



CAD-COMPACT BASIC





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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.



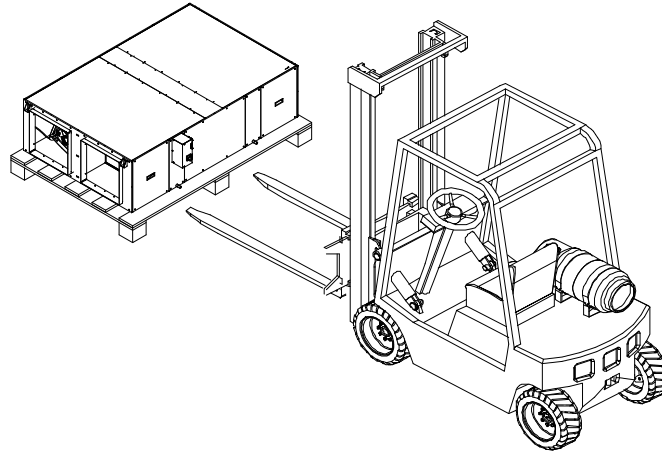
Danger signs



Prohibition signs

5. HANDLING

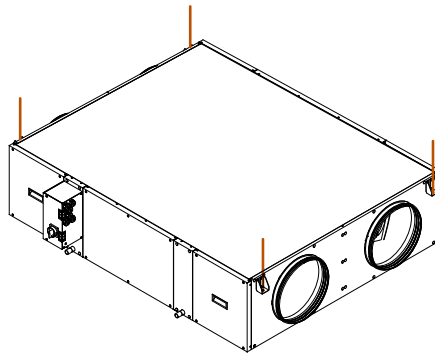
The CAD-COMPACT BASIC units are delivered fixed with screws to the pallets. The handling machines will be adapted to the load and the lifting conditions. In all cases, the lifting will be done at the device's base. The centre of gravity is located at the centre of the unit. The device must be carefully manipulated only in the horizontal position.



6. INSTALLATION

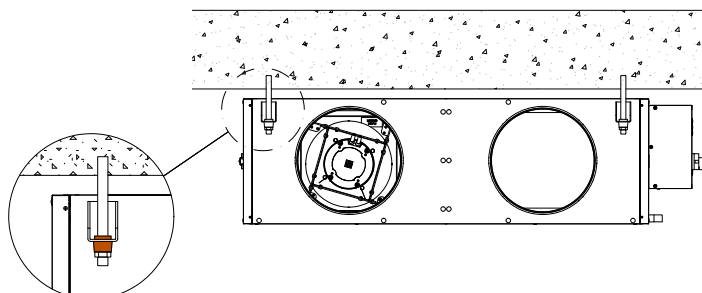
6.1. INTRODUCTION

All models are designed to be installed hanging from the ceiling or located behind a false ceiling. When installing the unit, it is necessary to distribute the unit weight between the 4 supports existing in the units. Using studded rods ($\varnothing 8$ mm), it can be secured to the ceiling and levelled:



Check the distances between supports in the diagrams of the section: "Dimensions and free dimensions for maintenance".

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



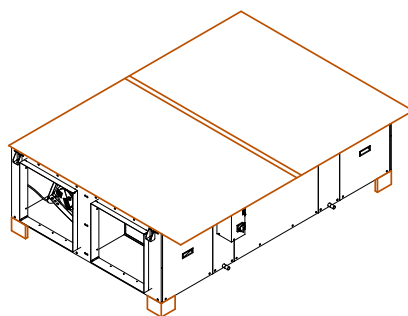
Model	Total weight of unit (kg)	Anti vibration kit support (Composed of 4 pcs.)
CAD-COMPACT 500	70	KIT AM CAD-COMPACT
CAD-COMPACT 900	86	KIT AM CAD-COMPACT
CAD-COMPACT 1300	137	KIT AM CAD-COMPACT
CAD-COMPACT 1800	145	KIT AM CAD-COMPACT
CAD-COMPACT 2500	235	KIT AM CAD-COMPACT
CAD-COMPACT 3200	235	KIT AM CAD-COMPACT
CAD-COMPACT 4500	336	KIT AM CAD-COMPACT

6.1.1. Outdoor installation

The CAD-COMPACT BASIC range is advisable to be mounted indoors. Outdoor mounting is limited to areas with less extreme climates. 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 (accessory). 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.

There is a Kit composed of 4 feet, which facilitates the installation on floor of these versions: KIT PIES CAD-COMPACT.

Both in the case that the KIT PIES CAD-COMPACT is used, and if the unit is based on vibrators or supports made on site, it is essential that the heat exchanger's support is guaranteed on 4 existing support points (4 pcs. in the corners of the unit).



Detail of a CAD-COMPACT with the corresponding canopy and the kit of feet

List of necessary accessories recommended for outdoor installation:

Model	Pies soporte	Tejadillo
CAD-COMPACT 500	KIT PIES CAD-COMPACT	TPP-CAD-COMPACT 500
CAD-COMPACT 900	KIT PIES CAD-COMPACT	TPP-CAD-COMPACT 900
CAD-COMPACT 1300	KIT PIES CAD-COMPACT	TPP-CAD-COMPACT 1300
CAD-COMPACT 1800	KIT PIES CAD-COMPACT	TPP-CAD-COMPACT 1800
CAD-COMPACT 2500	KIT PIES CAD-COMPACT	TPP-CAD-COMPACT 2500
CAD-COMPACT 3200	KIT PIES CAD-COMPACT	TPP-CAD-COMPACT 3200
CAD-COMPACT 4500	KIT PIES CAD-COMPACT	TPP-CAD-COMPACT 4500

In addition to the roof and Kit feet, it is necessary to equip the duct network with rain hoods or air intakes equipped with anti-bird mesh to prevent the entry of animals or objects into the heat recovery unit.

Avoid condensations in electrical cabinet

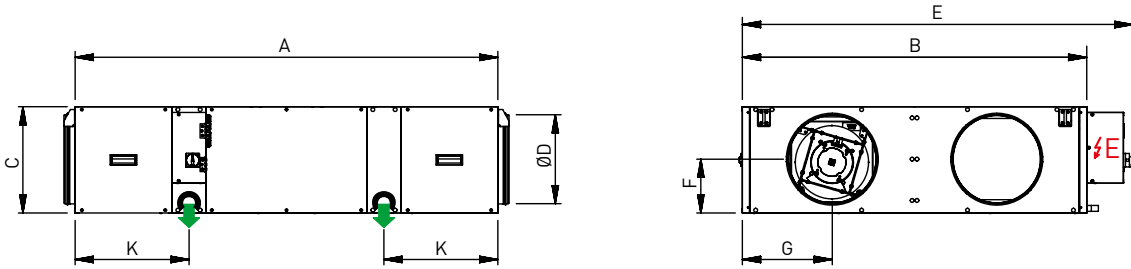
In units located outdoors in which the heat recovery units is stopped during the night or during long intervals of time, it is necessary to:

- Install isolation dampers in the outdoor air inlet and air discharge.
- Add anticondensation devices inside the electrical cabinet as: cabinet heating elements that prevent condensation formation on cabinet surfaces and electronic components. As alternative, maintain the electronic under voltage, this way the own heating produced by the electronic will avoid the condensation formation.

6.2. DIMENSIONS AND FREE SPACE FOR MAINTENANCE

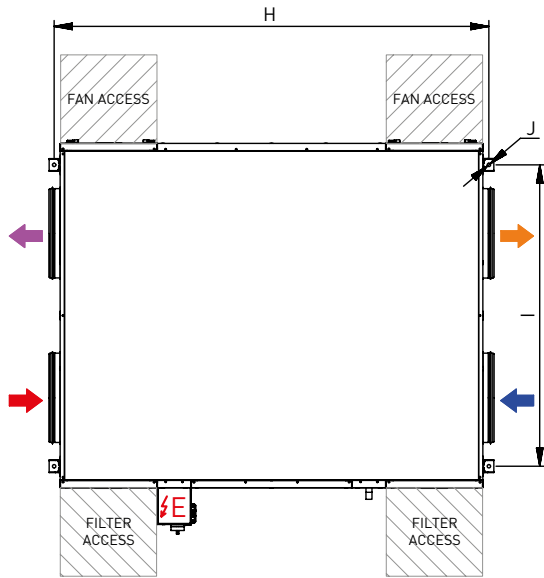
6.2.1. Dimensions

a) CAD-COMPACT 500 to 1800 models

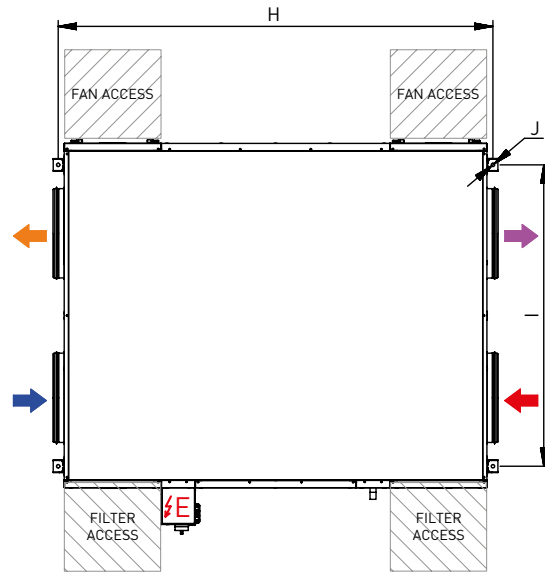


TOP VIEW

BY DEFAULT (FACTORY SUPPLY)



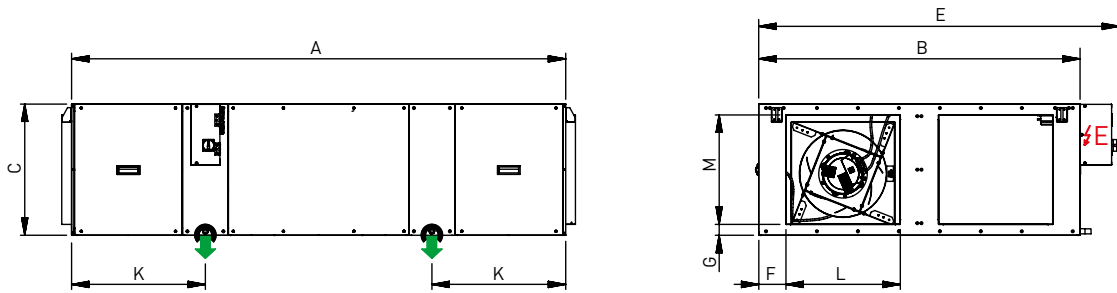
CONFIGURATION RESULT OF SIMPLE MODIFICATION ON SITE



- ELECTRICAL CABINET
- OUTDOOR AIR INTAKE
- SUPPLY FRESH AIR
- EXTRACT INDOOR AIR
- EXHAUST INDOOR AIR
- CONDENSATE OUTLET 1/2"

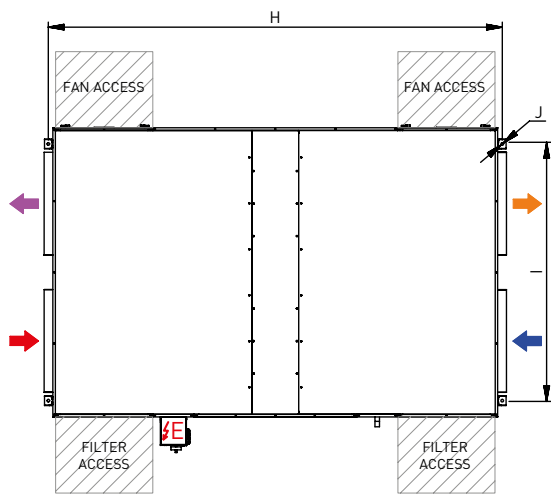
Model	A	B	C	D	E	F	G	H	I	J	K
CAD-COMPACT 500	1120	698	289	200	862	147	188	1163	546	12	256
CAD-COMPACT 900	1345	843	376	315	1007	190	225	1388	691	12	328
CAD-COMPACT 1300	1495	1218	376	315	1382	190	318	1538	1066	12	403
CAD-COMPACT 1800	1580	1083	453	355	1247	228	285	1623	931	12	393

b) CAD-COMPACT 2500 to 4500 models

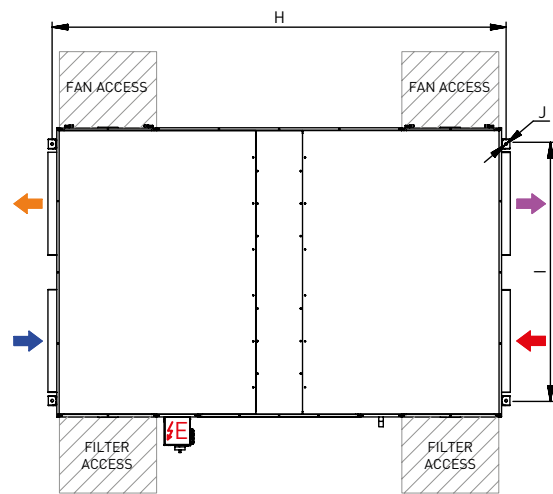


TOP VIEW

BY DEFAULT (FACTORY SUPPLY)



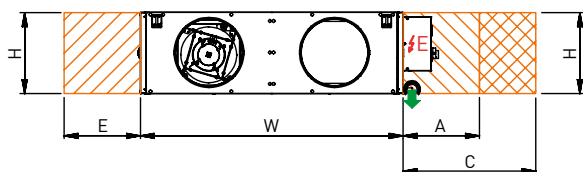
CONFIGURATION RESULT OF SIMPLE MODIFICATION ON SITE



- ELECTRICAL CABINET
- OUTDOOR AIR INTAKE
- SUPPLY FRESH AIR
- EXTRACT INDOOR AIR
- EXHAUST INDOOR AIR
- CONDENSATE OUTLET 1/2"

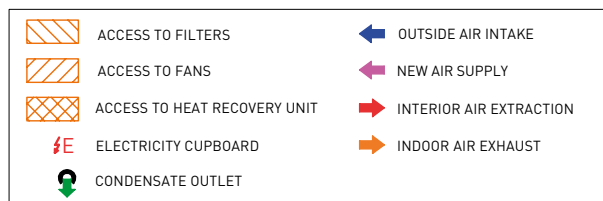
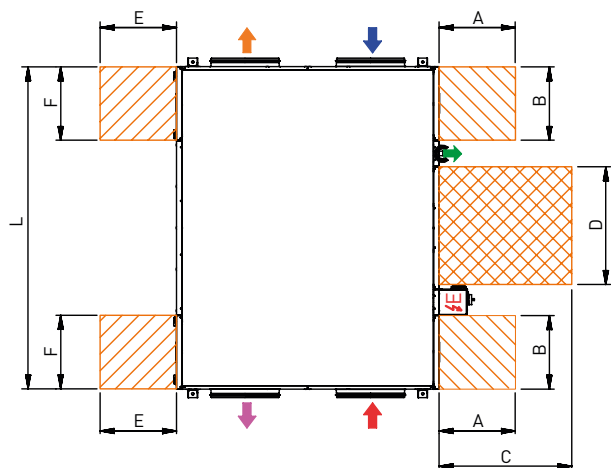
Model	A	B	C	D	E	F	G	H	I	J	K	L	M
CAD-COMPACT 2500	1845	1495	453	-	1670	127	41	1888	1343	17	385	570	375
CAD-COMPACT 3200	2038	1325	541	-	1489	113	43	2081	1176	12	552	470	450
CAD-COMPACT 4500	2207	1993	598	-	2156	165	79	2250	1844	12	594	700	440

6.2.2. Free space for maintenance



TOP VIEW

BY DEFAULT (FACTORY SUPPLY)



TOP VIEW

CONFIGURATION RESULT OF SIMPLE MODIFICATION ON SITE

Model	Unit			Filters			Heat exchanger			Fans		
	L	W	H	H	A	B	H	C	D	H	E	F
CAD-COMPACT 500	1120	698	289	289	295	300	289	500* / 550**	487	289	500	300
CAD-COMPACT 900	1345	843	376	376	365	300	376	500* / 680**	570	376	500	300
CAD-COMPACT 1300	1495	1218	376	376	555	350	376	500* / 1020**	570	376	580	350
CAD-COMPACT 1800	1580	1083	453	453	490	350	453	500* / 820**	650	453	500	350
CAD-COMPACT 2500	1845	1495	453	453	360	350	453	500* / 650**	650	453	550	350
CAD-COMPACT 3200	2038	1325	541	541	280	300	541	500* / 550**	745	541	550	300
CAD-COMPACT 4500	2207	1993	598	598	440	450	598	500* / 820**	800	598	800	450

* On-site inspection or cleaning (recommended)

** Exchanger disassembly dimension (not recommended)

6.3. MOUNTING PROCESS OF AN ADDITIONAL SUPPLY FILTER

The heat recovery unit is supplied with the filters already installed. F7 (ePM1 70%) in the supply air and M5 (ePM10 50%) in the extract air. In addition, it is possible to mount a second filter in the unit (accessory) (for more information see section "Replacing filters").

6.4. RANGE SPECIFICATIONS

Model	Diameter connections air (mm)	Nominal airflow 150Pa** (m ³ /h)	Efficiency heat recovery unit* (%)	Electrical power supply	Maximum absorbed power** (kW)	Maximum current** (A)	Weight (kg)
CAD-COMPACT 500	200	440	82,2	1/230V, 50-60Hz	0,31	2,0	70
CAD-COMPACT 900	315	790	82,0	1/230V, 50-60Hz	0,45	3,2	91
CAD-COMPACT 1300	315	1.120	82,3	1/230V, 50-60Hz	0,88	4,0	120
CAD-COMPACT 1800	355	1.670	82,7	1/230V, 50-60Hz	1,02	4,2	150
CAD-COMPACT 2500	570x375	2.180	83,5	1/230V, 50-60Hz	0,92	3,9	200
CAD-COMPACT 3200	470x450	3.000	83,7	1/230V, 50-60Hz	2,00	8,7	235
CAD-COMPACT 4500	700x440	4.165	84,6	3/400V, 50-60Hz	2,76	4,2	336

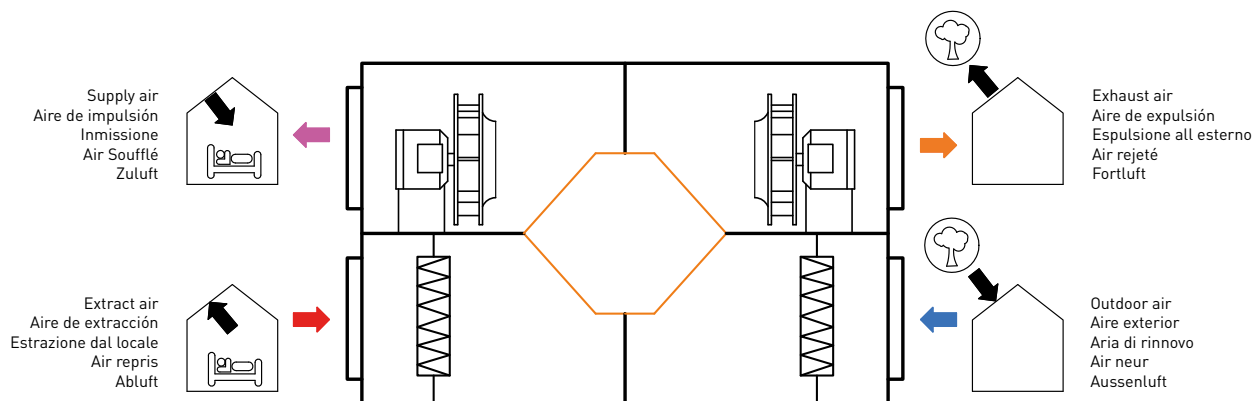
* Wet efficiency referred to nominal airflow, external conditions [-5°C 80% RH] and interior [20°C / 50% RH].

** Sum of both fans.

6.5. CONNECTIONS

6.5.1. Connection with air duct

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

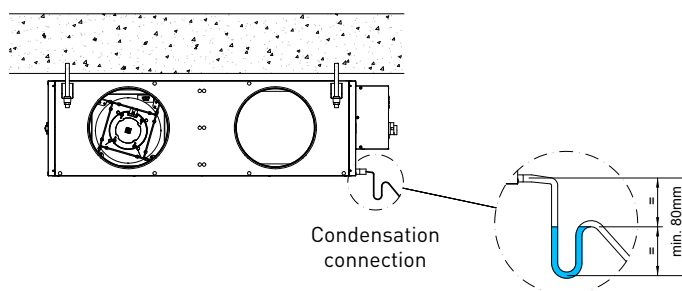


6.5.2. Condensate drainage

The units are supplied with 2 drains (one for each circuit). For added security it has to connect two drains to the drain pipe of the building. Drain tips are 1/2 "GM threaded.

Drainage system

- To ensure the removal of draining condensate from the tray, a siphon must be installed sized in the way that the distance between the water beam inside the siphon and the drain tray, will be higher than the static fan pressure.
- 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.

6.5.3. Electrical connection

In the recovery unit CAD-COMPACT BASIC range, all components integrated into the device, are supplied into the electrical panel (motors, pressure filters, fans temperature sensors and by-pass damper). The electrical connection is limited to the connection of control terminal (10 m. of cable are supplied) and possible electrical accessories such as CO₂ sensors and finally the connection of the power supply line directly on the cut-off switch located on the cover of the electrical cabinet.

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

It is recommended to reduce the wiring lengths of the control maneuvers in order to reduce possible effects of the environment on the control signals.

To avoid interference that may affect the operation of the unit, it is recommended that the wiring be routed away from other electrical power lines, motors, refrigeration compressors, frequency inverters or the like.

This equipment complies with the Electromagnetic Compatibility Regulations that are applicable to them.

The use of shielded cables is recommended, although in environments with a high level of electromagnetic disturbances, it may become necessary to shield the wiring using a metal tube.

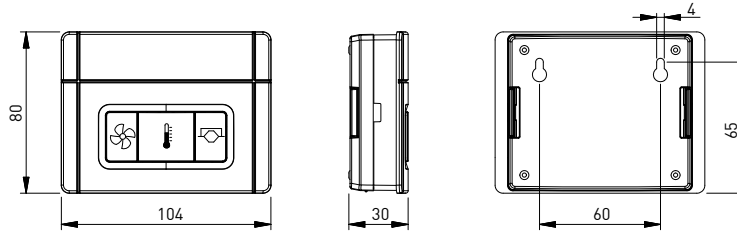
6.5.3.1. External Touch Display (ETD) control connection

The remote control is supplied with a 10 meter length cable, and it can be replaced by a cable up to 30 meters (recommended control cable type. H05VV-F-4G 0.25).

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

Once the parameter setting is done, the remote control can be disconnected.

Dimensions of the remote control:



The integration in Modbus networks and the use of the remote controller are not compatible.

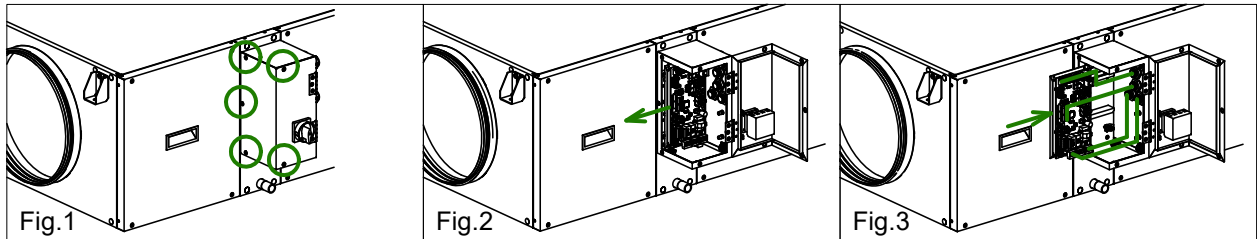
The wiring of the RS-485 net is connected at the same terminals used for the remote hand terminal plug.

6.5.4. Connecting electrical accessories

With the existing accessories is possible to perform the fans control as well as the automatic control in VAV (variable airflow) and COP (constant pressure) modes. This last is only possible when the unit is controlled via Modbus from a BMS (Not available from the remote control).

To access the electrical terminal block and conveniently make the electrical connection of the accessories it is advisable to remove the connection board, follow the following sequence:

1. Loosen the 5 screws that are distributed by the cover of the electrical cabinet (Fig. 1)
2. Open the cover and pull the metal plate on which the electrical terminals are located until it is outside the cabinet (Fig. 2).
3. The electrical cabinet has a PG connector for the electrical power cable. Further of this, in a bag that is supplied inside the unit, there are 3 more connectors that can be used to route the control wiring to the control accessories or the control panel of the building. Pass the necessary wiring through the connectors.
4. Make the electrical connection to the control board and put it back inside the electrical cabinet, making it slide through the existing guides (Fig. 3).



Recommended accessories for fan speed regulation

Model	VAV for CO ₂		COP Only available via Modbus
	Ambient	Duct	
CAD-COMPACT 500 to 3200	SC02-A 0/10V	SC02-G 0/10V	TDP-D

6.5.4.1. VAV Control (variable airflow), with CO₂ sensor or similar

CAD-COMPACT BASIC units are equipped with EC motors. The motors have specific terminals to receive a regulation signal to control fan speed (0-10V). The 0V signal corresponds to the fan stop, while the signal of 10V corresponds to fan maximum speed.

To perform the speed regulation in VAV with speed control from an external CO₂ sensor or similar, it is only necessary to have a sensor with 0-10V output signal (air quality, relative humidity, etc.) and connect it to the electrical panel as indicated in the instruction manual.

6.5.4.2. CCOP Control (constant pressure)

This mode is only available when the unit is controlled via Modbus from a BMS

Constant Pressure (COP)

This type of regulation is associated to multi-zone ventilation systems in which ventilation multi-room is carried out by a single heat recovery unit. Flow regulation per zone is done using motorized dampers, so speed regulation of the fans aims to maintain a constant pressure in the ductwork. The value of this pressure must be deter-

mined experimentally during the system start-up process.

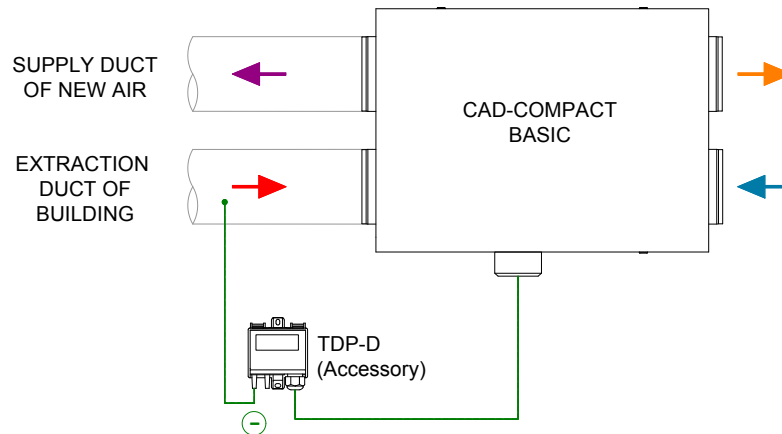
CAD-COMPACT BASIC units are equipped with EC motors. The motors have specific terminals to receive a regulation signal to control fan speed (0-10V).

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

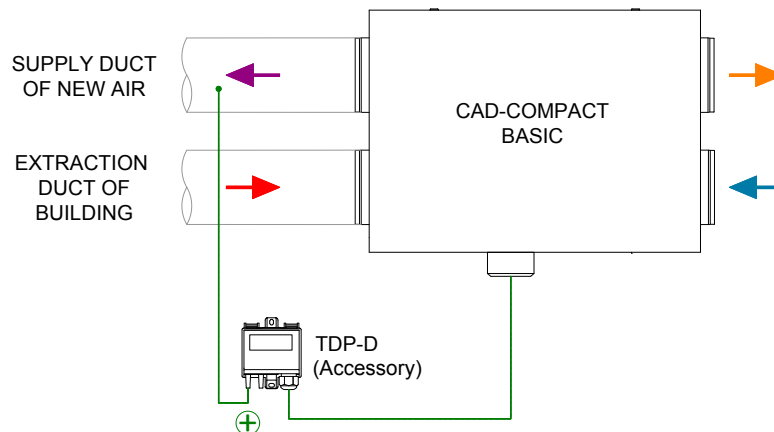
To perform speed regulation in constant pressure mode, it is only necessary to have a pressure transmitter with a 0-2000ppm full scale and 0-10V output signal and connect it to the electrical panel as indicated in the electric diagrams. Carry out the integration of the pressure transmitters in the ductwork, as indicated in the following images:

1° Connect the pressure transmitter TDP-D (accessory) to the duct system where the heat recovery unit is ducted:

Position of the pressure taps of the TDP-D transmitter in COP systems with control of the extraction pressure

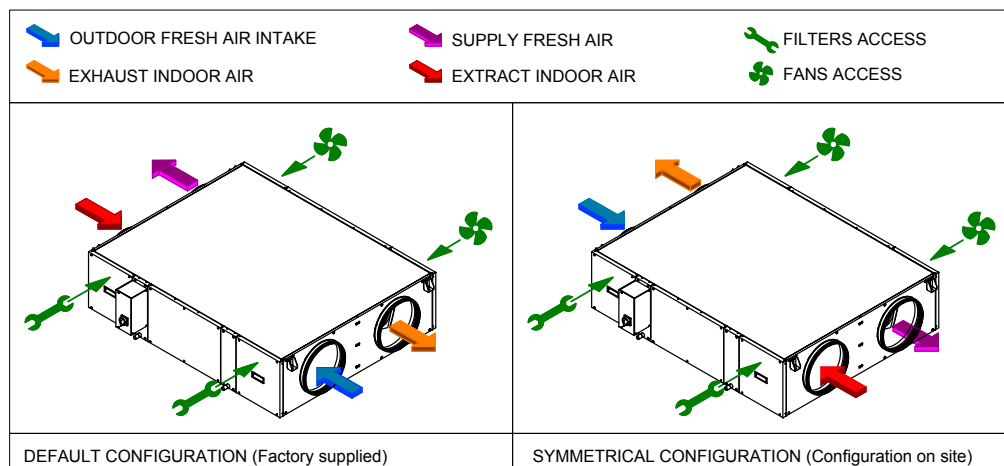


Position of the pressure taps of the TDP-D transmitter in COP systems with control of the supply pressure



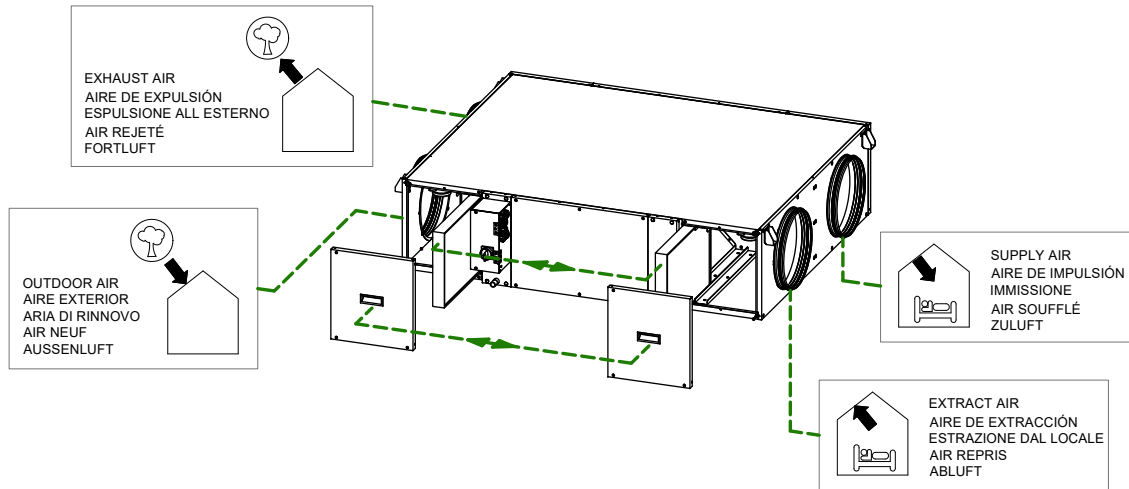
6.6. REVERSE OUTDOOR AIR / INDOOR AIR SIDE

In all units it is possible to exchange the supply and extract air sides (Supply side per Extract side):

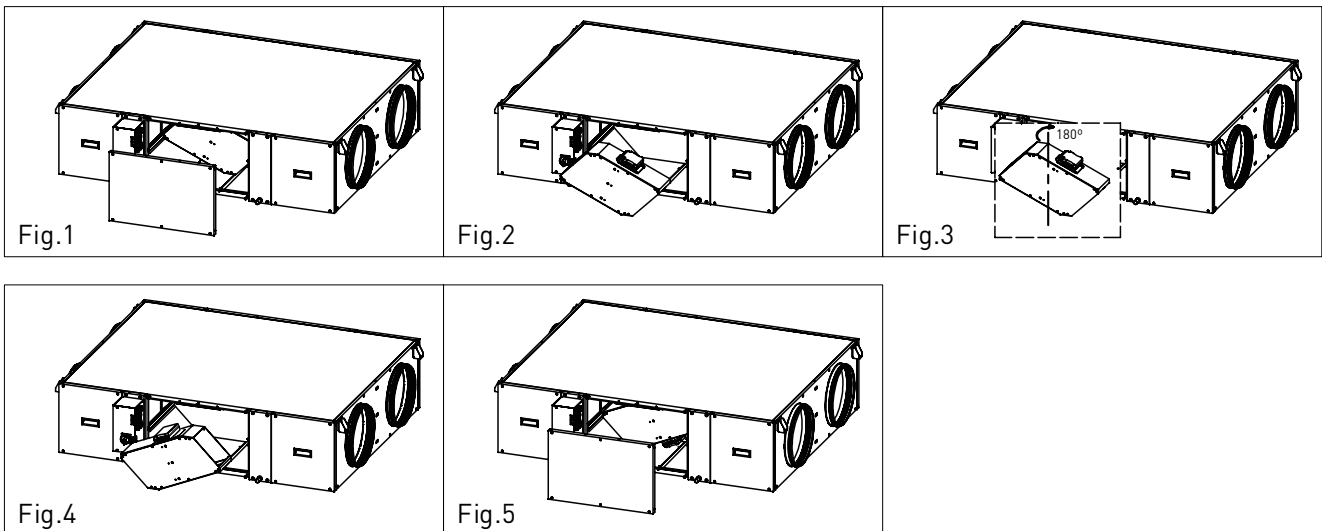


To carry on this modification it is necessary to make the following modifications to the unit:

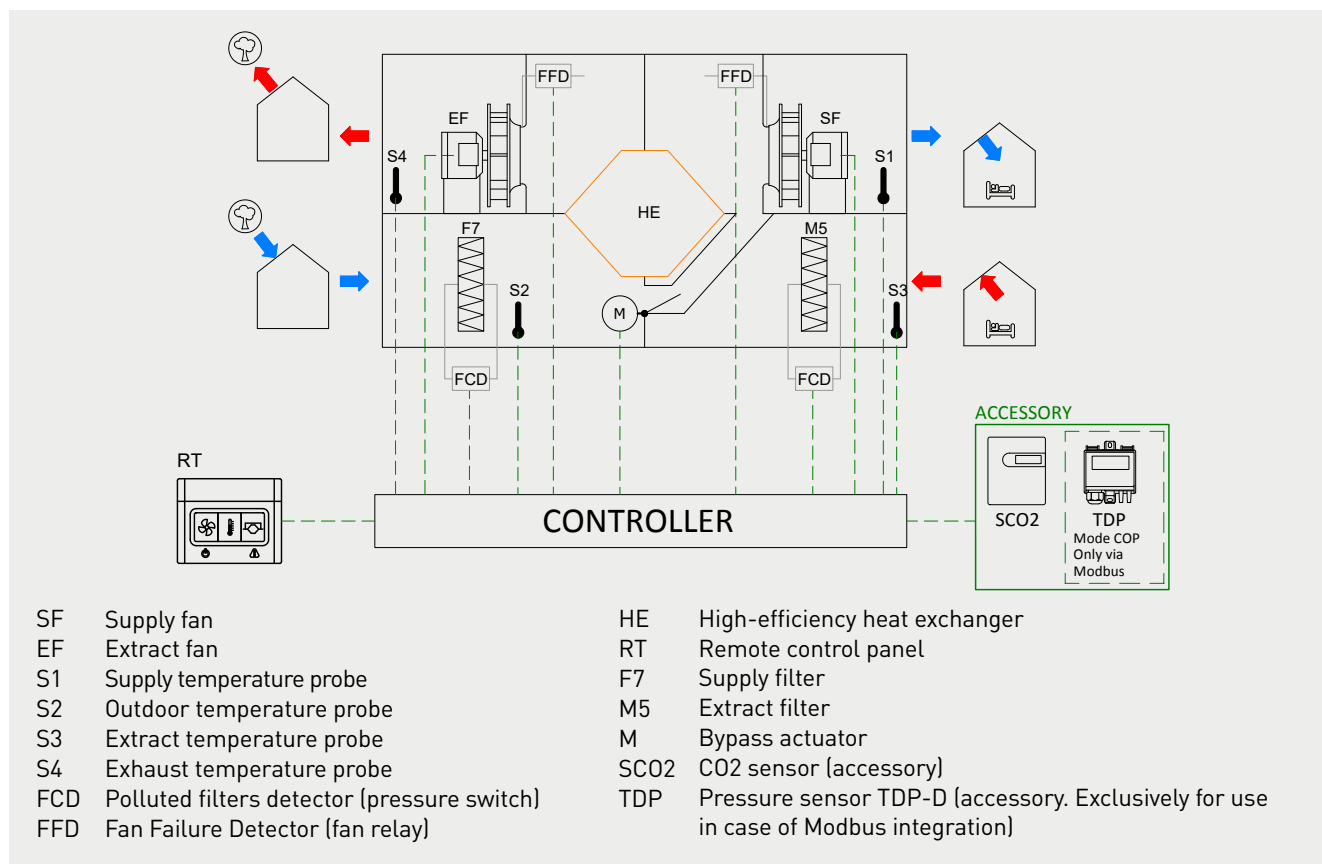
1. Exchange the supply and extract filters as well as the access covers to the filters.
2. Replace the labels that identify the function of the air inlet/outlet. To do this, a new set of labels is supplied with the unit.



3. Modify the position of the Jumper JP6 on the PCB of the electrical panel. See point "8.4. Advanced parameters configuration" in page 16.
4. Only in cold climates where by-pass is used as part of the heat exchanger defrost strategy: Reverse the direction of the by-pass so that it remains at the supply side of the unit.
 1. Disconnect the power supply of the heat recovery unit.
 2. Remove the heat recovery unit panel (fig.1).
 3. Extract carefully the bypass (fig.2).
 4. Disconnect the electrical connector connected to the bypass.
 5. Turn the bypass according to image (fig.3 and 4).
 6. Connect again the electrical connector to the bypass.
 7. Place the bypass in its housing again (fig.5), close the panel and start up the unit.



7. CONTROL SCHEMES



8. CONTROL BASIC OPERATION

8.1. DESCRIPTION

The control BASIC is a Plug & Play control factory mounted and wired that allows the management and supervision of heat recovery units of the series CAD-COMPACT.

8.2. MAIN FUNCTIONS

The BASIC controller allows the management of the following functions:

8.2.1. Via the remote terminal supplied with the unit

FUNCTIONALITY
Manual fans speed adjustment
Automatic fans speed adjustment in VAV mode. Fans adjust their speed from the signal measured by an external sensor (CO ₂ , Relative humidity or Temperature)
Remote stop / start of the unit via external contact (Free of voltage)
BOOST function: Forced preset speed via external contact free of voltage
Bypass damper management
Heat exchanger anti-freezing protection
Alarm display in remote control
Control of polluted filters via pressure switches (included)
Control of fans status / failure
Inversion of the supply and extraction airflows (The supply fan becomes the extraction fan and viceversa)
Modbus RTU communication



8.2.2. Through integration to Modbus network (external BMS)

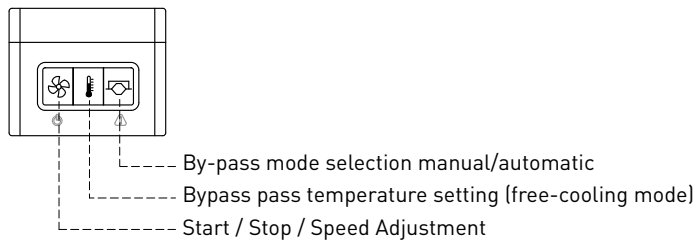
Integration into Modbus networks is incompatible with the use of the remote control. In addition to all functionality available through the remote control, through the map of modbus registers it is possible to obtain the following functionalities and information:

FUNCTIONALITY
Automatic fan speed adjustment in COP (Constant Pressure) mode. Fans vary their speed to maintain a constant pressure in the ductwork. It is necessary to install an external TDP-D sensor.
Visualization of functional parameters of the unit, including:
- Outdoor air temperature
- Supply temperature
- Indoor air temperature
- Exhaust air temperature
- Current fan speed
- Detailed information about alarms

8.3. USE OF REMOTE TERMINAL - USER LEVEL

Using the three buttons on the remote terminal, simple operation settings can be done, as well as obtain information on its operating status.

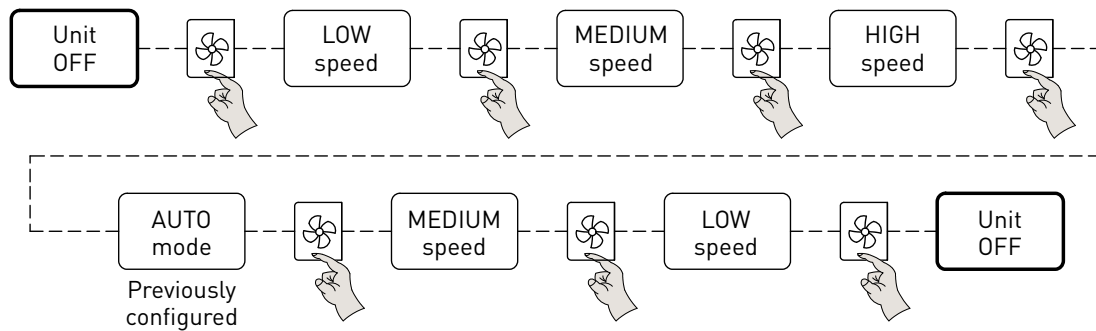
Function of the buttons:



8.3.1. Fan speed selection (Start / Stop / Speed adjustment)

Pressing the button both fans start running, the fans increase progressively its speed until reaching the LOW setpoint speed. Through successive pulsations it is possible to change the fans speed.

The control of this operation mode will be carried out by means of the button of speed selection, following the sequence:



The colour of the speed button lights up depending on the selected speed:

Speed	Default value* 0-10V signal	Led colour
LOW	3,5 V	Green
MEDIUM	6 V	Orange
HIGH	9,5 V	Red
AUTO	-	Flashing green

* The set speeds are modifiable (See chapter Control settings).

8.3.2. Free-cooling function setting

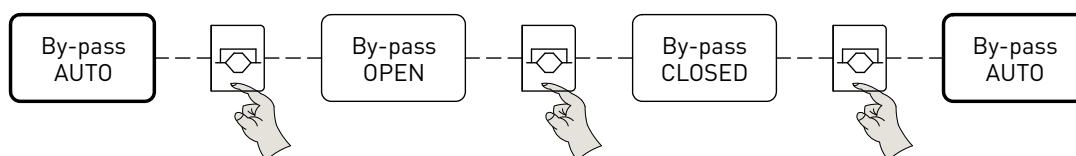
The heat recovery units of the CAD-COMPACT range are equipped with a by-pass damper that, when opened, allows outdoor air to be introduced in the building without being heated / cooled in the heat exchanger. (As this is a partial bypass a small percentage of air continues passing through the heat exchanger).

The BASIC controller manages the by-pass damper based on the temperatures measured by the 4 temperature probes in the unit.

The opening of the bypass occurs under the following conditions:

1. Forced manual opening from the remote controller
2. Free-cooling function, with the bypass being in Automatic mode and there is cooling demand:
 - Setpoint temperature < Supply air temperature
 - Outdoor temperature < Supply air temperature
 - Outdoor temperature > 12°C
3. Free-cooling function, with the bypass being in Automatic mode and there is heating demand:
 - Setpoint temperature > Supply air temperature
 - Outdoor temperature > Supply air temperature
 - Outdoor temperature < 30°C
4. Frost exchanger protection function. In winter conditions, when there is risk of freezing the condensates inside the heat exchanger, the bypass is opened as the last action of the defrost strategy. Previously, the fan speed is reduced until it reaches the minimum speed.

By pressing on the “bypass” button, the bypass status is modified, being selectable the following positions:



By-pass state	Led colour*
Manually opened	Green
Manually closed	Orange
Automatic mode	Off

* If there are active alarms, the free-cooling led will light up alternately showing both the status of the display and the number of the alarm. The bypass status will be displayed 3 seconds with the corresponding LED color (green or orange) and the corresponding sequence of each alarm.

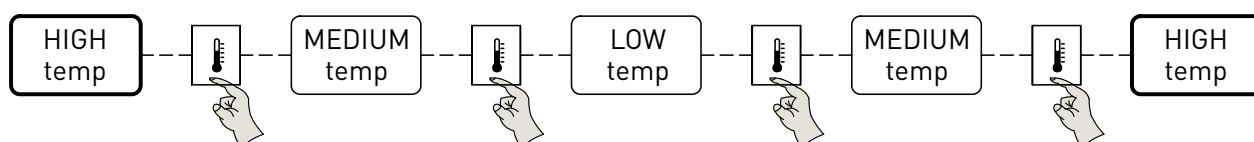
When the bypass is activated manually, it will always have priority over the automatic and will remain in the indicated state for 8 hours.

Operation in automatic mode

The free-cooling / free-heating mode is programmed with the following algorithm: The lower temperature limit of the T_{ODA} probe is a minimum of 12°C, below this temperature the bypass operation does not happens in order to avoid discomfort due to the entry of air excessively cold.

8.3.3. Setting the by-pass temperature in free-cooling mode

Pressing on the button modifies the setpoint temperature value of the by-pass. Below this temperature, whenever there is a demand for cooling in the building, the by-pass damper will be opened:



Temperature	Default value*	Led colour
High	25°C	Red
Medium	20°C	Orange
Low	15°C	Green

* The setpoint temperatures can be modified (See chapter Control settings).

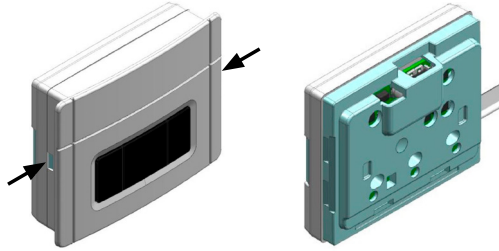


8.4. ADVANCED PARAMETERS CONFIGURATION

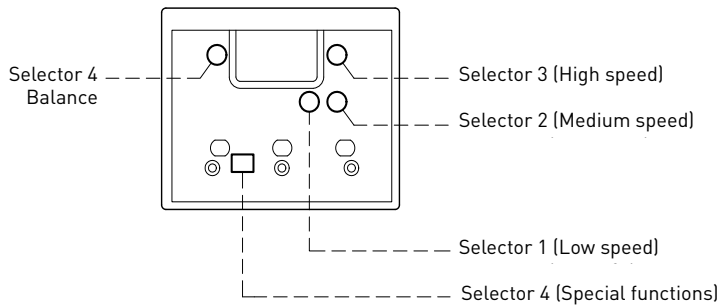
In addition to the functions that can be performed through the three buttons of the hand terminal, it is also possible to modify some of the parameters and functionalities set from factory. Depending on the parameter to be modified, it will be necessary to access the electronic board of the controller (inside the electrical cabinet) or the remote hand terminal.

Access to the selectors inside the remote hand terminal (rotary type)

By disassembling the front of the remote control it is able to access to a serie of potentiometers that allow to modify some of the factory settings. Using a screwdriver, perform a light pressure in the side slots until the front of the control is released.

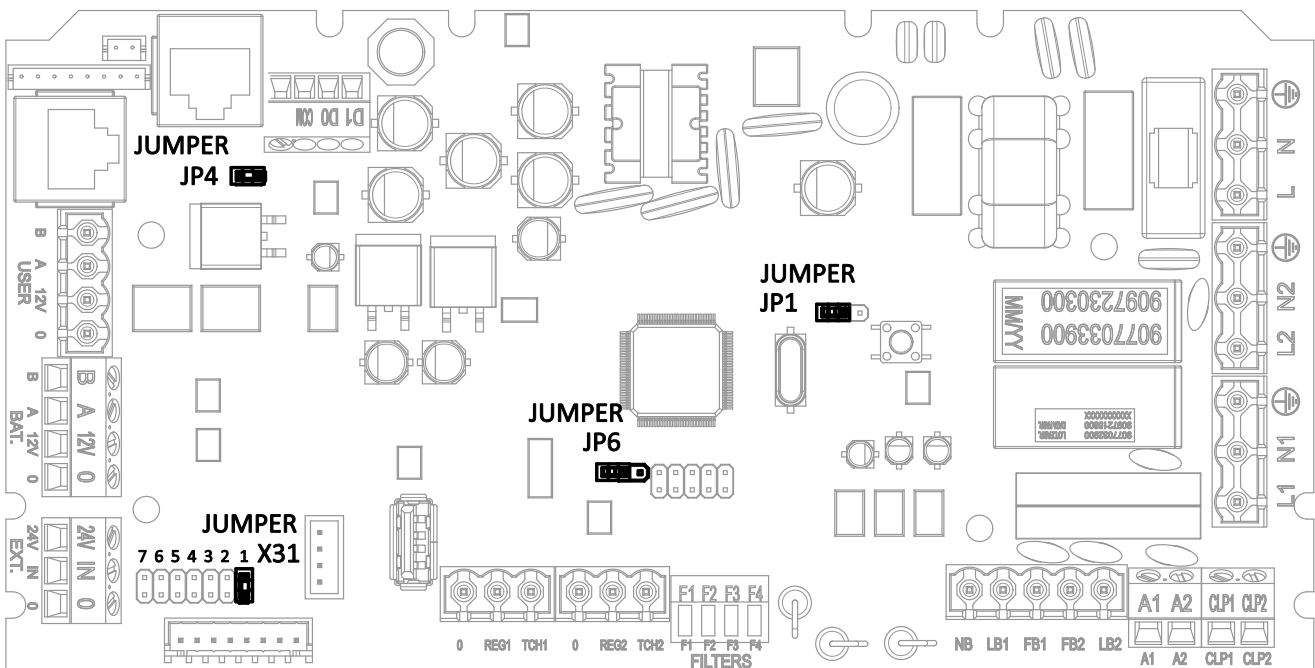


View of the rotary selectors, once the cover is removed:



Access to controller PCB selectors and jumpers

Inside the electrical cabinet is the PCB controller, which has some selectors and jumpers through which it is possible to change the factory settings of the controller:



Jumper	Functionality
JP1	Enable Modbus communication (Control of the unit from the BMS)
JP4	In Modbus networks, define last unit in the network (end of line)
JP6	Exchange of the supply and extraction airflows
X31	Origin of fan speed control (Command, external sensor, etc.)

Functionality of the selectors and jumpers on the controller board (inside the electrical cabinet).

8.4.1. Modification of predefined speeds

Low Speed (Selector 1): Setting of the supply fan low speed. Between 2,1 and 3,5V with increments of 0,2V for each position of the selector. Default setting 3.5V (Selector position F).

Medium Speed (Selector 2): Setting of supply fan medium speed. Between 3,5V and 6,5V with increments of 0,2V for each position of the selector. Default setting 6V (Selector position D).

High Speed (Selector 3): Setting of supply fan high speed. Between 6,5V and 9,5V with increments of 0,2V for each position of the selector. Default setting 9,5V (Selector position F).

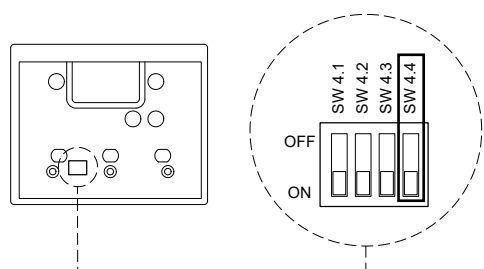
Balance (Selector 4): The predefined setpoints with selectors 1,2 and 3 will be directly those applied to the supply fan, while the extract fan may work with a certain unbalance regarding the supply fan. This unbalance is defined through the selector 4, as a percentage between -30% and 30% with increments of 5%. The unbalance values assigned to each position of the selector are the following ones:

Selector position	Selector 1 (Low speed) (Vdc)	Selector 2 (Medium speed) (Vdc)	Selector 3 (High speed) (Vdc)	Selector 4 (Balance)
0	2,1	3,5	6,5	-30 %
1	2,1	3,7	6,7	-25 %
2	2,1	3,9	6,9	-20 %
3	2,1	4,1	7,1	-15 %
4	2,1	4,3	7,3	-10 %
5	2,1	4,5	7,5	-5 %
6	2,1	4,7	7,7	0 %
7	2,1	4,9	7,9	5 %
8	2,1	5,1	8,1	10 %
9	2,3	5,3	8,3	15 %
A	2,5	5,5	8,5	20 %
B	2,7	5,7	8,7	25 %
C	2,9	5,9	8,9	30 %
D	3,1	6,1	9,1	0 %
E	3,3	6,3	9,3	0 %
F	3,5	6,5	9,5	0 %

Possible regulations depending on the position of the control selectors.

8.4.2. Modification of the bypass opening setpoint (free-cooling mode)

Using the **SW4.4** selector it is possible to select between two ranges of setpoint temperatures:



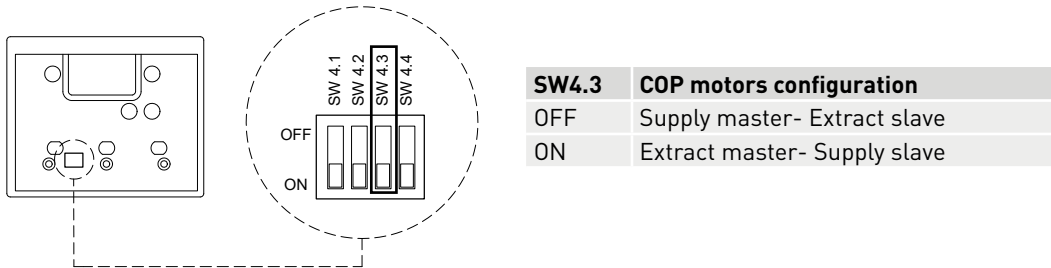
SW4.4	Predefined temperature range
OFF	13/18/23°C
ON	15/20/25°C (by default)

Once a certain range has been selected, the setpoint value is selected by pressing on the temperature icon (See section "Remote control setting - User").

8.4.3. Fan selection that acts as a master (only available on units controlled via Modbus in COP mode)

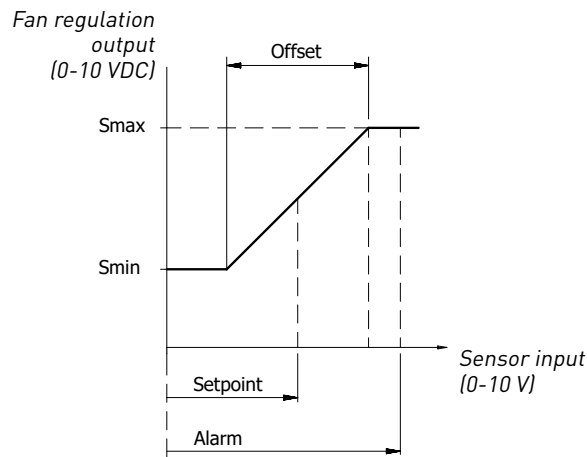
Using the **SW4.3** selector it is possible to define which of the two fans acts as a master. The fan defined as master must be the one that supplies or extracts air from the network of ducts in which the pressure transmitter is installed.

The speed of the fan defined as a slave is regulated as a percentage of the speed of the master fan, being possible to apply a percentage of unbalance.



8.4.4. Operation at Variable Airflow (VAV) mode, depending on an external sensor (CO₂, temperature or relative humidity)

CAD-COMPACT BASIC units can regulate fan control speed proportionally to the signal of an external sensor with 0-10V output. The increase of the sensor measure causes the fan speed to be increased according to a previously configured proportional ramp.



From factory, this functionality is disabled. The automatic operation mode is enabled and configured by means of the jumper in the X31 pin strip (in the controller board). The position of the jumper depends on the type of sensor used according to the following table:

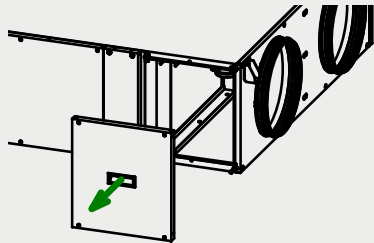
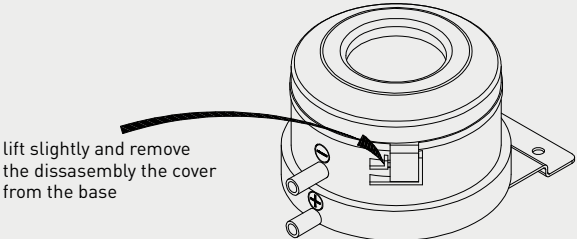
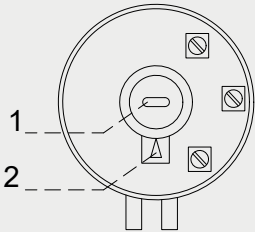
	Without sensor	CO ₂	Temp.	Hum. Rel.	Control 0-10V desde BMS	Not used	Not used
Jumper position	1	2	3	4	5	6	7
Range	-	2000ppm	50°C	100%	10V		
Setpoint	-	1100ppm	25°C	50%	5V		
Offset reg. (+/-)	-	400ppm	2°C	5%	2.5V		
Alarm	-	1600ppm	28°C	70%	10V		
Smin	-	2V	2V	2V	2V		
Smax	-	10V	10V	10V	10V		

8.4.5. Filter supervision

CAD-COMPACT BASIC heat recovery units are supplied with pressure switches mounted on both filters (supply and extraction). When the differential pressure value measured by the pressure switches exceeds 200Pa an alarm is produced. Depending on the particularities of the installation (operating hours and pollution of the outdoor environment) it may be advisable to change the pressure switch setting as indicated in the following table:

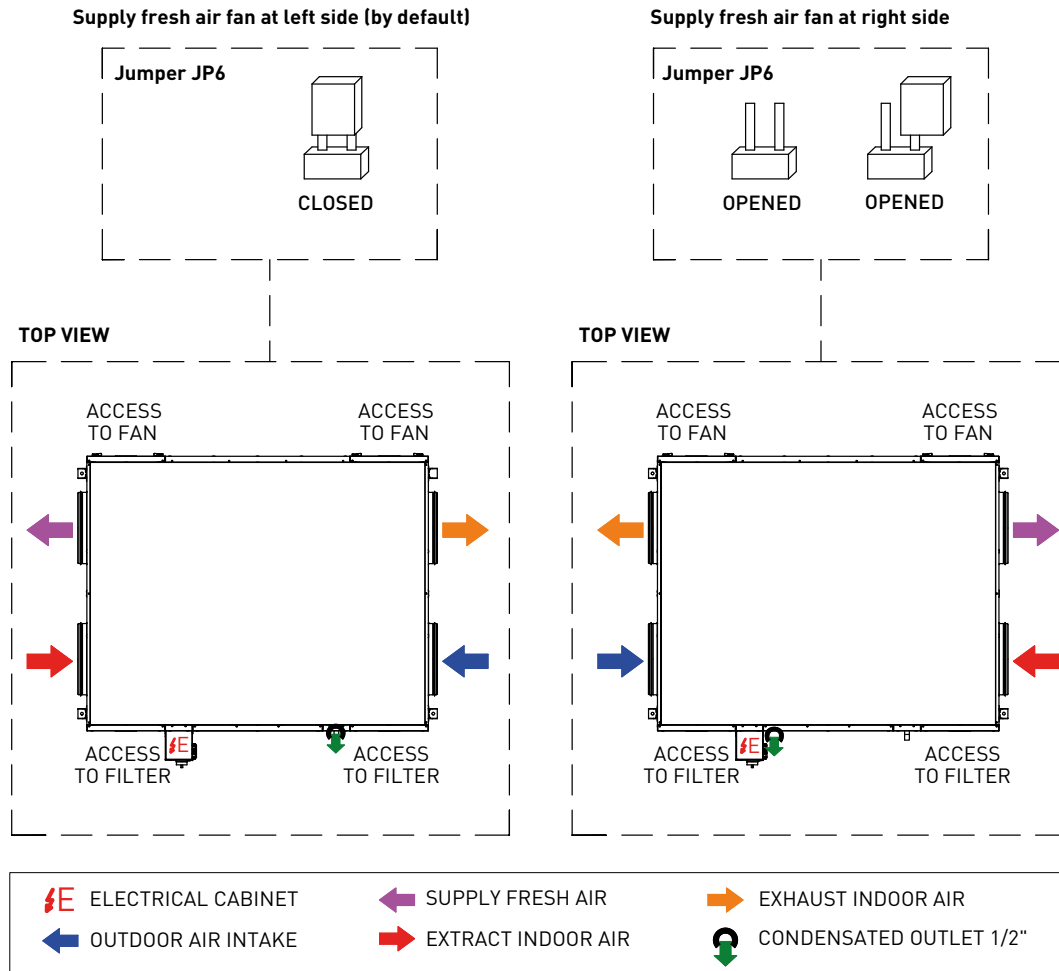
Filters state	Airflow	Action
The filters alarm appears often	When the dirty filter alarm is active, the air flow is correct	Increase pressure switch setting to 300 Pa
No dirty filter alarm appears or it takes too long to appear	Insufficient air flow due to filter clogging	Reduce the pressure switch setting to less than 200Pa
The filters alarm appears with too much frequency	When the dirty filter alarm is active, the airflow is insufficient	The performance of the heat recovery unit is not enough: <ul style="list-style-type: none"> - Review the dimensioning of the duct system - Check leakages - Oversize the selected heat recovery unit

To change the pressure switch setting, follow the sequence below:

<p>1. Access the filter zone in which the pressure switch filters are placed</p>	
<p>2. Lift the pressure switch cover</p>	
<p>3. Turn the dial (1) using a flathead screwdriver, until the pointer (2) indicates the pressure value to be defined</p>	

8.4.6. Exchange the function of the supply and extraction circuits

- By the JP6 Jumper existing on the electronic board of the electrical panel, it is possible to interchange the function of the supply and extract fans.
- The supply fan becomes the extraction fan and viceversa.



The position of jumper **JP6** defines:

Jumper JP6	Function
Closed-ON (by default)	Fresh air supply on the left side seen from the electrical panel
Open-OFF	Fresh air supply on the right side seen from the electrical panel

8.4.7. Boost function

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

Operation: when activating and deactivating the boost (push-button operation) on terminals F3-F4, fans start running at Boost speed. The unit will stay at that speed during the preset time (30 minutes by default). After this time the fans go back to its previously selected speed.

By means of the corresponding Modbus registers it is possible to configure:

- Fan control signal in Boost mode (5 to 10V)
- Duration of boost time
- Type of contact (NO, NC): Coil, 6

Deactivation Boost Function: once the Boost is active, it can be deactivated either by stopping the unit via the remote hand terminal, or by disconnecting it from the power supply.

8.4.8. 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 CLP1 and CLP2, 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 suddenly.

8.4.9. Protection of heat exchanger unit

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

In order to protect the heat exchanger, the BASIC controller implemented 3 different strategies:

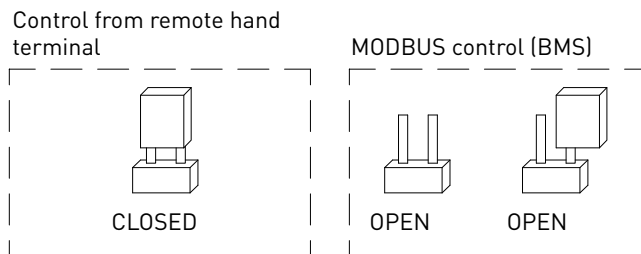
Function	Strategy
Fans unbalancing	<ul style="list-style-type: none"> It is activated when the exhaust air temperature descends 4°C. The unit comes into Defrost mode, setting the supply fan SAF at 50% of its nominal speed, while the extract fan EAF remains at his nominal speed.
By-pass opening	<ul style="list-style-type: 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.

9. BUILDING MANAGEMENT SYSTEM (BMS) CONNECTION

Jumper	Functionality
JP1	Enable Modbus communication (Control of the unit from the BMS)
JP4	In Modbus networks, define the last unit of the network (End of line)

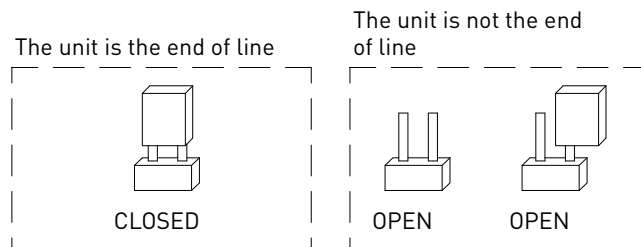
The controller has a Modbus communication module through which it is possible to control the unit from an external BMS, as well as monitor a large part of the functional variables of the unit.

By default, the communication is disabled, to enable it, the position of the JP1 jumper existing on the controller board must be modified.



Jumper JP1: MODBUS communication

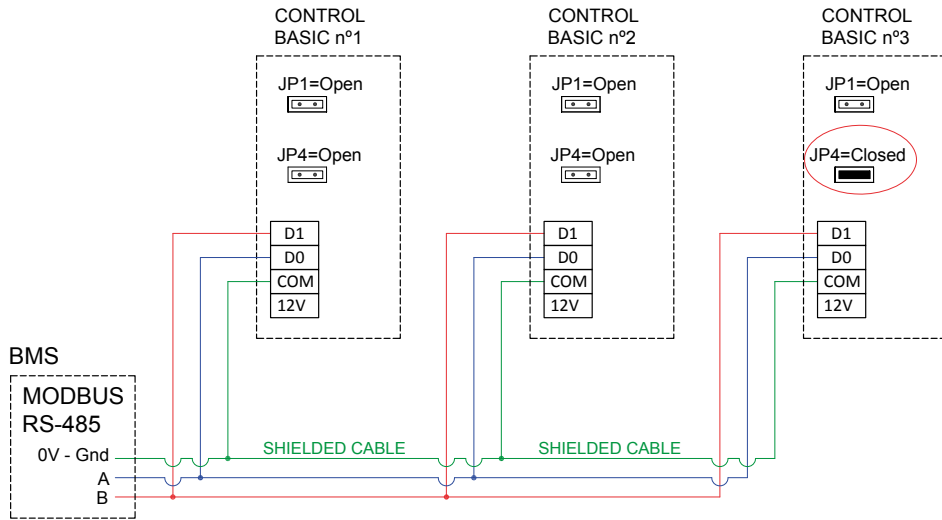
Once the MODBUS network wiring has been completed, the last unit of the network (end of line) must be specified using the JP4 jumper on the controller board.



Jumper JP4: End of line resistance (in Modbus networks)



Position of the JP1 and JP4 Jumpers depending on the location of the unit in the Modbus network.



Basic characteristics of the Modbus-RTU controller

Addressing	Slave: configurable address from 1 to 247
Diffusion	Yes
Transmission speed	19200
Parity	EVEN
Mode	RTU
Electrical interface	RS-485 2W-wired or RS232
Connector type	RJ 45

MODBUS message

Address	Function	Data	CRC verification
8 bits	8 bits	N x 8 bits	16 bits

The format for each byte in RTU mode is:

- Code system: 8-bit binary
- Bits per Byte: 1 bit of START (start)
- 8 data bits, the most significant bit is sent the first
- 1 bit for the parity (Even parity required)
- 1 bit of STOP (end)

Modbus memory map

N° Reg.	Type of register	Description	Range	Data	Default value	R/W	Comments
General configuration							
9	Coil	Unit status	0 1	Off Run	1	R/W	
7	Coil	Contact CLP start/stop	0 1	Contact NO Contact NC	0	R/W	
0	Coil	Fans working mode	0 1	VAV mode COP mode	0	R/W	
0	Input Register	Vin	0 - 10	V		R	Analogic input value (V)
1	Input Register	TODA	-30 - 50	°C		R	Outdoor Air Temperature (Fresh air)
2	Input Register	TETA	-30 - 50	°C		R	Extract Air Temperature (Foul air)
3	Input Register	TEHA	-30 - 50	°C		R	Exhaust Air Temperature (Foul air)
4	Input Register	TSUP	-30 - 50	°C		R	Supply Air Temperature (Fresh air)

N° Reg.	Type of register	Description	Range	Data	Default value	R/W	Comments
MODBUS configuration							
0	Holding Register	Communication channel	1 - 247	Channel / Node	1	R/W	
1	Holding Register	Baudrate	0	110	8	R/W	
			1	300			
			2	600			
			3	1200			
			4	2400			
			5	4800			
			6	9600			
			7	14400			
			8	19200			
			9	28800			
			10	38400			
			11	56000			
			12	57600			
			13	115200			
2	Holding Register	Parity	0	Without parity	2	R/W	Involves that will exist 2 stop bits
			1	ODD			
			2	EVEN			
0	Discret input	Communication alarm	0	No alarm	0	R	
			1	Alarm active			
Fans configuration							
4	Holding Register	Pulses per supply fan turn	1 - 5	Pulses/Turn	1	R/W	It is necessary to obtain the actual RPM of the fan. It is a function of the model: - 500: 2 pulses - 900, 2500, 3200 and 4500: 1 pulse - 1300 and 1800: 5 pulses
3	Holding Register	Pulses per extract fan turn	1 - 5	Pulses/Turn	1	R/W	
5	Holding Register	Minimum RPM	50 - 500	RPM	300	R/W	
1	Discret input	Supply fan alarm	0	No alarm	0	R	
			1	Alarm active			
2	Discret input	Extract fan alarm	0	No alarm	0	R	
			1	Alarm active			
6	Input Register	RPM supply fan	0-5000	RPM supply fan	0	R	
5	Input Register	RPM extract fan	0-5000	RPM extract fan	0	R	
2	Coil	Fan selection master/slave	0	Supply fan master	0	R/W	
			1	Extract fan master			
9	Holding Register	Unbalance slave fan	-30 - 30	%	0	R/W	
Fans operation mode VAV							
50	Holding Register	Selected speed	1	Low speed	1	R/W	
			2	Medium speed			
			3	High speed			
			4	Automatic			
6	Holding Register	Low speed	0,5 - 5	Volts	3,5	R/W	
7	Holding Register	Medium speed	3 - 8	Volts	6	R/W	
8	Holding Register	High speed	5 - 10	Volts	9,5	R/W	



N° Reg.	Type of register	Description	Range	Data	Default value	R/W	Comments
10	Holding Register	Type of sensor	0	Without sensor	0	R/W	
			1	CO2			
			2	Temperature			
			3	Relative humidity			
			4	0-10V external control			
11	Holding Register	Range PPM	0 - 4000	CO2 PPM	2000	R/W	If type sensor = 1
12	Holding Register	Temperature Range	0 - 80	°C	50	R/W	If type sensor = 2
13	Holding Register	Rel.Humidity range	0 - 100	% Humidity	100	R/W	If type sensor = 3
14	Holding Register	Range 0-10V	0 - 10	Volts	10	R/W	If type sensor = 4
15	Holding Register	Setpoint PPM	0 - End of range	PPM	1100	R/W	If type sensor = 1
16	Holding Register	Setpoint °C	0 - End of range	°C	25	R/W	If type sensor = 2
17	Holding Register	Setpoint % humidity	0 - End of range	% Humidity	50	R/W	If type sensor = 3
18	Holding Register	Setpoint 0-10V	0 - End of range	Volts	50	R/W	If type sensor = 4 Value = Volts x10
19	Holding Register	Offset regulation (+/-) PPM	0 - End of range	PPM	400	R/W	If type sensor = 1
20	Holding Register	Offset regulation (+/-) °C	0 - End of range	°C	2	R/W	If type sensor = 2
21	Holding Register	Offset regulation (+/-) % humidity	0 - End of range	% Humidity	5	R/W	If type sensor = 3
22	Holding Register	Offset regulation (+/-) 0-10V	0 - End of range	Volts	25	R/W	If type sensor = 4 Value = Volts x10
51	Holding Register	Alarm limit PPM	0 - End of range	PPM	1600	R/W	If type sensor = 1
52	Holding Register	Alarm limit °C	0 - End of range	°C	28	R/W	If type sensor = 2
53	Holding Register	Alarm limit % humidity	0 - End of range	% Humidity	70	R/W	If type sensor = 3
54	Holding Register	Alarm limit 0-10V	0 - End of range	Volts	100	R/W	If type sensor = 4 Value = Volts x10
3	Discret input	Status alarms	0	Alarm not active	0	R	
			1	Alarm active			
23	Holding Register	Minimum output	0 - 5	Volts	2	R/W	
24	Holding Register	Maximum output	5 - 10	Volts	10	R/W	
Fans operation mode COP							
25	Holding Register	Sensor range	0 - 2500	Pascal	2500	R/W	
26	Holding Register	Setpoint	0 - End of range	Pascal	200	R/W	
29	Holding Register	Kp	1 - 250	Proportional constant	20	R/W	
30	Holding Register	Ki	1 - 250	Integral constant	20	R/W	
27	Holding Register	Minimum output	0 - 5	Volts	2	R/W	
28	Holding Register	Maximum output	5 - 10	Volts	10	R/W	
BOOST							
8	Coil	BOOST status	0	Not active	0	R/W	
			1	Active			
31	Holding Register	Timmer mode boost	0-600	Minutes	60	R/W	
32	Holding Register	Fan speed setpoint when boost	5 - 10	Volts	10	R/W	
6	Coil	Contact F3-F4 (Boost)	0	Contact NO	0	R/W	
			1	Contact NC			

N° Reg.	Type of register	Description	Range	Data	Default value	R/W	Comments
BY-PASS management							
4	Discret input	By-pass status	0 1	Open Closed	0	R	
33	Holding Register	By-pass operation mode	1 2 3	Automatic Manual open Manual closed	0	R/W	
3	Coil	Definition of Tcontrol	0 1	TETA TSUP	1	R/W	Control in extract air Control in supply air
38	Holding Register	Timmer after by-pass manual operation	0 - 600	Minutes	480	R/W	
49	Holding Register	TODA	5 - 20	°C	12	R/W	Outdoor air temperature
39	Holding Register	TSUP minimum	5 - 20	°C	12	R/W	Supply air minimum temperature
40	Holding Register	TSUP maximum	15 - 30	°C	30	R/W	Supply air maximum temperature
34	Holding Register	TSP low	5 - 30	°C	13 / 15	R/W	Low temperature setpoint
35	Holding Register	TSP medium	5 - 30	°C	18 / 20	R/W	Medium temperature setpoint
36	Holding Register	TSP high	5 - 30	°C	23 / 25	R/W	High temperature setpoint
37	Holding Register	Active Setpoint Temperature	1 2 3	TSP low TSP medium TSP high	2	R/W	
Defrost management							
6	Discret input	Defrost status	0 1	Not active Active	0	R	
41	Holding Register	TRISK	0 - 10	°C	5	R/W	
42	Holding Register	TSUP min defrost	5 - 25	°C	11	R/W	
44	Holding Register	Waiting time after activation Pre-heater	1-40	Minutes	5	R/W	
46	Holding Register	Wait time post Open Bypass	1 - 40	Minutes	2	R/W	
47	Holding Register	Fan speed deceleration ramp	0,1 - 2	V/min	0,5	R/W	
55	Holding Register	Stop time of unit	30-600	Minutes	30	R/W	
Clogged filter alarm							
5	Discret input	Alarm status	0 1	Alarm not active Alarm active	0	R	
4	Coil	Type of supervision	0 1	Supervision by time Supervision by pressure switch	1	R/W	
48	Holding Register	Time to filter change alarm	500 - 5000	Hours	2500	R/W	
ODA sensor alarm							
8	Discret input	Alarm status	0 1	Alarm not active Alarm active	0	R	
SUP sensor alarm							
9	Discret input	Alarm status	0 1	Alarm not active Alarm active	0	R	
ETA sensor alarm							
10	Discret input	Alarm status	0 1	Alarm not active Alarm active	0	R	
EHA sensor alarm							
11	Discret input	Alarm status	0 1	Alarm not active Alarm active	0	R	

10. INSPECTION, MAINTENANCE AND CLEANING

10.1. FILTERS REPLACEMENT

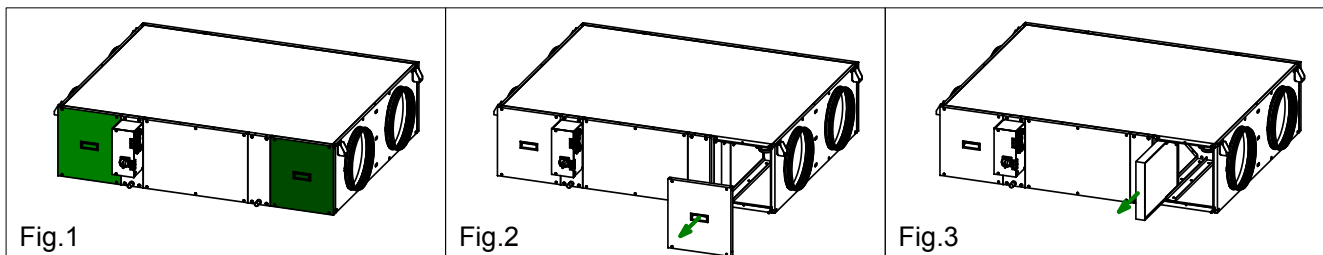
The maintenance side for filters replacement depends on the model and version. The exact location of the filters is identified by a label in the unit profile that indicates the type of filter and its characteristics.



FALLING OBJECTS

When 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 signpost the area below the heat recovery unit and prevent person access to it.

Access to filters is done by removing the two registration panels located on the side of the heat recovery unit. To replace the filters, follow the following sequence:



1. Access to the filters is done by removing the two existing side panels on the side where the electrical cabinet is located (Fig. 1).
2. Remove the 4 screws that fix the filter access panel. Hold the panel preventing it from falling when loosening the last screw. (Fig 2).
3. Pull the dirty filter outwards, sliding it on the existing guide.

In the process of assembling the new filter, follow the reverse order, paying attention to the arrow that defines the direction of the air that you will find in the new S&P filter.

Filters spare parts table

Model	Accessory filters and spare parts for CAD-COMPACT*			
	G4	M5	F7	F9
CAD-COMPACT 500	AFR-CAD-COMPACT 500 G4	AFR-CAD-COMPACT 500 M5	AFR-CAD-COMPACT 500 F7	AFR-CAD-COMPACT 500 F9
CAD-COMPACT 900	AFR-CAD-COMPACT 900 G4	AFR-CAD-COMPACT 900 M5	AFR-CAD-COMPACT 900 F7	AFR-CAD-COMPACT 900 F9
CAD-COMPACT 1300	AFR-CAD-COMPACT 1300 G4	AFR-CAD-COMPACT 1300 M5	AFR-CAD-COMPACT 1300 F7	AFR-CAD-COMPACT 1300 F9
CAD-COMPACT 1800	AFR-CAD-COMPACT 1800 G4	AFR-CAD-COMPACT 1800 M5	AFR-CAD-COMPACT 1800 F7	AFR-CAD-COMPACT 1800 F9
CAD-COMPACT 3200	AFR-CAD-COMPACT 3200 G4	AFR-CAD-COMPACT 3200 M5	AFR-CAD-COMPACT 3200 F7	AFR-CAD-COMPACT 3200 F9

* From factory the units are supplied with F7 filter in supply side and M5 in extraction. All models allow the installation of a second filter inside, obtaining, among others, the following combinations: F7 + F9, M5 + F7 or G4 + F7.

10.2. ADDITIONAL FILTER INSTALLATION

The heat recovery is supplied with mounted filters.

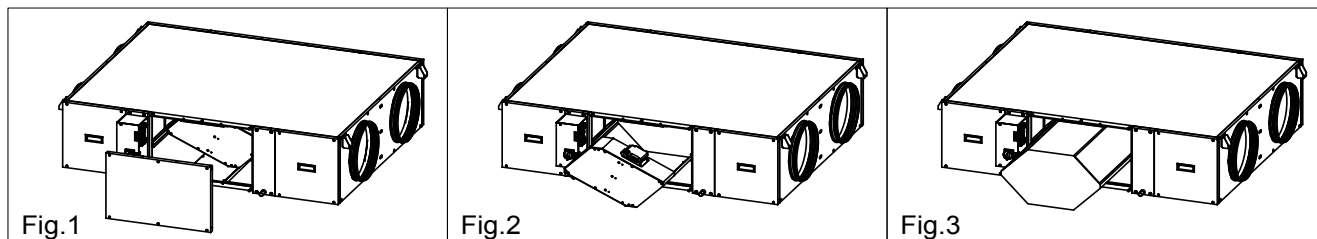
Low pressure F7 filter for supply air and M5 for extract air.

Inside the heat recovery unit there is a specific rail for mounting a second additional filter (supplied as an accessory).

10.3. HEAT EXCHANGER

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:

Core disassembly sequence per side



To disassemble of the heat exchanger follow the following sequence:

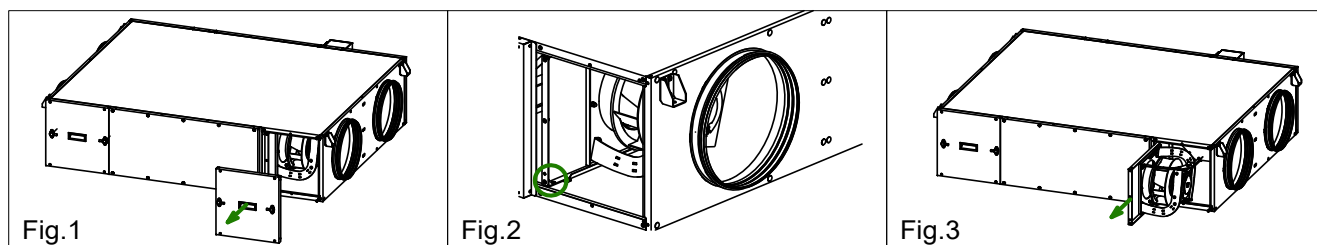
- Loosen the screws that hold the side panel. Before releasing the panel, ensure that it is well supported by the operator, preventing it from falling (Fig. 1).
- Remove the bypass assembly, releasing its electrical connector (Fig. 2).
- Pull the heat exchanger until it is completely removed from the equipment (Fig. 3).

10.4. FANS

It is not necessary to access the fan to carry out maintenance tasks, nor to carry out the electrical connection since both fans are wired to the electrical cabinet. However, it is necessary to leave enough space around the unit in order to allow access to fans in case of its failure. Do not install the heat exchanger against a wall or an obstacle that prevents access to the fans.

If you need to replace the fan, follow the following sequence:

- Remove the access panel for the affected fan (Fig. 1).
- Release the screws that lock the metal plate on which the fan is mounted (Fig. 2).
- Pull out the plate and once outside, remove the fan and proceed to replace it (Fig. 3).



10.5. CONDENSATION DRAINPIPE

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



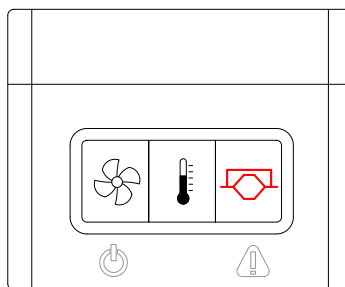
11. OPERATION ANOMALIES

11.1. GENERAL ANOMALIES

Anomaly	Cause	Solution
Difficult to start.	Reduced power supply voltage. Insufficient static torque of motor.	Check motor specification plate. Close the air inlets to reach the maximum speed. Change the motor is necessary. Contact the S&P Post-Sales service.
Insufficient airflow. Insufficient pressure.	Blocked pipes and/or inlet points closed. Fan obstructed. Filter overloaded. Insufficient rotation speed. Exchanger package blocked.	Clean inlet tubes. Clean fan. Clean or replace filter. Check power supply voltage. Clean the exchanger.
Reduction in performance after a period of acceptable operation.	Leaks in the circuit before and/or after the fan. Damaged roller.	Check the circuit and restore original conditions. Check the impeller and if necessary, replace with an original spare part. Contact the S&P post sales service.
New air temperature too cold.	Outdoor air -5°C or less.	Insertion of post-heating resistances. Contact the S&P post sales service.
Insufficient performance of the exchanger.	Fins dirty.	Clean the exchanger.
Formation of frost on the exchanger.	Outdoor air below -5°C.	Insertion of pre-heating devices (anti-ice). Contact the S&P Customer Advice service.
Air pulsation.	Fan working in excessively low flow conditions. Flow instability, obstruction or bad connection.	Modification of the circuit and/or replacement of the fan. Clean and/or readjust the inlet channels. Operate the electronic regulator, increasing the minimum speed (insufficient voltage). Contact the S&P Customer Advice service.
There is water inside the unit.	Drain clogged or wrongly 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 instructins of this manual.

11.2. LIST OF ALARMS

If an alarm is activated or an error occurs, the red LED on the right button will flash.

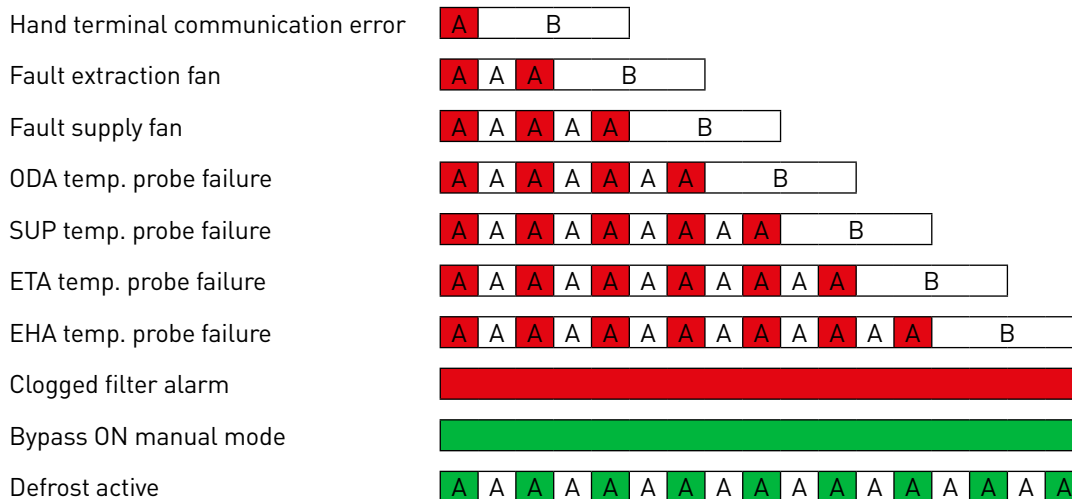


The blinking of the red LED can be combined with green flashes which refer to the by-pass working mode.

The number of LED flashes refers to the type of error detected:

Priority	Alarm/Status	Led	Actuation
1	Communication error between hand terminal and electronic board	Red led, 1 blink	Stop the unit
2	Extraction fan failure	Red led, 2 blinks	Stops unit after 90 s (adjustable) from the "Fan Fault" activation. The "Fan Fault" will be activated only when the alarm situation has been maintained active for 30 s (configurable).
3	Supply fan failure	Red led, 3 blinks	Stop unit after 90 s (adjustable) from the "Fan Fault" activation. The "Fan Fault" will be activated only when the alarm situation has been maintained active for 30 s (configurable).
4	Defrost active	Flashing green led	Defrost management
5	Bypass OPEN in manual mode	Continuous green led	Normal operation
6	Clogged filter alarm	Continuous red led	Normal operation
7	ODA temp. probe failure (fresh air)	Red led, 4 blinks	The unit stops
8	SUP temp. probe failure (supply)	Red led, 5 blinks	Normal operation
9	ETA temp. probe failure (extraction)	Red led, 6 blinks	Normal operation
10	EHA temp. probe failure (exhaustion)	Red led, 7 blinks	The unit stops (freezing risk of the heat exchanger)

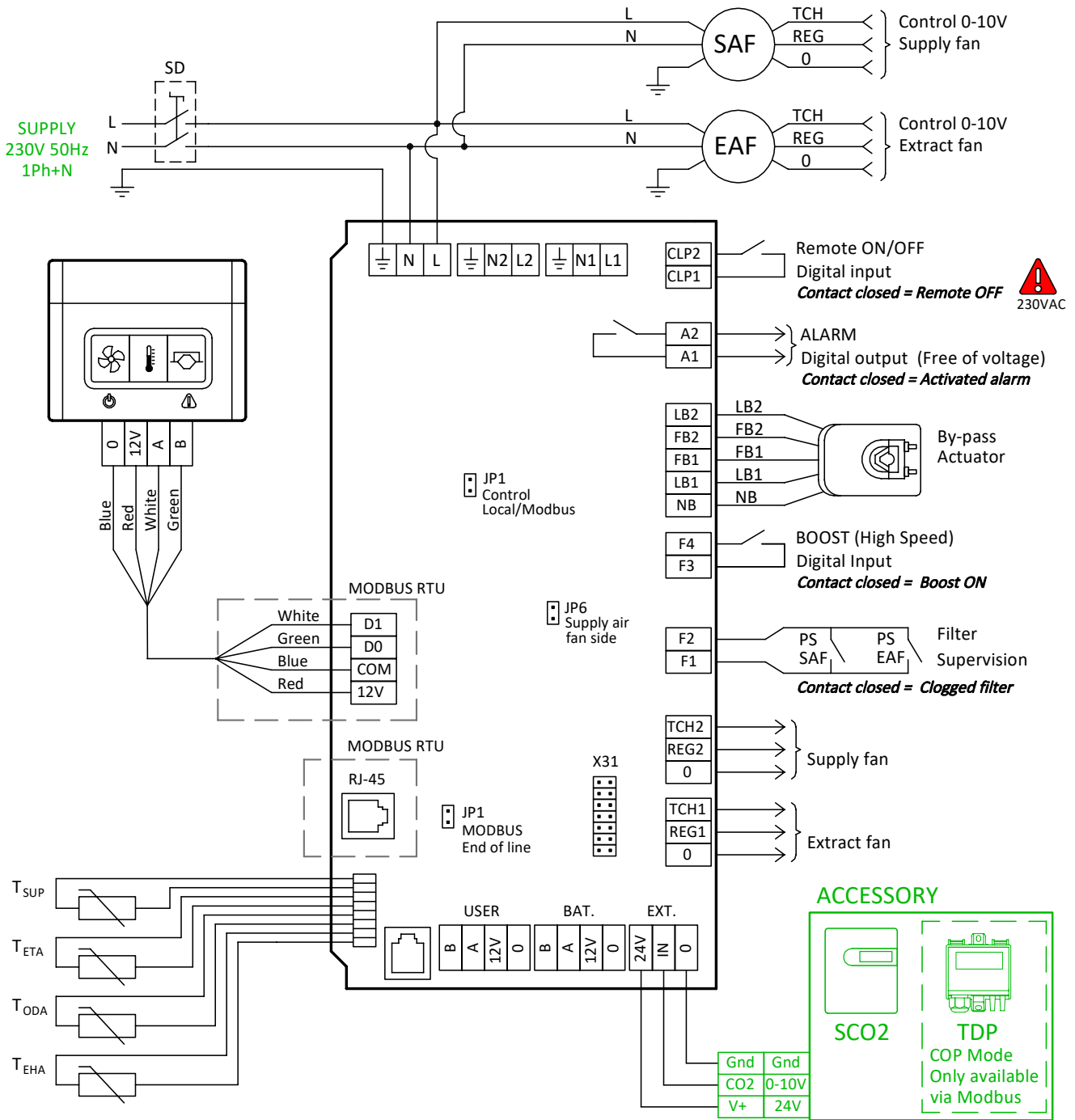
The appearance of an alarm generates the activation of the digital output A1-A2, with the exception of alarms for "Defrost active" and "Bypass open in manual mode".



A: 0,75 s
B: 3 s

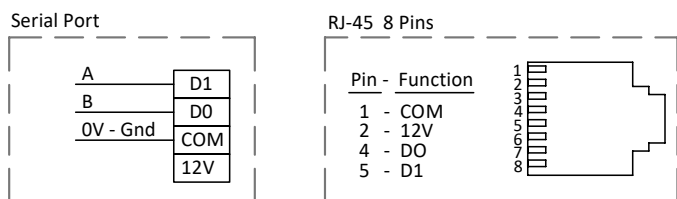
12. WIRING DIAGRAMS

12.1. CAD-COMPACT 500 TO 3200 MODELS



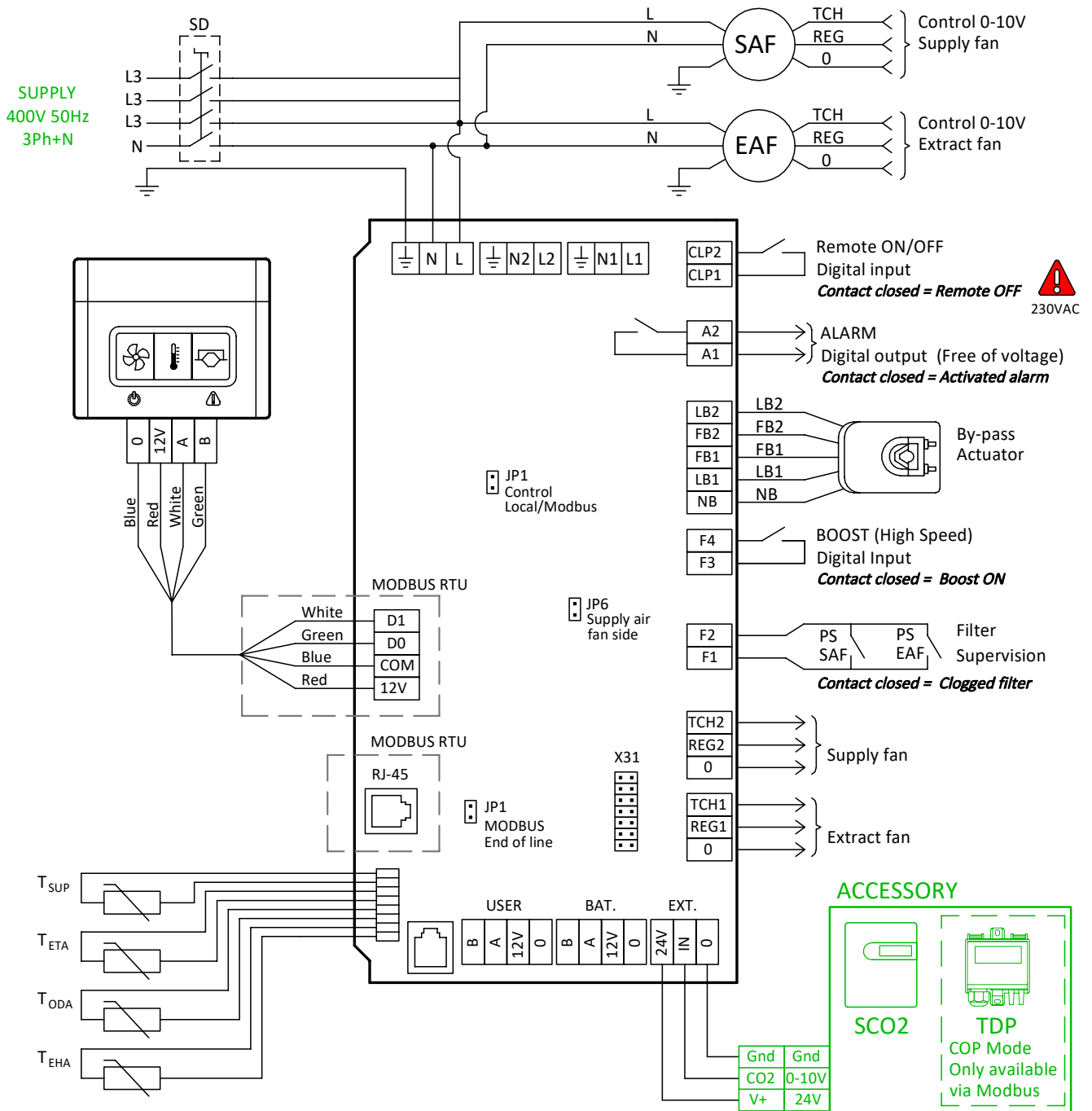
- SD: Switch
- SAF: Supply fan
- EAF: Extract fan
- PS: Pressure Switch
- T_{SUP}: Supply Air Temp. probe (Fresh air)
- T_{ETA}: Extract Air Temp. probe (Foul air)
- T_{ODA}: Outdoor Air Temp. probe (Fresh air)
- T_{EHA}: Exhaust Air Temp. probe (Foul air)

MODBUS INTEGRATION



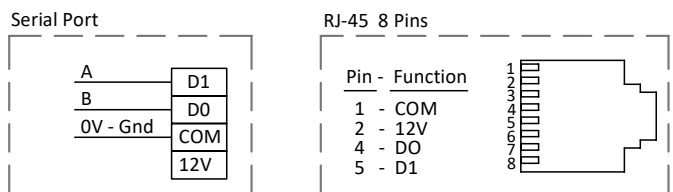
The Modbus RTU network connection can be made through the RJ-45 connector or through the terminals to which the command is connected (in this case the command is disabled)

12.2. CAD COMPACT 4500 MODEL



- SD: Switch
- SAF: Supply fan
- EAF: Extract fan
- PS: Pressure Switch
- T_{SUP}: Supply Air Temp. probe (Fresh air)
- T_{ETA}: Extract Air Temp. probe (Foul air)
- T_{ODA}: Outdoor Air Temp. probe (Fresh air)
- T_{EHA}: Exhaust Air Temp. probe (Foul air)

MODBUS INTEGRATION



The Modbus RTU network connection can be made through the RJ-45 connector or through the terminals to which the command is connected (in this case the command is disabled)



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