

*“Compact and silent
Scroll compressors
All-season operation*



Cooling capacity: 40 to 161 kW



**Cooling
only**



USE

The new generation of CONDENCIAT condensation units is the solution for all split-system direct expansion cooling applications encountered within the office, healthcare, industry, administration, commercial and shared residential sectors.

These units are designed for outdoor installation and require no special protection against adverse weather conditions.

CONDENCIAT is optimised to use ozone-friendly HFC R410A refrigerant.

This units are designed to be connected on-site to one or more direct expansion exchangers of the following type:

- Direct expansion air treatment unit air coil
- Separate shell and tube or brazed plate type water cooling evaporator.

RANGE

CONDENCIAT, CD series

Cooling only version.

DESCRIPTION

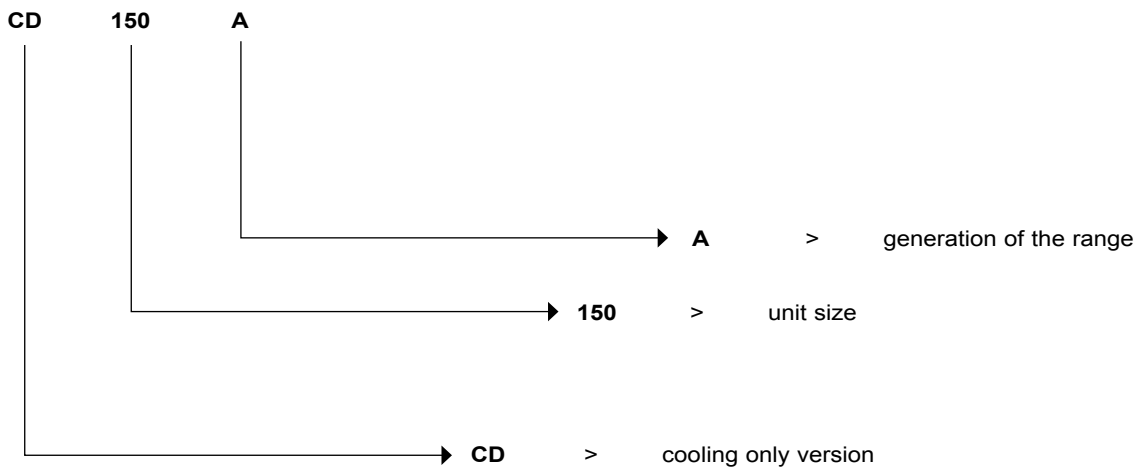
CONDENCIAT units are supplied as standard with the following components:

- Hermetic SCROLL compressors
- Air-cooled exchanger with copper tube coil, aluminium fins and axial fan motor assembly
- Electrical power and remote control cabinet:
 - 400V-3ph-50Hz (+/-10%) general power supply + earth
 - transformer fitted as standard on the machine for supplying the remote control circuit with 24V
- Electronic control module
- Casing for outdoor installation

The entire CONDENCIAT range complies with the following EC directives and standards:

- Machinery directive 2006/42/EC
- Electromagnetic compatibility directive 2014/30/EC
- EMC immunity and emissions EN 61800-3 "C3 and C1"
- Low voltage directive 2014/35/EU
- RoHS 2011/65/EU
- Pressure equipment directive (PED) 2014/68/EU
- Machinery directive EN 60-204 -1
- Refrigerating systems and heat pumps EN 378-2

DESCRIPTION



CONFIGURATION

CD	Standard
CD, XLN option	Standard Xtra Low Noise

DESCRIPTION OF THE MAIN COMPONENTS

■ Compressors

- Hermetic SCROLL type
- Electronic motor overheating protection
- Crankcase heater
- Mounted on anti-vibration mounts

■ Air-cooled exchanger

- Air-cooled exchanger with copper tube coil, aluminium fins and metallic protection grilles
- axial fans with composite blades offering an optimised profile, fixed speed as standard or variable speed as an option
- motors – IP 54, class F

■ Refrigerating accessories

- Dehumidifier filters
- Hygroscopic sight glasses
- Solenoid valves

■ Control and safety instruments

- Low and high pressure sensors
- Safety valves on refrigerating circuit

■ Electrical cabinet

- Electrical cabinet with IP 44 protection rating
- A connection point without neutral
- Front-mounted main safety switch with handle
- Control circuit transformer
- 24V control circuit
- Fan and compressor motor circuit breaker
- Fan and compressor motor contactors
- Microprocessor-controlled electronic control module
- Wire numbering
- Marking of the main electrical components

■ Frame

Frame made from RAL7035 light grey & RAL 7024 graphite grey painted panels.

■ Control module

The electronic control module performs the following main functions:

- Management of compressor operation
- Management of fan operation
- Actuation of evaporator evacuation solenoid valves (valves delivered in a kit with the machine)

■ Remote control

Several contacts are available as standard, enabling the machine to be controlled remotely by wired link:

- Automatic operation control: when this contact is open, the machine stops
- Compressor stage control
- Fault reporting: this contact indicates the presence of a major fault which has caused one or both refrigerating circuits to stop
- Operational status reporting indicates that the unit is in production mode.

AVAILABLE OPTIONS

Options	Description	Advantages	CD
Condenser with anti-corrosion post-treatment	Copper/aluminium coils supplied with Blygold Polual treatment applied	Improved corrosion resistance, recommended for industrial, rural and marine environments	●
Corrosion protection, traditional coils	Fins made of pre-treated aluminium (polyurethane and epoxy)	Improved corrosion resistance, recommended for moderate marine and urban environments	●
Xtra Low Noise	Sound absorbing enclosure for the compressor and low speed fans	Reduces the noise level by reducing the fan speeds	●
Soft Starter	Electronic starter on each compressor	Reduces the start-up current	●
Winter operation (down to -20°C)	Controls the fan speed	Stable operation of the unit when the air temperature is between 0°C and -20°C.	●
Suction and liquid line valves	Ball valves on the suction and liquid line	Unit isolated from the rest of the refrigerating circuit	●
Compliance with Russian regulations	EAC certification	Compliance with Russian regulations	●
Replaceable filter dryer	Filter dryer with cartridge to replace the hermetic filter	Easy filter replacement without draining the refrigerating circuit	●
Anti-vibration mounts	Elastomer anti-vibration mounts to be fitted underneath the unit	Isolates the unit from the building, preventing vibrations and noise from being transmission to the building. Must be used in conjunction with a flexible connection on the water side	●
Flexible refrigerating sleeves	Flexible connections on the refrigerant pipes	Easy to install. Limits the transmission of vibrations to the refrigerant network	●

- ALL MODELS



TECHNICAL CHARACTERISTICS - COOLING ONLY

CONDENCIAT CD		150A	180A	200A	240A	260A	300A	360A	390A	450A	520A	600A
Rated cooling capacity for standard units (1)	kW	40,4	45,9	52,4	58,5	66,7	77,9	90,4	100,9	119,4	139,6	161,7
Electrical power consumption	kW	13,8	16,3	19,0	21,2	24,4	28,8	31,8	36,0	43,6	50,2	58,7
EER	kW/kW	2,92	2,81	2,75	2,76	2,74	2,7	2,84	2,81	2,74	2,78	2,75
Sound levels												
Standard unit												
Sound power *	dB(A)	80	81	81	81	87	87	84	84	84	90	90
Sound pressure level at 10 m**	dB(A)	49	49	49	49	55	55	52	52	52	58	58
Standard unit + Xtra Low Noise option												
Sound power *	dB(A)	79	80	80	80	80	80	83	83	83	83	83
Sound pressure level at 10 m**	dB(A)	48	48	48	48	48	48	51	51	51	51	51
Dimensions												
Length	mm	1090	1090	1090	1090	1090	1090	2270	2270	2270	2270	2270
Width	mm	2110	2110	2110	2110	2110	2110	2123	2123	2123	2123	2123
Height	mm	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
Operating weight***												
Standard unit	kg	396	405	422	445	428	452	701	704	722	800	840
Compressor												
Hermetic scroll compressor 48.3 rev/s												
Circuit A		2	2	2	2	2	2	3	3	3	2	2
Circuit B		-	-	-	-	-	-	-	-	-	2	2
Number of power stages		2	2	2	2	2	2	3	3	3	4	4
Refrigerant												
R410A												
Control												
Electronic control												
Minimum power	%	50	50	50	50	50	50	33	33	33	25	25
Distribution of power, circuit A/B	%	100/0	100/0	100/0	100/0	100/0	100/0	100/0	100/0	100/0	50/50	50/50
Condensers												
Grooved copper pipes and aluminium fins												
Fans												
Quantity		1	1	1	1	1	1	2	2	2	2	2
Maximum total air flow	l/s	3885	3883	3987	3908	5013	5278	6940	6936	7370	10026	10556
Maximum rotation speed	r/s	12	12	12	12	16	16	12	12	12	16	16
Refrigerant connections												
Suction pipe diameter	inch	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8
Liquid pipe diameter	inch	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
Casing paint												
Colour code: RAL 7035/7024												

(1) Rated conditions: evaporation temperature = 5°C, outdoor air temperature = 35°C, overheating = 5°C, equivalent length = 15 m.

* In dB ref=10-12 W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)).

** In dB ref 20µPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power Lw(A).

*** Values are guidelines only. Refer to the unit nameplate

ELECTRICAL SPECIFICATIONS

CONDENCIAT CD		150A	180A	200A	240A	260A	300A	360A	390A	450A	520A	600A
Power circuit												
Nominal voltage	V-ph-Hz	400-3-50										
Voltage range	V	360-440										
Control circuit supply												
24 V via internal transformer												
Maximum start-up current (Un)*												
Standard unit	A	114,2	132,4	141,3	143,7	170,4	209,4	169,4	196,4	240,4	226,2	275,2
Unit with soft starter option	A	74,7	86,5	93,8	96,2	114,4	139,8	130,4	155,4	181,4	186,4	215,4
Power factor at maximum capacity**												
		0,83	0,81	0,81	0,83	0,81	0,78	0,83	0,81	0,79	0,81	0,78
Max. operating input power**												
	kW	19,5	22,3	24,5	27,9	31,2	35,8	42,3	45,6	52,5	62,4	71,6
Unit rated current draw ***												
	A	26,2	30,4	34,6	37,6	44,2	53,8	57,8	64,4	78,8	88,4	107,6
Max. current draw (Un)****												
	A	35,6	40,0	43,8	48,6	55,8	65,8	74,3	81,8	96,8	111,6	131,6
Max. current draw (Un-10%) †												
	A	38,0	49,0	51,2	57,8	73,2	79,8	88,1	107,9	117,9	146,4	159,6
Customer standby capacity, unit												
	kW	Customer standby on the 24V control circuit										
Withstand capacity and short circuit protection												
See the table "Short circuit current withstand capability"												

- * Maximum instantaneous starting current (maximum operating current of the smallest compressor(s) + fan current(s) + locked rotor current of the largest compressor).
- ** Input power, compressors + fans at the unit operating limits (evaporation temperature = 15°C, condensing temperature = 65°C) and the nominal voltage of 400V (data given on the unit nameplate)
- *** Rated conditions: evaporation temperature = 5°C, outdoor air temperature = 35°C
- **** Maximum unit current draw at maximum unit power input and 400V (values given on the unit nameplate).
- † Maximum unit current draw at maximum unit power input and 360V

Short circuit current withstand capability (TN system *)

CONDENCIAT CD		150A	180A	200A	240A	260A	300A	360A	390A	450A	520A	600A
Value without upstream protection												
Short time (1s) assigned current - I _{cw} - kA eff		3,36	3,36	3,36	3,36	3,36	3,36	5,62	5,62	5,62	5,62	5,62
Allowable peak assigned current - I _{pk} - kA pk		20	20	20	20	20	15	20	20	15	20	15
Value with upstream protection												
Conditional short circuit assigned current I _{cc} - kA eff		40	40	40	40	40	40	40	40	40	30	30
Associated Schneider circuit breaker Compact range type		NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS160H	NS160H	NS250H	NS250H
Reference**		29670	29670	29670	29670	29670	29670	29670	30670	30670	31671	31671

- * Type of system earthing
- ** If another current limiting protection device is used, its time-current trip and I_{2t} thermal stress characteristics must be at least equivalent to those of the recommended Schneider circuit breaker. Contact your manufacturer's representative.

INTELLIGENTLY-DESIGNED ACOUSTICS

To comply with the various restrictions on integration, the CONDENCIAT has two sound finish levels enabling it to be easily integrated into a number of zones without causing disruption to users or their neighbours.

■ Basic version

The distinguishing feature of the CONDENCIAT range is its rigorous design incorporating "noiseless" assembly techniques to reduce vibrations and sources of noise:

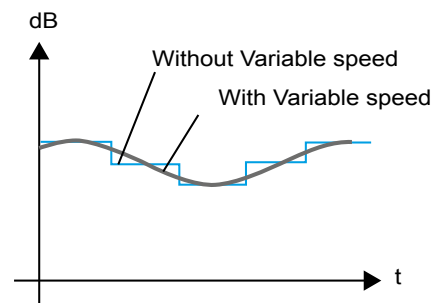
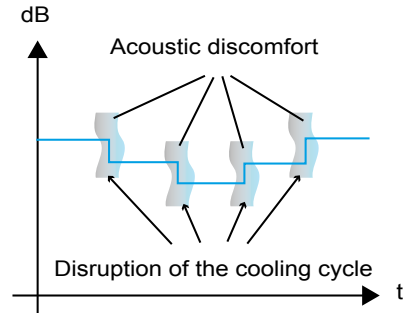
- New generation scroll compressors with a continuous scrolling motion to lessen vibrations
- Compressor structure separated from the unit by anti-vibration mounts
- Pipes separated from the unit structure
- Fans made from a synthetic material, with aerodynamic blades offering an optimised profile. Optimised coil-fan combination, the result of many hours of study of the thermal and acoustic properties in our Research and Innovation Centre, to ensure a linear flow of air without turbulence, to limit noise to an acceptable acoustic spectrum.
- The controller automatically adjusts the fan air flow rate according to the outdoor air temperature and the unit's load rate which enables the sound level to be significantly reduced, particularly at night, mid-season, morning and evening, which totals more than 75% of the time the unit is used

■ Xtra Low Noise option

In this version, the compressors are housed in jackets and the fan rotation speed is reduced whilst ensuring the output and thermal performance remain optimised.

■ Acoustic signature

As important as the sound power level, the acoustic signature reflects the noise disturbance generated by the unit.



The CONDENCIAT can be equipped as an option with a variable speed motor, enabling a soft start of the fan (all-season operation).

It avoids the increases in noise linked to the on/off sequences, thereby improving the unit's acoustic signature.

With all these benefits and its two acoustic finish levels (Standard and Xtra Low Noise), the CONDENCIAT can be integrated into any site, ensuring any constraints in terms of the sound environment can be met.

SOUND LEVELS

CD, Standard version

■ Sound power levels ref 10^{-12} W \pm 3 dB (L_w)

At nominal EN 14511-3: 2013 operating conditions – Cooling mode

CONDENCIAT	SOUND POWER LEVEL SPECTRUM (dB)						Overall power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
150A	77	79	79	75	72	67	80
180A	77	79	79	76	73	67	81
200A	77	79	79	76	72	68	81
240A	77	79	79	76	74	69	81
260A	81	84	84	83	77	73	87
300A	81	84	85	83	77	71	87
360A	80	82	82	79	76	71	84
390A	80	82	82	79	76	74	84
450A	80	82	82	79	77	71	84
520A	84	87	87	86	80	76	90
600A	84	87	88	86	80	74	90

■ Sound pressure level ref 2×10^{-5} Pa \pm 3 dB (L_p)

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

CONDENCIAT	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
150A	45	47	47	43	40	36	49
180A	45	47	47	44	41	36	49
200A	45	47	47	44	41	36	49
240A	45	47	47	44	42	37	49
260A	50	52	53	51	45	41	55
300A	50	52	53	51	46	39	55
360A	48	50	50	47	44	39	52
390A	48	50	50	47	44	42	52
450A	48	50	50	47	45	40	52
520A	53	55	56	54	48	44	58
600A	53	55	56	54	48	42	58

NB: Sound pressure levels depend on the installation conditions of each system. As such, the levels listed here are given for information only. Only the sound power levels are comparable and certified.

SOUND LEVELS

CD, Standard version, XTRA LOW NOISE option

■ Sound power levels ref 10^{-12} W ± 3 dB (Lw)

At nominal EN 14511-3: 2013 operating conditions – Cooling mode

CONDENCIAT	SOUND POWER LEVEL SPECTRUM (dB)						Overall power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
150A	77	79	78	75	70	63	79
180A	77	79	79	75	70	63	80
200A	77	79	79	75	70	63	80
240A	77	79	78	75	70	64	80
260A	77	79	79	75	71	66	80
300A	77	79	79	75	71	64	80
360A	80	82	81	78	73	66	83
390A	80	82	82	78	73	68	83
450A	80	82	82	78	74	67	83
520A	80	82	82	78	74	69	83
600A	80	82	82	78	74	67	83

■ Sound pressure level ref 2×10^{-5} Pa ± 3 dB (Lp)

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

CONDENCIAT	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
150A	45	47	47	43	38	31	48
180A	45	47	47	43	38	31	48
200A	45	47	47	43	38	31	48
240A	45	47	47	43	39	32	48
260A	45	47	47	43	39	35	48
300A	45	47	47	43	39	33	48
360A	48	50	50	46	41	34	51
390A	48	50	50	46	41	37	51
450A	48	50	50	46	42	35	51
520A	48	50	50	46	42	37	51
600A	48	50	50	46	42	36	51

NB: Sound pressure levels depend on the installation conditions of each system. As such, the levels listed here are given for information only. Only the sound power levels are comparable and certified.

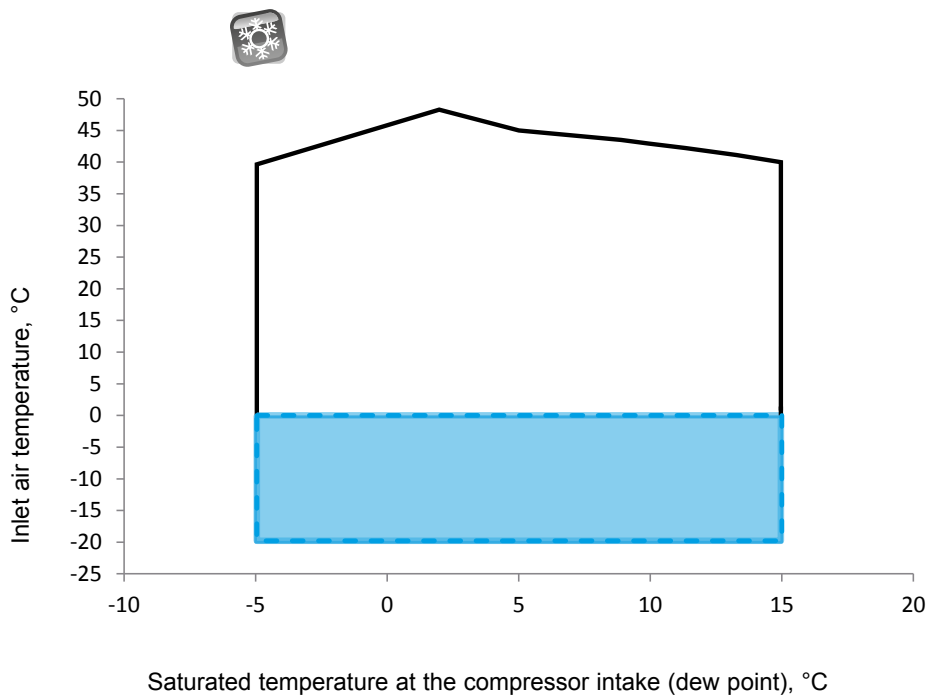
OPERATING RANGE

CONDENCIAT units have a broad field of application, enabling them to meet a range of cooling requirements in the most varied of climates.

■ Operating limits

Multi-climate: -20°C to +48°C

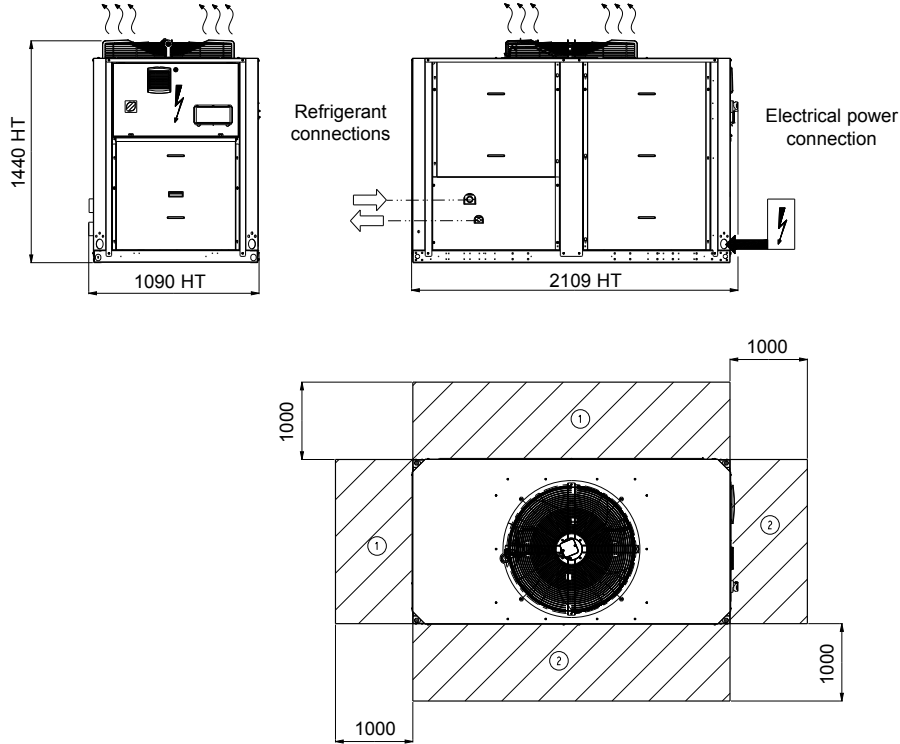
CONDENCIAT units are equipped as standard with all the management devices and algorithms to enable all-season operation down to temperatures of 0°C, with the option of extending this to -20°C if the variable speed fan option is selected.



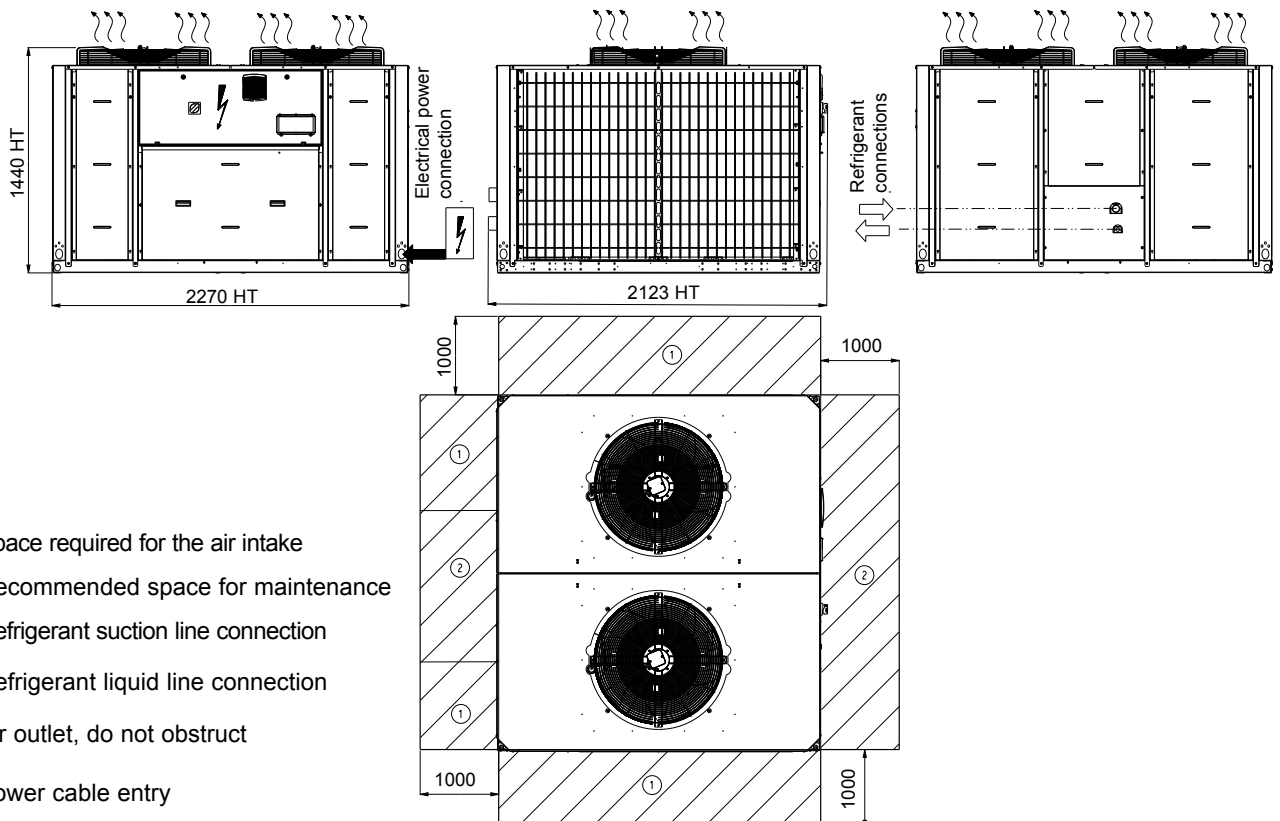
- Standard operation
- Winter operation option

DIMENSIONS

CONDENCIAT CD 150A to 300A



CONDENCIAT CD 360A to 450A



INSTALLATION RECOMMENDATIONS

■ Lifting and handling

The utmost safety precautions must be taken when lifting and handling the unit.

Always follow the lifting diagram on the unit and in the instruction manual.

Before attempting to lift the unit, make sure the path leading to its intended location is free from obstacles. Always keep the unit vertical when moving it. Never tip it or lie it on its side.

■ Choosing a location for the unit

CONDENCIAT units are designed for outdoor installation. Special attention should be paid to ensure sufficient free space (including at the top) to allow maintenance. The unit must be placed on a perfectly level, fireproof surface strong enough to support it when ready for operation. Noise pollution from auxiliary equipment should be studied thoroughly.

Potential noise transmission routes should be studied, with assistance from an acoustical engineer if necessary, before installing the unit. It is strongly recommended that flexible couplings are placed over pipes and anti-vibration mounts are fitted underneath the unit (equipment available as an option) to reduce vibrations, and the noise this causes, as much as possible.

■ Fitting the supplied accessories

A number of optional accessories, supplied in the unit, may be installed on the unit on site.

You must follow the instructions in the manual.

■ Electrical connections

You must follow the instructions in the manual. All information concerning electrical connections is stated on the wiring diagrams provided with the unit. Always follow this information to the letter.

Electrical connections must be made in accordance with best current practices and applicable standards and regulations. Electrical cable connections to be made on-site:

- Electrical power supply to unit
- Contacts available as standard enabling the machine to be controlled remotely

It should be noted that the unit's electrical system is not protected against lightning strikes.

Therefore devices to protect against transient voltage surges must be installed on the system and inside the power supply unit.

■ Refrigerant connections

You must follow the instructions in the manual.

Work must be carried out in accordance with the most stringent industry guidelines, which generally include the following:

- Careful study of the pipe routing (slope, trap and diameter) to facilitate the return of oil to the compressor
- Fitting of liquid and suction refrigerant pipes between the direct expansion coil and the CONDENCIAT condensation unit
- Fitting of refrigerating accessories on the direct expansion coil (expansion device, electrical valve).

- The length of the refrigerant pipes between the two devices must be as short as possible, with as few elbows as possible, to minimise pressure drops. Maximum linear length = 30 metres; maximum height difference = 16 metres. If in doubt, consult our technical service.

- Insulation of the intake pipe

- Evacuation of the refrigerating circuit, refrigerant charge and system start-up.

- The condensation unit, refrigerant pipes and direct expansion evaporator assembly must be assembled in accordance with the pressure equipment directive PED 2014/68/EU. The CIAT condensation unit and evaporators comply with this directive.

- The devices must be connected up using anti-vibration sleeves.

■ System start-up

CIAT or a CIAT-approved firm must perform system start-up on the units.

You must follow the instructions in the manual.

List of system start-up checks (non-exhaustive):

- Correct siting of unit
- Power supply protections
- Phases and direction of rotation of the fans and compressors
- Wiring connections on unit
- Checking of the refrigerant connection between the condensation unit and the evaporator (maximum linear length, maximum height difference, etc.)
- Pressure in the refrigerating circuit
- Operating readings

■ Maintenance operations

Specific preventive maintenance operations are required at regular intervals and should be performed by CIAT-approved contractors.

The operating parameters are read and noted on a "CHECK LIST" form to be returned to CIAT.

It is essential to comply with the instruction manual.

You must take out a maintenance contract with a CIAT-approved refrigeration equipment specialist. Such a contract is required even during the warranty period.



→ Air-cooled condensation units

This document is non-contractual. As part of its policy of continual product improvement, CIAT reserves the right to make any technical modification it feels appropriate without prior notification.

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