



**ROYAL®
CLIMA**

Компрессорно-конденсаторные блоки ROYAL
CLIMA

Модели: REV-16-CU - REV-32-CU



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SYMBOLS USED

Symbol	Meaning
	DANGER! The DANGER sign warns the operator and maintenance personnel about risks that may cause death, physical injury, or immediate or latent illnesses of any kind.
	DANGER LIVE COMPONENTS! The DANGER: LIVE COMPONENTS sign warns the operator and maintenance personnel about risks due to the presence of live voltage.
	DANGER SHARP SURFACES! The DANGER: SHARP EDGES sign warns the operator and maintenance personnel about the presence of potentially dangerous sharp edges.
	WARNING HOT SURFACE! The DANGER: HOT SURFACES sign warns the operator and maintenance personnel about the presence of potentially dangerous hot surfaces.
	DANGER MOVING PARTS! The DANGER: MOVING PARTS sign warns the operator and maintenance personnel about risks due to the presence of moving parts.
	IMPORTANT WARNING! The IMPORTANT WARNING sign indicates actions or hazards that could damage the unit or its equipment.
	SAFEGUARD THE ENVIRONMENT! The environmental safeguard sign provides instructions on how to use the machine in an environmentally friendly manner.

REFERENCE STANDARDS

UNI EN 292	Safety of machinery. Concetti fondamentali, principi generali di progettazione.
UNI EN 294	Safety of machinery. Distanze di sicurezza per impedire il raggiungimento di zone pericolose con gli arti superiori.
UNI EN 563	Safety of machinery. Temperature of contact surfaces. Ergonomic data to establish limit values for temperatures of hot surfaces.
UNI EN 1050	Safety of machinery. Principles of risk assessment.
UNI 10893	Product technical documentation. User instructions
EN 13133	Brazing. Brazer approval.
EN 12797	Brazing. Destructive tests of brazed joints.
EN 378-1	Refrigeration systems and heat pumps – safety and environmental requirements. Basic requirements, definitions, classification and selection criteria.
PrEN 378-2	Refrigeration systems and heat pumps – safety and environmental requirements. Design, construction, testing, installing, marking and documentation.
CEI EN 60204-1	Safety of machinery. Electrical equipment of machines. Part 1: General requirements
CEI EN 60335-2-40	Sicurezza degli apparecchi elettrici d'uso domestico e similare. Parte 2: norme particolari per le pompe di calore elettriche, per i condizionatori d'aria e per i deumidificatori.
UNI EN ISO 3744	Determinazione dei livelli di potenza sonora delle sorgenti di rumore mediante pressione sonora. Metodo tecnico progettuale in un campo essenzialmente libero su un piano riflettente.
EN 50081-1:1992	Electromagnetic compatibility – Generic emission standard Part 1: Residential, commercial and light industry.
EN 61000	Electromagnetic compatibility (EMC).

I SECTION I :: USER

I.1 MACHINE DESCRIPTION

I.1.1 DECLARED CONDITIONS OF USE

MCAEBY are air cooled condensing. Range is equipped with axial fans. Use is expected to civil air-conditioning systems, and the correct operation of the unit is subject to the strict observance of the operating instructions in respect of the technical spaces in the installation and operating limits specified in this manual. The machine is designed for outdoor installation.

	DANGER! The machine is designed for outdoor installation. Segregate the unit if installed in areas accessible to persons under 14 years of age.
	DANGER! Do not introduce pointed objects through the air flow and intake grilles.
	IMPORTANT! The unit will function correctly only if the instructions for use are scrupulously followed, if the specified clearances are complied with during installation, as well as the use restrictions indicated in this manual.
	IMPORTANT! If clearance distances are not maintained at installation, it could cause malfunctioning with an increase in absorbed power and a considerable reduction in cooling capacity.
	DANGER! Be careful of hot surfaces inside the machine

I.1.2 MACHINE IDENTIFICATION

The units feature a serial number plate located on the side which includes machine identification data. 1).

	
MATRICOOLA	MODELLO
<input type="text"/>	<input type="text"/>
Alimentazione	V/V
Potenza ass.	A
Corrente ass.	A
Corrente di spunto	A
Grado di protezione	IP
Tipo fluido frig.	kg
Carica fluido frig.	kg
Carica olio	kg
Press. Oil. Cilo	kPa
Press. Max. gas	kPa
Press. Min. gas	kPa
Press. Max. H ₂ O	kPa

Fig. 1

I.1.3 STRUCTURAL FEATURES

Load-bearing structure and panels in galvanised and RAL 9018 painted sheet metal; galvanised steel sheet metal base, soundproofed compressor compartment.

N° 1 Hermetic Scroll-type compressor with thermal protection.

Air side exchanger composed of coil with copper pipes and aluminium fins, complete with protection grille.

Electric fans axial fans with external rotor, equipped with internal thermal protection and complete with protection and electronic speed control.

Refrigerant circuit in annealed copper pipe (EN 12735-1-2) complete with: drier filter, Load connections, safety pressure switch with manual reset on the high pressure side, conveyable safety valves, pressure switch with automatic reset to control the pressure on the low side. Crankcase heater, Liquid humidity indicator, thermostatic expansion valve, reverse cycle valve, receiver of liquid and gas separator and check valves, taps with flare.

Unit complete with:

- canalizable condensate discharge
- Ecological R410A refrigerant fluid load.

I.1.4 ELECTRICAL CONTROL BOARD

Electrical panel accessible by removing the front panel, conforming to IEC standards, equipped with opening and closing using the appropriate tool.

Complete with:

- electrical wiring arranged for power supply 400V-3ph+N-50Hz;
- auxiliary circuit power supply 230V-1ph-50Hz derived from main power supply;
- isolator, complete with door lock safety device;
- three-pole circuit breaker to protection of the compressor;
- fuse for the fan and the auxiliary circuit;
- controller phase sequence / phase loss;
- power contactor;
- user interface terminal board;
- removable machine control.

The electronic control card is managed by the keyboard inserted in the machine. This electronic board performs the following functions:

- management of safety delays; functions that control the working interventions of the unit devices;
- complete protection of the unit, possible shutdown and display of all the triggered alarms;
- display of operating devices by LED; of the heat pump;
- self-diagnosis with continuous monitoring of the unit functioning status.

Advanced functions:

- arranged for serial connection, with RS485 outlet for logical dialogue with building automation, centralized systems and supervision networks;
- check-up and monitoring of scheduled maintenance status;
- computer-assisted unit testing.

I.1.5 FUNCTIONING LIMITS R410A

Cooling cycle:

B.S. Temperature inlet air to the heat exchanger:

20°C ÷ 43°C for REV;

I.1.6 SAFETY INFORMATION

	DANGER! Always install a general automatic switch in a protected area near the machine, which has a characteristic delayed curve, sufficient capacity and breaking power. There must be a minimum distance of 3 mm between the contacts. Earth connection is compulsory by law to ensure user safety while the machine is in use.
	DANGER! Connections must be made in compliance with current standards and with the diagrams provided with the machine.

The safety door interlock automatically prevents electric power being fed to the unit if the cover panel over the electrical panel is opened.

I.1.7 INFORMATION REGARDING UNINTENDED USE

	DANGER! The machine was designed and built solely to function as reversible condensing with condensation / evaporation air; any other use other than this is Expressly Forbidden. Installing the machine in an explosive environment is prohibited.
---	---

1.2 WARNINGS REGARDING POTENTIALLY TOXIC SUBSTANCES

	DANGER! Read the following information about the refrigerants employed carefully.
--	---

1.2.1.1 Identification of the type of refrigerant fluid used

- Difluoromethane (HFC 32) 50% by weight
N° CAS: 000075-10-5
- Pentafluoroethane (HFC 125) 50% by weight
N° CAS: 000354-33-6

1.2.1.2 Identification of the type of oil used

The lubricant used in the unit is polyester oil; please refer to the indications on the compressor data plate.

	DANGER! For further information regarding the characteristics of the refrigerant and oil used, refer to the safety data sheets available from the refrigerant and oil manufacturers.
--	--

1.2.1.3 Main ecological information regarding the types of refrigerant fluids used

- Persistence, degradation and environmental impact.

Fluid	Chemical formula	GWP (over 100 years)
R32	CH ₂ F ₂	550
R125	C ₂ HF ₅	3400

HFC R32 and R125 refrigerants are the single components which mixed at 50% make up R410A. They belong to the hydrofluorocarbons group and are regulated by the Kyoto protocol (1997 and subsequent revisions) being gases that contribute to the greenhouse effect. The index which measures how much a certain mass of greenhouse gas contributes to global warming is the GWP (Global Warming Potential). The standard measure for carbon dioxide (CO₂) is GWP=1. The value of GWP assigned to each refrigerant represents the equivalent amount in kg of CO₂ released over a period of 100 years, in order to have the same greenhouse effect of 1kg refrigerant released over the same period of time. The R410A mixture does not contain elements that are harmful to the ozone layer, such as chlorine; therefore, its ODP (Ozone Depletion Potential) is zero (ODP=0).

Refrigerant	R410A
Components	R32/R125
Composition	50/50
ODP	0
GWP (over 100 years)	2000

	SAFEGUARD THE ENVIRONMENT! Fluorocarbons fluids contained in the unit can not be dispersed in the atmosphere because they are fluids that produce greenhouse gases.
--	---

R32 and R125 are hydrocarbons which decompose rapidly into the lower atmosphere (troposphere). Decomposition by-products are highly dispersible and thus have a very low concentration. They do not affect photochemical smog (that is, they are not classified among VOC volatile organic compounds, according to the guidelines established by the UNECE agreement).

- **Effects on effluent treatment**

Waste products released into the atmosphere do not cause long-term water contamination.

- **Personal protection/exposure control**

Use protective clothing and gloves; protect eyes and face.

- **Professional exposure limits:**

R410A	
HFC 32	TWA 1000 ppm
HFC 125	TWA 1000 ppm

- **Handling**

	DANGER! Users and maintenance personnel must be adequately informed about the risks of handling potentially toxic substances. Failure to observe the aforesaid indications may cause personal injury or damage the unit.
---	--

Avoid inhalation of high concentrations of vapour. The atmospheric concentration must be reduced as far as possible and maintained at this minimum level, below professional exposure limits. The vapours are heavier than air, and thus hazardous concentrations may form close to the floor, where overall ventilation may be poor. In this case, ensure adequate ventilation. Avoid contact with naked flames and hot surfaces, which could lead to the formation of irritant and toxic decomposition by-products. Do not allow the liquid to come into contact with eyes or skin.

- **Procedures in case of accidental refrigerant leakage**

Ensure adequate personal protection (using means of respiratory protection) during clean-up operations. If the conditions are sufficiently safe, isolate the source of leak.

If the extent of the spill is limited, let the material evaporate, as long as adequate ventilation can be ensured. If the spill is considerable, ventilate the area adequately.

Contain the spilt material with sand, soil, or other suitable absorbent material.

Prevent the liquid from entering drains, sewers, underground facilities or manholes, because suffocating vapours may form.

1.2.1.4 Main toxicological information on the type of refrigerant used

- **Inhalation**

A high atmospheric concentration can cause anaesthetic effects with possible loss of consciousness. Prolonged exposure may lead to an irregular heartbeat and cause sudden death.

Higher concentrations may cause asphyxia due to the reduced oxygen content in the atmosphere.

- **Contact with skin**

Splashes of nebulised liquid can produce frostbite. Probably not hazardous if absorbed through the skin. Repeated or prolonged contact may remove the skin's natural oils, with consequent dryness, cracking and dermatitis.

- **Contact with eyes**

Splashes of liquid may cause frostbite.

- **Ingestion**

While highly improbable, may produce frostbite.

1.2.1.5 First aid measures

- **Inhalation**

Move the person away from the source of exposure, keep him/her warm and let him/her rest. Administer oxygen if necessary. Attempt artificial respiration if breathing has stopped or shows signs of stopping. In the case of cardiac arrest carry out heart massage and seek immediate medical assistance.

- **Contact with skin**

In case of contact with skin, wash immediately with lukewarm water. Thaw tissue using water. Remove contaminated clothing. Clothing may stick to the skin in case of frostbite. If irritation, swelling or blisters appear, seek medical assistance.

- **Contact with eyes**

Rinse immediately using an eyewash or clean water, keeping eyelids open, for at least ten minutes.

Seek medical assistance.

- **Ingestion**

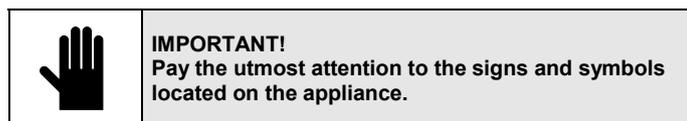
Do not induce vomiting. If the injured person is conscious, rinse his/her mouth with water and make him/her drink 200-300 ml of water.

Seek immediate medical assistance.

- **Further medical treatment**

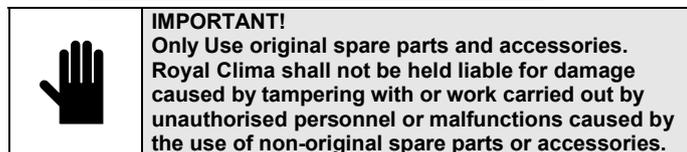
Treat symptoms and carry out support therapy as indicated. Do not administer adrenaline or similar sympathomimetic drugs following exposure, due to the risk of cardiac arrhythmia.

1.2.1.6 Information about residual risks that cannot be eliminated



If any risks remain in spite of the provisions adopted, i.e. there lie potential and unclear risks, these are indicated by labels attached to the machine in compliance with standard ISO 7000.

1.3 SPARE PARTS AND ACCESSORIES



KSA - Rubber anti-vibration mountings

KIS - RS 485 serial interface for interconnection with distributed intelligent systems for integrated building automation

KUSB - RS485/USB serial converter for interconnection between RS485 serial network and supervision systems, with serial connection to PC via USB port (USB cable supplied)

Description and fitting instructions are supplied with each accessory.

1.4 DESCRIPTION OF CONTROLS

The controls consist of the main switch, the circuit breaker panel and the user interface accessible on the machine.

1.4.1 GENERAL SWITCH

Manually controlled type "b" mains power supply disconnection device (ref. EN 60204-1§5.3.2).

1.4.2 CIRCUIT BREAKERS

- **Automatic compressor protection switch**

This switch allows the power supply and the isolation of the power circuit unit.

- **Fuse to protect the circuit and fan**

The fuse makes possible the feeding and the isolation of the auxiliary circuit unit.

1.4.3 ON BOARD CONTROL PANEL



Fig. 2



DISPLAY:

views the values of all the parameters, any alarm codes and the resource statuses.

UP-DEFROST key: makes it possible to alter parameters upwards. If pressed for 3 seconds, it activates manual defrosting. If pressed together with the DOWN key, it manually resets an alarm.

DOWN-ON/OFF key: makes it possible to alter parameters downwards. If pressed together with the UP key, it manually resets an alarm.

ESC key: to exit without saving. If pressed together with the SET key, it allows entering Programming.

SET key: Allows to confirm the set value/exit with saving. If pressed together with the ESC key, it allows entering Programming. Also allows to access the Statuses menu.



SUMMER LED: indicates the operating mode (flashes when unit is on or in standby)



WINTER LED: indicates the operating mode (flashes when unit is on or in standby)



DEFROSTING LED: (active only for MHAE) indicates that the unit is defrosting



ALARM LED: indicates that an alarm is triggered



PROGRAMMING LED: indicates that you have entered programming



COMPRESSOR LED: indicates operation (on) or the timer (flashing) of the compressor



RESISTANCE LED: indicates activation of an external resistance (not supplied) during defrosting



FAN LED: indicates activation of the fan outlet

1.5 INSTRUCTIONS FOR USE

The unit is remotely controlled depending on the type of evaporating section connected to it. For most applications a room thermostat is used.



By means of the switches and keypads the user may carry out the following operations:

- power the unit;
- start-up;
- standby (room thermostat);
- change/select the functioning mode (room thermostat);
- view alarms via the display;
- display of main components status via LED or display;
- stop the unit;
- disconnect the unit from the mains power supply.

1.5.1 POWERING THE UNIT

Act on the master switch after having set the circuit breakers protecting the compressor (three-pole) and the auxiliary circuit (bipolar).

- The "power supply" LED lights up.

1.5.2 START-UP

Press the **ON/OFF** key for 2 seconds.

- The display reads **OFF**;

All models are started by remote control (room thermostat or specific switch mounted on system during installation by installer).

- The LED relative to the active operating mode switches on;
- The display reads **ON**;
- The LED that signals the compressor timer (compressor status LED) will start to flash;
- After a short period of time, the LED lights up to indicate compressor start-up.

1.5.3 STAND-BY

If there is no heating or cooling demand from the remote position (room thermostat or specific switch mounted on system during installation by installer) the unit goes into standby.

- The display shows **OFF**.

I.5.4 STOPPING THE UNIT

The unit can be shut down at the end of the day remotely (room thermostat or specific switch mounted on system during installation by installer).

- The compressor and active operating mode LEDs go out;
 - The display shows O;
- If the unit is shut down by remote control (SCR) the display shows OFF.

I.5.5 ISOLATION FROM THE ELECTRIC MAINS

Act on the master switch.

- The display switches off meaning that the unit is no longer connected to electricity.

IMPORTANT!
If the circuit breaker switch of the auxiliary circuit is open, power is excluded from the compressor crankcase resistance. The switch should only be disconnected for cleaning, maintenance or repair of the machine.

I.5.6 REGULATION VARIABLES THAT CAN BE MODIFIED FROM KEYBOARD

The adjustment variables that can be edited from the keyboard are illustrated in the following table:

Parameter	Function	Value to set
PSS	Password	

I.5.7 SETTING PARAMETERS

You must move within the different levels represented in the figure to modify parameters

IMPORTANT!
Utmost attention must be paid when modifying the machine's operating parameters, in order not to create conflicts with the other set parameters.



[set]	Programming [esc] + [set]			
Statures	Parameters Par	Functions FnC	Password PASS	Alarm events EU
Analogue Inputs Ai	Configuration Par/CF	Manual defrost FnC/dEF	Password setting PASS	EU00
Digital inputs di	User Interface Par/Ui	Alarm silencing FnC/tA		...
Analogue outputs AO	Temperature controller Par/tr	Tool On/OFF FnC/St	Password setting PASS	EU99
Digital outputs dO	Statuses Par/St	Use of Copy Card FnC/CC		
Clock CL	Compressors Par/CP	Alarm log reset FnC/Eur		
Alarms AL	Pump Par/PI			
Setpoint SP	Fans PAr/FI			
Actual setpoint Sr	Fans PAr/FE			
Functioning hours Hr	Pump PAr/PE			
	Resistances PAr/HI			
	Resistances PAr/HE			
	Resistances Aux PAr/HA			
	Boiler PAr/br			
	Dynamic defrost PAr/dF			
	Dynamic setpoint PAr/dS			
	Adaptive PAr/Ad			
	Antifreeze PAr/AF			
	Power Restriction PAr/PL			
Alarms PAr/AL				

I.5.8 LED STATUS SIGNALS

STATUS AND OPERATING MODES LEDS



Icon	Description	Colour	On	Flashing
	Alarm	Red	Alarm in progress	Alarms silenced
	Heating		---	Remote heating mode
	Cooling		---	Remote cooling mode
	Stand by		---	---
	Defrosting		Defrosting active	Manual defrosting enabled

UNIT OF MEASUREMENT LED



Icon	Description	Colour	On	Flashing
	Clock (RTC)	red	Displays current time (24:00 format)	Time-saving
	Centigrade degrees		/	/
	Pressure (Bar)		/	/
	Relative humidity (% RH)		Not used	Not used
	Menu (ABC)		Menu browsing	/

Alarm	Alarm description	Reset
Er00	General alarm	
Er01	High pressure	Manual
Er05	Low pressure	Automatic 3 times then Manual
Er10	Compressor thermal protection	Manual
Er41	Fan thermal protection	Manual
Er75	Heat exchanger pressure transducer	Automatic
Er80	Summary/Winter inputs active simultaneously	Automatic
Er81	Compressor hour limit exceeded indication	----

I.5.10 LIST OF OPERATING STATUSES

Allows to CHECK the operating status of the machine equipment in real time.

To view the machine status, press **SET**; the label **Ai** will appear. Using the **UP/DOWN** keys allows you to view all the sub-labels decoding them. Press **ESC** to go back to the initial menu.

Label	Sub-label	Display (Meaning)
Ai (analogue inputs)	Ai01	Disabled
	Ai02	Disabled
	Ai03	Pressure value in bar of external heat exchanger probe
	Ai04	Disabled
AL (alarms)	Erxx	List of active alarms
Hr (operating hours) (with password)	CP01	Number of compressor operating hours since last hour reset

UTILITIES LED



LED symbol on display	LED	Default	Default icon on front
	LED 1 (first from left)	Compressor 1	
	LED 2	Compressor 2	
	LED 3	Electric resistance 1 primary heat exchanger	
	LED 4	Electric resistance 2 primary heat exchanger	
	LED 5	Cylinder	
	LED 6	Disposable heat exchanger fan	
	LED 7	Primary circuit water pump	

I.5.9 ALARM SIGNALS



IMPORTANT!

Malfunctions and alarms displayed by the machine should NEVER be ignored. The problem should be checked and resolved as soon as possible. If the alarm re-occurs, call after-sales assistance.

In the presence of an alarm, the alarm code is shown on the display according to the following table.

In case of a manually reset alarm:

- use the key to check which alarm is indicated;
- reset the alarm (press the **UP+DOWN** keys simultaneously).
- make sure the unit restarts,

I.6 NATURE AND FREQUENCY OF THE SCHEDULED CHECKS

I.6.1 DECOMMISSIONING

When the machine is out of use for long periods of time, it is necessary to disconnect it from the mains by opening the master switch.

I.6.2 STOP DAILY

To put the machine in sleep mode at the end of the day, simply press the button **ON/OFF, RESET-DOWN OFF** position or in the remote control (SCR or thermostat).

In this way it is ensured the electrical supply to the resistance of the compressor crankcase.

I.6.3 RESTART AFTER PROLONGED SHUTDOWN

Before starting up again, make sure that:

- the air side heat exchanger is well ventilated and clean.
- the crankcase heater is operated for 12 hours.

II SECTION II :: INSTALLATION AND MAINTENANCE

II.1 TRANSPORT - HANDLING STORAGE

	DANGER! The unit must be transported and handled by skilled personnel trained to carry out this type of work.
	IMPORTANT! Be careful to prevent damage by accidental collision.

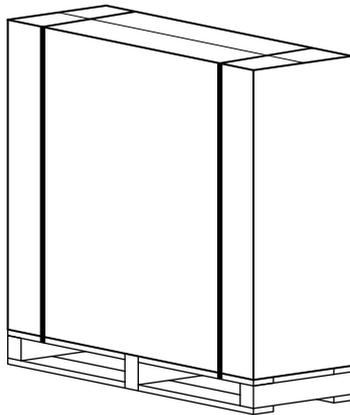
II.1.1 PACKAGING COMPONENTS

	DANGER! Do not open or tamper with the packaging before installation. Do not leave the packaging within reach of children.
	SAFEGUARD THE ENVIRONMENT! Dispose of the packaging materials in compliance with the national or local legislation in force in your country.

Models REV 16÷32 are supplied:

- covered with a cardboard box.
- protected at the top by a wooden frame;
- fixed to a pallet with 4 screws;
- linked via two regette;

REV 16÷32



Bring the machine with original packaging to the place of installation by forklift truck or pallet truck, paying attention to the position of the center of gravity is not centered (position of the symbol indicative and approximate, always check the stability).

The units are supplied in a cardboard box.

Each unit is supplied complete with:

- User instructions
- wiring diagram
- list of authorised service centres;
- warranty document
- safety valve certificates
- manual of use and maintenance of safety valves and fans;

II.1.2 HANDLING GUIDELINES

	DANGER! The position of the center of gravity is off-center could give rise to sudden movements and dangerous. Movement of the unit must be performed with care, in order to avoid damage to the external structure and to the internal mechanical and electrical components. Also make sure that there are no obstacles or people along the route, in order to prevent the risk of impact, crushing or tipping the lifting device.
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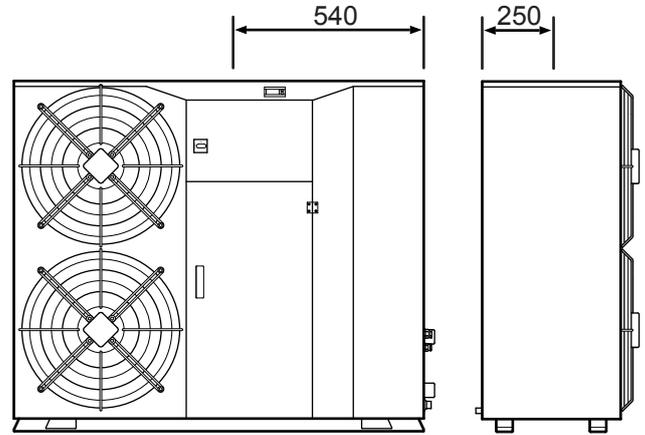


Fig. 4

Position of center of gravity is only indicative and approximate.

All handling operations must be performed with the utmost care and attention. Absolutely do not use this method for lifting or moving different from those described.

ATTENTION

To lift the unit, use textile webbing not worn and with protection for sharp corners. Sling machine as shown in Fig 7 ,by passing the textile webbing on the appropriate passages in the crankcase. Tighten the belts making sure that they remain on the top edge of the slot, lift the unit, taking care not to place the body parts in order to avoid any risk from any crushing or impact resulting from accidental falls or sudden movements of the Vicar.



Fig. 7

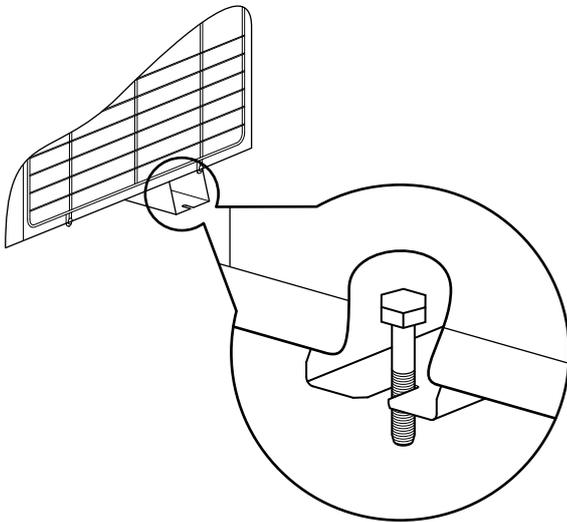
	SAFEGUARD THE ENVIRONMENT! Dispose of the packaging materials in compliance with the national or local legislation in force in your country.
	DANGER! Do not leave the packaging within reach of children.

II.1.3 STORAGE CONDITIONS

The units cannot be stacked. The temperature limits for storage are -9+45°C.

II.2 INSTALLATION INSTRUCTIONS

	DANGER! Installation must only be carried out by skilled technicians, qualified for working on air conditioning and refrigeration systems. Incorrect installation could cause the unit to run badly, with a consequent deterioration in performance.
	DANGER! The unit must be installed according to national or local standards in force at the time of installation. If the drive you installed is accessible to persons under 14 years of age to use safety nets or other devices designed to avoid any possibility of contact. The documentation for accessories supplied loose included with each kit.
	DANGER! Do not lean on the heat exchanger and in the corners of the structure, as improper use can cause cuts, use appropriate personal protection equipment (gloves, glasses, etc..).



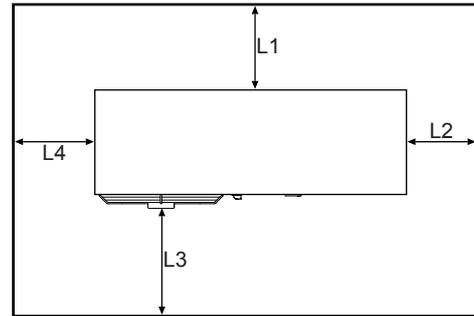
If the unit is not fixed to anti-vibration mounts (KSA), once it has been set on the ground, it must be firmly bolted down to the floor using M10 metric threaded bolts. Slots are provided in the base for this purpose.

II.2.1 CLEARANCE AND POSITIONING

	IMPORTANT! Before installing the unit, check the noise limits allowed in the place where it will be used.
	IMPORTANT! The unit should be positioned in accordance with the minimum recommended keeping in mind the accessibility of refrigerant and electrical connections.

The unit is designed for outdoor installation. The unit must be installed in compliance with the minimum recommended technical spaces, bearing in mind the access to the water and electrical connections. The unit should be correctly levelled and positioned on a supporting surface capable of sustaining its full weight. It must not be installed on brackets or shelves.

REV 16÷32



Modello	16÷32	
L1	mm	300
L2	mm	600
L3	mm	A free outlet
L4	mm	300

	IMPORTANT! Incorrect positioning or installation of the unit may amplify noise levels and vibrations generated during operation.
---	--

The following accessories are available to reduce noise and vibration:
KSA - Anti-vibration mountings.

When installing the unit, bear the following in mind:

- non-soundproofed reflecting walls near the unit may increase the total sound pressure level reading near the appliance by as much as 3 dB(A) for every surface;
- install suitable anti-vibration mountings under the unit to avoid transmitting vibrations to the building structure;
- piping should be supported in a rigid and solid structures. If the pipes are routed through walls or panels, insulate with elastic sleeves. If, after installation and start-up of the unit, structural vibrations are observed in the building which provoke such strong resonance that noise is generated in other parts of the building, refer to a qualified acoustic technician for a complete analysis of the problem.

II.2.2 REFRIGERANT CONNECTIONS



II.2.2.1 Preparation of cooling lines

The refrigerant piping for the connection to the evaporator section must be made of copper pipes for refrigeration systems of the type EN 12735, electrolytic, annealed, degreased and deoxidized. Also make sure that there are no impurities or humidity in the piping which could be extremely harmful for the cooling circuit. The cooling lines must also be insulated individually covered in closed cell fireproof expanded material at least 9 mm thick.

The table below shows the maximum equivalent lengths of the connection pipes with the evaporator section and the relative diameters.

		Equivalent distance (*)					
REV			5 m	10 m	15 m	20 m	25 m
16	Liquid	mm	15,9	15,9	15,9	15,9	15,9
		inch	5/8"	5/8"	5/8"	5/8"	5/8"
19	Gas	mm	19,1	19,1	25,4	25,4	25,4
		inch	3/4"	3/4"	1"	1"	1"
25	Liquid	mm	15,9	15,9	15,9	15,9	15,9
		inch	5/8"	5/8"	5/8"	5/8"	5/8"
32	Gas	mm	22,2	22,2	25,4	25,4	31,8
		inch	7/8"	7/8"	1"	1"	1 1/4"

(*) The equivalent length can be roughly obtained by adding 1.2 m for each bend and 1 m for each change of cross-section to the straight pipes

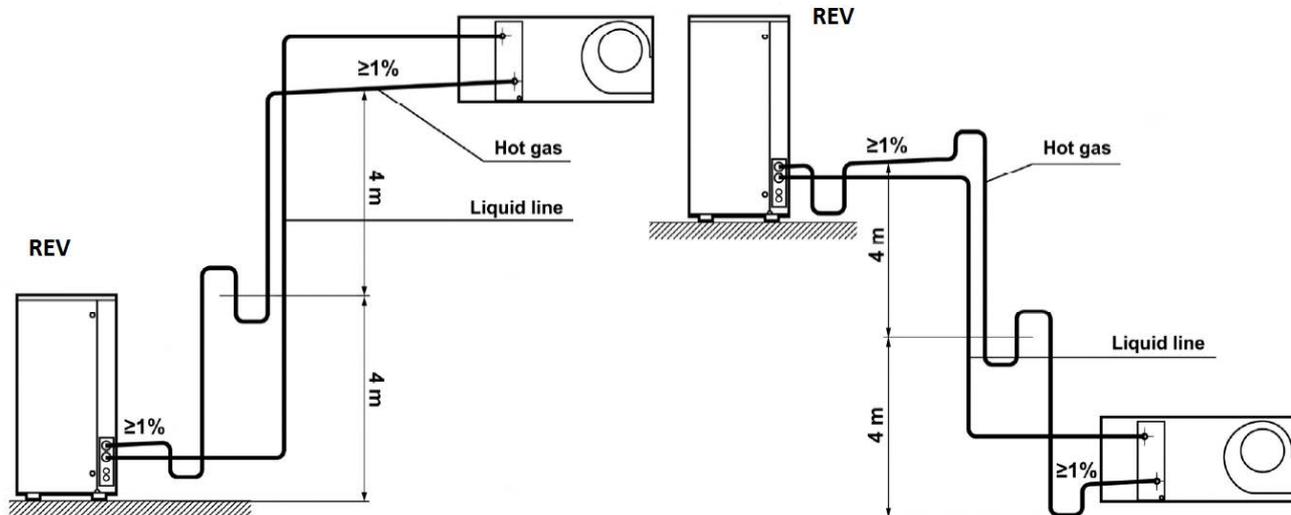
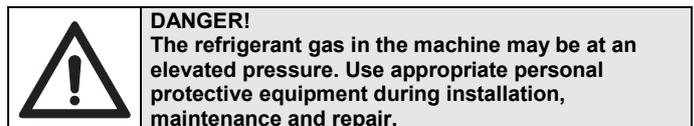


Fig. 10

The maximum difference allowed between the machine and the evaporating section is 8 m, and the maximum equivalent length of the line connection is 25 m.

Bigger height differences are possible provided siphons are included every 6 m on the gas line. The siphons must have a height appropriate to the section of the pipe. In the installation of the pipes should operate with care and with the aid of bending of the type suitable to the diameter of the pipe, to avoid possible deformations. Bend the tubes by cutting the insulation in order to free up the tube and then carefully reposition the insulation if removed, joining the joints with tape or mastic suitable and fix the pipes by means of brackets. The horizontal suction line must be sloped towards the compressor at least 1% is that the compressor is on top is that it is lower than the evaporating section. The exit of the evaporator section must be realized a siphon to allow the oil drag towards the compressor (Fig. 10).

II.2.2.2 Refrigerant charge



The units are supplied with a charge of refrigerant (R410A) indicated on the serial number plate.

II.2.2.3 Connecting cooling lines

Are supplied with the machine cartellati the tubes to allow the union between the taps and the brazing with the connecting pipes.
Cut the pipes connecting to the predetermined distance, with a certain margin of safety and taking into account the precautions indicated.

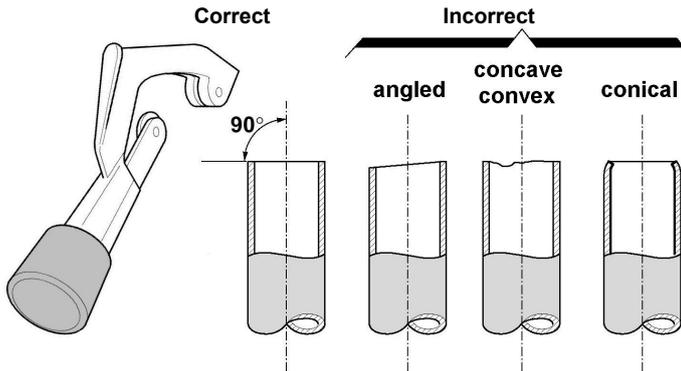


Fig. 11

Eliminate any burrs formed during cutting, facing the pipe opening downwards during this operation to keep any filth from entering.
The junction between the tubes cartellati (supplied) and the refrigerant lines must be preceded by adaptation of the diameters of the pipes of the line or, alternatively, by means of pipes cartellati belling or tapering according to the need. The fittings must be removed from the car and taps on the pipes tucked cartellati supplied before operations to adapt and brazing.
E should make a visual inspection of the ends to be welded must be free of anomalous deformation, scratches and breakage.

	IMPORTANT! The junction zone must be thoroughly cleaned and deoxidized. This is the only way to guarantee the mechanical sealing of strong braze-welding.
--	---

We recommend a interpenetration of the pipes to be brazed to a length greater than or equal to 25 mm (Fig. 12) and the clearance between the cylindrical surfaces must be uniform over the entire circumference and between 0,05 mm and 0,25 mm. For the preparation of the junction of the pipes, it is recommended to refer to what is written in standard EN 14276.

Tubes cartellati	REV	16-19	25÷32
Liquid line coupling Ø _e	mm	15,8	15,8
	inch	5/8"	5/8"
Gas line coupling Ø _e	mm	19,5	22,2
	inch	3/4"	7/8"
Condensate drain connection Ø _e	mm	30	30

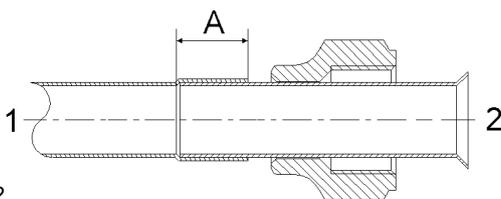


Fig. 12

- 1. Refrigerant line;
- 2. Cartellato tube end;
- A. ≥ 25 mm.

The junction must be made by means of strong braze welding. The operation must be performed by qualified personnel in compliance with the rules provided in standard prEN 14276.

	DANGER! Strong braze welding must be carried out by qualified personnel.
	DANGER! DO NOT braze in the presence of flammable substances; air out the environment where braze welding is performed; be in a safe position.

Strong brazing must be carried out with pipes disconnected from the machine to avoid dangerous overtemperatures and overpressures for components and operators.
Coat the refrigerant lines with suitable insulation.

Connect the refrigerant lines to the attacks of the unit by matching perfectly the two ends. Hand tighten the flare nut, then tighten using the torque wrench, respecting torque values shown in the table.

Nut	Screwing strength		
		Min	Max
inch 1/2"	Nm	34	47
inch 5/8"	Nm	54	75
inch 3/4"	Nm	68	71
inch 7/8"	Nm	90	120

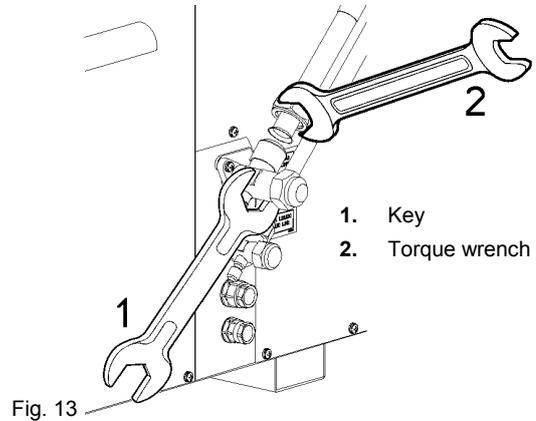


Fig. 13

When connecting the unit to keep firm taps with a further key (Fig. 13), to avoid that the hose or the sheets undergo torsions.

II.2.2.4 Evacuating and loading circuit

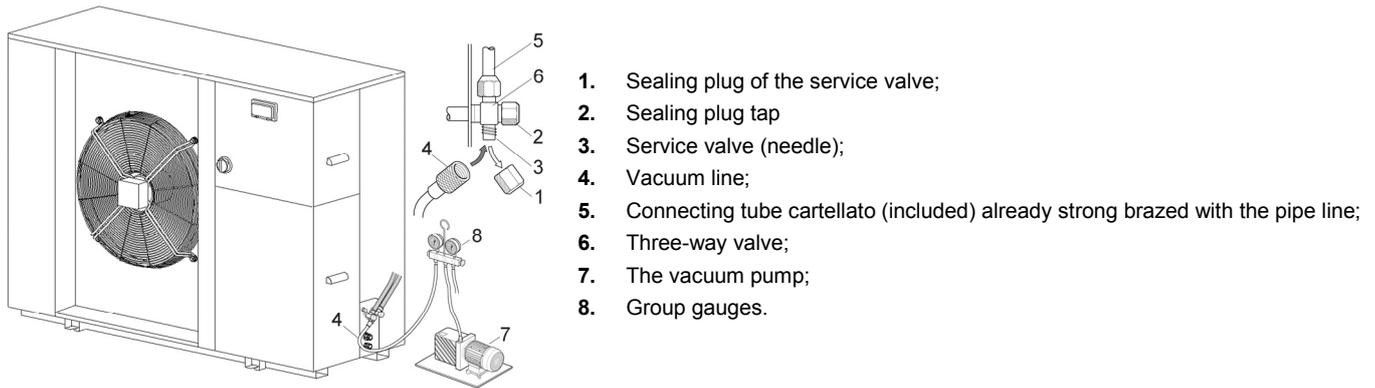


Fig. 14

Remove the sealing plug (1) of the service valve (3) pressure present in the gas line. Connect the vacuum line coming from the pressure gauge unit. Evacuate the system until it reaches a pressure of at least 0.3 mbar and keep it there for a suitable amount of time to check for leaks. Close the valve on the pressure gauge unit (8) connected to the vacuum pump (7) and switch it off. Get off the plug seals the taps (2) of the three-way valves (6) and open the taps with the Allen key, sending circulating the refrigerant gas contained in the unit. Screw and tighten the caps securely seal the taps (2). Remove the vacuum line from the service valve (3) and screw (4) and tighten the relative sealing plug (1). If the unit was already refrigerant charge, after evacuating the gas line and that of the liquid it is possible to open its taps. Start the machine it is necessary to verify the correct refrigerant charge using the following procedure:

measure the temperature T_e (evaporation) and T_c (condensation) with two dual scale gauges (pressure / temperature) and the temperatures you (low pressure) t_c (high pressure) with contact thermometer downstream of the evaporator and condenser, check that $t_c - T_c = 4 \pm 10^\circ\text{C}$ (subcooling).

- If the superheat is less than 4°C , the refrigerant charge is excessive or there is poor air flow on the indoor unit.
- If the superheat is greater than 10°C , the charge is insufficient, ie the thermostatic valve creates a pressure jump abnormal; in this case adjust the overheating by acting on the adjustment screw of the valve.
- If subcooling is greater than 10°C , there is too much load.
- If subcooling is less than 4°C , the battery is low or there is a lack of air flow on the condenser coil.

When checking the load, you may observe oscillations of evaporation pressure of ± 0.5 bar.

This is normal and does not jeopardise machine operation. When replacing any component of the cooling circuit (compressor, thermostatic valve, filter, etc.) it must be dried and vacuum performed in it. This operation requires a high vacuum pump which can have the circuit reach an absolute pressure of at least 0.8 mbar.

Topping up units with R410A refrigerant must be carried out in the liquid phase, piping it from a cylinder so as not to alter its composition.

For leaks and correct closing of the taps (Allen key), may be useful values for tightening torques:

Valves	1/2	5/8	3/4	7/8
Torque	10 Nm	10 Nm	35 Nm	35 Nm

These seals are covered by additional caps hexagonal (rif. 1, Fig. 14)

	SAFEGUARD THE ENVIRONMENT! refrigerant fluid should not be discharged into the atmosphere. It should instead be recovered by means of homologated devices, stored in suitable cylinders and delivered to a company authorised for the collection
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II.2.3 ELECTRICAL CONNECTIONS

	DANGER! The electrical connection of the unit must be carried out by qualified personnel, in compliance with the regulations applicable in the country where the unit is installed. A non-compliant electrical connection raises Royal Clima from liability for damage to property and people. In making the electrical connections to the board, cables must be routed so that they do not touch the hot parts of the machine (compressor, flow pipe and liquid line). Use the special slots for anchoring the clamps placed on the panel of the compressor and protect cables from any burrs.
	IMPORTANT! For the electrical connection of the unit and the accessories, refer to the wiring diagram supplied.

After removing the bottom panel right side of the unit to route the power cables through the appropriate cable glands on the external paneling and right through the glands that are located at the base of the cabinet, taking care to avoid hot parts and cutting edges to 'inside of the machine.

The electrical connections must be carried out according to the regulations and the wiring diagrams supplied with the unit.

The electrical power supplied by the three-phase line, must be taken to the main isolator switch.

The power cord must be of the flexible sheath of polychloroprene not lighter than H05RN-F. The grounding conductor must be longer than the other wires so that it is the last to stretch in case of loosening of the fastener of the cable, refer to the section of the circuit diagram.

	DANGER! Always install a protected area in the vicinity of the machine circuit breaker (IG) with a delayed characteristic curve, with adequate capacity and breaking capacity and with minimum contact opening of 3 mm. The circuit breaker (IG) must be located upstream of the entire system in order to interrupt the power supply of the main unit and all accessories connected to it constitute the entire system (for more information refer to the diagrams electrical bonding). Earth connection is compulsory by law to ensure user safety while the machine is in use.
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II.2.3.1 Remote management through connections prepared by the installer

Refer to the wiring diagram enclosed with the unit in which they highlighted the terminals for the predispositions by the user:

TE – Summer working thermostat.

SCR - Remote control selector switch.

LBG - Block lamp.

- **Connecting the unit REV (TE)**

The thermostat is generally a room thermostat but may be replaced by any other control device suitable for the specific purpose.

	IMPORTANT! When the unit is set to OFF by remote control selector switch, the display will show OFF.
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- **Enable ON / OFF control of REV (SCR)**

To remotely control the two signals, connect the two lamps according to the instructions provided in the wiring diagram supplied with the machine.

ATTENTION	Open contact: unit in OFF
	Closed contact: unit in ON

- **LBG remote control**

To remotely control the two signals, connect the two lamps according to the instructions provided in the wiring diagram supplied with the machine.

II.2.3.2 Remote administration using accessories supplied separately

KIS - RS 485 serial interface for interconnection with distributed intelligent systems for integrated building automation.

KUSB - RS485/USB serial converter for interconnection between RS485 serial network and supervision systems, with serial connection to PC via USB port (USB cable supplied)

II.3 INSTRUCTIONS FOR START-UP

	IMPORTANT! Machine commissioning or the first start up (where provided for) must be carried out by skilled personnel from workshops authorised by Royal Clima, qualified to work on this type of products.
	DANGER! Before starting up, make sure that the installation and electrical connections conform with the instructions in the wiring diagram. Also make sure that there are no unauthorised persons in the vicinity of the machine during the above operations.
	IMPORTANT! The manual of use and maintenance of safety valves and the fan is attached to this manual and should be read in its entirety.
	DANGER! Do not come close to the calibration values of the safety valves during any gas charges, their intervention causes violent roar and spills of oil and gas.

Pay particular attention to the presence of the safety valves on the flow calibration 41.7 Barg.

II.3.1 ACCESS TO PARAMETERS

Parameter access is only possible via LCD keypad or by personal computers and takes place at three levels: user, technical assistance and manufacturer.

II.3.2 CONFIGURATION

Safety component calibration settings	Intervention	Reset
High pressure switch	40,2 bar	28 Bar - Manual
Low pressure switch	2 bar	3,3 Bar – Automatic

Configuration parameters	Standard settings
Maximum time defrost	8'
Press. exclusion time low pressure at start	120"
Minimum time between 2 consecutive compressor start-ups	360"
Minimum time for compressor to start up	180"
Pre-ventilation time	30"

The units are tested in the factory, where they are also calibrated and the default parameter settings are put in. These guarantee that the appliances run correctly in rated working conditions. The machine configuration is carried out in the factory and should never be altered.

II.3.3 UNIT START-UP

	IMPORTANT! A few hours before starting up the unit (at least 12), supply power to the machine in order to power the electrical resistances designed to heat up the compressor crankcase. Each time the unit starts up the crankcase resistances switch off automatically.
---	---

Before starting the unit, perform the following checks.

- The electrical supply must comply with the specifications on the data plate and/or the wiring diagram and it must fall within the following limits:

- variation of the power supply frequency: ± 2 Hz;
- variation of the power supply voltage: $\pm 10\%$ of the nominal voltage;
- imbalance between the supply phases: $< 2\%$.
- the electrical supply system must be able to supply adequate current and be suitably sized to handle the load;
- open the electric panel and make sure the terminals of the power supply and of the contactors are tight (they may have come loose during transport, which could lead to malfunctions);
- make sure that the air side heat exchanger is well ventilated and clean;

Electrical connections must be made in compliance with the local installation standards in force in the place where the unit is installed, and with the instructions in the wiring diagram provided with the unit. The sizing of the power cables is the concern and responsibility of the installer.

	IMPORTANT! Before connecting the main power cables L1-L2-L3+N to the terminals of the general isolator, make sure that they are in the right order.
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The machine can be started by pressing button **ON/OFF**, DOWN place the keyboard on the machine and remotely (thermostat). Any anomalies will be immediately shown on the display on the keypad. After the safety time the compressor is started.

II.4 INSTRUCTIONS FOR MAINTENANCE

	DANGER! Maintenance operations, even if for inspection purposes only, must be carried out by skilled technicians, qualified to work on air conditioning and refrigeration products. Use suitable personal protective equipment (gloves, goggles, etc).
	DANGER! Do not introduce pointed objects through the air flow and intake grilles.
	DANGER! Always act on the general automatic switch (IG) protecting the system before carrying out any maintenance work, even if it is purely for inspection purposes. Make sure that no one accidentally supplies power to the machine; lock the general automatic switch (IG) in the zero position.
	DANGER! In the event cooling or fan circuit component fail or the refrigerant fluid charge drops, the upper part of the compressor casing and the discharge line may reach temperatures close to 180°C for brief periods of time.

II.4.1 ROUTINE MAINTENANCE

II.4.1.1 Refrigerant circuit

o Check refrigerant fluid charge

With the unit off, fit a pressure gauge on the test point on the outlet side and another on the test point on the inlet side. Start up the unit and check both pressure readings once they have stabilised.

o Check for the absence of refrigerant fluid leaks

With the unit off, check the refrigerant circuit with a suitable leak detector.

o Check that the air side heat exchanger is clean.

In Off observe the air heat exchanger and, depending on the case:

- remove all foreign matter from the finned surface that may block the passage of air;
- remove any dust deposits possibly aspirates;
- perform a mild washing with water, combined with a slight brushing;
- carry out the drying in air.

o Check the cleanliness of the condensate drain

II.4.1.2 Electrical circuit

The following checks are recommended on the electrical circuit:

- check the unit power consumption using a clip-on meter and compare the reading with the values shown in the technical data table;
- with the unit disconnected from the power supply, check and inspect electrical contacts and terminals for tightness.

II.4.2 SPECIAL MAINTENANCE

II.4.2.1 Component replacement instructions

If a unit requires repair, switch it off and drain the refrigerant from both the high and low pressure sides. This is because, if the coolant is only drained from the high pressure side, the compressor springs may close together, thereby preventing the pressure from equalising. In this way, the low pressure part of the casing and the inlet line could remain pressurised. In this case, if you apply a brazing torch to one of the low-pressure components of the system, the pressurised mixture of refrigerant and oil could blow out of the circuit and ignite on contact with the brazing torch. To avoid this hazard and that resulting from triggering of the safety valve, make sure that both the high and low pressure sides of the circuit have actually been drained before applying brazing torches.

II.4.2.2 Restoring the refrigerant load

The best way to load the refrigerant fluid is to load the unit on both sides, high and low pressure simultaneously, to avoid overloading the compressor which could damage it.

Topping up units with R410A refrigerant must be carried out in the liquid phase, piping it from a cylinder so as not to alter its composition.

II.4.2.3 Instructions to dismantle the unit and dispose of hazardous substances

	SAFEGUARD THE ENVIRONMENT! Royal Clima has always cared about protecting the environment. When the unit is dismantled it is important to adhere scrupulously to the following procedures.
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The unit must only be dismantled by a firm authorised for the disposal of scrap machinery/products.

The unit as a whole is composed of materials considered as secondary raw materials and the following conditions must be complied with:

- the compressor oil must be removed, recovered and delivered to a facility authorized to collect waste oil;
- refrigerant fluid should not be discharged into the atmosphere. It should instead be recovered by means of homologated devices, stored in suitable cylinders and delivered to a company authorised for the collection;
- the filter-drier and electronic components (electrolytic condensers) are considered special waste, and must be delivered to a body authorized to collect such items;
- the foamed polyurethane rubber and foamed polyethylene mesh pipe insulation, the foamed polyurethane (which surrounds the storage tank), the polystyrene packaging and the sound-absorbent sponge lining on the bodywork must be removed and processed as urban refuse.

II.4.2.4 Check-list

PROBLEM	RECOMMENDED ACTION
1 - HIGH FLOW PRESSURE	
Insufficient cooling air in air side heat exchanger: The fan does not work:	check clearances and make sure coil is not obstructed; check fan operation.
Excessive refrigerant charge:	drain the excess.
2 - LOW FLOW PRESSURE	
Insufficient refrigerant charge:	1 - detect and eliminate any leaks; 2 - restore correct load.
Mechanical problems in the compressor:	replace compressor.
3 - HIGH INTAKE PRESSURE	
Excessive thermal load:	check system sizing, infiltrations and insulation.
Irregular operation of the expansion valve:	check operation.
Mechanical problems in the compressor:	replace compressor.
4 - LOW INTAKE PRESSURE	
Insufficient refrigerant charge:	1 - detect and eliminate any leaks; 2 - restore correct load.
Filter partially obstructed (appears frosted):	replace filter.
Irregular operation of the expansion valve:	check operation.
5 - COMPRESSOR: DOES NOT START	
Microprocessor board alarm:	identify alarm and take appropriate action.
Phase sequence control device in alarm (yellow light)	reverse the sequence of the phases.
No voltage, switch open:	close the switch.
Overload protection triggered:	1 - reset the switch; 2 - check the unit at start up.
No request for cooling with user system set point correct:	check and if necessary wait for cooling request.
Working set point too high:	check and if necessary readjust set-point.
Defective contactors:	replace contactor.
Compressor electric motor failure:	check short circuit.
6 - CRANKCASE HEATER DOES NOT WORK	
Lack of electrical power supply:	check power supply and auxiliary fuses.
Crankcase heater interrupted:	check and replace the crankcase heater.
7 - COMPRESSOR: BUZZING CAN BE HEARD	
Incorrect power supply voltage:	check voltage, investigate causes.
Compressor contactor stuck:	replace contactor.
Mechanical problems in the compressor:	replace compressor.
8 - COMPRESSOR: FUNCTIONS INTERMITTENTLY	
Faulty low pressure switch:	check pressure switch calibration and operation.
Insufficient refrigerant charge:	1 - detect and eliminate any leaks; 2 - restore correct load.
Refrigerant line filter clogged (appears frosted):	replace filter.
Irregular operation of the expansion valve:	check operation.
9 - COMPRESSOR: YES STOP	
Faulty high pressure switch:	check pressure switch calibration and operation.
Insufficient cooling air in air side heat exchanger:	1 - check clearances and make sure coils are not obstructed; 2- check fan function.
Excessive ambient temperature:	check unit operation limits.
Excessive refrigerant charge:	drain the excess.
10 - COMPRESSOR: FUNCTIONS NOISILY-INTERMITTENTLY	
Compressor is pumping liquid, excessive increase in refrigerant fluid in crankcase:	1 - check operation of the expansion valve; 2 - check overheating; 3 - adjust overheating, replace the expansion valve if required.
Mechanical problems in the compressor:	replace compressor.
Unit running at the limit of conditions for use:	check unit functioning limits.
11 - COMPRESSOR: FUNCTIONS CONTINUOUSLY	
Excessive thermal load:	check system sizing, leaks and insulation.
Work set point too low in cooling cycle (high in heating cycle):	check calibration and reset.
Insufficient refrigerant charge:	1 - detect and eliminate any leaks; 2 - restore correct load.
Refrigerant line filter clogged (appears frosted):	replace filter.
Control board faulty:	replace the board.
Irregular operation of the expansion valve:	check operation.
Compressor contactor stuck:	replace contactor.
Poor ventilation of the coils:	1 - check clearances and make sure coils are not obstructed; 2 - check fan function.
12 - FAN: IT DOES NOT START, IT SWITCHES ON AND OFF	
Circuit breaker protection activated:	1- check for short-circuits; 2-replace the motor.

A1 DATI TECNICI

Modello REV		16	19	25	27	29	32
Potenza frigorifera nominale (*)	kW	16,3	18,4	24,3	25,7	29	30,7
E.E.R.		2,85	2,78	2,92	2,73	2,95	2,53
Pressione sonora (**) (Δ)	dB(A)	50	50	52	52	53	53
Potenza sonora (***)	dB(A)	72	72	75	75	76	76
Compressore Scroll/gradini	n°	1/1	1/1	1/1	1/1	1/1	1/1
Ventilatori	n° x kW	2 x 0,14	2 x 0,14	2 x 0,24	2 x 0,24	2 x 0,24	2 x 0,24
Carica refrigerante R410A		Vedi targa matricola					
Carica olio POE		Vedi targa compressore					

Dati elettrici							
Potenza assorbita in funzionamento estivo (*)	kW	5,7	6,6	8,3	9,4	9,8	12,1
Alimentazione elettrica di potenza	V-ph-Hz	400-3+N-50					
Alimentazione elettrica ausiliaria	V-ph-Hz	230-1-50					
Corrente nominale in funzionamento estivo (*)	A	13	15	18,8	20,7	19,8	24,6
Corrente massima	A	16	17	21,0	23,0	23,6	27
Corrente di spunto	A	74	74	97	97	97	131

Dimensioni							
Larghezza (L)	mm	1230	1230	1230	1230		1535
Altezza (H)	mm	1090	1090	1280	1280		1510
Profondità (P)	mm	580	580	600	600		695
Attacchi linea liquido (a cartella)	Ø	5/8"	5/8"	5/8"	5/8"		5/8"
Attacchi linea gas (a cartella)	Ø	3/4"	3/4"	7/8"	7/8"		7/8"

A1 Technical Data

Model MCAEY		16	19	25	27	29	32
Nominal cooling capacity (*)	kW	16,3	18,4	24,3	25,7	29	30,7
E.E.R.		2,85	2,78	2,92	2,73	2,95	2,53
Sound pressure (**) (Δ)	dB(A)	50	50	52	52	53	53
Sound power (***)	dB(A)	72	72	75	75	76	76
Scroll/step compressor	n°	1/1	1/1	1/1	1/1	1/1	1/1
Fans	n° x kW	2 x 0,14	2 x 0,14	2 x 0,24	2 x 0,24	2 x 0,24	2 x 0,24
Amount of R410A refrigerant		See serial number plate					
Amount of Oil POE		See compressor plate					

Electrical data							
Absorbed power in summer mode (*)	kW	5,7	6,6	8,3	9,4	9,8	12,1
Electrical power supply	V-ph-Hz	400-3+N-50					
Auxiliary power supply	V-ph-Hz	230-1-50					
Nominal current in summer mode (*)	A	13	15	18,8	20,7	19,8	24,6
Maximum current	A	16	17	21,0	23,0	23,6	27
Starting current	A	74	74	97	97	97	131

Dimensions							
Width (L)	mm	1230	1230	1230	1230		1535
Height (H)	mm	1090	1090	1280	1280		1510
Depth (P)	mm	580	580	600	600		695
Attacks liquid line (a folder)	Ø	5/8"	5/8"	5/8"	5/8"		5/8"
Attacks gas line (a folder)	Ø	3/4"	3/4"	7/8"	7/8"		7/8"

A1 Données techniques

Modèle REV		16	19	25	27	29	32
Puissance frigorifique nominale (*)	kW	16,3	18,4	24,3	25,7	29	30,7
E.E.R.		2,85	2,78	2,92	2,73	2,95	2,53
Pression sonore (**) (Δ)	dB(A)	50	50	52	52	53	53
Puissance sonore (***)	dB(A)	72	72	75	75	76	76
Compresseur Scroll/paliers	n°	1/1	1/1	1/1	1/1	1/1	1/1
Ventilateurs	n° x kW	2 x 0,14	2 x 0,14	2 x 0,24	2 x 0,24	2 x 0,24	2 x 0,24
Charge réfrigérant R410A		Voir plaquette signalétique					
Charge huile POE		Voir plaquette signalétique du compresseur					

Données électriques							
Puissance absorbée en mode été (*)	kW	5,7	6,6	8,3	9,4	9,8	12,1
Alimentation électrique de puissance	V-ph-Hz	400-3+N-50					
Alimentation électrique auxiliaire	V-ph-Hz	230-1-50					
Courant nominal en fonctionnement mode été (*)	A	13	15	18,8	20,7	19,8	24,6
Courant maximum	A	16	17	21,0	23,0	23,6	27
Courant de démarrage	A	74	74	97	97	97	131

Dimensions							
Largeur (L)	mm	1230	1230	1230	1230		1535
Hauteur (H)	mm	1090	1090	1280	1280		1510
Profondeur (P)	mm	580	580	600	600		695
Raccords ligne liquide (cartable)	Ø	5/8"	5/8"	5/8"	5/8"		5/8"
Raccords ligne gaz (cartable)	Ø	3/4"	3/4"	7/8"	7/8"		7/8"

A1 Technische Daten

Modell REV		16	19	25	27	29	32
Nennkühlleistung (*)	kW	16,3	18,4	24,3	25,7	29	30,7
E.E.R.		2,85	2,78	2,92	2,73	2,95	2,53
Schalldruckpegel (**) (Δ)	dB(A)	50	50	52	52	53	53
Schalleistungspegel (***)	dB(A)	72	72	75	75	76	76
Scroll-Verdichter/Leistungsstufen	n°	1/1	1/1	1/1	1/1	1/1	1/1
Ventilatoren	n° x kW	2 x 0,14	2 x 0,14	2 x 0,24	2 x 0,24	2 x 0,24	2 x 0,24
Kältemittel R410A		Siehe Typenschild					
Ölfüllung POE		siehe Typenschild Verdichter					

Elektrische Kenndaten							
Leistungsaufnahme in Sommerbetrieb (*)	kW	5,7	6,6	8,3	9,4	9,8	12,1
Leistungsstromversorgung	V-ph-Hz	400-3+N-50					
Hilfsstromversorgung	V-ph-Hz	230-1-50					
Nennstrom Sommerbetrieb (*)	A	13	15	18,8	20,7	19,8	24,6
Maximale Stromaufnahme	A	16	17	21,0	23,0	23,6	27
Anlaufstrom	A	74	74	97	97	97	131

Abmessungen							
Breite (L)	mm	1230	1230	1230	1230		1535
Höhe (H)	mm	1090	1090	1280	1280		1510
Tiefe (P)	mm	580	580	600	600		695
Angriffe Flüssigkeitsleitung (ein Ordner)	Ø	5/8"	5/8"	5/8"	5/8"		5/8"
Angriffe Gasleitung (ein Ordner)	Ø	3/4"	3/4"	7/8"	7/8"		7/8"

A1 DATOS TÉCNICOS

Modelo REV		16	19	25	27	29	32
Potencia frigorífica nominal (*)	kW	16,3	18,4	24,3	25,7	29	30,7
E.E.R.		2,85	2,78	2,92	2,73	2,95	2,53
Presión sonora (**) (Δ)	dB(A)	50	50	52	52	53	53
Potencia sonora (***)	dB(A)	72	72	75	75	76	76
Compresor Scroll/escalones	n°	1/1	1/1	1/1	1/1	1/1	1/1
Ventiladores	n° x kW	2 x 0,14	2 x 0,14	2 x 0,24	2 x 0,24	2 x 0,24	2 x 0,24
Carga de refrigerante R410A		Vea placa de matrícula					
Carga de aceite POE		Ver placa del compresor					

Datos eléctricos							
Potencia absorbida en funcionamiento de verano (*)	kW	5,7	6,6	8,3	9,4	9,8	12,1
Alimentación eléctrica de potencia	V-ph-Hz	400-3+N-50					
Alimentación eléctrica auxiliar	V-ph-Hz	230-1-50					
Corriente nominal con funcionamiento de verano (*)	A	13	15	18,8	20,7	19,8	24,6
Corriente máxima	A	16	17	21,0	23,0	23,6	27
Corriente de arranque	A	74	74	97	97	97	131

Dimensiones							
Ancho (L)	mm	1230	1230	1230	1230		1535
Altura (H)	mm	1090	1090	1280	1280		1510
Profundidad (P)	mm	580	580	600	600		695
Conexiones línea líquido (a cartera)	Ø	5/8"	5/8"	5/8"	5/8"		5/8"
Conexiones línea gas (a cartera)	Ø	3/4"	3/4"	7/8"	7/8"		7/8"

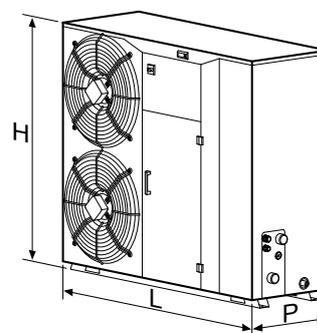
(*) Alle seguenti condizioni: Temperatura aria ingresso condensatore 35°C; temperatura evaporazione 5°C.
 (**) Livello di pressione sonora in dB(A) riferito ad una misura alla distanza di 5 m dall'unità, con fattore di direzionalità pari a 2.
 (***) Livello di potenza sonora in dB(A) sulla base di misure effettuate in accordo alla normativa UNI EN-ISO 3744 ed Eurovent 8/1.
 (Δ) Per le macchine allestite con accessorio "SIL" la pressione sonora deve essere corretta di -4dB(A) per i modelli 115-117 e di -3dB(A) per i modelli 122-130.

(*) In the following conditions: Condenser inlet air temperature 35°C; evaporating temperature 5°C.
 (**) Sound pressure level in dB(A) referring to a 5 m distance from the unit, in directionality factor equal to 2.
 (***) Sound power level in dB(A) on the basis of measurements taken in accordance with UNI EN-ISO 3744 and Eurovent 8/1 Standards.
 (Δ) For the machines with the SIL accessory installed, sound pressure must be corrected by -4dB(A) for 115-117 models and -3dB(A) for 122-130 models.

(*) Dans les conditions suivantes: Température de l'eau à l'entrée du condenseur 35°C; température d'évaporation 5°C.
 (**) Niveau de pression sonore en dB(A) se référant à une mesure à une distance de 10 m de l'unité, avec facteur de directivité = 2
 (***) Le niveau de puissance sonore total en dB(A) en fonction de mesures effectuées conformément à la norme UNI EN-ISO9614 et Eurovent 8/1
 (Δ) Pour les machines équipées d'accessoire la pression acoustique "SIL" doit être corrigé pour -4dB (A) pour les modèles 115-117 et -3 dB (A) pour les modèles 122-130.

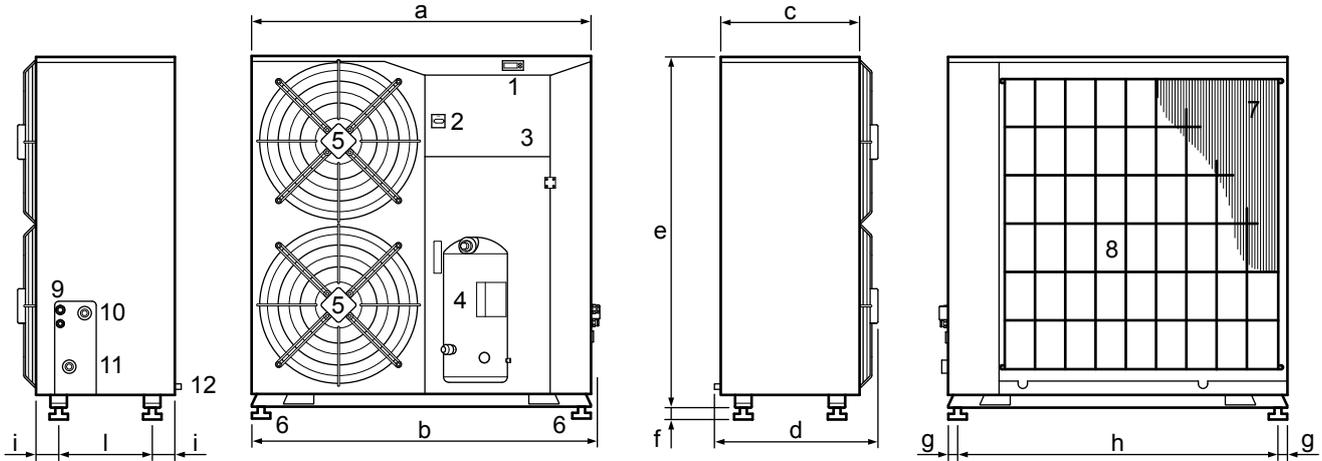
(*) Unter folgenden Betriebsbedingungen: Lufttemperatur am Verflüssigereingang 35°C; Verdampfungstemperatur 5°C.
 (**) Schalldruckpegel in dB(A), gemessen in einem Abstand von 10 Metern von der Einheit, mit Richtungsfaktor 2
 (***) Schalleistungspegel in dB(A) auf der Basis von Messungen, die gemäß UNI EN-ISO 3744 und Eurovent 8/1 ausgeführt wurden.
 (Δ) Bei Maschinen mit Zubehör "SIL" des Schalldrucks ausgestattet ist, um 4dB (A) für die Modelle 115-117 und -3 dB (A) für die Modelle 122-130 korrigiert werden.

(*) A las siguientes condiciones: Temperatura del aire en la entrada del condensador 35°C; temperatura de evaporación 5°C.
 (**) Nivel de presión sonora en dB(A) referido a una medición a una distancia de 10 m de la unidad, con factor de direccionalidad de 2
 (***) Nivel de potencia sonora en dB(A) según las medidas tomadas conforme a la norma UNI EN-ISO 9614 y Eurovent 8/1
 (Δ) Para máquinas equipadas con accesorio "SIL" la presión de sonido que debe corregirse para -4dB (A) para los modelos 115-117 y -3 dB (A) para los modelos 122-130.



A2 DIMENSIONI ED INGOMBRI / DIMENSIONS AND CLEARANCES / DIMENSIONS HORS TOUT / ABMESSUNGEN UND PLATZBEDARF / DIMENSIONES Y VOLÚMENES

REV 16÷32



Model		a	b	c	d	e	f	g	h	i	l	m
16	mm	1230	1255	500	580	1090	60	20	1192	82	340	150
19	mm	1230	1255	500	580	1090	60	20	1192	82	340	150
25	mm	1230	1255	500	600	1280	60	20	1192	82	340	150
27	mm	1230	1255	500	600	1280	60	20	1192	82	340	150
29	mm	1535	1555	600	695	1510	60	20	1492	82	440	176
32	mm	1535	1555	600	695	1510	60	20	1492	82	440	176

- 1. Pannello di controllo;
- 2. Sezionatore;
- 3. Quadro elettrico;
- 4. Compressore;
- 5. Ventilatore;
- 6. Supporto antivibrante (accessorio KSA);
- 7. Batteria;
- 8. Rete di protezione (accessorio KRP);
- 9. Ingresso alimentazione elettrica;
- 10. Rubinetto GAS
- 11. Rubinetto LIQUIDO
- 12. Scarico condensa.

- 1. Control panel;
- 2. Isolator;
- 3. Electrical Control Board;
- 4. Compressor;
- 5. Fan;
- 6. Anti-vibration support (KSA accessory);
- 7. Coil;
- 8. Coil protection (KRP accessory);
- 9. Power supply inlet;
- 10. GAS cock
- 11. LIQUID cock
- 12. Condensate drain.

- 1. Panneau de contrôle;
- 2. Sectionneur;
- 3. Tableau électrique;
- 4. Compresseur;
- 5. Ventilateur;
- 6. Support antivibratoire (accessoire KSA)
- 7. Batterie;
- 8. Grille de protection (accessoire KRP);
- 9. Entrée de l'alimentation électrique;
- 10. Robinet GAZ
- 11. Robinet LIQUIDE
- 12. Evacuation condensation.

- 1. Bedientafel;
- 2. Trennschalter;
- 3. Schaltkasten;
- 4. Verdichter;
- 5. Ventilator;
- 6. Schwingungsdämpfer (KSA Zubehör);
- 7. Register;
- 8. Schutzgitter (Zubehör KRP);
- 9. Eintritt Stromversorgung;
- 10. Hahn GASLEITUNG
- 11. Hahn FLÜSSIGKEITSLEITUNG
- 12. Kondensatablauf.

- 1. Panel de control;
- 2. Disyuntor;
- 3. Cuadro eléctrico;
- 4. Compresor;
- 5. Ventilador;
- 6. Soporte antivibratorio (accessorio KSA)
- 7. Bateria;
- 8. Malla de protección (accessorio KRP);
- 9. Entrada de la alimentación eléctrica;
- 10. Grifo GAS
- 11. Grifo LÍQUIDO
- 12. Desagüe de condensados.

Pesi / Weight / Poids / Gewichte / Pesos

Model		16	19	25	27	29	32
REV	kg	140	150	200	225	270	300

I pesi sono riferiti alle unità imballate.

The weights refer to packed units.

Les poids se réfèrent aux unités emballées.

Die Gewichte beziehen sich auf verpackte Einheiten.

Los pesos se refieren a las unidades embaladas.

NOTE

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