

# ELECTRIC EXTRACTOR FAN

# INSTALLATION USAGE AND MAINTENANCE MANUAL

**ATTENTION:**

- *The following instructions booklet is meant to be integral part of the equipment and it must be available for the workers for every kind of consultations.*
- *Read carefully before starting every operation, the information contained in this booklet, which are related to the safety, the installation, the usage and the maintenance.*
- *The equipment must be used only for the use, it was conceived for, and only by expert people.*
- *The installation, the maintenance and the fixing must be done only by an authorized specialized and qualified technical assistance centre, and only by highly professional qualified personnell, in obedience to the in force laws and based on the instructions given by the constructor. (only original spare parts).*
- *The Building House reclines every kind of responsibility for direct or indirect damages caused by a wrong installation, tampering or bad maintenance, improper use and if the rules contained in the instruction booklet are not followed.*

## 1.0 GENERAL DESCRIPTION

The units are composed by a perimetrical frame made of aluminium sections of a right section.

The closing panels are made of electrically galvanized and plastified plate, in galvanized plate and in some exceptions in stainless steel AISI 304.

The panels can be a double wall type, insulated with expanded polyurethane or just a simple wall with a polyethylene mousse insulation. They are pinned up with screws, apart from the going-over panels which are gifted with a lock closing system.

The blower, well-balanced and tested, and the engine, is mechanically fastened through antivibration props.

The intake group, which is inside the structure and can be either the type with the engine incorporated into the blower, or the type with trapezoidal belt transmission, is both compact and silent and with a high performance.

The working has been forecast both with one-phase stream 250/1/50 and with 400/3/50, depending on the models.

Depending on the models, there can be brassy mesh filters, acrylic filters, pocket filters, active carbon filters, heating battery, static heat recuperating engine air-air.

### 1.1 Use

The air extractors are conceived only for the air extraction for a civil and industrial use, and every other kind of used is to be considered improper and therefore dangerous.

## 2.0 CHECK

### 2.1 In Company supply control

Every extractor, before being sent, is subjected to the following controls:

- The right assembling of the various groups and sections;
- The compliance of the various preconceived safety conditions;
- The wholeness of all the pieces which compose the system;
- The affixing of the identification, safety and functioning labels;

## 9.0 SAFETY

### 9.1 Deveces and suggestions about safety

For moving the maschine, use personal security devices of the kind comply with law 626/89.

Never access to the rotating parts nor disassemble the safety protections if yu haven't made sure that the engine can be powered through the electricity. If the maschine is installed far from the control board, you are obliged to install an omnipolar service switch as near as possible.

Some of the used suggestions are the following:

- Inspection doors that can be opened through an appropriate key.
- On the inspection doors there are some labels that call the worker's attention on the danger deriving from the moving machines and on the necessity of cutting off power from the system before opening the inspection doors.
- Remove any sharp part from the accessible areas, in the internal or external tamponating.
- Use self thread screws with a protection on the protuding parts.
- On the inspection door there is a micro spark gap for unhooking, which can cut off power from the powering panel.



### 9.2 Working suggestions to avoid casualties

- Use always casualty-proof devices.
- Open the inspection doors only after having activated the local sectioner and always with the blower stopped.
- Work on the engine only if it's completely cool.
- Block the blower rotor mechanically before making any kind of maintenance.

## 10.0 DISPOSAL

In case of dismantling of the extractor or of any of its parts address to authorized dumps, which are equipped for the disposal. The material left in the environment can pollute.

## 8.0 LOOKING FOR DAMAGES OR ANOMALIES

### 8.1 Capacity reduction

It is the consequence of an increase of the drags in the air loop, which modifies the blower working.

Causes	Remedies
Obstruction of the filters or of the intake grille	Cleaning and/or replacing
Regulating rolling shutters partially or completely closed	Check the system calibration
Transmission of the motoventilating group not efficacious	Look at chapter 7.0 maintenance
The blower spins to the opposite side	Look at chapter 5.0 electrical connection modality

### 8.2 Capacity increase

It may happen if the sum of the drags in the air loop is lower than the one calculated in the planning phase.

The most frequent causes are: the wrong calibration of the capacity regulators (rolling shutters) or the inspection doors which may be open or not properly closed.

### 8.3 Noisiness

Causes	Remedies
Blower bearings worn or faulty	Replacement
Fan displacement caused by filth on the rotor	Cleaning
Foreign body in the rotor	Take out the foreign bodies and clean
Engine bearings worn or faulty	Replacement
Engine cooling fan and/or cap fan-cover let up	Fix the closing of the screws
Magnetic noise during the frequency reductions through the inverter	Look at the handbook for the inverter
Belt slipping, not in tension or worn	Check and/or replace it – Look at chapter 7.0
Pulleys not lined up	Relineup of the pulleys – Look at chapter 7.0
Untied pulley or with play on the dovetail	Check and fix the fastening points or replace them

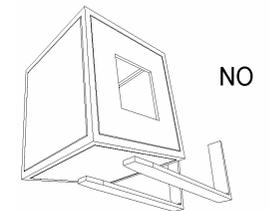
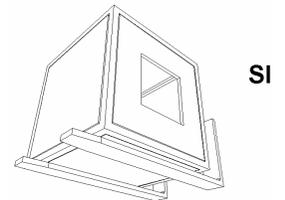
## 2.2 Package

The placement on a bench and the protection with a polyethylene film is forecast.

### 2.3 Transport and movement

Every kind of responsibility for any potential damage that the products may undergo during the handling operations are declined. Therefore we suggest the following safeguards:

- Firmly fasten the load, in order to preserve the safety during the trip;
- The movements must be done without stimulate the prominent attachments (handles, pivots, protection deck, etc...);
- Don't overturn the extractors, in order to avoid the breaking of the internal supports, elements and the shock absorbers;
- Don't subject the machine to wild blows;
- If the load, download and moving operations are made through forklift truck, the forks must be at least as long as the grip dimensions, in order to grant the firmness;
- During the transport, protecting the load from the weather fronts.



## 3.0 PLACEMENT AND ASSEMBLY

### 3.1 On a basis

The final placement of the extractor can be:

- Directly on the floor;
- On a piling basis;
- On steel sections as basis;

The placement must be done on an horizontal basis in order to avoid the imbalance of the on the antivibration supports and the difficulty in opening and closing the going-over doors. Any correction can be made through suitable thickness.

### 3.2 With brackets

If they are hung on the walls, you can use brackets of a suitable capacity and furnished with additional bits supports and they must be long enough.

In these situations or in case of suspended placement, when they are hung on the ceiling, you have to verify first the consistency of the building part at which you hang the extractor. It's always suggested to interject a stripe of insulating material between the extractor and the basis in order to isolate it from the vibrations.

## 4.0 CONNECTIONS TO THE DUCT

In order to optimize the connections to the root canal treatments, you need to:

- Carry out the intake hole of the suitable dimensions in the intake panel;
- Apply a gasket to the flange equipment in order to avoid losses and air infiltrations;
- Occlude accurately the connection screws;
- Furnish the sealing of the junction in order to grant the seal.

If the connection is through rubberized net junctions, they mustn't be stretched at the end of the assembling, in order to avoid damages or the vibration transmissions.

## 5.0 ELECTRICAL CONNECTION MODALITY

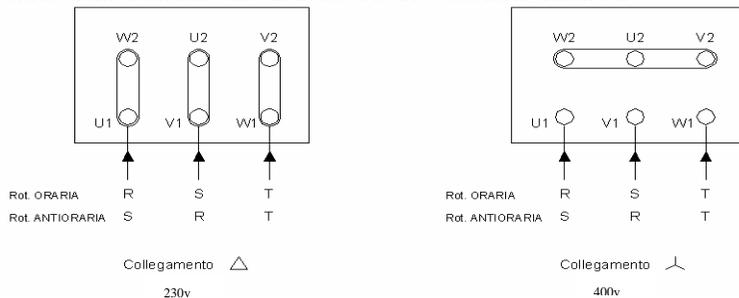
Before starting with the connection:

- Check through the electrical panel regarding the engine powers and make sure that the precautions are dimensioned to the maximum ampère of the plates;
- Check that the net tension is set to the engine ones, indicated on the labels

### 5.1 Connection for the direct start-up of three-phase engines at 1 speed

The easiest way of starting an electrical engine is connecting it to the powering net. The limitations derive from the high starting power (cue); we advise against this kind of starting for powers higher than 5,5 KW.

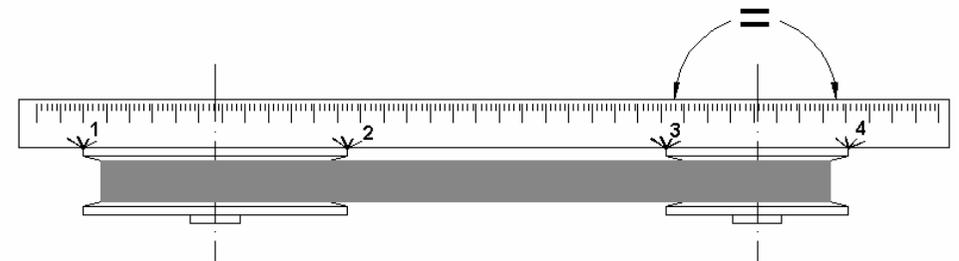
The connections schemes are indicated in the following pictures:



PLEASE NOTE:

- If the tension is low, the belt wears thin rapidly, and the transmission performance becomes low.
- If the tension is excessive, the engine and blower bearings get damaged.
- Every time that you stretch the belts, you need to check the lineup of the transmission using a general ruler (look at the picture beneath).

IN ORDER TO HAVE A PERFECT LINE UP OF THE PULLEIES MAKE SURE THAT THE POINTS 1,2,3 AND 4 TOUCH THE RULER.



### 7.2 Belt replacement

In order to replace the transmission belt:

- Let up the transmission working on the apposite device and take out the woreed belt;
- Verify the cleaning and wearing conditions of the pulleys, and if necessary, replace them.
- Insert the new belt without straining it, avoiding in this way microshocks on the transmission, which would injure the lasting time.
- Work on the lineup and the straining of the transmission.
- Verify again, after 10 working hours, the transmission straining.
- Replace the belts only with others of the same kind.

PLEASE NOTE:

In case of a transmission with more belts, these must be replaced at the same time. The number of belts must always correspond to the numbers of throats.

## 7.0 MAINTENANCE

We suggest a periodical maintenance of the extractors in order to protract the span and the efficiency as long as possible. Every operation must be performed by expert staff and in the absence of tension.

In order to keep the best working conditions of themaschine, you have to carry out the following checks, referring to the constructor (supplier), if you need to have one part changed or some spare parts:

- Cleaning status of the cochlea and the blower rotor, chipping off any possible waste.
- The seal of the antivibration joint (if there is one), put on the blower opening .
- The lack of strange noise due to the declension of the bearings.
- Removal of any possible deposit on the engine.
- Damages on the transmission (cracks on the belt or pulleies, the borders of the belts could be fraied).
- The lineup of the transmission.
- Check the filters jam.
- The cleaning of the heat exchangers (battery and heat recovery).

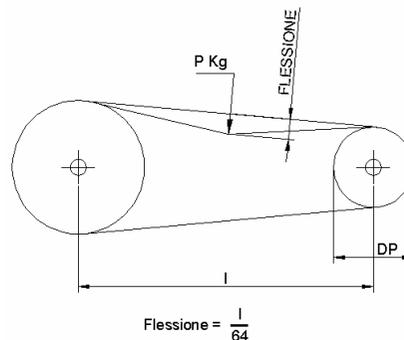
## 7.1 Determination of the belt tension

In order to vary the belts tension you need to work moving the engines placed on the belt stretchings slides, therefore it'll be necessary to work on the lock nuts and on the regulating screws to stretch or to ease off the transmission.

In order to find the right tension, you have to put on a strength (P), using a spring dynamometer, on the middle of the belt, perpendicularly to that, till when you get a bending equal to 1/64 of the wheel-track (nearly 16 mm/m).

TABLE 3.

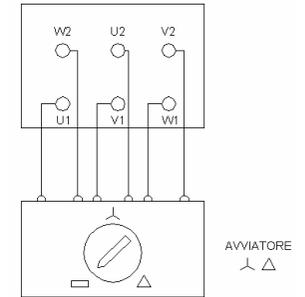
BELT SECTION	MINOR PULLEY GAUGE (mm)	STRENGTH " P " (daN)
<b>A</b>	70 - 120	9 - 15
	125 - 180	13 - 18
<b>SPA</b>	90 - 132	20 - 35
	140 - 224	30 - 45



## 5.2 Connection for three-phase engines at 1 speed through the star/triangle starter

If the cue stream at the engine start overpasses the one allowed by the the powering net, you'll have to use the start with star/triangle introduction.

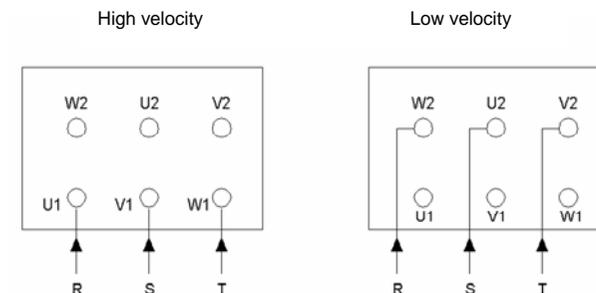
Starting from the 7.5 KW powers, the engines will have a tension of 400/690 Volt, allowing the engine the normal working. In this way the starting stream will be reduced of nearly 30%.



## 5.3 Connection for starting of three-phase engine at 2 speed

The scheme displayed in the following picture represents the connection to the poweringnet of an engine with two speeds and with two divided wrappings at 6 clamps.

DOUBLE WRAPPINGS – 6 CLAMPS – SINGLE TENSION – DIRECT INSERTION – 4/8, 4/6 POLES



For the electrical engine installed, we list in the following table:  
 The section of the connection cable;  
 Max A = nominal stream intensity;  
 The kind of starting suggested.

TABLE 1

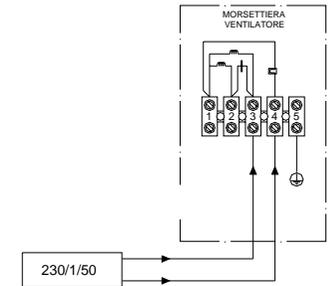
Three-phase engine		Kind of starting	Cable
Kw	A		mm <sup>2</sup>
0,18	0,7	Direct	1,5
0,25	0,85		1,5
0,37	1,15		1,5
0,55	1,55		1,5
0,75	2		1,5
1,1	2,9		1,5
1,5	3,7		1,5
2,2	5,2		2,5
3	6,9		2,5
4	9		25
5,5	12	6	
7,5	18	Star /triangle	6
11	23		6
15	30		10

TABELLA 2

Monophase engine 230/1/50		
Kw	Max. A	Cable (mm <sup>2</sup> )
0,184	1,9	1,5
0,42	3,6	
0,515	5	
0,55	4,6	

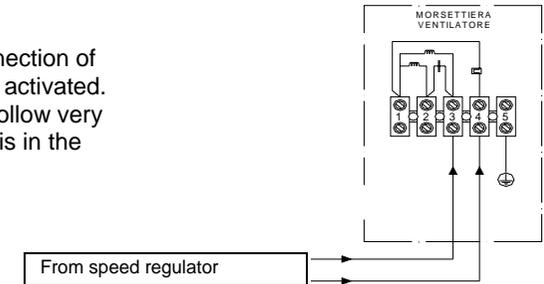
### 5.4 Connections for monophase engine start

The following scheme displays the connection of a monophase electrical blower directly to the electrical line:



### 5.5 Connections for monophase engine with electronic regulator

The following scheme displays the connection of a monophase electrical blower which is activated by an electronic stream regulator. In case an electronic stream regulator follow very carefully the connection scheme which is in the package.



## 6.0 START-UP

Before proceeding with the first start-up:

- Go over the electrical panel which displays the engines power and make sure that the protections have been calibrated to the ampère plate.
- Verify that the net tension is suitable to the engines one, indicated on the labels.
- Make sure that the shock absorbers are free from any possibly safe catches, that may have been installed in order to prevent any kind of damage during the transport.
- Verify that the spin way agrees with the arrow displayed on the cochlea.
- Make sure that all the filters have been installed.

