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Diamond
catering equipment

INSTALLATION OPERATING AND MAINTENANCE INSTRUCTIONS

GFP-GFPD

CONTENTS

SUBJECT	page
1 INTRODUCTION	3
2 CHARACTERISTICS OF THE MACHINE	3
2.1 WORKING RANGE	3
2.2 USE	3
3 CONTROL, PACKAGING AND TRANSPORTATION	3
3.1 CONTROL: CHECKING THE SUPPLY AT THE COMPANY'S	3
3.2 PACKAGING	3
3.3 TRANSPORT, LOADING AND UNLOADING	3
4 POSITION	4
4.1 ON A BASE	4
4.2 BRACKETS	4
5 CONNECTIONS	4
5.1 CONNECTION TO DUCTS	4
5.2 THREE-PHASE MOTOR CONNECTION	4
5.2.1 Direct start connection (1-speed motors).....	4
5.2.2 Connection of 1-speed motor with star/delta switching starter	5
5.2.3 2-speed motor connection	5
5.3 CONNECTION OF SINGLE-PHASE ELECTRIC FAN.....	6
5.3.1 Direct connection to the mains	6
5.3.2 Connection through MEC/D digital regulator	6
6 START-UP.....	6
7 MAINTENANCE	7
7.1 DETERMINING BELT TENSION	7
7.2 REPLACING THE DRIVE BELT.....	7
7.3 FILTER CHECKING	8
7.3.1 Synthetic filters.....	8
7.3.2 Reusable metal filters	8
7.3.3 Bag filters	8
7.3.4 Carbon filter	8
8 TROUBLESHOOTING	8
8.1 DECREASE IN CAPACITY	8
8.2 INCREASE IN FLOW RATE.....	8
8.3 NOISE LEVEL	8
9 DIMENSIONS AND CHARACTERISTICS.....	9
9.1 ECOLINE dimensions and characteristics	9
9.2 CCR dimensions and characteristics.....	9
10 SAFETY	10
10.1 SAFETY DEVICES AND TRICKS.....	10
10.2 ACCIDENT-PREVENTION TRICKS	10
11 DISPOSAL.....	10

1 INTRODUCTION

We recommend that the procedures described below are implemented by expert personnel, duly qualified in the air-conditioning and plant engineering sector, though the machine can be used also by incompetent people, thanks to its simple design.

The aim of this booklet is to ensure safe installation and use of our machines, and accordingly the instructions provided below must be strictly followed and implemented.

Fans can be serviced and installed only by personnel qualified according to the regulations in force.

2 CHARACTERISTICS OF THE MACHINE

Electric fans are made up of a perimetral frame consisting of aluminium structural shape of suitable section.

Closing panels are made of electro-galvanized and plastified sheet, galvanized sheet and, in some cases, AISI 304 stainless steel.

Panels can be of double-wall type, insulated with expanded polyurethane, or of single-wall type with polyethylene foam; they are secured by screws, exception made for the panel, on the drive side, that is equipped with a locking system.

The fan, once balanced and checked, and the motor are mechanically secured by antivibrating supports.

The suction unit installed inside the frame can be provided with a built-in motor (in the fan) or with V-belt drive. This is a compact and noiseless unit, featuring high delivery.

It can be operated with single-phase current 230/1/50 or 400/3/50, based on models.

2.1 WORKING RANGE

- Maximum temperature of the fluid conveyed: +60 °C
- Max. humidity: 80% R.H.

2.2 USE

Air exhausters are designed to exhaust the air for civil and industrial applications only; any other USE SHALL BE CONSIDERED IMPROPER AND THEREFORE DANGEROUS.

THE MANUFACTURER MAY NOT BE HELD LIABLE FOR ANY DAMAGE CAUSED BY APPLICATIONS NOT PROVIDED FOR BY THE CONTRACT.

3 CONTROL, PACKAGING AND TRANSPORTATION

3.1 CONTROL: CHECKING THE SUPPLY AT THE COMPANY'S

Before shipment each exhauster is checked as follows:

- correct assembly of the different units and sections.
- compliance with pre-determined safety conditions.
- integrity of all of the system's parts.
- application of identification, operation and safety plates.

3.2 PACKAGING

Positioned on a pallet and protected by a polyethylene film.

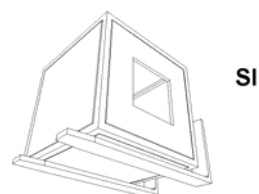
3.3 TRANSPORT, LOADING AND UNLOADING

The Company may not be held liable for any damage to the product during handling.

We recommend special precautions, such as:

- Secure the load, to preserve its integrity during transportation
- Any displacement must occur without touching any protruding accessories (handles, hinges, roofing etc.)
- Do not tilt exhausters, not to break internal supports, components and shock-absorbers.
- Do not hit the machine, not to hinder its conditions.
- If loading, unloading and handling operations are carried out with a lift truck provided with forks, these must not be shorter than package size, to ensure its stability
- During transportation, protect the product from atmospheric agents.

SI: YES



4 POSITION

4.1 ON A BASE

The exhauster can be installed:

- directly onto the floor
- on a concrete base
- on a steel section base
- on an hanging base

The equipment must be positioned on a horizontal plane, to prevent unbalance of masses on antivibrating devices and for easy opening/closing of inspection holes; any correction can be made with suitable shims.

4.2 BRACKETS

If fastened to a wall, use suitable brackets provided with angle braces and of adequate length.

In these cases, or if the equipment is fastened to the ceiling, check the condition of the wall the equipment will be fastened to. Place a ribbon of insulating material between the exhauster and its base or bracket, in order to avoid any vibration.

5 CONNECTIONS

5.1 CONNECTION TO DUCTS

In order to optimize connection to ducts, proceed as follows:

- make a suction hole of adequate diameter in the suction panel
- mount a gasket on flanges to prevent any leak/air infiltration
- tighten connecting screws
- seal the joint (with silicone) to ensure tightness.

In the presence of a connection with gummed cloth joints, once assembled they must never be too stretched, to avoid any damage or vibration transmission.

5.2 THREE-PHASE MOTOR CONNECTION

Before proceeding with connection:

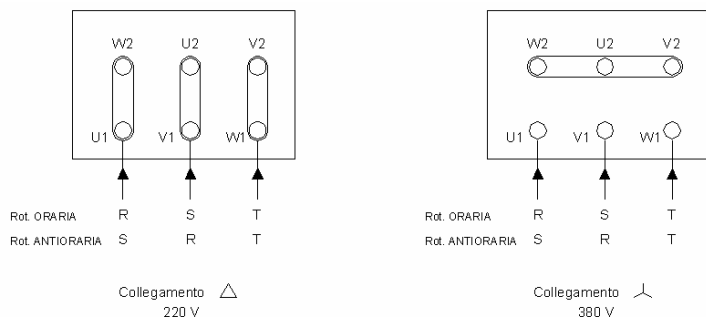
- 1) Check the motors' power SWITCHBOARD and make sure that protective devices meet the maximum plate amperage.
- 2) Check that the MAINS VOLTAGE is adequate to the motor voltage, indicated on the plate.

5.2.1 Direct start connection (1-speed motors)

The simplest way to start an electric motor is to directly connect it to the power supply network.

Restrictions derive from high starting current (break-away); this type of start is recommended for powers > 5.5 KW.

Wiring diagrams are indicated in the figure below

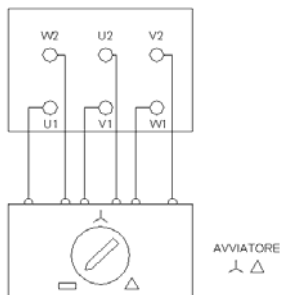


rot. oraria = clockwise rev.; rot. antioraria = anticlockwise rev.; collegamento = connection

5.2.2 Connection of 1-speed motor with star/delta switching starter

If the break-away current when the motor is started exceeds the value allowed by the supply network, use a star-delta switching starter. Starting from 7.5 KW, motors will have a 380/660V voltage, so to allow for the motor normal operation at 380 V (delta connection) and start-up at 660 V (star connection).

Starting current will be reduced by approx. 30 %.



Avviatore: Starter

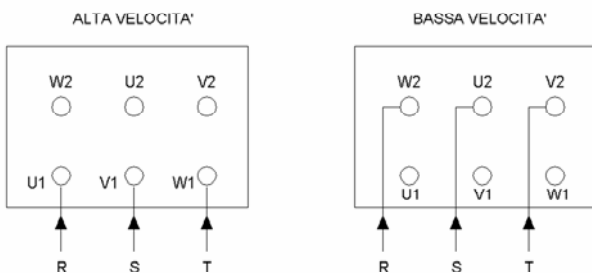
5.2.3 2-speed motor connection

The diagram illustrated in the figure below indicates connection to the power supply network of a 2-SPEED MOTOR with 2 separate windings (6 terminals).

This type of electric motor allow the star-triangle activation, with solenoid starter.

DOUBLE WINDING - 6 TERMINALS

SINGLE VOLTAGE – DIRECT ACTIVATION – 4/8 4/6 POLES



Alta velocità: high speed –Bassa velocità: low speed

Based on the electric motor installed, the table indicates:

- the section of the connecting cable
- Max A = rated current intensity
- the type of winding recommended

TABLE 1

3-phase motor		Start-up methods	Cable
Kw	A		mm ²
0,18	0,7	Direct	1,5
0,25	0,85		1,5
0,37	1,15		1,5
0,55	1,55		1,5
0,75	2		1,5
1,1	2,9		1,5
1,5	3,7		1,5
2,2	5,2		2,5
3	6,9		2,5
4	9		25
5,5	12		6
7,5	18	Star /triangle	6
11	23		6
15	30		10

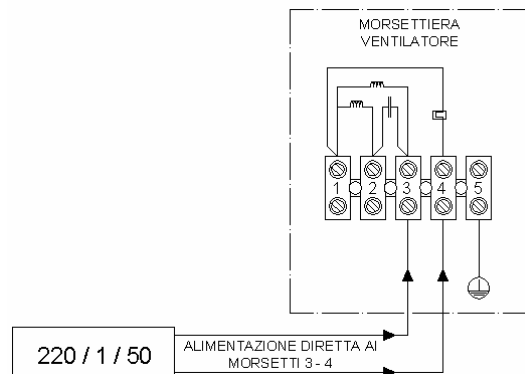
TABLE 2

Single phase motor 230/1/50		
Kw	Max A	Cable (mm ²)
0,184	1,9	1,5
0,420	3,6	1,5

5.3 CONNECTION OF SINGLE-PHASE ELECTRIC FAN

5.3.1 Direct connection to the mains

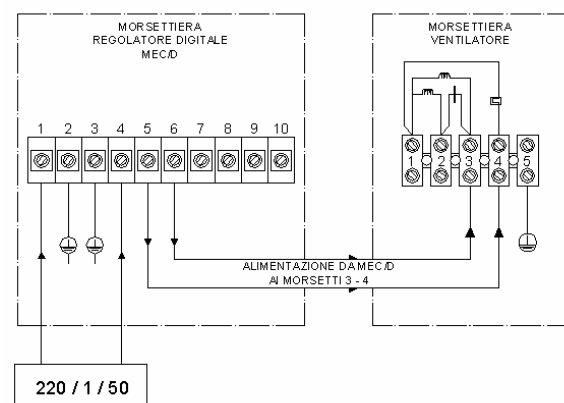
The following diagram shows direct connection of a single-phase electric fan to the power supply network.



Morsettiera ventilatore:FAN TERMINAL BOARD – Alimentazione diretta ai morsetti:DIRECT POWER SUPPLY TO TERMINALS

5.3.2 Connection through MEC/D digital regulator

The following diagram shows connection of a single-phase electric fan actuated by a 9-speed electronic regulator.



Morsettiera regolatore digitale:MEC/D DIGITAL REGULATOR'S TERMINAL BOARD – Morsettiera ventilatore:FAN TERMINAL BOARD – Alimentazione da MEC/D ai morsetti:POWER SUPPLY FROM MEC/D TO TERMINALS

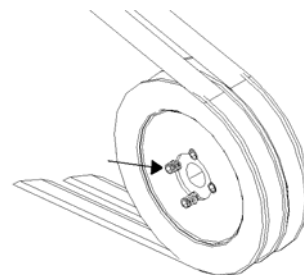
6 START-UP

Before the first start-up:

- Check the motors' power SWITCHBOARD and make sure that protective devices are calibrated for maximum plate amperage
- Check that the MAINS VOLTAGE is adequate to the motor voltage, indicated on the plate.
- Check that shock-absorbers are free from any safety stops, installed to avoid any damage during transportation (fig. 10).
- Check that the impeller's direction of rotation coincides with the arrow on the worm.

On any subsequent start-up check:

- the correct operation of the impeller (turn it manually)
- the tension of V-belts (see 7.1)
- the pulley alignment (see 7.1)
- that locking nuts (indicated in the figure on the right) are properly fastening pulleys to hubs.



7 MAINTENANCE

We recommend a regular maintenance on exhausters to ensure long life and satisfactory performance. Each operation can be carried out by qualified personnel, after disconnecting the equipment.

To maintain ideal working conditions, WE RECOMMEND THAT YOU CHECK THE FAN EVERY MONTH as follows:

- Cleaning of worm and impeller, removing any deposit.
- Tightness of the antivibrating joint (if any) on the fan's delivery.
- Absence of unusual noise caused by worn bearings.
- Removal of any deposit from the motor
- Damage to the drive (cracks on belts and pulleys, broken belt sides)
- Drive alignment.
- Belt tension.

7.1 DETERMINING BELT TENSION

To modify the drive belts' tension, move the motors positioned on belt slips; therefore, use locknuts and regulating screws to stretch or loosen the drive.

To calculate the correct tension, apply with a spring balance a force (P) on the belt center line (perpendicularly to it), until you obtain a flexure equal to 1/64 of the center distance (approx. 16 mm/m)

TABLE 5.

BELT SECTION	MOTOR PULLEY DIAMETER (mm)	FORCE "P" (daN)
A	70 - 120	9 - 15
	125 - 180	13 - 18
SPA	90 - 132	20 - 35
	140 - 224	30 - 45
SPB	140 - 224	35 - 50
	236 - 355	43 - 65

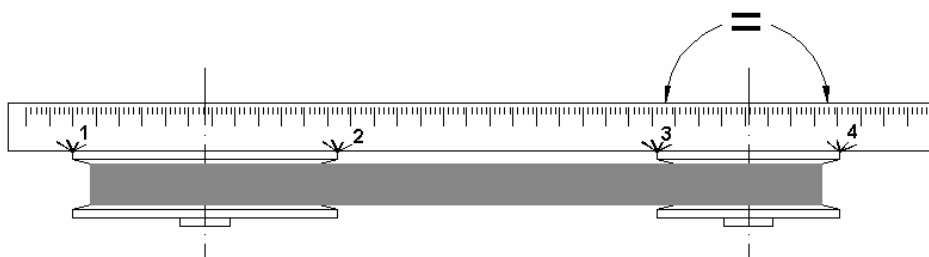
Flessione: Flexure

N.B.:

- If the tension is low, the belt wears out quickly and the drive performance is poor
- If the tension is excessive, the motor/fan's bearings are damaged.
- When stretching belts, check the drive alignment using a common ruler (see the figure below).

FOR PERFECT PULLEY ALIGNMENT, CHECK THAT POINTS 1, 2, 3 AND 4 ARE TOUCHING THE RULER

PER UN PERFETTO ALLINEAMENTO DELLE PULEGGE VERIFICARE CHE I PUNTI 1, 2, 3 E 4 TOCCHINO IL RIGHELLO

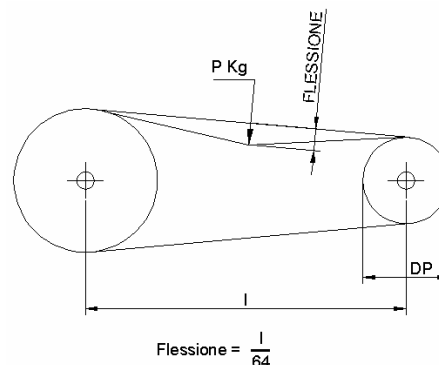


7.2 REPLACING THE DRIVE BELT

To replace the drive belt:

- loosen the drive with the relevant device and remove the worn belt
- check pulleys for wear and cleaning and, if necessary, replace them
- insert the new belt without forcing, preventing any microtraumas to the drive, that would shorten its life
- align and tension the drive (see 7.1)
- after some 10 working hours, check the drive operation again
- replace belts only with other belts of the same type.

Regarding multi-belt drives, belts must be replaced at the same time. The belt number must be the same as the race number.



7.3 FILTER CHECKING

A proper filter maintenance is a guarantee of unaltered performance. Do not forget that poor maintenance on pre-filters will cause clogging of the filter sections nearby.

7.3.1 Synthetic filters

Check every week for clogging (visual inspection). Replace if necessary.

7.3.2 Reusable metal filters

Check every 15 days and wash with detergent and water, if necessary.

7.3.3 Bag filters

Check every month for clogging, checking the consistency of the bags, that are heavier and stiffer.

Replace them with care, when mounting new items, to prevent bag tearing.

7.3.4 Carbon filter

Check the carbon adsorbing performance every 15 days.

Remove cartridges, if necessary, by turning them slightly and removing them one at a time. Unscrew the base and remove the exhausted carbon. Fill with suitable carbon, and press it to reach the quantity indicated in the Manufacturer's declaration.

Note: maintenance intervals are considered in the medium term. Practical checks will indicate the control interval. In case of heavy use, we recommend that you install a differential pressure gauge for a visual checking of clogging.

8 TROUBLESHOOTING

The most common malfunctions are:

- decrease in capacity
- increase in flow rate
- anomalous noise level
- filter clogging

8.1 DECREASE IN CAPACITY

This is the effect of a uncontrolled increase in resistance in the aeraulic circuit, that modifies the fan operation.

The most frequent causes are the following:

- clogged intake grid(s) or filters
- registers completely or partially closed
- poor performance of the ventilating unit's drive
- fan rotating backwards.

8.2 INCREASE IN FLOW RATE

The resistance sum in the aeraulic circuit may be lower than the value taken into account during the development of the project.

The most frequent causes are a wrong calibration of flow rate regulators (dampers), or inspection doors open or not shut properly.

8.3 NOISE LEVEL

The fan noise may be produced by:

- worn or faulty bearings
- wrong balancing of the fan
- dirty impeller
- foreign matter in the impeller.

The electric motor noise may be produced by:

- worn or faulty bearings
- loosened cooling fan and/or fan cap
- magnetic noise during any frequency drop (using an inverter).

The drive noise may be produced by:

- belt slippage
- worn belt
- non-aligned pulleys
- loosened pulley or clearance on the connection.

To solve the problems listed above, CONSULT THE MAINTENANCE CHAPTER ,OR, IF NECESSARY, OUR TECHNICAL DEPARTMENT.

9 DIMENSIONS AND CHARACTERISTICS

9.1 ECOLINE dimensions and characteristics

FIANCO = SIDE

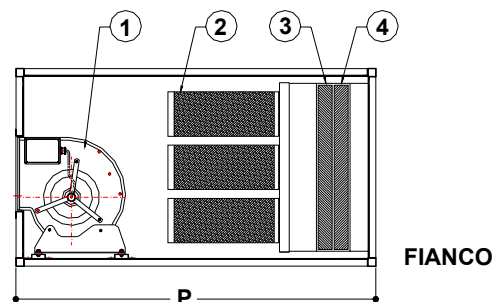
Model – DIMENSIONS – Weight

Installed power – Voltage – Flow rate –

HST pressure – Total carbon content

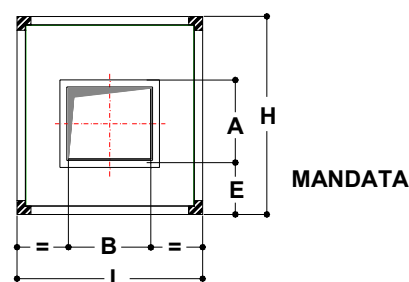
MANDATA = DELIVERY

- 1 – Transmission fan
- 2 – Activated carbon filters
- 3 – Synthetic filters
- 4 – Mesh filters



Modello	DIMENSIONI (in mm)						Peso
	L	P	H	A	B	E	Kg
ECO LINE 5	700	1300	450	260	298	95	65
ECO LINE 9	700	1400	700	260	298	190	92

Modello	Potenza installata	Tensione	Portata	Pressione HST	Contenuto totale carbone
	Kw	V	m³/h	Pa	Kg
ECO LINE 5	0,42	230/1/50	1500	100	23
ECO LINE 9	0,42	230/1/50	2800	120	42

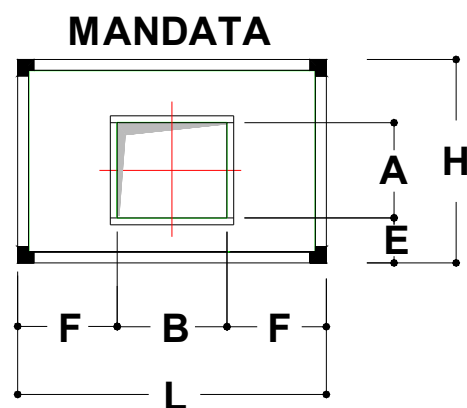
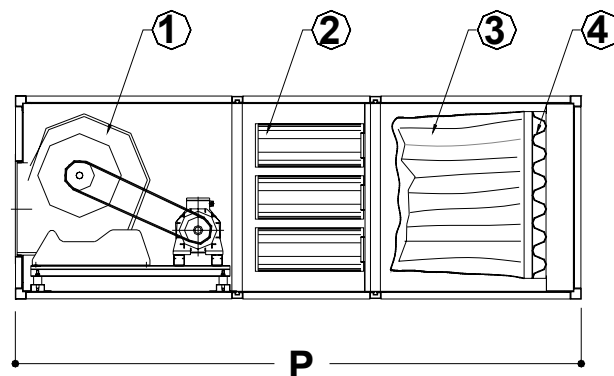


9.2 CCR dimensions and characteristics

- 1 – Transmission fan
- 2 – Activated carbon filters
- 3 – Bag filters
- 4 – Synthetic filters

CCR model	DIMENSIONS (in mm)							
	L	P	H	A	B	E	F	G
130	670	2200	670	300	344	153	163	163
145	980	2300	750	355	410	153	285	285
160	1280	2200	800	410	488	153	447	447
175	1590	2200	800	410	488	153	553	553
190	1280	2400	980	490	573	233	600	235
1120	1280	2200	1280	490	573	233	600	235

CCR model	Flowrate	Static pressure	Sound level	Fan	Installed power	Voltage	Weight
	m³/h	Pa	dB(A)	rpm	Kw	V	Kg
130	2700	191	64	1338	1,1	400/50/3	170
145	4000	192	65	1133	1,5	400/50/3	220
160	5500	198	66	939	2,2	400/50/3	320
175	6700	148	66	887	3	400/50/3	360
190	8200	278	69	798	3	400/50/3	390
1120	9800	108	70	745	4	400/50/3	450



MANDATA = DELIVERY

10 SAFETY

10.1 SAFETY DEVICES AND TRICKS

PRECAUTIONS

Control and/or maintenance must be carried out by qualified staff only.

When operating the equipment, relevant personal protective equipment must be used, in compliance with Law 626/89.

Before touching any rotating parts or taking down safety guards, make sure the motor is not connected to a power supply.

Should the equipment be far from the control board and/or control station, it is mandatory to have an omnipolar master switch next to it.

A few PRECAUTIONS are listed below:

1. Inspection doors openable with the relevant key.
2. Plates are affixed onto inspection doors, to recall the operator's attention on the hazard created by moving components and on the need of de-energizing the system before opening the inspection doors.



MOVING COMPONENTS – ELECTRIC HAZARD

3. Remove any accessible cutting parts in the internal or external infill
4. Use self-tapping screws with a csp on the protruding part
5. A release microswitch is available on the inspection door, to turn off the power from the switchboard.

In any case, ALWAYS install an ISOLATING SWITCH for maintenance jobs.

10.2 ACCIDENT-PREVENTION TRICKS

- Always use personal protective equipment
- Open inspection doors only once the local isolating switch has been enabled, only when the fan is shut-down.
- Before working on the motor, make sure that it is cold
- Lock the fan impeller before doing maintenance on it, because (especially after removing the belt) "the flue effect" caused by the channel can make it rotate, thus compromising the operator safety.

11 DISPOSAL

If the exhauster is dismantled or when replacing filters, contact authorized landfills, qualified and equipped for this type of disposal. The material, if left in the environment, may become a source of pollution.