RIVACOLD

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MANUALE USO E MANUTENZIONE AEROEVAPORATORI CUBICI A SOFFITTO

USE AND MAINTENANCE HANDBOOK CEILING CUBIC UNIT COOLERS

RC

RC REV. 07 05/07

ENGLISH

UK

Contents

1. HANDBOOK PURPOSE

This handbook is issued in order to assist an operator properly to bring the unit cooler on stream , give explainations about the relevant safety norms in force within the European Community and avoid any risks that may be caused by a wrong usage.

2. NORMS FOR GENERAL USE

- For a correct and safe use of the machine, it is necessary to follow the prescriptions present in this manual as it gives instructions and information about :
  - ✓ installation
  - ✓ use
  - ✓ maintenance
  - ✓ disabling and disposal

- *The manufacturer cannot accept any liability for damages resulting from failure to follow the prescriptions and advice given in this handbook.*
- Read carefully labels placed on the machine, do not cover them for any reason and replace them in case they are damaged .
- Keep this manual carefully.
- The manufacturer may review this manual at any time, without notice.
- The unit coolers are designed for the use in industrial and commercial refrigeration application for stable cold rooms. They are not intended for any other purpose. Any other use is to be considered improper and dangerous .
- When the package is removed, please check that every part of the machine is intact; if not, contact the retailer immediately .
- It is forbidden the use of the machine in environment with presence of inflammable gas or where there is a risk of explosion.
- Do not clean the machine with direct water jet, under pressure or with improper substances .
- Do not use the machine without its protections (housing and grid)
- Do not expose the machine to heating sources
- In case of fire use a powder fire extinguisher
- Packaging material must be suitably disposed of according to the low in force

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3. MACHINE IDENTIFICATION

All the machines are equipped with an identifying label (the position of the label is shawn in Drawing 1) where the following data are quoted :

- code
- no. of fan motors - no. of revolutions(RPM)
  Watt absorption (W)
  Ampere absorption (A)
  Power supply voltage (Volt/Ph/Hz)
- defrosting:
  heaters number
  Watt absorption(W)
  power supply voltage (Volt/Ph)
- refrigerant group: Group 2(*)
- PS pressure (max working pressure)
- TS temperature (min. operating temp.)
- serial number

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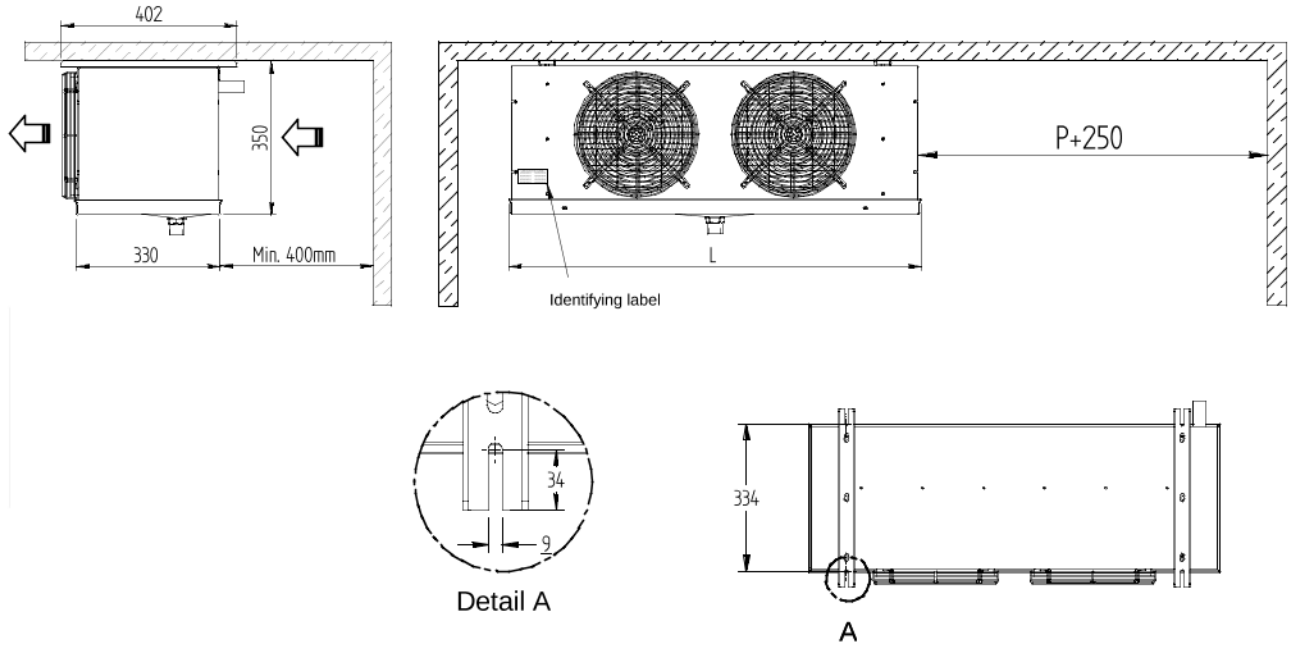
(*) According to EN378/1 norm belong to the group 2 the following gas types:
R22,R134a,R507,R404A,R407C,R410A,R410B

All RC range unit coolors belongs to CAT 0 in conformity with the 97/23/CE (P.E.D.) directive.

Drawing 1



RC Model		125-16 125-16ED	225-25 225-25ED	225-30 225-30ED	325-33 325-33ED	325-45 325-45ED	425-61 425-61ED
Dimensions	P	400	770	770	1140	1140	1510
(mm)	L	574	944	944	1314	1314	1684
coil connections	inlet	Ø 12 mm	Ø 12 mm	Ø 12 mm	Ø 12 mm	Ø 12 mm	Ø 12 mm
	outlet	Ø 16 mm	Ø 16 mm	Ø 22 mm	Ø 22 mm	Ø 22 mm	Ø 28 mm
drain connection		Ø 33 mm	Ø 33 mm	Ø 33 mm	Ø 33 mm	Ø 33 mm	Ø 33 mm
Weight	Without ED	10,6	17,7	19,7	25,2	28,2	37,9
(kg)	With ED	11,3	19	21	27	30	40,2

Serial number designation :

- number 1 and 2 = last two numbers of the manufacturing year
- number 3 and 4 = week of the year when the unit was manufactured
- numbers 5,6,7and 8 = progressive number

4. INSTALLATION (general notes)

Installation must be carried out by qualified personnel having the necessary technical requirements asked for by the country where the machine is to be installed.
For moving the machine use safety anti-cut gloves and suitable hoisting device.
Check that the structure where the RC is going to be fixed is suitable to its weight .
Do not convey the motor fan air in order not to increase load losses.
Particular operating conditions such as cold rooms having too small height, excessive loading , obstacles to the air flow, may have an influence to the stated performances .

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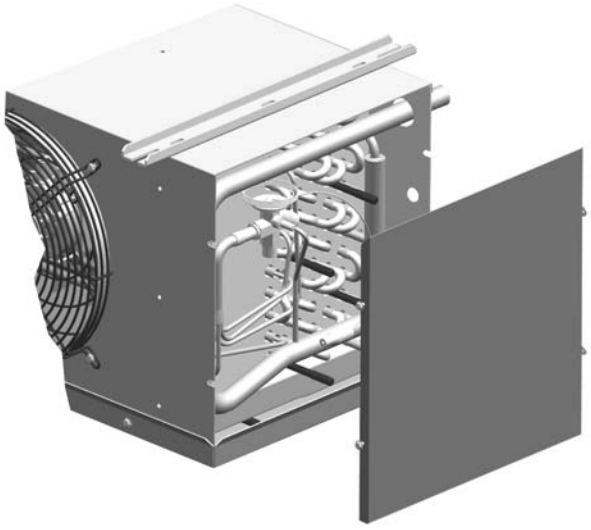
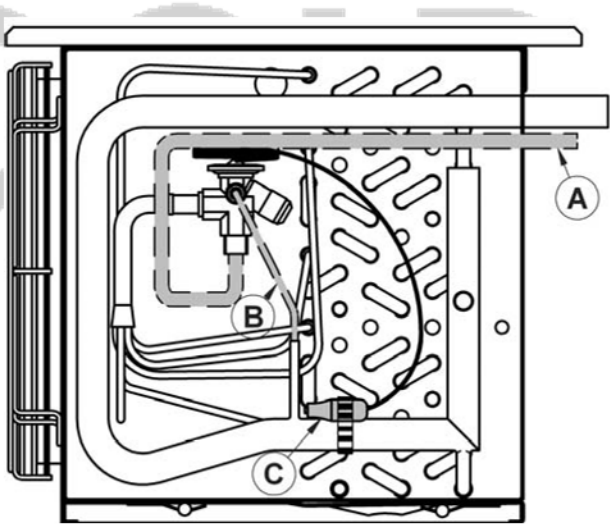
4. 1 Thermostatic valve mounting (not supplied):

The thermostatic valve is to be properly sized and will have to be installed with external balance. Unloose the 4 screws which fix the panel placed on the header side (pipes outlet side) and remove it (see Drawing 2). Check that the coil is still under nitrogen pressure by opening the Schrader valve placed on the suction line (a hissing sound should be heard, produced by the nitrogen gas coming out from the unit). Cut the pipe of the distributor according to the dimension needed and solder the thermostatic valve outlet. For the connection to the external balance, cut the 6 mm pipe placed on the suction header and solder the external balance pipe of the thermostatic valve (Drawing 3; Part B). Place the thermostatic valve bulb just before the external balance pipe placed on the suction header. Fix it on the upper side of the suction pipe by means of metal clamps (see Drawing 3; Part C).
Solder on the inlet side of the thermostatic valve, a pipe , peviously bent in the proper way, (see Drawing 3 ; Part A). The pipe will come out from the cooler through the preset hole and will be connected then to the liquid pipe of the refrigerating system.
Mount then the cover again and fasten the screws .

Drawing 2	Drawing 3





4. 2 Positioning on the ceiling

Once the thermostatic valve is connected, fix the unit cooler to the cold room ceiling.
The unit has to be installed in horizontal position, by means of the proper fixing slots. The fixing distances between centers and the position of the fans relating to the cold room walls is shown in Drawing 1. Keep around the unit enough space for a good air cycling and for a maintenance operation in safe conditions.
The minimum distance from the wall is of 400mm (Drawing 1). Keep enough space on the side for an easy replacement of the thermostatic valve and for fitting or replacing the electrical defrosting heaters (if it is not possible to have enough space on the heater side provide an opening through the cold room wall by means of a demounting panel).

5. REFRIGERATING CONNECTION

Connect the outlet of the unit cooler (upper pipe) to the suction line of the refrigerating system.
Connect the pipe that was previously soldered to the inlet side of the thermostatic valve to the liquid piping of the refrigerating system.

In order to guarantee a good hermetic seal and reduce break risks, execute all the joints by means of a " bell type" welding . If the pipe diameter do not allow that , use proper soldering joints .
During the pipe connection procedure pay attention not to force or modify the position of the header as this may a cause of breaks.

6. CONDENSATE DRAIN CONNECTION

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The piping for the condensate water drain is to be connected to the 1" Gas male connection placed at the centre of the drip tray (the minimum gradient must be over 20%) . Provide on the cold room wall, next to the unit cooler, for a hole through which the pipe will come out leading to a siphon trap. Seal the hole by means of silicon (the features of which will be suitable to the cold room use) in order to avoid infiltration of warm air. In case of a low temperature cold room the draining line must to be heated during defrosting time by means of a silicon heater (optional) of about 100W placed inside it .

7. ELECTRICAL INSTALLATION

The wiring must be carried out by qualified personnel having the necessary technical requirements asked for by the country where the machine is to be installed.

- Provide for proper protection systems on the power supply line and check that the voltage corresponds to that quoted on the label placed on the unit (allowed tolerance ± 10% of the rated tension).
- The law requires that the unit is earthed: therefore it is necessari to connect it to an efficient earthing equipment. No liability whatsoever can be accepted if the above instruction requirement is not complied with or if the electrical plant to which the unit is to be connected is not made by following the law in force
- On the unit cooler is to be installed a mechanical thermostat properly set which will disabile the heaters in case of overheating. The thermostat bulb must be placed inside the finned coil on the upper side of the unit cooler .

7. 1 Electrical connection

On the electrical connection side (see Drawing 6) it is placed the terminal box used for the connection of all electrical components of the unit cooler . Inside the terminal box there are two terminal boards : one for the earth connection the other for the fast connections were the power supply of the fan motors and heaters will connected .
For the placing of wires on the fast connections terminal board , see the instructions as follows:

1- Insert a screw driver in the proper opening (near the centre of the terminal board)
2- the screw blade keeps the spring open allowing the insertion of the wire
3- Insert the wire end without insulating cover or provided with pinched terminal
4- Take the screw driver out. The wire now is fixed in a safe way .

All models are equipped with fan motors having a voltage of 230V/1Ph/50-60Hz . The models with /ED are fitted with defrosting heaters, which are preset for being powered with a voltage of 400V/3Ph/50-60Hz (see Drawing 4). In case there is the need of powering the heaters with a voltage of 230V/1Ph/50-60Hz, change the connection as shown in Drawing 5.
For making the wires pass through , use the preset side openings .

Warning: heaters are fitted only in the ED version models (version with electrical defrost)

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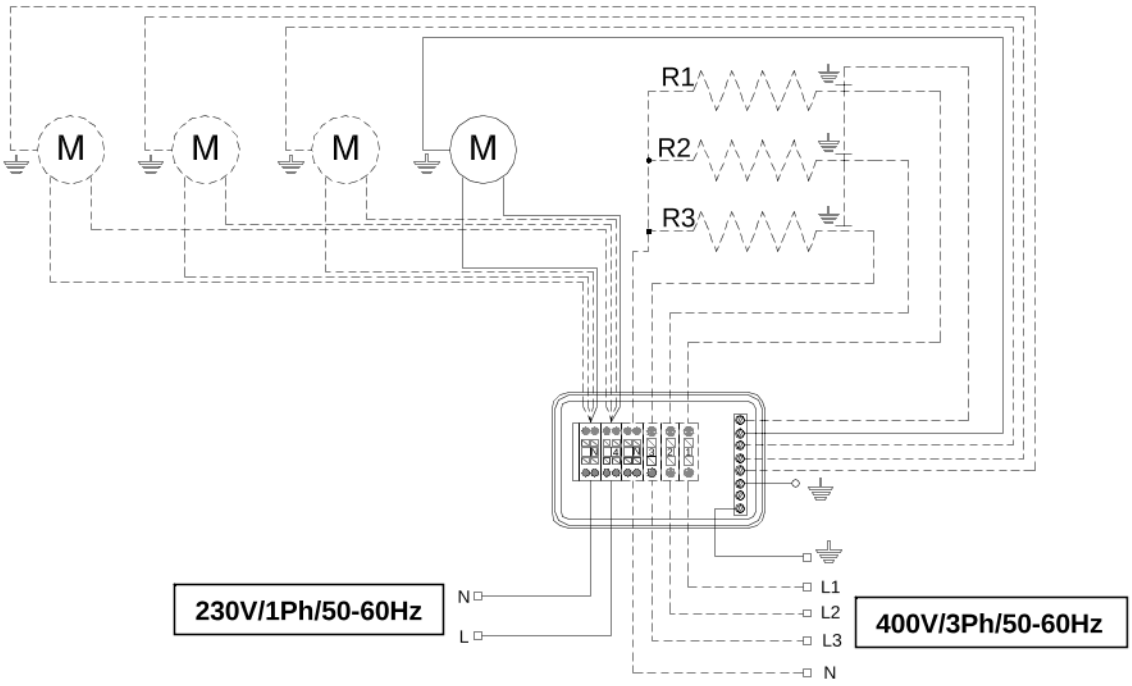
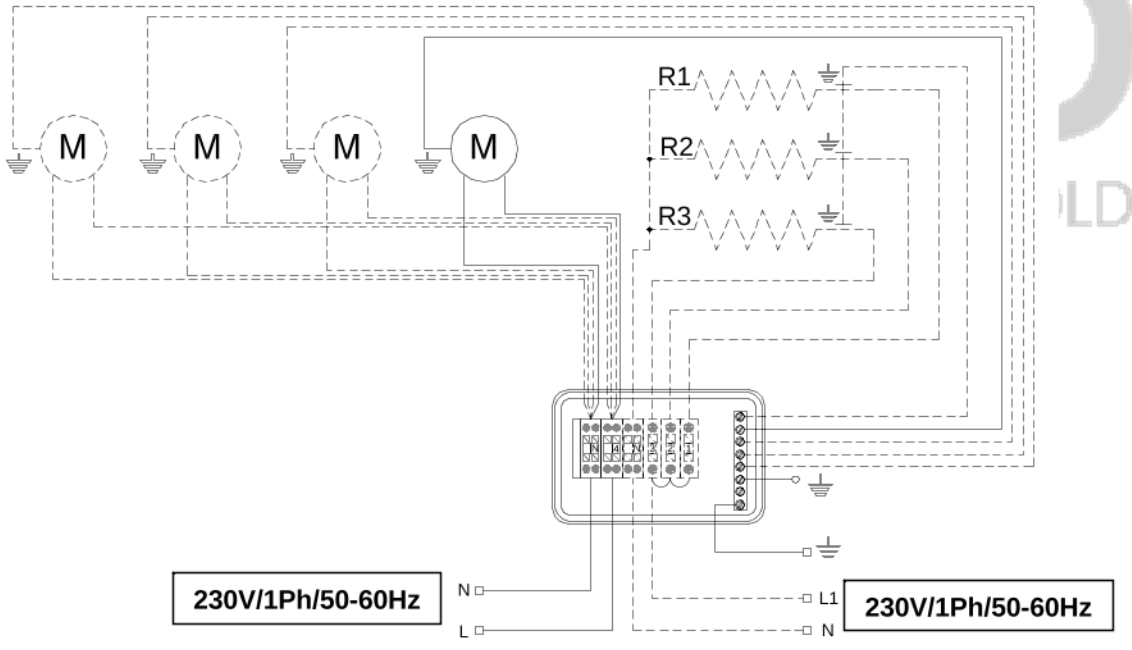
Drawing 4



Drawing. 5



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Model	RC	125-16 125-16ED	225-25 225-25ED	225-30 225-30ED	325-33 325-33ED	325-45 325-45ED	425-61 425-61ED
Fan motors	n x Ømm	1x250	2x250	2x250	3x250	3x250	4x250
Fan motor absorptions	A	0,45	0,9	0,9	1,35	1,35	1,8
	W	65	130	130	195	195	260
Heater power *	W	750	1350	1350	1950	1950	2700

* Valid for the ED version only

The fan motors are equipped with an internal protection system with automatic cutout.
In case there is the need of fitting a regulation system of fan motor number of revolutions , check that it is suitable for the fan motor itself .

8. TECHNICAL DATA

All unit coolers are supplied under nitrogen pressure .
They are equipped with axial fan motors which are not suitable for additional air pressure drops
The heat exchanger is made of copper-aluminium ; therefore it is not suited for being used in aggressive ambient.

9. MAINTENANCE AND CLEANING

Maintenance and cleaning have to be carried out by qualified technical presonnel only .
Before any intervention make sure that the electrical feed is disconnected from the mains.

- Check the fastening of all terminals inside the terminal box (every four months)
- Visually check the refrigerating circuit completely, also inside the machines, in order to detect refrigerant leaks, that are also put in evidence by traces of lubricant oil. Make a fast intervention and further check in case of doubt . (every four month)
- Periodically clean the unit in order to avoid deposits of toxic substances. The use of water and soap is recommended and avoid using solvents , aggressive agents , abrasive or ammonia-based materials.
- In the event that machine parts need replacing, they have to be replaced by items exactly the same to the originals ones

Important: once the maintenance is accomplished, replace all safeties previously removed (housing and grid ; see Drawing 6).

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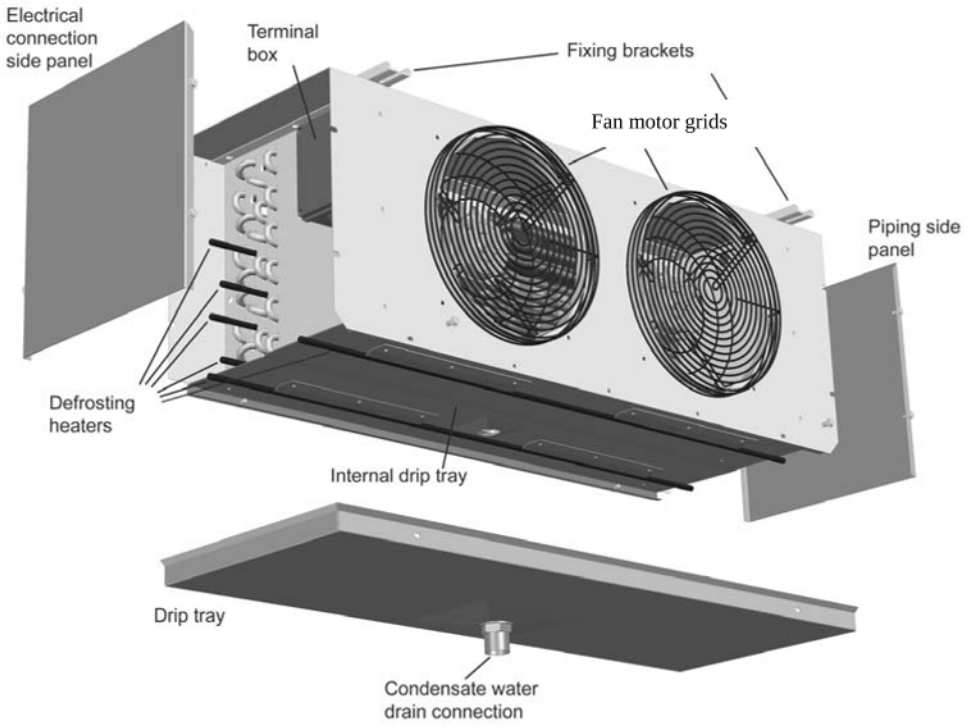
Drawing 6



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10. DISPOSAL

In case the machine is to be disabled , it is necessariy to disconnect it from the mains. The gas inside the plant must not be dispersed in the environment.

11. Failures : Causes – solutions

Problem	Possibile cause	solution
Iced Evaporator	Defrosting time too short	Increase defrosting time.
	Time Interval between two defrostings too long	Increase defrosting cycles. Check the possibile presence of squashed pipes
	Dripping time not long enough	Check the set dripping time.
	Air infiltration through the door which is too frequently opened	Reduce the door opening frequency and eliminate possibile fissure
	Burnt electrical heaters.	Replace the faulty heaters .
Iced evaporator only near the thermostatic valve	The refrigerant inflow to the evaporator is reduced .	Check the size of the thermostatic valve.
	The orifice of the thermostatic valve is too little.	Increase the orifice diameter
	High Overheating.	Check the temperatures and operate on the valve
Damaged evaporator	Deformed finns	Straighten the finns with a comb .
Blocked fan motors	Fan motor breakdown.	Replacement.
	Mains Tension lower than the allowed limits.	Check the tension value by a voltmeter .

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12. OPTIONAL ITEMS

Coil varnishment

The varnishment give the coil a protection from corrosive agent that can be present inside the cold room.

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Discharge pipe heater

It has to be inserted into the condensation water discharge pipe so that the water formed during defrosting operations does not freeze inside the waste.
This is used for application in low temperature cold rooms.

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DICHIARAZIONE DI CONFORMITÀ

Produttore: RIVACOLD S.r.l.
Indirizzo: Via Sicilia 7, 61020 Montecchio (PU), Italia.

Con la presente la **Rivacold S.r.l.** dichiara che l'aeroevaporatore a soffitto **serie RC**, è conforme alle seguenti **direttive:**

98 / 37 CE Direttiva Macchine
89 / 336 CEE Compatibilità Elettromagnetica
73 / 23 CEE Bassa Tensione

è stato realizzato applicando le seguenti **norme**:

EN 60 204- 1	Sicurezza del macchinario – Equipaggiamento elettrico delle macchine
CEI EN 60335-1	Sicurezza degli apparecchi elettrici
CEI EN 60335-2-24	Sicurezza degli apparecchi elettrici
UNI EN 12100 – 1; UNI EN 12100 - 2	Sicurezza del macchinario
EN 378 – 1 prEN 378 – 2	Impianti refrigeranti e pompe di calore – Requisiti di sicurezza e ambientali

Gli evaporatori Rivacold della serie RC, sono progettati, costruiti e collaudati in accordo alle disposizioni riguardanti la sicurezza delle attrezzature sottoposte a pressione, disposte dalla **direttiva 97/23/CE**.
In particolare si evidenzia che tali evaporatori rientrano nella **Cat. 0** (Articolo 3.3, vedi tabella 7).
La pressione massima ammissibile (PS) è di **25 bar**.
I **fluidi** per i quali gli scambiatori sono predisposti, appartengono al **gruppo 2**.

Direzione Generale
Alceste Vitri

REV 16

DICLARATION OF CONFORMITY

Manufacturer: RIVACOLD S.r.l.
Address: Via Sicilia 7, 61020 Montecchio (PU), Italy.

Hereby **Rivacold S.r.l.** states that ceiling cubic unit coolers of the **RC range** conform with the following **direttives:**

98 / 37 CE Machine directive
89 / 336 CEE Electro-magnetic Compatibility
73 / 23 CEE Low tension

And were manufactured in conformity with the following **norms** :

EN 60 204- 1	Machinery safety – Machinery electrical equipment
CEI EN 60335-1	Electrical devices safety
CEI EN 60335-2-24	Electrical devices safety
UNI EN 12100 – 1; UNI EN 12100 - 2	Machinery safety
EN 378 – 1 prEN 378 – 2	Refrigerating equipment and heat pumps – Safety and environmental requirements

RC range unit cooler, have been designed , manufactured and tested in conformity with provisions of **97/23/CE directive** concerning the safety of equipment under pressure
In particular it is to point out that all unit coolers are of **Cat. 0** (Article 3.3, see table 7).
The maximum pressure allowed (PS) is **25 bar**.
The fluids which the heat exchangers are preset for, belong to the **group 2**.

Managing Director
Alceste Vitri

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