

EM36

Manual for use and maintenance



EM36

Air extraction fan

EM36

Manual for use and maintenance

Original instructions

This manual for use and maintenance is an integral part of the apparatus together with the attached technical documentation.

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Warranty

For Warranty information please refer to "General terms and condition of sale" available on https://www.munters.com/globalassets/terms-and-policies/condizioni_generali_vendita.pdf

Conditions and Limitations:

- Products and Systems involved in a warranty claim under the "General terms and condition of sale" shall have been properly installed, maintained and operated under competent supervision, according to the instructions provided by Munters;
- Malfunction or failure resulting from misuse, abuse, negligence, alteration, accident or lack of proper installation or maintenance shall not be considered a defect under the Warranty.



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1. INTRODUCTION

1.1 Disclaimer

Munters reserves the right to make alternations to specifications, quantities, dimensions etc. for production or other reasons, subsequent to publication. The information contained herein has been prepared by qualified experts within Munters. While we believe the information is accurate and complete, we make no warranty or representation for any particular purposes. The information is offered in good faith and with the understanding that any use of the units or accessories in breach of the directions and warnings in this document is at the sole discretion and risk of the user.

1.2 Thank you

Thank you for purchasing a Munters fan!

In order to realize the full benefit from this product it is important that it is installed, commissioned and operated correctly. Before installation or using the fan, this manual should be studied carefully. It is also recommended that it is kept safely for future reference. The manual is intended as a reference for installation, commissioning and day-to-day operation of the Munters fans.

1.3 Notes

Date of release: 2019.

Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

All rights reserved. No part of this manual may be reproduced in any manner whatsoever without the expressed written permission of Munters. The contents of this manual are subject to change without notice.

1.4 Disposal

Do not dispose of this product with general household waste. This product must be disposed according to the laws governing Waste Electrical and Electronic Equipment. If required, contact your local authorities for information regarding the available disposal facilities.

1.5 Attached technical documentation

The listed documentation is to be considered an integral part of this manual:

- technical sheet/electric motor instruction booklet.

2. SAFETY ASPECTS



WARNING Failure to respect safety or behavioral rules can produce hazardous situations for users as well as damage to the machine and the place where it is installed. The fan must only be used if it is in perfect operating condition, by personnel who are perfectly aware of the safety measures and possible hazards, and in strict compliance with the instructions given in this manual.

2.1 Personnel requirements

Equipment may only be used by personnel who know and apply the specific requirements given in the user and maintenance manual and the more general instructions contained in various regulations for accident prevention and applicable legislation regarding safety in the workplace, as well as other European Community directives incorporated by the member states into their national legislation.

Knowledge and understanding of the manual and of the attached documents constitute an indispensable tool for reducing hazards and promoting the safety and health of workers.

Personnel training

All operators engaged in the use of the fan must have received adequate information from the employer relating to:

- risks to health and safety at work connected with the use of the machine;
- first aid procedures, fire precautions and evacuation of workplaces;
- devices provided for the safety of operators, and residual risks generated by the machine.

In particular, the employer has the following duties:

- when assigning tasks to operators, to take into account their capabilities in the interests of safeguarding their health and safety;
- to provide adequate means of protection;
- to require compliance by individual operators with the company rules and provisions regarding safety and the use of the collective and individual protective measures at their disposal;
- to ensure that normal and special maintenance operations, or in any event operations necessary for machine safety, are regularly carried out.

All operators must take care of their own safety and health as well as that of other people in the workplace who may be affected by their actions or omissions, in accordance with their personal skills, and the instructions and means provided to them by the employer.



WARNING Unauthorized tampering/replacement of one or more parts of the machine, or the use of accessories, tools or materials other than those recommended by the manufacturer, are prohibited and release the manufacturer from all liability.



WARNING Operators must be trained to deal with the occurrence of possible faults, malfunctions or dangerous conditions to themselves or others, and in such an event must:

- stop the fan immediately by operating the emergency stop device (mushroom-shaped pushbutton/main switch mounted on the electrical panel);
- not carry out operations which are beyond their duties and/or technical knowledge.

2.2 General safety instructions



WARNING

- Safety devices must not be removed or rendered ineffective;
- the fan must not be started with guards removed;
- any adjustment or maintenance operation must be performed with the electrical isolating device activated and locked in position with a padlock;
- any operation is prohibited which may cause arcing or sparks or other situations which could start a fire;
- in the event of alarm signals resulting in the intervention of safety devices, the operator must ask for immediate action by qualified technicians responsible for maintenance;
- user must ensure that the environmental and electricity supply conditions in which the fan operates are always within the limits specified in this user manual;
- do not for any reason modify parts of the fan in order to fit additional devices.

2.3 Safety devices

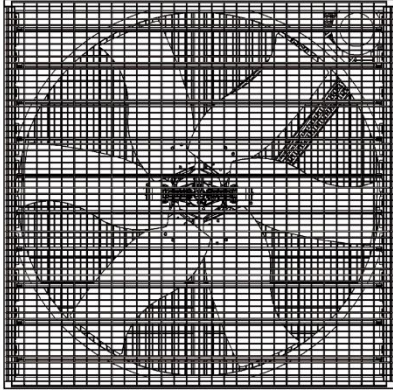
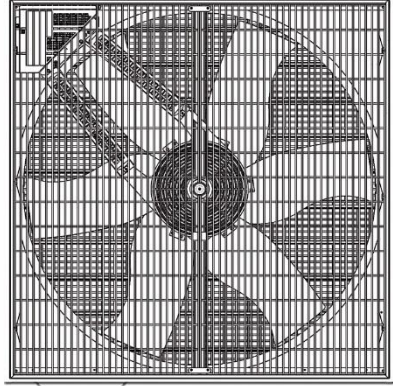
In the process of designing and building the fan, the manufacturer adopted the necessary technical solutions to ensure compliance with fundamental safety requirements: the object of the risk reduction process was to ensure that the operator can use the fan in safety. The machine is provided with protection devices of fixed type and is fitted with an actuator for the emergency stop function.

Fixed guards

The fixed guards are solidly fixed to the structure of the machine and cannot easily be eluded: the guards are fixed with systems which require the use of tools for dismantling.



WARNING Do not start the fan with fixed guards removed: the guards can only be removed with special tools, by specialized and trained personnel and with the system stationary (emergency system activated and electricity and hydraulic fluid isolated). At the end of maintenance operations, the guards which were removed must be replaced correctly.

Position of guard	Type of guard	Notes
Intake side of fan	Guard of fixed type made of metal mesh.	Dimensions and positioning in accordance with the instructions in the standard UNI EN 13857. Removable only by means of special tool.
fig.1		
Outlet side of fan	Guard of fixed type made of metal mesh.	Dimensions and positioning in accordance with the instructions in the standard UNI EN 13857. Removable only by means of special tool.
fig.2		

Emergency stop function



fig.3

The machine must be equipped at the installation stage with an electrical panel, on which must be installed an actuator for the emergency stop function, which when operated brings dangerous movements to a halt by isolation of the power supply: the button must be mushroom-shaped and colored red, provided with mechanical restraint and released by turning.

2.4 Residual risks

Mechanical hazards		
Part of machine/stage of use	Description	Plates/provisions/PPE
Installation of machine	Hazard arising from failure to observe ergonomic principles, caused by excessive strain, i.e. generic mechanical hazard during the moving and installing stages of the machine.	
Electrical hazards		
System area	Description	Plates/provisions/PPE
Panels, covers and electrical apparatus.	The safety signs must be fixed in an extremely visible position on the door of the electrical panel and on covers containing electrical apparatus, to highlight the risks to which an operator could be exposed in the event of opening the electrical panel (danger resulting from the presence of live parts), the level of voltage present, the prohibition of tampering by unauthorized personnel and the prohibition on the use of liquids on electrical apparatus in the event of fire.	

fig.4

fig.5

Hazards generated by noise (<i>measured at 2m distance</i>)	
Fan model	Sound pressure level Lp [dB(A)]
EM36 - 0.75 hp	78

A measurement has been made of the noise produced by the machine during normal operation in order to calculate the equivalent level in conditions of normal use. These values are shown in the above table.



WARNING The user and the employer must comply with current national law in terms of protection against daily personal exposure of operators to noise, by providing the use of personal protective equipment (earmuffs, earplugs, etc.) if necessary, depending on the overall level of sound pressure in the installation area, and the daily personal exposure of the employees. In areas where the overall sound level reaches excessive values, personal protective equipment must be used.



WARNING Children shall not play with the fan.



WARNING The fan must only be used if it is in perfect operating condition, by personnel, aged more than 14 years who are perfectly aware of the safety measures and possible hazards, and in strict compliance with the instructions given in this manual.

NOTE There are no components in the devices containing mercury and asbestos.

3. BEFORE USING

3.1 Delivery check

Upon receipt, inspect the fan for external damage and if found, inform the forwarding agent without delay. Check the data on all the rating plates, especially voltage and frequency. Turn propeller by hand to check free rotation. Check the opening of the shutter by hand.

3.2 Packaging and transport of assembled fans

The fan has a self-supporting structure in galvanised steel and it is usually delivered without packaging. Upon request fans can be delivered packed in cardboard boxes.

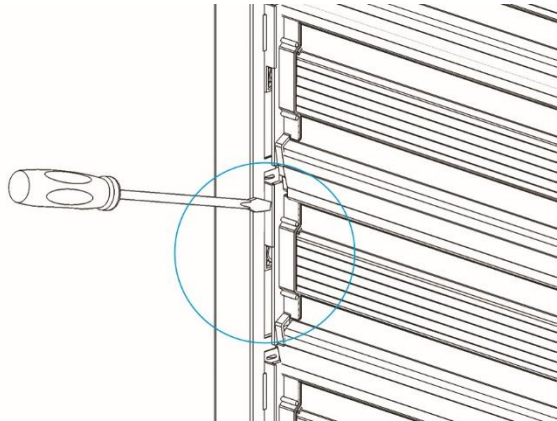


fig.6

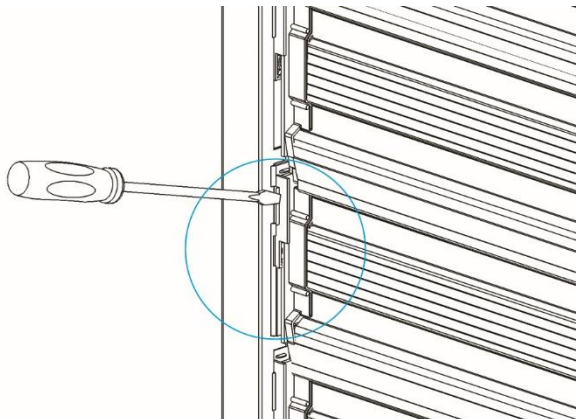


fig.7

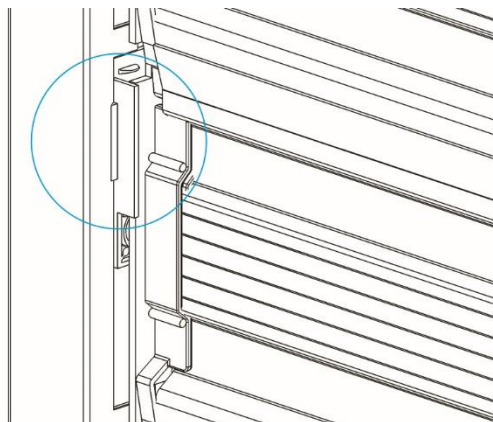


fig.8

Once unpacked check the opening of the shutter manually by rotating the central shutter blade. Verify that during transportation the plastic shutter bearings did not fall off from their operation condition. If yes restore them by mean of a screw-driver and re-check the opening of the shutter.

Follow the steps shown in the pictures.

Fans should not be permanently stocked one upon the other, regardless if they are delivered with or without packaging. Handling of the fans should not be done manually as the fans have no handles or grips. Consequently one of the following alternatives should be used:

- trolley: when loading the fan on the trolley make sure fan shutter is positioned outwards;
- forklift: before loading, make sure the forks are opened as much as possible to avoid bending of the fan bottom panel and damaging the shutter;
- crane: fix two bolts in the M8 bushes situated on the sides of the fan housing and hook the lifting cable over the bolts



WARNING Make sure a steel cable or rope of adequate size is being used when the fan is lifted by crane. Fan weights are shown in the technical specification table (see section 7.1).

3.3 Structure

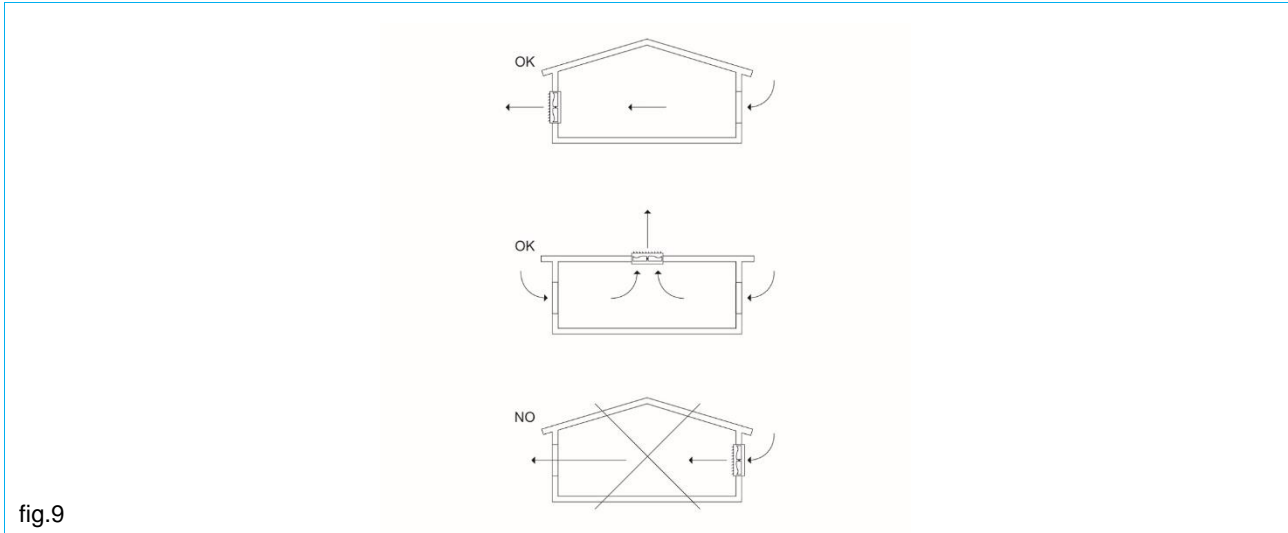
The fans consist of the following components:

- fan housing in Munters Protect coated steel without welding spots;
- fan shutter in Munters Protect coated steel, which pivots on UV protected plastic bushes and pins;
- propeller with six blades in stainless or Munters Protect coated steel; blades are fixed to the propeller by high-strength pop rivets;
- asynchronous three-phases motor; B3 form; F class winding insulation, IP55 protection class; single-speed;
- centrifugal operated shutter opening device.

4. OPERATING CONDITIONS

4.1 Intended conditions of use

Fans are machines designed for moving air to control temperature and humidity in greenhouses or rearing sheds by extraction, not under pressure. They can even be installed horizontally, without altering or modifying their characteristics.



The fan has been designed and built to operate in safety for the user, if used according to the conditions intended by the manufacturer and stated in this user and maintenance manual.



NOTE For further information, please refer to the technical documentation attached to this manual.

4.2 Non-permitted conditions of use

Total or partial failure to observe the instructions given in this manual could cause damage to the fan and/or people.

The following uses are to be considered not permitted and improper:

- use in the event of faults and/or tampering with the installed safety devices;
- use by personnel not specifically trained;
- installation of the fan for extraction or circulation under pressure;
- use contrary to existing regulations;
- incorrect installation differing from instructions given in this manual;
- supply from an electrical network with characteristics different from that specified in the wiring diagram;
- total or partial failure to observe instructions;
- insufficient maintenance;
- use of non-original spare parts;
- use of lubricants with characteristics different from those specified in the technical documentation attached to the manual;
- use by minors;
- use under the influence of drugs, alcohol, etc.



WARNING Use of the fan other than as described in the user manual or outside the operational limits laid down by the manufacturer is considered IMPROPER USE. In the event of IMPROPER USE the manufacturer declines all liability in relation to any damage that may be caused to persons or property, and any kind of warranty will be considered invalidated.

Use of non-original spare parts

Original spare parts ensure the reliability and safety of the operation of the fan: in the event of maintenance/replacement, consult the spare parts list, the list of parts and components used and the relevant technical documentation attached to this manual.



WARNING In the event of replacement of safety devices, it is essential to maintain the safety and operational characteristics of the original device, preferring replacement with an identical component.

Insufficient maintenance

A correct normal maintenance is one that maintains the original integrity or restores the fan's efficiency, while at the same time limiting normal deterioration resulting from use.

Special maintenance work can also prolong the usable life of the machine and/or, secondarily, can improve its efficiency, reliability, productivity and ease of maintenance and inspection.

Unauthorized modifications or tampering

No operation is permitted which is aimed at making modifications to the fan and the safety devices fitted to it; similarly, it is not possible to alter its operational and performance characteristics.



WARNING Interference with the command and control circuits is prohibited: such operations could cause damage to the equipment and serious danger to the operator.



NOTE Modifications made to the fan which do not come into the categories of normal and special maintenance, or which alter its operational and performance characteristics, invalidate the machine's compliance with the requirements of the applicable directives, as attested by the manufacturer with the EC declaration of conformity: it is up to the person responsible for the modification to resubmit the machine to the assessment conformity procedures specified in the applicable directives.

Use in a potentially explosive atmosphere

The fan has been designed and built to operate in environments where the presence of a potentially explosive atmosphere is not expected, in other words it is not intended to handle materials which release explosive dust. Emission into the atmosphere of harmful particles or gases must be contained within the limits established by current regulations.



WARNING The fan has been designed and built in such a way that it CANNOT operate in a classified area, according to directive 1999/92/EC.



WARNING The metal sheets used for constructing the fan housing and shutter blades have a surface coating made of an alloy of Zinc, Aluminum and Magnesium ('Munters Protect'), classified as ZM120 (equivalent to 9 µm of coating thickness on each side of the panels) which corresponds to a corrosion resistance in salty mist of 1800 hours.

Whenever it is intended to use the fans in ambients characterized by the presence of particularly aggressive agents (ammonia, clavulanic acid, etc.) the user, before installing the fan at the installation site must verify that the environmental conditions are compatible with the intended use of the materials that compose the fan.

5. INSTALLATION

After fan has been delivered but before fitting and installation, check condition of the consignment: in the event of discrepancy or damage to the machine, the manufacturer or carrier must be informed immediately.



WARNING Fitting and installation of the fan must be performed by specialized personnel, in order to prevent damage to the equipment or hazards to people as a result of faulty fitting.

Fitting the fan must be carried out according to the following stages:

- positioning and anchoring the fan;
- connection to the mains electricity supply;
- operational testing and putting into operation.

5.1 Choice of site and checking installation requirements

The user is responsible for preparing an area suitable for installation of the equipment and complying with the requirements laid down by European directives and national law governing safety at places of work.

Environmental conditions for operating the equipment are as follows:

Ambient temperature during operation	Ambient humidity during operation
- 15°C / + 40 °C	< 90%

For operation of fan installation, a manoeuvring area must be made available that is suitable for the fan dimensions and the chosen lifting equipment: electrical points must be provided in the installation area for fan connection to the mains electricity supply.



WARNING The fans must be installed at a height of not less than 2.7 m from the ground. If they are installed at a lower height, the fans must be fitted with the optional pyramidal safety mesh by the manufacturer, to protect the internal rotor.

Failure to install the safety mesh releases the manufacturer from all liability and shall be considered an improper use of the machine.



WARNING There must be no obstacle neither in front or behind the fans. The outgoing airflow must be kept free at least of a length of 3-times fan diameter and the ingoing airflow must be kept free at least in a radius of 1.5 m distance in front of the fan.

Irrespective of the place of installation, suitable indelible warning signs are attached to the fan, warning of danger and giving instructions to remain at a safe distance not to place hands inside the shutter and not to run in proximity of the fan. The warning signs are yellow, self-adhesive and indelible. They are fitted to the front and rear of the fan, and marked with the numbers A-1997 and B-1997 (see fig.10).

The area adjacent to the fan in the premises from which air is being extracted must be kept clear to allow the air to exit freely. It is also prohibited for anyone to remain in this area, because of the presence of organic gases and dust which may be present in the airflow.

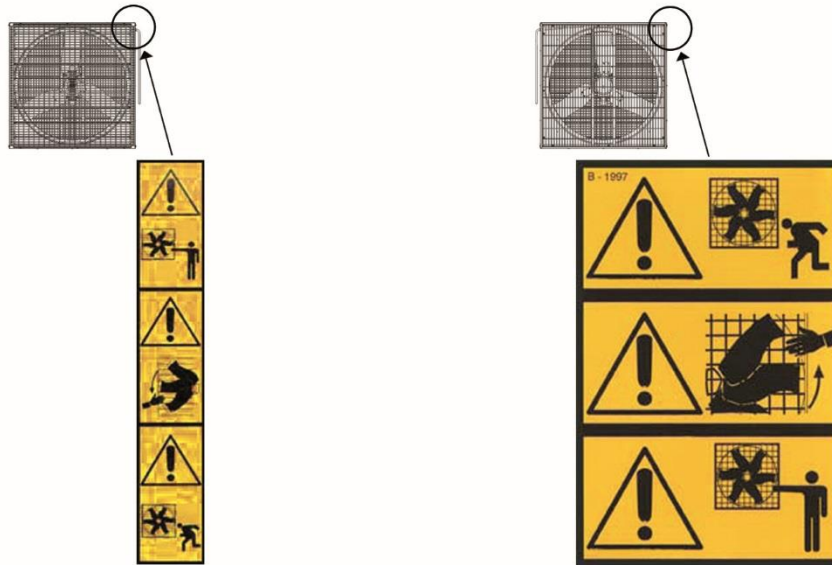


fig.10



WARNING The fans must be installed to carry out extraction of the air present in the area, and must not operate under positive pressure. It is also permissible to install the fan in a horizontal position.

5.2 Installing Series EM fans

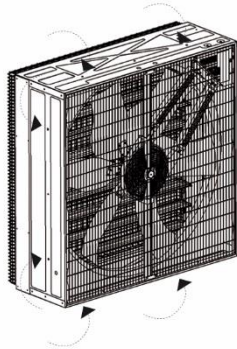


fig.11

If the fan is fixed directly to a metal structure, M8 bolts type 8.8 must be used, screwing them into the threaded inserts provided for the purpose on the bodywork (two per side).

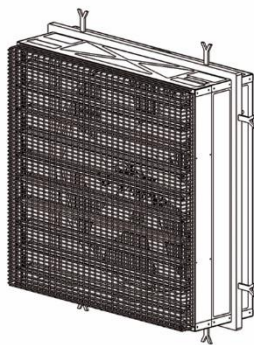






fig.12

If the fan is installed in a masonry structure, an iron outer frame must be constructed (not supplied with the fan), with a 60 mm L-shaped profile at least 5 mm thick, with suitably-sized clamps.

When the outer frame is properly built-in, i.e. perfectly level and upright, insert the fan, screwing four M8 bolts type 8.8 (not supplied with the fan) into the threaded inserts provided on the sides of the bodywork, two per side.

5.3 Connection to the electrical system

The fan is supplied without a command and control circuit, but with all the internal electrical connections already made. At the fitting stage, the installer must set up a control panel in compliance with the requirements of standard IEC EN 60439-1, and arrange the wiring of the fan in accordance with the instructions in standards IEC EN 60204-1 and IEC 60364. The electrical panel of the fan must generally be equipped with the following devices (bearing EC marking as per directive 2006/95/EC):

 fig.13	Lockable isolating switch.
 fig.14	Magnetothermic switch (chosen to suit the power of the motor). The need to fit a switch of differential type depends on the configuration of the electrical system supplying the fan: it is the installer's responsibility to make this assessment in accordance with the instructions in standard IEC 60364.
 fig.15	Red emergency stop button, mushroom type, provided with mechanical locking and release by turning (in compliance with UNI EN ISO 13850). Operating the button must bring about the electromechanical isolation of the power supply to the electric motor (category 0/1 according to IEC EN 60204-1).
 fig. 16	Start/stop selector switch (with characteristics compatible with the nominal current of the motor), or main panel for managing the equipment, with control devices which act on the electrical supply to the fan.



WARNING Do not supply power to the fan during installation stage.

Installer must issue a declaration of correct installation in accordance with applicable legislation in the country of use.

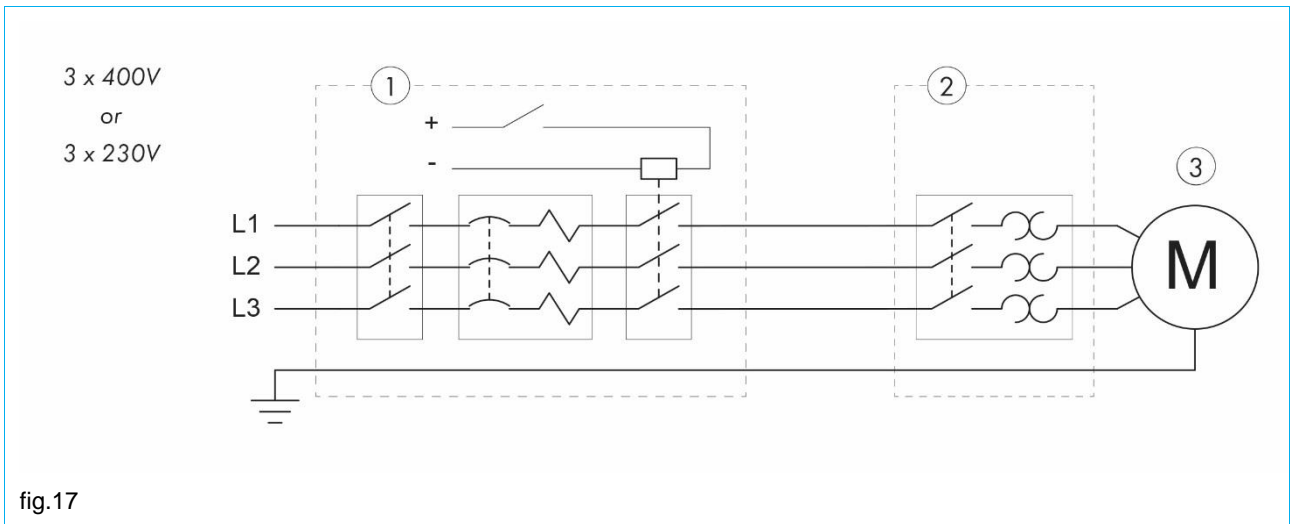


fig.17

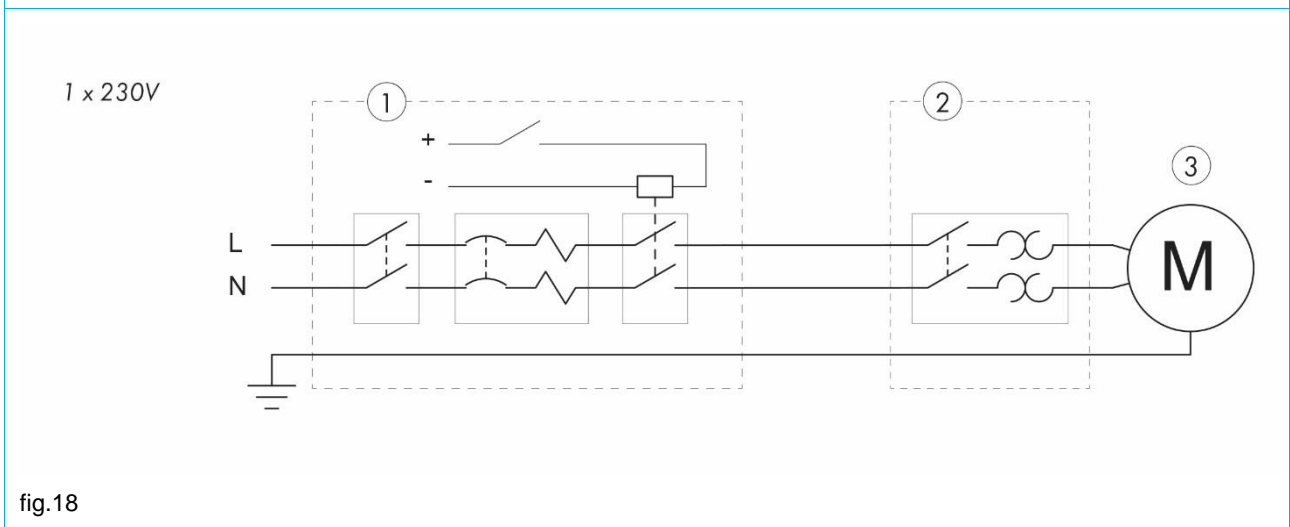


fig.18

- 1 = Overload protection switch
- 2 = Circuit breaker
- 3 = Fan motor



WARNING The rating plate data of the electric motor and the instructions given in the attached technical documentation must be used for sizing the power supply cable.



WARNING In the event of installations that do not comply with the directions given in this chapter, the manufacturer's liability ceases.

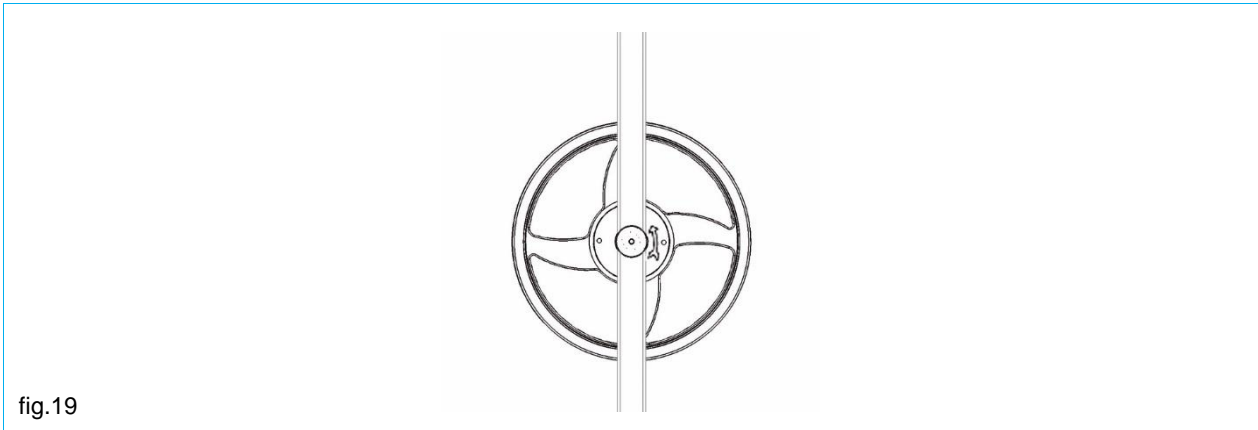
The electrical lines must be laid in accordance with requirements of the laws applying in the place of installation, and in any event:

- they must be laid with cables of adequate section for the power of the fan and the length of the line itself;
- they must make an effective earth connection;
- they must have isolating devices and automatic protection against overload and short circuits.

Before activating the electrical supply to the machine by turning the isolator switch to position On, a series of checks must be made:

- check that the voltage and frequency of the power source correspond to those indicated in the equipment technical data and electrical diagram;
- check that the supply cables and the conductor providing external protection are correctly connected;
- check that the connections in the control and power circuits are properly tight;
- check that the intensity of the short-circuit expected at the connection terminals is compatible with the breaking power of the protection switch upstream of the electrical panel;

- check that the protection devices (fuses, magnetothermic switches) are correctly sized, and that the phases are connected in the correct order: check that the fan rotates in the direction of the arrow shown on the driven pulley (see fig. 19).



Equipotential earthing wiring safeguard

To create effective protection against the risk of electrocution, the outer protection conductor must be connected to terminal PE inside an electrical panel.

For correct sizing of the protection conductors, see following requirements as indicated in standard IEC EN 60204-1:

- phase conductor up to 16 mm²: section of the protection conductor equal to the section of the supply conductor;
- phase conductor between 16 and 35 mm²: section of protection conductor equal to 16 mm²;
- phase conductor over 35 mm²: section of protection conductor equal to at least half the section of the supply conductor.



WARNING When connecting all the metal masses to the earth system, check that there are no insulating elements between the various conductive masses (metal parts). The system must not be put into operation unless the equipotentiality of the masses and the connection to the earth system have previously been checked.

Protection against contact voltages

The choice of device to protect the electrical system must be made in such a way as to ensure the safe intervention of the main automatic switches and any differential devices linked to them. For an appropriate choice of the type of protection for the machine's supply line, taking into account whether the distribution system is TT or TN, it is advisable to consult an electrical systems designer, in order to ensure compliance with the requirements of standard IEC 64-8 or the equivalent provisions in the country where the machine is being installed.

5.4 Tests and checks before startup

Before startup, it is extremely important to carry out a very careful check of the fan, in order to prevent malfunctions and/or accidents.

In particular, perform the following operations:

1. Equipotential earthing wiring safeguard:
 - check the fan visually, verifying that there are no particular mechanical irregularities or foreign bodies inside the structure;
 - check that the protective structures (fixed guards made of metal mesh) are correctly positioned and fixed;
 - check that the emergency stop function actuator operates correctly.



WARNING Tension the belt after three days of operation: improper tension will lead to premature wear on the transmission devices.

2. Checking the electrical system:
 - check that the supply conductors are properly fixed to the terminals of the isolating switch;
 - check the connections of the conductors in the equipotential earthing wiring safeguard;
 - check that the guards inside the electrical panel are correctly positioned and fixed;
 - check that the safety devices are receiving power and are active, and check their effectiveness.

After this series of checks has been carried out, the fan is ready for its first startup.



WARNING Some models of our fans allow to adjust the number of revolutions through inverter (also called VFD). In case of adjustment made by VFD the installer has to pay particular attention to the following aspects:

- it is necessary that the resistance of the ground line to which the equipment are connected has a very low values (about 15-20 ohm) in order to avoid high currents that can flow through the motor bearings and damage them.
- It is necessary to install the proper line filters, to avoid interference and allow proper operation of the equipment.
- The minimum frequency of operation of the engines in the case of absence of a forced external ventilation is 30 Hz. In the case of an operating frequency below 30 Hz is necessary to provide an external forced ventilation to the engine.

6. COMMISSIONING



WARNING The fan must not be used without first reading and understanding the user manual and becoming completely familiar with the controls.

6.1 Control devices

This chapter gives instructions on the control devices with which the electrical control panel must be fitted, which shall be done at the installation stage. At the fitting stage, the installer must set up a control panel complying with the requirements of standard IEC EN 60439-1 and arrange the wiring of the fan in accordance with the instructions in standards IEC EN 60204-1 and IEC 60364. The electrical circuit of the fan must generally be fitted with the devices indicated in *section 5.3*.

6.2 Instructions for machine use

Switching on and starting up

Before starting the machine:

- check that all the guards for the hazardous areas are in their correct positions;
- check that all the electrical safety components are in place and check their effectiveness by activating them;
- check the presence of the electricity supply.

To start the fan, go through the following procedure:

- turn the isolator switch to position On;
- press the fan starter button.

Normal stopping

In the event of necessity the fan can be stopped by operating the relative control device (stop), which shall be installed on the electrical panel.

Activating this control must cause the fan blade to stop rotating, but does not cause isolation of the power supply: the fan can be started again by pressing the start button.

In the event that the fan does not need to be used for an extended period of time, the following stop procedure must be used:

- operate the stop button
- operate the emergency stop button;
- open the main isolator switch (position "0") on the electrical panel and attach a padlock to the actuator.



WARNING Interrupting the electricity supply, equivalent to isolating by the operator with the main switch, causes complete fan shutdown: restoring the electricity supply will not cause any movement in the machine.

Emergency stop

Operating the main emergency stop button causes the fan to stop moving.

The function is controlled by a red mushroom type button on a yellow background, provided with mechanical locking and release by turning. Operating it causes the instantaneous interruption of the power supply to the electric motor which makes the rotor turn (uncontrolled shutdown category 0 according to IEC EN 60204-1).

Resetting after stopping

1. Resetting after normal stopping

After normal stopping the operating cycle must be reset by following the procedure described in *section 6.1*.

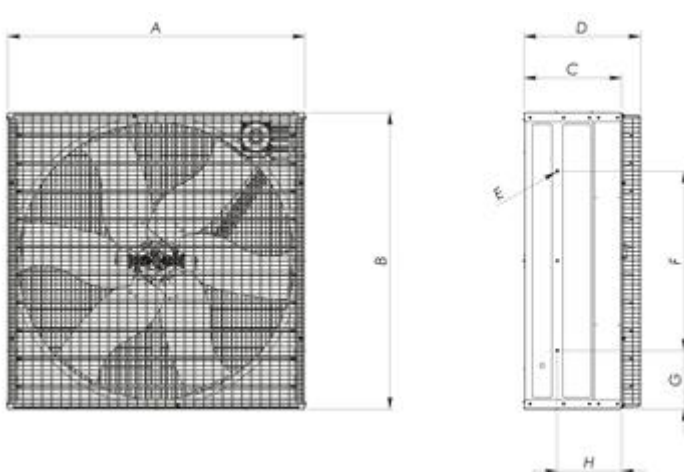
2. Resetting after emergency stop

After an emergency stop, the operating cycle must be reset by following the procedure described below:

- reset the actuator by which the emergency stop command was given (by turning the relative mushroom button);
- for an exact reset sequence, refer to the instructions given in *section 6.2*.

7. TECHNICAL DATA

7.1 Dimensions

Dimensions [mm]							
							
fig.20							
A	B	C	D	E	F	G	H
1,090	1,090	450	530	M8	600	245	305

7.2 Technical specifications

Technical specifications				
Models		0.5 hp	0.75 hp	1.0 Hp
Number of blades		6		
Number of shutter blades		8		
Propeller diameter	mm [inch]	915 [36]		
Weight of fully equipped fan*	[kg]	64	65	67
Airflow at 0 Pa	m ³ /h [cfm]	17,900 [10,535]	19,880 [11,700]	22,250 [13,095]
Airflow at 20 Pa	m ³ /h [cfm]	15,700 [9,240]	17,930 [10,550]	20,750 [12,210]
Specific performance at 0 Pa	m ³ /h /W [cfm /W]	25.1 [14.8]	22.3 [13.1]	18.5 [10.9]
Max. operating temperature	°C [°F]	40 [104]		

Max. operating pressure	[Pa]	50		
Nominal propeller speed	[rpm]	460	510	580
IEC protective class of electric motor		IP55		
Electric motor winding insulation grade		F		

8. MAINTENANCE

Task	Frequency
Visual inspection to check for defects	Daily
Check belt tension	3 days after first starting and then monthly
Clear dust	Every second month Warning: No high pressure water to be sprayed on motor and bearings.

8.1 Introduction

Maintenance must only be carried out by qualified personnel only using suitable tools and working methods. Before any maintenance steps are taken, make sure the power switch is in the off position and locked by a padlock. Make sure the propeller is at a complete standstill. Fans do not contain parts needing periodic lubrication, as moving parts are either manufactured from self-lubricating materials, or are sealed with lifetime lubrication.

8.2 Cleaning

Inspect the fan at regular intervals and keep it clean. It is advised to perform periodic cleaning of safety mesh guards. Dust on the safety mesh guards causes extra power consumption; severe dust on the motor can cause overheating and subsequent motor failure.



WARNING Keep motor body clean. Dust deposit on motor body will lead to overheating and failure of bearings and motor itself.

Do not use water for motor cleaning. Use compressed air only. Water spraying will cause rust inside the bearings and lead to their failure.



WARNING All the components and spare parts **MUST** be stored in dry and clean environment.

8.3 Belt tensioning check up

Check V-belt tension at regular intervals, the correct tension is obtained when maximum deflection (half-way from motor and central pulley) is about 15 mm, when pushed in by thumb.



WARNING Tighten fan belt after the fan has been running for 3 days. Without adjusting the tension, transmission components can wear out early.

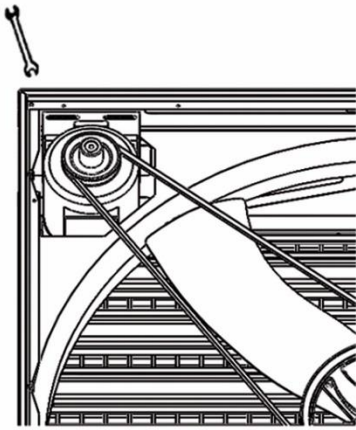


fig.21

To reset the correct tension:

1. with the propeller at a complete standstill, open the safety mesh guard on the pulley/motor side;
2. loosen motor slide fixing screws;
3. tighten the V-belt by pushing the motor sideways;
4. tighten the fixing screws adequately;
5. fix the safety meshes guard to the fan housing.

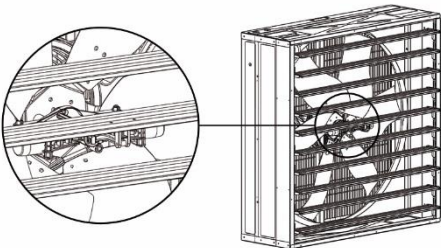


WARNING Do not operate the fan with the safety protections removed: safety meshes can be removed only with specific tools by qualified technicians when the fan reaches a complete standstill.

The fixing systems of the safety protections are not interchangeable with other devices. Therefore, if for maintenance reasons the user damages or loses any component, this must be definitely ordered from the manufacturer as spare parts and it cannot just be replaced with other components, even similar, not supplied by the constructor itself. In this particular event the manufacturer refuses all responsibility on consequent damages caused to things and people and considers any kind of warranty lost.

8.4 Replacement of propeller

If propeller damaging occurs, it is necessary to substitute the whole propeller because of the difficulty to balance it, in the field.



1. Open shutter by hand and take away the pin, which connects central shutter blade to centrifugal system.

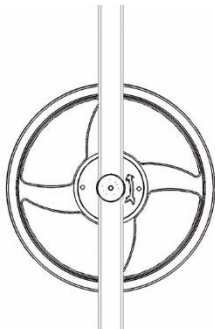


fig.23

2. Loosen motor to propeller V-belt from pulleys throat;
3. unscrew the fixing nut.

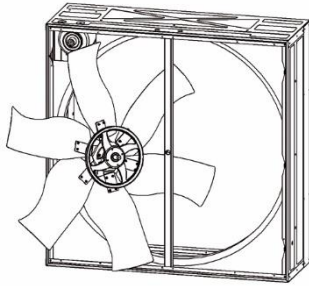


fig.24

4. Take out the pulley-propeller-centrifugal system assembly from fan frame.

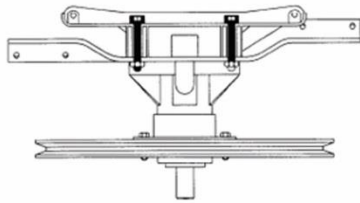


fig.25

5. Remove centrifugal system by unscrewing central allen screws (M8) fixing it to propeller;
6. disassemble the propeller from central pulley unscrewing the 4 hub fixing screws;
7. assemble the new propeller following the reverse procedure.

8.5 Replacement of central pulley

To replace the central pulley follow the same procedure of the propeller replacement (see section 8.4).

8.6 Replacement of shutter bearing assembly

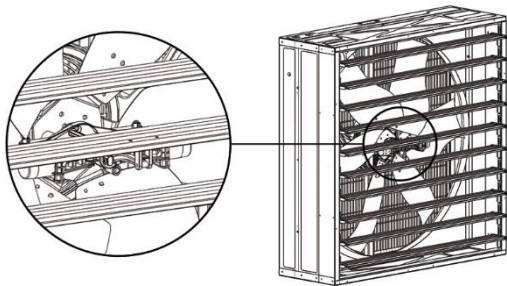


fig.26

1. open shutter by hand and take away the pin, which connects central shutter blade to centrifugal system;

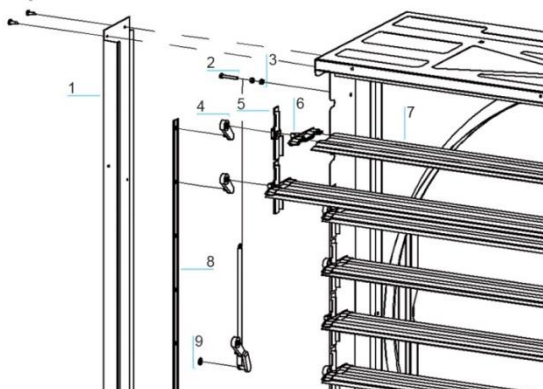


fig.27

2. remove the side cover plates (see n.1) and break steel stop collars (see n.9) on central bearing assembly with pliers;
3. unthread two tie-rod with holes (see n.8) and unscrew M6 bolts (see n.2) and nuts (see n.3) which fix shutter closing spring;
4. pull off the shutter blades (see n.7) from their slot and unhook the damage shutter bearing assembly (see n.4,5,6);
5. insert the new shutter bearing assembly;
6. put back the shutter blades and fix the closing springs in their position;
7. fit the cover side plates back (see n.1).

8.7 Fan bearing lubrication

Bearings are properly sized, with double sealed protection (2RS) and lubricated for life, therefore they do not require any additional lubrication.

8.8 Replacement of shutter opening device (centrifugal system)

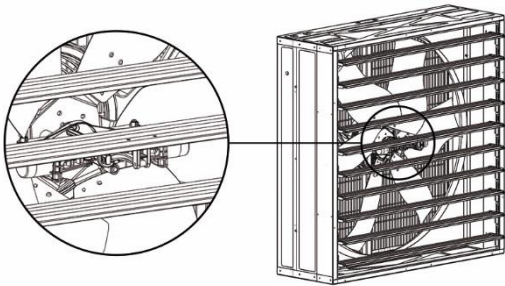


fig.28

1. open shutter by hand and take away the pin, which connects central shutter blade to centrifugal system;

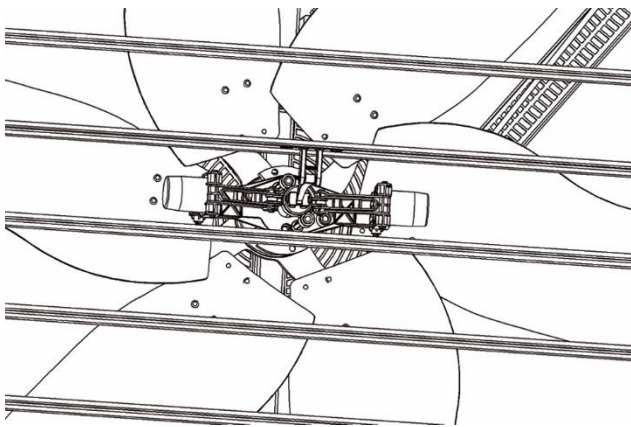


fig.29

2. unscrew the two M8 hexagonal socket head cap screws and pull out the whole centrifugal system through the shutter blades.
3. do the reverse procedure to replace the shutter opening device and put back the pin, which connects central shutter blade to centrifugal system.



WARNING There are a number of steps that can greatly reduce or eliminate the white rust formation on the tightly packed components of fans delivered unassembled:

- keep the components dry;
- unpack the components to permit air circulation between the surfaces;
- stack the components to allow water to drain out;
- keep the packed components in such way to prevent moisture contact with the Munters Protect coated surface.

9. SPARE PART LIST

EM36

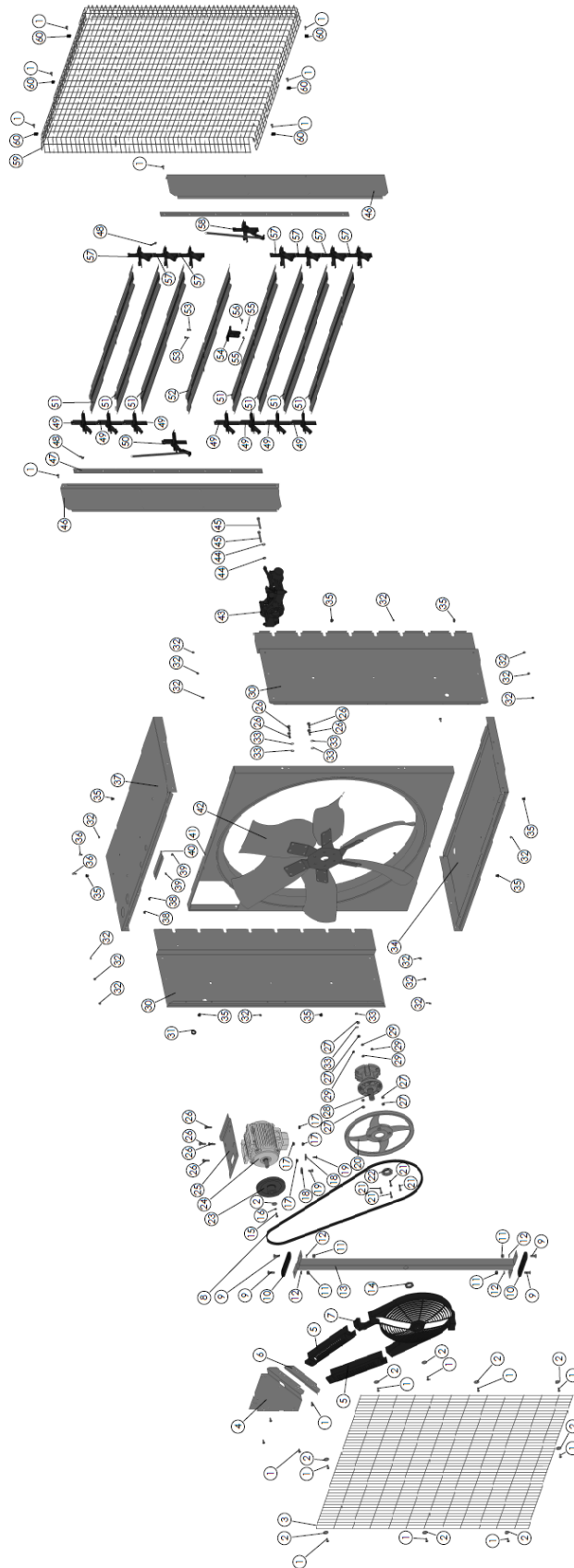


fig.30

REF.	DESCRIPTION	QUANTITY
1	Ø6,3x19 SELF-TAPPING SCREW	23
2	Ø6x24 WASHER	10
3	REAR SAFETY MESH	1
4	CARTER FOR MOTOR	1
5	CARTER FOR BELT	2
6	PLATE FOR MOTOR CARTER	1
7	CARTER FOR PULLEY	1
8	A75 V-BELT	1
9	M10x30 SCREW	4
10	OVAL PLATE	2
11	M10 HEX NUT	4
12	EXT TOOTHED WASHER D10,5X18	4
13	CENTRAL SUPPORT	1
14	M25 HEX NUT	1
15	M06x20 HEX SCREW	1
16	Ø6 SPRING WASHER	1
17	M08 HEX NUT W/FLANGE	4
18	Ø8X32 WASHER	2
19	M08X16HEX SCREW	2
20	CENTRAL PULLEY	1
21	M06x30 HEX SCREW	4
22	WATERPROOF DISTANCE PIECE	1
23	MOTOR PULLEY*	1
24	MOTOR*	1
25	MOTOR SLIDE	1
26	M08x25 HEX SCREW	8
27	M08 HEX NUT	6

28	HUB W/SHAFT AND BEARING	1
29	M06 HEX NUT W/FLANGE	4
30	SIDE PANEL	2
31	RUBBER FOR CABLE	1
32	Ø6.4X8 POP UP RIVET	16
33	Ø8 EXT THOATED WASHER	6
34	BOTTOM PANEL	1
35	M08x17.5 THREADED BUSH	8
36	Ø6x16 TT64 BOLT	2
37	TOP PANEL	1
38	M08x12.5 THREADED BUSH	2
39	TS6.4M KAK COLLAR	2
40	MOTOR SLIDE PLATE	1
41	ORIFICE	1
42	PROPELLER	1
43	CENTRIFUGAL SYSTEM	1
44	Ø8X16 WASHER	2
45	M08x55 HEX SCREW	2
46	CARTER	2
47	TIE ROD	2
48	HOOK FOR SPRING	2
49	COMPLETE RIGHT BEARING	7
50	CENTRAL RIGHT SHUTTER BEARING	1
51	SHUTTER BLADE	7
52	CENTRAL SHUTTER BLADE	1
53	M06x16 HEX SCREW	2
54	PLASTIC FORK	1
55	M06 THIN HEX NUT	2

56	KNURLED AXLE	1
57	COMPLETE LEFT BEARING	7
58	CENTRAL LEFT SHUTTER BEARING	1
59	PYRAMIDAL MESH	1
60	METAL CLIP FOR PYRAMIDAL MESH	6

**the components change depending on the configuration utilized*

Munters EM36 extraction fan is developed and produced by Munters Italy S.p.A., Italy



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