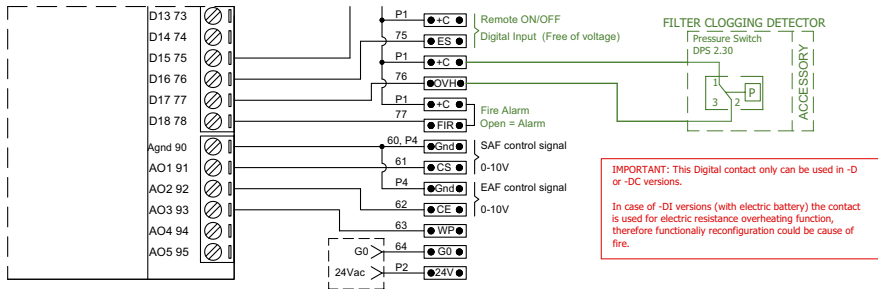


CADB-HE-D 04 - 100 PRO-REG

Required for the control of coil module BA-DX HE accessory (Direct expansion coil)



Required for the control of filter module FB CA HE / FBL-HE accessory





S&P SISTEMAS DE VENTILACIÓN, S.L.U.

C. Llevant, 4
Polígono Industrial Llevant
08150 Pareds del Vallès
Barcelona - España

Tel. +34 93 571 93 00
www.solerpalau.com



Ref. 9023121700