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EXPAIR™

Instruction manual



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The illustrations in this document are for illustrative purposes only and not part of any offer for sale or contract. The manufacturer reserves the right to change the design at any time without notice.

1 - INDOOR UNIT(S) (EXPAIR™)



Appropriate PPE (Personal Protective Equipment) must be worn whenever 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.

Introduction to the range:

EXPAIR™ is a range of precision close control units that is specifically adapted to meet the air handling needs of computer and telecommunications rooms, and rooms for special purposes (electronic, sensitive storage, medical, clean rooms).

The EXPAIR™ range operates with chilled water or direct expansion

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

EXPAIR™ CW 16 UNDER1

① ② ③ ④

① **Range**

② **Unit type CW:** Chilled water

Unit type DXA: Direct expansion

③ **Cooling capacity**

④ **Type of assembly**

- UNDER 1,
- OVER 3, 4 or 5

2 - RECEIPT

Each unit has a name plate bearing an identification number. This number must be quoted in all correspondence.

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.

► Equipment storage

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.

► Equipment warranty

See the general terms and conditions of sale.

► Identifying the equipment

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

Ref. produit/Item Nbr 7323226.333462		Designation/Description	
An(Year) 2015	N. Serie/Serial Nbr 02183458/0008	Reperel/Part	
Fluide - Charge/Fluid - Load	Froid/Cold	Tension/Voltage	
BP/LP Mini	Regime	Intensité/Current	
HP Maxi	Chaud/Heat	Poids/Weight	
Temp. Maxi (°C)	Regime - Type	N° Declaration CE 7033238.12	

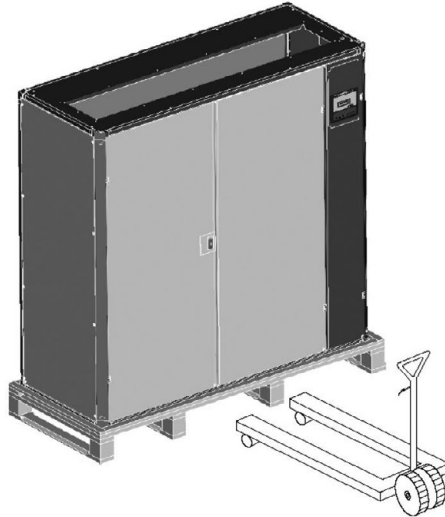
- ① Product reference
- ② Product description
- ③ Year of manufacture
- ④ Serial no. (to be quoted in all correspondence)
- ⑤ Type of fluid used in the exchanger and operating pressure.
- ⑥ Cooling capacity + water temperature used
- ⑦ Heating capacity + water temperature used (if heating coil option)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

3 - HANDLING

The unit must be lifted using slings or a spreader beam or be carried by a pallet truck and all four corners of the unit must be supported by wooden blocks. In all cases, the lifting point has to be at the base of the unit. The unit shall be handled by qualified personnel. Refer to the information given on the relevant label on the unit.



The unit must be handled with care and kept vertical.



3.1 - Weights and dimensions:

SIZES	CW unit	
	Dimensions H x W x D.	Weight (kg)
5	1700 x 680 x 500	115
8		120
12		125
16	1900 x 850 x 780	280
27	1900 x 1150 x 780	310

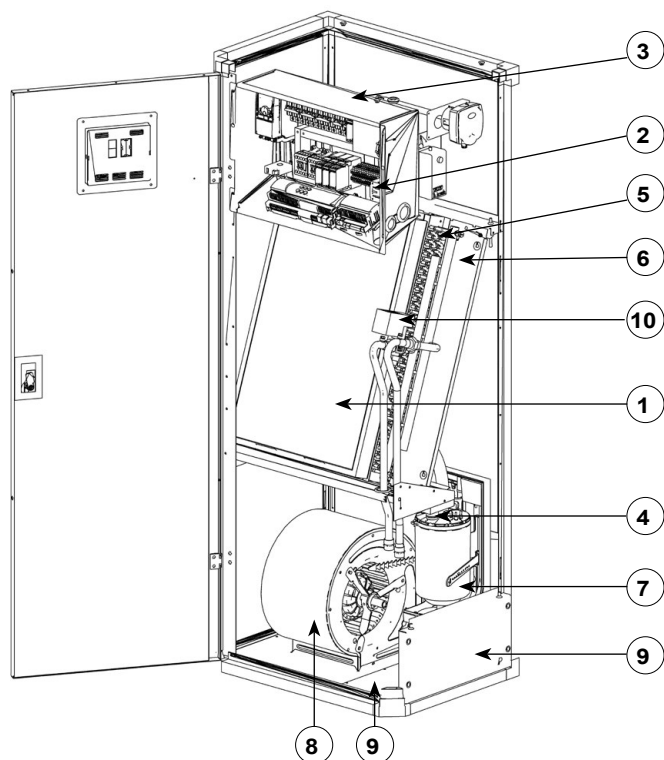
SIZES	DXA Indoor unit	
	Dimensions H x W x D	Weight (kg)
5	1700 x 680 x 500	115
8		120
10		125
12	1900 x 850 x 780	280
15		
19		
24	1900 x 1150 x 780	310
31		
36		
38	1900 x 1490 x 780	375
48		
	1900 x 1990 x 780	480

SIZES	CL2 condensation unit Outdoor unit	
	Dimensions H x W x D	Weight (kg)
CL2 28	658 x 1035 x 449	69
CL2 28	658 x 1035 x 449	69
CL2 35	658 x 1035 x 449	69
CL2 35	658 x 1035 x 449	69
CL2 50	1258 x 1035 x 449	101
CL2 65	1258 x 1035 x 449	112
CL2 75	1258 x 1035 x 449	118
2 x CL2 50	1258 x 1035 x 449	202
2 x CL2 65	1258 x 1035 x 449	224
2 x CL2 65	1258 x 1035 x 449	224
2 x CL2 75	1258 x 1035 x 449	236

4 - LOCATION OF COMPONENTS

4.1 - CW 5/8/12/16/27:

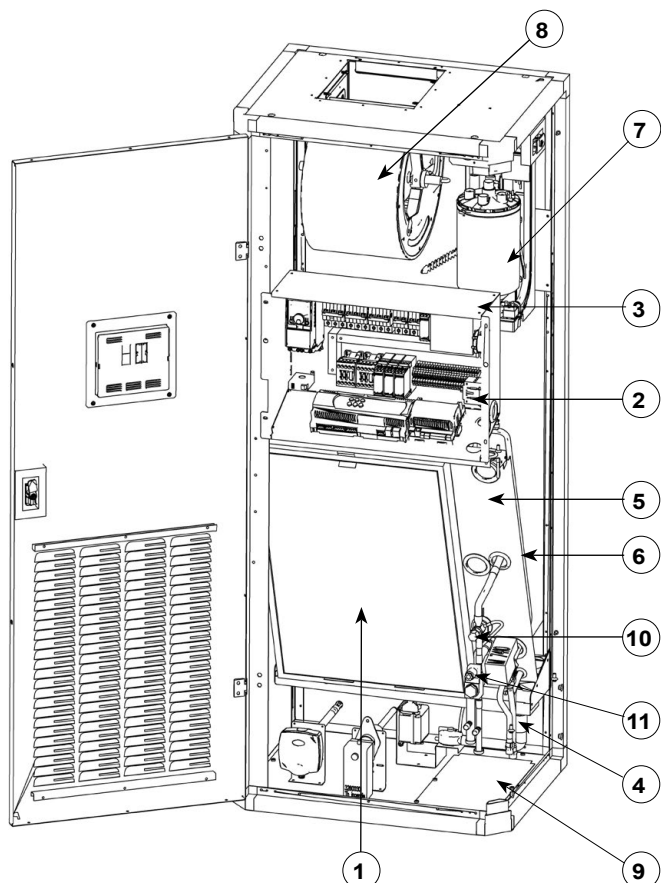
Chilled water model



- 1- Filter
- 2- Disconnect switch
- 3- Control unit
- 4- Condensate draining
- 5- Cooling coil
- 6- Heating coil (optional)
- 7- Humidifier (option)
- 8- Fan motor assembly
- 9- Removable plate for hydraulic connections (bottom or right-hand side)
- 10- Control valve

4.2 - DXA 5/8/10/12/15/19/24/31/36/38/48:

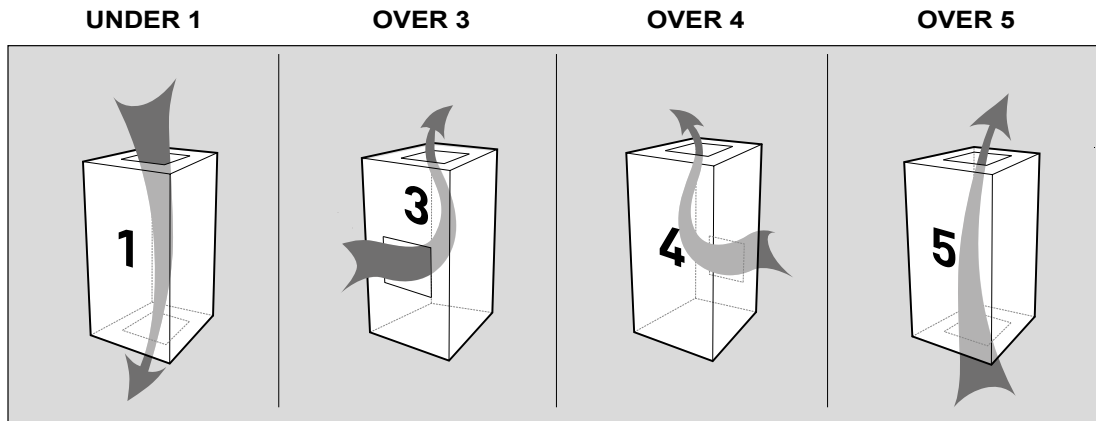
Direct expansion model



- 1- Filter
- 2- Disconnect switch
- 3- Control unit
- 4- Condensate draining
- 5- Evaporator coil
- 6- Heating coil (optional)
- 7- Humidifier (option)
- 8- Fan motor assembly
- 9- Removable plate for hydraulic connections (bottom or right-hand side)
- 10- Expansion valve
- 11- Solenoid valve

4 - LOCATION OF COMPONENTS

4.3 - Assembly/air flow direction



5 - INSTALLATION: UNIT/FRAME/PLENUM

5.1 - Setting the unit in place

- The unit must be placed on a flat, smooth surface which is as level as possible (ratio of approx. one to one thousand).
- If the supply air is conveyed through a raised floor, the seal between the unit and the floor must be tight.
- The unit need not be anchored to the floor if it is operated under normal conditions.
- Provide sufficient space for maintenance around the unit.
- The cabinet frame must rest fully on its contact surface.

► Units fitted with a support base

- The floor must be as flat as possible,
- A seal must be placed between the unit and bed of the frame.
- Level the unit by adjusting the legs on the support base (see the sub-base provided with the unit).

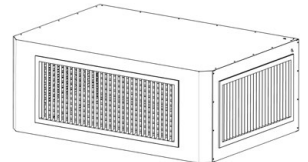
5.2 - Units supplied with a plenum:

► Supply/extraction plenum

Proposed when air is to be distributed directly into a space. It is mounted on top of the cabinet and features double-deflection grilles to allow the direction of the air stream to be adjusted.

The plenum may also be used mounted at the bottom to carry air directly from a space back to the air handling system.

The plenum is secured from the inside at the 4 corners. To secure it, the diffusion grille on the front panel must therefore be removed.



6 - CONNECTIONS

6.1 - Air connections

► Indoor unit

The air connection is made using rigid ducts in sheet steel or similar, fitted with a drilled connection flange. It is secured with self-tapping screws. A gasket should be fitted between the flange and the unit.

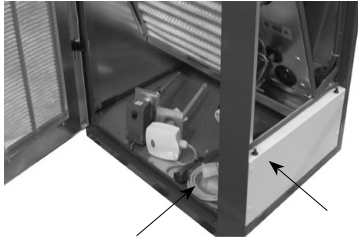
For units to be fitted as UNDER models (air discharge to the ground), a support base is available as an option to enable this. If the raised floor allows, a single hole is required, in the raised floor itself, with the same dimensions as the base. Tightness will be ensured by fitting a gasket between the unit and the support frame.

6.2 - Hydraulic connections

The hydraulic pipes must be routed through the plate provided for this purpose.

UNDER

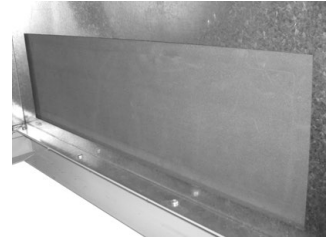
(removable bottom or right-hand side plate)



- 1 - Remove the precut foam panel,
- 2 - Drill the external panel,
- 3 - Make the correct cut-outs in the plate
- 4 - Put it back in place before routing the tubing, and **seal** to prevent any air bypass.

OVER

(Routing on the right-hand side)



► Condensate drain

- Fit a siphon: H = 100 mm
- If the humidifier option is selected: the drained water will not flow into the unit's drain pan.
- To have a single drain for both, connect the humidifier drain after the unit's drain pan.
- Two wrenches must always be used when connecting or tightening couplings to avoid bending pipes.
- When the condensate pump option is present, it is fitted inside the unit (connection via a flexible pipe with a Ø 5 mm), if the humidifier option has not been selected.



The operating pressure on the chilled or hot water network must not exceed 8 bar.

► Diameters of water coil connections

CW unit		CW 5	CW 8	CW 12	CW 16	CW 27
Cooling coil	Inlet	G1/2" M	G3/4" M	G3/4" M	G3/4" M	G1" M
	Outlet	G1/2" M	G3/4" M	G3/4" M	G3/4" M	G1" M

CW unit		CW 5	CW 8	CW 12	CW 16	CW 27	DXA 31/36	DXA 38/48
DXA unit		DXA 5	DXA 8	DXA 10	DXA 12/15	DXA 19/24		
Heating coil	Inlet	G1/2" M	G1/2" M	G1/2" M	G1/2" M	G3/4" M	G3/4" M	G3/4" M
	Outlet	G1/2" M	G1/2" M	G1/2" M	G1/2" M	G3/4" M	G3/4" M	G3/4" M

Refer to the section on the "Humidifier" to connect the humidifier.

6.3 - Refrigerant connection, DXA unit

► Installation precautions

- The refrigerant connections between the unit and the condenser must be made by qualified personnel.
- Only insulated copper refrigeration pipes must be used.
- This network must be designed and constructed correctly in order to ensure the entire system operates correctly.
- The pipes must be sufficiently flexible to withstand fluctuations in length, expansion and contraction.
- The liquid line must be angled to ensure it always conveys the fluid to the unit.

It is important to avoid:

- Excessive refrigerant fluid loss,
- Accumulation of oil,
- Liquid ingress into the compressor, either when operating or idle,

The pipe route must:

- not hinder, nor be hindered by, the existing installation,
- be protected against accidental shocks,
- be visible in its entirety, and not be encased in plaster or concrete.
- The height differences and equivalent lengths between the indoor and outdoor unit must be meet the recommendations (see Table).
- The pipe dimensions must ensure a minimum pressure drop, and the minimum and maximum speeds must be complied with to ensure correct circulation of the gas and movement of the oil.

6 - CONNECTIONS

- Fit oil traps every 4 metres on the vertical columns to ensure the oil is returned to the compressor.
- Check that no contamination has fallen into the tube.
- Carry out all brazing operations using a nitrogen purge.

► Refrigerant connection diameters

DXA unit	DXA 5	DXA 8	DXA 10	DXA 12	DXA 15	DXA 19	DXA 24	DXA 31	DXA 36	DXA 38	DXA 48
Ø Liquid	3/8"	3/8"	1/2"	1/2"	1/2"	1/2"	1/2"	2 x 1/2"	2 x 1/2"	2 x 1/2"	2 x 1/2"
Ø Gas	5/8"	5/8"	3/4"	7/8"	7/8"	1" 1/8"	1" 1/8"	2 x 7/8"	2 x 7/8"	2 x 1" 1/8"	2 x 1" 1/8"

CL2 condensation unit	CL2 28	CL2 28	CL2 35	CL2 35	CL2 50	CL2 65	CL2 75	2 x CL2 50	2 x CL2 65	2 x CL2 65	2 x CL2 75
Ø Liquid	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	1/2"	2 x 3/8"	2 x 3/8"	2 x 3/8"	2 x 1/2"
Ø Gas	5/8"	5/8"	3/4"	3/4"	3/4"	7/8"	7/8"	2 x 3/4"	2 x 7/8"	2 x 7/8"	2 x 7/8"

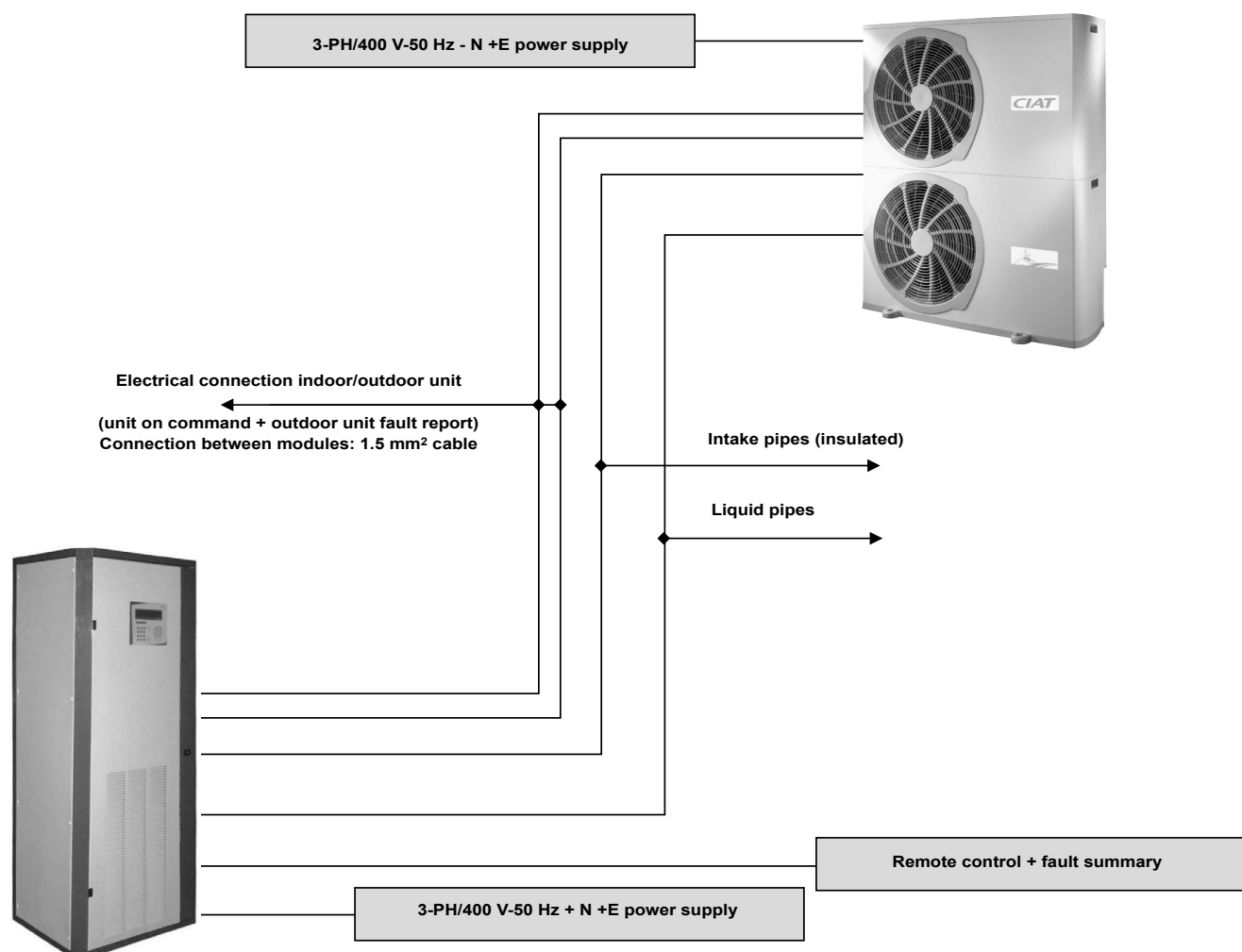
► Refrigerant connections (Outdoor unit)

Refer to the instructions contained in the outdoor unit



The unit is delivered with a safety charge. Refer to the table of charges in the "system start-up" chapter

► PRINCIPLE FOR INSTALLATION



Note:

- For all electrical connections, refer to the wiring diagram sent with the indoor and outdoor unit.
- Electrical connection not supplied by CIAT
- Refrigerant pipe not supplied by CIAT



EXPAIR™ (DXA 31, DXA 36, DXA 38, DXA 48) models have 2 outdoor units.

6 - CONNECTIONS

► Table of the maximum lengths for refrigerant connections

The tables below show the permitted lengths for the pipers and the corresponding maximum height difference.

The values in the tables show the reduction in cooling capacity as compared to the nominal capacity as a percentage.

DXA 5 + CL2 28 / 3/8" liquid line, 5/8" gas line

Total length (m) Height difference (m)	6	20	30
0	0	-6	-9
5	0	-6	-9
10	-	-6	-

DXA 8 + CL2 28 / 3/8" liquid line, 5/8" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-3	-5	-7	-9
10	-	-3	-5	-7	-9
20	-	-3	-5	-7	-9
30	-	-	-5	-7	-9

DXA 10 + CL35 / 3/8" liquid line, 3/4" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-2	-4	-6	-8
10	-	-2	-4	-6	-8
20	-	-2	-4	-6	-8
30	-	-	-4	-6	-8

DXA 12 + CL2 35 / 3/8" liquid line, 3/4" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-2	-4	-6	-8
10	-	-2	-4	-6	-8
20	-	-2	-4	-6	-8
30	-	-	-4	-6	-8

DXA 15 + CL2 50 / 3/8" liquid line, 3/4" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-2	-4	-6	-8
10	-	-2	-4	-6	-8
20	-	-2	-4	-6	-8
30	-	-	-4	-6	-8

DXA 19 + CL2 65 / 3/8" liquid line, 7/8" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-4	-5	-6	-7
5	0	-4	-5	-6	-7
10	-	-4	-5	-6	-
20	-	-4	-5	-	-

DXA 24 + CL2 75 / 1/2" liquid line, 7/8" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-2	-3	-4	-5
10	-	-2	-3	-4	-5
20	-	-2	-3	-4	-5
30	-	-	-3	-4	-5

DXA 31 + 2 x CL50 / 2 x 3/8" liquid line, 2 x 3/4" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-5	-7	-8	-9
10	-	-5	-7	-8	-9
20	-	-5	-7	-8	-9
25	-	-	-7	-8	-

DXA 36 + 2 x CL65 / 2 x 3/8" liquid line, 2 x 7/8" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-4	-5	-6	-7
10	-	-4	-5	-6	-7
20	-	-4	-5	-	-

DXA 38 + 2 x CL2 65 / 2 x 3/8" liquid line, 2 x 7/8" gas line

Total length (m) Height difference (m)	6	20	30	40
0	0	-4	-5	-6
10	-	-4	-5	-6
20	-	-4	-5	-

DXA 48 + 2 x CL2 75 / 2 x 1/2" liquid line, 2 x 7/8" gas line

Total length (m) Height difference (m)	6	20	30	40	50
0	0	-5	-7	-8	-9
10	-	-5	-7	-8	-9
20	-	-5	-7	-8	-9
30	-	-	-7	-8	-

6 - CONNECTIONS

6.4 - Electrical connection

- The cable must be protected by a grommet.
- The electrical connections and wiring must be set up as shown on the electrical diagram included with the unit and in accordance with applicable codes and regulations.
- Make sure that electrical rating given on the unit's number plate matches that of the mains supply.
- The unit must be connected to earth and the electrical supply must always be powerful enough to supply the necessary power.
- Indoor and outdoor units each have their own power supplies.
- The electrical cable must be selected based on the necessary length, power, protection and operating mode, and in accordance with applicable codes and regulations.

► INDOOR UNIT electrical characteristics

3-PH/400 V + Earth + Neutral – 50 Hz

CW unit		CW 5	CW 8	CW 12	CW 16	CW 27	DXA 31/36	DXA 38/48
DXA unit		DXA 5	DXA 8	DXA 10	DXA 12/15	DXA 19/24		
Fan motor assembly	Voltage (V)	230 V						
	Capacity (kW)	1,036			1,029	2,072	2,058	3,087
	Current (A)	4,51			4,38	9,02	8,76	13,14
Control circuit (transformer)	Voltage (V)	24 V						
	Current (A)	1						
Humidifier (option)	Voltage (V)	400 V						
	Capacity (kW)	2,25			6			
	Current (A)	3,2			8,7			
Electric heater (option)	Voltage (V)	400 V						
	Capacity (kW)	3	6	9	12	18	24	
	Current (A)	4,3	8,7	13	17,3	26	34,6	
Total current without option	Current (A)	5,51			5,38	10,02	9,76	14,14
	Rating of main switch (A)	16						
Total current with humidifier only	Current (A)	8,71			14,08	18,72	18,46	22,84
	Rating of main switch (A)	16				25		
Total current with electric heater only	Current (A)	9,81	14,21	18,38	27,32	35,76	48,74	
	Rating of main switch (A)	16			25	40		63
Total current all options (Humidif + Elec. heater)	Current (A)	13,01	17,41	27,08	36,02	44,46	57,44	
	Rating of main switch (A)	16	25	40			63	

► OUTDOOR UNIT electrical characteristics

3-PH/400 V power supply + Neutral + Earth – 50 Hz

Refer to the instructions contained in the outdoor unit

To connect the Indoor/Outdoor unit, see the appendix at the end of the instructions.

7 - TECHNICAL CHARACTERISTICS

7.1 - 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.

EN 779-2012 efficiency: F7

ISO16890 efficiency: ePM1: 60%

Thickness: 48 mm

Efficiency: 85% opacimetric

Filtering area: 17 x face area with a thickness of 48 mm

Fire rating: M1

CW unit DXA unit	CW 5 DXA 5	CW 8 DXA 8	CW 12 DXA 10	CW 16 DXA 12/15	CW 27 DXA 19/24	DXA 31/36	DXA 38/48
Dimensions	508 x 465	604 x 465	700 x 465	945 x 565	945 x 400	945 x 565	945 x 500
Number	1	1	1	1	2	2	4

► Pressure drops - clean filters

CW unit DXA unit	CW 5 DXA 5	CW 8 DXA 8	CW 12 DXA 10	CW 16 DXA 12/15	CW 27 DXA 19/24	DXA 31/36	DXA 38/48
Nominal flow rate (m³/h)	1 300	2 000	2 500	4 000	6 000	8 000	12 000
ΔP (Pa) M5/ePM10 50%	33	49	55	53	58	53	58
ΔP (Pa) F7/ePM1-60%	35	53	59	57	63	57	63
ΔP (Pa) M5+F7(ePM10 50%+ePM1 60%)	-	-	-	110	121	110	121

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

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

7.2 - Cooling coil:

Note: Make sure that the chilled water supply pipes are insulated.

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

► Coil characteristics

CW unit		CW 5	CW 8	CW 12	CW 16	CW 27
Coil characteristics	Nominal water flow rate ⁽¹⁾ (m³/h)	1,1	1,4	1,67	2,57	3,7
	Capacity (l)	2,2	2,74	3,87	9,2	13,1
	KV valve	1,6	2,5	4	4	10
Fan characteristics	ΔPmax (Pa) 2-way valve	1200	400	400	600	600
	ΔPmax (Pa) 3-way valve	250	100	240	600	600

(1) Return air conditions 24 °C RH 50%, water temperature 7/12 °C

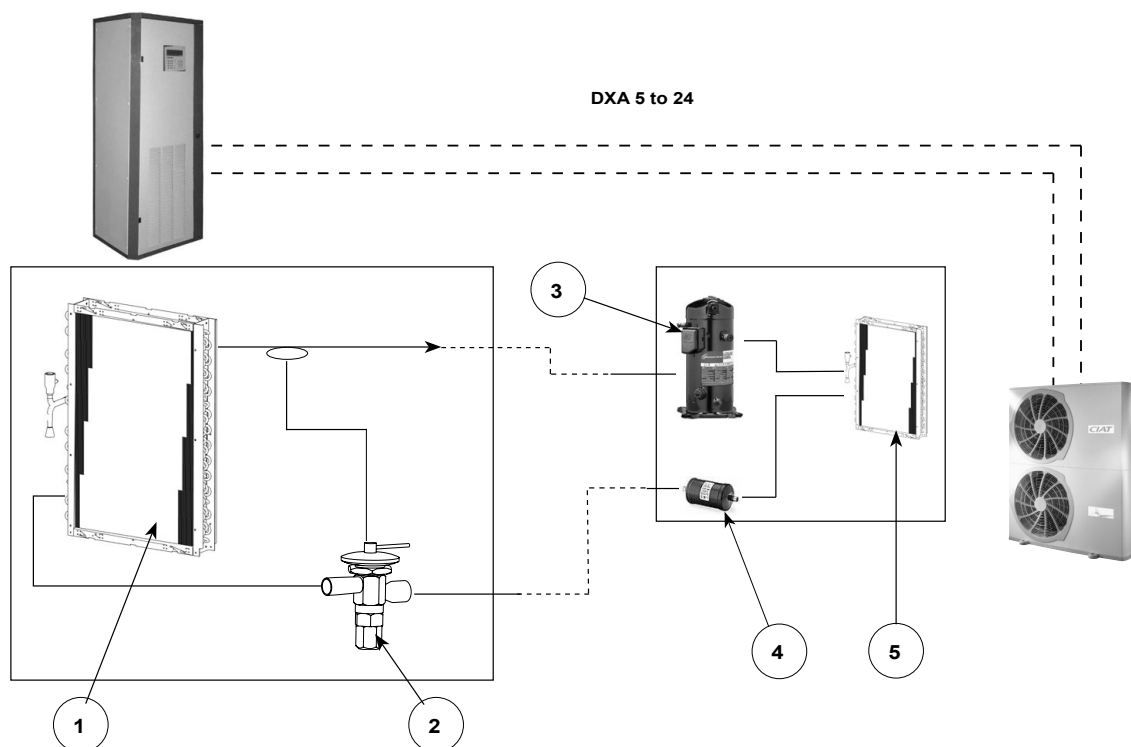
NOTE: Refer to your temperature range selection sheet for the technical information (capacity, water flow, pressure drops, etc.).

7 - TECHNICAL CHARACTERISTICS

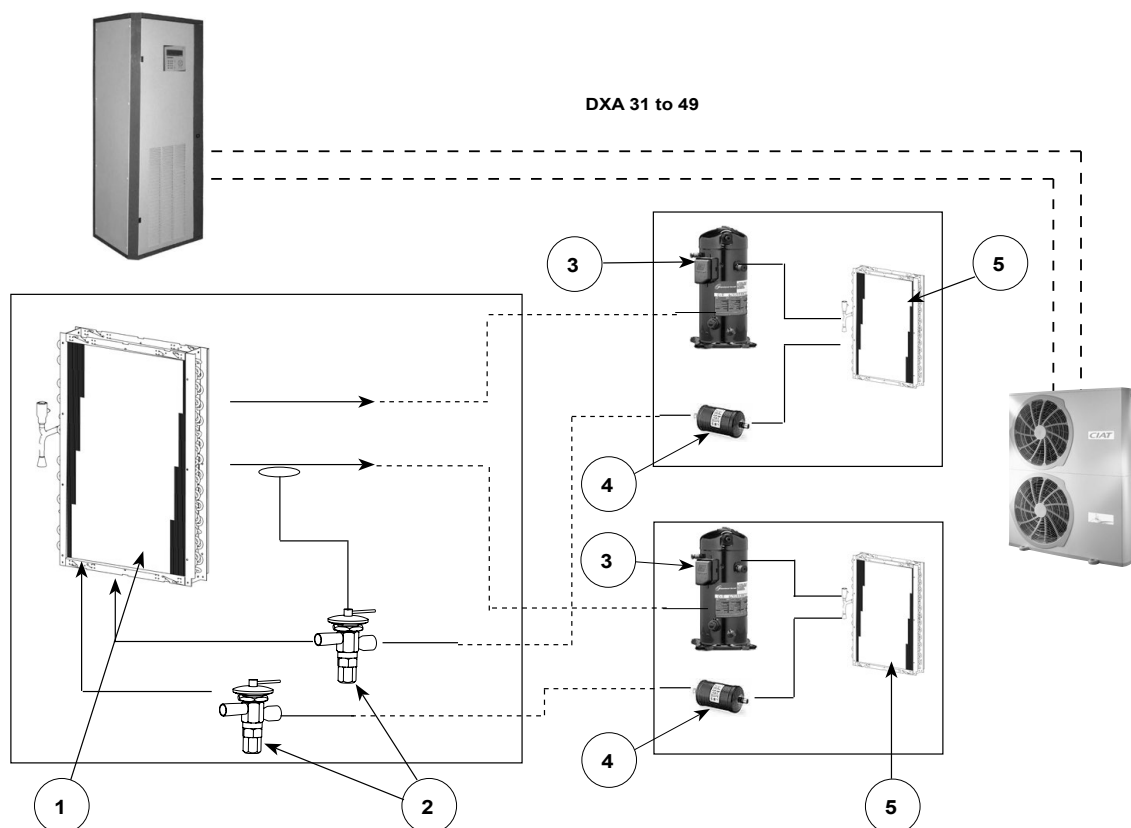
7.3 - 7.3 Refrigerating circuit:

DXA schematic diagram:

1 REFRIGERATING CIRCUIT



2 REFRIGERATING CIRCUITS



- 1 - Evaporator coil
- 2 - Thermostatic expansion valve
- 3 - Compressor

- 4 - Filter drier
- 5 - Condenser coil

7 - TECHNICAL CHARACTERISTICS

► R410A refrigerant charges:

Table 1

Charge in kg per circuit, distance between CABINET and CONDENSATION UNIT CL2 = 0 m

DXA cabinet	DXA 5	DXA 8	DXA 10	DXA 12	DXA 15	DXA 19	DXA 24	DXA 31	DXA 36	DXA 38	DXA 48
CL2 condensation unit	CL2 28	CL2 28	CL2 35	CL2 35	CL2 50	CL2 65	CL2 75	2 x CL2 50	2 x CL2 65	2 x CL2 65	2 x CL2 75
Charge in kg	1,69	1,69	1,952	1,952	3,134	3,68	3,894	3,334	3,38	4,38	4,594
Heater	OPTION	OPTION	OPTION	OPTION	STD	STD	STD	STD	STD	STD	STD
Crankcase ⁽¹⁾											

(1) Maximum charge without crankcase heater: 4.5 kg

Table 2

Charge in kg per circuit to be added according to distance between CABINET and CL2 outdoor unit

CL2 condensation unit	Distance (m)												
	1	3	6	9	12	15	20	25	30	35	40	45	50
28	0,055	0,165	0,33	0,495	0,66	0,825	1,1	1,375	1,65	1,925	2,2	2,475	2,75
35	0,058	0,174	0,348	0,522	0,696	0,84	1,16	1,45	1,74	2,03	2,32	2,61	2,9
50	0,061	0,183	0,366	0,549	0,732	0,915	1,22	1,525	1,83	2,135	2,44	2,74	3,05
65	0,07	0,21	0,42	0,63	0,84	1,05	1,4	1,75	2,1	2,45	2,8	3,15	3,5
75	0,101	0,303	0,606	0,909	1,212	1,515	2,02	2,525	3,03	3,535	4,04	4,545	5,05

On-site charge calculation per circuit = Table 1 charge + table 2 charge

7.4 - Heating coil and valve (optional)



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

► Coil and valve characteristics:

CW unit DXA unit		CW 5 DXA 5	CW 8 DXA 8	CW 12 DXA 10	CW 16 DXA 12/15	CW 27 DXA 19/24	DXA 31/36	DXA 38/48
Coil specifications	Nominal water flow rate ⁽¹⁾ (m³/h)	0,2	0,25	0,33	0,6	0,86	1,21	1,24
	Capacity (l)	0,56	0,67	0,78	1,67	2,35	3	4
Valve specifications	KV valve	1,6				4		
	ΔPmax (Pa) 2-way valve	1200				400		
	ΔPmax (Pa) 3-way valve	250	250	250	250	240	240	240

(1) Nominal flow rate water ΔT: 20 °C

NOTE: Refer to your temperature range selection sheet for the technical information (capacity, water flow, pressure drops, etc.).

7 - TECHNICAL CHARACTERISTICS

7.5 - Air flow rate setting (indoor unit)

The air flow rate can be adjusted directly on site on the controller:

- Parameter P155 (µAIR CONNECT 2 controller)
- No control, inside the electrics box.

► Min. air flow rate (m³/h) for EXPAIR™ CW with electric heater and/or humidifier

CW unit	CW 5	CW 8	CW 12	CW 16	CW 27
Min. air flow rate value (m³/h)	650	1000	1250	2000	3000

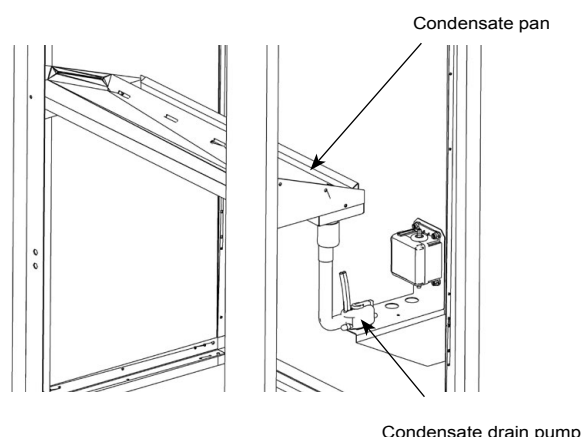
► Min. air flow rate (m³/h) for DXA unit

DXA unit	DXA 5	DXA 8	DXA 10	DXA 12	DXA 15	DXA 19	DXA 24	DXA 31	DXA 36	DXA 38	DXA 48
Min. air flow rate value (m³/h)	600	900	950	2 000	2 000	4 000	4 000	6 000	6 000	8 000	8 000

7.6 - Condensate drain pump (optional)

Characteristics:

- 230 V-50 Hz-35 W power supply
- Max flow rate: 30 l/h
- Max. discharge height: 10 m



Condensate drain pump

► Table of actual flow rates

The pressure drops defined in this table are calculated with a hose 6 mm in diameter	Discharge height (m)	Total pipe length			
		5 m (l/h)	10 m (l/h)	20 m (l/h)	30 m (l/h)
NPSH 0 m	1	29	27	25	23
	2	27,5	25,5	24	22
	3	25,5	24	22	20,5
	4	23,5	22	20	19
	5	21	19,5	18	16,5
	6		16,5	15	14
	7		14	12,5	11,5
	8		11,5	10	9
	9		9	7,5	6,5
	10		6	5	4

7 - TECHNICAL CHARACTERISTICS

7.7 - Humidifier (option)

The immersed-electrode humidifier is fitted with a microprocessor-based controller that adapts, within the allowable operating limits, to the physical and chemical properties of the water used.

Current passes through the water between the immersed electrodes, heating it to boiling point.

The water acts as an electrical resistance, ensuring continuity between the electrodes and a minimum of dissolved salts.

CW unit DXA unit		CW 5/8/12 DXA 5/8/10	CW 16/27 DXA 12/15/19/24/31/36/38/48
Make/model		KUE T1 COW21	KUE T2 COW21
Control voltage	V	24	24
Absorbed power in control circuit		Without 9 VA valve With 35 VA valve	
High power circuit voltage		3-PH/400 V	3-PH/400 V
Power circuit current	A	3,2	8,7
Protection rating	A	10	16
Max. steam flow rate	kg/h	3	8
Maximum capacity	kW	2,25	6
Factory steam flow rate setting	kg/h	CW 5/DXA 5: 1.5 CW 8/DXA 8: 1.9 CW 12/DXA 10: 2.4	CW 16/DXA 12/15: 3.9 CW 27/DXA 19/24: 5.7 DXA 31/36 : 7.7 DXA 38/48 : 8.0
Factory power setting	kW	CW 5/DXA 5: 1.13 CW 8/DXA 8: 1.45 CW 12/DXA 10: 1.80	CW 16/DXA 12/15: 2.88 CW 27/DXA 19/24: 4.32 DXA 31/36 : 5.75 DXA 38/48 : 6.00
Water supply pressure	bar	1 to 10	
Max. water supply flow rate	l/min	0,6	1,2
Conductivity of supply water	µS/cm	350 to 1250	
Hardness of supply water	TH in mg/l CaCO ₃	100 to 400	
Drain water flow rate	l/min	10	
Ø water supply		G 3/4 M	
Ø drain		32 M	
Weight	kg	2	3,3

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. (TH = 150 mg/l CaCO₃)



7 - TECHNICAL CHARACTERISTICS

7.8 - Electric heater (option)

► Characteristics:

Choice of electric heater per model

- Galvanised sheet metal panel
- Shielded, coiled finned tubing
- High-inertia heater element
- Power supply voltage: 400 V, 3-phase, 50 Hz
- Control: 2 stage or Triac depending on option selected.

CW unit DXA unit		CW 5 DXA 5	CW 8 DXA 8	CW 12 DXA 10	CW 16 DXA 12/15	CW 27 DXA 19/24	DXA 31/36	DXA 38/48
Voltage	V	400						
Capacity	kW	3		6	9	12	18	24
Current	A	4,3		8,7	13	17,3	26	34,6
Capacity	Stage 1 kW	3,0			6,0		12,0	
	Stage 2 kW	-			3,0		6,0	
Number of heaters x Capacity	Stage 1 kW	3 x 1			3 x 2		3 x 4	
	Stage 2 kW	-			3 x 1		3 x 2	
Total current	A	4,3		8,7	13	17,3	26	34,6

7.9 - Control

CIAT µAIR CONNECT 2 configurable controller. For adjustment and parameter setting, refer to the corresponding manual.



CIAT µAIR CONNECT 2

8 - COMMISSIONING



All operations on the refrigerant circuit must be carried out in accordance with the applicable environmental regulations.

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 cabinet is clean and free of foreign bodies,
- Check the electrical supply voltage and the ratings of the overload protections against the current ratings of each component,
- Check the height of the trap,
- Vent the air out of the coils via the bleed screws,
- Check the circuits for any leaks; retighten the valve if necessary,
- To configure the setpoints, refer to the μ AIR CONNECT 2 manual,
- The air flow rate can be adjusted manually using the inverter
- If a master/slave control system is used, make sure that the connection cable between the cabinets is in place.
- Evacuate the system to obtain -0.1 M Pa (-760 mm Hg),
- Fill with the required quantity of refrigerant fluid (for charges see the "Refrigerating circuit" section),
- Simulate a trip of the electrical components, controlled instruments and alarms.
- Check the current of each.

► **Standard components:**

- Temperature alarm,
- Air flow alarm,
- Condensation unit,
- Fan motor assembly

► **Optional components:**

- Temperature low limit alarm,
- Outer contact 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 ePM1 60% filter.

9 - MAINTENANCE

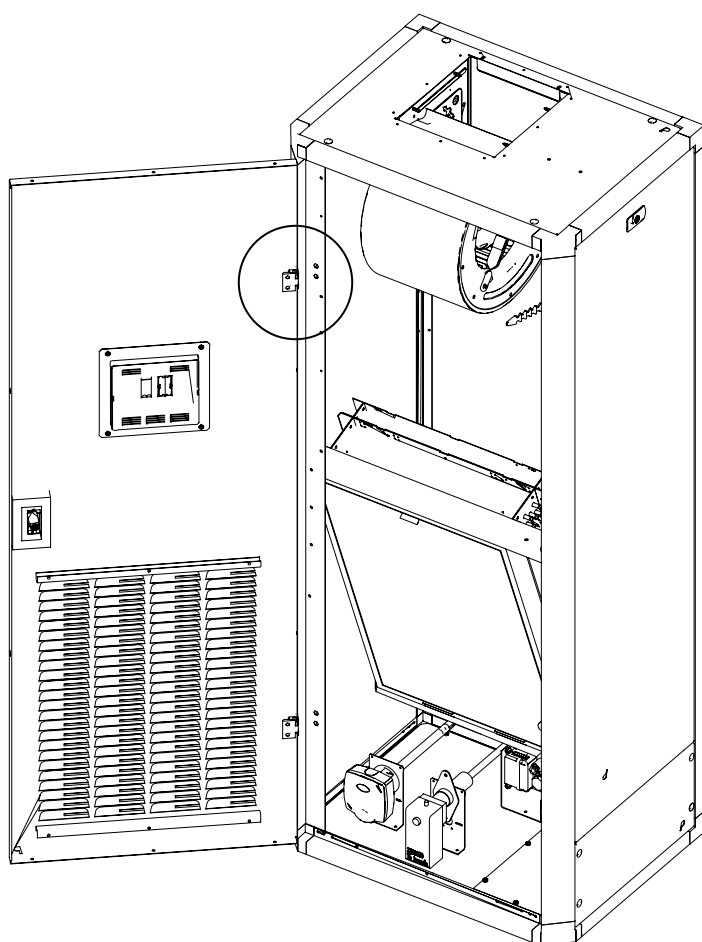
It is possible to remove the doors in order to facilitate access to the various components.

For dual doors:

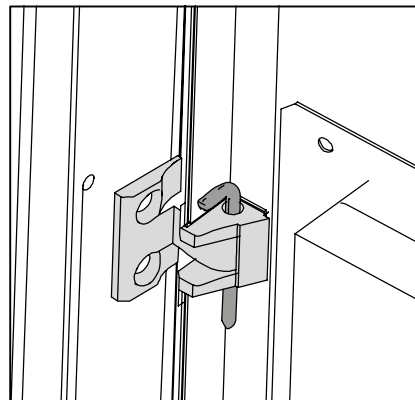
Open the left-hand door using the centre latch and lower the 2 right-hand door targets (for dual doors).

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

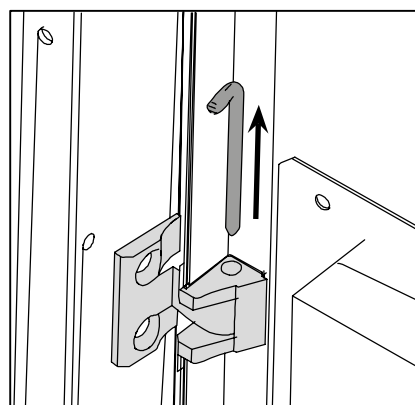
Lift off the door (detail C)



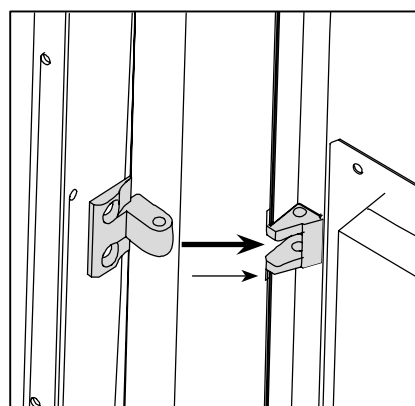
DETAIL A



DETAIL B



DETAIL C



9 - MAINTENANCE

9.1 - 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, even in the case of 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.

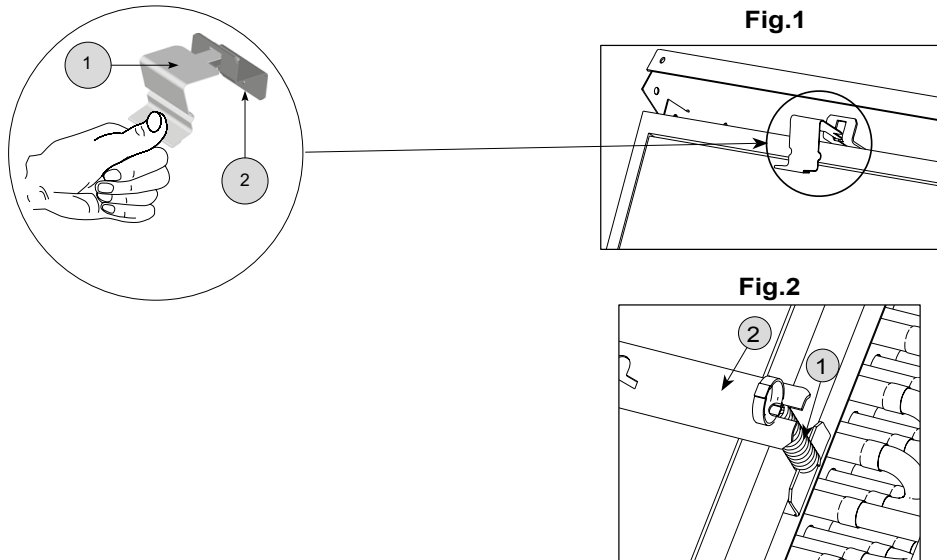
Turn off the unit.

Access the filters by opening the panels on the front.

For sizes CW 5/8/12, DXA 5/8/10 (Fig 1):

- Press the lug and pull it towards you (no.1) to unclip it and release the filter.

NOTE: The lug remains attached to the support bracket (no.2).



For other sizes (Fig.2):

- Remove the spring (no.1) from the runner (no.2).
- Remove the filters by moving the runner aside.
- Replace the used filters with new filters using cells fitted with a gasket. 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.

9.2 - 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.

9.3 - Electric heater

► Maintenance intervals

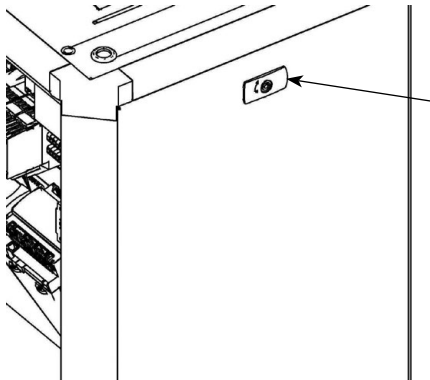
The electric heater requires very little maintenance. However, the following checks are necessary:

Visually inspect the heating elements, wires and connection cables after every 1500 hours of operation.

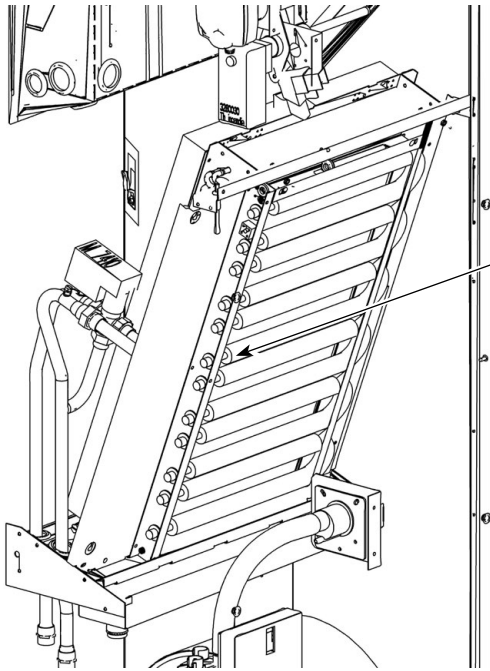
Check and retighten the connections once or twice a year.

9 - MAINTENANCE

► Cleaning procedure



To access the electric elements, remove the removable side panel by turning the latch a quarter turn



Accessing heating elements located behind the hydraulic coil.
Cleaning using an air nozzle.

To remove the heating elements:

- 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.

9.4 - Humidifier

► Maintenance

Clean the humidifier once a year and replace its tank.

► Cleaning or replacing the steam cylinder

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:

- Drain the tank completely via the manual drain programme actuated by the control (See extract from the control manual, 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.

9 - MAINTENANCE

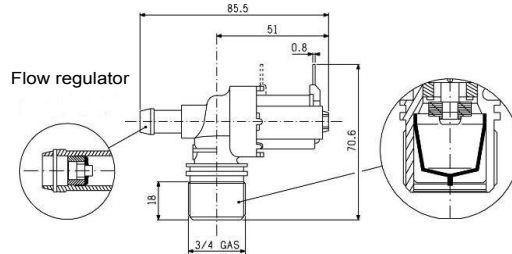
Procedure:

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.

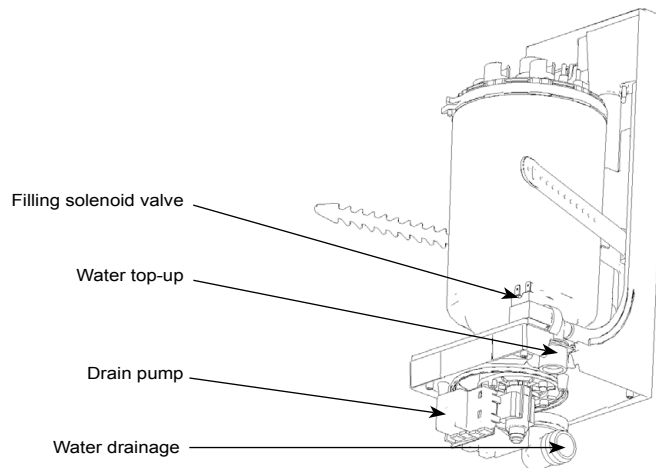
CHARGING UNIT



In case of a fault on the humidifier (no steam produced), check the water conductivity:

- it must be between 350 and 1250 μ S/cm.

If frequent descaling is necessary, check the water hardness. It should be 15°F < TH < 30°F

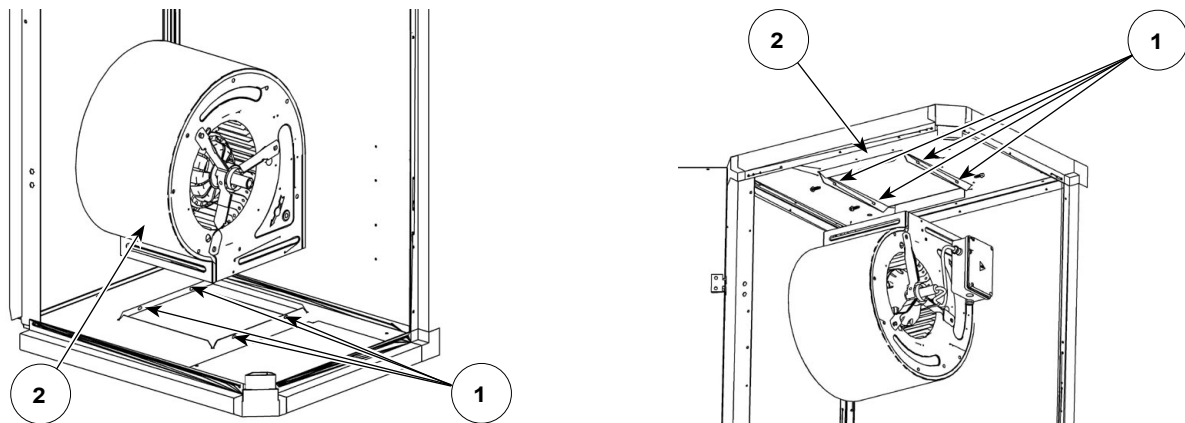


9.5 - Fan

Check and retighten the connections once a year.

► Removing the fan:

- Remove the 4 screws holding the fan in place (no.1) to separate it from the air supply panel (no.2).



9.6 - Electrics box

Retighten the connections once a year.

Visually inspect the components, wires and cables.

10 - SERVICE INTERVAL SUMMARY TABLE

Regular maintenance will keep the unit running at optimum performance. The values given in the table below are provided for guidance only. They do not take into account individual factors that can lengthen or shorten the unit's service life.

COMPONENT	AT COMMISSIONING	2-3 MONTHS	12 MONTHS
Filters		- Replace	-Replace
Cooling coil		- Clean	- Check and clean the condensate drains
Electric heater (option)	- Check the connections	- Clean	- Retighten the electrical connections - Check the components
Humidifier (optional) ⁽¹⁾	- Check the connections	- Check the condition of the cylinder, replacing it if necessary	- Retighten the electrical connections - Check the components - Check the condensate drains - Make sure that steam is evenly distributed
Fans	- Check the connections		- Retighten the electrical connections
Electrics box	- Check the connections	- Check correct operation	- Retighten the electrical connections
Hydraulic circuit	- Check correct operation		- Check the components
Water leak detection sensor and relay			- Check the components
			- Check the insulation
	- Check correct operation		
Filter pressure switch	- Check correct operation and setpoint adjustment	- Check correct operation and setpoint adjustment	- Check correct operation and setpoint adjustment
Thermostat and fire control relay	- Check correct operation	- Check correct operation	- Check correct operation
Valve	- Check circuit for correct operation and tightness		- Check correct operation
CL2 condensation unit	Refer to the corresponding instructions		

(1) 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.

11 - OPERATING READINGS

		Date/Hour				
Compressor	Extraction pressure (bar)					
	Extraction temperature (°C)					
	Condensation pressure (bar)					
	Condensation temperature (°C)					
Heat exchange coil	Gas/liquid inlet temperature (°C)					
	Gas/liquid outlet temperature (°C)					
	Air inlet temperature (°C)					
	Air outlet temperature (°C)					
Plate heat exchanger	Water inlet temperature (°C)					
	Water outlet temperature (°C)					
	Gas/liquid inlet temperature (°C)					
	Gas/liquid outlet temperature (°C)					
Rated voltage (V)						
Voltage at terminals (V)						
Compressor absorbed current (A)						
Fan motor absorbed current (A)						
Mechanical inspection: Tubes, fastenings.						
Electrical connection tightness check						
Outdoor coil cleaning						
Check the control						
Differential pressure switch						
Leak test						
Filter check						

12 - REGULATIONS



Declaration of Conformity UE

This unit complies with the provisions of European Directives:

- 2006/42/EC (Machinery)
- 2014/30/EU (EMC)
- 2011/65/EU (RoHS)
- Electronic Equipment Regulations 2012
- 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 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
- 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

13 - OUTDOOR UNIT(S) (CL2) ASSOCIATED WITH EXPAIR™ DXA

CL2 air-cooled condensation units are outdoor packaged units equipped as standard with:

- Low-noise scroll compressor.
- Air-cooled condenser.
- Axial fan(s) with variable speed control.

These are factory tested and supplied with an a nitrogen charge.

14 - RECEIVING THE EQUIPMENT

Check the unit for any damage or missing components upon delivery. Note any damaged or missing parts on the delivery slip.

IMPORTANT: You must notify the carrier of any damage and/or missing parts by registered letter within three days of the delivery date.

15 - EQUIPMENT IDENTIFICATION

Each unit has a name plate bearing an identification number.

Please state this number in all correspondence.

16 - WARRANTY

The warranty is effective for a period of 12 months from the date the unit is first commissioned into service provided said date occurs within three months of the invoice date.

It is effective for a period of 15 months from the unit invoice date in all other cases.

NOTE: For further information, refer to the application of the CIAT warranty.

17 - SAFETY RECOMMENDATIONS

To avoid the risk of accidents during installation, system start-up and adjustment operations, it is essential

- to take the specific characteristics of the equipment into consideration, including:
- Pressurised refrigeration circuit
- Presence of refrigerant
- Presence of voltage
- Location
- Temperatures up to 150 °C

Only experienced and qualified persons may work on this equipment. The recommendations and instructions given in the maintenance brochures and the special instructions on the labels must be followed.

Always comply with applicable standards and regulations.

IMPORTANT: before carrying out any work on the unit, make sure it is powered off.

18 - UNIT LOCATION

The installer must check the following points before handling, placing or connecting the unit:

- These units are intended for use outdoors, near a building, on a deck/patio or in a garden. Although it is rain resistant, it may be installed under a shelter with adequate ventilation on all four sides.
- The ground or surface on which the unit is placed must be strong enough to support the weight of the unit.
- Position the unit above the average snow depth for the region where the unit is installed.
- The unit must be perfectly level.
- Leave sufficient room around the unit to allow easy access for servicing and maintenance.

Sound level: our units are designed to operate quietly. However, as soon as you begin designing your system, you should take into consideration the outdoor environment in order to estimate the radiated noise and the building type in order to estimate the noise transmitted through the air and by solid materials (vibrations).

If in doubt, have an analysis performed by an acoustical engineer.

19 - WEIGHT AND HANDLING

Now that you have chosen a location for your unit, you may begin installing it. Take into account the weight and dimensions of the unit (see Technical characteristics table "Dimensions").



raise the unit carefully and keep it vertical.

20 - OPERATING LIMITS

The CL2 must be used within the following operating ranges:

	Minimum	Maximum
Outdoor temperature	-15 °C	+45 °C
Evaporation temperature	+20 °C	+12.5 °C

21 - TECHNICAL SPECIFICATIONS

CL2			28	35	50	65	75
Compressor	Quantity		1				
	Type		SCROLL				
	Oil capacity	I	1,25			1,7	
	Oil type		POE				
Refrigerant			R410a				
Refrigerant charge			Refrigerant not supplied (nitrogen charge)				
Crankcase heater power and current		W/A	40 W/0,17 A	45 W/0,2 A	45 W/0,2 A		
Coil type			Grooved copper tubes - aluminium fins				
Fan	Type		Propeller				
	Quantity		1		2		
	Nominal flow rate	m³/h	2350	2770	4700	5540	5000
	Speed	RPM	700	904	700	904	
Weight		kg	69	69	101	112	118
Refrigerant connections	Liquid line	inch	3/8"				1/2"
	Gas line	inch	5/8"	3/4"		7/8"	

22 - ELECTRICAL CHARACTERISTICS

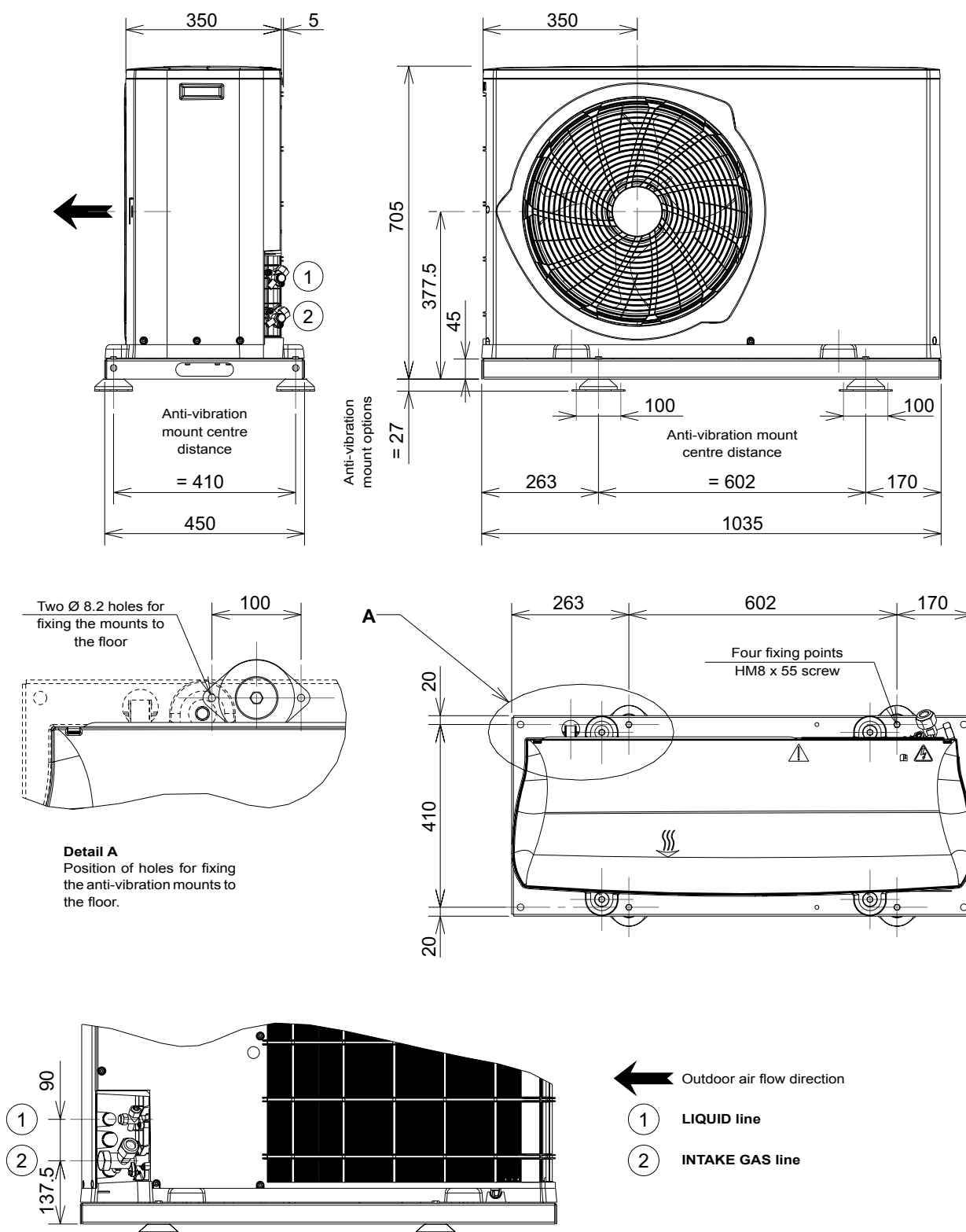
CL2			28	35	50	65	75
Compressor	Voltage		400 V - 3 Ph - 50 Hz				
	Maximum current	A	6,9	8,0	10,3	15,0	15,0
Fans	Maximum current	A	0,46	0,97	0,92	1,94	
Rated voltage of unit		V	400 V - 3 Ph+N - 50 Hz				
Total current		A	7,5	9,0	11,3	17,0	17,0
Starting current		A	38	43	65,5	75,5	102,5
Electrical cables not supplied ⁽¹⁾		mm²	5G1,5	5G2,5	5G4	5G6	5G6
Recommended rating for the proximity switch		Am	10		16	20	20

(1) Cable with 2 or 3 charged conductors in a raceway or duct, exposed mounting, for temperatures below 60 °C and a maximum length of 30 m.

Note: For different conditions, refer to the current standard in the country of installation (example for France: NFC 15-100).

23 - DIMENSIONS

23.1 - Models CL2 28 and 35

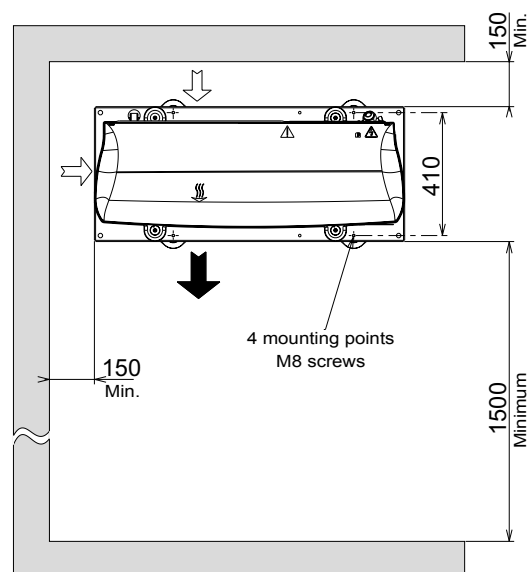
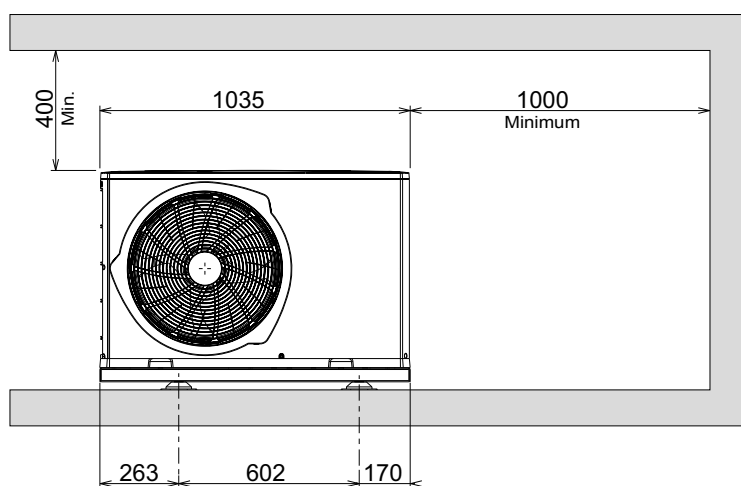


Anti-vibration mounts are fitted to the heat pump using 4 x HM8 screws, 55 mm in length.

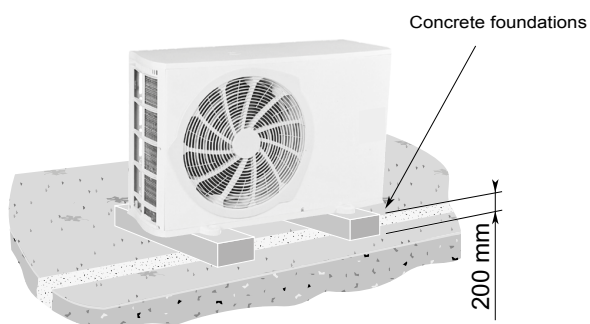
23.2 - Models CL2 50, 65 and 75



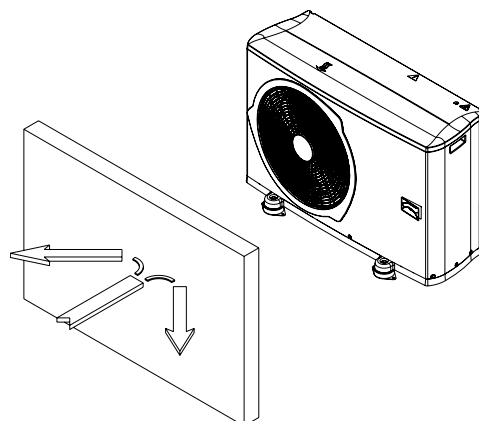
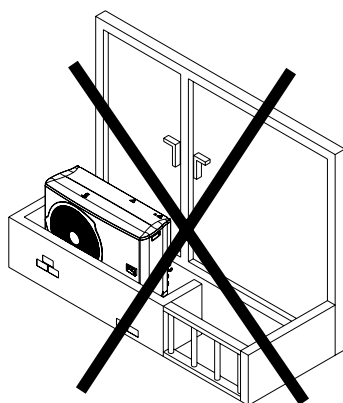
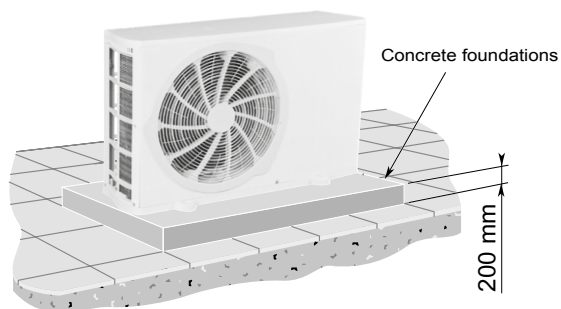
24 - INSTALLATION



Installation on soft ground



Installation on concrete ground



Nothing should obstruct the free flow of air over the air-cooled exchanger.
Adhere to the minimum distances shown above.
Protect from prevailing winds

25 - ELECTRICAL CONNECTIONS

CL2 units conform to the requirements of the European Low Voltage Directive and, more specifically, with those of international standards EN 60335-1, EN 60335-2-40, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3 and EN 61000-6-4.

Always disconnect the unit before attempting to wire connections.

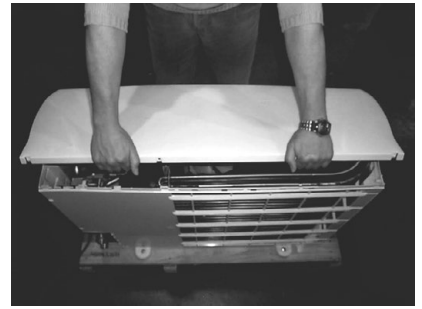
Open the roof as shown above, make the electrical connections as per the wiring diagram supplied with the unit and tighten the terminals.



remove the middle screw (rear section)



unclip at both ends



remove the roof

- The electrical characteristics of the mains supply must be identical to those on the name plate.
- The power supply must meet the requirements: $400\text{ V}_{-10}^{+6} \%$ 50 Hz for all models.
- All wiring must be connected in accordance with the regulations that apply to the installation site (e.g. NF C 15100 in France).
- The cable must be carefully chosen based on the maximum current of the unit (see table of electrical characteristics), the distance of the unit from the main supply point, the upstream protection and the neutral operating conditions.

IMPORTANT: Connect the unit to earth before making any other electrical connections.
A main cut-off switch must be installed on the unit.

Cable routing



Detail of electrics box supply

- External control input: this potential-free (dry) contact positioned between terminals 1 and 2 is used to start the compressor
 - contact closed = on
 - contact open = off

To avoid damage to the compressor, the number of on/off cycles must not exceed 10 per hour.

Information to be taken into account for the contact quality: the current passing through it is 35 mA at 230 V.

- Fault reporting outputs: They indicate that one of the 2 pressure switches has been deactivated.

Contact characteristics:

- Minimum current: 10 mA
- Minimum voltage: 10 V
- Charge: 4000 VA for AC1, 750 VA for AC15

26 - SETTING THE CONTROL AND SAFETY DEVICES

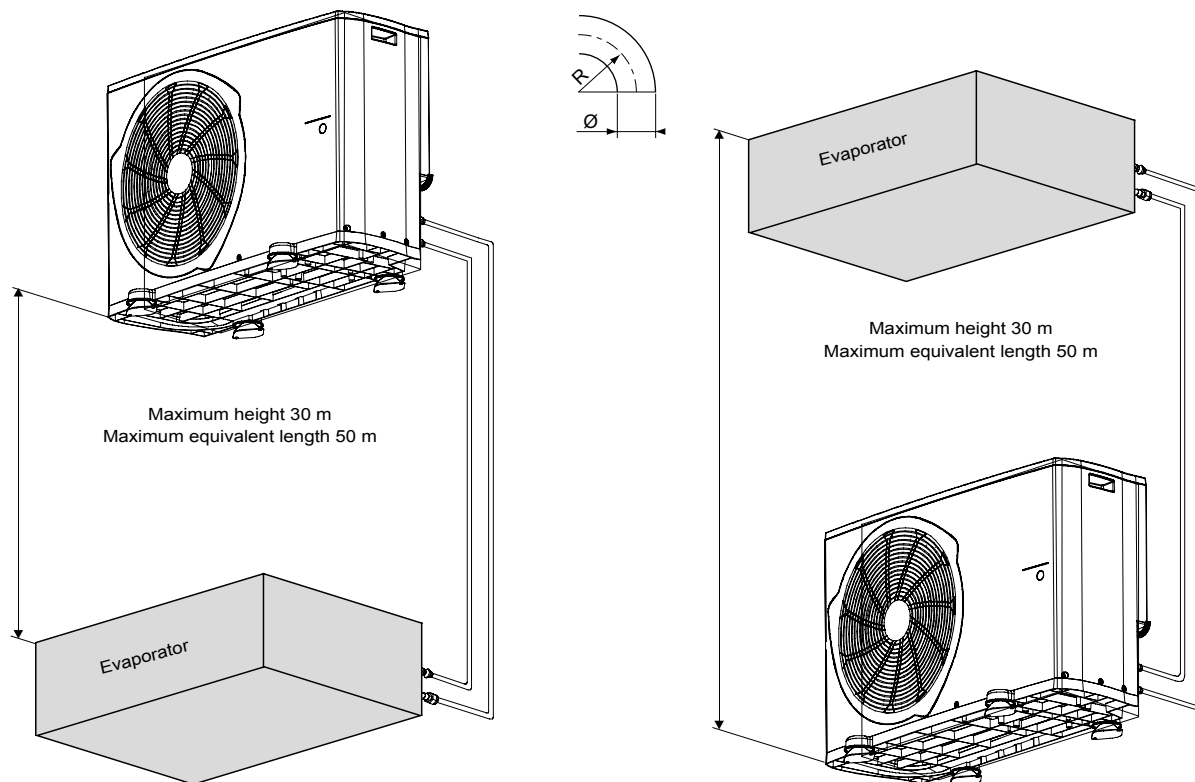
High pressure switch with manual reset: deactivated at 41.5 bar

Low pressure switch with automatic reset: deactivated at 2.5 bar/activated at 4.5 bar

Condensation pressure control: 24 bar regulation (factory setting)

27 - REFRIGERANT CONNECTIONS

Once the outdoor and indoor units have been installed, the refrigerant connections must be made to link the units. When doing this, apply the installation standards and carefully study the pipe diagram, ensuring the shortest distance and the smallest number of elbows. Likewise, avoid restrictions by ensuring the shallowest possible curves on the elbows (curve radius greater than $3.5 \times \varnothing$).



To calculate the equivalent length, take into account the accessories pressure drops.

Equivalent elbow lengths at 90°:

Pipe diameter (inches)	3/8"	1/2"	5/8"	3/4"	7/8"
Equivalent length (m)	0,35	0,45	0,55	0,65	0,70

► Preparing the pipes

For refrigerant pipes, only use refrigeration grade copper tubes (Cu-DHP type in accordance with standard ISO 1337), insulated, degassed and deoxidised, suitable for an operating pressure of at least 4200 kPa and minimum burst pressure of 20,700 kPa. Domestic water type copper pipes must never be used.

- Smooth the ends of the pipes by inclining them downwards. Make sure there is no contamination inside the pipes.
- Remove the flare nuts from the unit and place them on the pipe. Flare the ends of the pipes
- Characteristics of a properly flared pipe:
 - Smooth, polished inner surface.
 - Polished, even outer edges.
 - Conical flare, uniform length.
- Insulate the two pipes.

► Connecting the units

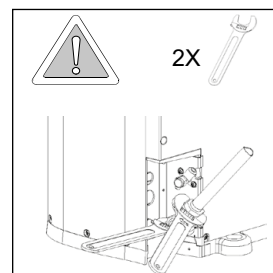
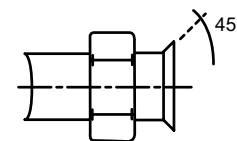
- Connect the two units.

For the CL2, tighten the flare unions using two wrenches.

If these two wrenches are not used, there is a risk of breakage, which will void the warranty.

- Tighten the pipes to the correct torque given in the table below. An insufficient tightening torque may result in gas leaks, while an excessive torque may damage the pipe flare and allow gas to escape.

Pipe diameter		Minimum pipe thickness	Tightening torque
mm	inch	mm	Nm
9,52	3/8"	0,80	30
12,70	1/2"	0,80	40
15,87	5/8"	0,89	60
19,05	3/4"	1,00	80
22,22	7/8"	1,20	100



27 - REFRIGERANT CONNECTIONS

Since it is forbidden to discharge R410A into the atmosphere (standard NF EN 378-2 paragraph 6.3.4.1), R410A may not be used in pressure tests on the refrigerant connections.

- Remove the plugs from the CL2 shut-off valves and open the valves (anticlockwise).

Shut-off valve plugs



- Refit the plugs on the shut-off valves.
- Use the charging valve (Schrader) on the CL2 to fill the outdoor module, two refrigerant pipes and evaporator with nitrogen and helium (if you have a helium detector) up to a pressure of 10 bar.
- Check all the connections for leaks

R410A evacuation and charging

- Evacuate the pressure from the circuit.
- Connect the manifold to the gas charging valve (Schrader) on the CL2. Connect the vacuum pump.
- Evacuate the CL2, the two pipes and the evaporator to obtain a value of -0.1 Mpa (-76 cm Hg).
- Turn off the vacuum pump and make sure the pressure remains stable for five minutes.
- Disconnect the vacuum pump.
- Connect the R410A canister to the manifold, without tightening it.
- Open the valve on the R410A canister momentarily to drain the hose.
- Tighten the union on the manifold.
- Open the tap on the R410A canister to break the vacuum in the installation.
- Disconnect one of the wires from the low-pressure pressostat.
- Before starting up the compressor, check that the operations below have been carried out:
 - Electrical connection (check that all the connections are correctly tightened and that the voltage is stable and in accordance with the data on the manufacturer's data plate).
 - Connecting the refrigeration lines.
 - Pressure test.
 - Evacuation.
- To charge with R410A fluid, if it is not possible to fill the unit with all of the charge with the compressor off, power up and start the compressor (close the contact on the external control input):

For CL2 connected to CIAT air handling units:

CL2 units are not pre-charged. To the charge indicated in the CIAT air handling unit manual, add the charge from the outdoor module plus the additional charge, depending on the length of your pipes below.

CONDENCIAT CL2	Outdoor module charge (kg)	Additional charge (g/m)
28	1,6	55
35	1,6	58
50	2,65	61
65	2,75	70
75	3	101

Example: for 3 metres of pipes between the CL2 50 and the indoor unit, the additional charge will be 3x61g.

For other configurations:

Top up the charge by checking the overheating and the subcooling. Values normally used:

- Overheating: 5 to 6K
- Subcooling:
 - 3 to 4K for an evaporation temperature of 10°C
 - 6 to 9K for an evaporation temperature of 0°C
- Once charging is complete, close the tap on the R410A canister.
- Stop the compressor and power off. Rewire the low pressure switch.
- Remove the charging device.

28 - COMMISSIONING

- You can now restart the equipment and check that it is operating correctly.
- Check the safety components.

It is recommended to note the operating readings (table below) for the equipment, indicating the serial number and all other required data that appears on the identification plate. This enables the system efficiency to be checked and faults prevented.

		Date/Time			
CL2 operating readings System start-up date: Serial No.: Installer: Site of installation: Model: 28 <input type="checkbox"/> 35 <input type="checkbox"/> 50 <input type="checkbox"/> 65 <input type="checkbox"/> 75 <input type="checkbox"/>					
Compressor	Suction pressure	bar			
	Intake temperature	°C			
	Condensation pressure	bar			
	Condensing temperature	°C			
Air-cooled condenser	Gas inlet temperature	°C			
	Liquid outlet temperature	°C			
	Air inlet temperature	°C			
	Air outlet temperature	°C			
Nominal voltage		V			
Voltage at terminals		V			
Motor(s) input current		A			
Mechanical inspection: Tubes, fastenings.					
Electrical connection tightness check					
Clean the coil					
Control check					

29 - CARE AND MAINTENANCE

Before working on the unit, disconnect it from its electrical power source. For units equipped with orange terminals, raise all the orange breaking devices and cut the 2 circuit breakers.

- Compressor:
 - The compressor is fastened to the platform by four dia. 8 mm screws.

Warning: Do not tighten these screws to a torque of more than 13 Nm.

If you do not have a torque wrench, tighten them until they are snug then tighten a further $\frac{3}{4}$ turn.

Recommendations:

Take the operating readings and perform the checks (listed in the table § 27) at least once a year.

To ensure your unit runs smoothly and to obtain service under the warranty, take out a maintenance contract with your installer or an approved maintenance company.

With the system running, check it thoroughly for any abnormal visual signs or noises.

Make sure there are no traces of oil around the unit.

Specific details and mandatory checks relating to the use of refrigerant fluid

In accordance with Regulation (EC) No. 842/2006 on certain greenhouse gases.

R410A refrigerant fluid is a gas which has the following impact on the environment:

- 1/ No impact on the ozone layer: ODP (Ozone Depletion Potential) = 0.**
- 2/ Impact on the greenhouse effect: GWP (Global Warming Potential) = 2088.**
- Users must have units containing over 3 kg of refrigerant periodically checked for leaks by qualified personnel (2 kg in France, decree and order of 7 May 2007). Regardless of the refrigerant charge in your system, CIAT requires that this check be carried out in order to keep your system in good working order.
- Users of any system containing over 3 kg of refrigerant (2 kg in France) are required to keep a log of the quantities and types of refrigerants used, added or recovered, and to include the dates and results of leak checks. The name of the technician and his company must also be recorded. The manufacturer strongly recommends keeping such a log even if the refrigerant charge of your system does not require one.
- A leak check must be carried out one month after any leak repairs.
- System users are responsible for collecting used refrigerant and having it recycled, regenerated or destroyed.

Mandatory check each year

Detection of leaks on the refrigerating circuit.

Clean the coil:

- Remove the unit's cover (see procedure in electrical connection section).
- Using a vacuum cleaner, carefully clean the coil and the entire blower compartment.
- Put the cover back in place.

Clean the unit's pan.

30 - TROUBLESHOOTING

IMPORTANT: When carrying out repairs, always use original parts, paying particular attention to their installation, as all parts must remain in their original positions.

Symptom	Cause	Solution
Condensation temperature too low	a) Insufficient gas b) Obstacle in the expansion component	a) Look for leaks and top up the charge b) Check the expansion valve
Condensation pressure too high compared to the discharge air, high pressure alarm	a) Insufficient air flow b) Air intake temperature too high c) Condenser fouled (no exchange) d) Excessive refrigerant charge (condenser flooded) e) The condenser fan is faulty f) Air in the refrigerating circuit	a) Check the condenser fan b) Check the condensation regulation setting c) Clean it d) Bleed e) Repair f) Bleed
The compressor does not start	a) Power supply fault b) The contacts of a control components are open c) Contactor coil blown d) Internal electronic thermistor thermostat open	a) Check the differential and fuses b) Check the safety chain c) Replace it d) Wait for the restart and check the input current
The compressor does not start, the motor makes an intermittent noise	a) Network voltage very low b) Power supply cable disconnected	a) Check the line voltage and locate the voltage drop b) Check the connections
The compressor stops and starts repeatedly	a) External control contact cycling too rapidly a) Insufficient gas. c) Evaporator fouled d) The evaporator fan or accelerator pump is not working. e) Expansion device damaged or blocked by impurities f) Dehumidifier filter blocked.	a) Adjust the control (increase the control differential) b) Look for the leak and recharge the equipment c) Clean it d) Repair or replace it e) Replace it f) Replace it
The compressor is noisy	a) Mounting loose b) Insufficient oil c) Noise inside the compressor	a) Retighten b) Add oil to the recommended level c) Replace it
Noisy operation	a) unit installed without anti-vibration protection	a) Place the base on anti-vibration mountings
Evaporation pressure too low.	a) Insufficient flow rate in the evaporator b) Evaporator frozen (for air evaporators) c) Expansion valve blocked a) Insufficient gas e) Condensation temperature very low f) Evaporator fan or accelerator pump faulty	a) Check the flow rates b) Check the defrosting c) Remove and clean the expansion valve d) Look for the leak and top up the charge e) Air temperature in the condenser very low (air flow rate very high), adjust the flow rate using the CL2 control board f) Repair it

