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condensciat CL2

Instruction manual



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1 - INTRODUCTION

The standard **CONDENCIAT CL2** are outdoor air cooled condensing units equipped with :

- Low-noise scroll compressor.
- Air cooled condenser
- Axial flow fan or fans with speed regulation.

All units are factory checked and tested ; they are supplied with a full R 410A refrigerant charge.

2 - INCOMING GOODS

Check the unit and the conformity of the delivery on arrival.

If the unit has been damaged or if the delivery is incomplete, express all necessary reservations on the delivery note.

IMPORTANT: You must confirm these reservations to the shipping company by registered letter within three days following delivery.

3 - IDENTIFICATION OF THE EQUIPMENT

A manufacturer's data plate is fitted on each unit, with an identification number.

The number must be mentioned in all correspondence.

4 - GUARANTEE

The guarantee covers a period of 12 months after commissioning, if this occurs within the 3 months following the invoicing date.

In all other cases, it covers a period of 15 months after invoicing date.

NB : For further details, refer to the document concerning the CIAT guarantee.

5 - SAFETY RECOMMENDATIONS

To avoid all risks of accidents at the time of installation, starting-up and adjustment operations, it is essential to take into consideration the specific aspects of the equipment such as:

- Refrigerant circuit under pressure
- Presence of refrigerant
- Presence of electrical voltage
- Location
- Temperatures up to 150°C

Only experienced, qualified persons can work on this type of equipment. It is essential to comply with the recommendations and instructions mentioned in the maintenance manuals, on labels or specific instructions.

All standards and regulations in force must be complied with at all times.

IMPORTANT: before carrying out any work on the unit, make sure that it has been disconnected from power supply.

6 - UNIT LOCATION

Before handling, installing and connecting the unit, the installer must check the following points:

- These units must be installed in the open air, close to the building, on a flat roof or in a garden. They are designed to operate in the rain, but can also be installed under a four-side open shelter.
- The surface of the ground or the structure must be strong enough to bear the weight of the unit.
- Place the unit above the average snow depth for the region where the unit is being installed.
- The unit must be set perfectly level.
- The unit must be fully accessible to enable servicing and maintenance work to be carried out easily.

Noise level: our units have been designed to operate at low noise levels. Nonetheless, it is necessary to make sure, at the installation design stage, that the outside environment is suitable for radiated noise and that the type of building is suitable for airborne and solid-borne noise (vibrations).

Have a study carried out by an acoustician if necessary.

7 - WEIGHT AND HANDING

Once the location has been selected for the unit, install the equipment. Take the weight and the overall measurements of the unit into account (see the technical characteristics table and the «Dimensions» paragraph).

Attention: lift the unit carefully and keep it upright at all times.

8 - OPERATING LIMITS

The CL2 has to operate within the limits below :

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

9 - TECHNICAL CHARACTERISTICS

CONDENCIAT CL2		28	35	50	65	75	
Compressor	Number	1					
	Type	SCROLL					
	Oil capacity	l	1.25		1.7		
	Type of oil	POE					
Refrigerant		R410a					
Refrigerant weight	Kg	1.6		2.65	2.75	3	
Crankcase heater Power and current	W/A	45W / 0.2A Option (1)		45W / 0.2A			
Type of coil		Grooved copper tubes - aluminium fins					
Fan	Type	Hélicoid					
	Number	1		2			
	Nominal air flow	m³/h	2350	2770	4700	5540	5000
	Rpm		700	904	700	904	
Weight	Kg	69	69	101	112	118	
Refrigerant connections	Liquid line	inches	3/8"			1/2"	
	Gas line	inches	5/8"	3/4"		7/8"	

10 - ELECTRICAL CHARACTERISTICS

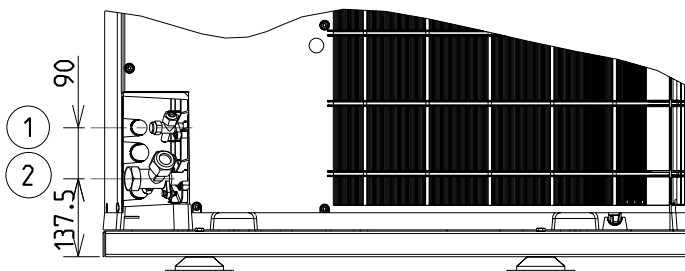
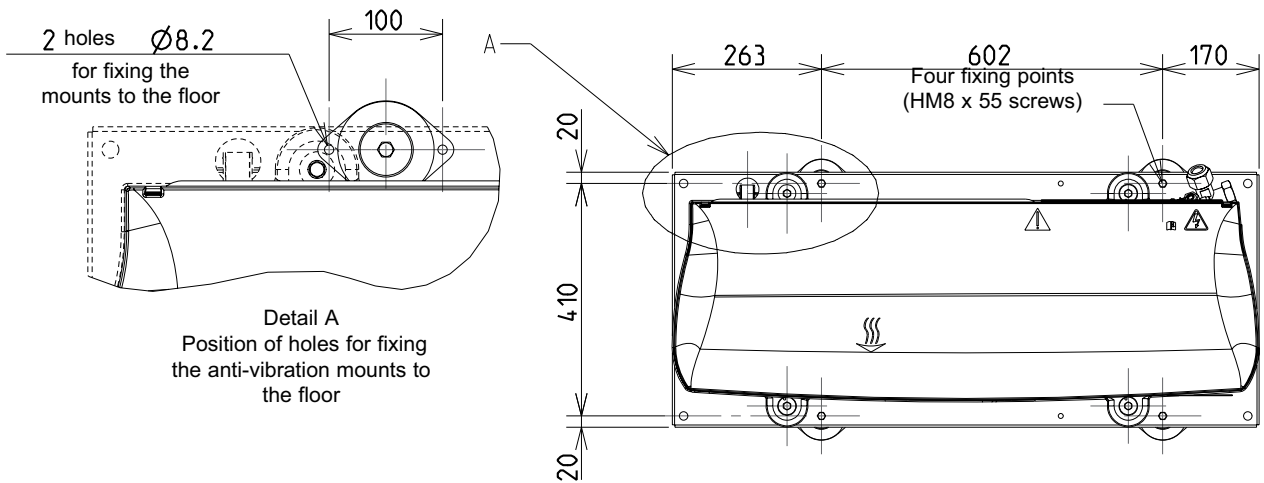
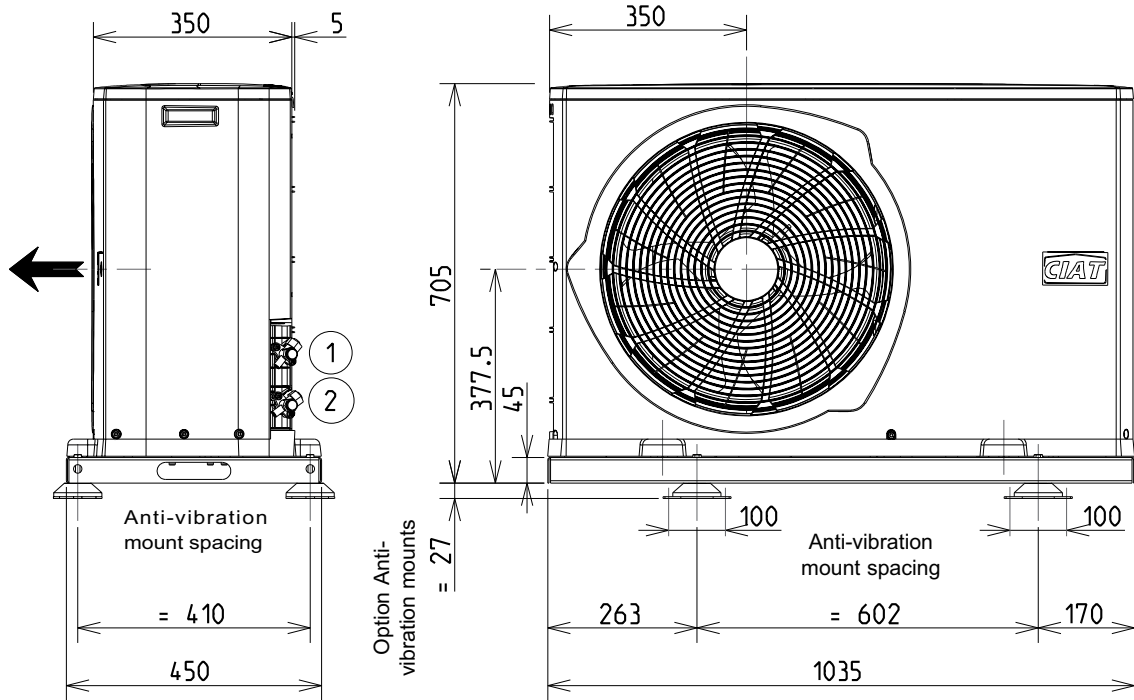
CONDENCIAT CL2		28	35	50	65	75	
Compressor	Voltage	400 V - 3 Ph - 50 Hz					
	Maximum operating current	A	6.9	7.6	10.3	11.2	14.3
Fans	Maximum operating current	A	0.46	0.97	0.92	1.94	
Unit nominal voltage		V	400 V - 3 Ph + N - 50 Hz				
Total intensityNominal unit voltage	A	7.5	8.7	11.3	13.3	16.4	
Starting current	A	36	49	65.5	75.5	102.5	
Electrical cables not supplied *	mm²	5G1.5	5G2.5	5G4		5G6	
Recommended rating for proximity lockable switch	Am	10		16		20	

* 2 or 3-wire cable, under visible duct or channel, for temperatures of less than 60°C, and for a maximum length of 30 m.

Note: for different conditions, refer to the standard in force in the country of installation

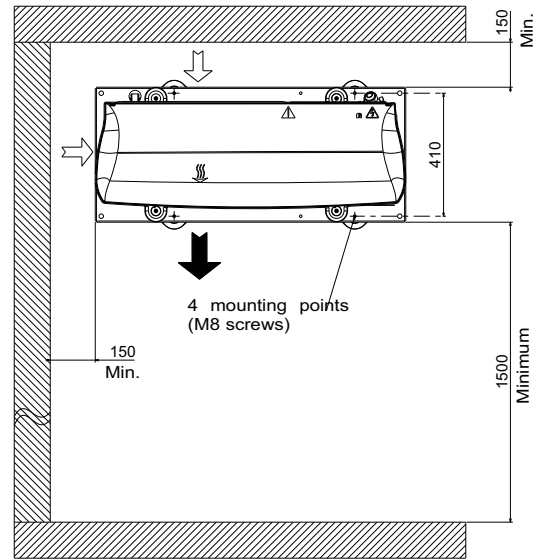
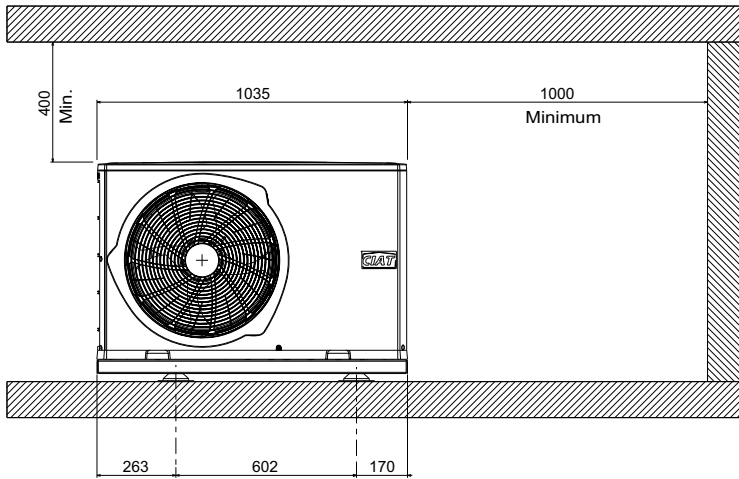
11 - DIMENSIONS

Condenciat Models CL2 28 and 35

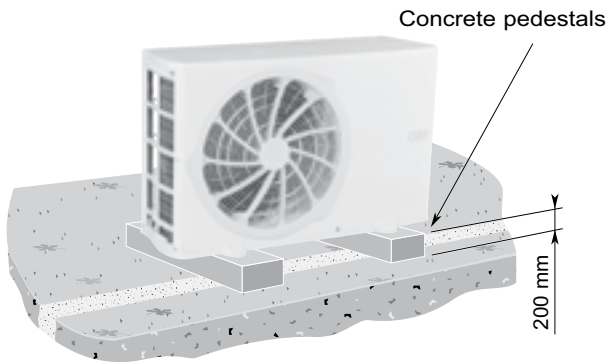


- ← External air flow
- ① LIQUID Line
- ② SUCTION Gas Line

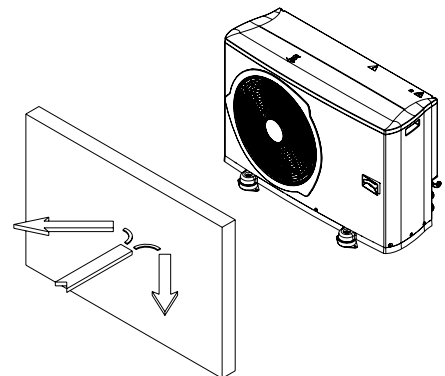
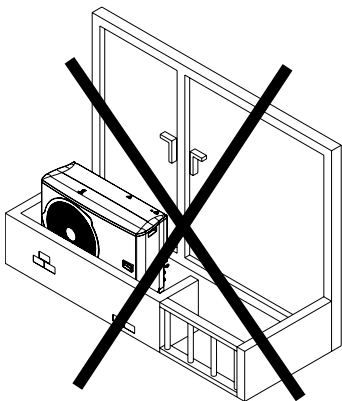
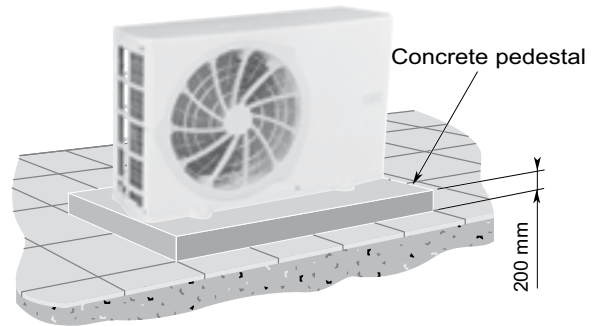
12 - INSTALLATION



Installation on loose ground



Installation on a concrete basement



There must be no obstacles preventing free air circulation around the air heat exchanger. Follow the minimum distances given above. Avoid prevailing winds.

13 - ELECTRICAL CONNECTIONS

The **CONDENCIAT CL2** units are designed in conformity with the low voltage directive and more specifically in compliance with the 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. When making the electrical connections, disconnect the unit from the power supply before carrying out any handling work. Open the top of the unit as shown below and do the electrical connections in accordance with the supplied wiring diagram, and tighten the terminals carefully.



Remove the central screw
(at the back)



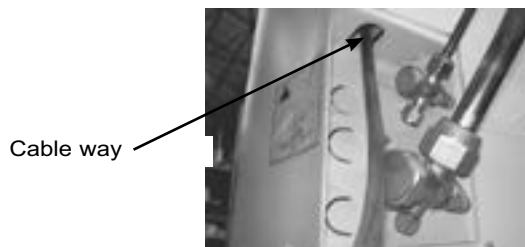
Unclip at each end



Remove the cover

- The electrical characteristics of the available power supply available must correspond to the values shown on the manufacturer's plate.
 - The electrical power must meet the following requirements for all the models:
 $230\text{ V } \begin{matrix} +6 \\ -10 \end{matrix} \% 50\text{ Hz}$ or $400\text{ V } \begin{matrix} +6 \\ -10 \end{matrix} \% 50\text{ Hz}$
 - All the wiring installations must be made in accordance with the regulations in force on the site of installation (in France, NF C 15100).
- The appropriate cable must be selected depending on the maximum current absorbed by the unit (see the electrical characteristics table), the distance between the unit and the starting point of the power supply, the protection upstream, the operating system used for the neutral terminal.

IMPORTANT : Connect the earthing circuit before making any other electrical connections.
The installation must be fitted with a master isolating switch.



Detail for the supply of the electrical panel

- Input for external control : this potential-free contact positioned between terminals 1 and 2 is used to start the compressor
 - closed contact = run
 - open contact = stop

To avoid damaging the compressor, do not exceed 10 ON / OFF cycles per hour

Data to be taken in account for the quality of the contact : the current which goes through is 35 mA under 230V.

- Fault outputs: they indicate the actuation of one of the 2 pressure switches.

Contacts characteristics :

- Minimum current : 10 mA
- Minimum voltage : 10 V
- Load : 4000 Va in AC1, 750 VA in AC15

14 - SETTING OF SAFETY AND CONTROL DEVICES

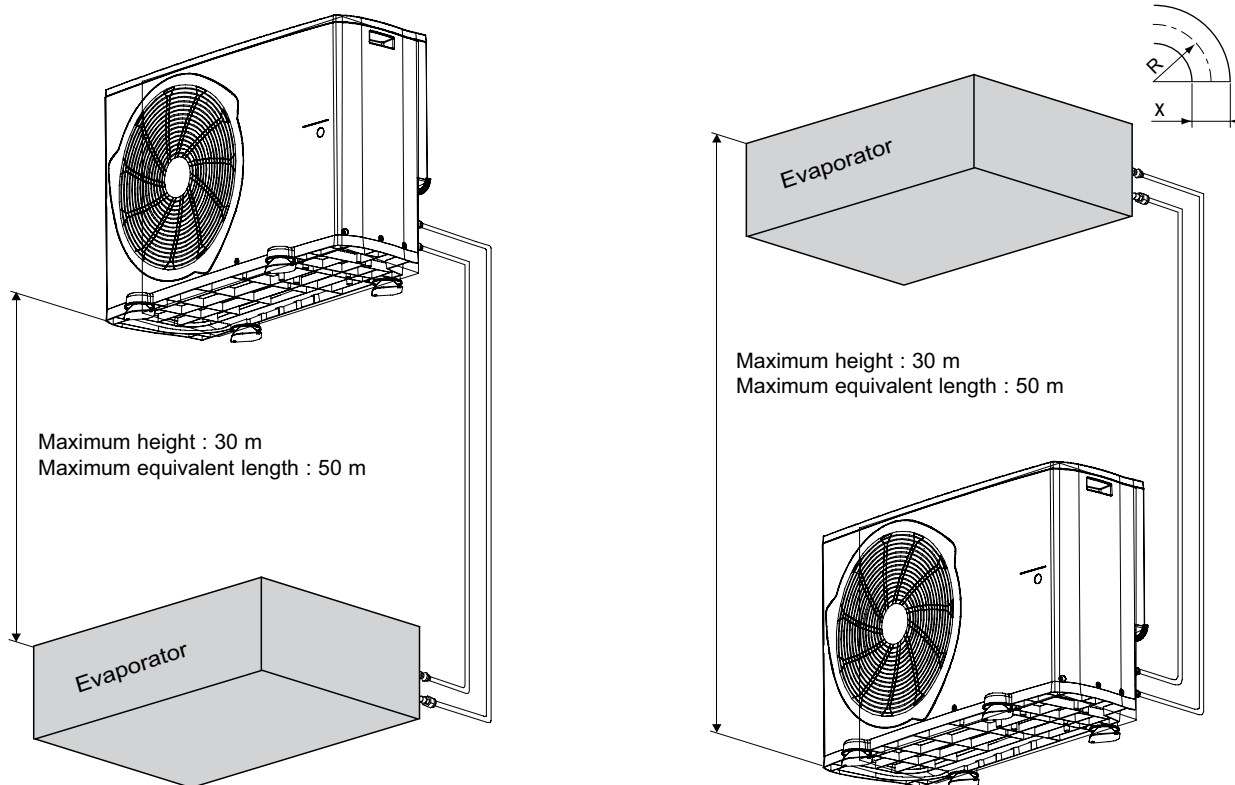
High pressure switch, manual reset : start at 41.5 bars.

Low pressure switch, automatic reset : actuation at 2.5 bars / release at 4.5 bars.

Condensing pressure control : control at 24 bars (factory setting).

15 - REFRIGERANT CONNECTIONS

Once the indoor and outdoor units are positioned, the refrigerant connections must be carried out to connect the units. Installation norms must be respected and the pipe lay-out carefully studied, trying to get the smallest distance between both split units and the smallest number of curves as possible. The elbow angles must be as wide as possible.. (Bend Ratio must be $\geq 3.5 \times \varnothing$) :



To calculate the equivalent pipe length, pressure drops on accessories must be taken into consideration.

Equivalent Length for 90° elbows:

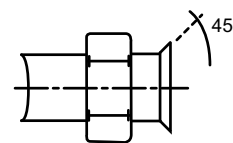
Pipe diameter (inches)	3/8"	1/2"	5/8"	3/4"	7/8"
Equivalent length (m)	0.35	0.45	0.55	0.65	0.70

Pipe preparation

For refrigerant lines, use only copper refrigerant type tubing (Cu DHP type according to the ISO 1337 norm) insulated, cleaned and deoxidized, adapted to an operating pressure of at least 4200 kPa and a minimum bursting pressure of 20700 kPa. Use of sanitary copper piping is prohibited.

- Smooth the tube ends, tilting them downward. Be sure that no dust is introduced inside the tube.
- Remove the Flare nuts from the unit connector. Insert them through the pipe. Flare the pipe ends.
- A proper flare must have the following characteristics :
 - * Smooth and polished internal surface
 - * Even and polished outside edges surface
 - * Even length conic flare

Insulate both pipes.



Connection of the units

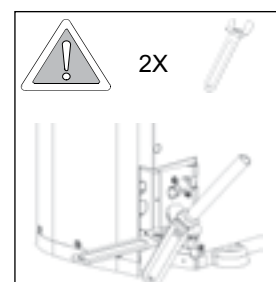
- Connect both units

For the CL2, tighten the flare connectors with 2 spanners.

If 2 spanners are not used, a breaking may happen, and the product guarantee will be lost.

- Tighten with the torque indicated in the following chart. In case of insufficient torque a refrigerant leakage may occur. On the other hand, an excessive torque may damage the flare connection and a leakage may also occur.

Pipe diameter		Minimum pipe thickness	Torque
mm	(inches)	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



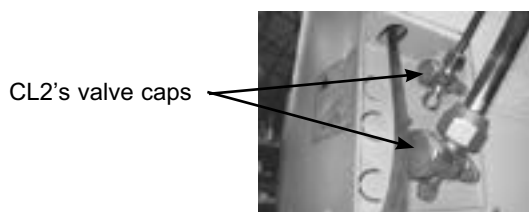
Under pressure test

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.

- Keep the CL2's isolating valves closed.
- Use the CL2's service valve (Schrader) to add a small amount of R410A and some nitrogen up to 10 bars.
- Check that every connections are tight.

Vacuuming and R410 charge

- Remove the pressure from the circuit.
- Connect the Manifold on the CL2's gas service valve (Schrader). Connect the vacuum pump.
- Make the vacuum inside the evaporator and the 2 pipes until reaching -0.1Mpa (-76cm Hg).
- Stop the vacuum pump and be sure that the pressure remains stable during 5 minutes.
- Disconnect the vacuum pump.
- Connect the R410A cylinder on the Manifold, without tightening.
- Open momentarily the valve of the R410A cylinder to purge the charge hose.
- Tighten the nut on the Manifold.
- Open the valve of the R410A cylinder to break the vacuum of your installation.
- Remove the CL2's isolating valve caps and open the valves (counter clockwise).



- Place back the caps of the valves.
- Disconnect one wire of the low pressure switch.
- Before starting the compressor, check that following steps are finished :
 - Electrical connections (check every connections are well tightened, voltage is constant and conform to the manufacturer's plates).
 - Refrigerant connections
 - Pressure test
 - Vacuuming
- To load R410A, switch power supply ON and start the compressor (closing of the contact on the external control input)

Case of CL2 connected to CIAT's air handling unit :

CL2 are preloaded with R410A. Add the load indicated in the user's guide of the air handling unit and the additional load below corresponding to the length of your pipes :

Condenciat CL2	Additional charge (g/m)
28	55
35	58
50	61
65	70
75	101

Example : for 3 meters of pipes between the CL50 and the indoor unit, the additional load will be 3x61g.

For other cases :

Add refrigerant while controlling superheating and subcooling.

- Superheating : 5 to 6K
- Subcooling :
 - 3 to 4K for an evaporating temperature of 10°C
 - 6 to 9K for an evaporating temperature of 0°C
- Once the charge is completed, close the valve of the R410A cylinder.
- Stop compressor and switch OFF power supply. Reconnect the wire of the low pressure switch.
- Remove the charging device

16 - COMMISSIONING

- You can now restart the equipment and check its smooth running.
- Check the safety devices.

It is recommended to fill the operating report (table below) of the equipment, indicating serial number and all other required data, printed on the manufacturer plate. It will help controlling the performances of the installation and preventing failures.

		Date / Time				
Operating report CONDENCIAT CL2						
Commissioning date :						
Serial number :						
Installer :						
Installation place :						
Model : 28 <input type="checkbox"/> 35 <input type="checkbox"/> 50 <input type="checkbox"/>						
65 <input type="checkbox"/> 75 <input type="checkbox"/>						
Compressor	Suction pressure	bars				
	Suction temperature	°C				
	Condensing pressure	bars				
	Condensing temperature	°C				
Air condenser	Gas inlet temperature	°C				
	Liquid outlet temperature	°C				
	Air inlet temperature	°C				
	Air outlet temperature	°C				
Nominal voltage		V				
Voltage at terminals		V				
Current absorbed by motors		A				
Mechanical inspection : tubes, fastenings,...						
Electrical connections tightness control						
Battery cleaning						
Check of control functions						

17 - MAINTENANCE

Maintenance

Before carrying out any maintenance work on the unit, disconnect it from the power supply. For units fitted with orange terminals, open all the orange switching terminals and switch off the 2 circuit breakers.

Maintenance work on compressor

The compressor is fixed to the platform by 4 screws diameter 8 mm.

Attention: when tightening these screws, the maximum torque to be applied is 13 Nm.

If you do not have a torque wrench, tighten the screws until you feel a certain resistance, and then tighten a further threequarters of a turn.

Advice

Make operating reports and checks as set out in the table (above) at least once a year.

To ensure correct operation of the unit and benefit from the guarantee: take out a maintenance contract with your installer, or with an approved maintenance company.

Make a visual and auditory check of the whole installation in operation.

Check that there are no traces of oil around the unit

Specificities 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 that 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) = 1720.

- Users must have systems containing over 3 kg of refrigerant periodically checked for leaks by qualified personnel. Regardless of the refrigerant charge in your system, CIAT demands 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 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 tests, the name of the technician and of the technician's company. CIAT strongly recommends keeping such a log even if the refrigerant load of your system does not require one.

- A leak test must be carried out one month following any leak repairs.

- It is the duty of operators to collect used refrigerant and to have it recycled, regenerated or destroyed.

Compulsory annual inspection

Detection of leaks on the cooling circuit.

Battery cleaning:

- Remove the cover of the unit (see « Electrical connections » procedure chapter).

- Carefully clean the battery and the ventilation compartment with a vacuum cleaner.

- Put the cover back in place.

Clean the drain pan of the unit.

18 - FAILURES CONTROL AND ANALYSIS

Important : use the original spare parts for repairs.

Problem	Cause	Solution
Condensing pressure too low	a) Insufficient refrigerant charge b) Obstacle in the expansion device	a) Find the leak, add refrigerant b) Check expansion device
Condensing pressure too high compared to with external air temperature, high pressure alarm	a) Insufficient air flow b) Air temperature too high c) Condenser dirty (no exchange) d) Excessive refrigerant charge (flooded condenser) e) External fan damaged f) Air inside refrigerant circuit	a) Check the condenser fan b) Check the condensation regulation settings c) Clean it d) Purge e) Repair f) Purge
Compressor does not start, humming noise	a) Power supply default b) Some control contacts are opened c) Compressor contactor coil burnt d) Internal klixon thermostat open	a) Check circuit breaker, fuses b) Check safety chain c) Replace d) Wait for restart.
Compressor does not start. Motor makes sporadic noises.	a) Low voltage b) Power wire unplugged	a) Measure voltage and find voltage drop b) Check connections
Compressor does not start. Motor makes sporadic noises	a) External control cycling too rapidly b) Insufficient refrigerant gas c) Evaporator coil dirty d) Evaporator fan or pump does not work e) Expansion device damaged or blocked f) Dirty Filter Dryer	a) Modify control (increase the differential of the control) b) Repair the leakage. Add refrigerant charge c) Clean it. d) Repair or replace it e) Replace expansion device f) Replace it
Compressor is noisy	a) Loose fixation b) Lack of oil c) Internal friction noise	a) Tighten it b) Add oil to the recommended level c) Replace it
Noisy operation	a) Unit installed without antivibrations mounts	a) Place the unit on antivibrations mounts
Evaporating pressure too low	a) Insufficient flow through the evaporator b) Frozen evaporator (if air-cooled type) c) Expansion device blocked. d) Insufficient refrigerant charge e) Condensing pressure too low f) Evaporator or evaporator's accelerator pump failure	a) Check flow b) Check anti-frost operation c) Remove and clean expansion device. Change filter drier d) Repair the leakage. Add refrigerant charge e) (excessive condenser air flow). Adjust the flow with the wheel of the CL2's control board f) Repair it

19 - DECLARATION OF CONFORMITY

- ❶ Condenciat CL2
- ❷ CIAT
- ❸ 01/12/14

ENGLISH NOTIFICATION OF COMPLIANCE (Directive CEM 2004/108/CEE) (Directive Machines 2006/42/CE) (Directive RoHS 2011/65/UE)	
THE MANUFACTURER : CIAT Avenue Jean Falconnier Boite Postale N°14 01350 CULOZ - FRANCE	
declares that the designated machine below :	
❶	Désignation : Condenciat CL2
❷	Trademark : CIAT
is in accordance with the arrangements of the modified Machines Directive and with the national legislations transposing it.	
CULOZ, ❸	

20 - GUARANTEE

See our general terms of sale.



Siège social

Avenue Jean Falconnier B.P. 14
01350 Culoz - France
Tel. : +33 (0)4 79 42 42 42
Fax : +33 (0)4 79 42 42 10
info@ciat.fr - www.ciat.com

Compagnie Industrielle
d'**A**pplications **T**hermiques
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CIAT Service

Tel. : 08 11 65 98 98 - Fax : 08 26 10 13 63
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