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MANUALE USO E MANUTENZIONE AEROEVAPORATORI A SOFFITTO

USE AND MAINTENANCE HANDBOOK CEILING UNIT COOLERS

RSI

ENGLISH

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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

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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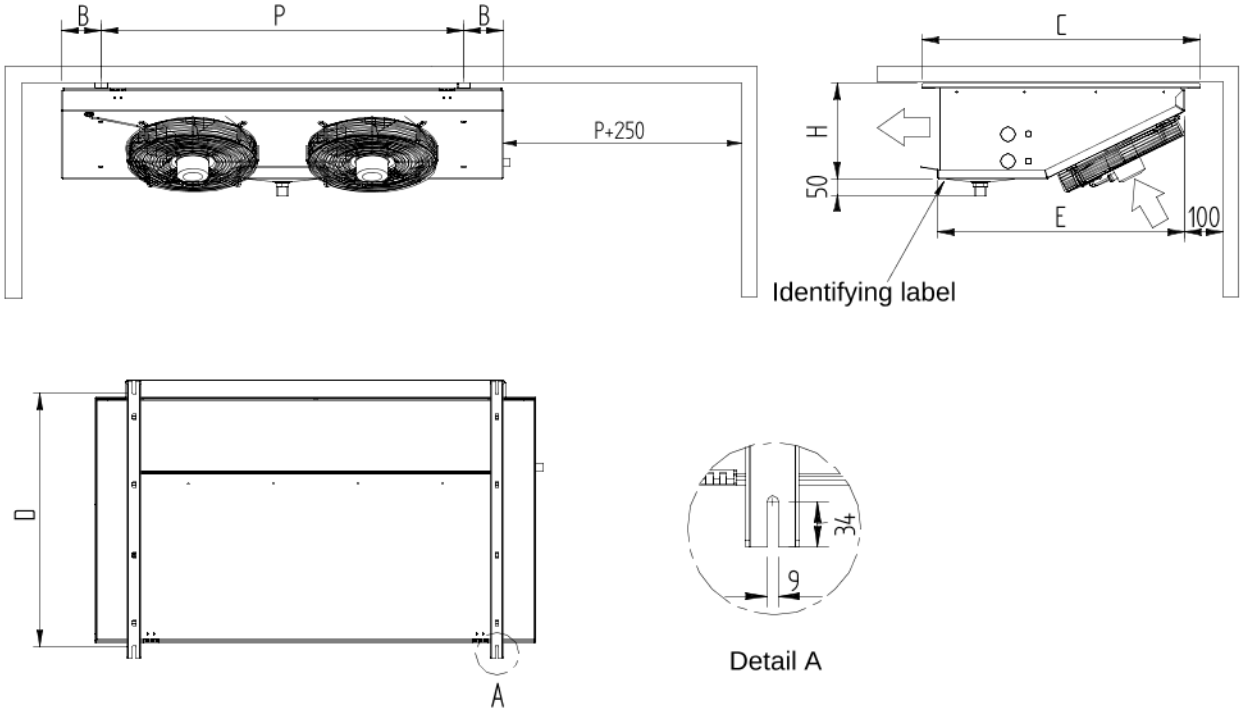
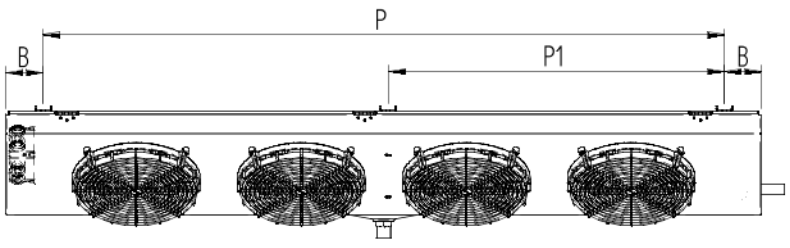
(*) According to EN378/1 norm belong to the group 2 the following gas types:
R22,R134a,R507,R404A,R407C,R410C,R410A,R410B

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

Drawing 1



RSI version with 4 fan motors and
3 fixing brackets;



Features table for model RSI –250

Model	RSI	1250 1250ED	2250 2250ED	3250 3250ED	4250 4250ED
Dimensions	P	400	770	1140	1510
(mm)	P1	---	---	---	765
	B	82.5	82.5	82.5	82.5
	C	550	550	550	550
	D	483	483	483	483
	E	461	461	461	461
	H	241	241	241	241
Coil connections	inlet	12 x1 mm	12 x1 mm	12 x1 mm	12 x1 mm
	outlet	16 x1 mm	16 x1 mm	22 x1 mm	22 x1 mm
Drain connection		Ø 20mm	Ø 20mm	Ø 33mm	Ø 33mm
Weight	Without ED	9.0	17.0	20.5	26.0
(kg)	With. ED	9.5	18.0	22.0	28.0

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Features table for model RSI –350

Model	RSI	23503 23503ED	23507 23507ED	33503 33503ED	33507 33507ED	43503 43503ED	43507 43507ED
Dimensions (mm)	P	1070		1520		1970	
	P1	---		510		985	
	B	115		115		115	
	C	820		820		820	
	D	753		753		753	
	E	726		726		726	
	H	287		287		287	
Coil connections	inlet	12 x1 mm – 1/2" SAE		12 x1mm – 1/2" SAE		12 x1mm – 1/2" SAE	
	outlet	22 x 1 mm		28 x 1.5mm		28 x 1.5mm	
Drain connection		Ø 33mm		Ø 33mm		Ø 33mm	
Weight	Without ED	35.9	34.9	49.5	48.0	60.2	58.2
(kg)	With. ED	38.4	37.4	53.0	51.5	64.7	62.7

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 RSI 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 .

4. 1 Thermostatic valve mounting (not supplied)

The thermostatic valve is to be properly sized and will have to be installed with external balance. Open the machine as illustrated in Fig. 8, loosening the screws A and unscrewing the fastening screws B.
Connect the thermostatic valve outlet to the distributor, as illustrated in Fig. 3, point A (*).
Fit the external equaliser pipe, which must be welded to the thermostatic valve and close to the

evaporator manifold, in the position shown in Fig. 3, point 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 clamp (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 D). 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 .
* NOTE: For RSI models with ø=350, connect the thermostatic valve outlet to the distributor, which is already fitted with a coupling to be flanged.

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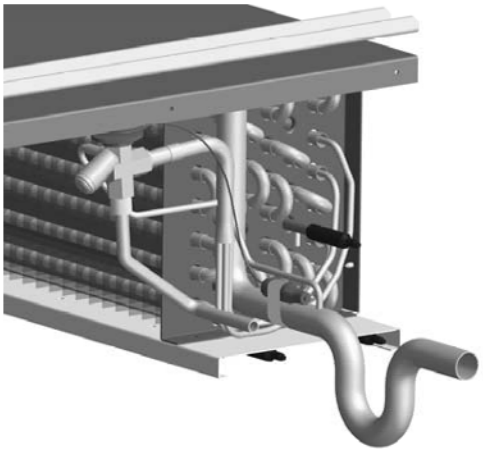
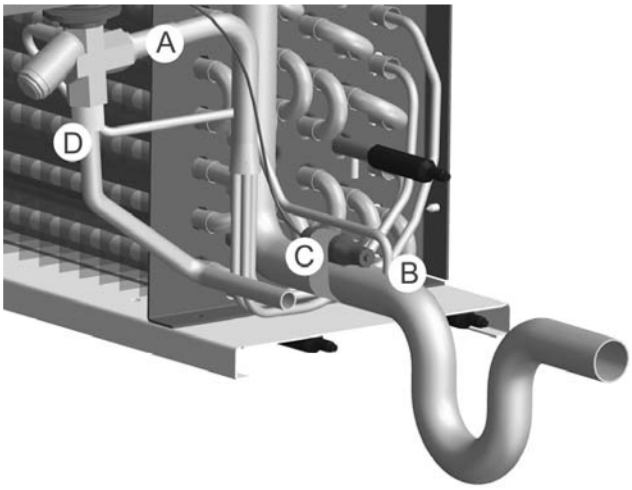
Drawing 2	Drawing 3
	

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 100mm (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

A siphon must be inserted on the evaporator outlet (bottom pipe) (Fig. 3), and this must be welded to the suction pipe of the cooling 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

The piping for the condensate water drain is to be connected to the 20mm male coupling (for models 1250/1250ED E 2250/2250ED) or a 33mm (for all other RSI models); female 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).

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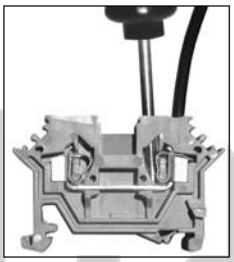
- The law requires that the unit is earthed: therefore it is necessary to connect it to an efficient earthing equipment. No liability whatsoever can be accepted if the above instruction requirement is not complied with or if the electrical plant to which the unit is to be connected is not made by following 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 8) it is placed the terminal box used for the connection of all electrical components of the unit cooler . For RSI models with a diameter of ø 250, 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 models with ø 350, inside the terminal box, there is a single terminal block for the fast connection were the power supply of the fan motors, heathers and grounds 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 model with /ED are fitted with defrosting heaters, which are preset for being powered with a voltage of 400V/3Ph/50-60Hz (see Drawing 4-6). 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 5-7.
For making the wires pass through , use the preset side openings .

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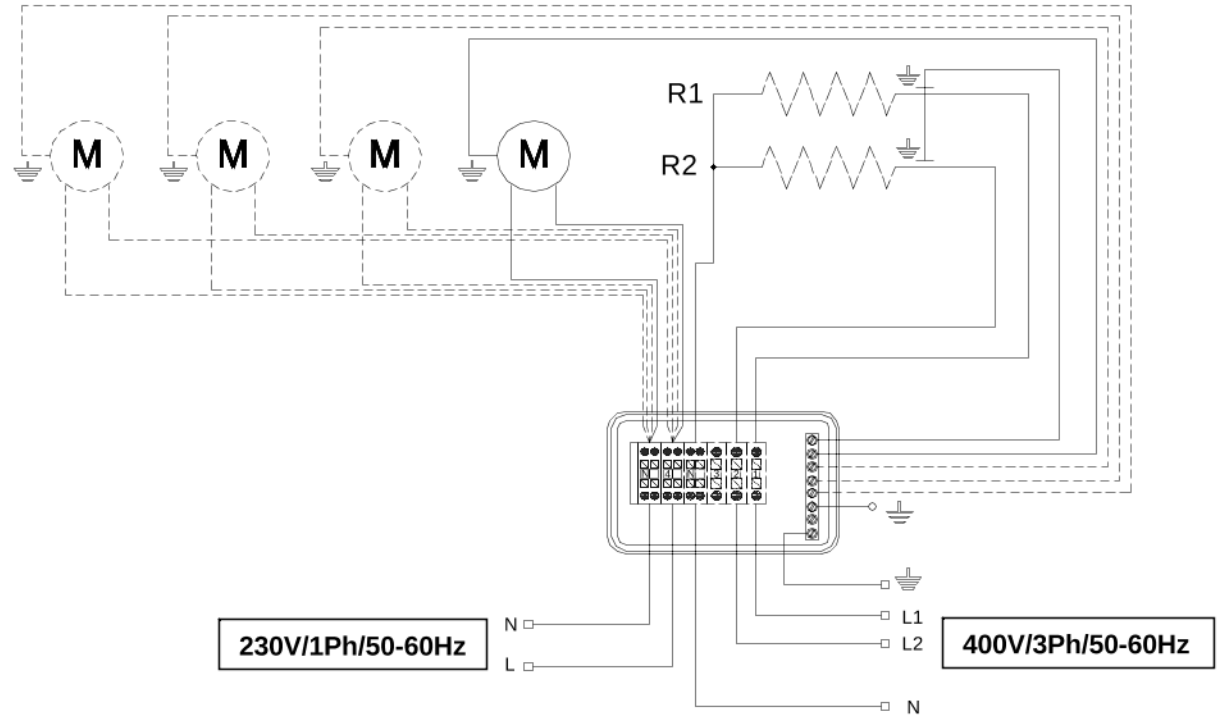
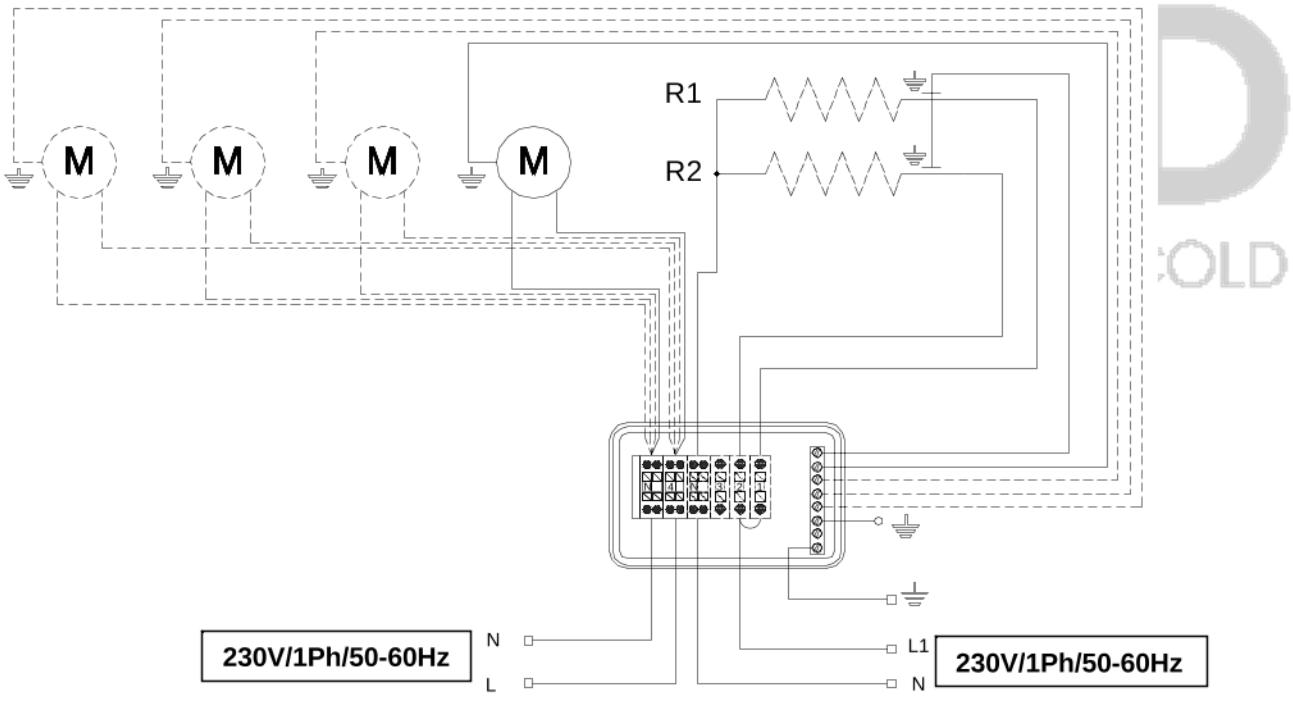
Drawing 4



Drawing 5



Model	RSI	1250 1250ED	2250 2250ED	3250 3250ED	4250 4250ED
Fan motors	n x ømm	1 x 250	2 x 250	3 x 250	4 x 250
Fan motor absorptions	A	0,45	0,90	1,35	1,8
	W	65	130	195	260
Heater power	W	500	900	1300	1800

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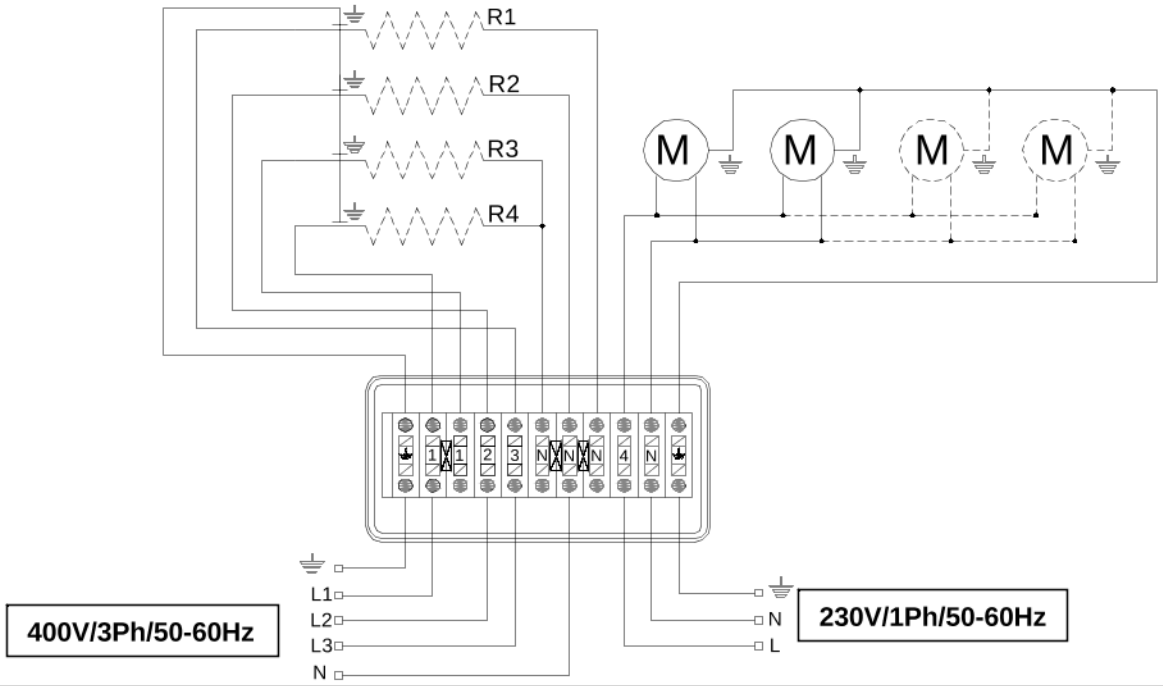
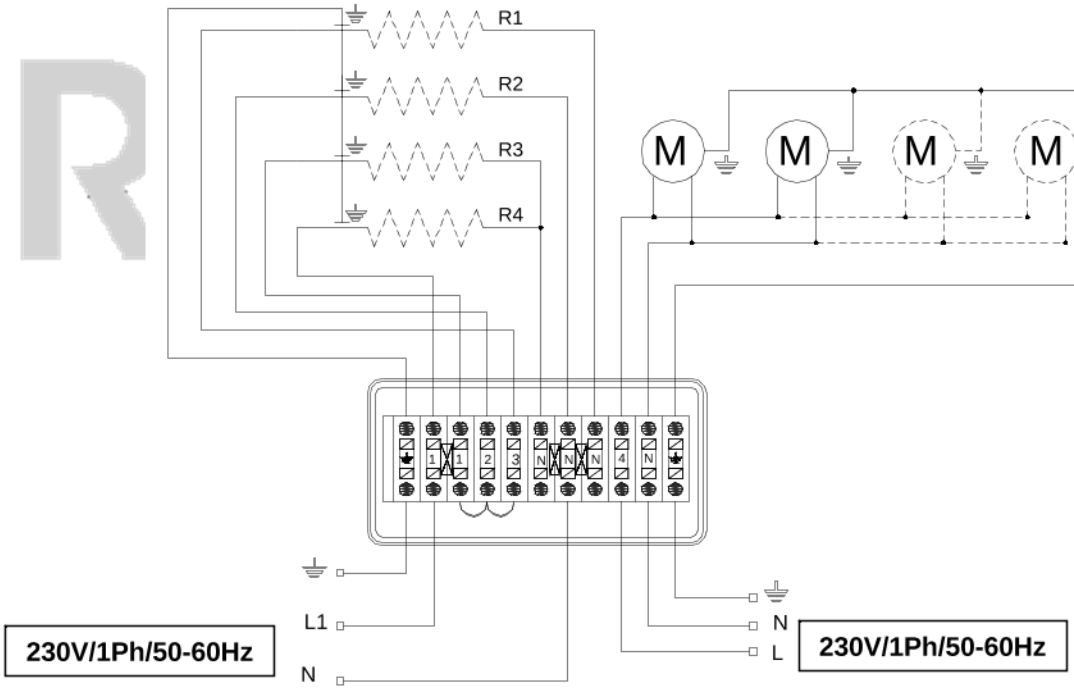
Drawing 6



Drawing 7



Model	RSI	23503 - 23503ED 23507 - 23507ED	33503 - 33503ED 33507 - 33507ED	43503 - 43503ED 43507 - 43507ED
Fan motor	n x ømm	2 x 350	3 x 350	4 x 350
Fan motor absorption	A	1,16	1,74	2.32
	W	260	390	520
Heater power	W	2800	4096	5360

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

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

9. MAINTENANCE AND CLEANING

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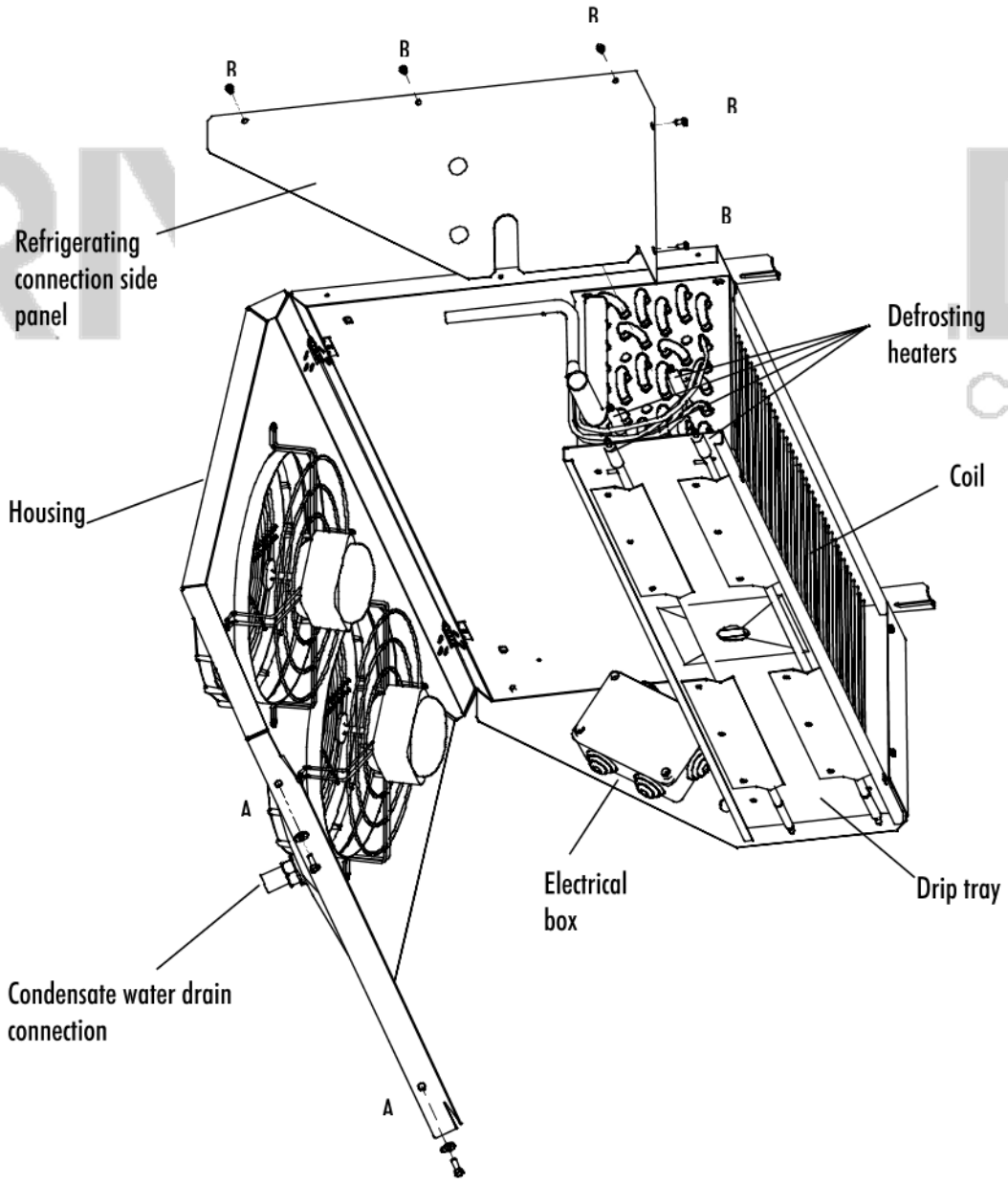
Maintenance and cleaning have to be carried out by qualified technical presonnel only .
Before any intervention make sure that the electrical feed is disconnected from the mains.

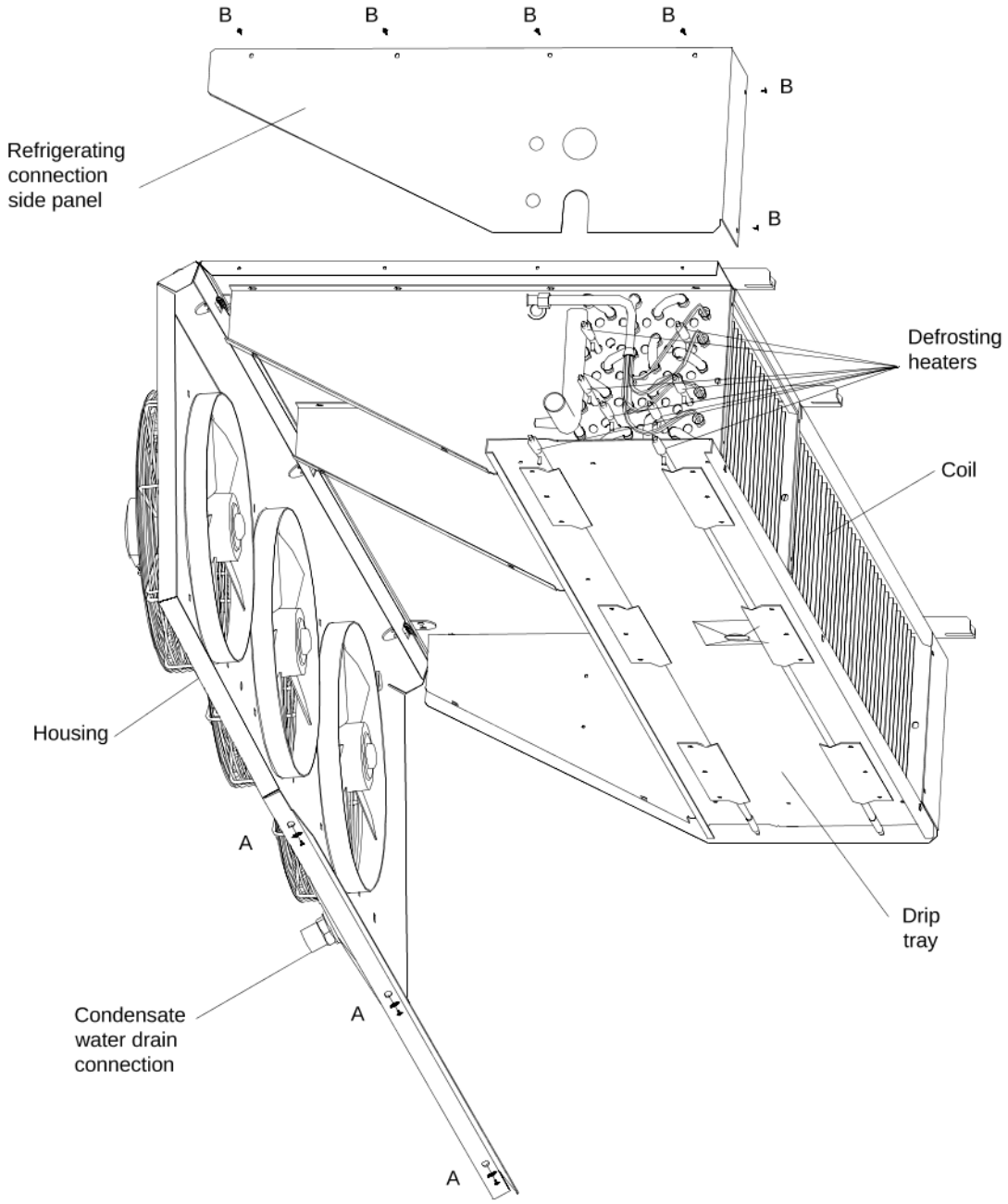
- Check the fastening of all terminals inside the electrical box (every four months)
- Visually check the refrigerating circuit completely, also inside the machines, in order to detect refrigerant leaks, that are also put in evidence by traces of lubricant oil. Make a fast intervention and further check 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 8-9).

Drawing 8



Drawing 9



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10. DISPOSAL

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

11. FAILURES : Causes – Solutions

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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 .

12. OPTIONAL ITEMS

Coil varnishment

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

Discharge pipe heater

It is 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.