

# INSTALLATION, USE AND MAINTENANCE MANUAL



## INNOV@ DHF Chilled water CD-CU-CX

Air Conditioning Units for Close Control Application

INNOV@-DHF-IOM-0922-EN





<b>1</b>	<b>General description</b>	<b>1</b>
1.1	Structure	5
1.2	Application limits	5
1.3	Cooling circuit	5
1.4	Installation warnings	9
<b>2</b>	<b>Inspection / Transport / Positioning</b>	<b>11</b>
2.1	Inspection on receipt	11
2.2	Lifting and transport	11
2.3	Unpacking	11
2.4	Positioning	11
<b>3</b>	<b>Installation</b>	<b>13</b>
<b>4</b>	<b>Supply water properties</b>	<b>15</b>
<b>5</b>	<b>Humidifier</b>	<b>17</b>
<b>6</b>	<b>Electrical connections</b>	<b>21</b>
6.1	Generalities	21
<b>7</b>	<b>Operating diagrams</b>	<b>23</b>
<b>8</b>	<b>Start-Up</b>	<b>25</b>
8.1	Preliminary checks	25
8.2	Starting operations	25
<b>9</b>	<b>Setting operating parameters</b>	<b>27</b>
9.1	Generalities	27
<b>10</b>	<b>Maintenance</b>	<b>29</b>
10.1	Warnings	29
10.2	Generalities	29
<b>11</b>	<b>Troubleshooting</b>	<b>33</b>

## 1 General description

DH\_C CCAC chilled water units are specially designed for installation in technological environments such as Computer rooms, laboratories and in general where a high precision in climate control and a 24h/day operation are requested.

TREF units represent the state of the art between technology and design as well as all ours products. furthermore, the innovative design and the high-tech selected colours make TREF units complementary to the last generation of IT devices. The internal design of the units in firstly made looking to efficiency and reliability but don't losing accessibility.

All components, including electrical heaters, fans, compressors, valves, etc. can be maintained from the front and furthermore the door(s) are dismountable in few seconds thanks to an innovative hinge: this is very important when units are installed in small corridors. The exclusive use of primary brands components and a fully integrated development process (CAD+CAM, CAE) stands for highest possible quality level regarding efficiency, reliability, maintenance time, pre and after sales support.

DH units can be ordered in different air flow configuration, according with the needs and the datacenter layout. Downflow, upflow, displacement (D, U, X) versions are available.

DH units can be ordered in different configurations, designed to optimize the unit according to the working condition of the datacenter. For this reason, three different versions are available for every model (A, B, C) that work with high, middle, low water flow respectively.

Finally, DH units can be ordered in double circuit with double water valve, this allow hight redundancy and the use of less space in the datacenter.

Table 1  
DH synoptic.

1	Unit name	
	DH	Close control unit
2	Size	
	040	Cooling capacity [kW] at the nominal working conditions
	...	
	240	
3	Configuration	
	A	High water flow configuration
	B	Middle water flow configuration
	C	Low water flow configuration
4	Execution	
	C	Chilled water unit
5	Air flow	
	D	Downflow unit
	U	Upflow unit
	X	Displacement unit
Example:		
DH	040	A _ C D
↓	↓	↓ ↓ ↓
1	2	3 4 5

Figure 1  
Downflow unit components.

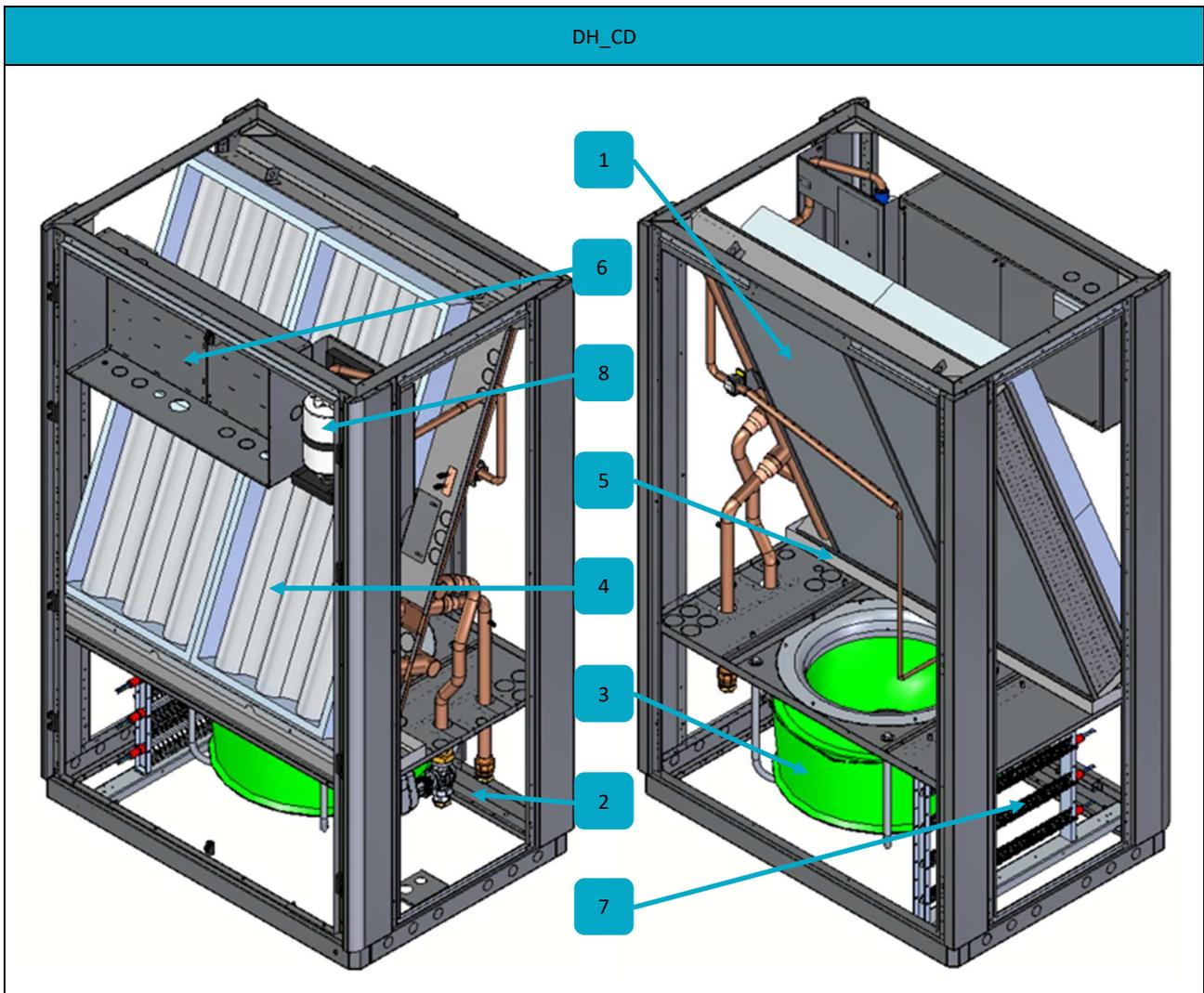


Table 2

Position	Description	Position	Description
1	Chilled water coil	2	Water valve
3	Fan	4	Air filter
5	Stainless steel drain pan	6	Electrical pane
7	Electrical heaters	8	Humidifier

Figure 2  
Displacement unit components.

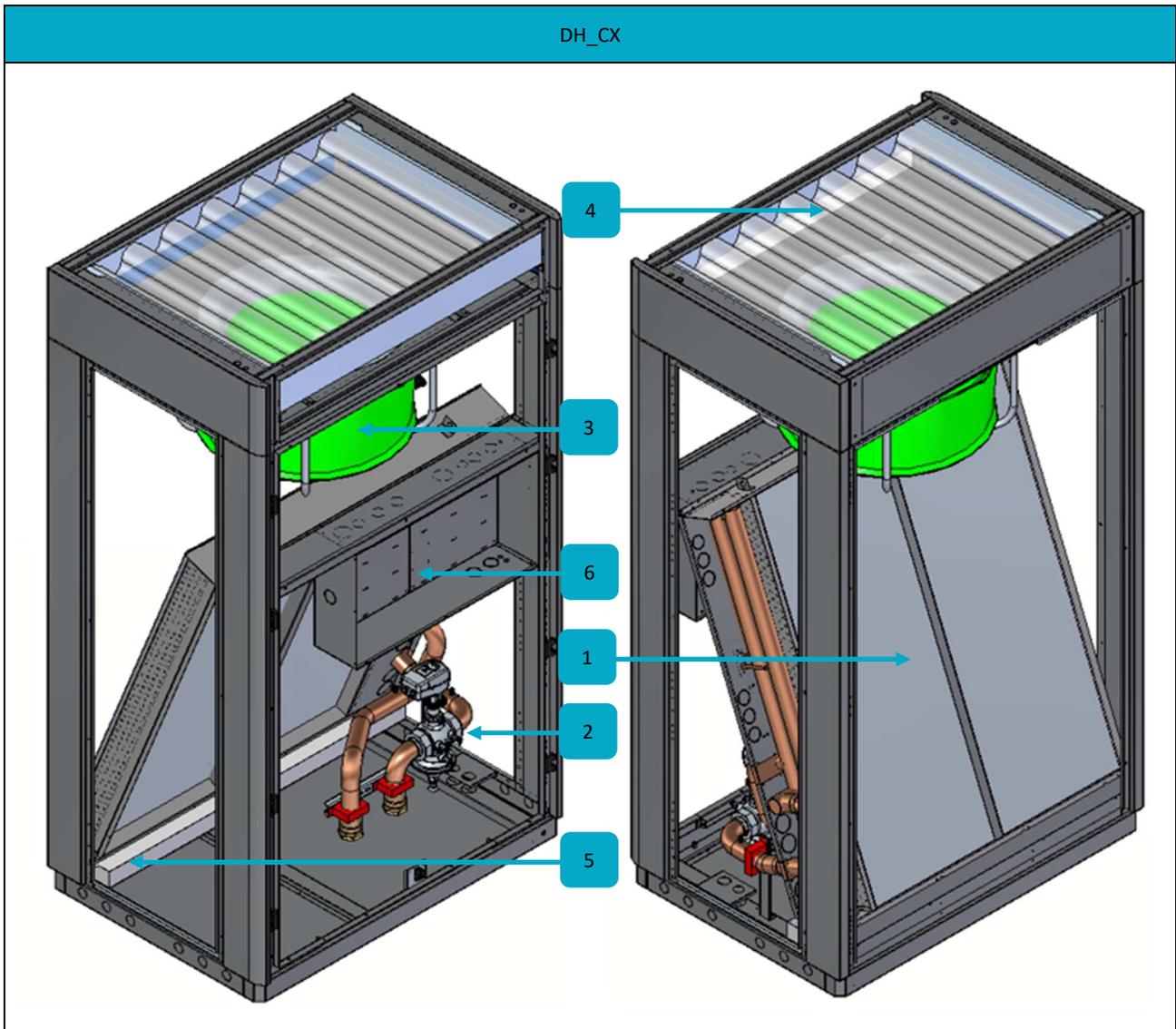


Table 3

Position	Description	Position	Description
1	Chilled water coil	2	Water valve
3	Fan	4	Air filter
5	Stainless steel drain pan	6	Electrical pane

## 1.1 Structure

DH units are designed with a self-supporting frame and all components are produced using sophisticated computer driven machines and special tools. All sheet metals are galvanized, and all external panels are powder coated RAL 7016 giving to the units the image and the quality like last generation of IT devices. Units are completely closed, and only frontal access is requested. Anyway, it is also possible to have side access to reach the steam piping and the drain pan, or simply to substitute a damaged side panel: all these problems are very rare, but with TREF units it is possible to solve them. The shape of the units is characterized with the curved edges with variable radius as for all HiRef products: this feature is obtained using special tools and gives both a good aesthetic and advantages against injuries. The compressor compartment is separated from the air flow and the special internal design allows the simple dismounting of the upper part of it ensuring an insuperable accessibility to all refrigerating components.

All fixing elements are made in stainless steel or in non-corroding materials. The dray pan is made in stainless steel to ensure long time operation without damages.

All panels are thermally insulated with a polyurethane foam class 1 according to UL 94 norms: this material, thanks to the open cells, gives good performances in sound absorption. As an option, sandwich panels are available: in this case mineral fibres are closed between the panel and a second sheet of metal giving the maximum in terms of internal cleaning. Double skin panels are classified between non-flammable materials class A1 according to DIN 4102 norms: the sound insulation is better than the standard solution, but the internal reflected sound power will increase the amount in delivery side (+2dB).

## 1.2 Application limits

Table 4

Power supply *		[V / Ph / Hz]	400 (±10%) / 3+N / 50
Storage conditions	Temperature	Min	-10°C
		Max	60°C
	Relative humidity	Max	90%
* In case of different power supply see the electrical drawing attached.			

## 1.3 Cooling circuit

The entire refrigerating circuit is assembled in our production line including all pipe work and using only primary brand for components. The workers involved in the welding and pipe work process are qualified by a third part according to CEE 97/23.

Cooling components

- Three/two-way water valves with 0-10 V regulation
- Relief valves

## Electric control board

Electric control board: The electric control board is constructed and wired in accordance with Directives 73/23/EEC and 89/336/EEC and related standards. The board may be accessed through a door after the main switch has been turned off. All the remote controls use 24 V signals powered by an insulating transformer situated on the electric control board.



### NOTE

The mechanical safety devices such as the high pressure switched are of the kind that trigger directly; their efficiency will not be affected by any faults occurring in the microprocessor control circuit, in compliance with 97/23 PED.

## Microprocessor control

The microprocessor built into the unit allows the different operating parameters to be controlled from a set of pushbuttons situated on the electric control board:

- Alarm management:
  - Dirty filters alarm (optional);
  - Air flow alarm;
- Alarm signalling;
- Display of operating parameters;
- RS232, RS485 serial output management (optional).

See microprocessor control manual attached for further details, also in relation to customer specifications.

Figure 3  
Base refrigerant circuit.

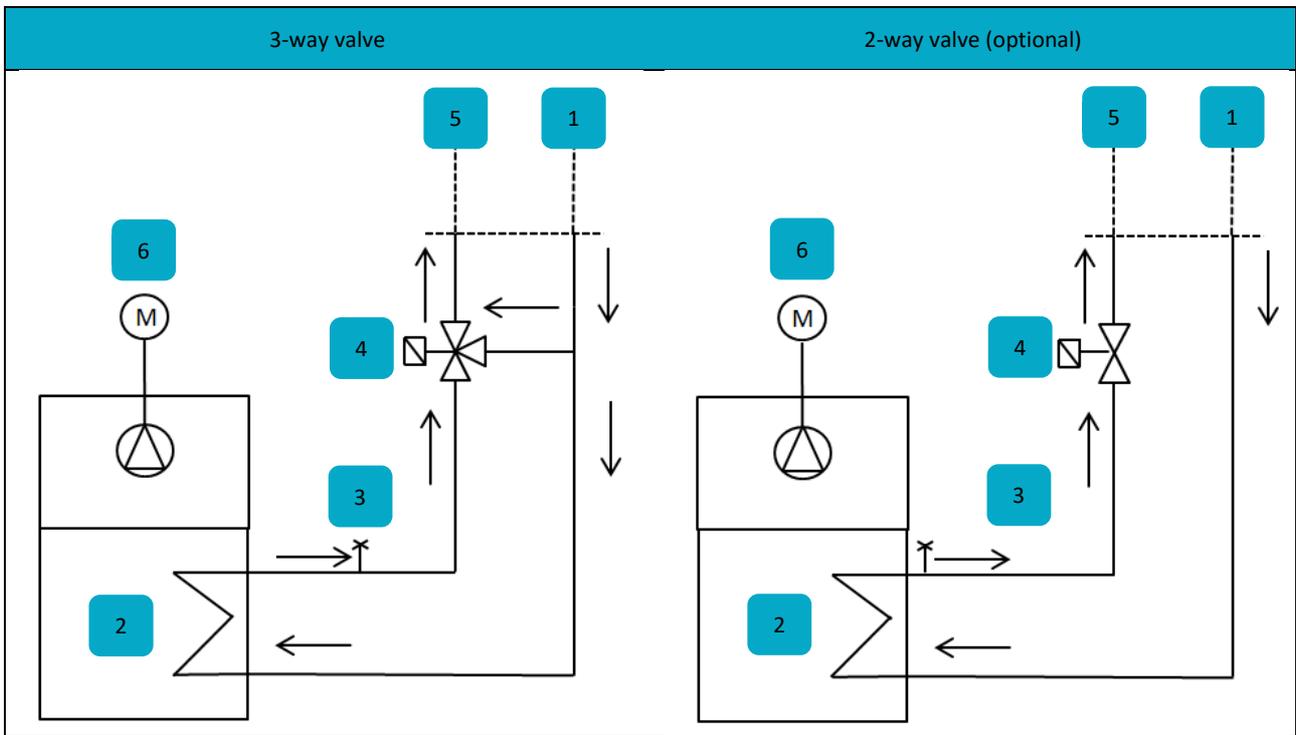


Table 5

Riferimento	Descrizione	Riferimento	Descrizione
1	Inlet chilled water	2	Chilled water coil
3	Relief valve	4	Water valve
5	Outlet chilled water	6	Fan

Figure 4  
Base refrigerant double circuit (optional).

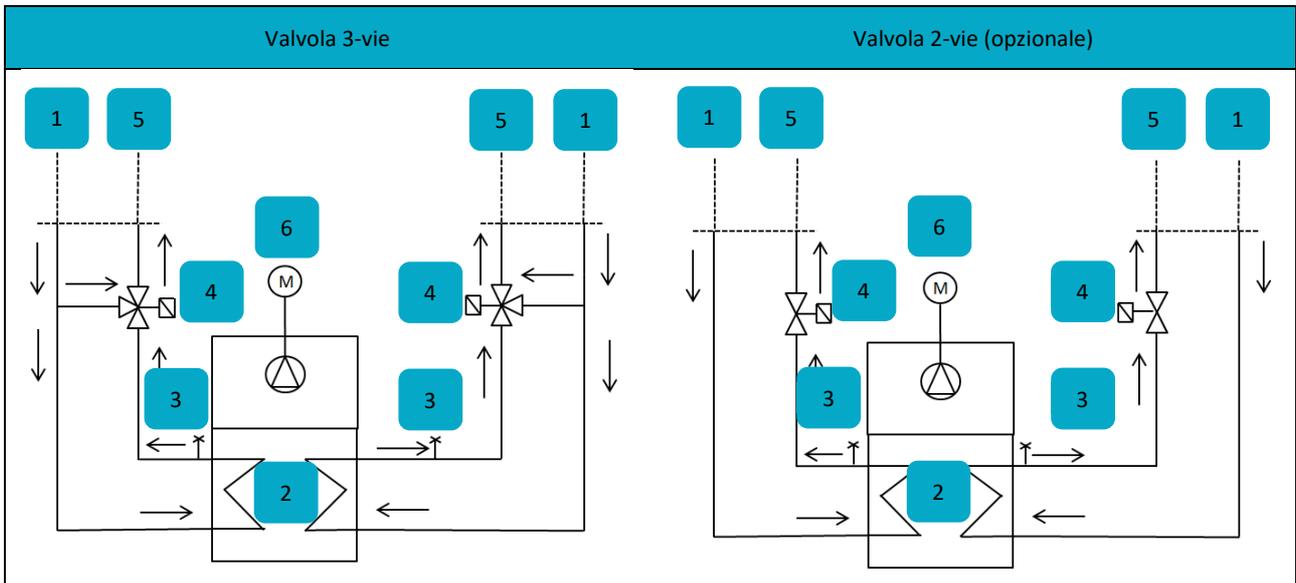


Table 6

Riferimento	Descrizione	Riferimento	Descrizione
1	Inlet chilled water	2	Chilled water coil
3	Relief valve	4	Water valve
5	Outlet chilled water	6	Fan

## 1.4 Installation warnings

### General rules

- When installing or servicing the unit, you must strictly follow the rules provided in this manual, comply with the directions on the units themselves and take all such precautions as are necessary.
- The fluids under pressure in the cooling circuit and the presence of electrical components may cause hazardous situations during installation and maintenance work.



**WARNING**

All work on the unit must be carried out by qualified personnel only, trained to do their job in accordance with current laws and regulations.

- Failure to comply with the rules provided in this manual or any modification made to the unit without prior authorisation will result in the immediate invalidation of the warranty.



**WARNING**

Before performing any kind of work on the unit, make sure it has been disconnected from the power supply.

## 2 Inspection / Transport / Positioning

### 2.1 Inspection on receipt

On receiving the unit, check that it is perfectly intact: the unit left the factory in perfect conditions; immediately report any signs of damage to the carrier and note them on the “Delivery Slip” before signing it.

The Manufacturer or its Agent must be promptly notified of the entity of the damage. The Customer must submit a written report describing every significant sign of damage.

### 2.2 Lifting and transport

While the unit is being unloaded and positioned, utmost care must be taken to avoid abrupt or violent manoeuvres. The unit must be handled carefully and gently; avoid using machine components as anchorages or holds and always keep it in an upright position.

The unit should be lifted using the pallet it is packed on; a transpallet or similar conveyance means should be used.



#### WARNING

In all lifting operations make sure that the unit is securely anchored to prevent accidental falling or overturning.

### 2.3 Unpacking

The packing must be carefully removed to avoid the risk of damaging the unit. Different packing materials are used: wood, cardboard, nylon etc. It is recommended to keep them separately and deliver them to suitable waste disposal or recycling facilities to minimise their environmental impact.

### 2.4 Positioning

Bear in mind the following aspects when choosing the best site for installing the unit and the relative connections:

- Positioning and dimensions of the water connections;
- Location of power supply;
- Solidity of the supporting floor.

It is recommended to first prepare holes in the floor/wall for passing through the power cables and for the air outlet (downflow units).

The dimensions of the flange (optional) and the holes for power cable are shown in the dimensional drawing of the unit attached.

### 3 Installation

The DH air-conditioning unit is suitable for all environments except aggressive ones. Do not place any obstacles near the units and make sure that the air flow is not impeded by obstacles and/or situations causing back suction.

Figure 5  
Service area.

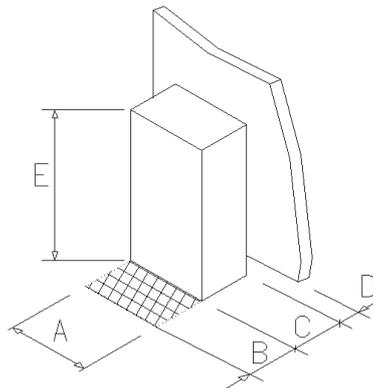


Table 7  
Service area for downflow units.

DH_CD		A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
040	060	1010	750	890	10	2000
070	080	1270	750	890	10	2000
090	100	1760	750	890	10	2000
110	130	2020	750	890	10	2000
150	170	2510	750	890	10	2000
180	210	3160	750	890	10	2000
240		3160	750	960	10	2000

Table 8  
Service area for upflow units.

DH_CU		A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
040	060	1010	750	890	10	2000
070	080	1270	750	890	10	2000
090	100	1760	750	890	10	2000
110	130	2020	750	890	10	2000
150	170	2510	750	890	10	2000
180	210	3160	750	890	10	2000

Table 9  
Service area for displacement units.

DH_CX		A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
040	060	1010	750	890	10	2250
070	080	1270	750	890	10	2250
090	100	1760	750	890	10	2250
110	130	2020	750	890	10	2250
150	170	2510	750	890	10	2250
180	210	3160	750	890	10	2250

The following steps should be carried out to ensure proper installation:

- Apply an anti-vibration rubber lining between the unit and the bottom;
- Position the unit on the floor / floorstand (base frame).

The recommended sizes for the power cables and emergency line are shown in the related electrical drawings attached.

## 4 Supply water properties

The quality and chemical composition of the cooling and heat transfer medium have a great influence on the Lifetime and on heat transfer and thus on the performance of the specific unit.

Basically, avoid all types of floating matter in the cooling and heat transfer medium. When the suspended matter accumulates in the heat exchanger the heat transfer and thus the performance of the unit deteriorate.

Below are the values of the dissolved substances and the water properties recommended by the manufacturer listed.

The information refers to the use of exchangers made of copper.

If the concentration of some components will be out of range, the customer has to introduce a correction, otherwise the system will be out of warranty.

Table 10

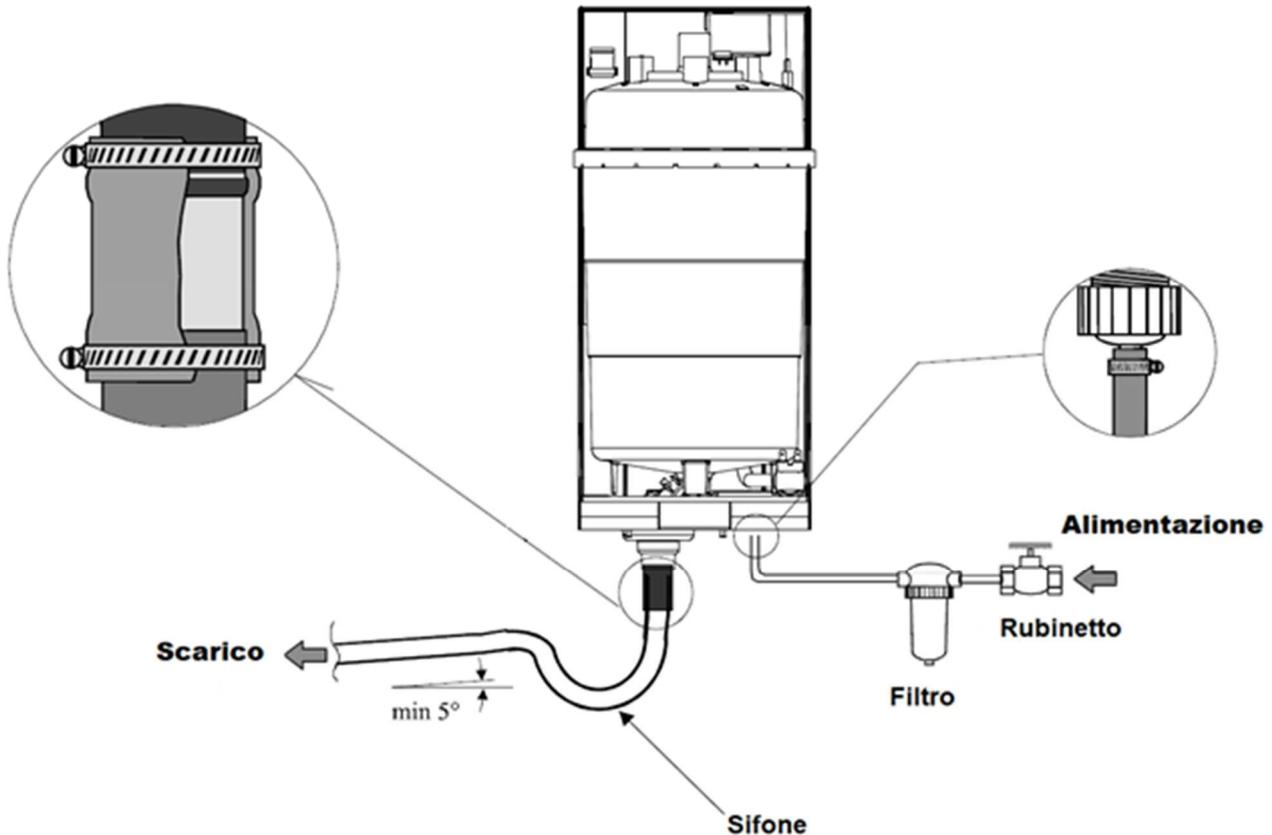
Substance		Concentration
Alkalinity	HCO <sub>3</sub> <sup>-</sup>	70 – 300 ppm
Sulphate	SO <sub>4</sub> <sup>2-</sup>	< 70 ppm
	HCO <sub>3</sub> <sup>-</sup> / SO <sub>4</sub> <sup>2-</sup>	> 1.0 ppm
Electrical conductivity		10 – 500 µS/cm
Potential of hydrogen pH *		7.5 – 9.0
Ammonium	NH <sub>4</sub> <sup>+</sup>	< 2 ppm
Chloride	Cl <sup>-</sup>	< 30 ppm
Free chlorine	Cl <sub>2</sub>	< 0.5 ppm
Hydrogen sulphide	H <sub>2</sub> S	< 0.05 ppm
Carbon dioxide	CO <sub>2</sub>	< 5 ppm
Total hardness		4.5 – 8.5 °dH
Nitrate	NO <sub>3</sub> <sup>-</sup>	< 100 ppm
Iron **	Fe	< 0.2 ppm
Aluminium	Al	< 0.2 ppm
Manganese **	Mn	< 0.05 ppm
Calcium carbonate	CaCO <sub>3</sub>	< 200 ppm
Phosphate	PO <sub>4</sub> <sup>3-</sup>	< 2 ppm

Ammonia	NH <sub>3</sub>	< 0.5 ppm
Temperature		< 65 °C
Oxygen content		< 0.1 ppm
<p>* Generally, a low pH value (less than 6) increases the risk of corrosion, and a high pH (above 7.5) decreases the risk of corrosion.</p> <p>** Fe<sup>3+</sup> e Mn<sup>4+</sup> are powerful oxidants and may increase the risk of localized corrosion on stainless steel.</p>		

## 5 Humidifier

The installation of the humidifier requires the connection to the water supply and drain hoses.

Figure 6  
Humidifier.



To simplify installation, it is recommended to use hose with an inside diameter of 6 mm and an outside diameter of 8 mm and the revolving 3/4" G connection, either straight or 90°.

A shut-off tap and a mechanical filter should be installed to trap any solid impurities.

The drain water is connected using a section of rubber or plastic hose resistant to 100°C, with a recommended inside diameter of 32 mm.

The drain connector is suitable for heat sealing with polypropylene drainpipes.



### WARNING

The drain hose must be free, without backpressure and with a drain trap immediately downstream of the connection to the humidifier.

The following conditions represent correct water connection:

- Installation of a shut-off tap in the supply water line;

- Presence of a mechanical filter in the supply water line;
- Water temperature and pressure within the allowed values;
- Drain hose resistant to temperatures of 100°C;
- Minimum inside diameter of the drain hose of 25 mm;
- Minimum slope of the drain hose greater than or equal to 5°;
- Electrically non-conductive sleeve;
- Presence of a drain trap in the drain hose.



**WARNING**  
 When installation is completed, flush the supply hose for around 30 minutes by piping the water directly into the drain without sending it into the humidifier. This will eliminate any scale or processing residues that may block the fill valve or cause foam when boiling.

### Supply water

The humidifier must be supplied with mains water, with the following characteristics:

- Pressure between 0.1 and 0.8 MPa (1 to 8 bar, 14.5 to 116 psi);
- Temperature between 1 and 40°C;
- Instant flow rate not lower than the rated fill solenoid valve flow rate (0.6 l/min);
- Connection type 3/4" G Male.

Table 11

Limit values for the supply water with medium-high conductivity in an immersed electrode humidifier.

Substance		Minimum	Maximum
Potential of hydrogen pH		7	8.5
Specific conductivity at 20°C	$\sigma_{R, 20^{\circ}\text{C}}$	300	1250 $\mu\text{S/cm}$
Total dissolved solids TDS		*	* mg/l
Dry residue at 180°C	$R_{180}$	*	* mg/l
Total hardness TH	$\text{CaCO}_3$	100 **	400 mg/l
Temporary hardness	$\text{CaCO}_3$	60 ***	300 mg/l
Iron + Manganese	Fe + Mn	0	0.2 mg/l
Chlorides	Cl	0	30 ppm
Silica	$\text{SiO}_2$	0	20 mg/l

Residual chlorine	Cl <sup>-</sup>	0	0.2 mg/l
Calcium sulphate	CaSO <sub>4</sub>	0	100 mg/l
Metallic impurities		0	0 mg/l
Solvents, diluents, soaps, lubricants		0	0 mg/l
* Values depending on specific conductivity; in general: TDS $\cong$ 0.93 * $\sigma_{20}$ ; R <sub>180</sub> $\cong$ 0.65 * $\sigma_{20}$			
** Not lower than 200% of the chloride content in mg/l of Cl <sup>-</sup>			
*** Not lower than 300% of the chloride content in mg/l of Cl <sup>-</sup>			

Table 12

Limit values for the supply water with medium-low conductivity I the immersed electrode humidifier.

Substance		Minimum	Maximum
Potential of hydrogen pH		7	8.5
Specific conductivity at 20°C	$\sigma_{R, 20^{\circ}\text{C}}$	125	500 $\mu\text{S/cm}$
Total dissolved solids TDS		*	* mg/l
Dry residue at 180°C	R <sub>180</sub>	*	* mg/l
Total hardness TH	CaCO <sub>3</sub>	50 **	250 mg/l
Temporary hardness	CaCO <sub>3</sub>	30 ***	150 mg/l
Iron + Manganese	Fe + Mn	0	0.2 mg/l
Chlorides	Cl	0	20 ppm
Silica	SiO <sub>2</sub>	0	20 mg/l
Residual chlorine	Cl <sup>-</sup>	0	0.2 mg/l
Calcium sulphate	CaSO <sub>4</sub>	0	60 mg/l
Metallic impurities		0	0 mg/l
Solvents, diluents, soaps, lubricants		0	0 mg/l
* Values depending on specific conductivity; in general: TDS $\cong$ 0.93 * $\sigma_{20}$ ; R <sub>180</sub> $\cong$ 0.65 * $\sigma_{20}$			
** Not lower than 200% of the chloride content in mg/l of Cl <sup>-</sup>			
*** Not lower than 300% of the chloride content in mg/l of Cl <sup>-</sup>			



**WARNING**  
No relation can be demonstrated between water hardness and conductivity.



**WARNING**  
Do not treat water with softeners! This could cause corrosion of the electrodes or the formation of foam, leading to potential operating problems or failures.

**Avoid:**

- Using well water, industrial water or water drawn from cooling circuits; in general, avoid using potentially contaminated water, either from a chemical or bacteriological point of view;
- Adding disinfectants or corrosion inhibitors to water, as these substances are potentially irritant.

**Drain water**

Inside the humidifier the water boils and is transformed into steam, without the addition of any substances. The drain water, as a result, contains the same substances that are dissolved in the supply water, yet in greater quantities, depending on the concentration in the supply water and the set draining cycles, and may reach temperatures of 100°C. Not being toxic, it may be drained into the sewage system. The drain connector has an external diameter of 32 mm.

## 6 Electrical connections

### 6.1 Generalities



**WARNING**

Before carrying out any job on electrical parts, make sure the power supply is disconnected.

Check that the mains electricity supply is compatible with the specifications (voltage, number of phases, frequency) shown on the unit rating plate.

The power connection for single-phase loads is to be made with a three-pole cable and “N” wire at the centre of the star (optional: power supply w/o neutral).



**WARNING**

The size of the cable and line protections must conform to the specifications provided in the wiring diagram (attached to the documentation of the unit).

The supply voltage may not undergo fluctuations exceeding  $\pm 10\%$  and the unbalance between phases must always be below 2%.



**WARNING**

The above operating conditions must always be complied with: failure to ensure said conditions will result in the immediate invalidation of the warranty.

The electrical connections must be made in accordance with the information shown in the wiring diagram provided with the unit and with current and local regulations.

An earth connection is mandatory. The installer must connect the earthing wire using the earthing terminal situated on the electric control board (yellow and green wire).

The power supply to the control circuit is taken from the power line through an insulating transformer situated on the electric control board.

The control circuit is protected by suitable fuses or automatic breakers depending on the unit size.



**WARNING**

When the motor runs independently due to air flowing through or if it continues to run down after being turned off, dangerous voltages of over 50V can arise on the motor internal connections through operation of the generator.



**WARNING**

Even after disconnecting the mains voltage, life-threatening charges can appear

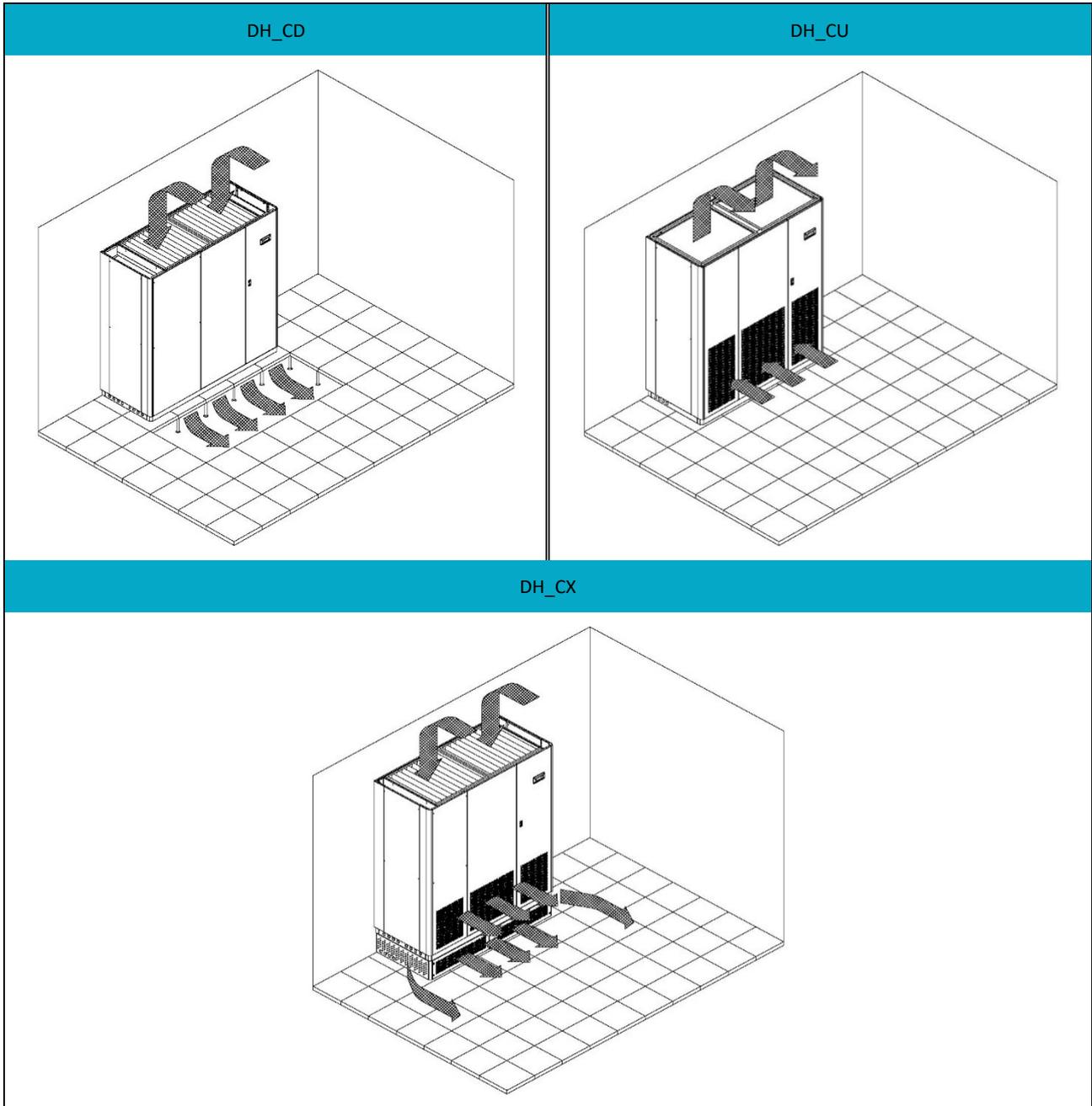
between the protective ground “PE” and the mains connection. The protective earth is conducting high discharge currents (dependent on the switching frequency, current source voltage and motor capacity). Earthing in compliance with EN specifications shall therefore be observed even for testing and trial conditions (EN 50 178, Art.5.2.11).

Regarding the differential protection that needs to be installed upstream, it is necessary to use a type A switch that is sensitive to direct currents. It is mandatory for it to have the following features:

- Calibratable operation threshold;
- Calibratable operation delay.

## 7 Operating diagrams

Figure 7  
Air flow.



## 8 Start-Up

### 8.1 Preliminary checks

Check that the electrical connections have been made properly and that all the terminals are securely tightened. This check should also be included in a periodic yearly inspection.

### 8.2 Starting operations

Before starting the unit, turn the main switch on, select the operating mode desired from the control panel and press the "ON" button on the control panel (see software manual also).

If the unit fails to start up, check if the service thermostat has been set according to the nominal values provided.

**WARNIG**

You should not disconnect the unit from the power supply during periods when it is inoperative but only when it is to be taken out of service for a prolonged period (e.g. at the end of the season).

## 9 Setting operating parameters

### 9.1 Generalities

All the control devices are set and tested in the factory before the unit is dispatched. However, after the unit has been in service for a reasonable period you can perform a check on the operating and safety devices. The settings are shown in Table 13.



**WARNING**

All servicing of the equipment is to be considered extraordinary maintenance and may be carried out BY QUALIFIED TECHNICIANS ONLY: incorrect settings may cause serious damage to the unit and injuries to persons.

The operating parameters and control system settings configurable by means of the microprocessor control are password protected if they have a potential impact on the integrity of the unit.

*Table 13  
Setting of control devices.*

Control device	Set point	Differential
Differential air pressure switch (air flow)	70	30 Pa
Differential air pressure switch (dirty filter)	70	20 Pa

## 10 Maintenance

The only operations to be performed by the user are to switch the unit on and off. All other operations are to be considered maintenance work and must thus be carried out by qualified personnel trained to do their job in accordance with current laws and regulations.

### 10.1 Warnings



**WARNING**

All the operations described in this chapter **MUST ALWAYS BE PERFORMED BY QUALIFIED PERSONNEL ONLY.**



**WARNING**

Before carrying out any work on the unit or accessing internal parts, make sure you have disconnected it from the mains electricity supply.



**WARNING**

Be especially careful when working in proximity to finned coils since the 0.11 mm-thick aluminium fins can cause superficial injuries due to cuts.



**WARNING**

After completing maintenance jobs, always replace the panels enclosing the units and secure them with the fastening screws provided.

## 10.2 Generalities

To guarantee a constantly satisfactory performance over time, it is advisable to carry out routine maintenance and checks as described below. The indications below are related to standard tear and wear.

Table 14  
Routine maintenance.

Operation	Frequency
Check the efficiency of all the control and safety devices	Once a year
Check the terminals on the electric control board to ensure that they are securely tightened. The movable and fixed contacts of the circuit breakers must be periodically cleaned and replaced whenever they show signs of deterioration.	Once a year
Check the efficiency of the differential air pressure switch and dirty filter differential pressure switch (optional)	Every 6 months
Check the condition of the air filter and replace it if necessary	Every 6 months

Figure 8  
Inspecting the air filters in downflow units.

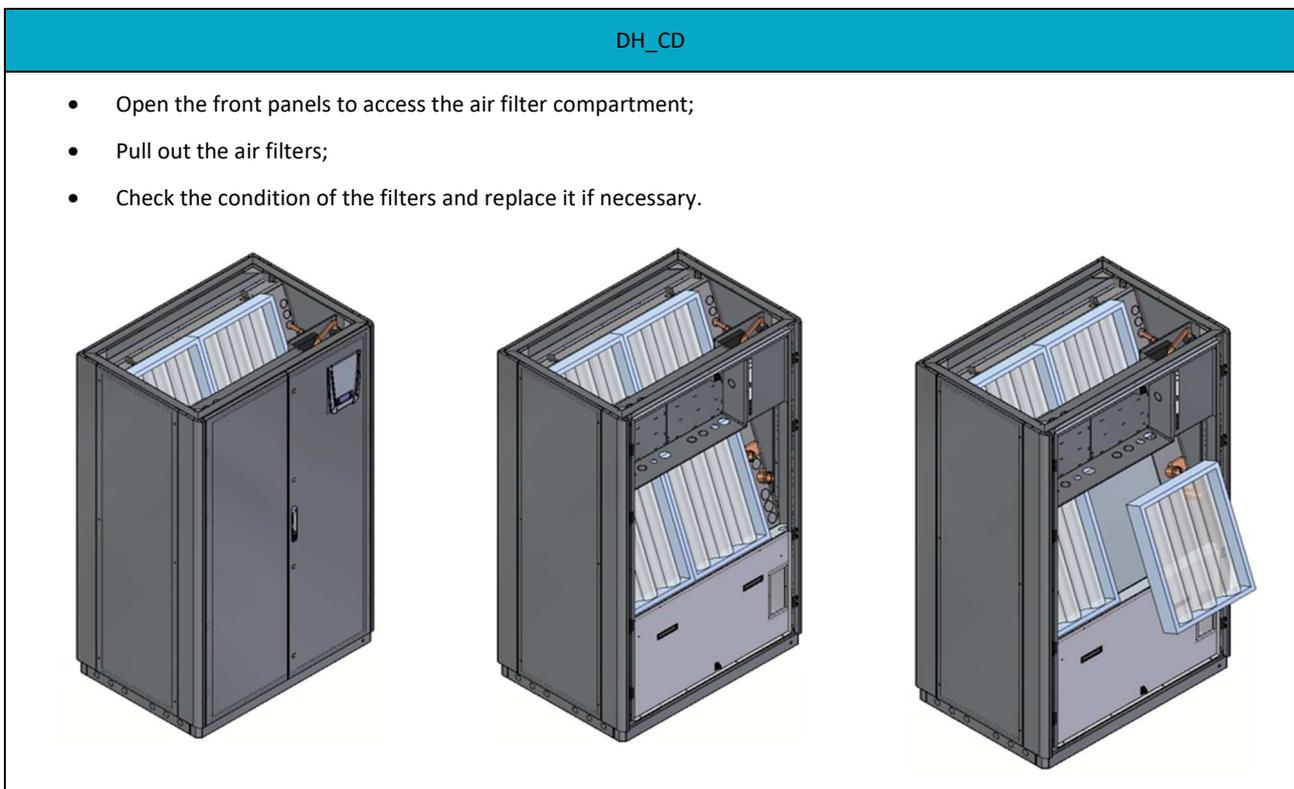


Figure 9  
Inspecting the air filters in displacement units.

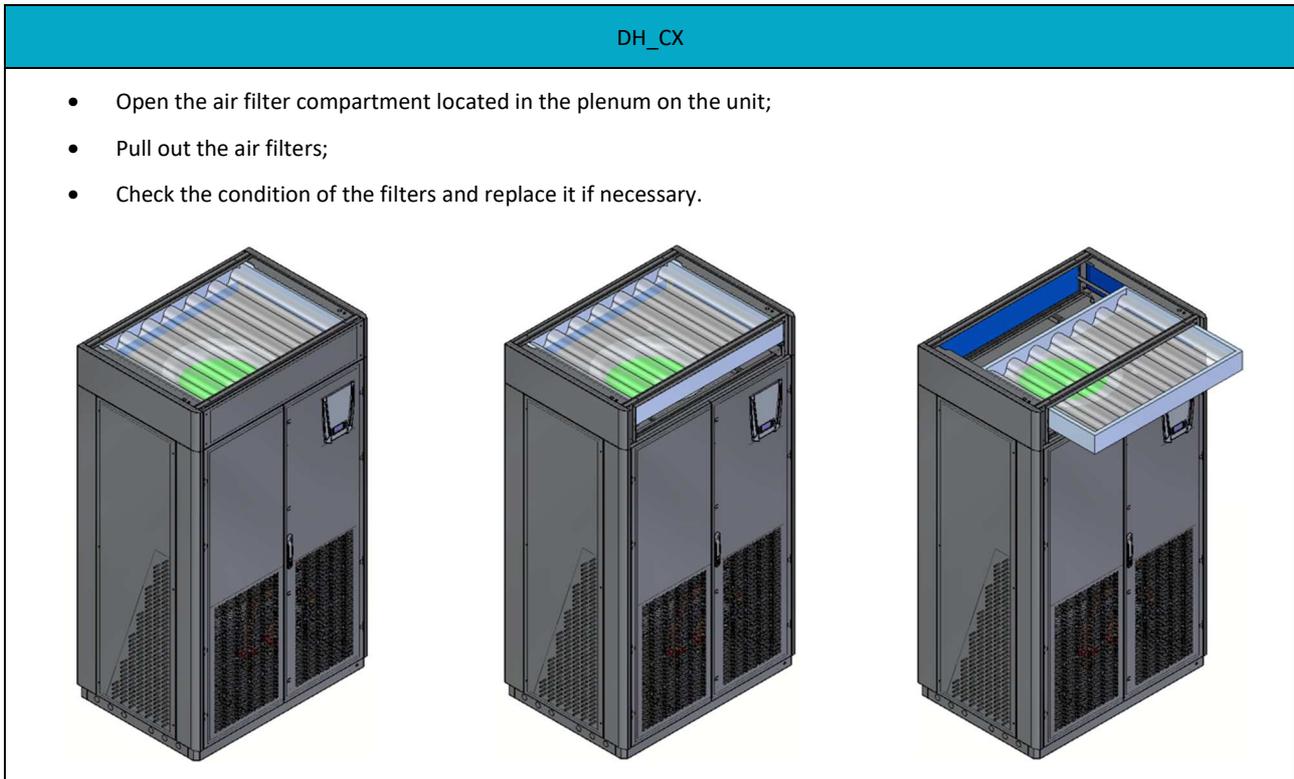


Figure 10  
Relief valves in downflow units.

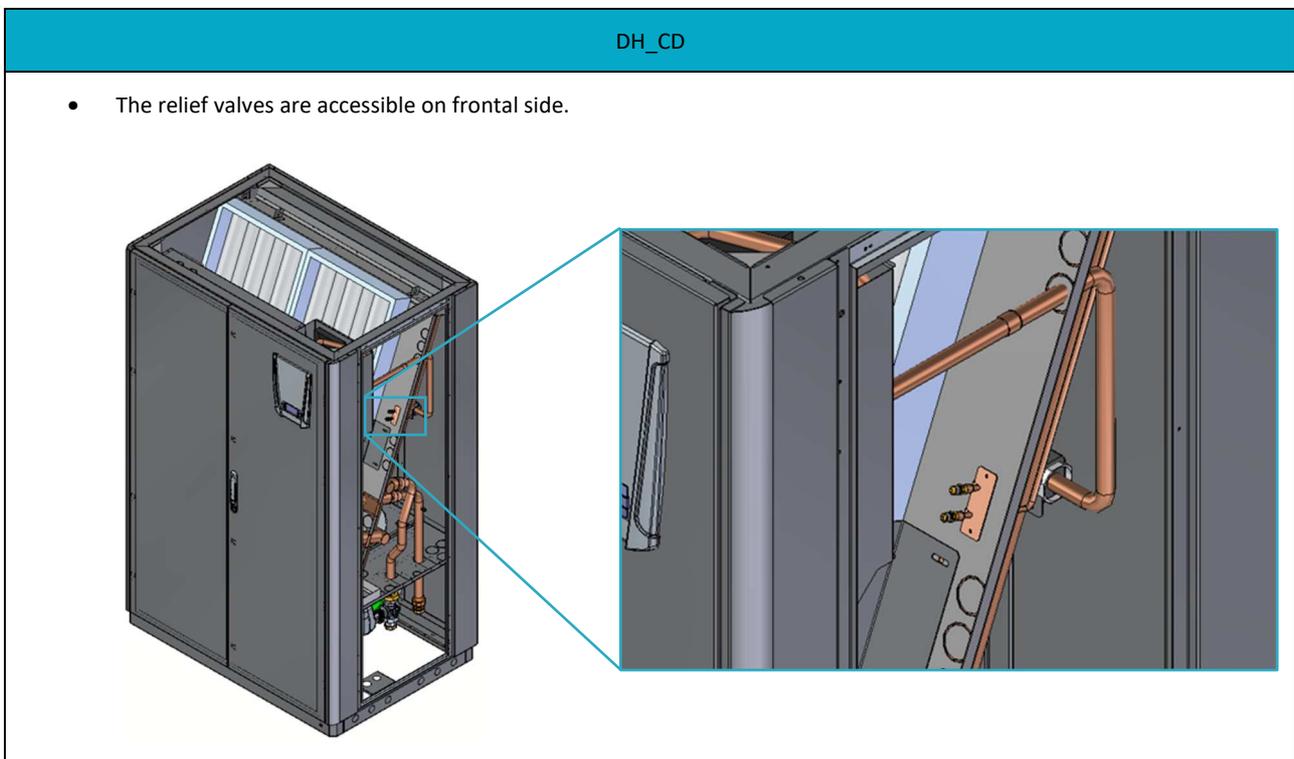
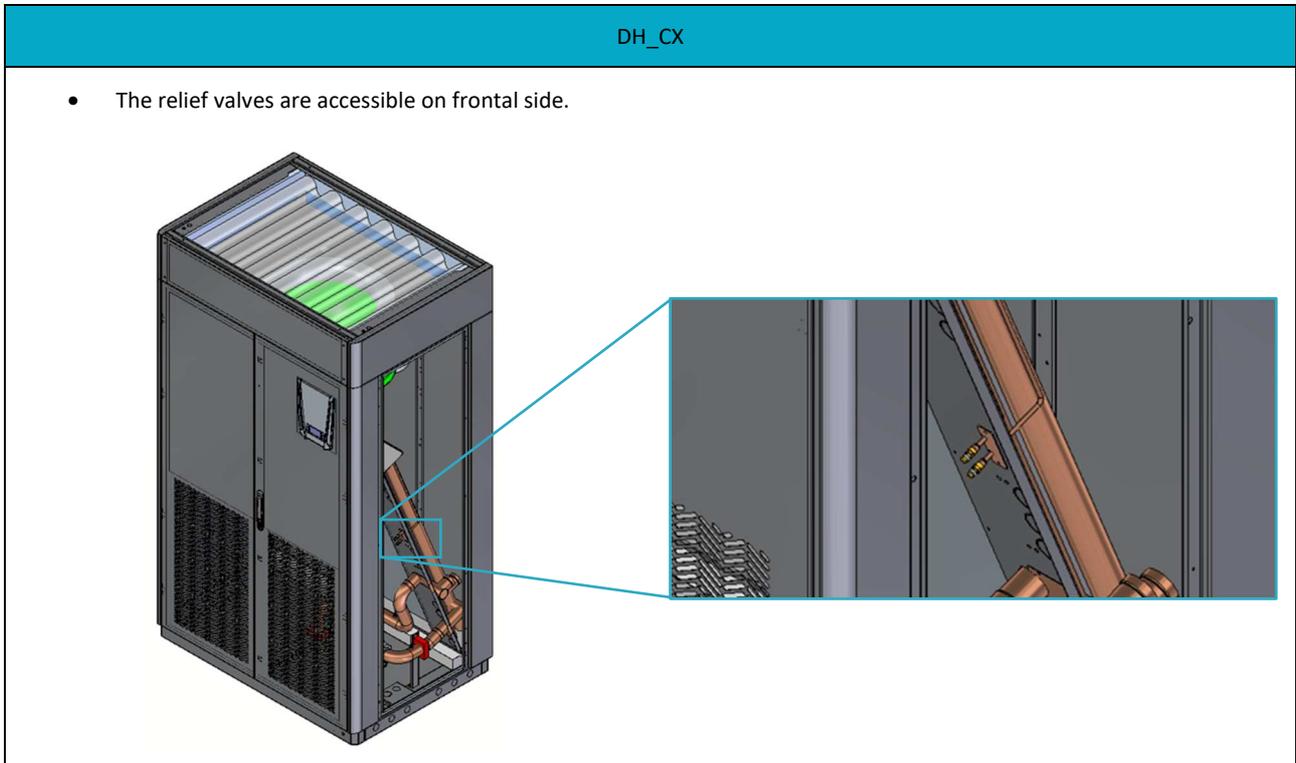


Figure 11  
Relief valves in displacement units.

Figure 11  
Relief valves in displacement units.



## 11 Troubleshooting

On the next pages you will find a list of the most common reasons that may cause the package unit to fail or any malfunction. This causes are broken down according to easily identifiable symptoms.



### WARNING

You should be extremely careful when attempting to implement any of the possible remedies suggested: overconfidence can result in injuries, even serious ones, to inexperienced individuals. Therefore, once the cause has been identified, you are advised to contact the manufacturer or a qualified technician for help.

Table 15

Fault	Possible causes	Corrective actions
The unit does not start	No power supply	Check if power is being supplied both to the primary and auxiliary circuits.
	The electronic card is cut off from the power supply	Check the fuses.
	Alarms have been released	Check whether any alarms are signalled on the microprocessor control panel, eliminate the causes and restart the unit.
	The phase sequence is wrong	Check the phase sequence relay. Invert the phases on the terminal board after disconnecting the unit and contact the manufacturer.
Air in the hydraulic circuit	During external connections	Open the relief valves positioned on the right side over the top of the coil
Water out from the unit	The drain pan hole is closed	Open the front panels, remove the sheet metal just below the e-panel (down flow units) and clean it.
	The siphon is missing	Check for the presence and provide for a new one.
	The air flow is too high	Reduce the fan speed up to reaching the nominal air flow
	Unit is not perfectly level	Place correctly the unit.

**AGENCES COMMERCIALES :****BELGIQUE ET LUXEMBOURG** + 32 3 633 3045**FRANCE** +33 1 64 76 23 23**ALLEMAGNE** +49 (0) 211 950 79 60**ITALIE** + 39 02 495 26 200**PAYS-BAS** + 31 332 471 800**POLOGNE** +48 22 58 48 610**PORTUGAL** +351 229 066 050**ESPAGNE** +34 915 401 810**UKRAINE** +38 044 585 59 10**ROYAUME-UNI ET IRELANDE** +44 1604 669 100**AUTRES PAYS :****LENNOX DISTRIBUTION** +33 4 72 23 20 20

Pour respecter ses engagements, Lennox s'efforce de fournir des informations les plus précises. Néanmoins, les spécifications, valeurs et dimensions indiquées peuvent être modifiées sans préavis, sans engager la responsabilité de Lennox.

Une installation, un réglage, une modification, un entretien ou une opération de maintenance inappropriés peuvent endommager le matériel et provoquer des blessures corporelles.

L'installation et la maintenance doivent être confiées à un installateur ou à un technicien de maintenance qualifié.

