RHE

AN

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).

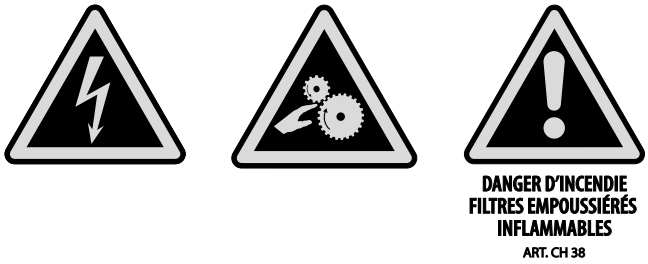
S&P shall not be held responsible for possible injuries and/or damages caused by the non compliance with safety instructions or following a modification of the product.

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 is guaranteed for 24 months from the invoice date. The warranty is limited to the replacement of parts or equipment whose operation is recognized as defective by the maker, excluding any compensation or penalties. The costs of labor, removal and rest, travel related to the replacement are the responsibility of the Customer. Excluded from our warranty are defects linked to abnormal use or not in accordance with the recommendations in our instructions, defects observed as a result of normal wear and tear, incidents caused by negligence, lack of monitoring or maintenance, defects due to incorrect installation of devices or poor storage conditions prior to assembly.
In any case, maker is not responsible for transformed material, even partially repaired.

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.

10 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), 15000 (15 000 m^3/h).

6 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).
- **RHE DC/DF :** integrated hot and cold water coils (on size 6000 - 8000 - 10000 - 15000 only).
- **RHE DX :** direct expansion coils (on HD configuration only except tailles 15000).

4 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 2500/3500/6000/8000/10000/15000).
- Variable rotation speed with inverter on 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.

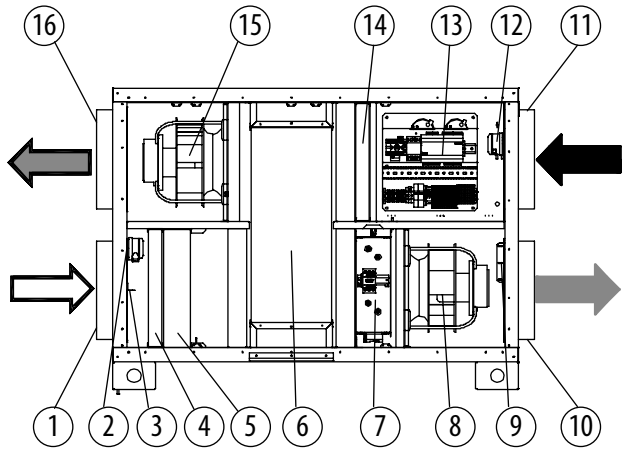
Example of a complete designation: RHE 2500 HDR DC

Performance :
- EN1886 : D2 / L2 / F7 / T3 / TB3 testing made in VIM laboratory
- Internal leakage, recirculation : C2 (<2%) according EN13141-7-2011.

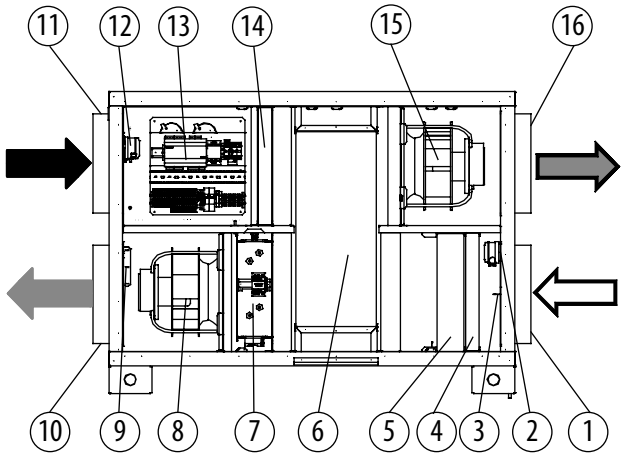
2.2 Main components

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

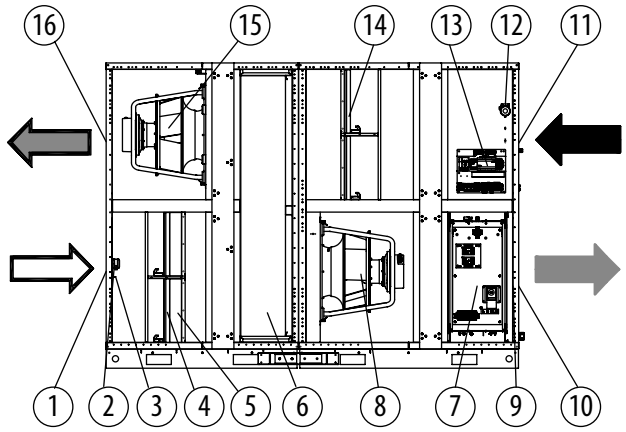
Version HDR

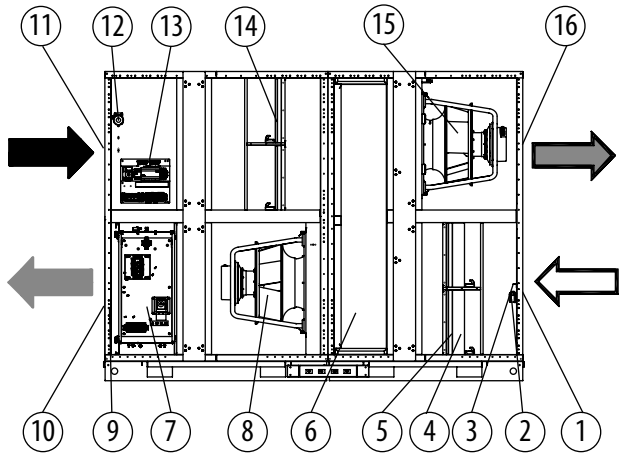


Version HDL

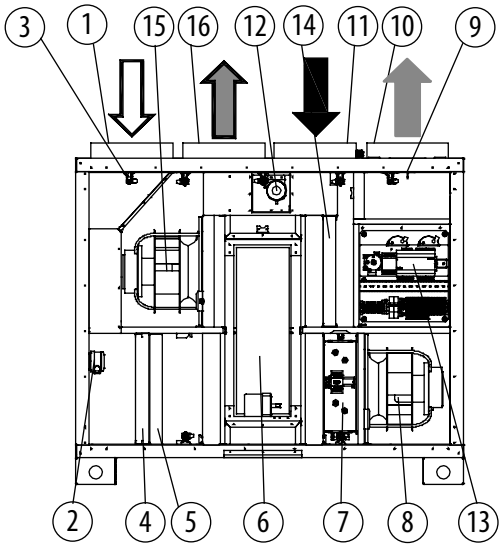


Electric heater DI after the fan on size 15000





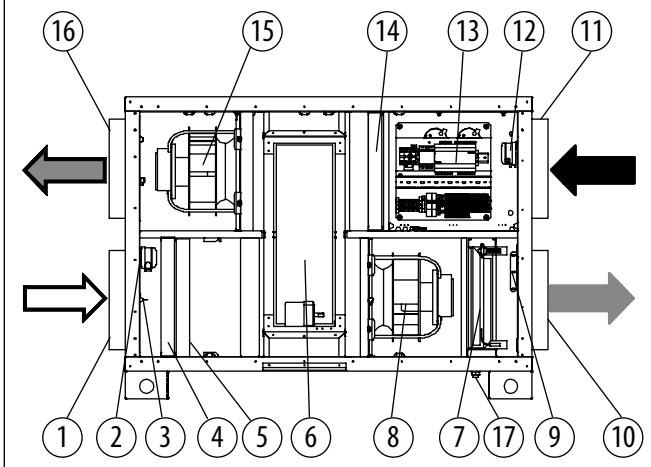
Version VD



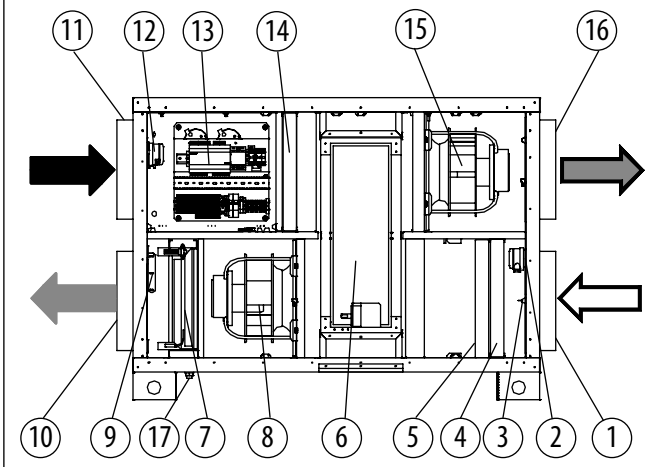
Ref	Description	Symbol
1	Outdoor air duct connection	
2	Pressure guard on outdoor air filter	
3	Outdoor air temperature sensor	
4	Filter G4 (Coarse 70%) outdoor air	
5	Filter F7 (ePM1 55%) outdoor air	
6	Rotary heat exchanger	
7	Electric post heater (DI)	
8	Supply air fan	
9	Supply air temperature sensor	
10	Supply air duct connection	
11	Extract air duct connection	
12	Pressure guard extract air filter	
13	Electrical connection box/ control system	
14	Filter M5 (ePM10 75%) exhaust air	
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

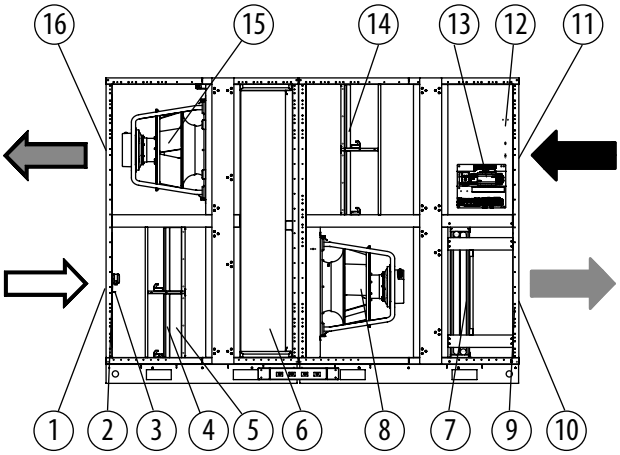
Version HDR

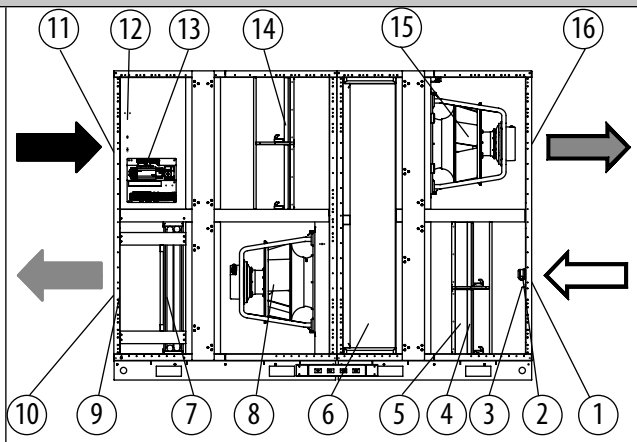


Version HDL

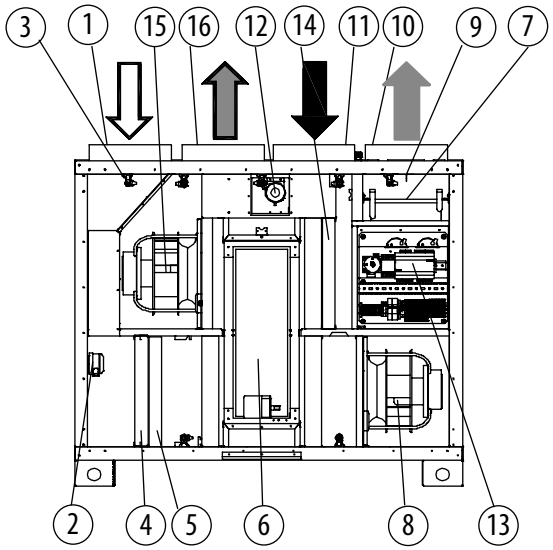


Size 15000





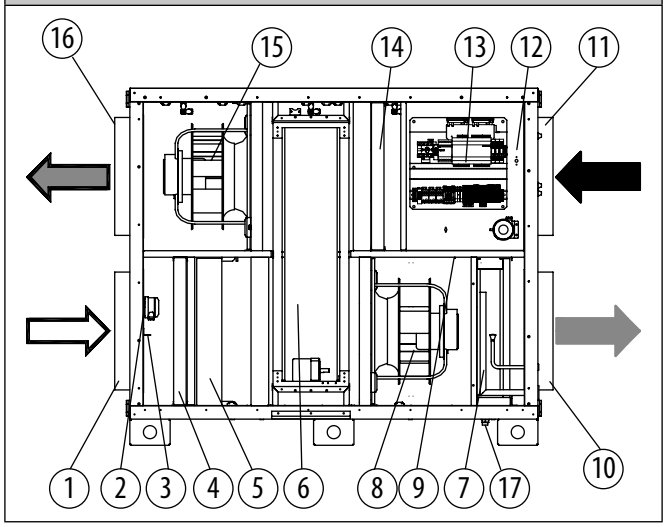
Version VD



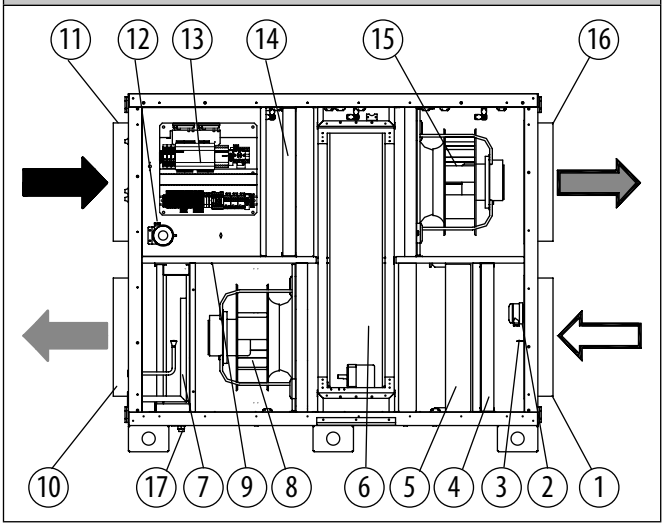
Ref	Description	Symbol
1	Outdoor air duct connection	
2	Pressure guard on outdoor air filter	
3	Outdoor air temperature sensor	
4	Filter G4 (Coarse 70%) outdoor air	
5	Filter F7 (ePM1 55%) outdoor air	
6	Rotary heat exchanger	
7	Hot water coil (DC) or reversible coil DFR (on HD configuration only)	
8	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	Filter M5 (ePM10 75%) exhaust air	
15	Exhaust air fan	
16	Exhaust air duct connection	
17	condensate drain 3/4" (ER only)	

General specification - Version direct expansion coil (DX)

Version HDR



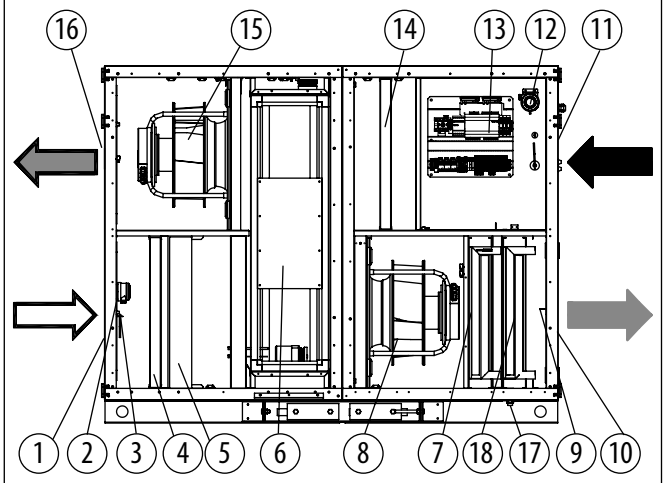
Version HDL



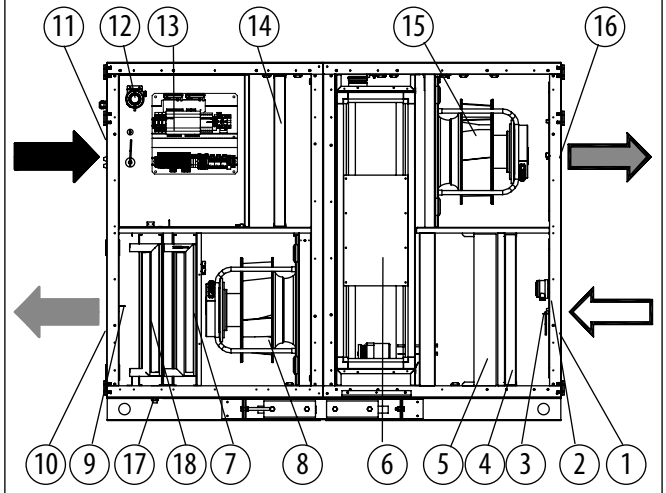
Reference	Description	Symbol
1	Outdoor air duct connection	
2	Pressure guard on outdoor air filter	
3	Outdoor air temperature sensor	
4	Filter G4 (Coarse 70%) outdoor air	
5	F7 (ePM1 55%) filter on outdoor Air	
6	Rotary heat exchanger	
7	Direct expansion coil	
8	Supply air fan	
9	Supply air temperature sensor	
10	Supply air duct connection	
11	Extract air duct connection	
12	Pressure guard extract air filter	
13	Electrical connection box/ control system	
14	M5 (ePM10 75%) filter on extract	
15	Exhaust air fan	
16	Exhaust air duct connection	
17	Evacuation of condensates 3/4"	

General specification - Hot and cold water coil (DC/DF)

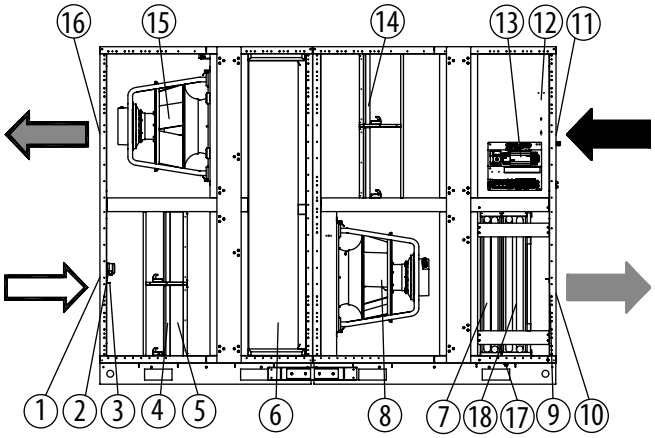
Version HDR

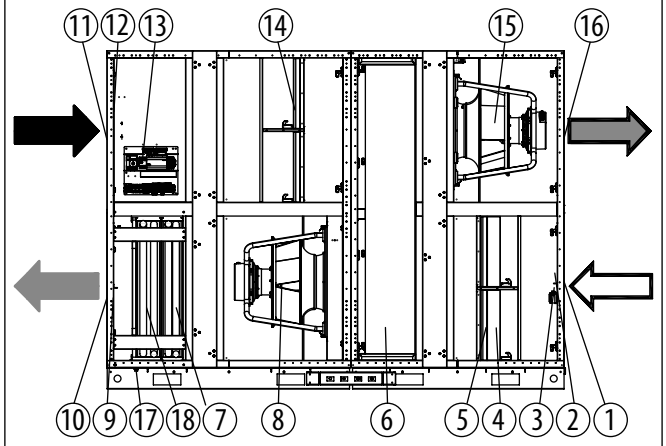


Version HDL



Size 15000





Ref	Description	Symbol
1	Outdoor air duct connection	
2	Pressure guard on outdoor air filter	
3	Outdoor air temperature sensor	
4	Filter G4 (Coarse 70%) outdoor air	
5	F7 (ePM1 55%) filter on outdoor Air	
6	Rotary heat exchanger	
7	Hot water coil	
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	M5 (ePM10 75%) filter on extract	
15	Exhaust air fan	
16	Exhaust air duct connection	
17	Evacuation of condensates 3/4"	
18	Cold water coil	

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.

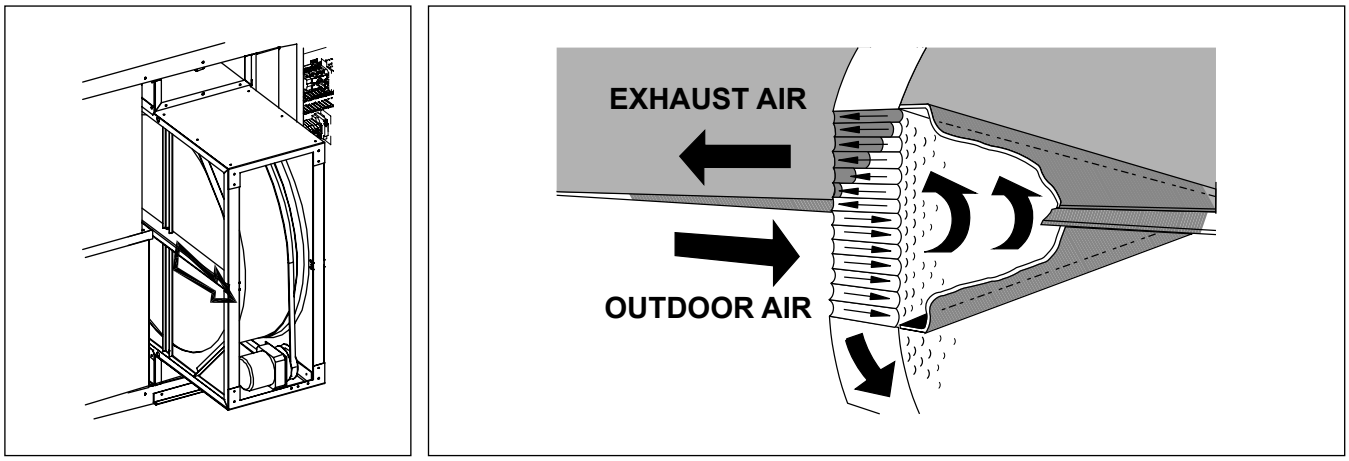
The thermal efficiency (sensible heat) is meanly function of air speed, diameter, wheel thickness and height of the corrugated foil flutes (wave).

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. 2 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.

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.

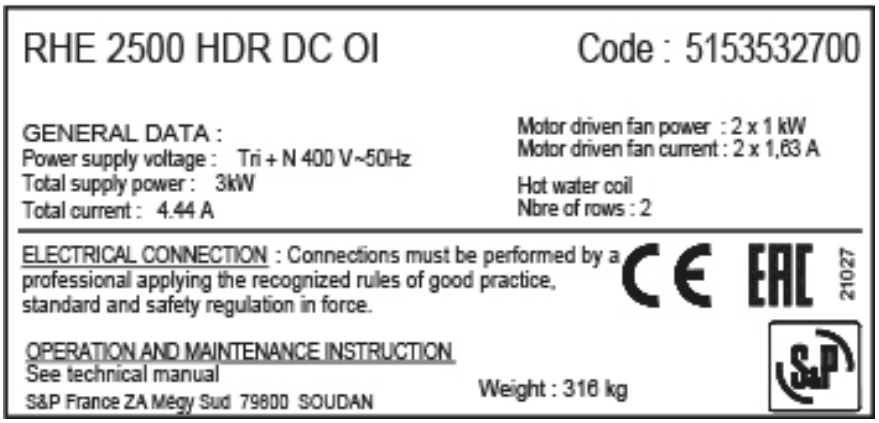


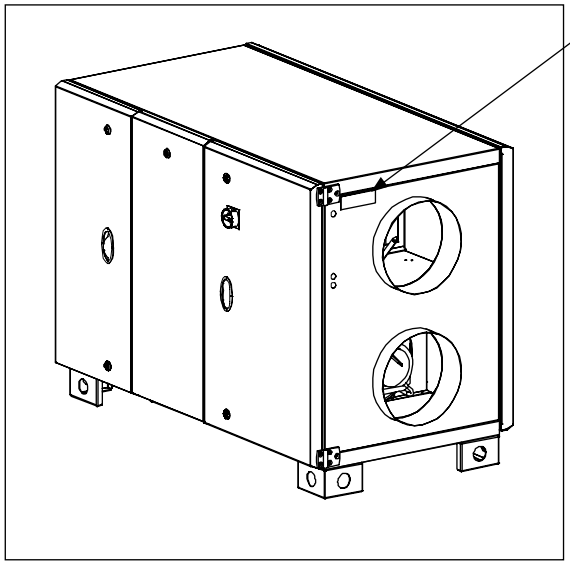
Principle of the bleed sector

3. INSTALLATION

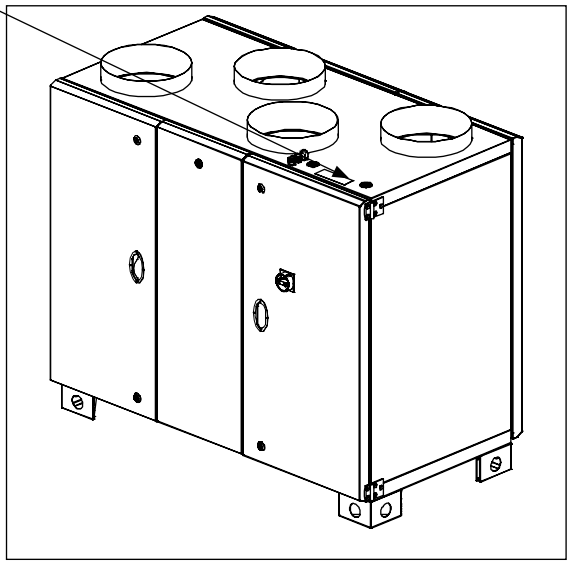
3.1 Machine identification / Symbols

Identification label – fixed on the casing



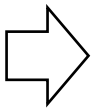
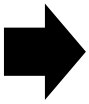
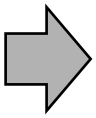


Version HD (supply side upward)



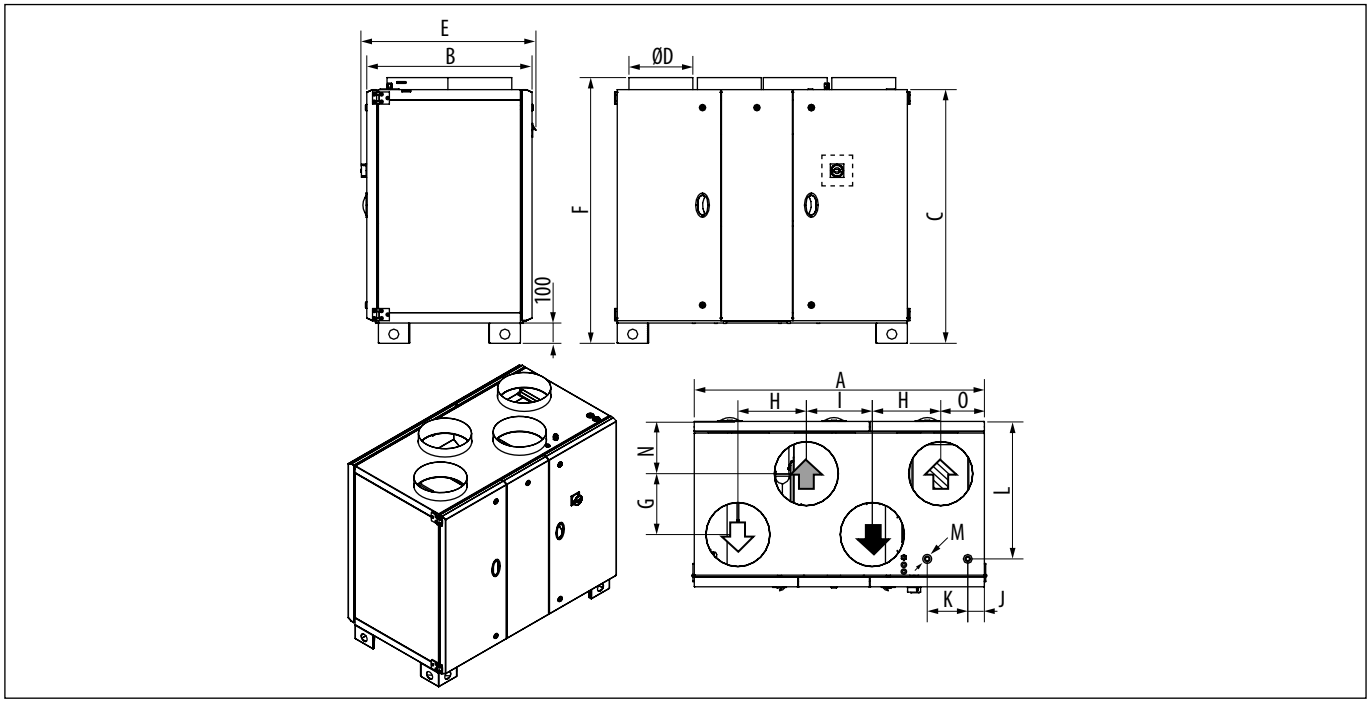
Version VD (on upper righthand corner)

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

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

Dimensions and weight

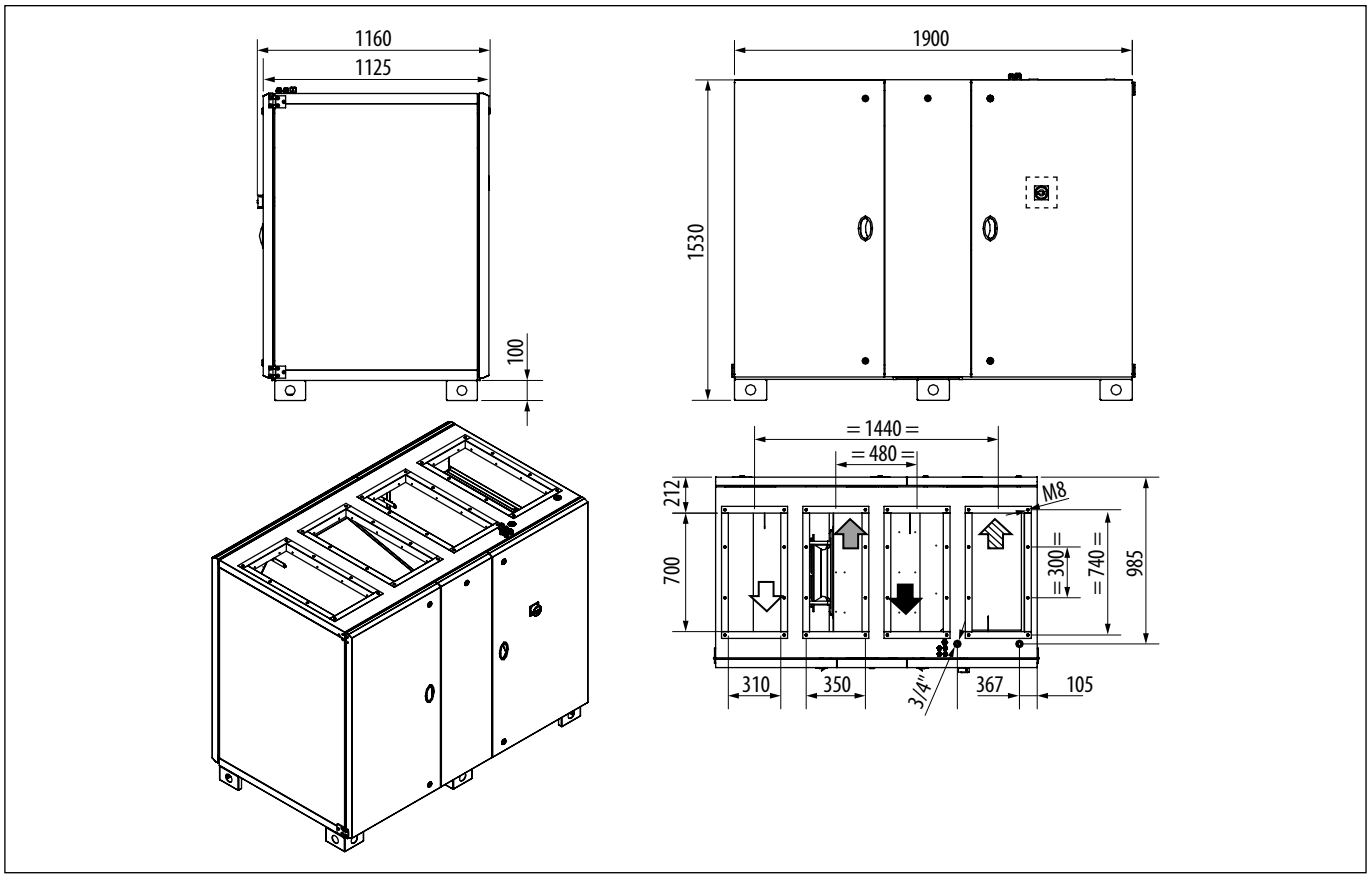
RHE VD 700 / 1300 / 1900 / 2500 / 3500



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

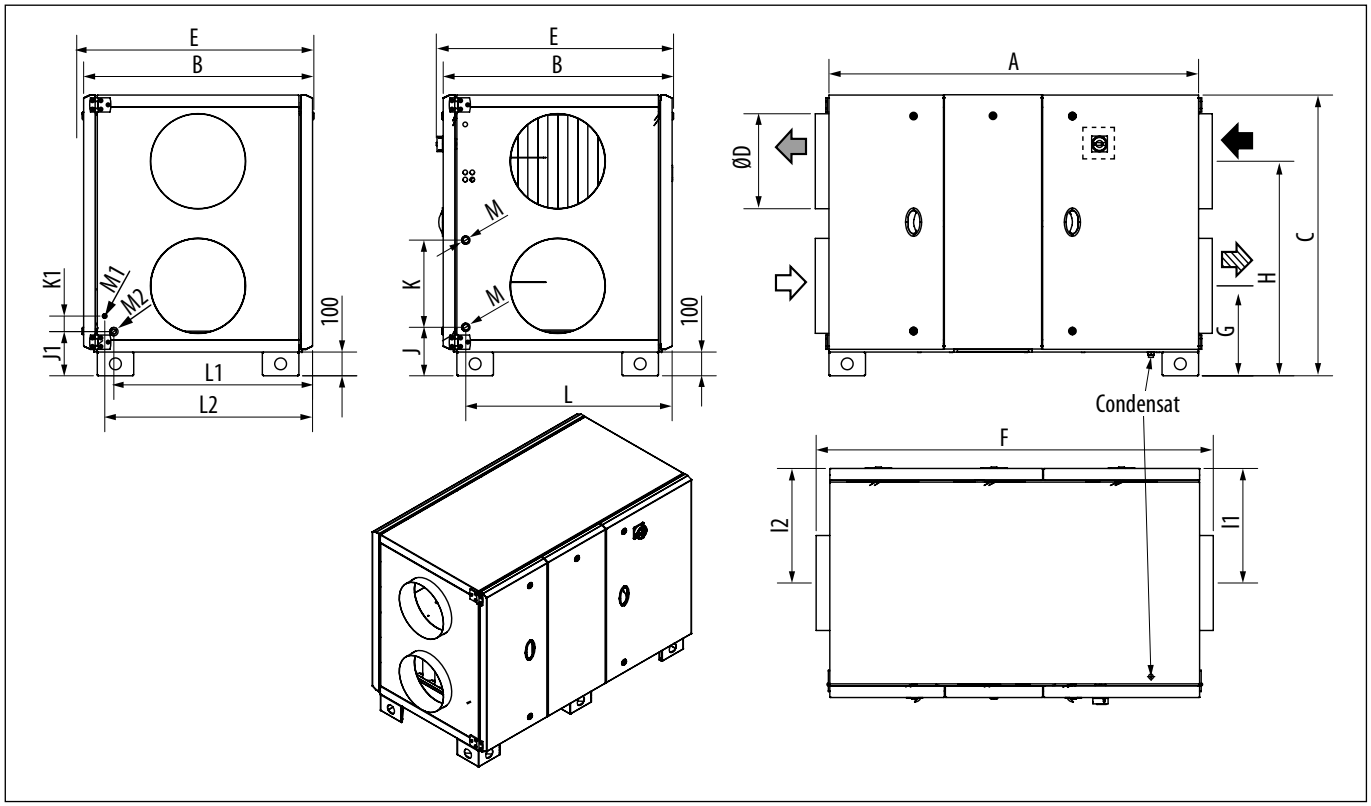
RHE VD 4500

Weight 451 kg



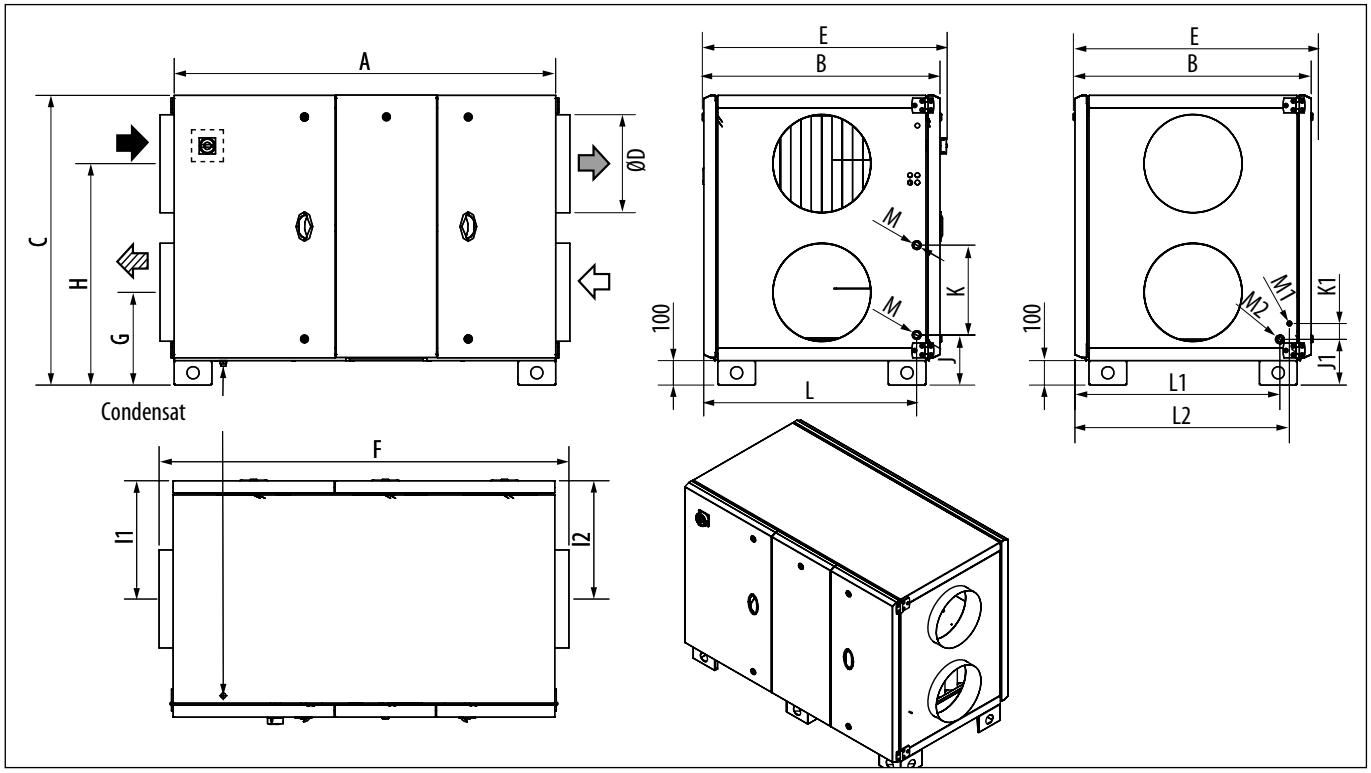
RHE HDR 700 / 1300 / 1900 / 2500 / 3500 / 4500

Right hand side access door on the supply air flow direction



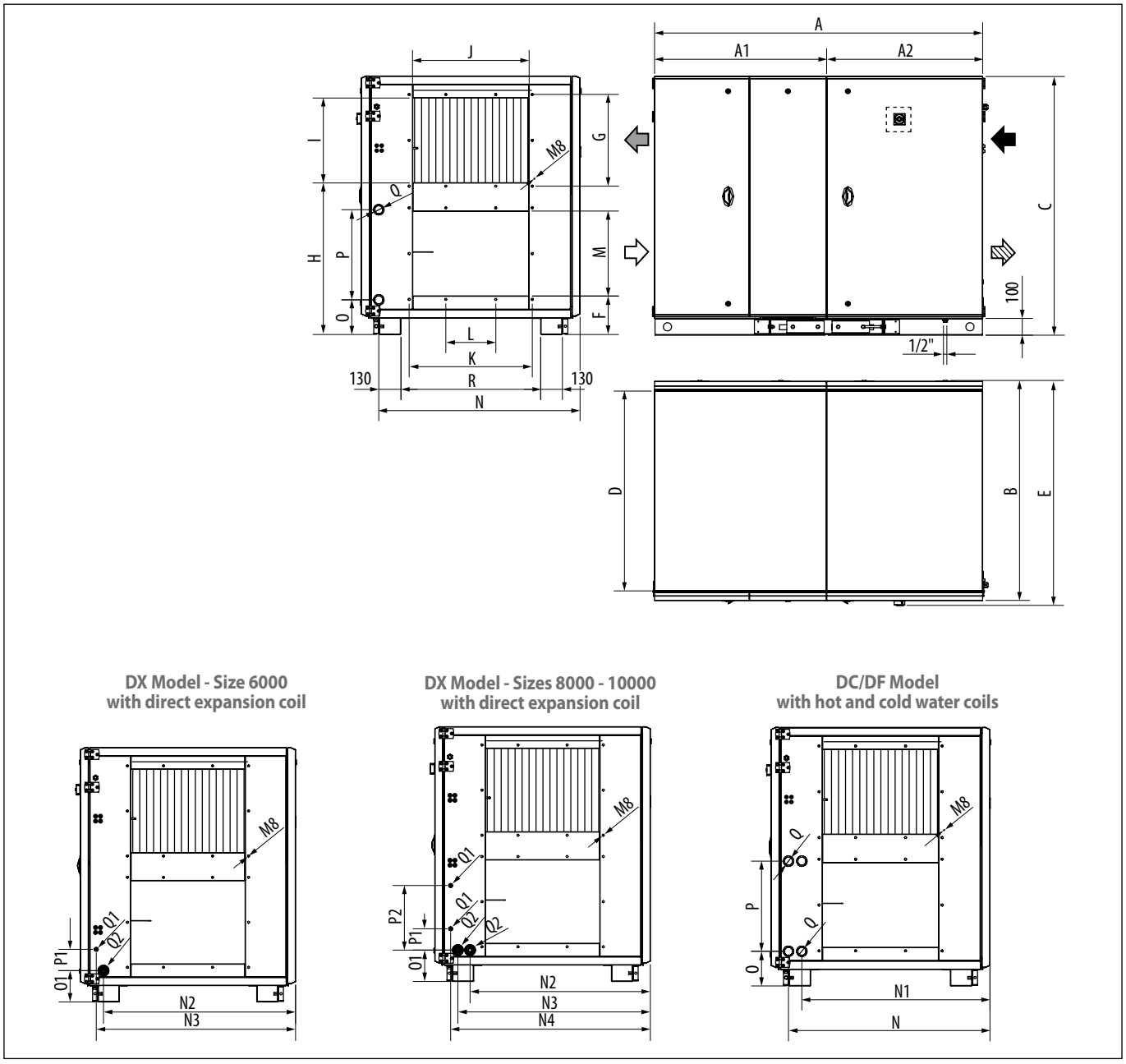
RHE HDL 700 / 1300 / 1900 / 2500 / 3500 / 4500

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 HD	1309	715	983	315	763	1425	329	754	327,5	357,5	210	255	625	1/2″	173
RHE 1300 HD	1309	715	983	315	763	1425	329	754	327,5	357,5	210	255	625	1/2″	173
RHE 1900 HD	1459	815	1085	355	851	1575	356	826	407,5	407,5	194	337	719	3/4″	217
RHE 2500 HD	1558	965	1183	400	1000	1675	379	904	482,5	482,5	204	367	869	3/4″	242
RHE 3500 HD	1558	1125	1363	450	1160	1675	436	1026	562,5	562,5	204	457	1030	3/4″	323
RHE 4500 HD	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



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

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

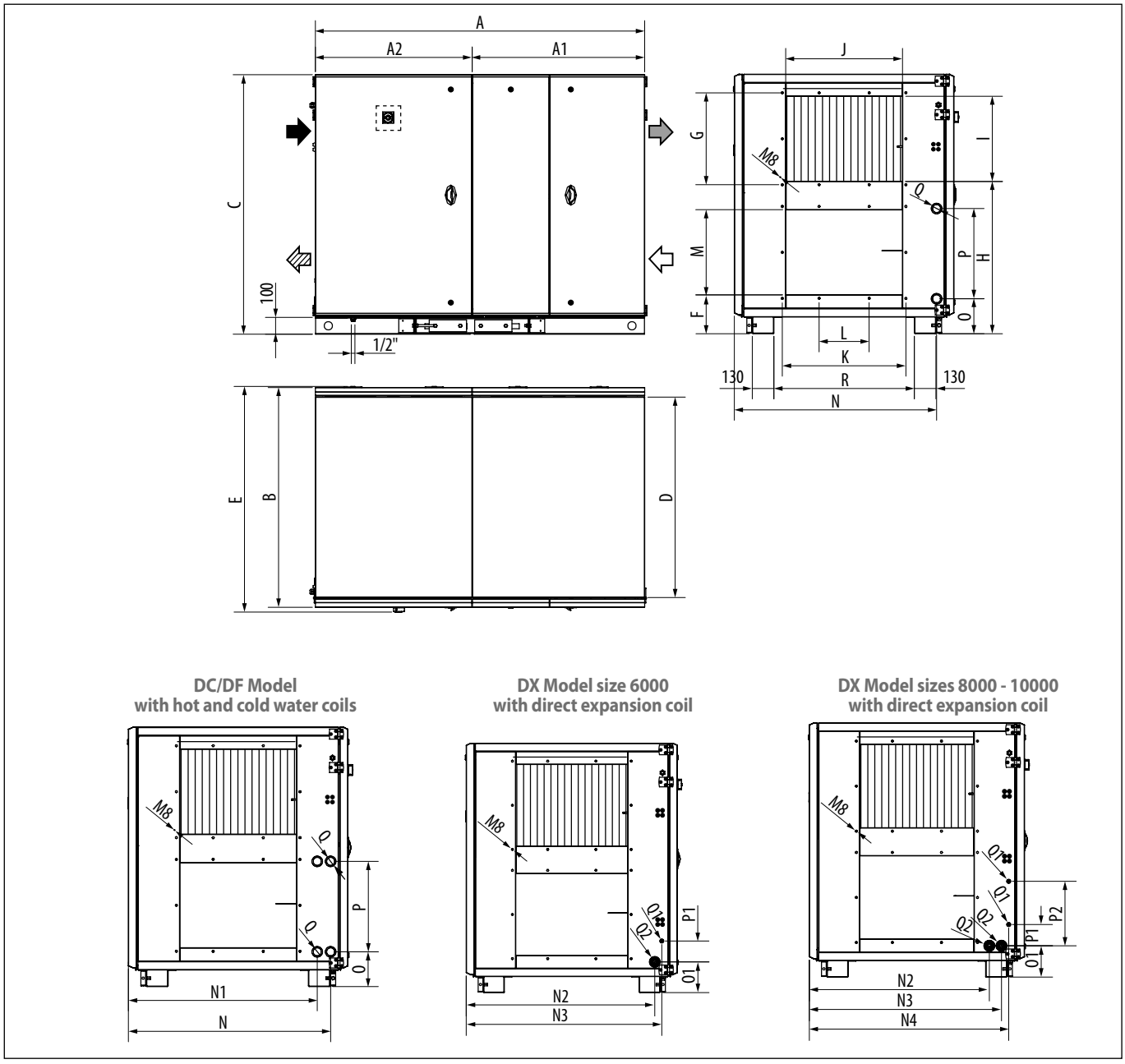
Sizes / Dim. (mm)	M	N	N1	N2	N3	N4	O	O1	P	P1	P2	Q*	Q1	Q2	R
RHE 6000 HD	510	1210	1131	1174	1218	-	208	213	541	109	-	1"(1"1/4)	12,7	28,5	840
RHE 8000 HD	610	1434	1334	1364	1410	1410	216	213	653	172	422	1"1/4 (1"1/2)	15,8	22,2	1090
RHE 10000 HD	610	1614	1514	1580	1580	1610	214	213	743	217	522	1"1/4 (1"1/2)	22,2	28,5	1260

* Value in brackets correspond to water coils 4 rows DFR4R.

Model	Weight (kg)																	
	D			DI			DC			DFR			DC/DF			DX		
	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2
RHE 6000 HD	345	224	569	345	251	596	345	245	590	345	252	597	345	273	618	345	262	607
RHE 8000 HD	457	285	742	457	322	779	457	313	770	457	323	780	457	352	809	457	337	794
RHE 10000 HD	550	354	904	550	398	948	550	388	938	550	400	950	550	434	984	550	416	966

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
RHE 6000 HD	1972	1034	938	1315	1553	1200	1350	235	550	915	510	700	740	300
RHE 8000 HD	2112	1114	998	1565	1803	1450	1600	245	650	1050	610	900	940	300
RHE 10000 HD	2412	1263	1149	1735	1971	1620	1770	285	650	1175	610	1100	1140	600

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

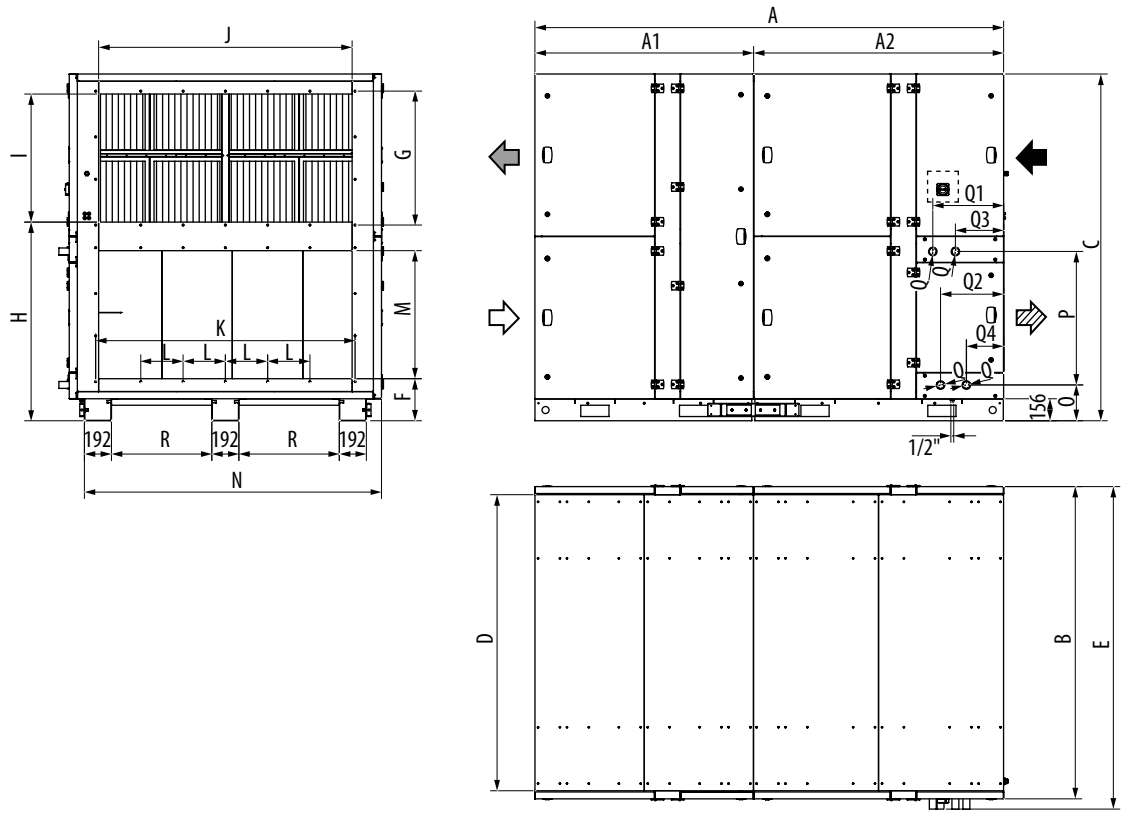
Sizes / Dim. (mm)	M	N	N1	N2	N3	N4	O	O1	P	P1	P2	Q*	Q1	Q2	R
RHE 6000 HD	510	1210	1131	1174	1218	-	208	213	541	109	-	1" (1"1/4)	12,7	28,5	840
RHE 8000 HD	610	1434	1334	1364	1410	1410	216	213	653	172	422	1" 1/4 (1"1/2)	15,8	22,2	1090
RHE 10000 HD	610	1614	1514	1580	1580	1610	214	213	743	217	522	1" 1/4 (1"1/2)	22,2	28,5	1260

* Value in brackets correspond to water coils 4 rows DFR4R.

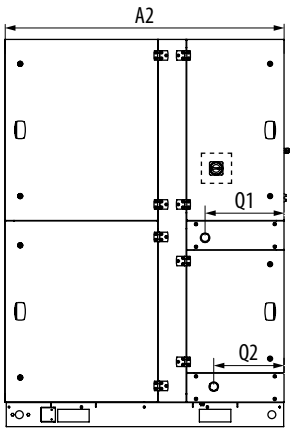
Model	Weight (kg)																	
	D			DI			DC			DFR			DC/DF			DX		
	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2
RHE 6000 HD	345	224	569	345	251	596	345	245	590	345	252	597	345	273	618	345	262	607
RHE 8000 HD	457	285	742	457	322	779	457	313	770	457	323	780	457	352	809	457	337	794
RHE 10000 HD	550	354	904	550	398	948	550	388	938	550	400	950	550	434	984	550	416	966

RHE HDR - Size 15000 model DC / DF

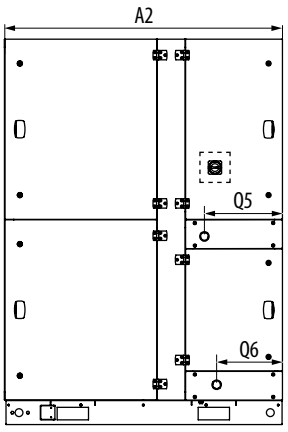
In line air connection / right hand side maintenance acces (delivered in 2 parts)



Model DC and DFR water coil



Model DFR4R water coil



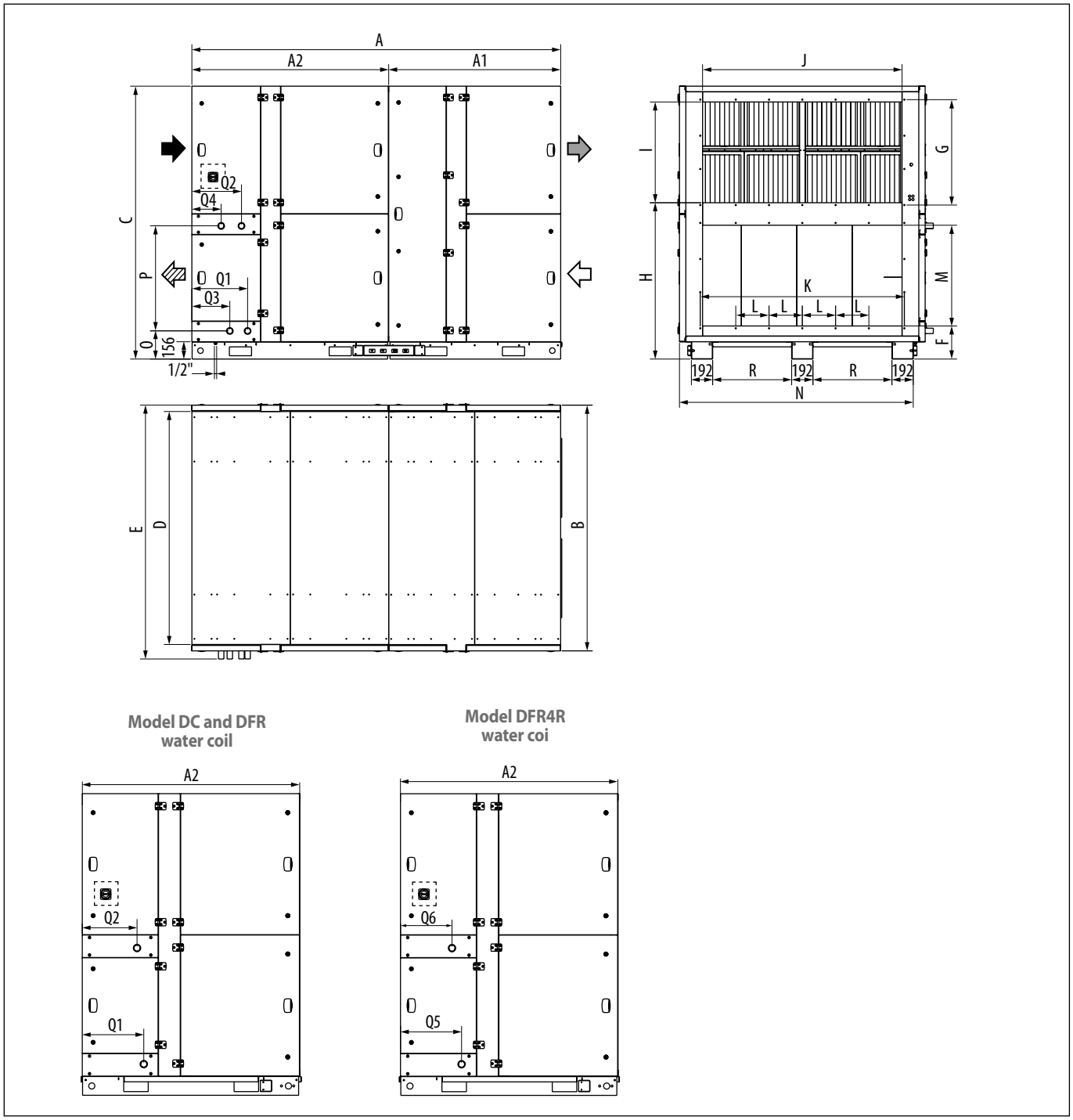
Model	A	A1	A2	B	C	D	E	F	G	H	I	J	K
RHE 15000	3325	1552	1774	2215	2460	2100	2288	298	950	1409	908	1798	1840

Model	L	M	N	O	P	Q	Q1	Q2	Q3	Q4	Q5	Q6	R
RHE 15000	300	908	2107	254	947	1 1/2"	502	447	342	264	498	420	712

Model	Weight (kg)														
	D			DI			DC / DFR2R			DFR4R			DC / DF		
	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2
RHE 15000 HD	930	710	1640	930	800	1730	930	750	1680	930	790	1720	930	830	1760

RHE HDL - Size 15000 model DC / DF

In line air connection / Left hand side maintenance acces (delivered in 2 parts)

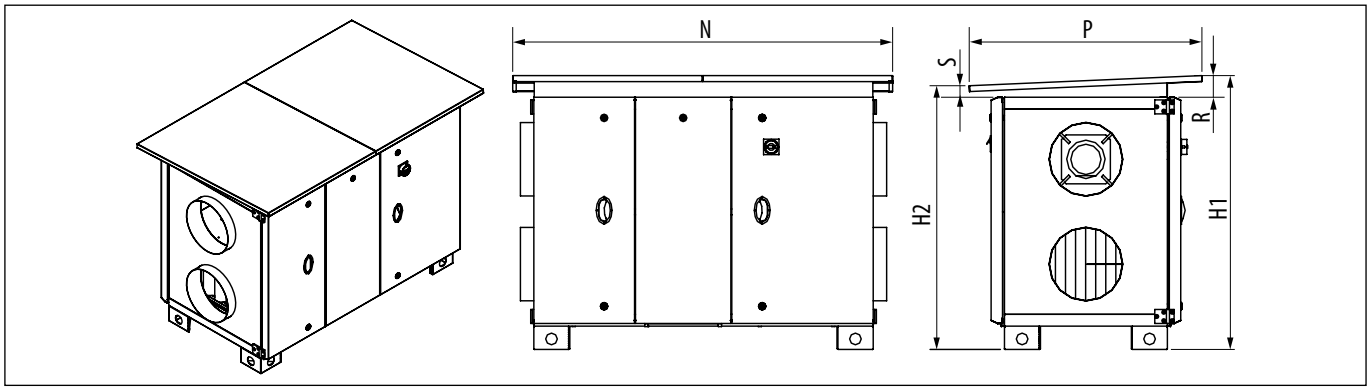


Model	A	A1	A2	B	C	D	E	F	G	H	I	J	K
RHE 15000	3325	1552	1774	2215	2460	2100	2288	298	950	1409	908	1798	1840

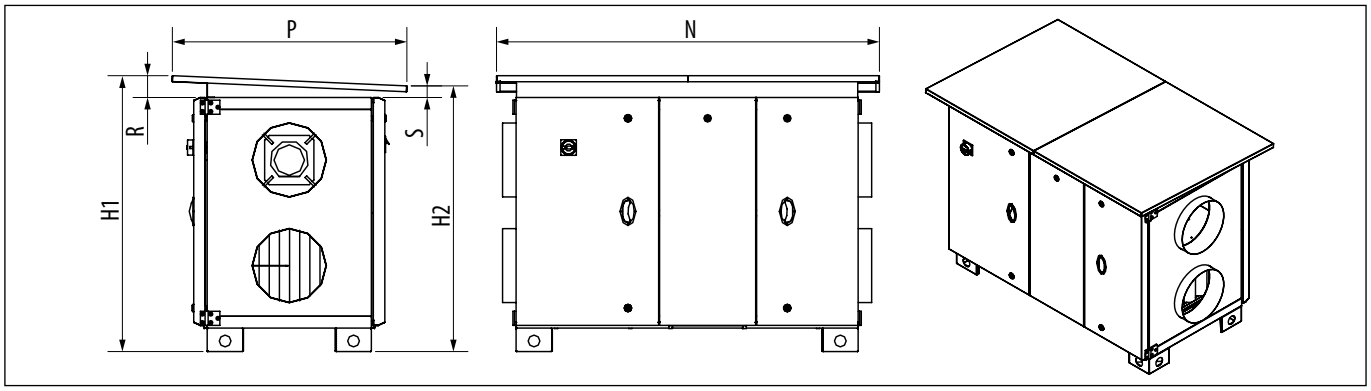
Model	L	M	N	O	P	Q	Q1	Q2	Q3	Q4	Q5	Q6	R
RHE 15000	300	908	2107	254	947	1 1/2"	502	447	342	264	498	420	712

Model	Weight (kg)														
	D			DI			DC / DFR2R			DFR4R			DC / DF		
	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2	A1	A2	A1 + A2
RHE 15000 HD	930	710	1640	930	800	1730	930	750	1680	930	790	1720	930	830	1760

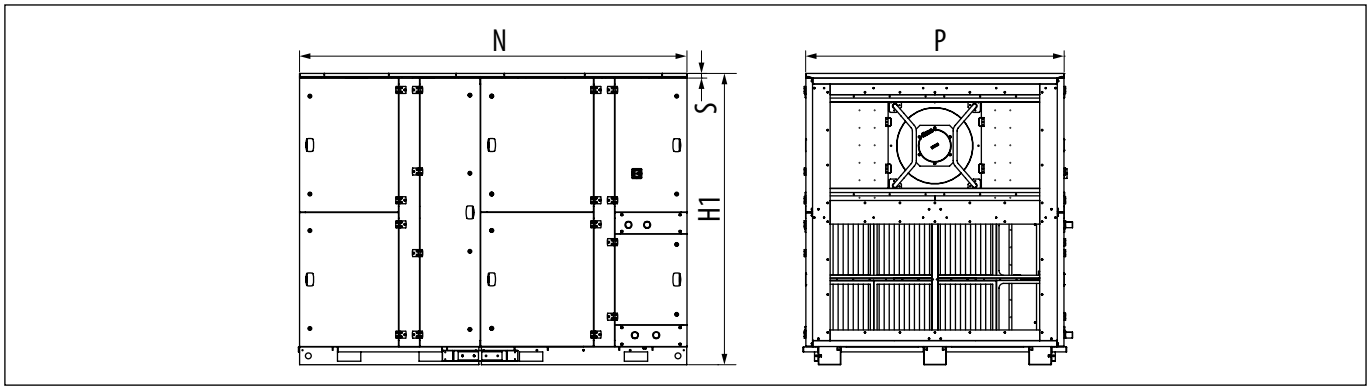
RHE HDR OI 700 / 1300 / 1900 / 2500 / 3500 / 4500 / 6000 / 8000 / 10000
Access from the right side,



RHE HDL OI 700 / 1300 / 1900 / 2500 / 3500 / 4500 / 6000 / 8000 / 10000
Access from the left side,



RHE HDR OI / HDRL OI 15000



Sizes/Dimensions (mm)	H1	H2	N	P	R	S
RHE 700 OI	1068	1036	1568	900	85	54
RHE 1300 OI	1068	1036	1568	900	85	54
RHE 1900 OI	1171	1136	1719	1000	89	54
RHE 2500 OI	1276	1236	1818	1150	94	54
RHE 3500 OI	1462	1416	1818	1309	99	54
RHE 4500 OI	1462	1416	1818	1309	99	54
RHE 6000 OI	1659	1606	2232	1500	106	54
RHE 8000 OI	1917	1856	2372	1750	115	54
RHE 10000 OI	2093	2026	2672	1920	122	54
RHE 15000 OI	2500	2500	3325	2215	-	40

Model	Weight (kg)				
	D	DI	DC	DR	DX
RHE 700 OI	199	205	205	208	209
RHE 1300 OI	206	212	212	215	216
RHE 1900 OI	255	263	263	266	270

Model	Weight (kg)				
	D	DI	DC	DR	DX
RHE 2500 OI	307	317	317	319	325
RHE 3500 OI	379	391	393	399	401
RHE 4500 OI	392	404	406	412	414

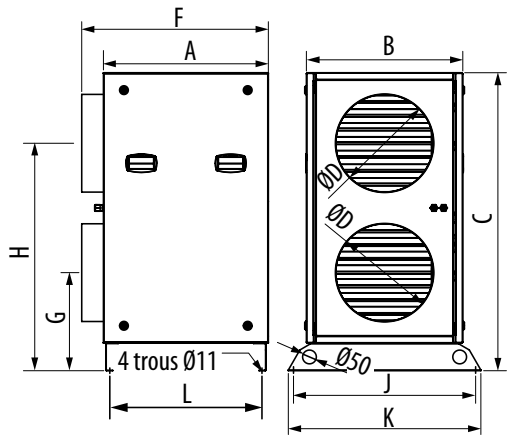
Model	Weight (kg)								
	D			DI			DC		
	A1	A2	A1+ A2	A1	A2	A1+ A2	A1	A2	A1+ A2
RHE 6000 OI	366	243	609	366	270	636	366	264	630
RHE 8000 OI	485	305	790	485	342	827	485	333	818
RHE 10000 OI	580	381	961	580	425	1005	580	415	995
RHE 15000 OI	995	780	1775	995	870	1865	995	820	1815

Model	Weight (kg)								
	DR			DC/DF			DX		
	A1	A2	A1+ A2	A1	A2	A1+ A2	A1	A2	A1+ A2
RHE 6000 OI	366	271	637	366	292	658	366	281	647
RHE 8000 OI	485	343	828	485	372	857	485	357	842
RHE 10000 OI	580	427	1007	580	461	1041	580	443	1023
RHE 15000 OI	995	860	1855	995	900	1895			

Recycling box : MIB ON-OFF / Mixing box : MIB 0-10V

Right or left version available according the unit configuration (same sizes).

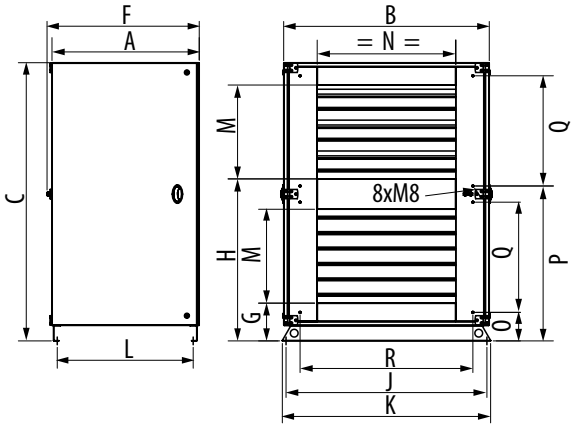
MIB for RHE 700 to 4500



Description	Dimensions (mm)				
	A	B	C	D	F
MIB 700/1300	550	470	982,5	315	630
MIB 1900	600	581	1082,5	355	678
MIB 2500	650	700	1182,5	400	700
MIB 3500	750	860	1362,5	450	830
MIB 4500	750	860	1362,5	500	830

Description	Dimensions (mm)				
	G	H	J	K	L
MIB 700/1300	330	754	562	600	503
MIB 1900	356	826	662	700	553
MIB 2500	380	904	812	850	603
MIB 3500	426	1036	972	1010	703
MIB 4500	426	1036	972	1010	703

MIB for RHE 6000 to 10000



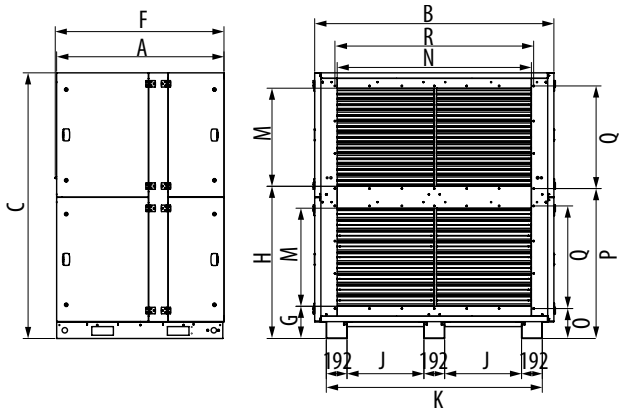
Description	Dimensions (mm)			
	A	B	C	F
MIB 6000	850	1082,5	1552,5	878,5
MIB 8000	954,5	1332,5	1802,5	981,5
MIB 10000	950	1502,5	1972,5	981,5

Description	Dimensions (mm)			
	G	H	J	K
MIB 6000	220	925	1052	1100
MIB 8000	245	1050	1302	1350
MIB 10000	287,5	1177,5	1472	1520

Description	Dimensions (mm)			
	L	M	N	O
MIB 6000	781	510	700	185
MIB 8000	881	610	900	185
MIB 10000	881	610	1100	185

Description	Dimensions (mm)		
	P	Q	R
MIB 6000	899	569	870
MIB 8000	1004	714	1120
MIB 10000	1175	714	1290

MIB for RHE 15000



Description	Dimensions (mm)				
	A	B	C	F	G
MIB 15000	1549	2215	2460	1563	298

Description	Dimensions (mm)				
	H	J	K	M	N
MIB 15000	1409	712	2000	908	1798

Description	Dimensions (mm)			
	O	P	Q	R
MIB 15000	277	950	1388	1840

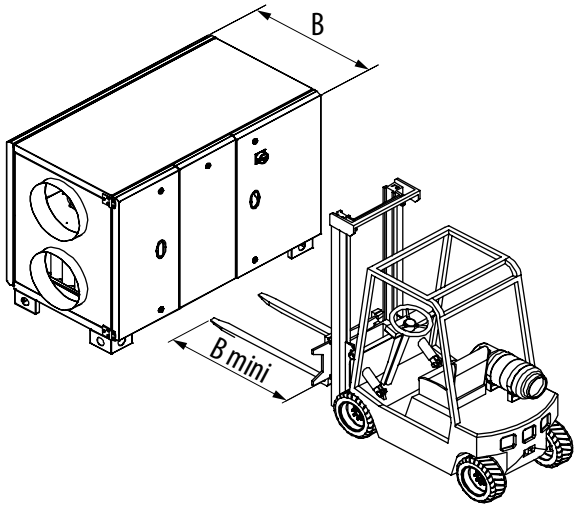
3.2 Handling

The units are delivered screwed to pallets, except on size 15000 delivered on its frame.

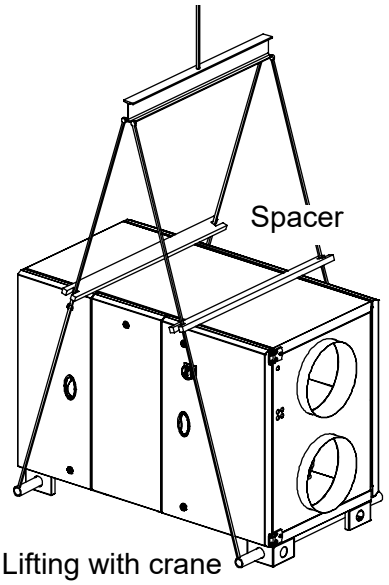
The RHE dual flow air handling units can be handled by a pallet transporter, a forklift, or a crane. The handling machines will be adapted to the load and the lifting conditions. In all cases, the lifting will be done at the device's base. The centre of gravity is located at the centre of the unit.

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 anel. Position the forks low enough so as to not damage the doors. Lift gently.

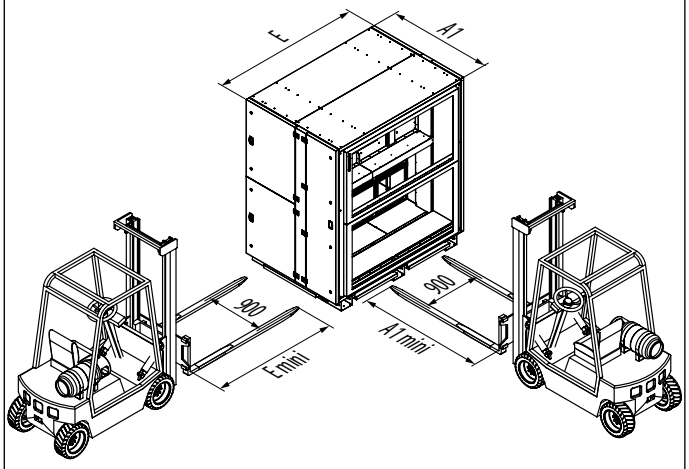
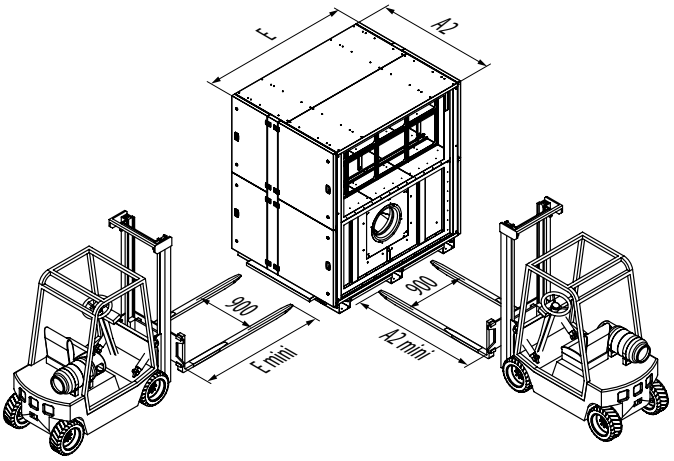


Lifting with forklift

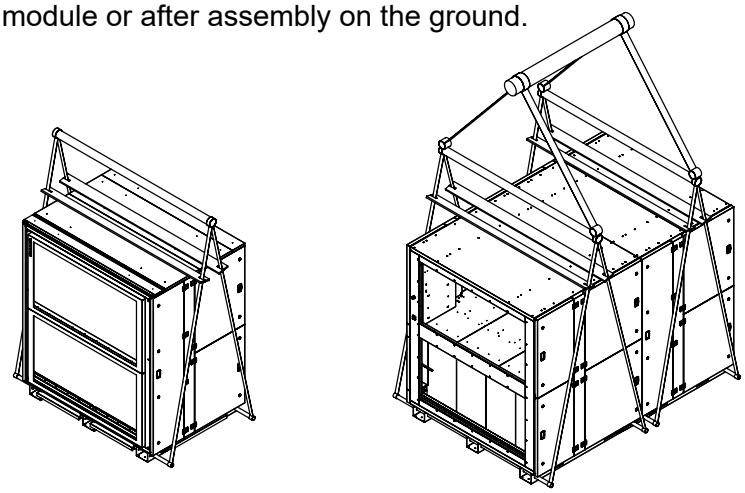


Lifting with crane

Moving and lifting RHE 15000

Exchanger module	Coil module
	

Crane lifting module by module or after assembly on the ground.

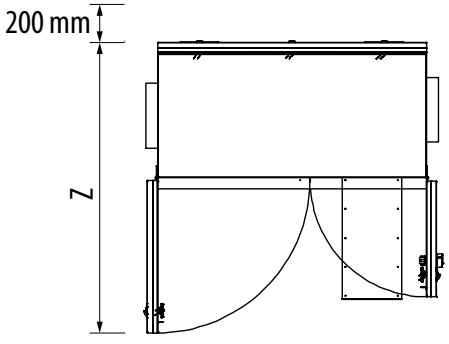


3.3 Placement and attachment point

Placement

The RHE must be laid on a smooth horizontal surface capable of supporting the load. The RHE HD units are designed for an installation inside the building. Only the OI versions delivered with a roof can be used outdoors. In all cases, provide the 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 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.

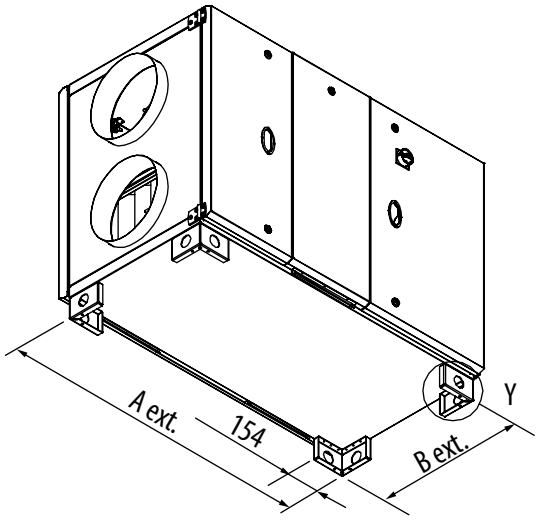


Type	Z (mm)
RHE 700	1450
RHE 1300	1450
RHE 1900	1500
RHE 2500	1800
RHE 3500	2100
RHE 4500	2100
RHE 6000	2515
RHE 8000	3015
RHE 10000	3294
RHE 15000	3183

Standard feet up to size 4500

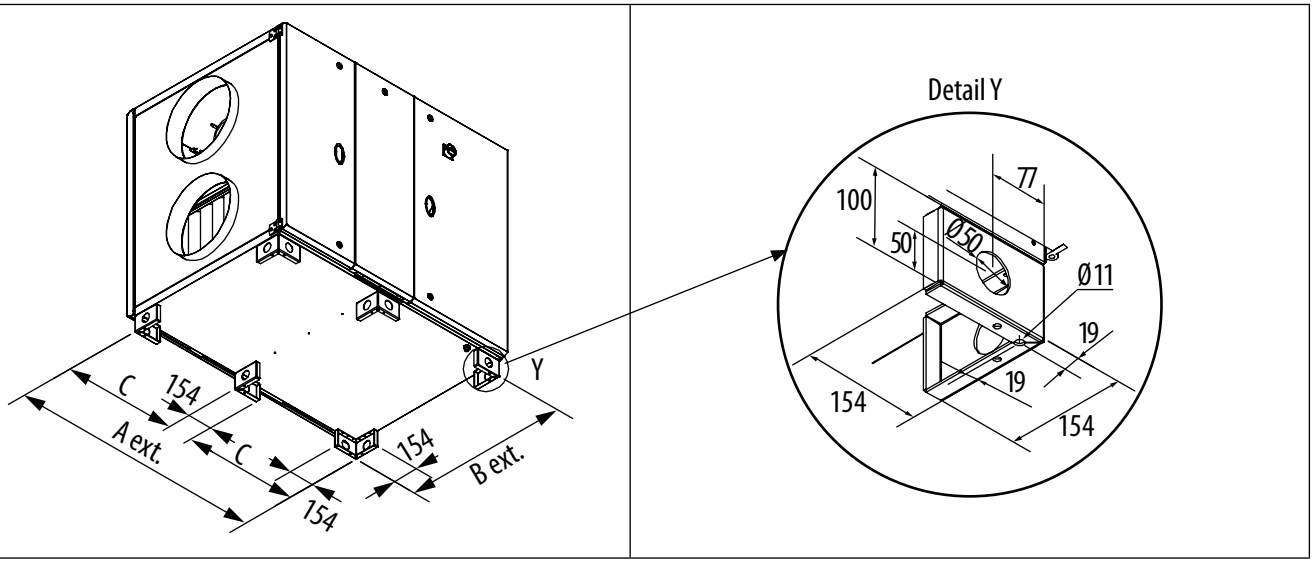
The units are delivered with their 4 or 6 feet according to the models. The support feet must stay on the entire contact surface.

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

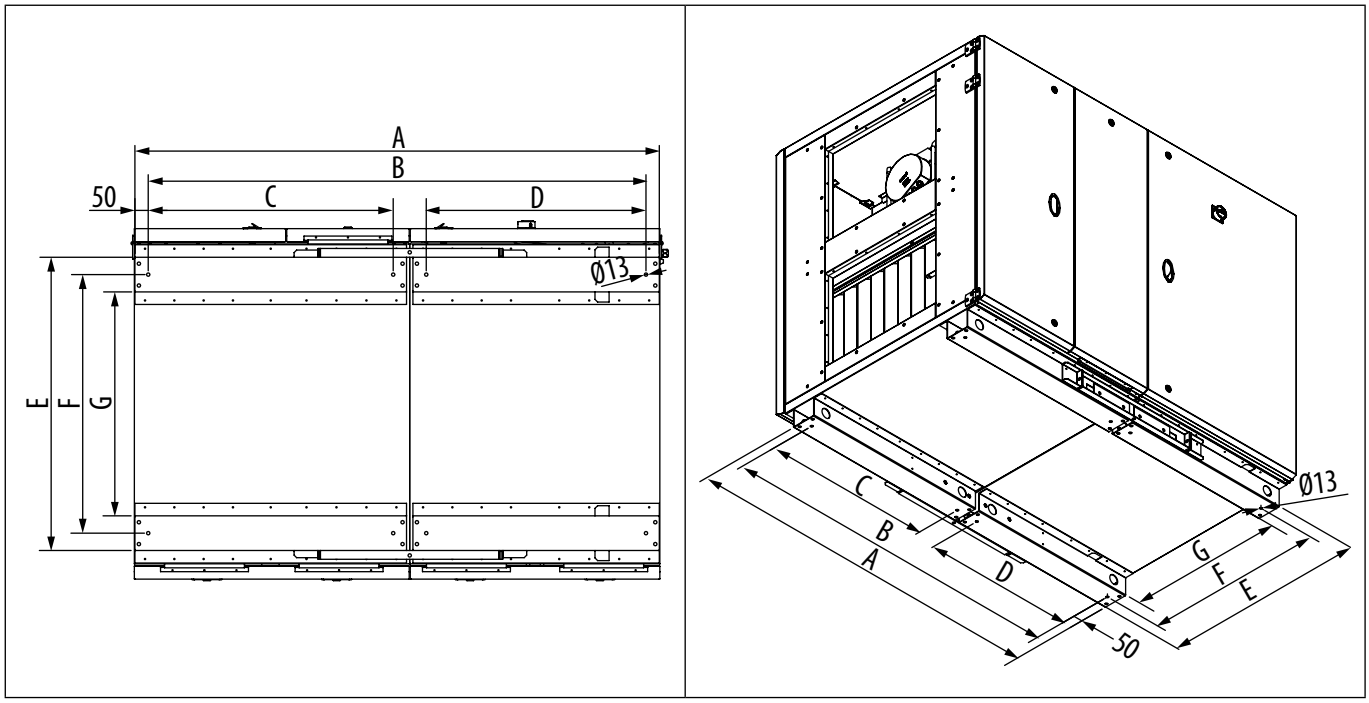
RHE 3500 / 4500



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

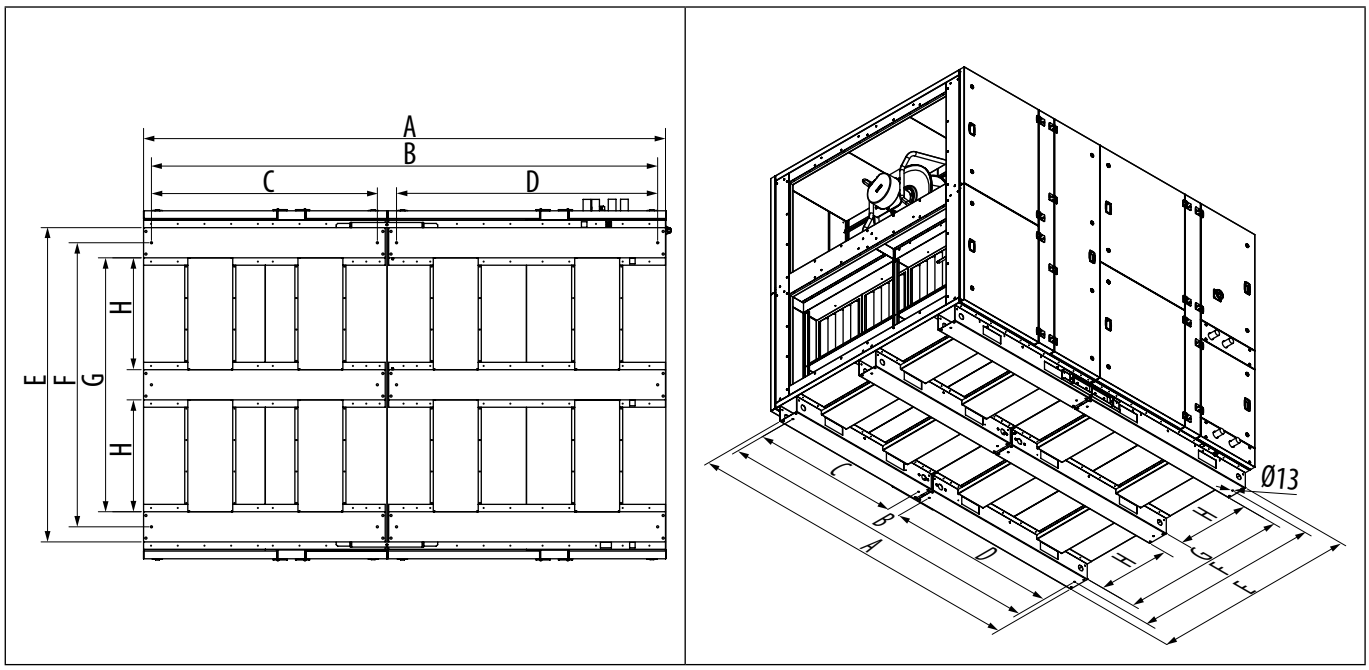
RHE 6000 / 8000 / 10000

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.



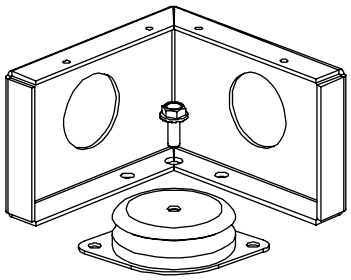
Sizes / Dimensions (mm)	A	B	C	D	E	F	G
RHE 6000 HD	1968	1868	919,4	824,6	1100	970	840
RHE 8000 HD	2108	2008	999,4	884,6	1350	1220	1090
RHE 10000 HD	2408	2308	1149,4	1034,6	1520	1390	1260

RHE 15000



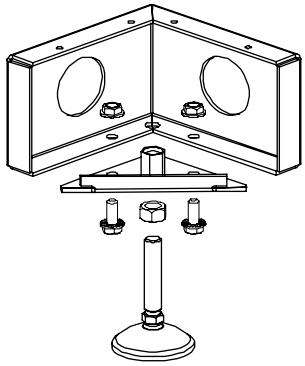
Sizes / Dimensions (mm)	A	B	C	D	E	F	G	H
RHE 15000	3322	3222	1438	1662	2000	1808	1616	712

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	5130272900	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	5130863400	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
RHE 15000	PAVZ 100	5130863400	3	28	124

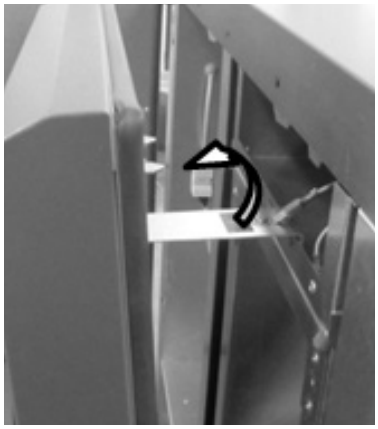
Adjustable feet (accessories)
It is possible to obtain a greater guard height by adding adjustable feet (option) under the standard feet. In this case, the use of antivibration supports is not necessary. For example, this space can allow installing a siphon.



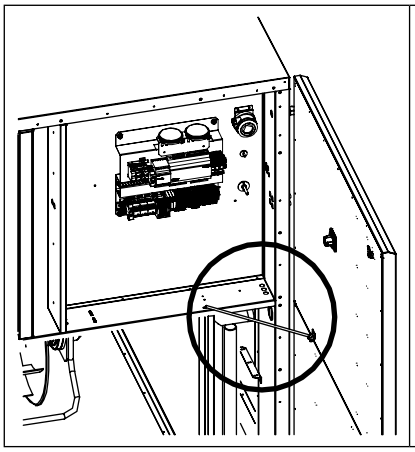
Model	Adjustable feet	Code	Qty to order (composed with 4 cup mounts)	Height (mm)	Attachement distance between centres (mm)
RHE 700	Kit of 4 feet	5407029800	1	75	50
RHE 1300	Kit of 4 feet	5407029800	1	75	50
RHE 1900	Kit of 4 feet	5407029800	1	75	50
RHE 2500	Kit of 4 feet	5407029800	1	75	50
RHE 3500	Kit 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
RHE 15000	Kit of 4 feet	5407029800	3	75	50

Opening of the doors
The RHE units up to size 10000 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.

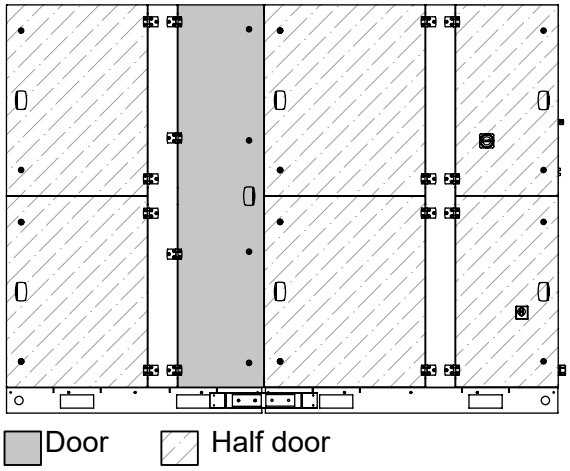
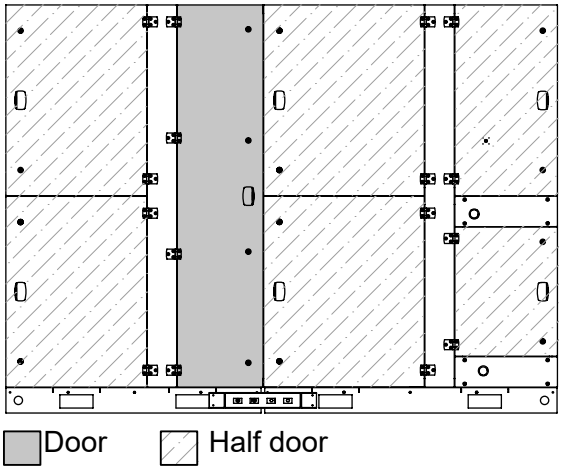


To completely open the latches, move the latches a quarter turn counterclockwise.
Don't forget to disconnect the earthing wires and reconnect them before start-up.



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..

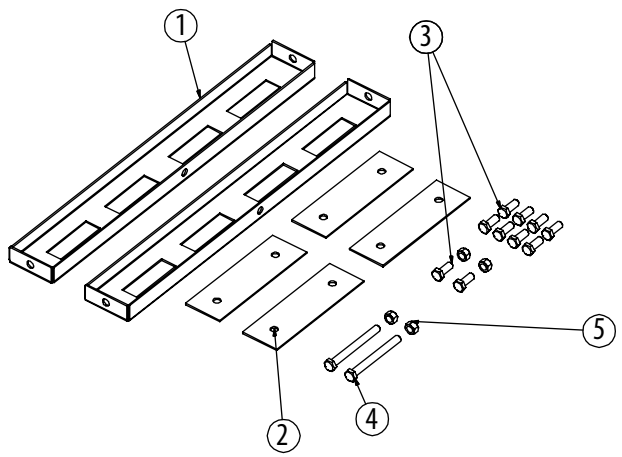
RHE 15000 are equipped with doors or half-doors mounted on hinges, closed by locks, on the front and back of the unit.

RHE 15000	
Without coil or electric heater	**With water coil**
	
Door Half door	Door Half door

3.4 Assembly of the units delivered in two parts

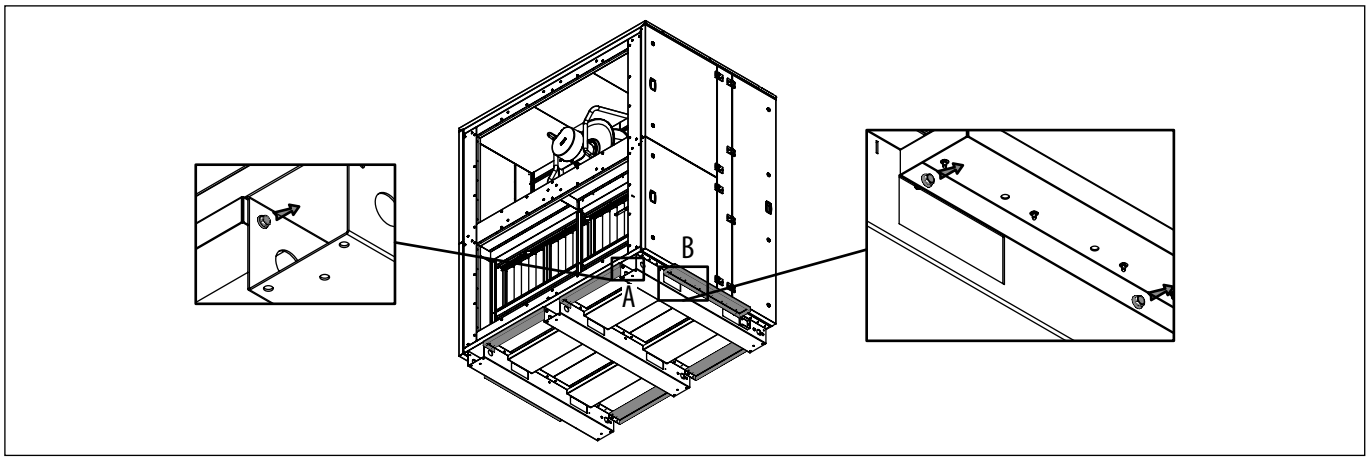
The RHE sizes 6000 to 15000 are delivered in two parts to facilitate the travel up to the installation site.
To decrease the weight of modules, it is possible to remove the back side panels, as well as the front doors. Filters, heat exchanger and ventilators could be easily removed also (see chapter "10. MAINTENANCE", page 94). 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.

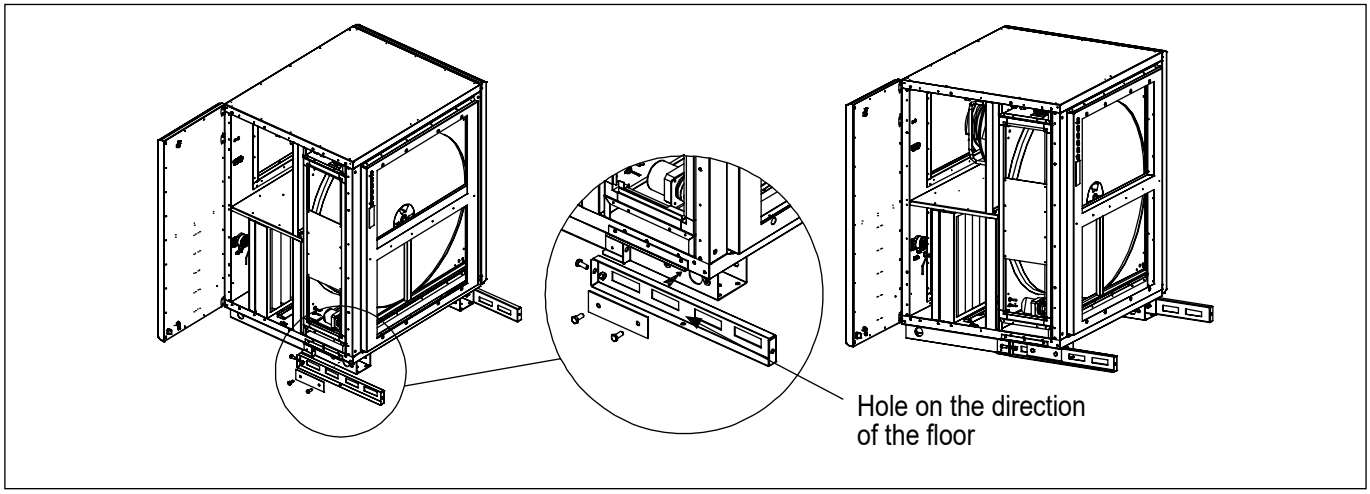


Junction kit components (code 018383) sizes 6000/8000/10000			
N°	**Qté**	**Réf**	**Description**
1	2	20434	Junction elements
2	4	20435	Junction strengthening elements
3	10	507364	Screw H M12x30
4	2	505511	Screw H M12x120
5	4	506531	Nut H M12
Junction kit components (code 018384) size 15000			
1	2	43633	Junction elements
2	4	44025	Junction strengthening elements
3	10	507364	Screw H M12x30
4	2	506674	Screw H M12&70
5	4	506531	Nut H M12

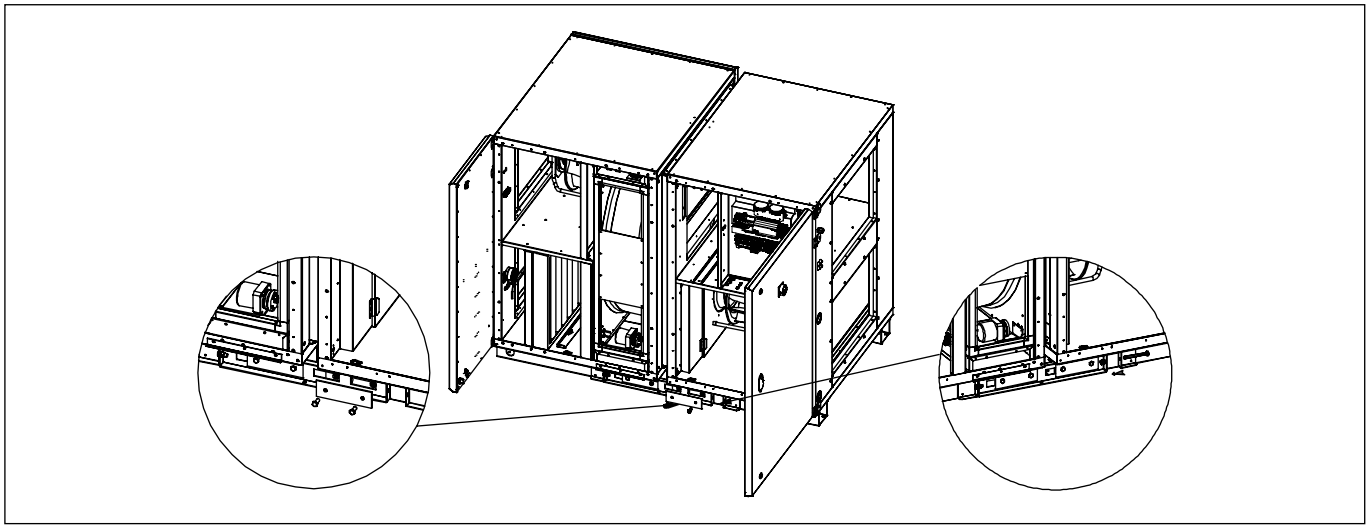
The units size 15000 are delivered with bumpers to prevent damage to the unit during transport and its handling. Once the unit is positioned, the bumpers must be removed, especially those at the junction of modules



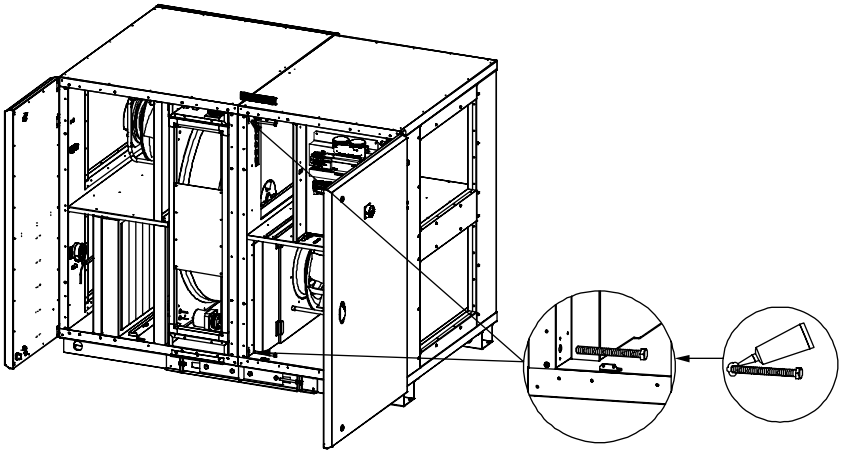
- On the first part, fix on both side the junction elements without fully tighten the junction strengthening elements.



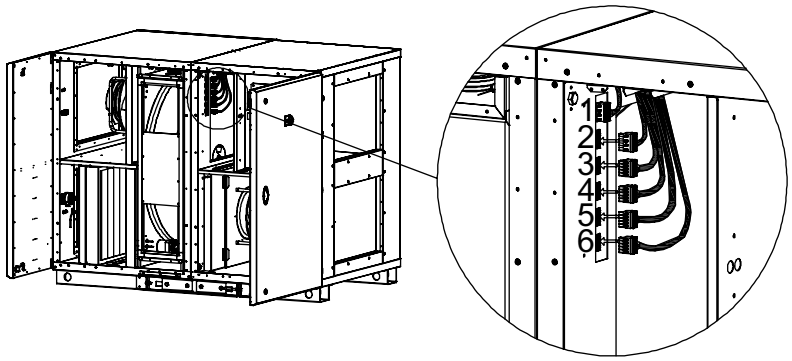
- Move closer as much as possible to both modules; fix the junction elements on the second module loosely. Finalize the junction with the tensioner screw.



- Once the two modules are edge to edge, finalize the assembly inside the modules using 4 screws (6 from the size 10000 and 15000) M12x120 supplied (key size 18). The locations are spread on the 4 internal angles (+ 2 points in the middle from size 10000/15000) on each side of the box equip with the controler. Before tightening, put a little grease on the screw. Check that the 2 modules are correct nested. Tighten all the screws including those of the joint reinforcements.



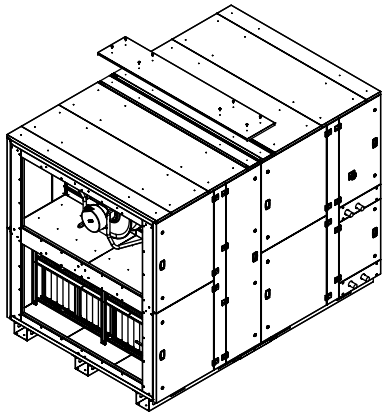
- Connect the fast electrical connector as shown :



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.

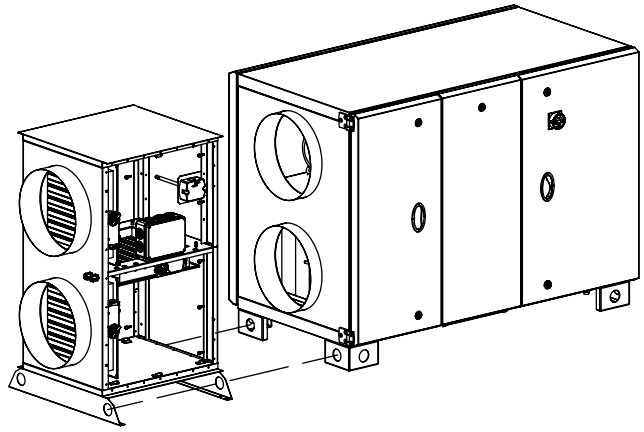
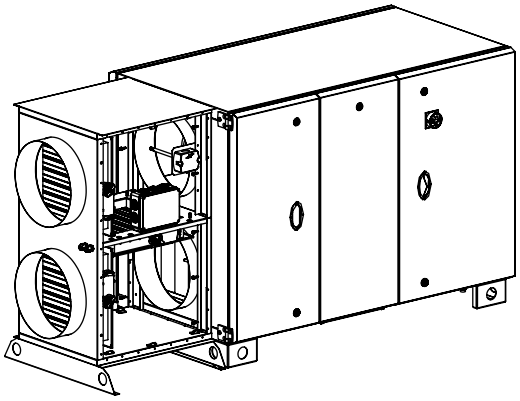
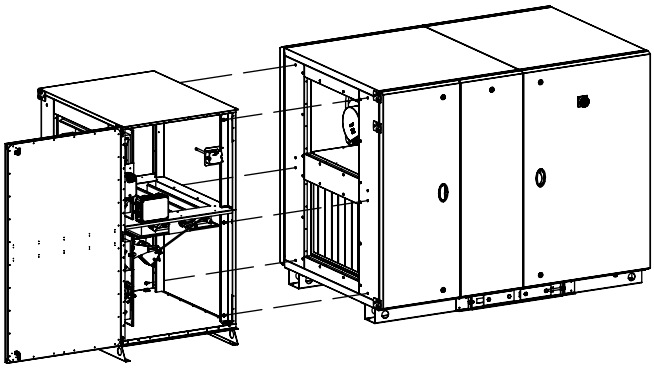
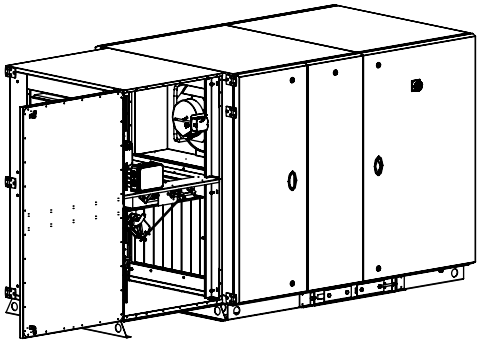
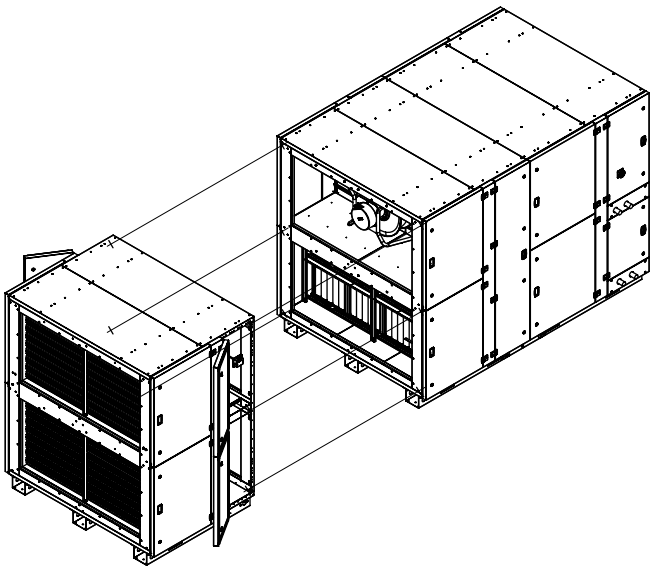
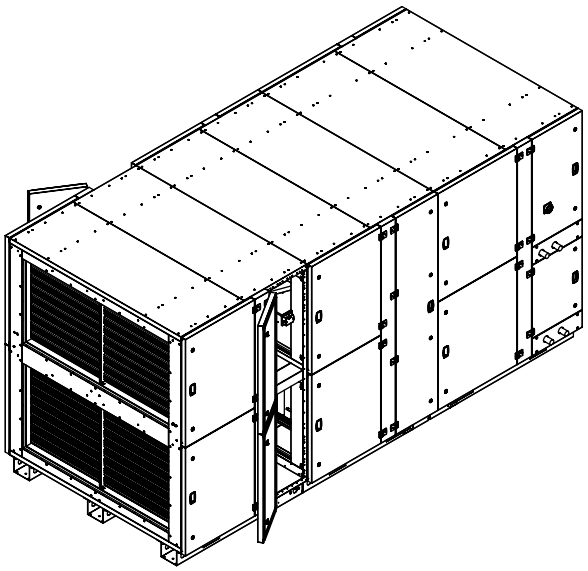
Roof mounting on RHE 15000 OI

On the OI models of sizes 15000, the roof is pre-assembled in the factory on each of the modules. The roof junction have to be mounted on site after assembling the 2 modules together.



3.5 Connection between mixing or recycling box and the RHE

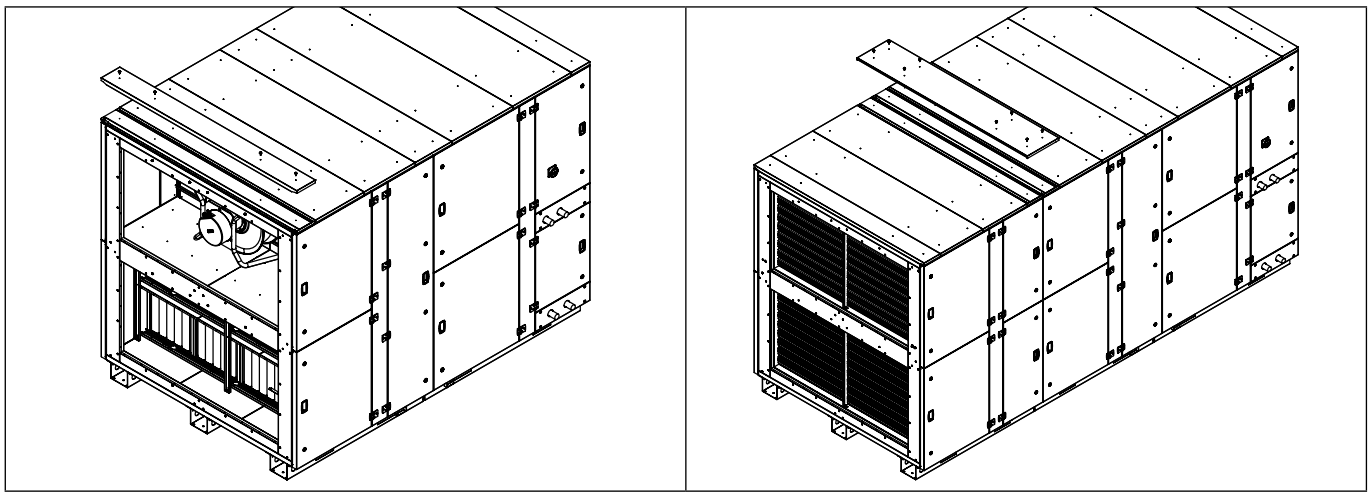
The unit can be equipped with mixing box (MIB 0-10V) or recycling box (MIB ON-OFF), connection according the below procedure :

<table>
<tr><th colspan="2">Size 700 to 4500</th></tr>
<tr><td>• Move closer the 2 modules by taking care to align the round cuts on the feet support.</td><td>• Screw 2 modules together with 10 auto-drills screws delivered with the box</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><th colspan="2">Size 6000 to 10000</th></tr>
<tr><td>• Move closer the 2 modules by taking care to align the cuts of the box with the inserts of the unit.</td><td>• Screw 2 modules together with the 6 M8 screws delivered with the unit.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><th colspan="2">Size HD 15000</th></tr>
<tr><td>  </td><td>  </td></tr>
</table>

Roof assembly between a RHE 15000 OI and a MIB

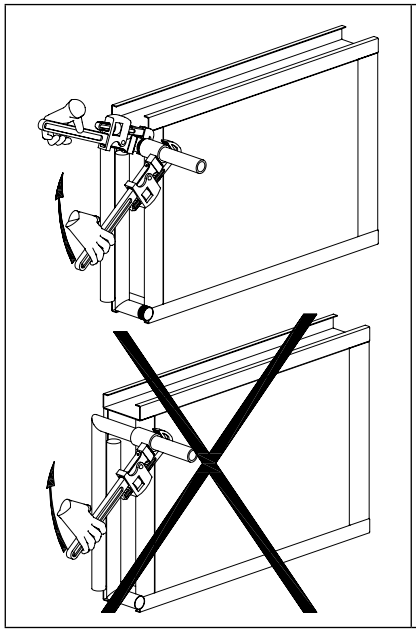
On the OI models of sizes 15000, the roof is pre-assembled in the factory on each unit's modules and on the MIB OI mixing / recycling box.

- Remove the end roof of the heat exchanger module from the unit.
- Assemble the unit and mixing box assembly
- Install and fix the junction roof between the unit and the box.



4. HYDRAULIC AND FLUID CONNECTION

4.1 Water coils connection

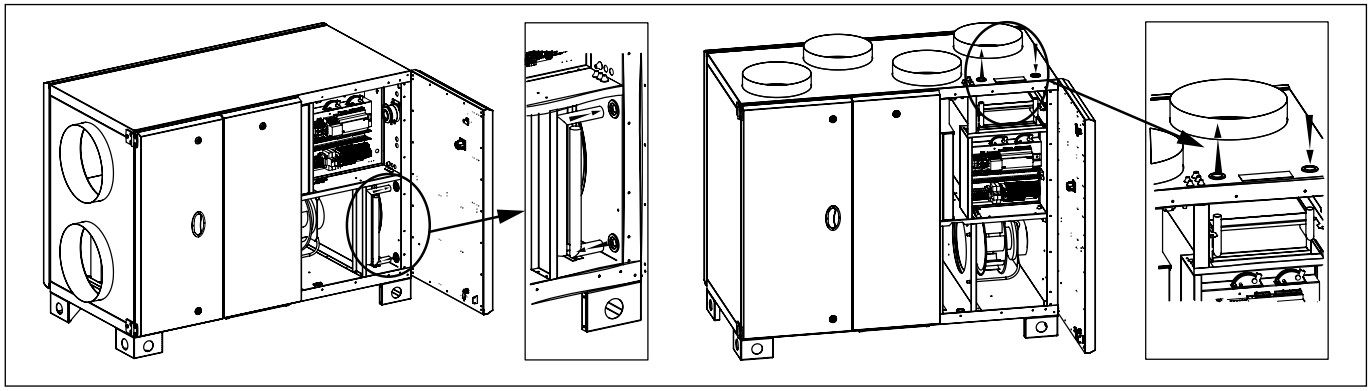


The unit’s hydraulic data are specific to your installation and are determined by the computer selection : Water pressure drop / Waterflow. Refer to the selection to size the network, accessories, pump, etc.

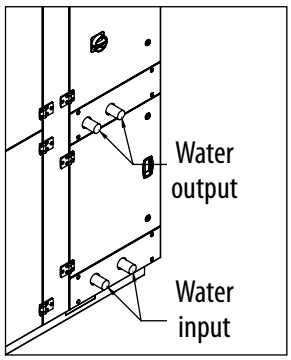
The pipe connection to the coil must not impose mechanical, vibrational or thermal (expansion) stresses
on the coil.
The coils are delivered end-threaded.
Sizes 700 / 1300 / 1900: Diameter 1/2˝
Sizes 2500 / 3500 / 4500: Diameter 3/4˝
Size 6000: Diameter 1˝
Size 8000 / 10000: Diameter 1 ¼ ˝
Size 15000: Diameter 1 ½"

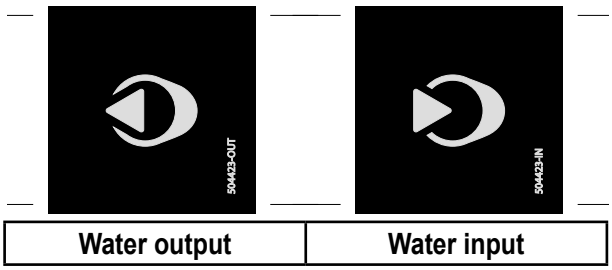
When tightening the coils threads, hold the pipe in the counter direction, for example, with a Stillson type wrench to prevent pipe damages by torsion.

The coils are connected to the network inside the unit, except on size 15000. Respect the water inlet and outlet directions.



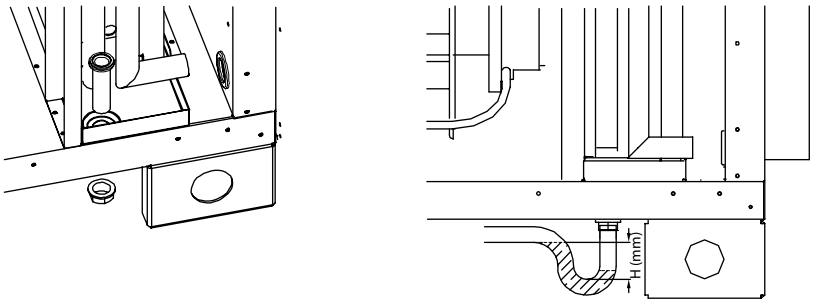
On size 15000, the water pipes are connected on the front, outside the unit.





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 300Pa 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.

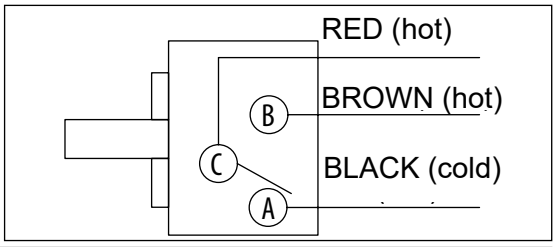
The minimum drain slope must be 5 / 1000.

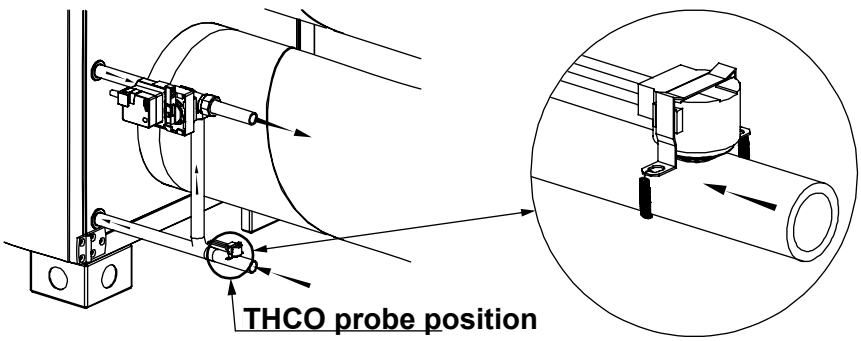


To size a siphon : H min (mm) = 4 + pressure drop of the air injection network (da Pa).

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.

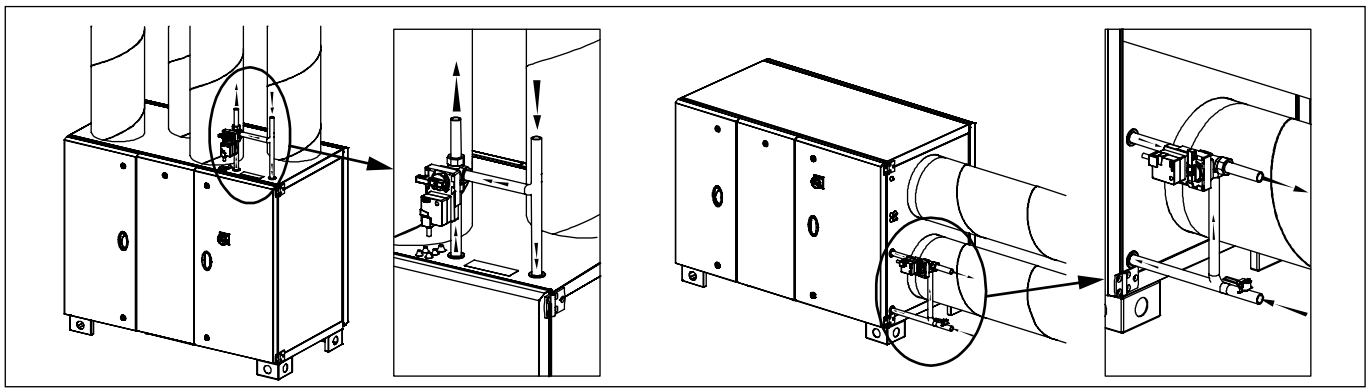
Technical data:
- Inverter contact output : 240 VAC, 3 A
- AC contact calibration open : 30 ± 4°C
- AC contact closed: 15 ± 4 °C
- Attachment by spring on the pipe
- 3-wire electric connection length : 1 500 mm
- Degree of protection : IP 65





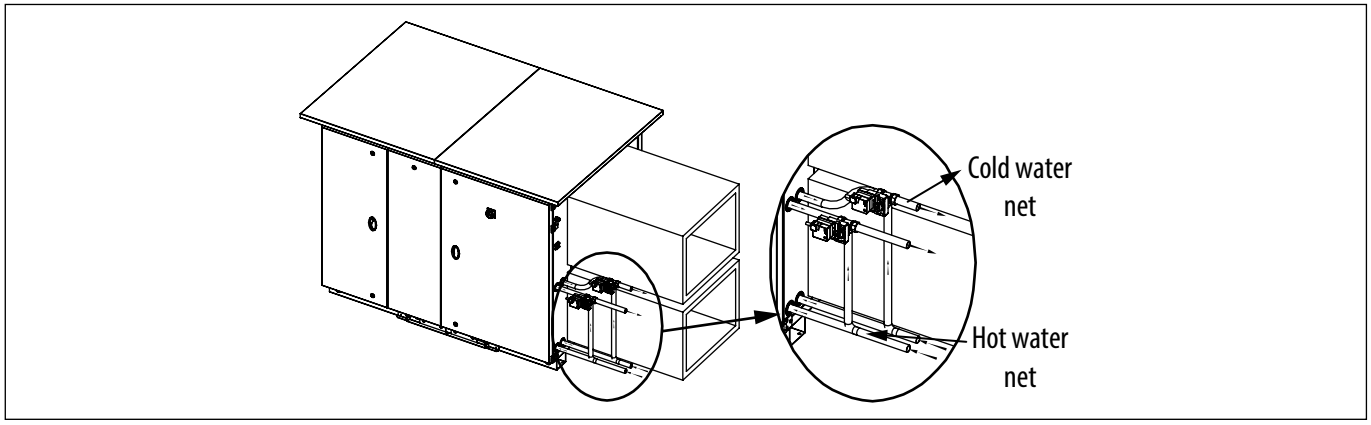
4.2 Valves connection

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.

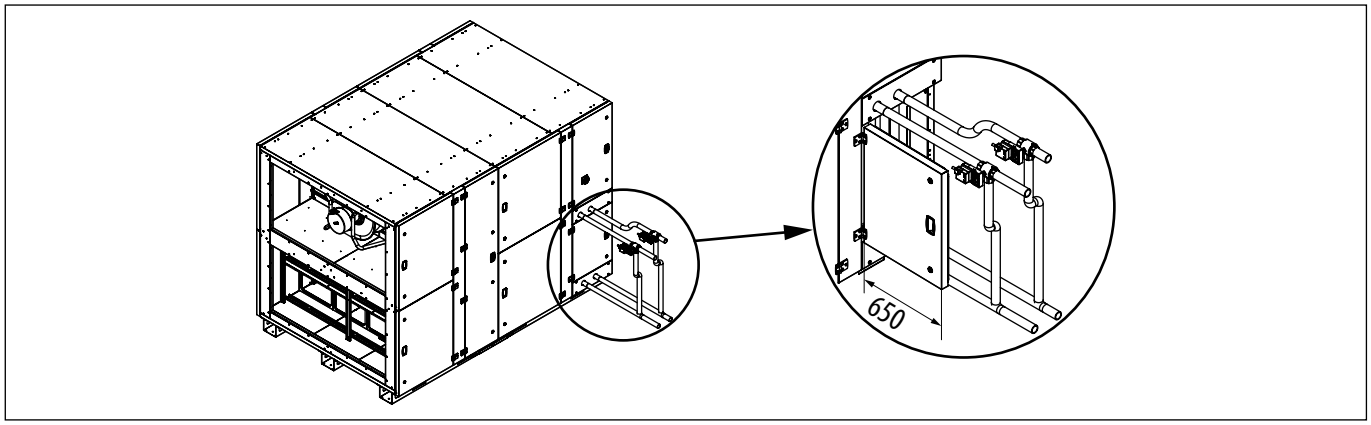


Electric connection on the RHE box: see subsection **"6.5 Inputs – outputs", page 43.**

Unit with hot and cold water up to size 10000.

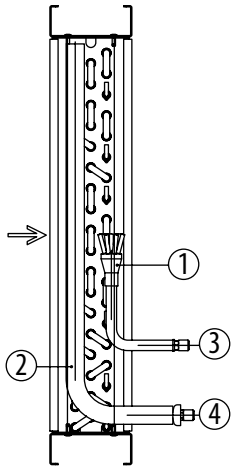
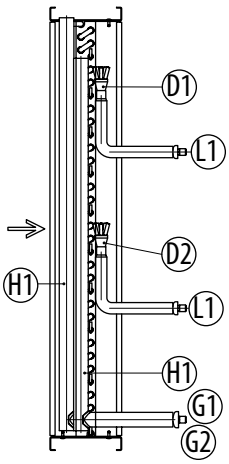


Unit with hot water coil and / or cold water coil from size 15000.
Connection on the main face of the unit. Provide sufficient space to allow the opening of the door for maintenance



4.3 Connection of direct expansion coils

The refrigeration connection must be carried out by a qualified refrigeration engineer.

DX COIL 1 CIRCUIT	DX COIL 2 CIRCUITS
① Distributor ② Outlet manifold ③ Refrigerant connection (liquid) ④ Refrigerant connection (gas) 	Ⓓ1 Distributor 1 Ⓗ1 Outlet manifold 1 Ⓛ1 Refrigerant connection (liquid) Ⓖ1 Refrigerant connection (gas) Ⓓ2 Distributor 2 Ⓗ2 Outlet manifold 2 Ⓛ2 Refrigerant connection (liquid) 2 Ⓖ2 Refrigerant connection (gas) 2 

Size	Internal coil volume (dm³)	Number of circuit	Liquid / gas connection (mm)
700	0,5	1	9,5 / 9,5
1300	0,7	1	12,7/15,8
1900	1	1	12,7/15,8
2500	1,5	1	12,7 /22,2
3500	2,1	1	12,7 /22,2
4500	2,1	1	12,7 /22,2
6000	4,7	1	12,7/28,5
8000	4,8	2	2x(15,8/22,2)
10000	6,1	2	2x(22,2/28,5)

5. AIR DUCT CONNECTION

5.1 Ducts connection

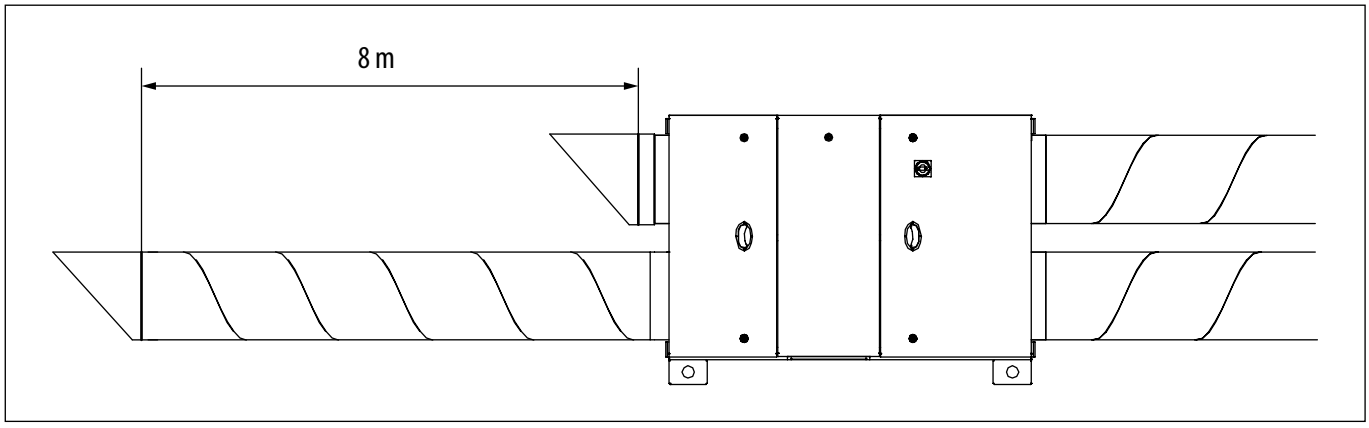
Connecting ducting to be correctly aligned self supporting.
Make sure that the motor driven fans are not accessible from the connection taps (Protection by the connection duct or a screened air intake).
Do not reduce the diameter of the ducts at the oulet of the connection taps.
On the other hand, the 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.

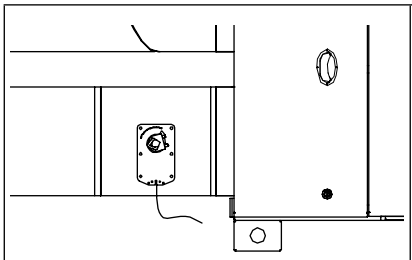
Respect a minimum distance of 8 m between the fresh air intake and the discharge. Place the fresh air intake far from any specific pollution.



5.2 Accessories connection

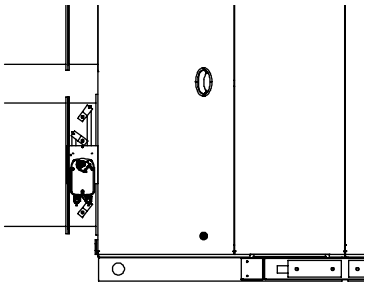
Dampers
Electric connection on the RHE box : see subsection “External components connection drawings”. When the unit is equipped with a water coil it is recommended to provide for an antifreeze protection damper on the fresh air network. If possible, use a motorized airtight damper.
A second damper should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

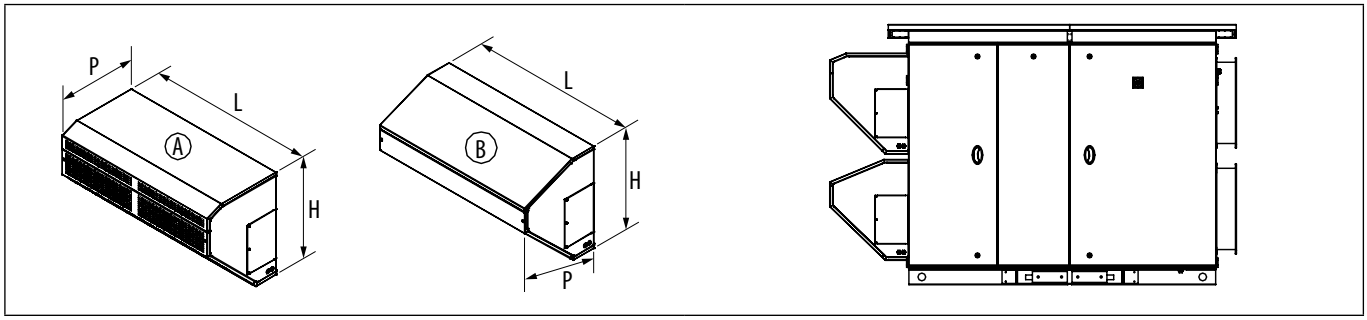
Unit size 6000 / 8000 / 10000 – rectangular air duct connection



Type	Code	Designation
4500 VD	5407039400	**MLD 4500 T L700 H310 mm - damper leakage performance class 3 blade distance 100mm**
6000 HD	5407031800	**MLD 6000 T L700 H510 mm - damper leakage performance class 3 blade distance 100mm**
8000 HD	5407031900	**MLD 8000 T L900 H610 mm - damper leakage performance class 3 blade distance 100mm**
10000 HD	5407037000	**MLD 10000 T L1100 H610 mm - damper leakage performance class 3 blade distance100mm**
15000 HD	5407035400	**MLD 15000 T L1800 H910 mm - damper leakage performance class 3 blade distance 100mm**

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

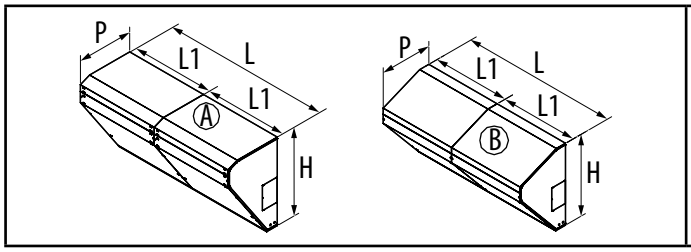
Exhaust air and outdoor air protection canopy



The outside units until the size 4500 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.

Type	Code	Designation	Dimensions (mm)		
			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

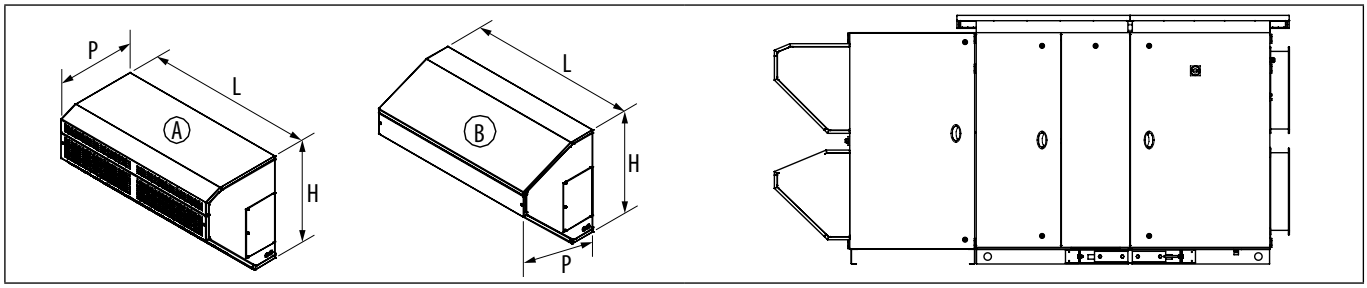
RHE size 15000



Type	Code	Designation	Dimensions (mm)			
			H	L	L1	P
A	5407035100	**APPR 15000**	1091	2100	**1050**	702
B	5407035300	**APPA 15000**	1091	2100	**1050**	702

Protection canopy for recycling and mixing box

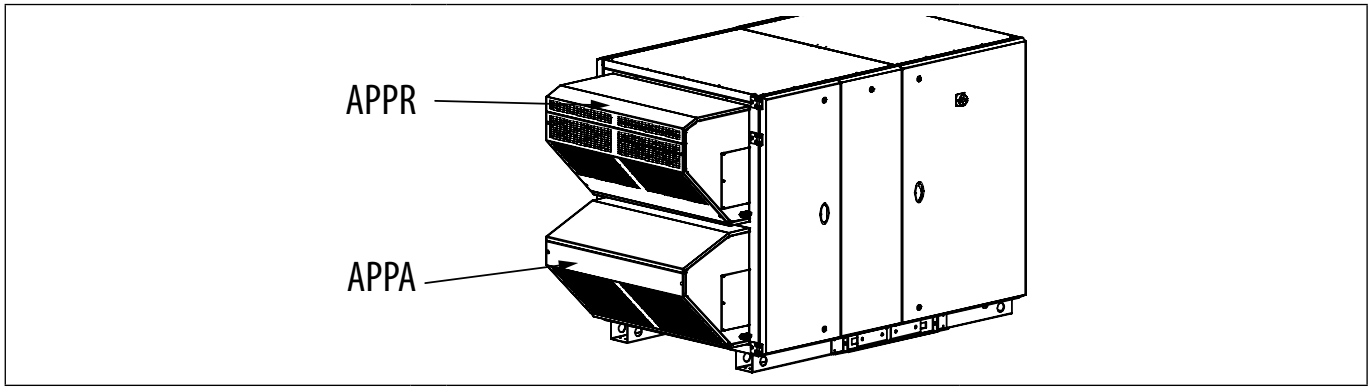
Recycling and mixing box until the size 4500 can be equipped with standard accessories for circular ducts, type APC for the exhaust air and outdoor air inlet protection canopy. For the sizes 6000, 8000 and 10000 with rectangular air connection, exhaust air and outdoor air protection canopy are specific.



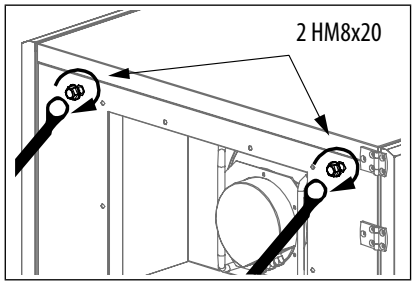
Type	Code	Designation	Dimensions (mm)		
			H	L	P
A	5407062400	**APPR-R 6000 Exhaust air protection canopy MIB 6000**	602	945	506
	5407062500	**APPR-R 8000 Exhaust air protection canopy MIB 8000**	747	1195	564
	5407062700	**APPR-R 10000 Exhaust air protection canopy MIB 10000**	747	1365	564
B	5407062600	**APPA-A 6000 Outdoor air protection canopy MIB 6000**	602	945	506
	5407062800	**APPA-A 8000 Outdoor air protection canopy MIB 8000**	747	1195	564
	5407062900	**APPA-A 10000 Outdoor air protection canopy MIB 10000**	747	1365	564

From size 15000 upwards, APPA and APPR are identical for connection to the unit or to the mixing box.

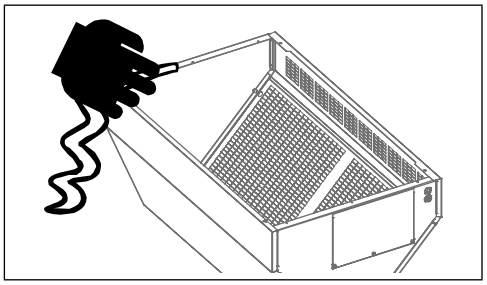
Installation APPA-APPR up to size 15000 (Screws included)



1



2



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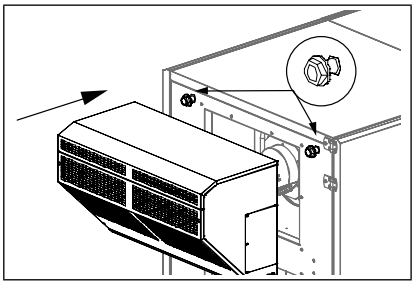

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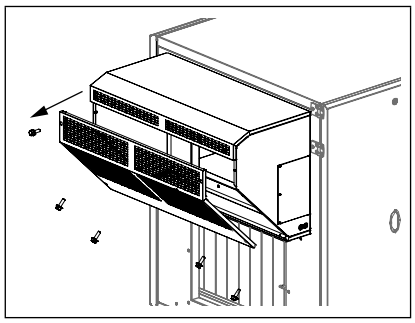

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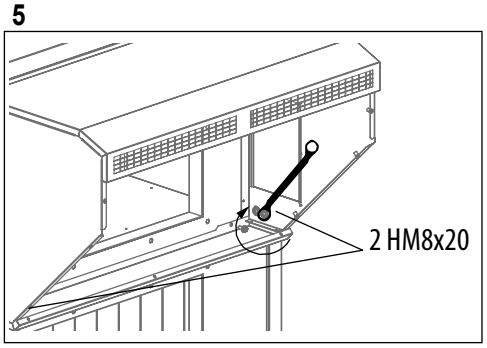
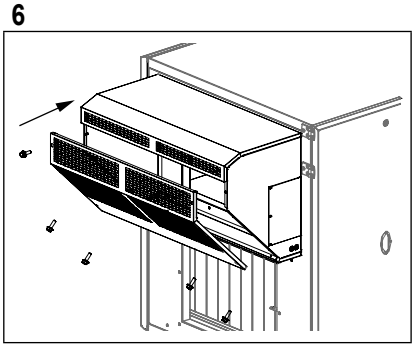
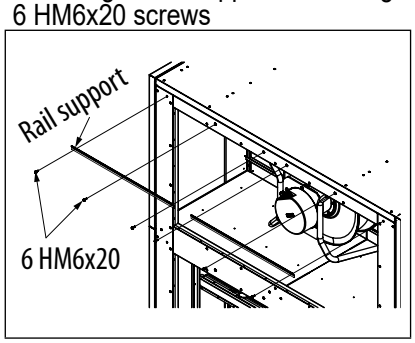


6

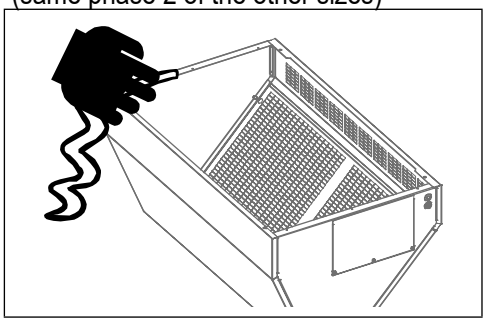


APPA / APPR specific mounting for size 15000

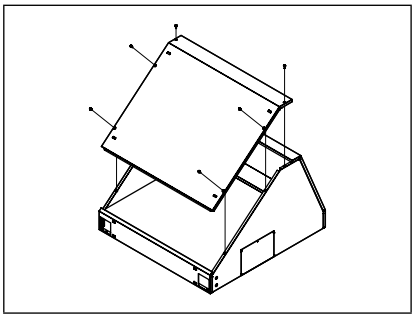
1
Mounting of the support rails using 6 HM6x20 screws



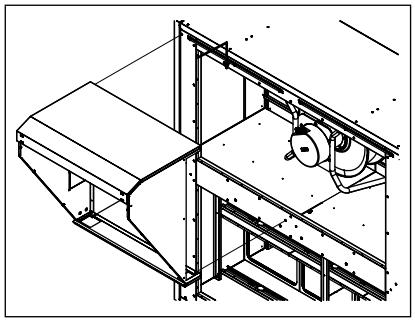
2
Installation of the peripheral seal (same phase 2 of the other sizes)



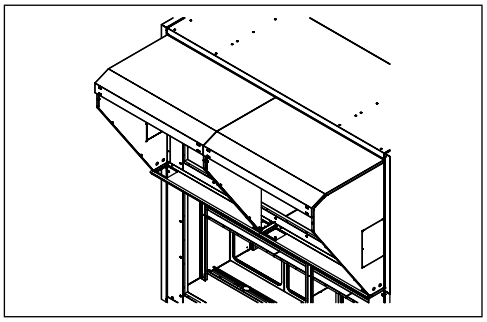
3
Remove the front grilles



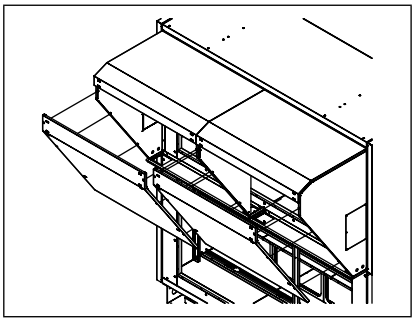
4
Installation of the 1st module thanks to the rail upper, fix it with 1 M8 screw top left and 2 M8 screws at the bottom.



5
Fix the 2nd module by following the same principle. Assemble the 2 modules between them by 4 M6x20 screws + nuts.

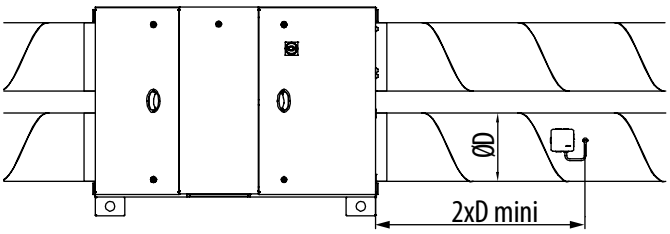


6
Remonter les grilles de façade.



Differential pressure probe – Operation in COP (Constant Pressure)
Electric connection on the RHE box: see subsection **"6.6 External components connection drawings (examples)", page 45.**

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)", page 45.**
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.

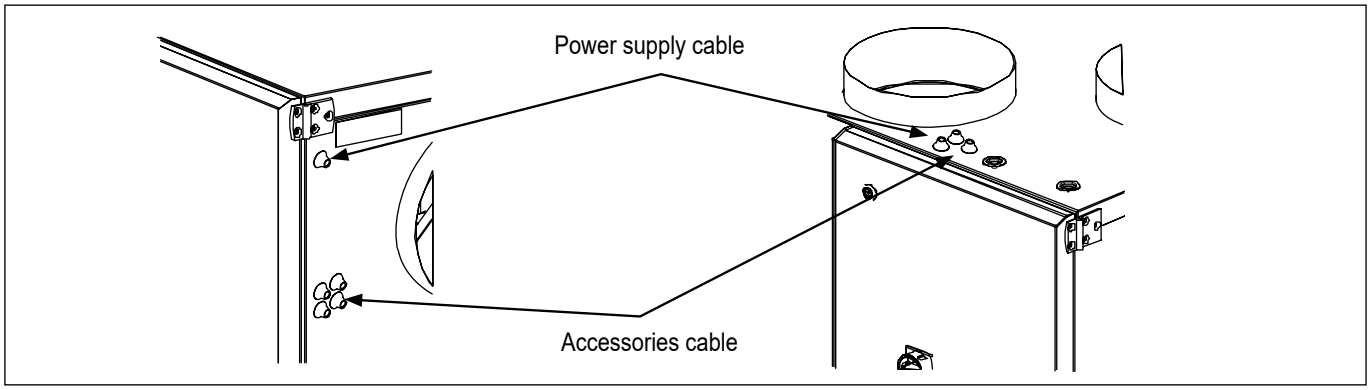
Recommended CO2 probes :

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.

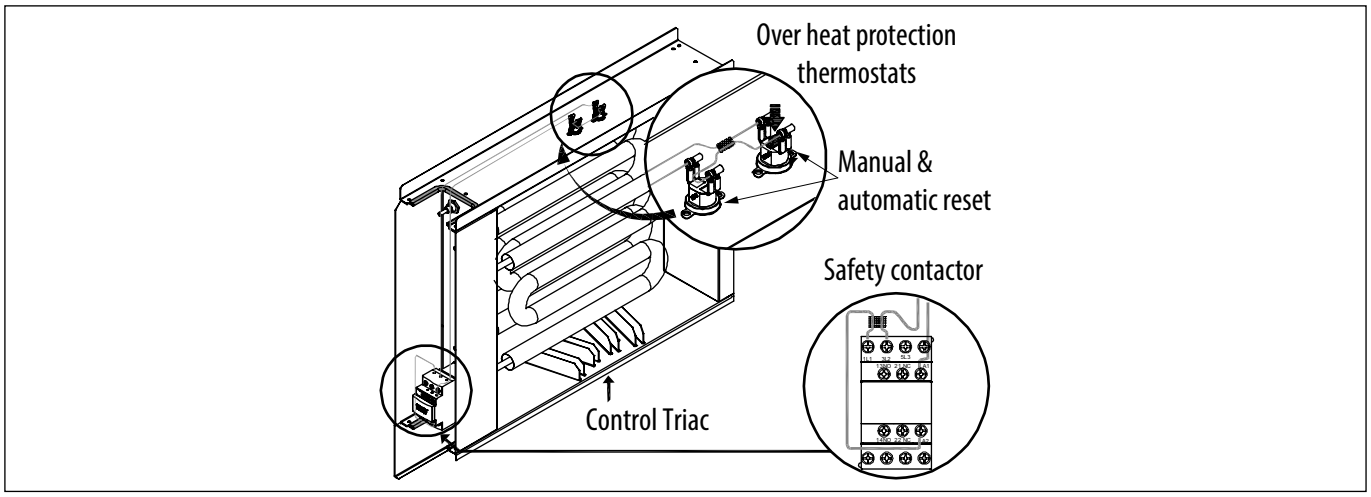
Capacity of the power connection terminal strip : 10 mm², tightening torque: 2.5Nm.

Modèle	Heat exchanger rotor drive motor			Fan				
	Voltage (V)	Nominal power (W)	Current (A)	Voltage (V)	Frequency (Hz)	Max absorbed power (W)	Current (A)	Maxi speed (rpm)
RHE 700 D/DC/DFR/DX	1 phase 230V	40	0,2	1 phase 230V	50/60	200	1,6	2650
RHE 1300 D/DC/DFR/DX	1 phase 230V	40	0,2	1 phase 230V	50/60	700	3	3450
RHE 1900 D/DC/DFR/DX	1 phase 230V	40	0,2	1 phase 230V	50/60	715	3,1	2800
RHE 2500 D/DC/DFR/DX	3 phase 400V	55	0,28	3 phase 400V	50/60	1000	1,6	2580
RHE 3500 D/DC/DFR/DX	3 phase 400V	55	0,28	3 phase 400V	50/60	1000	1,7	2140
RHE 4500 D/DC/DFR/DX	3 phase 400V	55	0,28	3 phase 400V	50/60	1850	2,9	2180
RHE 6000 D/DC/DFR/DX/DC-DF	3 phase 400V	55	0,28	3 phase 400V	50/60	1850	2,9	2180
RHE 8000 D/DC/DFR/DX/DC-DF	3 phase 400V	120	0,35	3 phase 400V	50/60	2730	4,2	2040
RHE 10000 D/DC/DFR/DX/DC-DF	3 phase 400V	120	0,35	3 phase 400V	50/60	3000	4,6	1500
RHE 15000 D/DC/DFR/DX/DC-DF	3 phase 400V	180	1,11	3 phase 400V	50/60	5000	7,7	1760
RHE 700 DI	1 phase 230V	40	0,2	1 phase 230V	50/60	200	1,6	2650
RHE 1300 DI	1 phase 230V	40	0,2	1 phase 230V	50/60	700	3	3450
RHE 1900 DI	1 phase 230V	40	0,2	1 phase 230V	50/60	715	3,1	2800
RHE 2500 DI	3 phase 400V	55	0,28	3 phase 400V	50/60	1000	1,6	2580
RHE 3500 DI	3 phase 400V	55	0,28	3 phase 400V	50/60	1000	1,7	2140
RHE 4500 DI	3 phase 400V	55	0,28	3 phase 400V	50/60	1850	2,9	2180
RHE 6000 DI	3 phase 400V	55	0,28	3 phase 400V	50/60	1850	2,9	2180
RHE 8000 DI	3 phase 400V	120	0,35	3 phase 400V	50/60	2730	4,2	2040
RHE 10000 DI	3 phase 400V	120	0,35	3 phase 400V	50/60	3000	4,6	1500
RHE 15000 DI	3 phase 400V	180	1,11	3 phase 400V	50/60	5000	7,7	1760

Model	Complet unit		
	Voltage (V)	Total Power (kW)	Current max total (A)
RHE 700 D/DC/DFR/DX	1 phase 230V	1	4,2
RHE 1300 D/DC/DFR/DX	1 phase 230V	2	7,2
RHE 1900 D/DC/DFR/DX	1 phase 230V	2	7,4
RHE 2500 D/DC/DFR/DX	3 phase 400V + N	3	4,4
RHE 3500 D/DC/DFR/DX	3 phase 400V + N	3	4,6
RHE 4500 D/DC/DFR/DX	3 phase 400V + N	4	7,2
RHE 6000 D/DC/DFR/DX/DC-DF	3 phase 400V + N	4	7,2
RHE 8000 D/DC/DFR/DX/DC-DF	3 phase 400V + N	6	9,8
RHE 10000 D/DC/DFR/DX/DC-DF	3 phase 400V + N	6,5	10,5
RHE 15000 D/DC/DFR/DX/DC-DF	3 phase 400V + N	12	18,5
RHE 700 DI	1 phase 230V	4	17,3
RHE 1300 DI	1 phase 230V	6	24,6
RHE 1900 DI	1 phase 230V	10	42,2
RHE 2500 DI	3 phase 400V + N	15	21,8
RHE 3500 DI	3 phase 400V + N	18	26,3
RHE 4500 DI	3 phase 400V + N	19	29
RHE 6000 DI	3 phase 400V + N	28	41,9
RHE 8000 DI	3 phase 400V + N	42	61,8
RHE 10000 DI	3 phase 400V + N	55	79,8
RHE 15000 DI	3 phase 400V + N	12	18,5
	3 phase 400V	72	104

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.



Sizes	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
RHE 15000 DI*	3 phase 400V	72	104

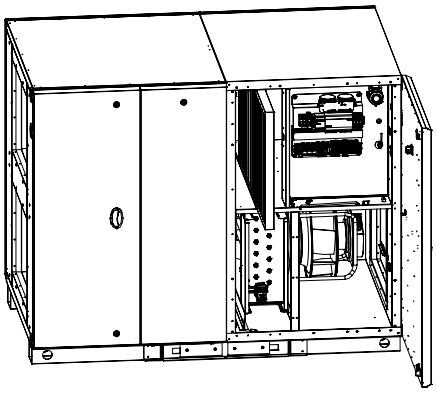
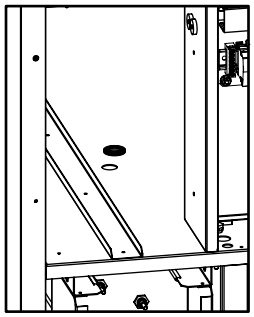
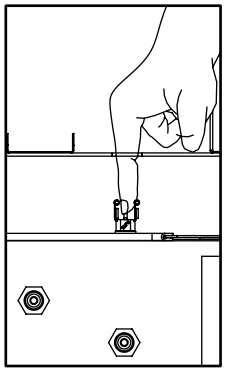
* Separate power supply for the electric heater on size 15000

It is possible on demand to have electrical heater with lower power than the standard configuration:

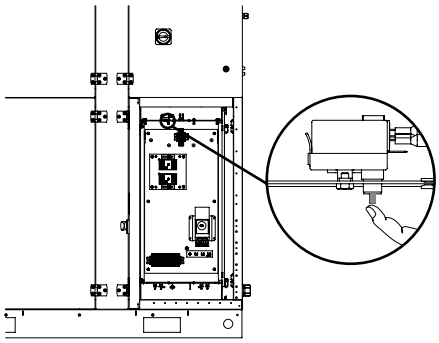
Sizes	Voltage (V)	Nominal power (W)	Current (A)
1300	1 phase 230V	2,5	11
		3	13
1900	1 phase 230V	3	13
		4	17
		6	26
2500	3 phase 400V	9	13
3500	3 phase 400V	9	13
		12	17
4500	3 phase 400V	9	13
		12	17
6000	3 phase 400V	9	13
		12	17
		15	22
		18	26

Sizes	Voltage (V)	Nominal power (W)	Current (A)
8000	3 phase 400V	9	13
		18	26
		27	39
10000	3 phase 400V	24	35
		27	39
		36	52
15000	3 phase 400V	60	87
		48	69
		36	52
		24	35

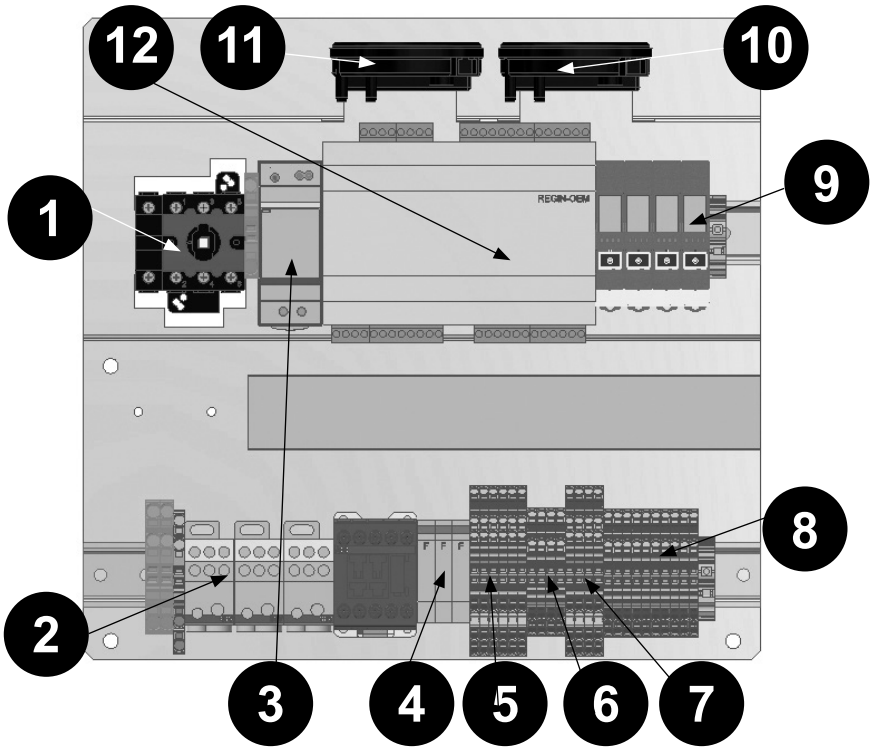
On the units of size 6000 - 8000 and 10000, the sécurity thermostat could be reseted from the inside of the unit.

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

On 15000 units, the electric heater safety thermostat is reset inside the unit on the front of the coil.

Slide finger to rearm


6.2 Internal electrical box – composition / connection



Position	Description
1	Main power connection switch / safety circuit breaker (1)
2	Electrical power distributor for the different components
3	Alimentation 230V/24V 50/60Hz
4	Control circuit protection fuse (F1= 1,6 A ; F2= 1,6 A; F3= 2,0 A)
5	Analogic output switches (2)
6	Temperature sensor switches (2)
7	Universal switches : CO2 sensor / pressure tranmitter …
8	Digital input switches : On/Off, thermostat… (2)
9	Relay outputs: KM1, KM2, KM4, KM5: information transfer, register command
10	Pressure transmitter control on exhaust air flow
11	Pressure transmitter control on supply flow
12	Controller CORRIGO : Regin-OEM ref 28ES 3P

(1) 40A switch disconnector (all RHE except sizes 8000 and 10000 if electric heater), connection capacity:

- Rigid cable : 2.5 à 16 mm² max
- Flexible cable : 2.5 à 10 mm² max

or

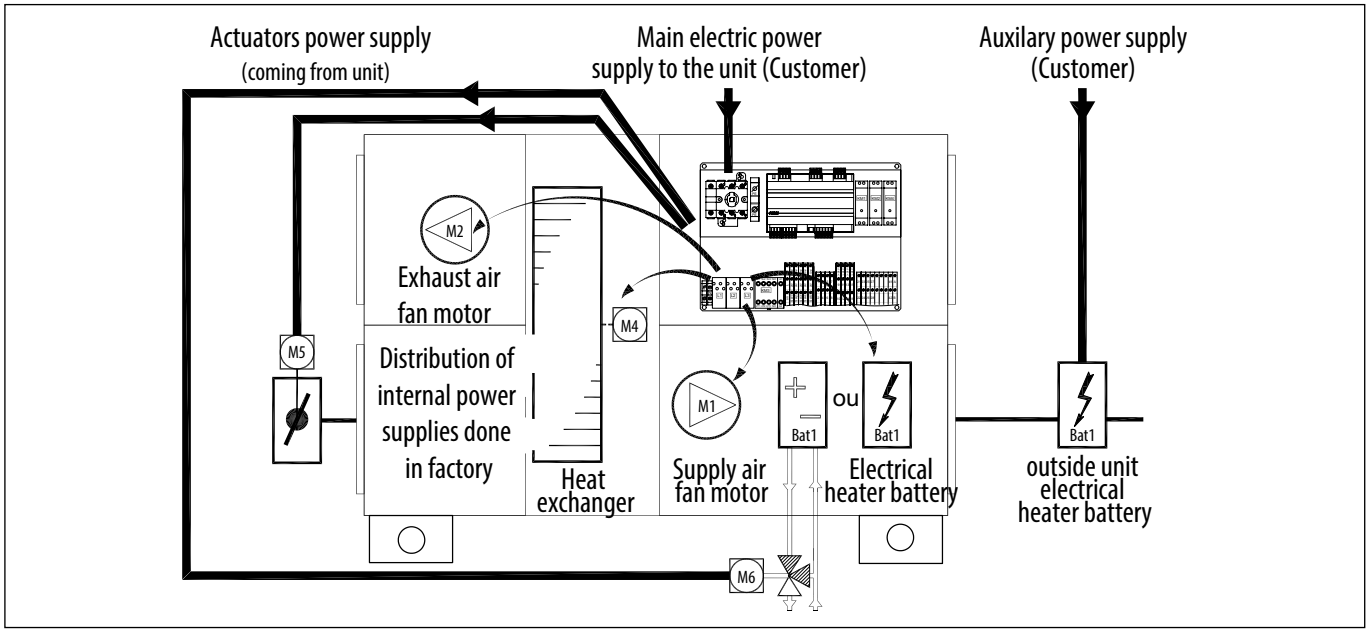
80A disconnect switch: (RHE 8000 and 10000 if electric heater) connection capacity:

- Rigid cable : 2.5 à 35 mm² max
- Flexible cable : 2.5 à 25 mm² max

(2) Wago spring cage terminal block:

- Operating tool: 3.5 mm wide flat screwdriver
- Cable:
  - Flexible wire with terminal: 2.5 mm² max
  - Rigid or flexible wire without terminal: 0.25 to 4 mm² max
- Stripping: 10 to 12 mm in length

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 mm²
- 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.

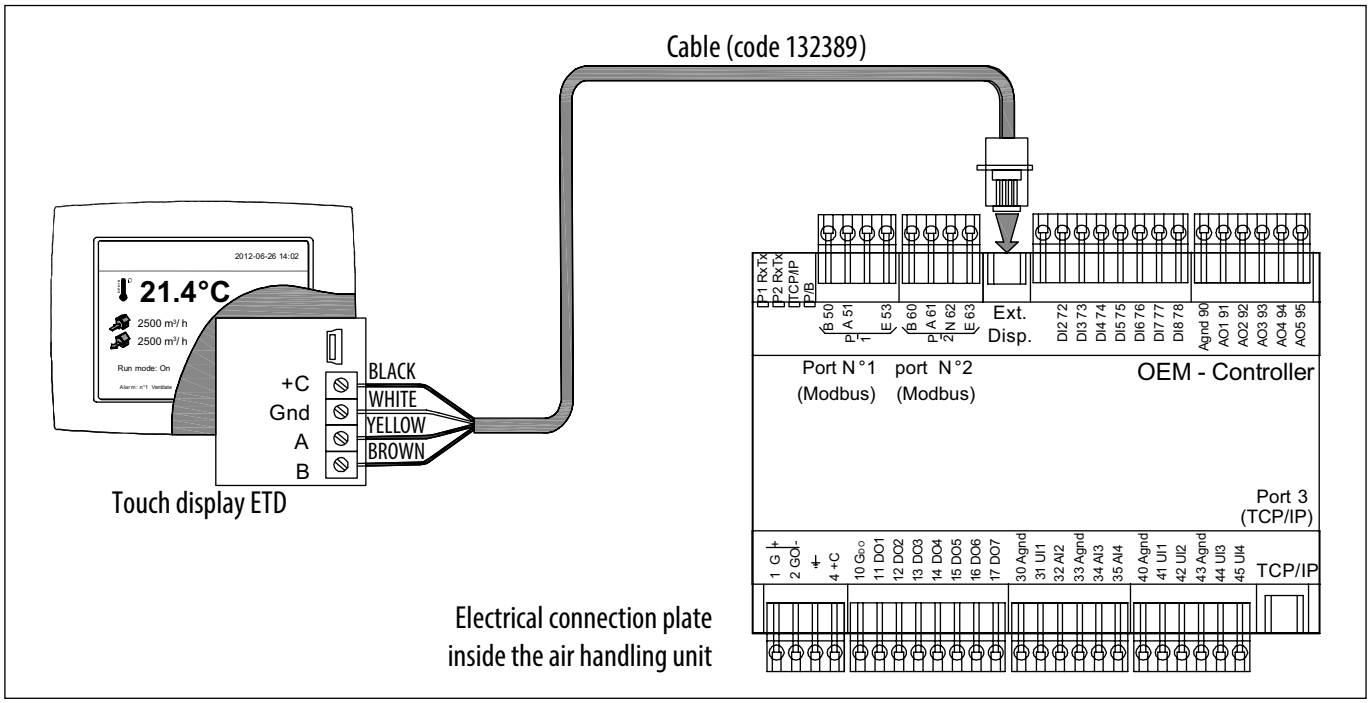
6.4 Display (ETD) control connection

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.

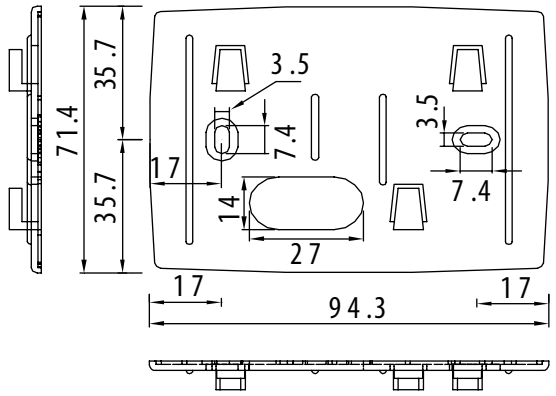
In case of an outdoor mounting of the RHE unit OI, you can also leave it inside the housing of the electrical box. Once the parameter setting is done, the remote control can be disconnected.

Electrical schematic diagram of the connection :

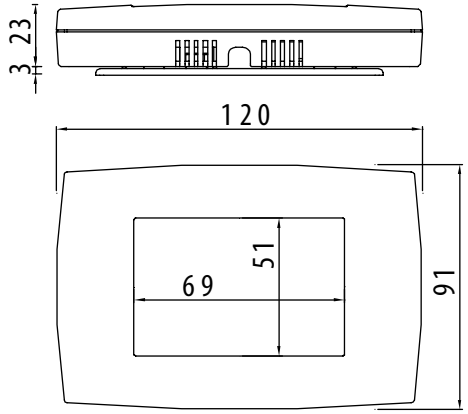


Placement of the support and the remote control :

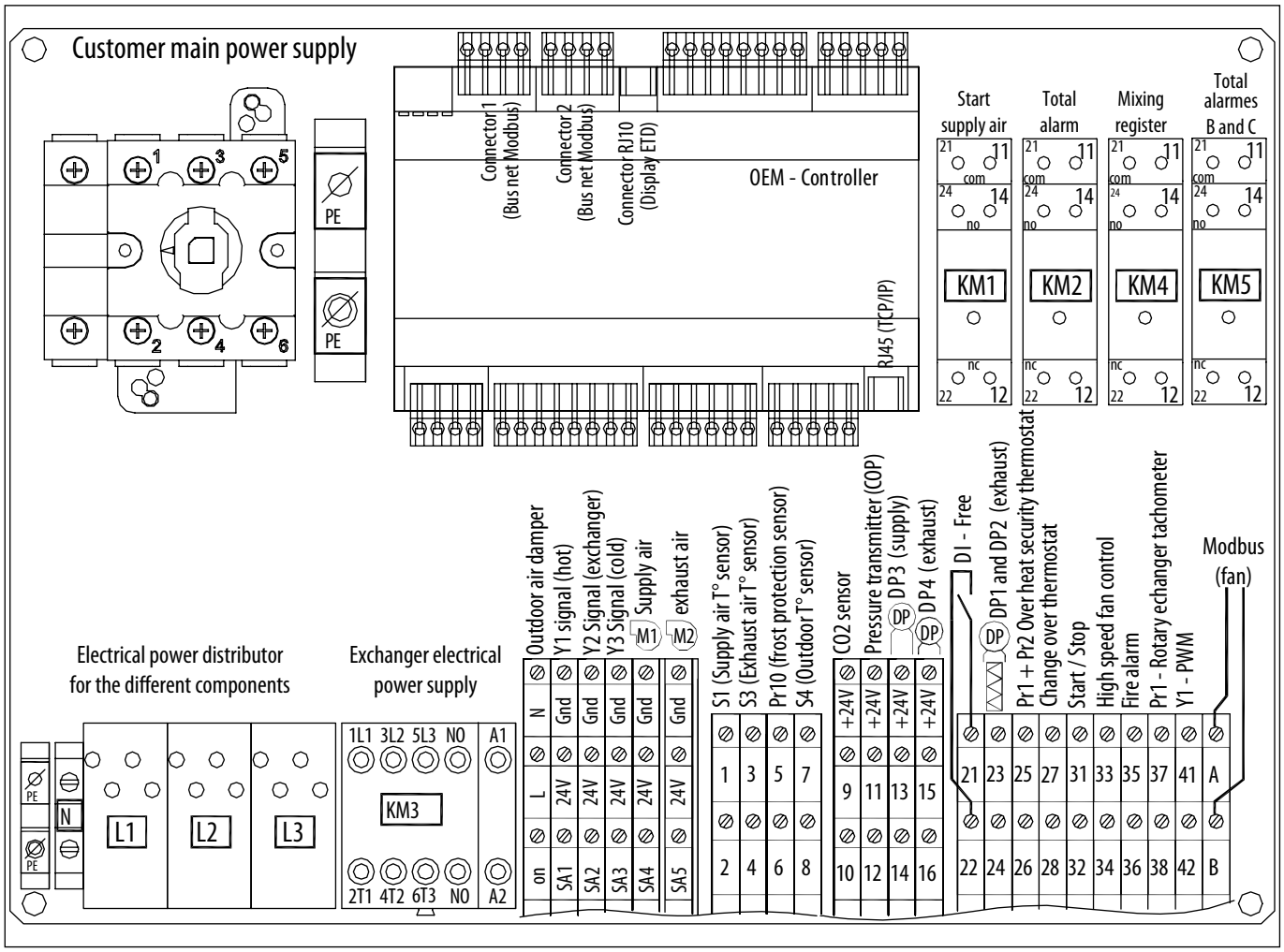
Mounting bracket



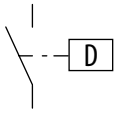
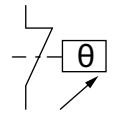
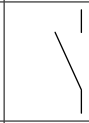
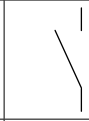
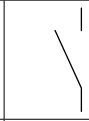
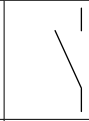
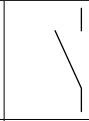
ETD remote control



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) +24V	0-10V	UI 2	DP Duct	Duct Pressure transmitter for constant pressure application (COP)
13 14 (Gnd) +24V	0-10V	UI 3	DP3 supply	Pressure transmitter for Supply airflow control
15 16 (Gnd) +24V	0-10V	UI 4	DP4 extract	Pressure transmitter for extract airflow control

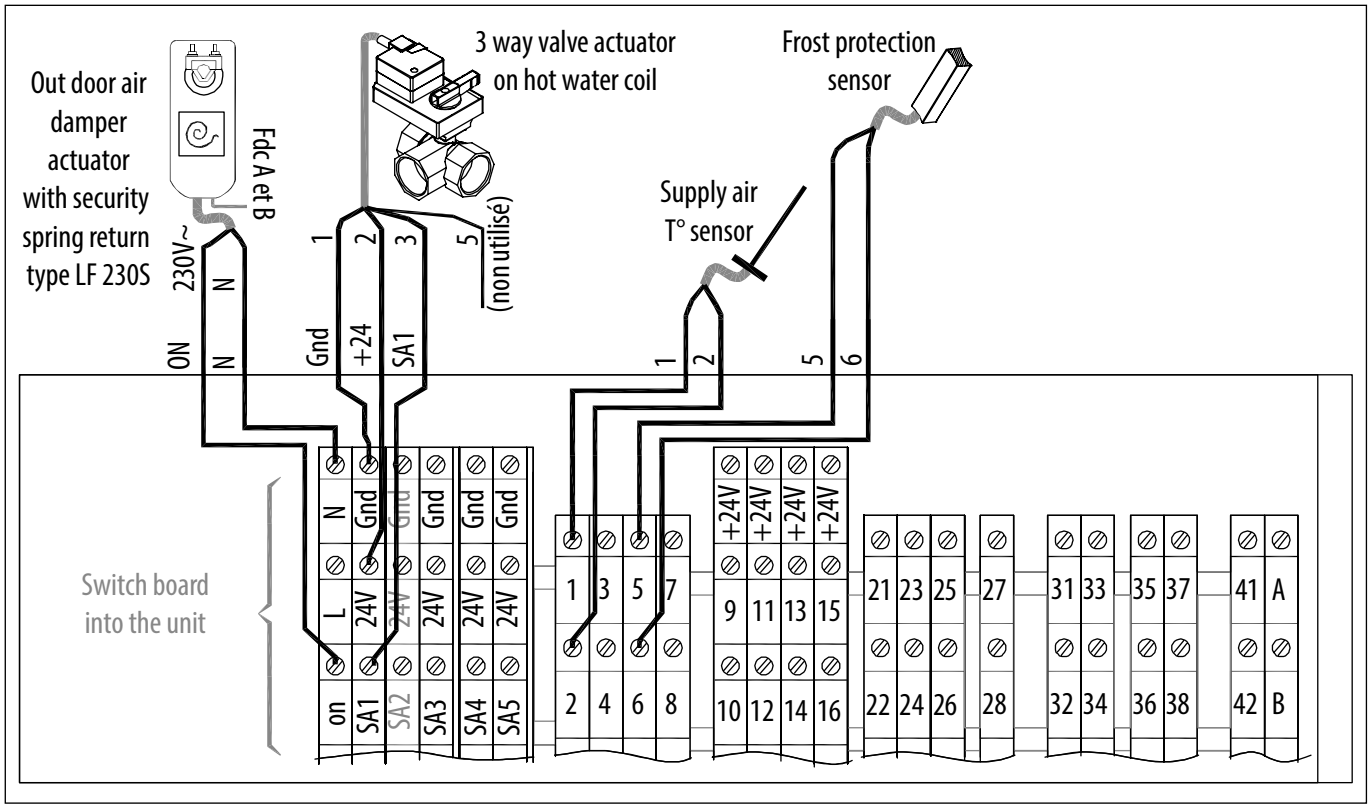
Logical Input (control and safety guard) : those input may only wire to voltage free contacts				
Switch	**Signal**	**Variable**	**Name**	**Description**
21-22		DI 1	Defrost DX Group	Reception of the signal of defrost procedure on DX group
23-24		DI 2	filter pressure guards	Monitoring of the filters 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

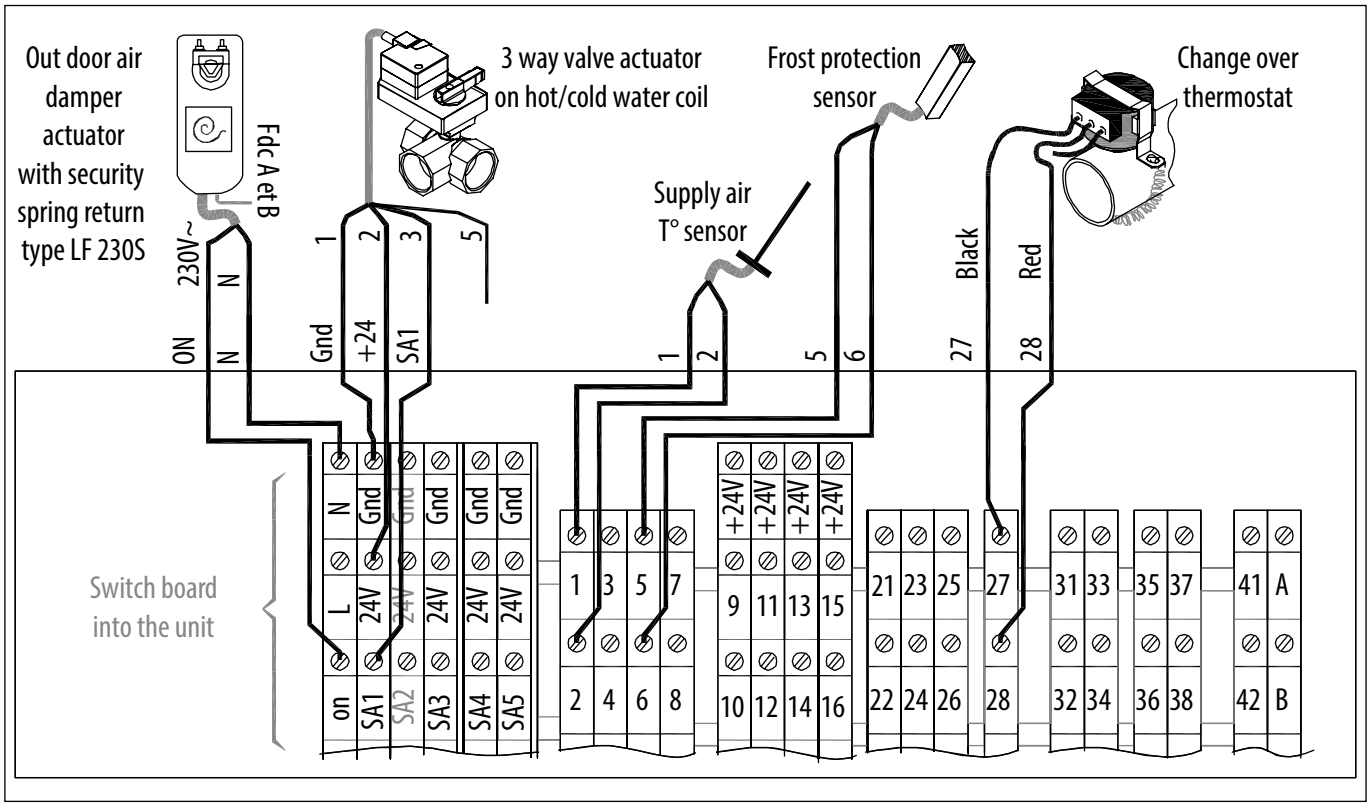
Logic output (actuator and info report) : contacts are potential free				
Switch	**Signal**	**Variable**	**Nom**	**Description**
KM1 : 12-11-14 N-L-on	11 12 | 14 ou 230V	DO1	Supply air fan	Control output for the fresh air register servo motor Available : - either for use of a 230 V register with a control 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	Total alarm	Total alarm status
KM3		DO3	Exchanger	Start control of the heat exchanger
KM4 : 12-11-14	11 12 | 14	DO4	Free cooling by night (or outdoor air damper if MIB ON-OFF - must be configure)	Status information of the fonction
KM5 : 12-11-14	11 12 | 14	DO5	Alarme B and C	Alarm B and C status
/	24VDC	DO6	Free	Logic output not assigned
41-42	24VDC	DO7	Heat	PWM control for the electric battery triac.

6.6 External components connection drawings (examples)

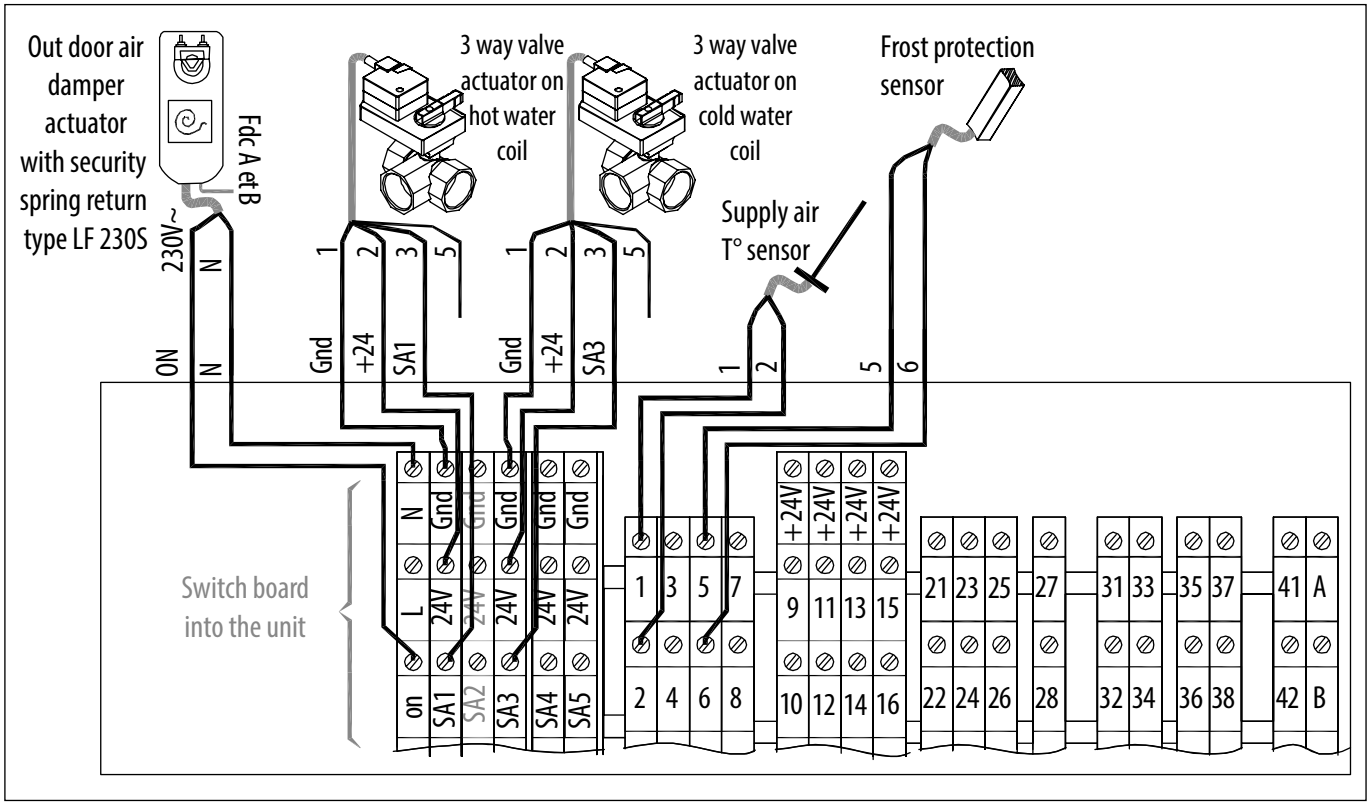
Case of a hot water coil DC (delivered mounted) + dampers (accessories)



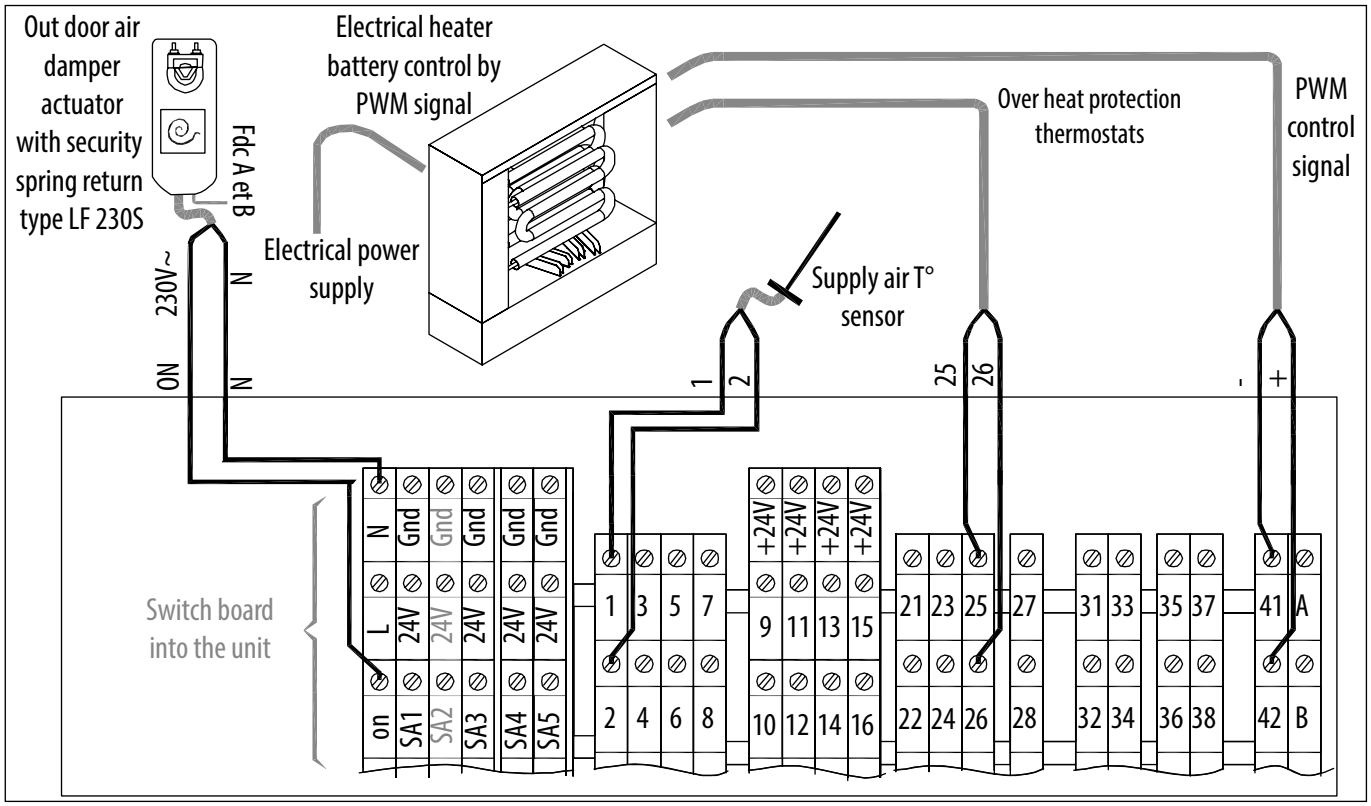
Case of a reversible water coil DFR (delivered mounted – cold or hot) + dampers (accessories)



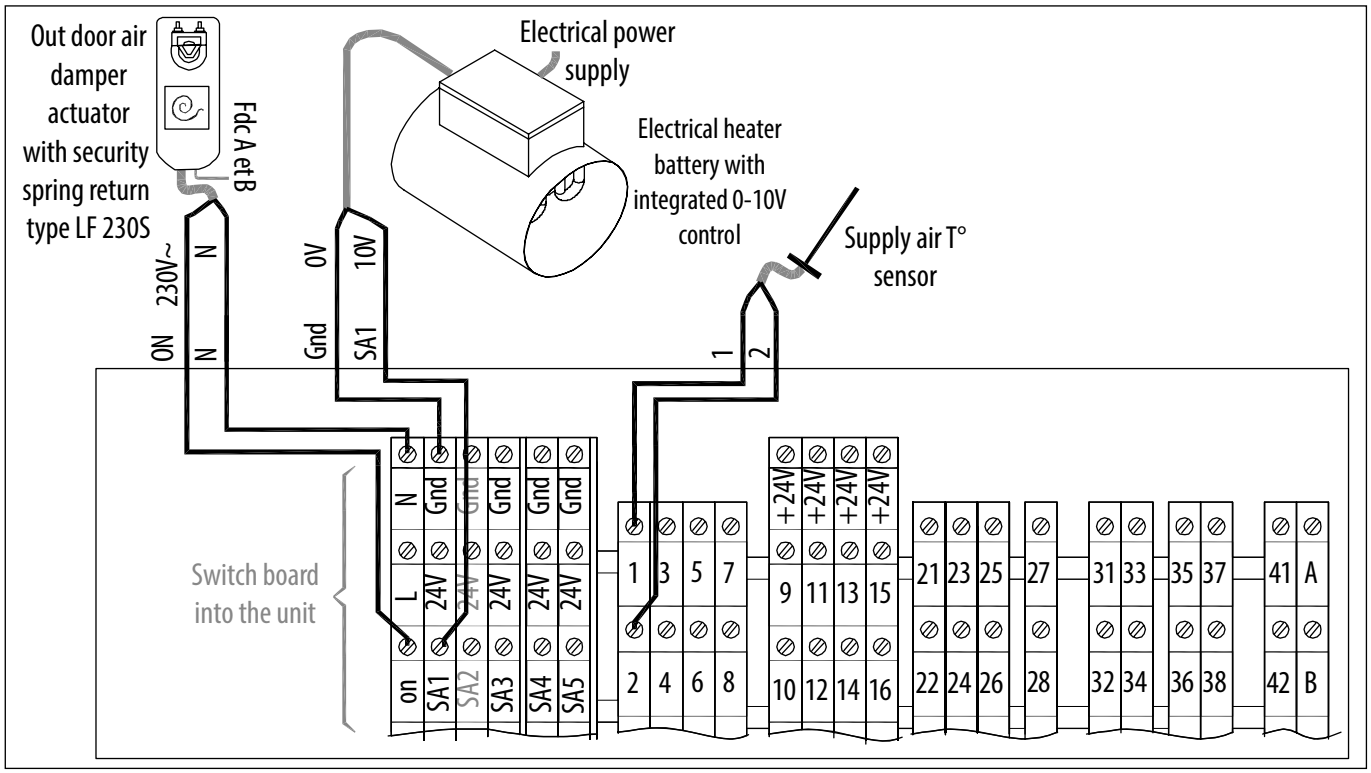
Case of two separate water coils (accessories – hot water + cold water circuit) + dampers (accessories)



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

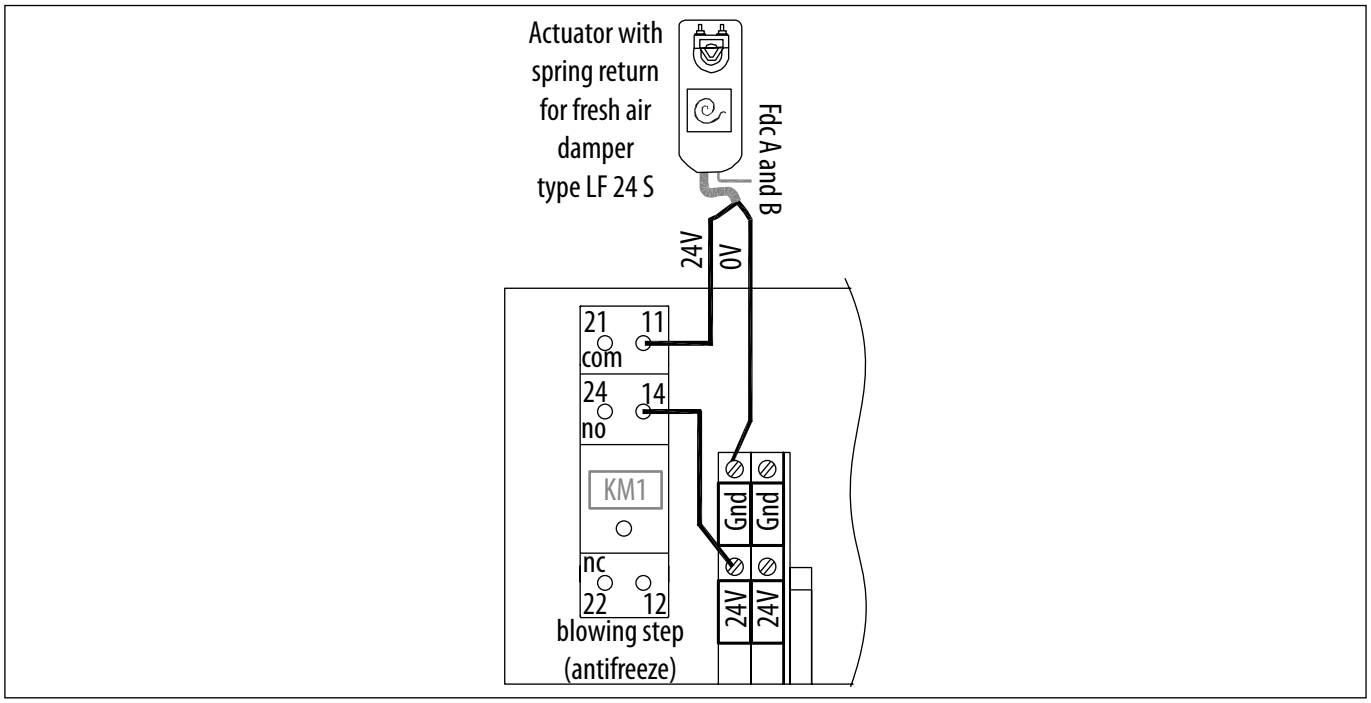


Case of a 0/10V controlled terminal electric heater (accessory) + dampers (accessories)

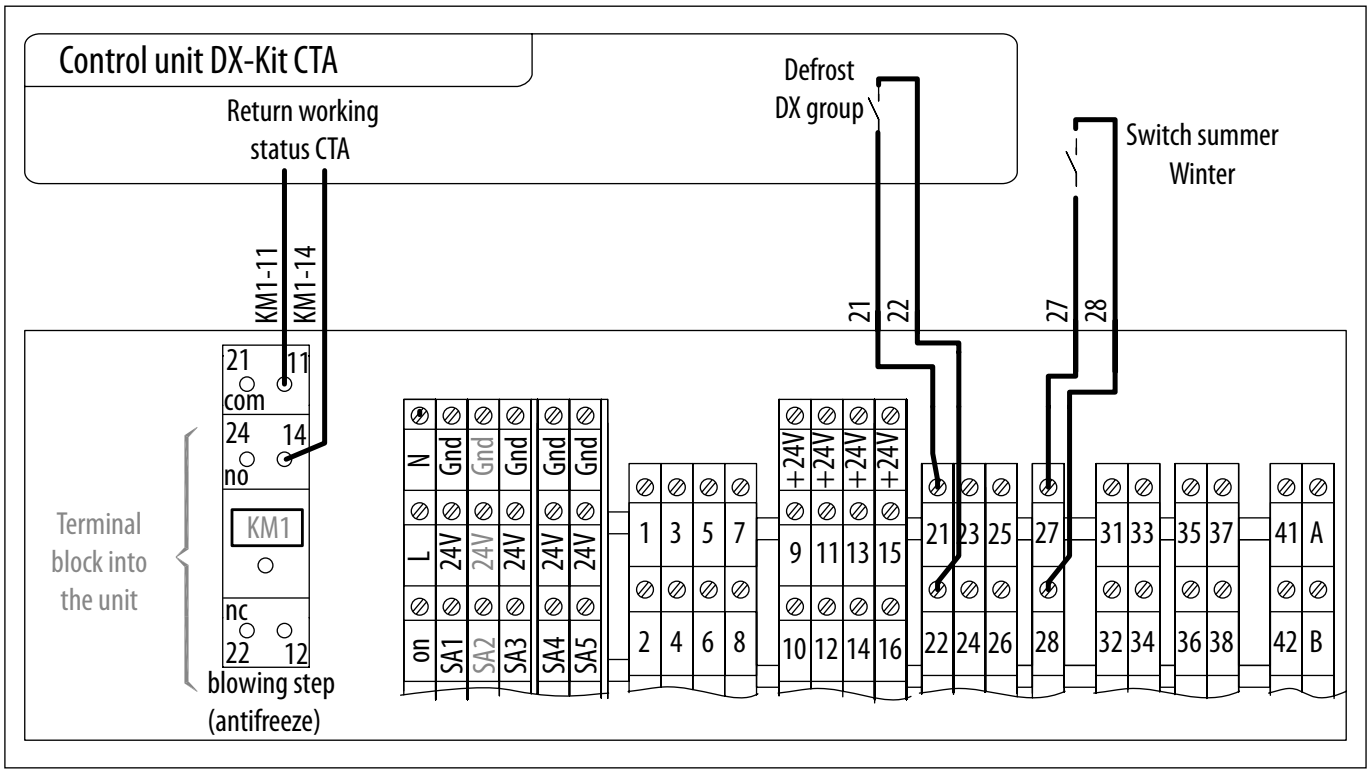


In the case of an outdoor heater, it is necessary to move the supply temperature probe.
Use a probe type TGK3 PT1000 and connect it instead of the probe integrated in the unit to the terminals 1-2.

Case of a register with 24V actuator (accessories)

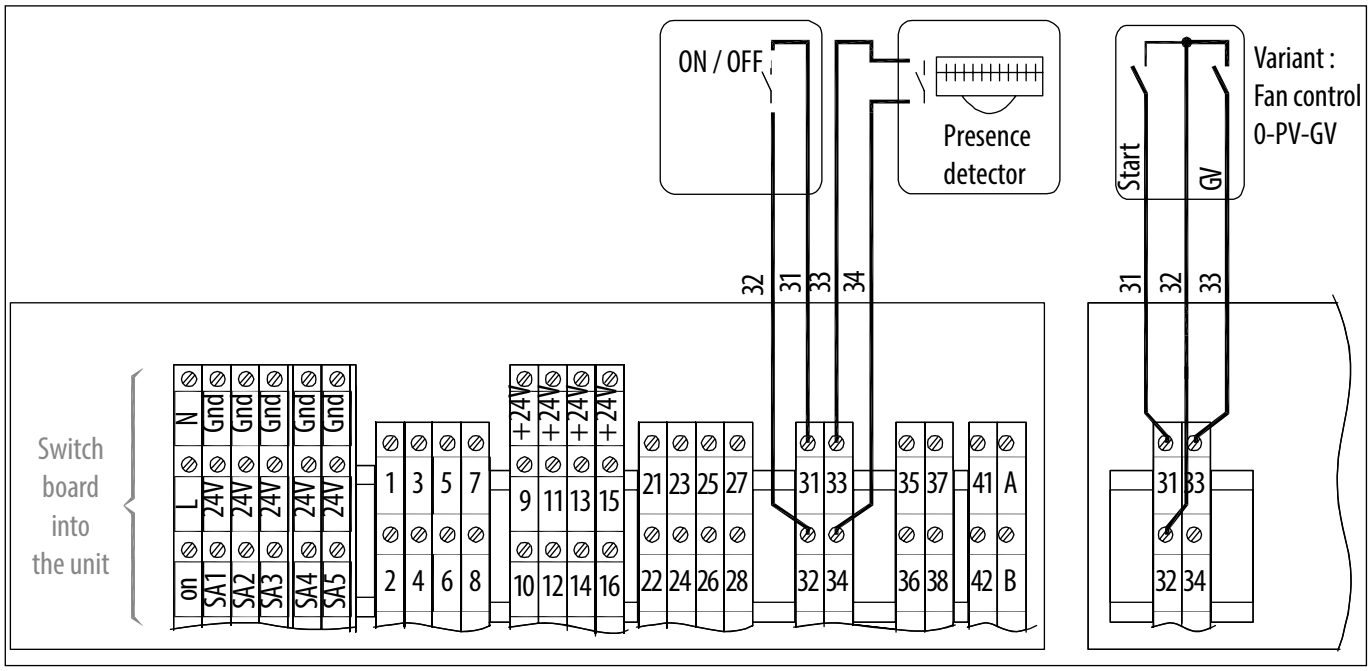


Case of DX coil with DX groupe quiped with CTA kit



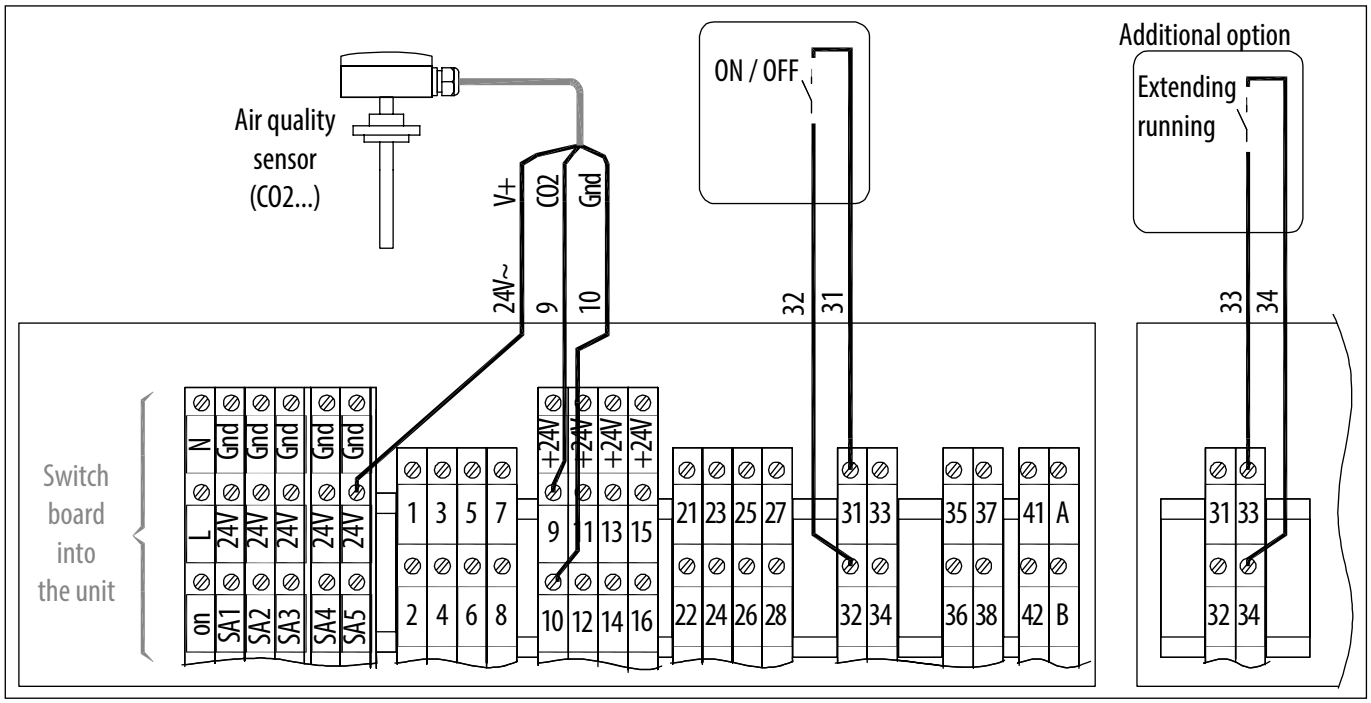
Case of operation in constant airflow (CAV) – controlled by optical sensor or box 0 / PV / GV (accessories)

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

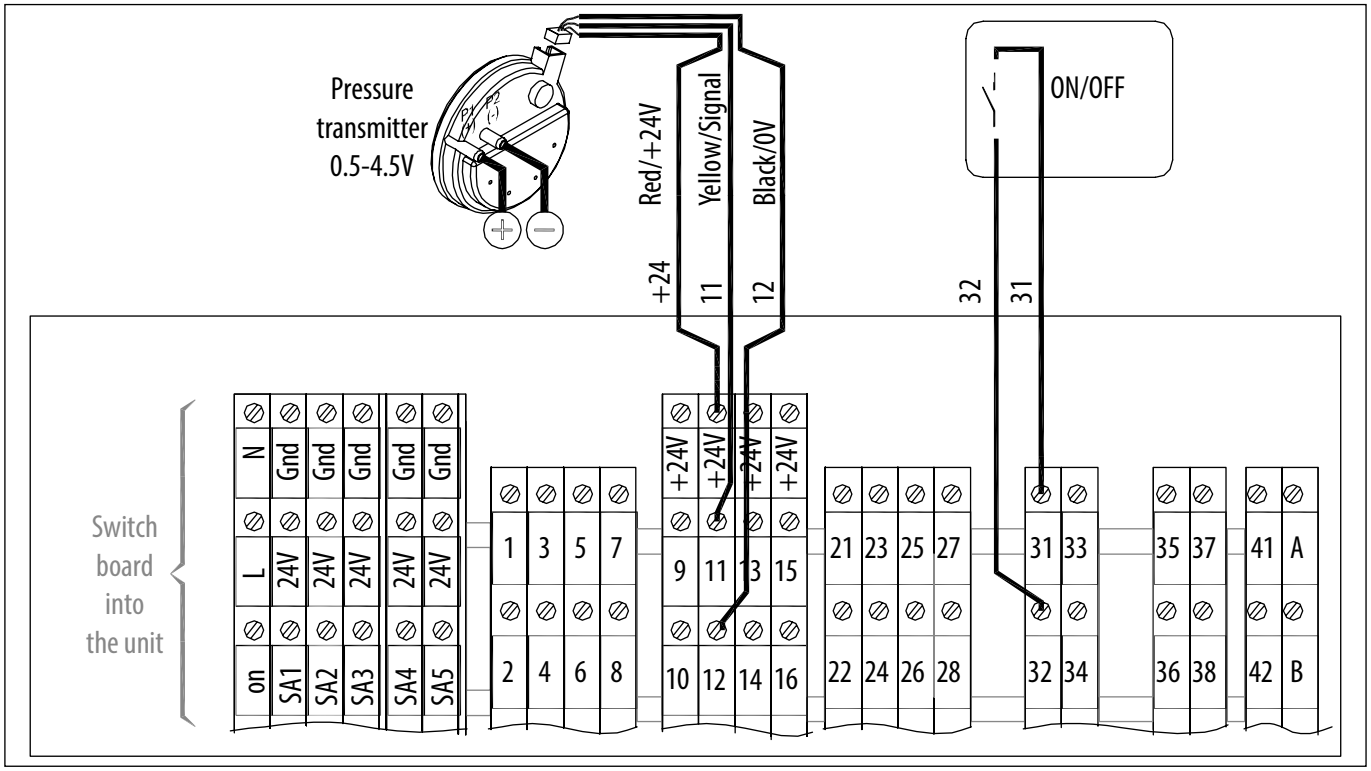


Case of operation in variable airflow (VAV) – CO2 probe (accessory)

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.



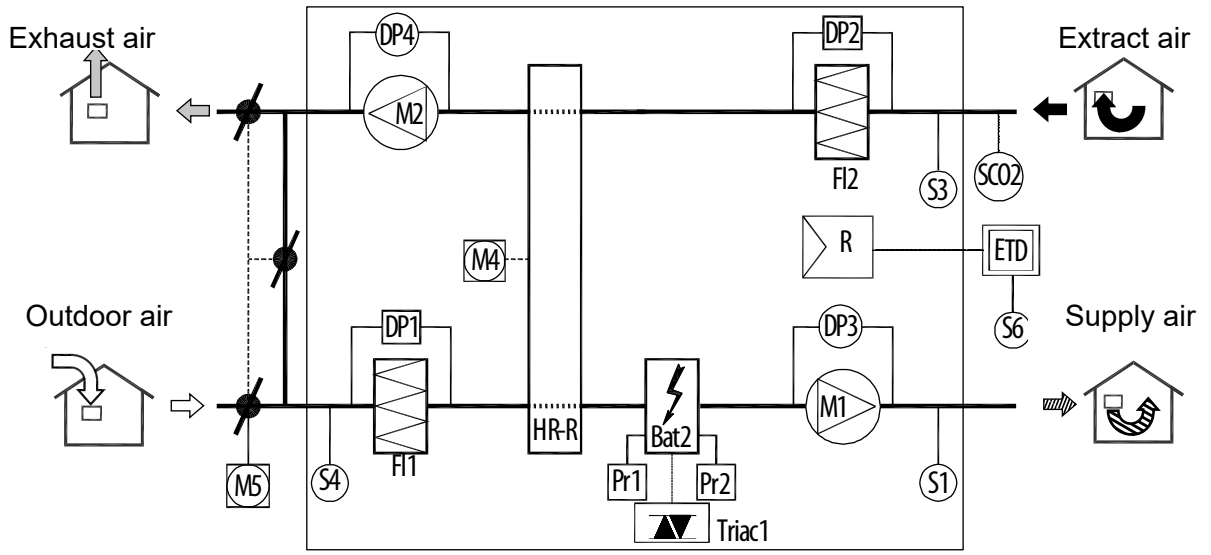
Case of operation in constant pressure (COP) – pressure probe at supply (accessory)
The unit is preprogrammed for the usage of a pressure probe with a range of 0 – 800 Pa (0-500Pa on size 700/1300) and a signal of 0.5 – 4.5 Vdc. Another probe can be used by means of an advanced parameter setting.



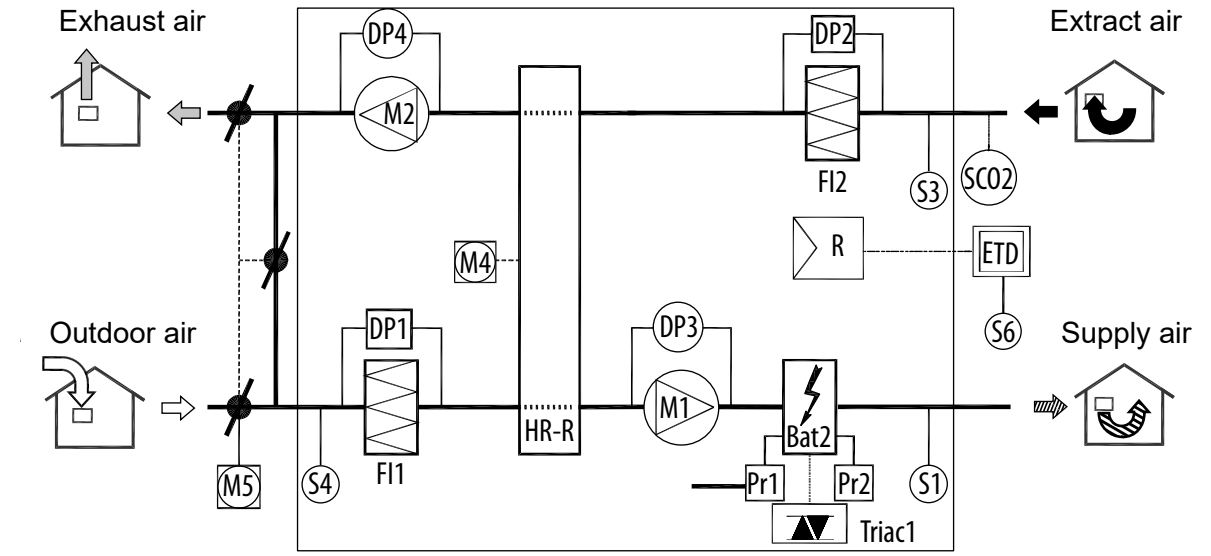
6.7 Synoptic installation diagrams (examples)

RHE D / DI

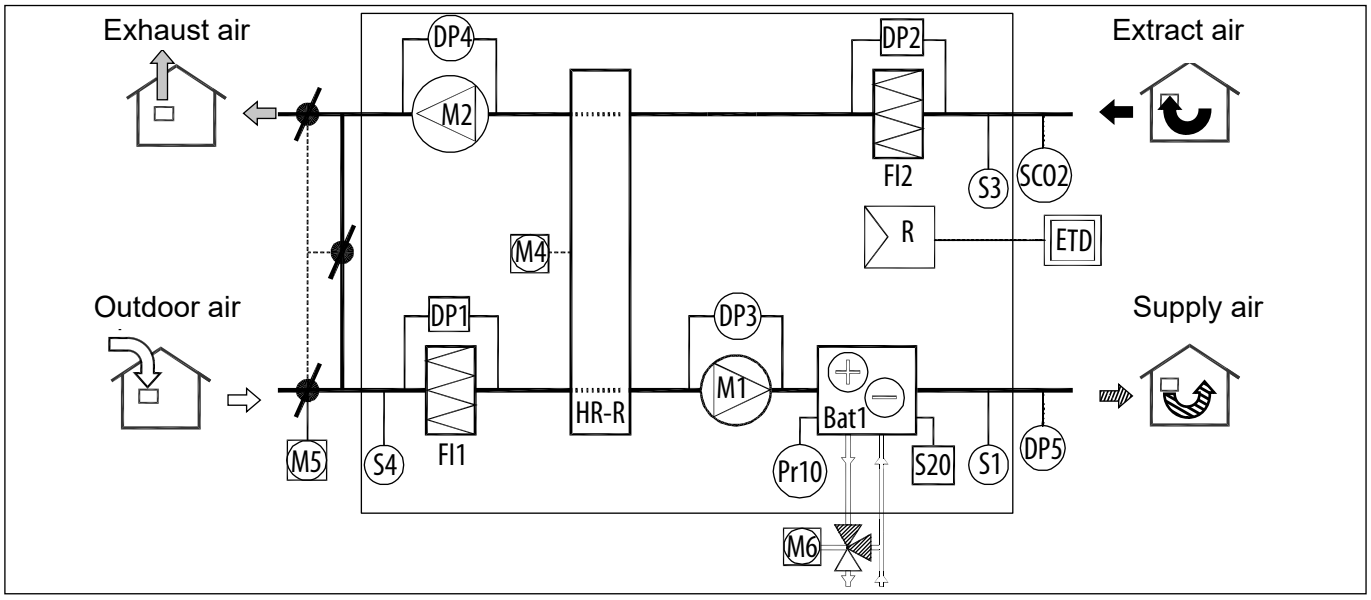
Sizes 700 to 10000



Size 15000

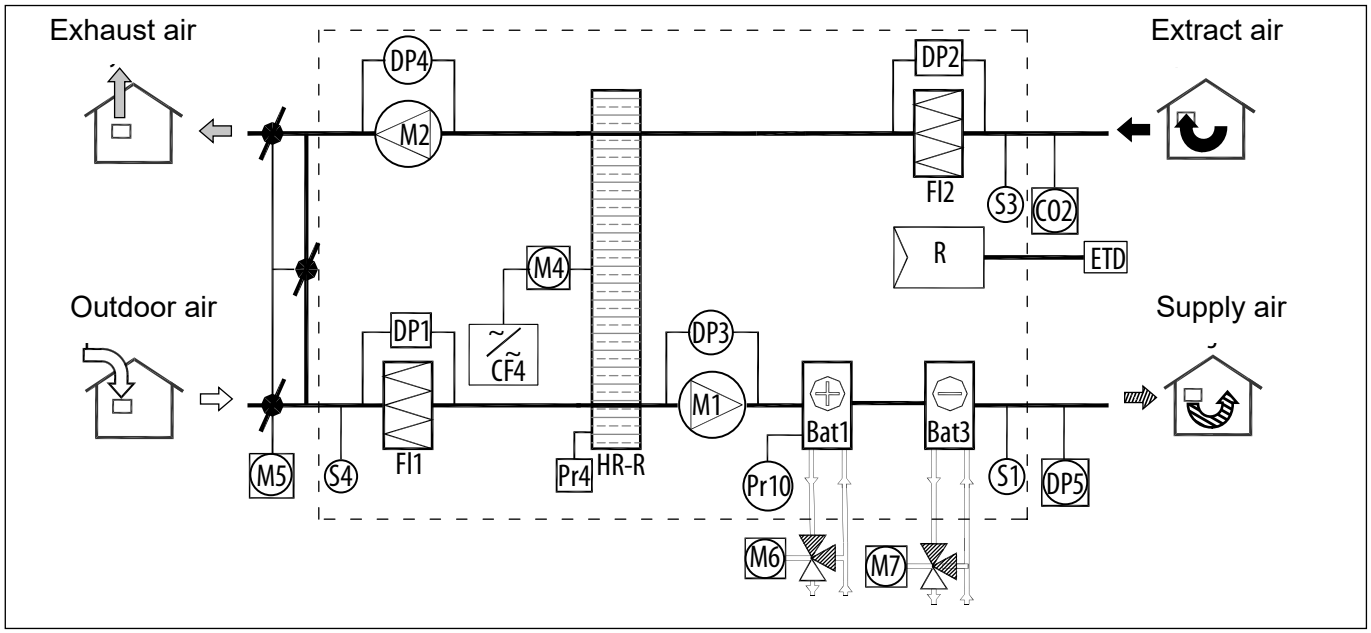


RHE DC / DFR

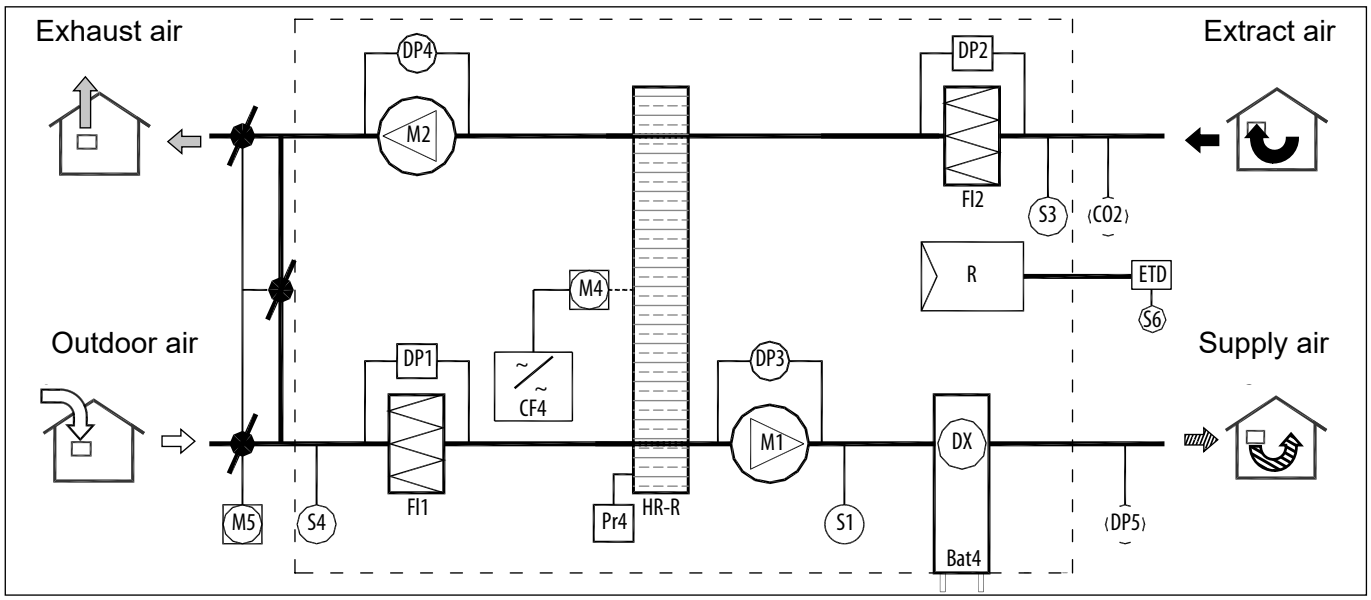


M1	Supply air fan motor	HR-R	Rotary heat exchanger	Pr1/ Pr2	Security thermostat (Manu/ Auto)
M2	Exhaust air fan motor			Pr10	Anti frost sensor
M4	Rotary exchanger motor	Fi1	Outdoor air filters	S20	Changer over Thermostat (DFR)
M5	Motorized damper	Fi2	Extract air filter	Bat 1	Water coil
M6	3 way valve actuator			Bat 2	Electrical heating resistance
		DP1	Outdoor air filter pressure guard		
S1	Supply air Tº sensor	DP2	Extract air filter pressure guard	R	Controler CORRIGO E28
S3	Extract air Tº sensor	DP3	Supply air fan pressure transmitter	ETD	Room touch screen display
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 DC / DF



RHE DX



M1	Supply air fan motor	HR-R	Rotary heat exchanger	Pr10	Anti frost sensor
M2	Exhaust air fan motor	Pr4	Tachometer (heat exchanger rotation control)	Pr1/ Pr2	Security thermostat (Manu/ Auto)
M4	Rotary exchanger motor	CF4	Inverter control on enthalpic or corption rotor	S20	Changer over Thermostat (DFR)
M5	Motorized damper				
M6	3 way valve actuator - heating accessory)	Fi1	Outdoor air filters	Bat 1	Water coil
M7	3 way valves actuator - cooling (accessory)	Fi2	Extract air filter	Bat 2	Electrical heating resistance
				Bat 3	Cold water coil DC / DF only
S1	Supply air Tº sensor	DP1	Outdoor air filter pressure guard	Bat 4	DX coil - not control by the controler
S3	Extract air Tº sensor	DP2	Extract air filter pressure guard		
S4	Outdoor Tº sensor	DP3	Supply air fan pressure transmitter	R	Controler CORRIGO E28
S6	Room Tº sensor	DP4	Exhaust air fan pressure transmitter	ETD	Room touch screen display
SCO2	Air quality sensor (optional VAV mode)	DP5	Duct pressure transmitter (optional COP 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)", page 61).
- 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 "8.14 Mesure des débits d'air - modification du coefficient K").
- Heating mode = constant supply T° (description in subsection "8.5 Temperature control", page 64).
- Heater type (description in subsection "8.1 Simplified menus / Accesses", page 57 : 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).

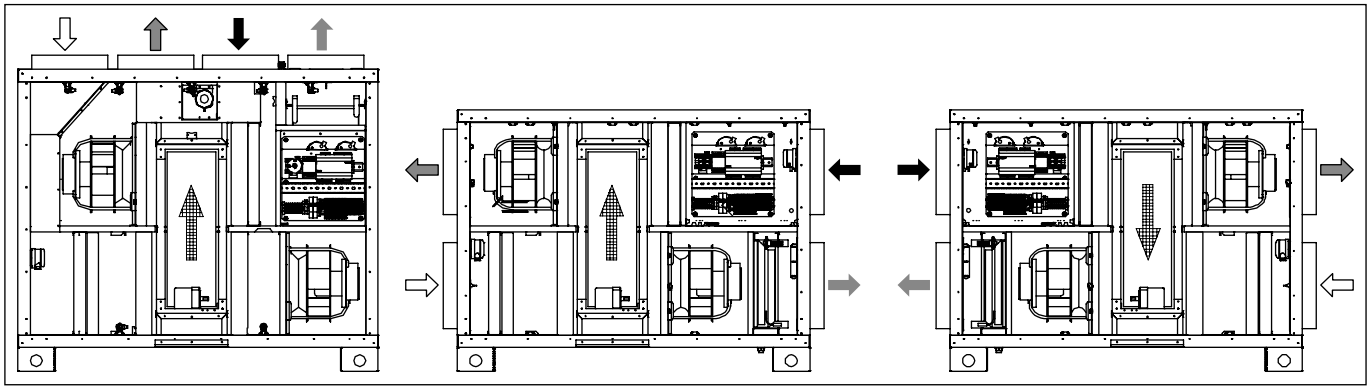
The commissioning and parameter setting of the controller must be performed by a qualified person respecting the safety instructions described in subsection "1.2 Safety instructions", page 4.

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 1900), 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

RHE CORRIGO CONTROL	D	DI	DC	DFR	DC-DF	DX
MAIN COMPONENTS						
Inyernal 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 oudoor 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	●	●	●	●	●	●
- Supply air temperature sensor	●	●	●	●	●	● (4)
- Frost protection sensor on water coil (DC - DFR - DC / DF)			●	●	●	
- "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 fex seconds)	●	●	●	●	●	●
Outdoor air damper actuator control (damper in option)	●	●	●	●	●	●
Internal electric resistance control :						
- Proportional control (PWM) for the electric battery triac		●				
Internal water coil control :						
- Proportional 0-10V control of 3 way valve actuator (3 way valve actuator in option)			○	○	○	
- Power control of the 3 way valve actuator			●	●	●	
External water coil control :						
- Proportional 0-10V control 3 way valve actuator (3 way 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	●	●	●	●	●	●
Communication :						
- MODBUS RTU as standard configuration (RS485) ou MODBUS IP on TCP-IP port	●	●	●	●	●	●
- BACNET IP on TCP/IP port	●	●	●	●	●	●
- Webserver application on TCP/IP port	●	●	●	●	●	●

● Inclued, ○ Optional

(1) cold / hot water coil, (2) cold water coil, (3) hot water coil, (4) Temperature probe install after the heat exchanger and before the DX coil.

Temperature control loop

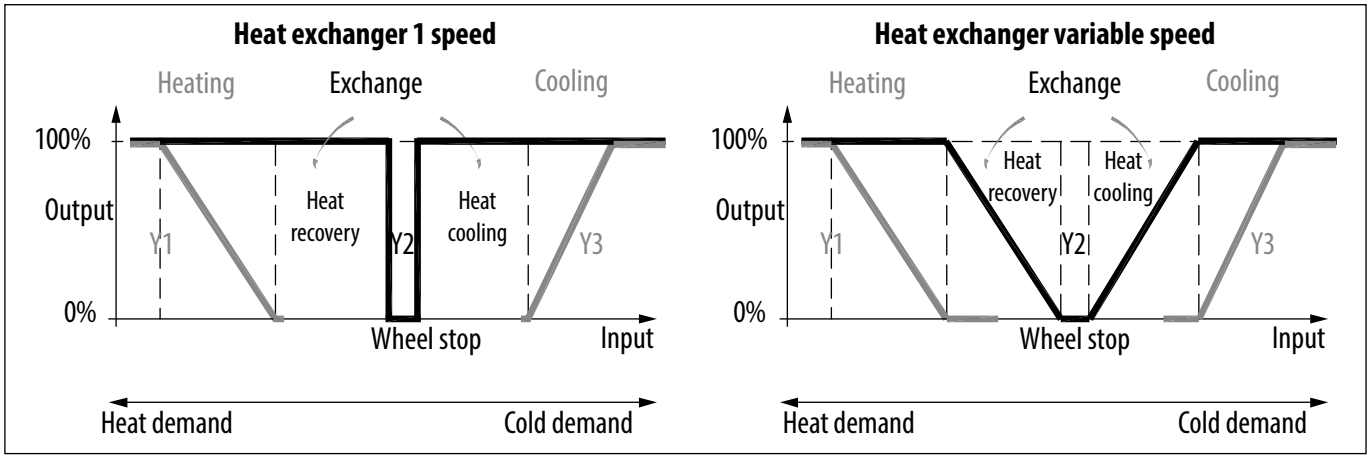
The temperature set point and the heating/cooling mode (supply air temperature control, room temperature control, outdoor temperature compensated supply air control) are entering with the touch display.

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 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.

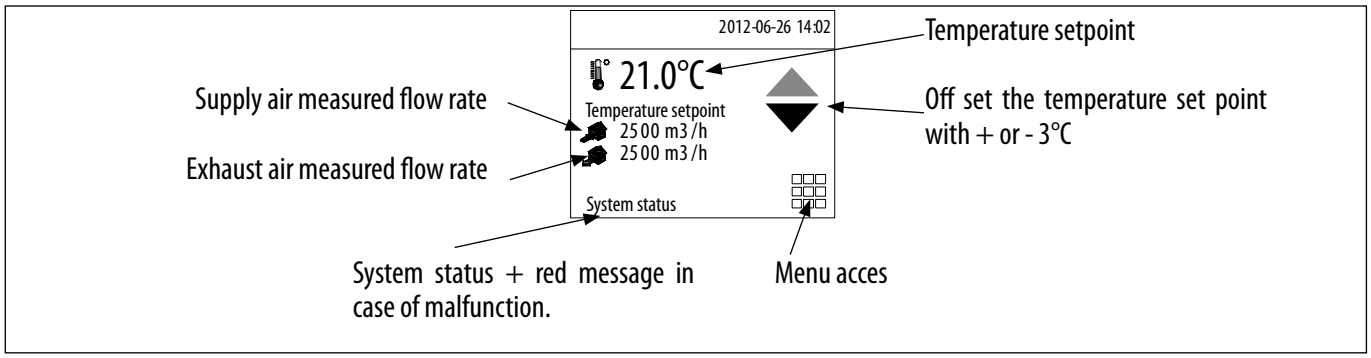
Original conditions	Exchanger		Variable speed rotary heat exchanger		Heating coil
	Rotary heat exchanger	Condition after the heat exchanger	Rotary heat exchanger	Condition after the heat exchanger	
Outdoor air T° < Setpoint T° **Outdoor air T° < exhaust air T**	ON	Supply air T° < Setpoint T°	Speed variation 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 :

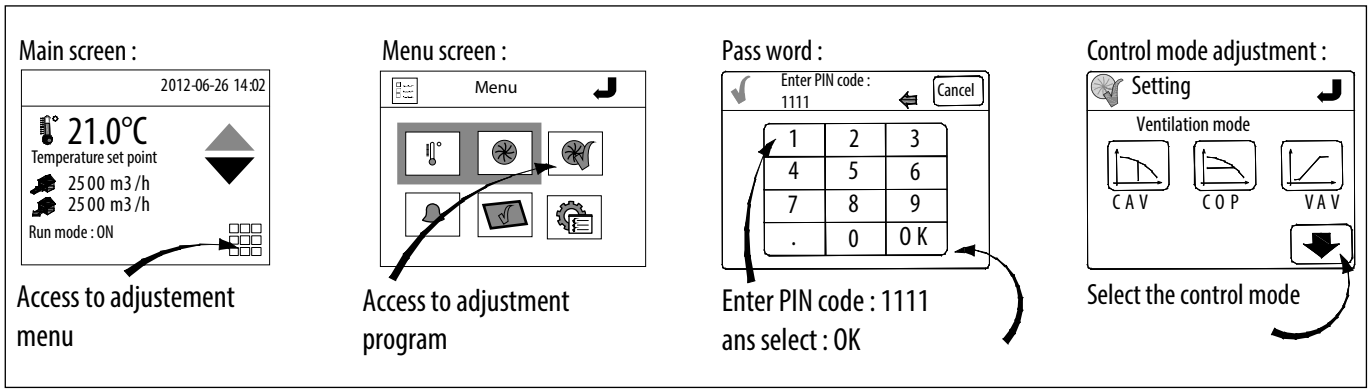
- User level (no password) – Access to the start/stop – auto or LS/HS functions and increase of the set point temperature (+/- 3°C).
- Operator level (password) – Access in read and write to adjustments and parameters, but no access to the system configuration.
- Master level (password) - Access in read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

First screen of the display integrate few informations:



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

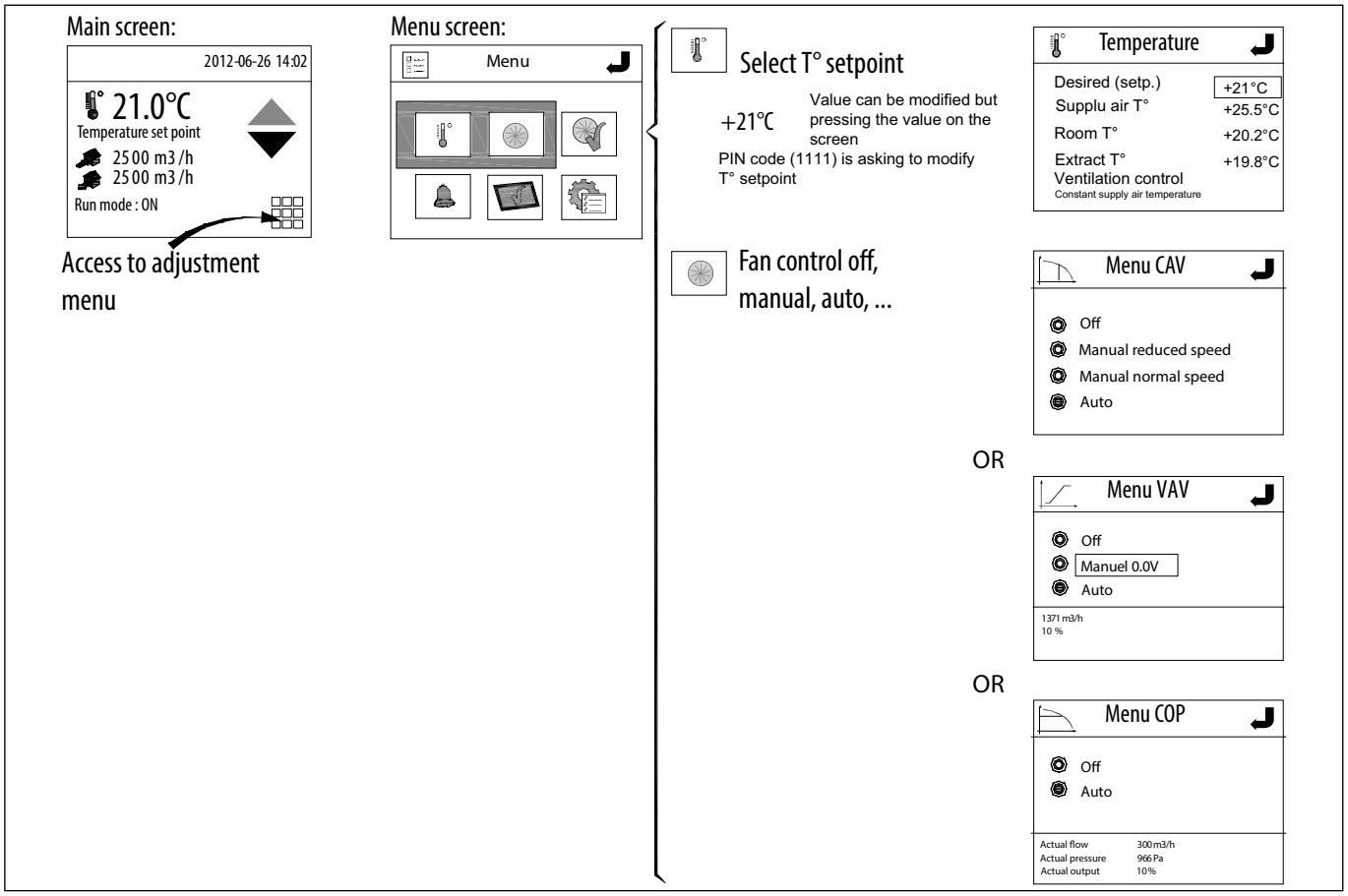
- **CAV : Operation at constant airflow**
- **VAV : Operation at variable speed**
- **COP : Operation at constant pressure**



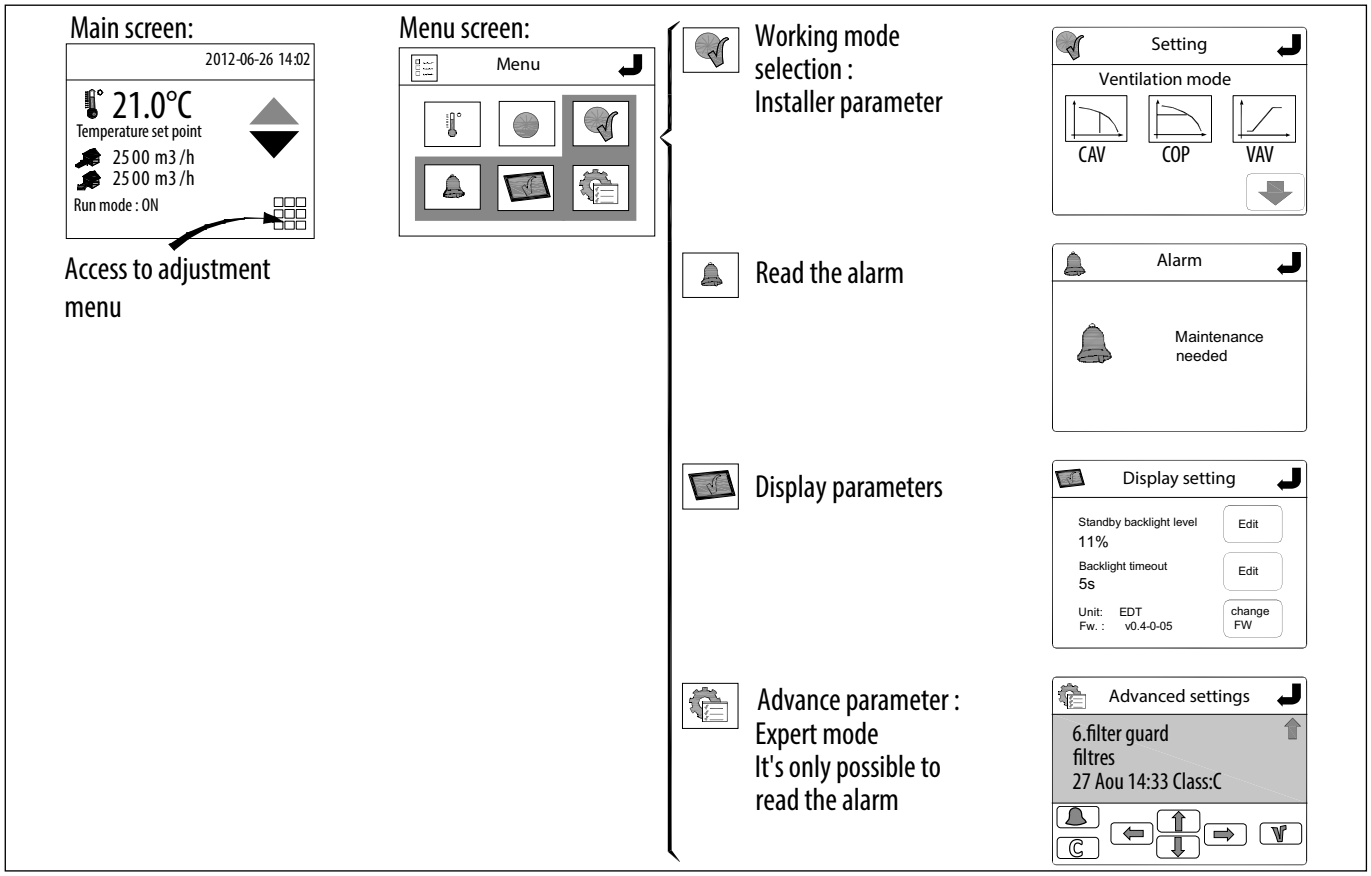
User level :

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 :

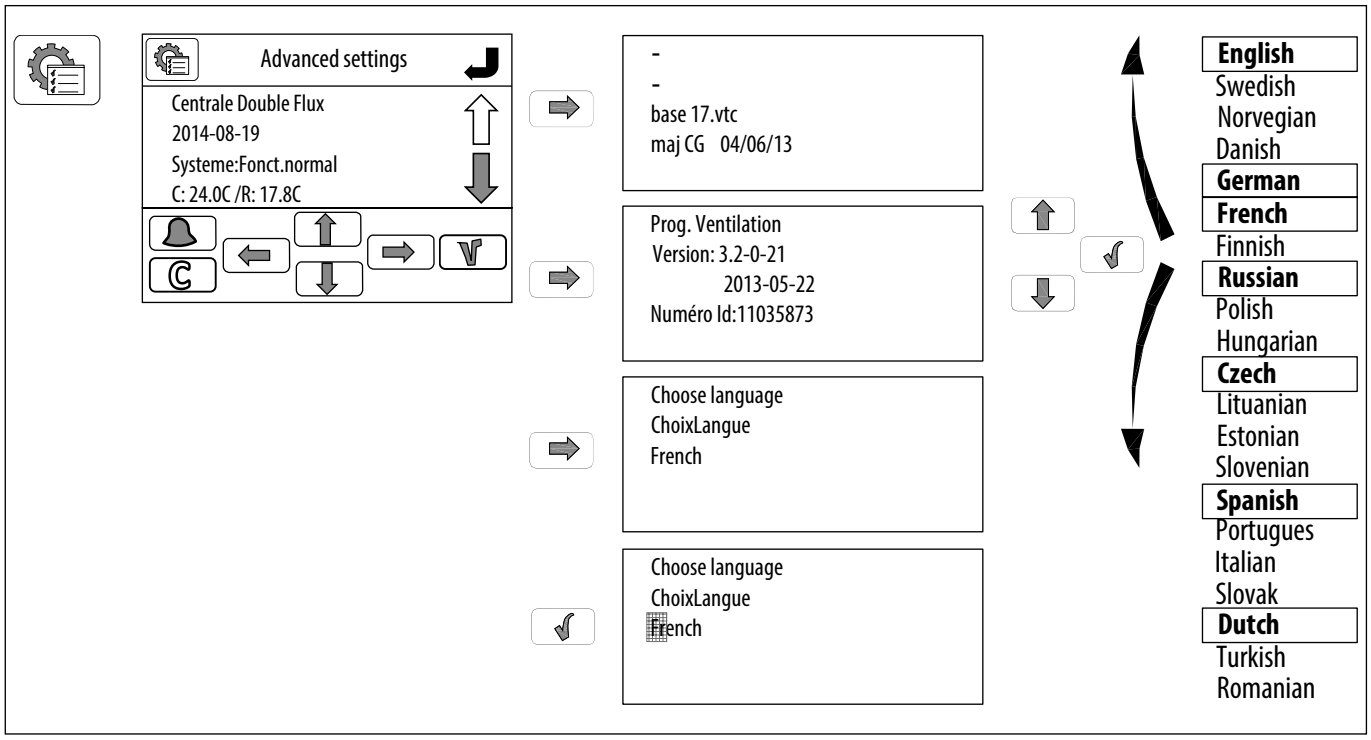


Installer level :
To set the operation parameters of the unit, fan, heater, console, fault read, etc.

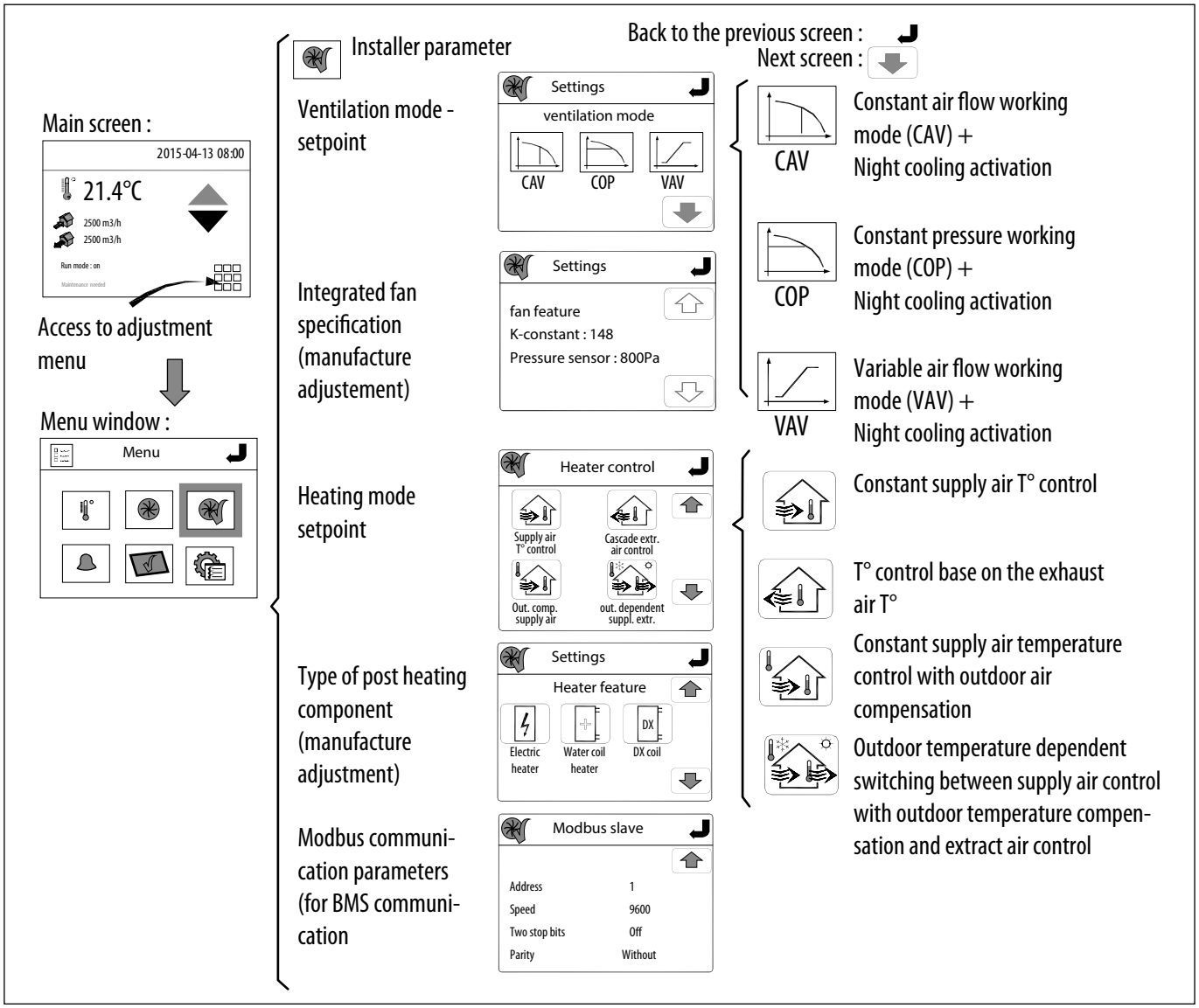


Change the display language

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

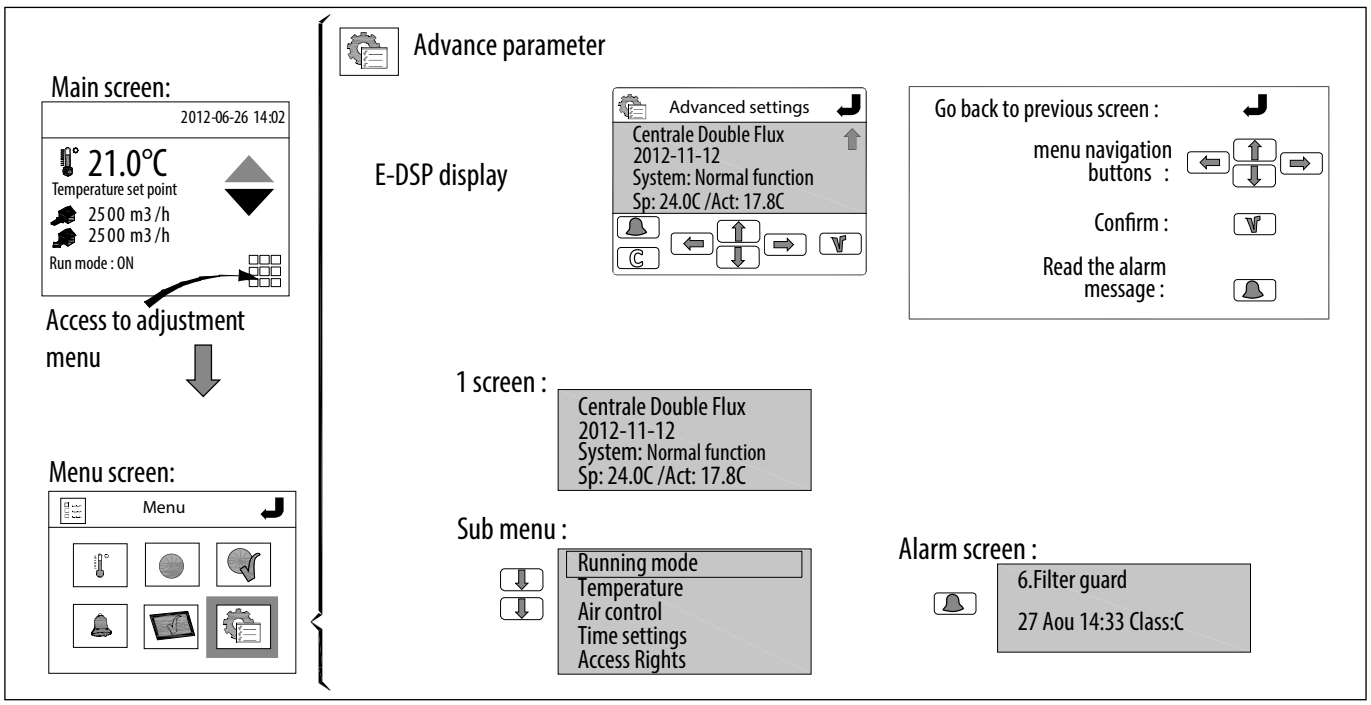


Operation mode :
Unit commissioning

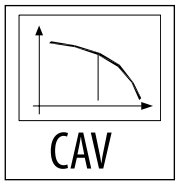


Advanced parameter setting: expert mode :

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



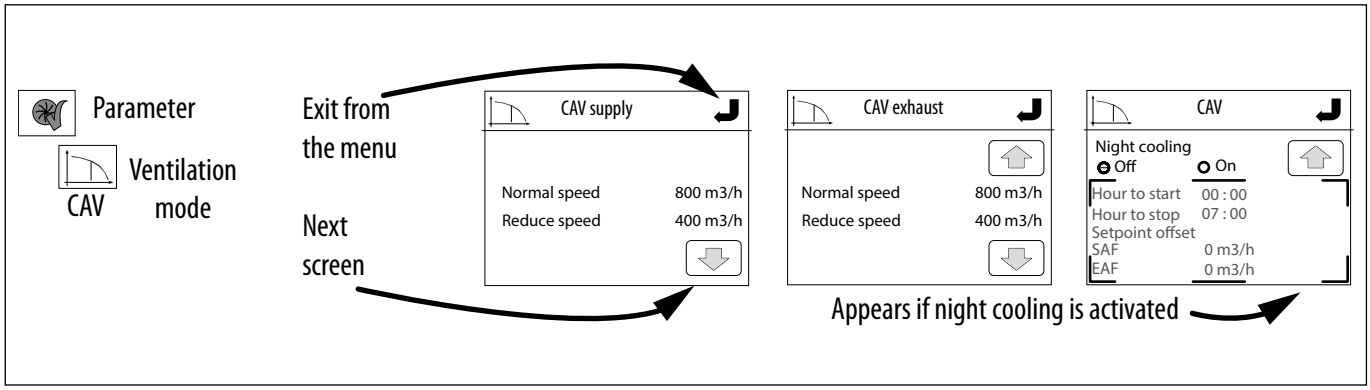
8.2 Constant airflow operation (CAV)



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.

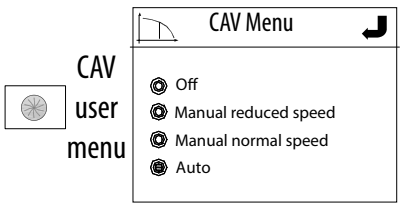
Functional parameter setting on ETD display
Access to the simplified parameter setting menu (via the password 1111) allows :

- The selection of Low Speed and High Speed airflows of each fan.
- The enable/disable of night-cooling ventilation, with the start and end times, as well as than the flow offset values to be taken into account during operation with over-ventilation.

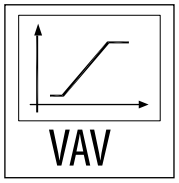


The selection of this mode in this installer menu automatically configures the screen of the user menu. The user can then change the unit's operation without touching the settings.

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

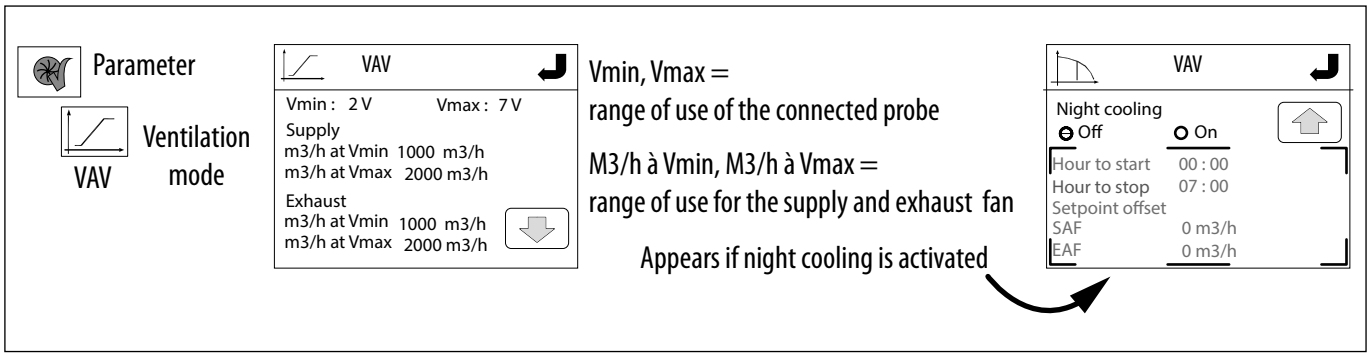
8.3 Variable airflow operation (VAV)

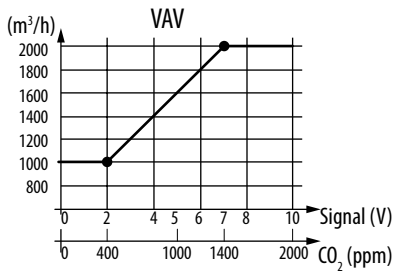


Mode recommended in single area configuration for variable airflow applications depending on a signal type 0-10v.
The airflow set point value depends on a signal 0-10 V coming from an outdoor probe (CO2, temperature, relative humidity, etc.) or a manual percentage. The ratio between the airflows is entered 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.
- The activation / deactivation of the night cooling, with the start and end times, as well as than the flow offset values to be taken into account during operation with night cooling ventilation.



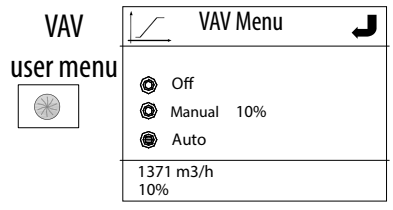


Usage example :
Connection of a probe SCO2 of a measurement range 0-2000ppm (0-10V)
To use the range 400-1400ppm, select Vmin=2V and Vmax=7V
By repeating the example now with airflows which must evolve from 1000 to 2000 m³/h, we get the curve.

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

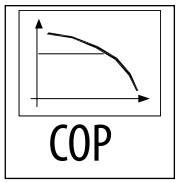


Stop, Manual x% = Manual setting of the airflow = flow at Vmim+ x% [flow at Vmax - flow at Vmin].

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

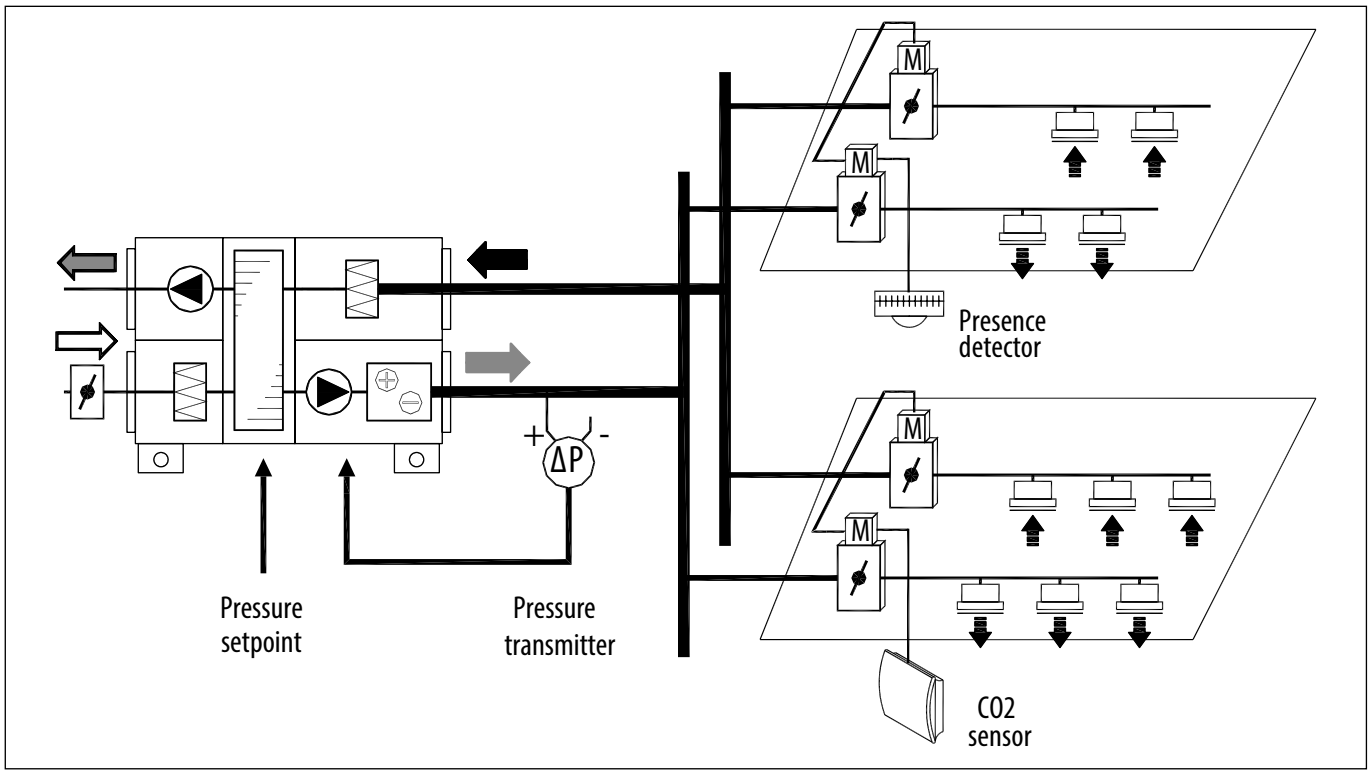
Note : an action by the terminals 31-32 / 33-34 has priority.

8.4 Constant pressure operation (COP)



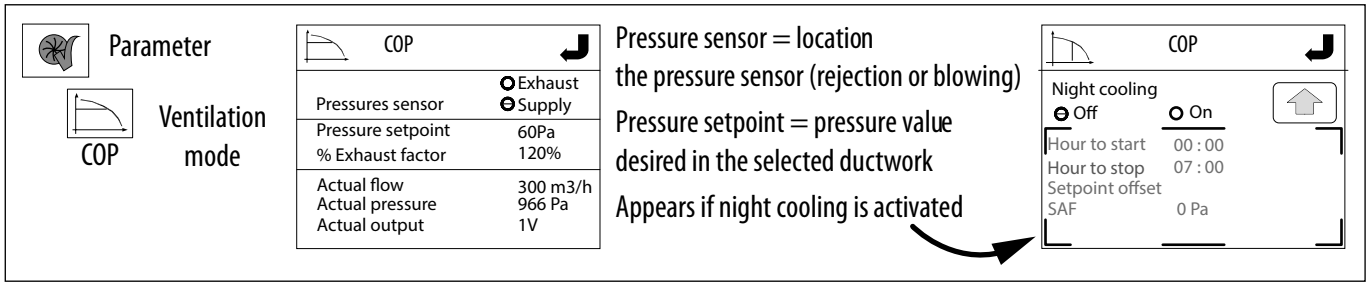
Mode recommended in a multi-area configuration for variable airflow applications with several modulation systems of the airflows installed at the network level.

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.

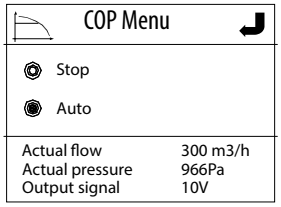
Functional parameter setting on ETD display



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.

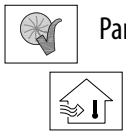
On size 15000, after the configuration COP operation, it is necessary to configure the type of duct transmitter which is different from the one installed on the fans (see "8.14 Mesure des débits d'air - modification du coefficient K", page 73.

Setting for the usage on ETD display

COP Use  	Stop = used by a manual action (via console) To switch off the unit by user. 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.

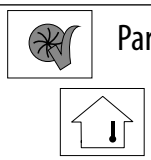
8.5 Temperature control

8.5.1 Constant supply air temperature maintenance

	The temperature control is driven from the comparison between the supplyair temperature and the set point value parameterized via the console.

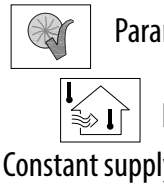
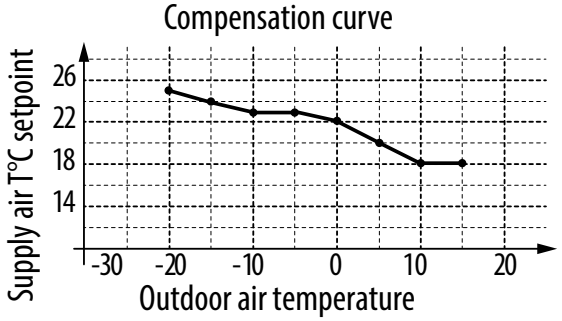
From the main screen the user can override by +/- 3°C this initial set point.

8.5.2 Constant exhaust air temperature control

	The supply air is controlled as part of a cascade controller together with the extract temperature controller. The extract temperature offset will dictate the supply air temperature setpoint. The controler will try keep the exhaust air temperature at the T° setting, playing with the supply air T° confortable range (12°C to 30°C)

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

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.

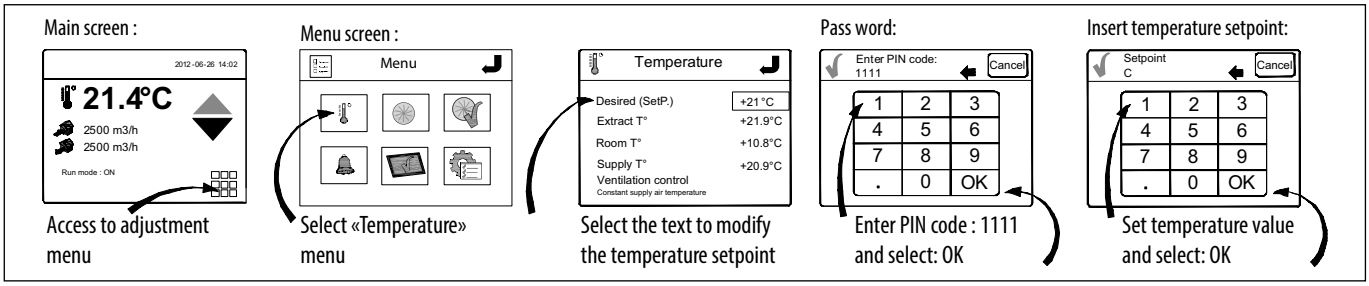
Other working mode available with the expert menu. For more information, please contact our after sale service.

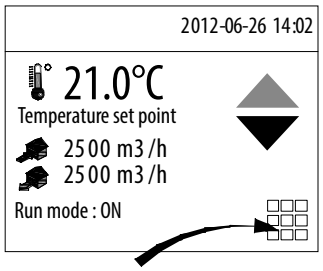
8.5.4 Winter / summer temperature control

Parameter Régulation Winter / summer	Outdoor temperature dependent switching between supply air control with outdoor temperature compensation and extract air T° control. • When outdoor air temperature is lower than 13°C(winter), heating mode is base on Constant supply air T°C with outdoor T°C compensation • When the outdoor air is higher than 13° (summer), heating mode is base on Constant exhaust air temperature control. The switch temperature of 13°C could be modify.

8.5.5 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 Temperature control with direct expansion coil unit DX

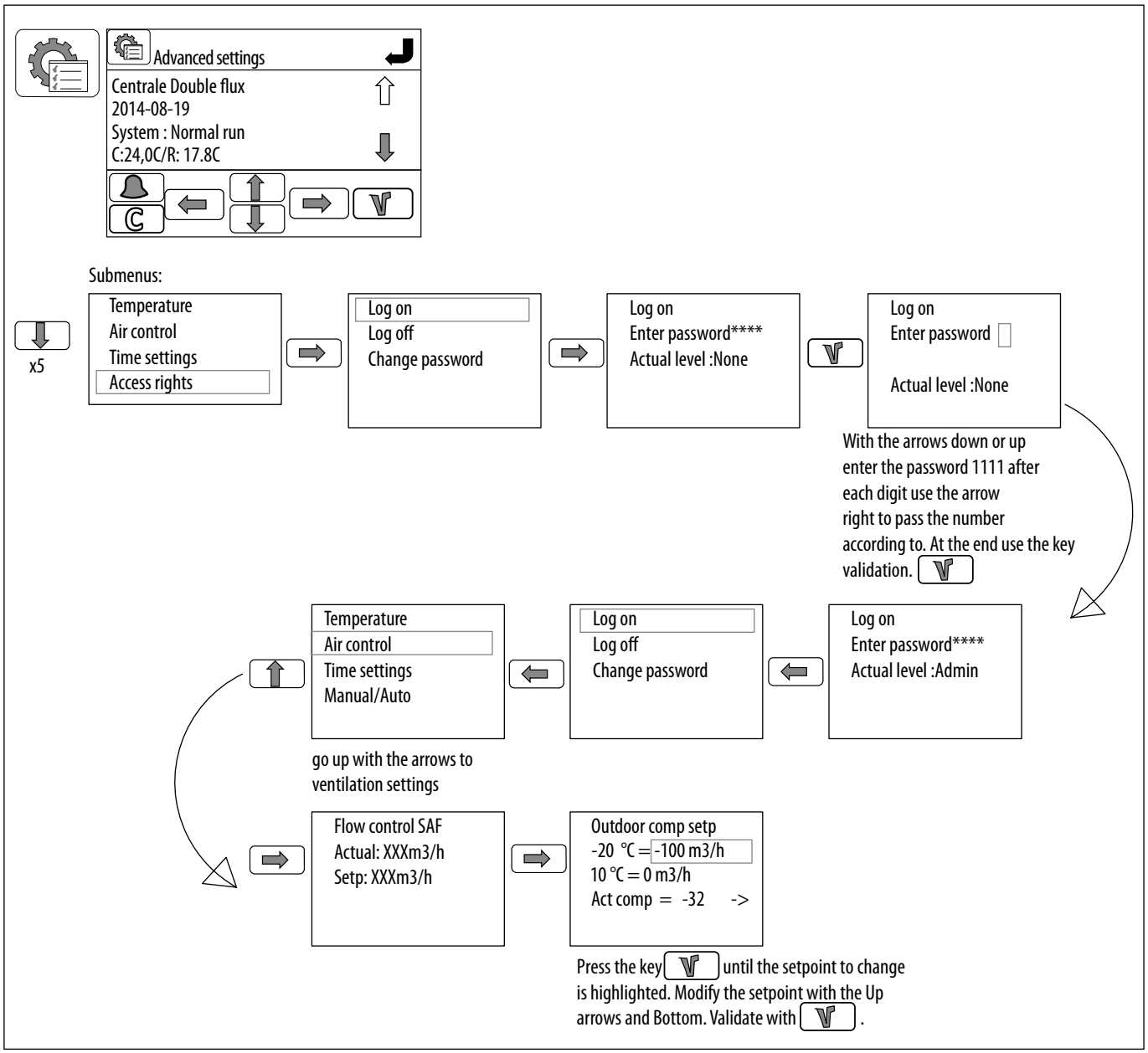
General
A communication box, “CTA kit”, must be provided by the group supplier. It makes communication possible between the direct expansion group and the Corrigo.
The direct expansion coil regulation mode is chosen on the touch control.

Temperature regulation by the DX group
The DX group controls the regulation temperature using its own sensors.
In this type of installation, the Corrigo does not perform temperature regulation functions. Supply air probe, supplied with the RHE must remain installed.
Corrigo → DX Group
Running authorization

Groupe DX → Corrigo
Defrost

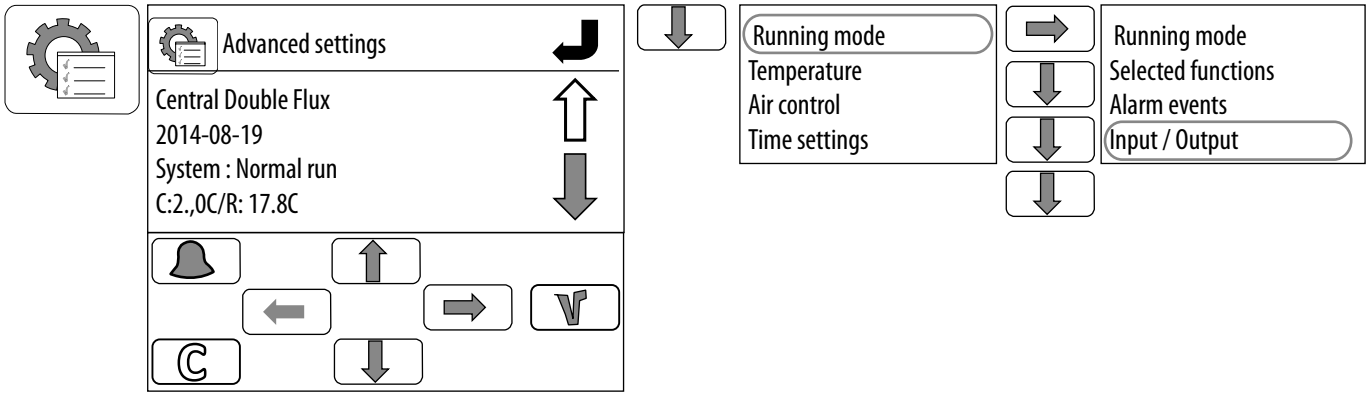
A 0-10V proportional hot / cold signal from the Corrigo can be used.

Defrost
Digital input DI 01-21 is used to reduce the flow rate of the unit during the defrost phase of the group with direct expansion. This reduced flow is the Low Speed flow, reduced by an offset value configurable with ETD, value set by default at 100 m³ / h.

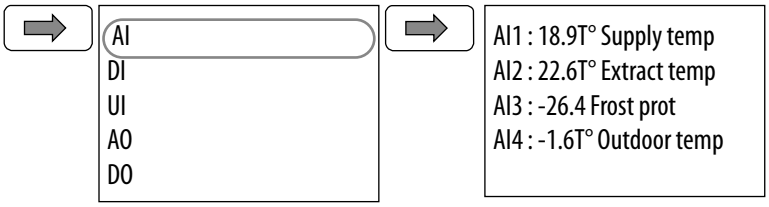


Example: Reduce speed setpoints at 4,800 m³ / h, Normal speed at 6,000 m³ / h, offset value set at 3,900 m³ / h. During group defrost, the flow will decrease to 4 800 - 3 900 = 900 m³ / h whatever the speed selected.

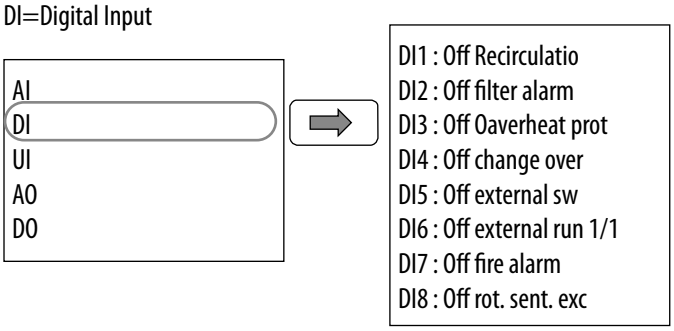
8.7 Expert menu : input / output statuts



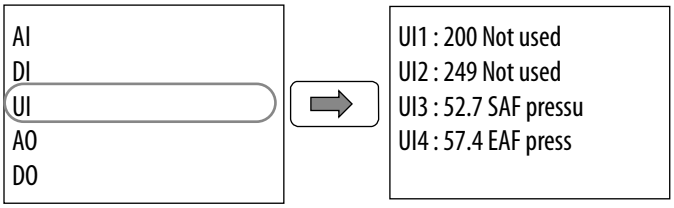
AI=Analogue Input



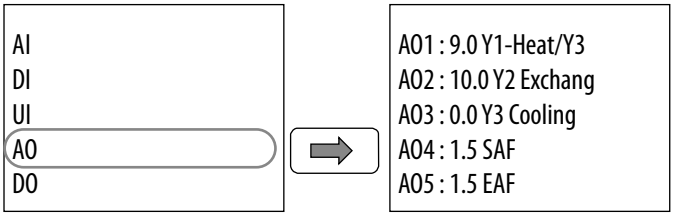
DI=Digital Input



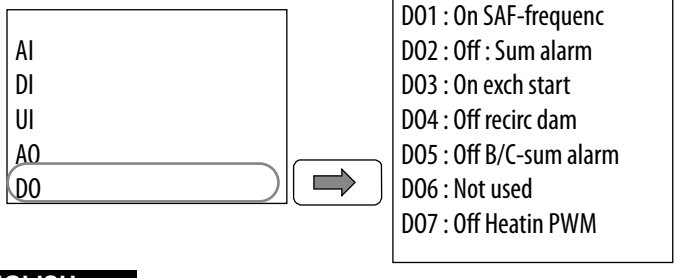
UI=Universal Input



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 : Extra alarm 10
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 of all alarm status
DO3 : Contact heat exchanger on/off
DO4 : Contact recirculation on/off
DO5 : Contact of B and C alarm status
DO6 : Not used
DO7 : Signal PWM for proportional control of electrical heater

8.8 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.

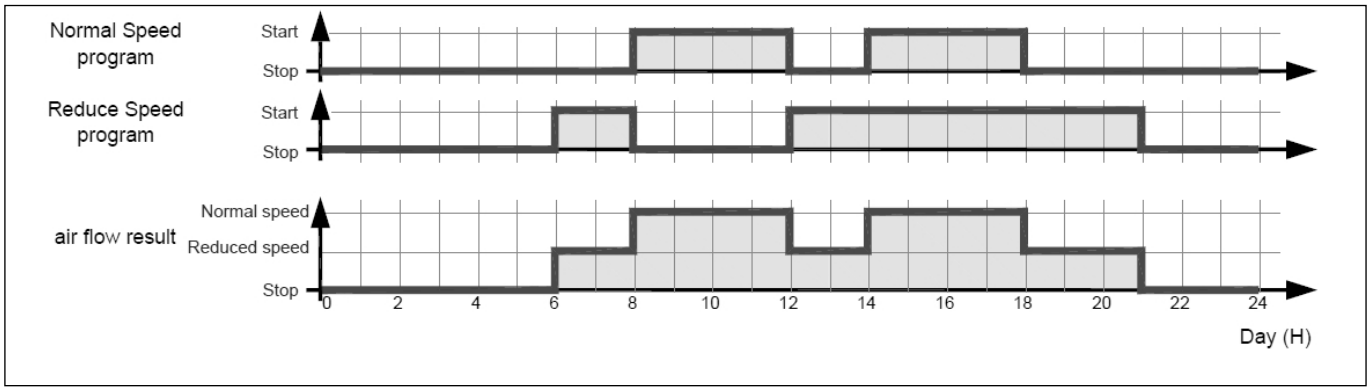
A free cooling by night function can be programmed to start the CTA controller outside of programmed periods.

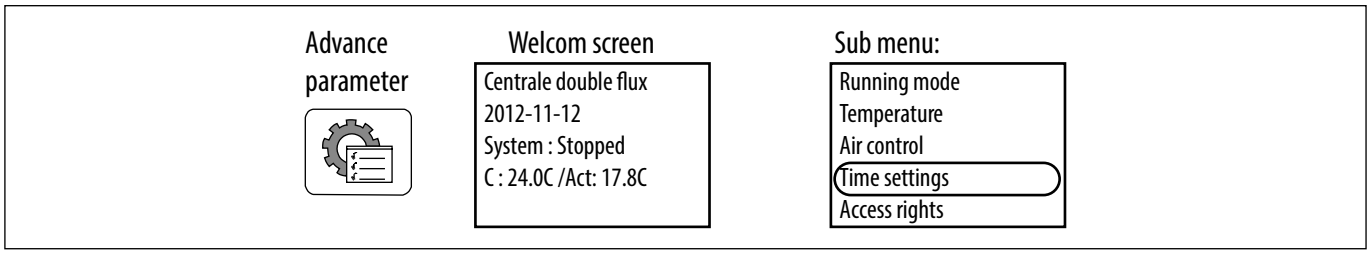
Clock parameter setting :
Only the operation ranges are programmed (outside these ranges the fans are stopped).
The installer can thus define two operation ranges in normal speed (the default speed or high speed) and the ‘’reduced‘’ speed (low speed when two speeds are possible).
For each speed, two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

For example :

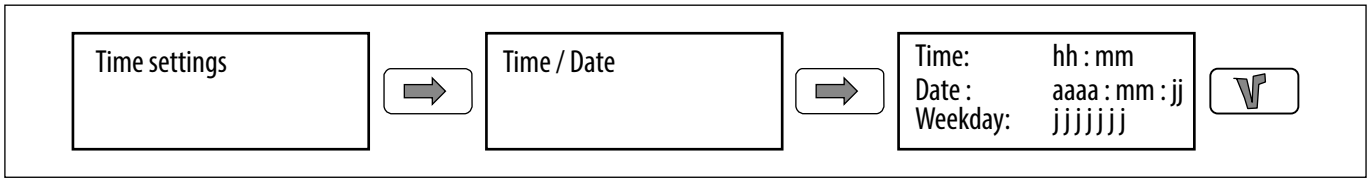
The High Speed can be defined from		8:00 am to	12:00 pm	in period 1
	and from	2:00 pm to	6:00 pm	in period 2
The Low Speed from		6:00 am to	8:00 am	in period 1
	and from	12:00 pm to	9:00 pm	in period 2

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

8.9 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

8.10 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.

8.11 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 night 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 night cooling function is active, the fans run:

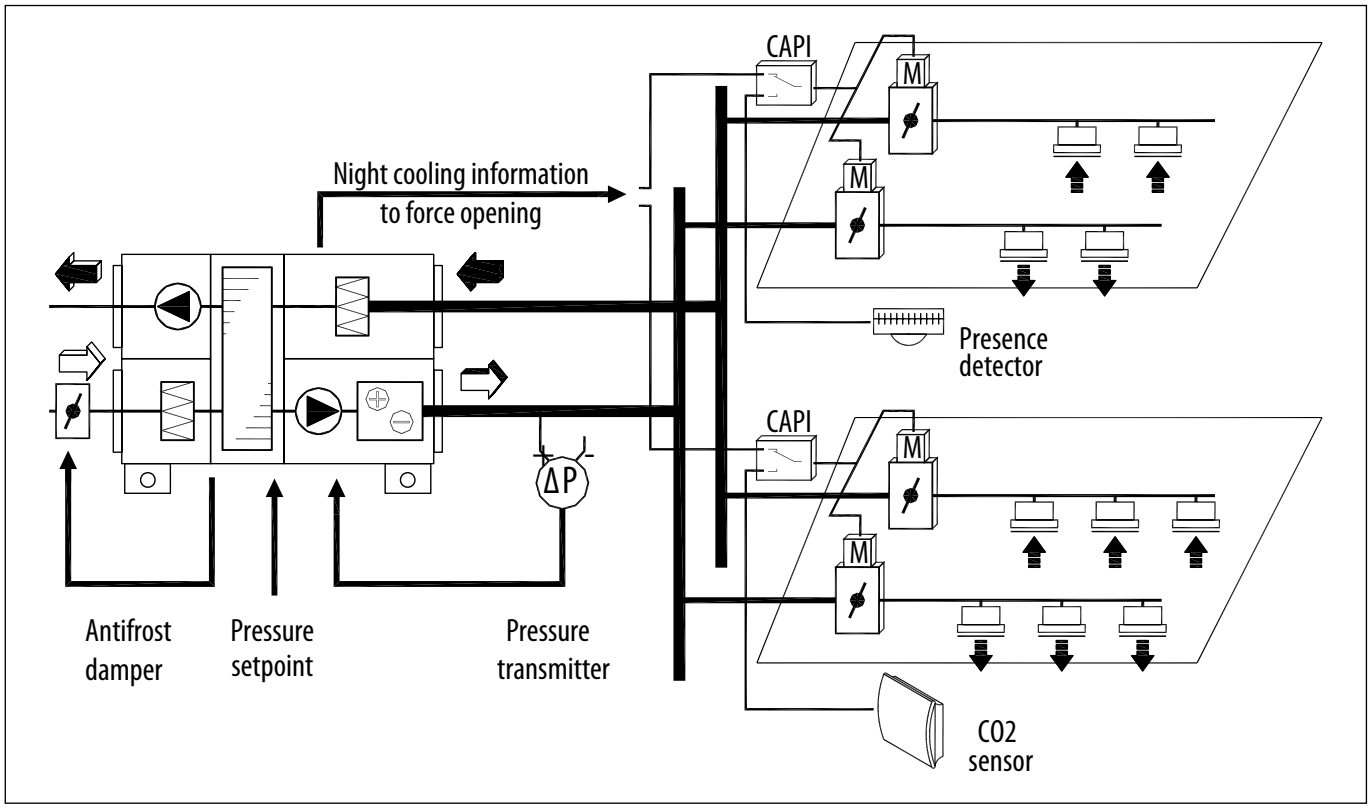
- In CAV at the speed configured for high speed + setpoint offset in m³ / h (offset entered in the CAV settings menu)
- In VAV at the speed configured in high speed (Vmax) + setpoint offset in m³ / h (offset entered in the VAV settings menu)
- In COP at the pressure configured in + a setpoint offset in Pa (offset entered in the COP settings menu).

The coil and exchanger control outputs are switch off.
The heating output remains blocked 60 min (1) after stopping the function.

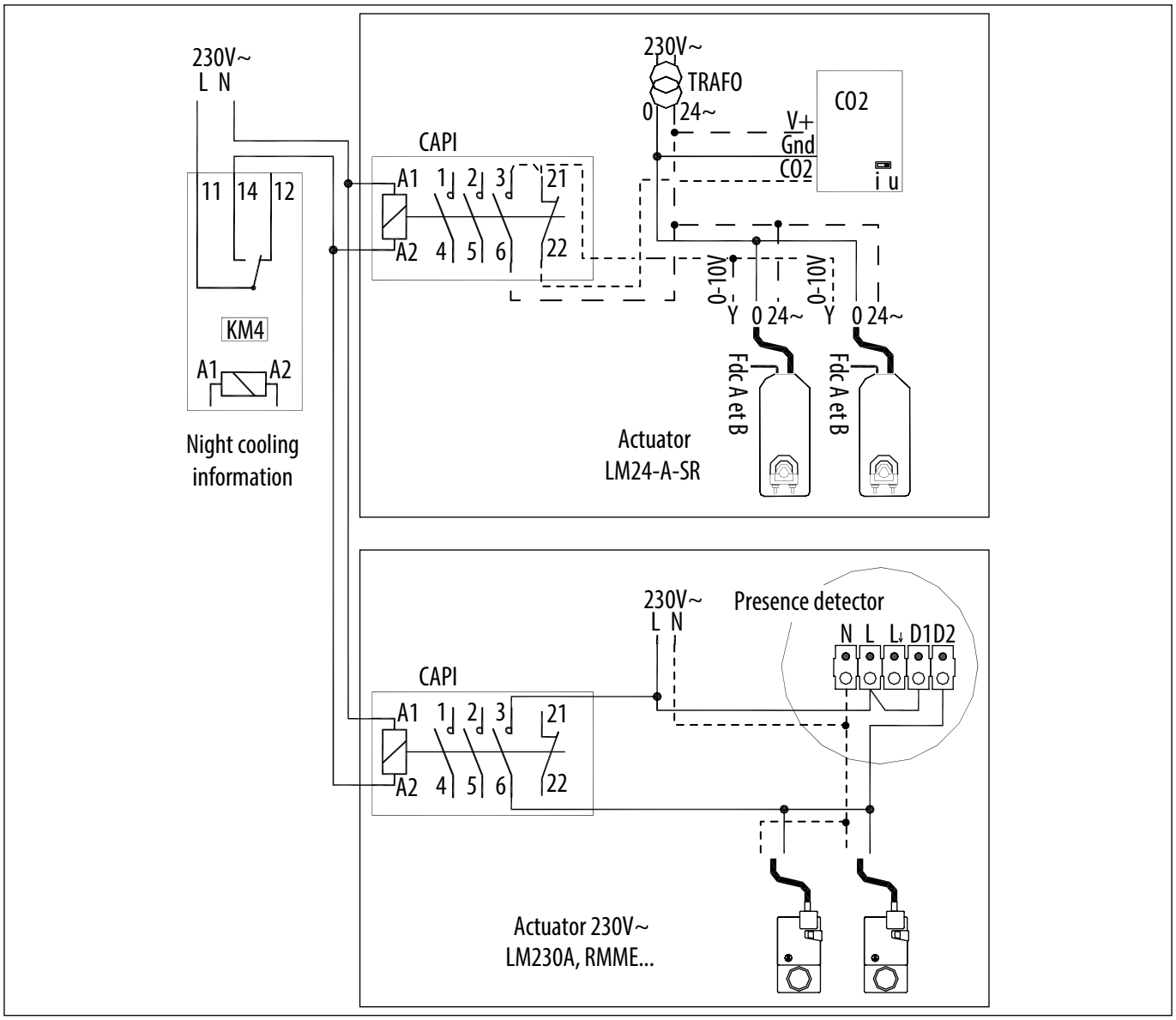
(1) default values which can be changed by a parameter setting in ‘’expert mode’’.

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”.

Connection drawing (example) :



To be able to benefit the night cooling, it is necessary to force the opening of the modulation dampers. wiring principle below:



8.12 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.

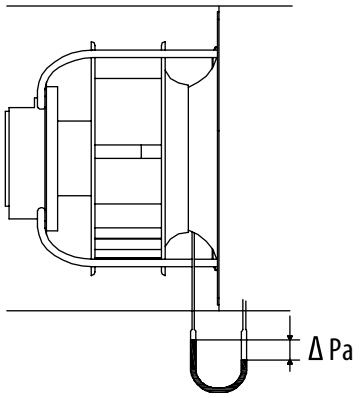
In case the water return temperature drops below the critical point (7°C), the fans are stopped and the dampers (accessories) closed, an alarm is activated.

The antifreeze protection remains active when the fans are stopped.

8.13 External input for fire mode

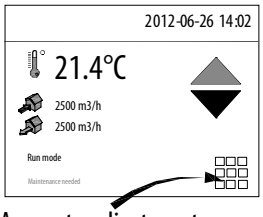
The controller is configured to receive a fire contact. If the fire input is activated, the unit is stopped. When the unit is stopped by the fire input, it can only be restarted after the alarm is acknowledged. It is possible to configure an automatic restart. Two terminals are available for this input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

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



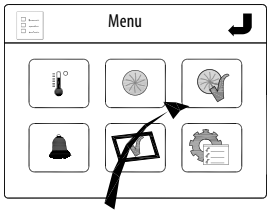
Each fan (supply and exhaust) on the unit is equipped with a pressure transmitter, connected to the control system.
RHE 700/1300 = pressure transmitter – 0-500Pa with 0,5-4,5V Vdc
Sizes 2500 to 10000 = pressure transmitter -0-800Pa with 0,5-4,5V Vdc
Size 15000 = pressure transmitter 0-3000Pa with 0,5-4,5 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:



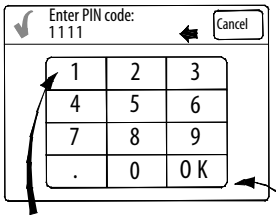
Access to adjustment menu

Menu screen:



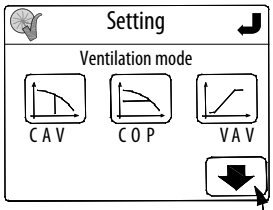
Access to ajustment program

Pass word:



Enter PIN code : 1111 and select: OK

Control mode adjustment:



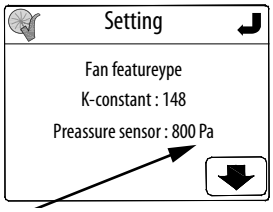
Select next screen

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

Coefficient K values:
RHE 4500 VD : K=186
RHE 6000 : K=188
RHE 8000 : K= 240
RHE 10000 : K= 327
RHE 15000 : K= 335

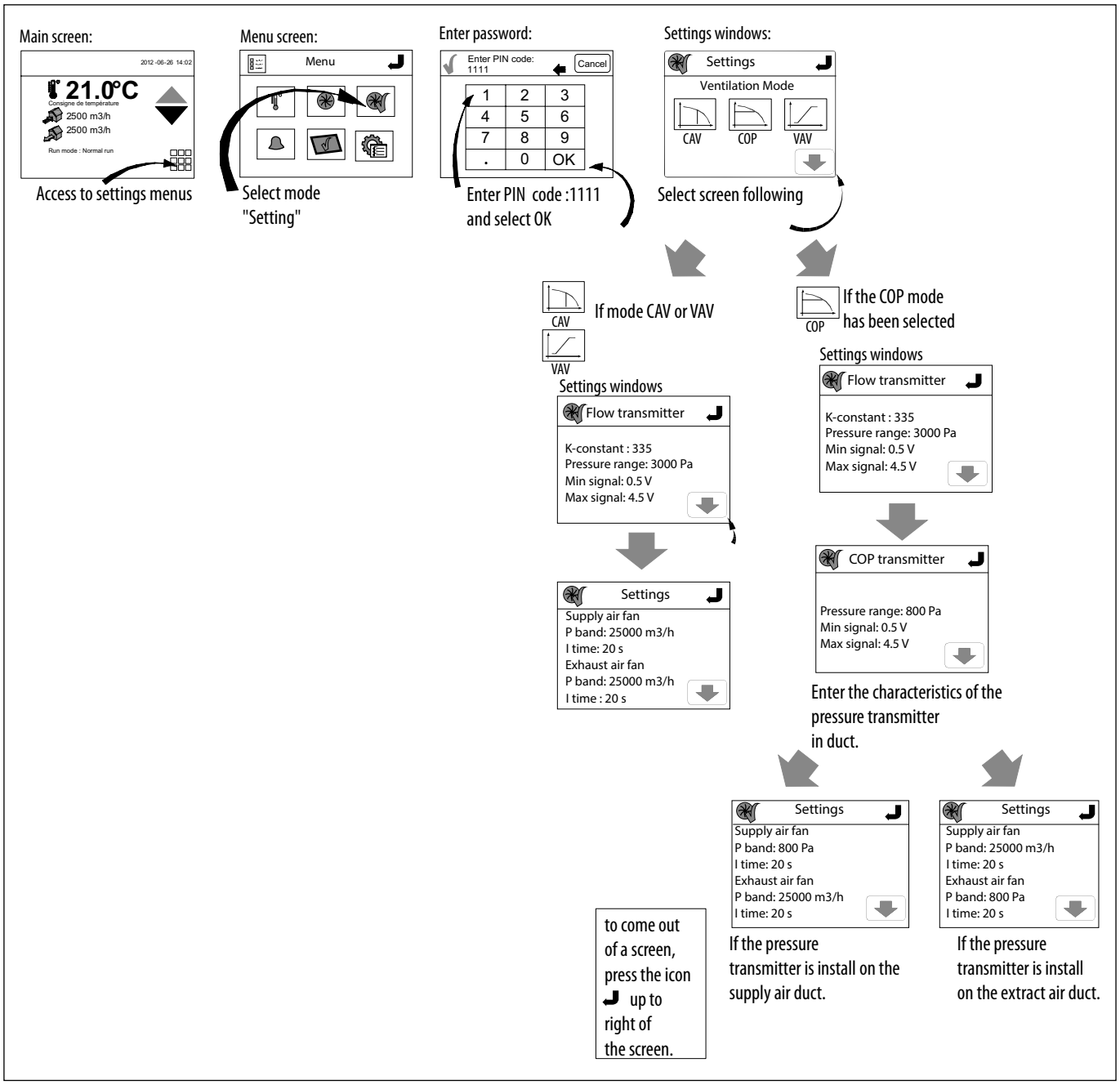
To exit from a screen, press the icon ↵ in the upper righthand corner of the screen

Control mode adjustment:



500 Pa only size 700/1300
3000 Pa size 15000

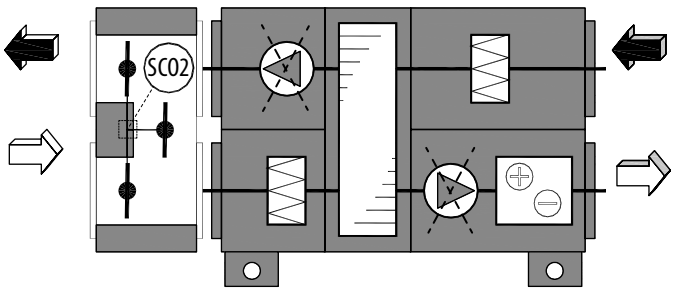
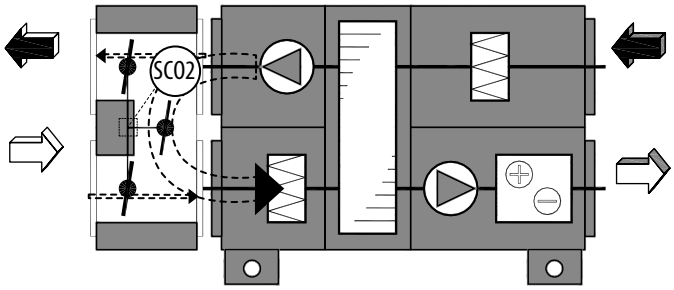
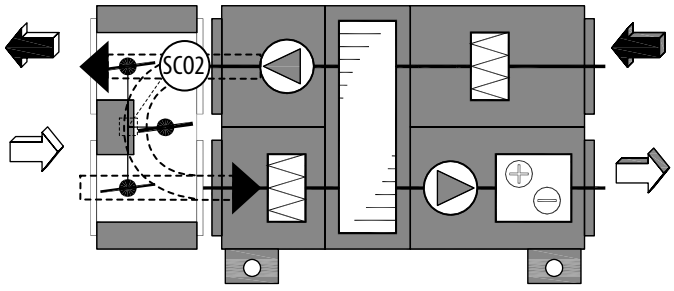
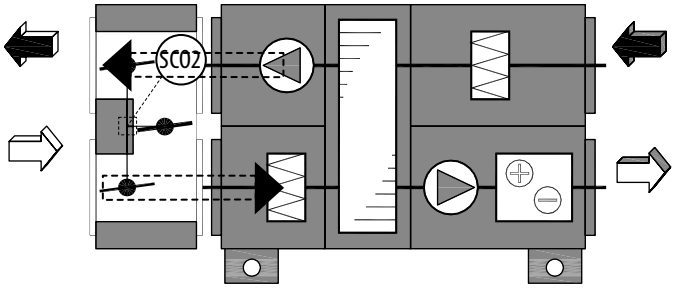
On RHE size 15000, setting the K coefficient and fan pressure sensor is done differntly than the one used for mesurement of pressure in duct (COP). To be more precise, the ducted one has a smaller scale than the pressure sensor used for fans.



8.15 MIB 0-10V - Mixing box

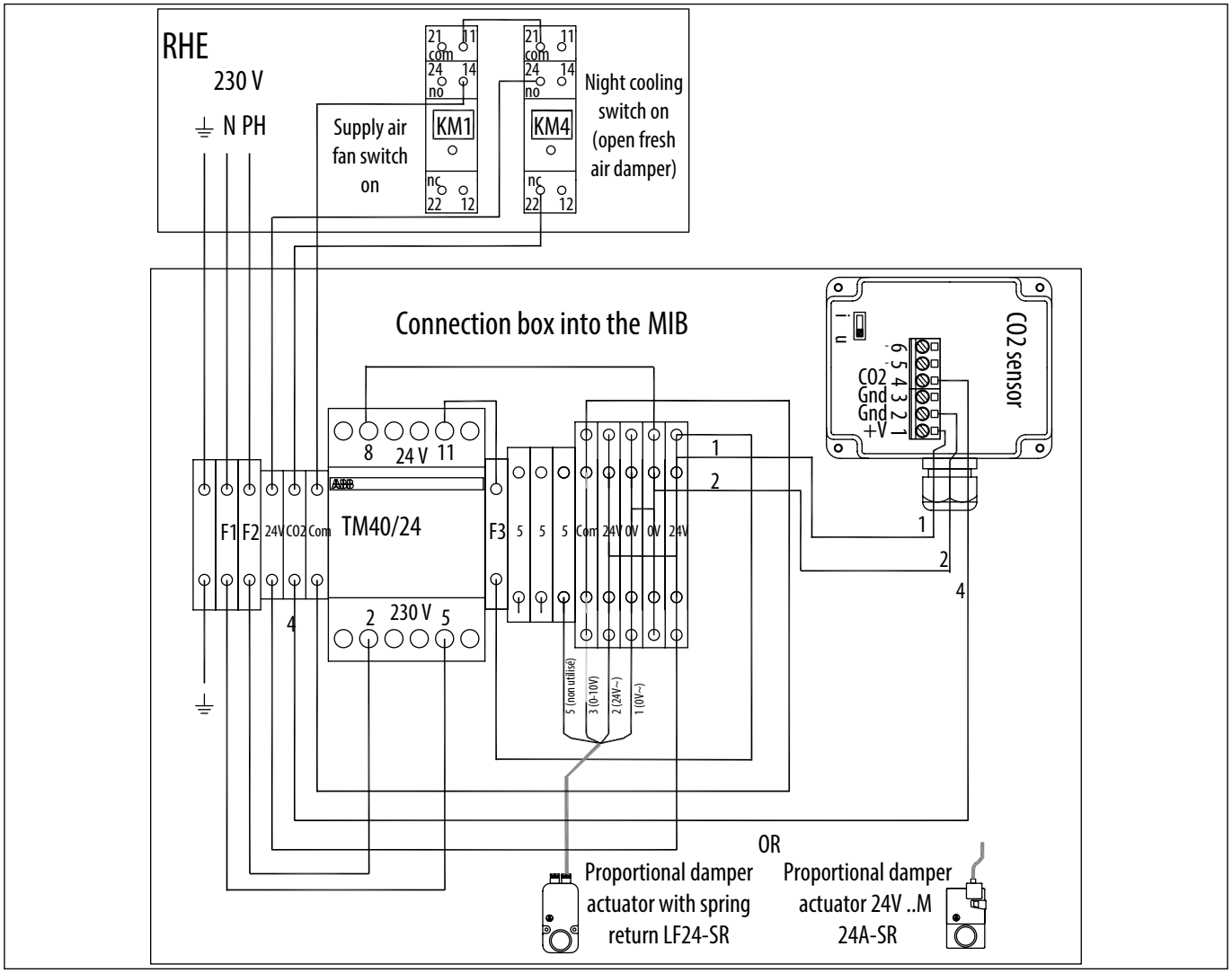
Mixing box is mainly used into ventilation and heating system. It will recycle the exhaust air in case of non-occupation, and use outdoor fresh air in case of maximum occupation.

Working mode:
The mixing box is equipped with a CO2 sensor (SCO2 A 0-10 400-1100ppm) which measure permanently the level of CO2 on the exhaust air, a proportional signal is send to the dampers actuators to open them according the air quality.

Unit switch off (anti frost protection, system stop) 	When the unit is stopped, exhaust and outdoor air dampers are closed; mixing damper is open to the maximum. In case of electric power switch off, this position will be obtain if actuator are equipped with spring return
Unit switch on, low level of CO2 (Night cooling off) 	When the unit is running, in low occupation period, the introduce air come mainly from the recycling of exhaust air, this reduce the energy cost of heating cooling system.
Unit switch on, mixing air proportional to CO2 level 	The mixing between outdoor air and recycling air is done proportionally to the air quality of the exhaust air.
Unit switch on, maximum CO2 level or night cooling activated 	When the CO2 level reaches 1100ppm or more, the unit run with 100% of fresh air, to improve the air quality into the building.This position will be used also in case of night cooling.

Electric wiring

Internal wiring from the connection box to the damper actuators and the CO2 sensor are made into the manufacture. Only the connection between the unit and the mixing box has to be done on the installation site.

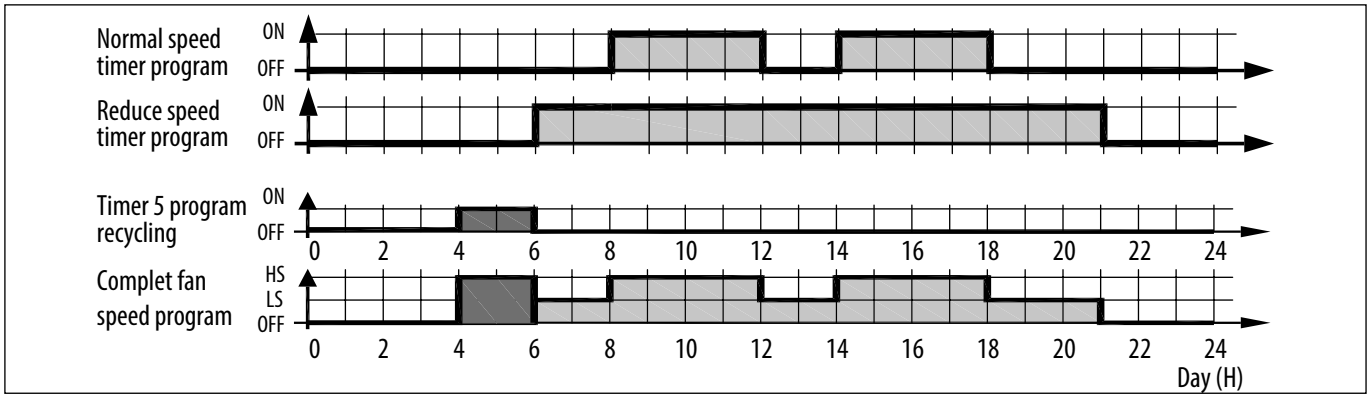


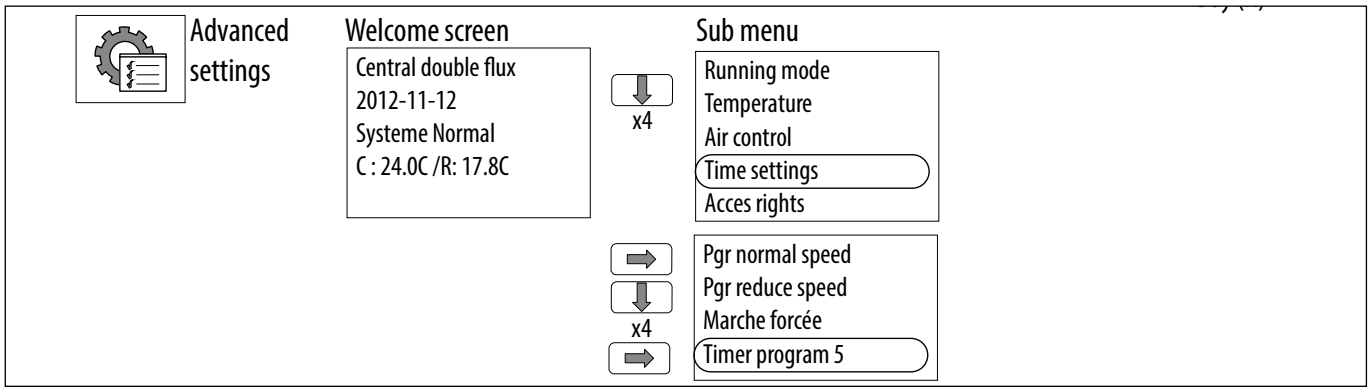
8.16 MIB ON-OFF - Recycling box

The recycling box is used when the exhaust air recycling is wish on non-occupation period according to timer program, to increase the temperature into the building for example.

Working mode:
The timer program has to be done on timer program 5. This time slot, non-priority, must be program out from the normal timer program (normal speed, reduce speed).

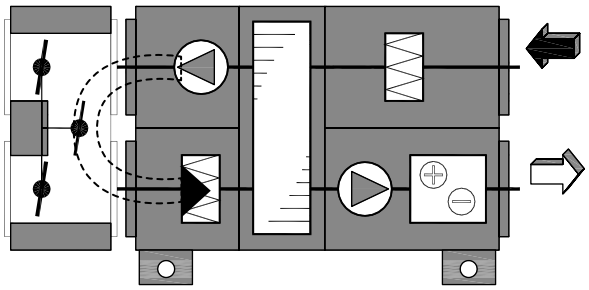
Example :





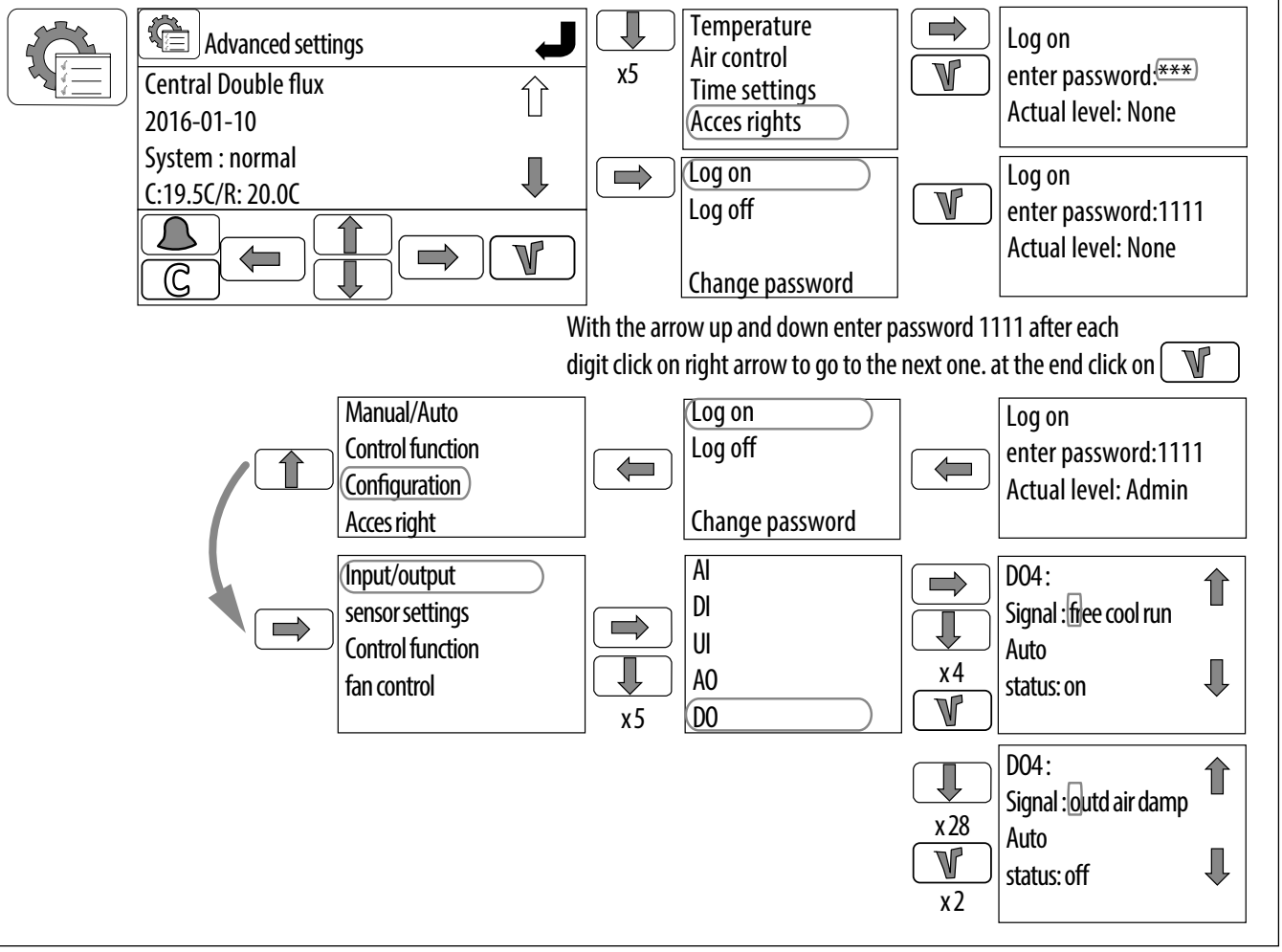
During the recycling periode program (dark grey), the system close the exhaust and outdoor air dampers, and open the reccling dampers to the maximum. The fan run on the normal speed.

Fonctionnement Recyclage durant la plage horaire 5



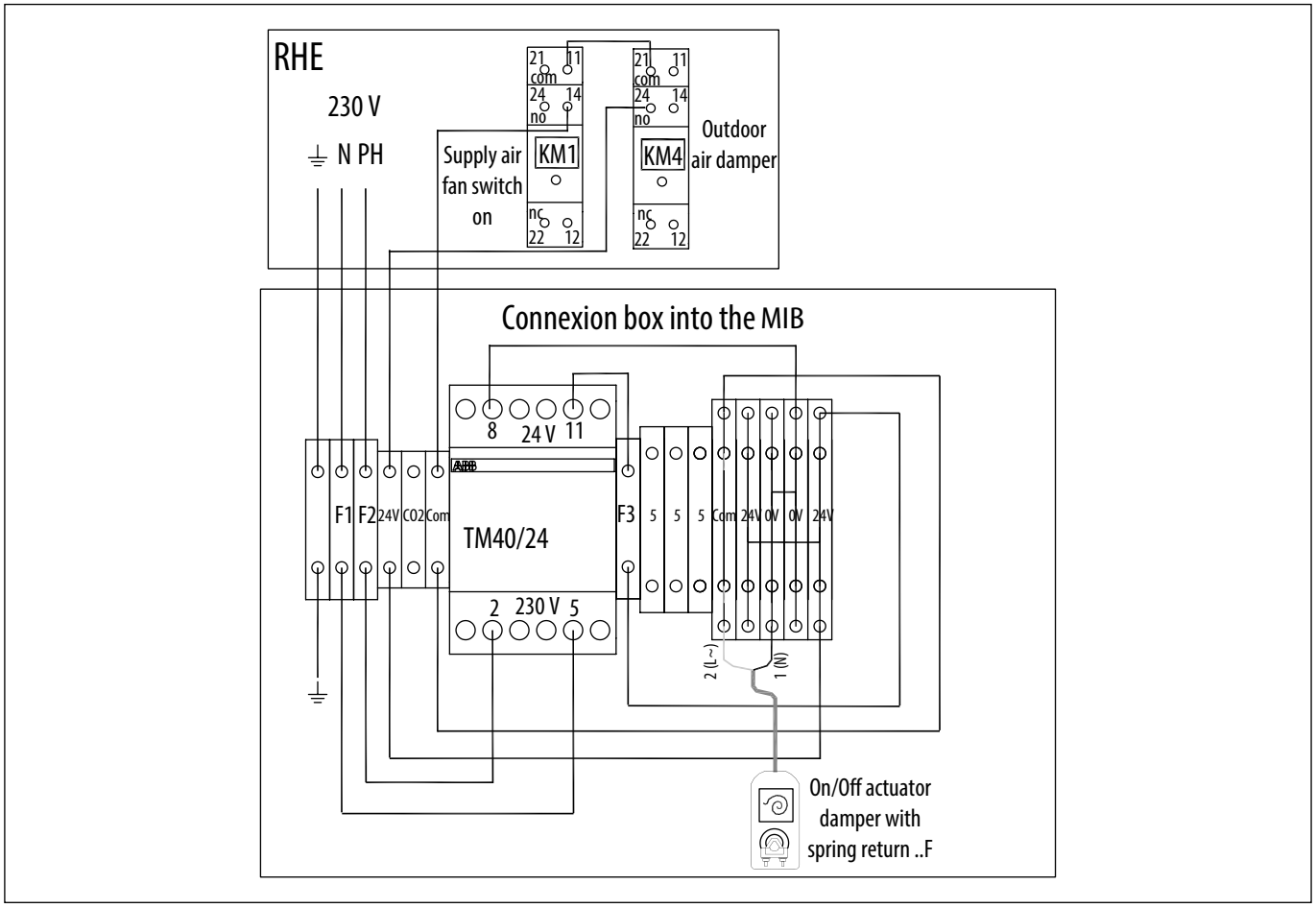
It is possible to switch off the exhaust air fan during the recycling period and to use only the supply air fan. Pay attention that the supply air fan has enough power to maintain the normal air speed air flow.

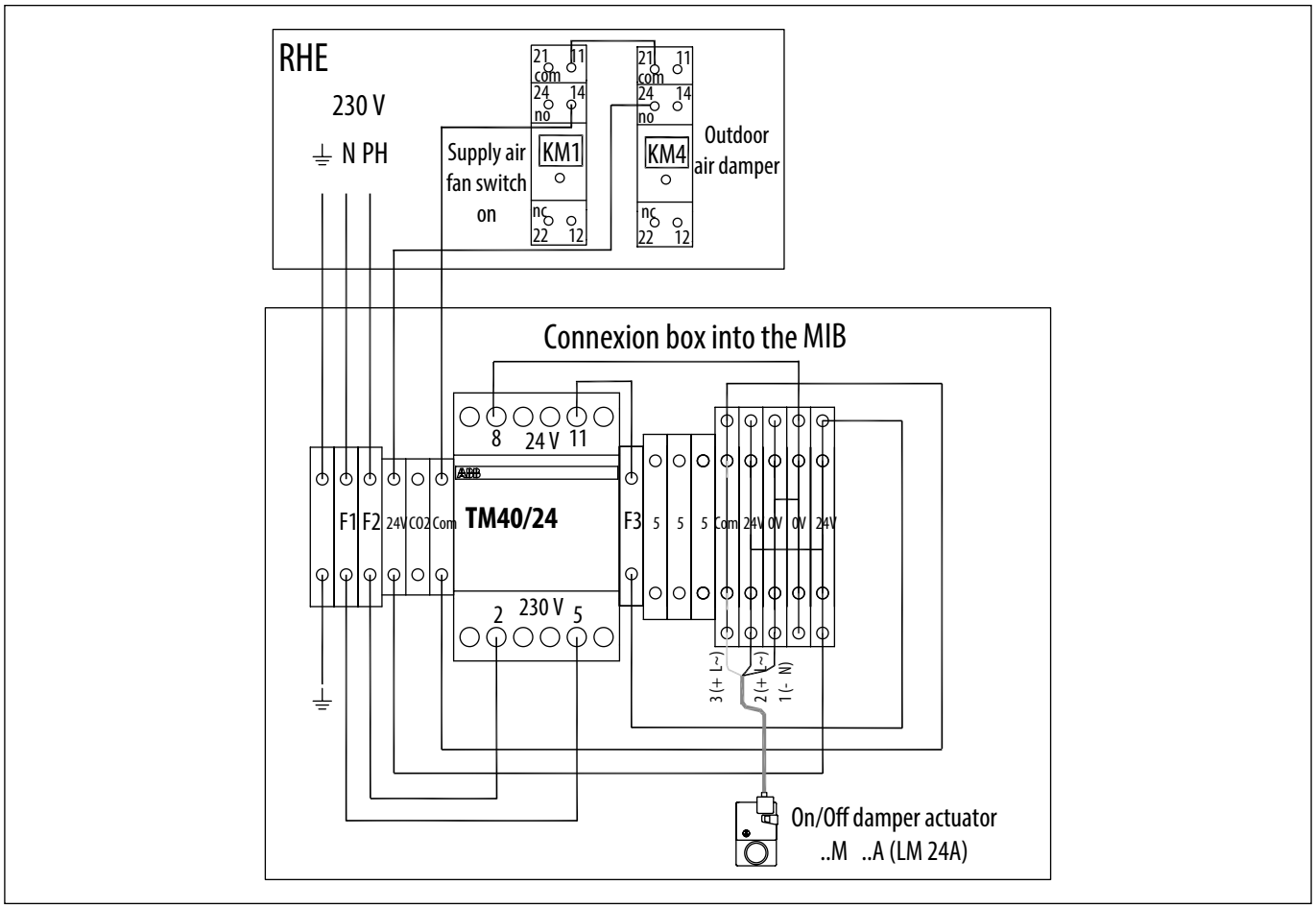
To activate the function :
Modify the associated function of the digital output DO4, from free cooling to outdoor air damper



Electric wiring

Internal wiring from the connection box to the damper actuatore are made into the manufacture. Only the connection between the unit and the mixing box has to be done on the installation site.

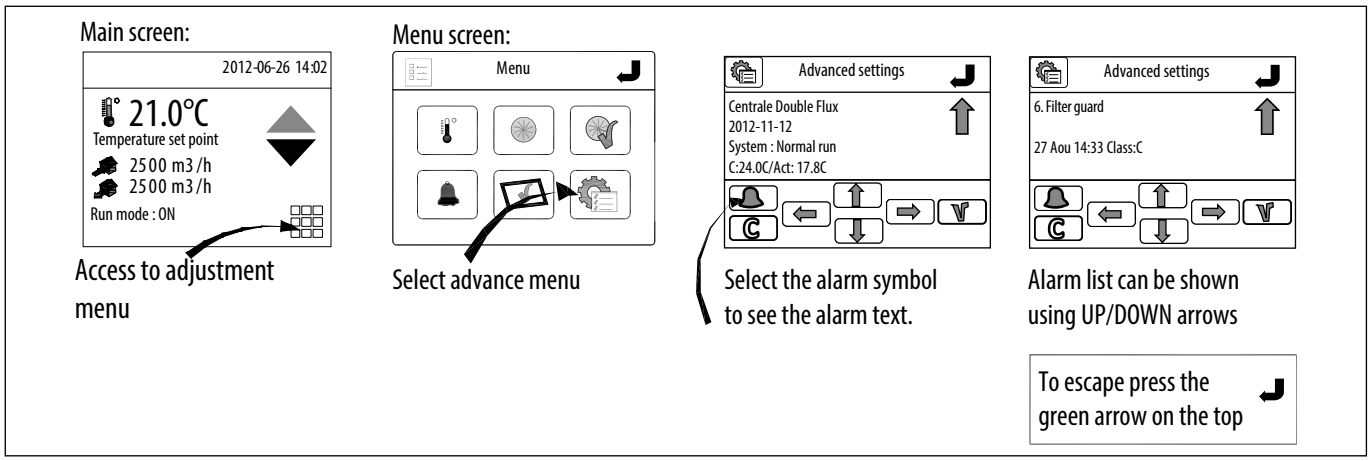




8.17 Failure list

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).

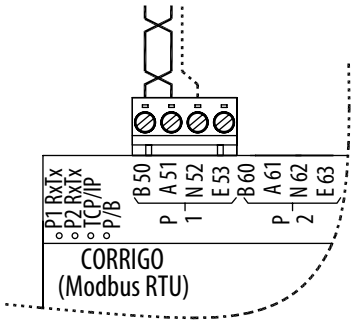


Alarm nbr	Alarm text	Description
1	Run Error Supply Air Fan	Malfunction Supply air fan
2	Run Error Extract Air Fan	Malfunction Extract air fan
6	Filter guard	Filter guard pressure switch activated
10	Fire alarm	Fire alarm activated
13	Supply Air control error	Supply air temperature deviates too much 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

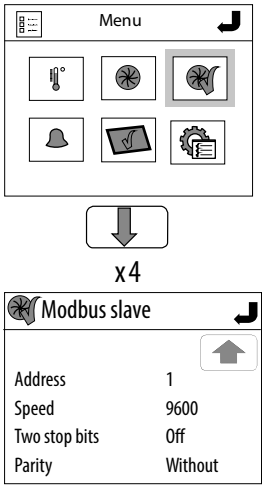
9. COMMUNICATION

9.1 Connection to BMS in modbus language

MODBUS RTU on port 1 - RS 485

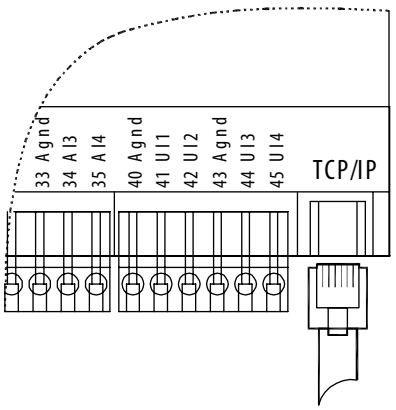


CORRIGO controler has 2 RS485 communication port, Port 1 is deducated to modbus RTU communication as standard.

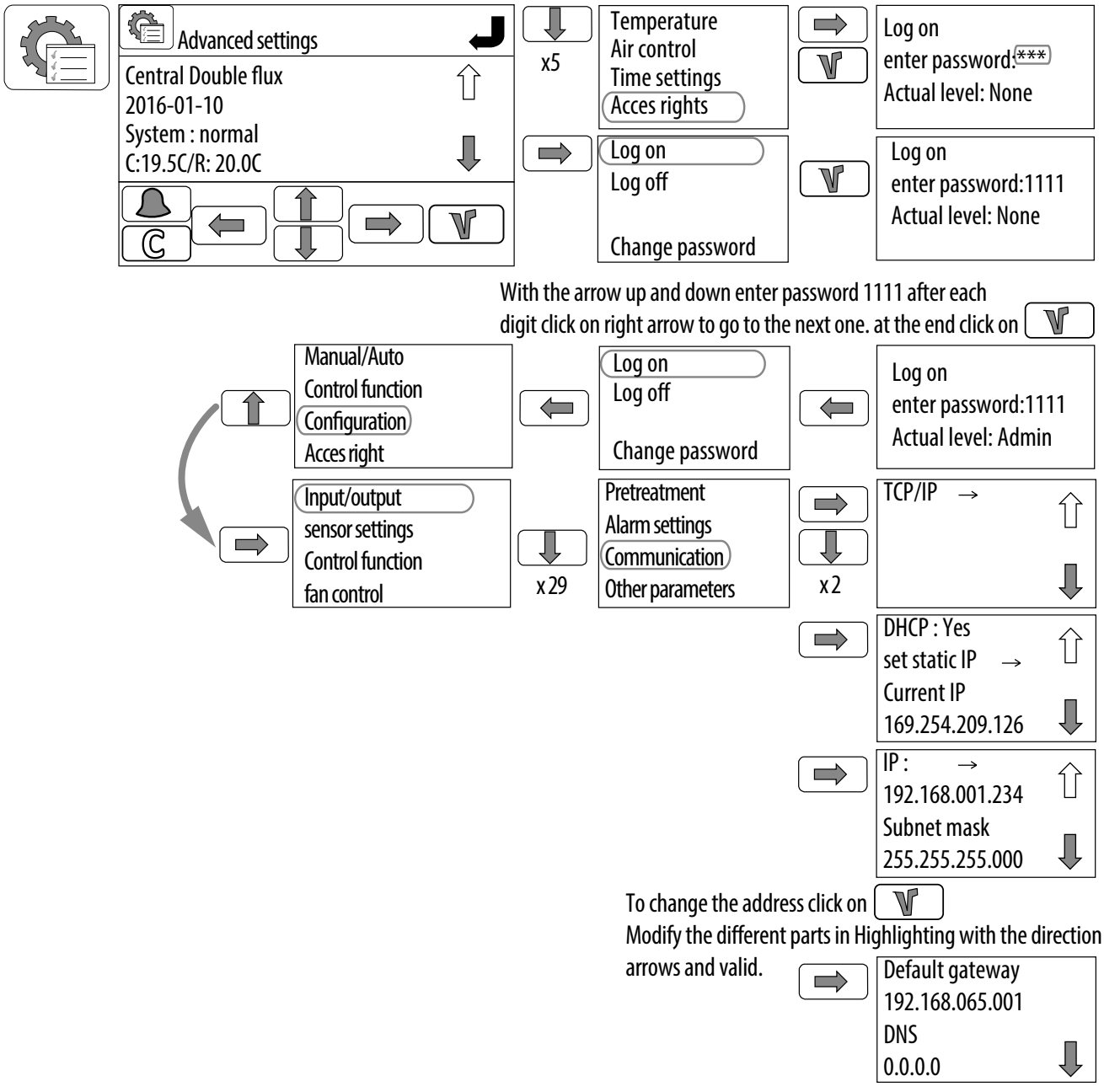


The Modbus address and communication configuration could be set directly on the last windows of the quick configuration menu.
The address by default is 1, if few units are connected, the address of each one must be different from the others, possible address from 1 to 254.
The communication parameters must be the same for all the units connected on the same network.
Speed available: 9600 (default parameter), 19200, 38400 or 76800 baud
Modbus communication takes place using 1 stop bit. It's possible to activate 2 bits stop.
Parity : none (could be modify)

MODBUS IP on port TCP/IP



CORRIGO controller is equipped with one TCP/IP communication port (RJ45 Connector). By default, this port is dedicated to Modbus IP communication.



Reduce list of Modbus network variable

The simplified list Modbus below includes the most usually data used in supervision communication in Modbus. All these points can be obtained for all the units equipped with Corrigo controller. Available information will dependent on the configuration of the construction site(work) (ways of working, or options chosen, assembly/ cabling etc.).

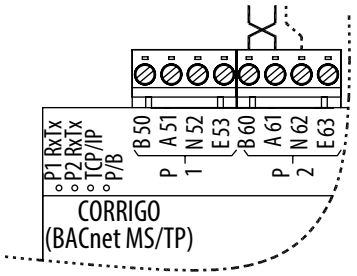
Function	Address	Read/Write	Description	Accepted value
FANS CONTROL				
Set point supply air flow	40428	R/W	Setpoint supply air flow ,Normal Speed ,CAV (Constant Air Volume) running mode	0..max air flow of the unit
	40429	R/W	Setpoint supply air flow ,Reduce Speed ,(Constant Air Volume) running mode	0..max air flow of the unit
Pressure set point on supply air	40024	R/W	Pressure set point in COP (COnstant Pressure) running mode, when pressure transmitter is installed on the supply air duct. Value: 0 .. 9999 means 0 .. 999.9Pa	0..max available pressure
Set point exhaust air flow	40030	R/W	Setpoint exhaust air flow ,Normal Speed ,CAV (Constant Air Volume) running mode	0..max air flow of the unit
	40031		Setpoint exhaust air flow ,Reduce Speed ,(Constant Air Volume) running mode	0..max air flow of the unit
Pressure set point on exhaust air	40449	R/W	Pressure set point in COP (COnstant Pressure) running mode, when pressure transmitter is installed on the exhaust air duct. Value: 0 .. 9999 means 0 .. 999.9Pa	0..max available pressure
Speed selector	40368	R/W	Manual speed selection 0=stop, 1=Reduce speed , 2=Normal speed, 3=Automatic (according to timer program)	0, 1, 2 ou 3
READING AIR FLOW /PRESSURE				
Supply air flow	30032	R	In COP mode with pressure transmitter on supply air duct = Value of ∆Pa mesurement on supply air fan nozzle Air flow is obtain by calculationl: Air flow= K*√ ΔP Coef.K value corresponding to the unit; √ΔP= √read value/10 Value: 0 .. 9999 signifiant 0 .. 999.9Pa	0..max flow
	30015	R	Supply air flow (M3/h), in CAV, VAV ou COP on exhaust air running mode	0..max flow
Supply air pressure	30013	R	Pressure on supply air fan (Pa), in COP on supply air duct Value: 0 .. 9999 means 0 .. 999.9Pa	0..max value of the unit
Exhaust air flow	30033	R	In COP mode with pressure transmitter on exhaust air duct = Value of ∆Pa mesurement on supply air fan nozzle Air flow is obtain by calculationl: Air flow= K*√ ΔP Coef.K value corresponding to the unit; √ΔP= √read value/10 Value: 0 .. 9999 signifiant 0 .. 999.9Pa	0..max value of the unit
	30016	R	Exhaust air flow (M3/h), in CAV, VAV ou COP on exhaust air running mode	0..max value of the unit
Exhauster pressure	30014	R	Pressure on exhaust air fan (Pa), in COP on supply air duct Value: 0 .. 9999 means 0 .. 999.9Pa	0..max value of the unit
Boost	10008	R	Status of boost function 0=boost off; 1=boost on	0 or 1
TEMPERATURE STATUS				
Supply air temperature	30007	R	Read the supply air temperature Value: -990 .. +990 means -99.0 .. +99.0 °C.	-999..999
Exhaust air temperature	30009	R	read the exhaust air temperature Value: -990 .. +990 means -99.0 .. +99.0 °C.	-999..999
Outdoor air temperature	30001	R	Read the outdoor air temperature Valeurs: -990 .. +990 signifiant -99.0 .. +99.0 °C.	-999..999
Water coil temperature	30019	R	Read the water coil temperature (anti frost probe value) Valeurs: -990 .. +990 signifiant -99.0 .. +99.0 °C.	-999..999

Function	Address	Read/Write	Description	Accepted value
ALARMS				
Total alarms	10184	R	A or B Alarm status 0=Normal, 1=Alarm	0 or 1
filters alarm	10038	R	Alarme pression filtres 0=Normal, 1=Alarm	0 or 1
Fans alarms	10033	R	Pressure fault on supply air fan	0 or 1
	10034	R	Pressure fault on exhaust air fan 0=Normal, 1=Alarm	0 or 1
Fire Alarm	10042	R	Fire alarm 0=Normal, 1=Alarm	0 or 1
Antifrost on water coil	10057	R	Low water temperature (<7°C) 0=Normal, 1= alarm	0 or 1
COIL STATUS				
Signal 0-10V of the valve actuator	30119	R	Hot water signal (0-10V) Y1 Value: 0..100 means 0,0V .. 10.0V.	0..100
	30121	R	Cold water signal (0-10V) Y3 Value: 0..100 means 0,0V .. 10.0V.	0..100
Saison/change over	10017	R	read position status (input DI4) 0= hot control position ; 1= cold control position	0 or 1
TEMPERATURE SETPOINT				
Supply air position set point	40001	R/W	Set point température in 'constant supply air Temperature' value: 0..+999 means 0 .. +99,9°C; 0 =off	0…999
Saison/change over	40230	R/W	Change over control mode 0=heating mode, 1=cooling mode, 2=auto	0, 1 or 2
ROTARU HEAT EXCHANGER / BY PASS STATUS				
Rotary heat exchanger	10028	R	Heat exchanger status(Value of digital output DO3) 0=off, 1=on	0 or 1
WORKING TIME				
Fans working time hours	30 004	R	Running time of supply air fans	0…999999
	30005	R	Running time of exhaust air fans Value: 0 .. 999999	0…999999

The complet list could be load on our web site or on Etool / help/corrigo variable list.

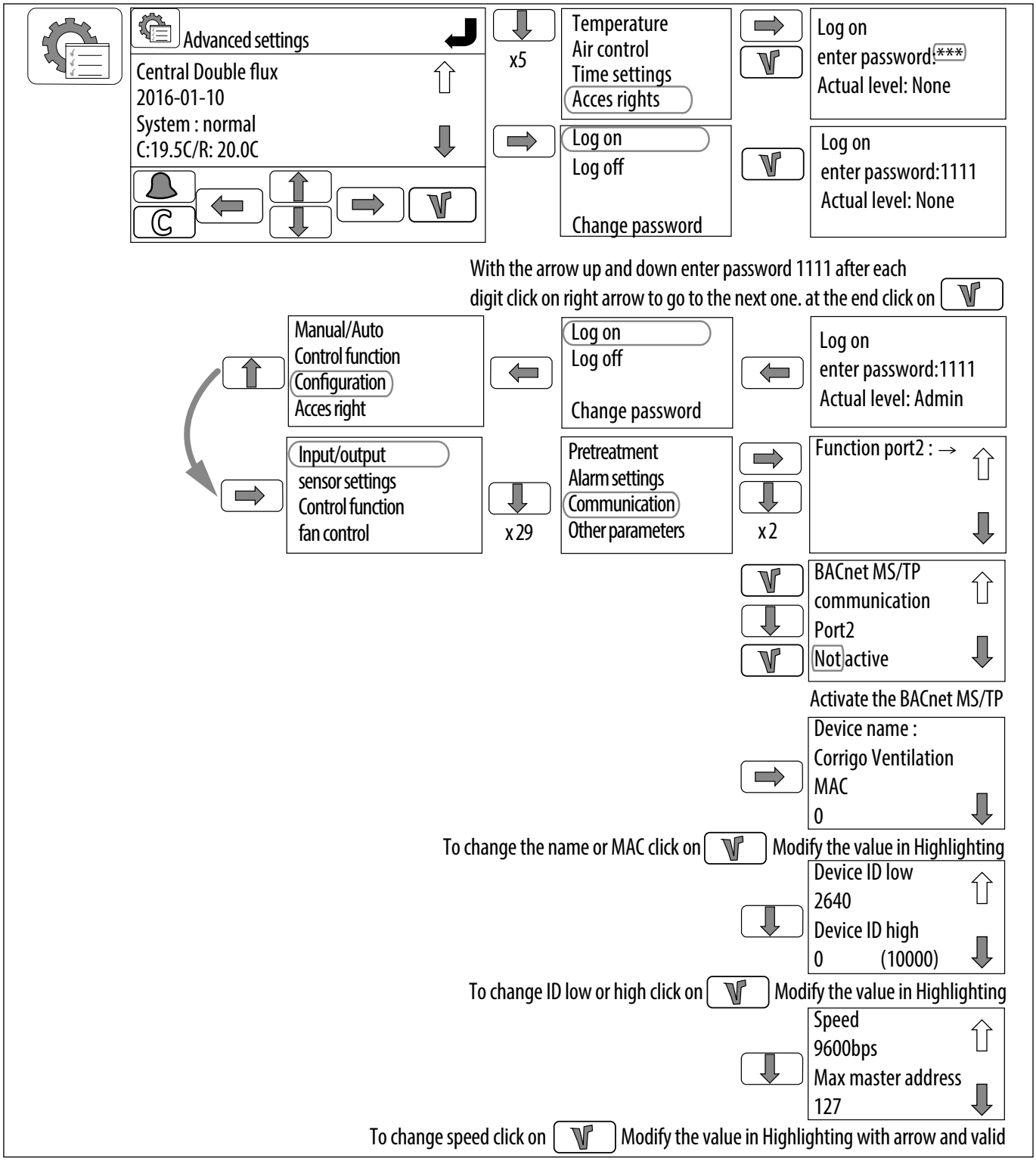
9.2 Bacnet communication protocole for BMS communication

BACnet MS/TP ON port 2 – RS485

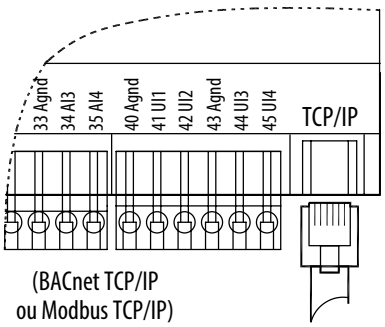


The regulator CORRIGO has 2 communication ports RS485 (to use with a cable STP), the port2 is dedicated by default to the communication in BACnet MS / TP, but the function must be activated to be able to work.

BACnet activation

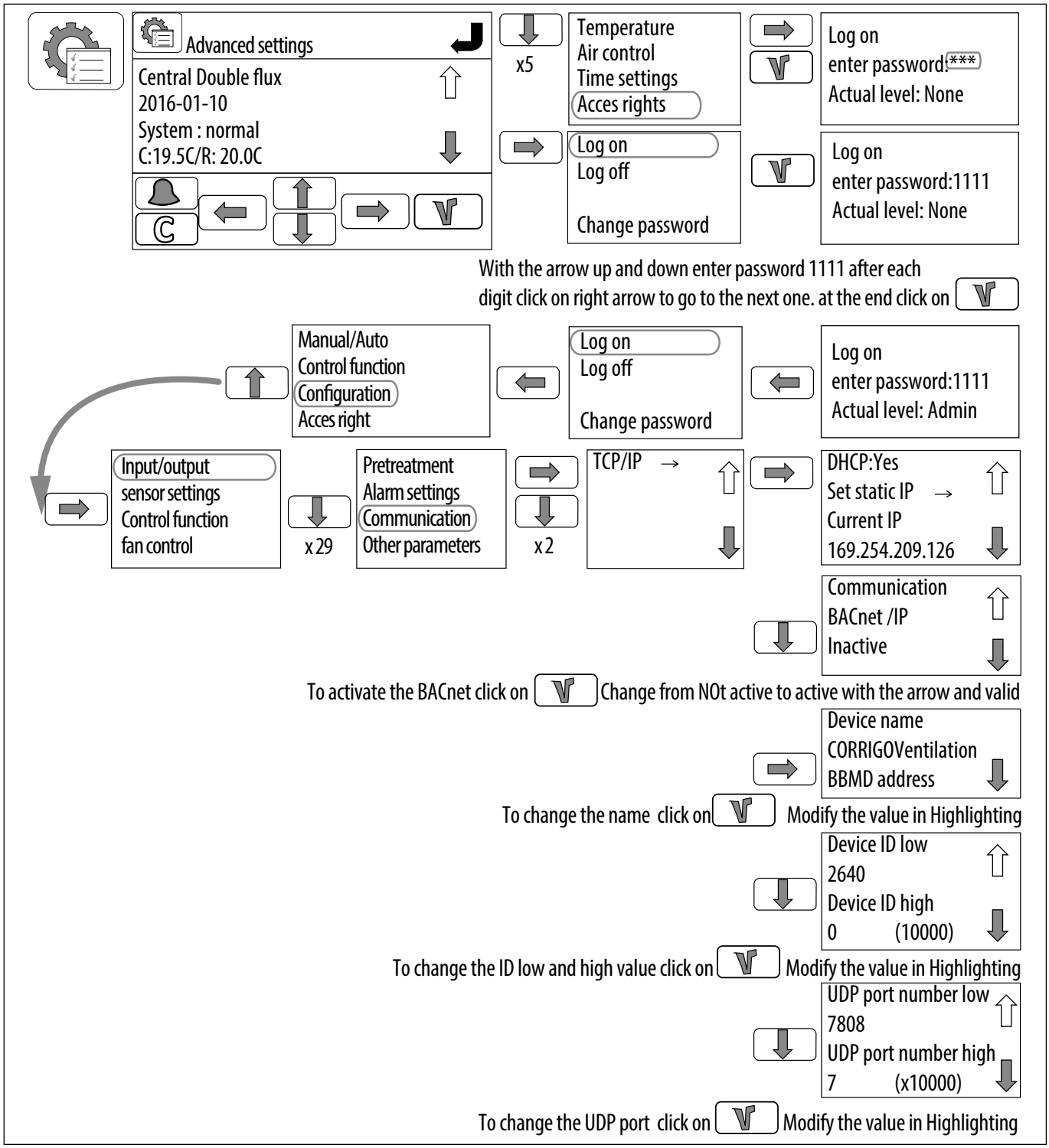


BACnet IP on port TCP/IP



The regulator CORRIGO has 1 communication ports TCP/IP to be connect with the TCP/IP network. This port has to be be configured to work on BACnet IP communication protocol

Activation du BACnet IP

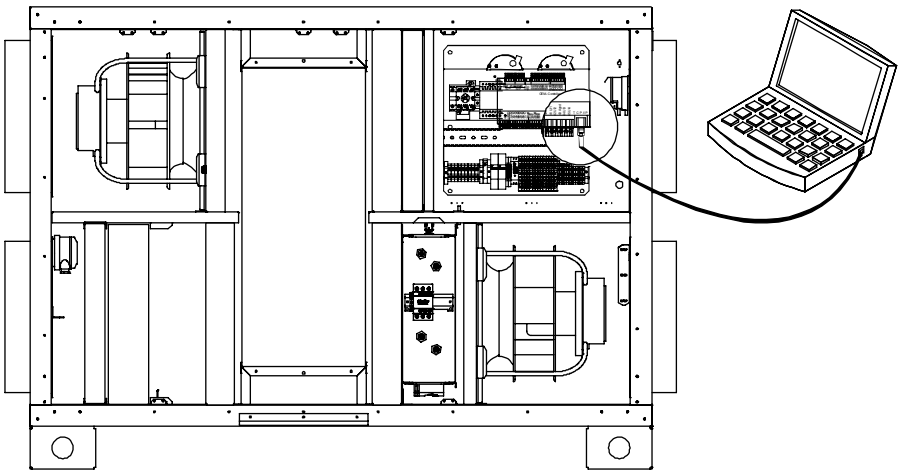


It is possible to give a static ip address to the CORRIGO (similar procedure as with Modbus IP).

9.3 BACnet IP configuration with Etool

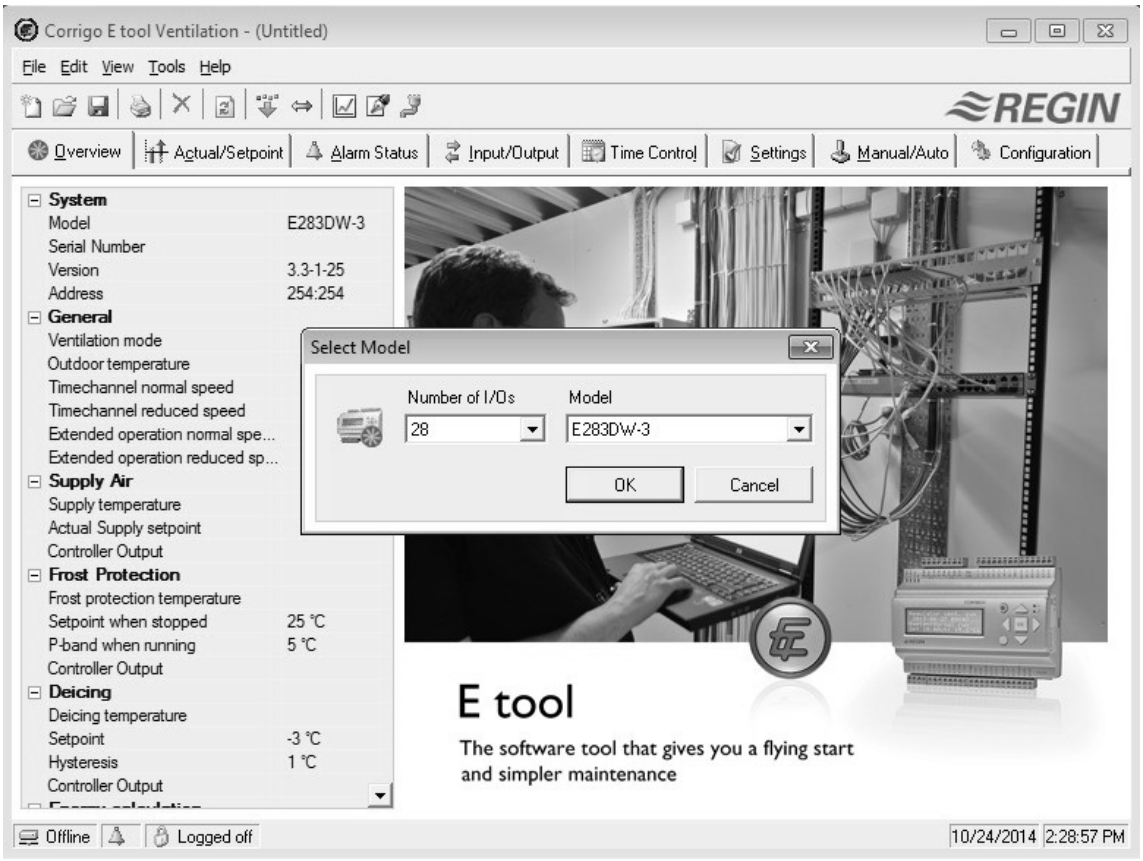
For example :
Name : AHU_1_OFFICE
static IP address : 192.168.10.100
Net Mask: 255.255.255.0
Default Gateway: 192.168.10.1

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.

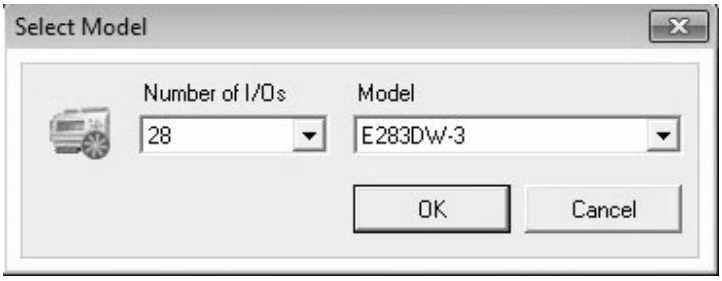


Click on the enclose icone :

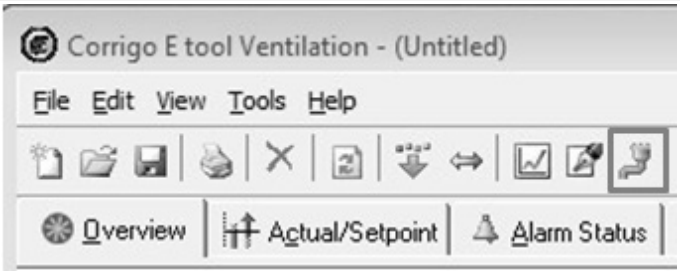
This window appear :



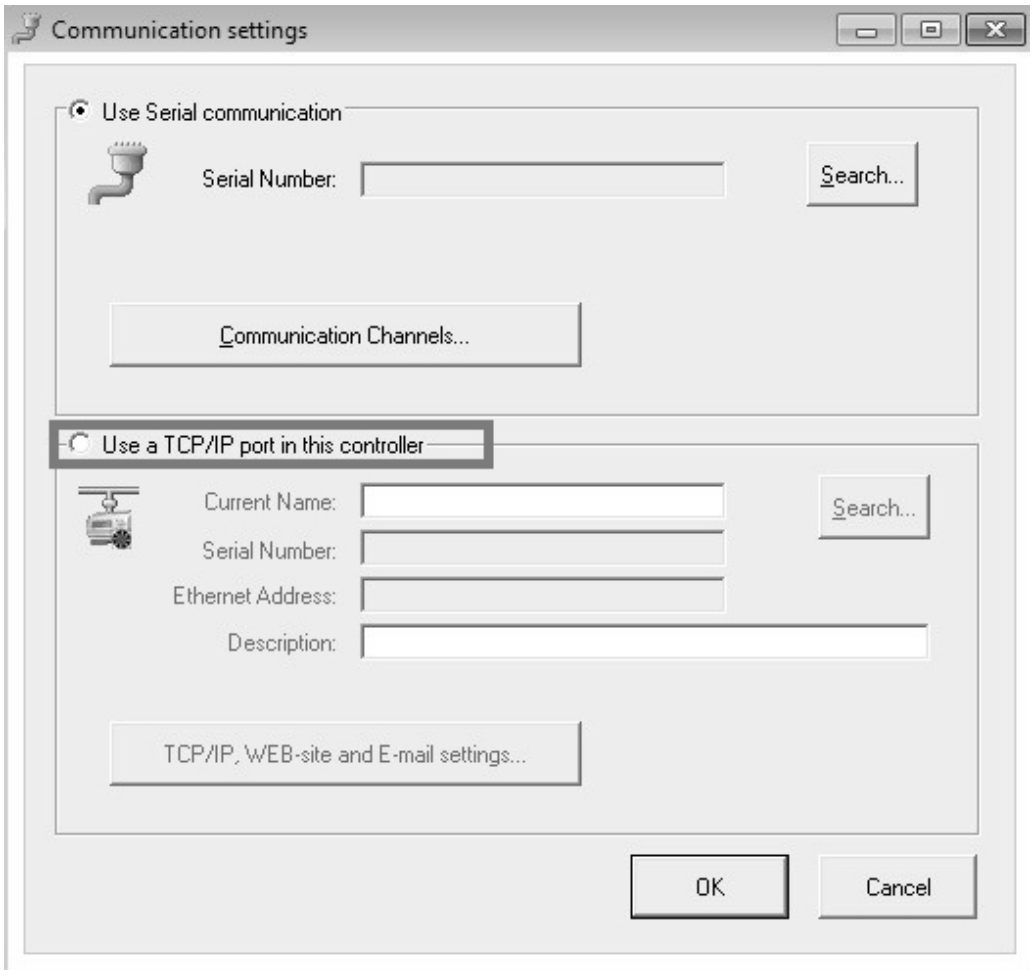
On the list of CORRIGO type, select:
Correspond to CORRIGO G3 3Ports used (E283DW-3).



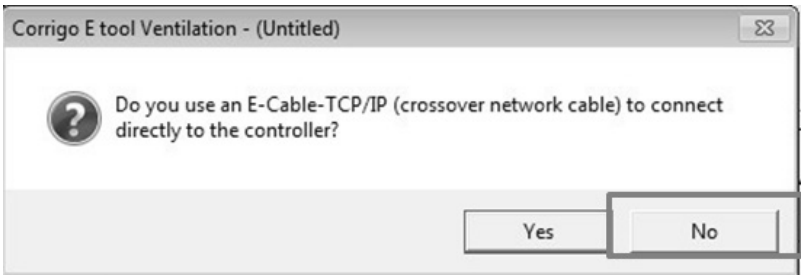
Click on the icon to select type of connection.



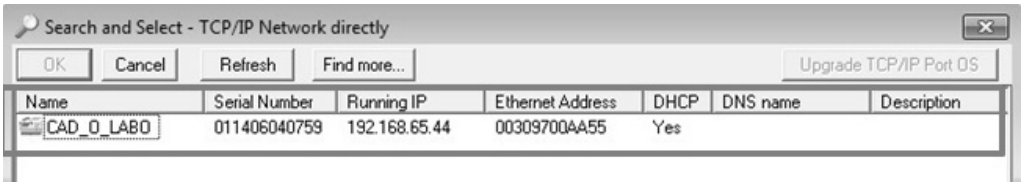
Select TCP/IP



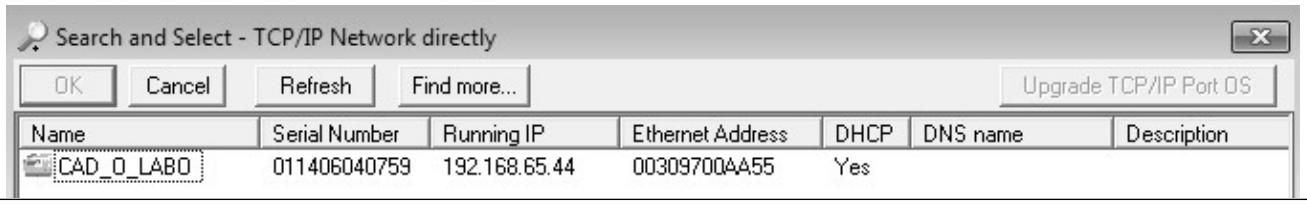
Select NO



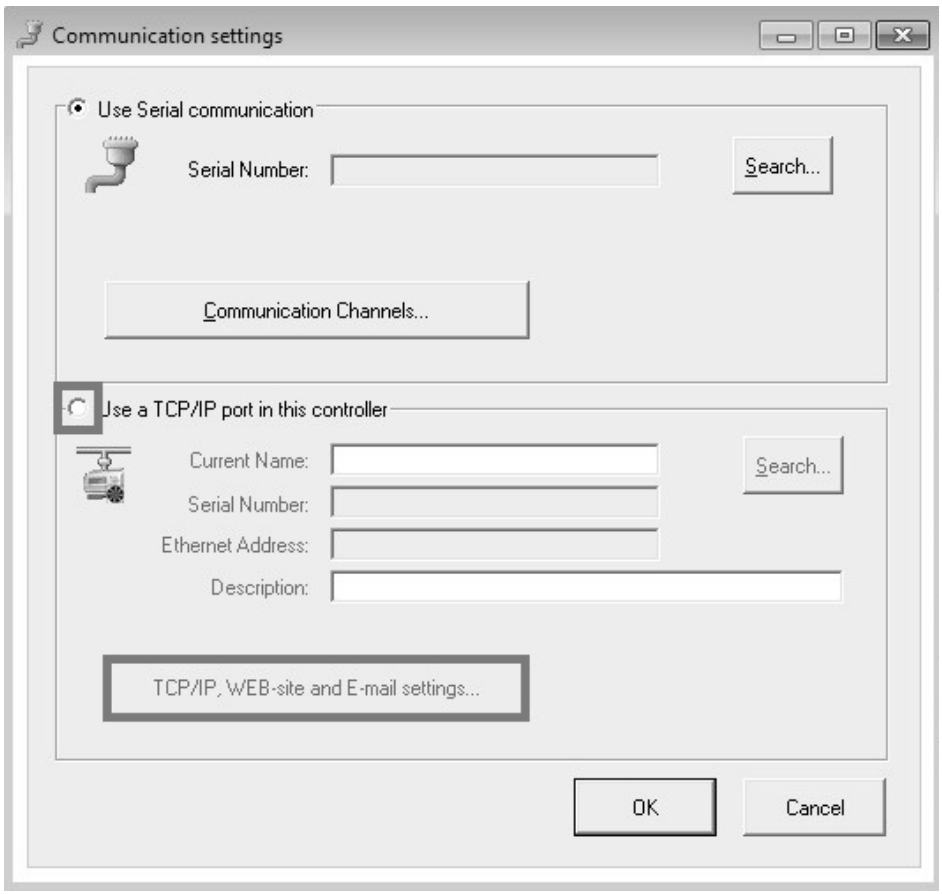
Press Search to locate the relevant Corrigo.



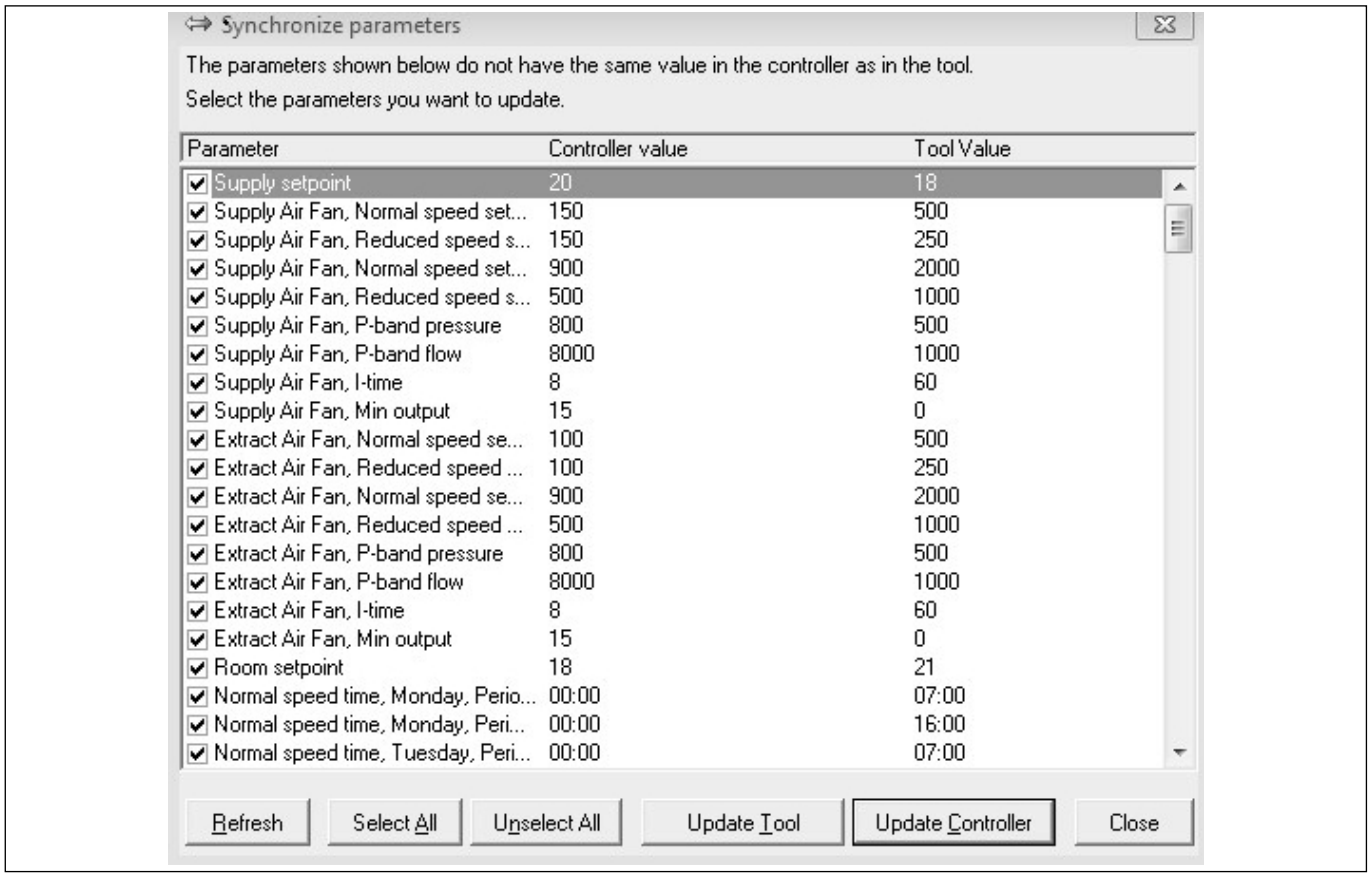
After the program has found the correct Corrigo, select it and click “OK”.



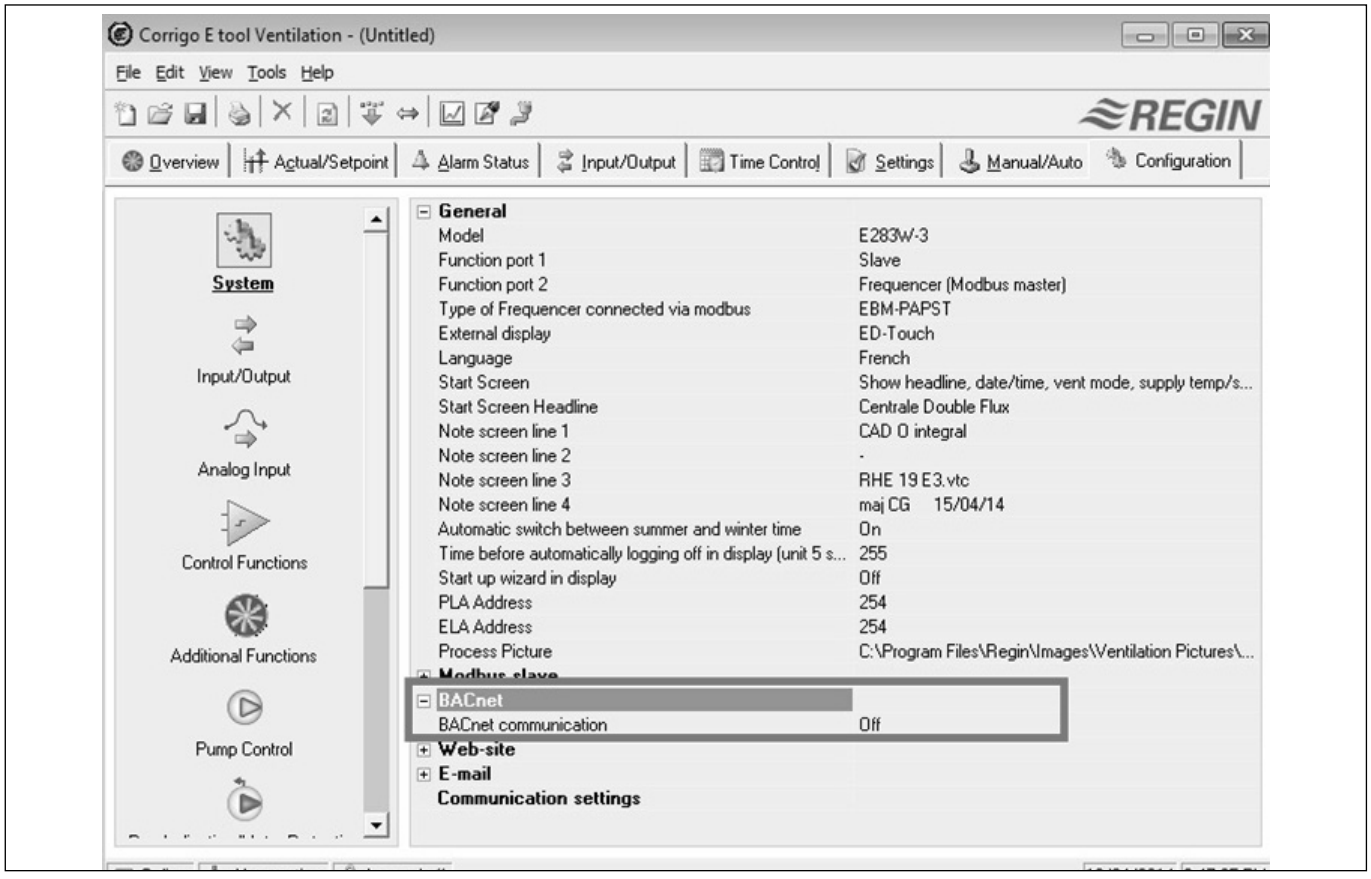
Turn back to the previous screen, the selected unit appear, you can modify the name to easily recognized it:



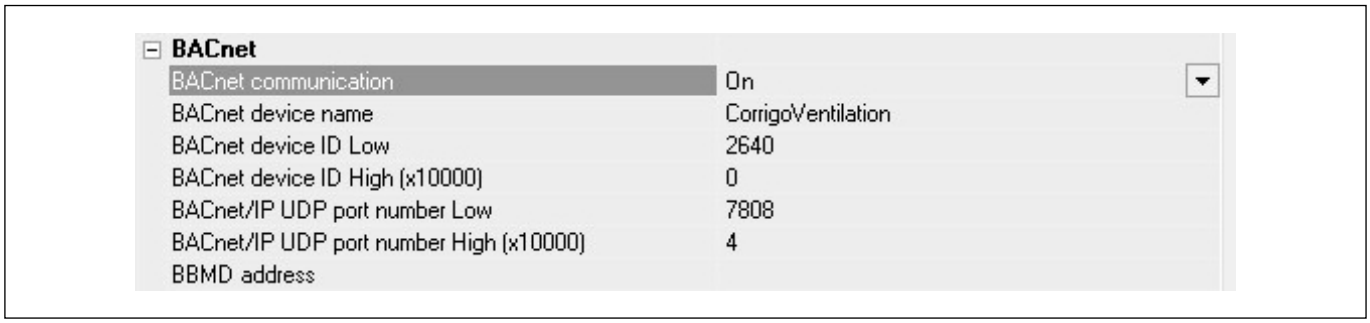
Click on TCP/IP,WEB site and Email setting, select automatic IP address, « load TCP/IP » to load the connection information into the CORRIGO. Synchronize the CORRIGO with you PC, to load on your PC the current parameter of the CORRIGO. Update E Tool. **Be careful not update the controler**.



Activation status of BACnet/IP protocol.

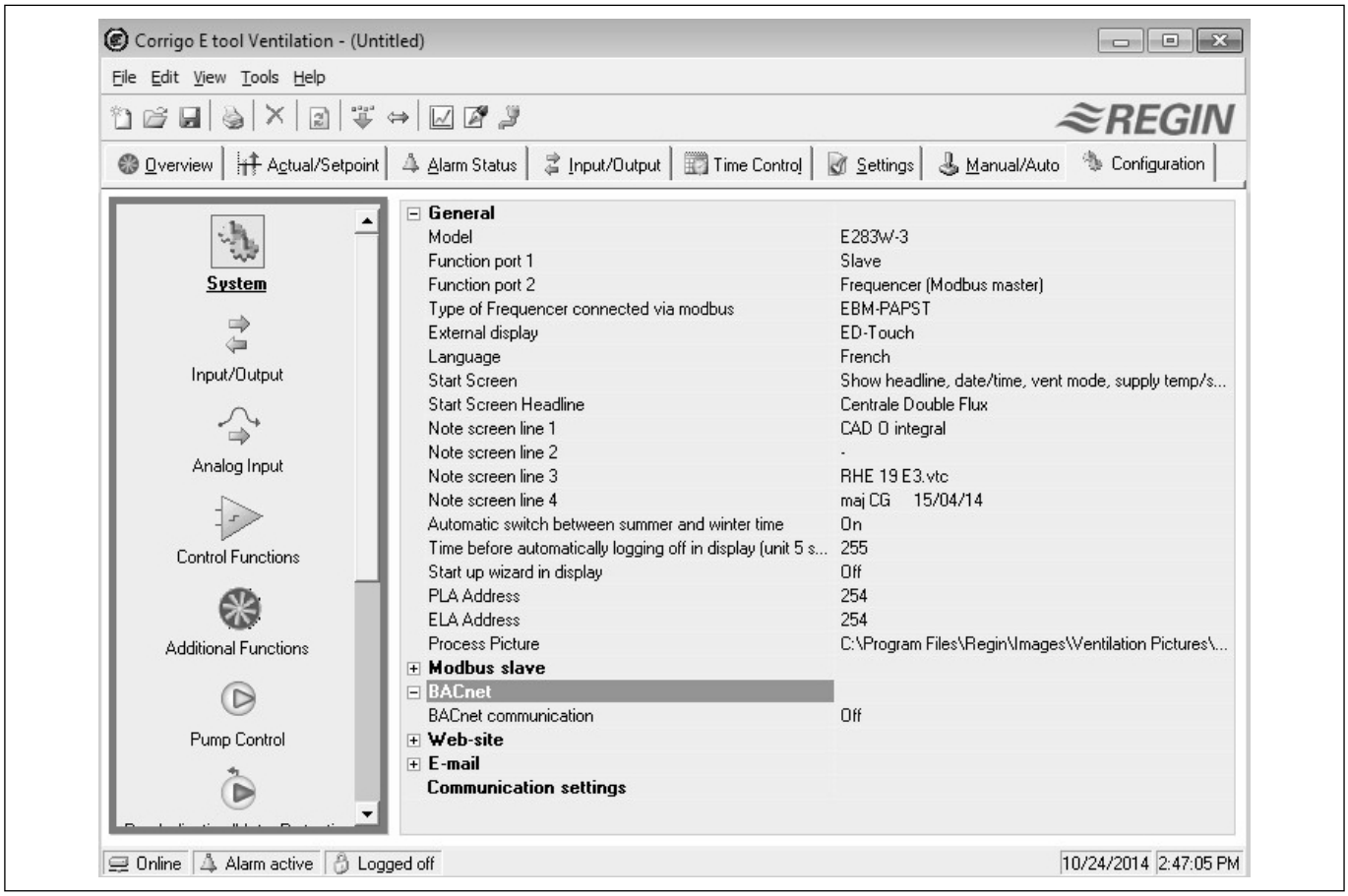


Select « ON »



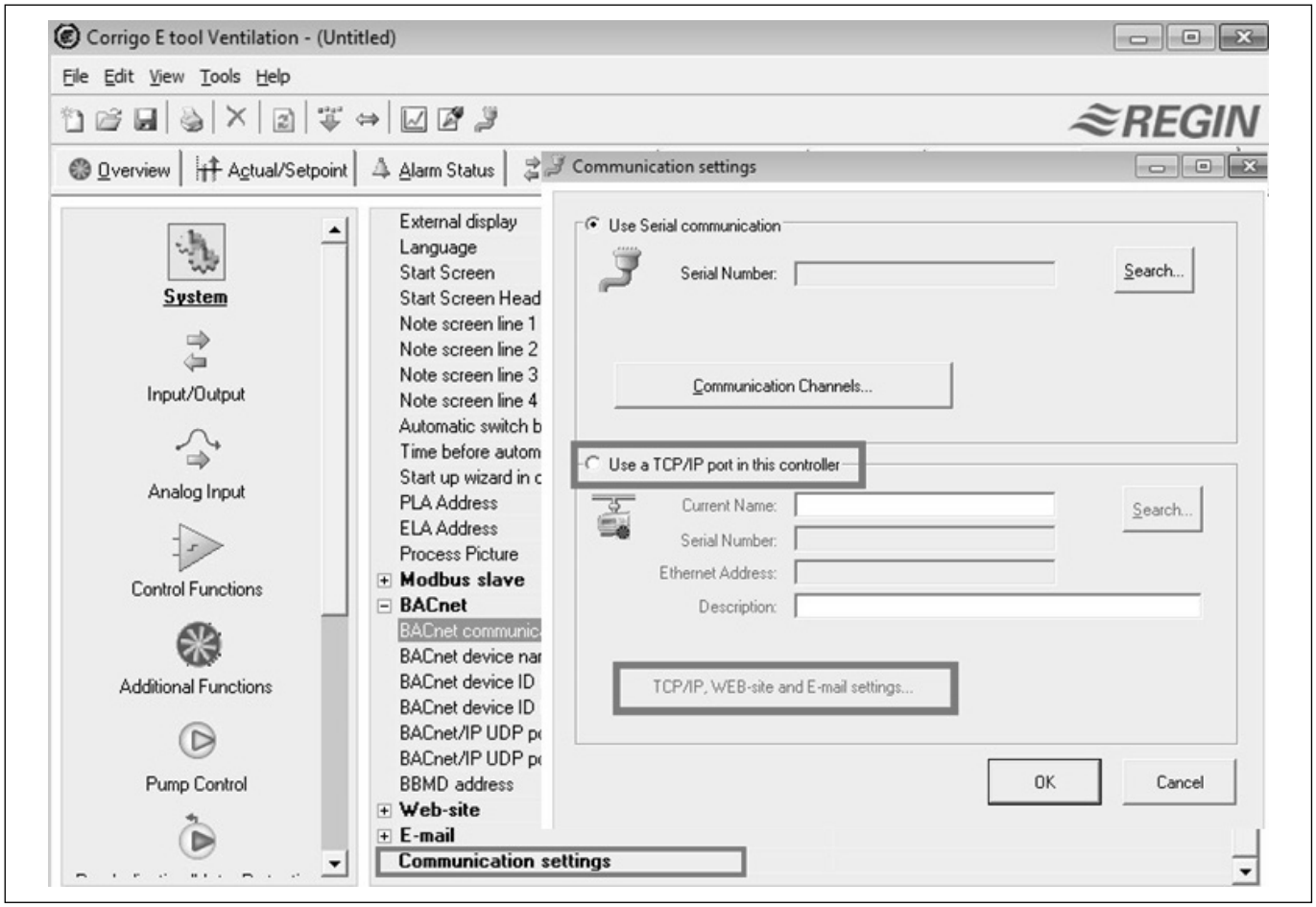
The name of the device could be change.
The device ID is divided into two parts, one low and one high. For example: If the high part of the ID would be “1”, then the device ID above would be “00012640”.
BACnet device ID low is by default 2640 on all CORRIGO, it’s necessary to change this ID when few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

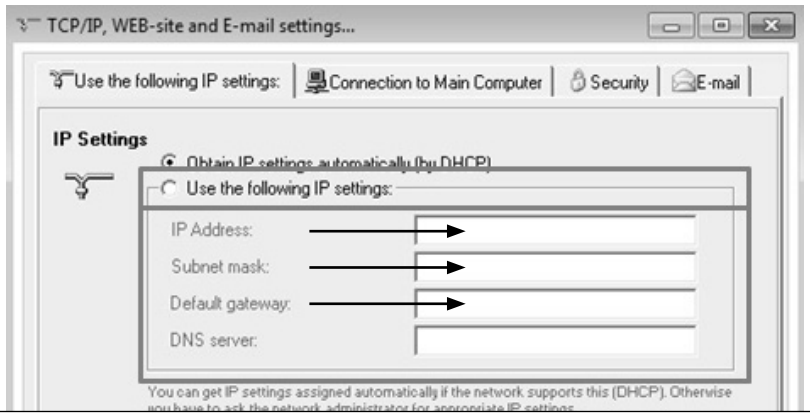


Click on Synchronize parameter ⇔, the modification done appear. Click on modify controller, admin code : 1111.

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



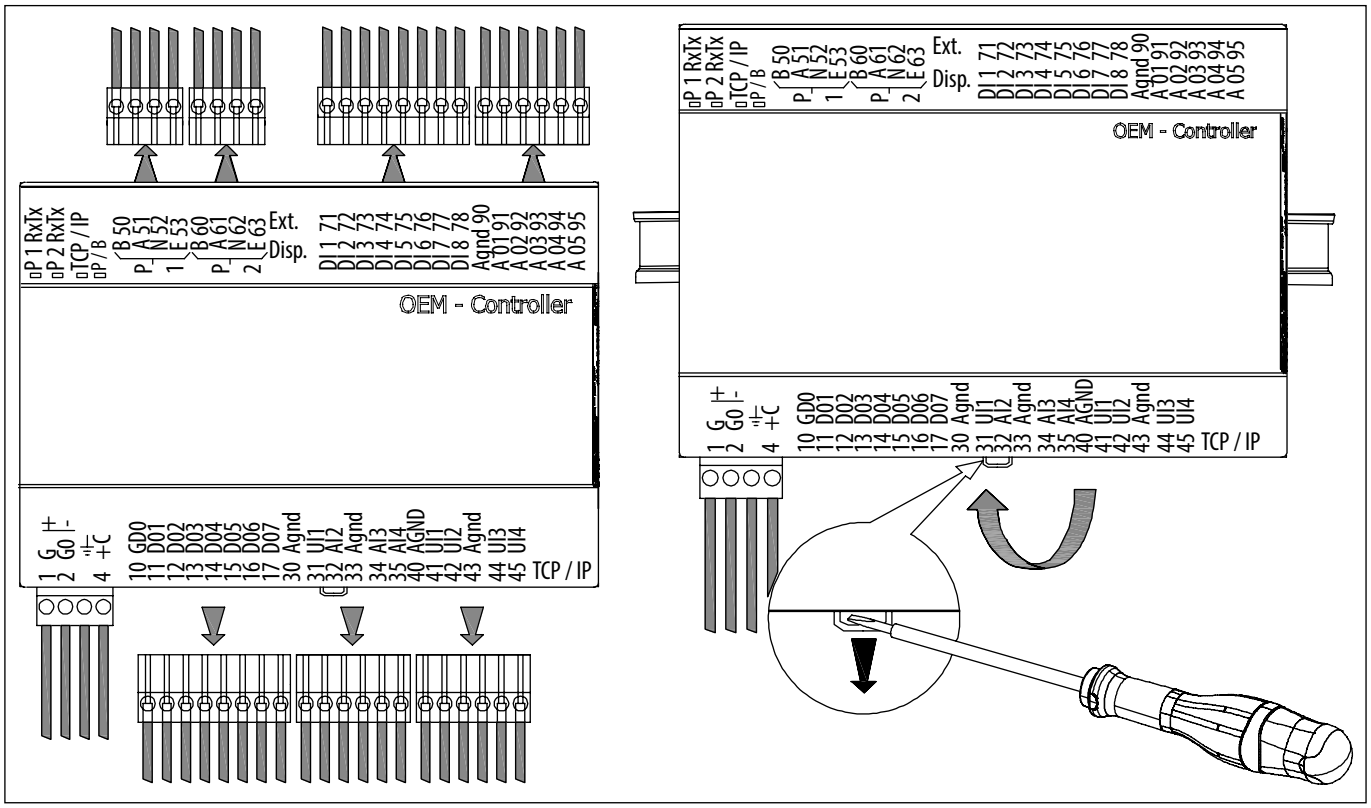
Enter the static IP adress informations and load TCP/IP settings



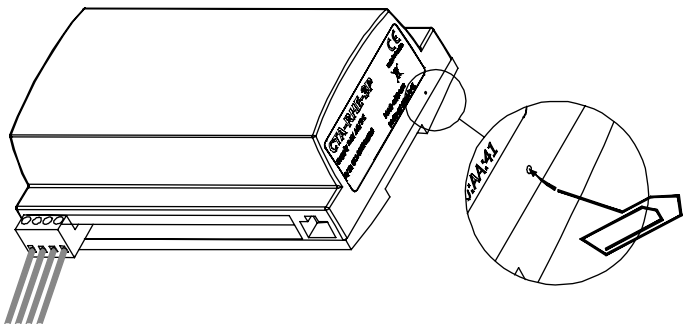
The CORRIGO is now ready to communicate on Bacnet IP.
The file of Bacnet protocole is on the PC where ETOOL is install on C:\Program Files\Domucmentation\English\Corrigo_BACnet_PICS.pdf

9.4 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.



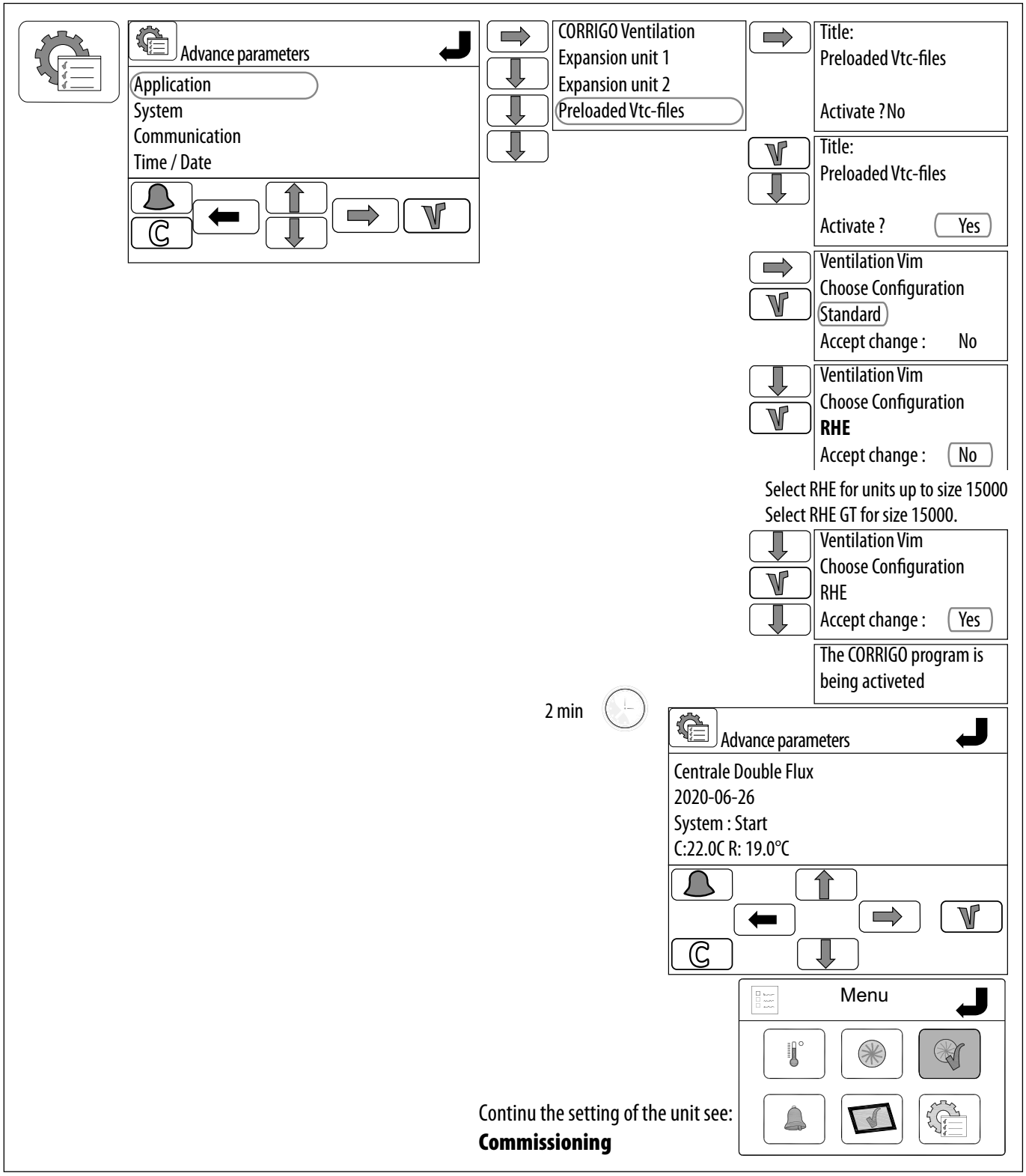
With a screw driver, unclip the CORRIGO from the DIN rail.



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 :

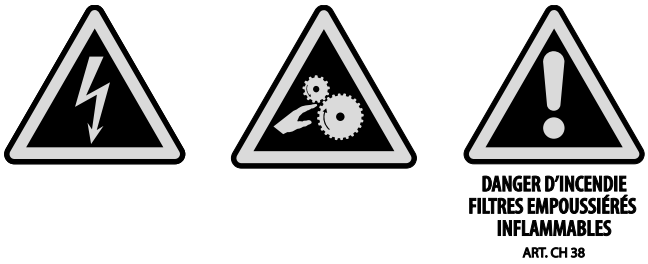


Switch off the unit, and plug all the CORRIGO connectors.

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, RHE include filters:

- on the extract air protecting the rotary heat exchanger the M5 (ePM10 75%) or F7 48mm (ePM1 55%) filter exchanger.
- on the fresh air G4 pre-filter (coarse 70%) + F7 filter (ePM1 55%) or F9 (ePM1 80%) (option).

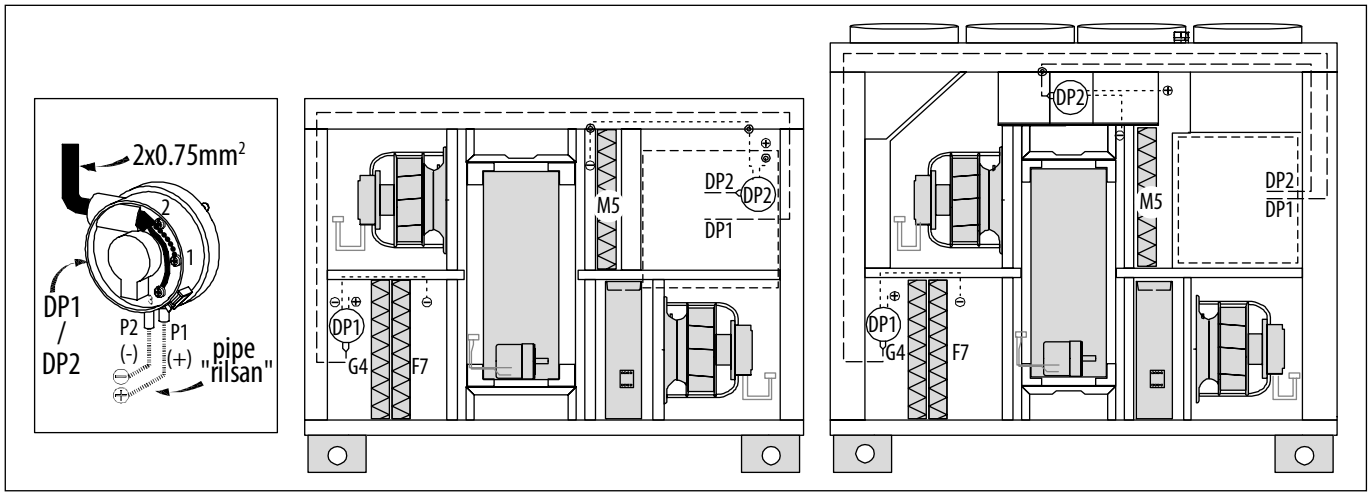
The filters F7 are held flush on the sealing joints by 2 compression latched slides.
The clogging of the filters is checked by differential pressure sensors with a return of information on the controller.

Size	Quantity	**G4** (Coarse 70%) / **M5** (ePM10 75%) (mm)	**G4** (Coarse 70%) Media surface (m²)	**M5** (ePM10 75%) Media surface (m²)	**F7** (ePM1 55%) / **F9** (ePMP1 80%) (mm)	Media surface (mm)
700/1300	1	600 x 372 x 48	0,57	3,69	600 x 372 x 96	6,81
1900	1	700 x 422 x 48	0,76	4,89	700 x 422 x 96	9,02
2500	2	425 x 472 x 48	0,52	3,32	425 x 472 x 96	6,12
3500/4500	2	505 x 562 x 48	0,73	4,70	505 x 562 x 96	8,66
6000	2	600 x 655 x 48	1,01	6,50	600 x 655 x 96	12,00
8000	3	483 x 790 x 48	0,97	6,23	483 x 790 x 96	11,50
10000	4	405 x 864 x 48	0,90	5,79	405 x 864 x 96	10,68
15000	8	525 x 512 x 48	0,69	4,45	525 x 512 x 96	8,21

Replacement filters : (see § "10.9 Spare parts list", page 97)

- Switch off the electrical power supply with the main circuit breaker.
- Open the access doors.
- Pull on the filters G4 (Coarse 70%) (Pre-filter on outdoor air) et M5 (extraction air filter).
- Pull on the mobile slides to unlock the filter F7 (ePM1 55%) ; 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 :

Seize	DP1 SUPPLY AIR		DP2 EXHAUST AIR	
	Setting in Pa if G4+F7	Setting in Pa if G4+F9	Setting in Pa if M5	Setting in Pa if F7
All sizes	300	300	150	200

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.

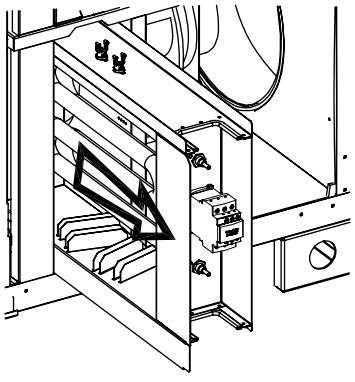
10.5 Servicing / replacement of the fans

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 Ø13 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.

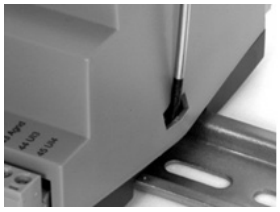
Depending on the ambient pollution and despite filtration, dust can be deposited on the coil.

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
5407030400	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 700/1300 F7
5407030500	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 1900 F7
5407030600	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 2500 F7
5407030700	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 3500/4500 F7
5407031400	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 6000 F7
5407031500	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 8000 F7
5407036100	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 10000 F7
5407074400	Filter F7 (ePM1 55%) - 1 piece	AFR RHE 15000 F7
5407030800	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 700/1300 F9
5407030900	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 1900 F9
5407031000	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 2500 F9
5407031100	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 3500/4500 F9
5407031600	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 6000 F9
5407031700	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 8000 F9
5407036200	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 10000 F9
5407074800	Filter F9 (ePM1 80%) - 1 piece	AFR RHE 15000 F9
5407030000	Filter G4 (coarse 70%) - 1 piece	AFR RHE 700/1300 G4
5407030100	Filter G4 (coarse 70%) - 1 piece	AFR RHE 1900 G4
5407030200	Filter G4 (coarse 70%) - 1 piece	AFR RHE 2500 G4
5407030300	Filter G4 (coarse 70%) - 1 piece	AFR RHE 3500/4500 G4

CODE	TYPE	NAME
5407031200	Filter G4 (coarse 70%) - 1 piece	AFR RHE 6000 G4
5407031300	Filter G4 (coarse 70%) - 1 piece	AFR RHE 8000 G4
5407036300	Filter G4 (coarse 70%) - 1 piece	AFR RHE 10000 G4
5407074300	Filter G4 (coarse 70%) - 1 piece	AFR RHE 15000 G4
5407036400	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 700/1300 M5
5407036500	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 1900 M5
5407036600	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 2500 M5
5407036700	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 3500/4500 M5
5407036800	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 6000 M5
5407036900	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 8000 M5
5407037100	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 10000 M5
5407074200	Filter M5 (ePM10 75%) - 1 piece	AFR RHE 15000 M5
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
R153142004	Electrical heater	BEOI 150 RHE 15000 72 kW Tri 400V
R153534105	Hot water coil on VD	BCOI RHE 700/1300 VD
R153534205	Hot water coil on VD	BCOI RHE 1900 VD
R153534005	Hot water coil on VD	BCOI RHE 2500 VD
R153531005	Hot water coil on VD	BCOI RHE 3500/4500 VD
R153531305	Hot/Cold water coil on HD	BROI RHE 700/1300 HD
R153531405	Hot/Cold water coil on HD	BROI RHE 1900 HD
R153531505	Hot/Cold water coil on HD	BROI RHE 2500 HD
R153533005	Hot/Cold water coil on HD	BROI RHE 3500/4500 HD
R153575605	Hot/Cold water coil on HD	BROI RHE 6000 HD
R153575705	Hot/Cold water coil on HD	BROI RHE 8000 HD
R153666015	Hot/Cold water coil on HD	BROI RHE 10000 HD
R153142104	Hot/Cold water coil on HD	BROI RHE 15000 2R HD
R153142204	Hot/Cold water coil on HD	BROI RHE 15000 4R HD
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
R153142060	replacement belt	CROI RHE 15000
R153532019	Heat exchanger motor	MEOI RHE 700/1300/1900 115M 40W 230V Mono 115 rpm
R153533019	Heat exchanger motor	MEOI RHE 2500/3500/4500/6000 214T 55W 400V Tri 214 rpm
R153575019	Heat exchanger motor	MEOI RHE 8000/10000 120W 400V Tri 170 rpm
R153142108	Heat exchanger motor	MEOI RHE 15000 186T 180W 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
R153666006	Standard rotary exchanger with motor	ENOI RHE 10000 D1570 250 Tri 400V

CODE	TYPE	NAME
R153142002	Standard rotary exchanger with motor	ENOI RHE 15000 D2050 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
R153142102	Sorption rotary exchanger with motor	ESOI RHE 15000 D2050 Tri 400V
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
R153142208	Plug fan - Price for 1 piece	PFOI RHE 15000 ECM D560 5500W Tri 400V
R153666018	Tachometer	Rotating control

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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