



RHE



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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 website www.vim.fr. 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).

VIM 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:


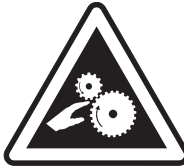

Indoor installation (recommended) or outdoor installation with accessories.


- Outdoor air operating temperature limits: -30°C / +40°C.
- 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

General

- Meaning of the danger labels present on the access doors:

| | | |
|---|---|---|
|  |  |  |
| Live equipment | Rotating machine | Potentially flammable dust filters |

- Put on appropriate PPE (Personal Protective Equipment) before any intervention.
- Before installing the air handling unit, ensure that the support and location are sufficiently strong enough to support the weight of the unit and accessories.
-  Do not open doors or panels without shutting down the unit.

Case of emergency or danger

- Cut off the power supply using the lockable disconnect switch and, if possible, the circuit breaker major.

AHU normal shutdown procedure

- Stop the unit from the ETD2 remote control or the BMS to allow the battery to ventilate before stopping the fans and the air handling unit. See § "8.2 Stop the AHU", page 66.
- Cut off the power supply using the lockable disconnect switch and, if possible, the circuit breaker major.
- Make sure that moving parts are stationary.

Before starting, check the following points:

- Check the earth connection.
- Check that the access doors are properly closed.

Tripping of safety thermostats (DI model)

- RHE DI units are fitted with 2 safety thermostats:
 - A manual reset thermostat that cuts the battery at 120°C
 - An automatic reset thermostat that cuts the battery at 85°C
- Any resetting or tripping information (via the BMS for example) involves looking for the cause of this triggering on the AHU and on the installation. Contact sav@vim.fr.

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 VIM. 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 splashing 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 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 m³/h), 1300 (1 600 m³/h), 1900 (2 100 m³/h), 2500 (3 000 m³/h), 3500 (3 600 m³/h), 4500 (4 500 m³/h), 6000/6000HP (6 000 m³/h), 8000/8000HP (8 000 m³/h), 10000/10000HP (10 000 m³/h), 15000/15000HP (15 000 m³/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 sizes 15000).

5 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
- **HDR OI** : in-line connection of the ducts with roof mounted for an outdoor installation. Access on the right hand side.
- **HDL OI** : in-line connection of the ducts with roof mounted for an outdoor installation - Access on the left Hand side.
- **VDR** : connection of the ducts by the top – Supply air on the right hand side unit front view. Indoor installation (up to size 4500 only).
- **VDL** : connection of the ducts by the top –Supply air on the left hand side unit front view. 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 2500/3500/4500/6000/8000/10000/15000).
- 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 VIM specific integrated CORRIGO programmable logic controller.
- Modbus communicating - ready to be connected control on port RS485 and BACnet IP on port TCP/IP.
- Remote touch panel (ETD2) control included.

Example of a complete designation: **RHE DC 2500 HDR**

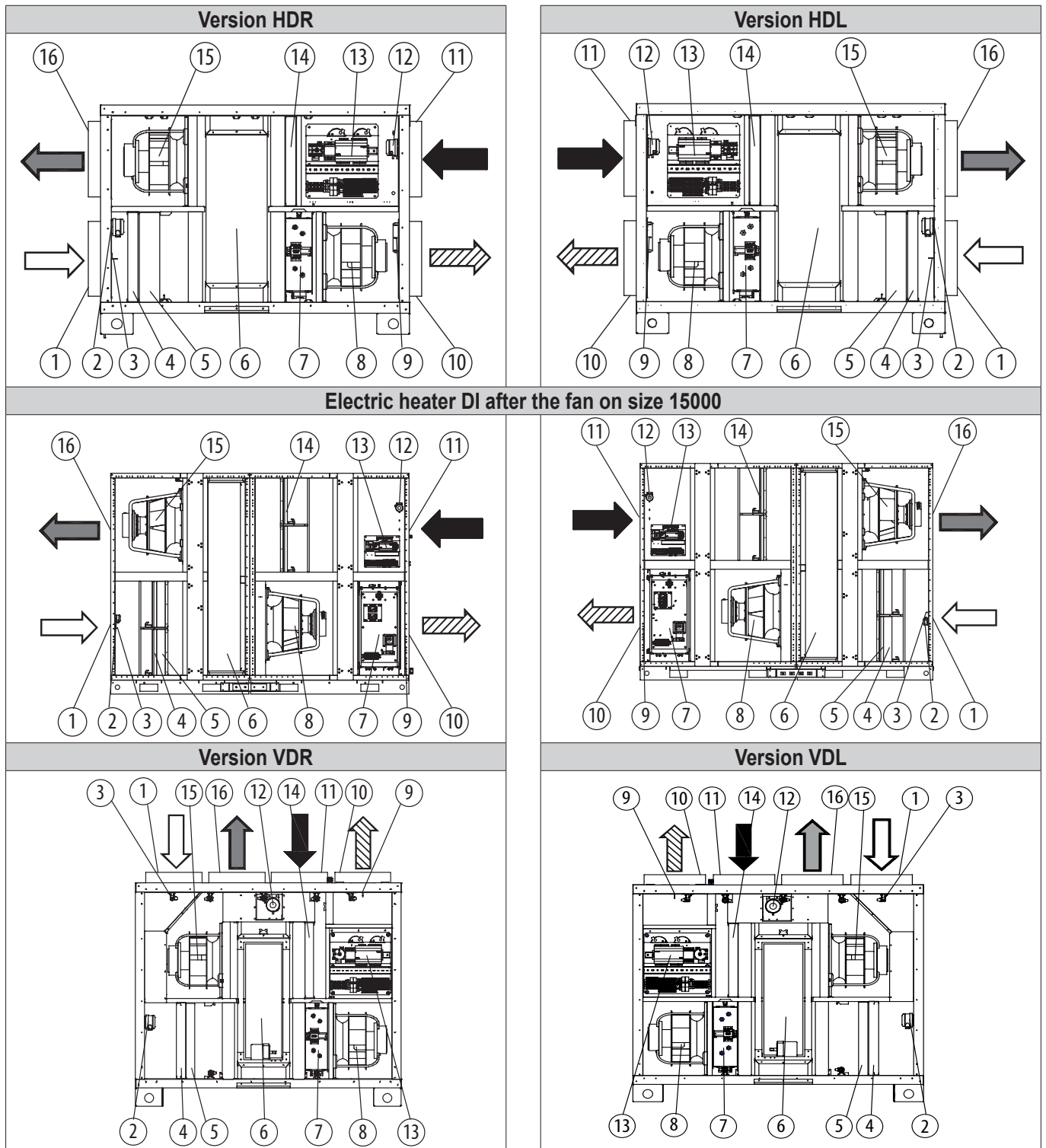
Performance :

- EN1886 : D2 / L2 / F9 / T2 / TB3 testing made in VIM laboratory
- Internal leakage, recirculation : C2 (<2%) according EN13141-7-2011.

2.2 Main components

2.2.1 General description

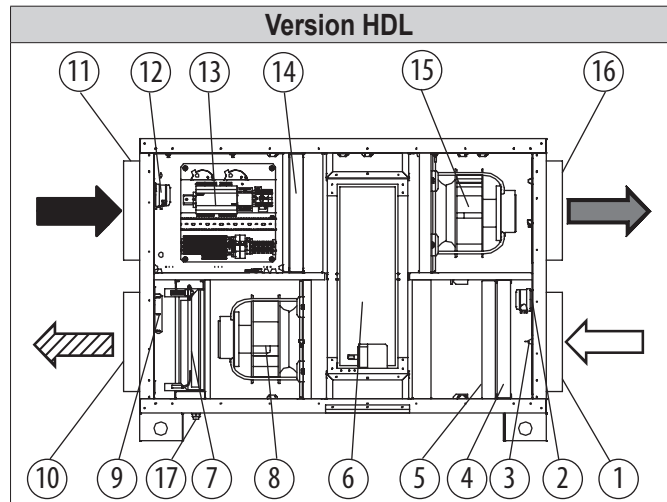
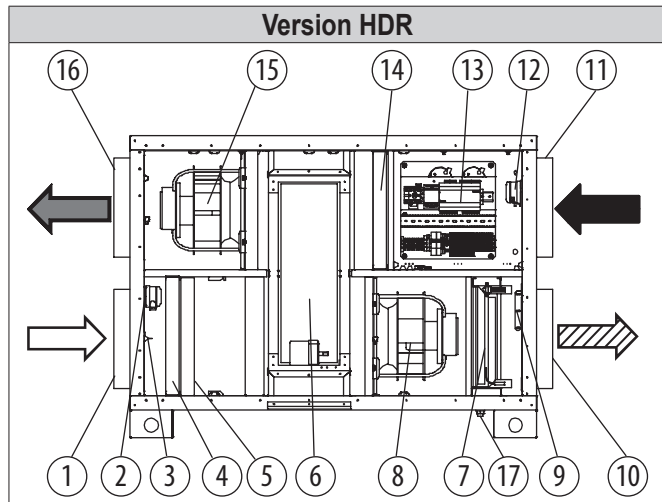
Version without heater (D) or with electric heater (DI)



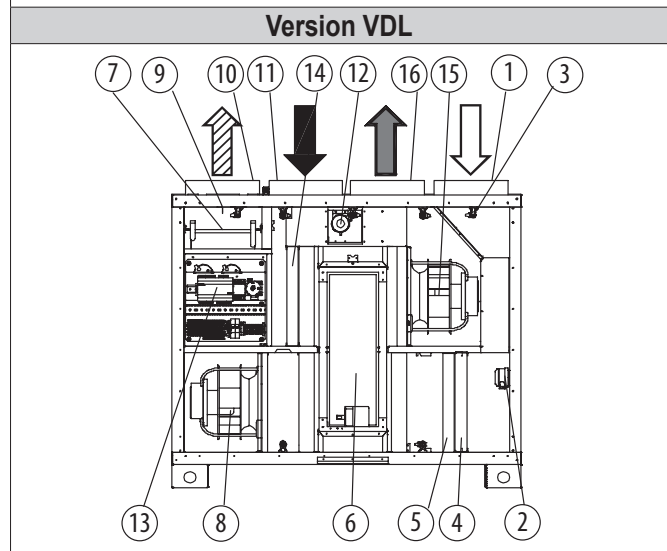
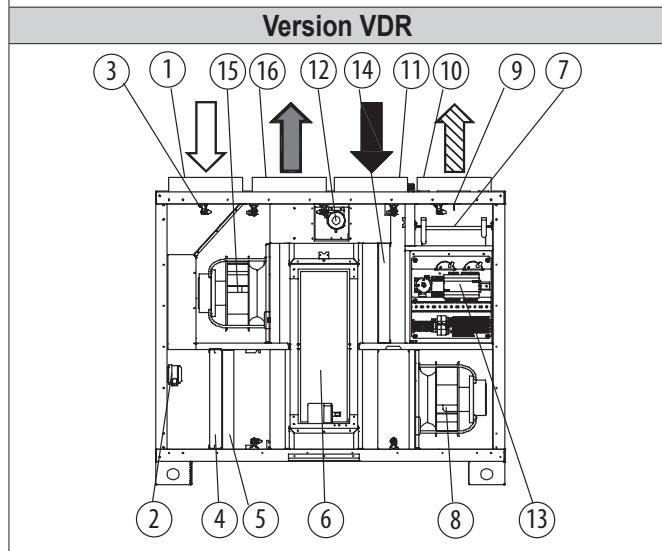
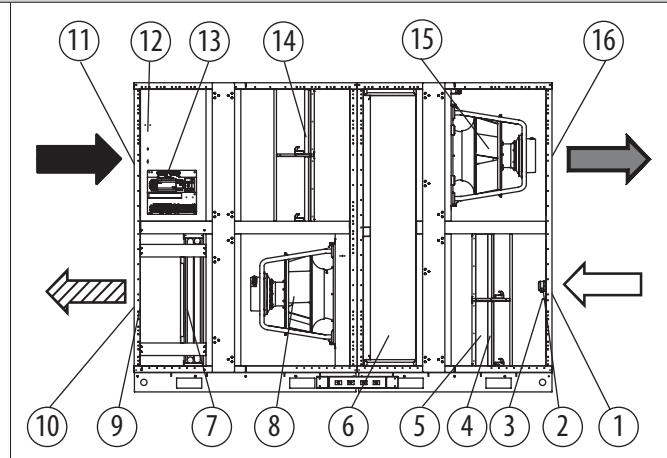
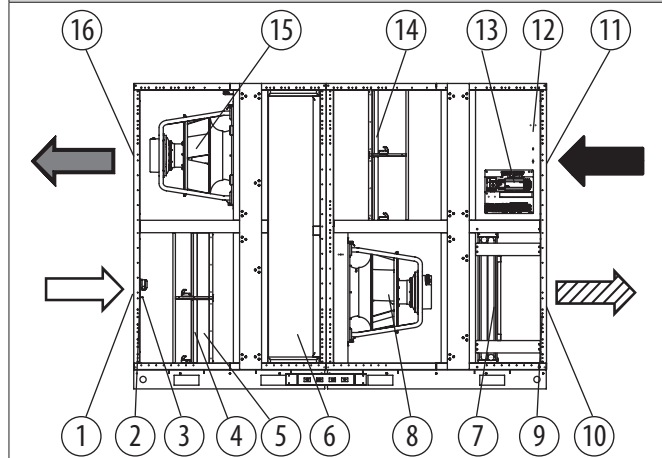
| Ref | Description | Symbol |
|-----|--------------------------------------|--------|
| 1 | Outdoor air duct connection | |
| 2 | Pressure guard on outdoor air filter | |
| 3 | Outdoor air temperature sensor | |
| 4 | Filter G4 (Coarse 70%) outdoor air | |
| 5 | Filter F7 (ePM1 55%) outdoor air | |
| 6 | Rotary heat exchanger | |
| 7 | Electric post heater (DI) | |
| 8 | Supply air fan | |
| 9 | Supply air temperature sensor | |

| Ref | Description | Symbol |
|-----|---|--------|
| 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 50%) exhaust air | |
| 15 | Exhaust air fan | |
| 16 | Exhaust air duct connection | |

Version hot water coil (DC) or reversible cold water/hot water coil (DFR)



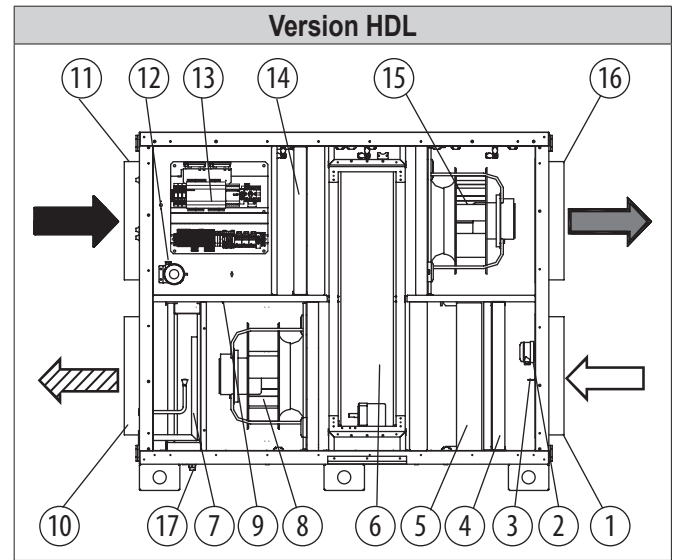
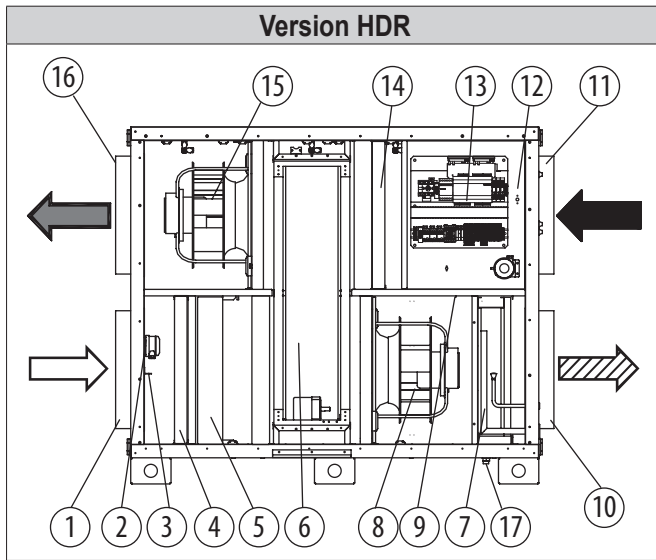
Size 15000



| 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 | 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 | |

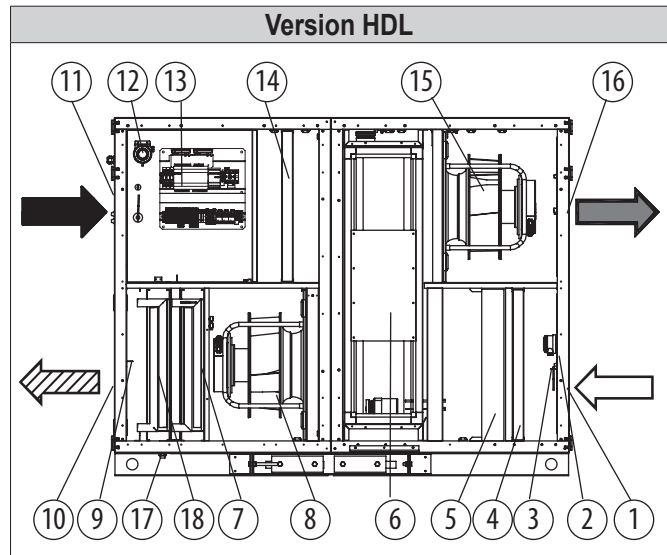
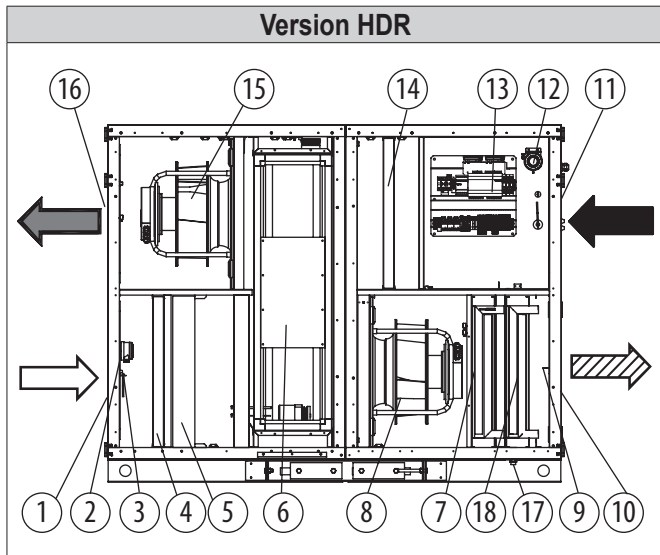
| Ref | Description | Symbol |
|-----|---|--------|
| 10 | Supply air duct connection | |
| 11 | Extract air duct connection | |
| 12 | Pressure guard extract air filter | |
| 13 | Electrical connection box/ control system | |
| 14 | Filter M5 (ePM10 50%) exhaust air | |
| 15 | Exhaust air fan | |
| 16 | Exhaust air duct connection | |
| 17 | condensate drain 3/4" (DFR only) | |

Version direct expansion coil (DX)

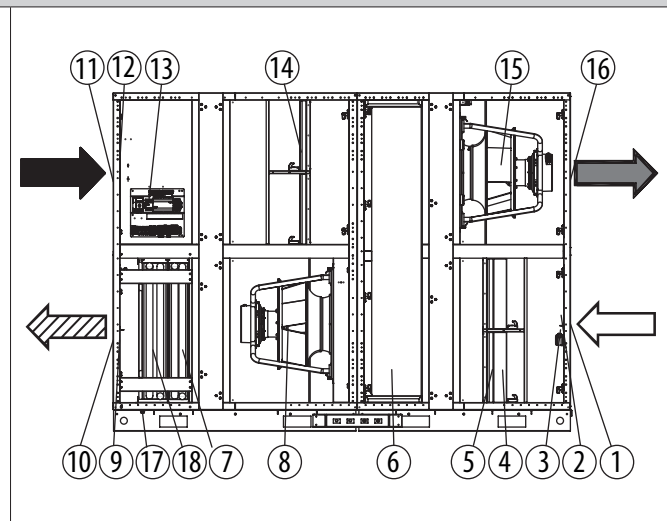
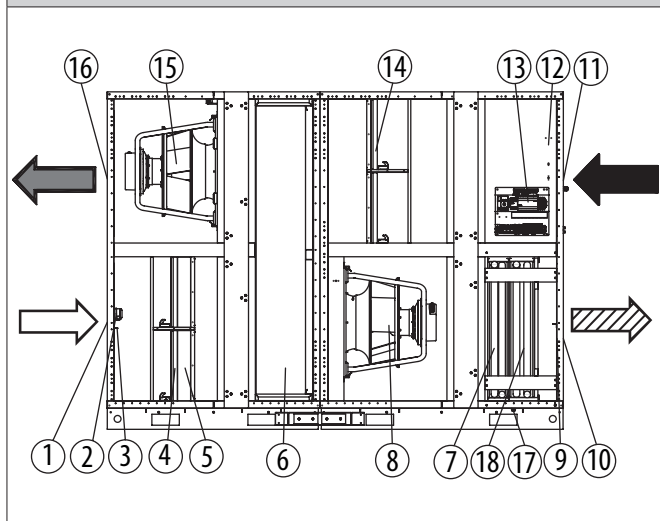


| Reference | Description | Symbol |
|-----------|---|--------|
| 1 | Outdoor air duct connection | ⇨ |
| 2 | Pressure guard on outdoor air filter | |
| 3 | Outdoor air temperature sensor | |
| 4 | Filter G4 (Coarse 70%) outdoor air | |
| 5 | F7 (ePM1 55%) filter on outdoor Air | |
| 6 | Rotary heat 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 50%) filter on extract | |
| 15 | Exhaust air fan | |
| 16 | Exhaust air duct connection | ⇨ |
| 17 | Evacuation of condensates 3/4" | |

Hot and cold water coil (DC/DF)



Size 15000



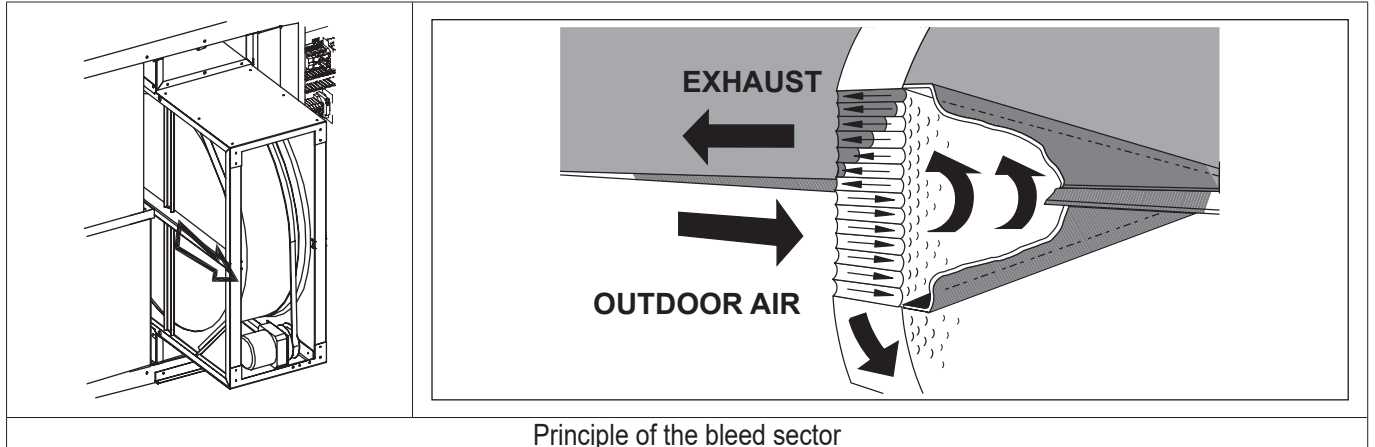
| Ref | Description | Symbol |
|-----|---|--------|
| 1 | Outdoor air duct connection | |
| 2 | Pressure guard on outdoor air filter | |
| 3 | Outdoor air temperature sensor | |
| 4 | Filter G4 (Coarse 70%) outdoor air | |
| 5 | F7 (ePM1 55%) filter on outdoor Air | |
| 6 | Rotary heat exchanger | |
| 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 50%) filter on extract | |
| 15 | Exhaust air fan | |
| 16 | Exhaust air duct connection | |
| 17 | Evacuation of condensates 3/4" | |
| 18 | Cold water coil | |

2.2.2 Rotary heat exchanger - Principle / Construction

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.

Purge sector:

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



Condensation rotary heat exchanger or Sorption:

The thermal efficiency (sensible heat) is mainly 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 will nevertheless be less dry, this contributes to a better thermal comfort. This rotor is drive with one speed motor.

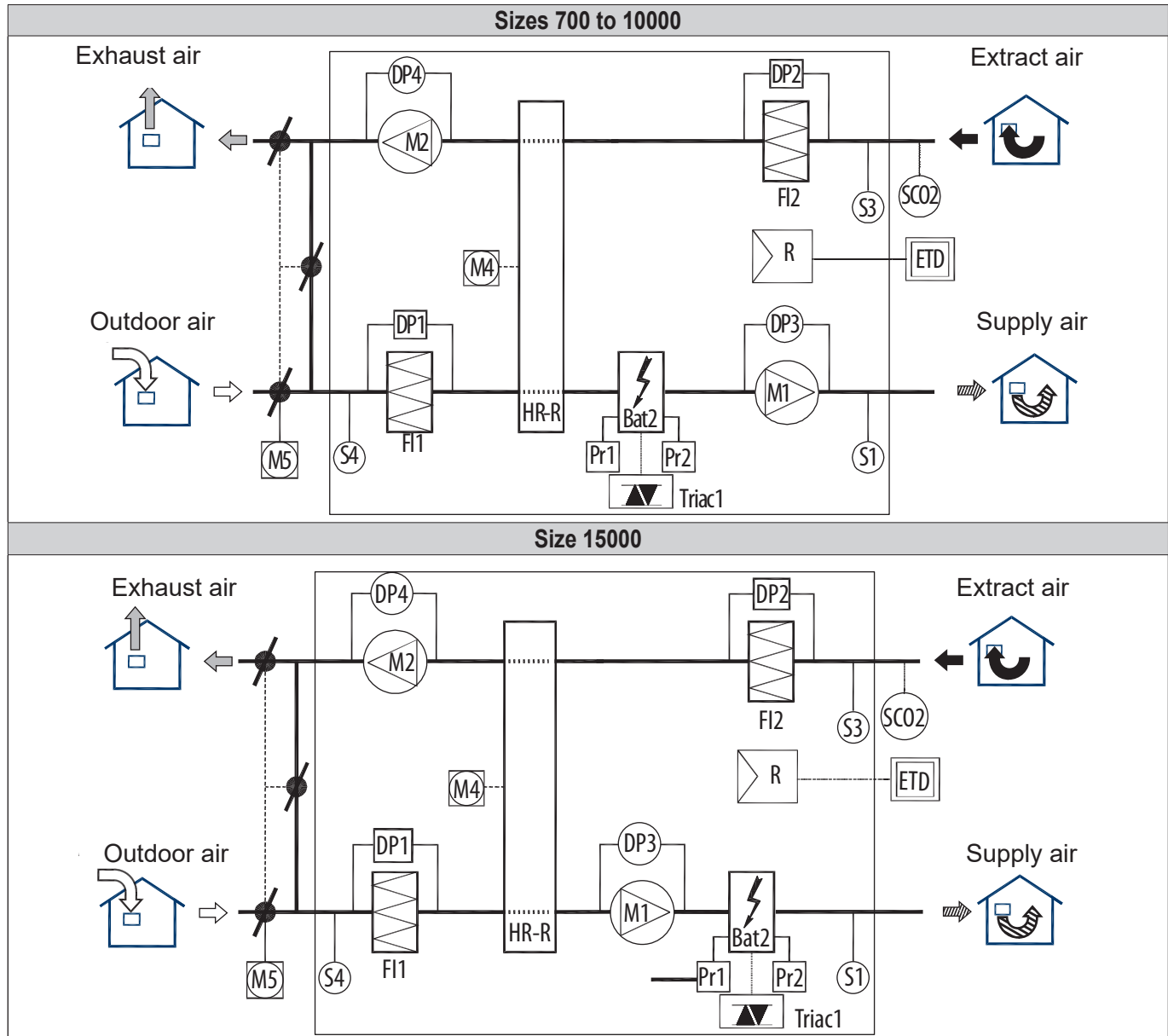
- **Sorption Rotor - (optional on RHE) :**

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.

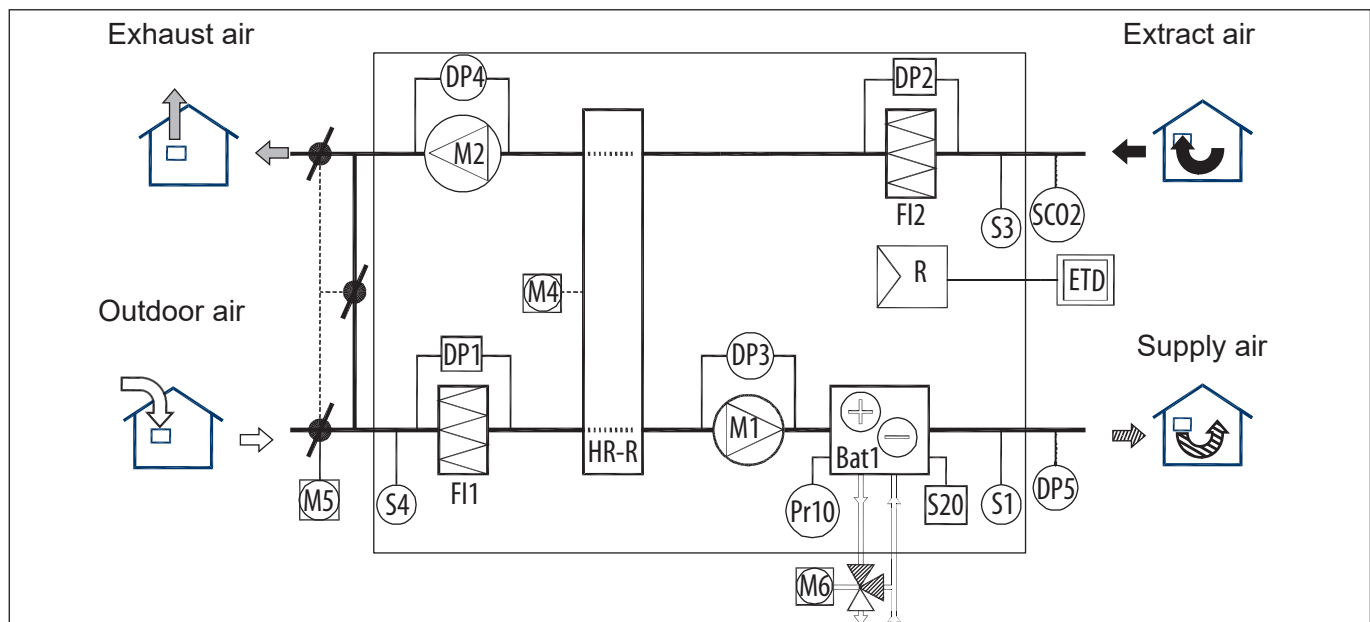
All our rotors are supplied with a purge section. Purge section works as follows: A small part of the supply air stream is redirected into the exhaust stream thus ensuring the cleaning process. Equally, any migration of exhaust air into the supply stream is inhibited.

2.3 Functional synoptics (examples)

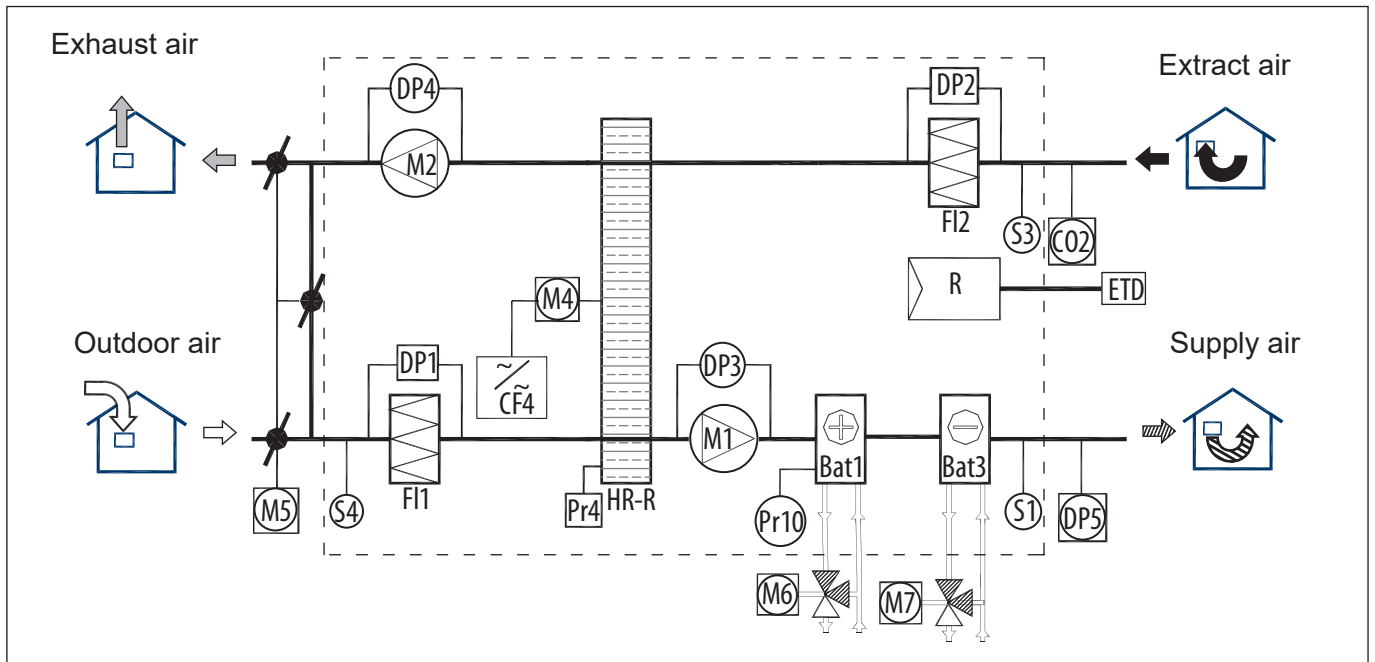
RHE D / DI



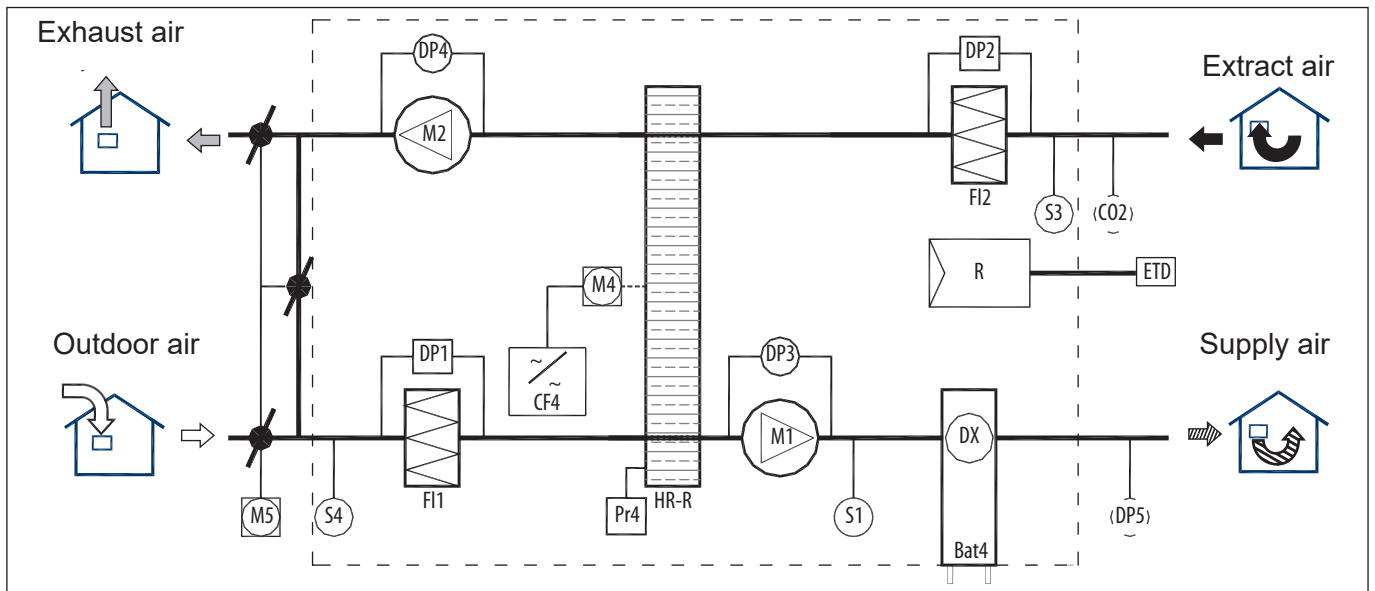
RHE DFR / DC



RHE DC/DF



RHE DX



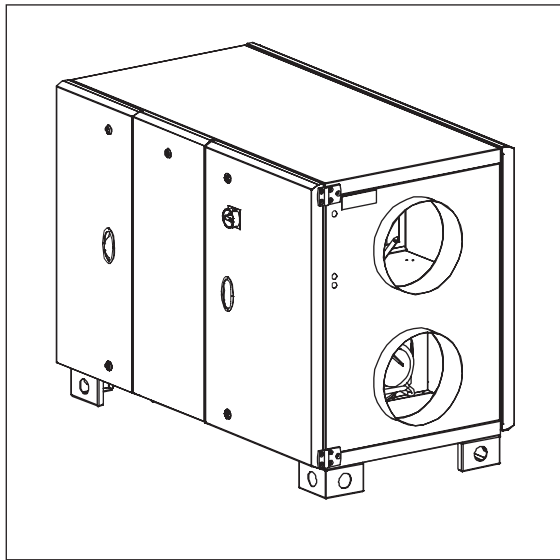
| | | | | | |
|------|---|------|--|-------------|---|
| M1 | Supply air fan motor | HR-R | Rotary heat exchanger | Pr10 | Anti frost sensor |
| M2 | Exhaust air fan motor | Pr4 | Tachometer - (rotating guard on the rotary heat exchanger) | Pr1/ Pr2 | Security thermostat (Manu/ Auto) |
| M4 | Rotary exchanger motor | CF4 | Inverter on rotary heat exchanger sorption | 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 T° sensor | DP1 | Outdoor air filter pressure guard | Bat 4 | DX coil - not control by the controller |
| S3 | Extract air T° sensor | DP2 | Extract air filter pressure guard | | |
| S4 | Outdoor T° sensor | DP3 | Supply air fan pressure transmitter | R | Controller CORRIGO E28 VIM |
| SCO2 | Air quality sensor (optional VAV mode) | DP4 | Exhaust air fan pressure transmitter | ETD2 | Room touch screen display |
| | | DP5 | Duct pressure transmitter (optional COP mode) | | |

3. INSTALLATION

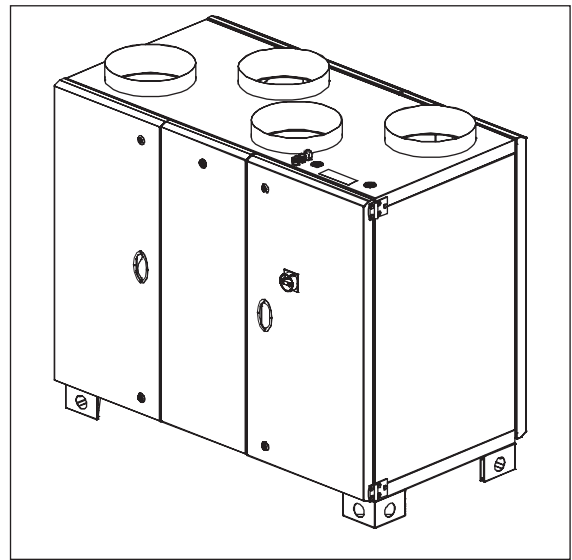
3.1 Machine identification / Symbols

Identification label fixed on the casing

| | | |
|---|-----------------------------------|---------------------------------------|
| CAD O Integral ER 25 VLD | | Code : 018044WW |
| CORRIGO Without Wheel | | |
| GENERAL DATA : | | |
| Power supply voltage : 400 V Triphase + N~50Hz | Motor driven fan power : 2 x 1 kW | Motor driven fan current : 2 x 1,63 A |
| Total supply power : 3kW | Réversible water coil | |
| Total current : 4.44 A | Nbre of rows : 2 | |
| ELECTRICAL CONNECTION : Connections must be performed by a professional applying the recognized rules of good practice, standard and safety regulation in force. | | |
| OPERATION AND MAINTENANCE INSTRUCTION | | |
| See technical manual | | |
| ZA Mégy Sud - F 79800 SOUDAN Tel: 05.49.06.60.00 | Weight : 293 kg | ViM |



Version HD (supply side upward)



Version VD (on upper righthand corner)

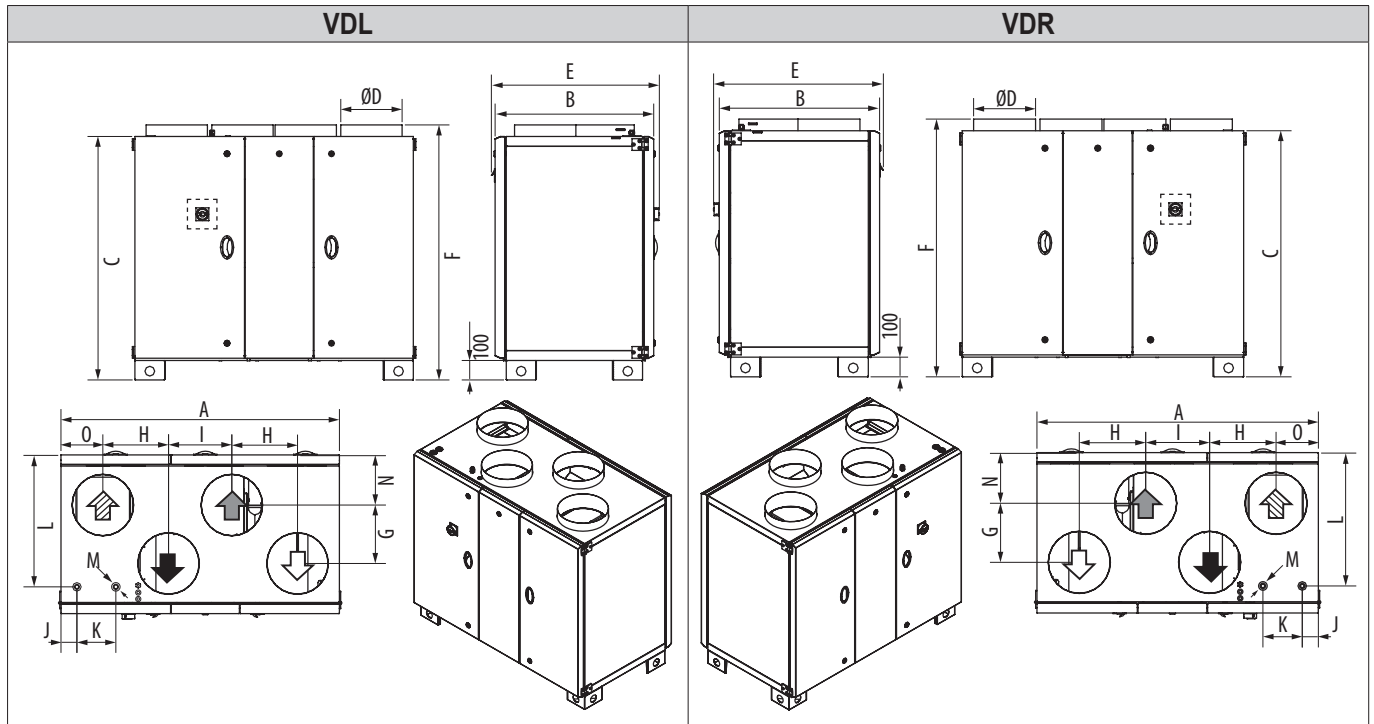
Meaning of the symbols present on the unit and in the manual

| AHU labelling | |
|--|--|
| <p>Prise air neuf extérieur Outdoor air</p> | <p>Reprise air vicié intérieur Extract air</p> |
| <p>Soufflage air neuf intérieur Supply air</p> | <p>Rejet air vicié Extérieur Exhaust air</p> |

| Symbol Instructions manual | |
|----------------------------|--------------------|
| <p>Outdoor air</p> | <p>Extract air</p> |
| <p>Supply air</p> | <p>Exhaust air</p> |

3.2 Dimensions and weight

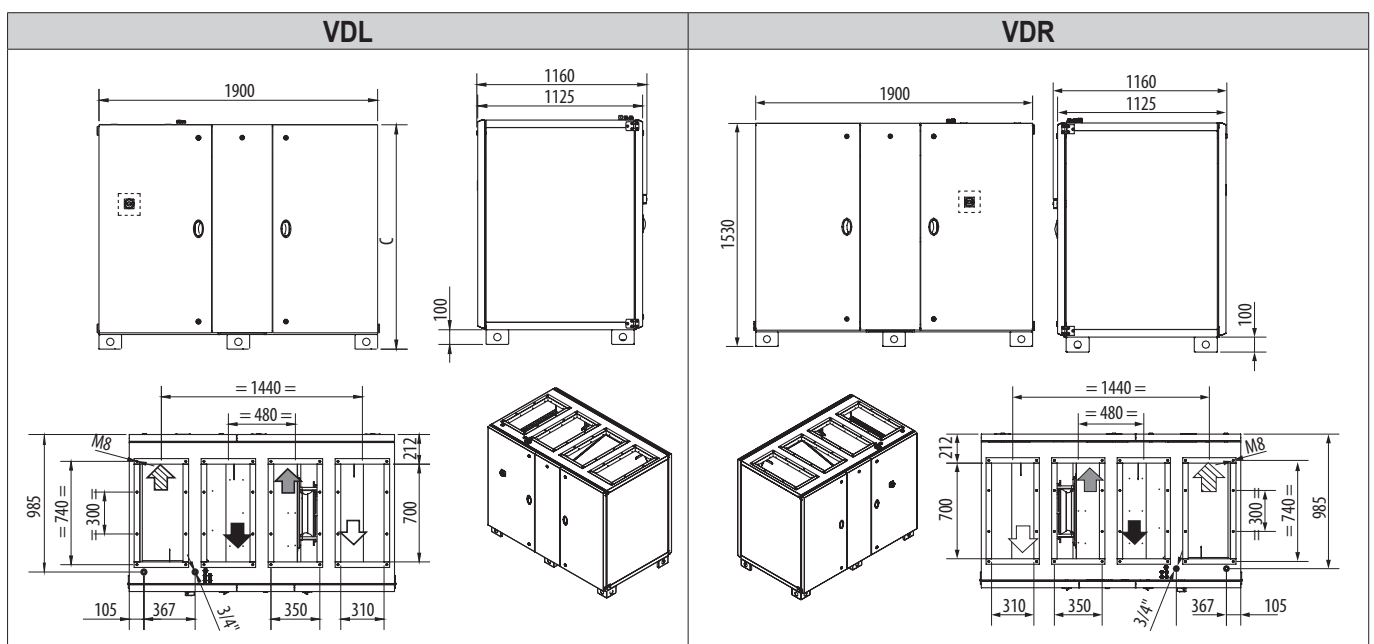
RHE VD 700 / 1300 / 1900 / 2500 / 3500



| Sizes | Dimensions (mm) | | | | | | | | | | | | | | | Weight (kg) | | |
|---------|-----------------|------|------|-----|------|------|-----|-----|-----|-----|-----|-----|------|-----|-----|-------------|-----|-----|
| | A | B | C | ØD | E | F | G | H | I | J | K | L | M | N | O | D | DI | DC |
| 700 VD | 1285 | 715 | 1125 | 250 | 750 | 1185 | 200 | 310 | 300 | 101 | 195 | 569 | 1/2" | 258 | 183 | 196 | 206 | 206 |
| 1300 VD | 1285 | 715 | 1125 | 250 | 750 | 1185 | 200 | 310 | 300 | 101 | 195 | 569 | 1/2" | 258 | 183 | 196 | 213 | 213 |
| 1900 VD | 1490 | 815 | 1250 | 315 | 850 | 1309 | 300 | 355 | 350 | 90 | 255 | 689 | 1/2" | 258 | 215 | 257 | 265 | 267 |
| 2500 VD | 1740 | 965 | 1350 | 355 | 1000 | 1410 | 400 | 420 | 400 | 105 | 307 | 825 | 3/4" | 283 | 250 | 328 | 344 | 345 |
| 3500 VD | 1900 | 1125 | 1530 | 450 | 1156 | 1590 | 450 | 460 | 400 | 105 | 367 | 985 | 3/4" | 338 | 290 | 395 | 431 | 431 |

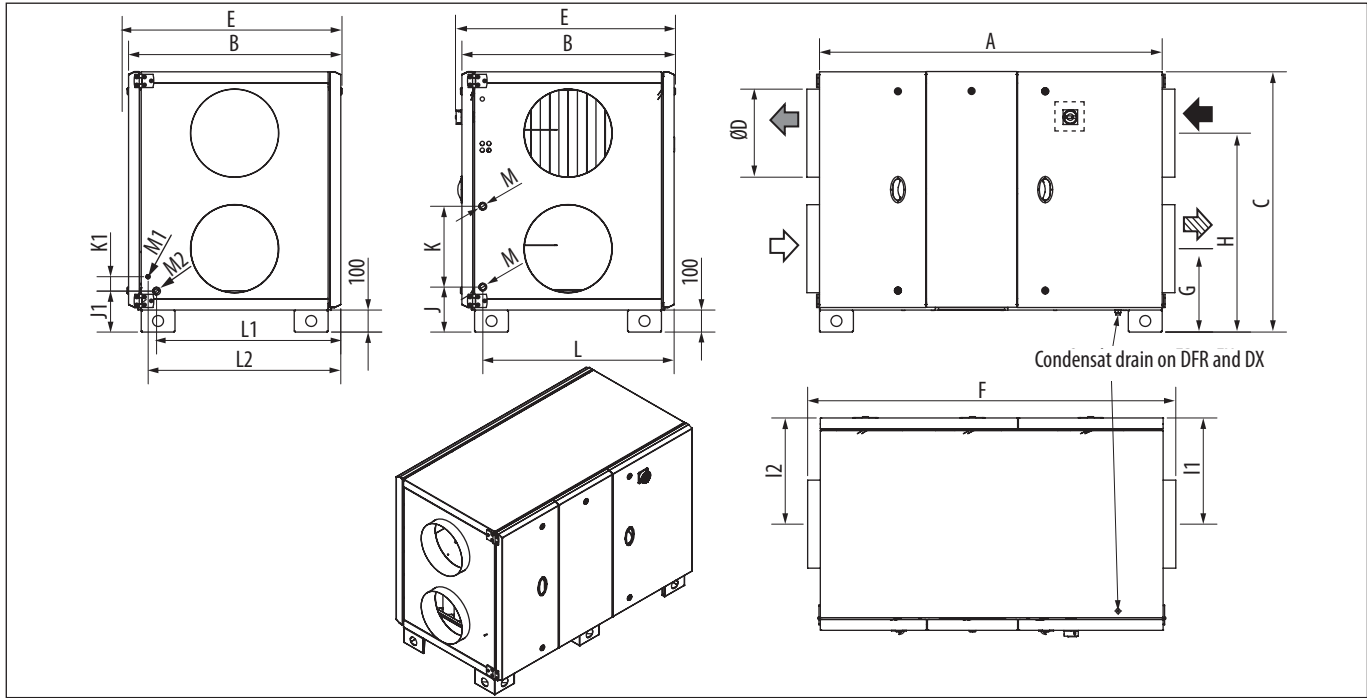
RHE VD 4500

Weight 451 kg



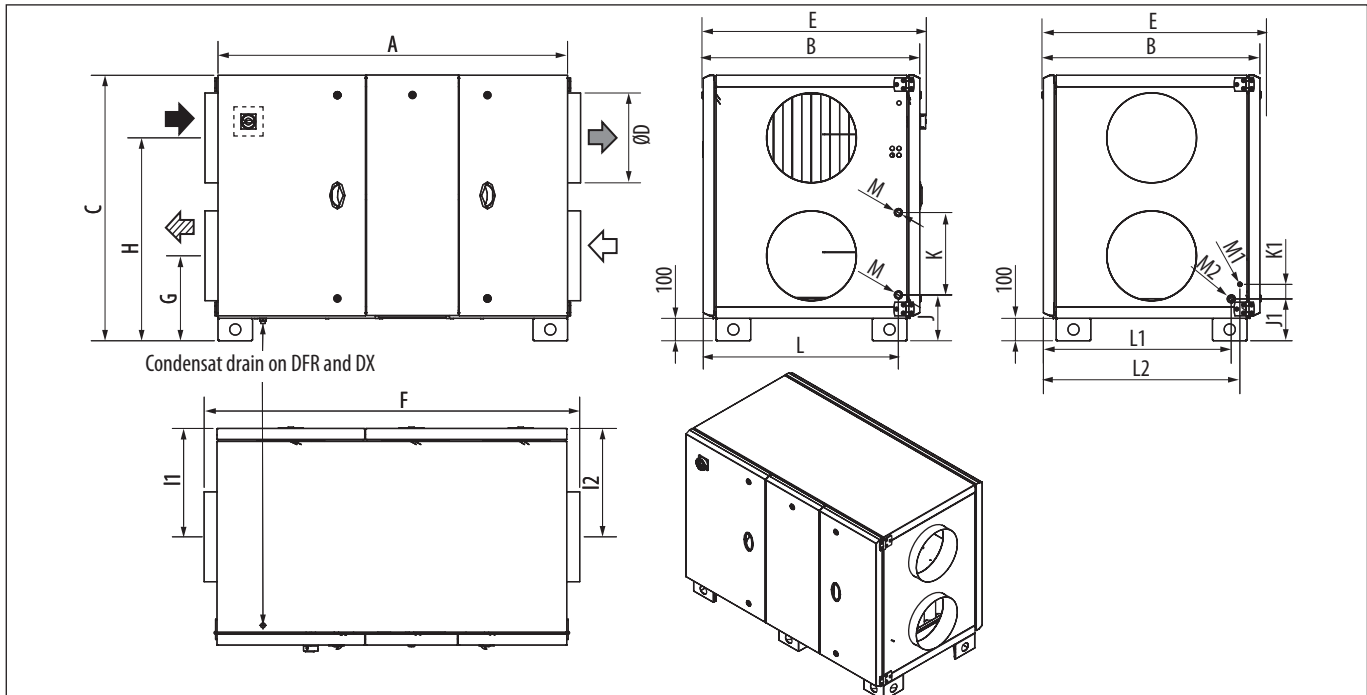
RHE HDR 700 / 1300 / 1900 / 2500 / 3500 / 4500

Right hand side access door on the supply air flow direction



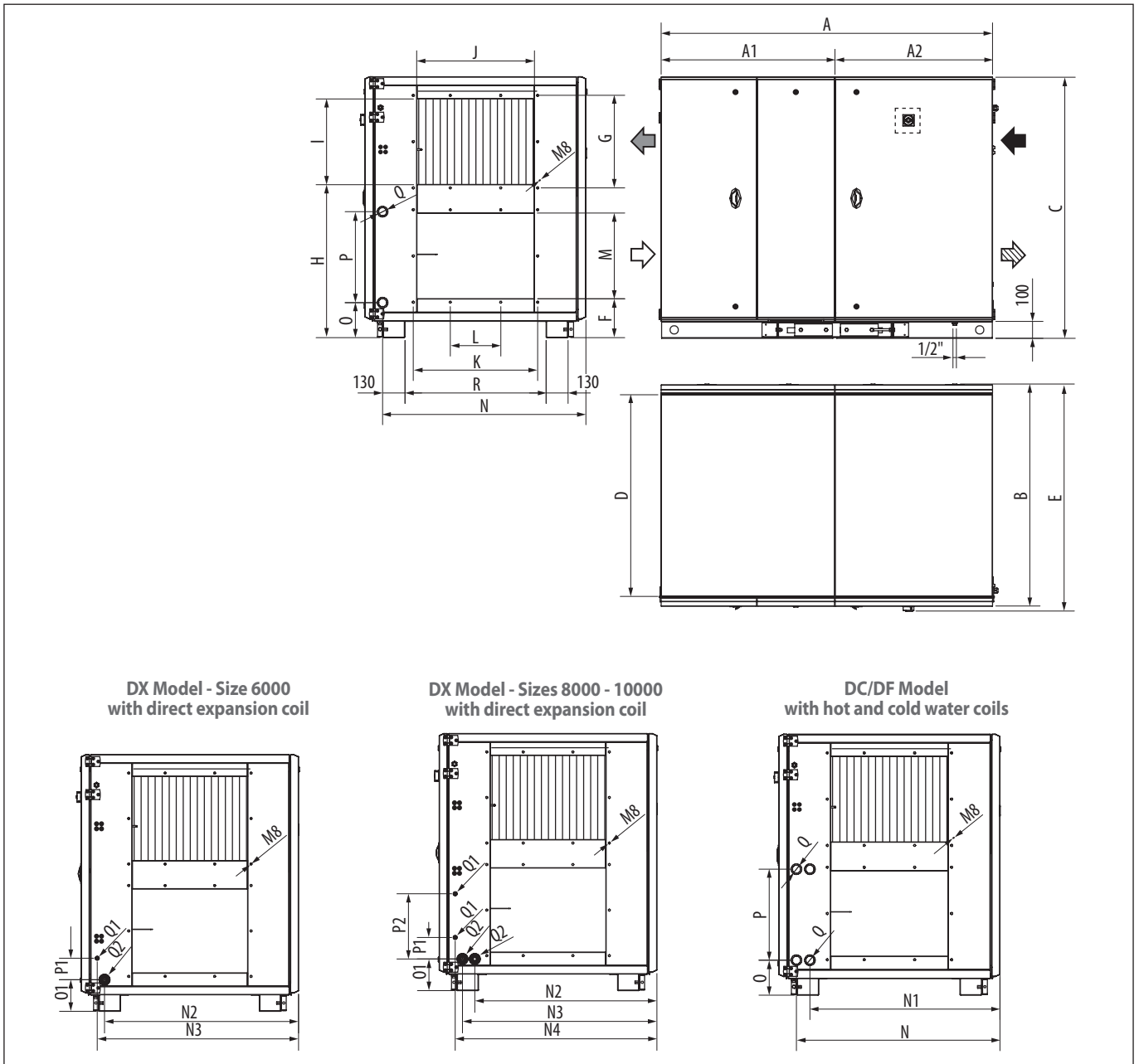
RHE HDL 700 / 1300 / 1900 / 2500 / 3500 / 4500

Left hand side access door on the supply air flow direction



| Size | Dimensions (mm) | | | | | | | | | | | | | | | | | | | |
|---------|-----------------|------|------|-----|------|---------|-------------|------|-------|-------|-----|---------|-------------|------|------|-----|-------|------|------|------|
| | A | B | C | ØD | E | F | G | H | I1 | I2 | J | J1 | K | K1 | L | L1 | L2 | M | M1 | M2 |
| 700 HD | 1309 | 715 | 983 | 315 | 763 | 1425 | 329 | 754 | 327,5 | 357,5 | 210 | 214 | 255 | 232 | 625 | 592 | 597 | 1/2" | 9,5 | 9,5 |
| 1300 HD | 1309 | 715 | 983 | 315 | 763 | 1425 | 329 | 754 | 327,5 | 357,5 | 210 | 214 | 255 | 232 | 625 | 592 | 597 | 1/2" | 12,7 | 15,8 |
| 1900 HD | 1459 | 815 | 1085 | 355 | 851 | 1575 | 356 | 826 | 407,5 | 407,5 | 194 | 213 | 337 | 15,5 | 719 | 672 | 720,5 | 3/4" | 12,7 | 15,8 |
| 2500 HD | 1558 | 965 | 1183 | 400 | 1000 | 1675 | 379 | 904 | 482,5 | 482,5 | 204 | 213 | 367 | 38,5 | 869 | 837 | 875,5 | 3/4" | 12,7 | 22,2 |
| 3500 HD | 1558 | 1125 | 1363 | 450 | 1160 | 1675 | 436 | 1026 | 562,5 | 562,5 | 204 | 213 | 457 | 85,5 | 1030 | 977 | 1033 | 3/4" | 12,7 | 22,2 |
| 4500 HD | 1558 | 1125 | 1363 | 500 | 1160 | 1675 | 436 | 1026 | 562,5 | 562,5 | 204 | 213 | 457 | 85,5 | 1030 | 977 | 1033 | 3/4" | 12,7 | 22,2 |
| Size | Weight (kg) | | | | | Size | Weight (kg) | | | | | Size | Weight (kg) | | | | | | | |
| | D | DI | DC | DFR | DX | | D | DI | DC | DFR | DX | | D | DI | DC | DFR | DX | | | |
| 700 HD | 180 | 186 | 186 | 189 | 190 | 1900 HD | 233 | 241 | 241 | 244 | 248 | 3500 HD | 350 | 362 | 364 | 370 | 372 | | | |
| 1300 HD | 187 | 193 | 193 | 196 | 197 | 2500 HD | 281 | 291 | 291 | 293 | 299 | 4500 HD | 363 | 375 | 377 | 383 | 385 | | | |

RHE HDR 6000 / 8000 / 10000 - Deliver in 2 parts.
 Right hand side access door on the supply air flow direction



| Sizes (mm) | A | A1* | A2 | B | C | D | E | F | G | H | I | J | K | L |
|-----------------|------|------|------|------|------|------|------|-----|-----|------|-----|------|------|-----|
| 6000 HD | 1972 | 1034 | 638 | 1315 | 1553 | 1200 | 1350 | 235 | 550 | 915 | 510 | 700 | 740 | 300 |
| 8000 HD | 2112 | 1114 | 998 | 1565 | 1806 | 1450 | 1600 | 245 | 650 | 1050 | 610 | 900 | 940 | 300 |
| 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

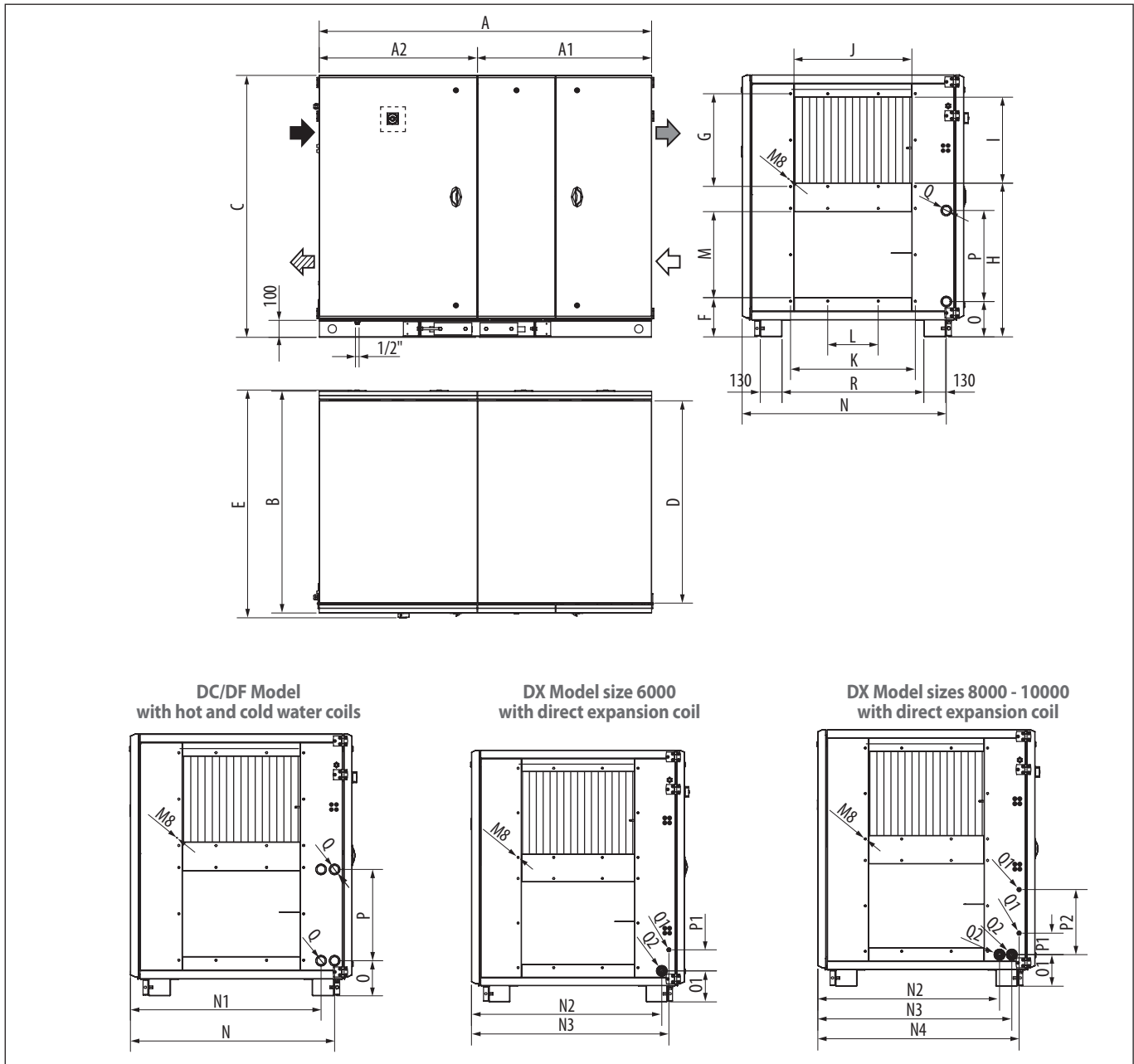
| Sizes (mm) | M | N | N1 | N2 | N3 | N4 | O | O1 | P | P1 | P2 | Q* | Q1 | Q2 | R |
|-----------------|-----|------|------|------|------|------|-----|-----|-----|-----|-----|---------------|------|------|------|
| 6000 HD | 510 | 1210 | 1131 | 1174 | 1218 | - | 208 | 213 | 541 | 109 | - | 1"(1"1/4)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

| Sizes | 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 |
| 6000 HD | 345 | 224 | 569 | 345 | 251 | 596 | 345 | 245 | 590 | 345 | 252 | 597 | 345 | 273 | 618 | 345 | 262 | 607 |
| 8000 HD | 457 | 285 | 742 | 457 | 322 | 779 | 457 | 313 | 770 | 457 | 323 | 780 | 457 | 352 | 809 | 457 | 337 | 794 |
| 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 (mm) | A | A1* | A2 | B | C | D | E | F | G | H | I | J | K | L |
|-----------------|------|------|------|------|------|------|------|-----|-----|------|-----|------|------|-----|
| 6000 HD | 1972 | 1034 | 938 | 1315 | 1553 | 1200 | 1350 | 235 | 550 | 915 | 510 | 700 | 740 | 300 |
| 8000 HD | 2112 | 1114 | 998 | 1565 | 1803 | 1450 | 1600 | 245 | 650 | 1050 | 610 | 900 | 940 | 300 |
| 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

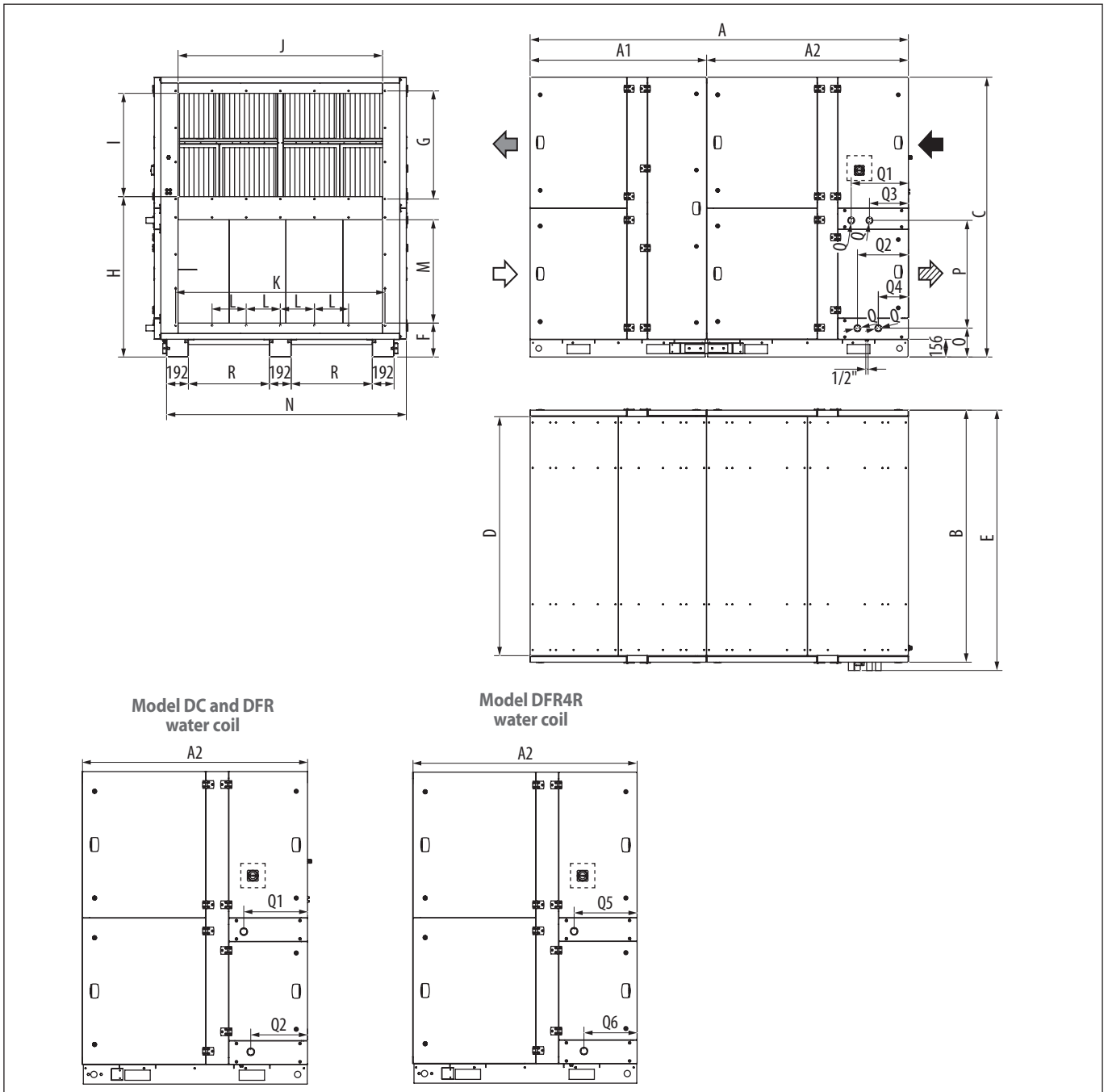
| Sizes (mm) | M | N | N1 | N2 | N3 | N4 | O | O1 | P | P1 | P2 | Q* | Q1 | Q2 | R |
|-----------------|-----|------|------|------|------|------|-----|-----|-----|-----|-----|----------------|------|------|------|
| 6000 HD | 510 | 1210 | 1131 | 1174 | 1218 | - | 208 | 213 | 541 | 109 | - | 1" (1"1/4)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

| Sizes | 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 | |
| 6000 HD | 345 | 224 | 569 | 345 | 251 | 596 | 345 | 245 | 590 | 345 | 252 | 597 | 345 | 273 | 618 | 345 | 262 | 607 | |
| 8000 HD | 457 | 285 | 742 | 457 | 322 | 779 | 457 | 313 | 770 | 457 | 323 | 780 | 457 | 352 | 809 | 457 | 337 | 794 | |
| 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)



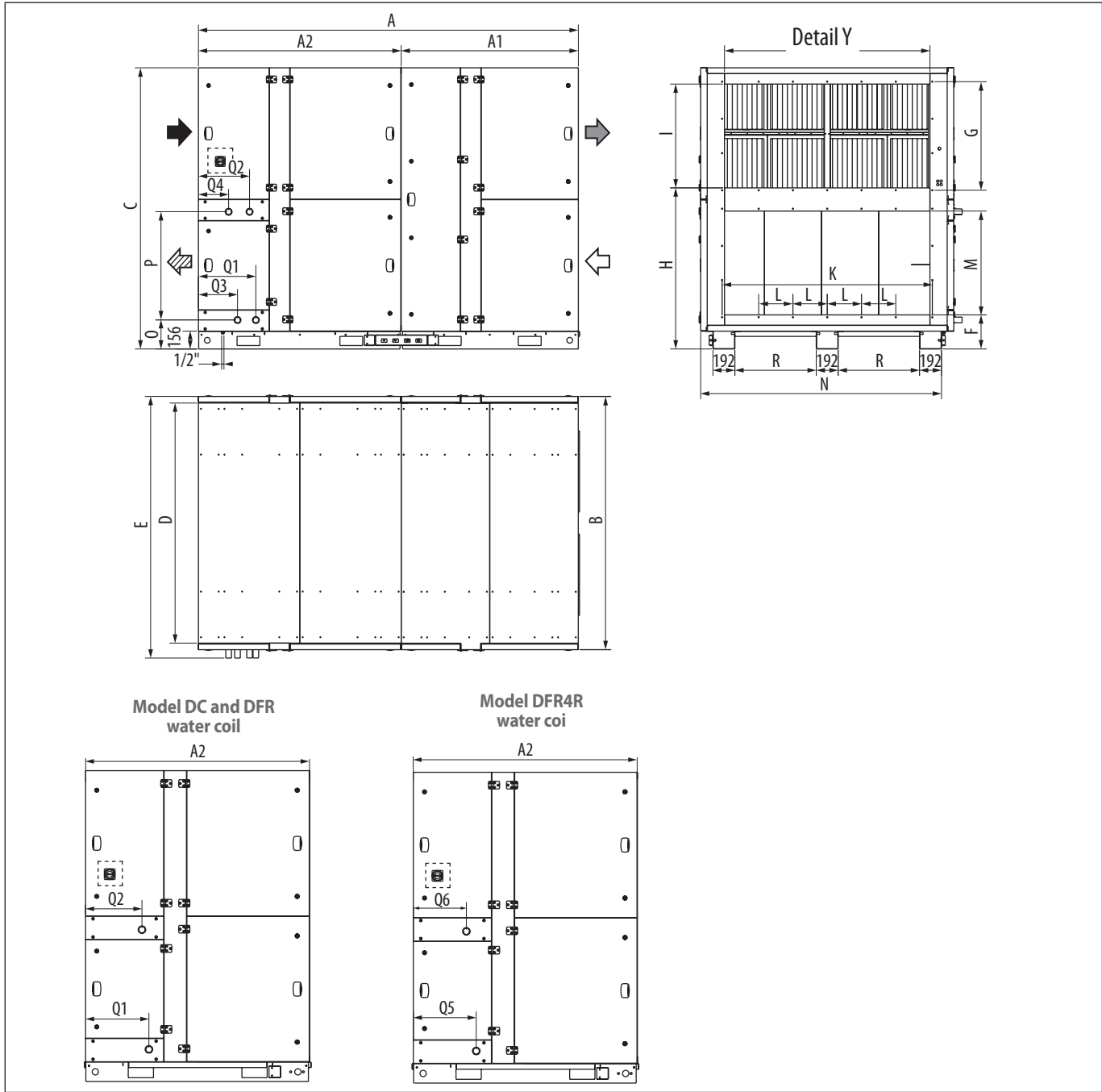
| Size | A | A1 | A2 | B | C | D | E | F | G | H | I | J | K |
|-------|------|------|------|------|------|------|------|-----|-----|------|-----|------|------|
| 15000 | 3325 | 1552 | 1774 | 2215 | 2460 | 2100 | 2288 | 298 | 950 | 1409 | 908 | 1798 | 1840 |

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

| Size | 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 |
| 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)



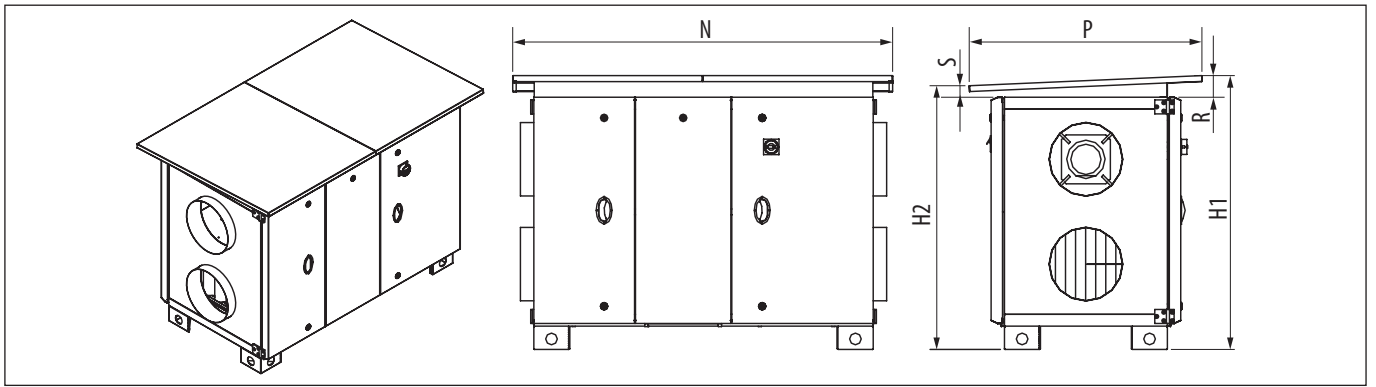
| Size | A | A1 | A2 | B | C | D | E | F | G | H | I | J | K |
|-------|------|------|------|------|------|------|------|-----|-----|------|-----|------|------|
| 15000 | 3325 | 1552 | 1774 | 2215 | 2460 | 2100 | 2288 | 298 | 950 | 1409 | 908 | 1798 | 1840 |

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

| Size | 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 |
| 15000 HD | 930 | 710 | 1640 | 930 | 800 | 1730 | 930 | 750 | 1680 | 930 | 790 | 1720 | 930 | 830 | 1760 |

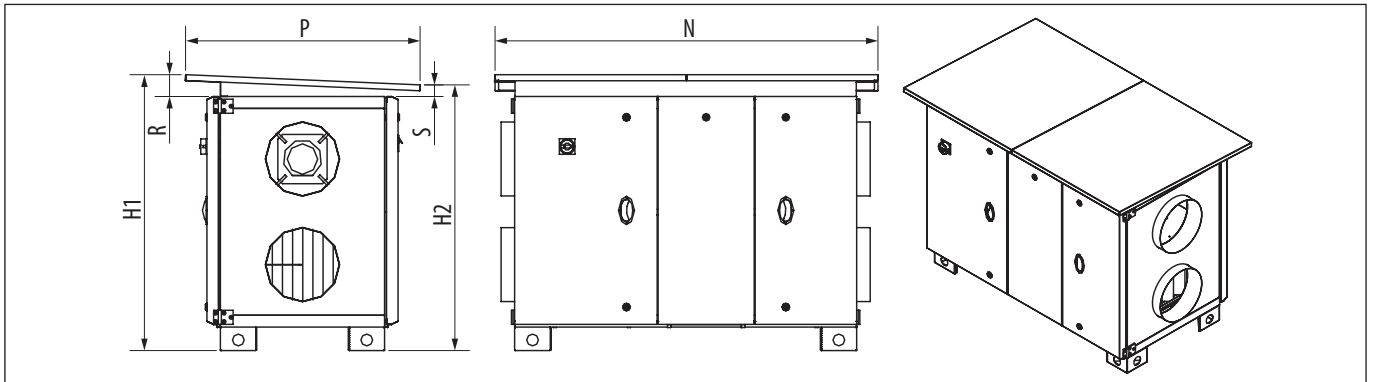
RHE HDR OI 700 / 1300 / 1900 / 2500 / 3500 / 4500 / 6000 / 8000 / 10000

Right hand side access door on the supply air flow direction

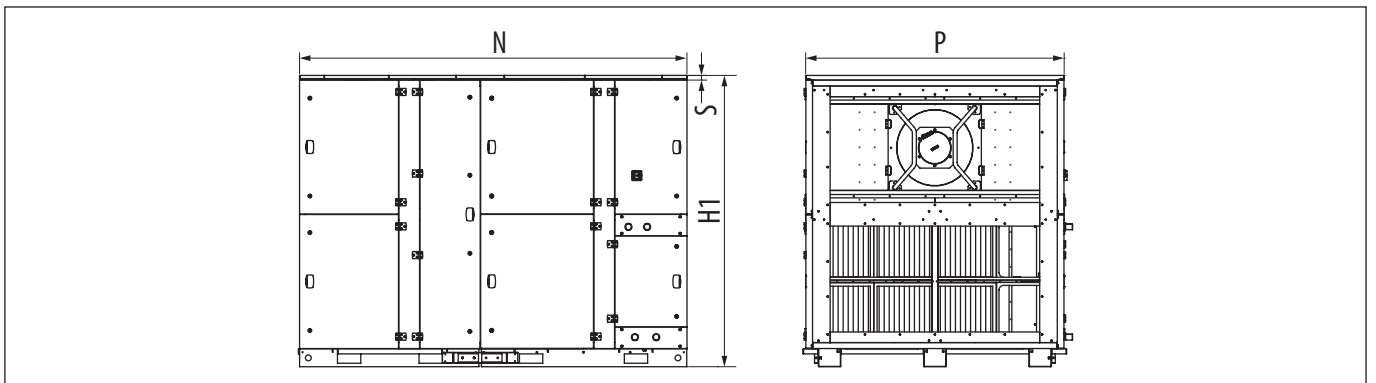


RHE HDL OI 700 / 1300 / 1900 / 2500 / 3500 / 4500 / 6000 / 8000 / 10000

Left hand side access door on the supply air flow direction



RHE HDR OI / HDL OI 15000



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

| Sizes | Weight (kg) | | | | |
|------------|-------------|-----|-----|-----|-----|
| | D | DI | DC | DFR | DX |
| 700 HD OI | 199 | 205 | 205 | 208 | 209 |
| 1300 HD OI | 206 | 212 | 212 | 215 | 216 |
| 1900 HD OI | 255 | 263 | 263 | 266 | 270 |
| 2500 HD OI | 307 | 317 | 317 | 319 | 325 |
| 3500 HD OI | 379 | 391 | 393 | 399 | 401 |
| 4500 HD OI | 392 | 404 | 406 | 412 | 414 |

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

| Sizes | Weight (kg) | | | | | | | | |
|--------------------|-------------|-----|--------|-------|-----|--------|-----|-----|--------|
| | DFR | | | DC/DF | | | DX | | |
| | A1 | A2 | A1+ A2 | A1 | A2 | A1+ A2 | A1 | A2 | A1+ A2 |
| 6000 HD OI | 366 | 271 | 637 | 366 | 292 | 658 | 366 | 281 | 647 |
| 8000 HD OI | 485 | 343 | 828 | 485 | 372 | 857 | 485 | 357 | 842 |
| 10000 HD OI | 580 | 427 | 1007 | 580 | 461 | 1041 | 580 | 443 | 1023 |
| 15000 HD 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 |
| | | 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 |
| | | 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 | | Dimensions (mm) | | | | |
|-------------------|-----------------|-----------------|------|------|------|--|
| Description | 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 | | |

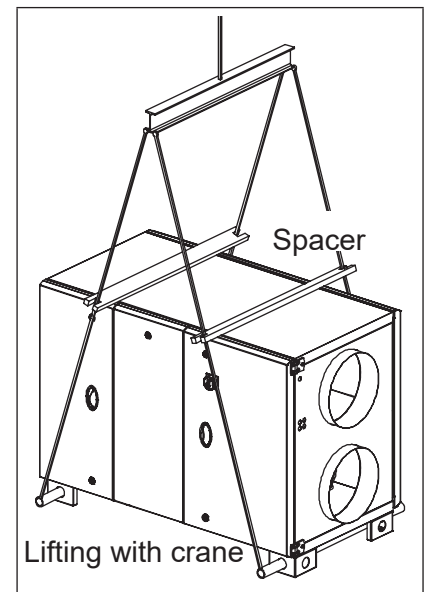
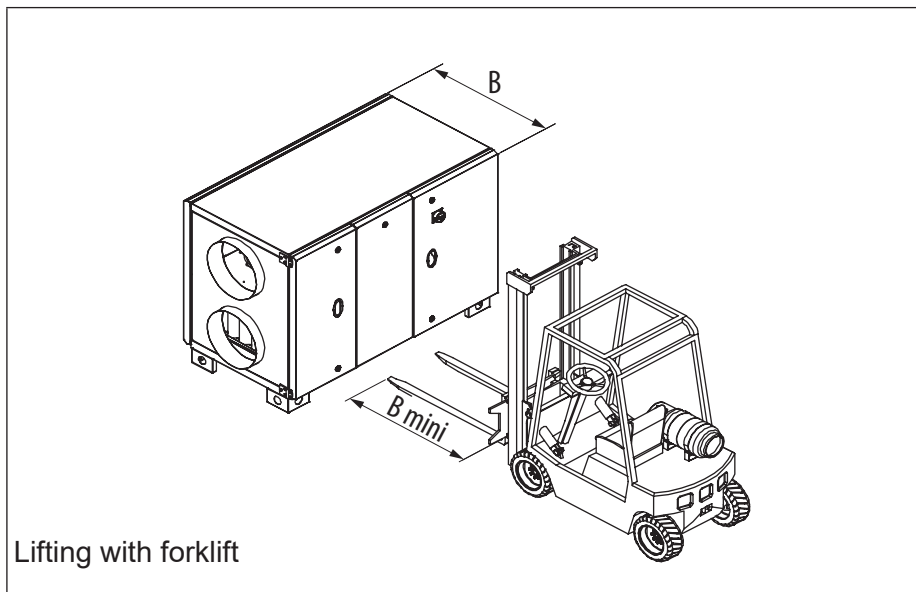
3.3 Handling and lifting

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

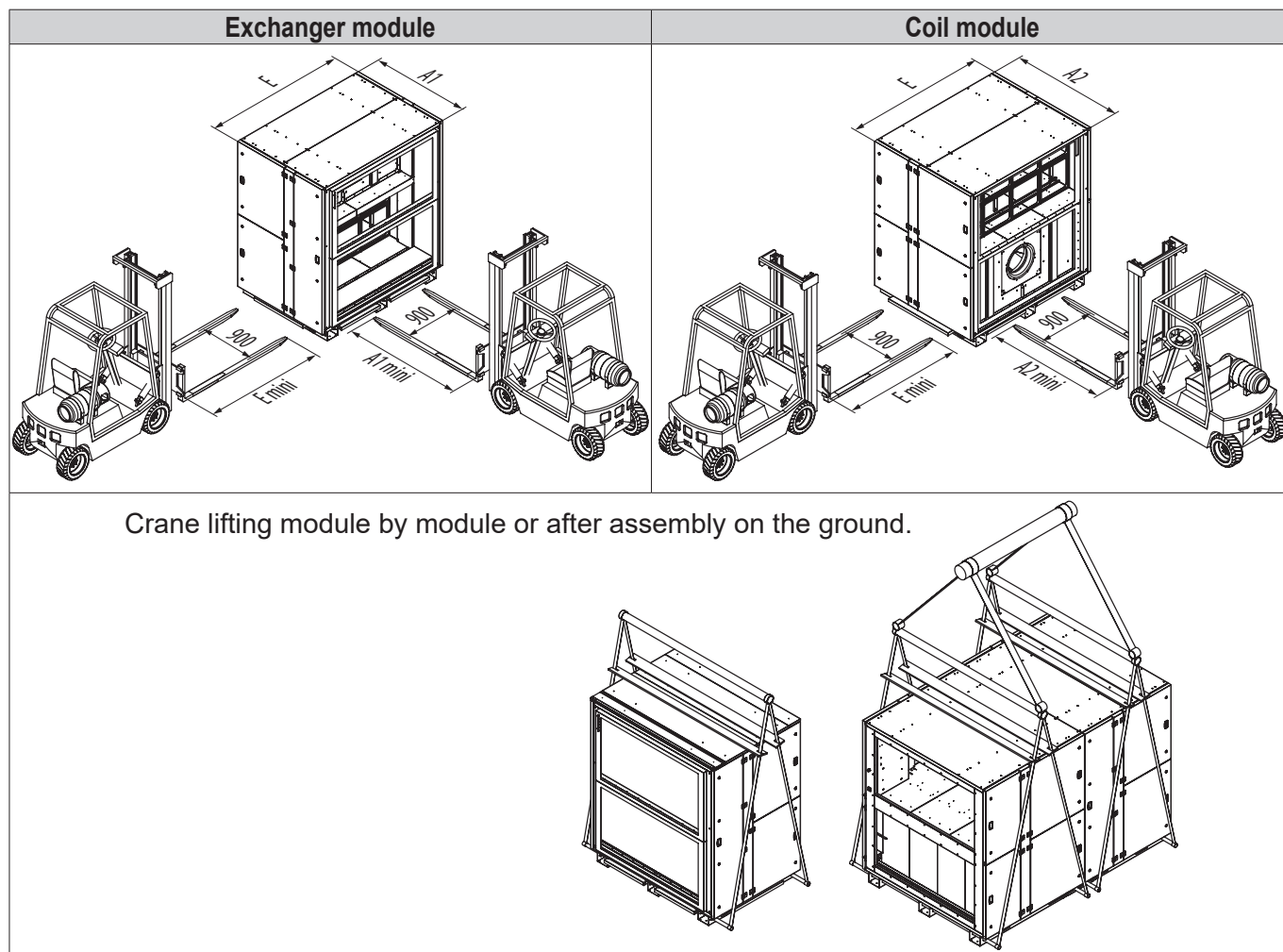
The RHE dual flow air handling units can be handled by a pallet transporter, a forklift, or a crane. The handling machines will be adapted to the load and the lifting conditions. In all cases, the lifting will be done at the device's base. The centre of gravity is located at the centre of the unit.

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



Moving and lifting RHE 15000



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

3.4 Placement and attachment point

Placement

The RHE must be laid on a smooth horizontal surface capable of supporting the load. The RHE HD / VD units are designed for an installation inside the building. Only the HD 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.

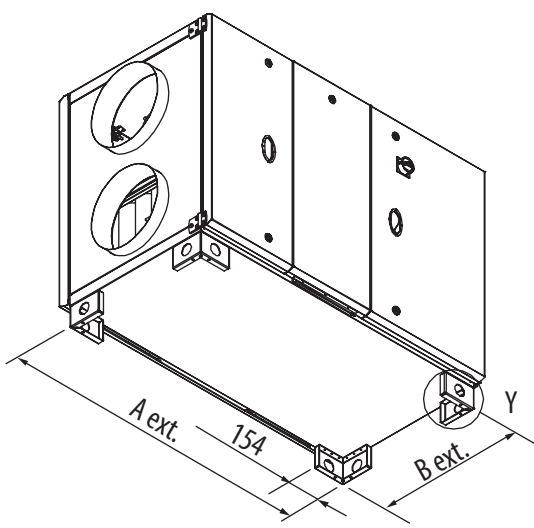
It is important to provide enough space (Z minimum) to allow opening the doors, commissioning and maintenance (filters, fans, heat exchanger). Do not position the unit against a wall to avoid the transmission of structurally borne noise.

| | Size | Z (mm) |
|-------|-----------|--------|
| | 700/1300 | 1450 |
| | 1900 | 1500 |
| | 2500 | 1800 |
| | 3500/4500 | 2100 |
| | 6000 | 2515 |
| | 8000 | 3015 |
| | 10000 | 3294 |
| 15000 | 4257 | |

Standard feet up to size 4500

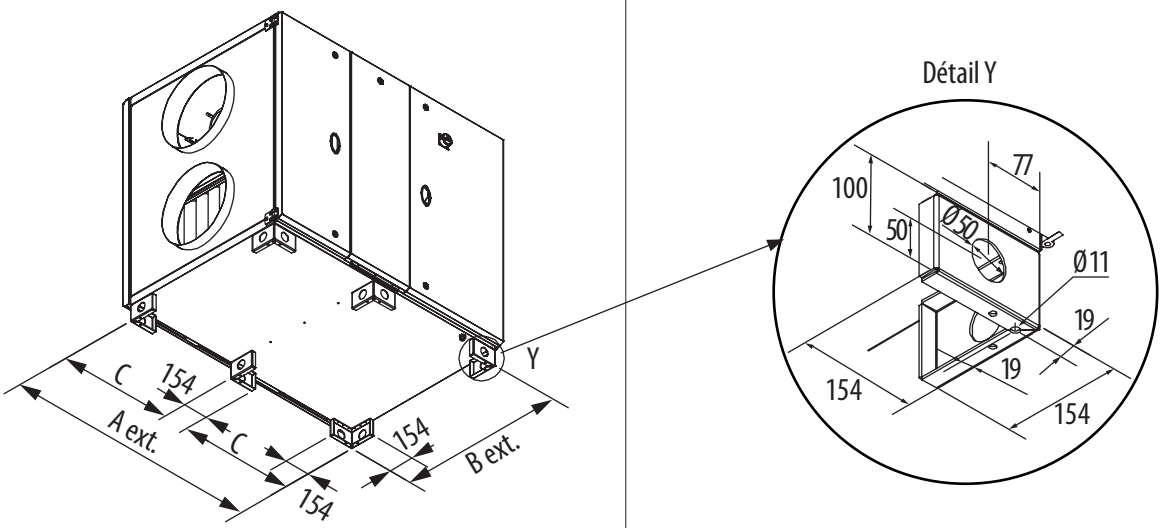
The units are delivered with their 4 or 6 feet according to the models. The support feet must stay on the entire contact surface.

RHE 700 / 1300 / 1900/ 2500



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

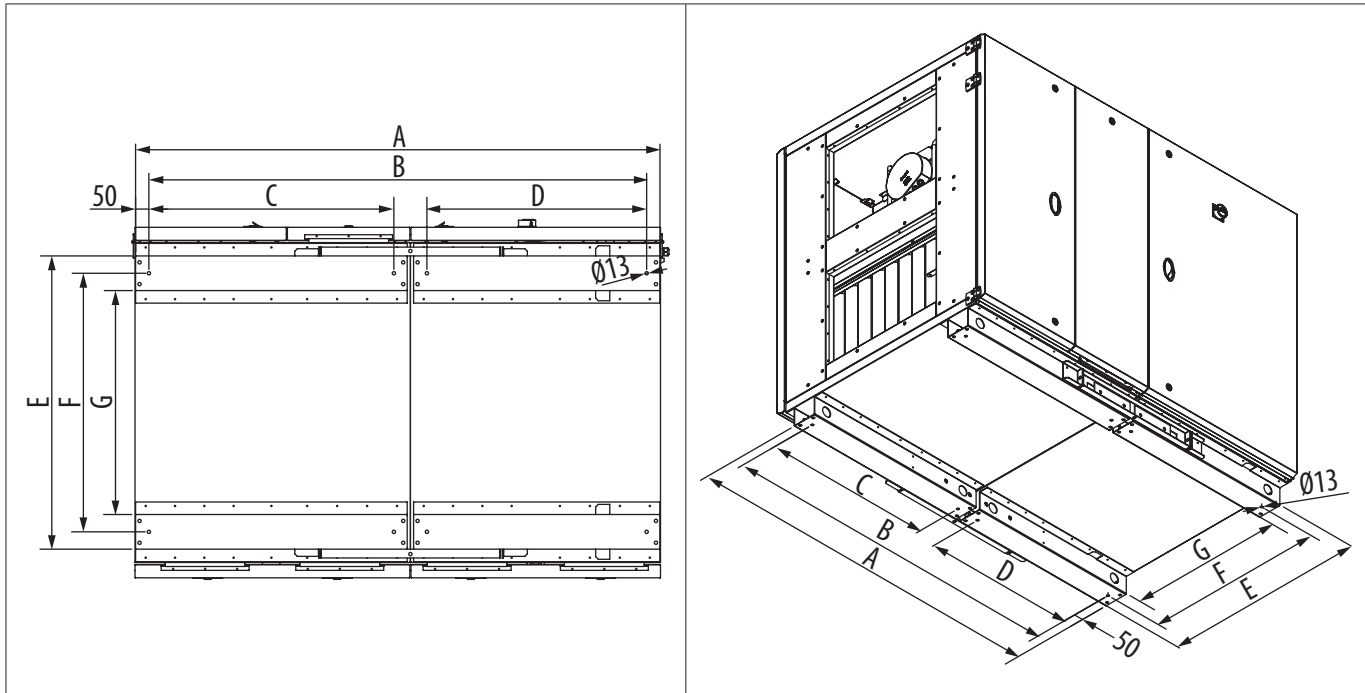
RHE 3500 / 4500



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

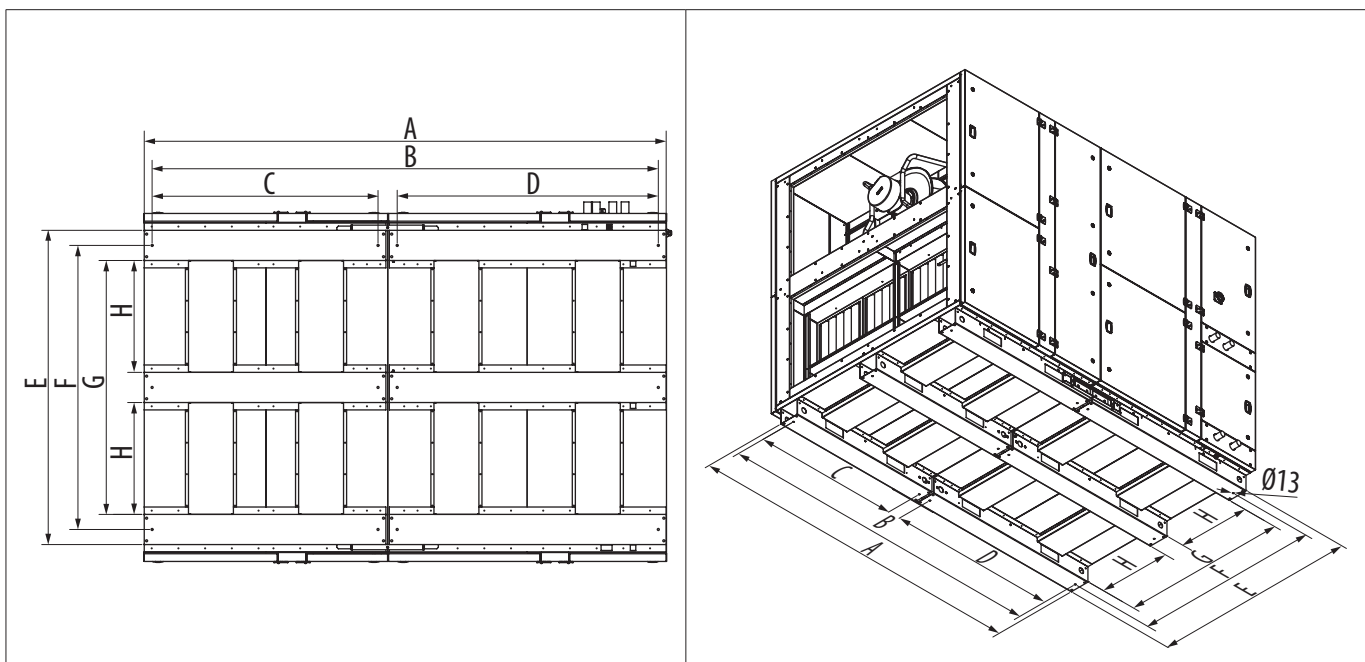
RHE 6000 / 8000 / 10000

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 feet. With this frame system, the unit could be lift with a crane after assembling the unit on the floor.



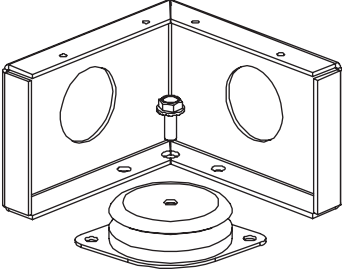
| Sizes | Dimensions (mm) | | | | | | |
|----------|-----------------|------|--------|--------|------|------|------|
| | A | B | C | D | E | F | G |
| 6000 HD | 1968 | 1868 | 919,4 | 824,6 | 1100 | 970 | 840 |
| 8000 HD | 2108 | 2008 | 999,4 | 884,6 | 1350 | 1220 | 1090 |
| 10000 HD | 2408 | 2308 | 1149,4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

RHE 15000



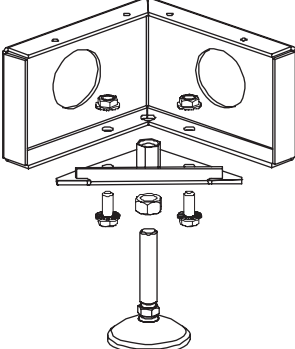
| Size | Dimensions (mm) | | | | | | | |
|-------|-----------------|------|------|------|------|------|------|-----|
| | A | B | C | D | E | F | G | H |
| 15000 | 3322 | 3222 | 1438 | 1662 | 2000 | 1808 | 1616 | 712 |

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

|  | Size RHE | Anti-vibratil cup mounts | Code | Qty to order | Height (mm) | Attachement distance between centres (mm) |
|---|----------|--------------------------|------------|--------------|-------------|---|
| | 700 | PAVZ 80 | 5130272900 | 1 | 27 | 100 |
| 1300 | PAVZ 80 | 5130272900 | 1 | 27 | 100 | |
| 1900 | PAVZ 80 | 5130272900 | 1 | 27 | 100 | |
| 2500 | PAVZ 100 | 5130863400 | 1 | 28 | 124 | |
| 3500 | PAVZ 100 | 5130863400 | 2 | 28 | 124 | |
| 4500 | PAVZ 100 | 5130863400 | 2 | 28 | 124 | |
| 6000 | PAVZ 100 | 5130863400 | 2 | 28 | 124 | |
| 8000 | PAVZ 100 | 5130863400 | 2 | 28 | 124 | |
| 10000 | PAVZ 100 | 5130863400 | 2 | 28 | 124 | |
| 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.

|  | Size RHE | Ajustable feet | Code | Qty to order (composed with 4 cup mounts) | Height (mm) | Attachement distance between centres (mm) |
|--|------------|----------------|------------|---|-------------|---|
| | 700/1300 | Kit 4 feet | 5407029800 | 1 | 75 | 50 |
| 1900 | Kit 4 feet | 5407029800 | 1 | 75 | 50 | |
| 2500 | Kit 4 feet | 5407029800 | 1 | 75 | 50 | |
| 3500/4500 | Kit 6 feet | 5407029900 | 1 | 75 | 50 | |

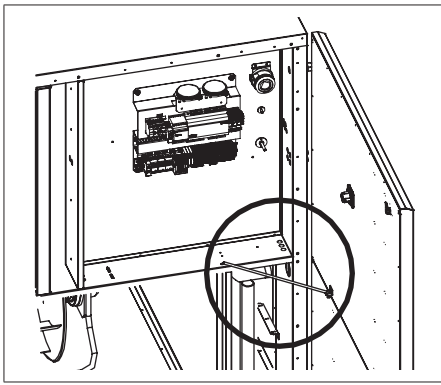
3.5 Opening of the doors

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.

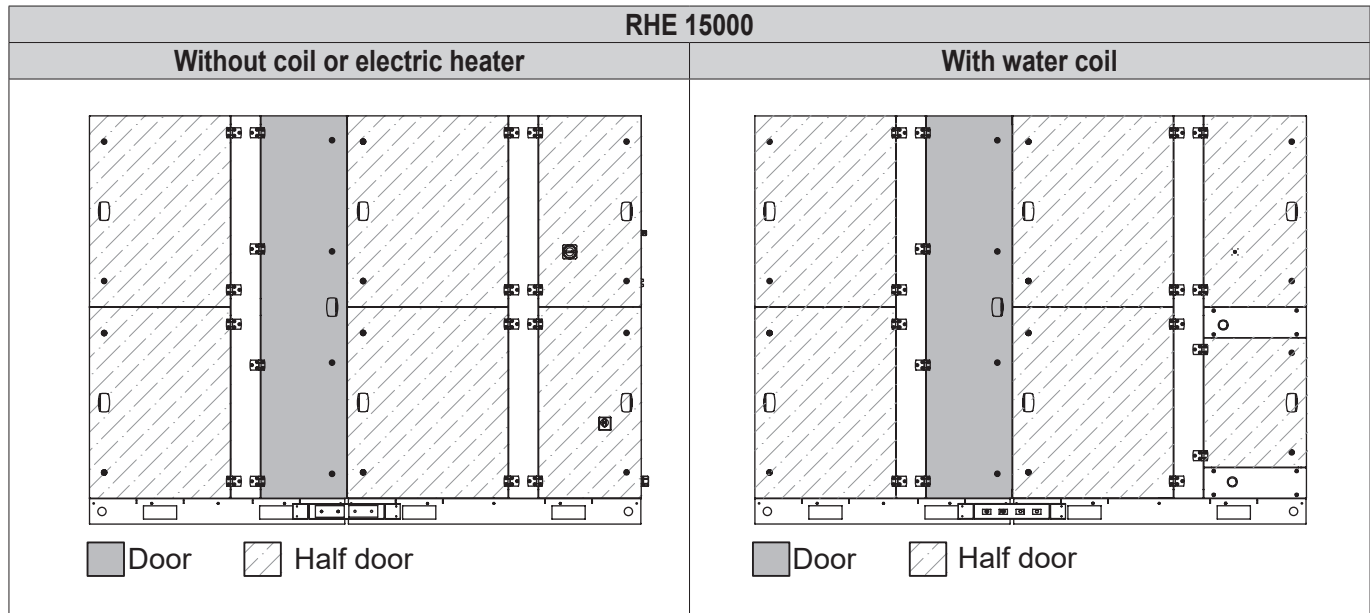


To completely open the latches, move the latches a quarter turn counterclockwise. Don't forget to disconnect the earthing wires and reconnect them before start-up.



On the units of size 6000 - 8000 and 10000, a door handrail is installed on the control 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.



3.6 Assembly of the units delivered in two parts

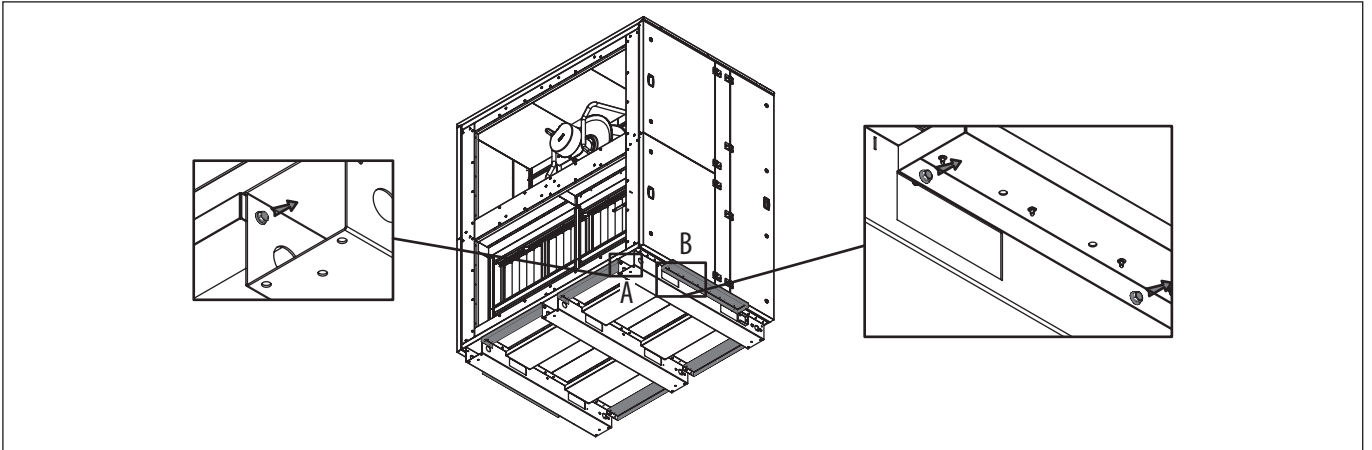
The RHE sizes 6000, 8000, 10000 and 15000 are delivered in two parts to facilitate the travel up to the installation site.

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 "11. MAINTENANCE - REPLACEMENT OF PARTS - ALARMS", page 87). Both modules must be installed on a plane surface and horizontal. Adjustable feet (accessories) allow to compensate a small level difference.

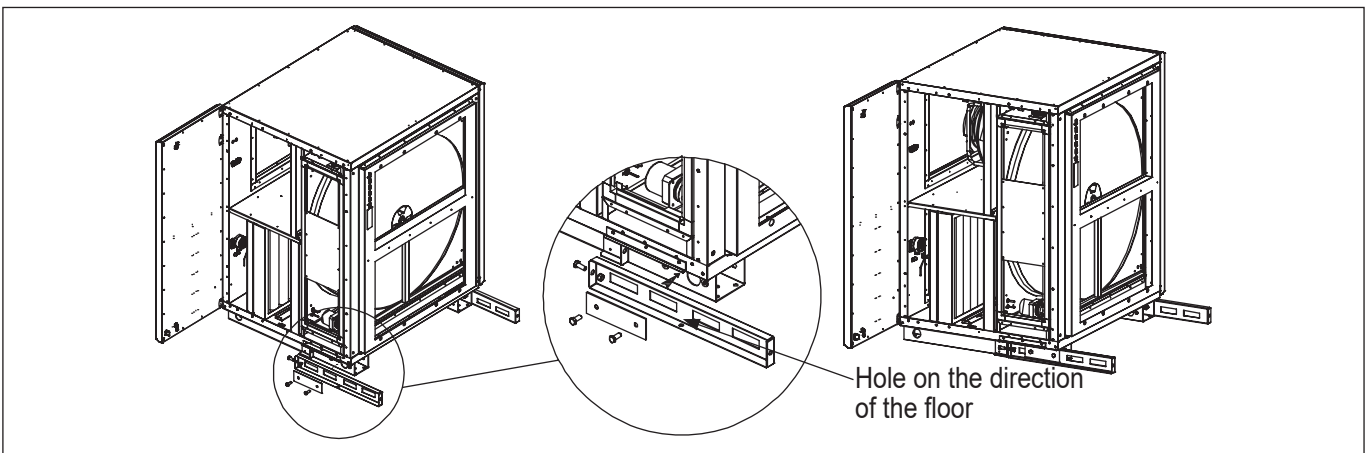
- AHU in 2 parts are delivered with a junction kit.

| 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 019383) 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 |

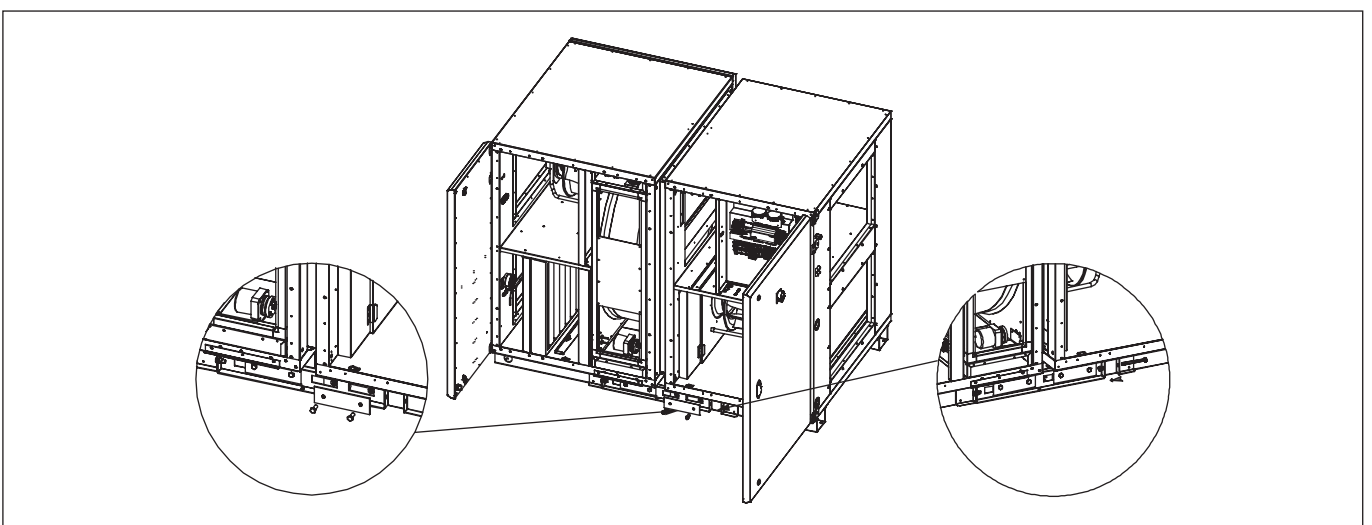
The units size 15000 are delivered with bumpers to prevent damage to the unit during transport and its handling. Once the unit is positioned, the bumpers must be removed, especially those at the junction of modules



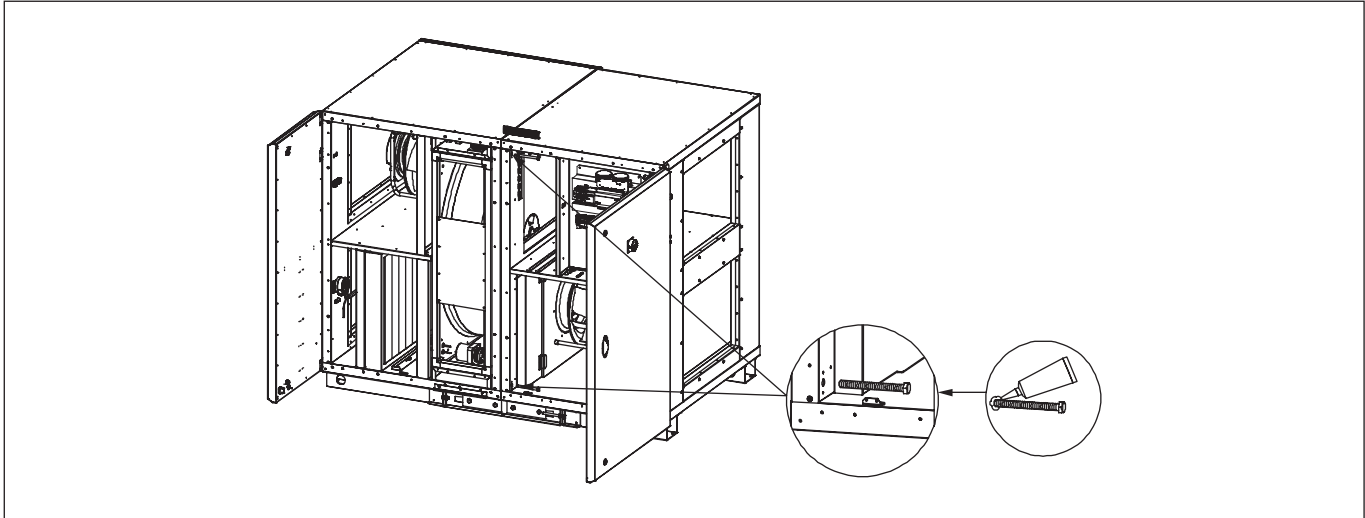
- On the first part, fix on both side the junction elements without fully tighten the junction strengthening elements.



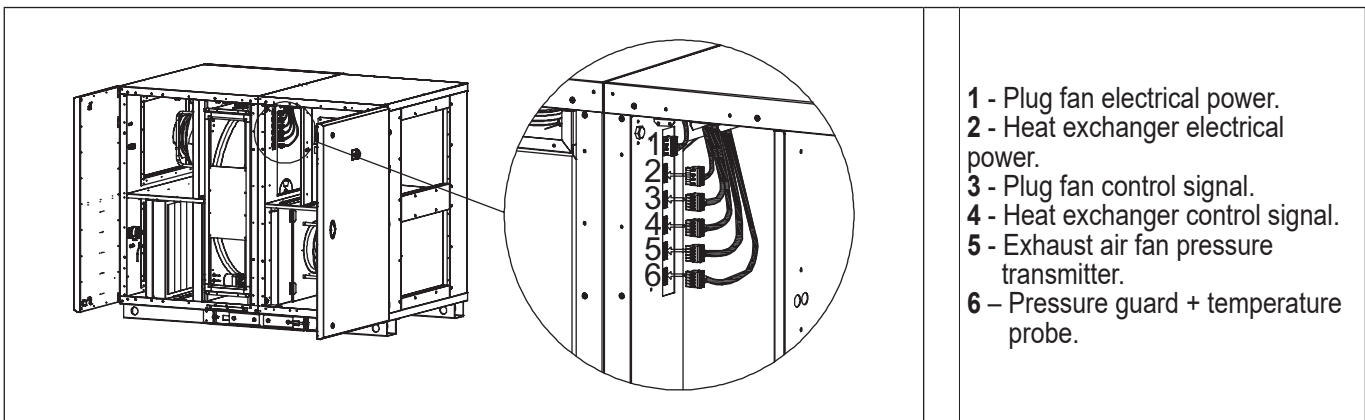
- Move closer as much as possible to both modules ; fix the junction elements on the second module loosely. Finalize the junction with the tensioner screw.



- 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 controller. 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.

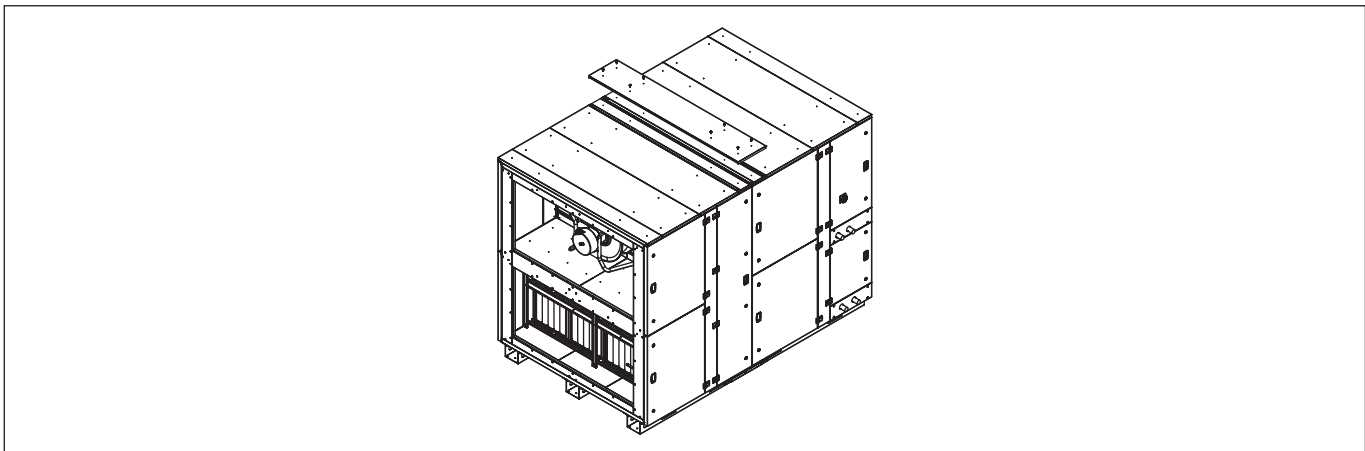


- Connect the fast electrical connector as shown :



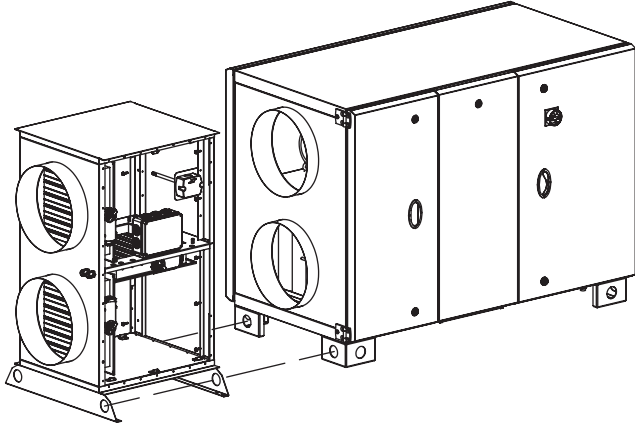
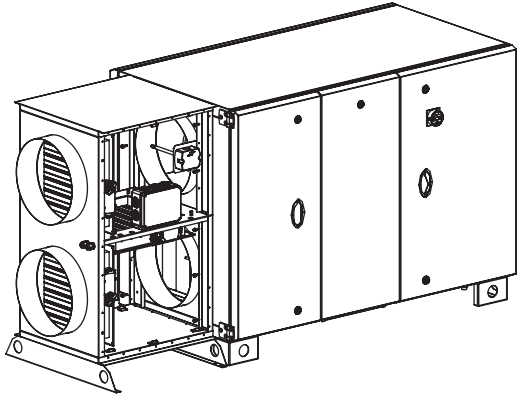
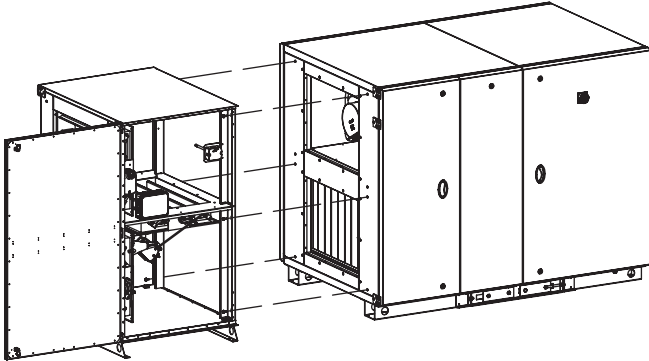
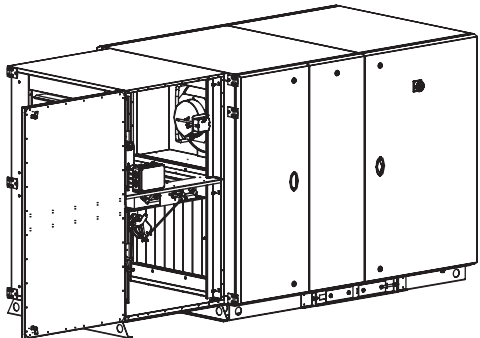
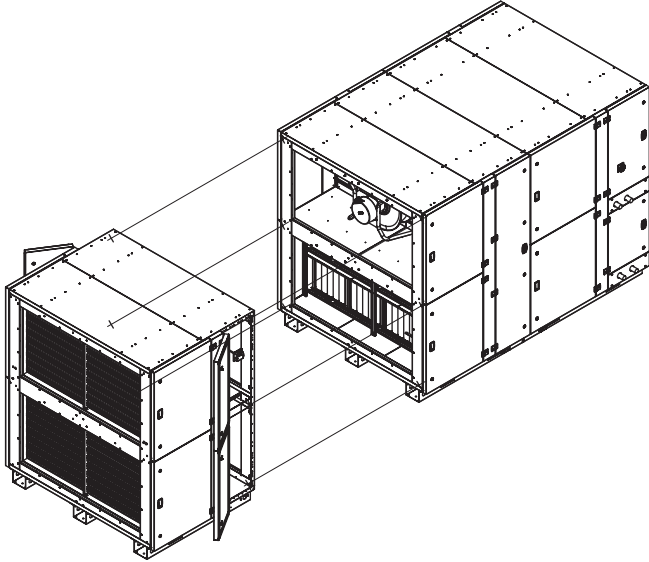
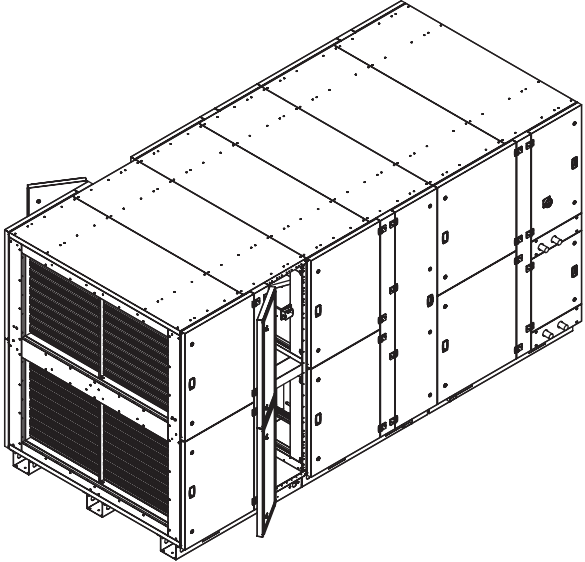
Roof mounting on RHE 15000 HD OI

On the HD 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.



3.7 Assembly of the mixing and recycling box

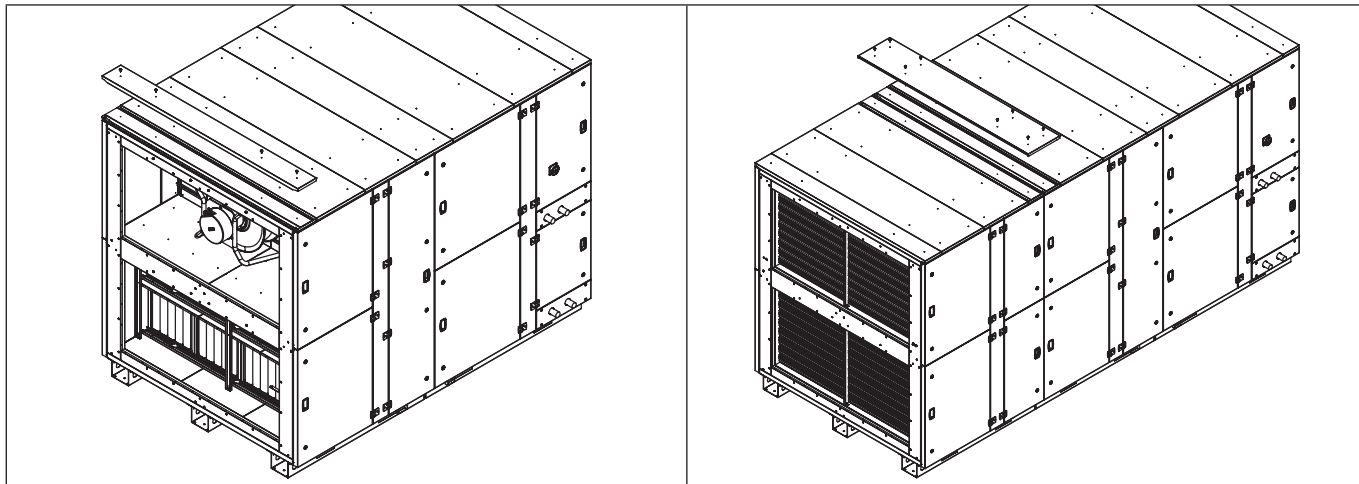
The unit can be equipped with mixing box (MIB 0-10V) or recycling box (MIB ON/OFF), connection according the below procedure :

| Size 700 to 4500 | |
|---|--|
| <ul style="list-style-type: none">• Move closer the 2 modules by taking care to align the round cuts on the feet support. | <ul style="list-style-type: none">• Screw 2 modules together with 10 auto-drills screws delivered with the box |
|  |  |
| Size 6000 to 10000 | |
| <ul style="list-style-type: none">• Move closer the 2 modules by taking care to align the cuts of the box with the inserts of the unit. | <ul style="list-style-type: none">• Screw 2 modules together with the 6 M8 screws delivered with the unit. |
|  |  |
| Size HD 15000 | |
|  |  |

Roof assembly between a RHE 15000 HD OI and a MIB 0-10V / MIB ON/OFF

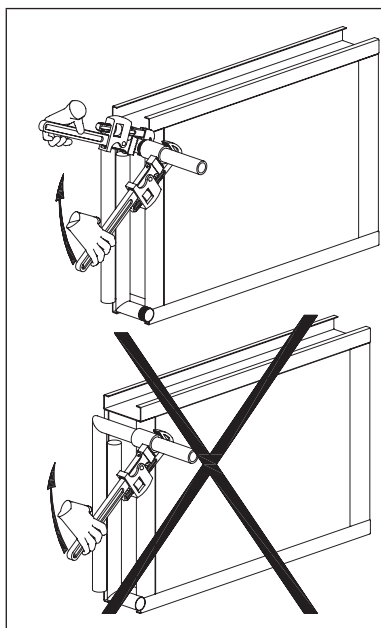
On the HD OI models of sizes 15000, the roof is pre-assembled in the factory on each unit's modules and on the MIB HD OI mixing / recycling box.

- 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"

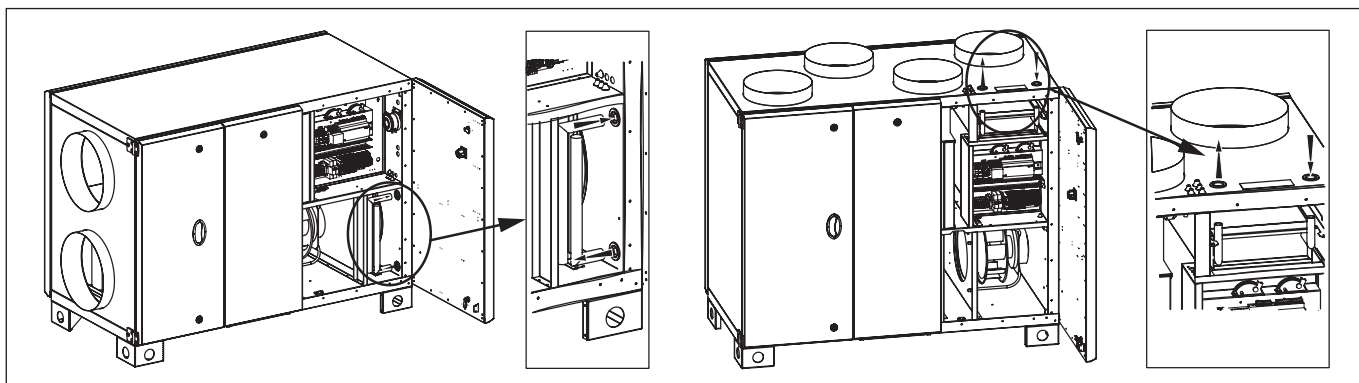
Size 6000: Diameter 1"

Size 8000 / 10000: Diameter 1 1/4"

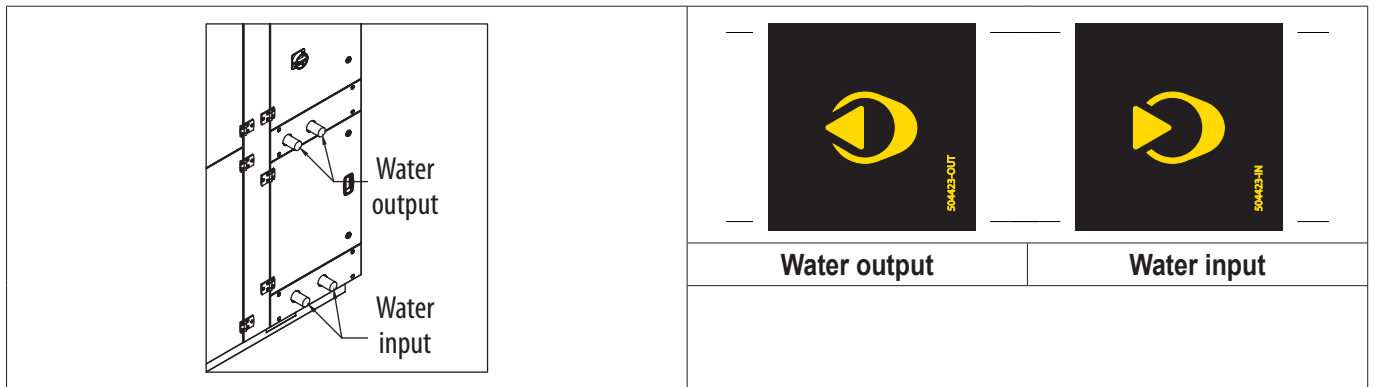
Size 15000: Diameter 1 1/2"

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.

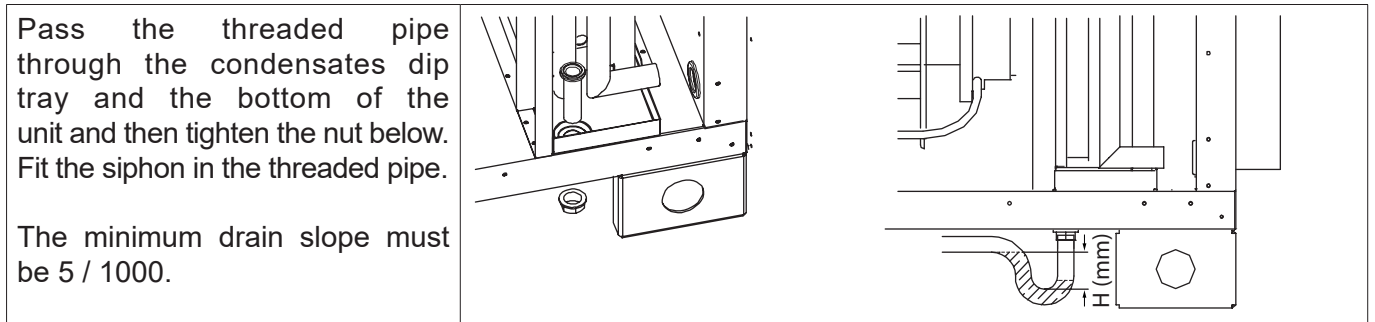


Condensates drain (reversible water coil DFR version HD only)

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 SIPH supplied with the RHE unit is designed for a pressure available on the supply system of 300 Pa maximum. The connection pipes inside the unit must be insulated to prevent condensation outside the condensate collection tray.



Pass the threaded pipe through the condensates dip tray and the bottom of the unit and then tighten the nut below. Fit the siphon in the threaded pipe.

The minimum drain slope must be 5 / 1000.

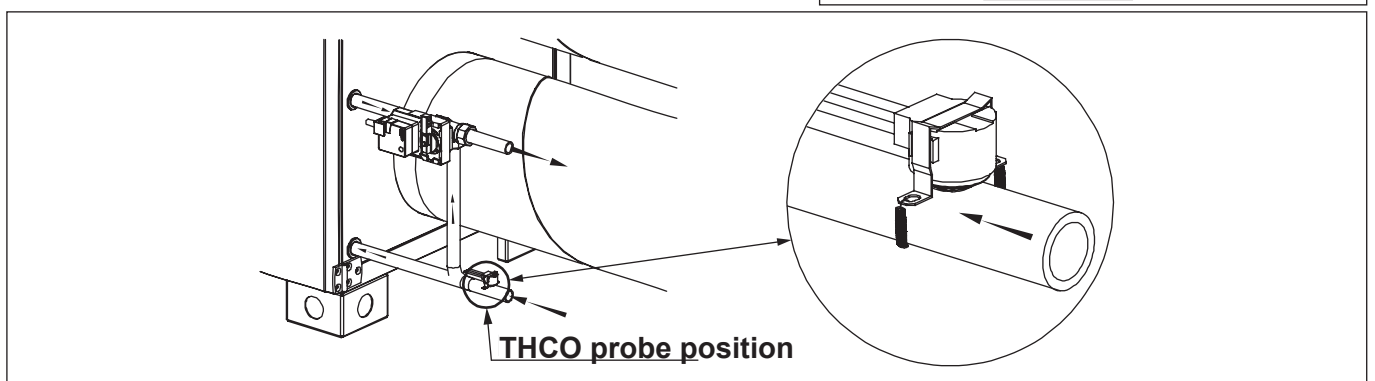
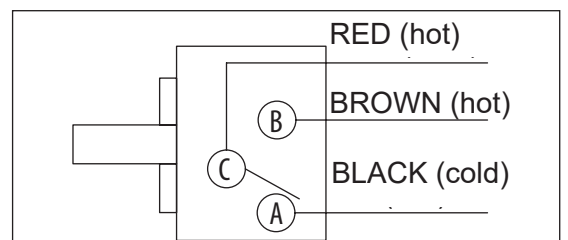
To size a siphon : $H \text{ min (mm)} = 4 + \text{pressure drop of the air injection network (da Pa)}$.

Installation of the change over thermostat (reversible water coil DFR HD version only)

A thermostat change over (THCO) 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.

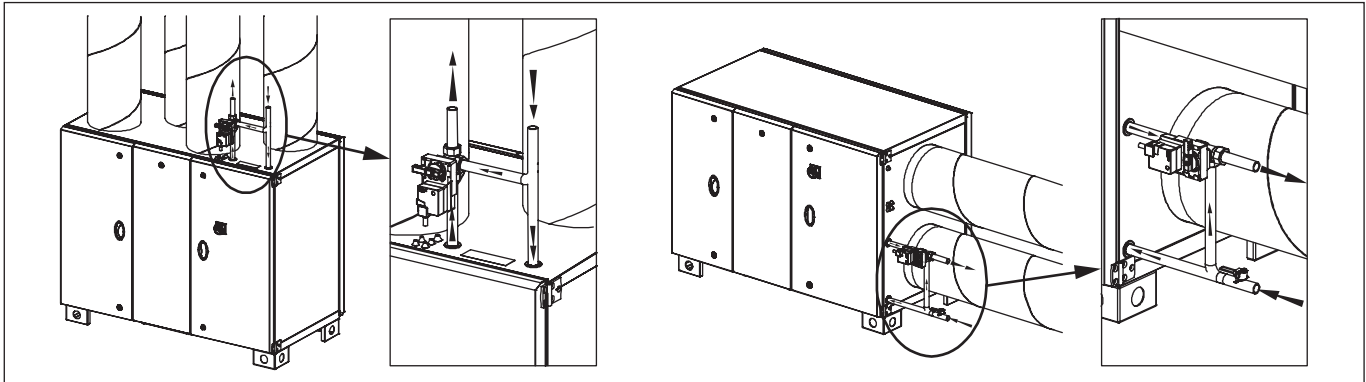
Technical data:

- Inverter contact output : 240 VAC, 3 A
- AC contact calibration open : $30 \pm 4^\circ\text{C}$
- AC contact closed: $15 \pm 4^\circ\text{C}$
- Attachment by spring on the pipe
- 3-wire electric connection length : 1 500 mm
- Degree of protection : IP 65



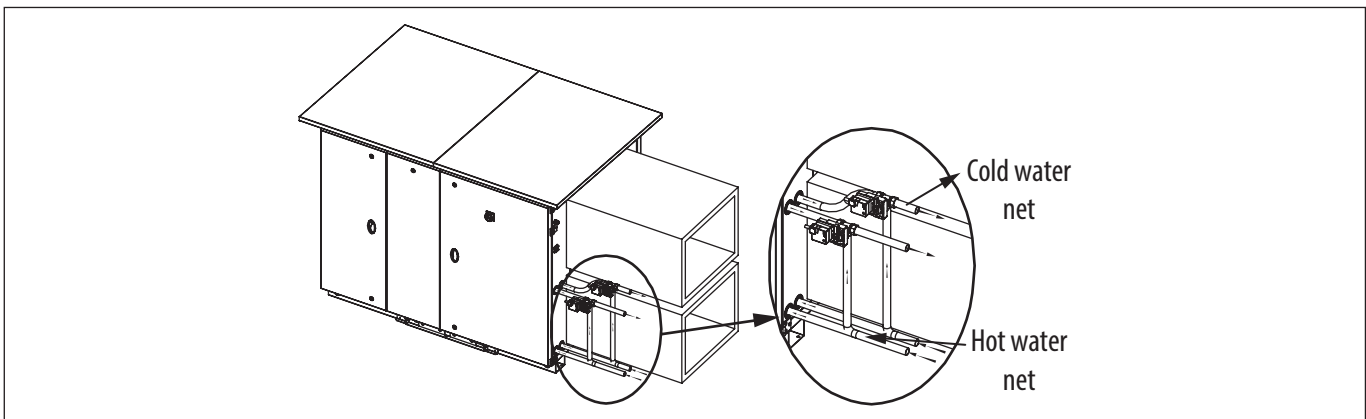
4.2 Valves connection

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



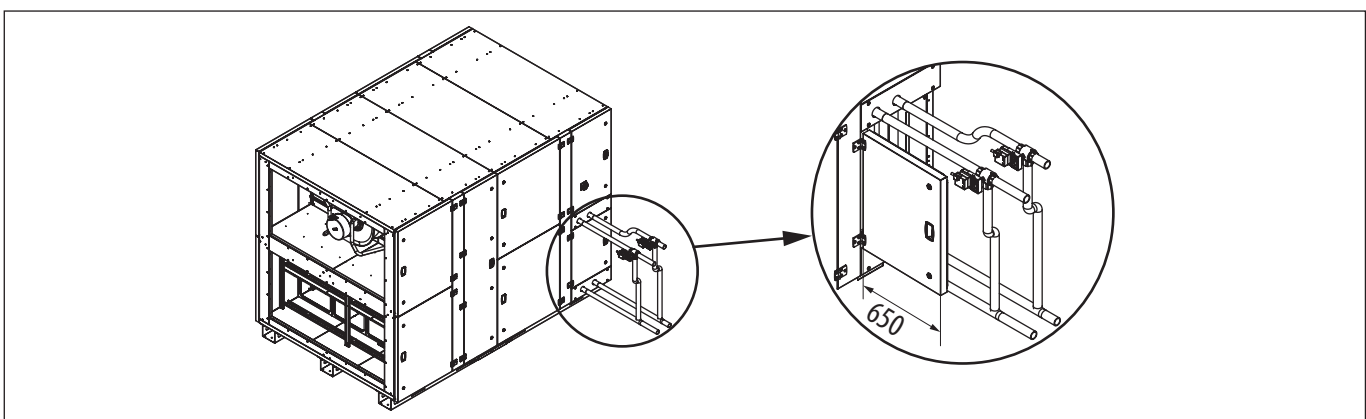
Electric connection on the RHE box: see subsection "Input – output tables (terminal block / signal / variable / function)", page 42

Unit with hot and cold water up to size 10000.



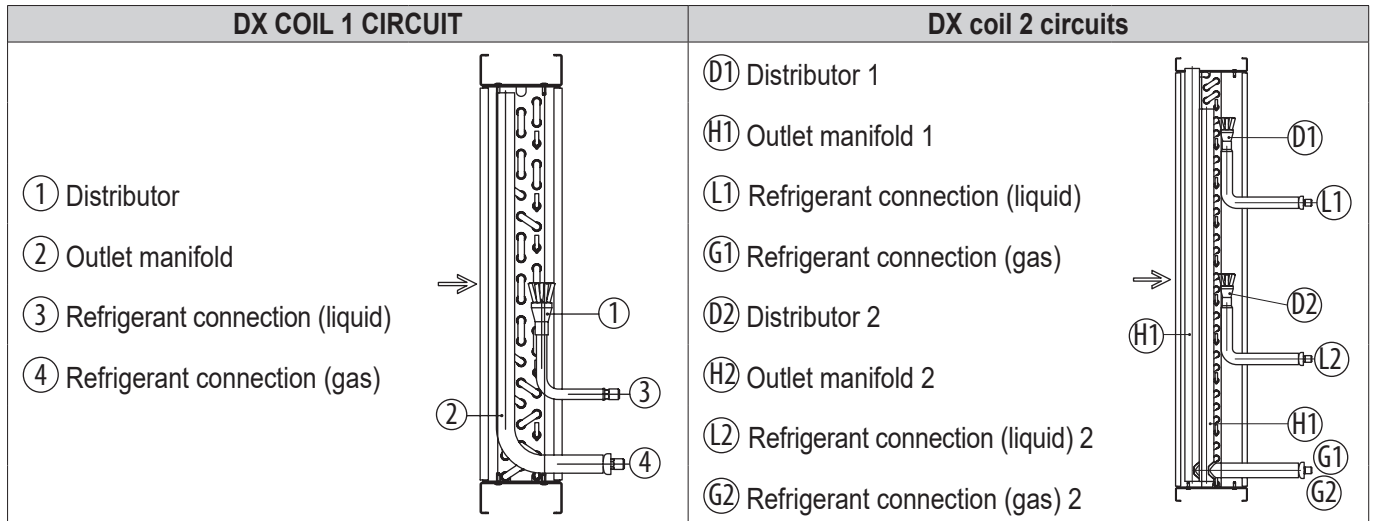
Unit with hot water coil and / or cold water coil from size 15000.

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.











| Size | Internal coil volume (dm ³) | 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 x 2,4) | 2 | 2x(15,8/22,2) |
| 10000 | 6,1 (2 x 3,05) | 2 | 2x(22,2/28,5) |

5. AIR DUCT CONNECTION

5.1 Duct connection

Before connecting the ducts, check that the 4 labels (below) stuck on the AHU correspond to the diagrams in "2.2.1 General description", page 6.

| AHU labels | Instructions symbols | AHU labels | Instructions symbols | AHU labels | Instructions symbols | AHU labels | Instructions symbols |
|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |
| Prise air neuf extérieur Outdoor air | Outdoor air | Reprise air vicié Intérieur Extract air | Extract air | Soufflage air neuf Intérieur Supply air | Supply air | Rejet air vicié Extérieur Exhaust air | Exhaust air |

The ducts must not exert any mechanical stress on the unit.

The fresh air supply and return air ducts must always be insulated, to avoid losses and the risk of condensation. The level of insulation, particularly in cold rooms and regions, must be reinforced.

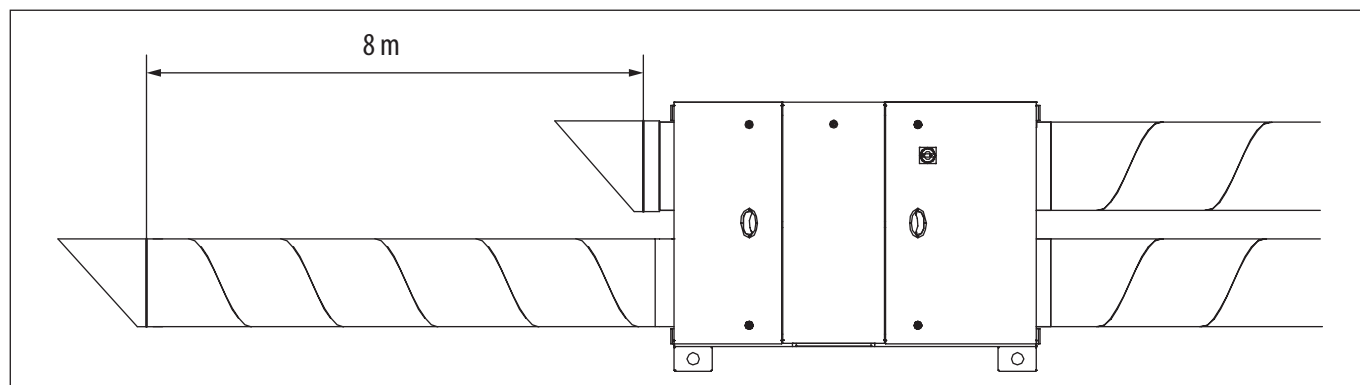
Take the greatest care in sealing the networks over all their lengths, from the inlets to the outlets. In circular, preferably use accessories with joints (at least class C according to EN12237).

Depending on the configuration of the installation and the sound level required, the addition of silencers may be necessary both on return and on supply air.

Do not reduce the section of the ducts connected to the AHU's taps or flanges.

Check that the fan motors are not accessible from the connection taps, provide a screened air intake or a sufficient length of duct.

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

Electrical connection on the RHE cabinet control: see "6.6 External components connection drawings (examples)", page 44.

5.2.1 Dampers

When the unit is equipped with a water coil it is recommended to provide for an antifreeze protection damper on the fresh air network. A second damper should be mounted on the extraction network to isolate the unit.

Airtight dampers for unit up to size 4500 – circular air duct connection

| | Size | Code | Designation | Duct Ø (mm) |
|--|----------------------------|--------|-------------|-------------|
| | 700 VD / 1300 VD | 165485 | REEV 250 | 250 |
| | 1900 VD / 700 HD / 1300 HD | 165486 | REEV 315 | 315 |
| | 2500 VD / 1900 HD | 165487 | REEV 355 | 355 |
| | 2500 HD | 165488 | REEV 400 | 400 |
| | 3500 VD / 3500 HD | 165489 | REEV 450 | 450 |
| | 4500 HD | 165490 | REEV 500 | 500 |

Airtight dampers for unit size 6000 / 8000 / 10000 – rectangular air duct connection

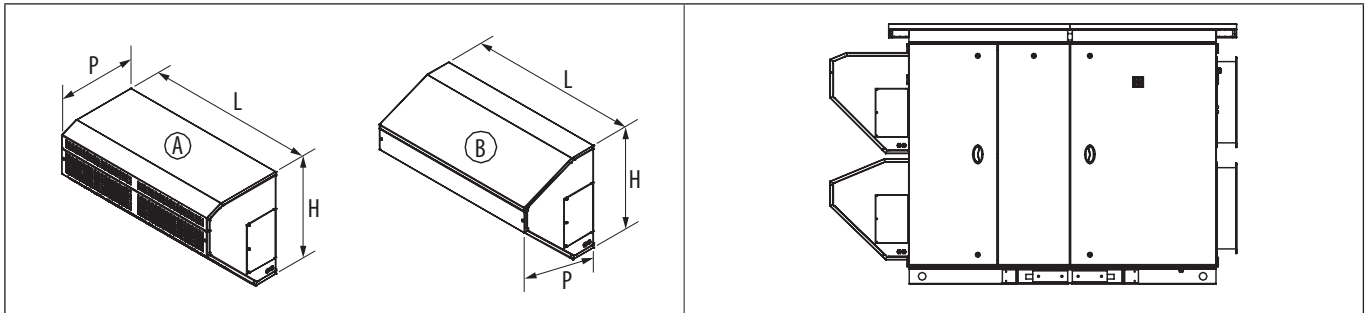
| | Type | Code | Designation |
|--|----------|---------|---|
| | 4500 VD | 932489 | MLD 100 L700 H310 mm damper leakage performance class 3 blade distance 100 mm |
| | 6000 HD | 929638 | MLD 100 L700 H510 mm damper leakage performance class 3 blade distance 100 mm |
| | 8000 HD | 929639 | MLD 100 L900 H610 mm damper leakage performance class 3 blade distance 100 mm |
| | 10000 HD | 932490 | MLD 100 T L1100 H610 mm damper leakage performance class 3 blade distance 100 mm |
| | 15000 HD | 170356E | MLD 150 T L1800 H910 mm damper leakage performance class 3 blade distance 100 mm |

Actuator

| Code | Designation | Description |
|--------|-------------|---|
| 165384 | LF 230 S | On/Off Spring return actuator 4Nm 230V / Auxiliary switch |

5.2.2 Rain protection canopy

Rain protection canopy for units up to size 10000



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.

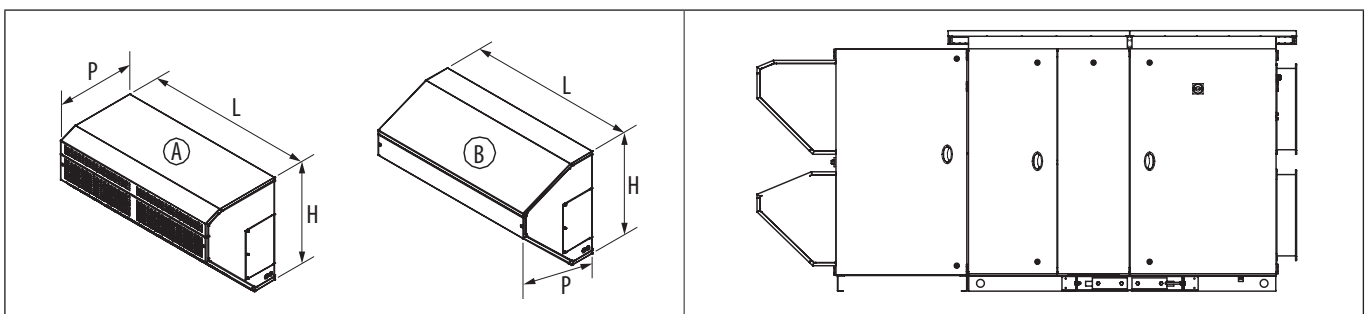
| Type | Designation | Dimensions (mm) | | |
|------|--|-----------------|------|-----|
| | | H | L | P |
| A | APPR 6000 Exhaust air protection canopy RHE 6000 | 647 | 1065 | 506 |
| | APPR 8000 Exhaust air protection canopy RHE 8000 | 747 | 1265 | 564 |
| | APPR 10000 Exhaust air protection canopy RHE 10000 | 747 | 1465 | 564 |
| B | APPA 6000 Outdoor air protection canopy RHE 6000 | 647 | 1065 | 506 |
| | APPA 8000 Outdoor air protection canopy RHE 8000 | 747 | 1265 | 564 |
| | APPA 10000 Outdoor air protection canopy RHE 10000 | 747 | 1465 | 564 |

Rain protection canopy for units up to size 15000

| Type | Designation | Dimensions (mm) | | | |
|------|-------------|-----------------|------|------|-----|
| | | H | L | L1 | P |
| A | APPR | 1091 | 2100 | 1050 | 702 |
| B | APPA | 1091 | 2100 | 1050 | 702 |

Protection canopy for recycling and mixing box

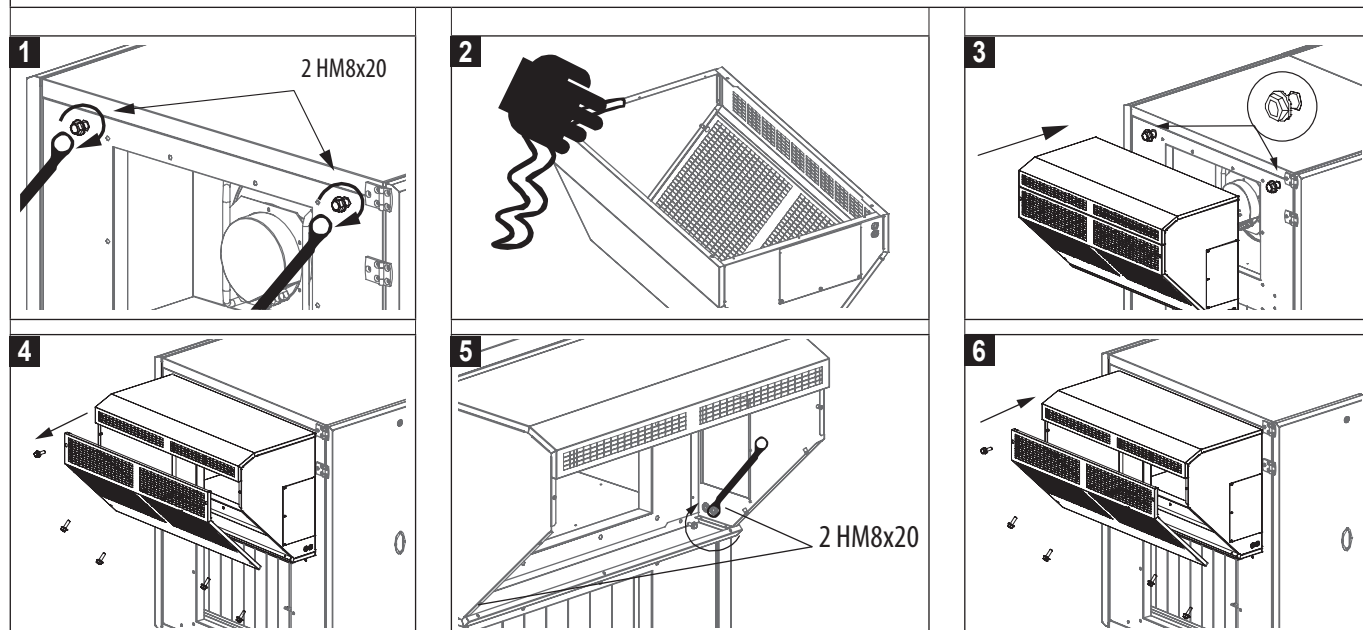
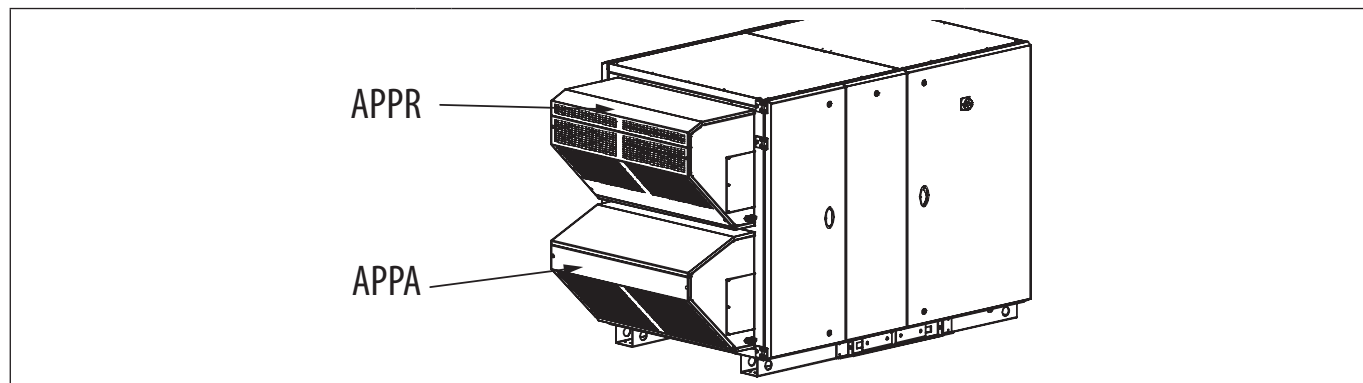
Recycling and mixing box until the size 4500 can be equipped with standard accessories for circular ducts, type APC for the exhaust air and outdoor air inlet protection canopy. For the sizes 6000, 8000 and 10000 with rectangular air connection, exhaust air and outdoor air protection canopy are specific.



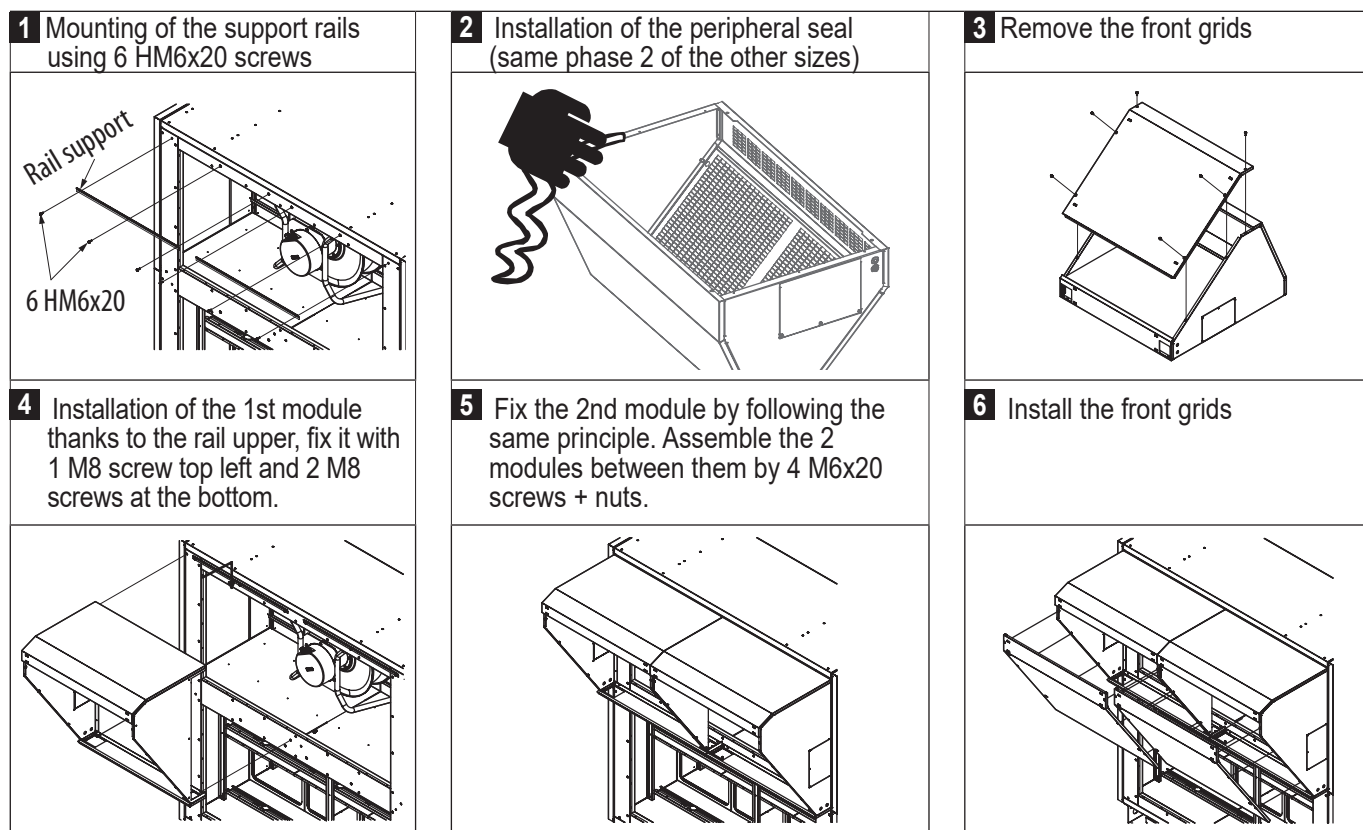
| Type | Designation | Dimensions (mm) | | |
|------|--|-----------------|------|-----|
| | | H | L | P |
| A | APPR-R 6000 Exhaust air protection canopy RHE 6000 | 602 | 945 | 506 |
| | APPR-R 8000 Exhaust air protection canopy RHE 8000 | 747 | 1195 | 564 |
| | APPR-R 10000 Exhaust air protection canopy RHE 10000 | 747 | 1365 | 564 |
| B | APPA-A 6000 Outdoor air protection canopy RHE 6000 | 602 | 945 | 506 |
| | APPA-A 8000 Outdoor air protection canopy RHE 8000 | 747 | 1195 | 564 |
| | APPA-A 10000 Outdoor air protection canopy RHE 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)



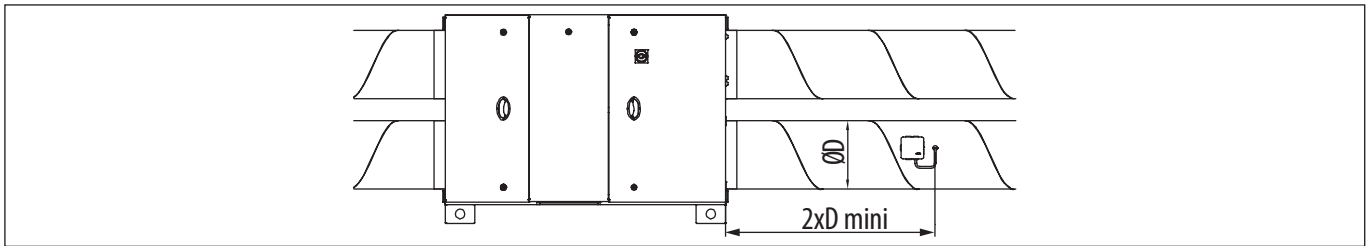
APPA / APPR specific mounting for size 15000



5.2.3 Sensors

Electric connection on the RHE box: see subsection "6.6 External components connection drawings (examples)", page 44.

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.



Recommended pressure sensor :

| Application | Code | Designation | Description |
|---------------------------|--------|----------------------|---|
| RHE 700/1300 | 132146 | 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 | 132105 | 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 | 132143 | 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 44.

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:

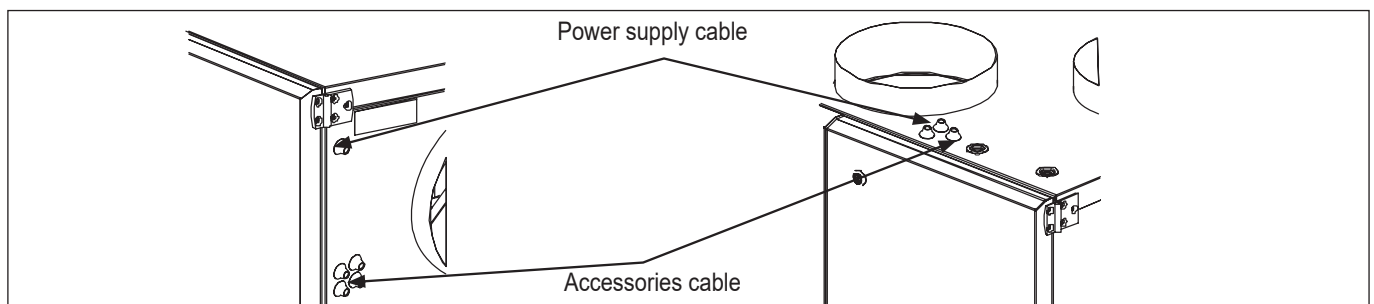
| Code | Designation | Description |
|------------|-----------------------------|---|
| 132376 | SCO2 AA-010-400-1100 | Room CO ₂ sensor with display 0-2000 ppm Output signal 0-10V |
| 132251 | SCO2 AA-010-0-2000 | Room CO ₂ sensor 0-2000 ppm Output signal 0-10V |
| 132375 | SCO2 A-010-400-1100 | Room CO ₂ sensor without display 400-1100ppm Output signal 0-10V |
| 132252 | SCO23 G MIX 0-2000 | Duct CO ₂ sensor 0-2000ppm output signal 0-10V or 4-20mA |
| 132377 | SCO23 G MIX 400-1100 | Duct CO ₂ sensor 400-1100ppm output signal 0-10V or 4-20mA |
| 5416845400 | AIRSENS COV | Room IAQ probe - COV mesurement, 0-10V, Modbus, power connection 230V |
| 132749 | E4000NG | Room IAQ probe - mesurement COV + CO ₂ + RH, 1-10V, Modbus, power connection 24V |

6. ELECTRICAL FEATURES AND CONNECTIONS

Electric connection on the RHE box: see subsection "6.6 External components connection drawings (examples)", page 44.

6.1 Connections

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



HD Version (supply on top side)

VD Version (on the upper right hand corner)

6.2 Electrical features

Global unit

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

Units up to size 15000 are fitted with a proximity disconnect switch.

Only size 15000 DI units, fitted with electric heaters, have a disconnect switch dedicated to supplying power to the electric heater.

| Size | Heat exchanger rotor drive motor | | | Fan to be multiplied by 2* | | | | | Compleat unit with coil | | |
|---------------------------|----------------------------------|----------------|-------------|-------------------------------|------------|--------------------|-------------|------------------|----------------------------|------------------|-----------------------|
| | Voltage (V) | Nom. power (W) | Current (A) | Voltage (V) | Freq. (Hz) | Max abs. power (W) | Current (A) | Maxi speed (rpm) | Voltage (V) | Total Power (kW) | Current max total (A) |
| 700 D-DC-DFR-DX | 1 ph. 230V | 40 | 0,2 | 1 ph. 230V | 50/60 | 200 | 1,6 | 2650 | 1 ph. 230V | 1 | 4,2 |
| 1300 D-DC-DFR-DX | 1 ph. 230V | 40 | 0,2 | 1 ph. 230V | 50/60 | 700 | 3 | 3450 | 1 ph. 230V | 2 | 7,2 |
| 1900 D-DC-DFR-DX | 1 ph. 230V | 40 | 0,2 | 1 ph. 230V | 50/60 | 715 | 3,1 | 2800 | 1 ph. 230V | 2 | 7,4 |
| 2500 D-DC-DFR-DX | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1000 | 1,6 | 2580 | 3 ph. 400V + N | 3 | 4,4 |
| 3500 D-DC-DFR-DX | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1000 | 1,7 | 2140 | 3 ph. 400V + N | 3 | 4,6 |
| 4500 D-DC-DFR-DX | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1850 | 2,9 | 2180 | 3 ph. 400V + N | 4 | 7,2 |
| 6000 D-DC-DFR-DX-DC/DF | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1850 | 2,9 | 2180 | 3 ph. 400V + N | 4 | 7,2 |
| 8000 D-DC-DFR-DX-DC/DF | 3 ph. 400V | 120 | 0,35 | 3 ph. 400V | 50/60 | 2730 | 4,2 | 2040 | 3 ph. 400V + N | 6 | 9,8 |
| 10000 D-DC-DFR-DX-DC/DF | 3 ph. 400V | 120 | 0,35 | 3 ph. 400V | 50/60 | 3000 | 4,6 | 1500 | 3 ph. 400V + N | 6,5 | 10,5 |
| 15000 D-DC-DFR-DX-DC/DF | 3 ph. 400V | 180 | 1,11 | 3 ph. 400V | 50/60 | 5000 | 7,7 | 1760 | 3 ph. 400V + N | 12 | 18,5 |
| 700 DI | 1 ph. 230V | 40 | 0,2 | 1 ph. 230V | 50/60 | 200 | 1,6 | 2650 | 1 ph. 230V | 4 | 17,3 |
| 1300 DI | 1 ph. 230V | 40 | 0,2 | 1 ph. 230V | 50/60 | 700 | 3 | 3450 | 1 ph. 230V | 6 | 24,6 |
| 1900 DI | 1 ph. 230V | 40 | 0,2 | 1 ph. 230V | 50/60 | 715 | 3,1 | 2800 | 1 ph. 230V | 10 | 42,2 |
| 2500 DI | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1000 | 1,6 | 2580 | 3 ph. 400V + N | 15 | 21,8 |
| 3500 DI | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1000 | 1,7 | 2140 | 3 ph. 400V + N | 18 | 26,3 |
| 4500 DI | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1850 | 2,9 | 2180 | 3 ph. 400V + N | 19 | 29 |
| 6000 DI | 3 ph. 400V | 55 | 0,28 | 3 ph. 400V | 50/60 | 1850 | 2,9 | 2180 | 3 ph. 400V + N | 28 | 41,9 |
| 8000 DI | 3 ph. 400V | 120 | 0,35 | 3 ph. 400V | 50/60 | 2730 | 4,2 | 2040 | 3 ph. 400V + N | 42 | 61,8 |
| 10000 DI | 3 ph. 400V | 120 | 0,35 | 3 ph. 400V | 50/60 | 3000 | 4,6 | 1500 | 3 ph. 400V + N | 55 | 79,8 |
| 15000 DI | 3 ph. 400V | 180 | 1,11 | 3 ph. 400V | 50/60 | 5000 | 7,7 | 1760 | 3 ph. 400V + N | 12 | 18,5 |
| 6000HP D-DC-DFR-DX-DC/DF | Tri 400V | 55 | 0,28 | Tri 400V | 50/60 | 2500 | 3,8 | 2450 | Tri 400V+N | 5,3 | 9 |
| 8000HP D-DC-DFR-DX-DC/DF | Tri 400V | 120 | 0,35 | Tri 400V | 50/60 | 3800 | 5,8 | 2795 | Tri 400V+N | 8,1 | 13 |
| 10000HP D-DC-DFR-DX-DC/DF | Tri 400V | 120 | 0,35 | Tri 400V | 50/60 | 5700 | 9 | 2250 | Tri 400V+N | 11,9 | 19,5 |
| 15000HP D-DC-DFR-DX-DC/DF | Tri 400V | 180 | 1,11 | Tri 400V | 50/60 | 3800 | 5,8 | 2795 | Tri 400V+N | 17,2 | 26,3 |
| 6000HP DI | Tri 400V | 55 | 0,28 | Tri 400V | 50/60 | 2500 | 3,8 | 2450 | Tri 400V+N | 29,3 | 43,7 |
| 8000HP DI | Tri 400V | 120 | 0,35 | Tri 400V | 50/60 | 3800 | 5,8 | 2795 | Tri 400V+N | 44,1 | 65 |
| 10000HP DI | Tri 400V | 120 | 0,35 | Tri 400V | 50/60 | 5700 | 9 | 2250 | Tri 400V+N | 60,4 | 89,8 |
| 15000HP DI | Tri 400V | 180 | 1,11 | Tri 400V | 50/60 | 3800 | 5,8 | 2795 | Tri 400V+N | 17,2 | 26,3 |
| | | | | | | | | | Tri 400V | 72 | 104 |

* except 150HP model to be multiplied by 4

DI model with electric post-heating coils

Delivered fully wired and connected to the controller.

Standard electric heater data:

| Sizes | Voltage (V) | Nominal power (W) | Current (A) |
|---------|-------------|-------------------|-------------|
| 700 DI | Mono 230V | 3 | 13.1 |
| 1300 DI | Mono 230V | 4 | 17,4 |
| 1900 DI | Mono 230V | 8 | 34,8 |
| 2500 DI | Tri 400V | 12 | 17,3 |
| 3500 DI | Tri 400V | 15 | 21,7 |

| Sizes | Voltage (V) | Nominal power (W) | Current (A) |
|----------|-------------|-------------------|-------------|
| 4500 DI | Tri 400V | 15 | 21.7 |
| 6000 DI | Tri 400V | 24 | 34,7 |
| 8000 DI | Tri 400V | 36 | 52 |
| 10000 DI | Tri 400V | 48 | 69,3 |
| 15000 DI | Tri 400V | 72 | 104 |

Data of electric heaters with lower powers - Option

| 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 | Tri 400 | 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 |

6.3 Controller CORRIGO - Technical data

- Supply voltage 24 V AC $\pm 15\%$, 50...60 Hz or 21...36 V DC
- Power consumption model D...W-3: 12 VA, 6 W (DC)
- Ambient temperature 0...50°C
- Storage temperature -40...+50°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 $\pm 0.4^\circ\text{C}$) or 0...10 V DC (accuracy $\pm 0.15\%$ 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 language)

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 7 or Windows 8.

6.4 Remote control with ETD2 display - Connection

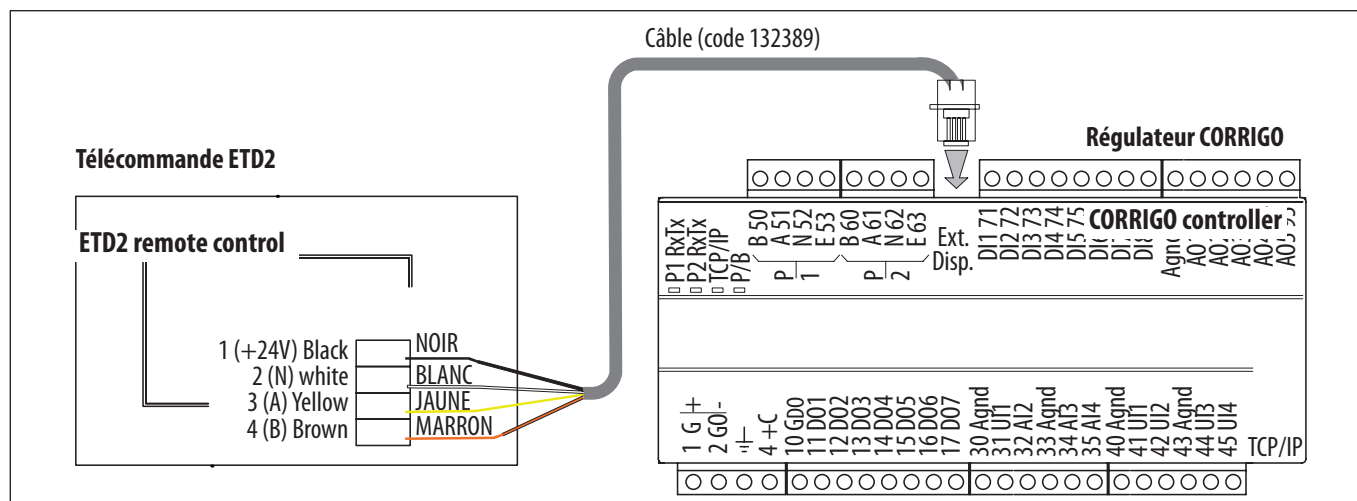
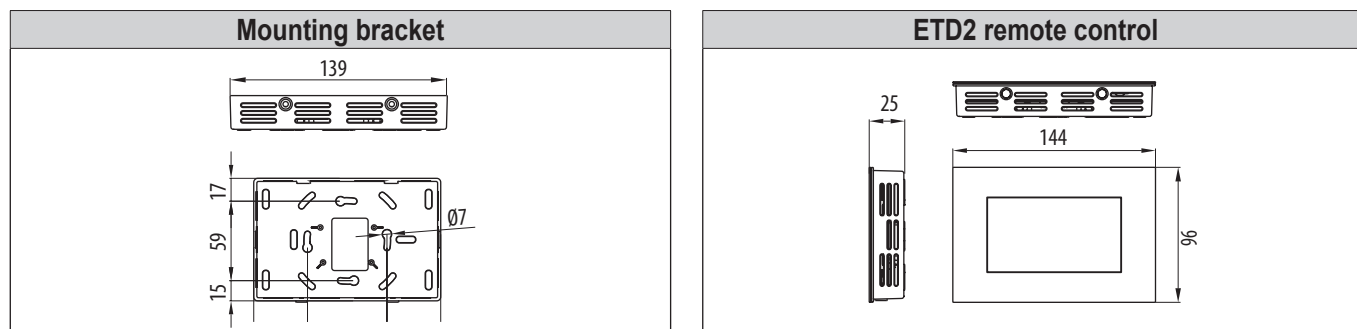
The ETD2 remote control is delivered with a 10 m cable (extension possible up to 100 m). Cable type delivered with the remote control is a 26AWG (4x 0.129mm²) equipped with a 4P4C (RJ9) connector on the controller side. For more than 10m, it will be necessary to increase the section within the limit of the possibilities of the connector (\varnothing 0.9mm).

Use one of the cable grommets available to connect inside the control unit. Once the connection completed, attach the cable to the mounting bracket with a collar to avoid strain on the connector's springs when handling.

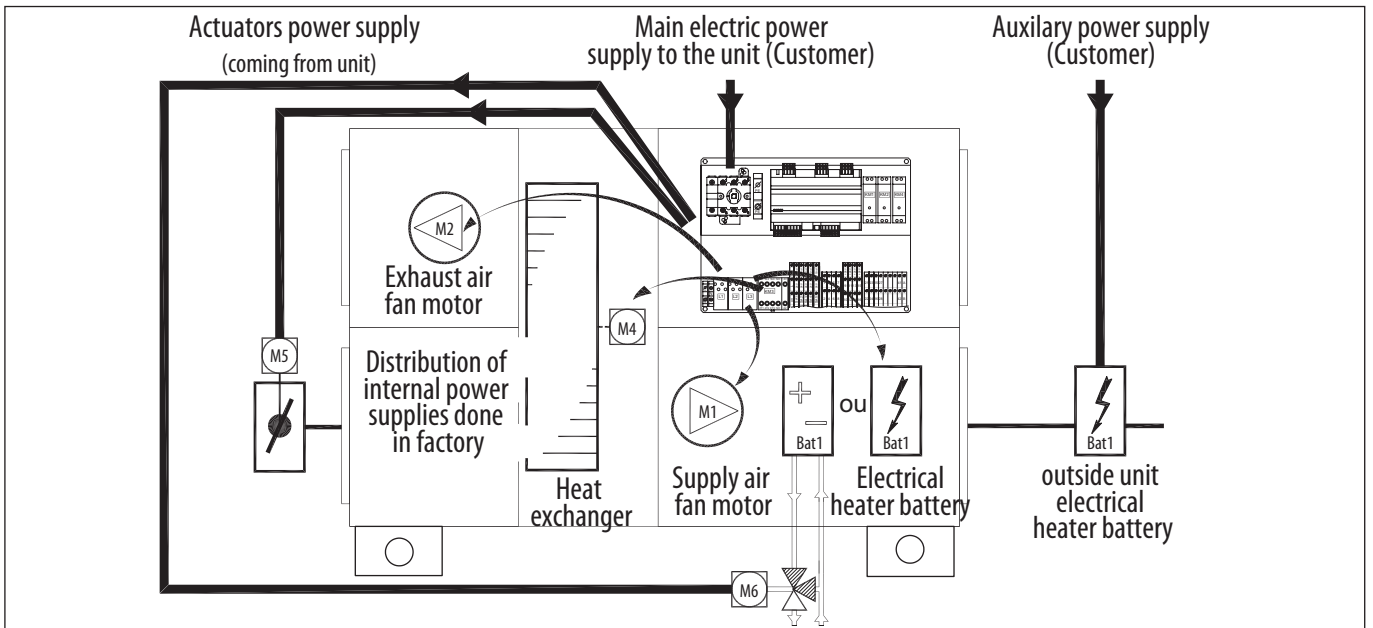
 The ETD2 remote control is IP20, it is exclusively reserved for indoor use, protected from humidity. It is equipped with an internal temperature sensor.

In the case of external mounting of the RHE HD OI, you can also leave it inside in the housing of the electrical box. Once the settings have been made, the remote control can be disconnected.

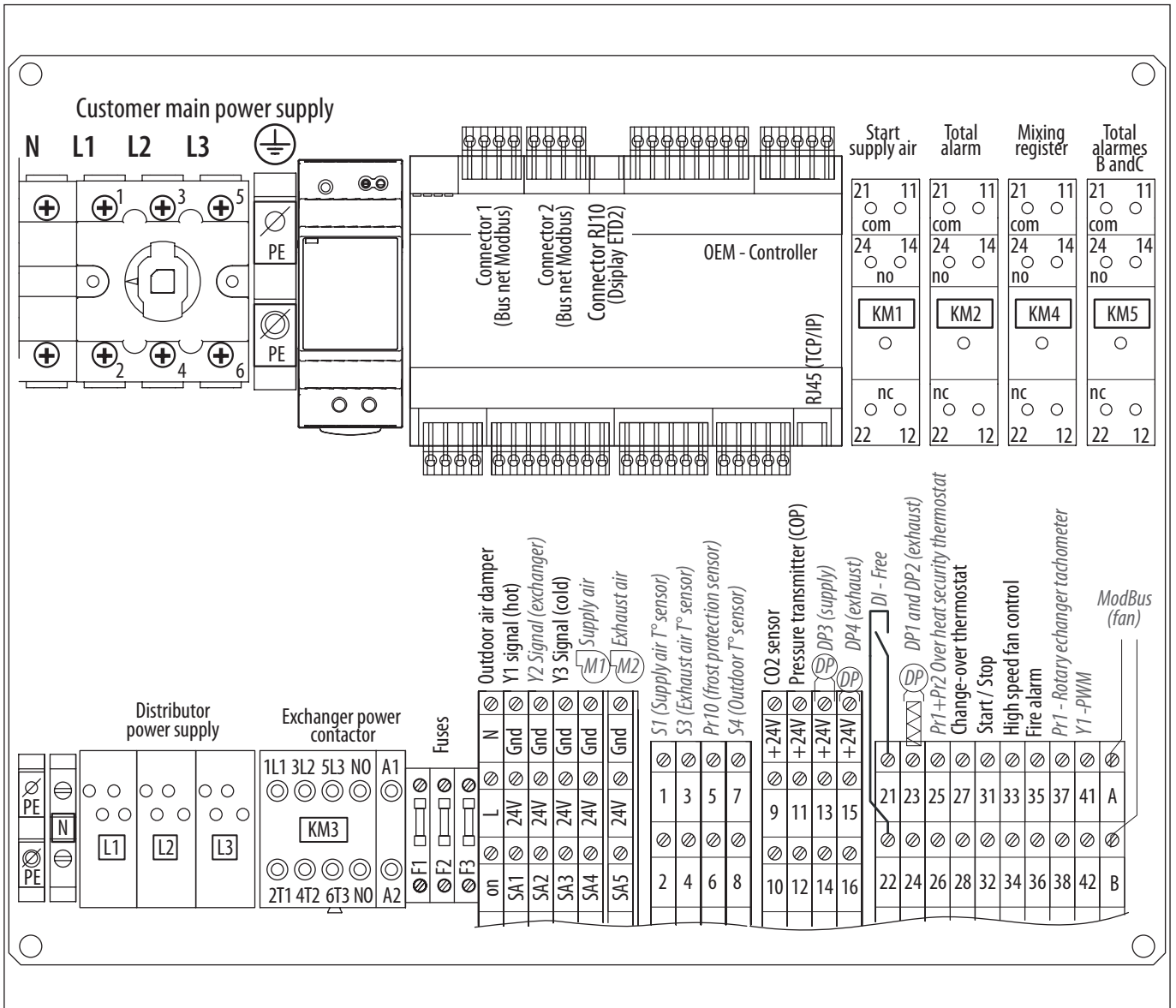
Placement of the support and the remote control :




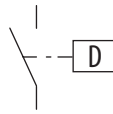
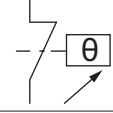





Power connection



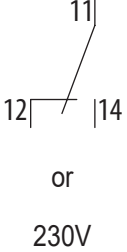
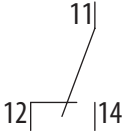
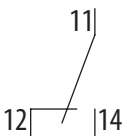
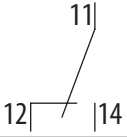
Input – output tables (terminal block / signal / variable / function)



| 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 |

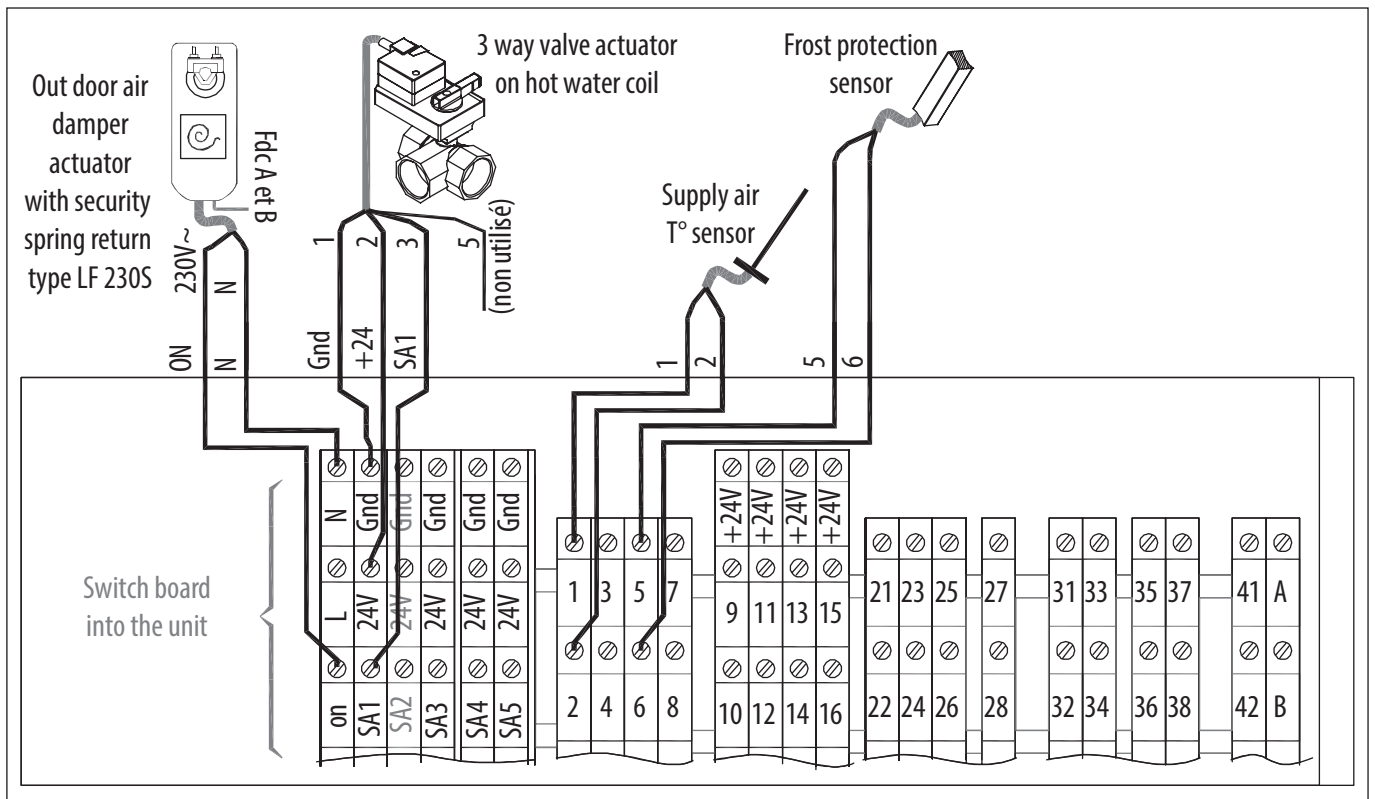
| Logical Input | | | | |
|---------------|---|----------|---------------------------------|--|
| Switch | Signal | Variable | Name | Description |
| 21-22 |  | DI 1 | Defrost DX Group | Reception of the signal of defrost procedure on DX group |
| 23-24 |  | DI 2 | filter pressure guards | Monitoring of the filters cleanliness condition |
| 25-26 |  | DI 3 | Over heat control | Monitoring of the safety thermostats triggering in case of an over heating of the electric battery |
| 27-28 |  | DI 4 | Change-over Thermostat | Monitoring of the water circuit inlet temperature to select the hot/cold mode of the reversible battery |
| 31-32 |  | DI 5 | On/Off system | Request to start or stop the system Note : Stop has priority over the clock, which should be for one |
| 33-34 |  | DI 6 | High speed demand on fan | Request to start at maximum speed Forcing has priority over the clock |
| 35-36 |  | DI 7 | Fire alarm | Request to select the unit in fire mode (see chapter for explanation about this operating mode) |
| 37-38 |  | DI 8 | Heat exchanger rotation control | rotation control by tachometer (belt monitoring) |
| B-A | | bus | | Communication bus of the fan motors |

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

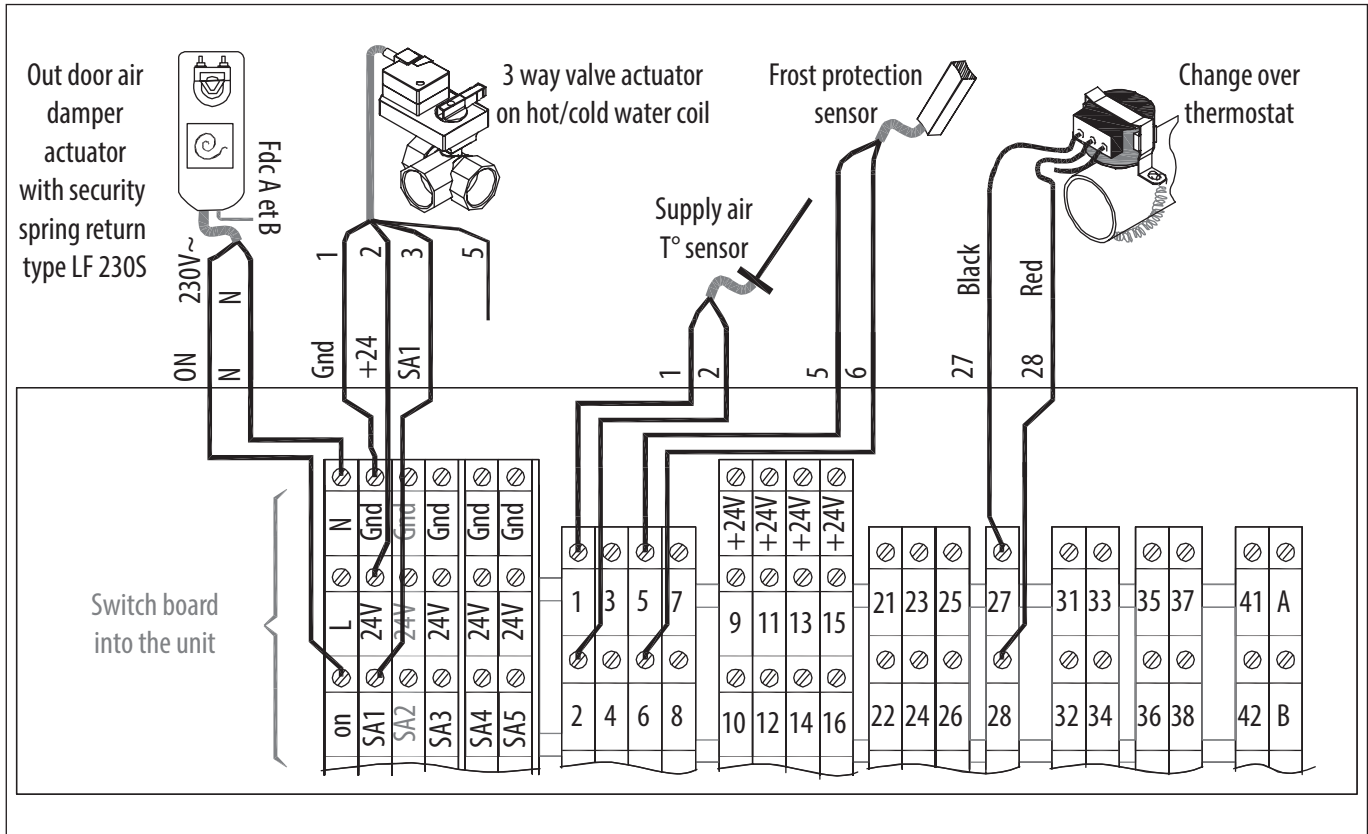
| Logic output (actuator and info report) : les contacts sont libres de potentiel | | | | |
|---|--|----------|--|--|
| Switch | Signal | Variable | Nom | Description |
| KM1 : 12-11-14 N-L-on |  | DO1 | Supply air fan | Control output for the fresh air register servo motor Available : - either for use 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 |  | DO2 | Total alarm | Total alarm status |
| KM3 | | DO3 | Exchanger | Start control of the heat exchanger |
| KM4 : 12-11-14 |  | 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 |  | 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)

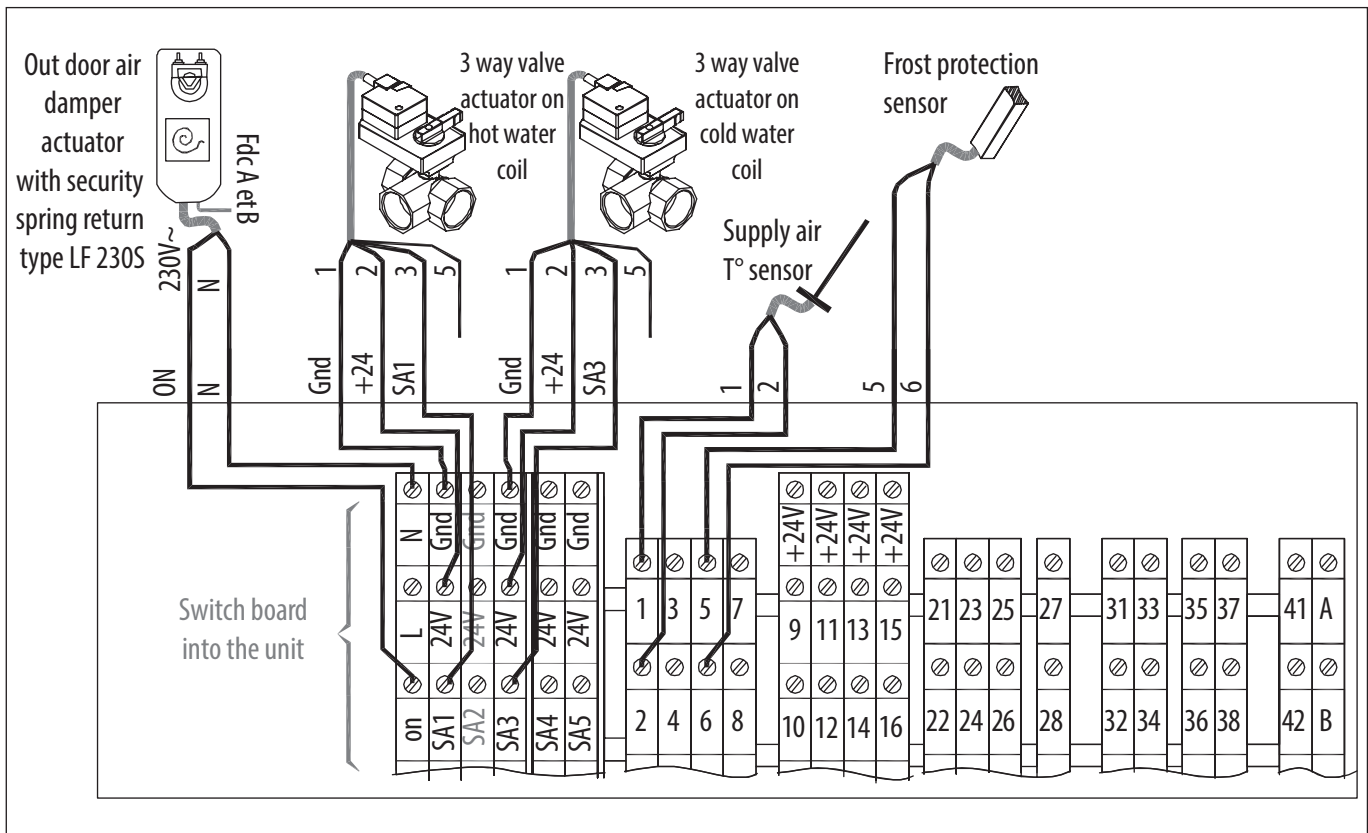
Case of a hot water coil DC (delivered mounted) + dampers (accessories)



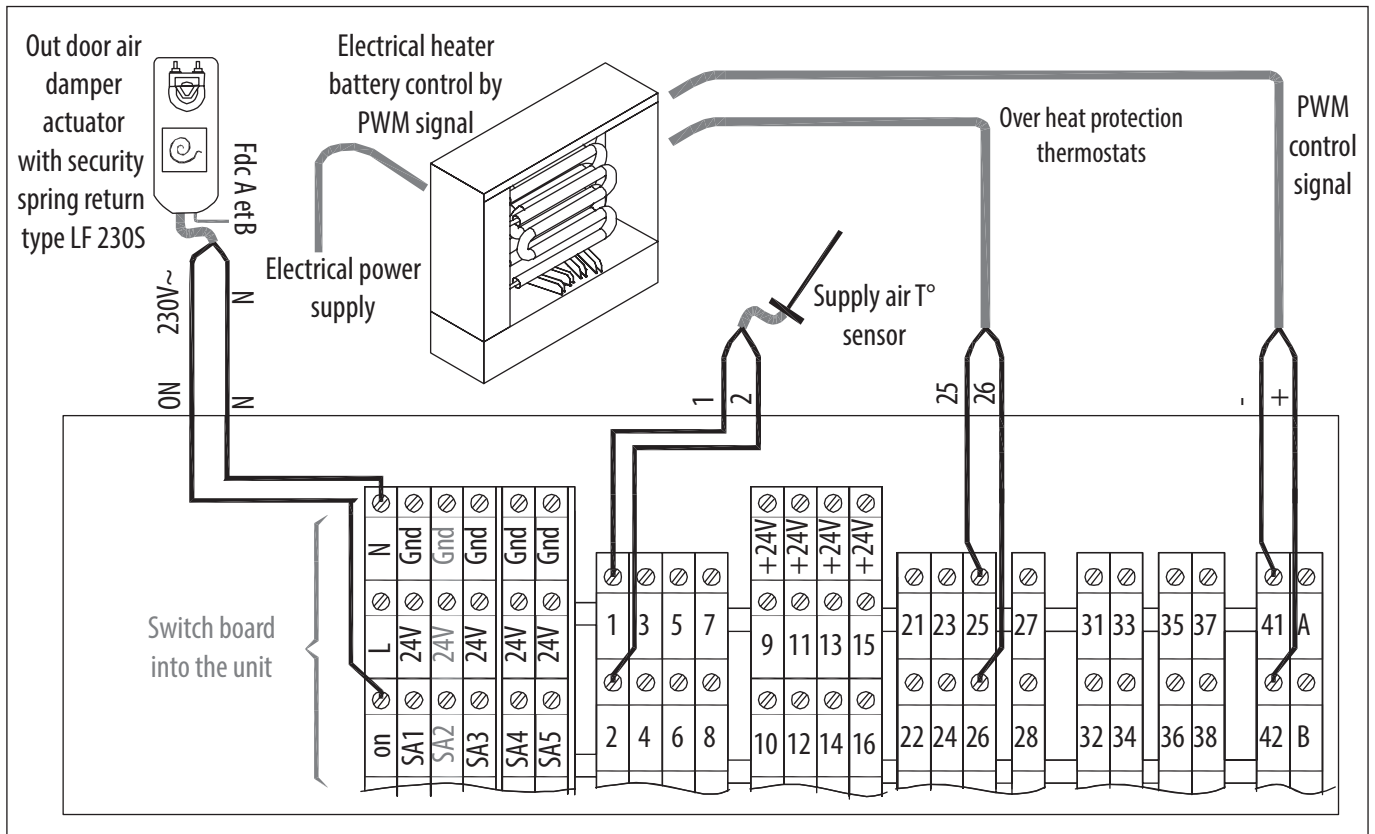
Case of a reversible water coil DFR (delivered mounted – cold or hot) + dampers (accessories)



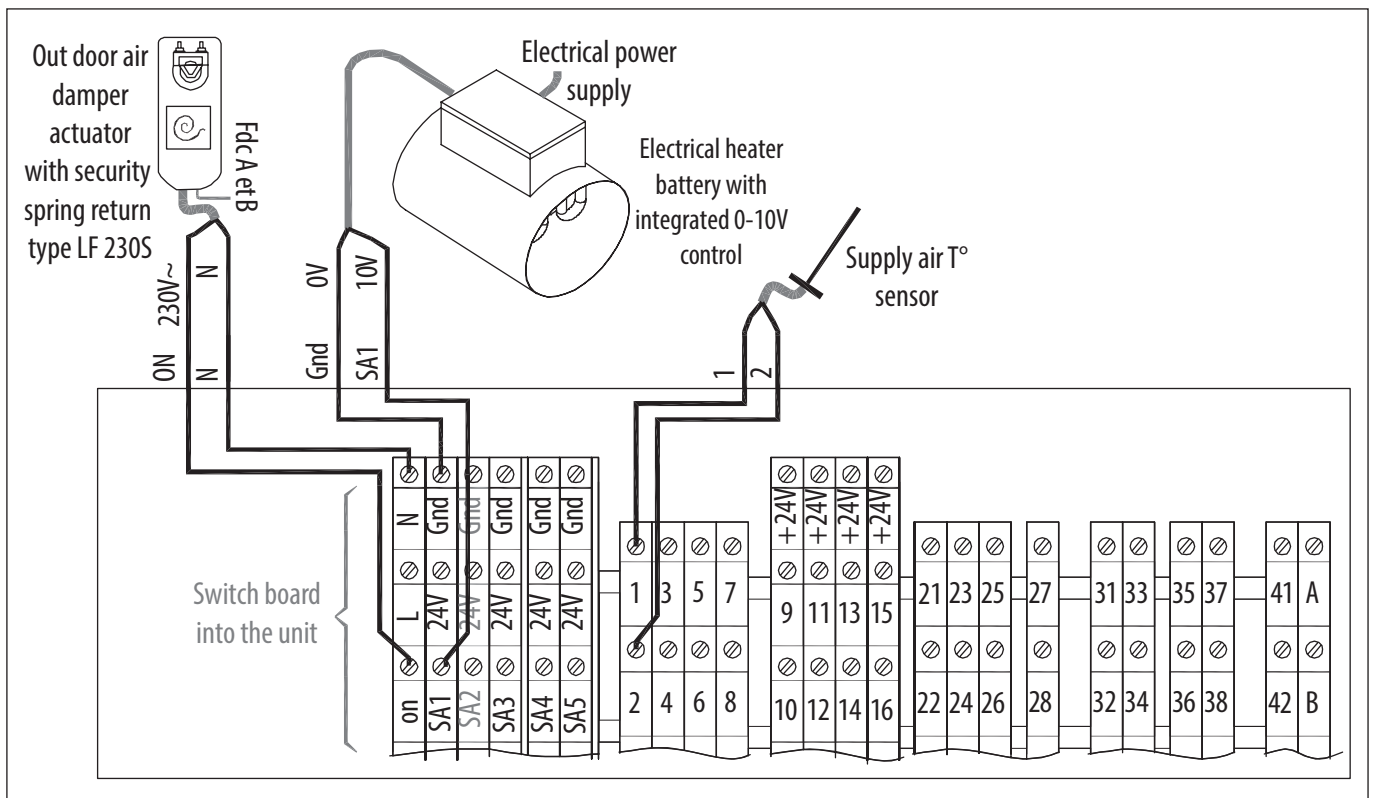
Case of two separate water coils DC/DF (accessories – hot water + cold water circuit) + dampers (accessories)



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

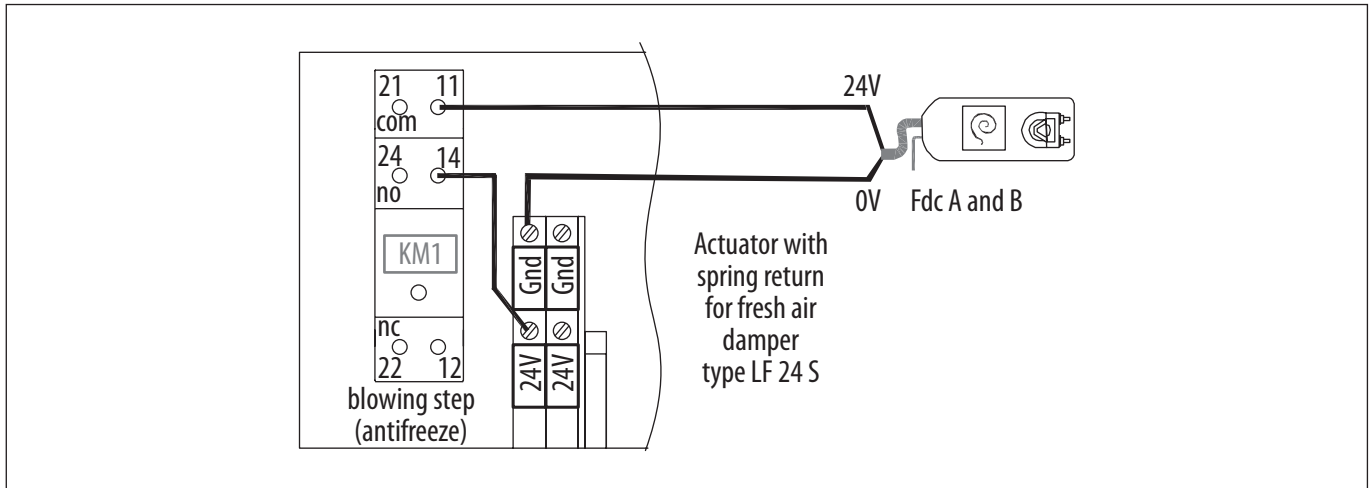


Case of a 0/10V controlled terminal electric heater (accessory) + dampers (accessories)

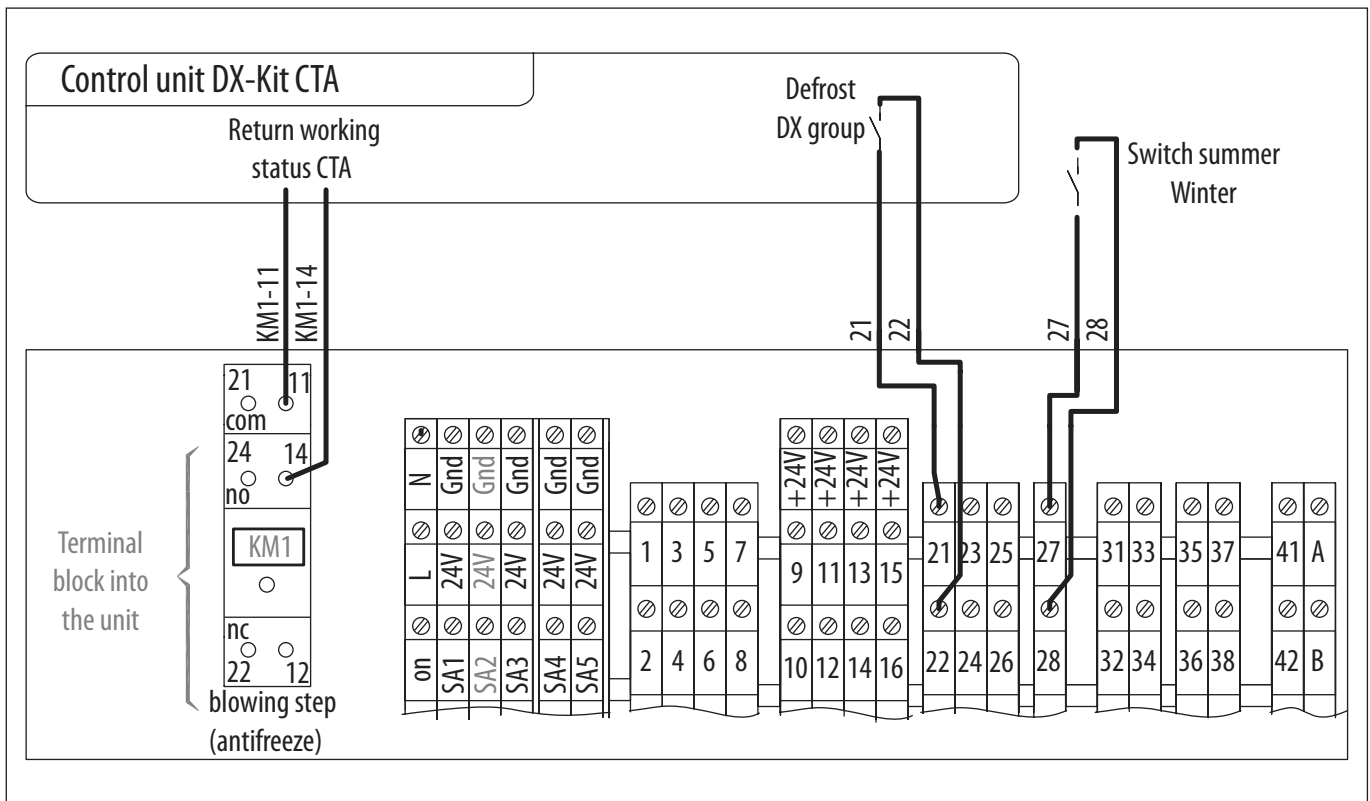


* ⚠ In the case of an outdoor heater, it is necessary to move the supply temperature probe. Use a probe type TKG3 PT1000 and connect it instead of the probe integrated in the unit to the terminals 1-2.

Case of a register with 24V actuator (accessories)

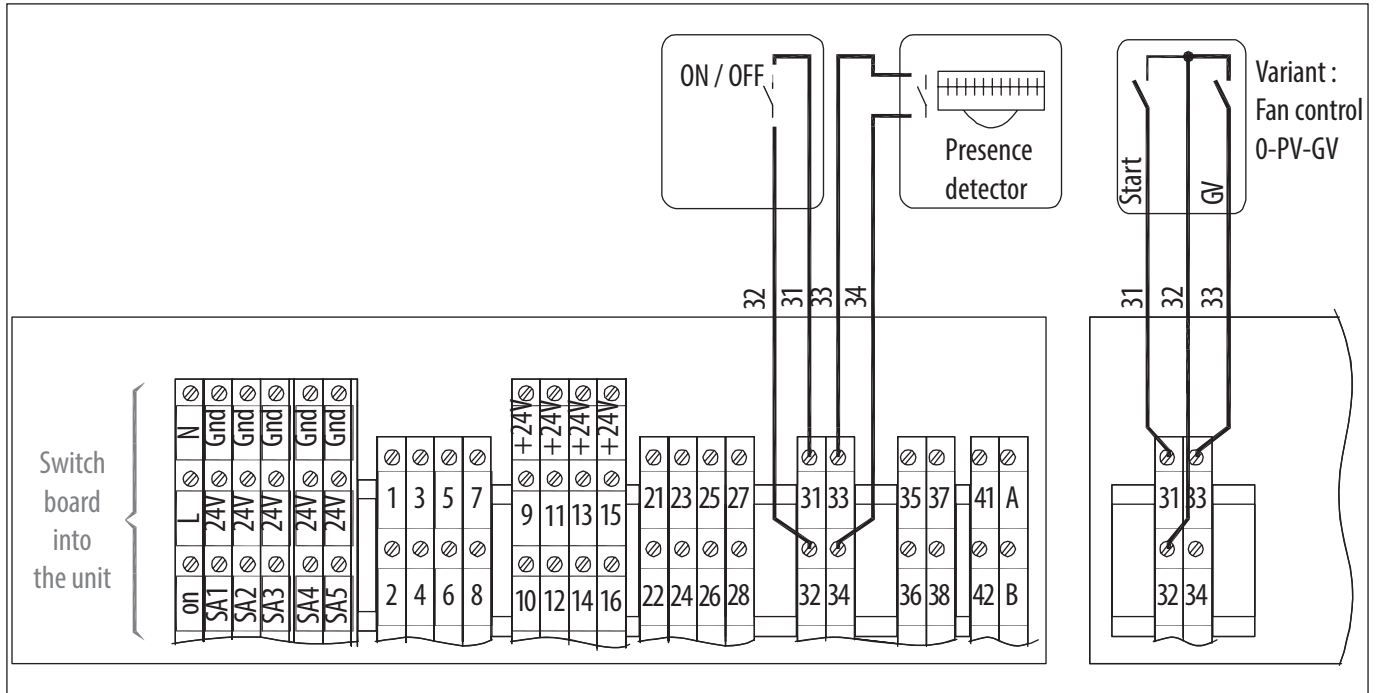


Case of DX coil with DX group equipped with AHU kit



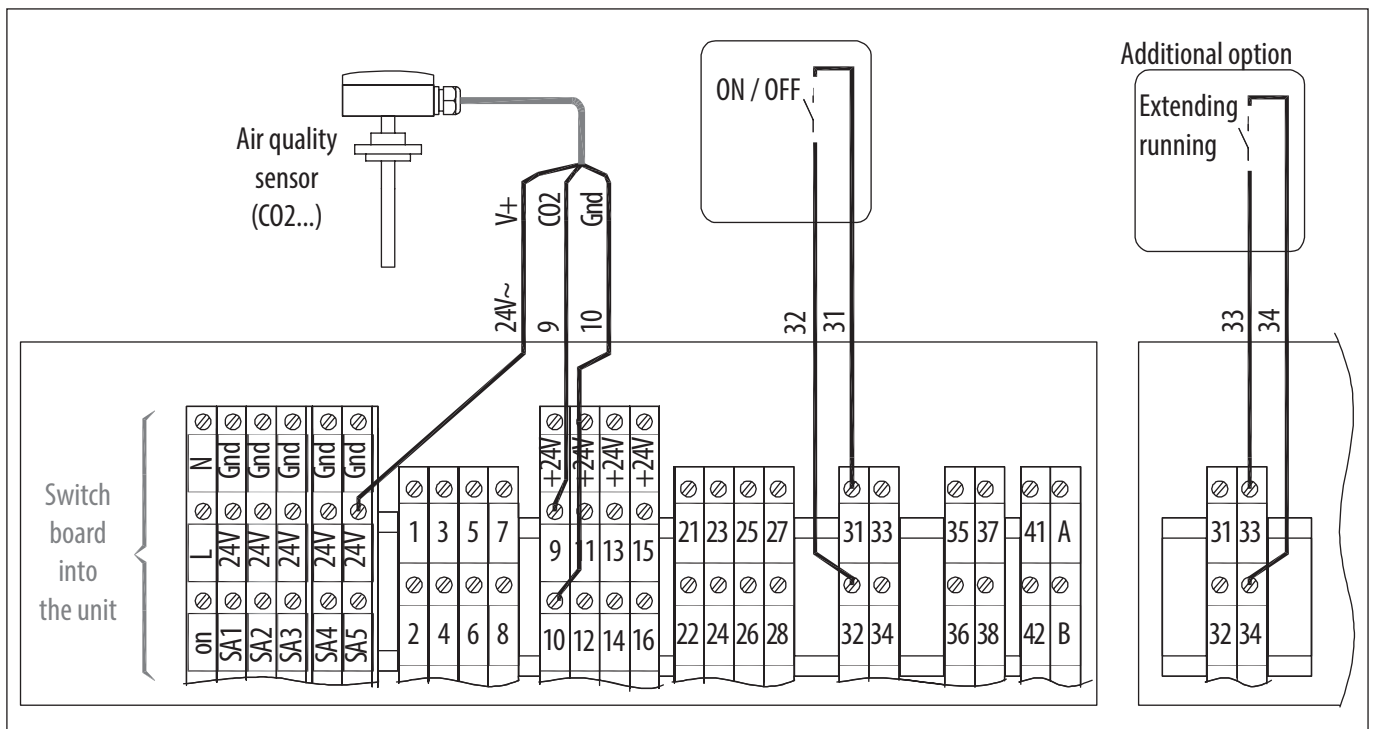
Case of operation in constant airflow (CAV) – controlled by optical sensor or box 0 / PV / GV (accessories)

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



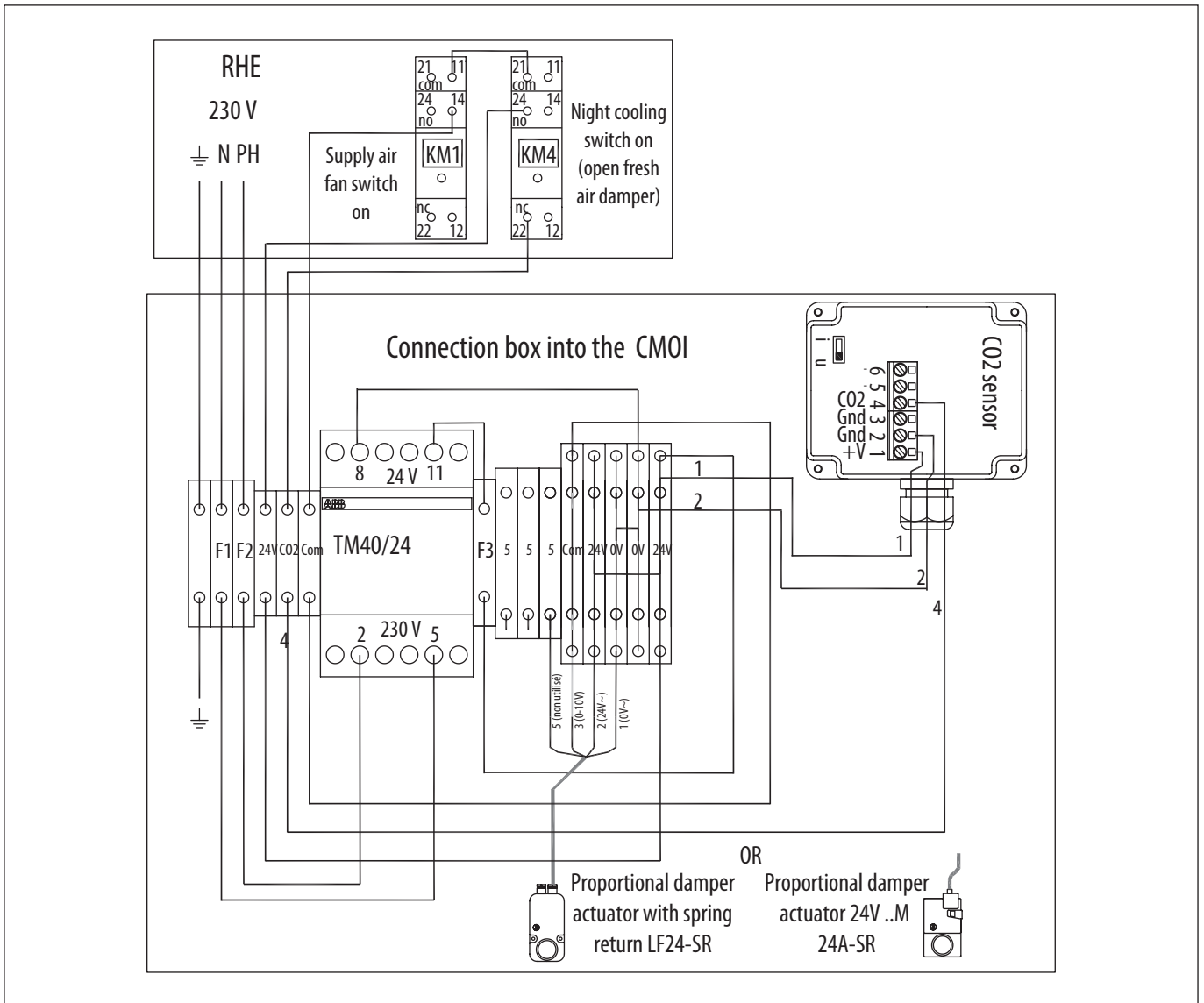
Case of operation in variable airflow (VAV) – CO2 probe (accessory)

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.



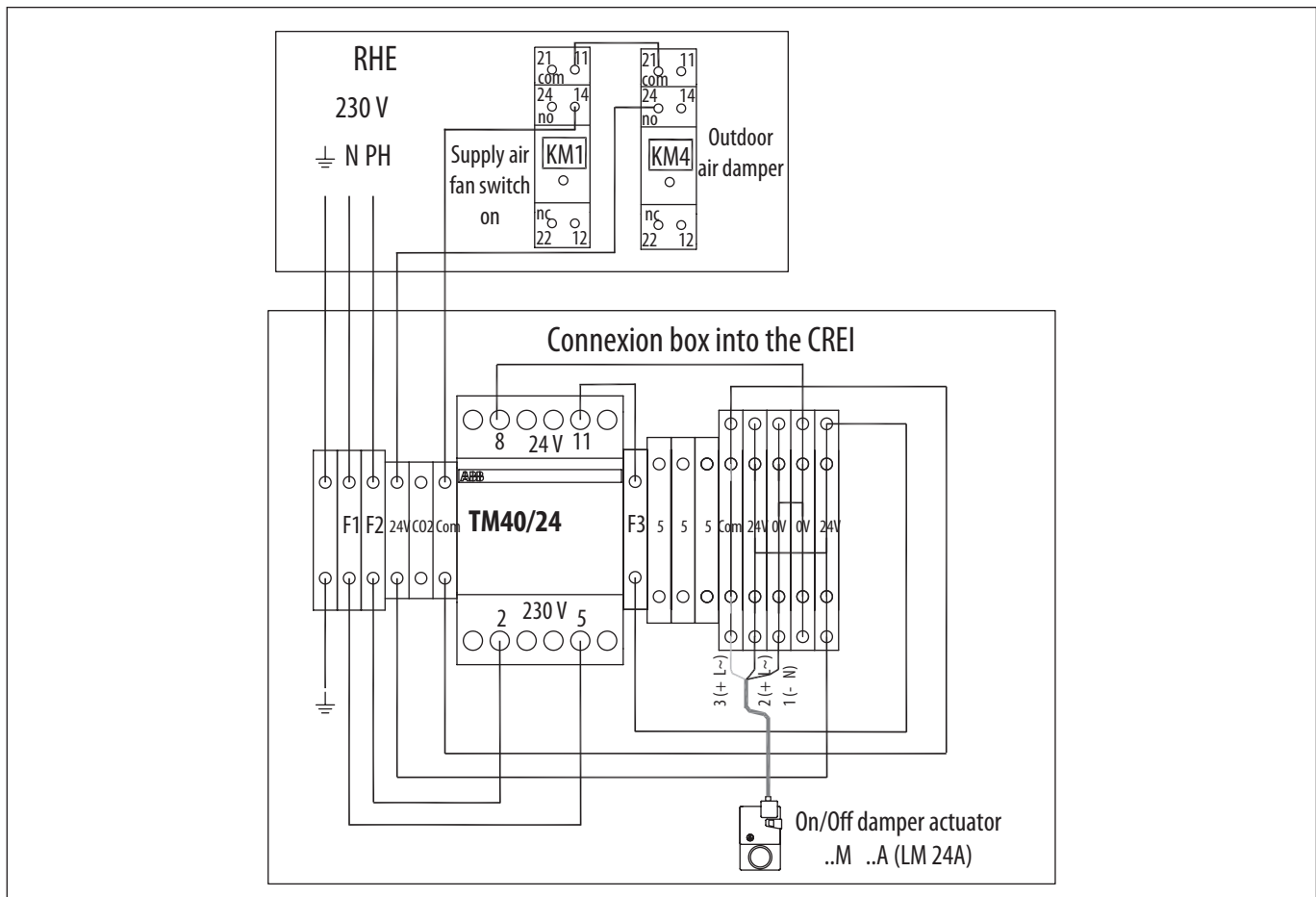
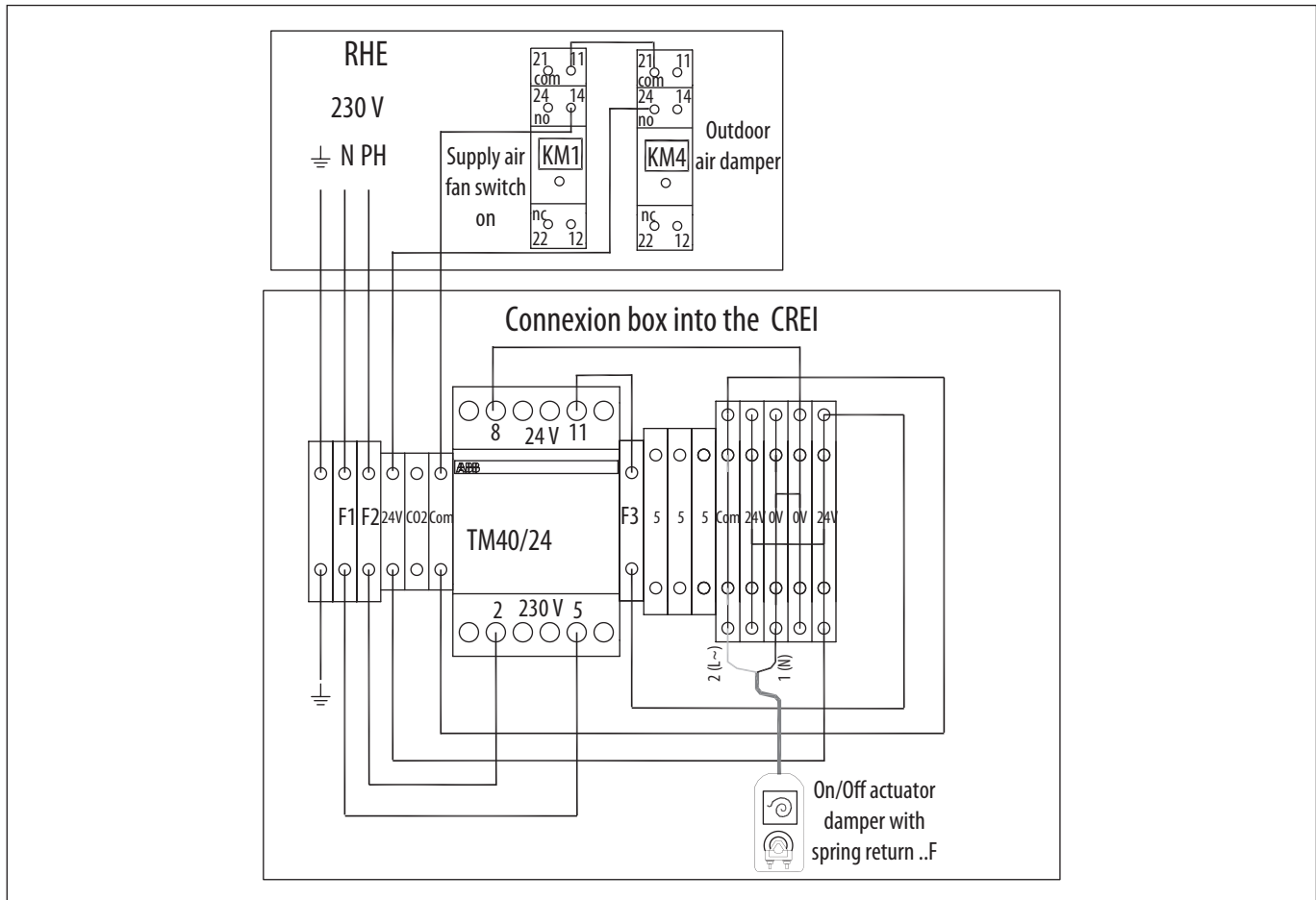
Electric wiring mixing box MIB 0-10V

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.



Electric wiring recycling box MIB ON/OFF

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



7. CONTROL - FUNCTIONAL ANALYSIS

7.1 Main elements of control

| CORRIGO CONTROL | D | DI | DC | DFR | DC/DF | DX |
|---|----------|----------|----------|----------|-------|----------|
| MAIN COMPONENTS | | | | | | |
| Internal electrical box - composition : | | | | | | |
| - Main power connection switch / safety circuit breaker | ● | ● | ● | ● | ● | ● |
| - Controller and terminal strip integrated into the unit, easy access main side | ● | ● | ● | ● | ● | ● |
| FUNCTIONS | | | | | | |
| Air flow control | | | | | | |
| - Constant or fixed air flow (CAV mode), up to 3 different flow setpoints | ● | ● | ● | ● | ● | ● |
| - Variable flow according to an external 0-10V signal or from the remote control (VAV mode) | ● | ● | ● | ● | ● | ● |
| - Constant pressure (with SPRD differential pressure sensor) | ● | ● | ● | ● | ● | ● |
| - Management of flows according to time slots (Clock) | ● | ● | ● | ● | ● | ● |
| - Boost forcing by external contact (reparameterization of a digital input) | ● | ● | ● | ● | ● | ● |
| - GV forcing by external contact | ● | ● | ● | ● | ● | ● |
| - STOP function by external contact | ● | ● | ● | ● | ● | ● |
| Measurement and 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" sensor to be installed on the battery water inlet (DFR) | | | | ● | | |
| Free cooling by switching off the heat exchanger rotation | ● | ● | ● | ● | ● | ● |
| Outdoor air damper actuator control (damper in option) | ● | ● | ● | ● | ● | ● |
| Regulation of internal electric heater by pwm signal or external by 0-10V signal: | | | | | | |
| - Proportional regulation of the power of the electric post-heating coil | | ● | | | | |
| Internal hot water coil regulation: | | | | | | |
| - 3 V motorized valves - proportional 0-10V supplied not fitted | | | ○ | ○ | ○ | |
| - Power control of the 3 way valve actuator | | | ● | ● | ● | |
| External water coil control : | | | | | | |
| - Regulation of the power of external hot and/or cold water coil(s) by signal proportional 0 - 10V | ○ (1) | ○ (1) | ○ (2) | ○ (3) | | |
| - Supply air duct sensor TGK3 PT1000 | ○ | ○ | ○ | ○ | | |
| - TGA1 PT1000 antifreeze temperature sensor | ○ | ○ | | ○ | | |
| - CHANGE OVER THCO sensor | ○ | ○ | | | | |
| Safety functions | | | | | | |
| - Filter clogging indication | ● | ● | ● | ● | ● | ● |
| - Fault signal on temperature sensors | ● | ● | ● | ● | ● | ● |
| - Malfunction of air fan | ● | ● | ● | ● | ● | ● |
| - Result deviates too much from the set point (Air flow, Pressure, T°) | ● | ● | ● | ● | ● | ● |
| - A fire alarm from a contact linked to the external fire detection system | ● | ● | ● | ● | ● | ● |
| - Communication failure between controller and display control | ● | ● | ● | ● | ● | ● |
| - Control of the risk of freezing on the water coil (opening of the valve, shutdown if the temperature water drops below 7°C in heating mode) | ● | ● | ● | ● | ● | |
| - Alarm history | ● | ● | ● | ● | ● | ● |
| Communication | | | | | | |
| - Remote control with graphic touch screen (ETD2) | ● | ● | ● | ● | ● | ● |
| Communicating regulation: | | | | | | |
| - MODBUS RTU as standard configuration (RS485) or MODBUS IP on TCP-IP port | ● | ● | ● | ● | ● | ● |
| - BACnet IP or MSTP | ● | ● | ● | ● | ● | ● |
| - Webserver application on TCP/IP port | ● | ● | ● | ● | ● | ● |

● Included, ○ 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.

7.2 Airflow control Fan

Airflow management can be carried out according to 3 control modes: CAV, VAV, COP.

Whatever mode is selected, each fan suction pavilion (extraction and supply) is equipped with a pressure tap and connected to a pressure sensor. The flow rates resulting from the pressure measurements are calculated by the regulator, according to a coefficient K specific to each fan.

- The DO1 digital output corresponds to the supply fan running command and can be used for accessory operation linked to the operating status of the fans (for example starting a DX unit if the supply fan is running).
- Analog output AO4 corresponds to the 0-10V control signal sent to the supply fan.
- Analog output AO5 corresponds to the 0-10V control signal sent to the exhaust fan.
- The choice of the different speed setpoints can be done automatically by time programming or manually from the remote control or by digital inputs.
- The remote control has priority over the time programming.
- The digital inputs have priority over the time programming and the remote control.

7.2.1 Constant flow operation (CAV)

Recommended mode for directly obtaining the desired flow rate in an installation.

The fan speed is set to provide precise airflow and keep it constant.

Supply and return airflows are controlled separately. The "ECO", "High Speed" and "BOOST" flow instructions are set independently in m³/h in the ETD2 remote control.

Pressure transmitters measure the differential pressures on the fan inlets. The flow rates resulting from the pressure measurements are calculated by the regulator, according to a coefficient K specific to each fan. Switching between the different setpoints will be carried out manually or automatically by time programming.

One PI control loop per fan maintains the setpoint by controlling the fans.

Stopping or switching from one speed to another can be done manually from the remote control, by digital inputs (except BOOST), or automatically by time programming.

- Digital input DI5 = Start/stop
- Digital input DI6 = GV override
- BOOST (extra m³/h) selection can be done from the remote control. To perform a BOOST forcing via a digital input, it is necessary to reparametrize a digital input (DI1 for example) and assign it the "Additional alarm 7" function. When closing this digital input, an "External BOOST forcing" message will appear on the main screen.
- A fourth flow set point for "night free cooling" overventilation can be entered via the remote control, in the form of an offset of the high-speed flow GV (see free cooling for operation)

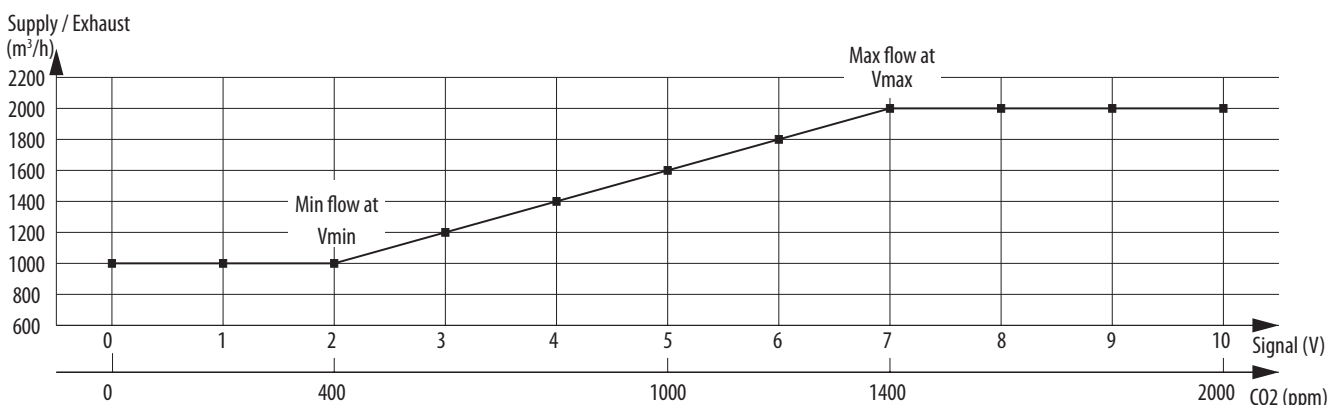
7.2.2 Variable airflow (VAV) operation

Recommended mode in single-zone configuration for applications with variable airflow based on a typical 0-10v signal

The airflow value depends on an external 0-10V signal from an air quality sensor or a potentiometer connected to analog input UI1.

The minimum flow corresponding to the minimum signal and the maximum flow corresponding to the maximum signal must be entered in m³/h during commissioning.

Example :



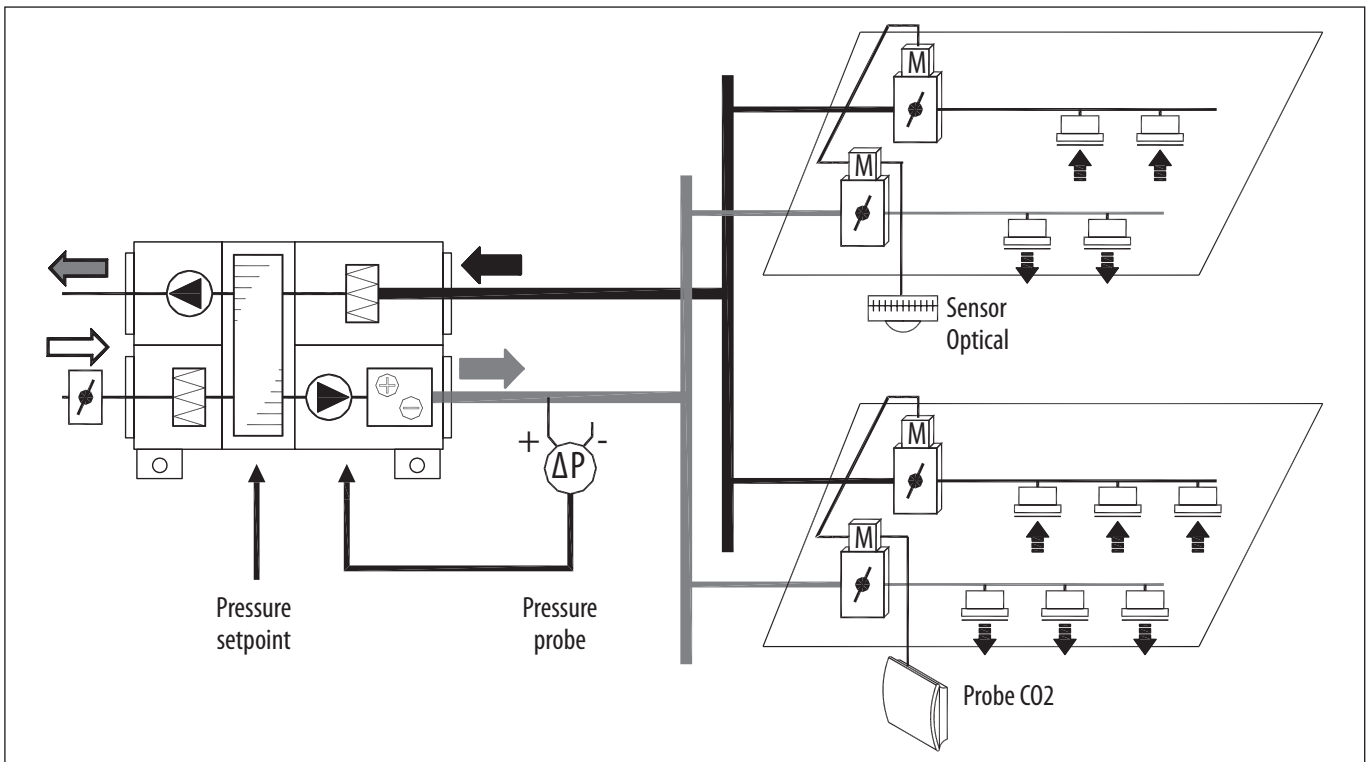
The air flow will automatically change between these two rates depending on the signal received.

Independently, a BOOST (extra m³/h) airflow can be programmed in the form of a fixed airflow for extraction and supply.

- Digital input DI5 = Start/stop.
- Digital input DI6 = forcing GV - forcing of the max flow rate set for the max signal.
- BOOST (extra m³/h) selection can be done from the remote control. To perform a BOOST forcing via a digital input, it is necessary to reparametrize a digital input (DI1 for example) and assign it the "Additional alarm 7" function. When closing this digital input, an "External BOOST forcing" message will appear on the main screen.
- A fourth flow set point for "night free cooling" overventilation can be entered via the remote control, in the form of an offset of the high-speed flow GV (see free cooling for operation)

7.2.3 Operation at constant pressure COP on extraction or supply mode

Recommended mode in multi-zone configuration associated with terminal airflow modulation systems.



The airflows are automatically modulated to maintain a constant pressure value in the duct, measured by an external pressure transmitter.

A single external pressure sensor will be required to control the 2 fans. After having indicated the setpoint value (possibility of entering 2 pressure setpoint values: ECO, NOMINAL), and the position where the pressure transmitter is located (extraction or supply), the fan concerned will regulate its speed to reach and maintain the set value in Pa.

The second fan will have the operating airflow of the first as its set point, with a percentage allowing a shift between the two airflows (x% extraction/supply).

- Digital input DI5 = Start/stop.
- Digital input DI6 = forcing GV - forcing of the max flow rate set for the max signal.
- A third pressure setpoint for "Night free cooling" overventilation can be entered via the remote control, in the form of an offset from the high-speed (GV) pressure setpoint (see free cooling for operation)

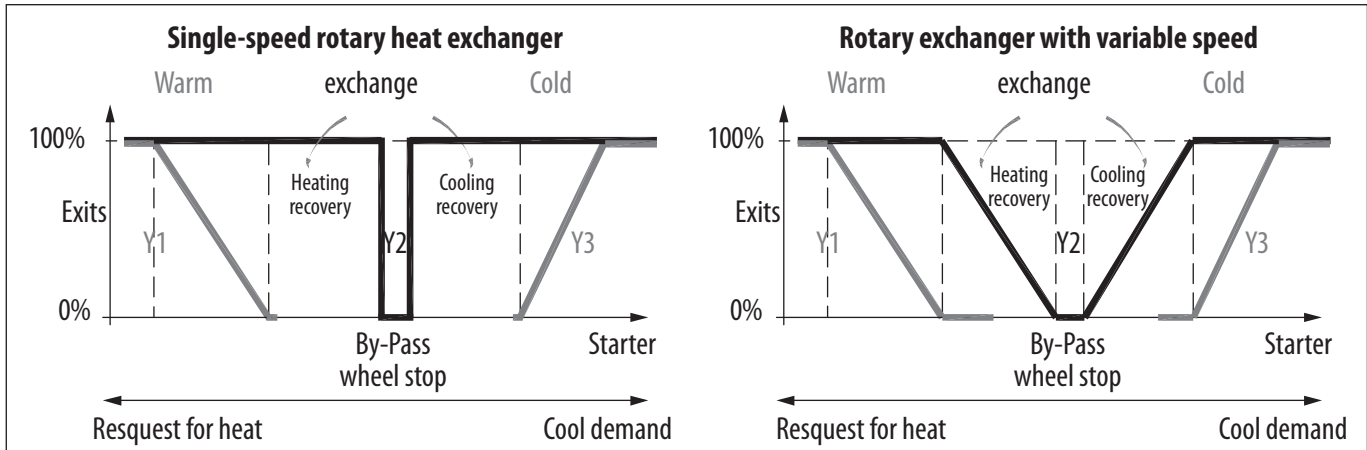
7.3 Temperature control

7.3.1 General principle

The temperature set point as well as the temperature regulation mode are entered via the touch screen. The supply or ambient temperature is maintained at the set value by acting on the controller outputs (heating/exchange/cooling), a single PI loop is used.

The exchanger is considered to be the first potential source of heat or cooling even before the batteries. For RHE fitted with a standard rotary heat exchanger (1 speed), the wheel is controlled in binary mode (on or off).

For RHE equipped with a sorption exchanger, the rotation speed is variable, proportional to a 0 - 10V signal. By varying the speed of rotation, it is therefore possible to modify the efficiency of the exchanger to reach a given temperature set point.



Example of temperature control in heating mode

| Starting conditions | Single speed rotary exchanger | | Variable speed rotary heat exchanger | | Hot battery |
|---|-------------------------------|--|--|---|--|
| | 1-speed rotary exchanger | Conditions after exchanger | Variable speed rotary heat exchanger | Conditions after exchanger | |
| Outdoor $T^\circ < \text{Setpoint } T^\circ$ Outdoor $T^\circ < \text{Return } T^\circ$ | Start | Supply $T^\circ < \text{Setpoint } T^\circ$ | Variation of the speed of the exchanger up to 100% of the possibilities to try to obtain the point | Supply $T^\circ < \text{setpoint } T^\circ$ | Proportional increase in heating power to reach the setpoint T° |
| | | Supply $T^\circ \geq \text{Setpoint } T^\circ$ | | Supply $T^\circ = \text{Setpoint } T^\circ$ Not used | |
| Outdoor $T^\circ < \text{Setpoint } T^\circ$ Outdoor $T^\circ > \text{Return } T^\circ$ | Stop | Supply $T^\circ < \text{Setpoint } T^\circ$ | Stop | Supply $T^\circ < \text{Setpoint } T^\circ$ | Proportional increase in heating power to reach the setpoint T° |
| Outdoor T° close to Setpoint T° Outdoor $T^\circ < \text{Indoor } T^\circ$ | Stop / Start | Supply $T^\circ \sim \text{Setpoint } T^\circ$ | Variation of the speed of the setpoint | Supply $T^\circ = \text{Setpoint } T^\circ$ | Stop |

7.3.2 Temperature control modes

The temperature regulation can be carried out according to the following 4 modes:

- **Supply air control at constant temperature**

The supply air temperature is maintained at the set value by acting on the exchanger outputs, hot output and cold output.

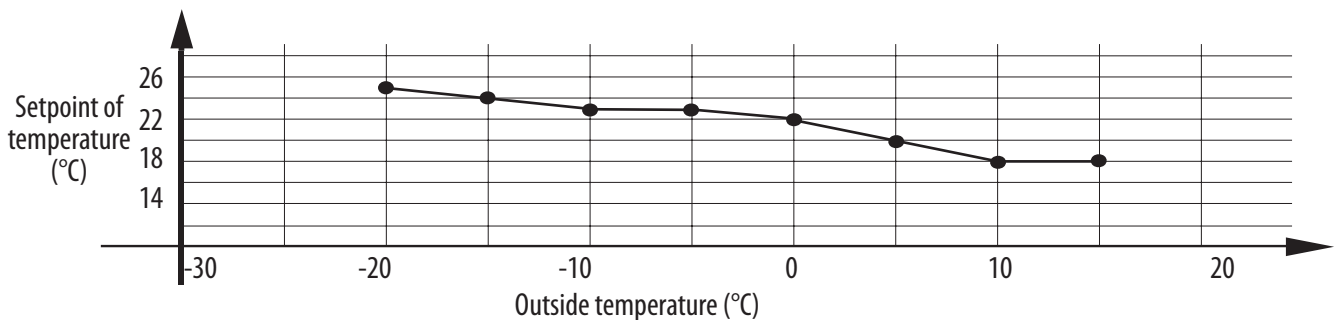
The setpoint is adjusted using the display and number keys.

The user set point for the mode is entered in °C in the settings menu.

- **Supply air control at constant temperature with outdoor temperature compensation**

The supply air temperature setpoint is adjusted according to the outside temperature according to a compensation law made up of 8 factory preset setpoints.

The supply temperature is maintained at the set value by acting on the exchanger, internal coil, exchanger, external coil outputs.



- **Supply air regulation with return temperature control:**

The return air temperature is maintained at the set value by a cascade control of the return air temperature and the supply air temperature. The supply air temperature value is generated according to the difference between the temperature setpoint and the temperature value measured by the return temperature sensor. The return temperature is maintained at the setpoint by acting on the exchanger, internal coil and external coil outputs. The set point for this mode is entered in °C in the settings menu

- **Summer/Winter control:**

Switching between supply air at constant temperature with outdoor temperature compensation and extract air control.

When the outdoor temperature drops below the configurable value of 13°C (winter), the controller is in constant temperature supply control mode with compensation for the outdoor temperature. Otherwise (summer), the regulator operates in regulation mode on the return temperature. An adjustable hysteresis is provided (0.2°C).

- **User limitation and override:**

To avoid risks of discomfort on all the regulation modes, the supply temperature will be limited to 13°C at the minimum and 30°C at the maximum.

The user can shift, override the set point by +/- 3°C using the up and down arrows on the first screen of the remote control.

7.3.3 Outputs

The controller outputs assigned to temperature control are:

- AO1 Hot or hot/cold signal output for reversible coils (0-10V)
- AO2 Exchanger output (0-10V)
- AO3 Cooling coil output (0-10V)
- DO3 Exchanger on/off
- DO7 Post-heating electric HEATER output heater (PWM type pulse train).

A change over signal activated by a digital input DI4, will make it possible to switch from a heating mode to a cooling mode. Contact open corresponds to heating mode, closed corresponds to cooling mode.

It is possible to switch off the heating by reparametrizing a digital input (DI1 for example) by assigning it the "additional alarm 8" function. When this input is closed, a "heating stop" message will appear on the main page and all the heating control signals will be stopped, both in PWM and in 0-10V.

7.4 Special case: temperature control with DX direct expansion coil

General:

- A communication box, "AHU kit", must be provided by the unit's supplier. He makes the communication possible between the direct expansion group and the CORRIGO regulator.
- The direct expansion coil regulation mode is selected on the touch control.
- Temperature regulation by DX group.
- The DX group controls the regulation temperature using its own sensors.
- In this type of installation, the CORRIGO regulator does not perform the regulation functions in temperature
- The probes supplied with the RHE must remain installed.

The information below can be exchanged:

- **From CORRIGO to the DX group**

Run authorization: digital output DO1

- **From the DX unit to the CORRIGO Unit**

Defrosting : the digital input DI 1 is used to reduce the air flow of the unit during the defrosting phase of the direct expansion unit. This reduced flow is the Low-Speed flow(ECO), reduced by an offset value configurable with the touch screen, value set by default at -100 m³/h.

7.5 Free cooling and cooling by night overventilation

7.5.1 Free cooling

Free cooling consists of using outside air when temperature is lower than the return temperature to cool the building, at night in summer for example.

To reduce the exchange, simply stop or slow down the rotary heat exchanger wheel.

Depending on the temperature set point and the temperature measured at the supply and return, the exchanger will receive the dimming or stop signal depending on the type of motor control used.

This function also applies to heating, if the outside temperature is warmer than the inside temperature, for example. We then speak of free-heating.

7.5.2 Free Cooling by night overventilation

This function is used during the summer to cool the buildings during the night using the fresh outside air. This reduces the need to use air conditioning during the day.

To use the cooling function by overventilation (night cooling), the regulation will use the information from the fresh air temperature sensor and the return temperature sensor present and integrated in the unit at the inlet levels.

The over-ventilation function is inactive by default and must be activated from the remote control when setting up the unit.

Cooling by overventilation (night cooling) will only start if the start conditions are met.

Starting conditions:

- Less than 4 days have elapsed since the installation was last started.
- The outdoor temperature during the previous operating period exceeded the preset limit. set 22°C ⁽¹⁾.
- It is between 00:00⁽¹⁾ and 07:00⁽¹⁾ in the morning⁽¹⁾.
- The unit is off or in ECO mode
- A time program will be activated ("On") during the next 24 hours.

If ALL the conditions are fulfilled, the cooling by overventilation starts. It remains on for 3 minutes to ensure that the temperature measurements are representative (by creating air movement in the ducts). After three minutes, the controller checks for shutdown conditions.

Stop conditions:

- The outside temperature is above 18°C⁽¹⁾ or below 10°C⁽¹⁾ (risk of condensation station).
- The return temperature is below 18°C⁽¹⁾.
- The time programs (timer) for normal speed, normal override and control are “On”.
- It is past 7:00⁽¹⁾ in the morning.

If at least one of these conditions is fulfilled after the first three minutes of operation, then the overventilation is stopped.

When the over-ventilation function is active, the fans run:

- In CAV at the speed set for high speed(GV) + an offset in m³/h (settings entered in the CAV settings menu).
- In VAV at the speed set in high speed (Vmax) + an offset in m³/h (setting entered in the VAV settings menu).
- In COP at the pressure set in + an offset in Pa (setting entered in the COP setting menu).

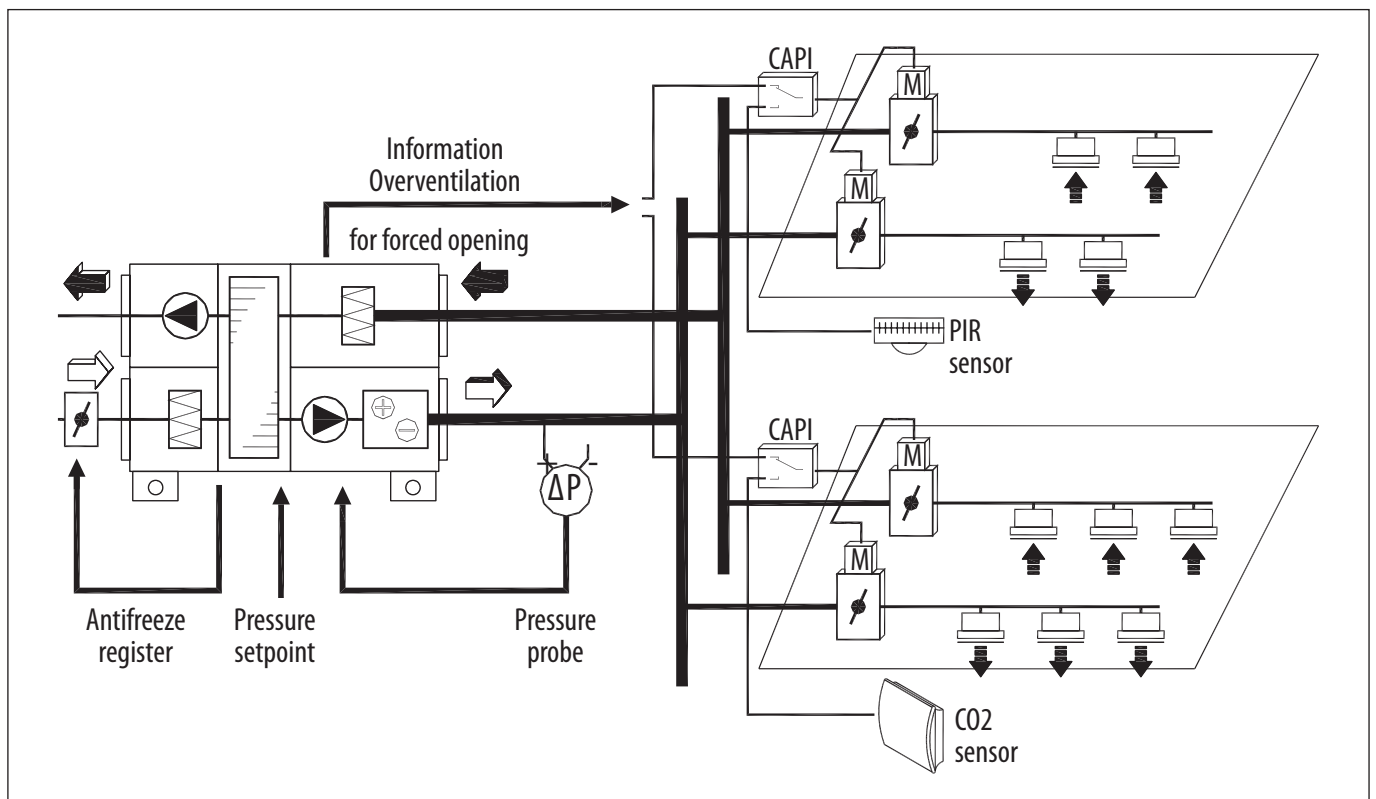
The coils and exchanger control outputs are cut. The heating output remains blocked for 60 min⁽¹⁾ after the function has stopped.

⁽¹⁾ Default values that can be modified in the advanced settings menu.

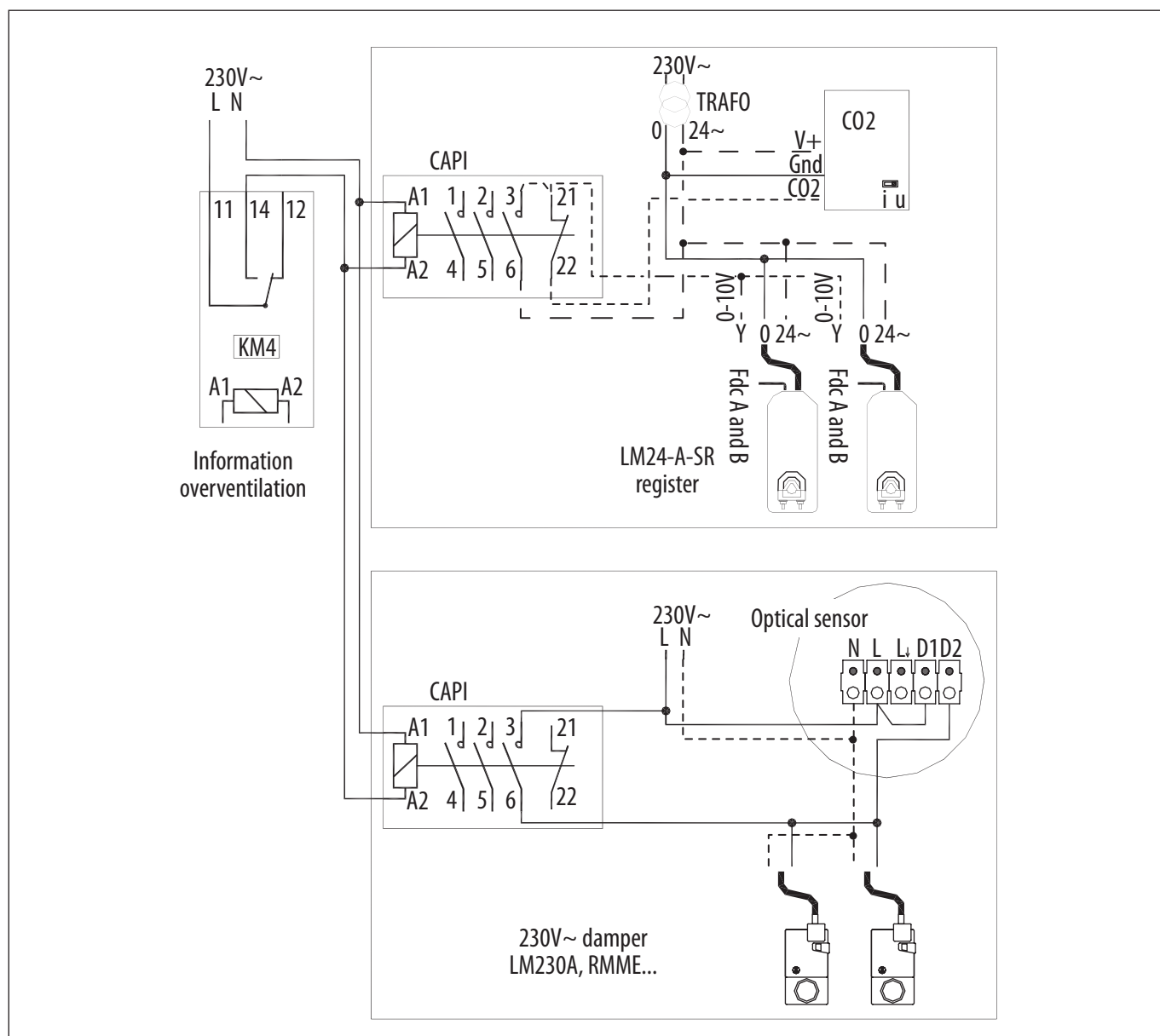
7.5.3 Special conditions for using free cooling overventilation in constant pressure mode (COP)

In constant pressure mode (COP), during the night, the airflow modulation dampers of the different zones can be in closed positions or set to the minimum airflow. To be able to take advantage of the nocturnal over-ventilation, it is necessary to force the opening of these dampers to allow the passage of the over-ventilation flow. We recommend the use of a power contactor box for CAPI type relaying.

Block diagram and wiring (example):



To be able to benefit from the nocturnal overventilation, it is necessary to force the opening of the modulation registers, wiring principle below:



7.6 Hot water coil frost protection

The hot water or reversible coils integrated in our units have a temperature sensor "Antifreeze protection sensor" installed on the water outlet network and connected to the controller on terminal AI3.

Too low a temperature generates an internal proportional signal, which is used to force the valve to heating in the open position, to prevent any risk of freezing.

The internal signal increases when the frost protection temperature drops below 12°C for reach 100% of the output when the temperature is equal to 7°C (frost protection alarm threshold). Then the installation is stopped, the heating output switches to "completely open" mode and an alarm is triggered.

Stopping the supply fan will close the fresh air damper (recommended accessory).

The installation restarts when the temperature at the antifreeze sensor is greater than or equal to 12°C.

Frost protection remains active when the fans are off. In this configuration, the controller controls the heating valve to maintain a constant temperature of 25°C (adjustable) in the circuit at the probe.

This strategy makes it possible to limit the risk of freezing, by ensuring water circulation in the battery. For provide superior protection against the risk of freezing under extreme or abnormal conditions (malfunction the hot water network for example), it is advisable to use glycol water.

7.7 Control of the fresh air damper

When a damper is provided on the fresh air and connected to the regulation, its operation is explained in the table below:

| Unit operating mode | Digital output DO 1 | Damper status |
|--------------------------|---------------------|---|
| Stop | Open (=0) | Damper closed |
| Start sequence | Closed (=1) | Open at start of start sequence |
| Standard | Closed (=1) | Damper open |
| Free cooling | Closed (=1) | Damper open |
| Night overventilation | Closed (=1) | Ditto start-up sequence if unit stopped |
| Defrost strategy failure | Open (=0) | Closing at the same time as the cooling fan stops blowing |
| Stopping sequence | Open (=0) | Closing at the same time as the cooling fan stops blowing |

7.8 AHU start and stop sequences

Start sequence

The air handling unit starts and operates normally after the following steps:

- Opening of the fresh air damper (accessory)
- Start of the exhaust fan
- Supply fan start
- Temperature control according to the configured control mode

Potential alarms are displayed after a delay of 70s (alarm delay at start-up)

Stop conditions

The installation stops when one of the following conditions is met:

- The time program (clock) is on "STOP" and no digital forcing (GV or BOOST) is activated
- One of the following alarms is triggered:
 - Fire alarm
 - Supply fan fault
 - Electric heater overheating
 - Risk of freezing on the hot water coil
- The "on/off" digital input is on Off
- The air handling unit is stopped manually from the remote control, speed selection on "STOP"

Stop sequence

- Shutdown of electric heating (DI model)
- Stopping of the extraction and supply fans after time delay:
 - Extraction or supply fan: time delay 0s (modifiable)
 - DI model with electric heater: 120s time delay (modifiable)
- Closing of fresh air and extracted air dampers (accessories)
- Standby mode
 - Active control of the water temperature on the hot water coils

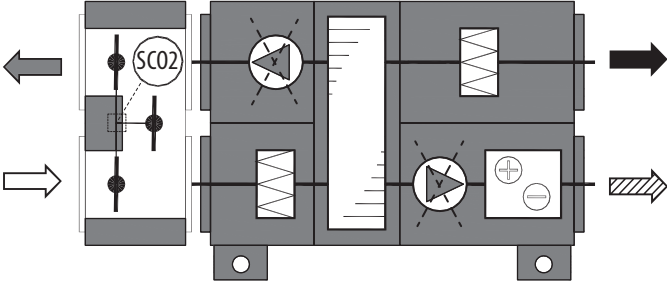
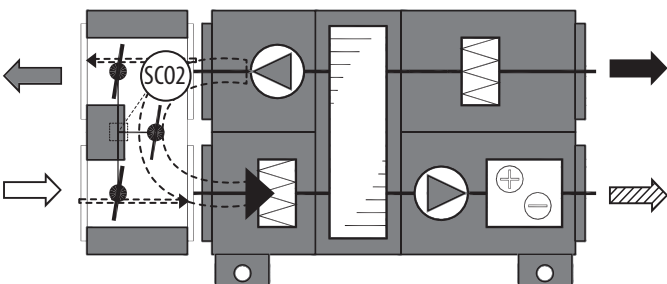
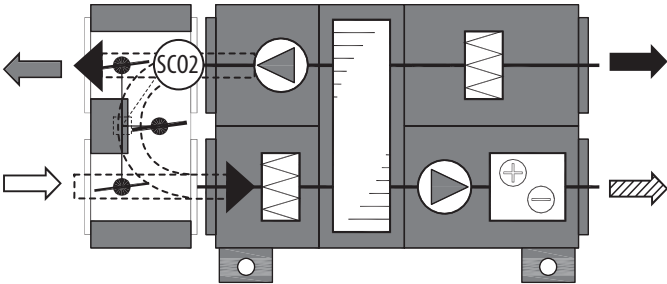
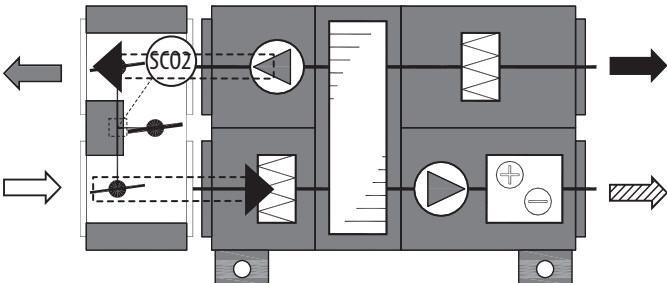
7.9 MIB 0-10V – Mixing box

The mixing box is mainly used in mixed ventilation and heating installations.

It will make it possible to operate in recycling mode during periods of non-occupation and in all fresh air during maximum occupancy of the premises.

Operating principle:

The mixing box is fitted with a CO₂ sensor (SCO₂ A-010 400-1100ppm) which continuously measures the level of CO₂ contained in the extracted air, it sends a proportional signal to the damper servomotors to open them more or less depending on the indoor air quality.

| | |
|---|---|
| <p>Unit shut down (antifreeze protection, system shutdown, etc.)</p>  | <p>When the unit is stopped, the extraction and fresh air dampers are closed, the mixing damper is open. This position will be obtained in the event of a power cut if the dampers are fitted with a return spring.</p> |
| <p>Unit in operation low CO₂ level (excluding overventilation)</p>  | <p>When the unit is running and during periods of low occupancy, most of the air flow introduced comes from the recycling of the extracted air, which makes it possible to minimize the energy cost of reheating the air.</p> |
| <p>System in fresh air operation proportional to the CO₂ rate</p>  | <p>The mixture of fresh air and recycled air is proportional to the air quality of the extracted air</p> |
| <p>Maximum CO₂ level or System in overventilation</p>  | <p>When the measured CO₂ level reaches 1100ppm or more, the unit operates with all fresh air, to improve indoor air quality. This position will be the one used if night over-ventilation is activated, which makes it possible to benefit from night cooling.</p> |

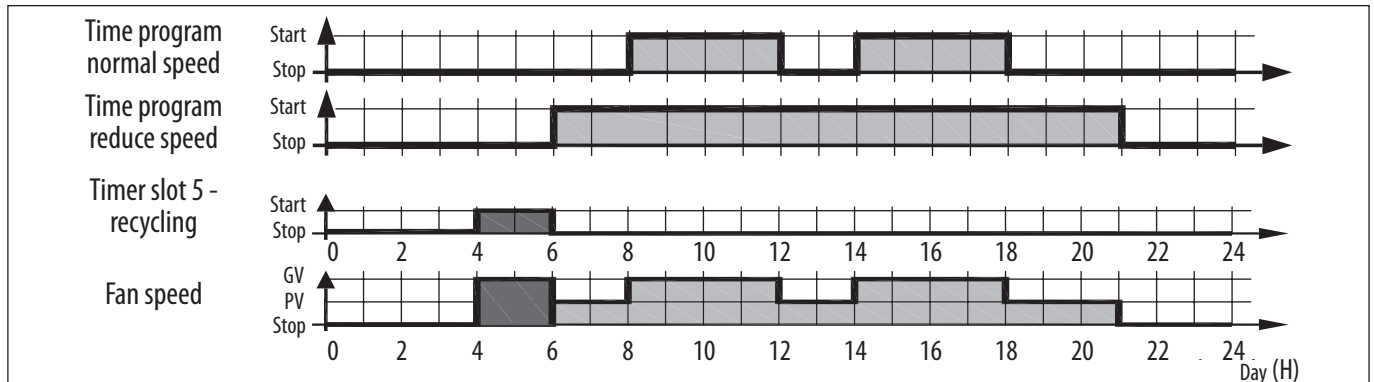
7.10 MIB ON/OFF - Recycling box

The recycling box is used when it is desired to recycle the air extracted over a time slot when it is not occupied, to allow for example a rise in temperature of the room.

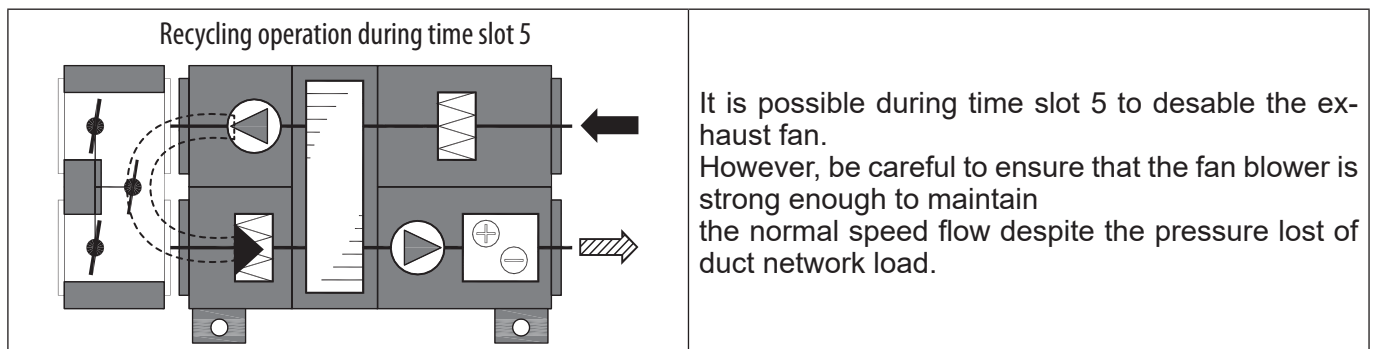
Operating principle:

Timer programming of recycling hours is to be carried out in time slot 5. This time slot, which does not have priority, is to be programmed outside the other time slots (normal speed or reduced speed).

Programming example:



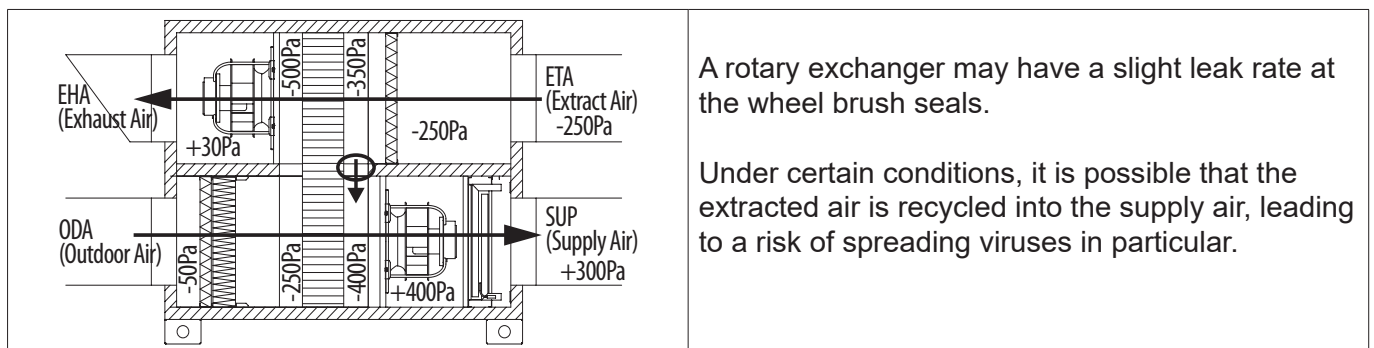
During the programmed period (in dark grey), the recycling box keeps the exteriors dampers closed and opened the recycling damper. The fans operate at the programmed airflow for the normal speed.



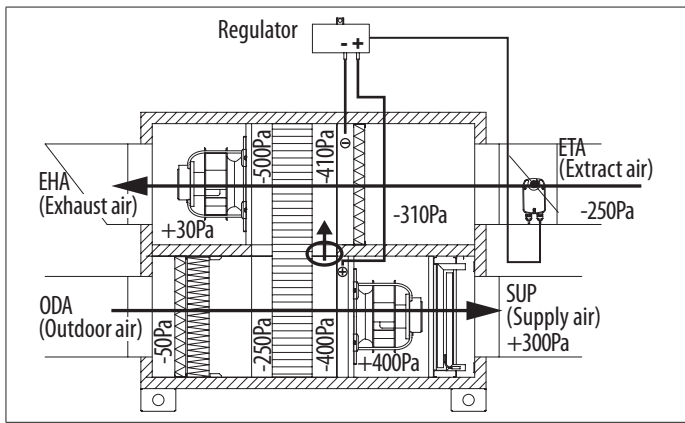
7.11 EAPK Automatic Pressure Balancing system (option)

Presentation :

The EAPK option is a pressure compensation system fitted at the factory on RHE. Its role is to eliminate any risk of recycling of the extracted air towards the supplied air.



EAPK makes it possible to maintain a slight depression in the upper part of the unit, used for the extracted air. The risks of leaks and the transfer of extracted air to the area used for blowing fresh air are thus neutralized.



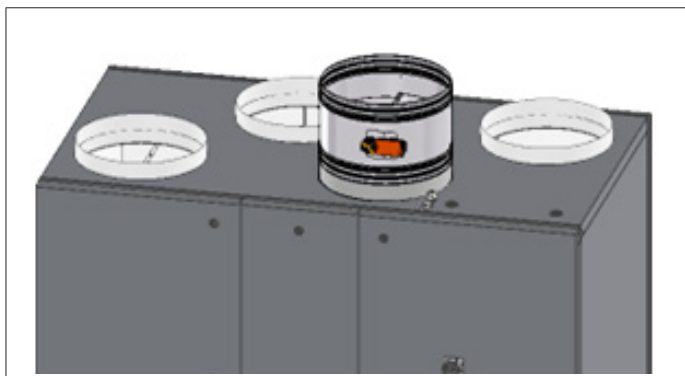
A pressure regulator varies the position of a damper to increase the vacuum in the return network. It will maintain a minimum difference of 10Pa at the level of the exchanger, which will force the escape of fresh air towards the stale air network and not the other way around.

Installation :

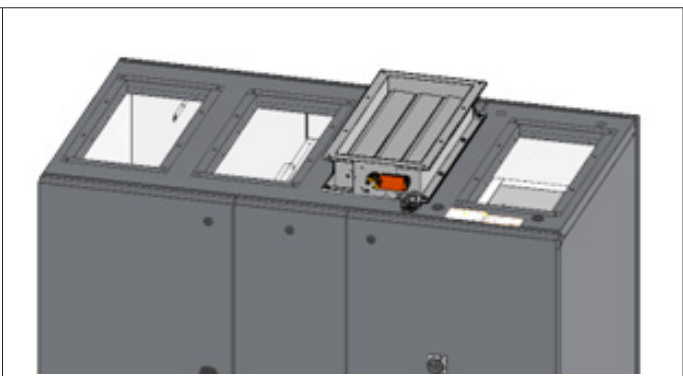
The EAPK system is factory wired.

On RHE HD sizes 700-1300-1900-2500-3500-4500, the damper is delivered placed on the roof of the plant for transport. During installation, the damper must be fitted and fixed onto the sleeve of the return connection.

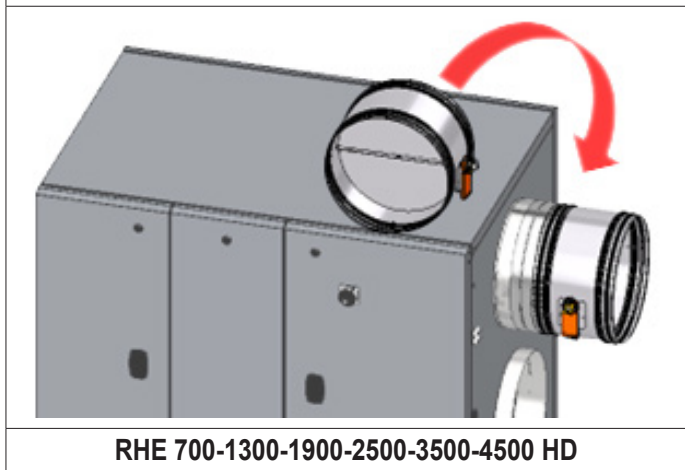
For other sizes and configurations, the registry is already installed.



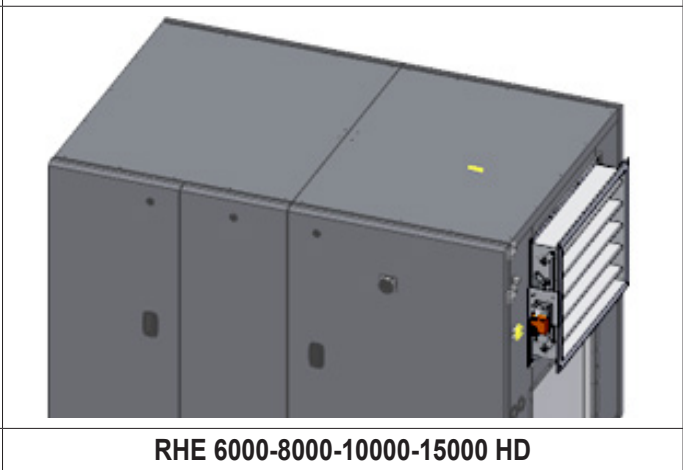
RHE 700-1300-1900-2500-3500 VD



RHE 4500 VD

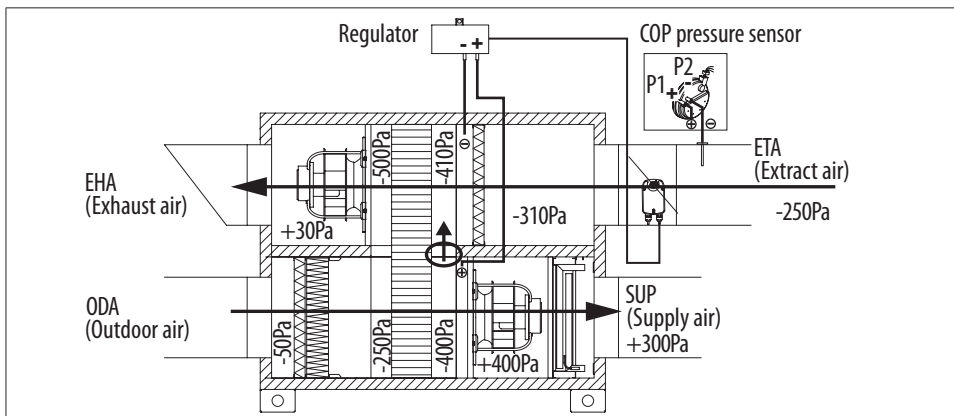


RHE 700-1300-1900-2500-3500-4500 HD



RHE 6000-8000-10000-15000 HD

COP installations on the return (constant pressure on the return network) :



Make sure to place the pressure tap of the COP sensor on the extract air duct upstream of the damper.

7.12 Input for external fire signal

The controller is configured to receive a fire contact. If the fire input is activated (DI7), the panel is stopped. When the control panel has been stopped by the fire input, it can only be restarted after an acknowledgment of the alarm.

7.13 Clock and time programming

From the clock menu, it is possible to update the date, the time, as well as the activation of the automatic winter/summer time change.

It is possible to set different time programs for each day of the week, plus a specific time program for holidays and vacations.

Time slots (time prg 5) can be programmed for air recycling if the unit is equipped with a recycling box. It is possible to define up to 24 holiday periods. A vacation period can last from 1 to 365 days. The time programs for holidays have priority over the others.

Clock setting:

Only the operating ranges are programmed (outside these ranges the unit is stopped).

The installer can define 3 operating ranges: reduced speed ECO, high speed GV, boost.

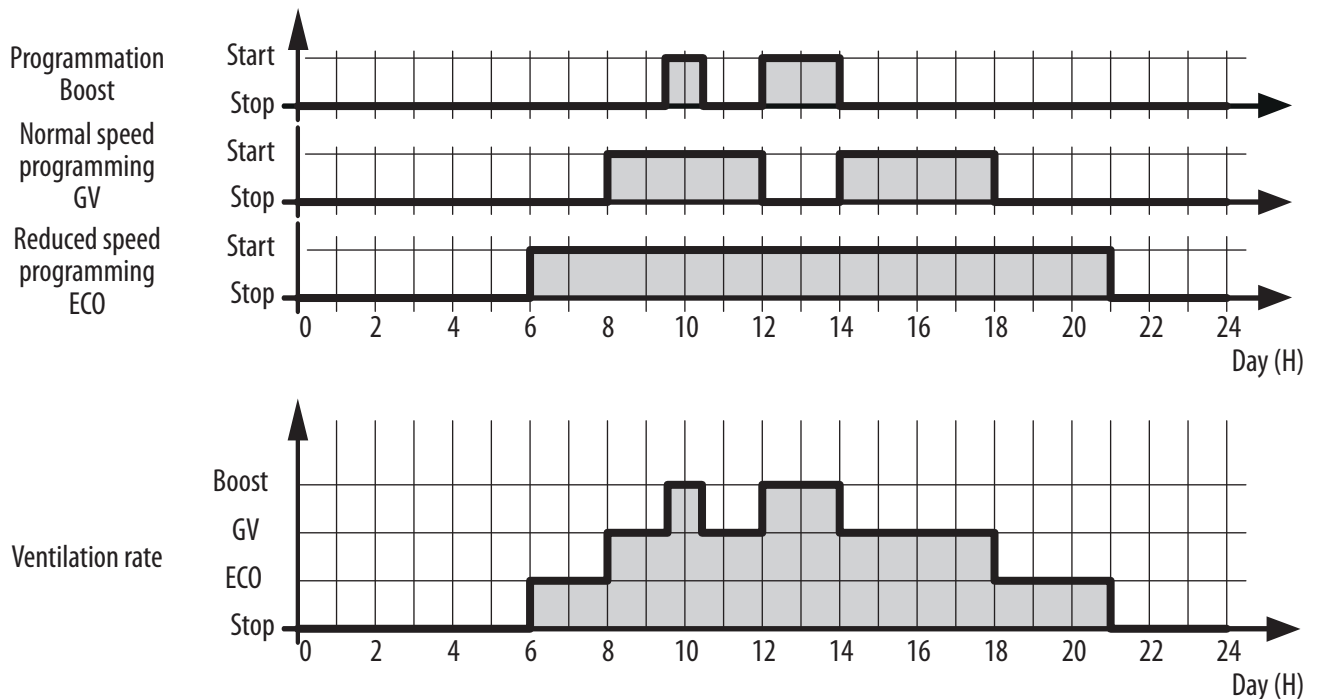
GV has priority over ECO, in the event of overlapping programming times, the unit will operate in GV. Boost takes priority over GV and ECO.

For each speed, 3 ranges can be entered per day.

Example :

| BOOST : | High Speed: | Low Speed: |
|--|---|---|
| <ul style="list-style-type: none"> • From 9:45 a.m. to 10:15 a.m. in period 1 • And from 12 p.m. to 2 p.m. in period 2 | <ul style="list-style-type: none"> • From 8 a.m. to 12 p.m. in period 1 • And from 2 p.m. to 6 p.m. in period 2 | <ul style="list-style-type: none"> • From 6 a.m. to 9 p.m. in period 1 |

The automaton will then control the fans as follows :




8. USE OF REMOTE CONTROL ETD2

8.1 Presentation of the ETD2 touch display

Welcome screen

This window displays strictly essential information on the state of the machine. It is possible to switch to the other available windows by pressing the menu window icon **8**.

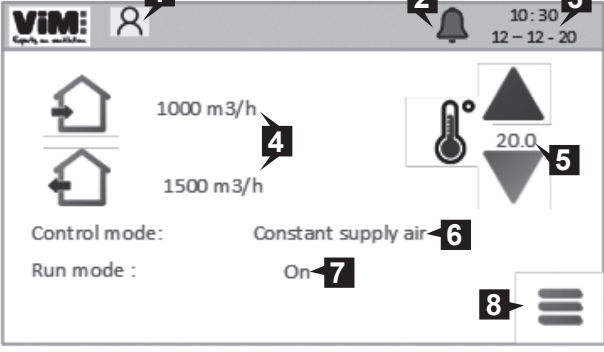
If a menu includes several pages, up and down scroll windows appear on the right of the screen, allowing you to move from one window to another. To scroll through the pages of the different menus, use the up/down arrow keys .

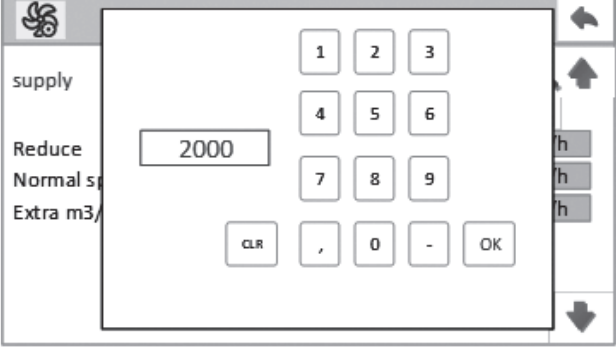
The back arrow  allows you to return directly to the main menu with several windows.

The remote control goes to sleep (screen off) after two minutes of inactivity, by pressing anywhere on the screen, it is automatically reactivated.

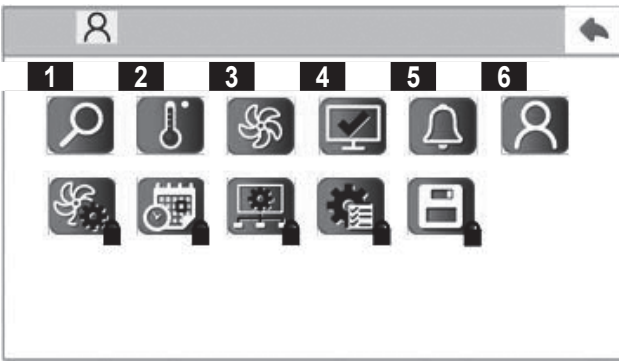
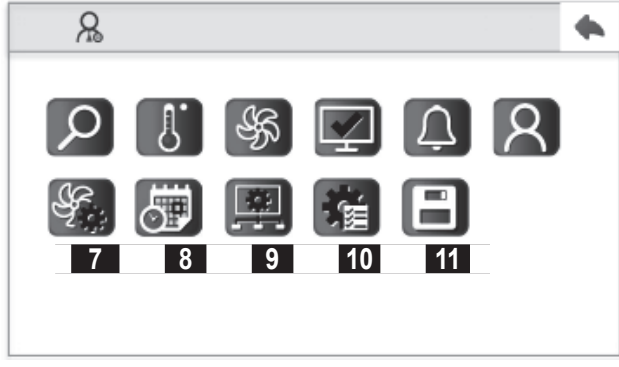
The temperature icon **5** allows the temperature to be increased or decreased by +/- 3 °C compared to the main set point.

If there are alarms, an orange bell **2** appears in the upper band of the screen. Pressing the bell allows direct access to the alarm message.

| | | | | | | | | | | | | | | | | | |
|--|---|----------|-----------------|----------|----------------------------|----------|---------------|----------|--|----------|---|----------|--------------------------|----------|-----------------------|----------|----------------------|
|  | <table border="1"> <tr> <td>1</td> <td>Authority level</td> </tr> <tr> <td>2</td> <td>Reporting of active alarms</td> </tr> <tr> <td>3</td> <td>Date and time</td> </tr> <tr> <td>4</td> <td>Instant airflows Supply and Extraction</td> </tr> <tr> <td>5</td> <td>Temperature set point and use override button +/- 3°C</td> </tr> <tr> <td>6</td> <td>Temperature control mode</td> </tr> <tr> <td>7</td> <td>Unit operating status</td> </tr> <tr> <td>8</td> <td>Main menu access key</td> </tr> </table> | 1 | Authority level | 2 | Reporting of active alarms | 3 | Date and time | 4 | Instant airflows Supply and Extraction | 5 | Temperature set point and use override button +/- 3°C | 6 | Temperature control mode | 7 | Unit operating status | 8 | Main menu access key |
| 1 | Authority level | | | | | | | | | | | | | | | | |
| 2 | Reporting of active alarms | | | | | | | | | | | | | | | | |
| 3 | Date and time | | | | | | | | | | | | | | | | |
| 4 | Instant airflows Supply and Extraction | | | | | | | | | | | | | | | | |
| 5 | Temperature set point and use override button +/- 3°C | | | | | | | | | | | | | | | | |
| 6 | Temperature control mode | | | | | | | | | | | | | | | | |
| 7 | Unit operating status | | | | | | | | | | | | | | | | |
| 8 | Main menu access key | | | | | | | | | | | | | | | | |

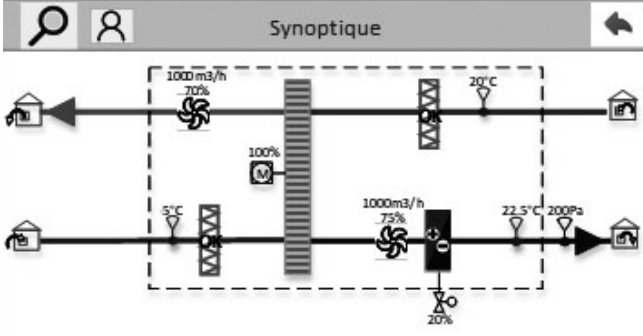
| | |
|--|---|
|  | <p>To change a value:</p> <ul style="list-style-type: none"> • Press the value to be modified • When the pop-up window appears, hold down the CLR button. until the value disappears • Enter the new value using the numeric keys |
|--|---|

Main menu

| | | | | | | | | | | | | | |
|---|---|----------|------------------------------------|----------|---------------------------------|----------|---|-----------|---|-----------|--|----------|--|
|  | <p>In the menu window, you can access the following functions:</p> <table border="1"> <tr><td>1</td><td>Synoptic</td></tr> <tr><td>2</td><td>Temperatures</td></tr> <tr><td>3</td><td>Fan stop and running speeds</td></tr> <tr><td>4</td><td>Screen display settings</td></tr> <tr><td>5</td><td>Alarms</td></tr> <tr><td>6</td><td>Password with 3 authority levels: User, Installer or Factory</td></tr> </table> <p>Depending on the level of authority entered, padlocks present on the icons indicate the impossibility of accessing the content.</p> | 1 | Synoptic | 2 | Temperatures | 3 | Fan stop and running speeds | 4 | Screen display settings | 5 | Alarms | 6 | Password with 3 authority levels: User, Installer or Factory |
| 1 | Synoptic | | | | | | | | | | | | |
| 2 | Temperatures | | | | | | | | | | | | |
| 3 | Fan stop and running speeds | | | | | | | | | | | | |
| 4 | Screen display settings | | | | | | | | | | | | |
| 5 | Alarms | | | | | | | | | | | | |
| 6 | Password with 3 authority levels: User, Installer or Factory | | | | | | | | | | | | |
|  | <p>Menu accessible with installer or factory password:</p> <table border="1"> <tr><td>7</td><td>Settings > with installer password</td></tr> <tr><td>8</td><td>Clock > with installer password</td></tr> <tr><td>9</td><td>Communication > with installer password</td></tr> <tr><td>10</td><td>Advanced settings and adjustments > with factory password</td></tr> <tr><td>11</td><td>Registration > with installer password</td></tr> </table> | 7 | Settings > with installer password | 8 | Clock > with installer password | 9 | Communication > with installer password | 10 | Advanced settings and adjustments > with factory password | 11 | Registration > with installer password | | |
| 7 | Settings > with installer password | | | | | | | | | | | | |
| 8 | Clock > with installer password | | | | | | | | | | | | |
| 9 | Communication > with installer password | | | | | | | | | | | | |
| 10 | Advanced settings and adjustments > with factory password | | | | | | | | | | | | |
| 11 | Registration > with installer password | | | | | | | | | | | | |

Synoptic visualization

Press the main menu icon **1** 

| | |
|---|---|
|  | <p>The synoptic is a graphical representation of the state of the machine with the different components and their values.</p> |
|---|---|

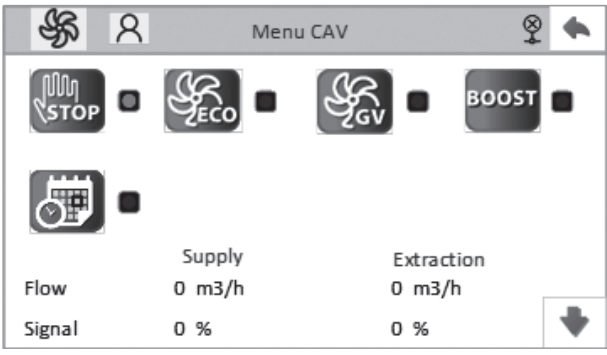

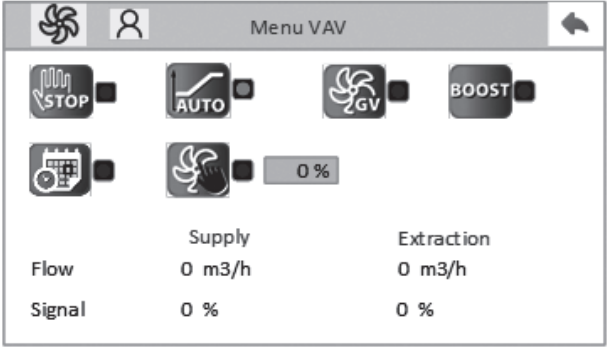

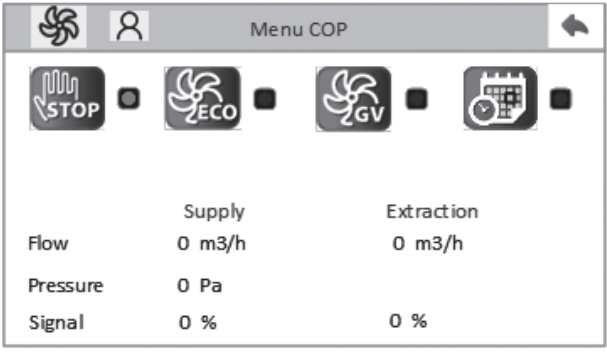

8.2 Stop the AHU

The normal procedure for shutting down the air handling unit is to press the icon **3**  on the main menu, then on the 1st STOP icon.

8.3 Main settings

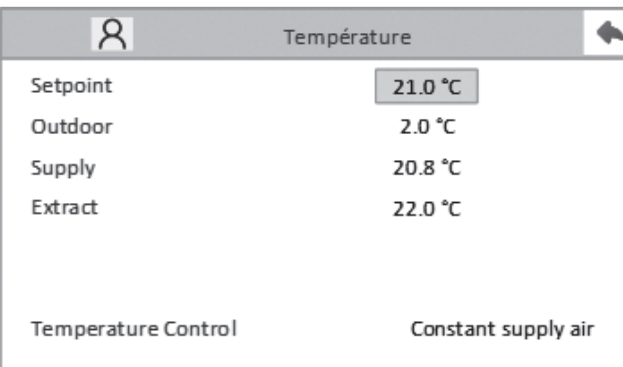
Selection of speeds according to operating mode CAV, constant flow, VAV, variable flow, COP, constant pressure

Press the main menu icon **3** 


| | |
|--|--|
|  <p>Menu CAV</p> <p>STOP ECO 2GV BOOST</p> <p>Supply: 0 m3/h, Extraction: 0 m3/h</p> <p>Signal: 0 %</p> | <p> CAV MENU</p> <p>Allows:</p> <ul style="list-style-type: none"> • to stop the unit > STOP • to manually select one of the 3 speeds parameters > ECO/GV/BOOST • to operate according to the time programming <p>The lower display shows the actual airflow and the fan control signal.</p> |
|  <p>Menu VAV</p> <p>STOP AUTO 2GV BOOST</p> <p>Supply: 0 m3/h, Extraction: 0 m3/h</p> <p>Signal: 0 %</p> | <p> VAV MENU</p> <p>Allows:</p> <ul style="list-style-type: none"> • to stop the unit > STOP • to manually select the GV speed (flow rate for Vmax set) • to manually select the BOOST speed • to operate according to the time program and to operate automatically according to the sensor signal CO2 (in the reduced speed time range) • to manually enter a control signal |
|  <p>Menu COP</p> <p>STOP ECO 2GV</p> <p>Supply: 0 m3/h, Extraction: 0 m3/h</p> <p>Pressure: 0 Pa</p> <p>Signal: 0 %</p> | <p> COP MENU</p> <p>Allows:</p> <ul style="list-style-type: none"> • to stop the unit > STOP • to manually select one of the 2 configured set point pressures • to operate according to the time schedule |

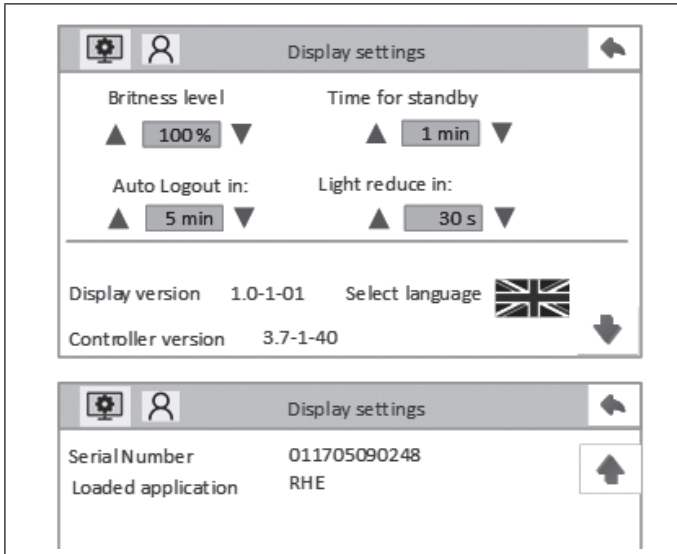
Temperature settings

Press the main menu icon **2** 

| | |
|--|--|
|  <p>Température</p> <p>Setpoint: 21.0 °C</p> <p>Outdoor: 2.0 °C</p> <p>Supply: 20.8 °C</p> <p>Extract: 22.0 °C</p> <p>Temperature Control: Constant supply air</p> | <p>It is possible to adjust the setpoint temperature from this menu (installer level)</p> <p>The temperatures measured by the probes appear in this screen.</p> <p>At the bottom of the page appears the selected temperature regulation mode.</p> <p>If a water coil is selected, it will also be possible to read the temperature measured by the contact probe.</p> <p>See §"7.3 Temperature control", page 55.</p> |
|--|--|

Screen settings

Press the main menu icon **4** 




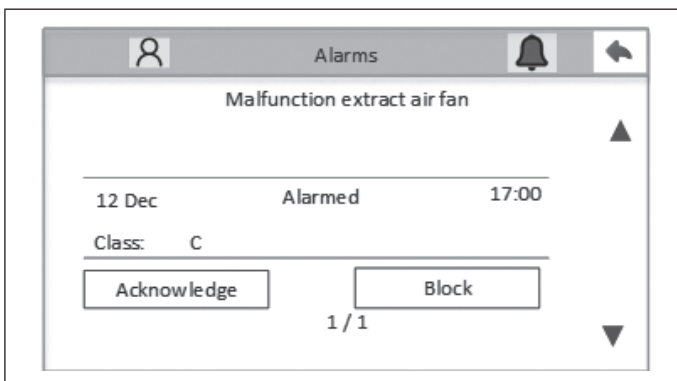
This menu is used to configure the characteristics of the screen and gives access to:

- **Choice of language:** among 4 languages French / English / German / Spanish

It also indicates the versions of the software used in the display and in the controller, the VTC (the application) loaded and the serial number of the controller.

Alarm settings

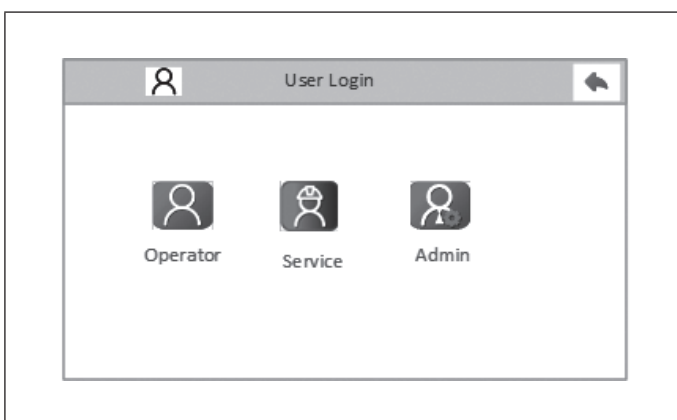
Press the main menu icon **5** 



Allows you to view active alarms, acknowledge them or block them if necessary.

Setting authority levels and passwords

Press the main menu icon **6** 

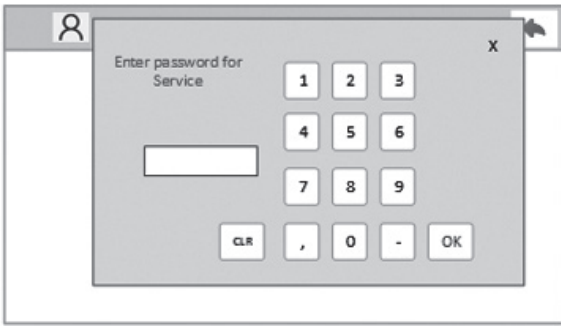


This page allows you to connect with a sufficient level of authority to perform certain functions.

User level - Password 3333 optional Default level that allows the use of the AHU without specific settings or backup operations.

Installer level - Password 2222 AHU usage level + specific settings and backups.

Expert level - Factory password transmitted only by our after-sales service
Access to all functions



To identify yourself, press the icon corresponding to the required level. Enter the password using the numeric window.



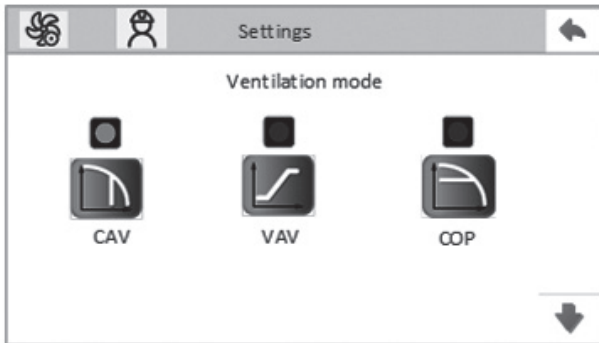
Once connected, it is possible to change the password or to disconnect from the level to return to the User level.

After a certain period of inactivity, the disconnection is done automatically.

8.4 Specific configuration of the ventilation modes CAV / VAV / COP

Press the main menu icon **7**  > **Installer level**

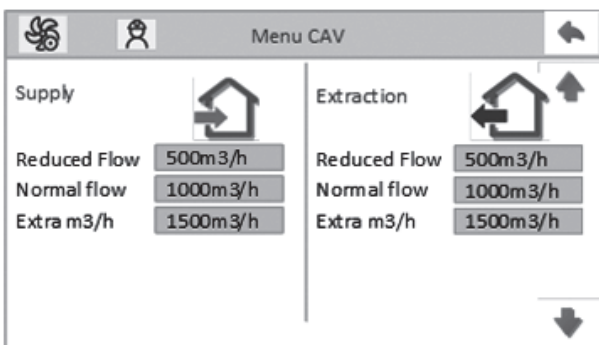
Access to this menu is used to modify the factory settings presented in § "10.1 AHU factory settings", page 85



Choice of fan regulation mode:

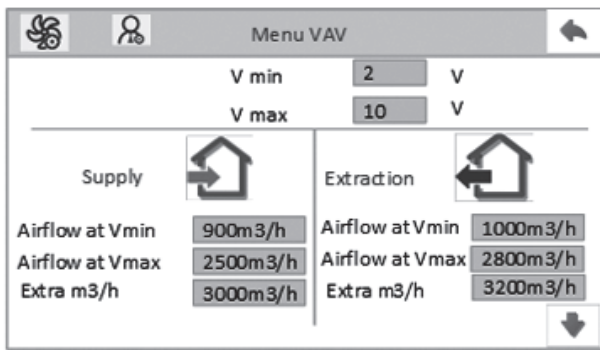
- **CAV** = Constant airflow
- **VAV** = Variable airflow according to an external signal (CO2 sensor for example)
- **COP** = Constant pressure
Supply COP (transmitter installed in the supply duct)
Extraction COP (transmitter installed in the extraction duct)

8.4.1 Specific settings on mode CAV or VAV



If Constant flow - CAV selected

On this page it is possible to enter the desired values in m³/h for the reduced ECO, normal GV and extra m³/h BOOST speeds, for extraction and supply.



If Variable flow - VAV selected

On this page it is possible to enter:

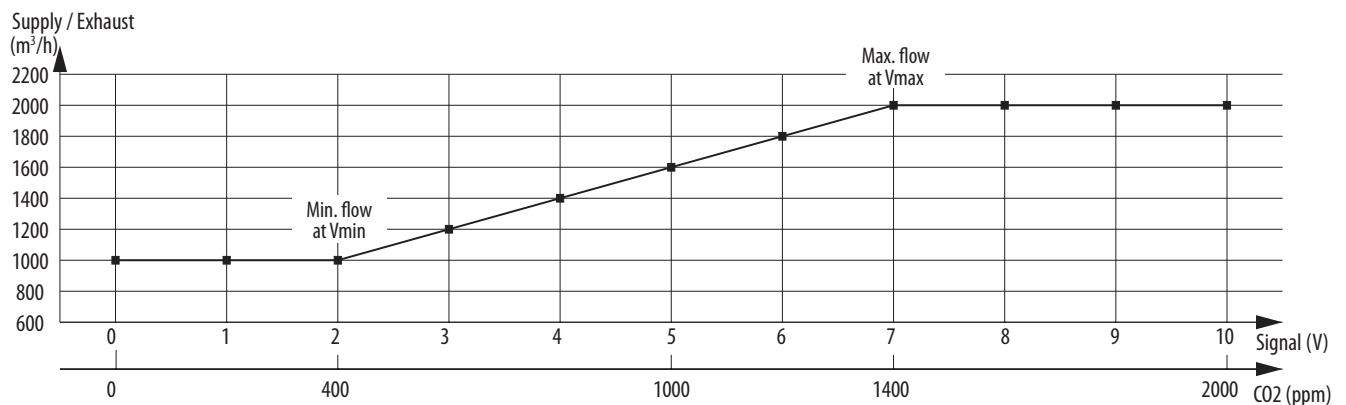
- The range of use of the connected air quality sensor Vmin and Vmax
- The desired values in m³/h for the mini signal Vmin ECO - for the normal Vmax GV and the values Extra m³/h BOOST, extraction and supply.

Example of use: connection of a CO2 sensor with a range of 0-2000ppm (0-10V).

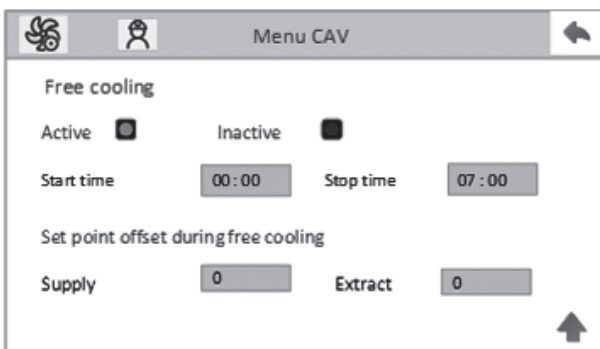
For use in the 400-1400ppm range, you must select:

- Vmin= 2V and Vmax= 7V
- The values Flow at Vmin is 1000 m³/h and Flow Vmax at 2000 m³/h

The curve below is thus obtained

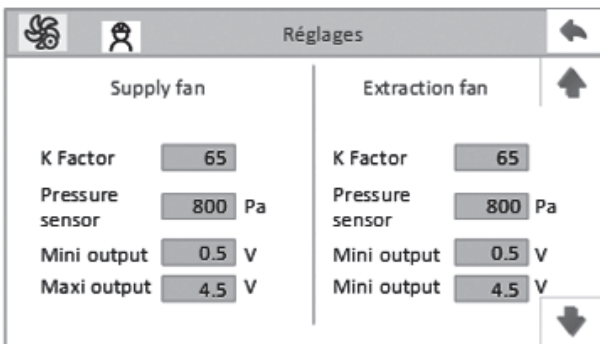


Nightcooling overventilation - Settings common to CAV and VAV modes



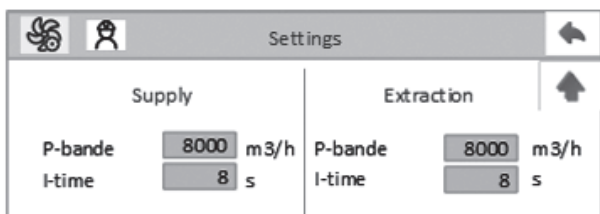
The page opposite is used to activate the nocturnal over-ventilation function, and to set the time slot during which this function will be active.

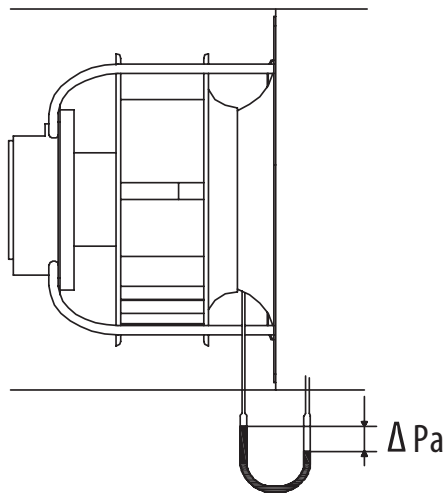
Finally, it is used to enter the setpoint offset (on normal HS speed) which will be added to the extraction and supply during overventilation.



Setting the extraction and supply fans:

- K factor
- Setting the scale of the pressure sensors used
- Characteristics of the proportional bands and integral times of the flow control loop (default values in the table below)





Each RHE fan is equipped with a differential pressure sensor, connected to the regulation.

- Sizes 700 to 1300 = 0-500 Pa pressure sensor and 0.5 - 4.5 Vdc signal.
- Sizes 1900 to 10000 = 0-800 Pa pressure sensor and 0.5 - 4.5 Vdc signal.
- Size 15000 = 0-3000 Pa pressure sensor and 0.5 - 4.5Vdc signal.

The pressure sensor measures the difference in static pressure before the suction horn and at the horn.
The airflow can be calculated according to the following equation:

$$Q_v = K \times \sqrt{\Delta Pa}$$

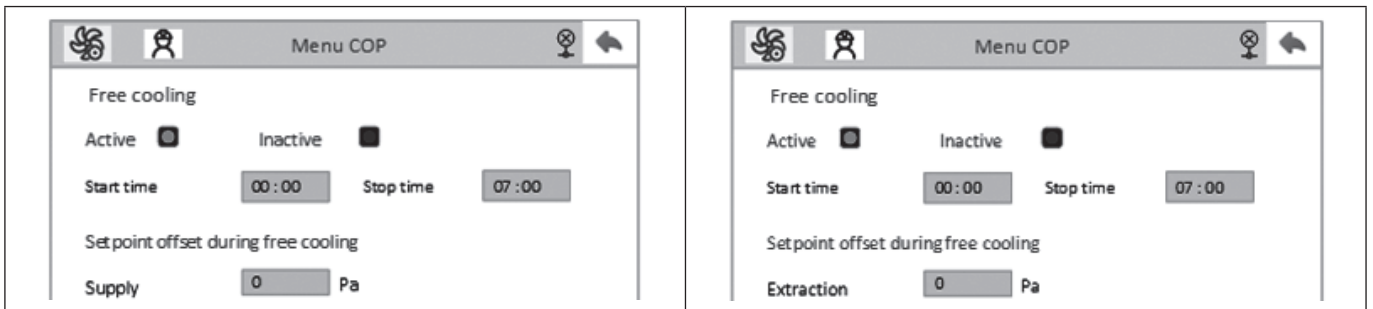
Q_v flow in m³/h. The K factor takes into account the specific characteristics of each fan.

| Size RHE | K factor | Pa-sensor | Signal V | P-band | Time I |
|----------|----------|-------------|-----------|--------|--------|
| 700 | 63 | 0 – 500 Pa | 0.5 – 4.5 | 8000 | 8 |
| 1300 | 65 | 0 – 500 Pa | 0.5 – 4.5 | 8000 | 8 |
| 1900 | 85 | 0 – 800 Pa | 0.5 – 4.5 | 8000 | 8 |
| 2500 | 101 | 0 – 800 Pa | 0.5 – 4.5 | 8000 | 8 |
| 3500 | 122 | 0 – 800 Pa | 0.5 – 4.5 | 8000 | 8 |
| 4500 HD | 172 | 0 – 800 Pa | 0.5 – 4.5 | 8000 | 8 |
| 4500 VD | 186 | 0 – 800 Pa | 0.5 – 4.5 | 8000 | 8 |
| 6000 | 188 | 0 – 3000 Pa | 0.5 – 4.5 | 8000 | 8 |
| 8000 | 240 | 0 – 3000 Pa | 0.5 – 4.5 | 20000 | 20 |
| 10000 | 348 | 0 – 3000 Pa | 0.5 – 4.5 | 20000 | 20 |
| 15000 | 335 | 0 – 3000 Pa | 0.5 – 4.5 | 20000 | 20 |
| 6000HP | 168 | 0 – 3000 Pa | 0.5 – 4.5 | 8000 | 8 |
| 8000HP | 187 | 0 – 3000 Pa | 0.5 – 4.5 | 20000 | 20 |
| 10000HP | 302 | 0 – 3000 Pa | 0.5 – 4.5 | 20000 | 20 |
| 15000HP | 374 | 0 – 3000 Pa | 0.5 – 4.5 | 20000 | 20 |

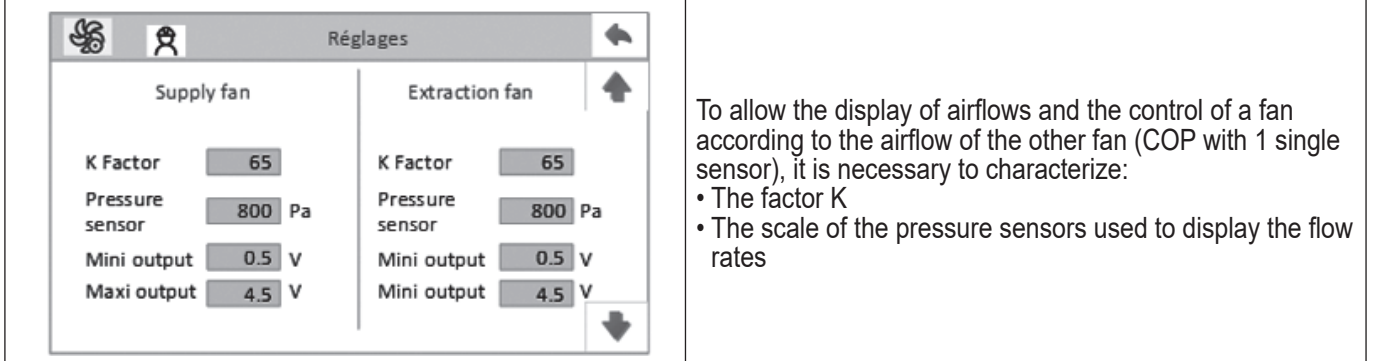
8.4.2 Specific settings to mode COP

| If COP constant pressure selected on SUPPLY | If COP constant pressure selected on EXTRACTION |
|---|---|
| | |

- Select the location of the pressure sensor in the duct (supply or extraction).
- Enter the pressure setpoints in Pa in ECO and GV mode for the supply fan or for the extraction fan. If you only have one set point, enter the same value twice.
- Enter, if necessary, an offset value between the extraction and supply airflow.

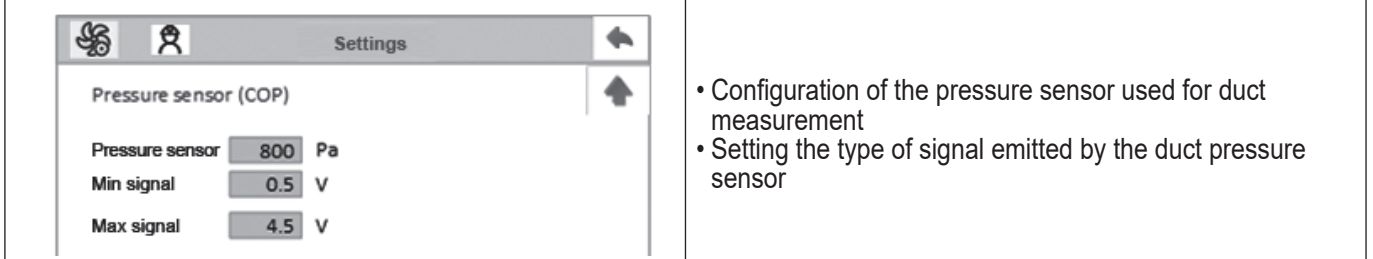


- Activate or deactivate the free cooling over-ventilation function and set the time range during which this function will be active.
- Enter the setpoint offset in Pa (on the normal speed GV) which will be added to the pressure setpoint during overventilation.

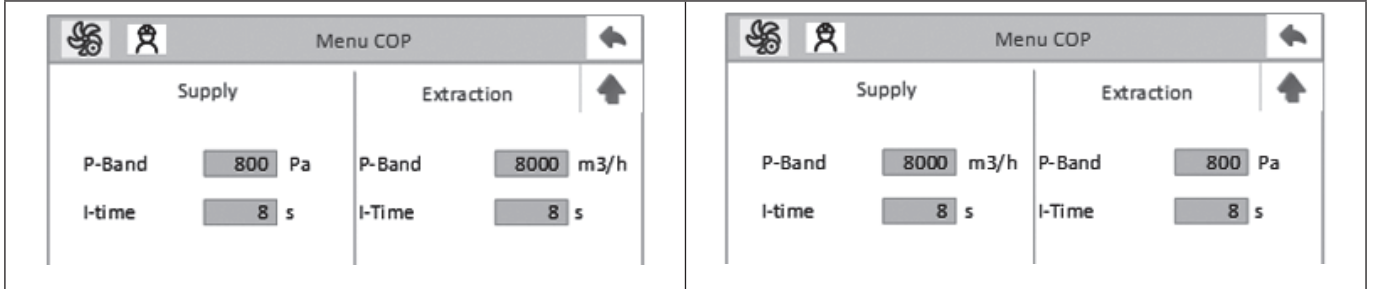


To allow the display of airflows and the control of a fan according to the airflow of the other fan (COP with 1 single sensor), it is necessary to characterize:

- The factor K
- The scale of the pressure sensors used to display the flow rates



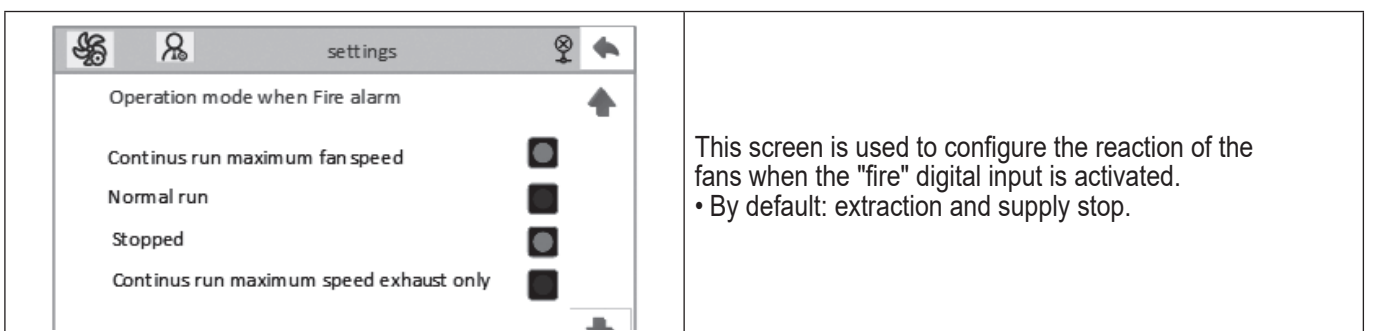
- Configuration of the pressure sensor used for duct measurement
- Setting the type of signal emitted by the duct pressure sensor



- Characteristics of the proportional bands and integral time of the pressure regulation loop (800 Pa 8 seconds) and flow rate for the slave fan (see CAV – VAV mode table).

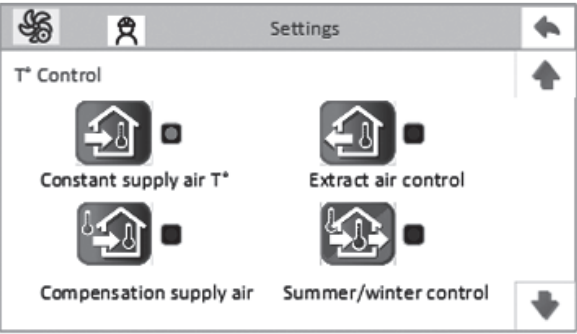
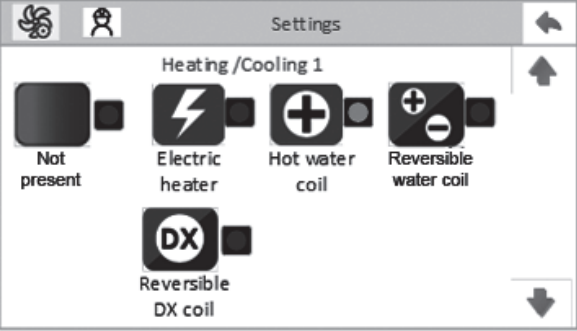
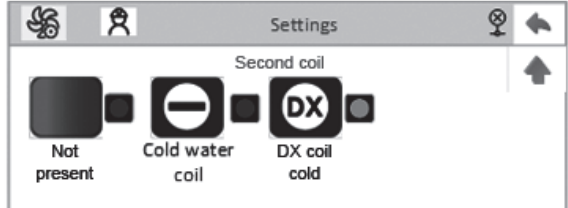
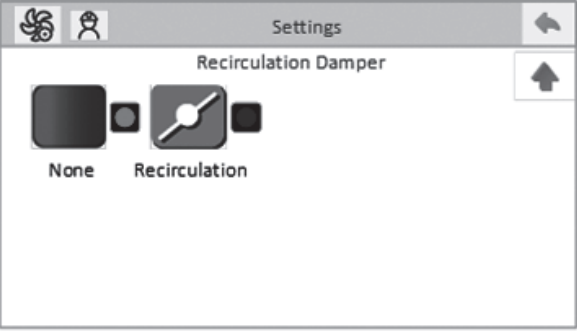
8.4.3 Settings common to all fan operating modes

Press the main menu icon **7**  > **Installer level**



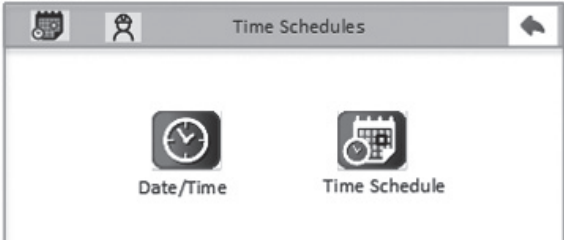
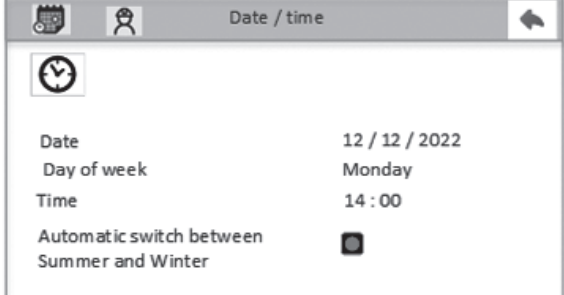

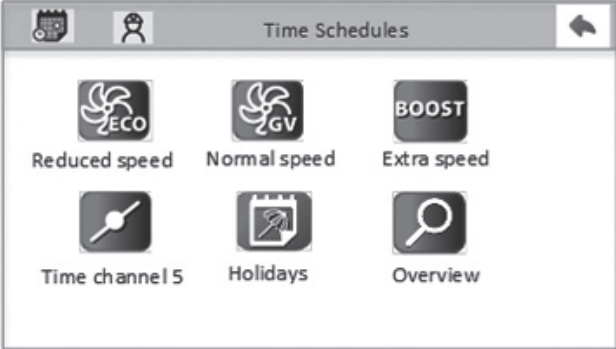
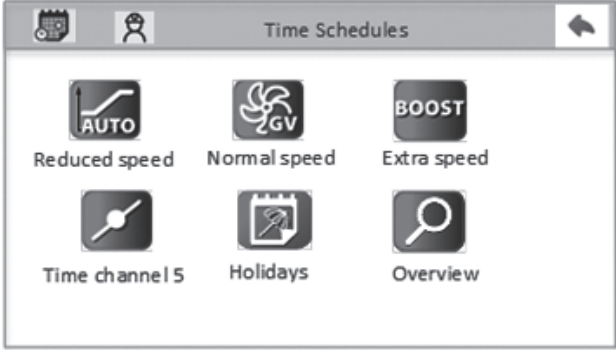
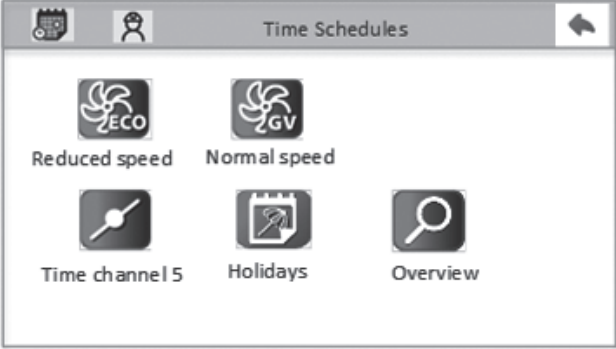

This screen is used to configure the reaction of the fans when the "fire" digital input is activated.

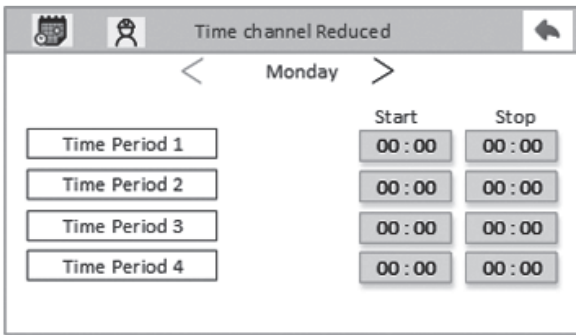
- By default: extraction and supply stop.

| | |
|---|---|
|  | <p>This screen is used to set the temperature regulation mode that will be used by the air handling unit.</p> |
|  | <p>This window allows you to configure the type of post-processing installed.</p> <p>By pressing the icons, it is possible to define the desired configuration:</p> <ul style="list-style-type: none"> • No electric coil post-heating coil • Hot water coil • Reversible water coil • Reversible DX coil |
|  | <p>This window is used to configure the type of 2nd battery installed.</p> |
|  | <p>This window allows you to declare a recycling box. The hours of operation must be set on timer program 5.</p> |

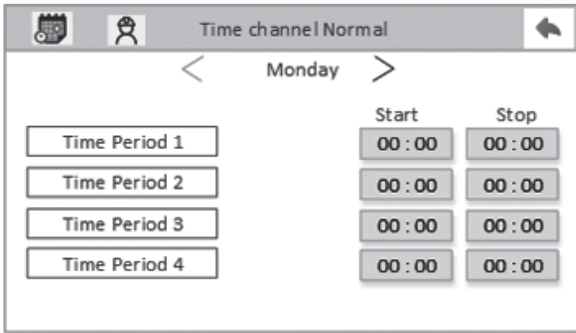
8.5 Time schedule

Press the main menu icon **8**  > **Installer level**

| | |
|--|---|
|  | <p>This menu is used to define:</p> <ul style="list-style-type: none"> • Date and time • Time programs for unit operation • Automatic Winter/Summer time change |
|  | <p> Date / time menu</p> <p>Allows the regulation to be set to the correct time and date. It is possible to automatically activate summer/winter time changes.</p> |
| <p>If unit configured in CAV:</p>  <p>If unit configured in VAV:</p>  <p>If unit configured in COP:</p>  | <p> Time program settings menu</p> <p>A Summary key allows viewing of all the configured time slots.</p> |



It is possible to configure up to 4 time programs per day of the week + 1 Holiday day



If the unit has been configured in CAV it is possible to select:

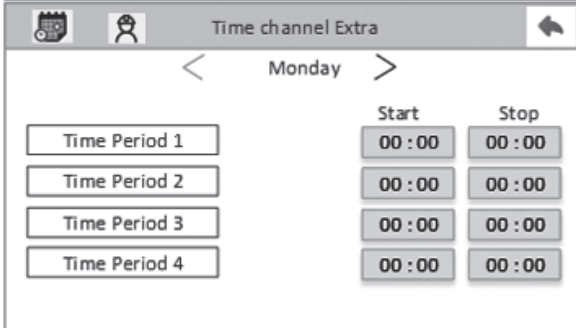
- STOP / ECO / GV / BOOST

If the unit has been configured in VAV it is possible to select:

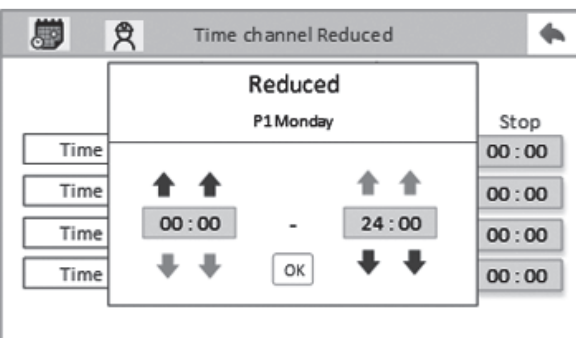
- STOP / AUTO / GV / BOOST

If the unit has been configured in COP , it is possible to select:

- STOP / ECO / GV

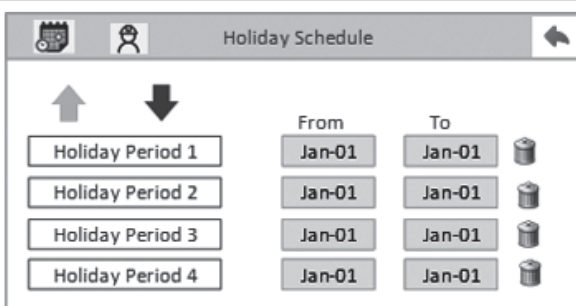


By default, time slot 1 of each day in mode ECO is populated from 00:00 to 24:00



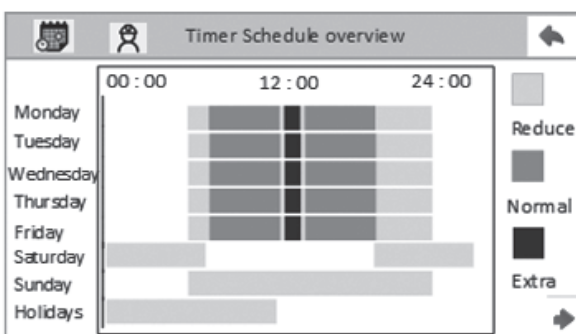
To modify a value, press the time slot of the program to be modified, a pop-up window appears.

Use the up arrows or down arrows for the hours or minutes to modify.



The "Holiday" button allows you to determine up to 24 periods during which the holiday day setting will be used.

To access the following or previous periods, use the up or down arrows.

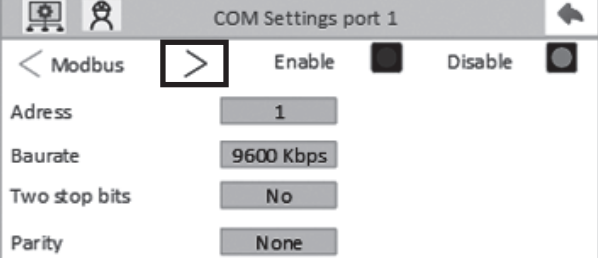
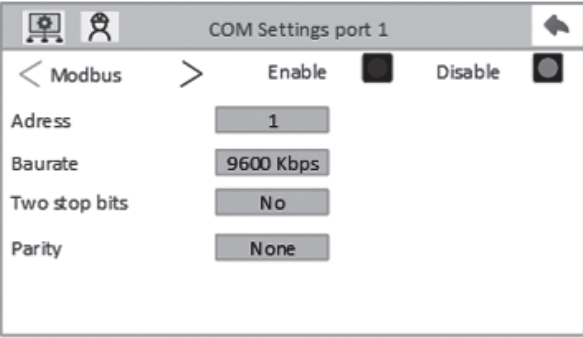
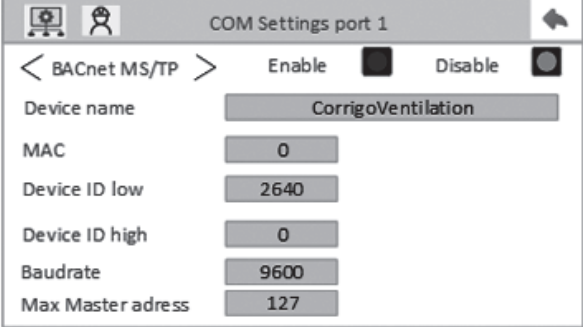
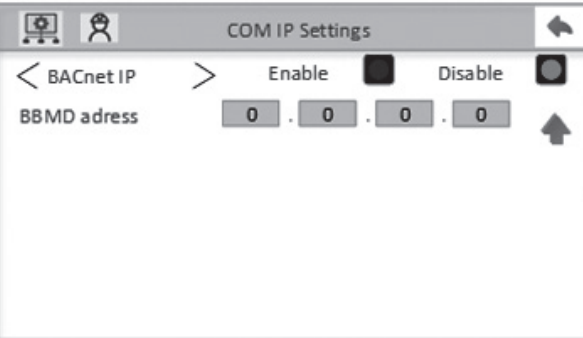


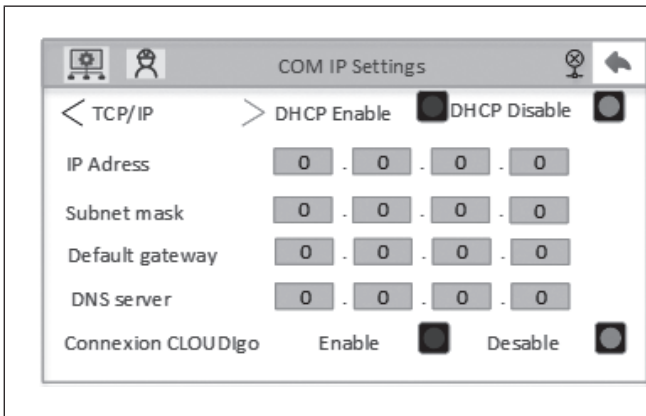
The summary key allows the visualization of the different ranges entered.

8.6 Setting up the communication protocol

Press the main menu icon **9**  > **Installer level**

This menu contains the configuration parameters for the MODBUS RS485 and MODBUS IP – BACnet MSTP – BACnet IP protocols. Communication to RS485 supervision must be done on communication port N°. 1.

| | |
|---|--|
|  <p>COM Settings port 1</p> <p>< Modbus > Enable <input type="checkbox"/> Disable <input checked="" type="checkbox"/></p> <p>Address: 1</p> <p>Baurate: 9600 Kbps</p> <p>Two stop bits: No</p> <p>Parity: None</p> | <p>Allows selection of the desired protocol using the arrows:</p> <ul style="list-style-type: none"> • Modbus • BACnet MS/TP • Modbus IP • BACnet IP |
|  <p>COM Settings port 1</p> <p>< Modbus > Enable <input type="checkbox"/> Disable <input checked="" type="checkbox"/></p> <p>Address: 1</p> <p>Baurate: 9600 Kbps</p> <p>Two stop bits: No</p> <p>Parity: None</p> | <p>Modbus</p> <p>This screen enables or disables the Modbus on port 1 RS485</p> <ul style="list-style-type: none"> • Address : Represents the address you wish to assign to the unit (by default the units are at address 1) • Transmission speed / stop bit / parity – correspond to the communication characteristics of your Modbus network <p>Contact your network administrator for the values to use for these settings</p> |
|  <p>COM Settings port 1</p> <p>< BACnet MS/TP > Enable <input type="checkbox"/> Disable <input checked="" type="checkbox"/></p> <p>Device name: CorrigoVentilation</p> <p>MAC: 0</p> <p>Device ID low: 2640</p> <p>Device ID high: 0</p> <p>Baudrate: 9600</p> <p>Max Master adress: 127</p> | <p>BACnet MS/TP</p> <p>This screen is used to:</p> <ul style="list-style-type: none"> • Activate or deactivate the BACnet MS/TP (port 1 RS485) • Give an explicit name to the unit • Assign it an address (by default the units have the address 2640) • The speeds communication <p>Contact your network administrator to obtain the values to use for these parameters</p> |
|  <p>COM IP Settings</p> <p>< BACnet IP > Enable <input type="checkbox"/> Disable <input checked="" type="checkbox"/></p> <p>BBMD adress: 0 . 0 . 0 . 0</p> | <p>BACnet IP :</p> <p>This screen allows you to:</p> <ul style="list-style-type: none"> • Activate or deactivate BACnet IP • Give an explicit name to the unit • Assign it an address (by default the units have the address 2640) <p>Contact your network administrator for the values to use for these settings</p> <p>BBMD Address: Enter the IP address of the BBMD (BACnet/IP Broadcast Management Device), if you are using a BBMD device on your network.</p> <p>Contact your network administrator for the values to use for these settings</p> <p>The configuration of the IP address and its data is to be carried out on the TCP/IP screen</p> |



TCP/IP

This screen allows you to enter:

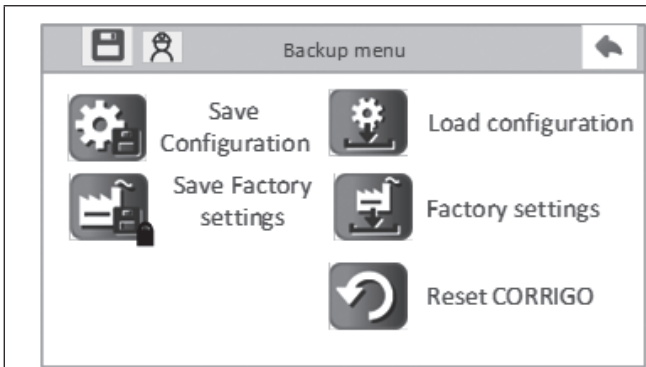
- **IP address**
- **Subnet mask**
- **Default gateway**
- **DNS server**

Corresponding to the characteristics of the fixed IP that you assign to the unit and to activate the CLOUDIGO if the offer has been subscribed.

Contact your network administrator for the values to use for these settings

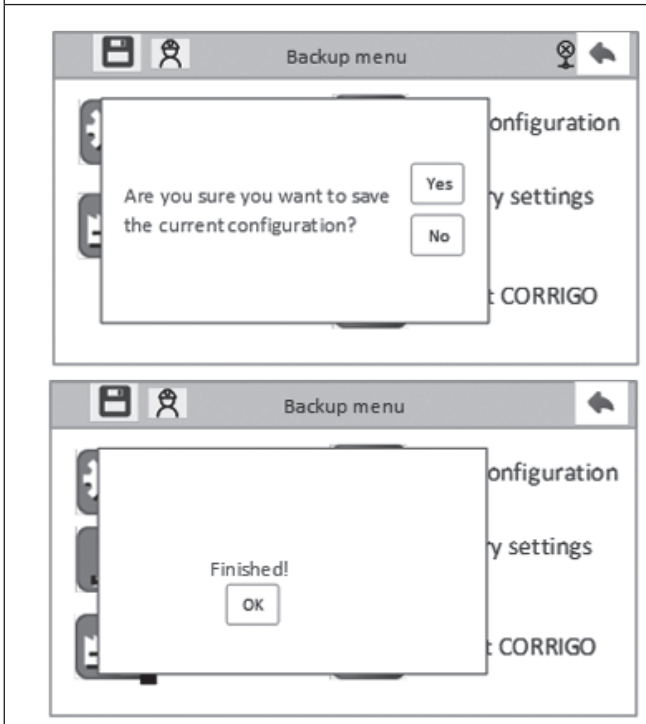
8.7 Save and restore

Press the main menu icon   > **Installer level**




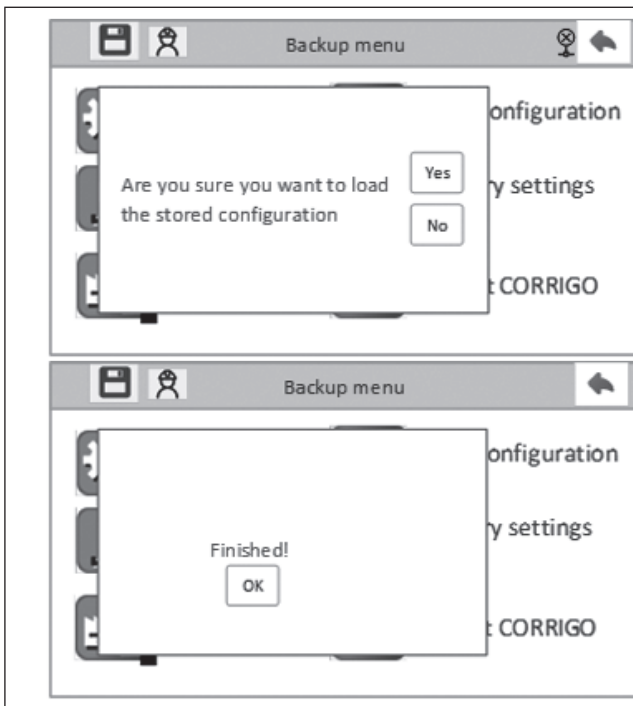
This menu allows:

- To save the configuration made on site after having finished commissioning
- To load the last configuration stored on site
- To return to the configuration of the unit leaving the factory (default parameters CAV mode)
- The recording of factory settings requires Expert level, only reserved for VIM after-sales service
- Resetting the CORRIGO to completely reload the unit's program - will require a complete reparameterization.




To save your site configuration:

- Press the corresponding icon 
- A pop-up window appears asking you to validate your request.
- A new window informs you when the operation is finished

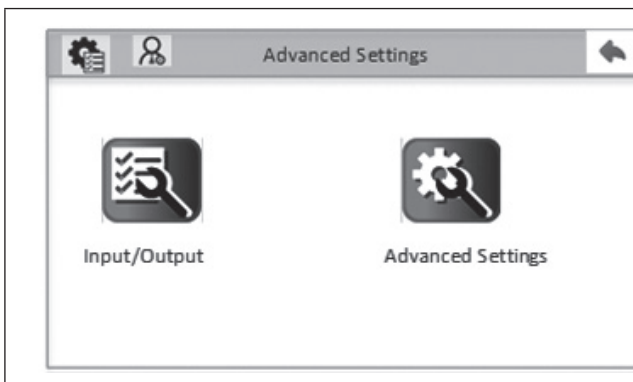


To recall the last saved configuration:

- Press the corresponding icon 
- A pop-up window appears asking you to validate your request.
- A new window informs you when the operation is complete.

8.8 Expert level configuration

Press the main menu icon   > **Expert level:** factory password transmitted only by our after-sales service



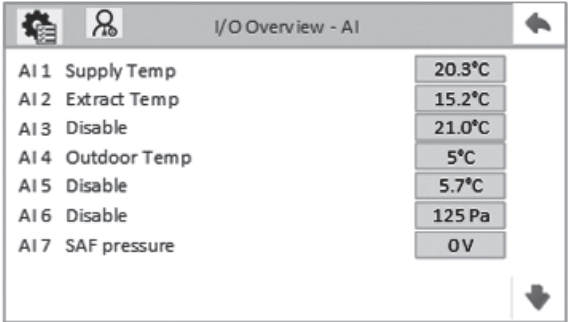
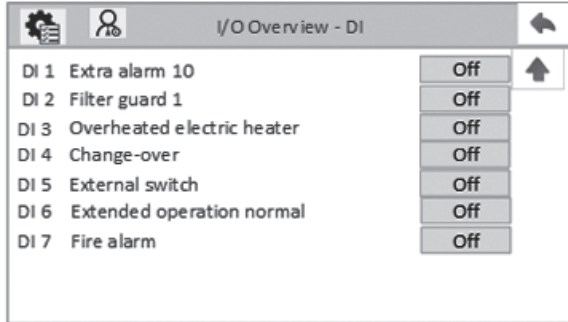


This menu is used to view the status of the inputs/ outputs, to force their values, to modify their assignments and their reactions.

It also allows you to modify the default parameters of certain functions.

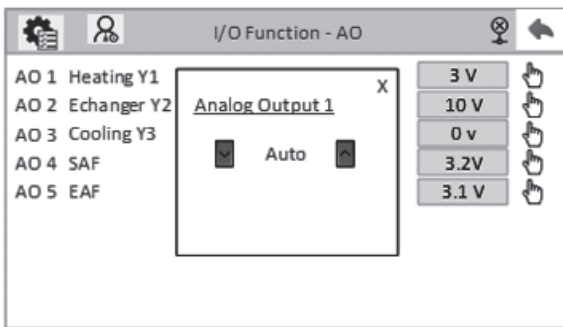
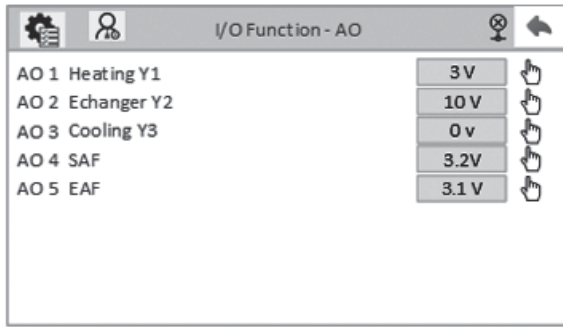
Use this menu only at the request of our experts or after-sales service.

8.8.1 Display / modification of inputs / outputs

Press the advanced settings menu icon 

| Vizualisation analog inputs | Vizualisation digital inputs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------------------------------|--------------|--------|---|--------------|-------------------|------|---------|---------|------|--------------|---------|------|---------|---------|------|---------|---------|------|--------------|----|---|------|----------------|-----|------|----------------|-----|------|----------------------------|-----|------|-------------|-----|------|-----------------|-----|------|---------------------------|-----|------|------------|-----|
|  <table border="1"> <tr><td>AI 1</td><td>Supply Temp</td><td>20.3°C</td></tr> <tr><td>AI 2</td><td>Extract Temp</td><td>15.2°C</td></tr> <tr><td>AI 3</td><td>Disable</td><td>21.0°C</td></tr> <tr><td>AI 4</td><td>Outdoor Temp</td><td>5°C</td></tr> <tr><td>AI 5</td><td>Disable</td><td>5.7°C</td></tr> <tr><td>AI 6</td><td>Disable</td><td>125 Pa</td></tr> <tr><td>AI 7</td><td>SAF pressure</td><td>0V</td></tr> </table> | AI 1 | Supply Temp | 20.3°C | AI 2 | Extract Temp | 15.2°C | AI 3 | Disable | 21.0°C | AI 4 | Outdoor Temp | 5°C | AI 5 | Disable | 5.7°C | AI 6 | Disable | 125 Pa | AI 7 | SAF pressure | 0V |  <table border="1"> <tr><td>DI 1</td><td>Extra alarm 10</td><td>Off</td></tr> <tr><td>DI 2</td><td>Filter guard 1</td><td>Off</td></tr> <tr><td>DI 3</td><td>Overheated electric heater</td><td>Off</td></tr> <tr><td>DI 4</td><td>Change-over</td><td>Off</td></tr> <tr><td>DI 5</td><td>External switch</td><td>Off</td></tr> <tr><td>DI 6</td><td>Extended operation normal</td><td>Off</td></tr> <tr><td>DI 7</td><td>Fire alarm</td><td>Off</td></tr> </table> | DI 1 | Extra alarm 10 | Off | DI 2 | Filter guard 1 | Off | DI 3 | Overheated electric heater | Off | DI 4 | Change-over | Off | DI 5 | External switch | Off | DI 6 | Extended operation normal | Off | DI 7 | Fire alarm | Off |
| AI 1 | Supply Temp | 20.3°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AI 2 | Extract Temp | 15.2°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AI 3 | Disable | 21.0°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AI 4 | Outdoor Temp | 5°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AI 5 | Disable | 5.7°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AI 6 | Disable | 125 Pa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AI 7 | SAF pressure | 0V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 1 | Extra alarm 10 | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 2 | Filter guard 1 | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 3 | Overheated electric heater | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 4 | Change-over | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 5 | External switch | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 6 | Extended operation normal | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 7 | Fire alarm | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  <table border="1"> <tr><td>AI 8</td><td>EAF pressure</td><td>0 V</td></tr> </table> | AI 8 | EAF pressure | 0 V |  <table border="1"> <tr><td>DI 8</td><td>Exchange rotation</td><td>On</td></tr> <tr><td>DI 9</td><td>Disable</td><td>Off</td></tr> <tr><td>DI 10</td><td>Disable</td><td>Off</td></tr> <tr><td>DI 11</td><td>Disable</td><td>Off</td></tr> <tr><td>DI 12</td><td>Disable</td><td>Off</td></tr> </table> | DI 8 | Exchange rotation | On | DI 9 | Disable | Off | DI 10 | Disable | Off | DI 11 | Disable | Off | DI 12 | Disable | Off | | | | | | | | | | | | | | | | | | | | | | | | |
| AI 8 | EAF pressure | 0 V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 8 | Exchange rotation | On | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 9 | Disable | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 10 | Disable | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 11 | Disable | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI 12 | Disable | Off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Analog outputs - visualisation and modification

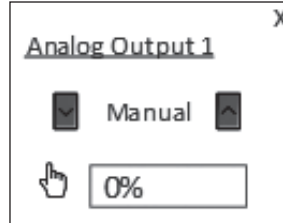


Press the value to modify, a pop-up window appears. The arrows allow you to select between:

- Value provided by the controller



- Force a manual set point value

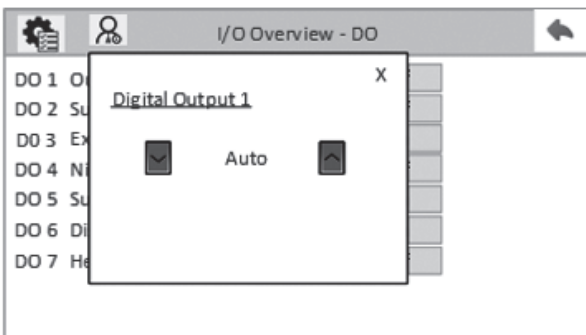
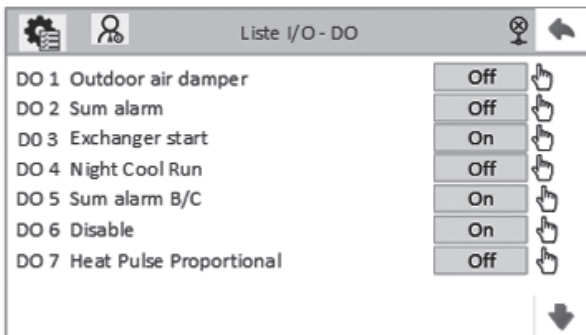


- Cut output



As long as the value is forced, the hand next to the value appears in red.

Digital outputs - visualisation and modification

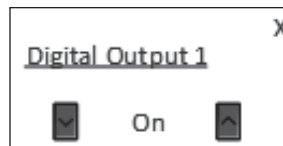


Press the value to modify, a pop-up window appears. The arrows allow you to select between:

- Value provided by the controller



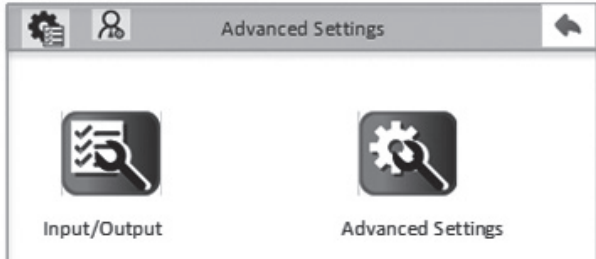
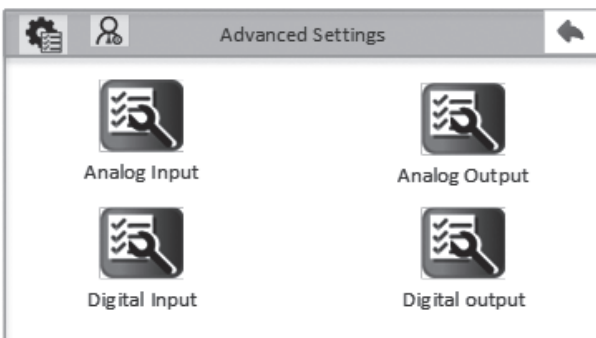

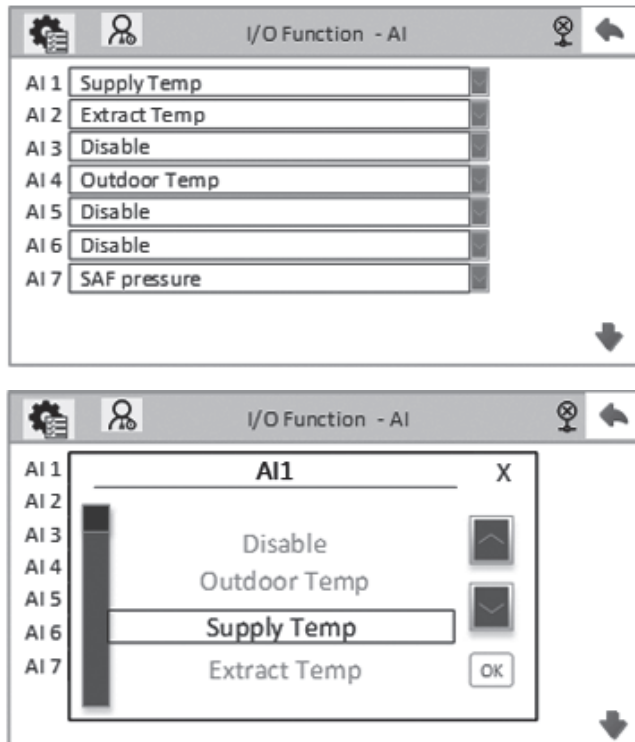

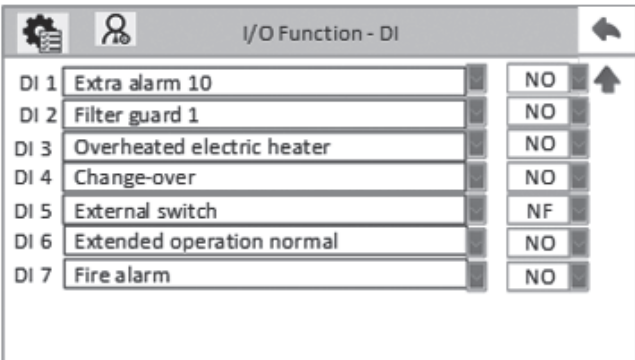

- Force a manual set point value



As long as the value is forced, the hand next to the value appears in red.

8.8.2 Inputs / outputs - Allocation of new functions

Press the advanced settings menu icon 

| | |
|---|---|
|  | <p>The advanced settings menu is broken down into 2 submenus:</p> <ul style="list-style-type: none"> • I/O functions (inputs / outputs) • Control functions |
|  | <p> I/O function (inputs / outputs)</p> <p>This menu is used to assign or reassign a function to the inputs/outputs.</p> |
|  | <p> Analog inputs</p> <p>To modify the assigned function, press the value to be modified, a pop-up window will open. With the up and down arrows, assign a new function then press OK</p> |
|  | <p> Digital inputs</p> <p>On the digital inputs it is additionally possible to specify the reaction of the input – normally open (NO) or normally closed (NC)</p> |

8.8.3 Control functions

Press the advanced settings menu icon 

| <p>Control functions</p> <p><u>Temperature control</u></p> <p>Min supply setpoint: 12 °C</p> <p>Max supply setpoint: 30 °C</p> <p>Cascade control at outdoor temp >: 18 °C</p> <p>Temperature offset (+/-) in Eco mode: 0 °C</p> | <p>Control functions</p> <p><u>Free-cooling</u></p> <p>Active if day outdoor temp > than: 22 °C</p> <p>Stop if outdoor air temp > than: 18 °C</p> <p>Stop if outdoor air temp < than: 13 °C</p> <p>Stop when room temp <: 18 °C</p> <p>Time to block heat after free cooling: 60 mn</p> <p>Outdoor sensor placed in intake channel: Yes</p> | | | | | | | | | | |
|--|--|--------|----------|-------|-------|-------|-------|-------|-------|------|-------|
| <p>Control Functions</p> <p><u>Fire protection</u></p> <p>Fan speed SAF when fire alarm: 100 %</p> <p>Fan speed EAF when fire alarm: 100 %</p> | <p>Control Functions</p> <p><u>Run Indication</u></p> <p>Run indication SAF: Run indication</p> <p>Min pressure SAF run indication: 10 Pa</p> <p>Run indication EAF: Run indication</p> <p>Min pressure EAF run indication: 10 Pa</p> | | | | | | | | | | |
| <p>Control Functions</p> <p><u>Step switch heating</u></p> <p>Step switch type: Binary step</p> <p>Number of steps: 1</p> <p>Min switch time: 60 s</p> | <p>Control function</p> <p><u>Temporisation</u></p> <p>Start delay SAF: 10 s</p> <p>Stop delay SAF: 30 s</p> <p>Outdoor air damper stop delay: 0 s</p> <p>Start delay EAF: 10 s</p> <p>Stop delay EAF: 30 s</p> <p>Start delay exchanger: 0 s</p> <p>Start delay with 100% exchanger: 2 s</p> | | | | | | | | | | |
| <p>Control Functions</p> <p><u>Temporisation</u></p> <p>Start alarm delay: 60 s</p> <p>Extended operation: 0 s</p> <p>Automatic restart after power on: Yes</p> | <p>Control Functions</p> <p><u>Outdoor compensation</u></p> <table border="1"> <thead> <tr> <th>T° Ext</th> <th>Setpoint</th> </tr> </thead> <tbody> <tr> <td>-20°C</td> <td>25 °C</td> </tr> <tr> <td>-15°C</td> <td>24 °C</td> </tr> <tr> <td>-10°C</td> <td>23 °C</td> </tr> <tr> <td>-5°C</td> <td>23 °C</td> </tr> </tbody> </table> | T° Ext | Setpoint | -20°C | 25 °C | -15°C | 24 °C | -10°C | 23 °C | -5°C | 23 °C |
| T° Ext | Setpoint | | | | | | | | | | |
| -20°C | 25 °C | | | | | | | | | | |
| -15°C | 24 °C | | | | | | | | | | |
| -10°C | 23 °C | | | | | | | | | | |
| -5°C | 23 °C | | | | | | | | | | |

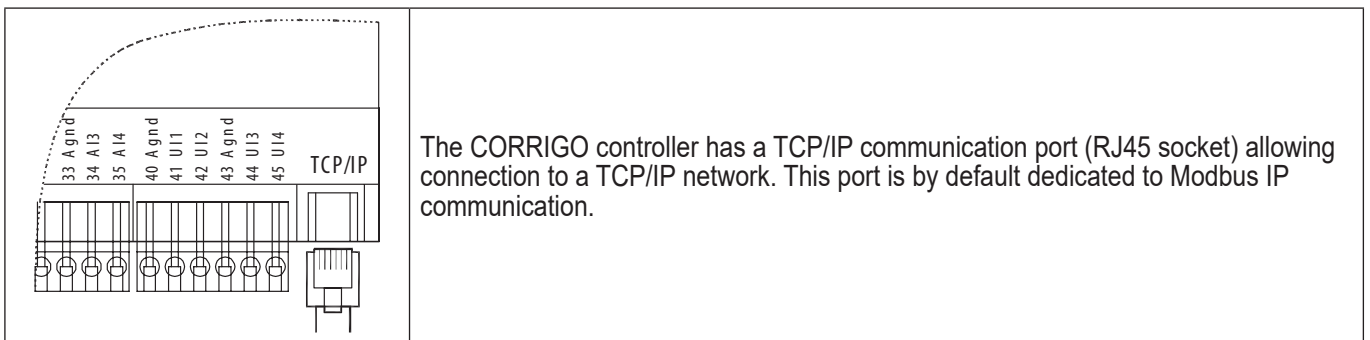
9. COMMUNICATION BMS

9.1 Communication in Modbus protocol

MODBUS RTU on port 1 - RS 485



MODBUS IP on TCP/IP port



Simplified MODBUS table

The simplified Modbus list below includes the data most commonly used in supervision. All of these points can be obtained for all units fitted with CORRIGO controls. The information available will however depend on the configuration of the site (operating modes or options chosen, assembly/wiring etc.).

| Function | Type | Register | Read/Write | Description | Accepted values |
|--|------------------|----------|------------|---|-----------------|
| AIR FLOW SETPOINT - PRESSURE - SPEED SELECTOR | | | | | |
| Supply pressure setpoint | Holding Register | 596 | R/W | Supply fan flow rate setpoint, in normal speed, in CAV mode | 0..max of unit |
| | Holding Register | 597 | R/W | Supply fan flow rate setpoint, in reduce speed, in CAV mode | 0..max of unit |
| | Holding Register | 600 | R/W | Supply fan flow rate setpoint, in Extra speed(boost), in CAV mode | 0..max of unit |
| Supply pressure setpoint | Holding Register | 24 | R/W | Pressure setpoint, in normal speed, COP SUPPLY mode - Values: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |
| | Holding Register | 25 | R/W | Pressure setpoint, in reduce speed, COP SUPPLY mode - Values: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |
| Extraction flow setpoint | Holding Register | 598 | R/W | Extract fan flow rate setpoint, in normal speed, in CAV mode | 0..max of unit |
| | Holding Register | 599 | R/W | Extract fan flow rate setpoint, in reduce speed, in CAV mode | 0..max of unit |
| | Holding Register | 601 | R/W | Extract fan flow rate setpoint, in Extra speed (boost), in CAV mode | 0..max of unit |
| Extraction pressure setpoint | Holding Register | 26 | R/W | Pressure setpoint, in normal speed, COP EXTRACT mode - Values: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |
| | Holding Register | 27 | R/W | Pressure setpoint, in reduce speed, COP EXTRACT mode - Values: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |

| Function | Type | Register | Read/Write | Description | Accepted values |
|---|-----------------------|----------|------------|--|-------------------|
| Pace in CAV mode | Holding Register | 611 | R/W | Manual control of the unit 0=Off, 1=reduce speed, 2=Normal speed, 3=Auto according timer, 4 =Extra speed (Boost) | 0,1, 2, 3 or 4 |
| Pace in VAV mode | Holding Register | 516 | R/W | Manual control of the unit 0=Off, 1=Manual, 2=Auto according external signal, 3=Extra speed (Boost), 4=auto according timer, 5= Grande vitesse | 0,1, 2, 3, 4 or 5 |
| | Holding Register | 517 | R/W | Manual control of VAV control signal (0..100% quand index 516 VAV=1) | 0...100% |
| Pace in COP mode | Holding Register | 883 | R/W | Manual control of the unit 0=Off, 1=Reduce speed, 2=Normal speed, 3=Auto according timer | 0, 1, 2, 3 |
| READING AIR FLOWS / PRESSURES | | | | | |
| Supply air flow | Input register | 15 | R | Supply fan air flow (m ³ /h), in CAV, VAV or COP EXTRACTION mode | 0..max of unit |
| | Input register | 612 | R | Pressure value of the pressure transmitter installed on supply air fan - calculates the flow rate on supply air fan in COP SUPPLY mode Air flow= K*√ ΔP Coef.K given according to unit size; √ΔP= √read value/10 Values: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |
| Supply air duct pressure in COP SUPPLY mode | Input register | 13 | R | Pressure measured in the supply duct in COP SUPPLY mode Value: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |
| Extraction air flow | Input register | 16 | R | Extract fan air flow (m ³ /h), in CAV, VAV or COP SUPPLY mode | 0..max of unit |
| | Input register | 615 | R | Pressure value of the pressure transmitter installed on extract air fan - calculates the flow rate on supply air fan in COP EXTRACT mode Air flow= K*√ ΔP Coef.K given according to unit size; √ΔP= √read value/10 Values: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |
| Extraction air duct pressure in COP EXTRACT mode | Input register | 14 | R | Pressure measured in the supply duct in COP EXTRACT mode Value: 0 .. 9999 meaning 0 .. 999.9Pa | 0..max of unit |
| Forcing normal speed | Input Status Register | 8 | R | Read forcing normal speed status 0=forcing normal speed disable; 1=Forcing normal speed enable | 0-1 |
| Forcing extra speed (boost) | Input Status Register | 14 | R | Read forcing Extra speed (boost) speed status 0=forcingExtra speed disable; 1=Forcing Extra speed enable | 0-1 |
| TEMPERATURE SETPOINT / SEASON | | | | | |
| Supply air temperature setpoint | Holding register | 1 | R/W | Supply air temperature setpoint in constant supply air temperature mode | -999...999 |
| Extract air temperature setpoint | Holding register | 18 | R/W | Temperature setpoint in supply temperature mode base on return air temperature | -999...999 |
| Season/change over | Holding register | 473 | R/W | Change over control 0=heating mode, 1=cooling mode; 2=auto (according to change over thermostat) | 0,1 or 2 |
| TEMPERATURE READING | | | | | |
| Supply air temperature | Input register | 7 | R | Read supply air temperature Value: -999...+999 meaning -99,0...+99,0°C | -999...999 |
| Extract air temperature | Input register | 9 | R | Read extract air temperature Value: -999...+999 meaning -99,0...+99,0°C | -999...999 |
| Outdoor air temperature | Input register | 1 | R | Read outdoor air temperature Value: -999...+999 meaning -99,0...+99,0°C | -999...999 |
| Water temperature | Input register | 19 | R | Reading the measured water temperature on the water return of the coil - antifreeze function Value: -999...+999 meaning -99,0...+99,0°C | -999...999 |

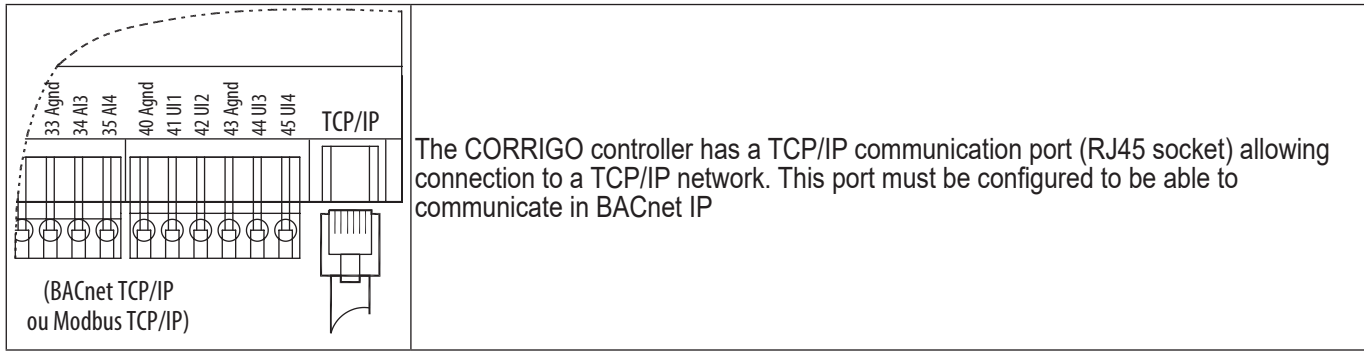
| Function | Type | Register | Read/Write | Description | Accepted values |
|--|-----------------------|----------|------------|--|-----------------|
| DISPLAY OF ALARMS | | | | | |
| Summary of alarms | Input Status Register | 184 | R | Presences of alarm 0=Normal 1=alarm | 0 or 1 |
| Filter alarm | Input Status Register | 38 | R | Alarm filter guard 0=Normal 1=alarm | 0 or 1 |
| Fan alarm | Input Status Register | 33 | R | Supply air fan alarm 0=Normal 1=alarm | 0 or 1 |
| | Input Status Register | 34 | R | Extract air fan alarm 0=Normal 1=alarm | 0 or 1 |
| Fire alarm | Input Status Register | 42 | R | Fire alarm 0=Normal 1=alarm | 0 or 1 |
| Alarm on rotary heat exchanger | Input Status Register | 61 | R | Default on rotary heat exchanger - rotation guard 0=Normal 1=alarm | 0 or 1 |
| Freezing risk on water coil | Input Status Register | 57 | R | Frost alarm on water coil - temperature too low 0=Normal 1=alarm | 0 or 1 |
| Over heating on electric heater | Input Status Register | 55 | R | Over heating on electric heater 0=Normal 1=alarm | 0 or 1 |
| READING COILS DATA | | | | | |
| Signal 0-10V valves | Input register | 119 | R | Analog output signal for heating Y1 or heating/cooling when reversible coil Y1/Y3 (0-10V) Value 0...100 meaning 0,0V...10,0 V | 0...100 |
| | Input register | 121 | R | Analog output signal for cooling Y3 (0-10V) Value 0...100 meaning 0,0V...10,0 V | 0...100 |
| READING HEAT EXCHANGER / BYPASS | | | | | |
| Heat exchanger | Input Status Register | 28 | R | Rotation of the heat exchanger (Value of digital output DO1) 0=Off; 1=On | 0 or 1 |
| RUNNING TIME | | | | | |
| Motors operating hours | Input register | 4 | R | Supply fan running time (hours) | 0...999999 |
| | Input register | 5 | R | Exhaust fan running time (hours) | 0...999999 |

9.2 Communication in BACnet protocol

BACnet MS/TP on port 1 – RS485

| | |
|--|---|
| <p>The diagram shows a terminal block with 12 pins. The top row of pins is labeled B50, A51, N52, E53, B60, A61, N62, and E63. The bottom row of pins is labeled P1, TX, RX, P2, TX, RX, P/B, and P/B. A dashed line indicates the connection for BACnet MS/TP, which involves connecting the TX and RX pins of the P1 and P2 ports to the corresponding TX and RX pins of the terminal block.</p> | <p>The CORRIGO controller has 2 RS485 communication ports (to be used with an STP cable), port 1 is by default dedicated to BACnet MS/TP communication, but the function must be activated in order to operate.</p> |
|--|---|

BACnet IP on TCP/IP port



It is possible to give a fixed IP address to the controller (procedure identical to Modbus IP).

For the various information reported by the Bacnet, contact S&P Technical Assistance Service.

10. COMMISSIONING

10.1 AHU factory settings

The AHUs are delivered in the configuration below. any other configuration requires configuration via the ETD2 remote control ("8. USE OF REMOTE CONTROL ETD2", page 65).

- Ventilation mode = CAV mode
- High speed = Unit's max airflow, Low speed = Max airflow / 2.
- Fan type: determined according to the airflow factor K specific to the fans
- Heating mode = constant supply T°
- Heater type : according to the requested option

| FACTORY SETTINGS | | | | | | | | | | |
|------------------|-----------|------|------|------|------|------|---------------|---------------|-----------------|-----------------|
| Mode | Unit size | | | | | | | | | |
| | 700 | 1300 | 1900 | 2500 | 3500 | 4500 | 6000 / 6000HP | 8000 / 8000HP | 10000 / 10000HP | 15000 / 15000HP |
| ECO | 300 | 700 | 900 | 1200 | 1500 | 2000 | 3000 | 4000 | 5000 | 6000 |
| GV | 700 | 1300 | 1900 | 2500 | 3500 | 4500 | 6000 | 8000 | 10000 | 15000 |
| BOOST | 700 | 1300 | 1900 | 2500 | 3500 | 4500 | 6000 | 8000 | 10000 | 15000 |

10.2 AHU factory control

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

- Electrical conformity tests : Continuity of the ground / Insulation of the electrically powered parts.
- Check of the reading of the temperature probes
- Control of the supply fan and its pressure transmitter
- Checking the extraction fan and its pressure transmitter
- Check of the heat exchanger (start/stop).

10.3 Recommendations









See § "1.2 Safety instructions", page 4.

The commissioning and setting of the regulation must be carried out by a qualified person. In France this service can be provided by VIM and its qualified service providers. Contact sav@vim.fr.

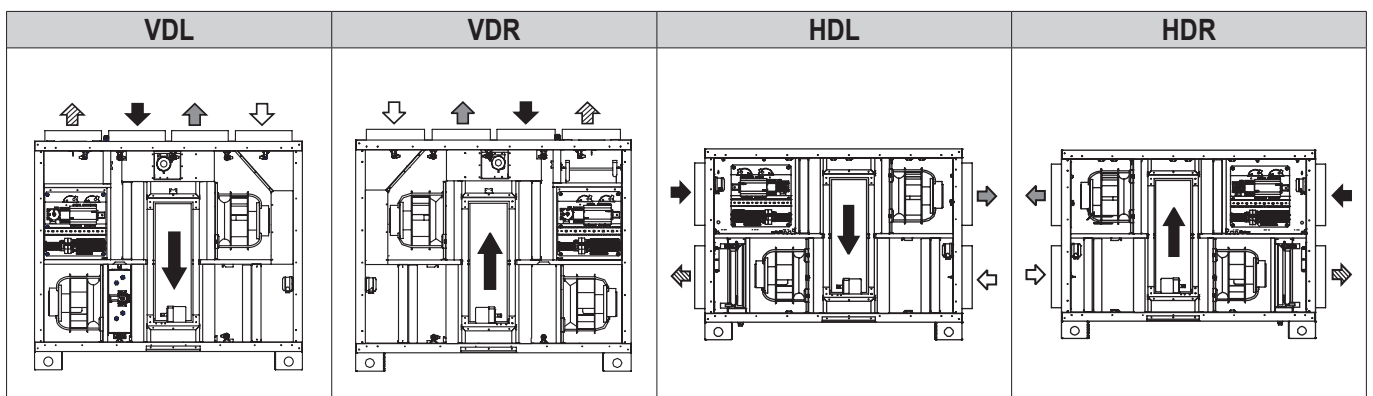
This service can only take place once the installation, the electrical connection operations, aerualics and hydraulics carried out.

For the commissioning and configuration of the CTA, bring the necessary data, flow rates, pressures, temperatures, desired operating mode and installation diagrams.

- Before connecting the ducts, check that the 4 labels (below) stuck on the CTA correspond to the diagrams in "2.2.1 General description", page 6.

| AHU labels | Instructions symbols | AHU labels | Instructions symbols | AHU labels | Instructions symbols | AHU labels | Instructions symbols |
|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |

- 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.
- Check that the fan motors are not accessible from the connection taps, provide a screened air intake or a sufficient length of duct.
- 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 electrical connections, lugs, terminals and the ground connection.
- Check the voltages, currents, gauges of the thermal protective devices.
- Check the airflow rates.
- Make sure that the filters are not clogged – clean them or replace them, if necessary.
- Check the rotating direction of the fans
- Check the direction of rotation of the exchanger on three-phase units (> size 1900). An arrow of direction is shown on the interchange. If it turns upside down, invert 2 phases at the power supply main or the KM3 contactor.






- Enter the control parameters; simulate the operation of the batteries / alarms / safeties.


11. MAINTENANCE - REPLACEMENT OF PARTS - ALARMS

11.1 Safety instructions

General:

- Meaning of the danger labels present on the access doors:

| | | |
|---|---|---|
|  |  |  |
| Live equipment | Rotating machine | Potentially flammable dust filters |

- Put on appropriate PPE (Personal Protective Equipment) before any intervention.
- Before installing the air handling unit, ensure that the support and location are sufficiently strong enough to support the weight of the unit and accessories.
-  Do not open doors or panels without shutting down the unit.

Case of emergency or danger

- Cut off the power supply using the padlockable disconnect switch and, if possible, the circuit breaker major.

AHU normal shutdown procedure

- Stop the unit from the ETD2 remote control or the GTC to allow the battery to ventilate before stopping the fans and the air handling unit. See § "8.2 Stop the AHU", page 66
- Cut off the power supply using the padlockable disconnect switch and, if possible, the circuit breaker major.
- Make sure that moving parts are stationary.

Before starting, check the following points

- Check the earth connection.
- Check that the access doors are properly closed.

Tripping of safety thermostats (DI model)

- RHE DI units are fitted with 2 safety thermostats:
 - A manual reset thermostat that cuts the battery at 120°C
 - An automatic reset thermostat that cuts the battery at 85°C
- Any resetting or tripping information (via the BMS for example) involves looking for the cause of this triggering on the CTA and on the installation. Contact sav@vim.fr.

11.2 Maintenance frequency

Comply with legal obligations as a minimum.

The table below gives indicative average maintenance frequencies.

It does not take into account specific factors such as indoor or outdoor installation, the intensity of atmospheric pollution, the number of occupants or the number of hours of operation, etc.

| Organ | At startup | At least every 6 months |
|-----------------|---|---|
| Filters | Check contamination + clean | Dust or replace |
| Fans | Check connections and direction of rotation | Check dirt + clean if necessary |
| Exchanger | Control rotation | Check dirt + clean if necessary Check belt tension |
| Electrical box | Check connections | Check connections |
| Electric Heater | Check connections | Dust |

| Organ | At startup | At least every 6 months |
|-----------------------------------|---|--|
| Water Coil | Check the tightness | Check dirt + clean if necessary. Check for leaks / tighten connections |
| Droplet separator | | To clean |
| Condensate collection tray | Check for tightness/ flow | To clean |
| Pressure switches | Check the electrical / aeraulic connections | Check function |
| Probes | Check operation / settings | Check operation / settings |
| Flexible sleeves | Check the tightness | Replace when needed |
| Fresh air intake / Exhaust grille | Control their presence | To clean |
| Duct networks | Check the tightness | To clean |
| Vents / diffusers / plenums | Check the tightness of the connections | To clean |

11.3 Maintenance / replacement of fresh air / extract air filters

When starting up for the first time, once the installation is complete, it is advisable to clean the filters or even replace them.

As standard, RHE include filters:

- on the extracted air protecting the exchanger filter M5 (ePM10 50%) or F7 48mm (ePM1 55%).
- on fresh air pre-filter G4 (coarse 70%) + Filter F7 (ePM1 55%) or F9 (ePM1 80%) (option).

The F7 filters are held flat on the seals by 2 compression locking slides.

Clogging of the filters controlled by differential pressure switches with information feedback on the regulation.

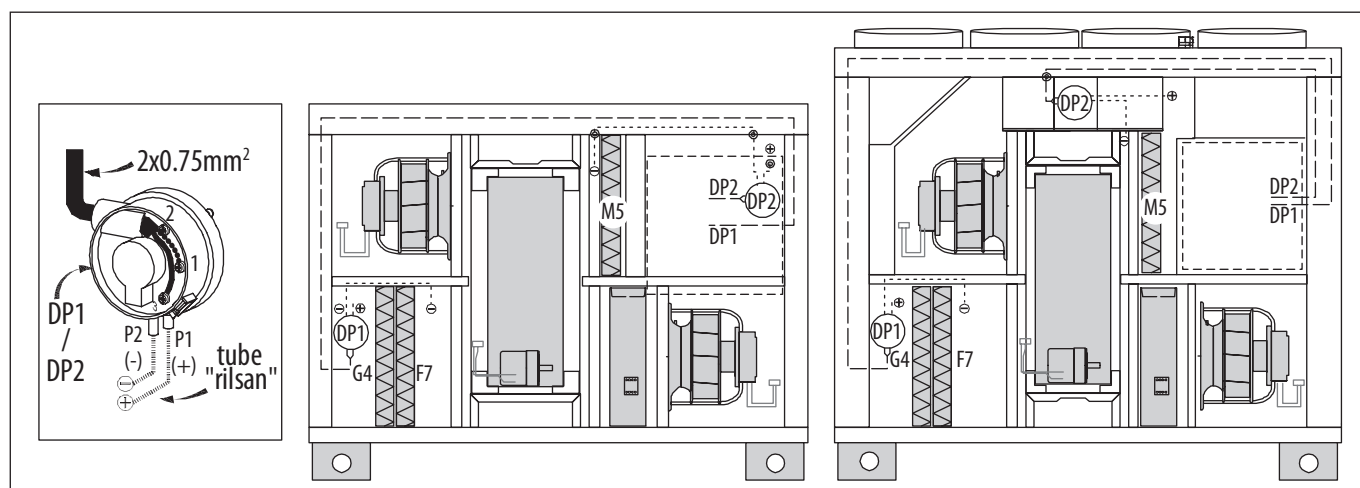
| Size | Qty | G4 (Coarse 70%) / M5 (ePM10 50%) (mm) | G4 (Coarse 70%) Media area (m ²) | M5 (ePM10 50%) Media area (m ²) | F7 (ePM1 55%) / F9 (ePMP1 80%) (mm) | Media area (mm) |
|-----------|-----|---------------------------------------|--|---|-------------------------------------|-----------------|
| 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 |

Filter replacement: (See §"11.10 List of main spare parts", page 96)

The F7 filters are held flat on the seals by 2 compression locking slides.

- Open the access doors.
- Pull on the G4 filters (Coarse 70%) (fresh air pre-filtration) and M5 (extraction filter).
- Pull on the movable slides to unlock the filter F7 (ePM1 55%), pull on the filter.
- Dust the compartment close to the filter slides.
- Place the new filters in the various slots, lock the mobile slides.
- Close the doors.
- Restart the unit, the filter alarm is automatically acknowledged, it should disappear from the alarms

The clogging of the filters is controlled by differential pressure switches with information feedback on regulation.



Factory settings:

| Sizes | DP1 OUTDOOR AIR | | DP2 EXTRACT AIR | |
|-----------|---------------------------|---------------------------|------------------------|------------------------|
| | Adjustment in Pa if G4+F7 | Adjustment in Pa if G4+F9 | Adjustment in Pa if M5 | Adjustment in Pa if F7 |
| All sizes | 300 | 300 | 150 | 200 |

11.4 Maintenance / replacement of the rotary exchanger and belt

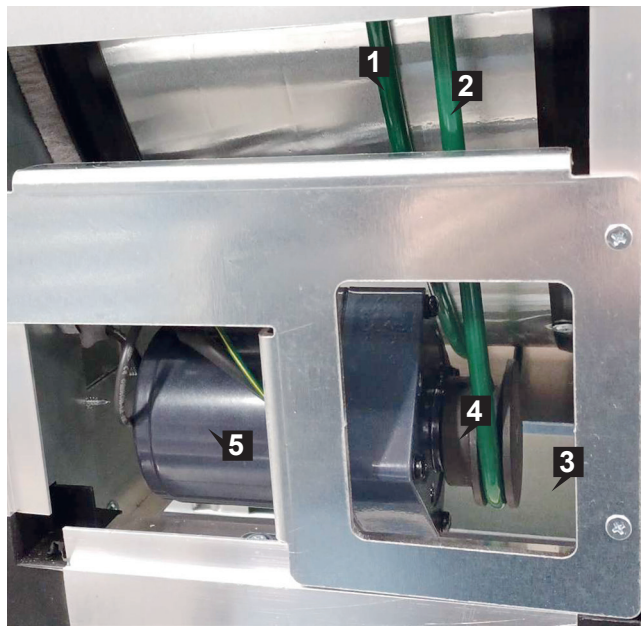
After a long period of use, dust can accumulate in the exchanger and reduce the passage of air. To maintain performance, it is important to check the exchanger at least once a year and clean it if necessary. To facilitate maintenance, the exchanger motor assembly can be removed from the unit:

- Turn off the power supply at the main circuit breaker.
- Open the access door.
- Disconnect the quick connector from the motor connection.
- Pull on the exchanger to remove it from the unit.
- Handle with care using suitable lifting means.
- Clean with compressed air or soapy water.
- Do not use ammoniated detergents.
- Check that the heat exchanger turns correctly by turning the wheel by hand after removing the belt from the groove of the motor pulley.
- Check the condition of the belt – an additional belt is mounted on the wheel.
- Check that the sealing brushes are not damaged or shifted.
- The rotor bearings do not normally require lubrication.
- Reassemble the assembly and reposition the connector.

Belt replacement:

Unit sizes 700 to 8000

Units of sizes 700 to 8000 are equipped with a tubular type round belt. A replacement belt is always planned around the interchange.



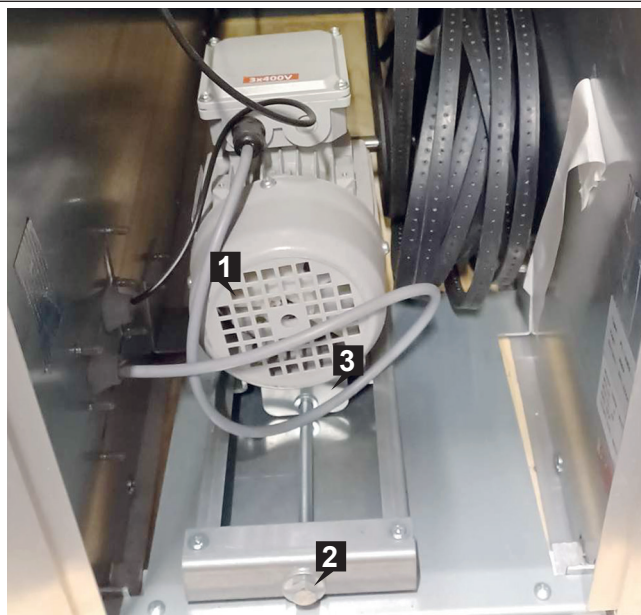
- | | |
|---|------------------|
| 1 | Replacement belt |
| 2 | Main belt |
| 3 | Access hatch |
| 4 | Exchanger pulley |
| 5 | Exchanger motor |

To use the replacement belt:

- Remove the old belt
- Pull on the exchanger to get it out of about twenty centimeters
- Pass one of the hands through the access hatch and the other from below the exchanger to pull on the replacement belt and the put in the groove of the exchanger pulley
- Push back the exchanger

Units larger than size 8000

Sizes larger than size 8000 are supplied with an SPA-type replacement strap not fitted around the interchange.



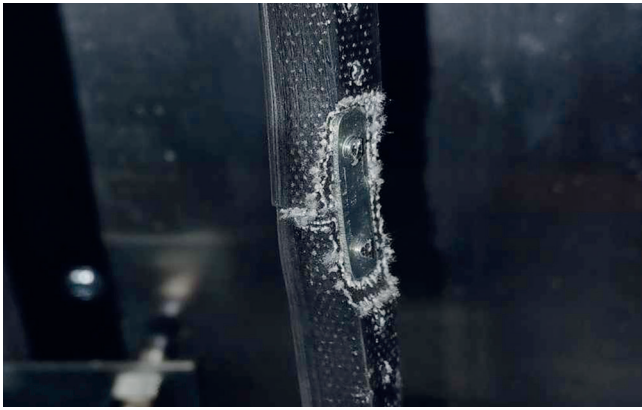
- | | |
|---|--------------------------|
| 1 | Exchanger motor |
| 2 | Tension adjustment screw |
| 3 | Motor carriage |

To use the replacement belt:

- Remove the old belt and use it as a jig to cut the new belt at the good length
- Move the motor carriage towards the exchanger by unscrewing with the tension screw (wrench of 13)
- Tape one end of the new belt on the exchanger
- Rotate the exchanger manually on a complete turn to retrieve the taped end.
- Lightly file the inner edges of the ends belt (narrowest part) to allow the integration of the plate of interior junction in the thickness of the belt



- Assemble the 2 ends of the belt with using the assembly plates, making sure that she has not twisted.



Throat side



Outer side

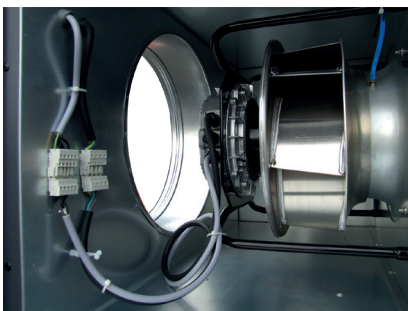
- Replace the belt inside the driving pulley



- Adjust the tension of the belt using the motor carriage tension screw.

11.5 Fan maintenance / replacement

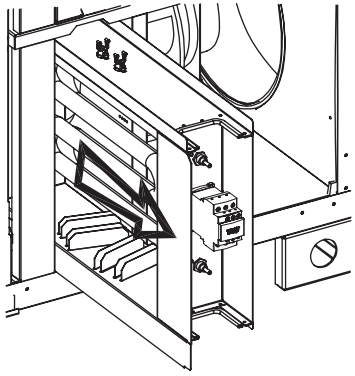
After a long period of use, dust can settle on the fan, a dust removal is then necessary.



To extract the fans:

- Open the access doors.
- Disconnect the power and control connection plugs on the side.
- Disconnect the pressure tap.
- Unscrew the two M8 screws using a Ø13 spanner from the support plate.
- Remove the fans.
- Clean the fan with a damp cloth – do not spray the fan with water.
- Put back in place by reversing the dismantling procedure.

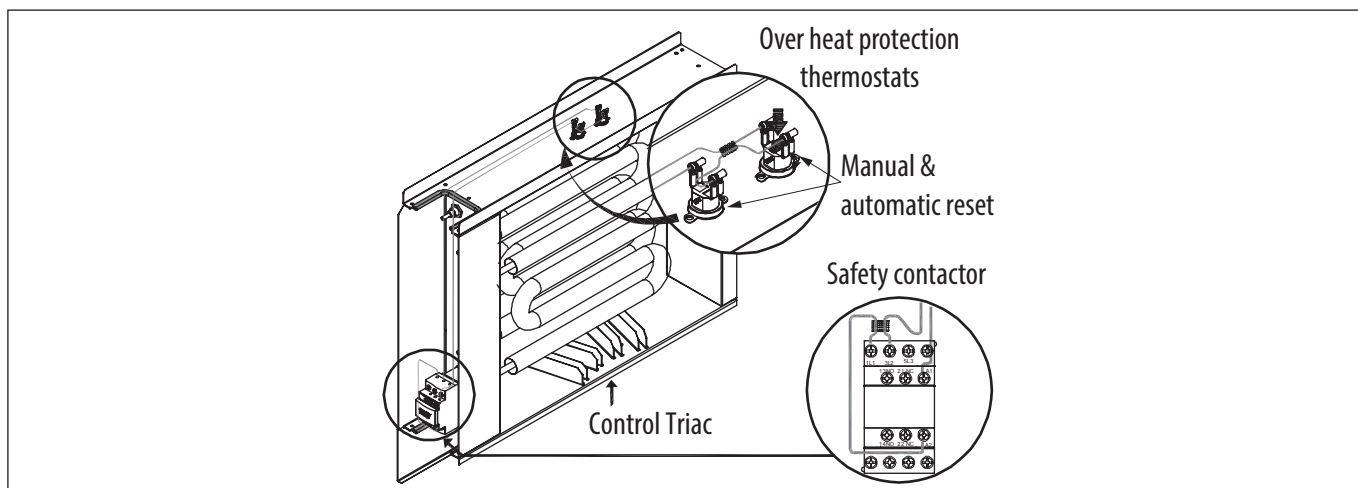
11.6 Maintenance / Reset / Replacement of electric heater

| Electric heater maintenance | |
|---|--|
|  | <p>Before the heating season, dust the resistors with compressed air or using a vacuum cleaner and a soft brush.</p> <ul style="list-style-type: none">• Open the access doors.• Visually check the condition of the components and tighten the connections.• Disconnect the cables before removing the battery. <p>Be careful not to tear or injure the cables by pulling on the battery.</p> |

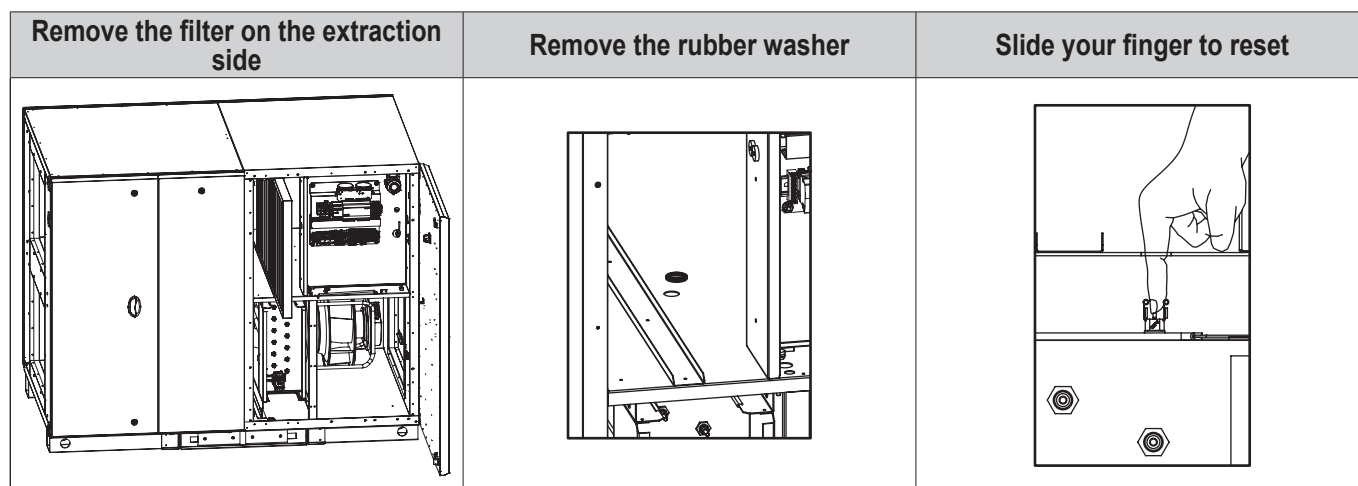
RHE DI units are fitted with 2 safety thermostats:

- A manual reset thermostat that cuts the heater at 120°C
- An automatic reset thermostat which cuts the heater at 85°C

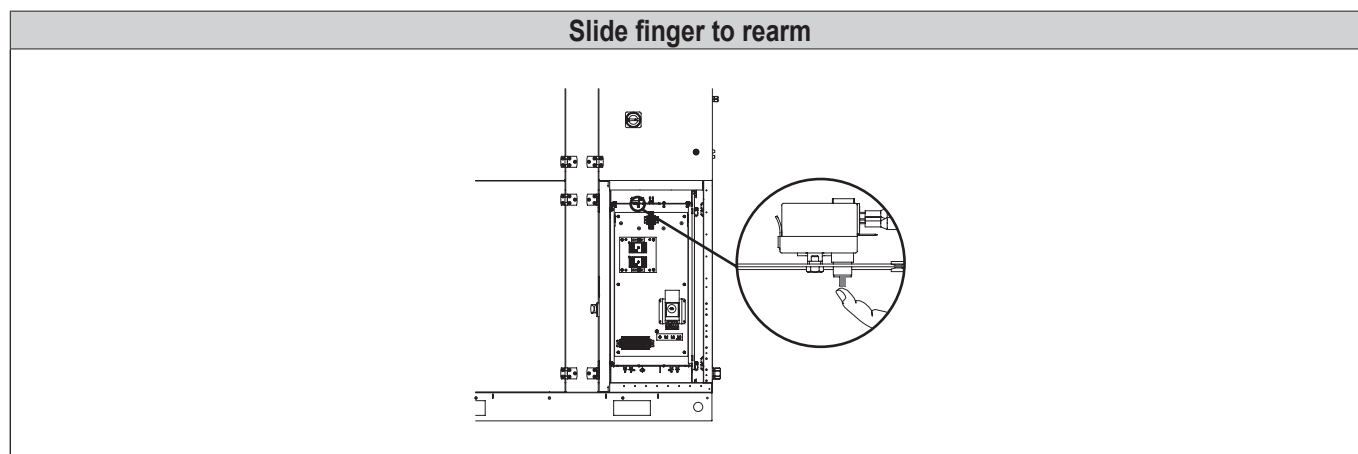
Access to the safety thermostats and resetting of the manual safety thermostat



On 6000 / 8000 / 10000 units, the resetting of the manual electric heater safety thermostat is done inside of the unit according to the following steps:



On 15000 units, resetting of the manual electric heater safety thermostat is done inside the unit on the front side of the heater.



11.7 Maintenance / replacement of the water coil

To preserve the characteristics of the battery, purge the water circuit once a year. Depending on the ambient pollution, and despite the filtration, dust may settle on the battery.

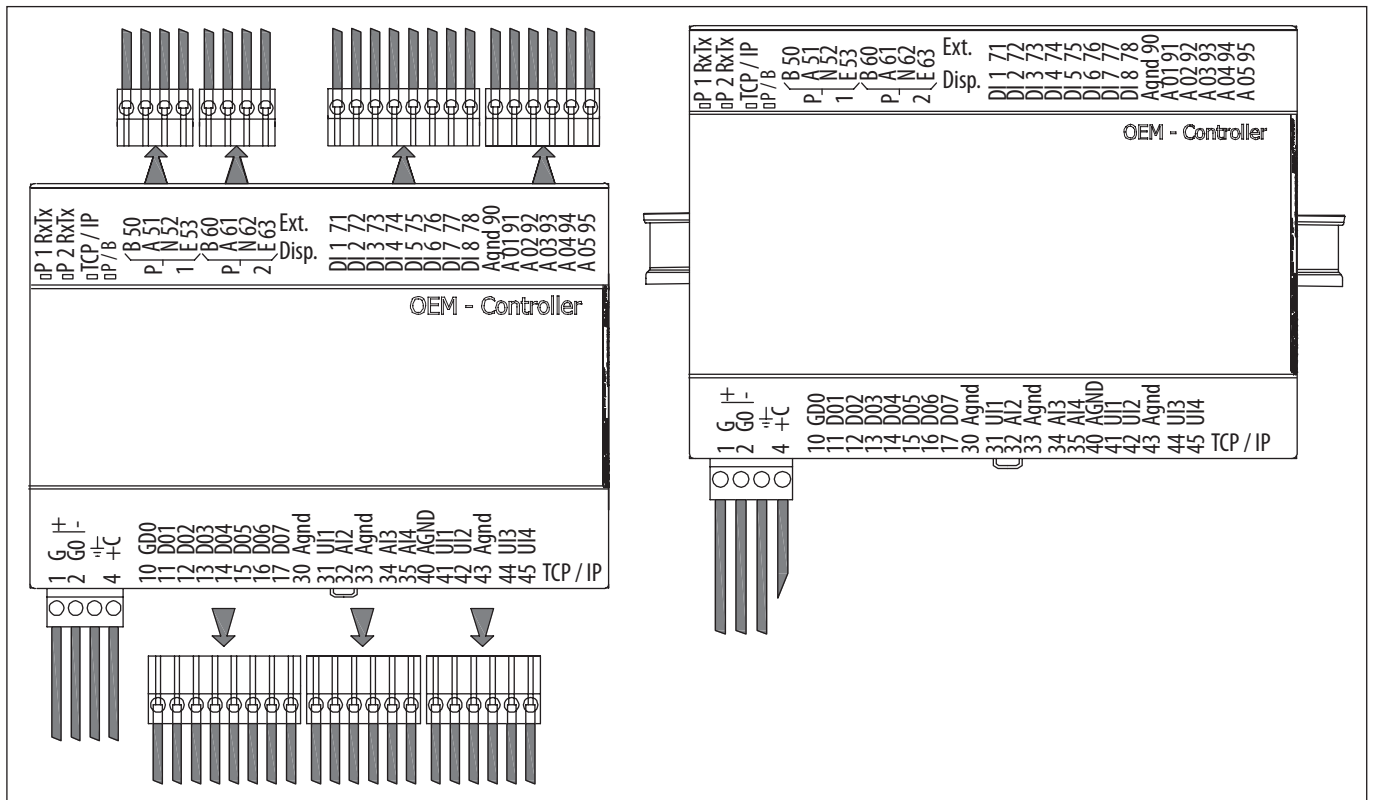
After disassembly, the coil can be cleaned with a jet of water, steam or compressed air, proceed with care not to damage the fins of the coil.

For units fitted with reversible cooling coils (DFR), clean the condensate pan with water and a non-abrasive detergent. Check for proper drainage and check the siphon.



11.8 CORRIGO controller - Reset and replace battery

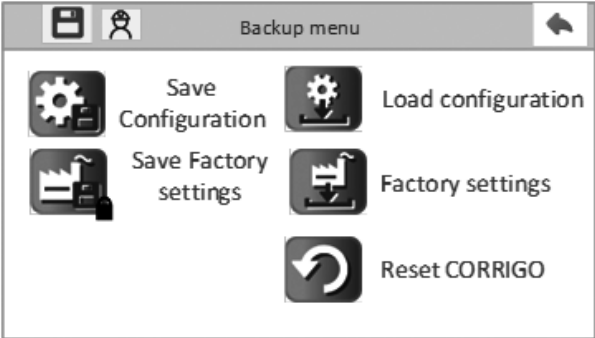
Resetting the CORRIGO regulator from the ETD2 remote control

In some cases, after multiple settings or following a malfunction, it is sometimes necessary to reset the programmer. **Perform this operation only after having been instructed to do so by the VIM after-sales service.**



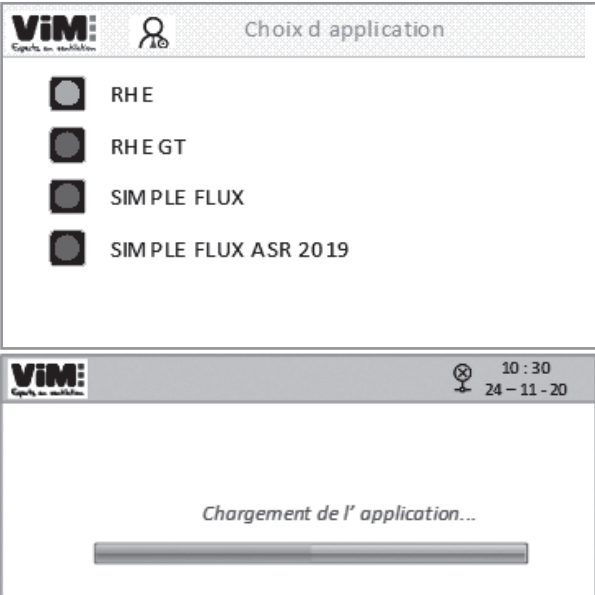
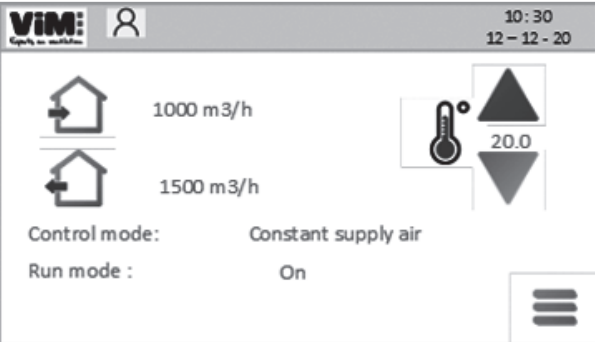
- Set the disconnecter to "OFF" and open the door.
- Remove the connectors on the CORRIGO except for the power supply located at the bottom left and the of the touch console.
- Close the door then return the disconnecter to "ON".

Press the main menu icon  



Press "Reset CORRIGO"

Wait for the end of the reset time

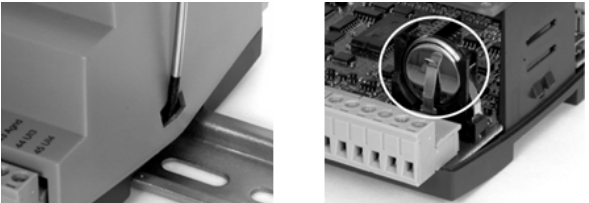
| | |
|--|--|
|  | <p>The screen used to choose the program to load into the controller appears:</p> <ul style="list-style-type: none"> • Select the RHE program for units up to size 10000 and RHE GT for size 15000. • Wait for the application to load |
|  | <ul style="list-style-type: none"> • The welcome screen appears • Set the disconnecter to "OFF" and open the door. • Reconnect the connectors to the CORRIGO then close the unit. • Set the disconnecter to "ON" then start the complete configuration of the unit |

Battery replacement - type CR2032

When the low battery alarm appears and the red indicator light turns on, it means that the backup battery for memory backup and real-time clock is too weak.

A capacitor saves the memory and keeps the clock running for about 10 minutes after the power is turned off.

If changing the battery takes less than 10 minutes, there is no need to reload the program and the clock continues to operate normally.

| | |
|---|--|
|  | <ul style="list-style-type: none"> • Press the clips on each side of the box with a small screwdriver to detach the cover from the base. • Hold the base and remove the cover. • Grasp the battery and gently pull upwards until the battery comes out of its compartment. • Take a new battery and slide it into the holder. Pay attention to the direction of assembly of the battery to correctly observe the polarity. |
|---|--|

11.9 Alarms and faults

In case of defect or alarm on the ETD2 remote control screen, a bell appears in orange. By pressing the bell, the type of alarm can be consulted, the fault is then clearly identified on the screen. The list of fault messages is given below.

Note: the alarms are declared with a class of type C alarms, resetting is automatic as soon as the problem is resolved (no manual acknowledgment required).

| Address | Text of alarm | Description |
|---------|--|---|
| 1 | Malfunction SAF | Malfunction supply air fan |
| 2 | Malfunction EAF | Malfunction extract air fan |
| 6 | Filter guard 1 | Filter guard 1 - check the filter (clean or replace) |
| 10 | Fire alarm | Fire alarm enable |
| 23 | Electric heating is overheated | Electric heating is overheated |
| 24 | Frost risk | Water temperature on water coil low (<12°C fixed value) |
| 25 | Low frost guard temp | Water temperature on water coil too low (7) |
| 27 | Sensor error outdoor temp | Sensor error outdoor temp |
| 29 | Rotation sentinel exchanger | Rotation sentinel exchanger |
| 31 | Supply air fan pressure control error | Supply air fan pressure control error |
| 32 | Extract air fan pressure control error | Extract air fan pressure control error |
| 41 | Manual heater control | Manual heater control |
| 42 | Manual exchanger control | Manual exchanger control |
| 43 | Manual cooler control | Manual cooler control |
| 48 | Internal battery error | Replace the internal battery of the controller |
| 49 | Sensor error supply air temp | Sensor error supply air temp |
| 50 | Sensor error extract air temp | Sensor error extract air temp |
| 55 | Sensor error SAF pressure | sensor error SAF pressure |
| 56 | Sensor error EAF pressure | Sensor error EAF pressure |
| 58 | Sensor error water sensor | Sensor error water sensor |
| 107 | Extra alarm 7 | External boost switch |
| 108 | Extra alarm 8 | Heating desable |
| 109 | Extra alarm 9 | Additional compensation air flow |
| 110 | Extra alarm 10 | DX group defrost (reduce speed + offset) |

11.10 List of main spare parts

| Code | Type | Name |
|------------|--|----------------------|
| 5407030400 | Filter F7 ePM1 55% 600x372x96 mm (1 piece) | AFR RHE 700/1300 F7 |
| 5407030500 | Filter F7 ePM1 55% 700x422x96 mm (1 piece) | AFR RHE 1900 F7 |
| 5407030600 | Filter F7 ePM1 55% 425x472x96 mm (1 piece) | AFR RHE 2500 F7 |
| 5407030700 | Filter F7 ePM1 55% 505x562x96 mm (1 piece) | AFR RHE 3500/4500 F7 |
| 5407031400 | Filter F7 ePM1 55% 600x655x96 mm (1 piece) | AFR RHE 6000 F7 |
| 5407031500 | Filter F7 ePM1 55% 483x780x96 mm (1 piece) | AFR RHE 8000 F7 |
| 5407036100 | Filter F7 ePM1 55% 405x864x96 mm (1 piece) | AFR RHE 10000 F7 |
| 5407074400 | Filter F7 ePM1 55% 525x512x96 mm (1 piece) | AFR RHE 15000 F7 |
| 5407030800 | Filter F9 ePM1 80% 600x372x96 mm (1 piece) | AFR RHE 700/1300 F9 |
| 5407030900 | Filter F9 ePM1 80% 700x422x96 mm (1 piece) | AFR RHE 1900 F9 |
| 5407031000 | Filter F9 ePM1 80% 425x472x96 mm (1 piece) | AFR RHE 2500 F9 |
| 5407031100 | Filter F9 ePM1 80% 505x562x96 mm (1 piece) | AFR RHE 3500/4500 F9 |
| 5407031600 | Filter F9 ePM1 80% 600x655x96 mm (1 piece) | AFR RHE 6000 F9 |
| 5407031700 | Filter F9 ePM1 80% 483x780x96 mm (1 piece) | AFR RHE 8000 F9 |
| 5407036200 | Filter F9 ePM1 80% 405x864x96 mm (1 piece) | AFR RHE 10000 F9 |
| 5407074800 | Filter F9 ePM1 80% 525x512x96 mm (1 piece) | AFR RHE 15000 F9 |
| 5407030000 | Filter G4 Grossier 70% 600x372x48 mm (1 piece) | AFR RHE 700/1300 G4 |
| 5407030100 | Filter G4 Grossier 70% 700x422x48 mm (1 piece) | AFR RHE 1900 G4 |
| 5407030200 | Filter G4 Grossier 70% 425x472x48 mm (1 piece) | AFR RHE 2500 G4 |
| 5407030300 | Filter G4 Grossier 70% 505x562x48 mm (1 piece) | AFR RHE 3500/4500 G4 |

| Code | Type | Name |
|------------|--|--------------------------------------|
| 5407031200 | Filter G4 Grossier 70% 600x655x48 mm (1 piece) | AFR RHE 6000 G4 |
| 5407031300 | Filter G4 Grossier 70% 483x780x48 mm (1 piece) | AFR RHE 8000 G4 |
| 5407036300 | Filter G4 Grossier 70% 405x864x48 mm (1 piece) | AFR RHE 10000 G4 |
| 5407074300 | Filter G4 Grossier 70% 525x512x48 mm (1 piece) | AFR RHE 15000 G4 |
| 5407036400 | Filter M5 ePM10 50% 600x372x48 mm (1 piece) | AFR RHE 700/1300 M5 |
| 5407036500 | Filter M5 ePM10 50% 700x422x48 mm (1 piece) | AFR RHE 1900 M5 |
| 5407036600 | Filter M5 ePM10 50% 425x472x48 mm (1 piece) | AFR RHE 2500 M5 |
| 5407036700 | Filter M5 ePM10 50% 505x562x48 mm (1 piece) | AFR RHE 3500/4500 M5 |
| 5407036800 | Filter M5 ePM10 50% 600x655x48 mm (1 piece) | AFR RHE 6000 M5 |
| 5407036900 | Filter M5 ePM10 50% 483x780x48 mm (1 piece) | AFR RHE 8000 M5 |
| 5407037100 | Filter M5 ePM10 50% 405x864x48 mm (1 piece) | AFR RHE 10000 M5 |
| 5407074200 | Filter M5 ePM10 50% 525x512x48 mm (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 RHE 15000 72 kW Tri 400V |
| R153534105 | Hot water coil VD | BCOI RHE 700/1300 VD |
| R153534205 | Hot water coil VD | BCOI RHE 1900 VD |
| R153534005 | Hot water coil VD | BCOI RHE 2500 VD |
| R153531005 | Hot water coil 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 |
| 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 |

12. WASTE MANAGEMENT

12.1 Treatment of Packaging and non-hazardous waste

Packaging (non-returnable pallets, boxes, films, wooden packaging) and other non-hazardous waste must be recycled by an approved service provider.

It is strictly forbidden to burn them, bury them or put them in wild dumping.

12.2 Treatment of Professional WEEE

This product must not be landfilled or treated with household waste but must be taken to an appropriate collection point for waste electrical and electronic equipment (WEEE).



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