RHE

Air Handling Unit with Rotating Heat Exchanger

Instructions manual

NT_51897201_RHE-AN_150629

INDEX

1. GENERAL

1.1 Warnings

This product was manufactured according to rigorous technical safety rules in compliance with DC standards. The DC declaration and the manual can be downloaded from the Internet.
Before installing and using this product, carefully read these instructions, which contain important indications to ensure your safety and that of the users during the installation, commissioning and servicing of this product.
Once the installation is terminated, leave this manual in the machine for future consulting.

The installation of this product (implementation, connections, commissioning, maintenance) and all other interventions must be performed by a professional applying the recognized rules of good practice, standards and safety regulations in force.
It must conform to the prescriptions related to Electromagnetic Compatibility (EMC) and the Low Voltage Directive (LVD).

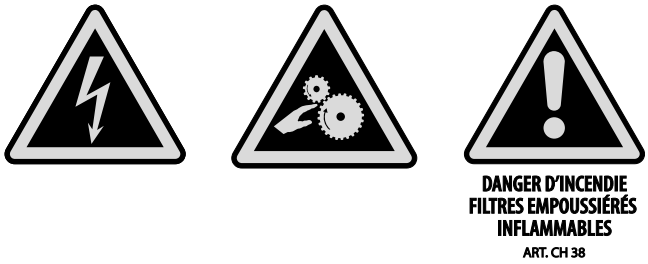
S&P shall not be held responsible for possible injuries and/or damages caused by the non compliance with safety instructions or following a modification of the product.

The RHE Dual Flow Air Handling Units are designed for dual flow air ventilation and air treatment applications in public and private buildings:

- Indoor installation (recommended) or outdoor installation with accessories.
- Permanent ambiance temperature : -25°C / +40°C.
- Outdoor air operating temperature limits: -30ºC / +40ºC.
- To avoid electronic damages the main switch has to be always «ON», except during maintenance.
- Relative humidity : max 95% non condensing.
- Atmosphere not potentially explosive.
- Atmosphere with low salt content, without corrosive chemical agents.

1.2 Safety instructions

- Wear appropriate IPE (Individual Protection Equipment) before any intervention.
- Before installing the air treatment unit, make sure that the support and placement are sufficiently resistant to withstand the unit's weight and that of the accessories.
- Respect the danger labels present on the various access doors :
- Equipment switched on / Machine rotating / Filters covered with dusts potentially inflammable



- Do not open the access doors without first switching off the electrical power supply with the padlockable mains power switch present on the unit.
- If the work is to be performed inside the device, switch off the electrical power supply on the main circuit breaker and make sure that no one can accidentally switch it on.
- Make sure that the moving parts are stopped.
- Make sure that the motor driven fans are not accessible from the connection taps (connection duct or screened protection).

Before starting, check the following points :

- Make sure that the device does not contain any foreign body.
- Make sure that all the components are attached in their original placements.
- Check manually that the fans do not rub or are not blocked.
- Make sure that the rotating heat exchanger is not blocked.
- Check the earthing connection.
- Make sure that the access doors are properly closed.

1.3 Acceptance – Storage

In case of missing, non-conforming, or totally or partially damaged delivered products, the Purchaser must make written reservation on the transporter's receipt and confirm them within seventy-two (72) hours by sending a recommended letter to the transporter, as well as a copy to S&P. Acceptance of the equipment without any reservation will deprive the Purchaser of any subsequent recourse against us.
The product must be stored in an area protected from bad weather, shocks and stains due to splashings or splatterings of any kind during its transport from the supplier to the end customer and onto the worksite before installation.

1.4 Warranty

The equipment supplied by S&P is warranted twelve (12) months – Parts only – starting from the invoicing date.
S&P agrees to replace the parts or the equipment whose operation is recognised defective by our departments except for all damages and interests or penalties such as operating losses, commercial prejudice, or other immaterial or indirect damages.
The following are not covered by our warranty : defects resulting from an abnormal usage or a usage not conforming to the recommendations of our manuals; faults observed as a consequence to normal wear ; incidents caused by negligence, lack of monitoring, or servicing ; faults due to the incorrect installation of the devices or to bad storage conditions before mounting.
In any case, S&P will not be responsible for transformed equipment, repaired even partially.

2. PRODUCT RANGE PRESENTATION

2.1 Range

Use
Extraction of stale air and supply of fresh air in public/private premises with heat recovery by a rotating heat exchanger. Installation on feet indoor or outdoor with accessories.

9 sizes
700 (700 m^3/h), 1300 (1 600 m^3/h), 1900 (2 100 m^3/h), 2500 (3 000 m^3/h), 3500 (3 600 m^3/h), 4500 (4 500 m^3/h), 6000 (6 000 m^3/h), 8000 (8 000 m^3/h), 10000 (10 000 m^3/h).

4 Models :
- **RHE D :** without heater.
- **RHE DI :** integrated post-heating electric heater.
- **RHE DC :** integrated hot water coil.
- **RHE DFR :** integrated reversible cold water/hot water coil (HD model only).

3 Constructions :
Vertical construction made in one piece up to size 4500, in 2 pieces for bigger sizes.
- **HDR :** in-line connection of the ducts - indoor installation. Right hand side access door on the supply air flow direction
- **HDL :** in-line connection of the ducts - indoor installation. Left hand side access door on the supply air flow direction
- **OI :** in-line connection of the ducts with roof mounted for an outdoor installation.
- **VD :** connection of the ducts by the top – indoor installation (up to size 4500 only).

Rotary heat exchanger :
- **Thermal efficiency between 77% and 88%** (depends of air T° and RH conditions).
- Constant rotation speed with 1 speed motor, 230V single phase (RHE 700/1300/1900) or 400V three phase (RHE 2500/3500/6000/8000/10000).
- Variable rotation speed with inverter on Enthalpy or Sorption rotor (optional).

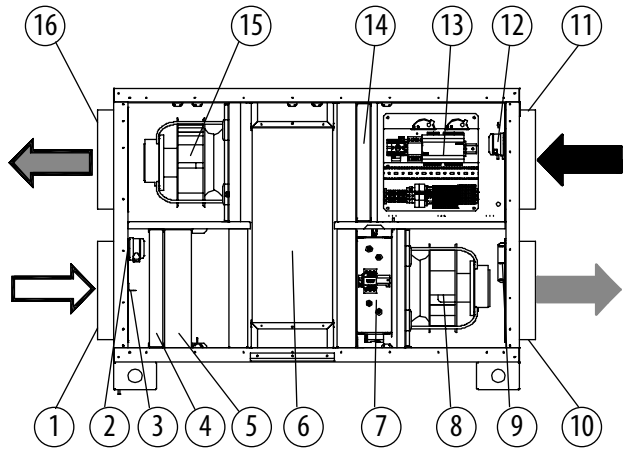
Modbus communicating control mounted / cabled – ready to be connected:
- Variable airflow (VAV), constant airflow (CAV), constant pressure (COP).
- Temperature control by the S&P specific integrated CORRIGO programmable logic controller.
- Modbus communicating - ready to be connected control on port RS485 and BACnet IP or webserver application on port TCP/IP.
- Remote touch panel (ETD) control included.

Example of a complete designation: RHE 2500 HDR DC

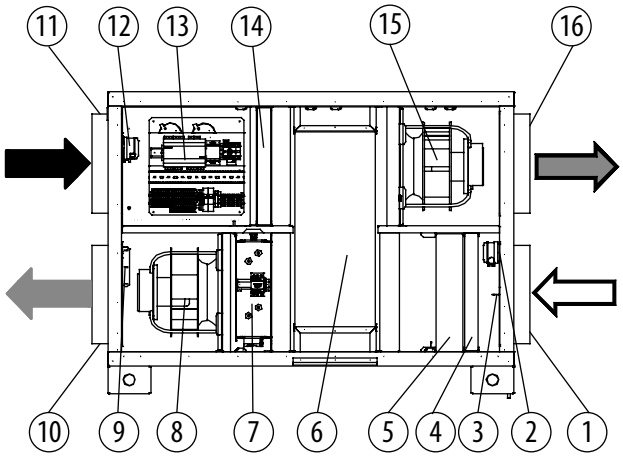
2.2 Main components

General specification - Version without heater (D) or with electric heater (DI)
Right hand installation in the supply air direction

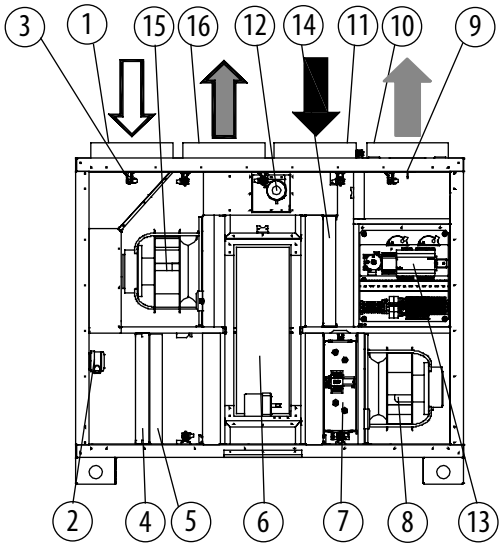
Version HDR



Version HDL



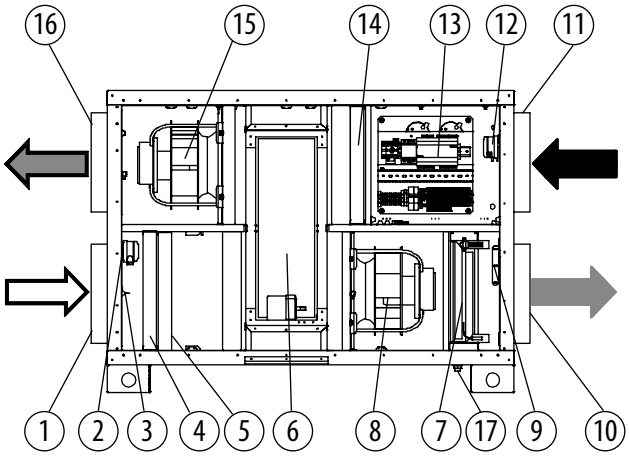
Version VD



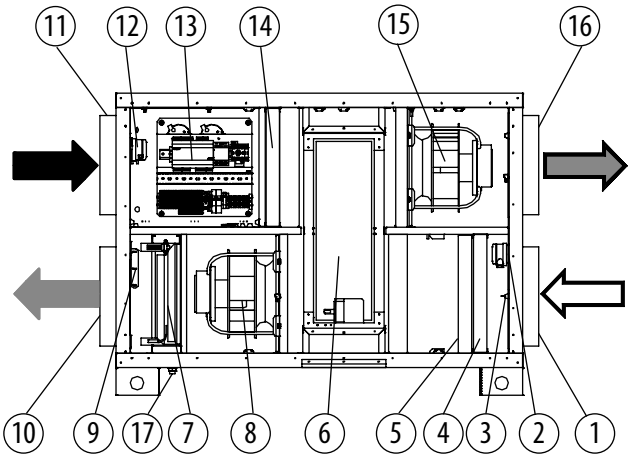
Reference	Description	Symbol
1	Outdoor air duct connection	
2	Pressure guard on outdoor air filter	
3	Outdoor air temperature sensor	
4	G4 filter on outdoor Air	
5	F7 filter on outdoor Air	
6	Rotary heat exchanger	
7	Electric heater	
8	Supply air fan	
9	Supply air temperature sensor	
10	Supply air duct connection	
11	Extract air duct connection	
12	Pressure guard extract air filter	
13	Electrical connection box/ control system	
14	G4 filter on extract	
15	Exhaust air fan	
16	Exhaust air duct connection	

General specification - Version hot water coil (DC) or reversible cold water/hot water coil (DFR)
Right hand installation in the supply air direction

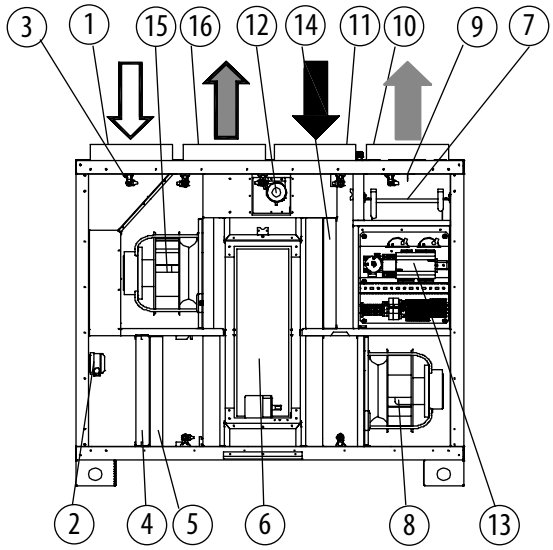
Version HDR



Version HDL



Version VD



Reference	Description	Symbol
1	Outdoor air duct connection	
2	Pressure guard on outdoor air filter	
3	Outdoor air temperature sensor	
4	G4 filter on outdoor Air	
5	F7 filter on outdoor Air	
6	Rotary heat exchanger	
7	Hot water coil (DC) or Hot/cold water coil reversible (DFR only on HD configuration)	
8	Supply air fan	
9	Supply air temperature sensor	
10	Supply air duct connection	
11	Extract air duct connection	
12	Pressure guard extract air filter	
13	Electrical connection box/ control system	
14	G4 filter on extract	
15	Exhaust air fan	
16	Exhaust air duct connection	
17	Evacuation of condensates 3/4" (ER only)	

Rotating heat exchanger

The construction of the rotating heat exchanger used into the RHE consists of alternating layers of flat and corrugated aluminum foil, which form a spiral from the center. This results in a defined structure of small triangular flutes. Supply and exhaust air each pass through half of the wheel in counter flow directions. The rotor exchanger is a rotating transfer media. It temporarily takes up the heat from the warm air stream and releases it in the colder air stream.

The thermal efficiency (sensible heat) is meanly function of air speed, diameter, wheel thickness and height of the corrugated foil flutes (wave).

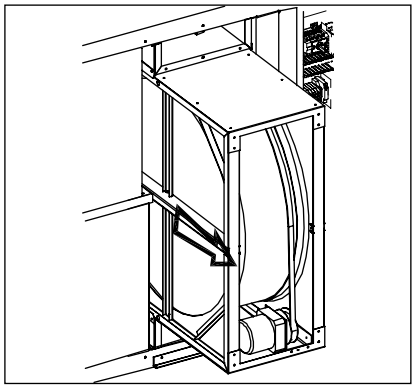
The hygroscopic / sorption coating of the storage media brings the additional advantage of recovering moisture. Typical summer application is dehumidification of warm and humid supply air to reduce the energy consumption of the down stream cooling equipment. During winter operation this feature recovers moisture from the exhaust air to reduce the humidification load. 3 types wheel could be defined according EUROVENT classification :

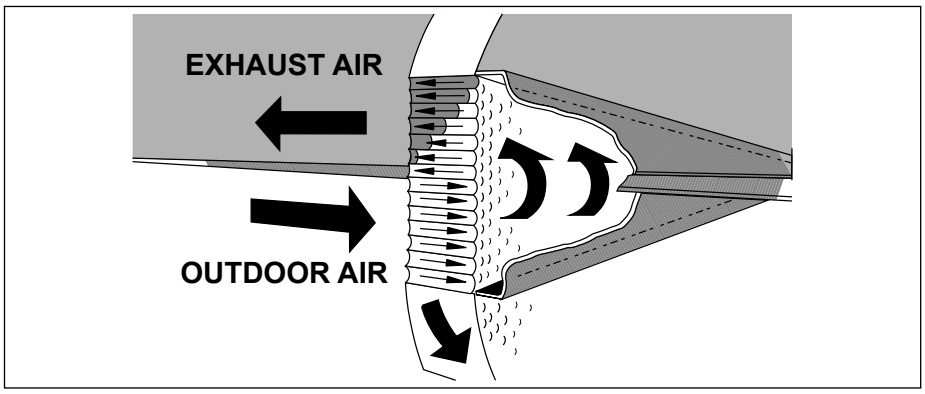
Condensation rotor (standard on RHE) :
The condensation rotor is a cost-efficient solution to recover heat and is suitable for standard applications in comfort ventilation. Humidity is only transferred in cases when the dew point of one of the air streams is reached during winter conditions. Compared with a counter flow plate heat exchanger, the supply air air will nevertheless be less dry, this contributes to a better thermal comfort. This rotor is drive with one speed motor.

Entalphy Rotors - (optional on RHE) :
The hydroscopic surface of this rotor class supports humidity transfer. Typically used for standard applications in comfort ventilation systems to recover humidity during moderate temperature periods. This rotor is drive with variable speed motor and control.

Sorption Rotor - (optional on RHE) :
The high performance desiccant coatings of the sorption rotor provide a maximum humidity transfer capacity. The high humidity efficiency is constant throughout all climate conditions. Sorption rotors are especially designed for summer season cooling recovery and dehumidification of supply air. Therewith, it should always be used in humid and hot climates, with dry cooling systems (chilled beams) and when in winter time humidifiers are used. This substantially reduces the cooling and humidification demand of the HVAC system. . This rotor is drive with variable speed motor and control.
All our rotors are supplied with a purge section. Purge section works as follows: A small part of the supply air stream is redirected into the exhaust stream thus ensuring the cleaning process. Equally, any migration of exhaust air into the supply stream is inhibited.

A bleed sector allows flushing stale air present in the “honeycombs” before the wheel passes in front of the fresh airflow.



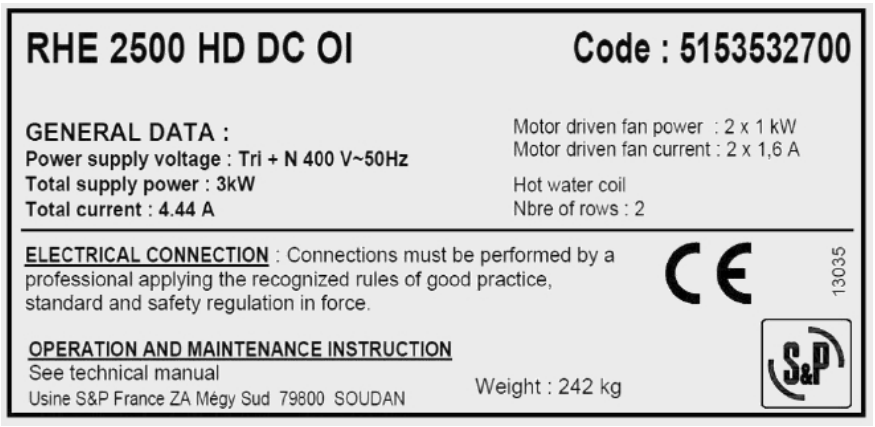


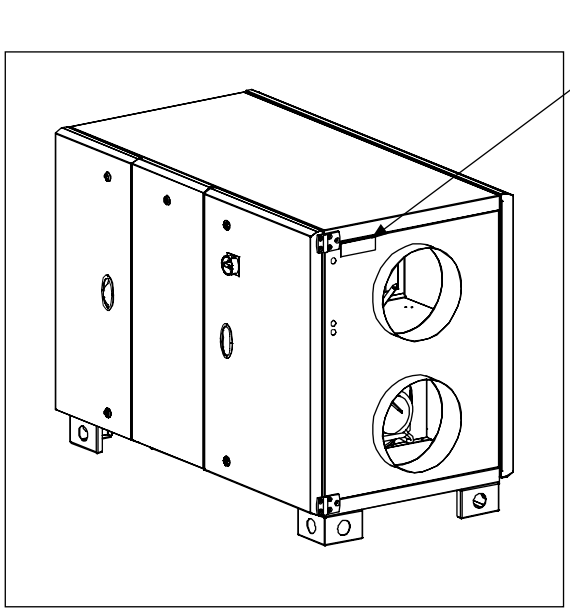
Principle of the bleed sector

3. INSTALLATION

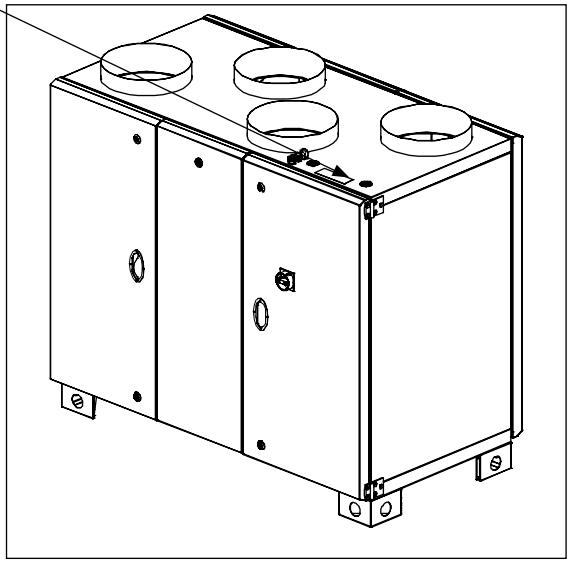
3.1 Machine identification / Symbols

Identification label – fixed on the casing





Version HD (supply side upward)



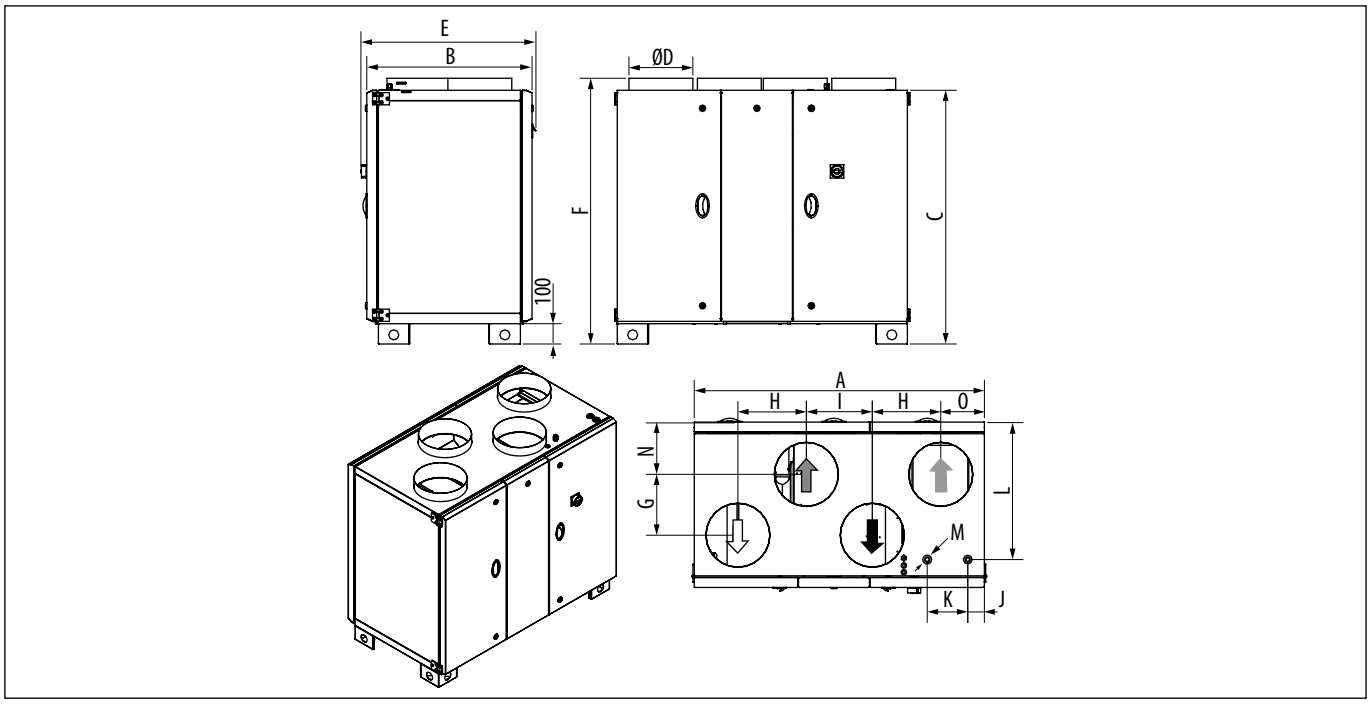
Version VD (on upper righthand corner)

Meaning of the symbols present on the unit and in the manual

Description	Symbol Machine	Symbol Instructions manual
Outdoor air		
Supply air		
Extract air		
Exhaust air		

3.2 Dimensions and weight

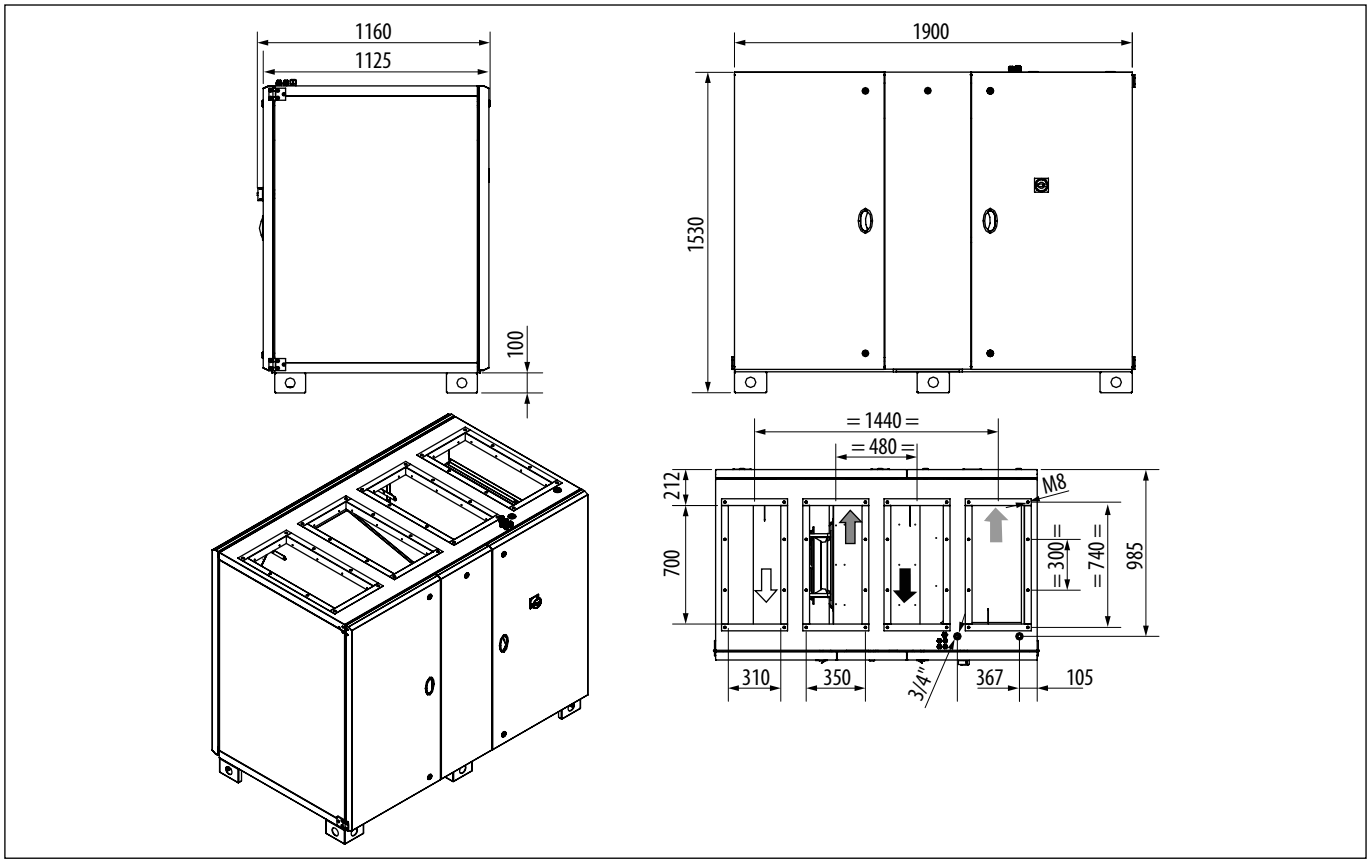
RHE VD 700 / 1300 / 1900 / 2500 / 3500



Sizes / Dimensions (mm)	A	B	C	ØD	E	F	G	H	I	J	K	L	M	N	O	Weight (kg)
RHE 700 VD	1285	715	1125	250	750	1185	200	310	300	101	195	569	1/2″	258	183	196
RHE 1300 VD	1285	715	1125	250	750	1185	200	310	300	101	195	569	1/2″	258	183	196
RHE 1900 VD	1490	815	1250	315	850	1309	300	355	350	90	255	689	1/2″	258	215	257
RHE 2500 VD	1740	965	1350	355	1000	1410	400	420	400	105	307	825	3/4″	283	250	328
RHE 3500 VD	1900	1125	1530	450	1156	1590	450	460	400	105	367	985	3/4″	338	290	395

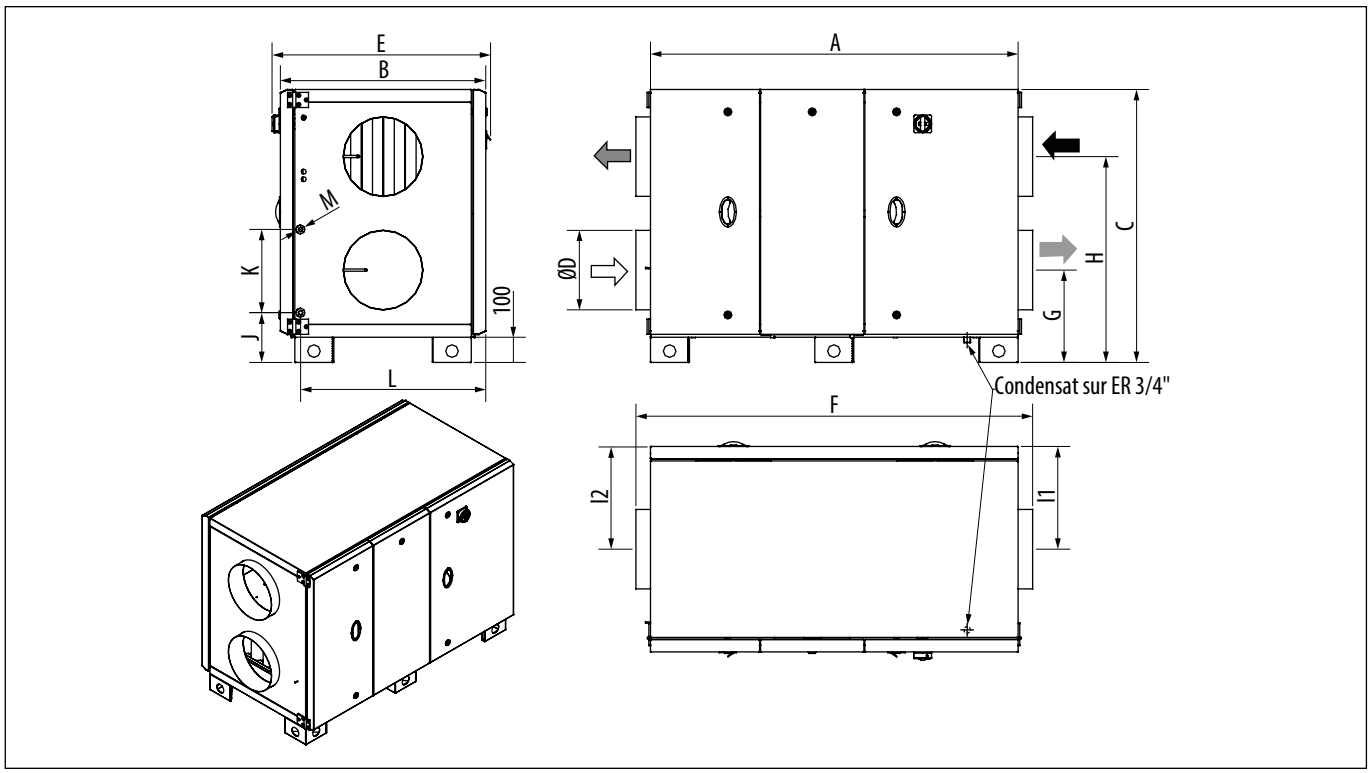
RHE VD 4500

Weight 451 kg



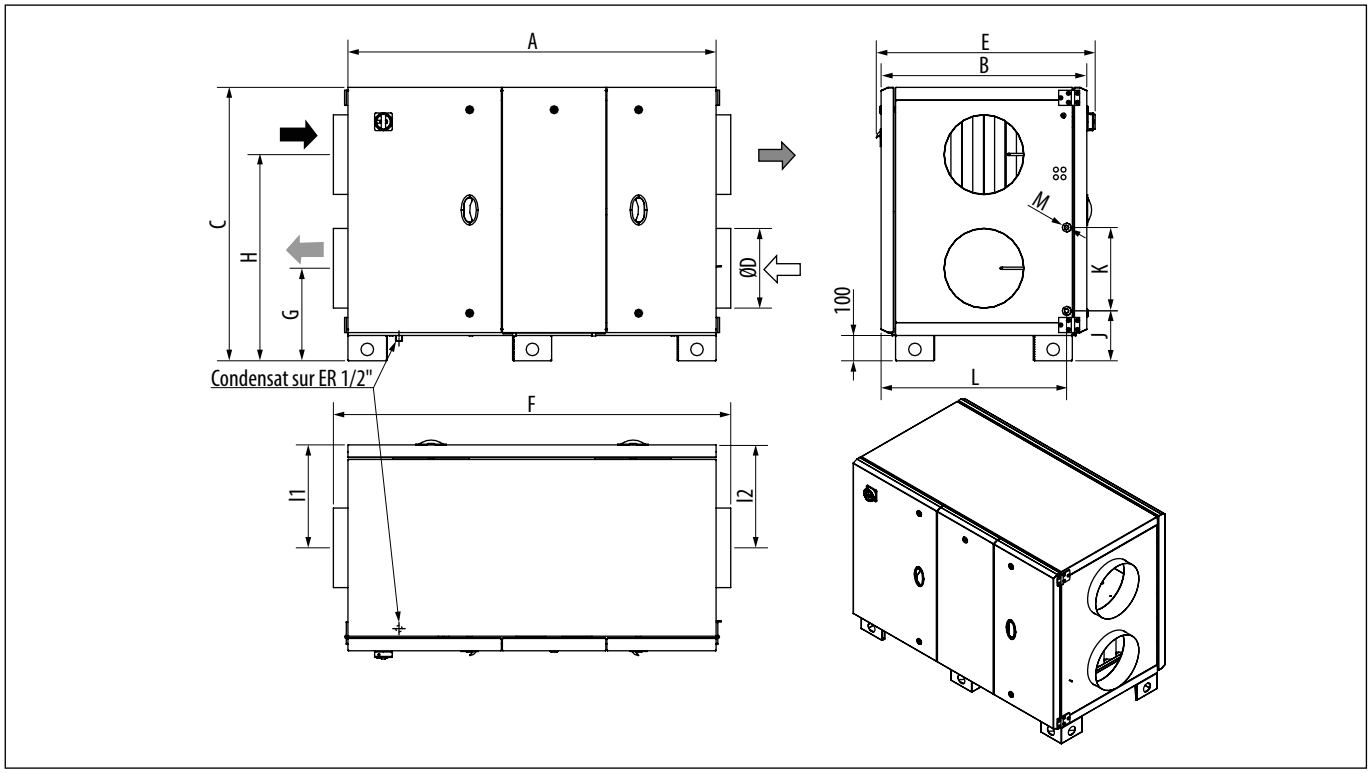
RHE HDR 700 / 1300 / 1900 / 2500 / 3500 / 4500

Right hand side access door on the supply air flow direction



RHE HDL 700 / 1300 / 1900 / 2500 / 3500 / 4500

Left hand side access door on the supply air flow direction

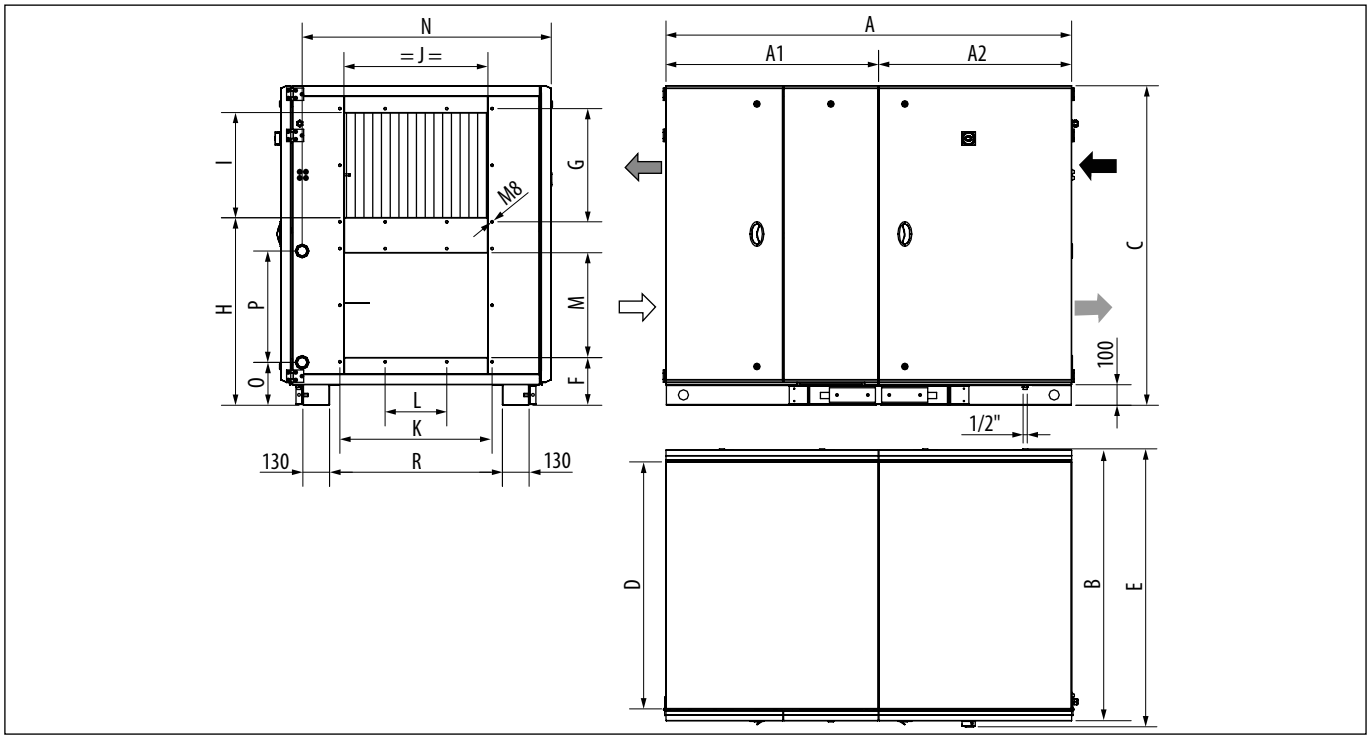


Sizes / Dimensions (mm)	A	B	C	ØD	E	F	G	H	I1	I2	J	K	L	M	Weight (kg)
RHE 700 HDL	1309	715	983	315	763	1425	329	754	327,5	357,5	210	255	625	1/2″	173
RHE 1300 HDL	1309	715	983	315	763	1425	329	754	327,5	357,5	210	255	625	1/2″	173
RHE 1900 HDL	1459	815	1085	355	851	1575	356	826	407,5	407,5	194	337	719	3/4″	217
RHE 2500 HDL	1558	965	1183	400	1000	1675	379	904	482,5	482,5	204	367	869	3/4″	242
RHE 3500 HDL	1558	1125	1363	450	1160	1675	436	1026	562,5	562,5	204	457	1030	3/4″	323
RHE 4500 HDL	1558	1125	1363	500	1160	1675	436	1026	562,5	562,5	204	457	1030	3/4″	323

RHE HDR 6000 / 8000 / 10000

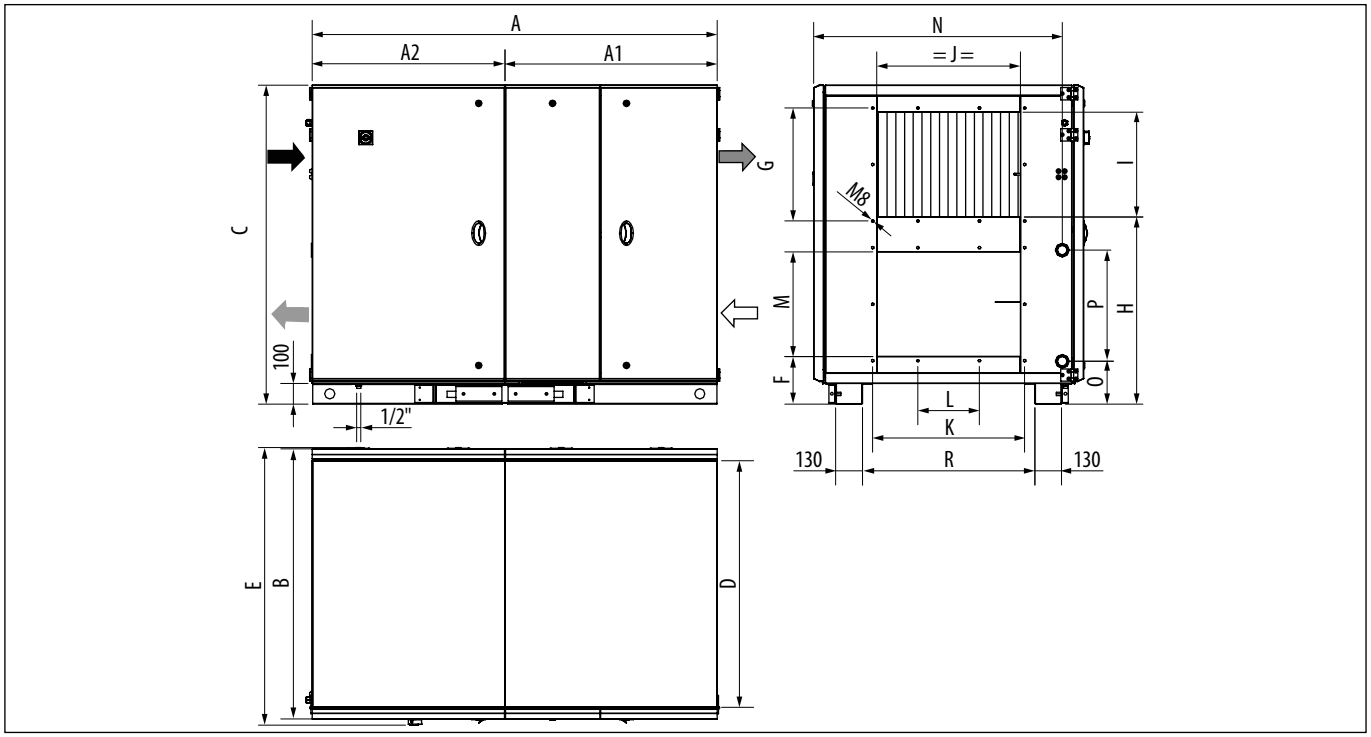
Deliver in 2 parts.

Right hand side access door on the supply air flow direction



RHE HDL 6000 / 8000 / 10000

Left hand side access door on the supply air flow direction

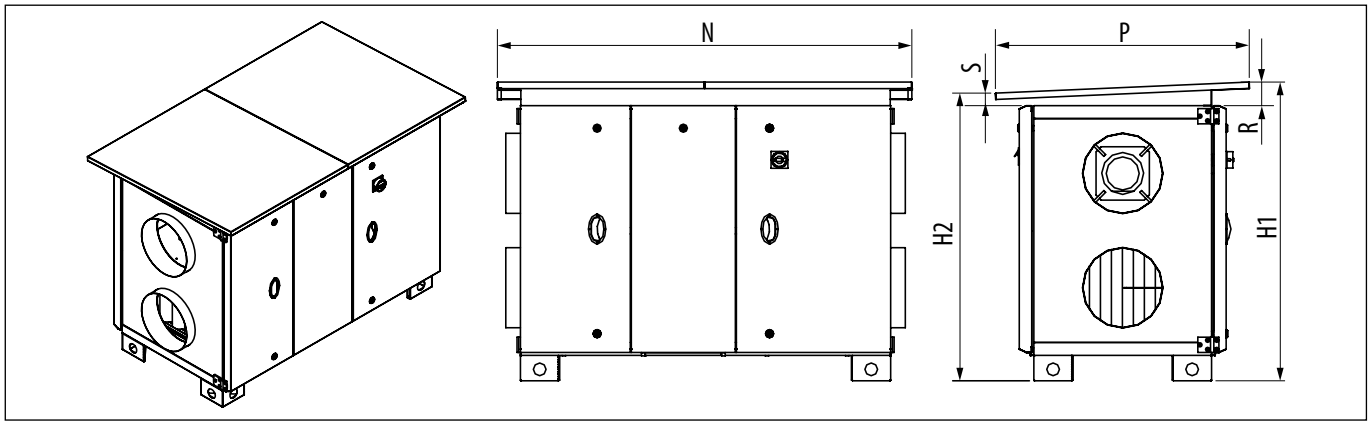


Sizes / Dim. (mm)	A	A1*	A2	B	C	D	E	F	G	H	I	J	K	L	M
RHE 6000 VD	1972	1034	938	1315	1553	1200	1350	235	550	915	510	700	740	300	510
RHE 8000 VD	2112	1114	998	1565	1803	1450	1600	245	650	1050	610	900	940	300	610
RHE 10000 VD	2412	1263	1149	1735	1971	1620	1770	285	650	1175	610	1100	1140	600	610

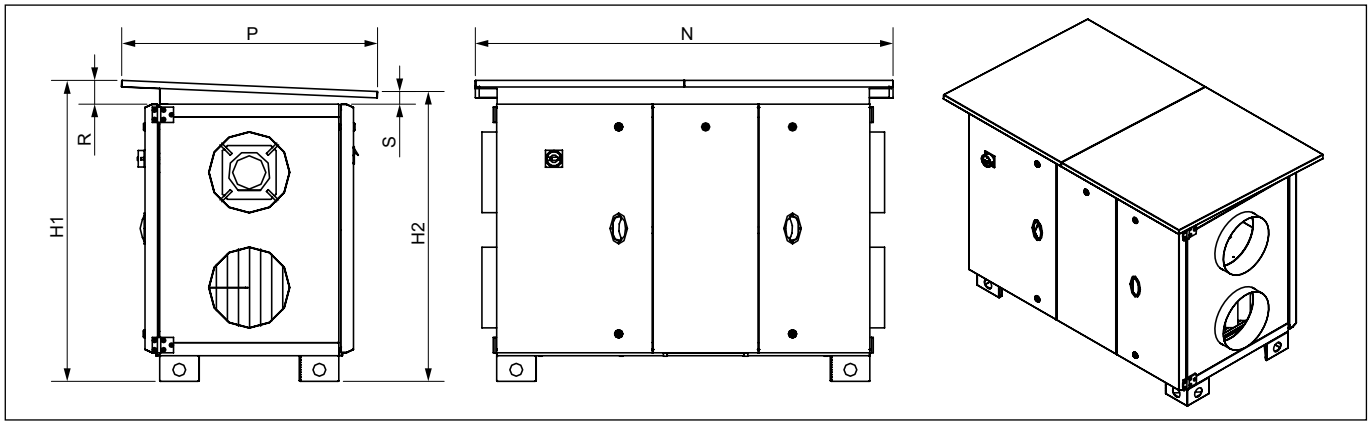
Sizes / Dim. (mm)	N	O	P	Q	R	Weight A1 (kg)	Weight A2 (kg)	Weight (kg)
RHE 6000 VD	1217	205	548	1″	840	290	240	530
RHE 8000 VD	1444	216	653	1 1/4″	1090	490	300	790
RHE 10000 VD	1614	214	743	1 1/4″	1260	584	394	977

* Fitting of 50mm, to add to obtain the length of the module alone

RHE HDR OI 700 / 1300 / 1900 / 2500 / 3500 / 4500 / 6000 / 8000 / 10000
Configuration en ligne servitude droite



RHE HDL OI 700 / 1300 / 1900 / 2500 / 3500 / 4500 / 6000 / 8000 / 10000
Configuration en ligne servitude gauche



Sizes / Dimensions (mm)	H1	H2	N	P	R	S	Weight (kg)
RHE 700 OI	1068	1036	1568	900	85	54	192
RHE 1300 OI	1068	1036	1568	900	85	54	192
RHE 1900 OI	1171	1136	1719	1000	89	54	239
RHE 2500 OI	1276	1236	1818	1150	94	54	267
RHE 3500 OI	1462	1416	1818	1309	99	54	352
RHE 4500 OI	1462	1416	1818	1309	99	54	352
RHE 6000 OI	1659	1606	2232	1500	106	54	569
RHE 8000 OI	1917	1856	2372	1750	115	54	836
RHE 10000 OI	2093	2026	2672	1920	122	54	1037

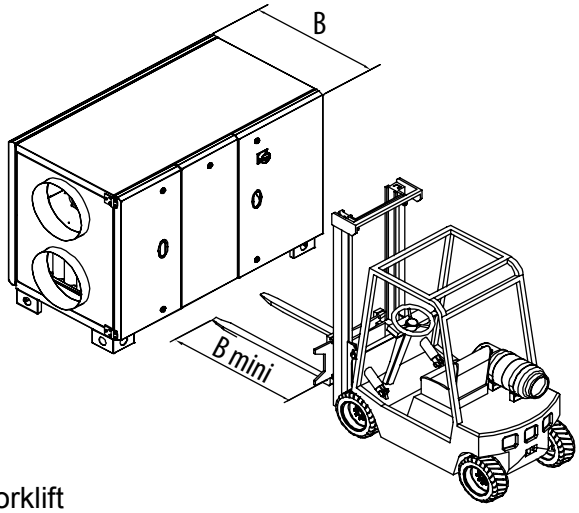
3.3 Handling

The units are delivered screwed to pallets.

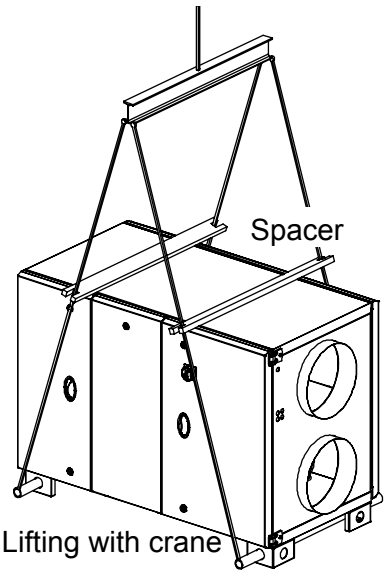
The RHE dual flow air handling units can be handled by a pallet transporter, a forklift, or a crane. The handling machines will be adapted to the load and the lifting conditions. In all cases, the lifting will be done at the device's base. The centre of gravity is located at the centre of the unit.

The device must be carefully manipulated only in the horizontal position. Ø 50 mm. holes are provided for in the frame to allow passing a pipe to hook the slings. To avoid deteriorating the unit's envelope, long length slings and lifting beam spacers must be used.

In case a forklift / pallet transporter is used, the forks should be long enough to avoid pushing in the lower panel. Position the forks low enough so as to not damage the doors. Lift gently.



Lifting with forklift



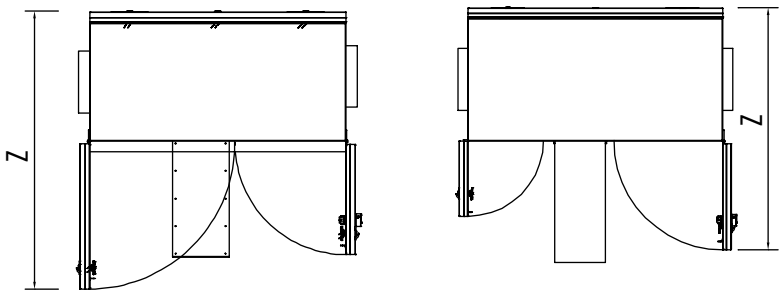
Lifting with crane

3.4 Placement and anchoring

Placement
The RHE dual flow air handling units must be laid on a smooth horizontal surface capable of withstanding the load. The RHE HD / VD Integral units are designed for an installation inside the premises. Only the OI versions delivered with a roof can be used outdoors.

In all cases, provide for ducts, connection accessories, heater antifreeze protection and antivibration equipment. In heavy snowfall zones, an additional protection must be provided for.

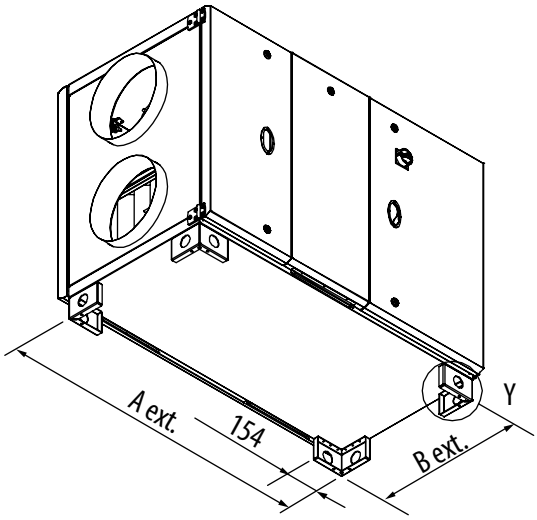
It is important to provide for enough space (Z minimum) to allow opening the doors, commissioning and maintenance (filters, fans, heat exchanger). Do not position the unit against a wall to avoid the transmission of structurally borne noise.



Type	Z (mm)
RHE 700	1450
RHE 1300	1450
RHE 1900	1500
RHE 2500	1800
RHE 3500	2100
RHE 4500	2100
RHE 6000	2515
RHE 8000	3015
RHE 10000	3294

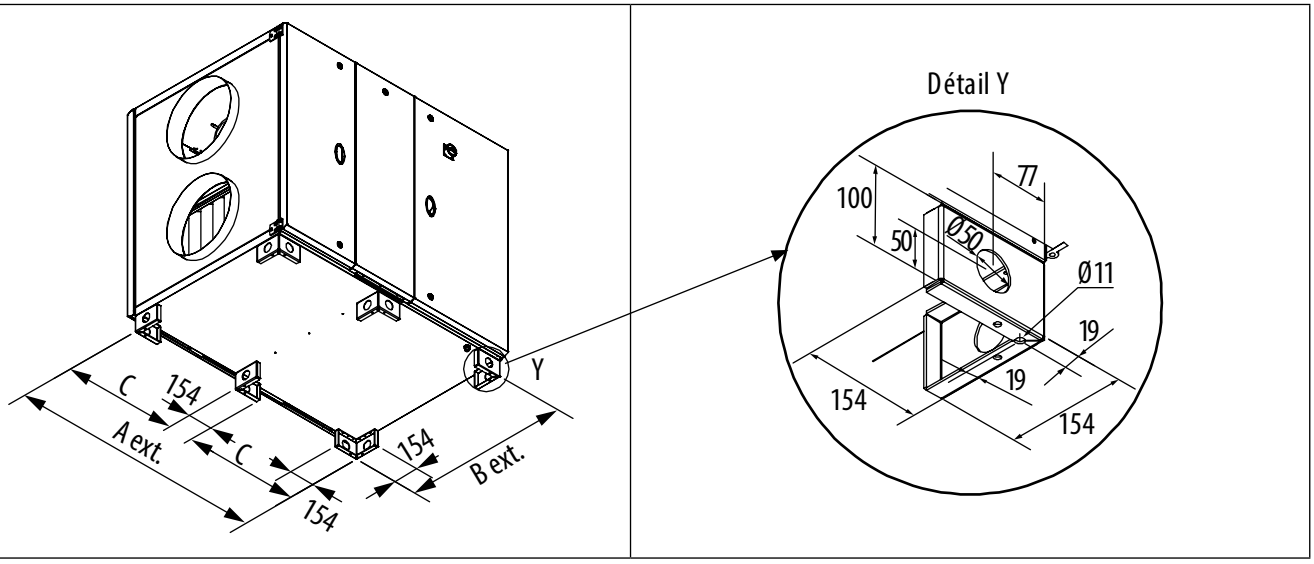
Standard feet up to size 4500
The units are delivered with their 4 or 6 feet according to the models. The support feet must rest on the entire contact surface.

RHE 700 / 1300 / 1900/ 2500



Sizes / Dim. (mm)	Cote A	Cote B
RHE 700/1300 HD	1308,5	600
RHE 1900 HD	1458,5	700
RHE 2500 HD	1558,5	850
RHE 1300 VD	1285	600
RHE 1900 VD	1490	700
RHE 2500 VD	1740	850

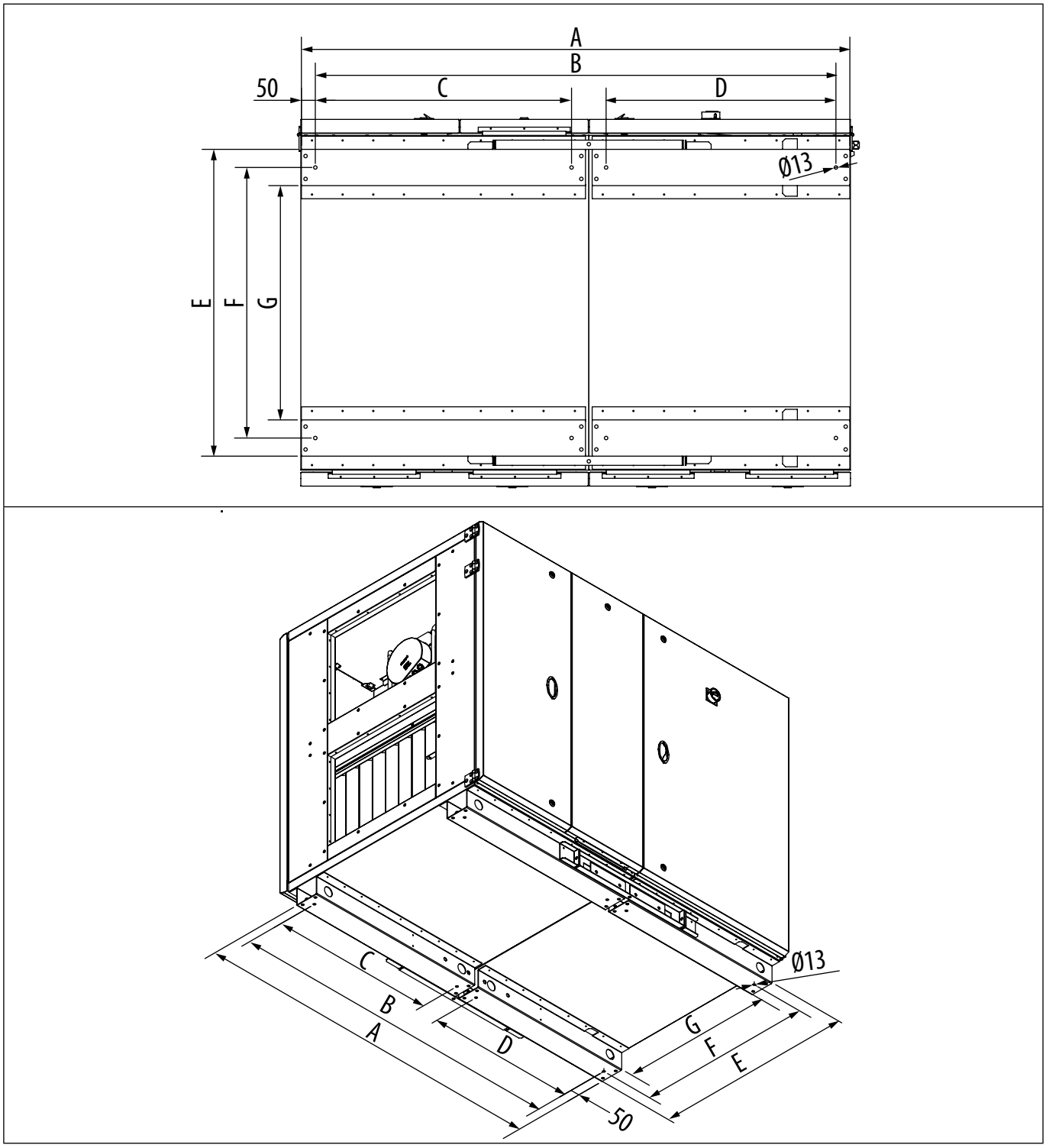
RHE 3500 / 4500



Sizes / Dimensions (mm)	A	B	C
RHE 3500/4500 HD	1558,5	1010	702,2
RHE 3500/4500 VD	1900	1010	873

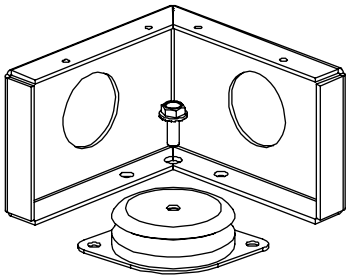
RHE 6000 / 8000 / 10000

On size 6000 - 8000 - 10000, units are delivered with frame in galvanized steel 3mm thickness, 100mm height, with assembling system between 2 modules, fixing holes for antivibration pads or adjustable feets. With this frame system, the unit could be lift with a crane after assembling the unit on the floor.



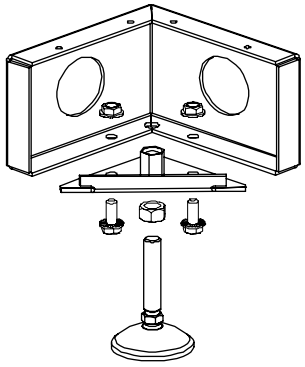
Sizes / Dimensions (mm)	A	B	C	D	E	F	G
RHE 6000 HD	1968	1868	919,4	824,6	**1100**	**970**	**840**
RHE 8000 HD	2108	2008	999,4	884,6	**1350**	**1220**	**1090**
RHE 10000 HD	2408	2308	1149,4	1034,6	**1520**	**1390**	**1260**

Use preferably antivibration pads or plates to be positioned between the feet and the ground.



Model	Antivibratil cup mounts	Code	Qty to order (composed with 4 cup mounts)	Height (mm)	Attachement distance between centres (mm)
RHE 700	PAVZ 80		1	27	100
RHE 1300	PAVZ 80	5130272900	1	27	100
RHE 1900	PAVZ 80	5130272900	1	27	100
RHE 2500	PAVZ 100	5130863400	1	28	124
RHE 3500	PAVZ 100	5130863400	2	28	124
RHE 4500	PAVZ 100		2	28	124
RHE 6000	PAVZ 100	5130863400	2	28	124
RHE 8000	PAVZ 100	5130863400	2	28	124
RHE 10000	PAVZ 100	5130863400	2	28	124

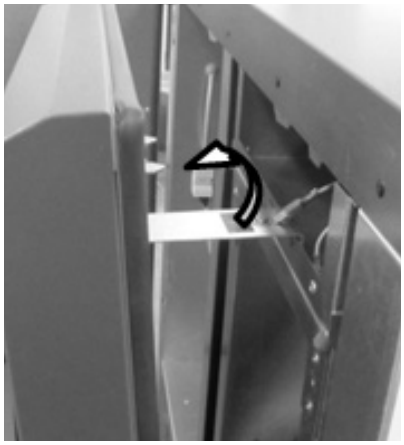
Adjustable feet (accessories)
It is possible to obtain a greater guard height by adding adjustable feet (option) under the standard feet. In this case, the use of antivibration supports is not necessary. For example, this space can allow installing a siphon.



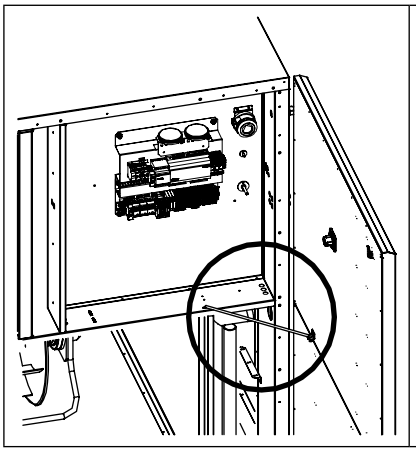
Model	Adjustable feet	Code	Qty to order (composed with 4 cup mounts)	Height (mm)	Attachement distance between centres (mm)
RHE 700	Kit of 4 feet	5407029800	1	75	50
RHE 1300	Kit of 4 feet	5407029800	1	75	50
RHE 1900	Kit of 4 feet	5407029800	1	75	50
RHE 2500	Kit of 4 feet	5407029800	1	75	50
RHE 3500	Kit of 6 feet	5407029900	2	75	50
RHE 4500	Kit of 6 feet	5407029900	2	75	50
RHE 6000	Kit of 4 feet	5407029800	2	75	50
RHE 8000	Kit of 4 feet	5407029800	2	75	50
RHE 10000	Kit of 4 feet	5407029800	2	75	50

Opening of the doors
The RHE units are equipped as follows :

- In the front on the lefthand and righthand sides, doors mounted on hinges held closed by latches.
- In the central front position, a door held up by a latch placed on the bottom on a support rail and retained in the top part by a retractable hook.
- In the back, doors held up by latches placed on the bottom on a support rail and retained in the top part by a retractable hook.



To completely open the latches, move the latches a quarter turn counterclockwise.
Don't forget to disconnect the earthing wires and reconnect them before start-up.

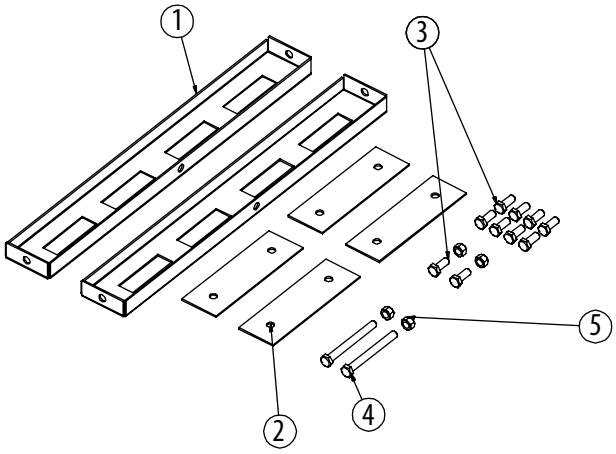


On the units of size 6000 - 8000 and 10000, a door handrail is install on the controler part. It allows the locking of the door in the open position..

3.5 Assembly of the units delivered in two parts

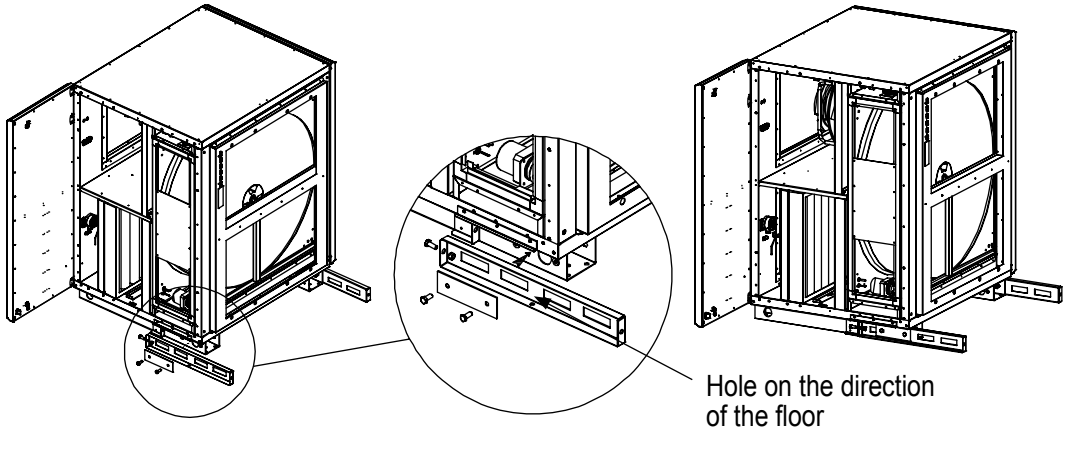
The RHE sizes 6000, 8000 and 10000 are delivered in two parts to facilitate the travel up to the installation site. To decrease the weight of modules, it is possible to remove the back side panels, as well as the front doors. Filters, heat exchanger and ventilators could be easily removed also (see chapter "10. MAINTENANCE"). Both modules must be installed on a plane surface and horizontal. Adjustable feet (accessories) allow to compensate a small level difference.

- Units in 2 parts are delivered with a junction kit.

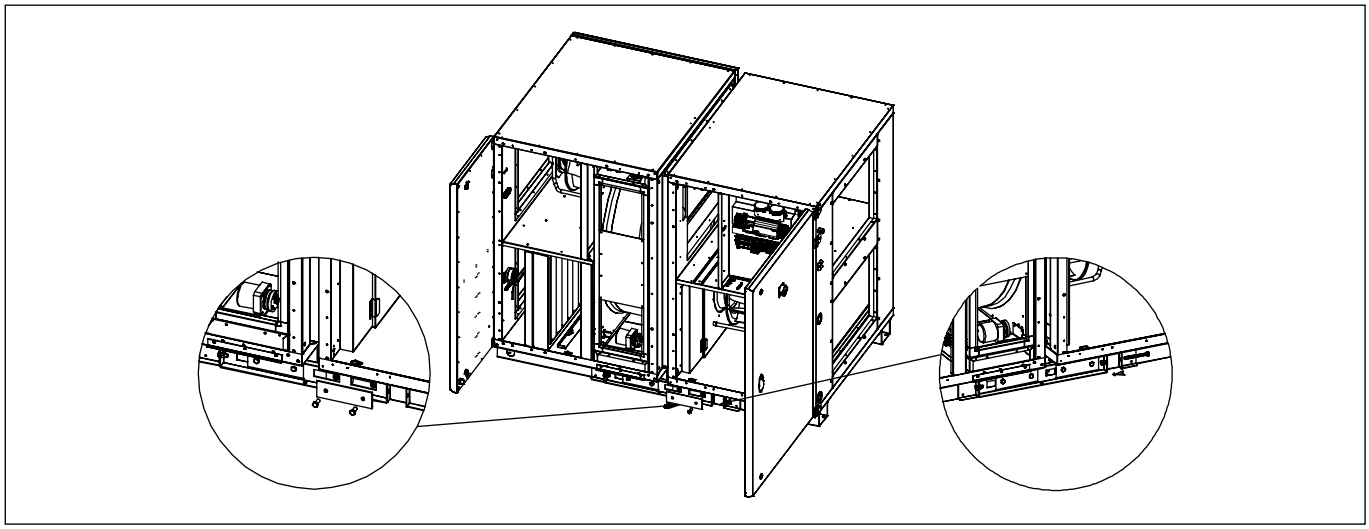


Junction kit components			
N°	Qté	Réf	Description
1	2	20434	Junction elements
2	4	20435	Junction strengthening elements
3	10	507364	Screw H M12x30
4	2	505511	Screw H M12x120
5	4	506531	Nut H M12

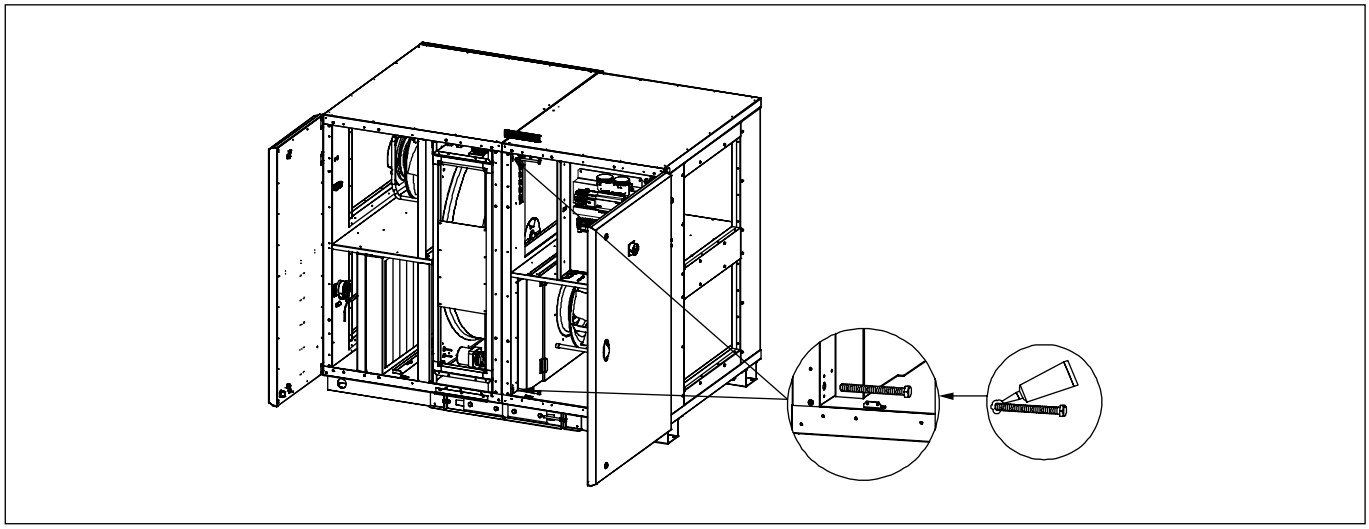
- On the first part, fix on both side the junction elements without fully tighten the junction strengthening elements.



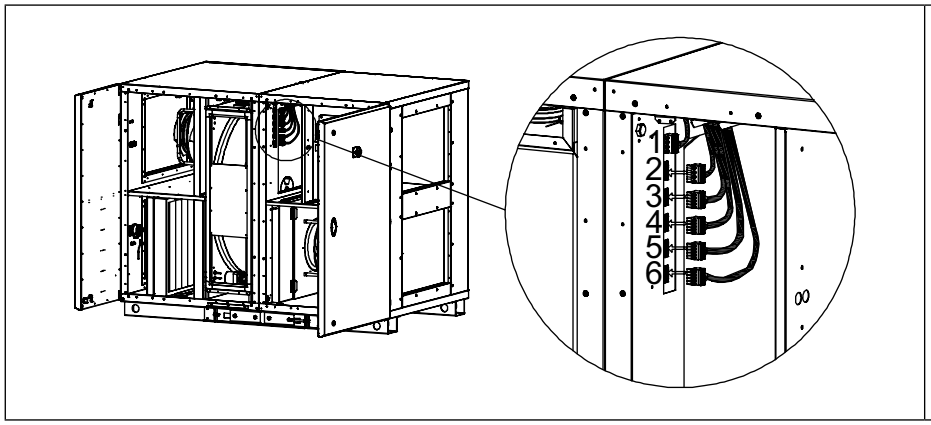
- Move closer as much as possible to both modules; fix the junction elements on the second module loosely. Finalize the junction with the tensioner screw.



The final junction of modules is made by screw M12x120 (key of 18th). The fixations locations are place on the 4th internal (+ 2 fixation points on the middle on size 100). Before tightening, put grease on the screw, and verify that the various components are correctly slid. Screw up all the fixing points.



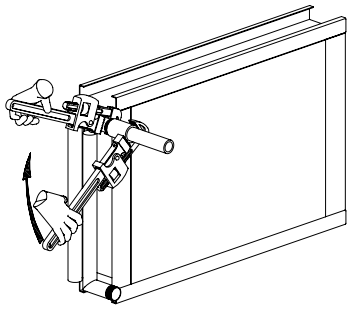
- Connect the fast electrical connector as shown :

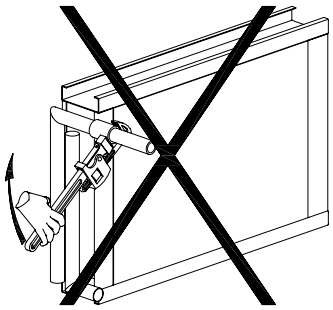


1 - Plug fan electrical power.
2 - Heat exchanger electrical power.
3 - Plug fan control signal.
4 - Heat exchanger control signal.
5 - Exhaust air fan pressure transmitter.
6 – Pressure guard + temperature probe.

4. HYDRAULIC CONNECTION

4.1 Water coils connection

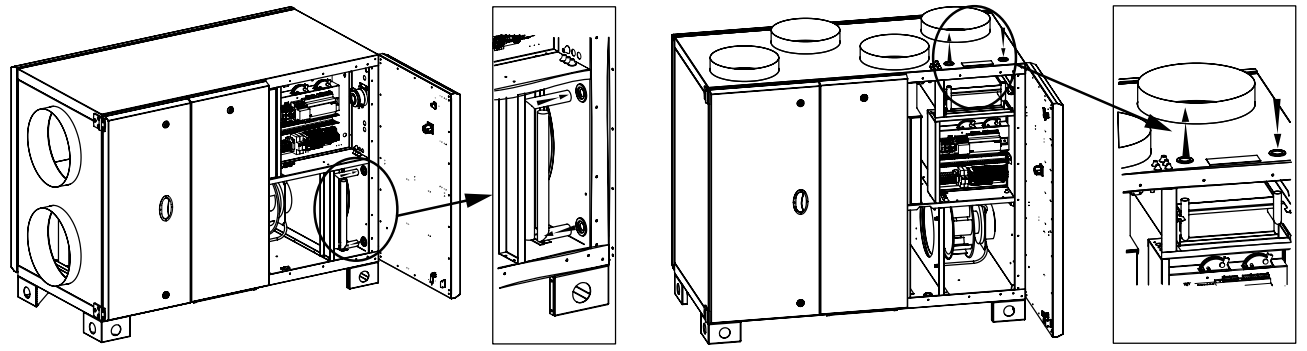




The unit's hydraulic data are specific to your installation and are determined by the computer selection : Water pressure drop / Waterflow. Refer to the selection to size the network, accessories, pump, etc.

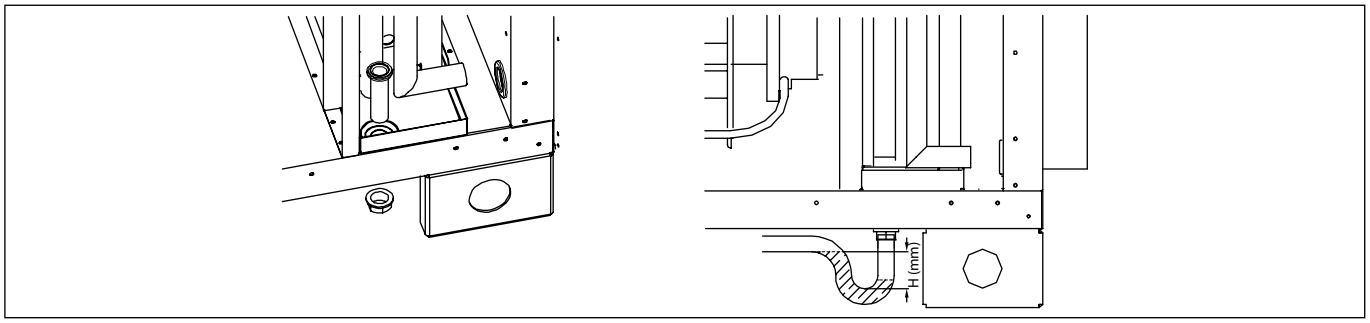
The pipe connection to the coil must not impose mechanical, vibrational or thermal (expansion) stresses
on the coil.
The coils are delivered end-threaded.
Sizes 700 / 1300 / 1900: Diameter 1/2″
Sizes 2500 / 3500 / 4500: Diameter 3/4″
Size 6000: Diameter 1″
Size 8000 / 10000: Diameter 1 ¼ ″
When tightening the coils threads, hold the pipe in the counter direction, for example, with a Stillson type wrench to prevent pipe damages by torsion.

The coils are connected to the network inside the unit. Respect the water inlet and outlet directions.



Condensates drain (reversible water coil DFR version HD only)
The installed coil is equipped with a droplet separator and a condensate dip tray made of stainless steel welded in the corners.
The condensates drain located under the unit (diameter 1/2″) is to be connected to a siphon.
The siphon supplied with the RHE unit is designed for a pressure available on the supply system of 300 Pa maximum. Pass the threaded pipe through the condensates dip tray and the bottom of the RHE unit and then tighten the nut below. Fit the siphon in the threaded pipe.

The minimum drain slope must be 5 / 1000.

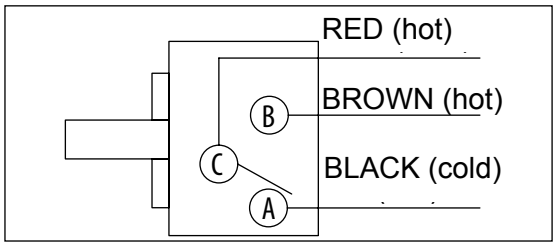


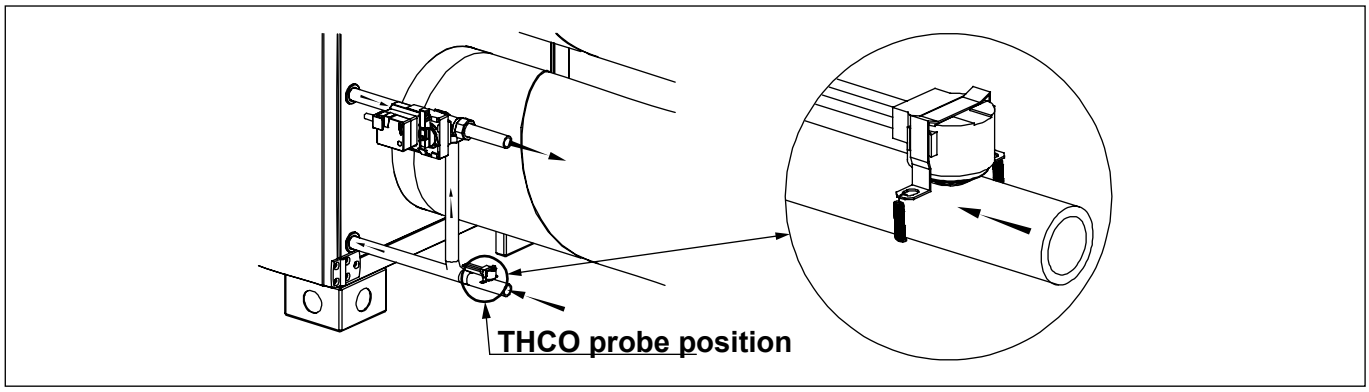
To size a siphon : H min (mm) = 4 + pressure drop of the air injection network (da Pa).

Thermostat change over (reversible water coil DFR version HD only)
A thermostat change over (THCO PROBE) have to be set on the hydraulic network and have to be connected to the unit's electrical box. It allows reversing the mixing valve control in installations with only one coil according to the temperature of fluid detected in the valve inlet.

Technical data:

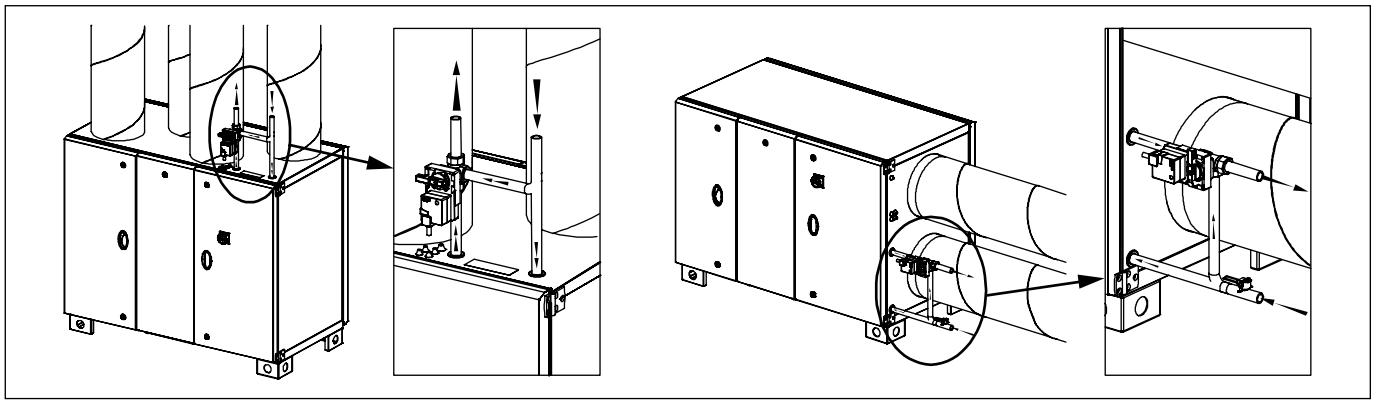
- Inverter contact output : 240 VAC, 3 A
- AC contact calibration open : 30 ± 4°C
- AC contact closed: 15 ± 4 °C
- Attachment by spring on the pipe
- 3-wire electric connection length : 1 500 mm
- Degree of protection : IP 65





4.2 Valves connection

Motorized 3-way valves are not delivered mounted. They are proposed as accessories by S&P.
Respect the positioning of the mixing valve on the network and the water inlet and outlet directions.



Electric connection on the RHE box: see subsection **"6.5 Inputs – outputs"**

5. AIR DUCT CONNECTION

5.1 Ducts connection

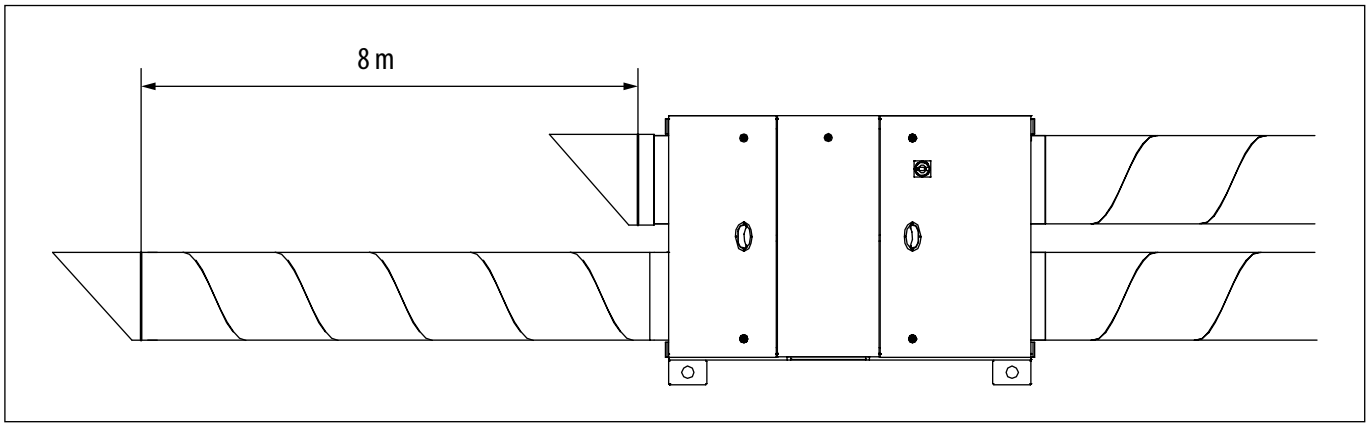
Connecting ducting to be correctly aligned self supporting.
Make sure that the motor driven fans are not accessible from the connection taps (Protection by the connection duct or a screened air intake).
Do not reduce the diameter of the ducts at the oulet of the connection taps.
On the other hand, the diameter can be increased to reduce the passage speeds in the network, limit the pressure drops and the sound level.
Depending on the installation's configuration and the required sound level, a silencer may have to be added at the discharge as well as at the supply.

Exercise the greatest care to ensure tightness over the entire lengths of the networks from inlets to outlets.

In circular operation, use preferably accessories with joints (at least class C according to EN12237).
Fresh air and discharge ducts must always be isolated to avoid losses and risks of condensation. The isolation level particularly in cold regions and parts must be reinforced.

In all cases, respect at least the regulations in force.

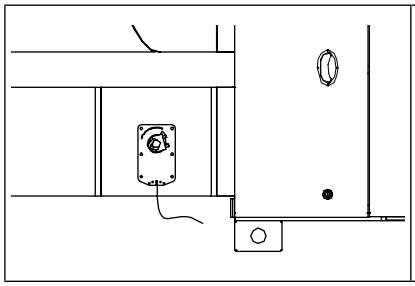
Respect a minimum distance of 8 m between the fresh air intake and the discharge. Place the fresh air intake far from any specific pollution.



5.2 Accessories connection

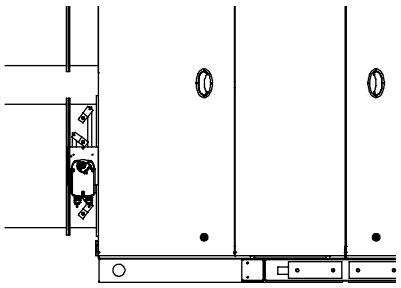
Dampers
Electric connection on the RHE box : see subsection "External components connection drawings". When the unit is equipped with a water coil it is recommended to provide for an antifreeze protection damper on the fresh air network. If possible, use a motorized airtight damper.
A second damper should be mounted on the extraction network to isolate the unit.

Unit up to size 4500 – circular air duct connection



RHE Type	Code	Designation	Duct Ø (mm)
700 VD / 1300 VD	5416762600	REEV 250	250
1900 VD / 700 HD / 1300 HD	5416786700	REEV 315	315
2500 VD / 1900 HD	5416762700	REEV 355	355
2500 HD	5416762800	REEV 400	400
3500 VD / 3500 HD	5416786800	REEV 450	450
4500 HD	5416820200	REEV 500	500

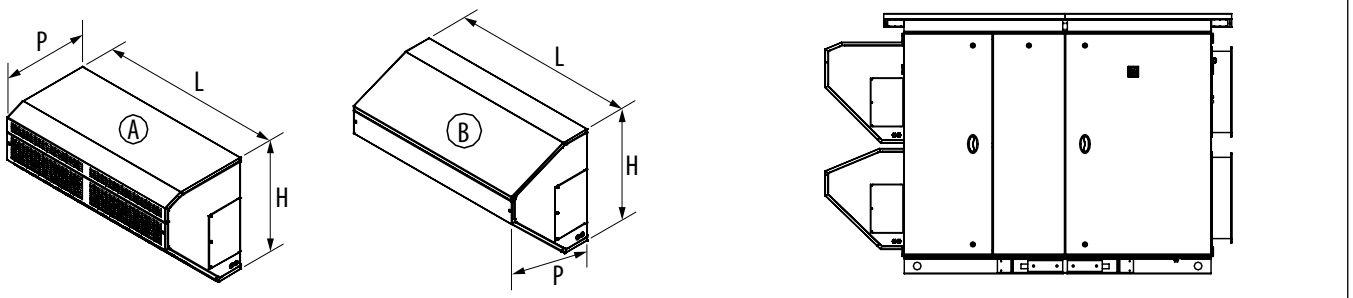
Unit size 6000 / 8000 / 10000 – rectangular air duct connection



RHE Type	Code	Designation
4500 VD	5407039400	**MLD 4500 T L700 H310 mm damper leakage performance class 3 blade distance 100 mm**
6000 HD	5407031800	**MLD 6000 T L700 H510 mm damper leakage performance class 3 blade distance 100 mm**
8000 HD	5407031900	**MLD 8000 T L900 H610 mm damper leakage performance class 3 blade distance 100 mm**
10000 HD	5407037000	**MLD 10000 T L1100 H610 mm damper leakage performance class 3 blade distance 100 mm**

Code	Designation	Description
5416762900	**LF 230 S**	On/Off Spring return actuator 4Nm 230V/ Auxiliary switch

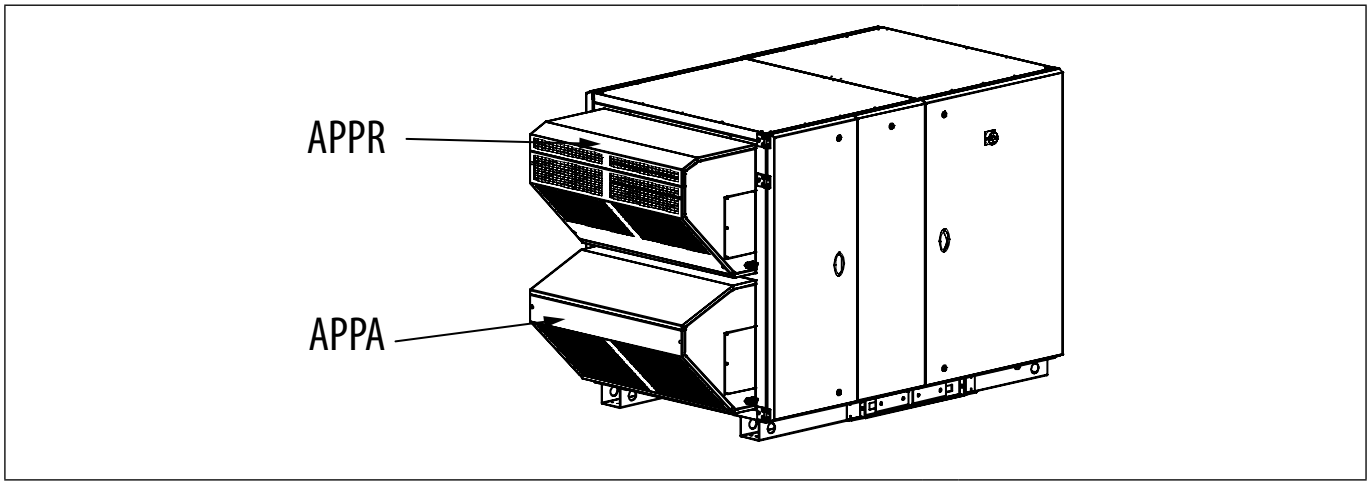
Exhaust air and outdoor air protection canopy



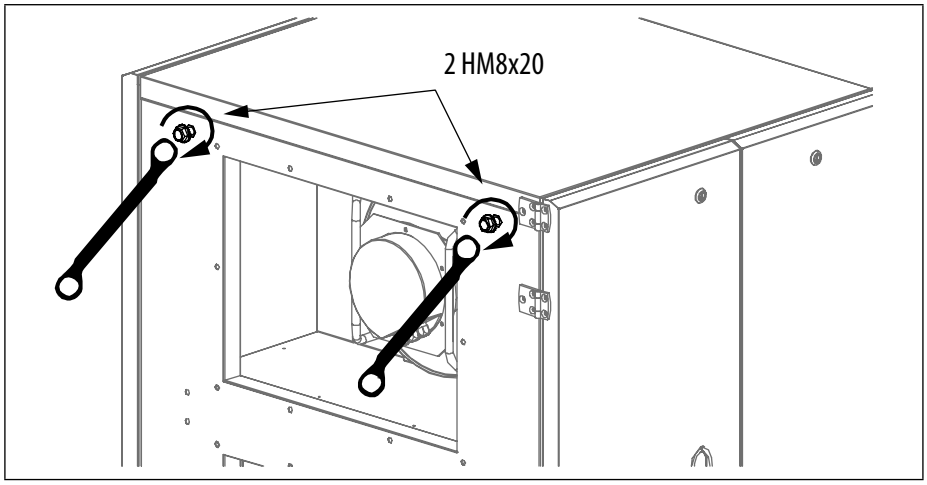
The outside units until the size 3500 can be equipped with standard accessories for circular ducts, type APC for the exhaust air and outdoor air inlet protection canopy. For the sizes 6000, 8000 and 10000 with rectangular air connection, exhaust air and outdoor air protection canopy are specific. (See installation instruction in the end of this technical manual).

Type	Code	Designation	H	L	P
A	5407032000	**APPR 6000 Exhaust air protection canopy RHE 6000**	647	1065	506
	5407032100	**APPR 8000 Exhaust air protection canopy RHE 8000**	747	1265	564
	5407036000	**APPR 10000 Exhaust air protection canopy RHE 10000**	747	1465	564
B	5407032200	**APPA 6000 Outdoor air protection canopy RHE 6000**	647	1065	506
	5407032300	**APPA 8000 Outdoor air protection canopy RHE 8000**	747	1265	564
	5407035900	**APPA 10000 Outdoor air protection canopy RHE 10000**	747	1465	564

Installation APPA-APPR
(Screws included)



1



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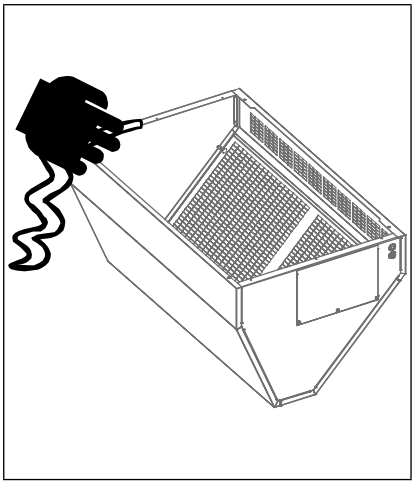

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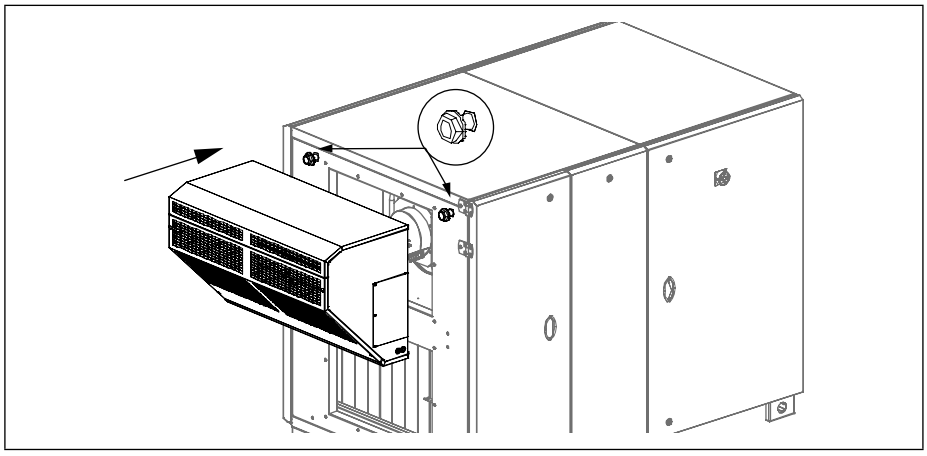

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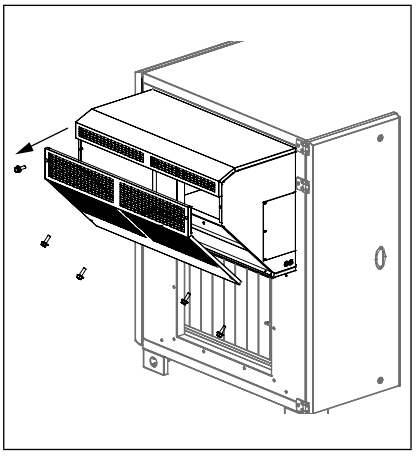

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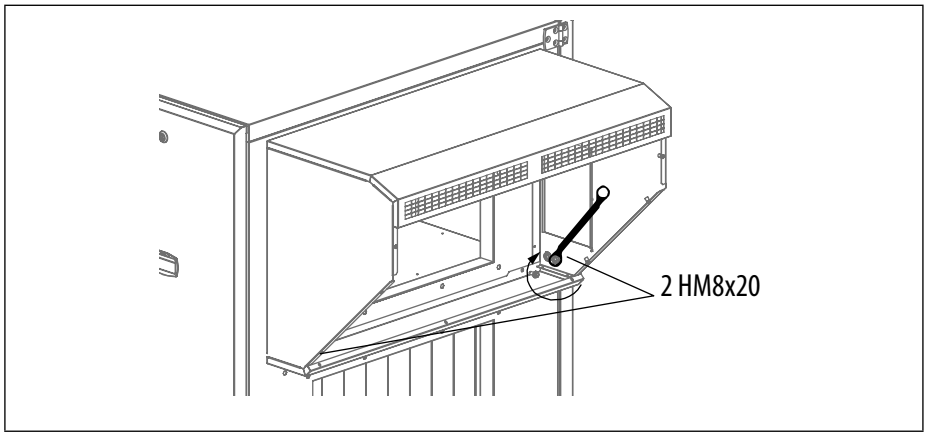

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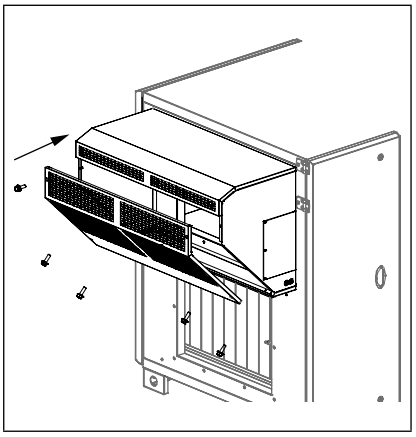
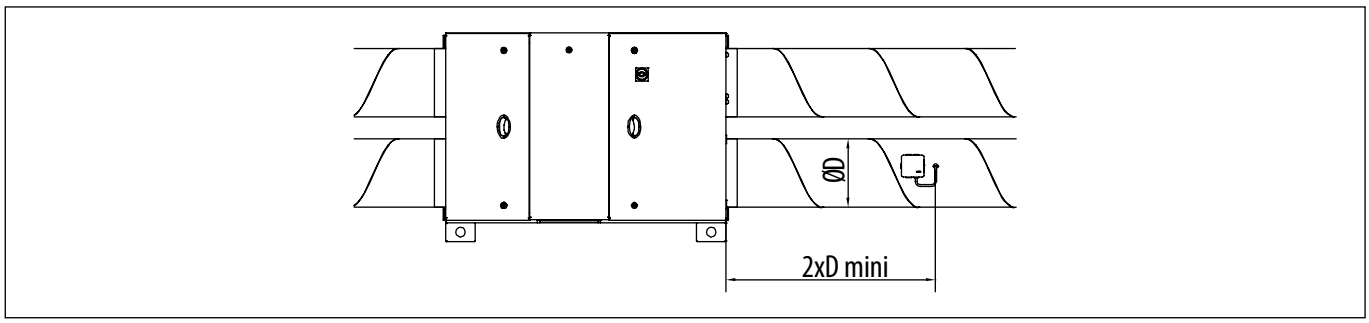


Differential pressure probe – Operation in COP (Constant Pressure)
Electric connection on the RHE box: see subsection **"6.6 External components connection drawings (examples)".**

For an operation at constant pressure, it is necessary to install a pressure probe (Accessory) in the supply duct at a minimum distance of twice the connection's diameter.



Sonde de pression conseillée :

Application	Code	Designation	Description
RHE 700/1300	5416826200	**SPRD-010B 500**	Pressure transmitter in box 0 to 500 Pa/ Output Signal 0,5/ 4,5 Vdc Nominal voltage 12 up to 24 V dc
All sizes except 700/1300	5416786900	**SPRD-010B 800**	Pressure transmitter in box 0 to 800 Pa/ Output Signal 0,5/ 4,5 Vdc Nominal voltage 12 up to 24 V dc
SPRD Accessoiry	5416787000	**KTPR**	Kit of 2 pressure taps + screws + 2 m Translucid tube

Air quality probe, measurement of CO2 - Operation in VAV (Variable Flow Rate)
Electric connection on the RHE box: see subsection **"6.6 External components connection drawings (examples)".**
For an operation with a variable airflow, it is necessary to install an air quality probe (in general, CO2) either in the discharge duct, or in the environment in the part to be treated.

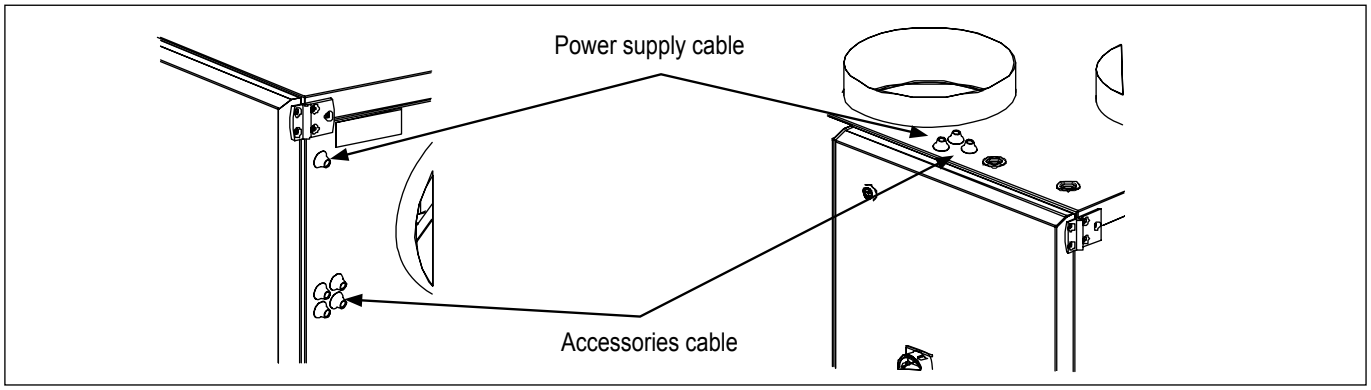
Recommended CO2 probes :

Code	Designation	Description
5401221000	**SCO2-A 0/10V**	Room CO2 sensor with display 0-2000 ppm Output signal 0-10V
5401221100	**SCO2-G 0/10V**	Room CO2 sensor 0-2000 ppm Output signal 0-10V

6. ELECTRIC CONNECTION

6.1 Electrical data

The power or connection cables of the accessories must pass by the provided cable sockets.



Version HD (supply on top side) **Version VD (on the upper right hand corner)**

Global unit
Power and current for the totality of the selected RHE unit.
Capacity of the power connection terminal strip : 10 mm², tightening torque: 2.5Nm.

Complet unit							
Model	**Voltage (V)**	**Total Power (kW)**	**Current max total (A)**	**Model**	**Voltage (V)**	**Total Power (kW)**	**Current max total (A)**
RHE 700 D/DC/DFR	1 phase 230V	1	3,6	**RHE 700 DI**	1 phase 230V	4	16,7
RHE 1300 D/DC/DFR	1 phase 230V	2	7,24	**RHE 1300 DI**	1 phase 230V	6	24,6
RHE 1900 D/DC/DFR	1 phase 230V	2	7,44	**RHE 1900 DI**	1 phase 230V	10	42,2
RHE 2500 D/DC/DFR	3 phase 400V	3	4,44	**RHE 2500 DI**	3 phase 400V	15	21,8
RHE 3500 D/DC/DFR	3 phase 400V	3	4,61	**RHE 3500 DI**	3 phase 400V	18	26,3
RHE 4500 D/DC/DFR	3 phase 400V	4	7,2	**RHE 4500 DI**	3 phase 400V	19	29
RHE 6000 D/DC/DFR	3 phase 400V	4	7,2	**RHE 6000 DI**	3 phase 400V	28	41,9
RHE 8000 D/DC/DFR	3 phase 400V	6	9,8	**RHE 8000 DI**	3 phase 400V	42	61,8
RHE 10000 D/DC/DFR	3 phase 400V	6,5	10,5	**RHE 10000 DI**	3 phase 400V	55	79,8

Motor driven fan groups

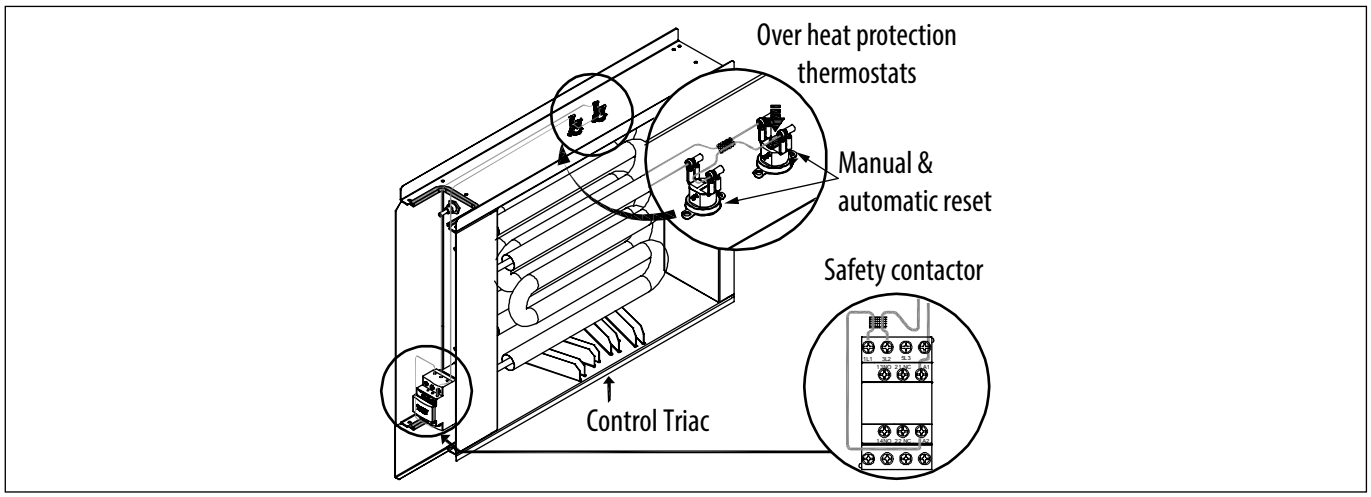
Sizes	**Fan**				
	Voltage (V)	**Frequency (Hz)**	**Max absorbed power (W)**	**Current (A)**	**Maxi speed (rpm)**
700	1 phase 230V	50/60	194	1,2	2650
1300	1 phase 230V	50/60	700	3	3450
1900	1 phase 230V	50/60	715	3,1	2800
2500	3 phase 400V	50/60	1000	1,6	2580
3500	3 phase 400V	50/60	1000	1,7	2140
4500	3 phase 400V	50/60	1850	2,9	2180
6000	3 phase 400V	50/60	1850	2,9	2180
8000	3 phase 400V	50/60	2730	4,2	2040
10000	3 phase 400V	50/60	3000	4,6	1500

Wheel drive motor

Sizes	Heat exchanger rotor drive motor		
	Voltage (V)	Nominal power (W)	Current (A)
700	1 phase 230V	40	0,2
1300	1 phase 230V	40	0,2
1900	1 phase 230V	40	0,2
2500	3 phase 400V	55	0,28
3500	3 phase 400V	55	0,28
4500	3 phase 400V	55	0,28
6000	3 phase 400V	55	0,28
8000	3 phase 400V	120	0,35
10000	3 phase 400V	120	0,35

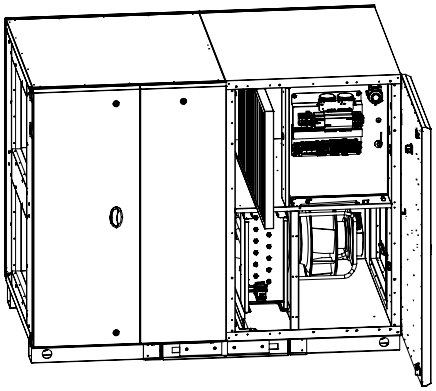
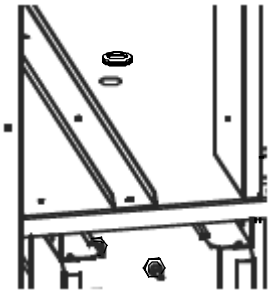
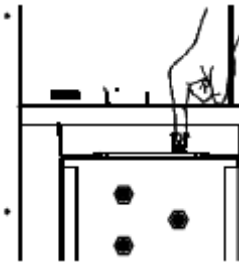
Integrated electric heater – Model DI

On the DI models, an electric heater is installed inside the unit. It is entirely cabled and connected to the controller.

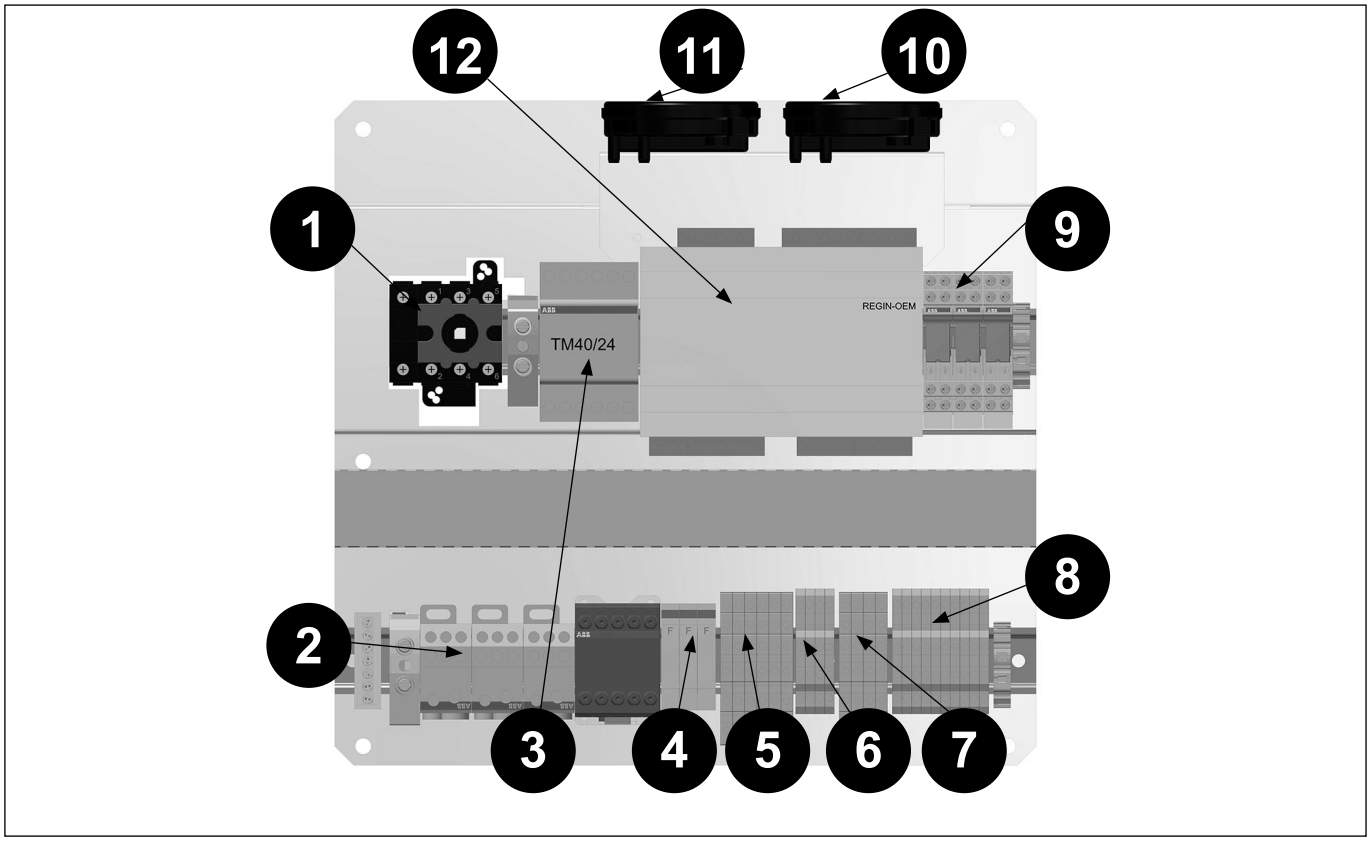


Model	Voltage (V)	Nominal power (W)	Current (A)
RHE 700 DI	1 phase 230V	3	13,1
RHE 1300 DI	1 phase 230V	4	17,4
RHE 1900 DI	1 phase 230V	8	34,8
RHE 2500 DI	3 phase 400V	12	17,3
RHE 3500 DI	3 phase 400V	15	21,7
RHE 4500 DI	3 phase 400V	15	21,7
RHE 6000 DI	3 phase 400V	24	34,7
RHE 8000 DI	3 phase 400V	36	52
RHE 10000 DI	3 phase 400V	48	69,3

On the units of size 6000 - 8000 and 10000, the sécurity thermostat could be reseted from the inside of the unit.

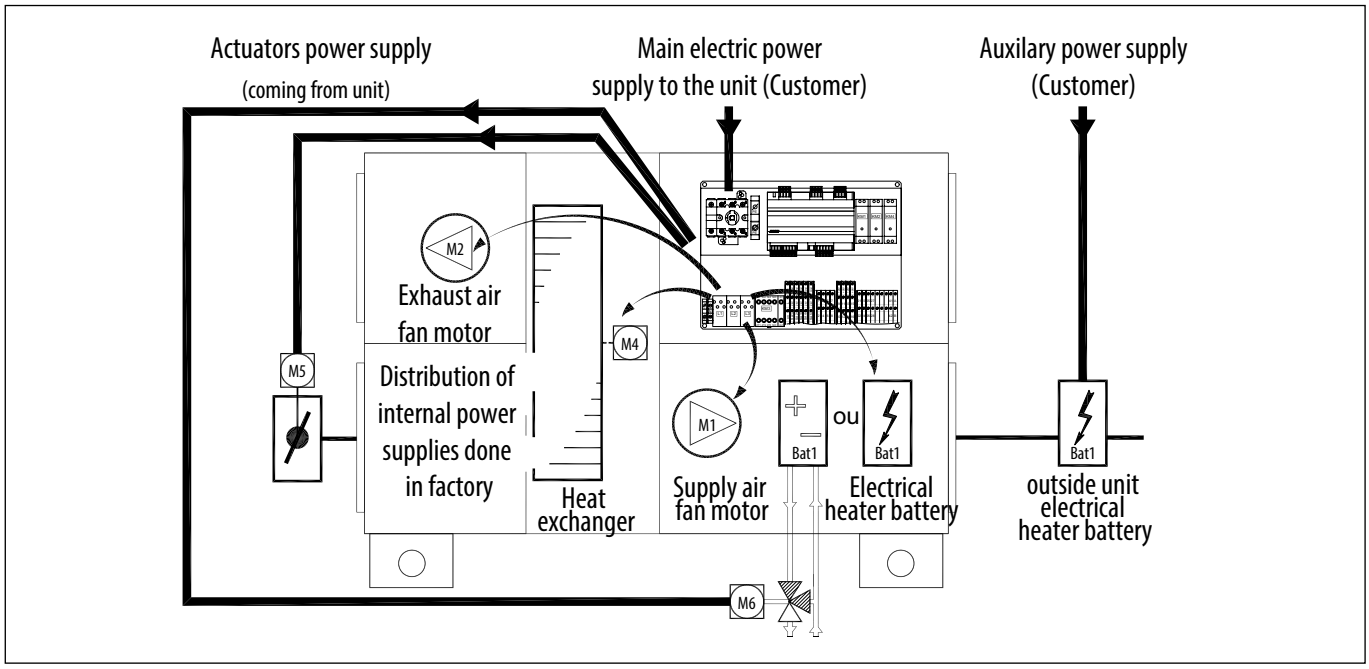
Put out the exhaust air filters	Put out the rubber washer	Reset the manual security thermostat
		

6.2 Internal electrical box – composition / connection



Position	Description
1	Main power connection switch / safety circuit breaker
2	Electrical power distributor for the different components
3	Transformer 230V/24V 50Hz
4	Control circuit protection fuse (F1= 1,6 A ; F2= 1,6 A; F3= 2,0 A)
5	Analogic output switches
6	Temperature sensor switches
7	Universal switches : CO2 sensor / pressure tranmitter …
8	Digital input switches : On/Off, thermostat…
9	Relay output : information report, damper actuator…
10	Pressure transmitter control on exhaust air flow
11	Pressure transmitter control on supply flow
12	Controller CORRIGO : Regin-OEM ref CTA-RHE

Power connection



6.3 Controller CORRIGO - Technical data

- Supply voltage 24 V AC ±15 %, 50…60 Hz or 21…36 V DC
- Power consumption model E...W-3: 12 VA, 6 W (DC)
- Ambient temperature 0...50°C Storage temperature -20...+70°C
- Ambient humidity Max. 90% RH, non-condensing
- Protection class IP20
- Connection Disconnectable terminal strips, 4 mm^2
- Memory backup Built-in long life battery gives long backup time of all settings incl. real time.

EMC emissions & immunity standard:
This product conforms to the requirements of the EMC Directive 2004/108/EC through product standards EN 61000-6-1 and EN 61000-6-3.

RoHS:
This product conforms to the Directive 2011/65/EU of the European Parliament and of the Council.

Inputs:
Analogue inputs For PT1000 sensors (accuracy ± 0.4°C) or 0...10 V DC (accuracy ± 0.15 % of full output signal). 12 bit resolution in the A/O conversion. Digital inputs For potential free contacts

Outputs:
Analogue outputs 0...10 V DC, 1 mA, short-circuit proof.
Digital outputs Mosfet outputs, 24 V AC or DC, 2 A continuous. Max. 8 A totally.

Communication ports:
1 TCP/IP port Web server, TCP/IP communication, BACnet/IP
2 RS485 Modbus RTU communication,or EXOline (REGIN langage)

Indications:
Operation indication Supply voltage is indicated with green LED.
Alarm indication Plain text and blinking red LED.
Sum alarm the output can be configured

E tool©:
System requirements computer with operating system MS Windows 2000, XP, Vista, Windows 7or Windows 8.

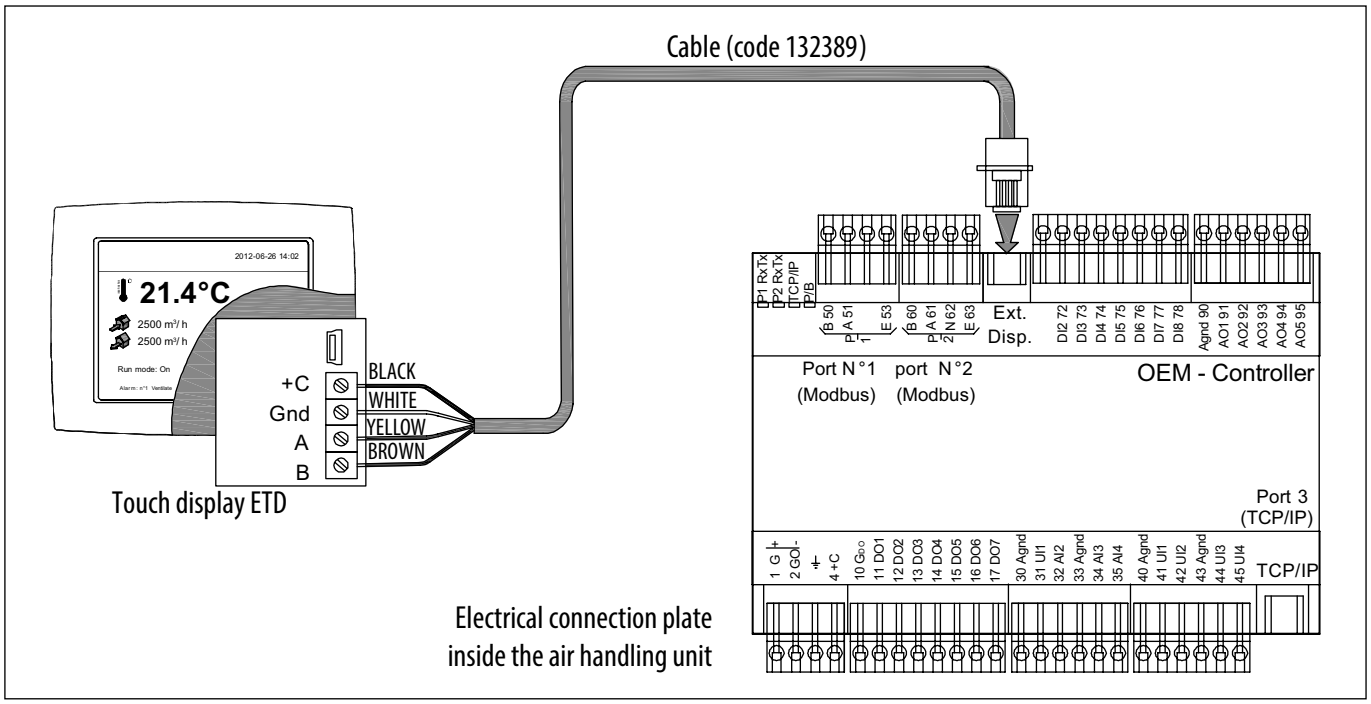
6.4 Display (ETD) control connection

The ETD display is deliver with a 10m long cable (could be lengthen up to 100m) equipped with a connector RJ10 4P4C for the connecting to the CORRIGO. Use one of available grommet for the display cable.

The ETD control is IP30; it is reserved exclusively for an indoor usage sheltered from moisture.
It is equipped with an internal temperature probe.

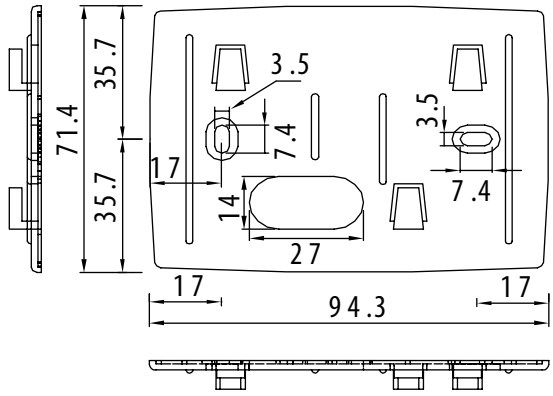
In case of an outdoor mounting of the RHE unit OI, you can also leave it inside the housing of the electrical box. Once the parameter setting is done, the remote control can be disconnected.

Electrical schematic diagram of the connection :

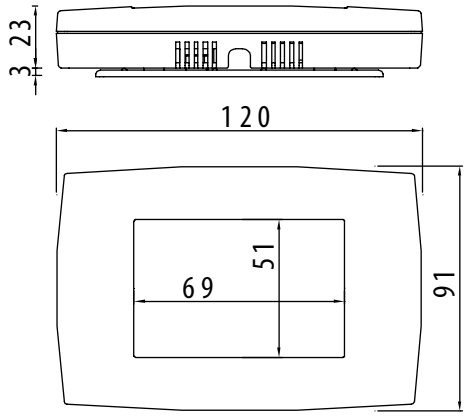


Placement of the support and the remote control :

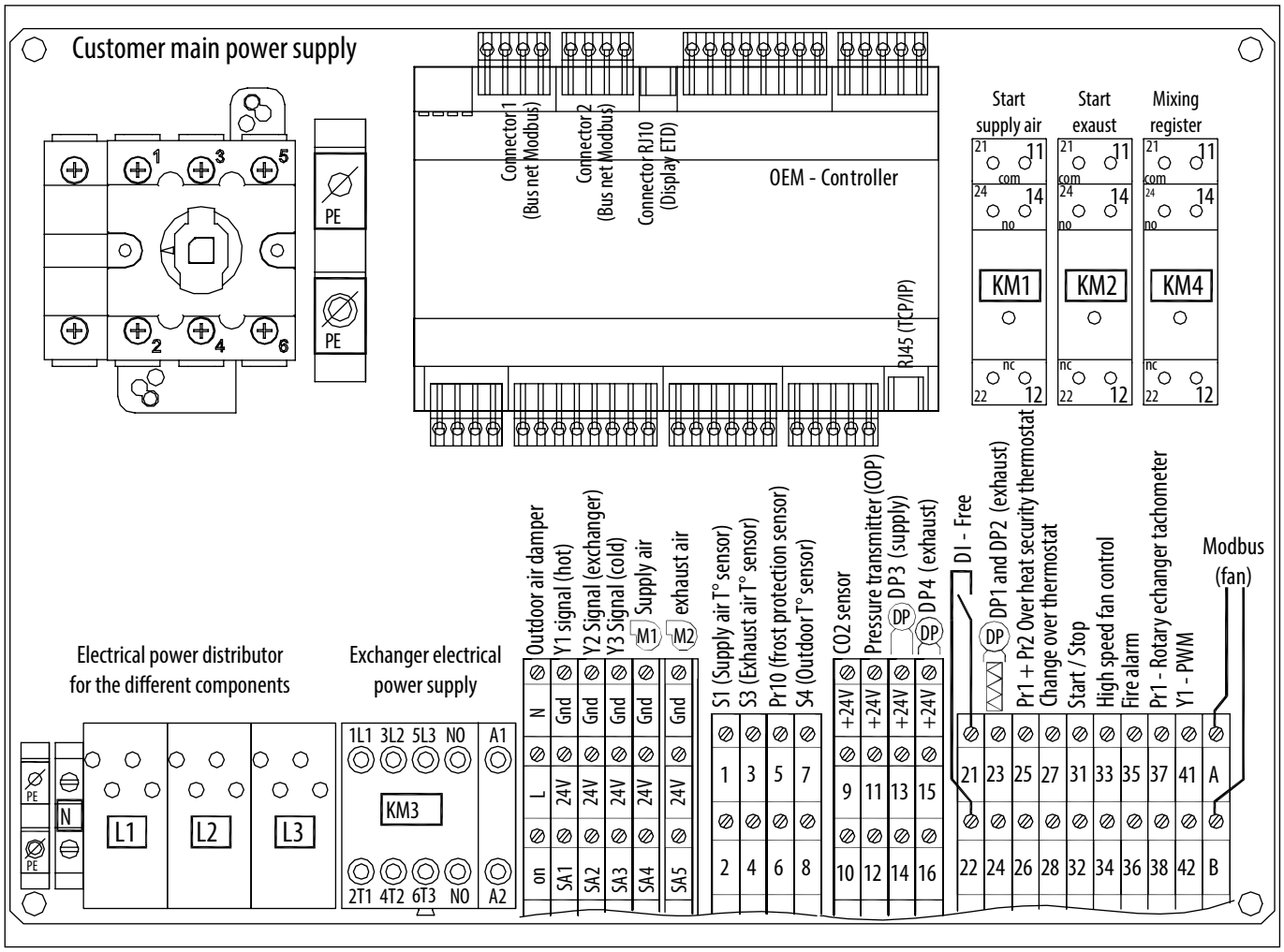
Mounting bracket



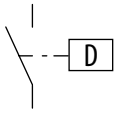
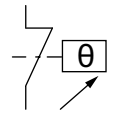
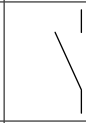
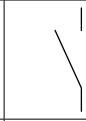
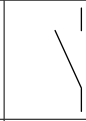
ETD remote control



6.5 Inputs – outputs



Analogic input (sensor)				
Terminals	**Signal**	**Variable**	**Name**	**Description**
1-2	PT1000	AI 1	Supply	Supply air sensor install on supply air duct connection
3-4	PT1000	AI 2	Extract	Extract air sensor install on extract air duct connection
5-6	PT1000	AI 3	Frost protection	Frost protection sensor install on water coil
7-8	PT1000	AI 4	Outdoor	Outdoor air sensor install on outdoor air duct connection
9 10 (Gnd) +24V	0-10V	UI 1	Ventilation setpoint	Air quality sensor (CO2) or external set point signal modulating the ventilation airflow
11 12 (Gnd) +24	0-10V	UI 2	DP Duct	Duct Pressure transmitter for constant pressure application (COP)
13 14 (Gnd) +24	0-10V	UI 3	DP3 supply	Pressure transmitter for Supply airflow control
15 16 (Gnd) +24	0-10V	UI 4	DP4 extract	Pressure transmitter for extract airflow control

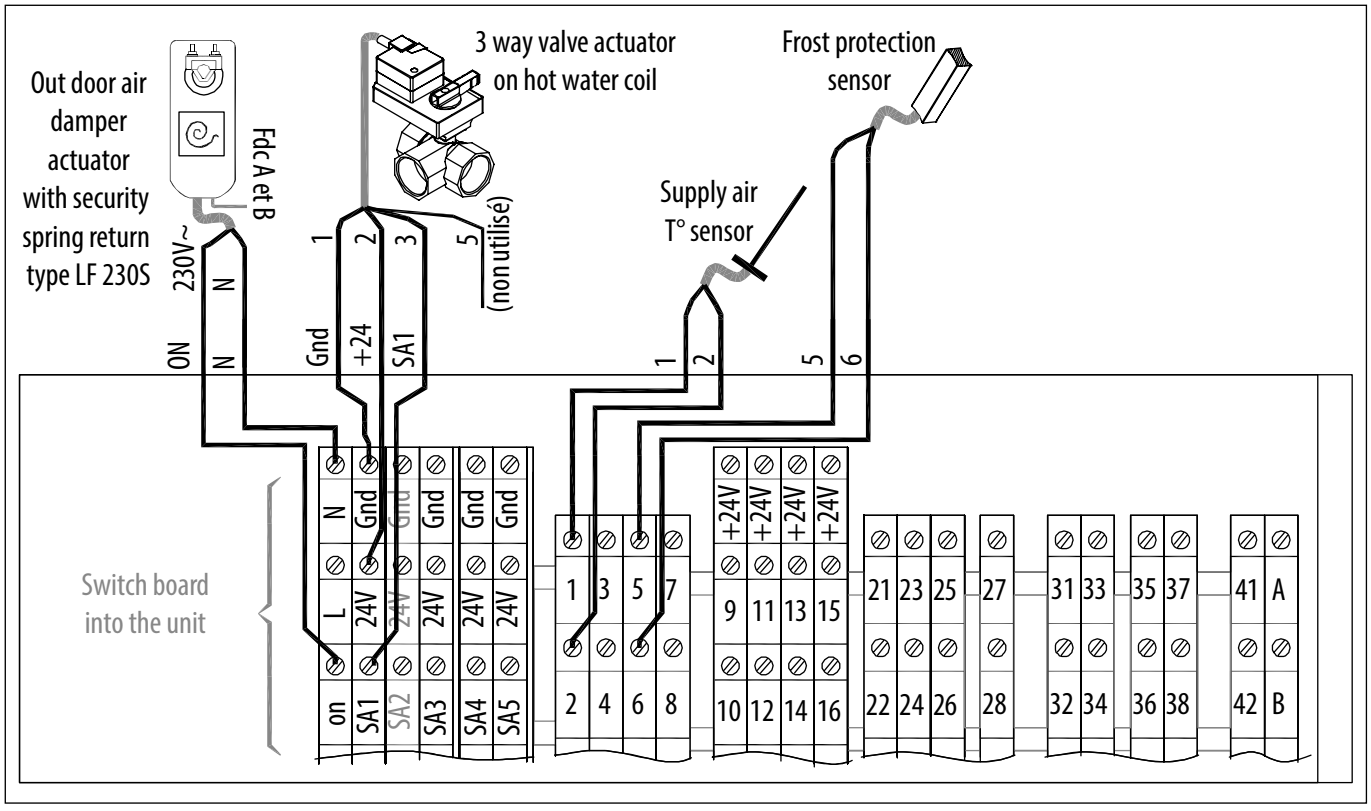
Logical Input (control and safety guard) : those input may only wire to voltage free contacts				
Switch	**Signal**	**Variable**	**Name**	**Description**
21-22		DI 1	Free	Logic input not assigned
23-24		DI 2	filter pressure guards	Monitoring of the filters cleanliness condition
25-26		DI 3	Over heat control	Monitoring of the safety thermostats triggering in case of an overheating of the electric battery
27-28		DI 4	Change-over Thermostat	Monitoring of the water circuit inlet temperature to select the hot/cold mode of the reversible battery
31-32		DI 5	On/Off system	Request to start or stop the system Note : Stop has priority over the clock, which should be for one
33-34		DI 6	High speed demand on fan	Request to start at maximum speed Forcing has priority over the clock
35-36		DI 7	Fire alarm	Request to select the unit in fire mode (see chapter for explanation about this operating mode)
37-38		DI 8	Heat exchanger rotation control	rotation control by tachometer (belt monitoring)
B-A		bus		Communication bus of the fan motors

Analogic output (control) : to dampers actuators, external coils…				
Switch	**Signal**	**Variable**	**Name**	**Description**
SA1 (24V-Gnd)	0-10V	AO1	Heat	0-10V proportional control of the heating request
SA2 (24V-Gnd)	0-10V	AO2	Exchanger	0-10 V proportional control of the exchange/bypass request
SA3 (24V-Gnd)	0-10V	AO3	cooling	0-10 V proportional control of the cold request
SA4 (24V-Gnd)	0-10V	AO4	Supply air fan	0-10 V proportional control of the supply air fan
SA5 (24V-Gnd)	0-10V	AO5	Exhaust air fan	0-10 V proportional control of the extraction fan

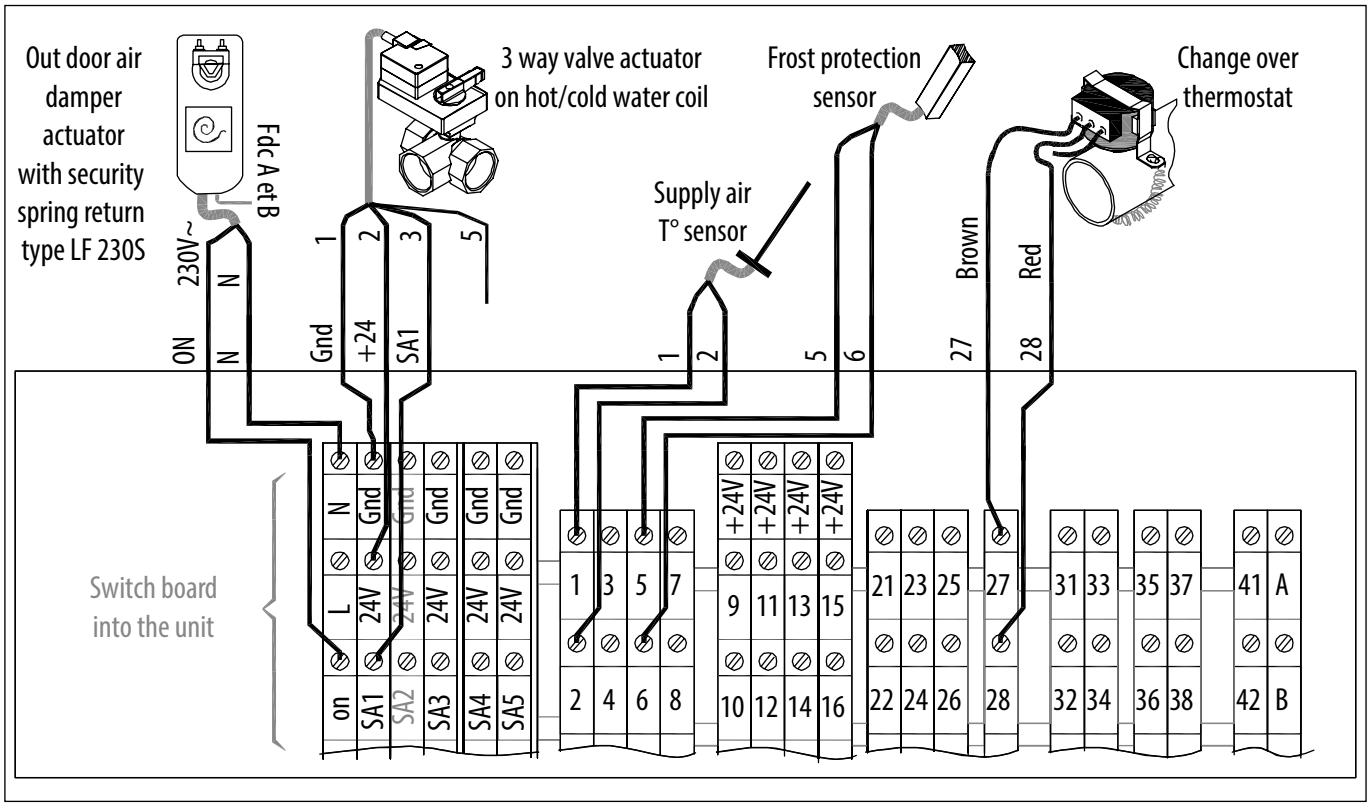
Logic output (actuator and info report) : les contacts sont libres de potentiel				
Switch	**Signal**	**Variable**	**Nom**	**Description**
KM1 : 12-11-14 N-L-on	11 12 | 14 ou 230V	DO1	Supply air fan	Control output for the fresh air register servo motor Available : - either for use of a 230 V register with a control by 230 V signal (on terminal) and a 230V power supply (L-N) - or by a dry contact for a general usage
KM2 : 12-11-14	11 12 | 14	DO2	Exhaust air fan	Information carryover of the extraction fan control
KM3		DO3	Exchanger	Start control of the heat exchanger
KM4 : 12-11-14	11 12 | 14	DO4	Recirculation damper actuators	Start control of the mixing register
/	24Vac	DO5	Alarm	Alarm information carry over (for class A or B alarm)
/	24Vac	DO6	Free	Logic output not assigned
41-42	24Vac	DO7	Heat	PWM control for the electric battery triac.

6.6 External components connection drawings (examples)

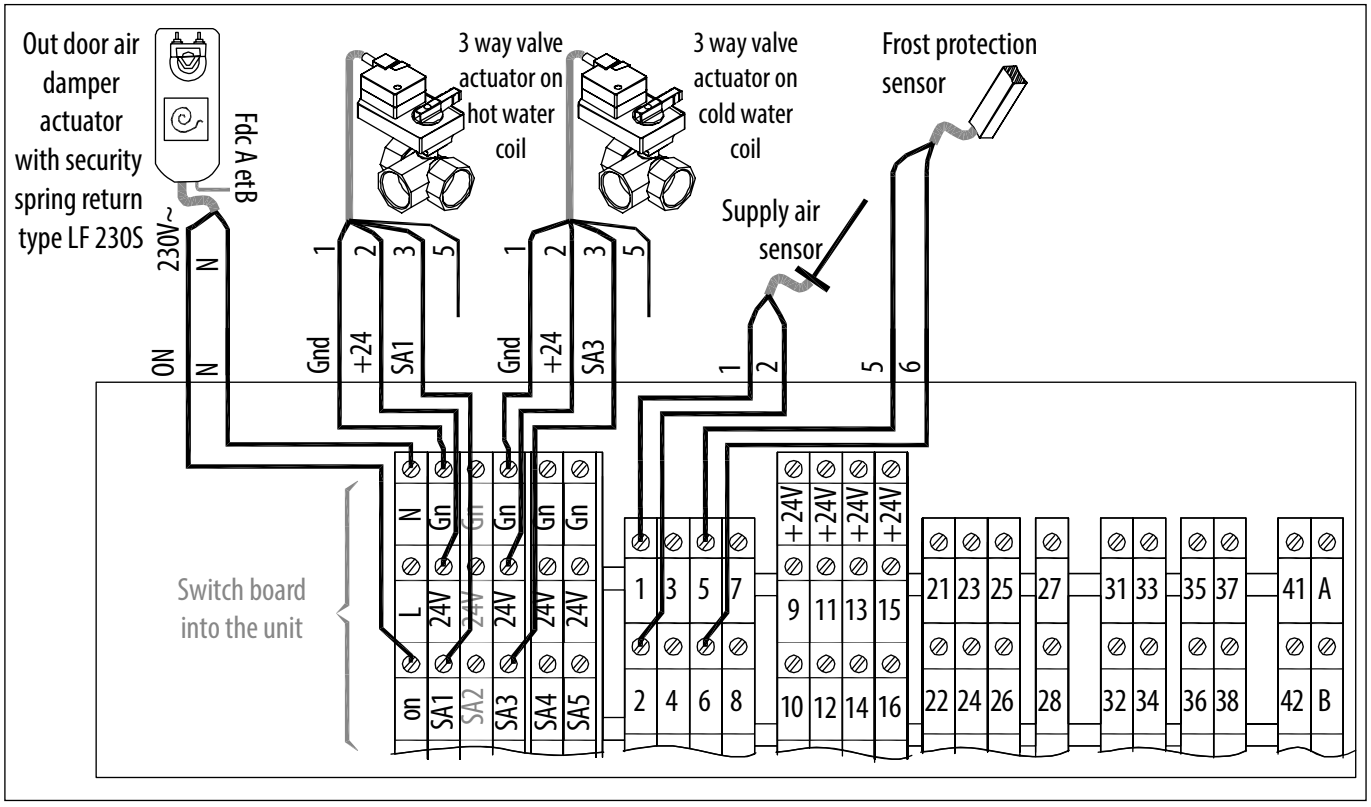
Case of a hot water coil DC (delivered mounted) + dampers (accessories)



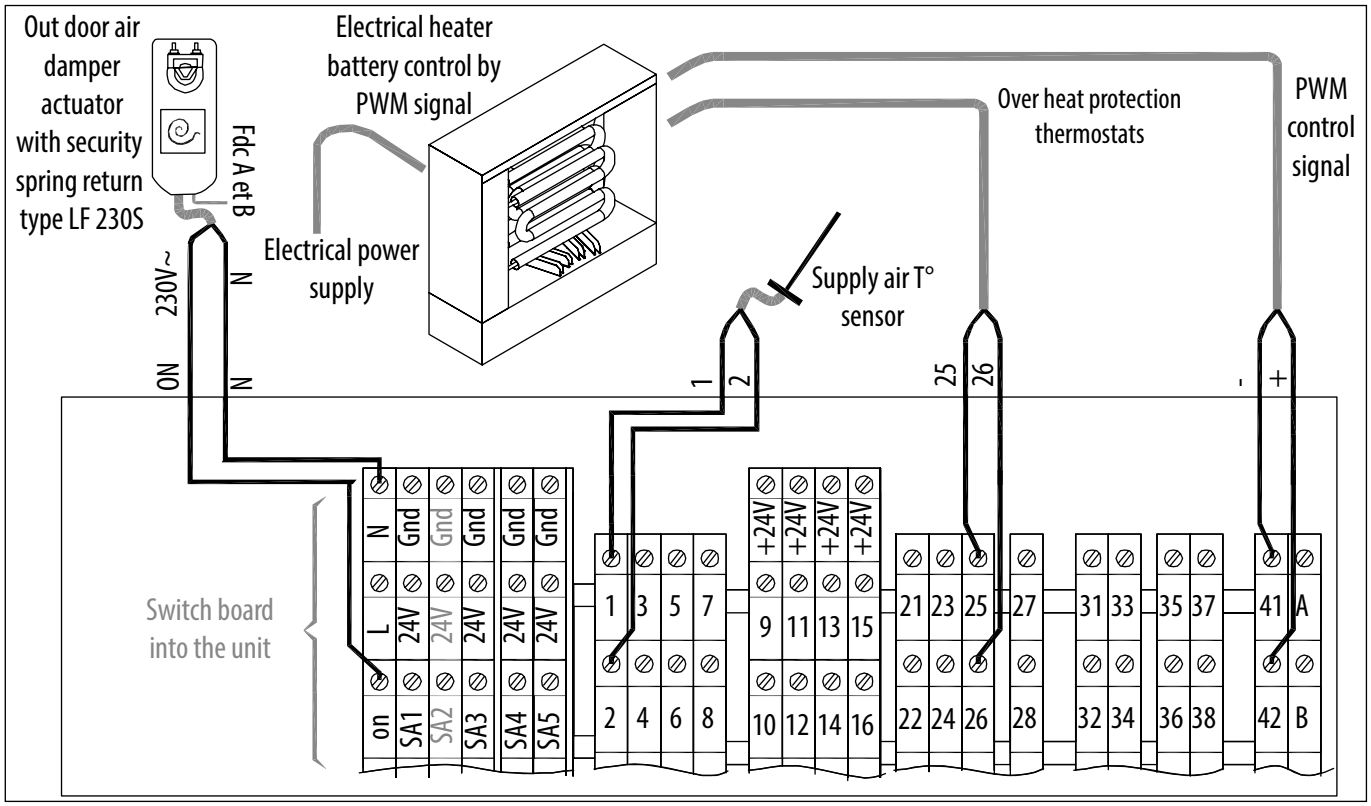
Case of a reversible water coil DFR (delivered mounted – cold or hot) + dampers (accessories)



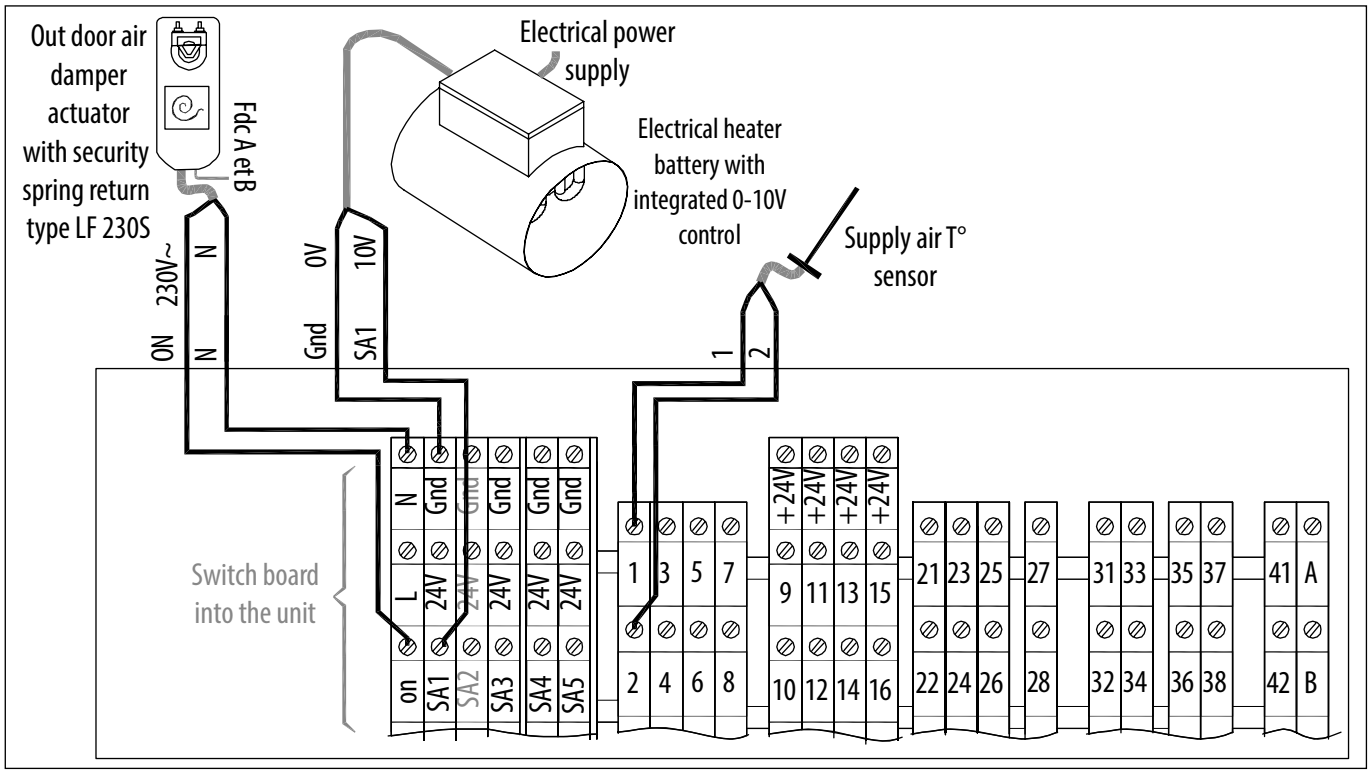
Case of two separate water coils (accessories – hot water + cold water circuit) + dampers (accessories)



Case of a PWM controlled DI electric heater (delivered mounted) + dampers (accessories)



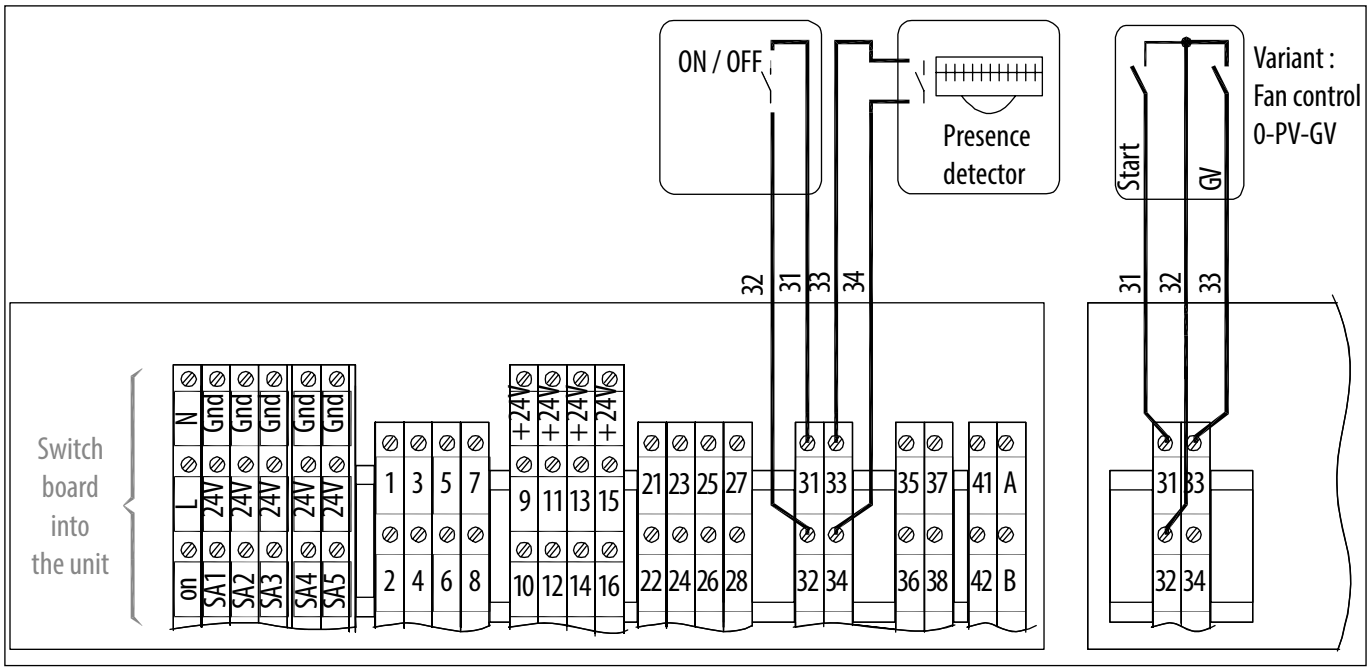
Case of a 0/10V controlled terminal electric heater (accessory) + dampers (accessories)



In the case of an outdoor heater, it is necessary to move the supply temperature probe.
Use a probe type TGK3 PT1000 and connect it instead of the probe integrated in the unit to the terminals 1-2.

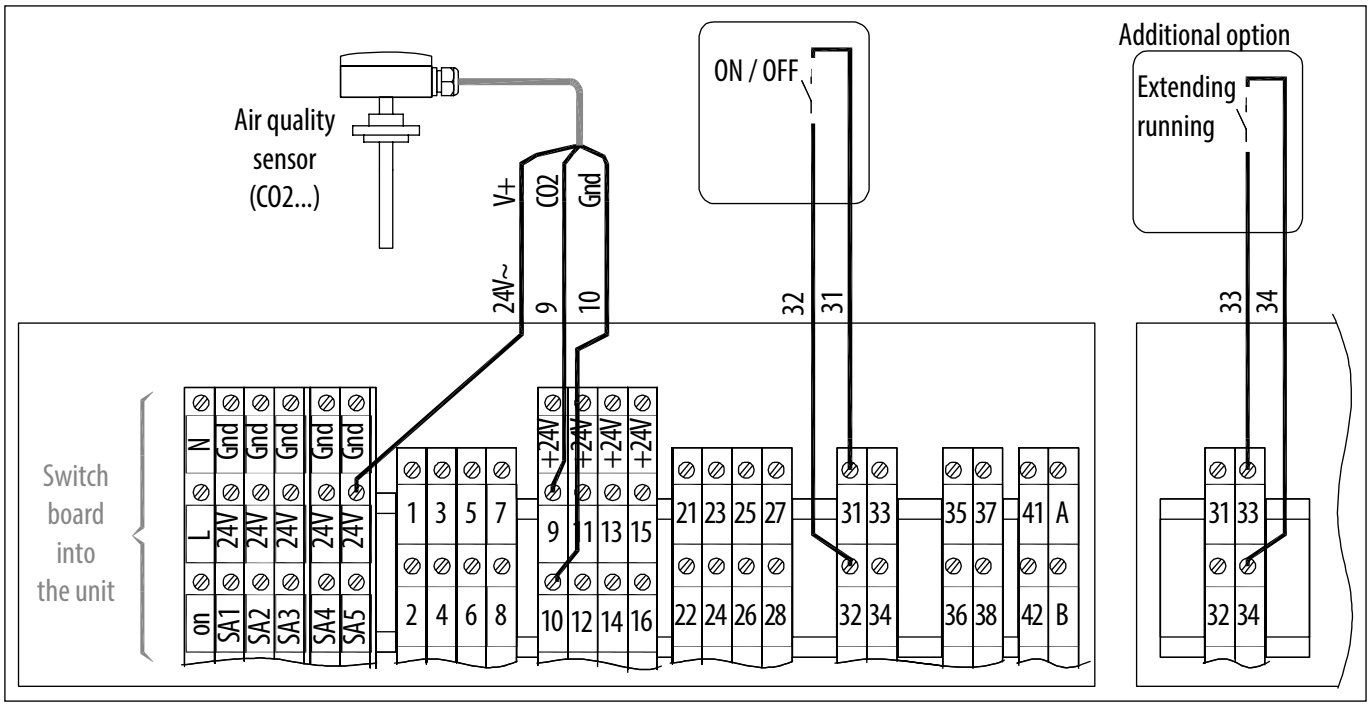
Case of operation in constant airflow (CAV) – controlled by optical sensor or box 0 / PV / GV (accessories)

Warning : All the controls must be made with potential free contacts

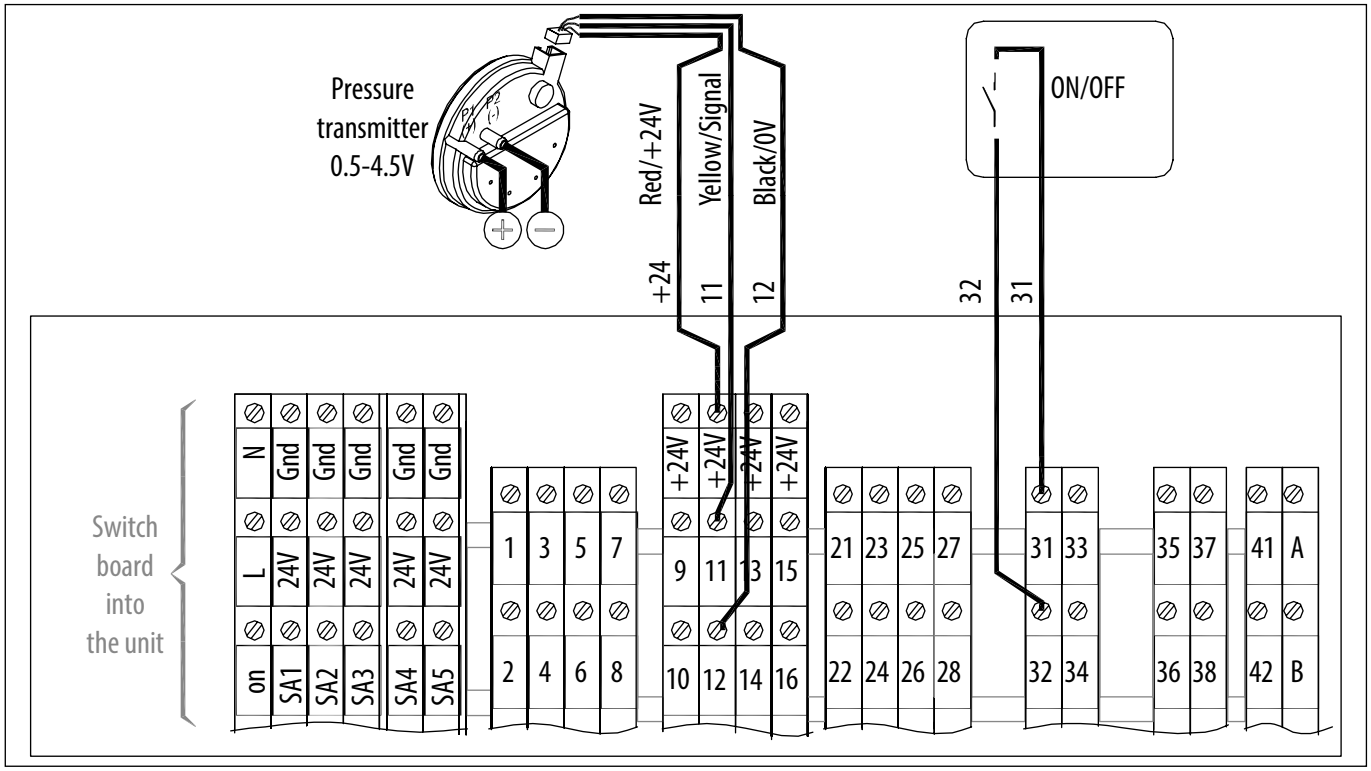


Case of operation in variable airflow (VAV) – CO2 probe (accessory)

The unit is preprogrammed for the usage of a CO2 measurement probe with a range 0 – 2000 ppm and a signal of 0 – 10 Vdc.

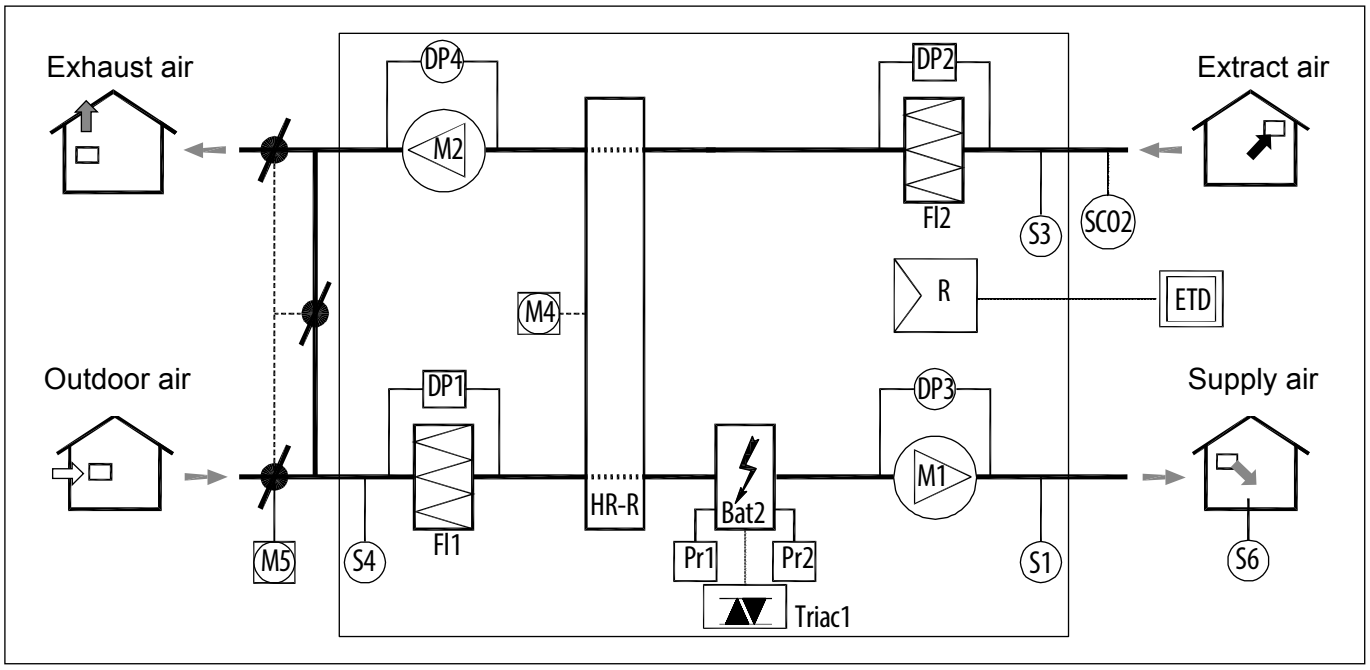


Case of operation in constant pressure (COP) – pressure probe at supply (accessory)
The unit is preprogrammed for the usage of a pressure probe with a range of 0 – 800 Pa (0-500Pa on size 700/1300) and a signal of 0.5 – 4.5 Vdc. Another probe can be used by means of an advanced parameter setting.



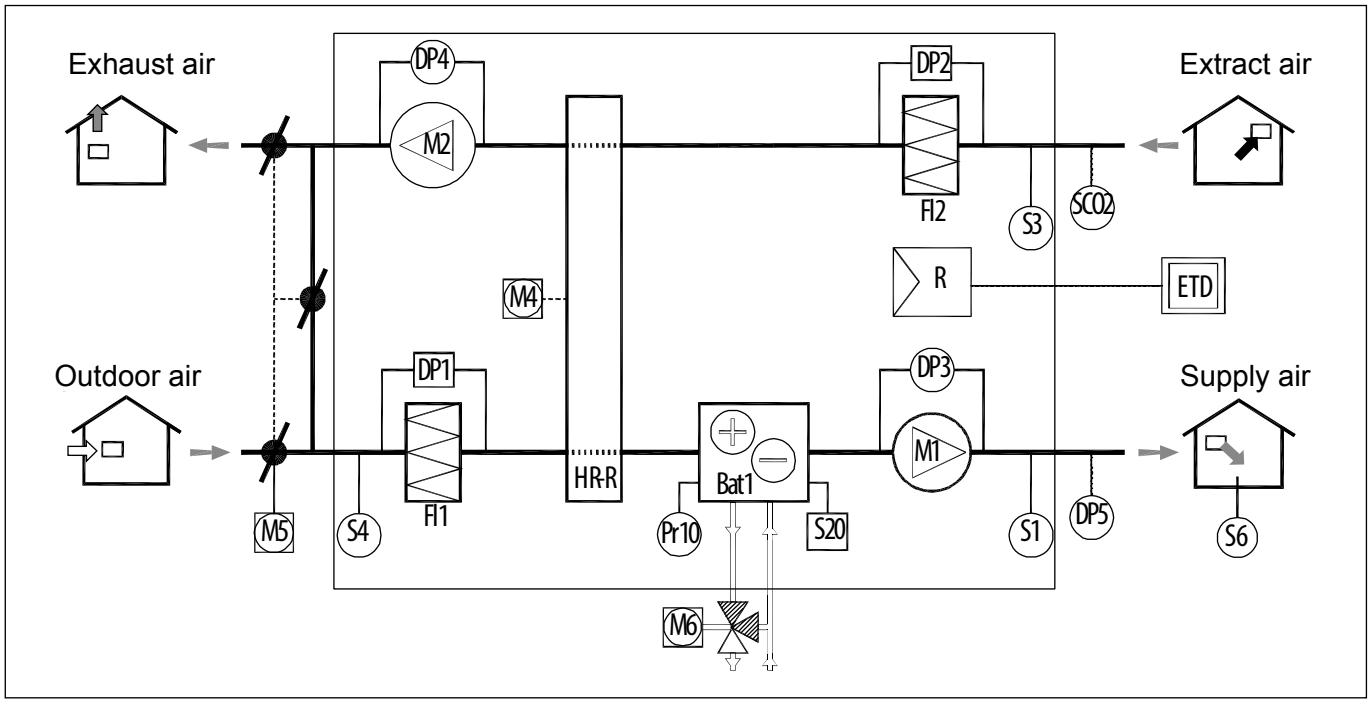
6.7 Synoptic installation diagrams (examples)

RHE EI



M1	Supply air fan motor	HR-R	Rotary heat exchanger	Pr1/ Pr2	Security thermostat (Manu/ Auto)
M2	Exhaust air fan motor			Bat 2	Electrical heating resistance
M4	Rotary exchanger motor	Fi1	Outdoor air filters		
M5	Motorized damper	Fi2	Extract air filter	R	Controler CORRIGO E28 S&P
				ETD	Room touch screen display
		DP1	Outdoor air filter pressure guard		
S1	Supply air Tº sensor	DP2	Extract air filter pressure guard		
S3	Extract air Tº sensor	DP3	Supply air fan pressure transmitter		
S4	Outdoor Tº sensor	DP4	Exhaust air fan pressure transmitter		
S6	Room Tº sensor	DP5	Duct pressure transmitter (optional COP mode)		
SCO2	Air quality sensor (optional VAV mode)				

RHE ER / EC



M1	Supply air fan motor	HR-R	Rotary heat exchanger	Pr10	Anti frost sensor
M2	Exhaust air fan motor			S20	Changer over Thermostat (ER)
M4	Rotary exchanger motor	Fi1	Outdoor air filters	Bat 1	Water coil
M5	Motorized damper	Fi2	Extract air filter		
M6	Moteur vanne 3V			R	Controler CORRIGO E28 S&P
		DP1	Outdoor air filter pressure guard	ETD	Room touch screen display
S1	Supply air Tº sensor	DP2	Extract air filter pressure guard		
S3	Extract air Tº sensor	DP3	Supply air fan pressure transmitter		
S4	Outdoor Tº sensor	DP4	Exhaust air fan pressure transmitter		
S6	Room Tº sensor	DP5	Duct pressure transmitter (optional COP mode)		
SCO2	Air quality sensor (optional VAV mode)				

7. COMMISSIONING

All the RHE units are subjected to a DC check and a functional test before they are delivered.

Factory parameter settings of the units:

- Ventilation mode = CAV mode (description in subsection "8.2 Constant airflow operation (CAV)").
- High speed = Unit's max airflow, Low speed = Max airflow / 2.
- Fan type: determined according to the airflow coefficient K specific to the fans (description in subsection "8.13 Mesure des débits d'air - modification du coefficient K").
- Heating mode = constant supply T° (description in subsection "8.5 Temperature control").
- Heater type (description in subsection "8.1 Simplified menus / Accesses" : Operation mode : Unit commissioning) : according to the requested option (by default the electrical resistance is selected).

Factory check of the units :

- Electrical conformity tests : Continuity of the ground / Insulation of the electrically powered parts.
- Check of the reading of the temperature probes (supply T°, extraction T°, outdoor T°, antifreeze T° according to option).
- Check of the supply fan only (Check of the corresponding airflow sensor).
- Check of the extraction fan only (Check of the corresponding airflow sensor).
- Check of the heat exchanger (start/stop).

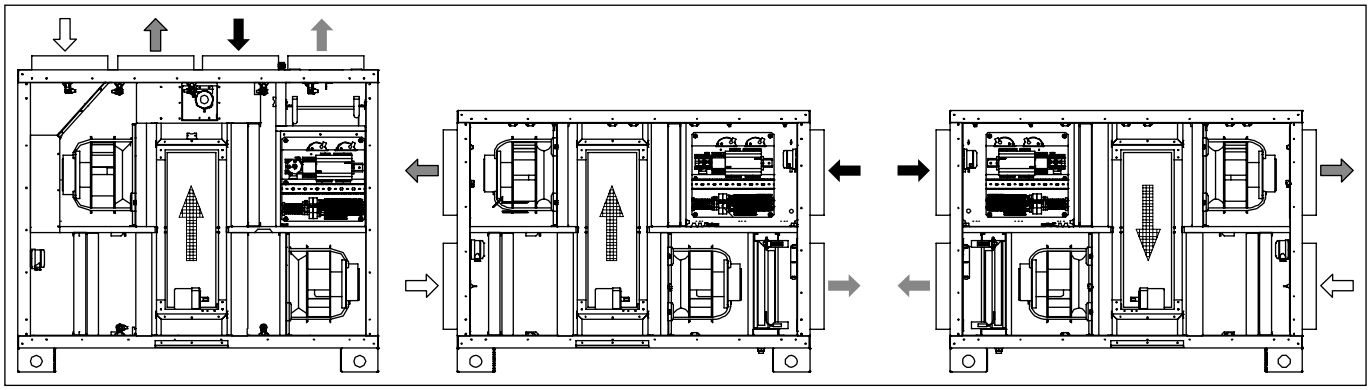
The commissioning and parameter setting of the controller must be performed by a qualified person respecting the safety instructions described in subsection "1.2 Safety instructions".

Only after the installation is completed can the electric, aerolic and hydraulic connection operations be performed.

Prior to commissioning and parameter setting, provide yourself with the necessary data, airflows, pressures, temperatures, desired operation mode and schematic diagrams of the installation.

- Make sure that the device does not contain any foreign objects.
- Make sure that all the components are attached in their original locations.
- Check manually that the fans do not rub or are not blocked.
- Make sure that the rotating heat exchanger is not blocked.
- Make sure that all the outdoor electrical devices are connected.
- Check the tightness of the electric connections / earthing connection.
- Check the voltages, currents, gauges of the thermal protective devices.
- Check the rotating direction of the fans – airflow directions.
- Check the airflow rates.
- Make sure that the filters are not clogged – clean them or replace them, if necessary.
- Enter the control parameters; simulate the operation of the batteries / alarms / safeties.

On 3 phases units (over the size 19), check direction of rotation of the heat exchanger. A direction arrow is stick on the heat exchanger. If the wheel turn on the wrong sense, reverse 2 phase on the mean electrical poweror on KM3 contactor.



VD **HDR** **HDL**

8. CONTROL - FUNCTIONS / PARAMETERS

CORRIGO control	D	DI	DC	DFR
MAIN COMPONENTS				
Internal electrical box – composition :				
- Main power connection switch / safety circuit breaker	●	●	●	●
- Controller and terminal strip integrated into the unit, easy access main side	●	●	●	●
FUNCTIONS				
Air flow control				
- Constant flow rate (CAV) : 2 different setpoint speed on supply and exhaust air	●	●	●	●
- Variable flow rate (VAV) : signal 0-10 V coming from an outdoor probe (CO2, temperature, relative humidity, etc.) or a manual percentage.	●	●	●	●
- Constant pressure (COP) value measured by an outdoor pressure sensor (SPRD)	●	●	●	●
- Time programming (week timer, Holiday periods…)	●	●	●	●
- Extending running BOOST by external contact demand	●	●	●	●
- On/Off system by external contact	●	●	●	●
TEMPERATURE CONTROL				
Temperature sensor :				
- Outdoor air temperature sensor	●	●	●	●
- Extract air temperature sensor	●	●	●	●
- Sonde de température de soufflage	●	●	●	●
- Frost protection sensor on water coil (DC - DFR)			●	●
- "CHANGE OVER" thermostat install on water input pipe (DFR)				●
Free cooling by switching off the heat exchanger rotation (to reduce the dust risk the rotation is tempory restart during few seconds)	●	●	●	●
Outdoor air damper actuator control (damper in option)	●	●	●	●
Internal electric resistance control :				
- Proportional control (PWM) for the électric battery triac		●		
Internal water coil control :				
- Proportional 0-10 V control of 3 way valve actuator (3way valve actuator in option)			○	○
- Power control of the 3 way valve actuator			●	●
External water coil(s) control :				
- Proportional 0-10 V control of 3 way valve actuator (3way valve actuator in option)	○ (1)	○ (1)	○ (2)	○ (3)
- Supply air duct sensor TGK3 PT1000	○	○	○	○
- Frost protection sensor on water coil TGA1 PT1000	○	○		○
- CHANGE OVER thermostat to be installed on water input pipe	○	○		
SECURITY AND ALARM CONTROL				
- Filter clogging indication	●	●	●	●
- Malfunction of connected sensor	●	●	●	●
- Malfunction of air fan	●	●	●	●
- Result deviates too much from the set point (Air flow,Pressure, T°)	●	●	●	●
- Fire alarm (contact available)	●	●	●	●
- Communication failure between controler and display control	●	●	●	●
- Low frost guard temperature on water coil (force the heating valve to open thereby preventing freeze-up of the heater if water T° lower than 7°C on heating mode - stop the unit if the water T° do not increase)	●	●	●	●
- Alarm liste management (40 latest alarm events)	●	●	●	●
COMMUNICATION				
- Room touch screen display	●	●	●	●
- Maintenance display E3DSP	○	○	○	○
Communication :				
- Modbus via integrated RS485 communication port	●	●	●	●
- BACnet IP on TCP/IP port	●	●	●	●
- built-in web server on TCP/IP port	●	●	●	●

● Inclued, ○ Optional

(1) cold / hot water coil, (2) cold water coil, (3) hot water coil.

Temperature control loop

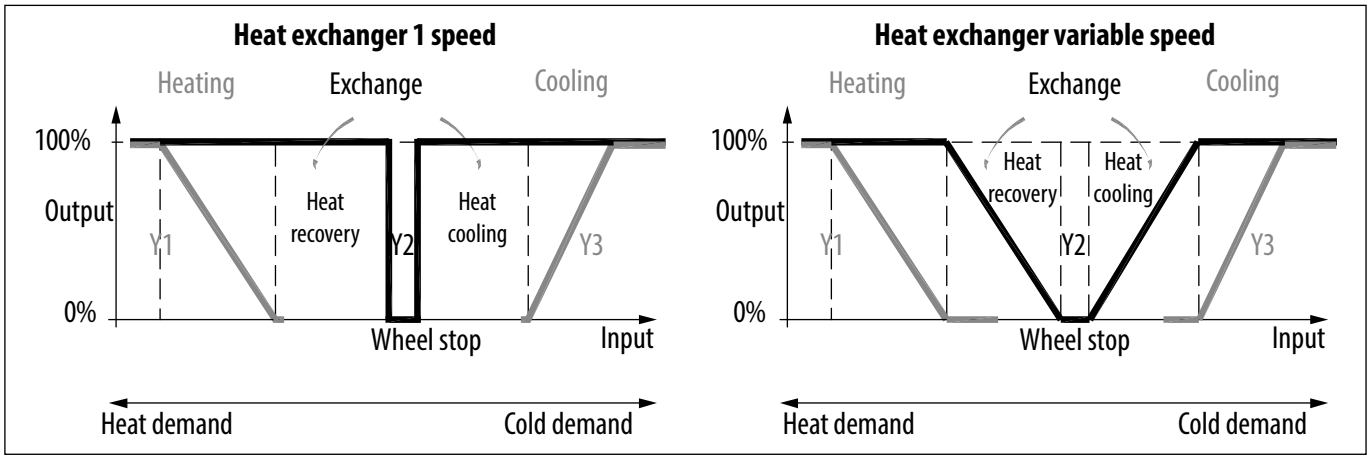
The temperature set point and the heating/cooling mode (supply air temperature control, room temperature control, outdoor temperature compensated supply air control) are entering with the touch display.

The supply air or room temperature is kept at the set point value by controlling the output signals for "Heating Y1", "Exchanger Y2", "Cooling Y3" corresponding to 0-10V analogue output on the controller. A single PI control loop is used.

The heat exchanger should be regarded as the first potential source of heat or cooling, before the water coil or electrical heater.

When the unit is equipped with standard rotary heat exchanger (1 speed), the wheel rotation is binary controlled (On-Off).

When the unit is equipped with enthalpy or sorption rotary heat exchanger (variable speed), the wheel rotation is variable controlled, according to 0-10V signal. The set point is reach using the speed variation of the rotation, decreasing or increasing the thermal efficiency of the wheel.



The block diagram below presents the technical operating.

Original conditions	Exchanger		Variable speed rotary heat exchanger		Heating coil
	Rotary heat exchanger	Condition after the heat exchanger	Rotary heat exchanger	Condition after the heat exchanger	
Outdoor air T° < Setpoint T° **Outdoor air T° < exhaust air T**	ON	Supply air T° < Setpoint T°	Speed variation of the wheel rotation to reach the setpoint up to 100% capacity	Supply air T° < Setpoint T°	Proportional increasing of heat power to reach T° setpoint
		Supply air T° ≥ Setpoint T°		Supply air T° = Setpoint T°	Not used
Outdoor air T° < Setpoint T° **Outdoor air T° > exhaust air T°**	OFF	Supply air T° < Setpoint T°	OFF	Supply air T° < Setpoint T°	Proportional increasing of heat power to reach T° setpoint
Outdoor air T° ~ Setpoint T° **Outdoor air T° < exhaust air T°**	OFF / ON	Supply air T° ~ Setpoint T°	Speed variation of the wheel rotation to reach the setpoint	Supply air T° = Setpoint T°	Not used

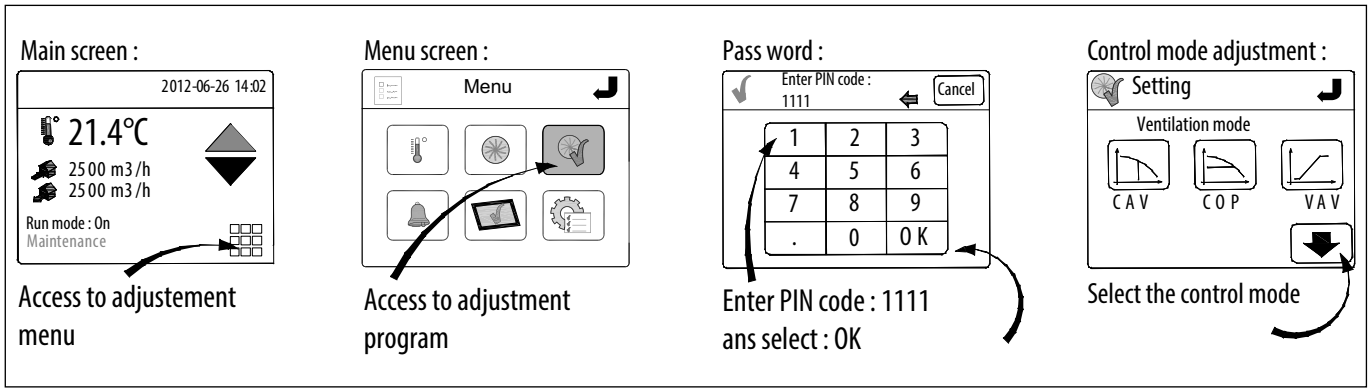
8.1 Simplified menus / Accesses

The RHE unit has a quick access to the main functions.
Accesses : There are 3 access levels to the controller :

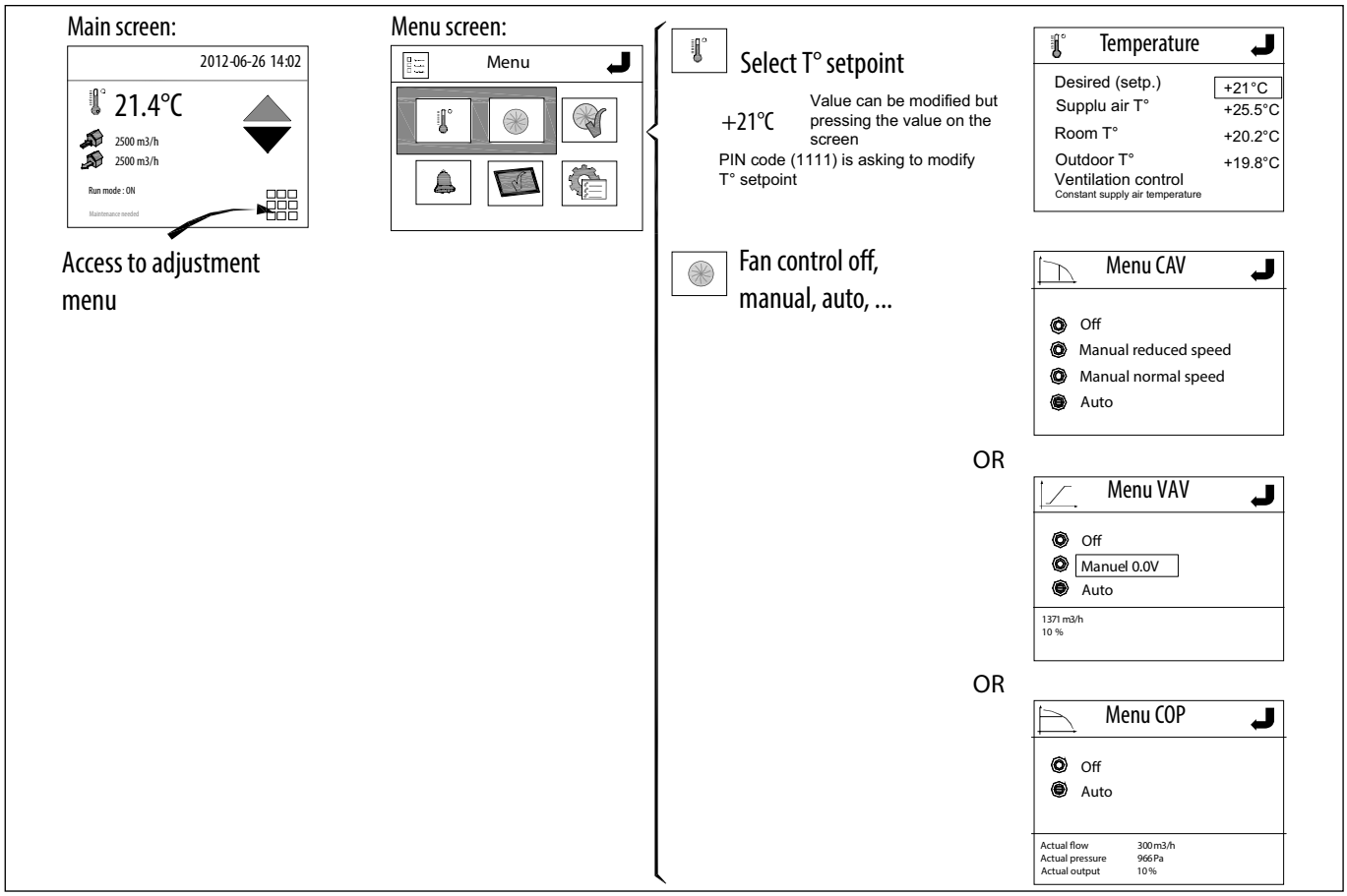
- User level (no password) – Access to the start/stop – auto or PV/GV functions and increase of the set point temperature (+/- 3°C).
- Operator level (password) – Access in read and write to adjustments and parameters, but no access to the system configuration.
- Master level (password) - Access in read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

The RHE units can operate according to 3 principles of operation :

- **CAV : Operation at constant airflow**
- **VAV : Operation at variable speed**
- **COP : Operation at constant pressure**

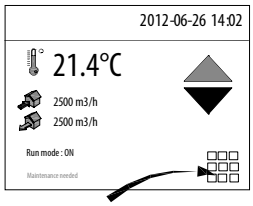


User level :
To adjust the temperature set point and the operation mode selection of the unit (use of the time program, stop the unit or possible forcing to a given speed).
These two temperatures and ventilation functions are accessible in two specific menus specially dedicated to this usage :



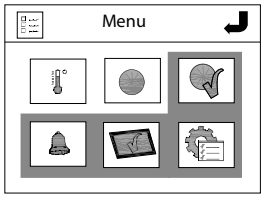
Installer level :
To set the operation parameters of the unit, fan, heater, console, fault read, etc.

Main screen:

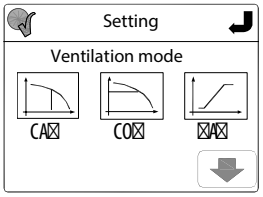


Access to adjustment menu

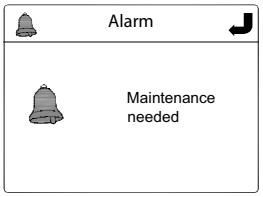
Menu screen:



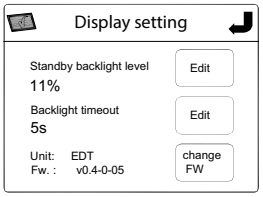
Working mode selection : Installer parameter



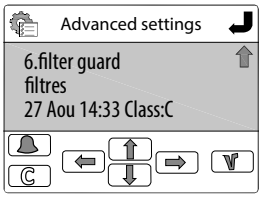
Read the alarm



Display parameters

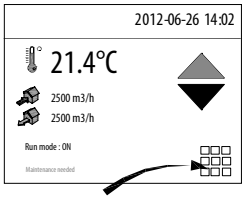


Advance parameter : Expert mode
It's only possible to read the alarm



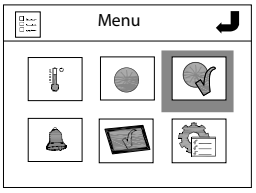
Operation mode :
Unit commissioning

Main screen:



Access to adjustment menu

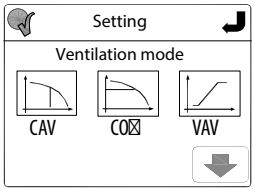
Menu screen:



Installer parameter

Back to preview screen:
Next screen:

Ventilation mode setpoint

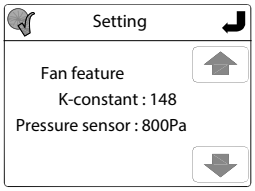


CAV — constant air volume working mode (CAV)

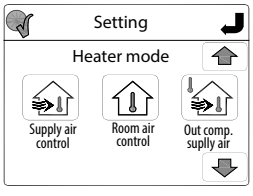
COP — Constant pressure working mode (COP)

VAV — Variable air flow working mode (VAV)

Integrated fan specification (manufacture adjustment)



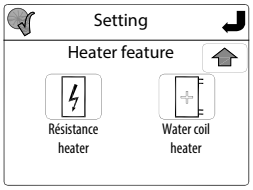
Heating mode setpoint



Constant supply air temperature control

Room temperature control

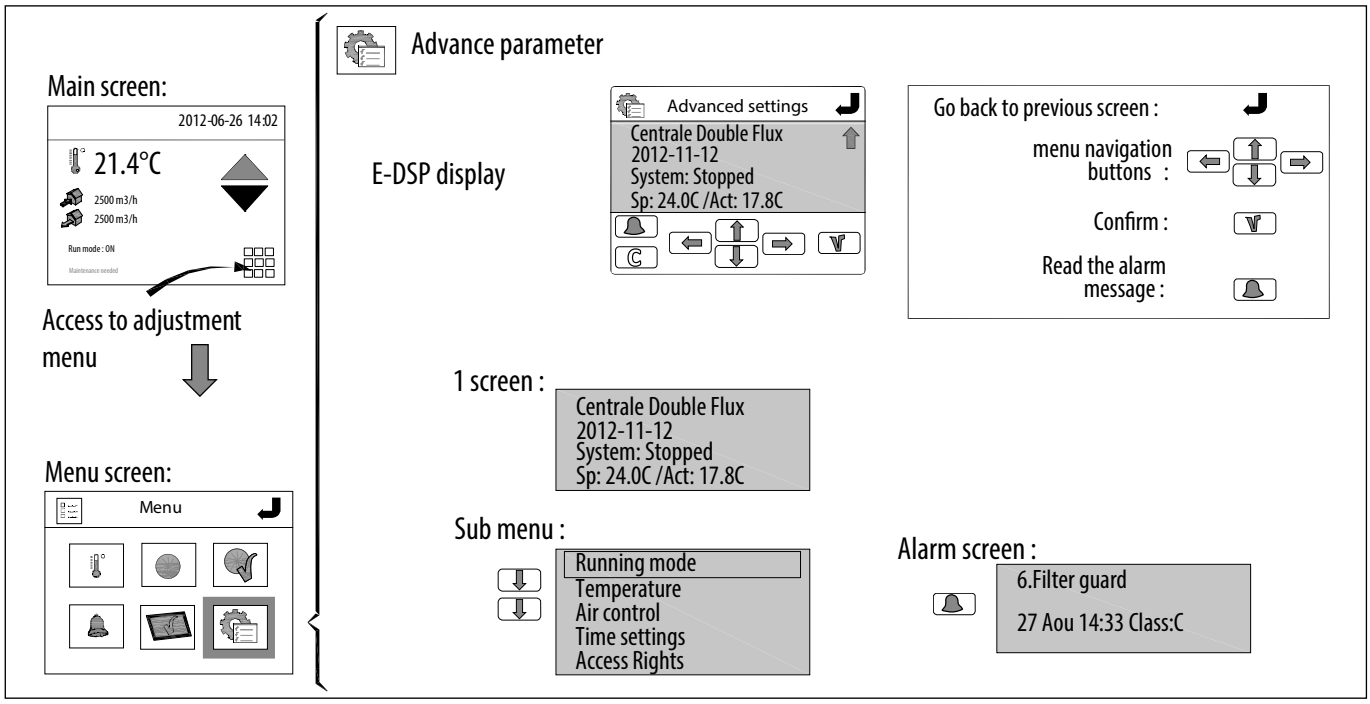
Type of post heating component (manufacture adjustment)



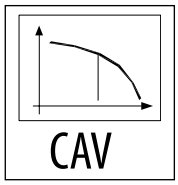
Constant supply air temperature control with outdoor air compensation

Advanced parameter setting: expert mode :

- Used to read the message of the alarm signaled on the main screen.
- Clock programming.



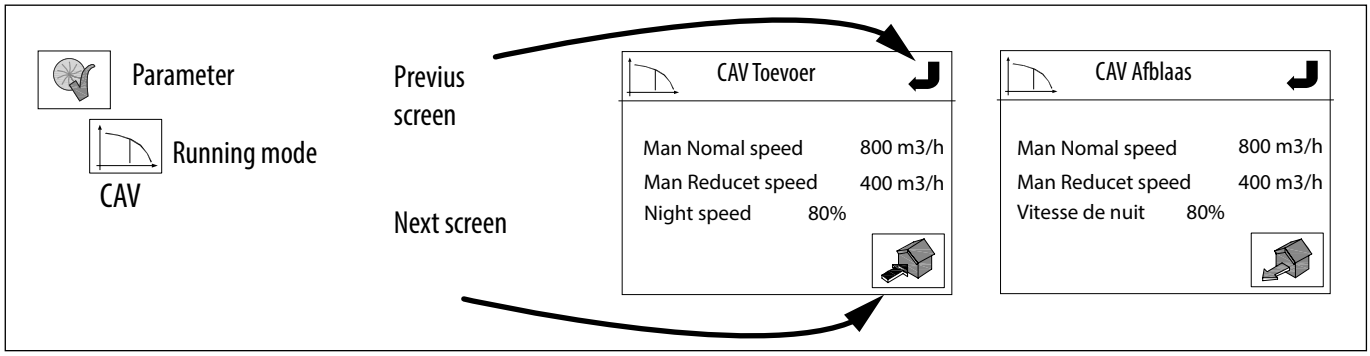
8.2 Constant airflow operation (CAV)



Mode recommended to directly obtain the desired airflow in an installation.
The speed of the fans is defined to provide an accurate flow rate and to keep it constant. The airflow rates at supply and extraction are separately controlled. The airflow instructions "Low Speed" and "High Speed" are independently controlled in m^3/h in the ETD display.
Pressure transmitters measure the differential pressures on the fans suction housings. The resulting airflows of the pressure measurements are calculated by the controller versus a coefficient K specific to each fan.
The switch over between the various set points will be done manually or automatically by a time programming. An IP control loop per fan maintains the set point by adjusting the fans.
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 speed rotation; it will be used during the night for free cooling (see corresponding function).
A 60s timeout is integrated in the program to ensure the protection of the heating elements in case a request is made to stop the unit.

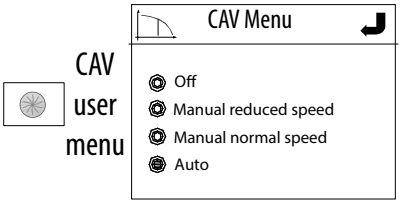
Functional parameter setting on the ETD display
Access to the simplified parameter setting menu (via the password 1111) allows :

- The selection of Low Speed and High Speed airflows of each fan.
- The night set point value of each fans.



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

Setting for the usage on ETD display

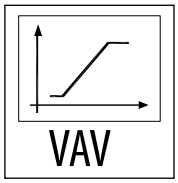


Stop, manual reduced Speed, manual Normal Speed

Auto = work according to clock or state of control terminal strip (start/stop + PV/GV).

Note : an action by the terminals 31-32 / 33-34 has priority.

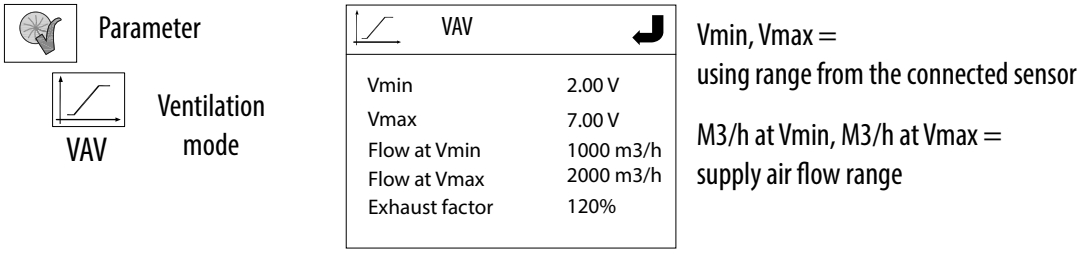
8.3 Variable airflow operation (VAV)

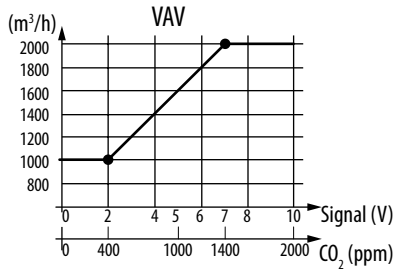


Mode recommended in single area configuration for variable airflow applications depending on a signal type 0-10v.
The airflow set point value depends on a signal 0-10 V coming from an outdoor probe (CO2, temperature, relative humidity, etc.) or a manual percentage. The ratio between the airflows is entered in the form of a discharge/supply percentage.

Functional parameter setting on ETD display
Access to the simplified parameter setting menu (via the password 1111) allows :

- The selection of the usage range of the signal 0-10V (see example below).
- The variation range of the supply fan's airflows.
- The percentage applied to the discharge airflow with respect to the supply airflow.



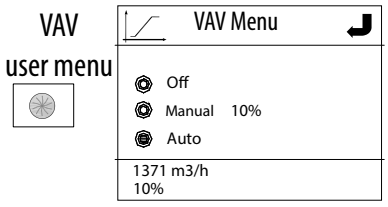


Usage example :
Connection of a probe SCO2 of a measurement range 0-2000ppm (0-10V)
To use the range 400-1400ppm, select Vmin=2V and Vmax=7V
By repeating the example now with airflows which must evolve from 1000 to 2000 m³/h, we get the curve.

Note : Using the High Speed Force when the "Boost" high speed is activated by the external contact the CO2 demand will be overwritten. (here 2000m³/h, regardless of the value measured by the probe).

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

Setting for the usage on ETD display

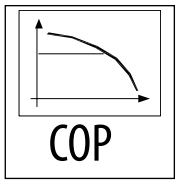


Stop, Manual x% = Manual setting of the airflow = flow at Vmim+ x% [flow at Vmax - flow at Vmin].

Auto = work according to clock or state of control terminal strip (start/stop + probe).

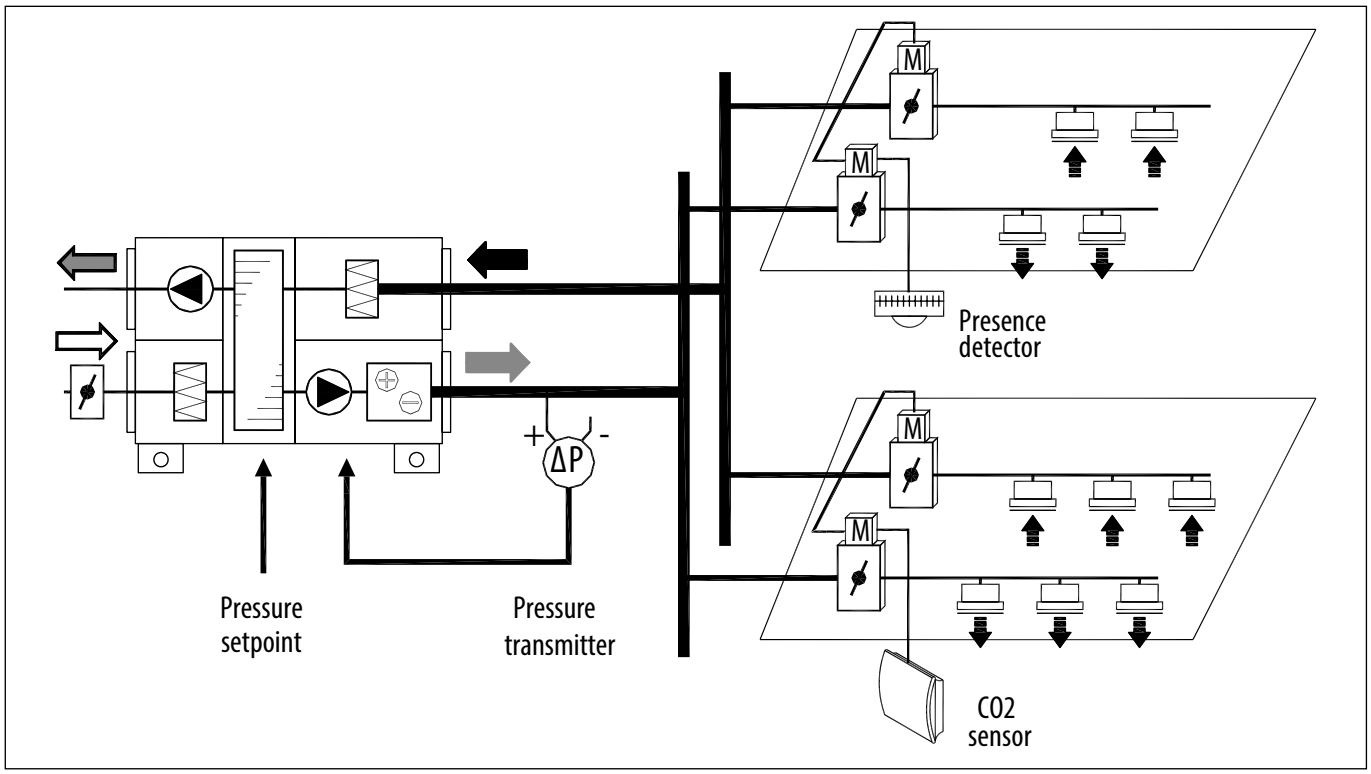
Note : an action by the terminals 31-32 / 33-34 has priority.

8.4 Constant pressure operation (COP)



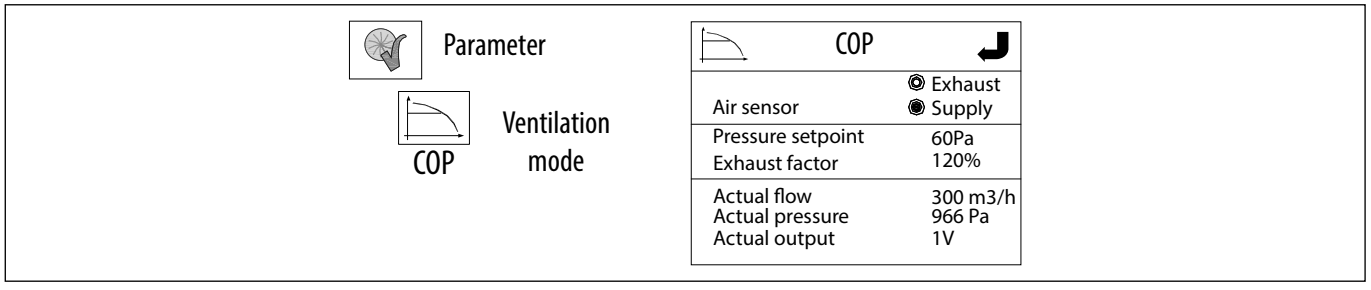
Mode recommended in a multi-area configuration for variable airflow applications with several modulation systems of the airflows installed at the network level.

Example :



Airflows automatically modulated to maintain a constant pressure value measured by an outdoor pressure sensor. From the ETD display, it will be indicated on what network the pressure sensor is placed (See Accessories – differential pressure probe).
The pressure set point is manually entered in Pa, as well as the desired % between the discharge airflow and the supply airflow.
The parameter setting screen on ETD allows displaying the airflow in real time at the desired pressure.

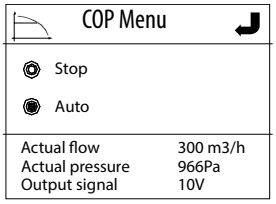
Functional parameter setting on ETD display



Pressure probe = location of the pressure tap (discharge or supply).
Pressure set point = value of desired pressure in the selected network.

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

Setting for the usage

COP Use  	Stop Auto = work according to clock or state of control terminal strip (start/stop unit). Note : an action by the terminals 31-32 / 33-34 has priority.

8.5 Temperature control

8.5.1 Constant supply air temperature maintenance

 Parameter  Heating mode Constant supply air T°C	The temperature control is driven from the comparison between the supplyair temperature and the set point value parameterized via the console.

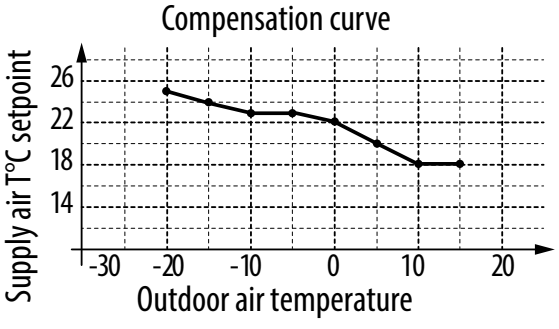
From the main screen the user can override by +/- 3°C this initial set point.

8.5.2 Constant ambient temperature maintenance

 Parameter  Heating mode Room T°C control	The supply is controlled in cascade with the ambient temperature. The difference between the ambient temperature and the set point determines the supply temperature. Therefore, the controller tries to respond to a request to hold the temperature in an ambiance while limiting the in-duct temperature, which remains in an allowable range (12-30C°).

From the main screen the user can override by +/- 3°C this initial set point.

8.5.3 Temperature set point adaptation vs. outdoor temperature

 Parameter  Heating mode Constant supply air T°C with outdoor T°C compensation	

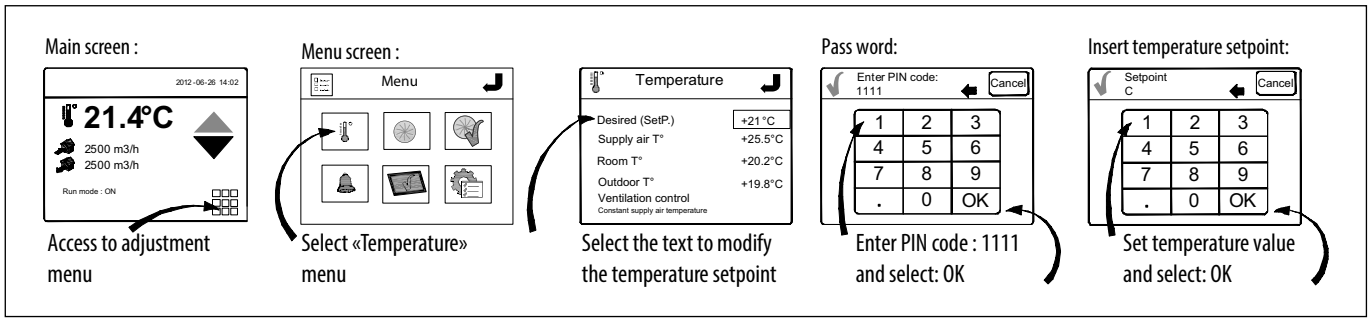
The controller's operation is similar to the 1st case.
The difference consists of not defining only one temperature set point, but a compensation curve itself defined in the factory with 8 set points.

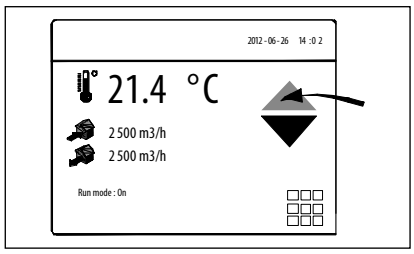
The supply set point is then adapted with respect to this curve, but the override of plus or minus 3°C possible from the main screen still remains effective.

Other working mode available with the expert menu. For more information, please contact our after sale service.

8.5.4 Initial temperature setpoint

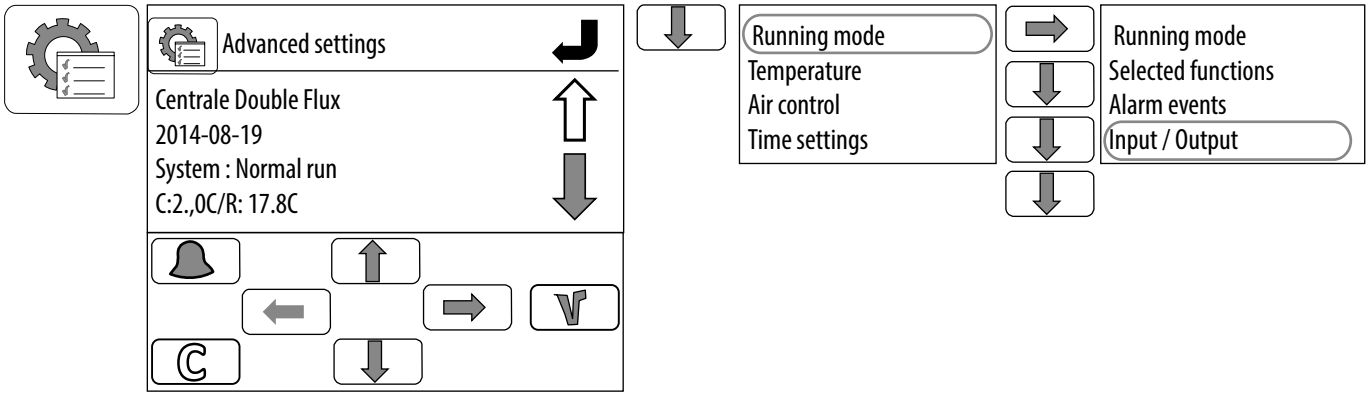
An initial set point value can be defined from the ‘’Temperature’’ screen in the menus.



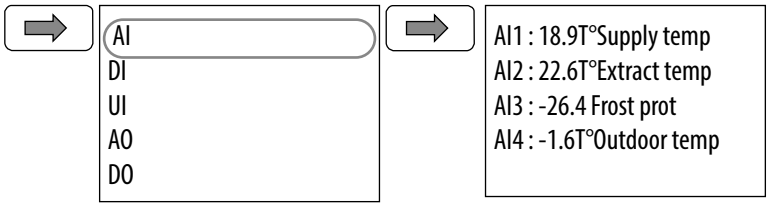


From the main screen the user can override by +/- 3°C this initial set point

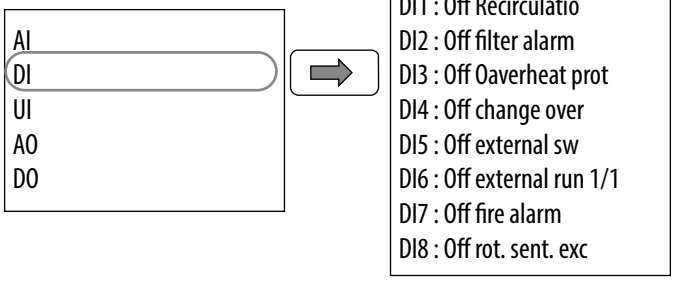
8.6 Expert menu : input / output statuts



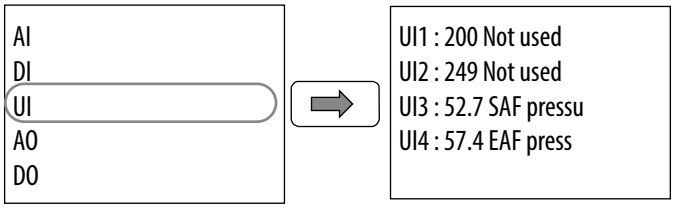
AI=Analogue Input



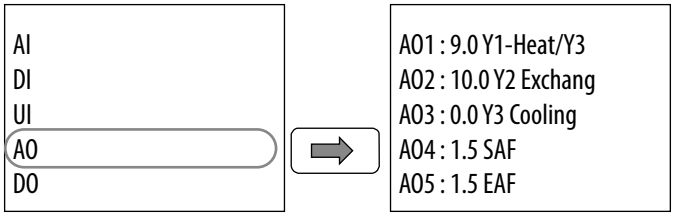
DI=Digital Input



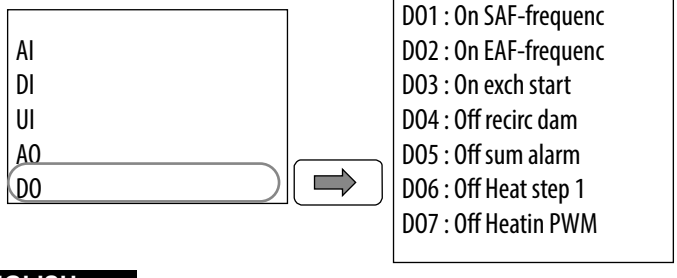
UI=Universal Input



AO=Analogue output



AO=Analogue output



SIGNIFICATION INPUT / OUTPUT :

AI1 : Supply air temperature probe
AI2 : Extract air temperature probe
AI3 : Frost protection probe install on water coil
AI4 : Outdoor air temperature probe

DI1 : Not used, Free for futur recirculation
DI2 : Filters pressure guards
DI3 : Over heat thermostat on electrical heater
DI4 : Chage over thermostat
DI5 : External on/off
DI6 : External request for high speed
DI7 : Fire alarm
DI8 : Heat exchanger tachometer(belt monitoring)

UI1 : External set point (CO2 sensor) ….m^3/h
UI2 : External pressure transmitter from the duct …Pa
UI3 : Pressure transmitter for supply air flow rate control (Pa)
UI4 : Pressure transmitter for extract air flow rate control (Pa)

AO1 : Signal 0-10V porportional control of the heating request
AO2 : Signal 0-10V proportional control of heat exchanger in case of variable speed control
AO3 : Signal 0-10V proportional control of cooling request
AO4 : Signal 0-10V prportional control of the supply air fan
AO5 : Signal 0-10V proportional control of the exhaust air fan

DO1 : Contact supply air fan on/off
DO2 : Contact exhaust air fan on/off
DO3 : Contact heat exchanger on/off
DO4 : Contact recirculation on/off
DO5 : Contact alarms information carry over
DO6 : Contact 1 stage electrical heater on/off
DO7 : Signal PWM for proportional control of electrical heater

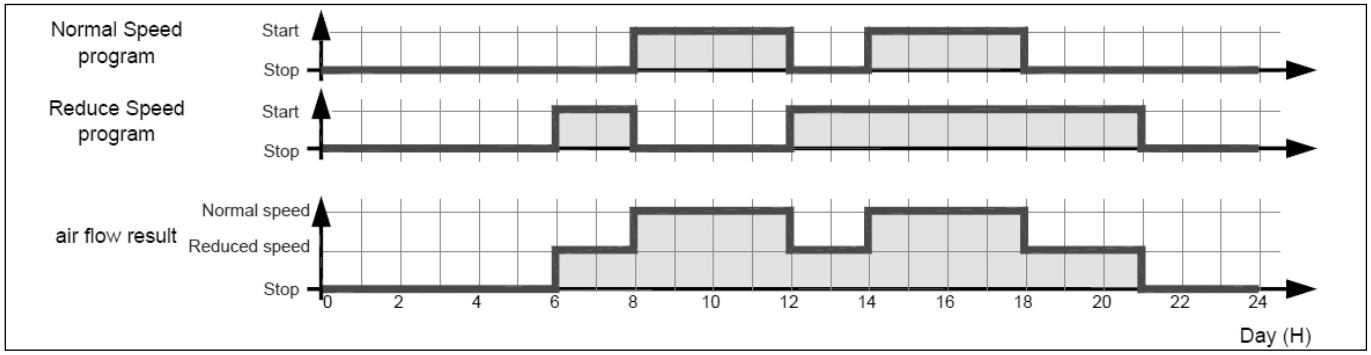
8.7 Time programming

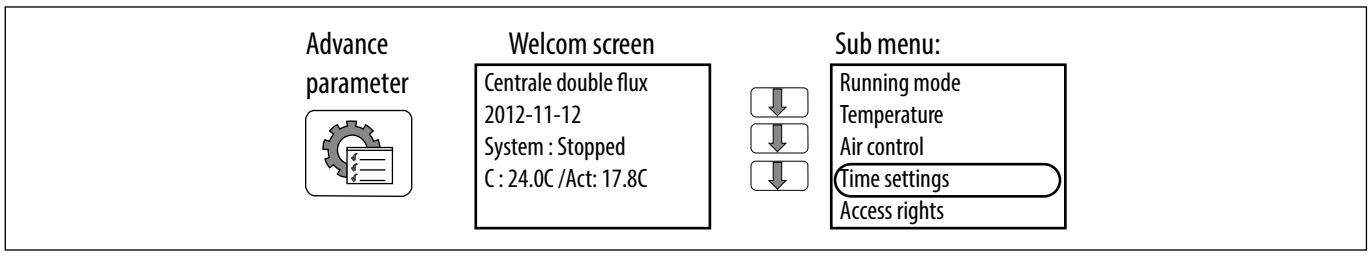
The controller has several clocks which allow the individual programming of : Reduced Airflow, Normal Airflow, Stop.
Holiday periods can be programmed; the transition to summer time is automatic.
A free cooling by night function can be programmed to start the CTA controller outside of programmed periods.

Clock parameter setting :
Only the operation ranges are programmed (outside these ranges the fans are stopped).
The installer can thus define two operation ranges in normal speed (the default speed or high speed) and the ‘’reduced‘’ speed (low speed when two speeds are possible).
For each speed, two ranges can be entered per day.
For example :

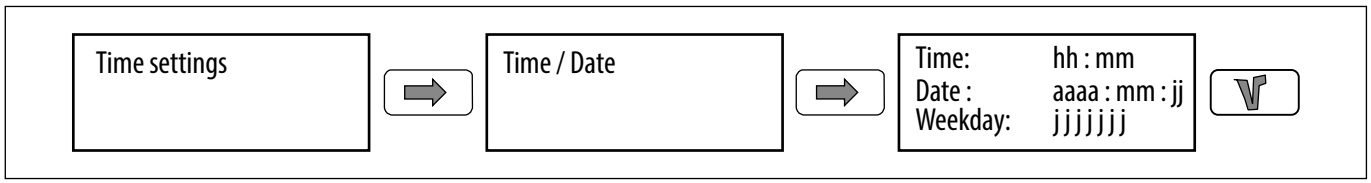
The High Speed can be defined from		8:00 am to	12:00 pm	in period 1
	and from	2:00 pm to	6:00 pm	in period 2
The Low Speed from		6:00 am to	8:00 am	in period 1
	and from	12:00 pm to	9:00 pm	in period 2

The programmable logic controller will then control the fans as follows :





In the time menu, before programming the ranges, make sure that the date and time are exact.
It is possible to set on:



To access the fields:

- Press the validation button (a cursor appears).
- Then with the arrows change the value.
- Once the value is obtained, press the validation button again.
- After all the fields are entered and the validation button pressed, the cursor disappears.

Time ranges 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:jj Weekday: jjjjjjj	
	Timer Normal speed	Normal speed Monday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	Normal speed Monday->Friday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00
		Normal speed Tuesday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		…	
		Normal speed Thursday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		Normal speed Friday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		Normal speed Saturday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	Normal speed Saturday->Holiday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00
		Normal speed Sunday Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	
		Normal speed Holidays Per 1: 00:00- 00:00 Per 2: 00:00- 00:00	

The ranges are programmed either 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	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

8.8 Force operation

A digital input allows forcing the unit’s normal operation state. The forcing duration is adjustable; the timeout is set in the factory to 0s to be compatible with our presence detection systems and our control buttons.
Terminals are available in the box for the connection of the input (use of a potential free contact).

Time settings	Extended running	Extended running 0 min Time in ext. Running Extended: 0 min

8.9 Free cooling

The principle of free-cooling uses free energy from the outdoor air to ventilate and cool buildings when outdoor air is lower than the exhaust air temperature, during the night in summer for example.
Reducing grain temperature can be done by stopping or reducing the rotation of the wheel.
According to the temperature setpoint, and the temperature measured on the supply air, the heat exchanger will receive the signal of variation or stop depends of the type of wheel driving control.

8.10 Free Cooling by night

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 "Start".
- 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 installation is again stopped.

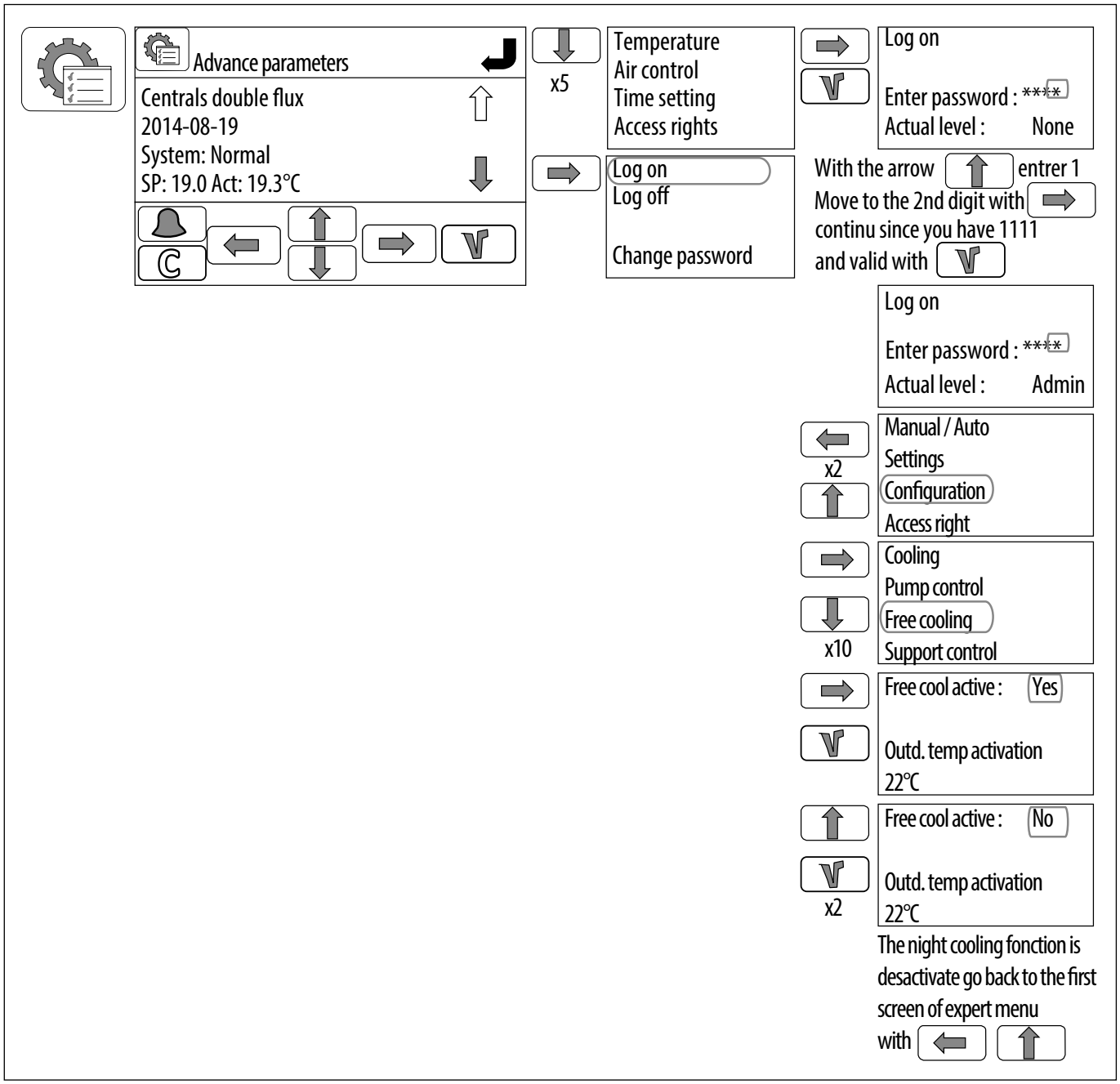
When the free cooling function is active, the fans run at maximum speed (it is possible to reduce this speed by setting the parameters); the coil and heat exchanger control outputs are switched off. The heating output remains inhibited for 60 min(1) after the function is stopped.

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

Special condition for night cooling in constant pressure working mode (COP)
In constant pressure running mode (COP), during the night, the air flow modulating dampers of the different zone could be in closed position, or on minimum air flow position.
To use the night cooling, it’s necessary to pry the opening of the damper to reach enough air passage for the overflow. We recommend using power contactor like “CAPI”.

To be able to use the night cooling, it’s necessary to force the dampers opening.

It's also possible to enable the night cooling function on the expert menu :



8.11 Antifreeze hot water coil protection

Frost protection for hot water coil, the water return temperature is transmitted to the controller by a probe. The controller permanently generates a signal to the valve motor which allows preserving a sufficient hot waterflow to prevent frost in the coil.

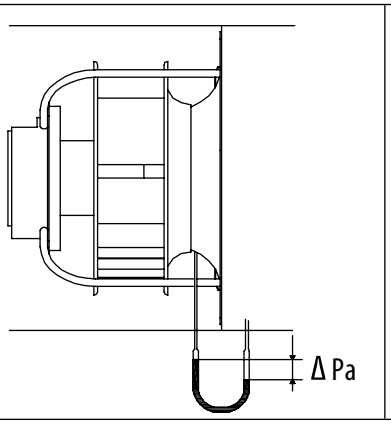
In case the water return temperature drops below the critical point (7°C), the fans are stopped and the dampers (accessories) closed, an alarm is activated.

The antifreeze protection remains active when the fans are stopped.

8.12 External input for fire mode

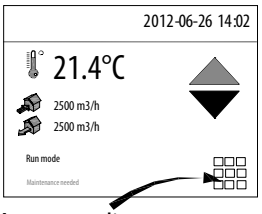
The controller is configured to receive a fire contact. If the fire input is activated, the unit is stopped. When the unit is stopped by the fire input, it can only be restarted after the alarm is acknowledged. It is possible to configure an automatic restart. Two terminals are available for this input (see connection).

8.13 Mesure des débits d'air - modification du coefficient K



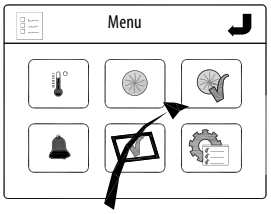
Each fan (supply and exhaust) on the unit is equipped with a pressure transmitter, connected to the control system.
RHE 700/1300 = pressure transmitter – 0-500Pa with 0,5-4,5V Vdc
Other size = pressure transmitter -0-800Pa with with 0,5-4,5V Vdc
The differential pressure approach compares the static pressure before the inlet nozzle with the static pressure inside the inlet.
Air flow is calculated on the basis of the differential pressure, with the following equation:
$Qv = K \times \sqrt{\Delta Pa}$
Qv= air flow in m^3/h
K coefficient take into account the specific nozzle characteristics.

Main screen:



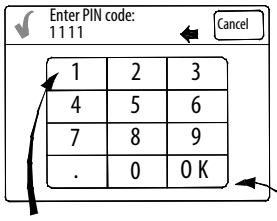
Access to adjustment menu

Menu screen:



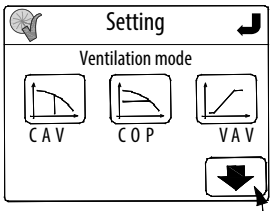
Access to ajustment program

Pass word:



Enter PIN code : 1111 and select: OK

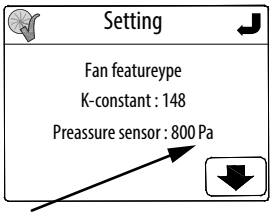
Control mode adjustment:



Select next screen

To exit from a screen, press the icon in the upper righthand corner of the screen

Control mode adjustment:



500 Pa only size 700/1300

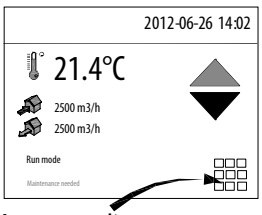
Coefficient K values:
RHE 700 : K= 63
RHE 1300 : K= 65
RHE 1900 : K= 85
RHE 2500 : K= 101
RHE 3500 : K= 122
RHE 4500 HD : K=172
RHE 4500 VD : K=186
RHE 6000 : K=188
RHE 8000 : K= 240
RHE 10000 : K= 327

8.14 Failure list

In case an alarm or a failure occurs, a "Maintenance To Do" message appears in red on the main screen. The alarm type 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.

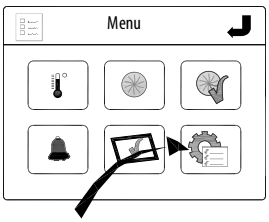
Note : the alarms are declared with an alarm class type C ; resetting is automatic as soon as the problem is resolved (no manual acknowledgement to be done).

Main screen:

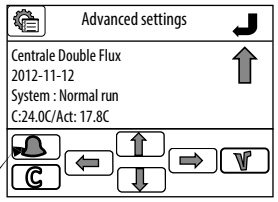


Access to adjustment menu

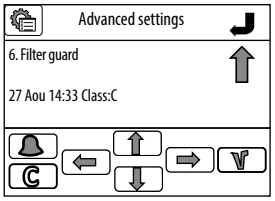
Menu screen:



Select advance menu



Select the alarm symbol to see the alarm text.



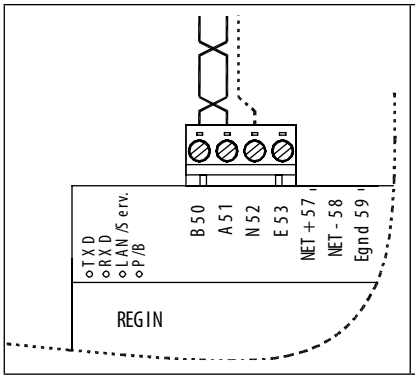
Alarm list can be shown using UP/DOWN arrows

To escape press the green arrow on the top

Alarm nbr	Alarm text	Description
1	Run Error Supply Air Fan	Malfunction Supply air fan
2	Run Error Extract Air Fan	Malfunction Extract air fan
6	Filter guard	Filter guard pressure switch activated
10	Fire alarm	Fire alarm activated
13	Supply Air control error	Supply air temperature deviates too much from the setpoint for too long
23	Electric heating is overheated	Heater high temperature limit switch activated
24	Frost risk	Frost protection function is overriding the control of the heater output (<12ºC)
25	Low frostguard temp	Frost protection temperature below frost limit value (<7ºC)
27	Sensor error Outdoor Tº	Malfunction of connected sensor
29	Rotation guard exchanger	Exchanger rotation sentinel alarm activated
31	Supply Air Fan control error	Supply air pressure deviates too much from the setpoint for too long
32	Extract Air Fan control error	Extract air pressure deviates too much from the setpoint for too long
41	Manual Heater Control	The heater is in manual mode
42	Exchange Ctrl manuel	Manual exchanger control
43	Manual cooler control	Cooling output in manual control
48	Internal heater error	Change the internal heater
49	Sensor error Supply Air temp	Malfunction of supply sensor
50	Sensor error Extract Air temp	Malfunction of return air sensor
51	Sensor error Room temp 1	Malfunction of ambient sensor
53	Sensor error Exhaust air temp	Malfunction of return air sensor
55	Sensor error SAF pressure	Malfunction of pressure sensor
56	Sensor error EAF	Malfunction of pressure sensor
58	Sensor error Frost Protection temp	Malfunction of antifrost sensor

9. COMMUNICATION

9.1 Building Management System (BMS) connection in Modbus RTU language

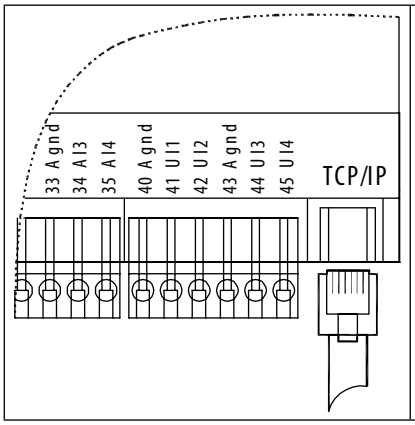


The controller in its standard version has an integrated RS485 communication port (to be used with an STP cable).

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

Modbus exchange table: Consult our site

9.2 Building Management System (BMS) connection in BACnet IP language

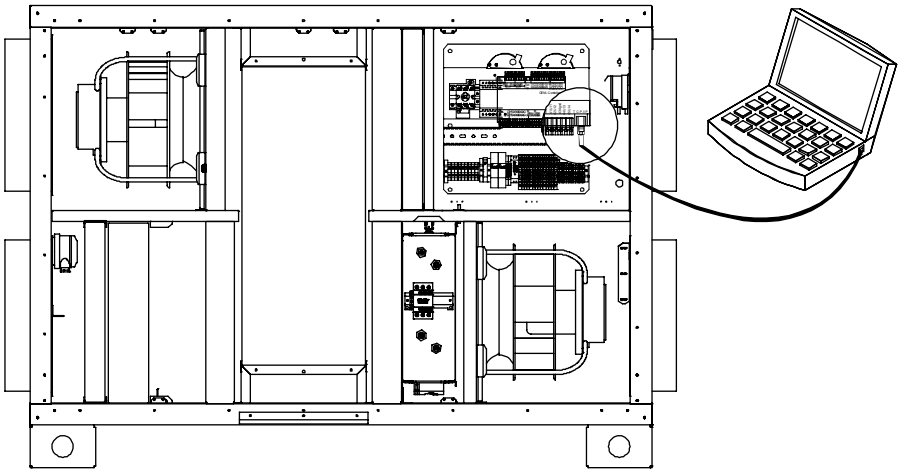


The CORRIGO is equipped with an integrated RJ45 port for TCP/IP communication, as support for BACnet IP communication.

It's necessary to configure the IP address on each CORRIGO, and activate and address the BACnet IP using ETOOL software (E tool© is delivered as a self-installing program and can be downloaded from http://www.regincontrols.com/Root/Documentations/42_105786/CorrigoEVentilation%203.4-1-24.zip)

For example :
Name : AHU_1_OFFICE
static IP address : 192.168.10.100
Net Mask: 255.255.255.0
Default Gateway: 192.168.10.1

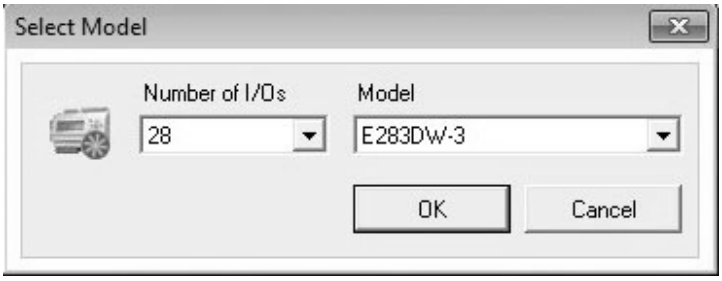
After the installation of ETOOL on your PC, connect it to the CORRIGO with a standard net cable with RJ45 connector. The CORRIGO must be powered; main switch has to be switch on.



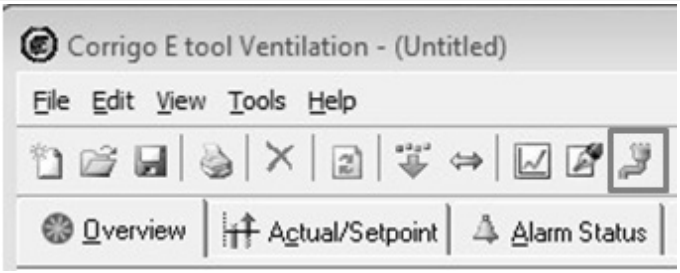
Click on the enclose icone :

This window appear :

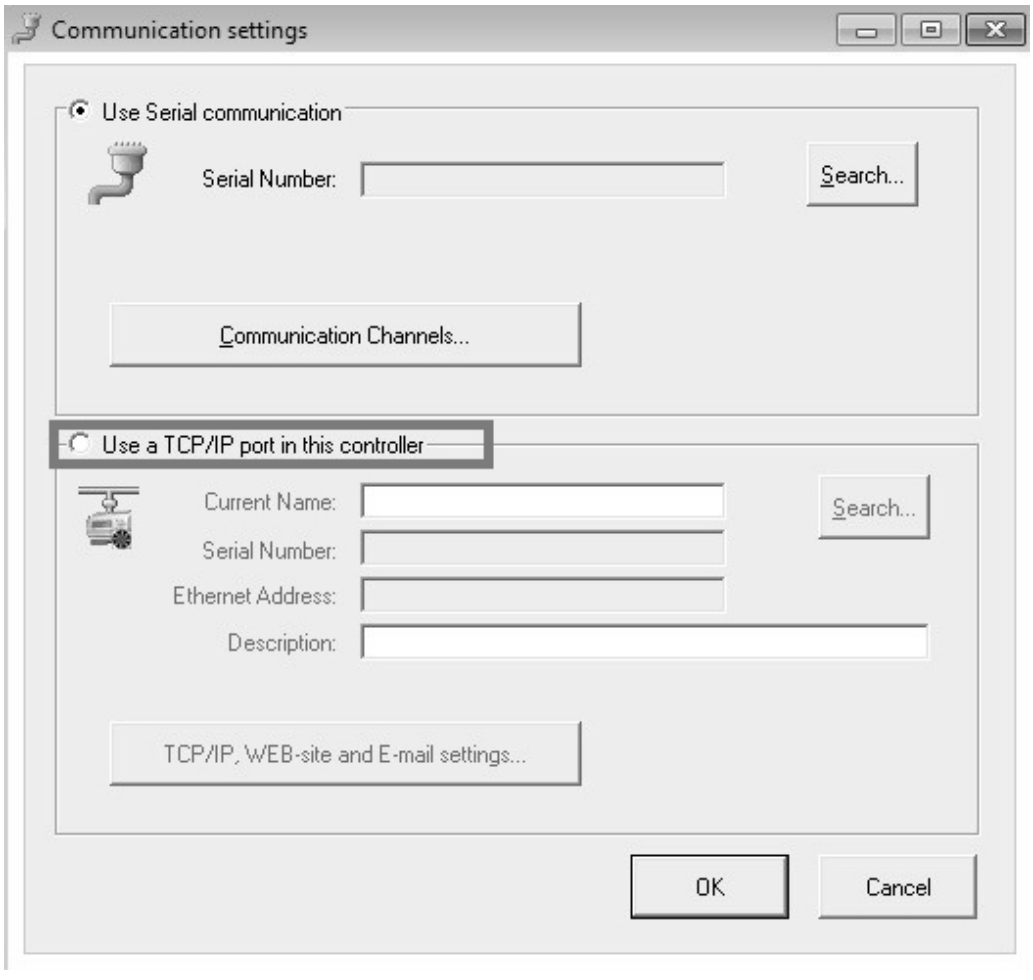
On the list of CORRIGO type, select:
Correspond to CORRIGO G3 3Ports used (E283DW-3).



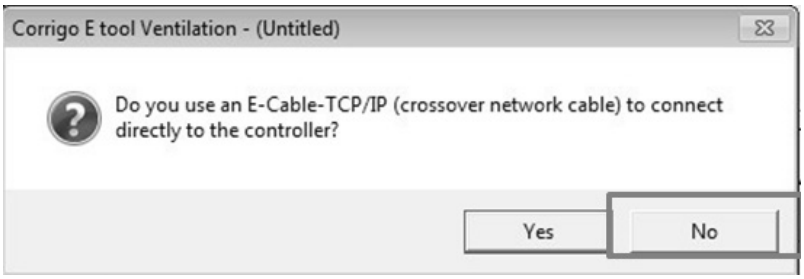
Click on the icon to select type of connection.



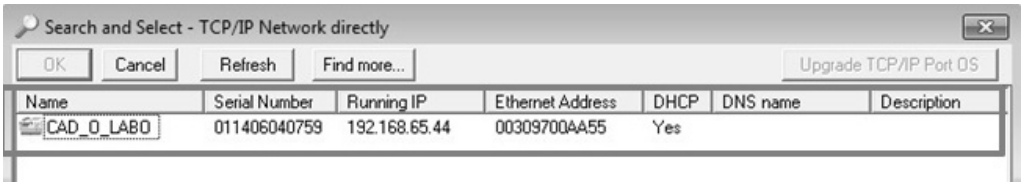
Select TCP/IP



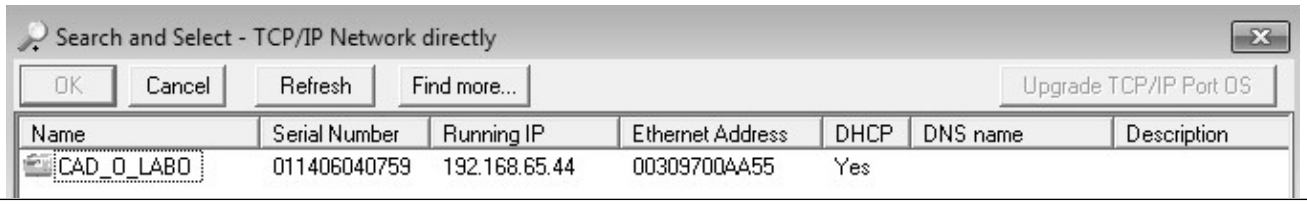
Select NO



Press Search to locate the relevant Corrigo.

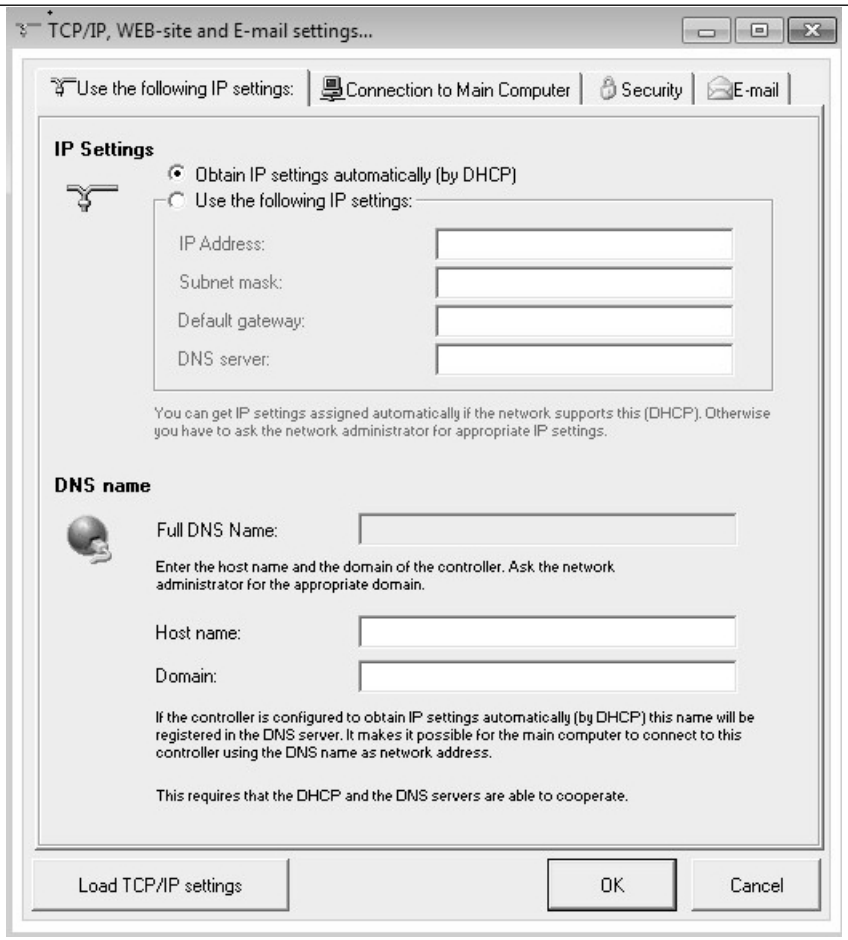


After the program has found the correct Corrigo, select it and click “OK”.

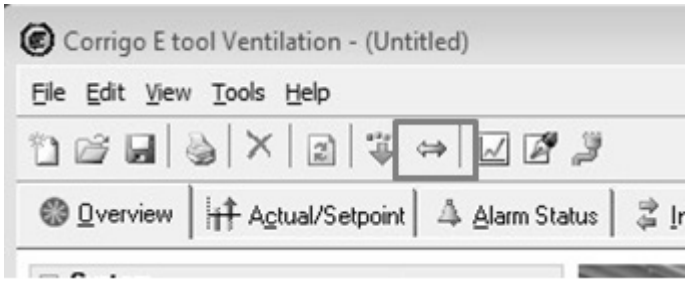


Turn back to the previous screen, the selected unit appear, you can modify the name to easily recognized it:

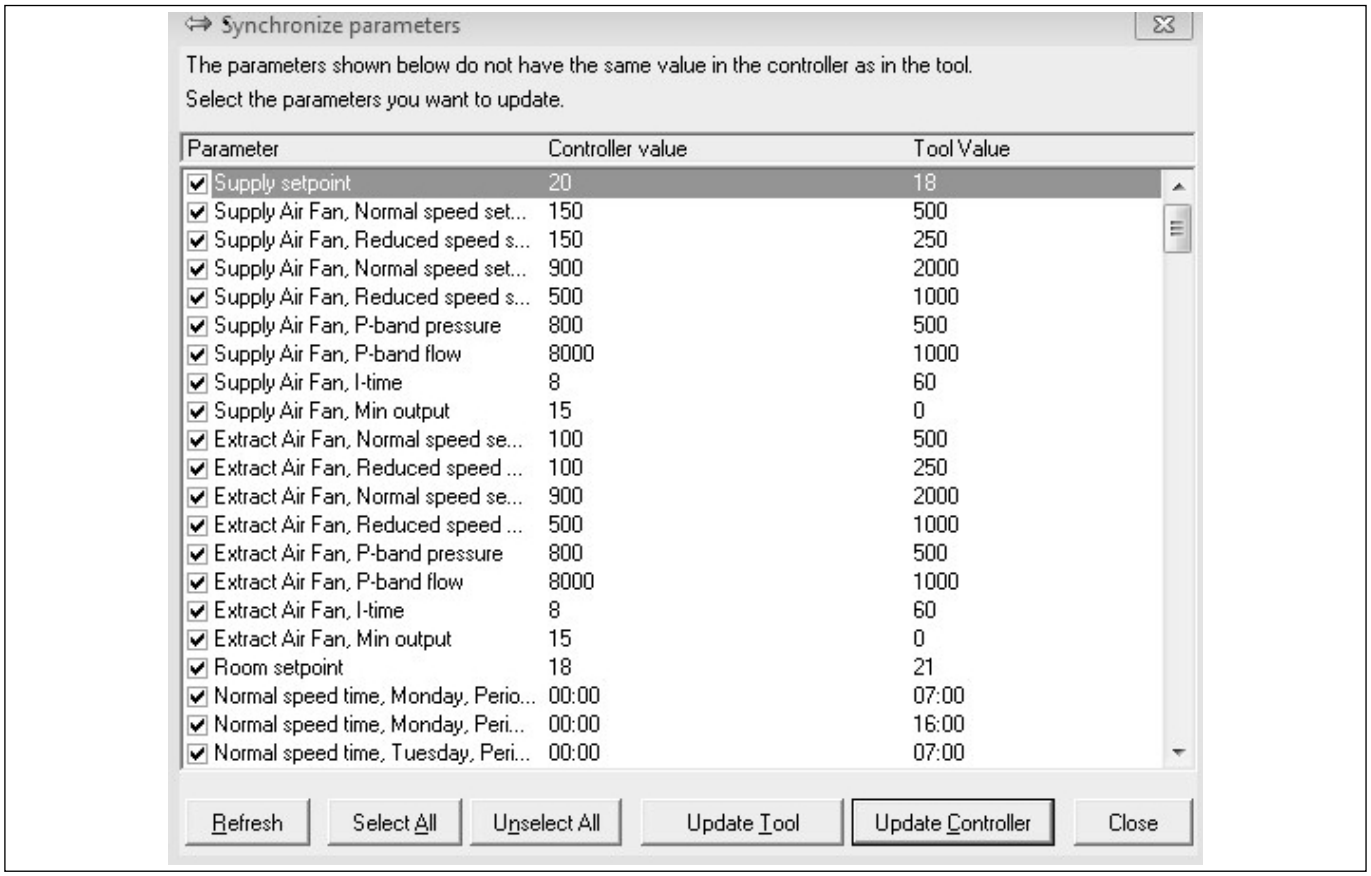
Click on TCP/IP,WEB site and Email setting, select automatic IP address, « load TCP/IP » to load the connection information into the CORRIGO.



Synchronize the CORRIGO with you PC, to load on your PC the current parameter of the CORRIGO.

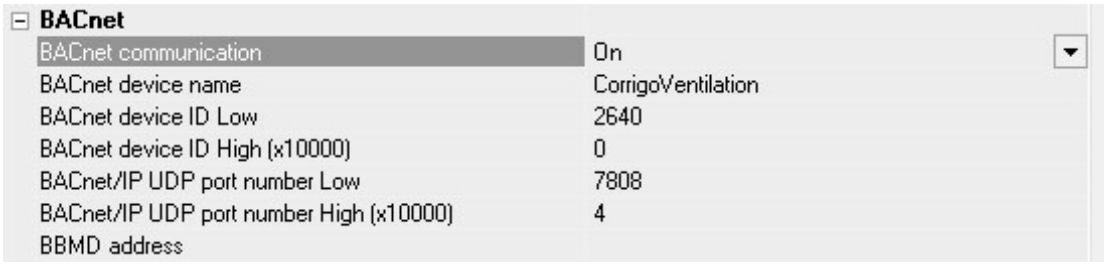


Update E Tool. **Be careful not update the controler**.



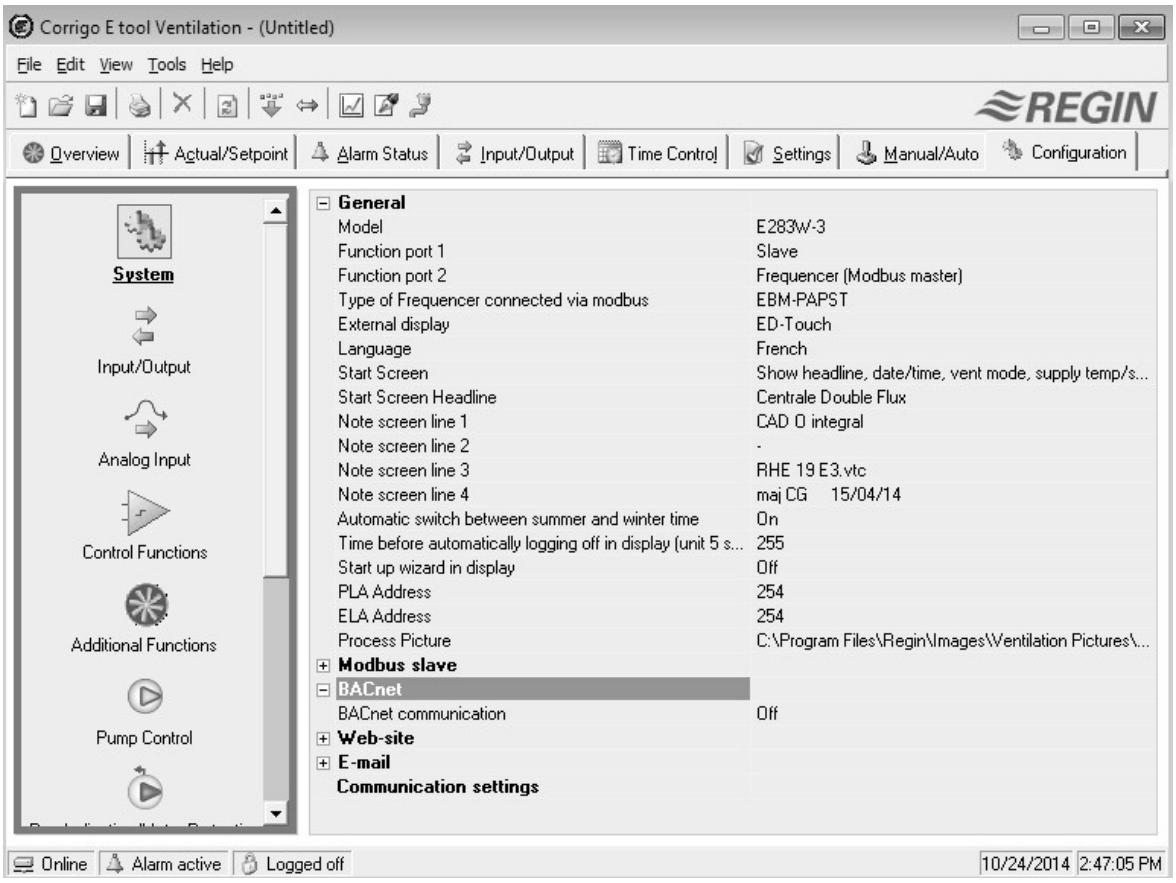
Activation status of BACnet/IP protocol.

Select « ON »



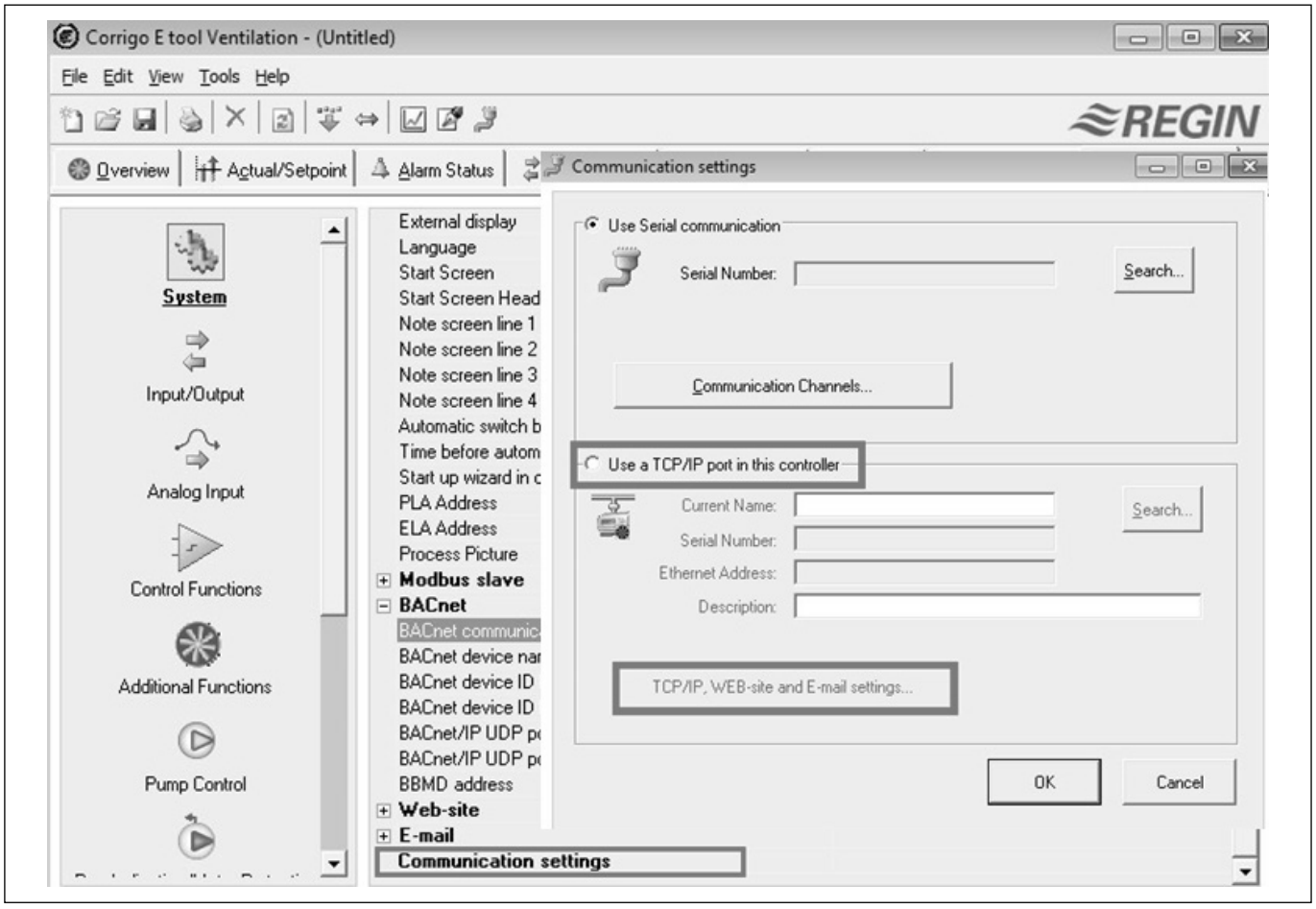
The name of the device could be change.
The device ID is divided into two parts, one low and one high. For example: If the high part of the ID would be “1”, then the device ID above would be “00012640”.
BACnet device ID low is by default 2640 on all CORRIGO, it’s necessary to change this ID when few units are install on the same system.
It’s necessary to export the modification on the controller.

Click on the right button of the mousse on the left-hand part of the screen :

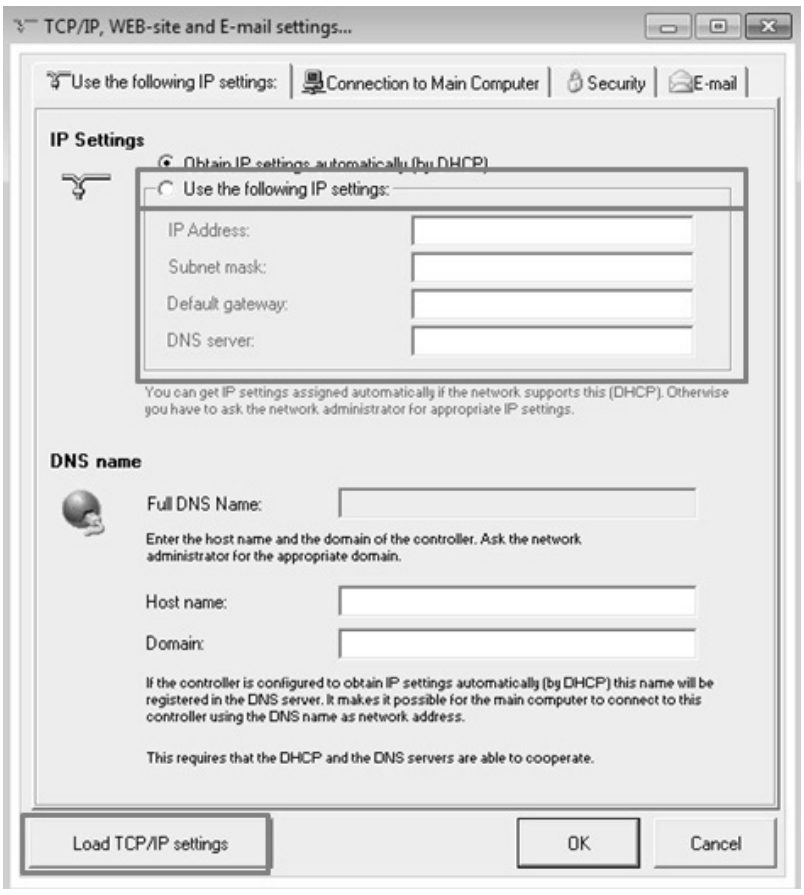


Click on Synchronize parameter ⇔, the modification done appear. Click on modify controller, admin code : 1111.

Now the BACnet is activated , it's now important to load a static IP address to the unit , to integrate it into the Network.

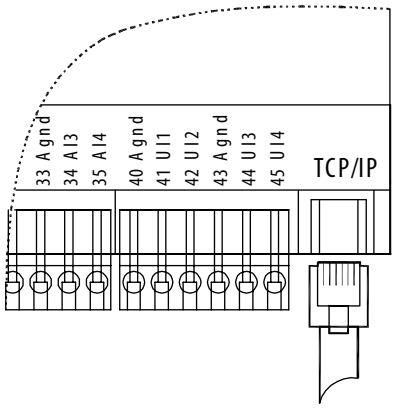


Enter the static IP adress informations and load TCP/IP settings

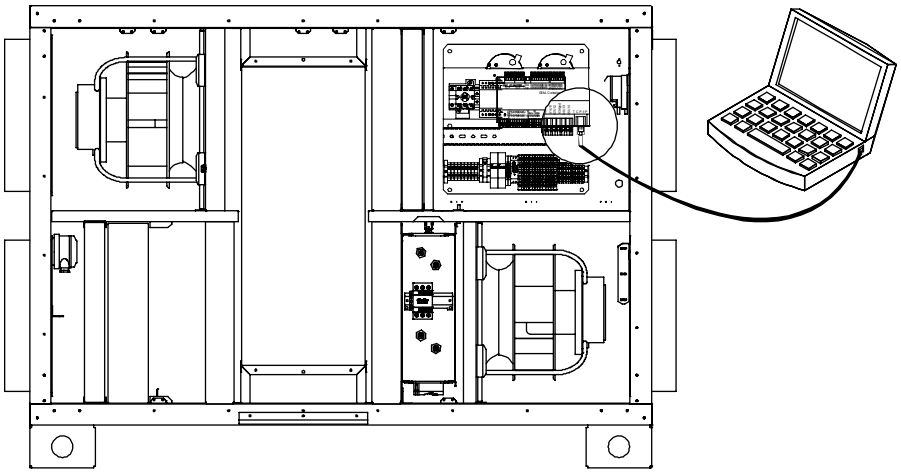


The CORRIGO is now ready to communicate on Bacnet IP.
The file of Bacnet protocole is on the PC where ETOOL is install on C:\Program Files\Domucmentation\English\Corrigo_BACnet_PICS.pdf

9.3 Integrated web server



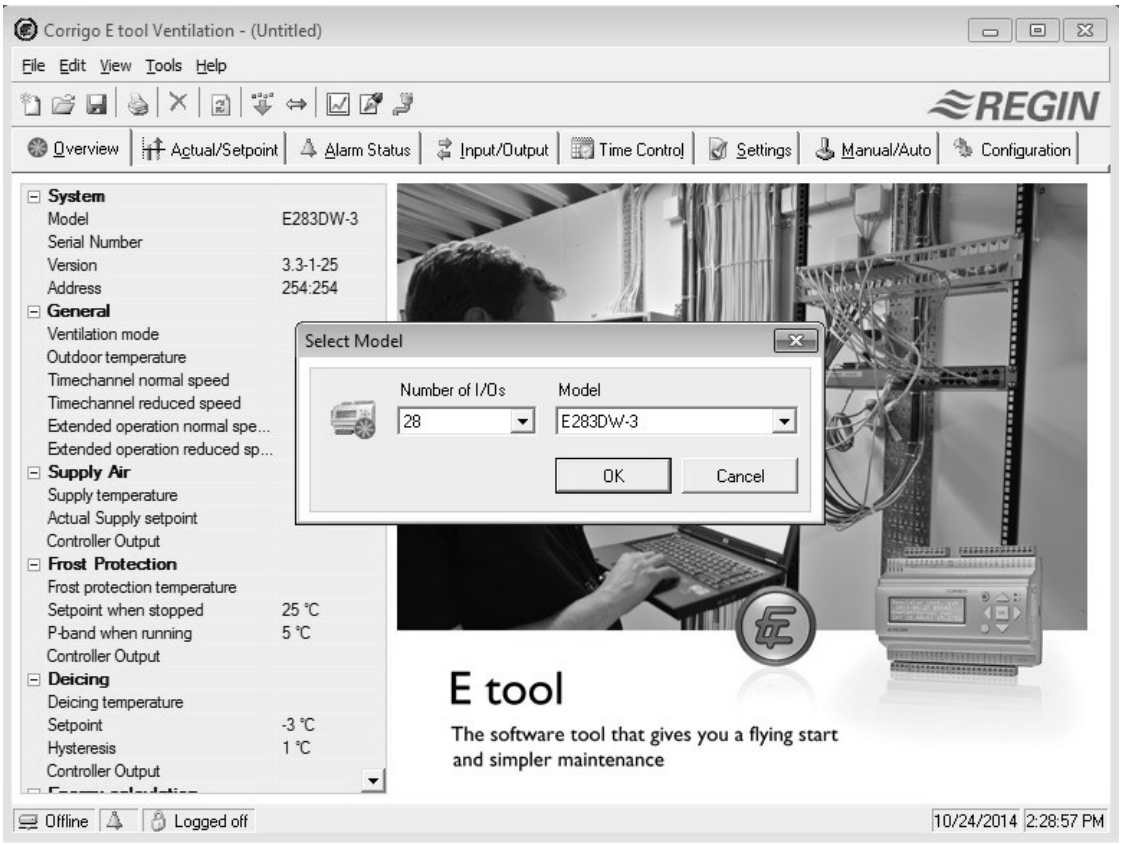
Corrigo is equipped with an integrated web server and a port for TCP/IP communication. This is the ideal solution for small to mid-sized buildings; enabling control, supervision and following up on status, events, trends and alarms via the Internet explorer using the building network.



It’s necessary to configure the IP address on each CORRIGO, using ETOOL software (E tool© is delivered as a self-installing program and can be downloaded from http://www.regincontrols.com/Root/Documentations/42_105786/CorrigoEVentilation%203.4-1-24.zip

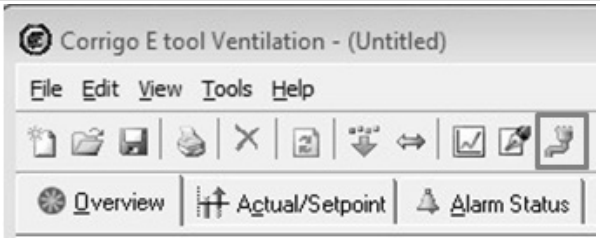
After the installation of ETOOL on your PC, connect it to the CORRIGO with a standard net cable with RJ45 connector. The CORRIGO must be powered; main switch has to be switch on.
Click on the enclose icone :

This window appear

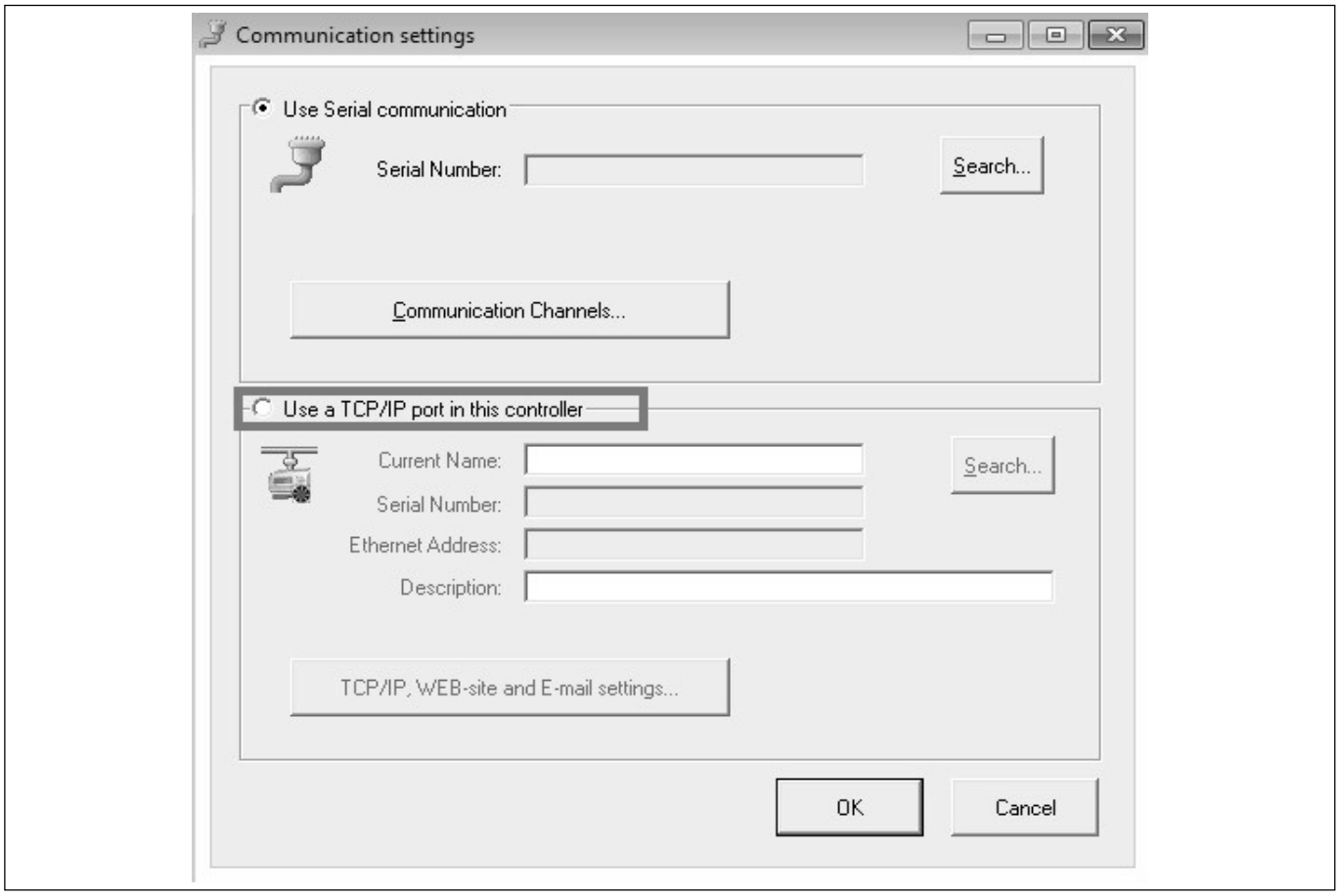


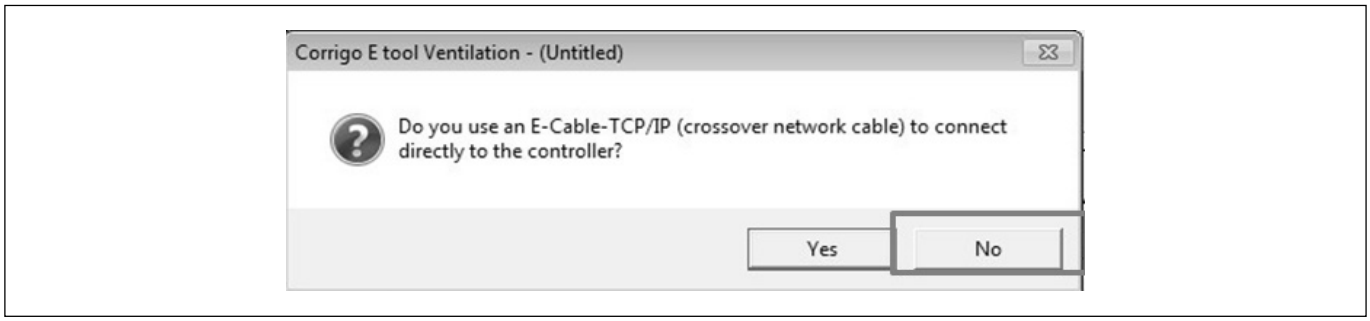
On the list of CORRIGO type, select "Model".
Correspond to CORRIGO G3 3Ports used (E283DW-3).

Click on the icon to select type of connection.

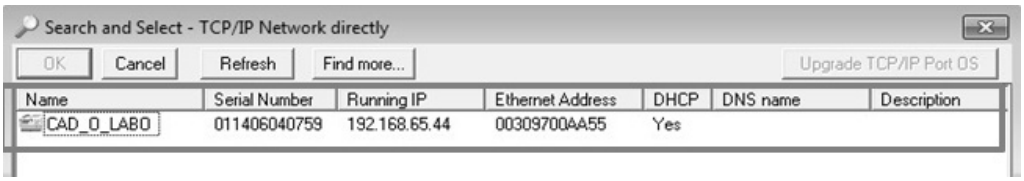


Select TCP/IP



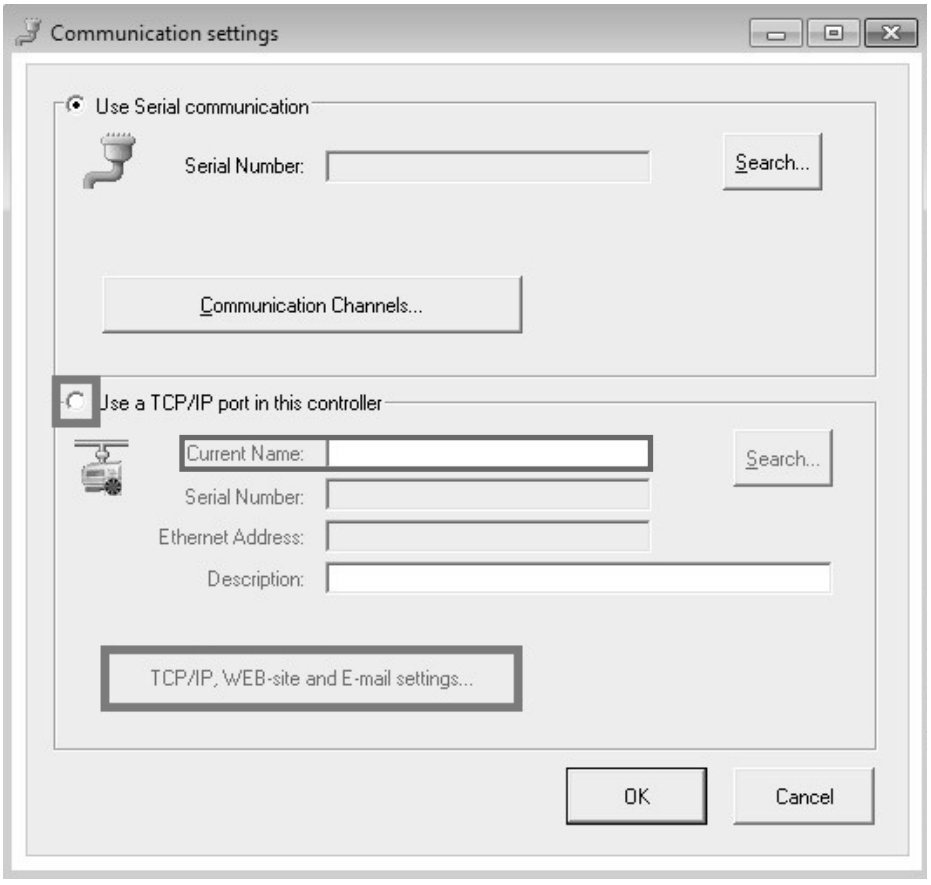


Press Search to locate the relevant Corrigo

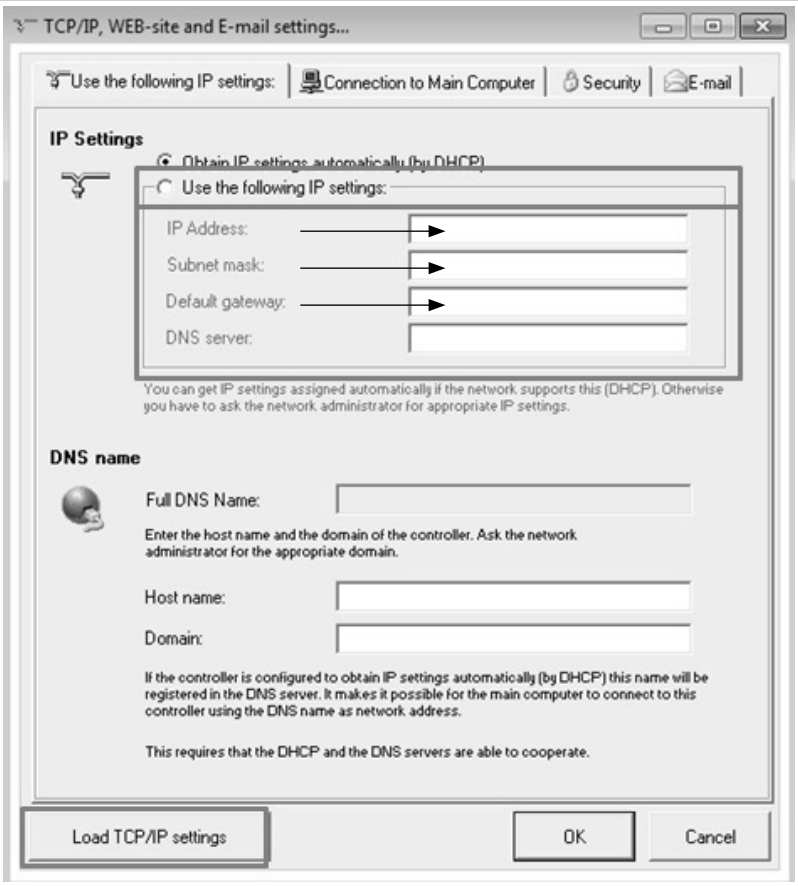


After the program has found the correct Corrigo, select it and click “OK”
You can note the Ethernet address, this information could be ask by the network administrator.

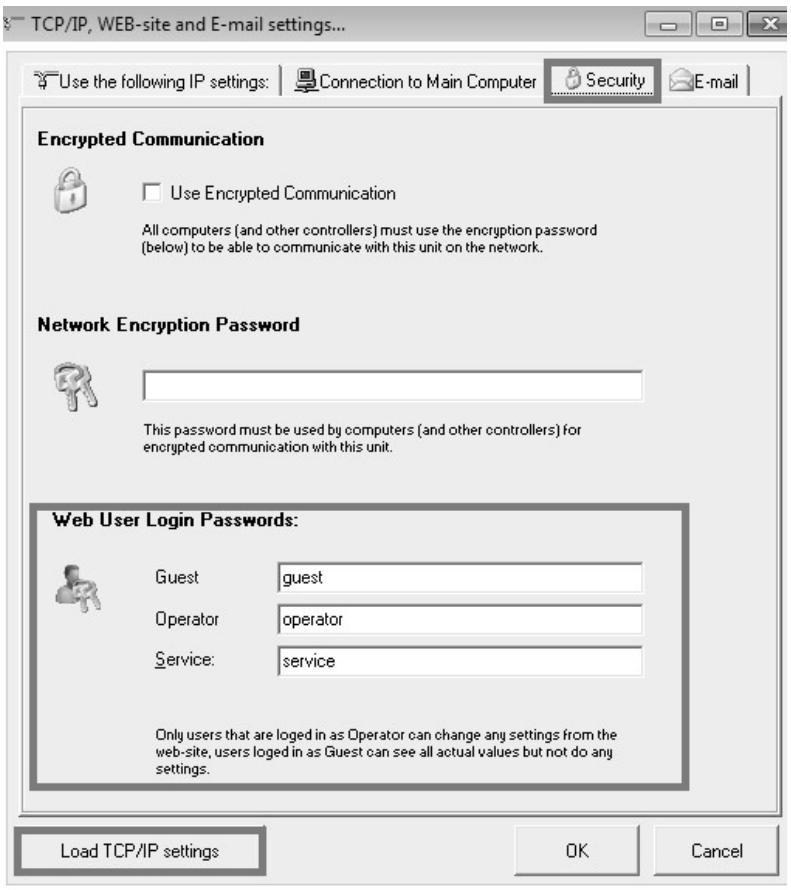
Turn back to the previous screen, the selected unit appear, you can modify the name to easily recognized it.



Click on TCP/IP,WEB site and Email setting, select "use the following ip settings"



Click on Security. Enter the static IP adress informations and load TCP/IP settings to load the connection information into the CORRIGO.



Web user login passwords are the passwords for logging on to the website.

Guests have permission to view all values.

Operators are authorised to view and change all values.
Service has no function via the web, but will instead function as Operator.
Web user login passwords could be change if needed, in case of change please click on load TCP/IP settings.

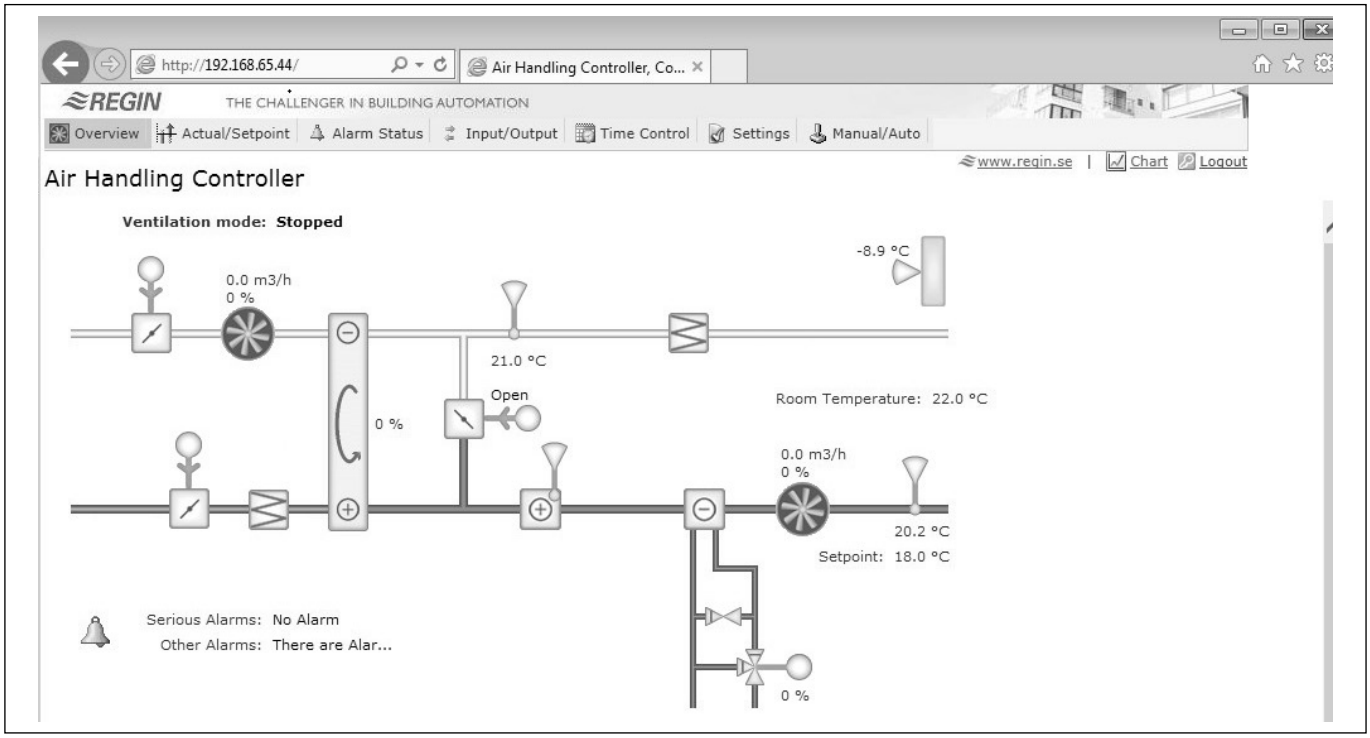
The CORRIGO is now ready for web server.

From your internet explorer, you can insert the static IP address you have load on the CORRIGO, for example : 192.168.10.100

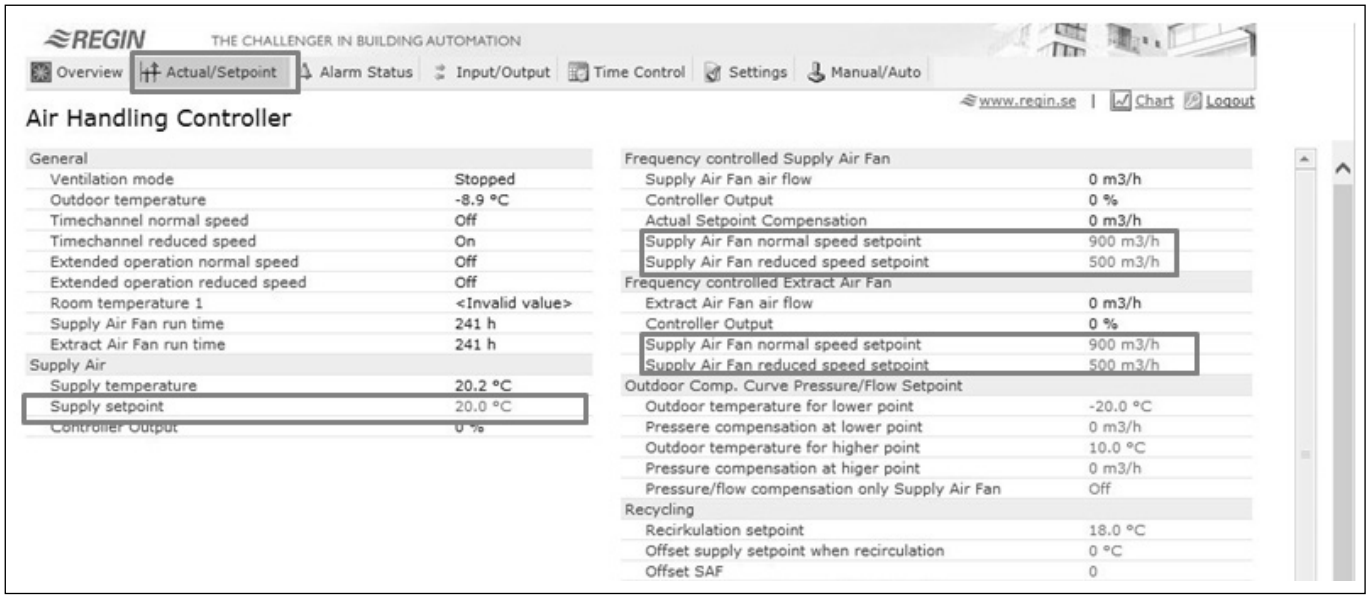
The window appear on your screen :

If necessary active JAVA.
The box Password is used to log on using the password entered under TCP/IP, website and e-mail settings.
Guests have permission to view all values.
Operators are authorised to view and change all values.
Service has no function via the web, but will instead function as Operator.

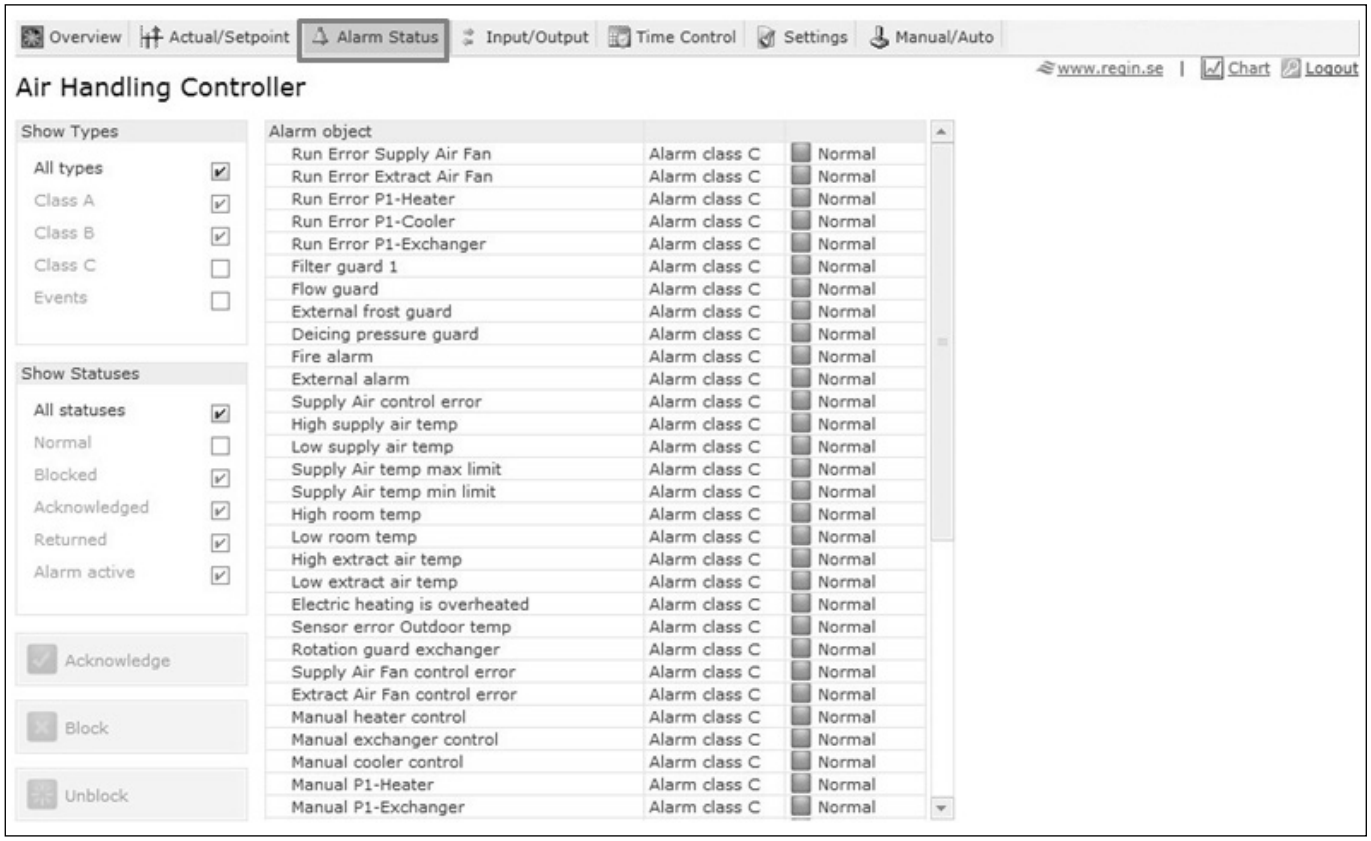
The 1st screen correspond to the overview of your unit.



The second screen represents the current set point.
All values written in blue text are changeable. As soon as a value has been changed and Enter has been depressed, the value is downloaded to the Corrigo. We strongly recommend to change only the usual setpoint, like air flow or temperature setpoint, and not the other data.



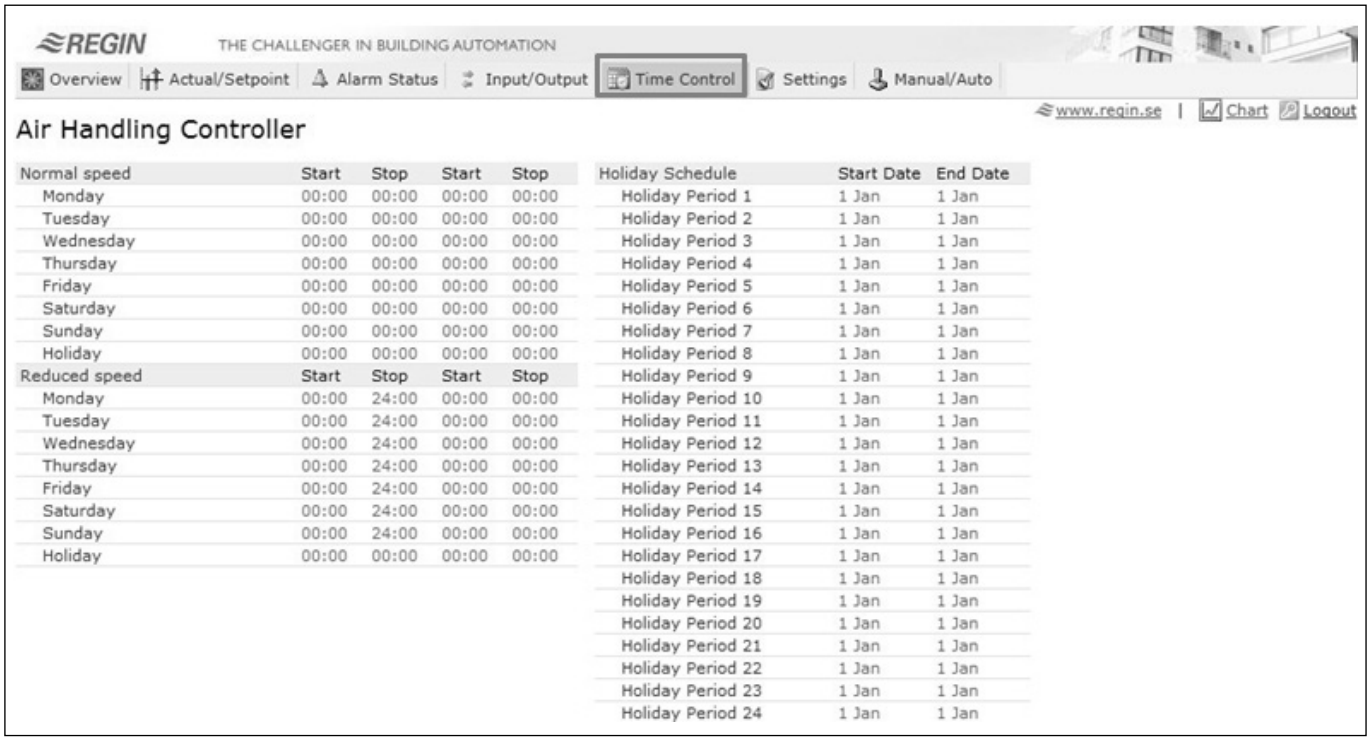
The 3rd page concern all the alarm status:



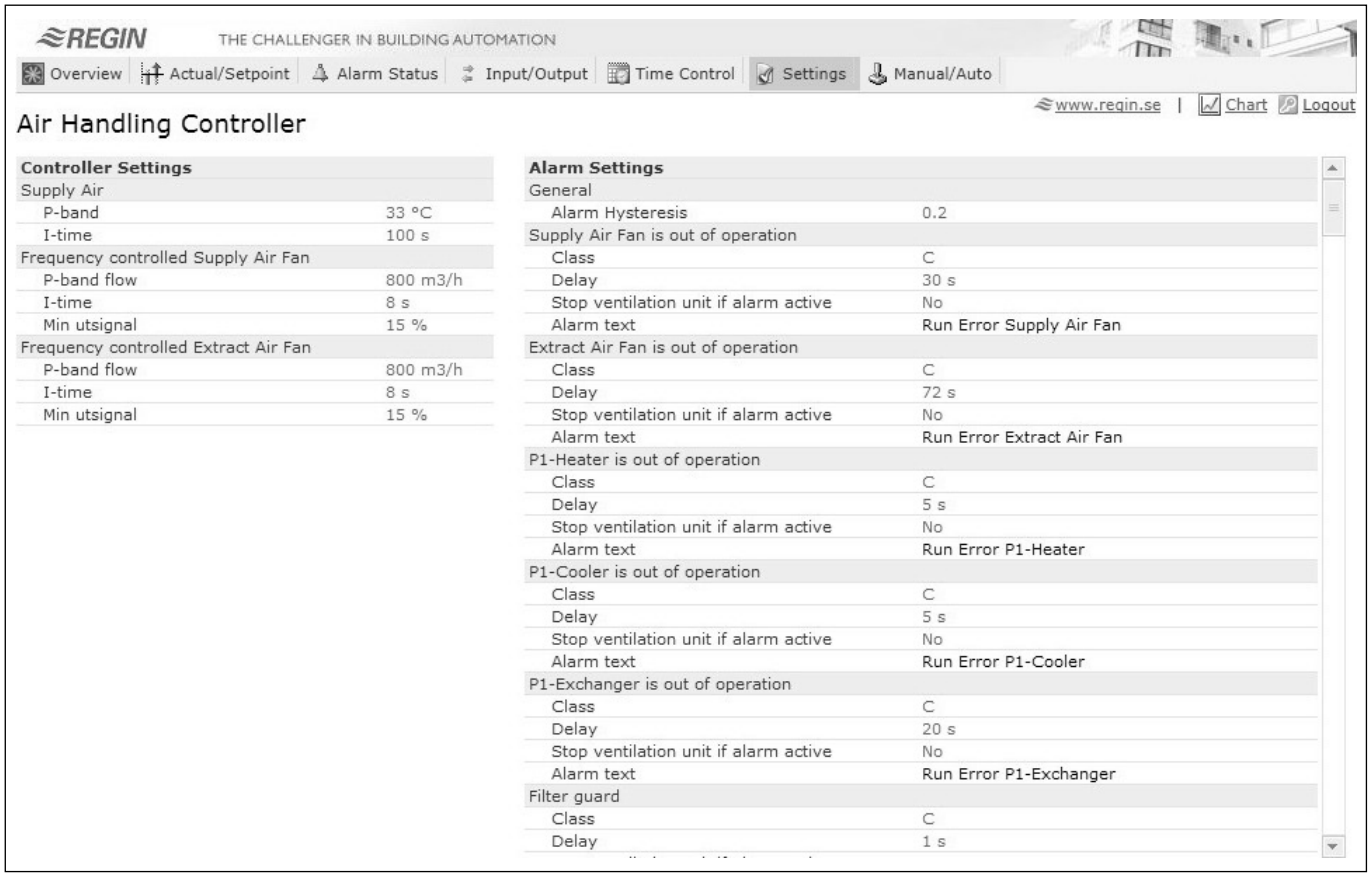
The 4th page the input/output status:

More details on « expert menu - input output status »

The 5th page will help you to have an over view of time control period and to friendly program holiday's periods:



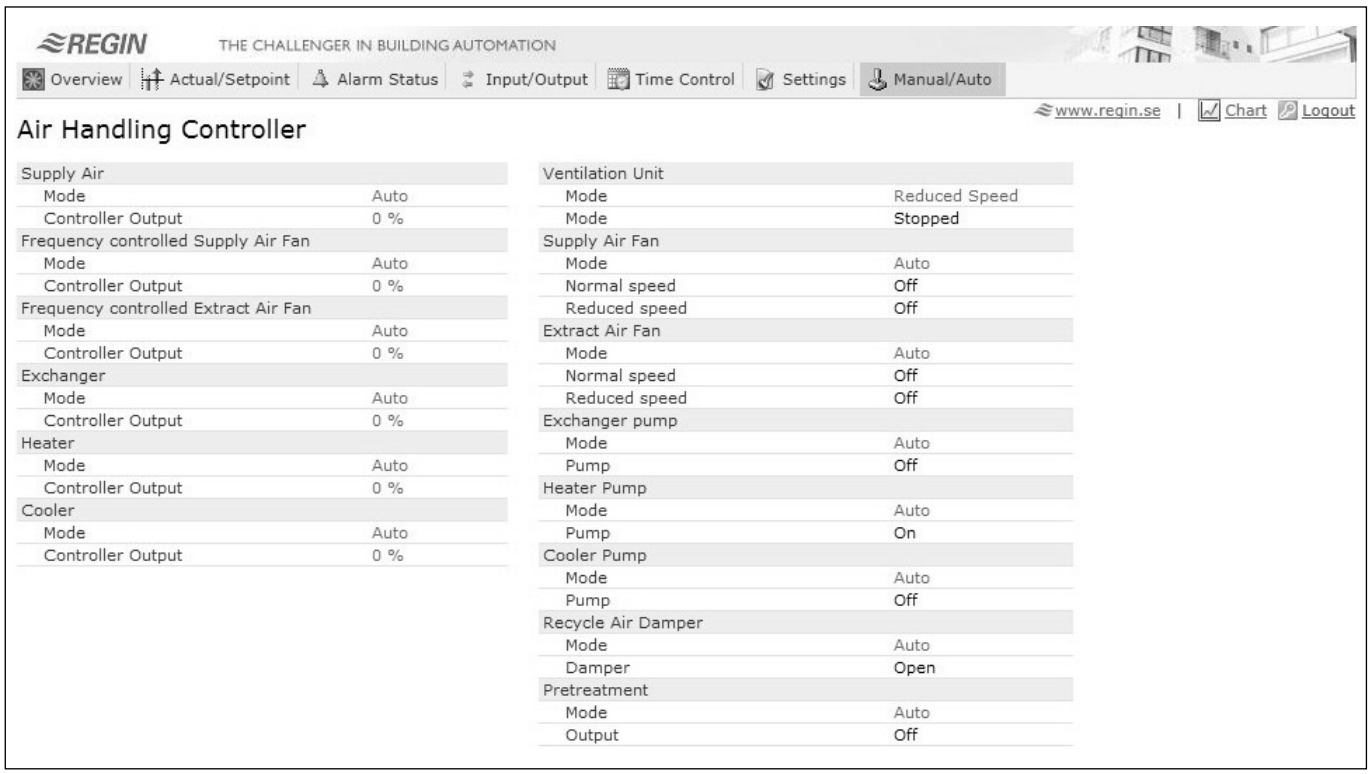
On the 6th page take place the different setting data like proportional or integral of PID control. **Don't change any data without any requirement from our side.**



Controller Settings	
Supply Air	
P-band	33 °C
I-time	100 s
Frequency controlled Supply Air Fan	
P-band flow	800 m3/h
I-time	8 s
Min utsignal	15 %
Frequency controlled Extract Air Fan	
P-band flow	800 m3/h
I-time	8 s
Min utsignal	15 %

Alarm Settings	
General	
Alarm Hysteresis	0.2
Supply Air Fan is out of operation	
Class	C
Delay	30 s
Stop ventilation unit if alarm active	No
Alarm text	Run Error Supply Air Fan
Extract Air Fan is out of operation	
Class	C
Delay	72 s
Stop ventilation unit if alarm active	No
Alarm text	Run Error Extract Air Fan
P1-Heater is out of operation	
Class	C
Delay	5 s
Stop ventilation unit if alarm active	No
Alarm text	Run Error P1-Heater
P1-Cooler is out of operation	
Class	C
Delay	5 s
Stop ventilation unit if alarm active	No
Alarm text	Run Error P1-Cooler
P1-Exchanger is out of operation	
Class	C
Delay	20 s
Stop ventilation unit if alarm active	No
Alarm text	Run Error P1-Exchanger
Filter guard	
Class	C
Delay	1 s

The last page allowed switching from automatic control to manual control. Except for testing don't change the working mode.

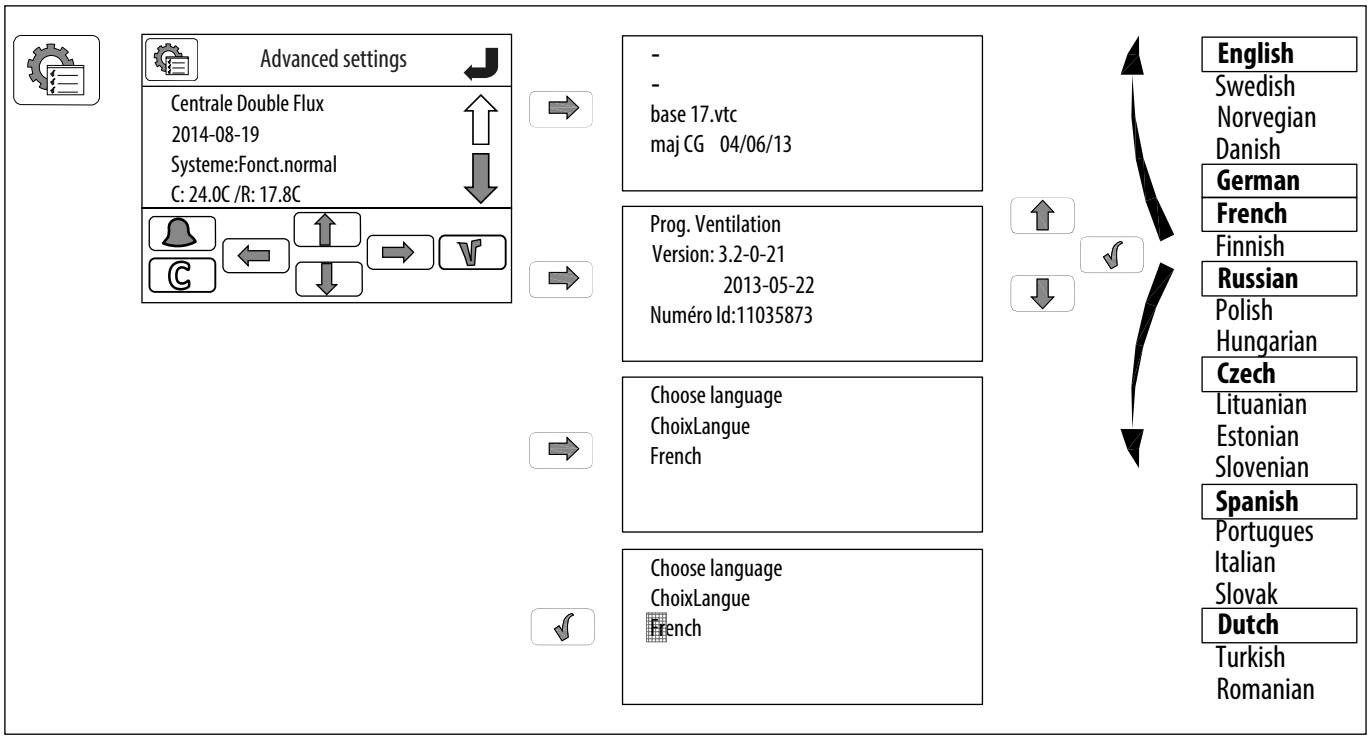


Supply Air	
Mode	Auto
Controller Output	0 %
Frequency controlled Supply Air Fan	
Mode	Auto
Controller Output	0 %
Frequency controlled Extract Air Fan	
Mode	Auto
Controller Output	0 %
Exchanger	
Mode	Auto
Controller Output	0 %
Heater	
Mode	Auto
Controller Output	0 %
Cooler	
Mode	Auto
Controller Output	0 %

Ventilation Unit	
Mode	Reduced Speed
Mode	Stopped
Supply Air Fan	
Mode	Auto
Normal speed	Off
Reduced speed	Off
Extract Air Fan	
Mode	Auto
Normal speed	Off
Reduced speed	Off
Exchanger pump	
Mode	Auto
Pump	Off
Heater Pump	
Mode	Auto
Pump	On
Cooler Pump	
Mode	Auto
Pump	Off
Recycle Air Damper	
Mode	Auto
Damper	Open
Pretreatment	
Mode	Auto
Output	Off

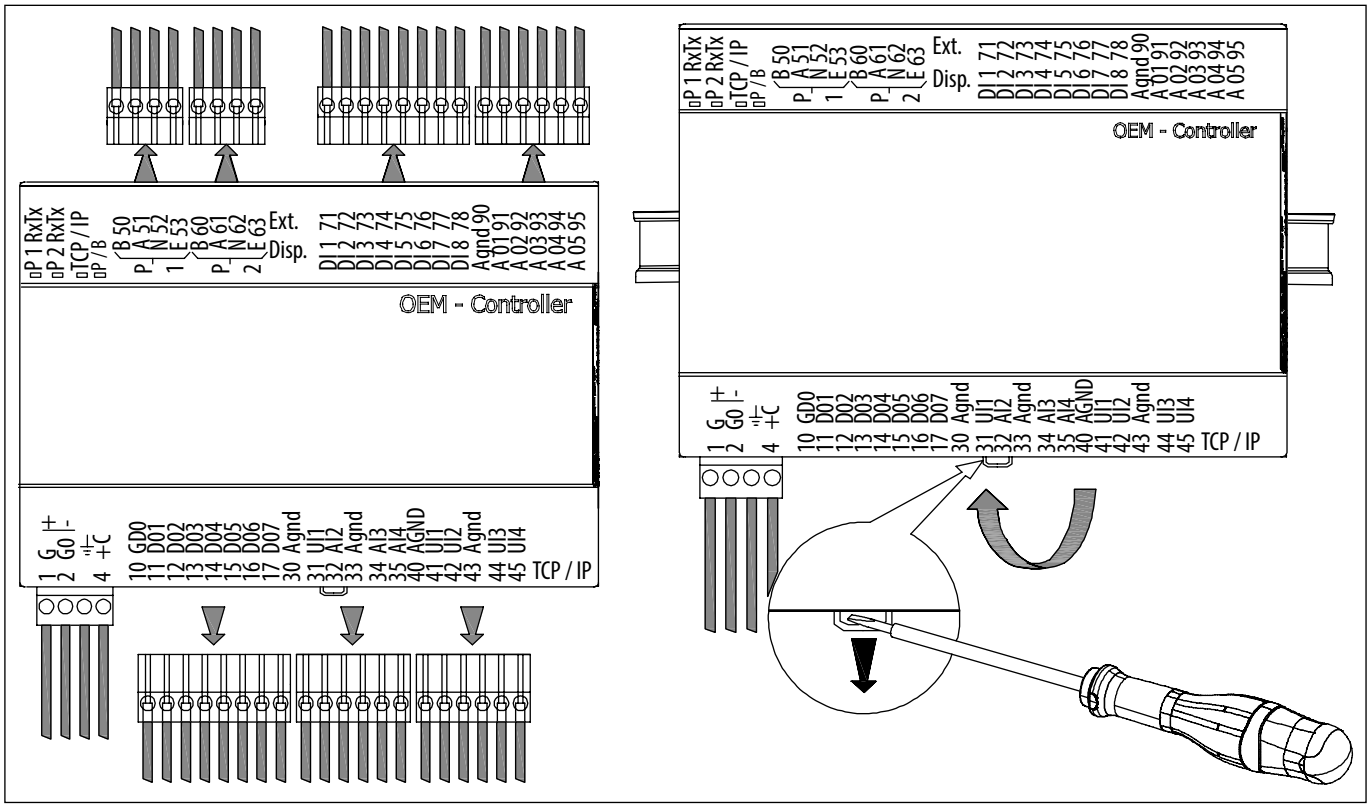
9.4 Change the display language

To change the display language follow the procedure bellow. Only the language surround are available.

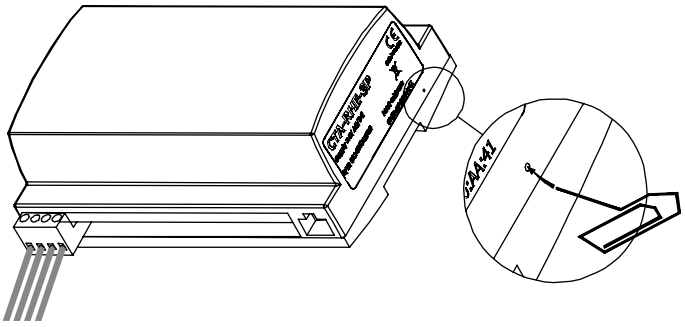


9.5 Reset the controler CORRIGO

In certain case, after many different settings or in case of malfunction, it's sometime necessary to reset the controller.
After switching of the main power with the safety circuit breaker, open the door on the controller side. Unplug all the CORRIGO connectors except the power one.



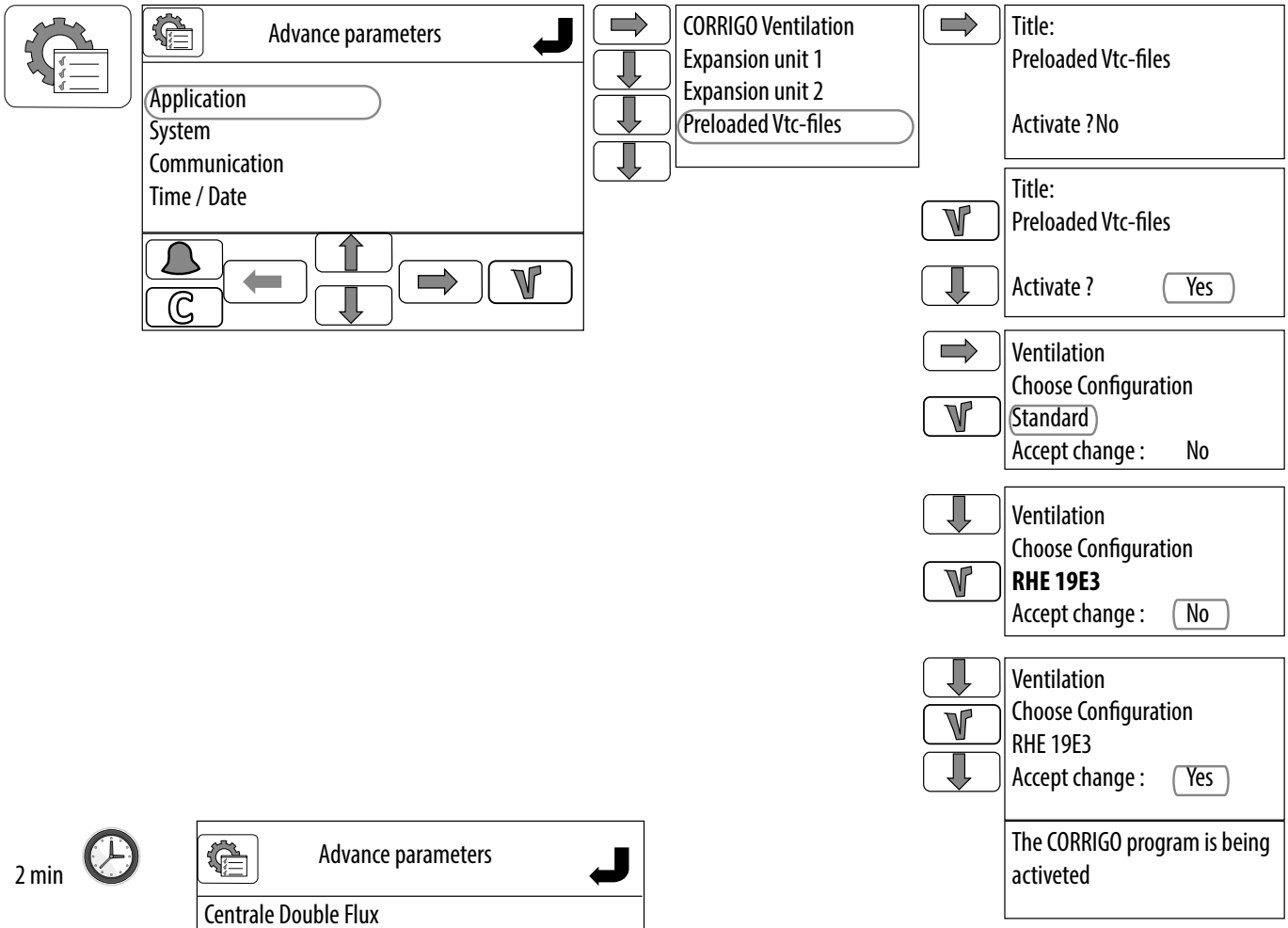
With a screw driver, unclip the CORRIGO from the DIN rail.



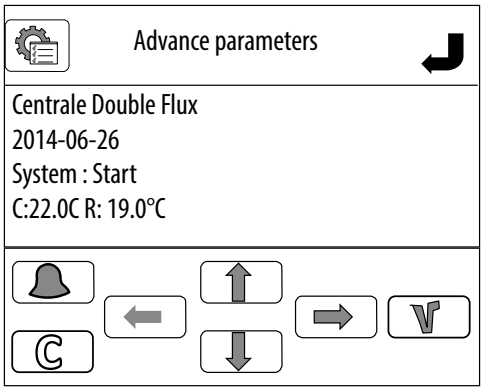
To do the reset operation, the CORRIGO must be powered, switch on the unit by turning the main switch.

With a small pin reset the CORRIGO as shown.
Clip the CORRIGO on the DIN rail, but do not plug the other connector before the complete setting except the one of the display.

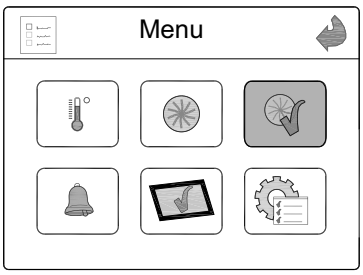
From the display follow the procedure below :



2 min



Continu the setting of the unit see :
Commissioning

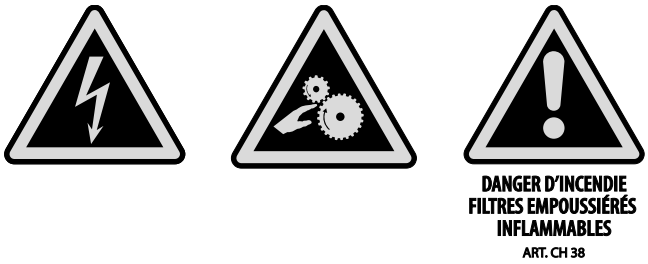


Switch off the unit, and plug all the CORRIGO connectors.

10. MAINTENANCE

10.1 Preliminary precautions

- Wear appropriate IPE (Individual Protection Equipment) before any intervention.
- Respect the danger labels present on the various access doors :



Equipment switched on / Machine rotating / Filters covered with dusts potentially inflammable

Do not open the access doors without first switching off the electrical power supply with the padlockable mains power switch present on the unit.
If the work is to be performed inside the device, switch off the electrical power supply on the main circuit breaker and make sure that no one can accidentally switch it on.
Make sure that the moving parts are stopped.

10.2 Servicing frequency

Respect at least the legal obligations.The table below gives for information the average maintenance frequencies. It does not take into account special factors such as the installation indoor or outdoor, the intensity of the atmospheric pollution, the number of occupants or the number of operating hours, etc.

Device	At commissioning	Every 6 months minimum
Filters	Check for cleanliness- clean	Remove dust or replace
Fans	Check connections - Check rotation direction	Check for cleanliness and clean if necessary
Exchanger	Check the rotation direction	Check for cleanliness and clean if necessary Check belt tension
Electrical connection box	Check the connections	Check the connections
Electrical heater	Check the connections	Remove dust
Water coil	Check water tightness	Check cleanliness and clean if necessary Check the tightness - retighten the connection if necessary
Droplet separator		Clean
Condensates dip tray	Check tightness/ flowt	Clean
Pressure guard/ transitter	Check electric/ air duct connection	Check operation
Sensor	Check operation/ adjust if necessary	Check the functioning/ adjust if necessary
Flexible sleeves	Check the tightness	Change when necessary
Outdoor and Exhaust air	Check the installatione	Clean
Duct networks	Check the tightness	Clean
Valves/ Diffusers/ Grill/ Plenum	Check connections tightness	Clean

10.3 Servicing / replacement of the fresh air / extracted air filters

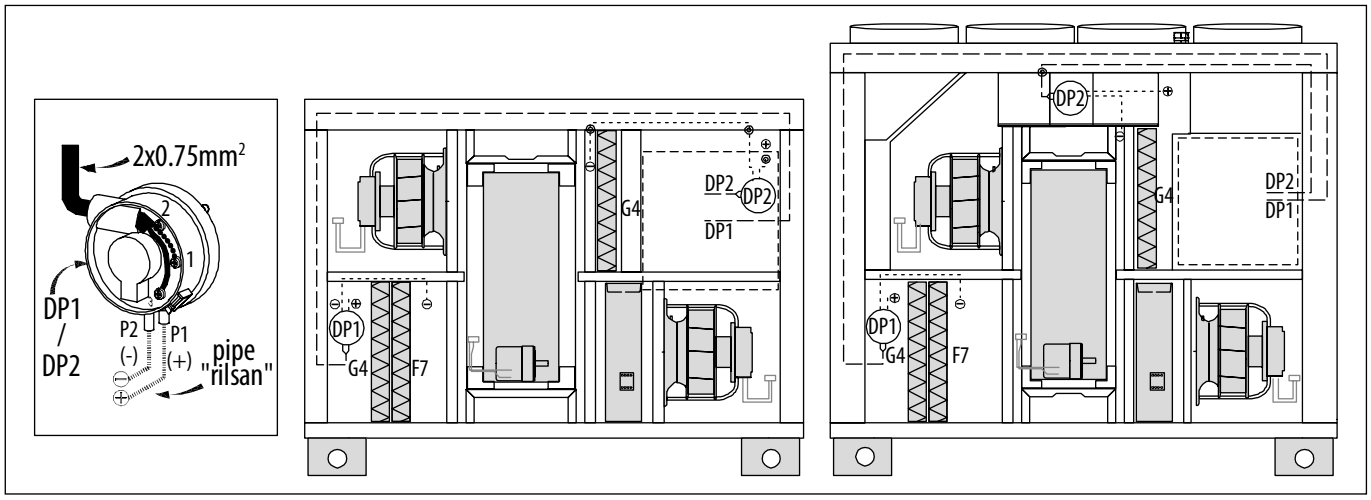
As standard, the RHE units have filters on the extracted air to protect the heat exchanger (Filter G4) and on the fresh air (Prefilter G4 + Filter F7 or F9).
The filters F7 are held flush on the sealing joints by 2 compression latched slides.
The clogging of the filters is checked by differential pressure sensors with a return of information on the controller.

Sizes	Quantity	Filter G4 (mm)	Surface media (m²)	Filter F7 or F9 (mm)	Surface media (m²)
700/1300	1	600 x 372 x 48	0,76	600 x 372 x 96	7,3
1900	1	700 x 422 x 48	1	700 x 422 x 96	9,7
2500	2	425 x 472 x 48	2 x 0,67	425 x 472 x 96	2 x 6,5
3500/4500	2	505 x 562 x 48	2 x 0,97	505 x 562 x 96	2 x 9,3
6000	2	600 x 655 x 48	2 x 1,35	600 x 655 x 96	2 x 13
8000	3	483 x 780 x 48	3 x 1,3	483 x 780 x 96	3 x 12,6
10000	4	405 x 864 x 48	4 x 1,2	405 x 864 x 96	4 x 11,5

Replacement filters : (see § "Spare parts list")

- Switch off the electrical power supply with the main circuit breaker.
- Open the access doors.
- Pull on the filters G4 (extraction and fresh air prefiltration).
- Pull on the mobile slides to unlock the filter F7 ; take him out.
- Remove the dust from the compartment next to the filter slides.
- Place the new filters and lock the mobile slides.
- Close the doors.
- Restart the unit ; the filter alarm is automatically reset and disappears.

Note : At the first commissioning, clean or replace the filters (see how to replace them).



The increasing of pressure drop due to dust on filter is control par pressostat , install and connect to the control system :

Sizes	Setting DP1	Setting DP2
700	150Pa	100Pa
1300	150Pa	100Pa
1900	150Pa	100Pa
2500	200Pa	100Pa
3500	200Pa	100Pa
4500	200Pa	100Pa
6000	200Pa	100Pa
8000	200Pa	100Pa
10000	200Pa	100Pa

10.4 Servicing / replacement of the rotating heat exchanger and belt

After a long usage period, dust can accumulate in the heat exchanger and reduce the passage of air. To maintain performances, it is important to check the heat exchanger at least once a year and to clean it, if necessary.

To facilitate maintenance, the motor/heat exchanger assembly can be extracted from the unit :

- Switch off the electrical power supply with the main circuit breaker
- Open the access door
- Disconnect the quick release connector of the motor connection
- Pull on the heat exchanger to extract the unit
- Carefully manipulate using adapted handling means
- Clean with compressed air or soapy water
- Do not use ammonia-based detergents
- Make sure that the heat exchanger rotates correctly by turning the wheel by hand after having removed the belt from the motor's pulley groove
- Check the condition of the belt – an additional belt is mounted on the wheel
- Make sure that the tightness brushes are not damaged or shifted
- The rotor's bearings do not need, in principle, to be greased
- Reinstall the assembly and reposition the connector
- To replace the belt : contact us.

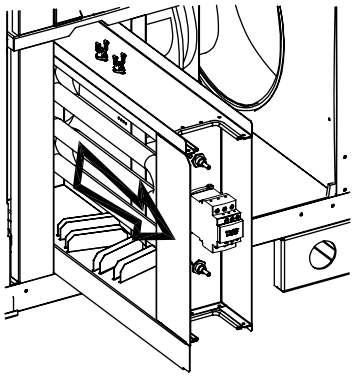
10.5 Servicing / replacement of the fans

Periodically, dust can be deposited on the fan ; the dust therefore has to be removed.

To extract the fans :

- Switch off the electrical power supply with the main circuit breaker.
- Open the access door.
- Disconnect the power and control connectors on the side.
- Disconnect the pressure tap.
- Using a Ø 13 mm wrench, unscrew the two M8 screws of the plate support.
- Remove the fans.
- Using a damp cloth, clean the fan – do not spray on the fan.
- Reinstall the fan by reversing the steps of the removal procedure.

10.6 Servicing / replacement of the electric heater



Before the cold season, remove dust from the heating resistances with compressed air or using a vacuum cleaner and a soft-bristle brush. Visually check the condition of the components and retighten the connections, if necessary.

- Switch off the electrical power supply with the main circuit breaker.
- Open the access door.
- Visually check the condition of the components and retighten the connections.

Warning : Do not rip out or damage the cables by pulling on the heater.

10.7 Servicing / replacement of the water coil

To preserve the coil's characteristics, drain the water circuit once a year.

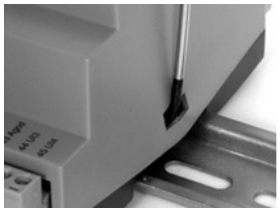
Depending on the ambient pollution and despite filtration, dust can be deposited on the coil.

After removal, the coil can be cleaned using a water spray, steam, compressed air ; carefully proceed so as to not damage the coil's fins.

For units equipped with reversible (hot/chilled) water coils (DFR), clean the condensate dip tray with water and a non-abrasive detergent. Make sure that the water is properly drained and check the siphon.

10.8 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.
- Take a new battery and slide it into the holder. Warning: be sure to respect the polarity when inserting the battery.

10.9 Spare parts list

CODE	TYPE	NAME
5407036100	Filter F7 - 1 piece	AFR RHE 10000 F7
5407036200	Filter F9 - 1 piece	AFR RHE 10000 F9
5407036300	Filter G4 - 1 piece	AFR RHE 10000 G4
5407037100	Filter M5 - 1 piece	AFR RHE 10000 M5
5407030400	Filter F7 - 1 piece	AFR RHE 700/1300 F7
5407030800	Filter F9 - 1 piece	AFR RHE 700/1300 F9
5407030000	Filter G4 - 1 piece	AFR RHE 700/1300 G4
5407036400	Filter M5 - 1 piece	AFR RHE 700/1300 M5
5407030500	Filter F7 - 1 piece	AFR RHE 1900 F7
5407030900	Filter F9 - 1 piece	AFR RHE 1900 F9
5407030100	Filter G4 - 1 piece	AFR RHE 1900 G4
5407036500	Filter M5 - 1 piece	AFR RHE 1900 M5
5407030600	Filter F7 - 1 piece	AFR RHE 2500 F7
5407031000	Filter F9 - 1 piece	AFR RHE 2500 F9
5407030200	Filter G4 - 1 piece	AFR RHE 2500 G4
5407036600	Filter M5 - 1 piece	AFR RHE 2500 M5

CODE	TYPE	NAME
5407030700	Filter F7 - 1 piece	AFR RHE 3500/4500 F7
5407031100	Filter F9 - 1 piece	AFR RHE 3500/4500 F9
5407030300	Filter G4 - 1 piece	AFR RHE 3500/4500 G4
5407036700	Filter M5 - 1 piece	AFR RHE 3500/4500 M5
5407031400	Filter F7 - 1 piece	AFR RHE 6000 F7
5407031600	Filter F9 - 1 piece	AFR RHE 6000 F9
5407031200	Filter G4 - 1 piece	AFR RHE 6000 G4
5407036800	Filter M5 - 1 piece	AFR RHE 6000 M5
5407031500	Filter F7 - 1 piece	AFR RHE 8000 F7
5407031700	Filter F9 - 1 piece	AFR RHE 8000 F9
5407031300	Filter G4 - 1 piece	AFR RHE 8000 G4
5407036900	Filter M5 - 1 piece	AFR RHE 8000 M5
R153534105	Hot water coil on VT	BCOI RHE 700/1300 VD
R153534205	Hot water coil on VT	BCOI RHE 1900 VD
R153534005	Hot water coil on VT	BCOI RHE 2500 VD
R153531005	Hot water coil on VT	BCOI RHE 3500/4500 VD
R153530122	Electrical heater	BEOI RHE 700 3KW Mono 230V
R153532105	Electrical heater	BEOI RHE 1300 4KW Mono 230V
R153532205	Electrical heater	BEOI RHE 1900 8KW Mono 230V
R153533905	Electrical heater	BEOI RHE 2500 12KW Tri 400V
R153532405	Electrical heater	BEOI RHE 3500/4500 15KW Tri 400V
R153575005	Electrical heater	BEOI RHE 6000 24KW Tri 400V
R153575205	Electrical heater	BEOI RHE 8000 36KW Tri 400V
R153666005	Electrical heater	BEOI RHE 10000 48KW Tri 400V
R153531305	Hot/Cold water coil on VL	BROI RHE 700/1300 HD
R153531405	Hot/Cold water coil on VL	BROI RHE 1900 HD
R153531505	Hot/Cold water coil on VL	BROI RHE 2500 HD
R153533005	Hot/Cold water coil on VL	BROI RHE 3500/4500 HD
R153575605	Hot/Cold water coil on VL	BROI RHE 6000 HD
R153575705	Hot/Cold water coil on VL	BROI RHE 8000 HD
R153666015	Hot/Cold water coil on VL	BROI RHE 10000 HD
R153532006	Enthalpic rotary exchanger with motor	EEOI RHE 700/1300 D540 200 Mono 230V
R153533206	Enthalpic rotary exchanger with motor	EEOI RHE 1900 D650 200 Mono 230V
R153531706	Enthalpic rotary exchanger with motor	EEOI RHE 2500 D800 200 Tri 400V
R153534406	Enthalpic rotary exchanger with motor	EEOI RHE 3500/4500 D960 200 Tri 400V
R153575106	Enthalpic rotary exchanger with motor	EEOI RHE 6000 D1150 250 Tri 400V
R153575306	Enthalpic rotary exchanger with motor	EEOI RHE 8000 D1400 250 Tri 400V
R153666601	Enthalpic rotary exchanger with motor	EEOI RHE 10000 D1570 250 Tri 400V
R153532906	Standard rotary exchanger with motor	ENOI RHE 700/1300 D540 200 Mono 230V
R153531006	Standard rotary exchanger with motor	ENOI RHE 1900 D650 200 Mono 230V
R153531605	Standard rotary exchanger with motor	ENOI RHE 2500 D800 200 Tri 400V
R153534006	Standard rotary exchanger with motor	ENOI RHE 3500/4500 D960 200 Tri 400V
R153575006	Standard rotary exchanger with motor	ENOI RHE 6000 D1150 250 Tri 400V
R153575206	Standard rotary exchanger with motor	ENOI RHE 8000 D1400 250 Tri 400V

CODE	TYPE	NAME
R153666006	Standard rotary exchanger with motor	ENOI RHE 10000 D1570 250 Tri 400V
R153533006	Sorption rotary exchanger with motor	ESOI RHE 700/1300 D540 200 Mono 230V
R153534206	Sorption rotary exchanger with motor	ESOI RHE 1900 D650 200 Mono 230V
R153531506	Sorption rotary exchanger with motor	ESOI RHE 2500 D800 200 Tri 400V
R153530006	Sorption rotary exchanger with motor	ESOI RHE 3500/4500 D960 200 Tri 400V
R153575406	Sorption rotary exchanger with motor	ESOI RHE 6000 D1150 250 Tri 400V
R153575506	Sorption rotary exchanger with motor	ESOI RHE 8000 D1400 250 Tri 400V
R153666602	Sorption rotary exchanger with motor	ESOI RHE 10000 D1570 250 Tri 400V
R153532019	Motor for rotor - alone	MEOI RHE 700/1300/1900 115M 40W 230V Mono 115 rpm
R153533019	Motor for rotor - alone	MEOI RHE 2500/3500/4500/6000 214T 55W 400V Tri 214 rpm
R153575019	Motor for rotor - alone	MEOI RHE 8000/10000 120W 400V Tri 170 rpm
R153530129	Plug fan - Price for 1 piece	PFOI RHE 700 ECM D250 200W Mono 230V
R153532909	Plug fan - Price for 1 piece	PFOI RHE 1300 ECM D250 700W Mono 230V
R153533009	Plug fan - Price for 1 piece	PFOI RHE 1900 ECM D280 715W Mono 230V
R153532009	Plug fan - Price for 1 piece	PFOI RHE 2500 ECM D310 1000W Tri 400V
R153531009	Plug fan - Price for 1 piece	PFOI RHE 3500 ECM D355 1000W Tri 400V
R153575009	Plug fan - Price for 1 piece	PFOI RHE 4500/6000 ECM D400 1850W Tri 400V
R153575209	Plug fan - Price for 1 piece	PFOI RHE 8000 ECM D450 2730W Tri 400V
R153666009	Plug fan - Price for 1 piece	PFOI RHE 10000 ECM D560 3000W Tri 400V
R153666018	Tachometer - contol of the wheel rotation	STCO Tachometer wheel
R153530139	replacement belt	CROI RHE 700/1300
R153530239	replacement belt	CROI RHE 1900
R153530339	replacement belt	CROI RHE 2500
R153530439	replacement belt	CROI RHE 3500/4500
R153575039	replacement belt	CROI RHE 6000
R153575239	replacement belt	CROI RHE 8000
R153698439	replacement belt	CROI RHE 10000

11. WASTE MANAGEMENT

11.1 Treatment of Packagings and non dangerous wastes

The packagings (unconsigned pallets, cartons, films, wooden boxes) and other non dangerous wastes must be made reusable by an approved service provider. It is strictly prohibited to burn, bury or dump them in nature.

11.2 Treatment of a Professional WEEE

This product must not be dumped or treated with household refuse, but must be deposited in an appropriate collection point for waste electrical and electronic equipment (WEEE).

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