

MANUALE USO E MANUTENZIONE AEROEVAPORATORI A SOFFITTO

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USE AND MAINTENANCE HANDBOOK CEILING UNIT COOLERS

RS



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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 explanations 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 law in force

3. MACHINE IDENTIFICATION

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

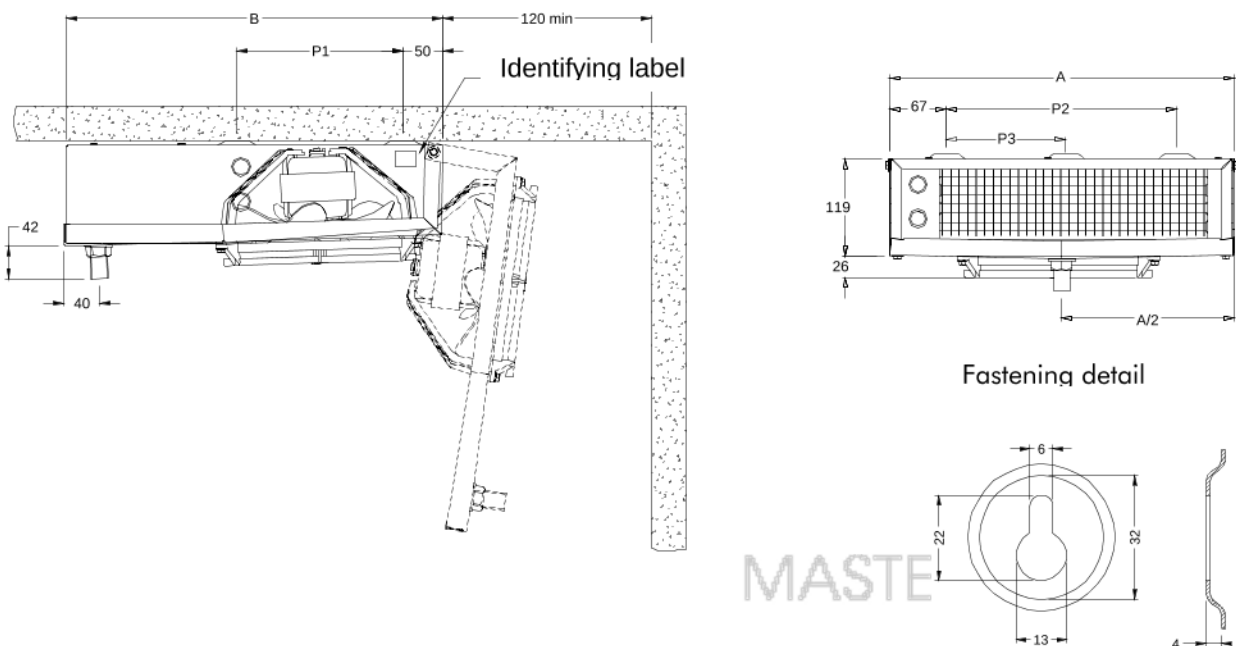
- code
- no. of fan motors - no. of revolutions(RPM)
- Watt absorption (W)
- Ampere absorption (A)
- Power supply voltage (Volt/Ph/Hz)
- defrosting:
heaters number
- Watt absorption(W)
- power supply voltage (Volt/Ph)
- refrigerant group: Group 2(*)
- PS pressure (max working pressure)
- TS temperature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



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

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

Drawing 1



Model	RS	1040	1040B	1060	1060B	2100	2100B	2130	2130B	3180*	3180B*	3290*	3290B*	4380*	4380B*
Dimensions (mm)	P1	175		190		190		190		190		190		190	
	P2	270		270		470		470		970		970		1245	
	P3	-		-		-		-		-		-		622,5	
	A	404		404		604		604		1104		1104		1379	
	B	360		433		433		433		433		433		433	
Coil connections	inlet	ø9,52		ø9,52		ø9,52		ø9,52		1/2"SAE		1/2"SAE		1/2"SAE	
	outlet	ø9,52		ø9,52		ø9,52		ø9,52		16mm		16mm		16mm	
Drain connection		ø20mm		ø20mm		ø20mm		ø20mm		ø20mm		ø20mm		ø20mm	
Weight (Kg)	Without ED	4,0	3,9	4,6	4,5	6,7	6,6	7,3	7,2	10,5	10,4	11,5	11,4	16,5	16,3
	With ED	-	4,2	-	4,8	-	7,0	-	7,6	-	11,0	-	12,0	-	17,1

*Thermostatic valve with external equaliser;

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 5,6,7 and 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 RS 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)

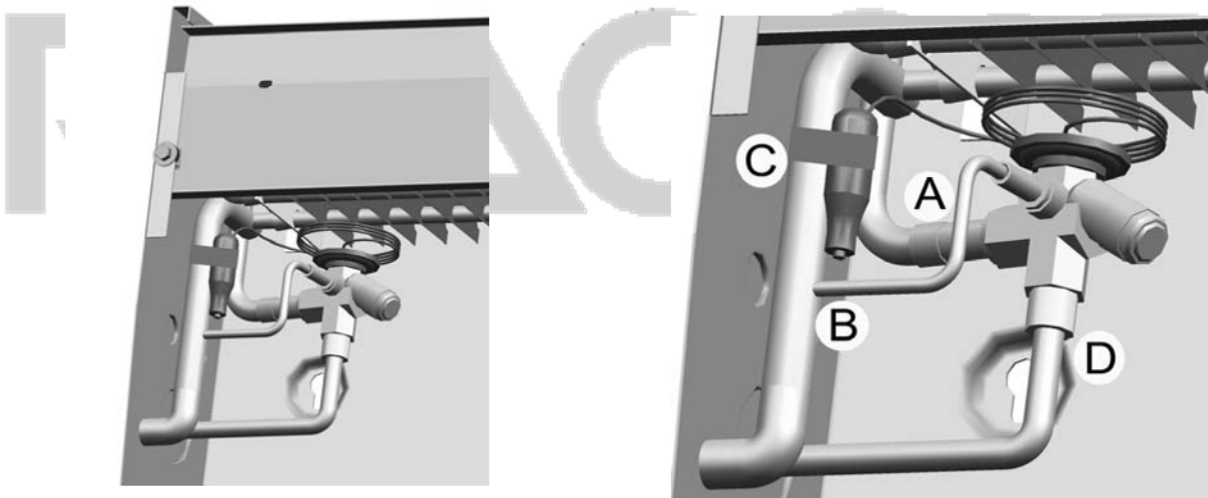
The thermostatic valve is to be properly sized (NOTE: for models RS3180-RS3180B-RS3290-RS3290B-RS4380-RS4380B it is necessary to use a thermostatic valve with external equaliser and outlet to be flanged).

Open the machine, as illustrated in Drawing 3, loosening the screws A and unscrewing the fastening screws B. Connect the thermostatic valve outlet to the evaporator inlet pipe (Drawing 2, point A).

For models RS3180-RS3180B-RS3290-RS3290B-RS4380-RS4380B only: fit the external equaliser pipe, which must be welded to the thermostatic valve and to the evaporator manifold, in the position shown in Drawing 2, point B. Place the thermostatic valve bulb on the suction pipe, just before the external equaliser pipe, if fitted (Drawing 2 point. C). Fix the bulb on the suction pipe by means of metal clamps.

Solder on the inlet side of the thermostatic valve, a pipe , previously bent in the proper way, (see Drawing 2 ; 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.

Drawing 2



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, only 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 recommended distance from the wall for the motor side is 120 mm (Drawing 1). To assemble, open the machine, as illustrated in Drawing 3, loosening the screws A and unscrewing the fastening screws B. Fix the machine, using the 4 special slots in the casing. To fit the defrosting heater, place it in the relevant notches above the coil and fix it into place using the two springs (G) (supplied).

Proceed to make the refrigerating and electrical connections, as described in the following paragraphs.

Reposition the conveyor and tighten the screws B and A, as shown in Drawing 3.

Connect the condensation discharge pipe to the pipe union F (supplied).

5. REFRIGERATING CONNECTION

Connect the evaporator outlet to the refrigerating system suction-pipe (we recommend fitting a siphon).

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 .

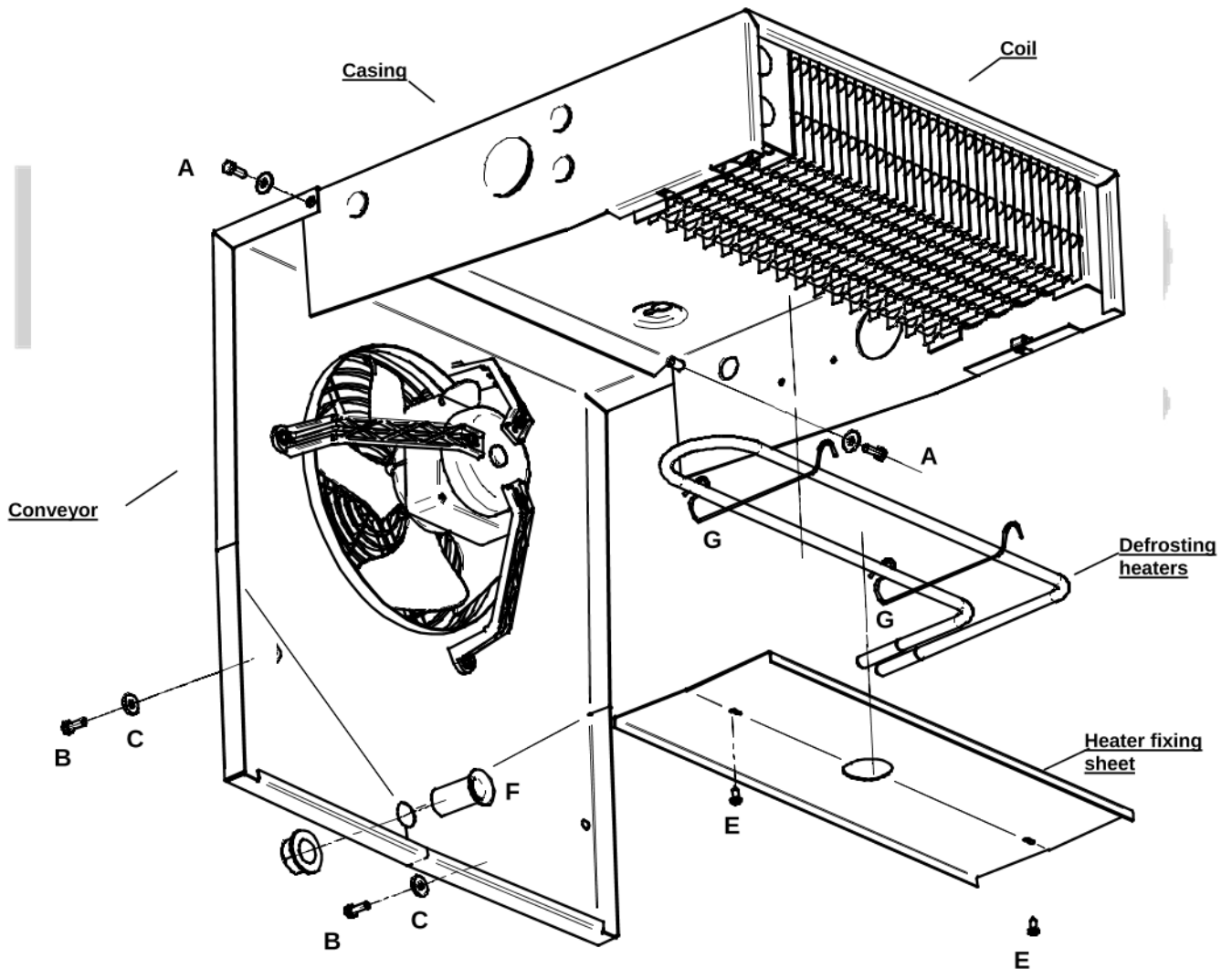
During the pipe connection procedure pay attention not to force or modify the position of the header as this may a cause of breaks.

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6. CONDENSATE DRAIN CONNECTION

The piping for the condensate water drain is to be connected to the 1/2" 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 .

Drawing 3



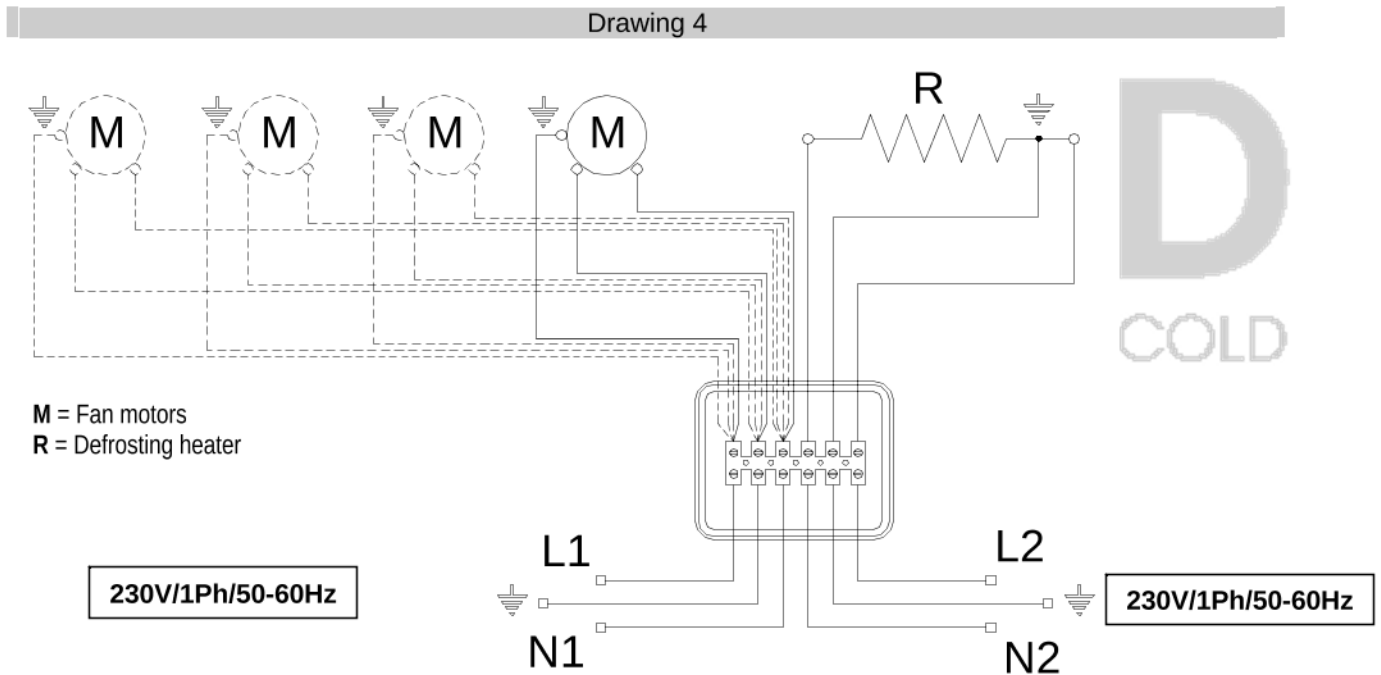
7. ELECTRICAL INSTALLATION

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 $\pm 10\%$ of the rated tension).
- 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.
- For evaporators equipped with defrosting heaters, it is necessary to install a mechanical thermostat (set to 40°C), which will disable the heaters in the event of excess temperature. The thermostat bulb should be positioned in the fin coil, in the highest point of the evaporator.

7. 1 Electrical connection

Connect the motors and the heater to the power supply, using the cable ducts already partially made in the sides. For the model with the model code RS....BED (low temperature) only, with heaters fitted as standard, the heater and motors are already connected to a terminal board, as illustrated in the wiring diagram in Drawing 4. All models have fan motors that are powered at 230V/1Ph/50-60Hz; ED models are equipped with defrosting heaters that are powered at 230V/1Ph/50-60Hz (see Drawing 4);



Model	RS RS...B	1040 - 1060	2100 - 2130	3180 - 3290	4380
Fan motors	nxømm	1x200	2x200	3x200	4x200
Fan motor absorption	A	0.23	0.46	0.69	0.92
	W	38	76	114	152
Heater power*	W	400	600 - 650	1000	1300

*Heaters are supplied already fitted and wired on RS....BED models 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**

RS unit coolers 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 personnel 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).

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**

Problem	Possible cause	solution
Iced Evaporator	Defrosting time too short	Increase defrosting time.
	Time Interval between two defrostings too long	Increase defrosting cycles. Check the possible 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 possible 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 fins	Straighten the fins 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 painted with epoxy powder varnish

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

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Defrosting heater

All RS models , except for RS...BED ones (where the heater is already fitted and wired in a terminal box) the defrosting heater is being supplied not fitted and only upon specific request .

Discharge pipe heater

This is used when the cold room where the unit cooler is installed operates at a negative temperature. It has to be inserted inside the condensation water drain pipe so that the water formed during defrosting does not freeze inside the drain pipe.

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