

EN7558843-04

03 - 2024

# MAGISTER®

Instruction manual



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# 1 - INTRODUCTION

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## Introduction to the range:

MAGISTER is a range of precision close control units operating with chilled water (temperature and humidity) that is specifically adapted to meet the needs of premises with high heat loads or of sensitive locations (DATA CENTRES, computer rooms, metrology laboratories, etc.).

The description of the unit is indicated using the following format:

### MAGISTER X X X

①

② ③ ④

Example of description: **MAGISTER CW40 UNDER1**

① **Range**

② **Unit type**

- CW: chilled water

③ **Cooling capacity**

④ **Assembly type (direction of air flow)**

- UNDER1: Return air above / supply air underneath

- OVER3: Return air in front / supply air above

- OVER5: Return air underneath / supply air above

## 2 - RECEIPT OF GOODS

### 2.1 - Checking the equipment

In accordance with Article 133-3 of the French Code of Commerce, the recipient is entirely responsible for checking the condition of the goods received.

In the event of missing items, the customer must provide the exact number of parcels delivered.

Any damaged or missing items must be specified on the delivery note in the presence of the driver before signing the delivery note.



**These comments must be confirmed to the carrier by registered letter within three business days.**

**The comments "conditional" and "pending unwrapping" shall have no value.**

**The client must unwrap the goods in the presence of the driver.**

**Claims must be made at the time of delivery and be described in detail.**

### 2.2 - Identifying the equipment

Each unit has a nameplate located at the bottom of the electric box that bears an identification number. This number must be quoted in all correspondence.

- ① Product reference
- ② Product description
- ③ Year of manufacture
- ④ **Serial no. (to be quoted in all correspondence)**
- ⑤ Type of fluid used in the exchanger and operating pressure.
- ⑥ Cooling capacity + water temperature used
- ⑦ Heating capacity + water temperature used (if heating coil option)  
+ usage type (2 stages or TRIAC, if electric heater option)
- ⑧ Information on the vertical unit
  - Supply voltage
  - Max. current
  - Weight of the unit

| Ref. produit/Item Nbr        | Designation/Description |
|------------------------------|-------------------------|
| 732326.333.62                | MAGISTER CW030 3OVER    |
| An(Year)                     | N. Serie/Serial Nbr     |
| 2014                         | 02183458/0008           |
| Repere/Part                  |                         |
| Fluide - Charge/Fluid - Load | Froid/Cold              |
| BP/LP Mini                   | Regime                  |
| HP Maxi                      | Chau/Heat               |
| Temp. Maxi (°C)              | Regime - Type           |
|                              | Tension/Voltage         |
|                              | Intensité/Current       |
|                              | Poids/Weight            |
|                              | N° Declaration CE       |
|                              | 7033238.12              |

### 2.3 - Documents

**The following documents should be inside the cabinet:**

- Instruction manual.
- Control manual.
- Wiring diagram for the vertical unit
- Key to the wiring diagram
- Dimensional drawing with connection diagram
- Additional diagrams depending on options

### 3 - SAFETY INSTRUCTIONS

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**Appropriate PPE (Personal Protective Equipment)  
must be worn when servicing the units**



**Warning**

The unit must be installed and maintained by a qualified, experienced technician. Follow the operating precautions to the letter when working on the unit. Labels have been placed on the unit to remind you of the safety instructions. As a general rule, follow all applicable safety regulations and standards.

### 4 - WARRANTY

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See the general terms and conditions of sale

### 5 - STORAGE OF EQUIPMENT

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The cabinet must be stored in a dry, sealed area, away from moisture and frost. The temperature in this area must not exceed 50 °C.

### 6 - HANDLING

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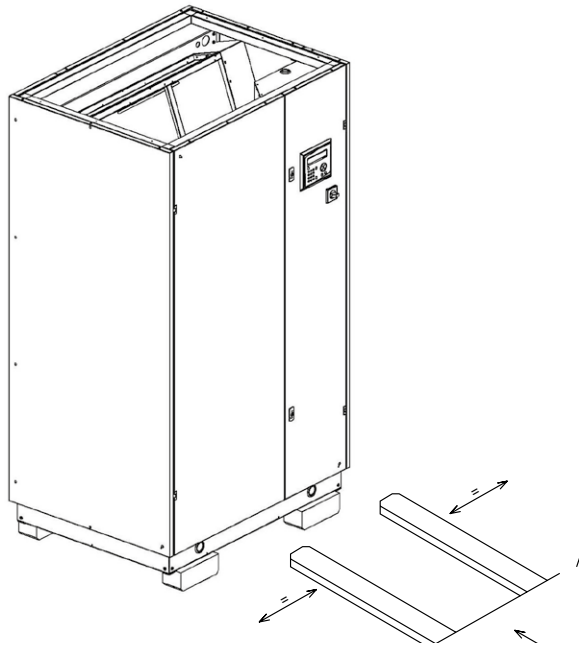
The unit must be handled either with a pallet truck or using a spreader beam and slings. This operation must be carried out by qualified personnel. Refer to the information given on the relevant label on the unit.



**Important: The unit must be handled with care and kept upright.**

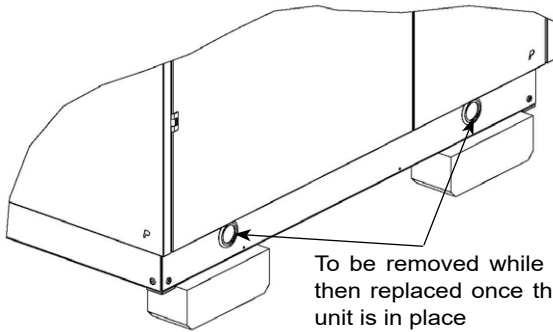
**In all cases, the vertical unit must be raised by its base.**

**Handling with a pallet truck**

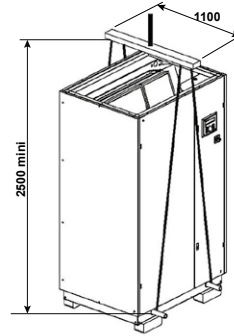


## 6 - HANDLING

### Handling with a spreader beam and slings



To be removed while handling, then replaced once the vertical unit is in place



If the unit is lifted using a spreader beam and slings:

- Protect the panels.
- First remove all the caps covering the holes for the tubing on the lower section of the unit. (Fig. 1).
- Use tubing ( $\varnothing$  max. = 40 mm) with a sufficient lifting capacity (see weight table).
- Use fabric slings.

#### 6.1 Weights and dimensions:

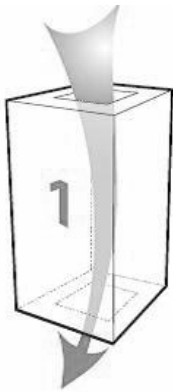
| SIZE   | Dimensions<br>H x W x D | Weight (kg) |
|--------|-------------------------|-------------|
| CW 40  | 1990 x 1190 x 890       | 350         |
| CW 53  | 1990 x 1520 x 890       | 385         |
| CW 78  | 1990 x 2070 x 890       | 545         |
| CW 100 | 1990 x 2620 x 890       | 635         |
| CW115  | 1990 x 3000 x 890       | 730         |

## 7 - SUPPLY AIR TYPE

3 supply air types:

#### Fitting UNDER

Return air above supply  
air underneath



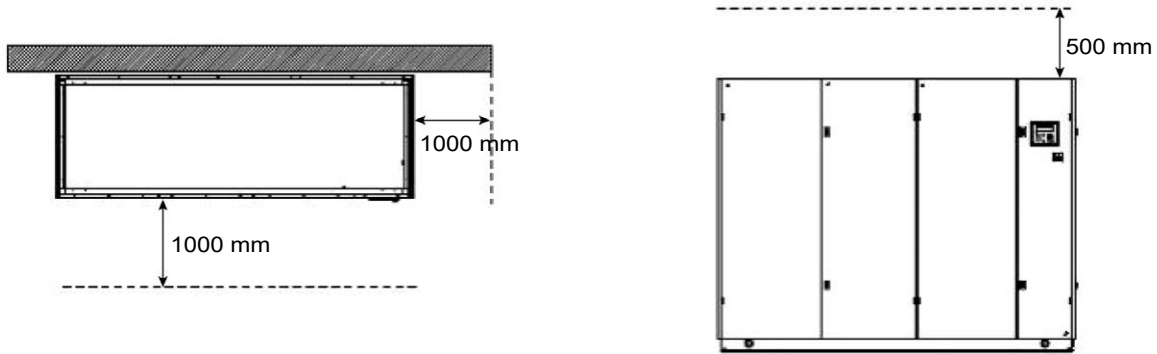
#### Fitting OVER

Return air on front, supply air above **except CW115**    Return air underneath, supply air above **except CW115**



## 8 - LOCATION & INSTALLATION

You must leave space for access to the front and to the right of the unit for maintenance and installation operations.  
For free air intake, there must be at least 500 mm above the unit.



Under no circumstances should these vertical units be installed in an atmosphere that is:

- **Explosive,**
- **Flammable,**
- **Corrosive, or dusty.**

Once at the place of installation, remove the wooden blocks.

- Different configuration options are possible:
  - The unit can be placed directly on the floor. In this case:

The unit must be placed on a flat, smooth surface which is as level as possible (ratio of approx. one to one thousand). The cabinet frame must rest fully on its contact surface. The unit need not be anchored to the floor if it is operated under normal conditions.

- Or on one of the following bases:

Support base, cased base with grids, cased base with damper.

(See the technical characteristics for these options in paragraph 12.2).

It should be placed on a floor that is as level as possible.

Each base comes with feet, which allow the height to be adjusted (in the event of a raised floor) and the base to be levelled before placing the unit on top.

Before placing the vertical unit on top, an adhesive seal (supplied with the option) is to be placed on the aluminium casing frame to ensure its tightness.

The cabinet can also come with a plenum with grids or a free-cooling plenum.

(See the technical specifications for these options in paragraph 12.2)

Before placing the plenum on the vertical unit, apply the adhesive seal (supplied with the option) to its tightness.

For practical reasons, when the CW 115 model unit is in its final position, the

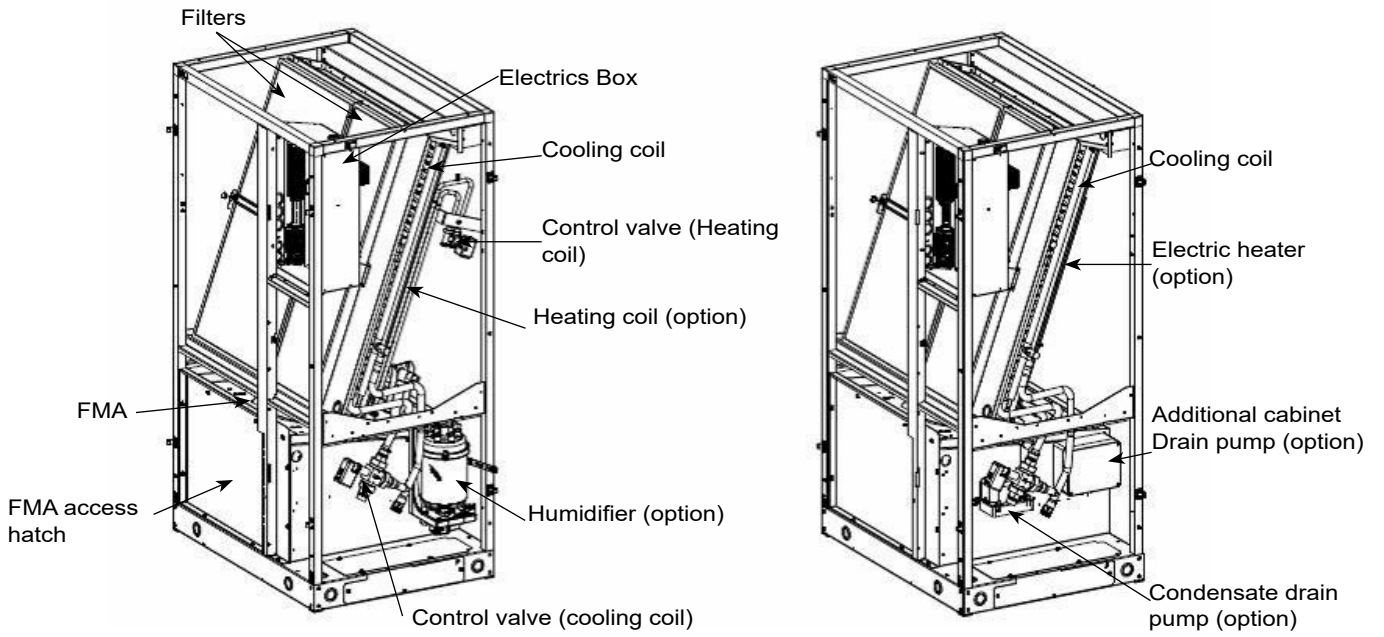
horizontal gussets (with round stamped holes), located at the bottom of the unit, can be removed (see photo).

### Horizontal gussets

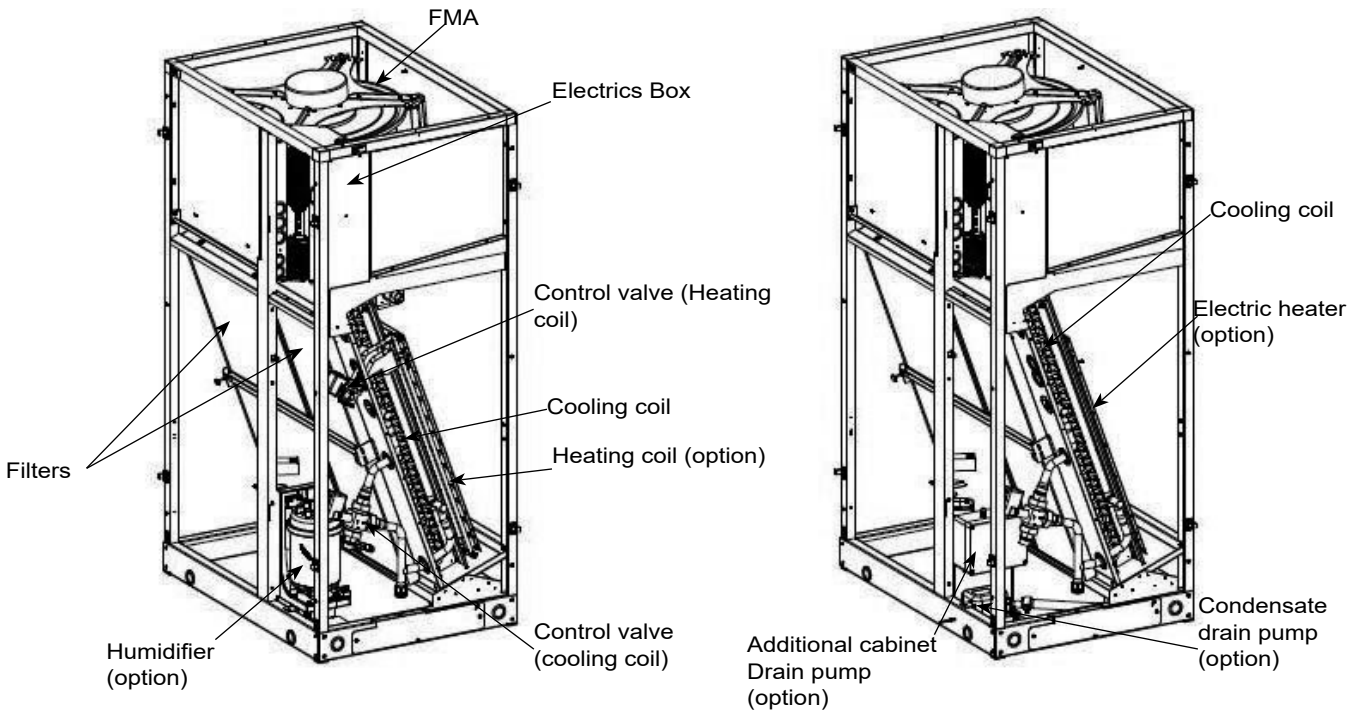


# 9 - LOCATION AND MARKING OF COMPONENTS

## CW40 to CW100, Under Assembly



## CW40 to CW100, Over Assembly

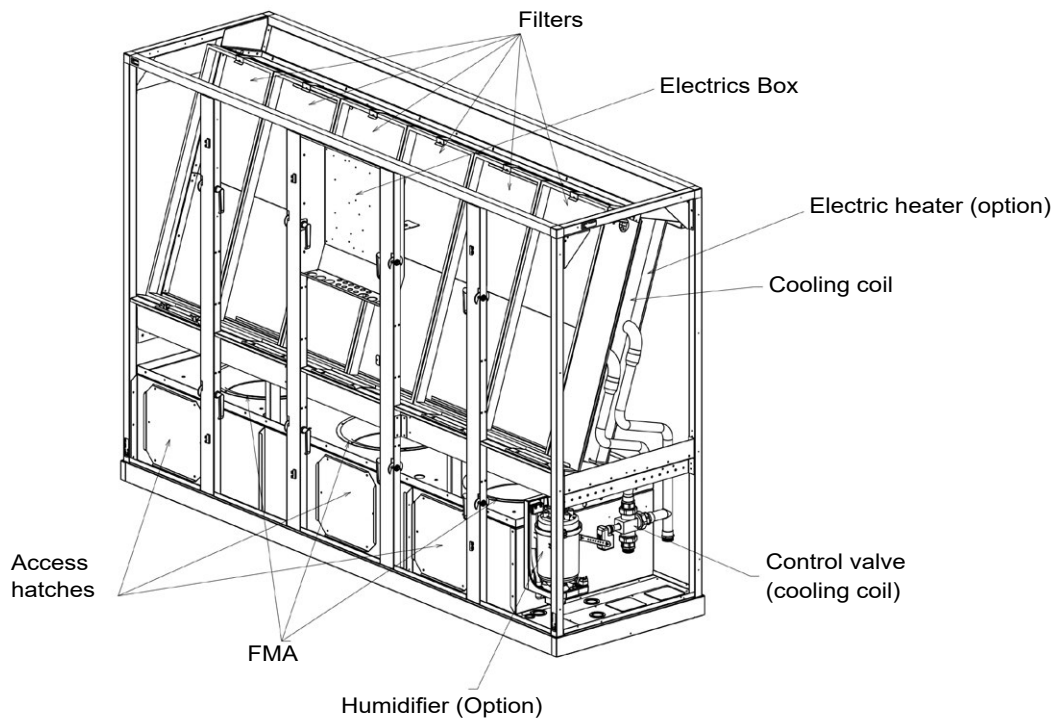




## 9 - LOCATION AND MARKING OF COMPONENTS

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CW115, Under Assembly

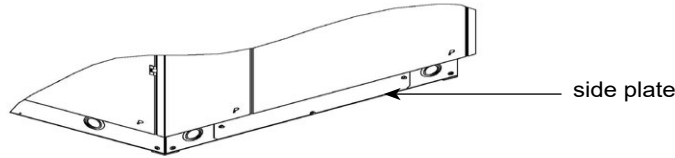


# 10 - CONNECTIONS

When following these steps, please consult the dimensional drawing and connection diagram as well as the wiring diagram found inside the vertical unit.

## 10.1 - Hydraulic connection

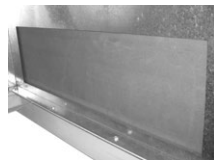
The hydraulic pipes must be routed through the plates provided for this purpose in the vertical unit frame. This is either done to the right of the unit or directly underneath.



These plates must be drilled (water circuit + condensate draining) then refitted in place before the hydraulic pipes are routed through them.

For the CW115 model, the pipes on the right are routed through a fixed insulated panel.

Foam panel



please see the dimensional drawing and connection diagram to locate the routing areas and connection positions.

### Connection diameters:

|              |        | CW 40       | CW 53       | CW 78       | CW 100      | CW115       |
|--------------|--------|-------------|-------------|-------------|-------------|-------------|
| Cooling coil | Inlet  | G 1"1/4 (M) | G 1"1/4 (M) | G 1"1/2 (M) | G 1"1/2 (M) | G 1"1/2 (M) |
|              | Outlet | G 1"1/4 (F) | G 1"1/4 (F) | G 1"1/2 (F) | G 1"1/2 (M) | G 1"1/2 (F) |

|              |        | CW 40      | CW 53      | CW 78      | CW 100     |
|--------------|--------|------------|------------|------------|------------|
| Heating coil | Inlet  | G 3/4" (M) | G 3/4" (M) | G 3/4" (M) | G 3/4" (M) |
|              | Outlet | G 3/4" (M) | G 3/4" (M) | G 3/4" (M) | G 3/4" (M) |

Always use two spanners when connecting or tightening the hydraulic couplings to avoid twisting the pipes and applying stress on the welds.

To avoid the risk of condensation, the hydraulic pipes and elements must be carefully insulated.

Before insulating, check the tightness of the couplings.

**Warning:** the operating pressure on the chilled or hot water network must not exceed 8 bar.

Once all the connections have been made, the access holes must be sealed.

Insulated flexible connections are available on request for carrying out hydraulic connections. Ensure these are not bent too acutely to avoid pinching the inner tube and restricting the flow of water.

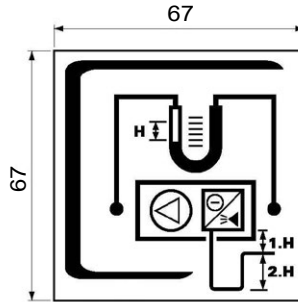
### Condensate drain

The condensate drain pan should include a siphon to avoid any risk of overflowing. (See position and connection diameter on the dimensional drawing).

In these vertical units, the pan is depressed due to its position in relation to the fan motor assembly.

To enable correct drainage, the height must be equal to at least twice the unit's depression.

## 10 - CONNECTIONS



A condensate drain pump option is available (see technical specifications in paragraph 12), provided that the humidifier option has not been requested.

If the humidifier option is selected, the discharge must not drain into the unit's drain pan. To have a single discharge for both, connect the humidifier drain downstream of the unit's drain pan.

**Warning:** the condensates from the humidifier can reach 100 °C.

### 10.2 - Electrical connection

The electrical connections and wiring must be set up as shown on the wiring diagram included with the unit and in accordance with applicable standards and regulations.

The unit's power supply cable must be determined according to the power of the unit, the length of the cable, the protection, and the operating mode.

Check that the characteristics of the electrical power supply conform with the indications on the name plate.

Please ensure the unit is connected to earth, and that the power supply is always able to supply the necessary power.

### Electrical specifications: Three-phase 400 V power supply + Earth - 50 Hz

Table of currents

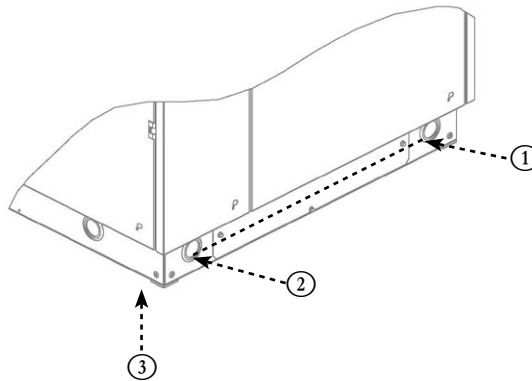
|                                    |                           | CW 40 | CW 53 | CW 78 | CW 100 | CW115 |
|------------------------------------|---------------------------|-------|-------|-------|--------|-------|
| Fan motor assembly                 | Voltage (V)               | 400   |       |       |        |       |
|                                    | Power (kW)                | 3,4   |       | 6,8   |        | 9,3   |
|                                    | Current (A)               | 5,4   |       | 10,8  |        | 14,7  |
| Control circuit (transformer)      | Voltage (V)               | 24    |       |       |        |       |
|                                    | Current (A)               | 1     |       |       |        |       |
| Humidifier (option)                | Voltage (V)               | 400   |       |       |        |       |
|                                    | Power (kW)                | 6     |       |       |        |       |
|                                    | Current (A)               | 8,7   |       |       |        |       |
| Electric heater (option)           | Voltage (V)               | 400   |       |       |        |       |
|                                    | Power (kW)                | 12    | 18    | 24    | 33,6   | 33,6  |
|                                    | Current (A)               | 17,4  | 26    | 34,6  | 48,4   | 48,4  |
| Total current without option       | Current (A)               | 6,4   | 6,4   | 11,8  | 11,8   | 15,7  |
|                                    | Rating of main switch (A) | 16    |       |       |        | 25    |
| Total current with humidifier      | Current (A)               | 15,1  | 15,1  | 20,5  | 20,5   | 24,4  |
|                                    | Rating of main switch (A) | 25    |       | 40    |        |       |
| Total current with electric heater | Current (A)               | 23,8  | 32,4  | 46,4  | 60,2   | 64,1  |
|                                    | Rating of main switch (A) | 40    |       | 63    | 80     |       |
| Total current all options          | Current (A)               | 32,5  | 41,1  | 55,1  | 68,9   | 72,8  |
|                                    | Rating of main switch (A) | 40    | 63    |       | 80     |       |

## 10 - CONNECTIONS

### Recommendations concerning electrical connections of the indoor unit.

Connect the indoor unit so that the main power supply comes from underneath the unit.

Either on the right side of the unit (1 or 2) or from underneath (3). If using a cased base, pass it through one of the grommets on the right side intended for this purpose (See technical characteristics in paragraph 12.2.5).

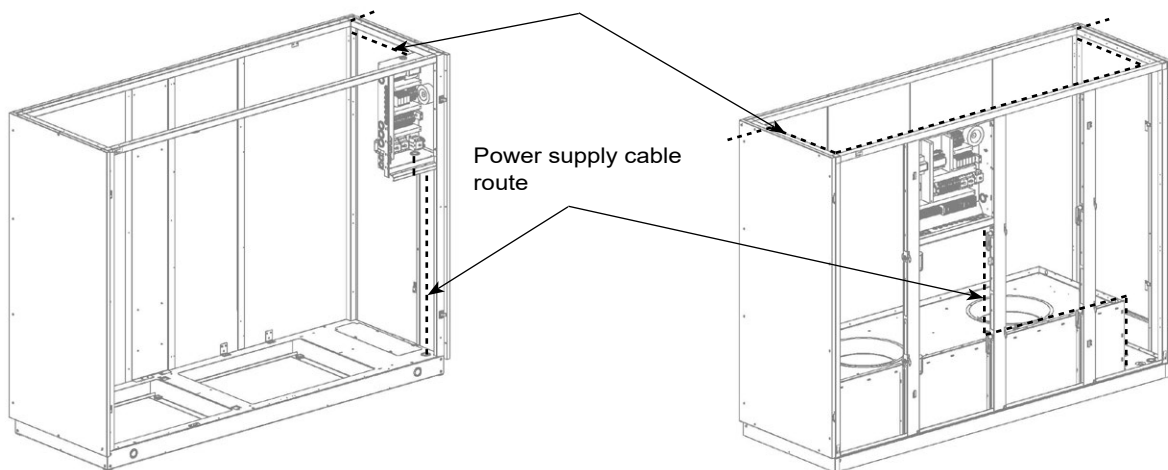


Then follow the routing shown in the figures below.

CW model

Cable routing for management (CMS) or room sensors.

CW115 model



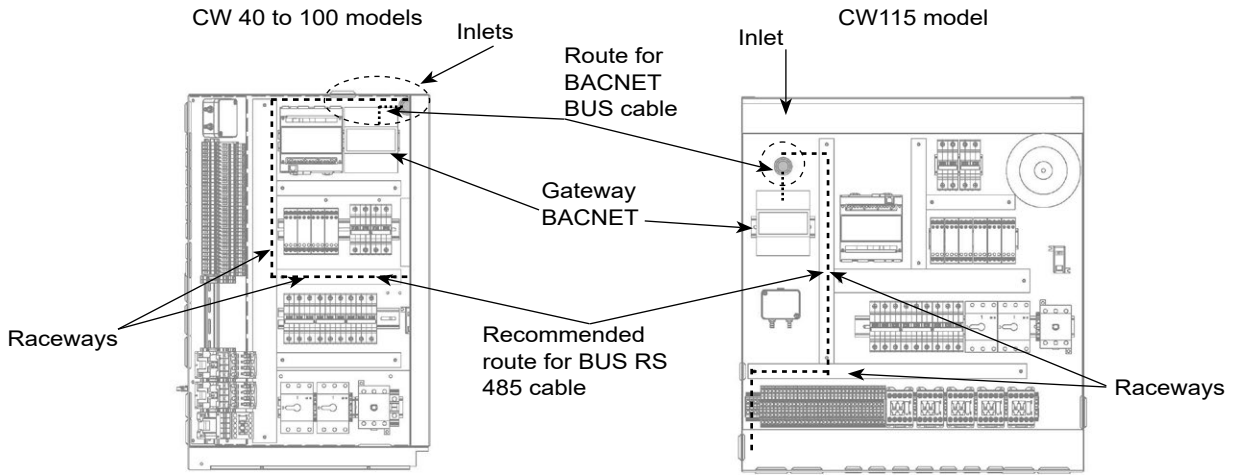
When wiring via management systems (CMS) or Lead/Lag control, as well as room sensors, go through the top of the cabinet and the top section of the box, through the grommets shown in the box views.

**In all cases, avoid following the power supply cables, to avoid interference to the signals sent.**

### **Recommendations concerning the cables and routing in the box.**

- For the communication cables:
    - BUS RS485 cable: Multiconductor shielded jacketed cable (shielding with braiding)
      - BUS RS485 cable for MODBUS or Lead/Lag communication.
      - BACNET BUS cable for BACNET communication (see BACNET specification)
  - For the room sensor cables:
    - Multipolar shielded cables of 3 to 5 wires with a maximum cross section of 1.5 mm<sup>2</sup>.
- Please refer to the control manual and electrical diagram for more details concerning connection.

# 10 - CONNECTIONS



All the cable routings in the unit must be sealed tight.

The CW115 model is supplied with covers which must be fitted on the side and front section of the casing.

# 11 - TECHNICAL CHARACTERISTICS

## 11.1 - Basic components

### 11.1.1 - Control

The vertical units are equipped with a CIAT  $\mu$ AIR CONNECT2 automatic control unit.



**CIAT  $\mu$  Air Connect 2**

The heart of the vertical unit, this manages the unit and ensures it functions correctly. It is built into the display. It can be connected to control systems so that the vertical unit can be controlled remotely, or to allow for Lead/Lag control with several vertical units.

For adjustment and configuration, refer to the corresponding manual (N09.41).

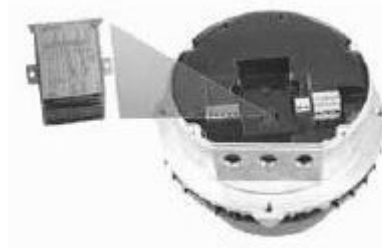
### 11.1.2 - Fan motor assembly (FMA)

EC motor (electronic communication) with "plug fan" type direct drive.

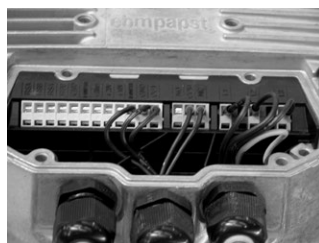
Thanks to their technology, these fans have low energy consumption.

#### Type of FMA control:

- **With the  $\mu$ RC2.1 control**
  - On CW40 to 100 vertical units: MODBUS control as the FMAs are equipped with a MODBUS card that sends the following information to the controller: rotation speed, current used and power input.



- On CW115 vertical units: progressive 0-10 V control.



- **No control**

- Progressive 0-10 V control via a manual voltage potentiometer located inside the electric box (graduated from 0 to 100 %)

|                         | CHILLED WATER |       |       |        |       |
|-------------------------|---------------|-------|-------|--------|-------|
|                         | CW 40         | CW 53 | CW 78 | CW 100 | CW115 |
| <b>Quantity</b>         | 1             | 1     | 2     | 2      | 3     |
| <b>Max. power (kW)</b>  | 3,4           | 3,4   | 6,8   | 6,8    | 9,3   |
| <b>Max. current (A)</b> | 5,4           | 5,4   | 10,8  | 10,8   | 14,7  |


# 11 - TECHNICAL CHARACTERISTICS

## Nominal flow rates of cabinets:

|                          | CHILLED WATER |       |       |        |       |
|--------------------------|---------------|-------|-------|--------|-------|
|                          | CW 40         | CW 53 | CW 78 | CW 100 | CW115 |
| Nominal flow rate (m³/h) | 10000         | 13300 | 18800 | 24500  | 27000 |
| Max. flow rate (m³/h)    | 13300         | 13300 | 20500 | 27000  | 27500 |

## Table of operating pressures downstream of the filters

| CW   | CW 40  |         | CW 53  |         | CW 78  |         | CW 100 |         | CW115  |         |
|--|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
|  | Rated  | Maximum | Rated  | Maximum | Rated  | Maximum | Rated  | Maximum | Rated  | Maximum |
| Air flow (m³/h)  | 10 000 | 13 300  | 13 300 | 13 300  | 18 800 | 20 500  | 24 500 | 27000   | 27 000 | 27 500  |
| Max. operating pressure with M5/ePM10 filter: 50% (Pa) | 400    | 171     | 229    | 229     | 400    | 400     | 343    | 157     | 400    | 400     |
| Max. operating pressure with F7/ePM1 filter: 50% (Pa)  | 400    | 60      | 140    | 140     | 400    | 400     | 261    | 68      | 400    | 385     |

 If the unit is not being used immediately after installation, it is recommended that the unit is run at full speed for at least 1 hour every 3 months so that any condensates that have infiltrated can evaporate and the roller bearings can move.

### 11.1.3 - Cooling coil

 **Make sure that the chilled water supply pipes are insulated.**  
**Moderately tighten the coil supply connections to avoid damaging the manifolds**

The coil is regulated by a two-way or three-way valve equipped with a 0-10V servomotor (mounted and connected)

#### Coil specifications:

|                   |                 | CHILLED WATER |       |       |        |       |
|-------------------|-----------------|---------------|-------|-------|--------|-------|
|                   |                 | CW 40         | CW 53 | CW 78 | CW 100 | CW115 |
| Coil (4-row coil) | Number of coils | 1             | 1     | 1     | 1      | 1     |
|                   | Capacity (l)    | 11,8          | 15,8  | 21    | 27,4   | 50,8  |
| Coil (6-row coil) | Number of coils |               |       |       |        | 1     |
|                   | Capacity (l)    |               |       |       |        | 73,8  |

| Units   | CW 40     | CW 53    | CW 78     | CW 100    | CW115    |
|---|-----------|----------|-----------|-----------|----------|
| Air flow (m³/h)   | 10 000    | 13 300   | 18 800    | 24 500    | 27 000   |
| * Maximum operating pressure with M5/ePM10 50% (Pa)         | 400       | 230      | 400       | 344       | 400      |
| * Maximum operating pressure with F7 / ePM1 filtration: 50% | 400       | 141      | 400       | 261       | 400      |
| Total/sensible cooling capacity (kW)                        | 41,9 / 40 | 57,4/ 54 | 80,7 / 76 | 107 / 100 | 123 /113 |
| Water flow (m³/h)   | 7,2       | 9,8      | 14        | 18        | 21       |
| "Pressure drop (mWC) (Coil + valve)"                        | 6,4       | 9,6      | 8,1       | 7,1       | 10       |

\* Conditions: return air 24 °C 45 % (RH)

Water temperature 7/12 °C\* Maximum operating pressure dependent on air flow rate. Take off approximately 20 Pa if there is a hot water coil on the MAGISTER. The operation point can be adjusted directly via the controller. All air flow/operating pressure combinations are therefore possible with maximum values as per the values in the table above.

# 11 - TECHNICAL CHARACTERISTICS

| Units  | CW 40   | CW 53  | CW 78   | CW 100    | CW115     |
|--|---------|--------|---------|-----------|-----------|
| <b>Air flow (m³/h)</b>   | 13 300  | 13 300 | 20 500  | 27 000    | 27 500    |
| <b>* Maximum operating pressure with M5/ePM10 (Pa) filtration: 50%</b> | 175     | 237    | 400     | 124       | 400       |
| <b>* Maximum operating pressure with F7 / ePM1 filtration: 50%</b>     | 66      | 148    | 400     | 30        | 395       |
| <b>Total/sensible cooling capacity (kW)</b>                            | 46 / 46 | 51/ 51 | 78 / 78 | 100 / 100 | 124 / 124 |
| <b>Water flow (m³/h)</b>   | 7,9     | 8,8    | 13      | 17        | 21        |
| <b>"Pressure drop (mWC) (Coil + valve)"</b>                            | 7,5     | 7,7    | 7,5     | 6,2       | 10        |

\* Conditions: return air 26 °C 40 % (RH)  
 Water temperature 10/15 °C\* Maximum operating pressure dependent on air flow rate. Take off approximately 20 Pa if there is a hot water coil on the MAGISTER.  
 The operation point can be adjusted directly via the controller. All air flow/operating pressure combinations are therefore possible with maximum values as per the values in the table above.

| Units  | CW40    | CW53   | CW78    | CW100     | CW115     |
|--|---------|--------|---------|-----------|-----------|
| <b>Air flow (m³/h)</b>   | 13 300  | 13 300 | 20 500  | 27 000    | 27 500    |
| <b>* Maximum operating pressure with M5/ePM10 (Pa) filtration: 50%</b> | 174     | 236    | 400     | 123       | 400       |
| <b>* Maximum operating pressure with F7 / ePM1 filtration: 50%</b>     | 67      | 145    | 400     | 30        | 384       |
| <b>Total/sensible cooling capacity (kW)</b>                            | 56 / 56 | 60/ 60 | 94 / 94 | 132 / 132 | 124 / 124 |
| <b>Water flow (m³/h)</b>   | 9,6     | 10     | 16      | 23        | 21        |
| <b>"Pressure drop (mWC) (Coil + valve)"</b>                            | 10      | 10     | 10      | 10        | 10        |

\* Conditions: return air 32 °C 35 % (RH)  
 Water temperature 12/17 °C\* Maximum operating pressure dependent on air flow rate. Take off approximately 20 Pa if there is a hot water coil on the MAGISTER.  
 The operation point can be adjusted directly via the controller. All air flow/operating pressure combinations are therefore possible with maximum values as per the values in the table above.

## Maximum permitted differential pressure on cold water valve

|                                | CW40 | CW53 | CW78 | CW100 | CW115 |
|--------------------------------|------|------|------|-------|-------|
| <b>KV</b>                      | 16   | 16   | 25   | 40    | 25    |
| <b>ΔP max. Three-way valve</b> | 300  | 300  | 300  | 260   | 300   |
| <b>ΔP max. Two-way valve</b>   | 1200 | 1200 | 1000 | 260   | 1000  |

### 11.1.4 - Filter

Filters:

EN 779-2012 efficiency: M5

ISO16890 efficiency: ePM10 50%

Thickness: 48 mm

Efficiency: 90% gravimetric

Filter area: 2 x the face area

Fire rating: M1

Filters:

EN 779-2012 efficiency: F7

ISO16890 efficiency: ePM1: 50%

Thickness: 48 mm

Efficiency: 85% opacimetric

Filter area: 17 x the face area

Fire rating: M1

|   | CHILLED WATER        |                      |          |          |          |
|---|----------------------|----------------------|----------|----------|----------|
|   | CW 40                | CW 53                | CW 78    | CW 100   | CW115    |
| <b>Dimensions</b>                       | 1192x600<br>1192x360 | 1192x600<br>1192x360 | 1192x600 | 1192x600 | 1140x450 |
| <b>Quantity</b>                         | 1<br>1               | 1<br>2               | 3        | 4        | 6        |
| <b>Thickness M5/ePM10 50% (Pa) (mm)</b> | 48                   | 48                   | 48       | 48       | 48       |
| <b>Thickness F7/ePM1: 50% (mm)</b>      | 48                   | 48                   | 48       | 48       | 48       |



# 11 - TECHNICAL CHARACTERISTICS

## Pressure drops - clean filters:

|                               | CHILLED WATER |        |        |        |        |
|-------------------------------|---------------|--------|--------|--------|--------|
|                               | CW 40         | CW 53  | CW 78  | CW 100 | CW115  |
| Flow rate (m <sup>3</sup> /h) | 10 000        | 13 300 | 18 800 | 24 500 | 27 500 |
| ΔP (Pa) M5/ePM10 50% (Pa)     | 52            | 57     | 52     | 50     | 69     |
| ΔP (Pa) F7/ePM1: 50% (mm)     | 140           | 150    | 140    | 130    | 120    |

Filter fouling is measured by a pressure sensor located in the electrics box.

It is set to 1.5 times the value for the filter when clean (pressure ports upstream and downstream of the filter).

### 11.1.5 - Standard control elements:

(factory-wired)

- Intake temperature sensor.
- Differential pressure sensor: attached to the electrics box, this allows the difference in pressure upstream and downstream of the filter to be measured, so as to determine whether the filter is fouled.
- Water leak sensor: found at the end of a wound cable located at the bottom of the vertical unit so that it is long enough to extend downwards into a raised floor, if required, and to be positioned in the area to be monitored.

It can be added on request.

## 11.2 - Optional components

### 11.2.1 - Heating coil



Moderately tighten the "coil supply" connections to avoid damaging the manifolds.

The coil is adjusted by a two-way or four-way valve equipped with a 0-10V servomotor (mounted and connected).

#### Coil specifications:

|              |                 | HOT WATER |       |       |        |
|--------------|-----------------|-----------|-------|-------|--------|
|              |                 | CW 40     | CW 53 | CW 78 | CW 100 |
| Coil (1 row) | Number of coils | 1         | 1     | 1     | 1      |
|              | Capacity (l)    | 3,82      | 4,92  | 6,29  | 6,29   |

|                              | HEATING COIL |         |         |         |         |         |         |         |         |         |
|------------------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|                              | CW 40        |         | CW 53   |         | CW 78   |         | CW 100  |         | CW115   |         |
|                              | Nominal      | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum |
| Air flow (m <sup>3</sup> /h) | 10 000       | 13 300  | 13 300  | 13 300  | 18 800  | 20 500  | 24 500  | 27 000  | 27 000  | 27 500  |
| Heating capacity (kW)*       | 36           | 40      | 44      | 44      | 63      | 66      | 71      | 73      |         |         |
| Heating capacity (kW)**      | 18           | 21      | 23      | 23      | 33      | 34      | 37      | 38      |         |         |

\* Conditions: return air 17 °C - 50 %, water temperature 80/60 °C

\*\* Conditions: return air 17 °C - 50 %, water temperature 45/40 °C

#### Heating coil pressure drop\*:

|   | HOT WATER |       |       |        |
|---|-----------|-------|-------|--------|
|   | CW 40     | CW 53 | CW 78 | CW 100 |
| Nominal water flow rate (m <sup>3</sup> /h) | 0,9       | 1,1   | 1,68  | 1,9    |
| KV valve                                    | 4         | 4     | 4     | 4      |
| ΔP Valve only (mWC)                         | 0,6       | 0,8   | 1,8   | 2,3    |
| ΔP (Pa) Valve + Coil (mWC)                  | 1,5       | 1,8   | 3     | 3,8    |

Nominal flow rate : water ΔT: 20 °C

|                                     | CW40 | CW53 | CW78 | CW100 |
|-------------------------------------|------|------|------|-------|
| KV                                  | 4    | 4    | 4    | 4     |
| ΔP max. <sup>1</sup> Four-way valve | 240  | 240  | 240  | 240   |
| ΔP max. <sup>2</sup> Two-way valve  | 400  | 400  | 400  | 400   |

# 11 - TECHNICAL CHARACTERISTICS

## 11.2.2 - Electric heater

Operates in two on/off stages or with TRIAC (modulating).

The latter allows the power of the electric heater to be varied to ensure it is as close as possible to the required heating capacity. The connection is carried out in the factory. It is equipped with 2 safety thermostats, one with automatic reset and the other manual.

|                   |            | CHILLED WATER |          |          |            |            |
|-------------------|------------|---------------|----------|----------|------------|------------|
|                   |            | CW 40         | CW 53    | CW 78    | CW 100     | CW115      |
| Power (kW)        | Power (kW) | 12            | 18       | 24       | 33,6       | 33,6       |
|                   | stage 1    | 6             | 12       | 12       | 16,8       | 16,8       |
|                   | stage 2    | 6             | 6        | 12       | 16,8       | 16,8       |
| Number of heaters | stage 1    | 3 x 2 kW      | 3 x 4 kW | 3 x 4 kW | 3 x 5.6 kW | 3 x 5.6 kW |
|                   | stage 2    | 3 x 2 kW      | 3 x 2 kW | 3 x 4 kW | 3 x 5.6 kW | 3 x 5.6 kW |
| Total current (A) |            | 17,3          | 26       | 34,7     | 48,6       | 48,6       |

## 11.2.3 - Humidifier

Functions only with municipal water, and not with demineralised or softened water.

The humidifier with immersed electrodes has a card known as CPY (mounted inside the box) to relay all information relating to the humidifier directly to the µAir Connect 2 controller. It adapts, within the allowable operating limits, to the physical and chemical properties of the water used. Voltage is applied to the immersed electrodes, and an electrical current passes between them, heating the water to boiling point. The water acts as an electrical resistor, ensuring continuity between the electrodes with a minimum of dissolved salts.

(The water must have a conductivity of between 350 µS/cm and 125 µS/cm.)

|                                   | CW 40 to CW115   |
|-----------------------------------|--|
| Make/model                        | KUET-2D  |
| Control voltage                   | 24 V   |
| Absorbed power in control circuit | Without 9 V A valve; with 35 V A valve                     |
| High power circuit voltage        | 3-PH/400 V   |
| Power circuit current (A)         | 8.7 A  |
| Protection rating                 | 16 A   |
| Max. power                        | 6 kW   |
| Factory power setting             | CW 40 to CW 100 : 6 kW                                     |
| Factory steam flow rate setting   | CW 40 to CW 100 8 kg/h: (100 %)<br>CW115 : 8 kg/h: (100 %) |
| Steam flow rate                   | 5 to 8 kg/h  |
| Water supply pressure             | 1 to 8 bar   |
| Max. water supply flow rate       | 0.6 L/min  |
| Conductivity of supply water      | 350 to 1250 µS/cm  |
| Hydrogen ion activity (PH)        | 7 to 8 ph  |
| Drain water flow rate             | 4 L/min  |
| Water supply ø                    | G ¾" male  |
| Drain ø                           | 32 mm  |
| Hardness of TH supply water       | 100 to 400 mg/l Ca CO <sub>3</sub>                         |

### Connection:

The humidifier is supplied with a flexible water supply tube at the back of the cabinet.

To drain it, carry out siphoning.



**Warning: the water temperature can reach 100°C.**

If the option without the µRC2.1 (CIAT) control has been chosen, there is a display in the cabinet which can be used to control the humidifier.

# 11 - TECHNICAL CHARACTERISTICS



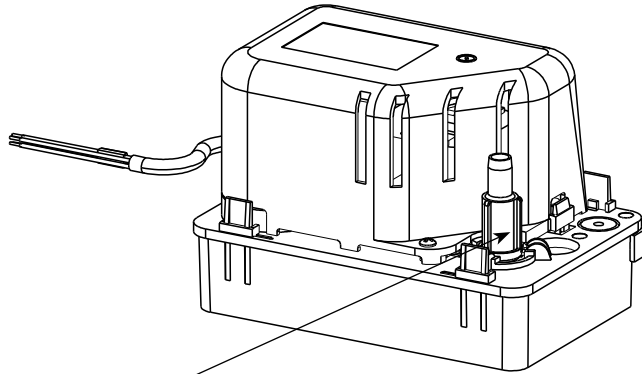
Please follow the instructions on the CPY card configuration sheet provided with the unit.

## 11.2.4 - Condensate drain pump:

This option is only available if the humidifier option has not been requested.

### Specifications:

- Electrical power supply: 230 V-50 Hz-90 W
- Max. flow rate: 500 l/h
- Max. discharge height: 5.4 m
- Integrated check valve



Condensate discharge with check valve

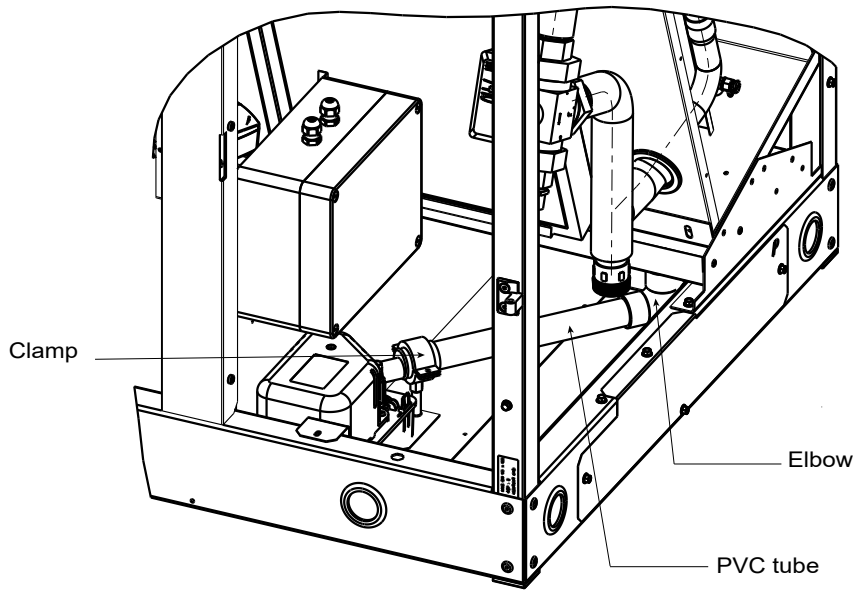
Table of actual flow rates for pump SI 1805

| The pressure drops defined in this table are calculated using 10 mm diameter flexible piping | Discharge height | Total pipe length |            |            |            |
|--|------------------|-------------------|------------|------------|------------|
|  |                  | 5 m (l/h)         | 10 m (l/h) | 20 m (l/h) | 30 m (l/h) |
|  | 1 m              | 460               | 380        | 280        | 200        |
|  | 2 m              | 390               | 320        | 240        | 180        |
|  | 3 m              | 300               | 250        | 190        | 150        |
|  | 4 m              | 200               | 180        | 130        | 100        |
|  | 5 m              | 90                | 80         | 60         | 50         |

Connect a Ø 10 int (3/8") flexible tube (not supplied by CIAT) to the pump discharge.

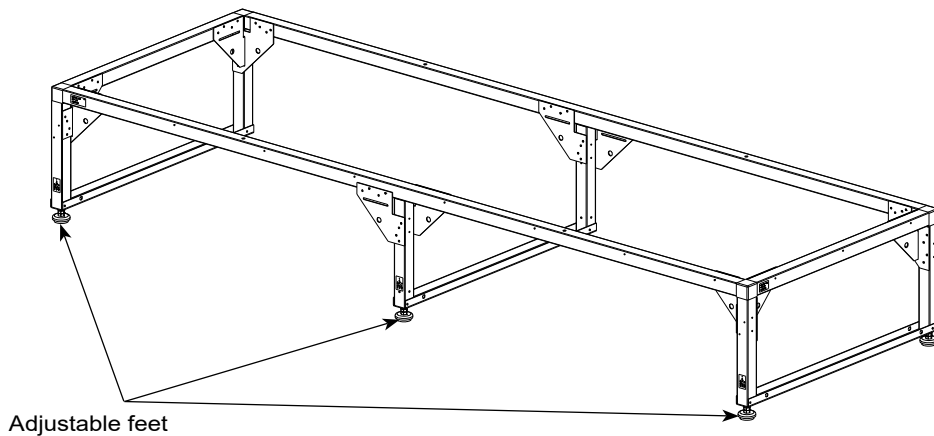
For OVER models (3 and 5), if using a spreader beam and slings, the PVC tube will not be directly connected to the pump, for handling reasons. It must therefore be angled in the right direction and fixed to the clamp, as shown below.

# 11 - TECHNICAL CHARACTERISTICS



## 11.2.5 - Bases:

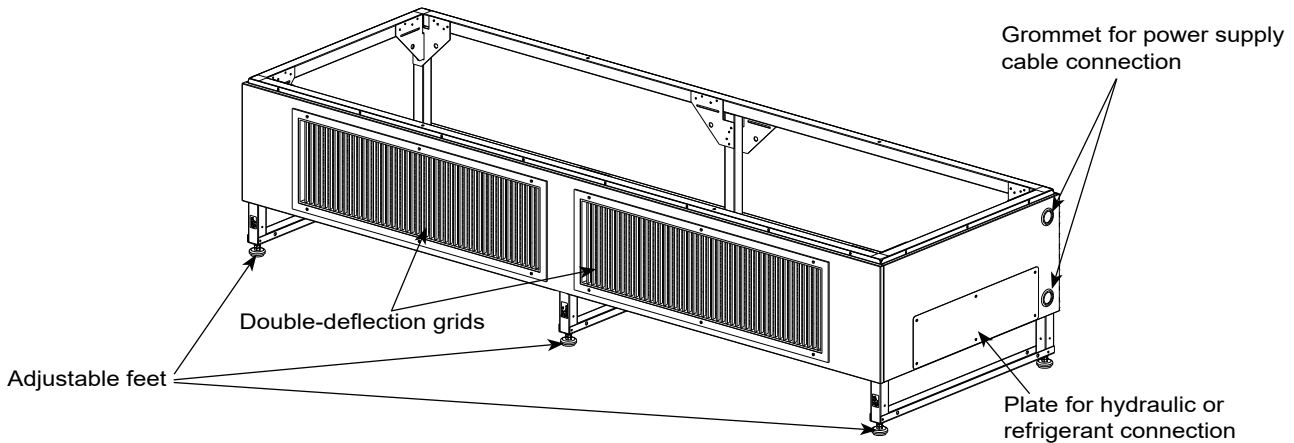
### Support base:



For supply air through a raised floor.

The height can be adjusted from 250 mm to a maximum of 610 mm. Adjustment screws are provided with the base for adjustment on site. Do not forget to stick the adhesive seal provided to the aluminium frame of the base to ensure tightness.

### Cased subbase with grid:



Can be used for both intake and supply air.

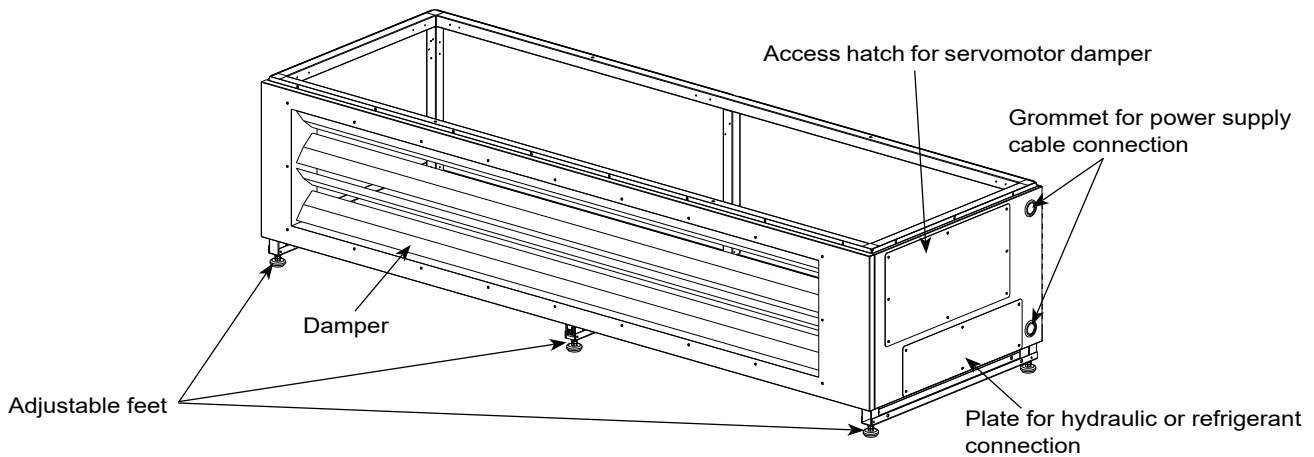
The height can be adjusted from 450 mm to a maximum of 860 mm. Adjustment screws are provided for adjustment on site. Do not forget to stick the adhesive seal provided to the aluminium frame of the base to ensure its tightness.

Made up of double-deflection grids to direct the air flow.

Side hatch for pipe connection (hydraulic or refrigerant connection) + grommet for power supply cable.

# 11 - TECHNICAL CHARACTERISTICS

## • Cased base with damper:



This is mainly used to insulate the cabinet when it is connected to a duct system.

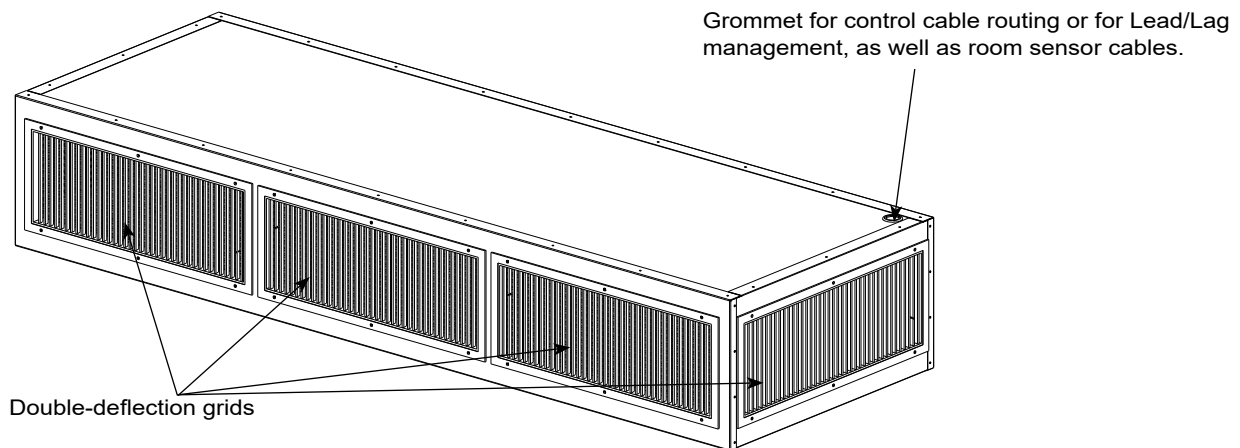
The damper prevents air returning to the unit when it is not operating and when other units are operating nearby.

The height can be adjusted from 630 mm to a maximum of 860 mm. Adjustment screws are provided for adjustment on site. Do not forget to stick the adhesive seal provided to the aluminium frame of the base to ensure its tightness.

Side hatches for pipe connection (hydraulic or refrigerant connection) and damper servomotor access, as well as a grommet for the power supply cable.

## 11.2.6 - Plenums:

### Supply air/intake plenum (H = 450 mm):



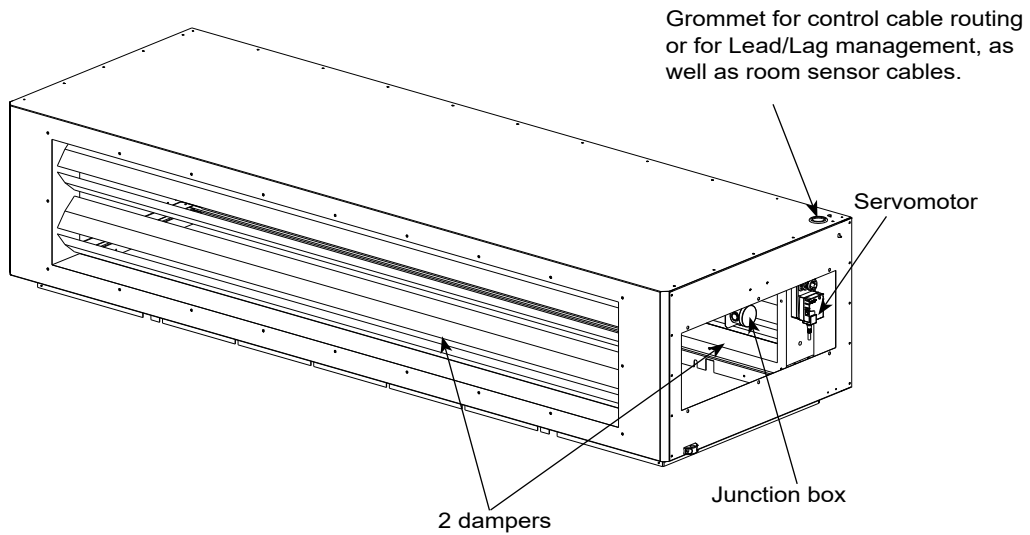
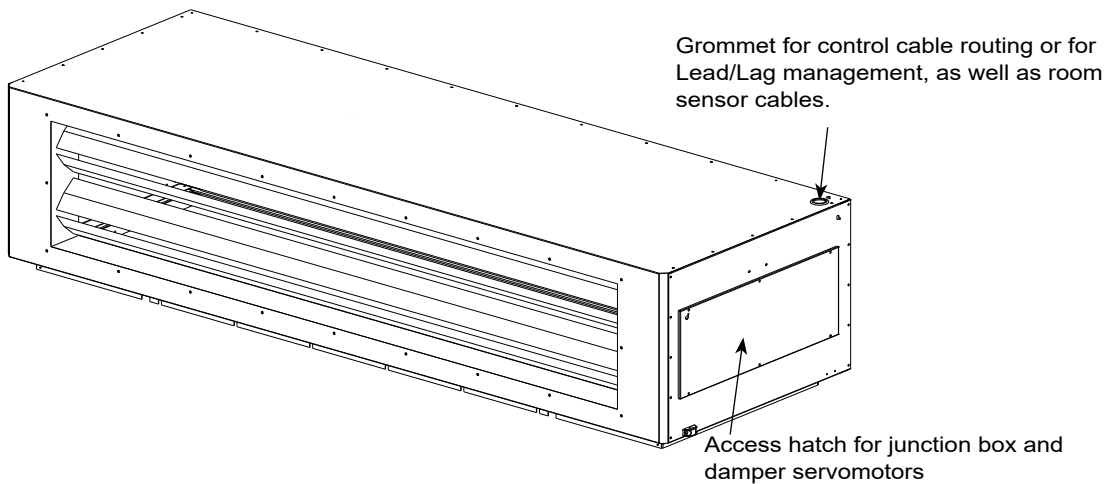
Proposed when air is to be distributed directly into a space. It is mounted on top of the cabinet and features double-deflection grids (one on each side and on the front) to allow the direction of the air stream to be adjusted manually. The plenum may also be used mounted at the bottom (UNDER) to carry air directly from a space back to the air handling system.

To mount the plenum, please refer to the diagram provided with the cabinet diagram.

Do not forget to stick the adhesive seal provided to the edge of the frame of the plenum that will be in contact with the cabinet to ensure its tightness.

# 11 - TECHNICAL CHARACTERISTICS

**Free-cooling plenum (Height = 550 mm):**



This accessory should not be installed in corrosive environments (saline environments) or explosive environments (ATEX area).  
**Composition:** this is a mixing box made up of two dampers (one on the fresh air side and the other on the room's return air side). Two combined temperature and humidity sensors are also provided at the back of the vertical unit. (One outdoor sensor and one internal room sensor).



Internal room sensor



Outdoor room sensor

The outdoor sensor should be installed in a well ventilated area that is not exposed to direct sunlight.

**Connection:** The plenum is positioned above the vertical unit. A diagram provided with the plenum explains the mounting system. Do not forget to stick the adhesive seal provided to the edge of the frame of the plenum that will be in contact with the cabinet to ensure its tightness.

## 11 - TECHNICAL CHARACTERISTICS

**Electrical connection:** When this option is chosen, a wound bundle can be found at the top of the cabinet.

Connect this bundle to the junction box as shown on the diagram. For sensors, the cross section of cables must be a maximum of 1.5 mm<sup>2</sup>. If possible, pass the cables through the top section of the plenum using the grommet provided for this purpose and refer to the routing recommendations in paragraph 11.3.

See electrical diagram for connection.



**Operation:**

**A filter must be installed upstream on the fresh air side (type F7, not provided by CIAT and at customer's expense) so that the indoor air is not adversely affected.**

The option allows cooling to be carried out using outdoor air (fresh air), in accordance with the temperature and humidity conditions, to decrease the room temperature. The opening and closing of dampers is managed by the controller according to the information relayed by the various sensors required for correct functioning.

Thanks to these control elements, the controller manages the unit's operating mode.

The cooling contribution to reach the temperature setpoint is then carried out:

- For vertical units using chilled water
  - Using fresh air only (outdoor air)
  - Fresh air + heat exchange coil.
  - Heat exchange coil

### 11.2.7 - Intake damper on the vertical unit:

This is mainly used to insulate the cabinet when it is connected to a duct system.

The damper prevents air returning to the unit when it is not operating and when other units are operating nearby.

This option is mounted and connected in the factory. Please see the dimensional drawing and connection diagram for the dimensions and mounting holes for any potential ducts.

The damper is controlled by the controller, which is fitted with a servomotor with a reset function.

### 11.2.8 - Optional control elements:

- Raised floor management

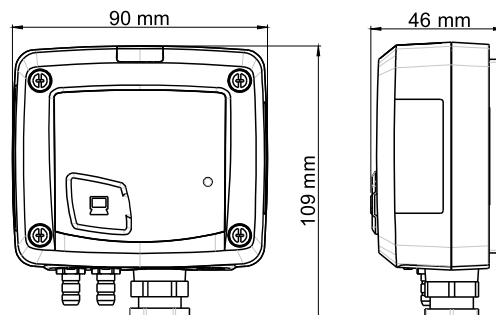
This option helps maintain a constant pressure in the suspended ceiling by adapting the fan speed.

- **Characteristics of the CP112 AN pressure sensor**



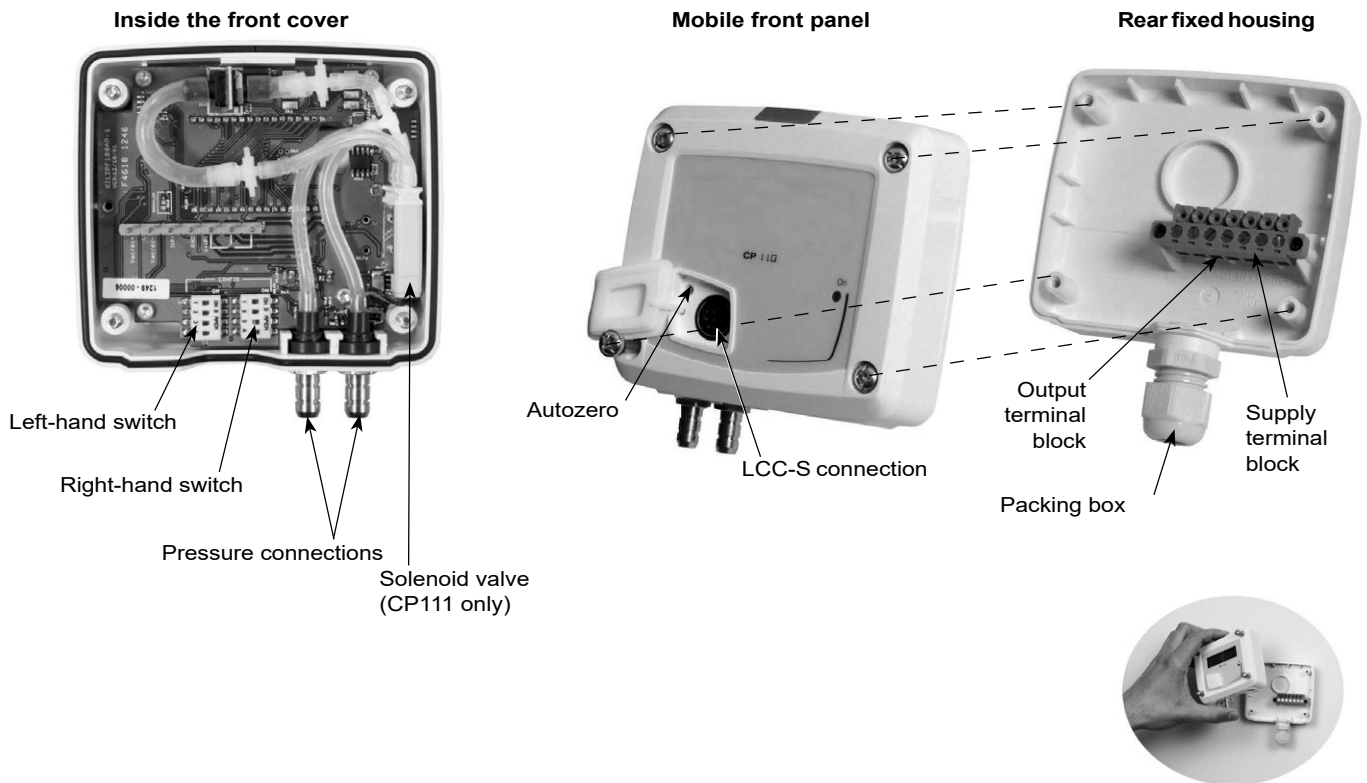
### Dimensions of the housing

(with mounting support)



# 11 - TECHNICAL CHARACTERISTICS

## Connectors



### Electrical connections (as per NFC15-100 standards)

See wiring diagram for connection

### Autozero

To perform an Autozero, disconnect the tubes from the 2 pressure connections and press the "Autozero" button. When an Autozero is performed, the green "On" indicator light goes out then comes on again.

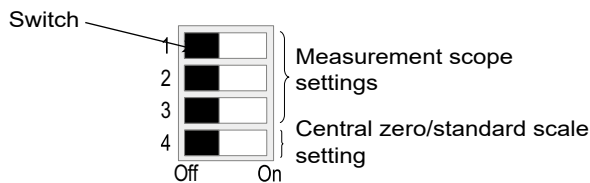


### Configuration:

To configure the sensor, switch it off and enter the desired settings by moving the switches as described below. Once the settings have been configured, switch the sensor back on.

To configure the sensor, undo the 4 screws on the housing and open it. The switches allowing for various settings are then accessible.

### Measurement scope settings - left-hand switch



To set a measurement scope, position switches 1, 2 and 3 of the measurement scopes as shown in the table below.

|             |                      |
|-------------|----------------------|
|             |                      |
|             | <b>Combination 2</b> |
| Sensor type | CP112                |
| Pa          | 250                  |



# 11 - TECHNICAL CHARACTERISTICS

Measurement scopes of the **CP112** on the **scale ± 250 Pa** depending on the measurement unit.

## Standard scale and central zero setting - left-hand switch

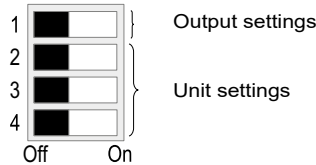
To set the type of measurement scope, position switch 4 as shown opposite:

E.g. 0-250 Pa: Full scale/0



| Configurations | Pleine échelle |
|----------------|----------------|
| Combinaisons   |                |

## Setting the output - right-hand switch



To set this type of analogue output, position switch 1 of the output as shown opposite.

| Configurations | 0-10 V |
|----------------|--------|
| Combinaisons   |        |

## Setting the units – right-hand switch

To set a unit of measurement, position switches 2, 3 and 4 of the units as shown in the table below.

| Configurations | Pa |
|----------------|----|
| Combinaisons   |    |



Once the sensor is in position, switch it on and carry out the autozero procedure to ensure the sensor operates correctly in any position.

## MAINTENANCE

Avoid the use of aggressive solvents. When cleaning with formalin-based products (parts or ducts), protect the device

### Temperature or temperature and humidity room sensors:

The room sensors are mounted on a wall in the room to be regulated. The sensors are provided at the back of the vertical unit. For connections, please see the wiring diagram and the recommendations in paragraph 11.3.



### - Changeover control:

Surface-mounted onto the hydraulic circuit. This option allows the temperature of the water network to be monitored and the exchanger (coil) to be operated in either cooling or heating mode (summer or winter mode).

- **Supply air low limit**
- **Fire thermostat**

## 11 - TECHNICAL CHARACTERISTICS

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### 11.2.9 - BACNET IP (OR BACNET MSTP) gateway

This is incorporated in the electrics box.

The gateway is used to translate the main information available in MODBUS into BACNET IP (OR BACNET MSTP).

It is possible to connect 1 to 2 units to the BACNET IP (OR BACNET MSTP) gateway.

Please see the recommendations for routing cables in paragraph 11.3 and in the control manual (N09.41).

## 12 - COMMISSIONING

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After making the necessary electrical and hydraulic connections, carry out the system start-up and check the following steps:

- Check the tightness of the electrical connections
- Check the hydraulic connections (direction of inlet/outlet connections)
- Make sure the inside of the vertical unit is clean and free of any foreign bodies
- Make sure the inside of the vertical unit is clean and free of any foreign bodies
- Check the power supply voltage and heat protection calibration in accordance with the current ratings of the various components.
- Check the height of the siphon
- Vent the air out of the coils via the air vents
- Check the circuits for any leaks; retighten the valve if necessary
- To configure the setpoints, please refer to the control manual. "µAir Connect 2"
- Depending on the solution chosen, the air flow may be:
  - adjusted based on the difference with the setpoint
  - fixed

(refer to the control manuals for the corresponding configurations)

- If a Lead/Lag control system is used, make sure each cabinet is interconnected by the connection cable,
- Simulate a trip of the electrical components, controlled instruments and alarms.
- Check the current of each.

Standard components:

- Temperature alarm
- Air flow alarm
- Water leak alarm
- Fan motor assembly

Optional components:

- Temperature low limit alarm
  - Outer contact servo control
  - Electric heater
  - Humidifier
  - Hot water valve
- Check the cleanliness of the humidifier supply water (option),
  - After allowing the unit to run for a few hours, check the clogging level of the filter, especially in the case of an F7 filter.

## 13 - MAINTENANCE

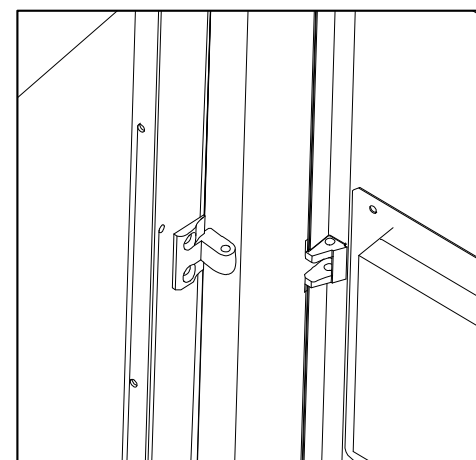
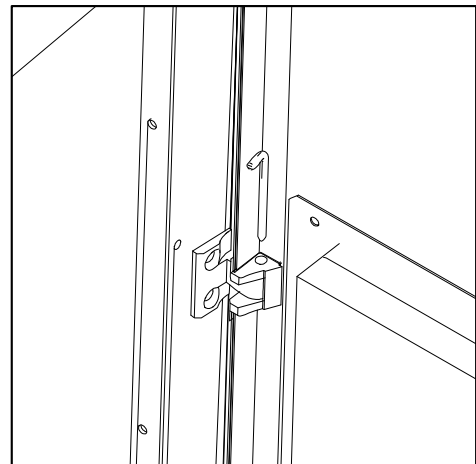
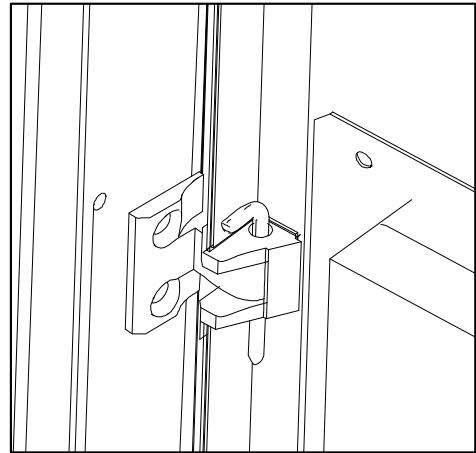
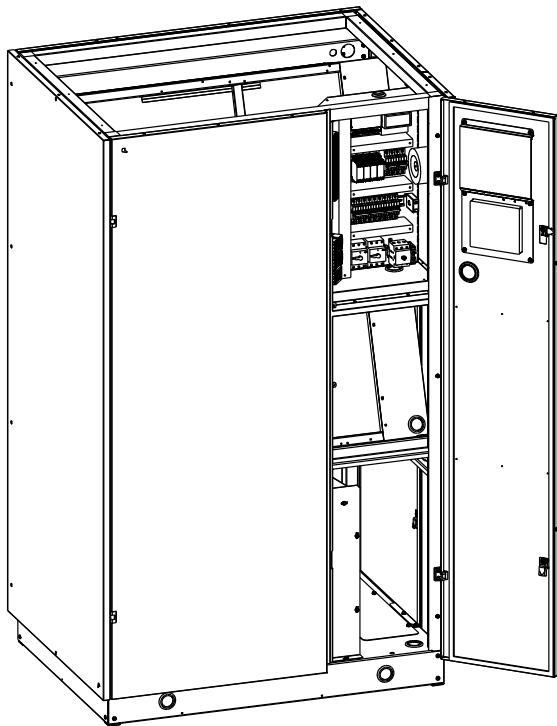
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The doors may be removed to facilitate access to all components (see removal diagram below)

Open the doors

Pull out the pin and remove the hinge (detail B)

Lift off the door (detail C)



## 13 - MAINTENANCE

### 13.1 - Filters

Check the filters frequently when commissioning the unit. The rate at which they will clog will depend on how well the air circuits were cleaned.

#### Maintenance intervals

The filter life depends essentially on the amount of dust in the air and the efficiency of the filtration system. The filtration quality cannot be maintained if the filter medium has been damaged during maintenance. We recommend that the filters be replaced once every two years in case of low to moderate use.

#### Replacing the filter elements

When performing maintenance, it is important to avoid releasing and spreading the dust that has accumulated in the filter.

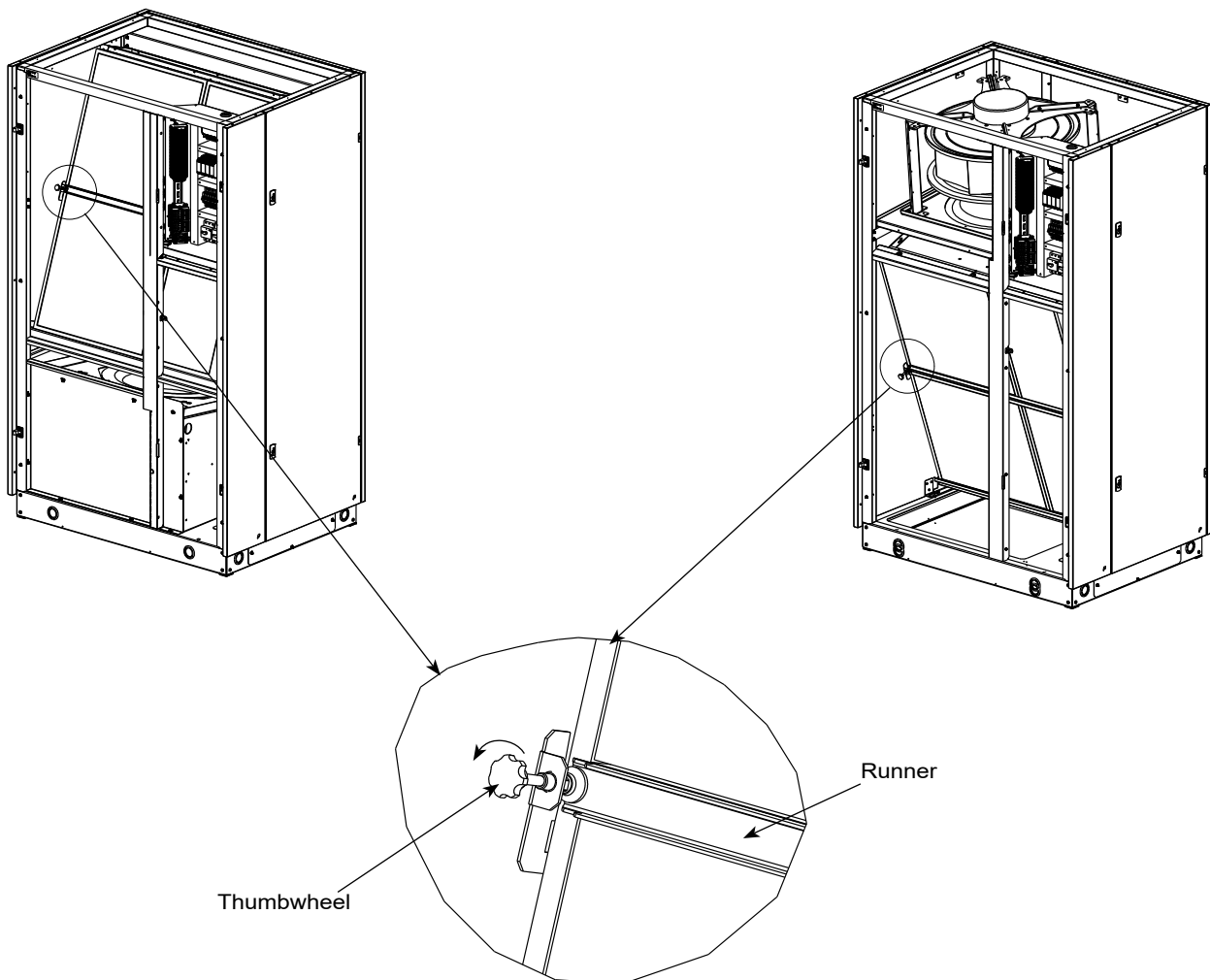
Turn off the unit.

Access the filters by opening the doors on the front.

#### For filter sizes **CW 40 to 100**

Replace the used filters by new filters. Take care to note the direction of air flow indicated on the new filters.

Always make sure that the filter elements are properly positioned before compressing them or turning the unit back on.



- Unscrew the thumbwheel to free the runner.
- Remove the runner to take the filters out.

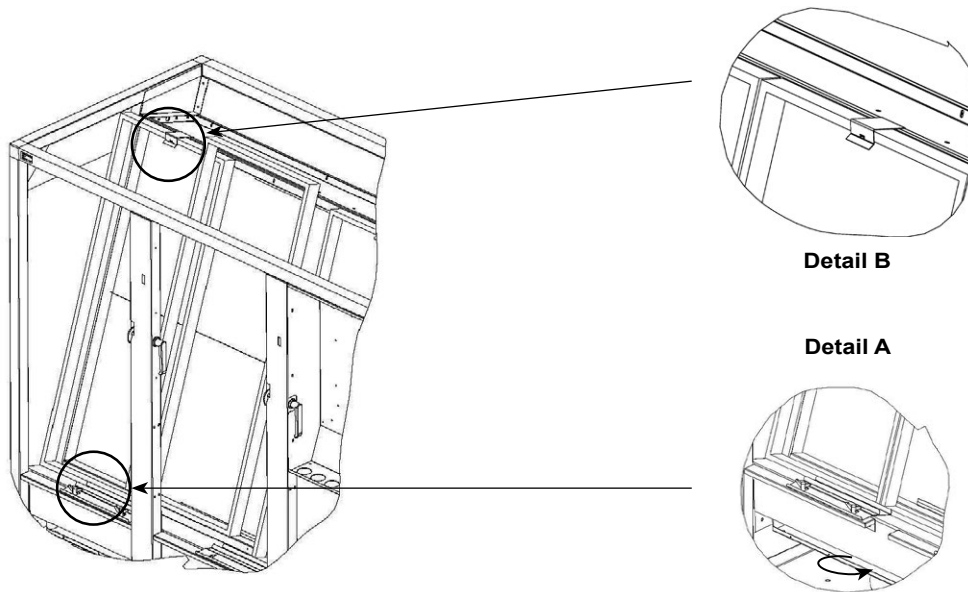
# 13 - MAINTENANCE

## For CW 115 size filters

- Unscrew the clamps on the bottom of the filter (detail A)
- Release the filter by pulling up the tab on the top of the filter (detail B)

Replace the used filters by new filters. Take care to note the direction of air flow indicated on the new filters.

Always make sure that the filter elements are properly positioned before compressing them or switching the unit back on



## 13.2 - Cooling coil

### Maintenance intervals

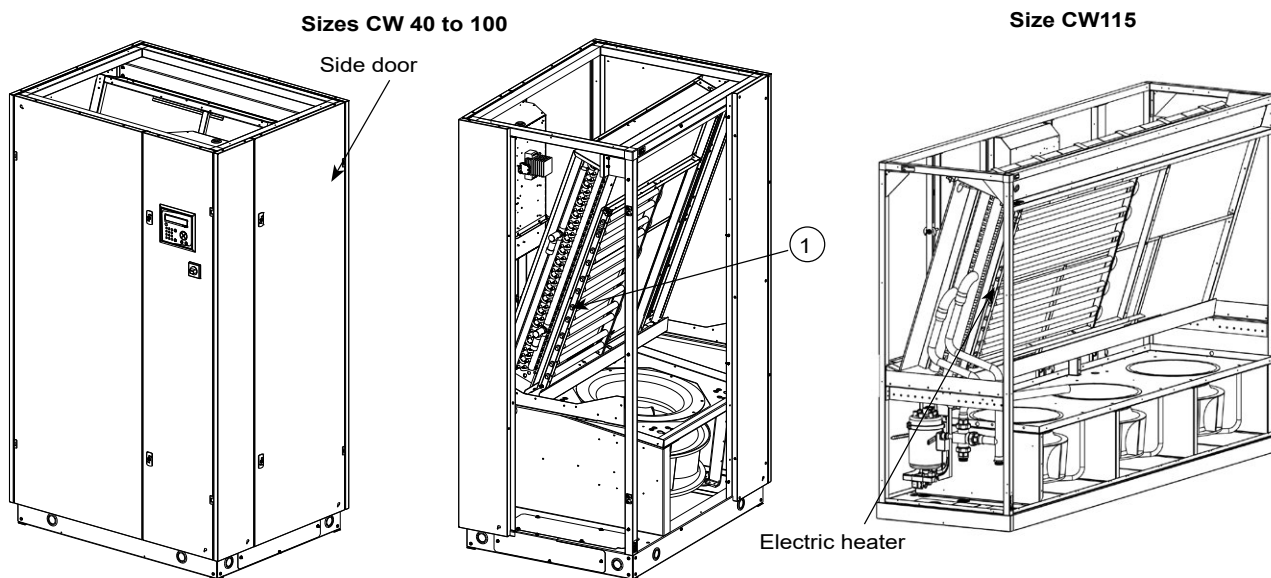
As the cooling coil is protected by a filter, its air circuits require very little maintenance

**!** Always cut the power supply to the cabinet before proceeding with cleaning.

## 13.3 - Electric heater

### Maintenance intervals

The electric heater requires very little maintenance. However, the following checks are necessary:  
 Visually inspect the heating elements, wires and connection cables after every 1500 hours of operation.  
 Check and retighten the connections once or twice a year.



### ① To remove the heaters

- Unscrew the bolt and remove the washer, and push the pin backwards to release it from its housing. Carry out this procedure in reverse when refitting.

The electric heater is located behind the exchanger (chilled water coil).  
 Open the side door to access it. Clean using an air nozzle.

## 13 - MAINTENANCE

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### **Cleaning procedure:**

Remove the filters as instructed above,

To avoid damaging the blower nozzle, make sure that it is not too close to the finned surface.

### **13.4 - Humidifier**

#### **Maintenance**

Clean the humidifier once a year and replace its tank.

#### **Cleaning or replacing the steam tank**

This operation is necessary when the deposits that form on the active surface of the electrodes prevent the correct flow of current (alarms E08, E06).

#### **To remove the tank:**

Completely drain the tank using the manual drain program governed by the controller.

(see extract from control manual N09.41 paragraph 6.2 parameter no. 911)

Cut the power to the unit by turning it off at the switch or removing the fuses on the line,

Remove the tank steam hose,

Disconnect the main electrodes and remove the pins from the level electrodes,

Remove the retention spring from the cylinder and lift the tank up and out.

In general, the steam tank can be reused after being descaled (scale on the electrodes prevents the free flow of water and current).

If the electrodes are too damaged to allow regeneration, replace the tank: simply change the tank body and the gasket.

Check the gasket and replace it if need be. Put the tank back in place by following the above steps in reverse order.

#### **Cleaning the unit and seasonal servicing**

The unit must be checked and cleaned once a year or after it is shut off for an extended period. Remember to always first drain the water from the tank and to cut the power supply.

#### **Procedure**

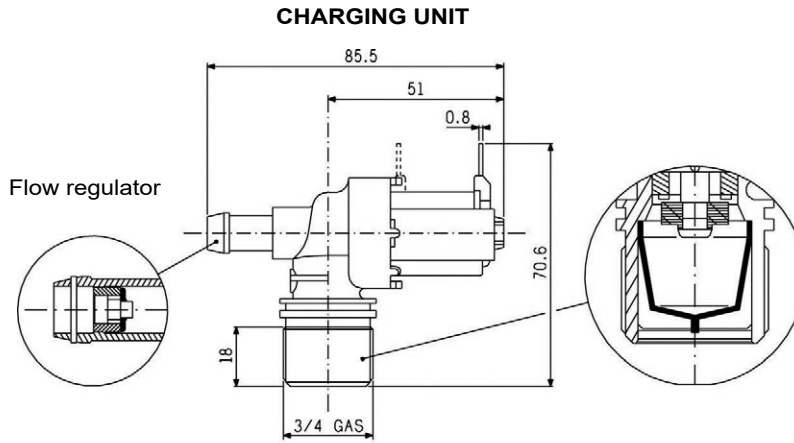
Remove or wash the water supply valve. Check the inlet filter for clogging.

If the pump malfunctions or becomes worn, it must be replaced.

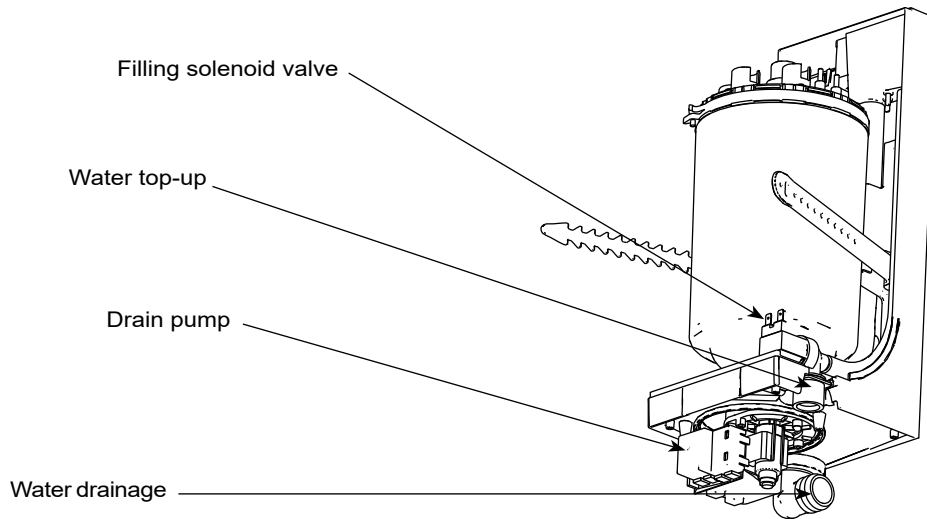
Inspect the water supply, steam supply and condensate drain pipes and replace them if necessary.

# 13 - MAINTENANCE

## Supply valve



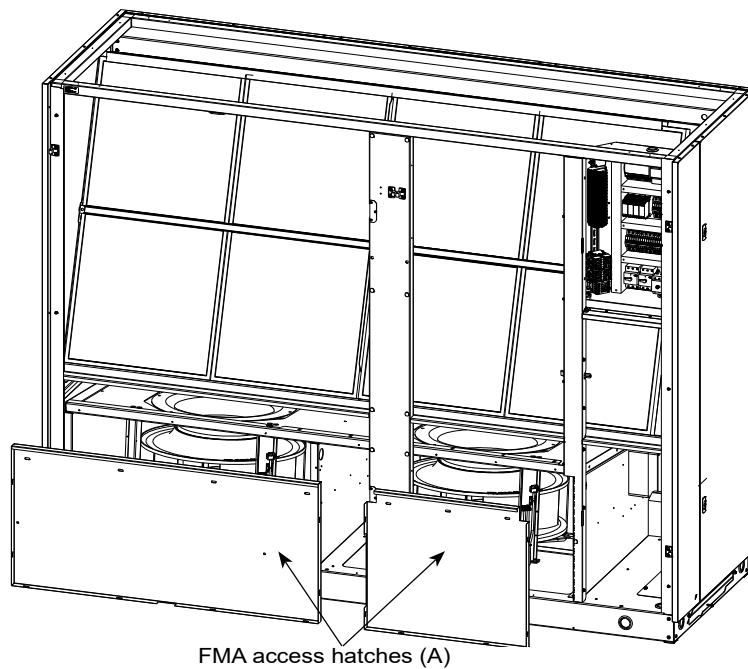
In case of a fault with the humidifier (no steam produced), check the water conductivity: it must be between 350 and 1250  $\mu\text{S}/\text{cm}$ . If frequent descaling is necessary, check the water hardness. It should be  $15^\circ\text{f} < \text{TH} < 30^\circ\text{f}$ .



## 13.5 - Fans

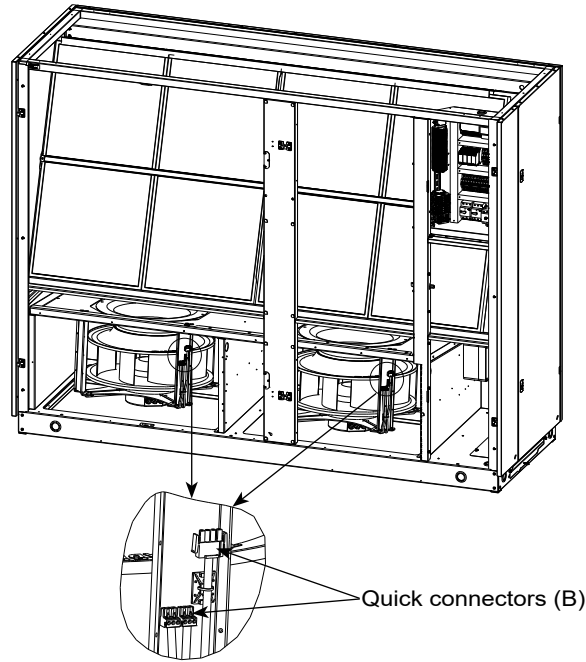
Sizes CW 40 to 100

Fitting UNDER

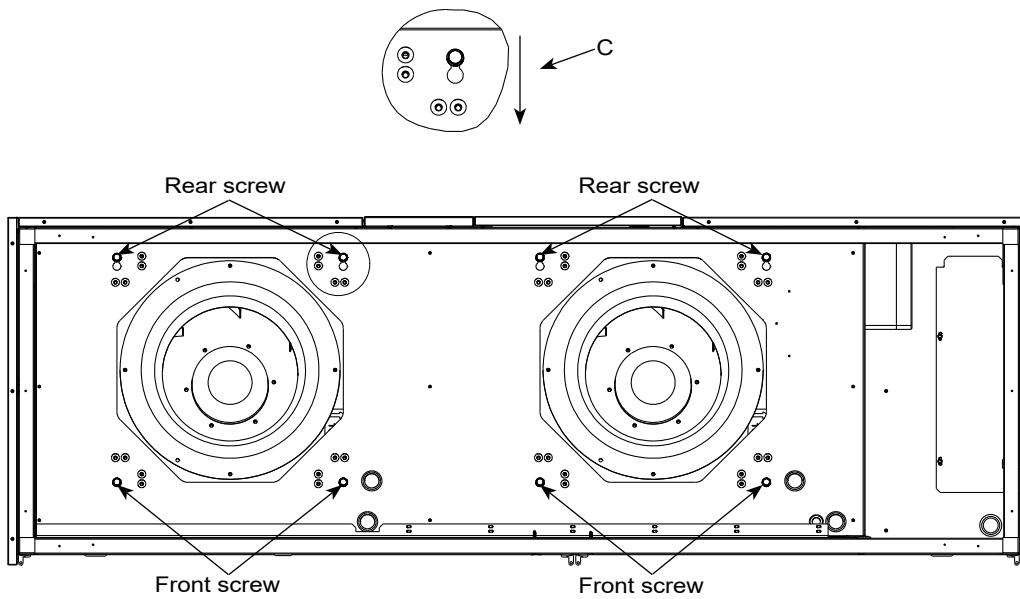


- Remove the screws on the fan access hatches and remove the hatches. (Figure A)

## 13 - MAINTENANCE



- Disconnect the quick connectors (figure B) for each fan motor assembly
- Slide shims/supports under the FMAs to support them.

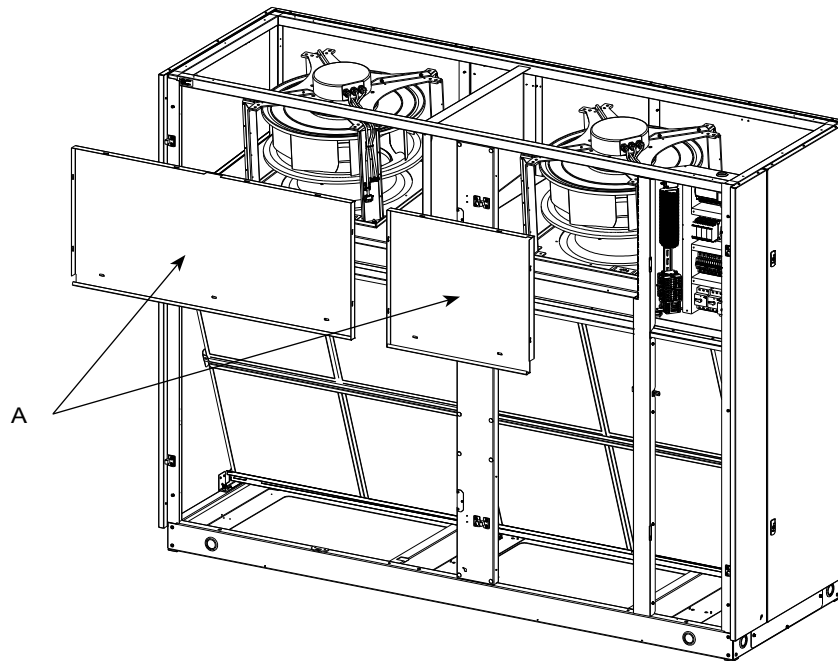


- Remove the front screws
- Gently unscrew the rear screws so that the FMAs do not fall out and so that they allow the FMAs to be removed by moving them forwards, as shown in figure C.
- When mounting the FMA(s), follow the steps in reverse order and ensure the FMA screws are sufficiently tightened.

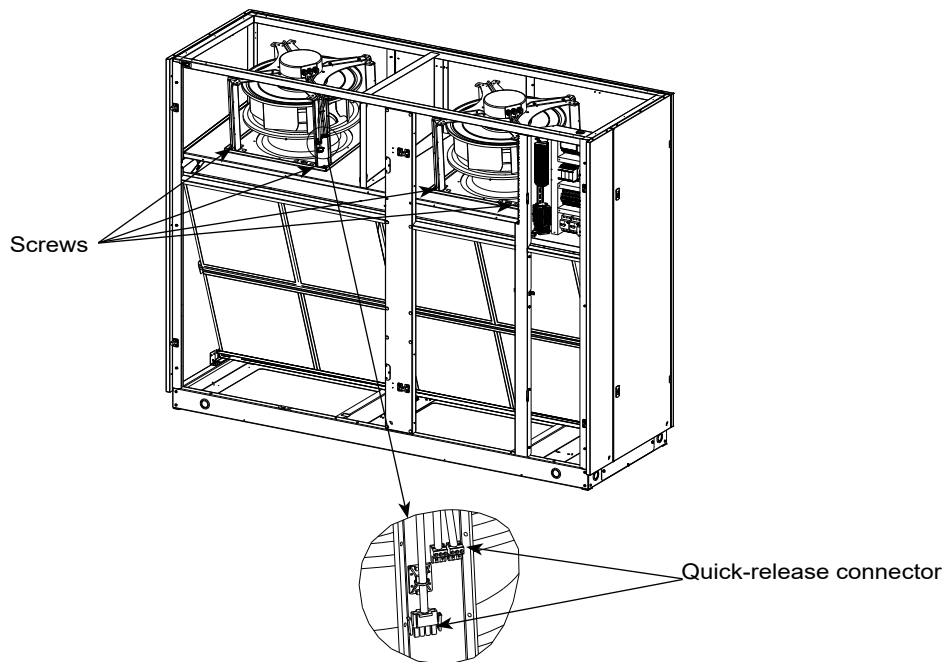


## 13 - MAINTENANCE

### Fitting OVER



- Remove the screws on the fan access hatches and remove the hatches (figure A)

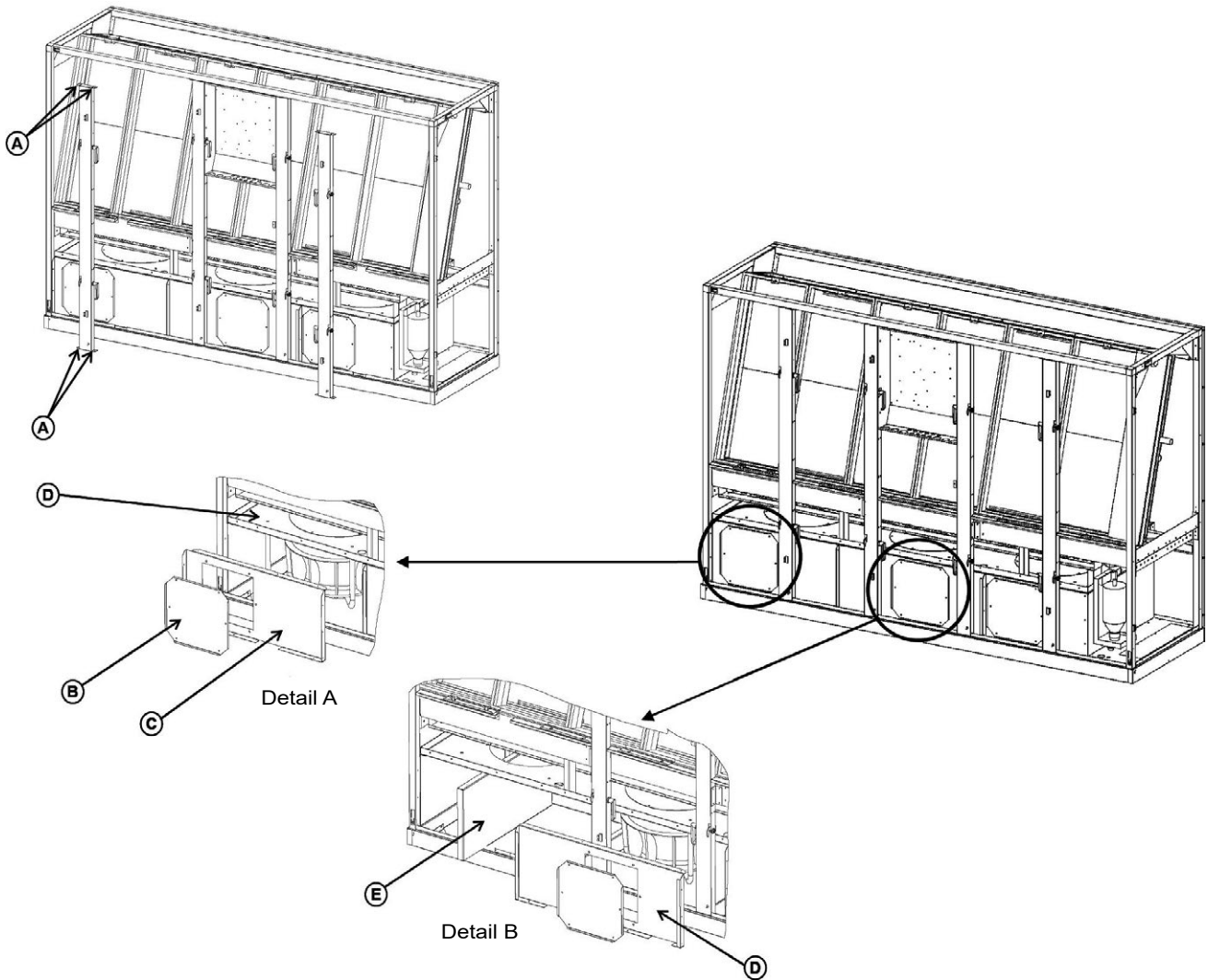


- Disconnect the quick-release connectors (figure B) for each FMA.
- Then unscrew the 4 screws per FMA that are situated level with the arches.
- When refitting the FMA(s), follow the steps in reverse order and ensure the FMA screws are sufficiently tightened.

## 13 - MAINTENANCE

### Size CW115

- Fan access: remove the 6 screws from the fan access hatch (B)
- Removing side fans (A):
- Remove the 4 screws (A) from the uprights then remove the uprights
- Remove the screws from the fan removal panel (C),
- Remove the fan attachment screws (D).
- Removing a central fan (B):
- Remove the four screws (A) on the left upright then remove the upright
- Remove the central and left fan removal panels
- Remove the fan divider panel (E)
- Slide the central fan to the left and pull it out.



### 13.6 - Electrics box

Retighten the connections twice a year.

Visually inspect the components, wires and cables

## 14 - SERVICE INTERVALS

| COMPONENT                                    | AT COMMISSIONING                                  | 2-3 MONTHS  | 12 MONTHS   |
|--|---|---|---|
| <b>Filters</b>                               |   | - Replace   | - Replace   |
| <b>Cooling coil</b>                          |   | - Clean   | - Check and clean the condensate drains   |
| <b>Electric heater (option)</b>              | - Check the connections                           | - Clean   | - Retighten the electrical connections<br>- Check the components  |
| <b>Humidifier (option)*</b>                  | - Check the connections                           | - Check the condition of the tank; replace if necessary | - Retighten the electrical connections<br>- Check the components  |
| <b>Fan(s)</b>                                | - Check correct operation                         |   | - Check the condensate drains<br>- Make sure that steam is evenly distributed<br>- Retighten the electrical connections |
| <b>Electrics box</b>                         | - Check the connections                           |   | - Retighten the electrical connections  |
| <b>Hydraulic circuit</b>                     |   |   | - Check the components  |
| <b>Water leak detection sensor and relay</b> | - Check correct operation                         | - Check correct operation                               | - Check the insulation<br>- Check correct operation   |
| <b>Filter pressure switch</b>                | - Check correct operation and setpoint adjustment | - Check correct operation and setpoint adjustment       | - Check correct operation and setpoint adjustment   |
| <b>Thermostat and fire control relay</b>     | - Check correct operation                         | - Check correct operation                               | - Check correct operation   |
| <b>Valve</b>                                 | - Check circuit for correct operation and leaks   |   | - Check correct operation   |

\* If a water softener or water treatment system is used, the water hardness should not be less than 40% of the initial hardness and should never be less than 15°f.

## 15 - OPERATING READINGS

| DATE/TIME   |  |  |  |  |  |
|---|--|--|--|--|--|
| <b>Rated voltage (V)</b>                              |  |  |  |  |  |
| <b>Voltage at terminals (V)</b>                       |  |  |  |  |  |
| <b>Fan motor absorbed current (A)</b>                 |  |  |  |  |  |
| <b>Mechanical inspection: tubes, fastenings, etc.</b> |  |  |  |  |  |
| <b>Electrical connection tightness check</b>          |  |  |  |  |  |
| <b>Clean the coil</b>                                 |  |  |  |  |  |
| <b>Check the control</b>                              |  |  |  |  |  |
| <b>Check the filters</b>                              |  |  |  |  |  |
| <b>Check the sealing</b>                              |  |  |  |  |  |

## 16 - REGULATIONS



Declaration of Conformity UE

This unit complies with the provisions of European Directives:

- 2006/42/EC (Machinery)
- 2014/30/EU (EMC)
- 2009/125/EC (Eco Design) et règlement 1253/2014/UE
- REGULATION (EC) No 1907/2006 (REACH)



UK Declaration of Conformity

This unit complies with the requirements of:

- Supply of Machinery (Safety) Regulations 2008
- Electromagnetic Compatibility Regulations 2016
- The Ecodesign for Energy-Related Products and Energy Information Regulations 2019, and following amendments
- UK REACH Regulations 2019

UK Importer:

- Toshiba Carrier UK Ltd, Porsham Close, Roborough, Plymouth, PL6 7DB

This document is not legally binding. As part of its policy for continual product improvement, CIAT reserves the right to make any technical modification it considers necessary without prior notice.

The quality management system of this product's assembly site has been certified in accordance with the requirements of the ISO 9001 standard (latest current version) after an assessment conducted by an authorized independent third party.

The environmental management system of this product's assembly site has been certified in accordance with the requirements of the ISO 14001 standard (latest current version) after an assessment conducted by an authorized independent third party.

The occupational health and safety management system of this product's assembly site has been certified in accordance with the requirements of the ISO 45001 standard (latest current version) after an assessment conducted by an authorized independent third party.

Please contact your sales representative for more information

Carrier, Rte de Thil - 01120 Montluel, France.

Manufacturer reserves the right to change any product specifications without notice.

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