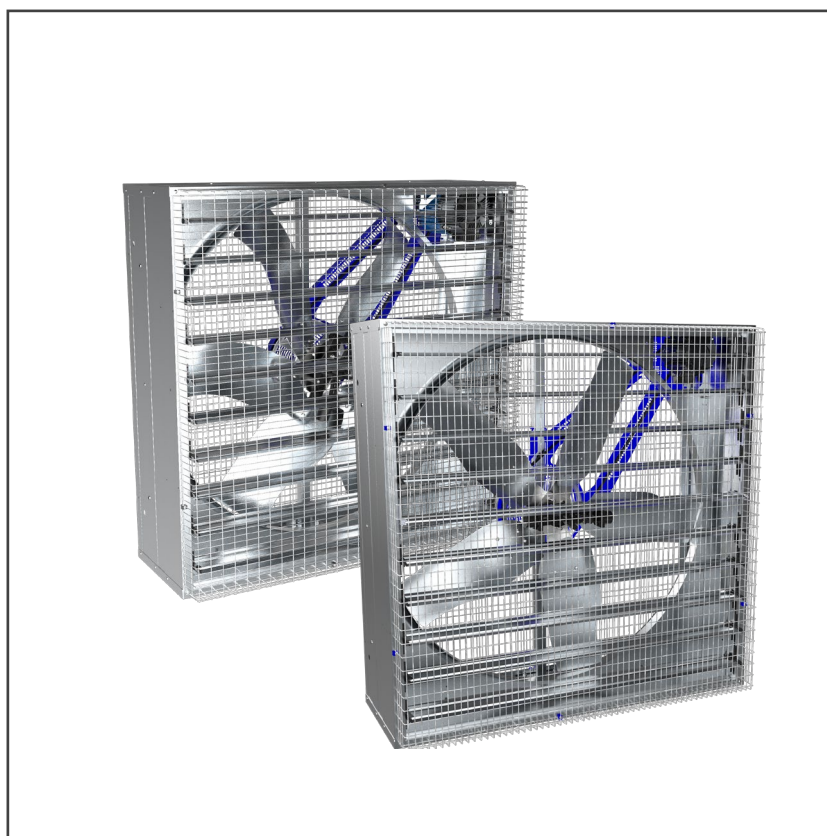


User Manual

Euroemme EM



Original Instructions

This manual for use and maintenance is an integral part of the apparatus together with the attached technical documentation and has been produced with reference to Directive 2006/42/EC, paragraph A, Annex II, and to ErP Directive 2009/125/CE Commission Regulation 2024/1834.

This document is destined for the user of the apparatus: it may not be reproduced in whole or in part, committed to computer memory as a file or delivered to third parties without the prior authorisation of the assembler of the system. GrainProteinTech Climate Control Air Treatment Italy S.p.A. reserves the right to effect modifications to the apparatus in accordance with technical and legal developments and to make alterations to specifications, quantities, etc., for production or other reasons, subsequent to publication.

Warranty Conditions and Limitations

For Warranty information please refers to "General terms and condition of sale" available by scanning the QR code.

- 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 GrainProteinTech Climate Control & Air Treatment;
- 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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DECLARATION OF INCORPORATION

(2006/42/CE Machine Directive Annex II, Part B)

GrainProteinTech Climate Control Air Treatment Italy S.p.A.
with registered offices in Strada Piani, 12 – 18027 Chiusavecchia (IM) – Italy
(Company Registration nr. 00081050080)

declares on its own responsibility that the partly completed apparatus:

Designation	Fan designed for moving air to control temperature and humidity in greenhouses or rearing sheds
Model	EM50 Erp, EM50 E-line, EMS50
Year of production	2026

Conforms to the essential health and safety requirements of Directive 2006/42/EC (Machinery Directive). Performance requirements comply with Regulation (EU) 2024/1834, adopted under Directive 2009/125/EC (ErP Directive), Directive 2014/30/EU (EMC Directive), and Directive 2014/35/EU (Low Voltage Directive)

with particular reference to the following harmonised standards:

UNI EN 14120:2015; UNI EN ISO 12100:2010; UNI EN ISO 12499:2009; UNI EN ISO 13857:2020;
UNI EN ISO 5801:2025; UNI EN IEC 60335-1; UNI EN IEC 60335-2-80 ; UNI EN IEC 61000-6-4 ;
UNI EN IEC 61000-3-3; UNI EN IEC 61000-3-2 ; CEI EN 60204-1:2018.

The manufacturer prohibits the commissioning of the partly completed machinery object of this declaration:

- Until the machine in which it must be incorporated has not been declared in compliance with the 2006/42/EC machine directive disposal
- Using the machine incorrectly, or in any case differently from the instructions indicated in the manual

Chiusavecchia, 10th May 2026
Daniela Giglioli
Legal Representative



EU DECLARATION OF CONFORMITY

(LVD 2014/35/EU, Annex IV)

GrainProteinTech Climate Control Air Treatment Italy S.p.A.

with registered offices in Strada Piani, 12 – 18027 Chiusavecchia (IM) – Italy
(Company Registration nr. 00081050080)

declares on its own responsibility that the object of the declaration described below:

Designation	Fan designed for moving air to control temperature and humidity in greenhouses or rearing sheds
Model	EM50 Erp, EM50 E-line, EMS50
Year of production	2026

Is in conformity with the relevant union harmonisation legislation:

CEI EN 60204-1:2018, UNI EN ISO 12499:2009, UNI EN ISO 12100:2010.

Chiusavecchia, 10th May 2026

Daniela Giglioli

Legal Representative



1. General Informations

1.1 Disclaimer

GrainProteinTech Climate Control & Air Treatment 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 GrainProteinTech Climate Control & Air Treatment. 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 Introduction

Congratulations on your excellent choice of purchasing a GrainProteinTech Climate Control & Air Treatment 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 GrainProteinTech Climate Control & Air Treatment fans.

1.3 Notes

Date of release: 2026.

GrainProteinTech Climate Control & Air Treatment 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 GrainProteinTech Climate Control & Air Treatment. The contents of this manual are subject to change without notice.

1.4 Description

Euroemme EM fans are intended for the movement of air to control humidity and temperature in greenhouses or animal farms, in extraction or internal recirculation, not under pressure.

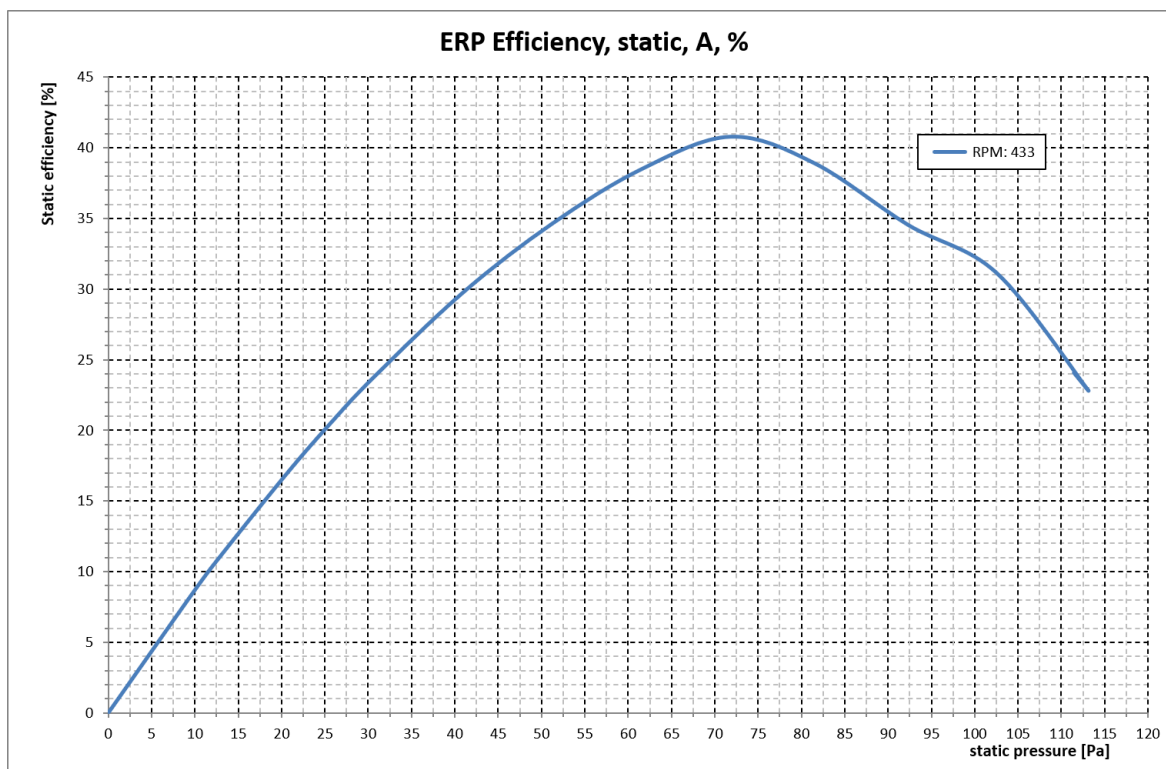
1.5 Data for Fan Eco Design Directive

Product information requirements* ↓ (according to ANNEX I – 2.2 of regulation)		EM50 Erp 1.5hp 3ph 50Hz	EM50 Erp 2 hp 3ph 50 Hz	EM50 E-line 2.5hp 3ph 50Hz	EMS50 1hp 3ph 50Hz
a	Fan Type	Axial	Axial	Axial	Jetfan
b	Overall efficiency $\eta\%$	40.0	42.3	41.8	28.7
c	VSD must be installed with the fan	No	No	Yes	No
d	Measurement category	A	A	A	E
e	Efficiency category	Static	Static	Static	-
optional	Target efficiency grade 2026	50	50	50	50
f	Efficiency grade	50.0	50.0	50.2	50.2
g1	Motor power input at optimum energy efficiency [W]	1117	1836	1571	970
g2	Flow rate at optimum energy efficiency [m3/h]	21,992	26,593	27,320	32,110
g3	Pressure at optimum energy efficiency [Pa]	73.2	105.1	81.2	-
i	direct current voltage below 100 V	No	No	No	No
l	RPM at optimum energy efficiency	509	614	432	378
m	Specific ratio	1	1	1	1

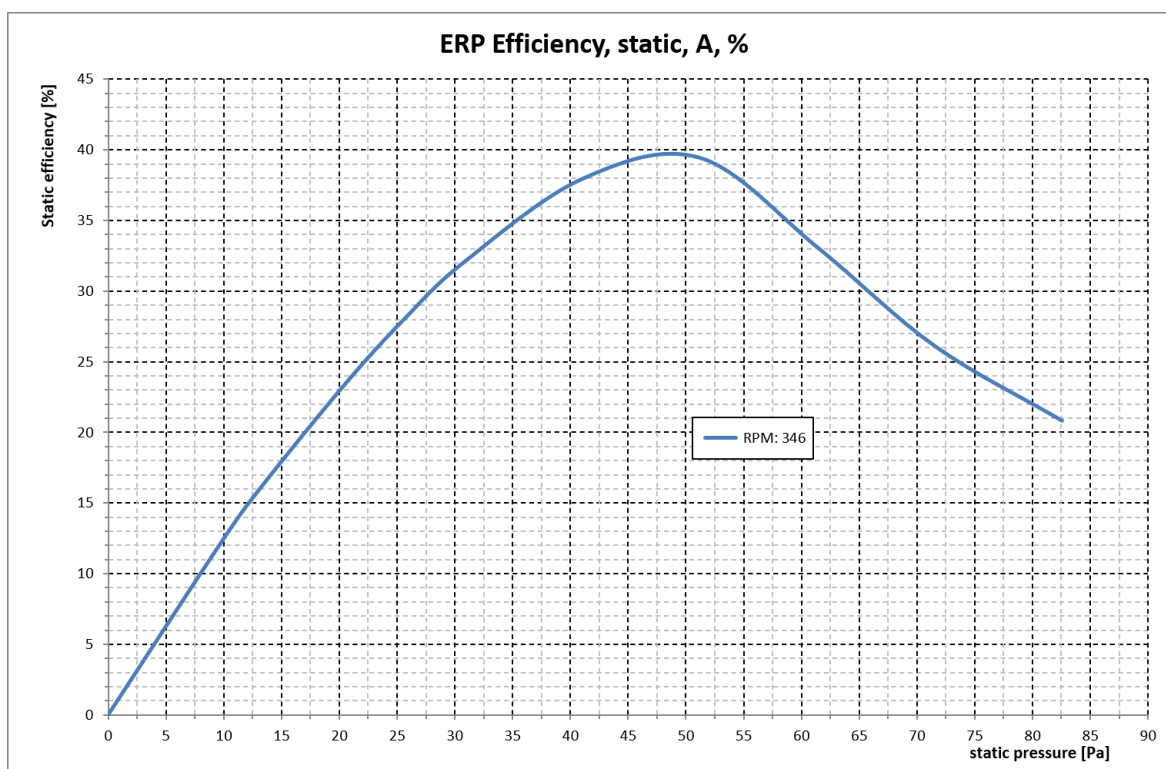
*Fans tested are configured according to COMMISSION REGULATION (EU) No 2024/1834 of 3rd July 2024 - ANNEX II - 1. Efficiency values, according to Commission Regulation (EU) 2024/1834, refers to exhaust fans only.

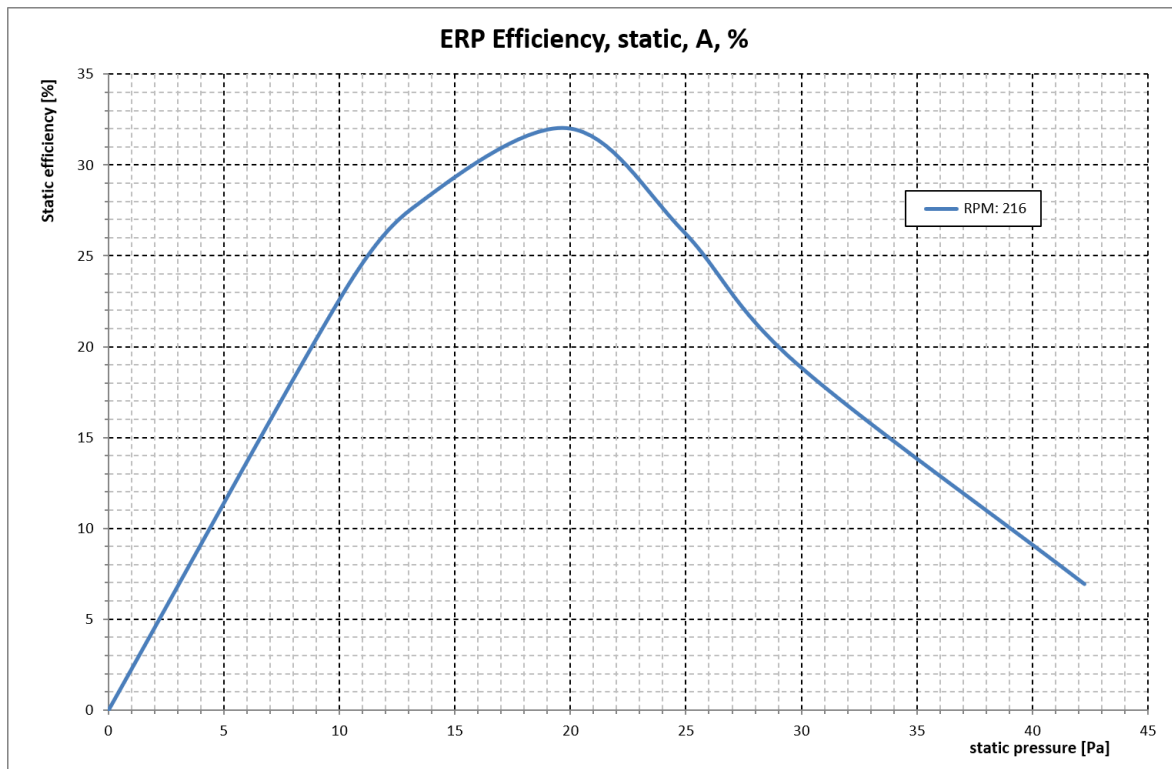
EM50 E-line Part-load efficiency curves*

100% [433 rpm]



80% [346 rpm]





*in accordance with Regulation (EU) 2024/1834

Attached technical documentation

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

- technical sheet/electric motor instruction booklet.

1.6 Decommissioning and dismantling

1. Disconnect power supply
2. Clean the fan
3. When disassembling, it is appropriate to separate the various components according to the material of which they are made of, in order to facilitate any possible subsequent reuse or selected disposal according to the legislation in force.

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.

Carry out the disposal of the fan by observing the classification of individual components and materials in accordance with the current guidelines in the country of operation.

Parts and Materials	
Parts	Materials
Impeller Blades	DX51D - ZM120 steel / Inox 304*
Impeller Spider	DD11 – Galvanized
Shutter blades	DX51D - ZM120 steel / Inox 304*
Conveyor	DX51D - ZM120 steel / Inox 304*
Inlet, Outlet mesh	Steel / Inox 304*
Chassis (Panels & Motor Support)	DX51D - ZM120 steel / Inox 304*
Brackets	DX51D - ZM120 steel / Inox 304*
Impeller Hub	Steel
Shutter Bearings	POM
Centrifugal system	POM
Oval Plate	PP
Motor	Aluminium

*Only for EMX models

2. Safety aspects



WARNING

Failure to respect safety or behavioural 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

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance

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.

2.2 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.*

2.3 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.*

2.4 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
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.

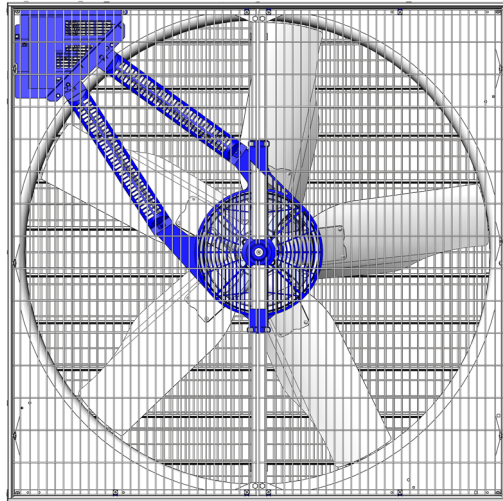
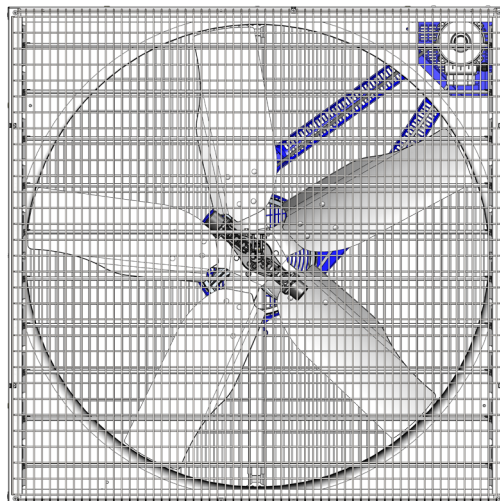


fig. 1

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
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* Mandatory for fans mounted below 2.7mt height

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 coloured red, provided with mechanical restraint and released by turning.

2.5 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 (measured at 4m distance)	
Fan model	Max sound pressure level Lp [dB(A)]
EM50 Erp – 2hp	75.3
EM50 E-line – 2.5hp	70.3
EM50 Erp – 1.5hp	69.9
EM52 – 2hp	70.3
EM50 – 1.5hp	70.4
EM50 – 1hp	67.6
EM36 – 1hp	68.4
EM36 – 0.75hp	63.9
EM36 – 0.5hp	62.1
EM30 – 0.75hp	66.9
EM30 – 0.5hp	63.4
EMS50 E-line – 2.5hp	68.8
EMS50 – 1.5hp	70.2
EMS50 – 1hp	67.3
EMS36 – 1hp	68.2
EMS36 – 0.75hp	63.6
EMS36 – 0.5hp	61.7
EMS30 – 0.75hp	66.7
EMS30 – 0.5hp	63.1
EMT30 – 0.75hp	66.7
EMT30 – 0.5hp	63.2

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. The measurement has been taken according to the UNI EN ISO 3744:2010.



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

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.

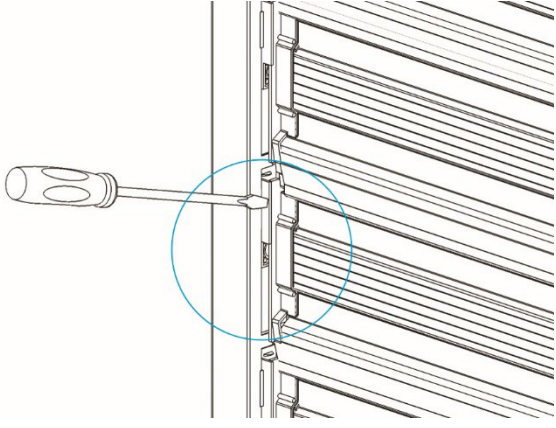
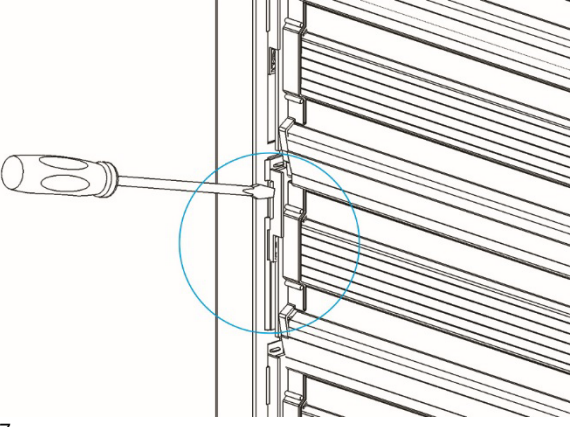
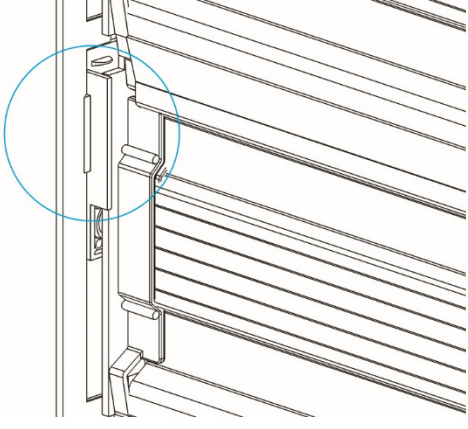
3. Before using

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	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 screwdriver and re-check the opening of the shutter. Follow the steps shown in the pictures.
 fig.7	
 fig.8	

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 8.2).

3.3 Structure

The fans consist of the following components:

- Fan housing in M-Protect coated steel without welding spots;
- Fan shutter in M-Protect coated steel, which pivots on UV protected plastic bushes and pins;
- Propeller with blades in stainless or M-Protect coated steel; blades are fixed to the propeller by high-strength pop rivets;
- Asynchronous three-phases motor (single-phase upon request); 50 or 60 Hz; B3 form; F class winding insulation, IP55 protection class; single-speed or multi-speed;
- Centrifugal operated shutter opening device.

4. Operating conditions

4.1 Intended conditions of use

Fans, fanjets and circulators are machines designed for moving air to control temperature and humidity in greenhouses or rearing sheds by extraction or internal recirculation, not for being operated in positive pressure environments. They can even be installed horizontally, without altering or modifying their characteristics.

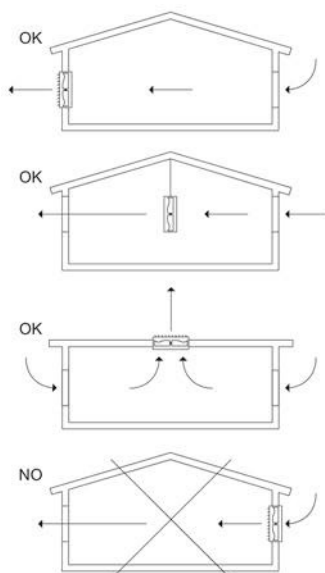


fig. 9

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 operating in positive pressure environments;
- 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.



WARNING

If unusual oscillating movement is observed, immediately stop using the fan and contact the manufacturer, its service agent or suitably qualified persons.

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.

The replacement of parts of the safety suspension system device shall be performed by the manufacturer, its service agent or suitably qualified persons.

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.



WARNING

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 EU 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, 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 ambient 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 / + 50 °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.

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.10/11).

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.

A-1997

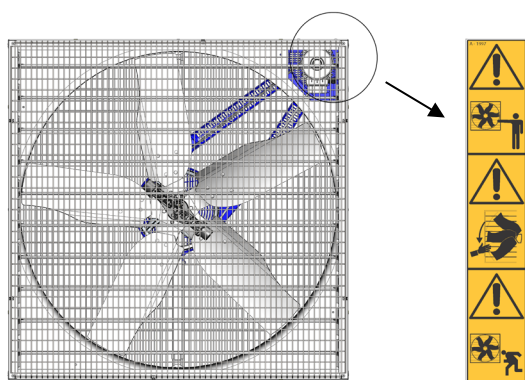


fig. 10

B-1197

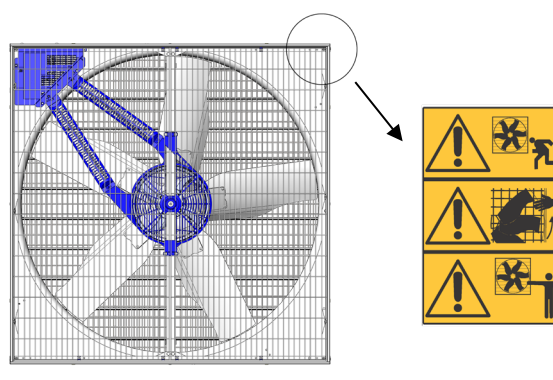


fig. 11

5.2 Installing EM Series fans

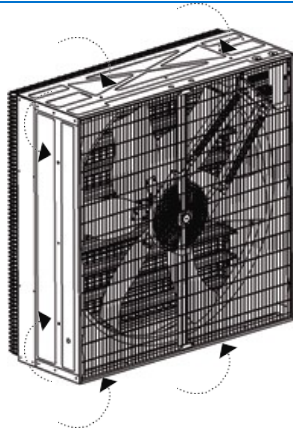


fig. 12

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).

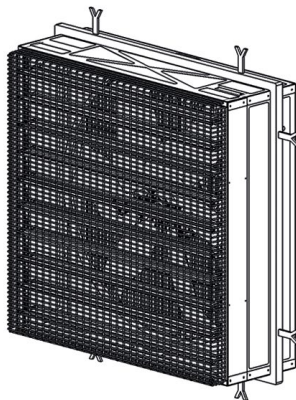


fig. 13

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.



WARNING

The fans must be installed to carry out extraction or an internal circulation of the air present in the area and must not operate in positive pressure environments. It is also permissible to install the fan in a horizontal position.



WARNING

There must be no obstacle neither in front nor behind the fans. The outgoing airflow must be kept free at least 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.



WARNING

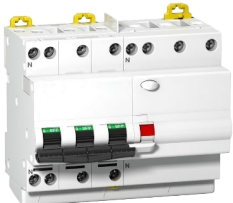
In order to comply with CE regulations, fans should be mounted so that the bottom of the fan is 2.7m or higher from the floor below it. If the fan is to be installed at a lower height it should be equipped with special safety meshes which are available as an optional extra.

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

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 61439-1:2010-01 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 2014/35/UE):

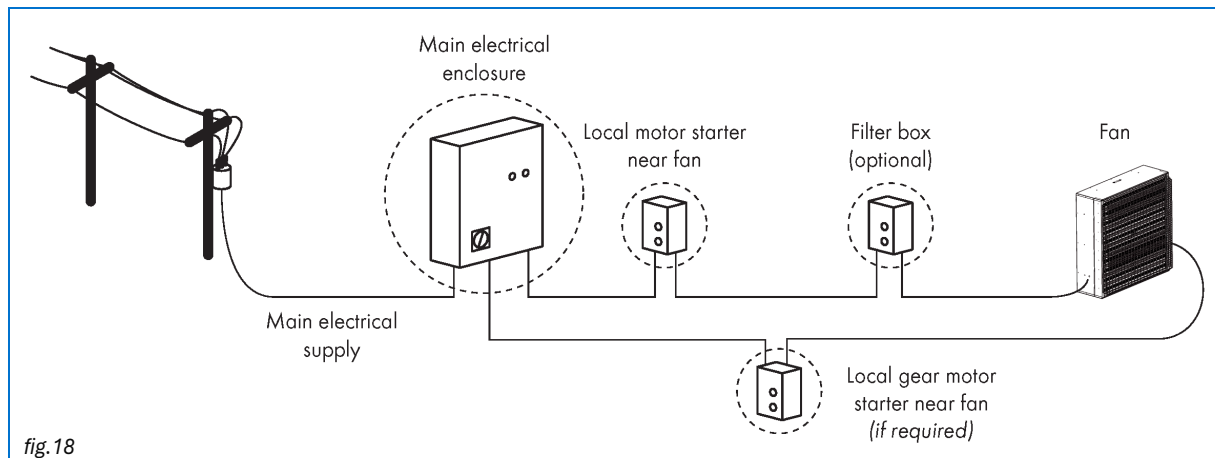
 fig. 14	Lockable isolating switch.
 fig. 15	Magnetothermic switch (chosen to suit the maximum current absorbed by the fan). The need to fit a switch of differential type depends on the configuration of the electrical system supplying the fan: it is the installer's responsibility to make this assessment in accordance with the instructions in standard IEC 60364.
 fig. 16	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. 17	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.

Connection to the power supply must be done by means of a thermal overload protection switch, whose size depends on maximum current absorbed by the fan. For safety reasons the overload switch can be locked by a padlock, not supplied by GrainProteinTech Climate Control & Air Treatment. Electrical earthing must be carried out according to local regulations before the motor is connected to the supply voltage.



Below are suggested wiring diagrams for connecting the fan to the mains electrical supply. These diagrams are however subject to local laws and regulations and should be modified if necessary to comply with such laws and regulations.

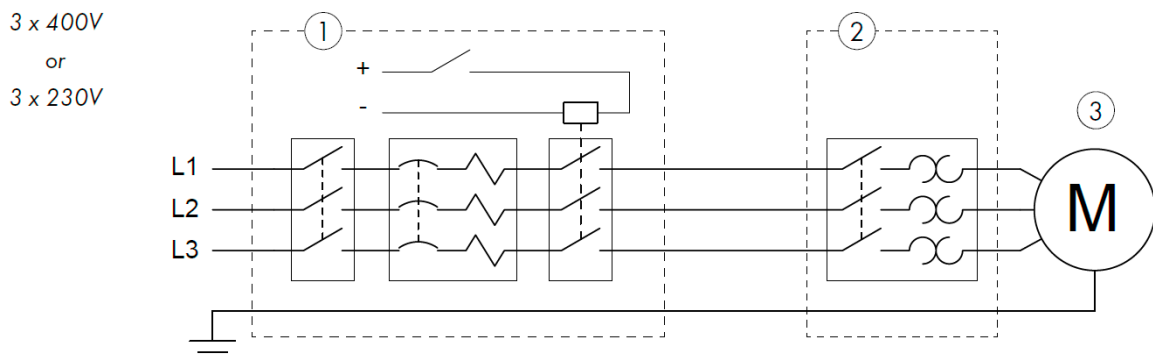


fig. 19 - wiring diagram for three-phase models

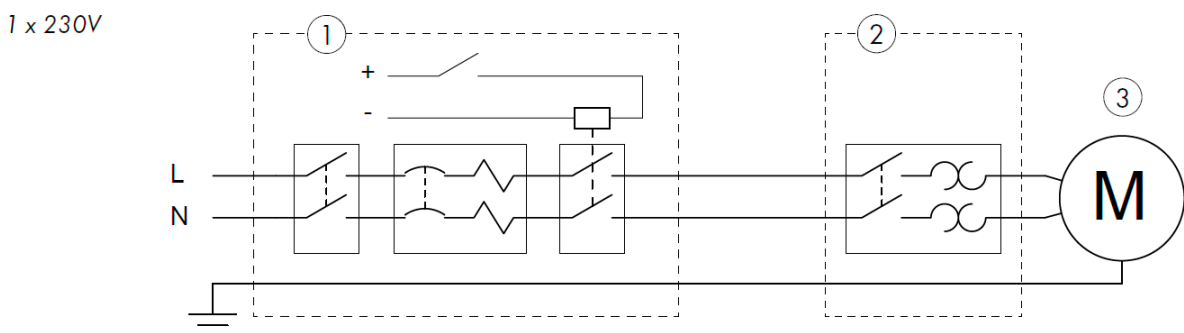


fig. 20 - wiring diagram for single-phase models

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

To avoid excessive voltage drop, which can be harmful to electrical motors, care must be taken as to the thickness of cables used as well as the distance from the main electrical enclosure to the motor. Proceed as follows:

- check that the data shown on the fan plate correspond to the connection data;
- before connecting the device, make sure that the supply voltage matches the device voltage;
- use only cables suitable for the current intensity indicated on the identification plate of the device.

For the sizing of the section, follow the sizing principles imposed by the EN 61800-5-1 standard. The protective conductor must have at least the same section as the external conductor.

Standard fan motors have the following voltage and frequency: **230/400V three-phase 50 or 60 Hz**



NOTE

Failure to operate the fan with an overload protection device will render the motor guarantee null and void. Such motor overload protection devices can be ordered from GrainProteinTech Climate Control & Air Treatment and be supplied with the fans.

The connection cable must be completely extracted from the fan housing in order to avoid being damaged by moving parts.

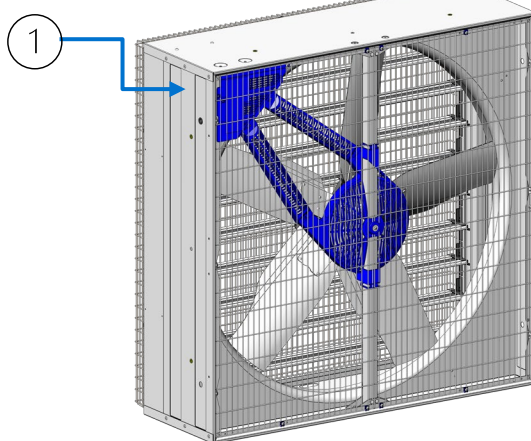


fig.21

Fan specifications are written on the label stuck on the frame (no. 1 in diagram).

To change the direction of rotation of a three-phase motor it is necessary to change the connection of two of the phases.



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.

In the event of installations that do not comply with the directions given in this chapter, the manufacturer's liability ceases, along with the validity of the EU Declaration of Conformity.

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, magnetothermal switches) are correctly sized, and that the phases are connected in the correct order: check that the fan rotates clockwise; look at the exhaust side of the fan and check rotation of propeller (see fig. 23).

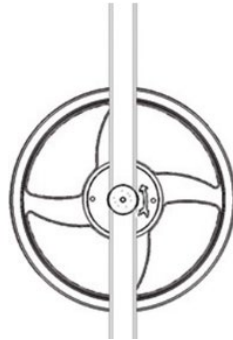


fig. 22

Equipotential protection circuit

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, considering 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 protection circuit:

- check the fan visually, verifying that there are no 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.

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 circuit;
- 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 must pay particular attention to the following aspects:

- *it is necessary that the resistance of the ground line to which the equipment is 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.*
- *Any speed adjustment carried out with an inverter not supplied by GrainProteinTech Climate Control & Air Treatment may not allow the shutter to open correctly.*

6. Inverter

This chapter illustrates the main characteristics of the inverter that equips E-line version.



WARNING

DO NOT open the motor. Failure to comply will void the warranty.

6.1 Working range

Voltage	Phases	Frequency
208 - 230Vac (-15% / +10%)	3-phases	50 or 60Hz
400 - 480Vac (-15% / +10%)	3-phases	50 or 60Hz

STAR: TN, TT and IT. DELTA corner grounded

Ambient working temperature:	RH%
-20°C + 50°C	0 ÷ 95%

The Motor and Inverter are IP66

6.2 Leds

The device is equipped with two LEDs, one green and one red, which are used to signal different states of the device as shown in the following table.

Green Led	Red Led	Description
Off	Off	Motor Off (without supply)
On	Off	Motor On (working properly)
Off	Flashing	Alarm
Flashing	Flashing	Inverter firmware update in progress

6.3 Pinout

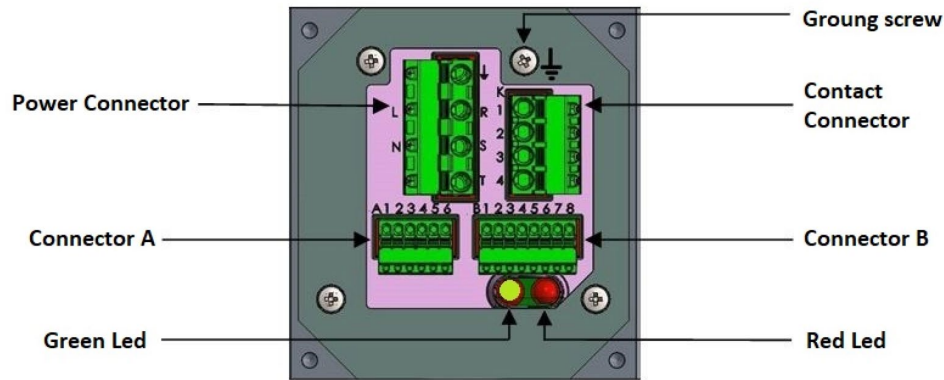


fig.23

Power Connector		
	Power Supply Ground (earth)	
R/L	3-Phases Supply (400-480Vac, 208-230Vac): R Phase Single Phase Supply (208-230Vac): Line	
S/N	3-Phases Supply (400-480Vac, 208-230Vac): S Phase Single Phase Supply (208-230Vac): Neutral	
T	3-Phases Supply (400-480Vac, 208-230Vac): T Phase Single Phase Supply (208-230Vac): Not used	
SELV Signal Connector A		
1	GND Modbus 485 Out	
2	Modbus 485 Out B/-	
3	Modbus 485 Out A/+	
4	GND Modbus 485 In	
5	Modbus 485 In B/-	
6	Modbus 485 In A/+	
SELV Signal Connector B		
1	GND 0-10V	0-10V input for motor speed control
2	Input(+) 0-10V 20KOhm 0,5mA @10V	0-10V input for motor speed control
3	GND Potentiometer 10,5V	External potentiometer power supply output
4	Output 10,5V Potentiometer max 10mA	External potentiometer power supply output
5	GND Input End of Line Shutter	Input End of Line Shutter (if present) Admissible Range: 0-24V
6	Input End of Line Shutter 1,2mA	Input End of Line Shutter (if present) Admissible Range: 0-24V
7	GND Input Enable o Run	Enable/disable the motor control through the 0-10V input. Close contact means Run
8	Input Enable o Run	Enable/disable the motor control through the 0-10V input. Close contact means Run
SELV Contacts 24Vdc 230Vac (MIN 100mA, MAX 1A)		
1	Pin 1 Alarm contact	Normal closed contact (NC) Closed contact means no active Alarms Open contact: active Alarm present
2	Pin 2 Alarm contact	Normal closed contact (NC) Closed contact means no active Alarms Open contact: active Alarm present
3	Pin 1 Shutter command (if present)	Closed contact: open Shutter
4	Pin 2 Shutter command (if present)	Open contact: close Shutter

Connection scheme

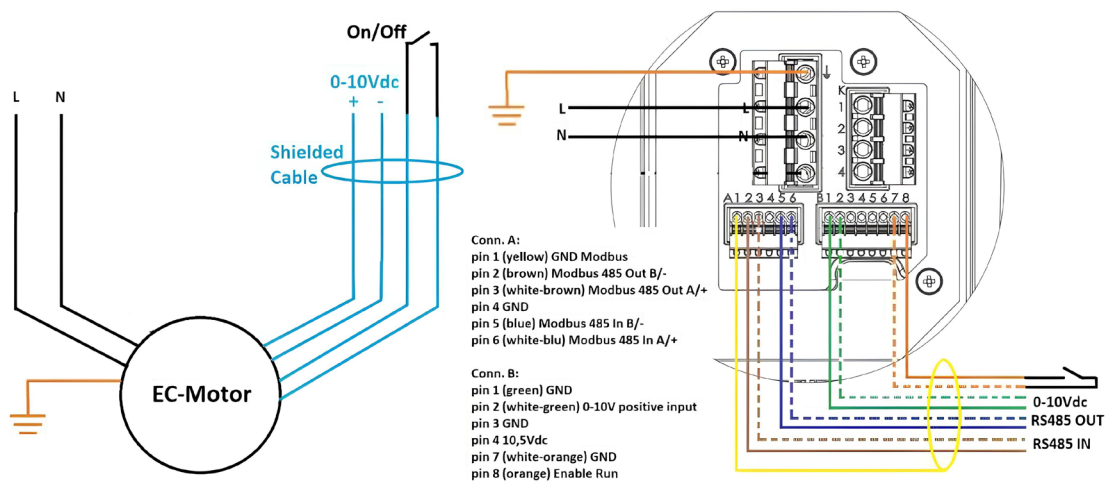


fig.24 - wiring diagram for single-phase models

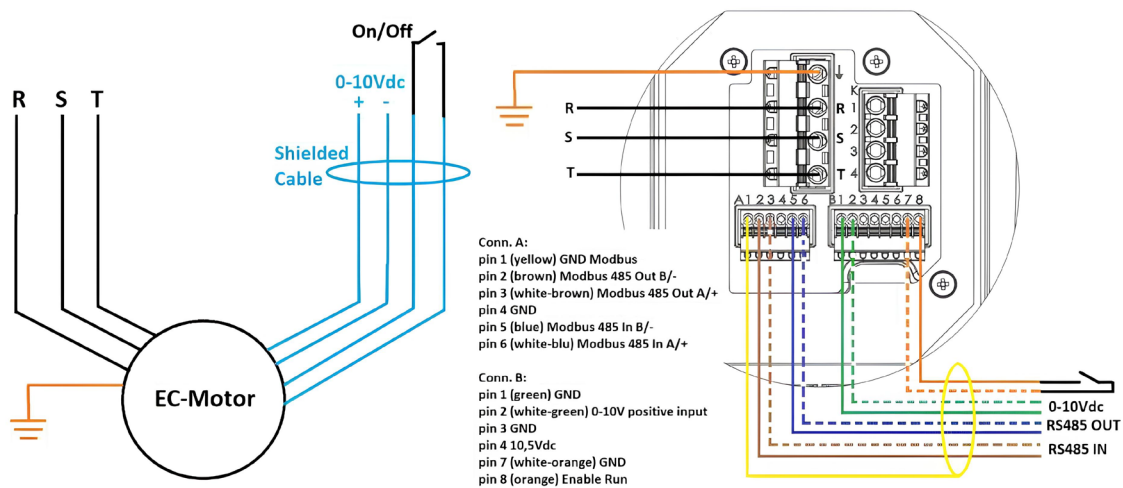


fig.25 - wiring diagram for three-phase models



WARNING

The power cable must be separated from the signal cable as per regulation
The shield of the signal cables (On/Off and 0-10Vdc or Modbus) must be connected to the gnd on the control unit side and not to earth.
Tighten the M4 screws of the terminal block cover with a torque of 3 Nm.



WARNING

Size the differential switch appropriately, considering the presence of the inverter and its leakage currents:

- 1.4mArms@400Vac
- 1,7mArms@480Vac
- 2,7mArms@480Vac corner ground

An RCD (Residual Current Device) of 300 mA type B is often used

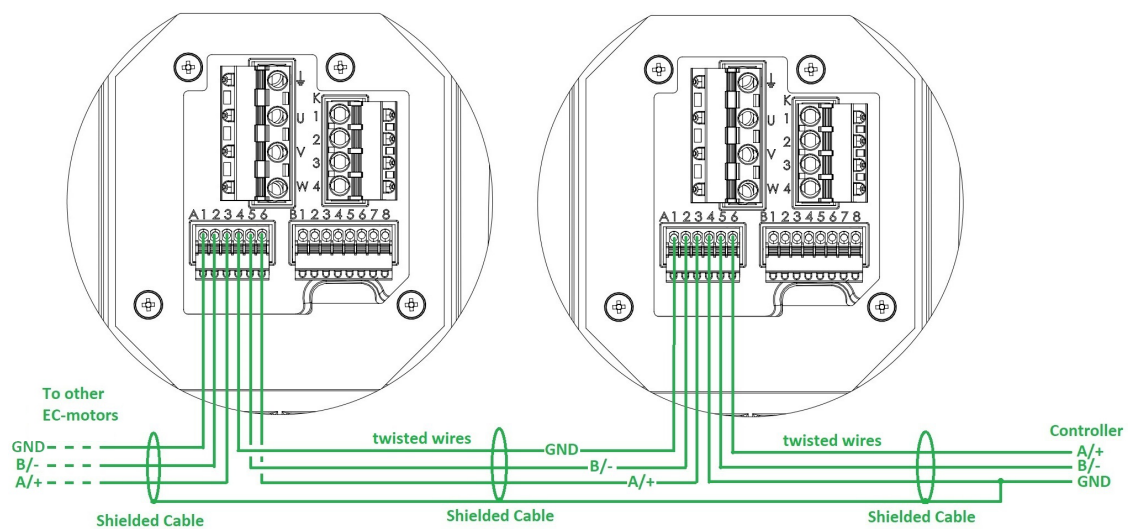
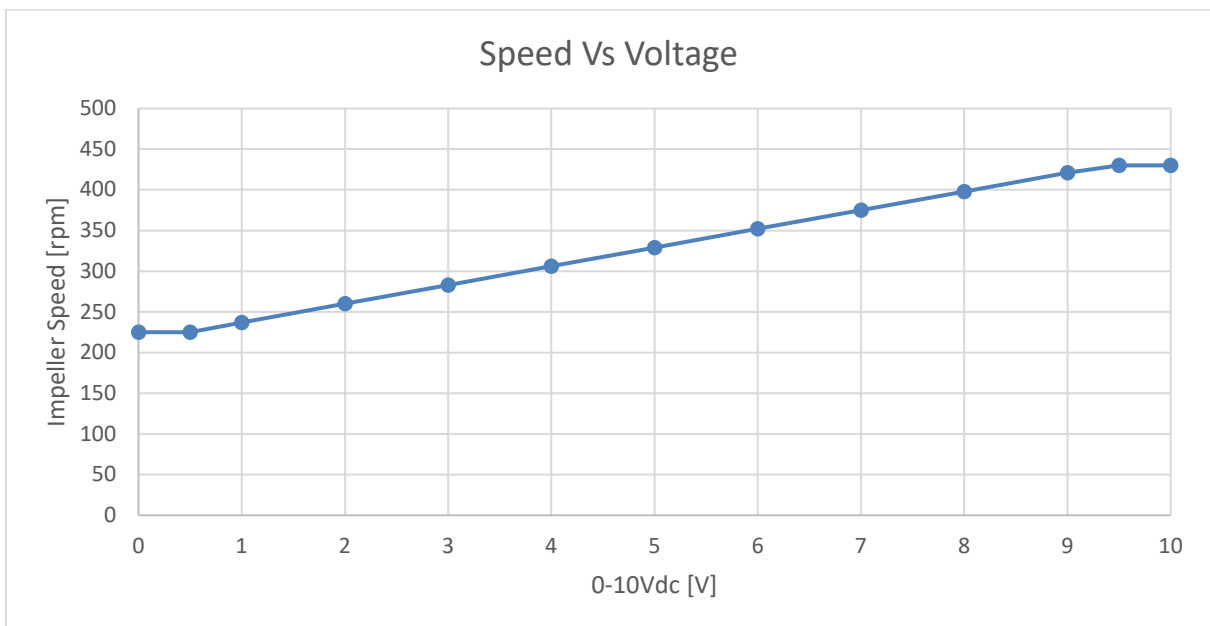


fig.26 - modbus diagram



NOTE

The shield of the signal cables (On/Off and 0-10Vdc or Modbus) must be connected to the "signal gnd" on the control unit side and not to "power gnd" (earth). It is possible to control the motor with 2 wires (0-10Vdc) only, so without the other 2 On/Off wires and this can be done via the E-line App and by connecting pins 7 and 8 together; in fact, it will be sufficient to set the "Enable under stop" register to 0 (Address 1010): if the 0-10Vdc voltage is less than the minimum voltage (for example: 0.5V for Saturn 5, EM50, Saturn Breeze), then the motor will stop, obviously in the opposite case (voltage 0-10Vdc greater than the minimum voltage) the impeller will start to rotate. In order to control the fan with just 2 wires, in addition to the setting on the E-line App (Enable under stop = 0), it is also necessary to connect pins 7 and 8 together.



With control units, it is also possible to obtain opposite control:
at 0V higher speed and 10V lower speed

6.4 Alarms

The following table shows the identification codes of the possible alarms that the device can generate:

Code	Description
1	Over Voltage: device supply voltage too high
2	Under Voltage: supply voltage too low
3	Temperature too high
4	Over Current (lock)
5	Loss of synchronism (lock)
6	Over Current
7	Loss of synchronism
8	Internal communication loss
9	Extra energy dissipated by the braking resistor
10	Broken fuse or loss of phase

Showing Alarm

The presence of an active alarm is highlighted by the flashing of a red LED; the number of flashes of the LED corresponds to the identification code of the alarm that occurred (for example, in the event of a Over Temperature alarm the red LED will flash three times).

The code of the active alarm can be read from the Modbus register or on the E-line App at address 4; in the absence of alarms the register has a value of 0, while in the event of an alarm it takes on the value corresponding to the identification code.

The alarms detected by the device are stored in an internal ROM memory.

The device can store up to 10 alarms before the oldest alarm is deleted to make space for the most recent one.

When an alarm occurs, the following information is saved in ROM memory.

Alarm codes:

- Timestamp hour
- Timestamp minute
- Timestamp second
- Vbus value when the alarm rises on
- Id value when the alarm rises on
- Iq value when the alarm rises on
- IGBT Module temperature when the alarm rises on
- NTC temperature (inside the inverter) when the alarm rises on
- Speed value when the alarm rises on

The information stored for each individual alarm can be retrieved by reading the Modbus registers as shown in the following table.

Alarm	Registers
0 ⁽¹⁾	7000 – 7010
1	7011 – 7021
2	7022 – 7032
3	7033 – 7043
4	7044 – 7054
5	7055 – 7065
6	7066 – 7076
7	7077 – 7087
8	7088 – 7098
9 ⁽²⁾	7099 – 7109

⁽¹⁾ Most recent alarm

⁽²⁾ Older alarm

Reset

In order to reset the alarms it is possible to write 0 in Modbus register 1008.

Troubleshooting

In the following list there are the actions that can be performed when a specific alarm occurs.

Failure	Reason	Solution
Fan not operating	Fan control set above ambient temperature	Set to a lower temperature
	Blown fuse or open circuit switch	Contact the supplier, the fuse might be blown.
	Faulty controller	Contact the supplier, the inverter might be faulty
	Defective motor	Contact the supplier, the motor might be faulty.”
Insufficient air flow	Reverse impeller rotation direction	Check the rotation direction of the impeller
	Drive belt slipping	Tension the belt
	Dirty guard	Clean guard
Excessive vibration	Loosening of fixing screws	Check and eliminate any interference
		Check the tightness of the screws of the guards, fixed components and moving parts
	Damaged fan	Replace the fan
The fan does not switch off	Thermostat set incorrectly	Set the correct temperature
	Control set for continuous operation	Set control correctly

Failure	Solution
Over Voltage	Check that the input voltage is within the range allowed by the device or that voltage spikes do not occur.
Under Voltage	Check that the input voltage is within the range allowed by the device or that there are no voltage drops. Note: when the device is turned off, an under voltage alarm can occur and it is to be considered normal
Over Temperature	Check that the ambient temperature at which the device operates is within the correct operating range of the equipment. Check that the fan nets are clean and that the motor dissipation heat sink are clean to allow correct dissipation of internal heat by the inverter. Wait for the device temperature to drop (below 80°C for the IGBT module and below 105°C for the electronic board) before requesting a new impeller movement (switch on the fan).
Over Current (lock)	The inverter detected an over current, so it reduced the speed and re-tried to go to the required rpm three consecutive times. Check that the fan is able to rotate without impediment (for safety reasons, before carrying out the checks, make sure that the fan is switched off). Check for any bearing problems by checking that there is no loose on the fan rotation axis (for safety reasons, before carrying out the checks, make sure that the fan is switched off). Check that the input voltage is within the correct operating range of the equipment and that the section of the cables in use is suitable. Reset the alarm and try the movement again or turn the device off and on again after waiting at least one minute for the internal capacitors to completely discharge. Check with GrainProteinTech Climate Control & Air Treatment if the acceleration at the start is not too high (boost).

Failure	Solution
Loss of synchronism (lock)	Reset the alarm and trying the movement again or turning the device off and on again after waiting at least one minute. Check with GrainProteinTech Climate Control & Air Treatment that the minimum speed is not too low (from FF to FOC) or that the acceleration at the start is not too high (boost).
Over Current	No action required, the device automatically retries the movement up to a maximum of three consecutive times. The time interval between one attempt and the next increases: after the first alarm the device waits for a time equal to 1 second before repeating the movement, if a second alarm rise on, the time for the a new attempt movement is equal to 10 seconds while on the occasion of the third alarm the last movement attempt is delayed by 20 seconds. If all three restarts attempt fail, the device generates the alarm.
Loss of synchronism	No action required, the device automatically retries the movement up to a maximum of three consecutive times. The time interval between one attempt and the next increases: after the first alarm the device waits for a time equal to 1 second before repeating the movement, if a second alarm rise on, the time for a new attempt movement is equal to 10 seconds while on the occasion of the third alarm the last movement attempt is delayed by 20 seconds. If all three restarts attempt fail, the device generates the alarm Loss of synchronism (lock).
Loss of internal communication	No action required, the device restarts automatically.
Braking resistance: too high wasted energy	The fan can reduce its speed in heavy conditions; in this case, turn off the fan, check that the damper or butterfly close correctly and make sure that the fan does not rotate by itself also without any command (windmill effect). In case of rotation caused by a discordant air flow, check the correct closing of the damper or butterfly (this operation must be done safely: switch off the fan and wait until the fan stops rotating); in case decrease the deceleration time. In case of rotation caused by a concordant air flow, check the correct closing of the damper or butterfly (this operation must be done safely: switch off the fan and wait until the fan stops rotating); in case increase the rotation speed. Note: in case of air flow consistent with the direction of rotation, pay attention to the required speed set point: if this is lower than the speed imposed by the wind on the blades, the braking resistors will always be active, increasing their temperature up to the maximum allowed. In this case it is necessary to increase the speed set point. If the problem persists, contact GrainProteinTech Climate Control & Air Treatment customer service to evaluate a possible reduction in the deceleration time.
Broken fuse or loss of phase	This alarm shows that at least one of the power phases is not connected to the motor correctly. Check with the help of an electrical technician that there are no interruptions along the line and that all the phases reach the motor correctly with the voltage values in the indicated range. If even after these checks the alarm persists and the green LED remains off, then the fuses inside the inverter may have blown or the inverter itself may have been damaged. If necessary, contact GrainProteinTech Climate Control & Air Treatment customer service.
Both Leds Off	If both motor LEDs are off, check that the motor protector and the safety switch on the fan side are both switched on, then with the help of an electrical technician, check that the power supply actually reaches the motor. If the power supply reaches the motor correctly, but the LEDs are both off and the fan does not rotate, the internal fuses may have blown or the inverter may have been damaged; in both cases contact GrainProteinTech Climate Control & Air Treatment customer service.

Failure	Solution
The impeller speed changes alone: decrease and then increase with constant speed setpoint	If the fan decreases its speed automatically (even if the set point is kept constant by the control unit), it means that the internal protection is working for some reason. The protections that can cause a temporary decrease in speed are over temperature or an increase on the deflux current (Id) or a Vbus too low (low input Voltage Supply). In both situations, the fan temporarily decreases the speed and then starts increasing it again (in accordance with the set point) as soon as the cause that triggered the limitation disappears (temperature decreases or deflux current falls below the threshold or input power supply increase). Check the NTC and IGBT temperatures, wait for the motor to cool down; with the fan off, clean the motor dissipation heat sink in order to allow better dissipation of internal heat. Check that the Id [A] (deflux current) is not too high and check with the help of an electrician that the Voltage supply is into the working range. Switch the supply of and check also that the fan can rotate easily and that there are not any obstacles. In case contact GrainProteinTech Climate Control & Air Treatment customer service.
The fan runs at maximum speed regardless of the applied voltage between 0-10V. 0-10V signal polarity inverted	Reverse positive with negative on the 0-10V signal
In-cab motor protection triggers signaling a short circuit. Incorrect connection of the 400V power supply on the "K" (Alarm Relay) connector, instead of the power supply connector	Correctly connect the power wires to the dedicated connector as shown in the circuit diagram (fig.24-25)

Speed reduction

Upon the occurrence of certain conditions that could lead to device damage, the inverter responds by automatically producing that speed reduction so that it continues to operate safely and efficiently.

Situations that result in a speed reduction can be:

- Id deflux current too high;
- Bus voltage too low;
- IGBT module or board temperature too high.

Should such a situation occur, safely check that the input voltage to the inverter is within the admissible range and check that the motor and dissipation fins are clean, also check that the fan can spin freely.

6.5 Mobile device E-line APP



NOTE

The **E-line app** is available for download on both Android and iOS devices. To install it, search for “E-line” in your device’s app store

When you open the app it starts scan for nearby inverter devices, displaying a list of all the devices found. To connect a device in the list, simply click on its address/name.

When connecting, the app may require you to enter the inverter pairing code which is the following: 123456. The inverter maintains a list of devices coupled to it; in the event that the device (smartphone, tablet, etc.) with which the connection is made is not present in the list, the app will request the insertion of the pairing code while otherwise it will not require the insertion of any code.

Dashboard

This tab of the application displays a whole series of information that allows monitoring of the device. The information displayed is shown in the following table.

Parameter	Description
HW	Hardware type (400Vac or 230Vac)
FW MAIN	Firmware version (motor microcontroller)
FW INTERFACE	Firmware version (interface microcontroller)
FW BLE	Firmware version (BLE module)
Inverter status	State of the inverter (standby, run or alarm)
Alarm Code	Alarm code
IGBT Module Temperature	Temperature IGBT power module [°C]
NTC Sensor Temperature	Temperature NTC sensor inside the inverter [°C]
Measured Speed	Measured rotation speed [rpm]
VBUS DC	Measured internal DC Bus Voltage [V]
Vd	Inverter Direct Voltage [V]
Vq	Inverter Orthogonal Voltage [V]
Vtot	Inverter Total Voltage [V]
Id	Inverter Direct Current [A]
Iq	Inverter Orthogonal Current[A]
Ito	Inverter Total Current [A]
Frequency Set	Frequency of the magnetic field [Hz]
Motor Speed	Setpoint: rotation speed [rpm]
Motor Direction	Motor direction if 1 means clockwise, if 0 means counter- clockwise
Absorbed Power	Motor absorbed power [watt]

Setup parameters

This tab allows to modify the operating parameters of the motor.

To view the contents of this tab you must enter the password 123456. The editable parameters are shown in the following table.



WARNING

Changing the configuration parameters can compromise optimal functioning of the fan. We recommend, before making any changes to contact GrainProteinTech Climate Control & Air Treatment customer service in order to avoid any issues.



WARNING

The settings must be made with the motor supplied but stopped (rpm = 0).

Parameter	Description
Mode	Control Mode Allow Value: [1;2;3] 1 Analog Mode (0-10V) 2 Digital Mode (Modbus) 3 Mixed Mode (0-10V e Modbus)
Modbus Address	Modbus Address Allow Value: [1;247] Default: 1
Alarm Reset	Alarm reset Allow Value: 0
Enable Live Command	In operation via Modbus Allow value: [0; 1] 0 Enable the rotation on Start command and stops when it receives the Stop 1 Enable the rotation only under periodic Start with “Motor start refresh” period
Enable under stop	Enable the rotation at minimum speed when the control voltage is lower than the minimum value. Allow value: [0; 1] The fan does not rotate if the driving voltage (0-10Vdc) is lower than the minimum voltage. The fan rotates at the minimum speed if the driving voltage (0-10Vdc) is lower than the minimum voltage. Default: 1
Speed Jump 1-4	Available 4-speed jump for the motor [RPM] at the same “Speed Amplitude”
Speed amplitude	Range of speed the motor skips
Enable 485	485 bus termination resistance enable Allow Value: [0; 1] 0 termination resistance disable 1 termination resistance enable Default: 0
Reverse procedure duration	Fan rotation time in the opposite direction after receive a stop command [s] Allow value: [0; 32767] Default: 25 second
Reverse speed factor	Fan rotation speed setpoint during the Reverse rotation; expressed as a percentage of the maximum rotation speed [%] Allow value: [1; 100] Default: 60

Parameter	Description
Boost/Reverse Configuration	Enable the boost and/or reverse features Boost: when turned on, the fan will go quickly to maximum speed and then reach the rotation speed set by the controller. Should be used in fans with Butterfly. Reverse: when turned off, the fan decelerates until it stops, once stopped it will begin to rotate with the opposite direction of rotation to the standard one so to "attract" the butterfly and help to close the shutter. Can be used in fans with Butterfly. Allow value: [0; 3] 0: Boost e Reverse disable 1: Boost enable, Reverse disable 2: Boost disable, Reverse enable 3: Boost and Reverse both enable Default: 0 NOTE with these parameters, once received the command to "Off", the fan will start to automatically rotate in opposite direction for a time predetermined.
Boost ramp time	Acceleration time to reach the maximum speed during the boost phase [s] Allow value: [2; 32767] Default: 10
Boost procedure duration	Fan rotation time after reaching the maximum speed during the boost phase [s] Allow value: [0; 32767] Default: 0
Boost speed	Max speed in "Boost procedure", can be up to 7% more than the maximum fan speed
Boost period	Indicates how often [minutes] the fan will perform an additional speed boost if running continuously.
Acceleration	Motor acceleration [rpm/s] Allow value: [10; max Acc.] Default: Max Acc.
Deceleration	Motor deceleration [rpm/s] Allow value: [10; max Dec.] Default: Max Dec.
Start delay	Delay in turning on the fan from the moment it receives the command from the control unit [s/10] Allow value: [0; 100] it means from 0 up to 10 sec Default: 0
Motor start refresh	When operating via Modbus and with "Enable Live Command=1", this register indicates the time [s/1000] in which the fan expects to receive an On command from the control unit, after which, if no command is received, the inverter will declare the loss of communication.
Fallback speed	Rotation speed in case of Modbus communication loss Activate only if "Enable Live Command (Reg.1009) = 1" If the Reg. Enable Live Command is = 0 and the modbus connection is lost, the fan will continue to turn at the last operating speed before the loss of communication [rpm] Allow value: 0, [rpm min; rpm_max] Default: 0
Slope swap	This Switch reverses the slope of the relationship between 0-10V voltage and rpm. Allows you to reverse operation from: Low voltage, low Speed and high voltage, high speed → Low voltage, high speed and high voltage, low speed

E-line APP screens

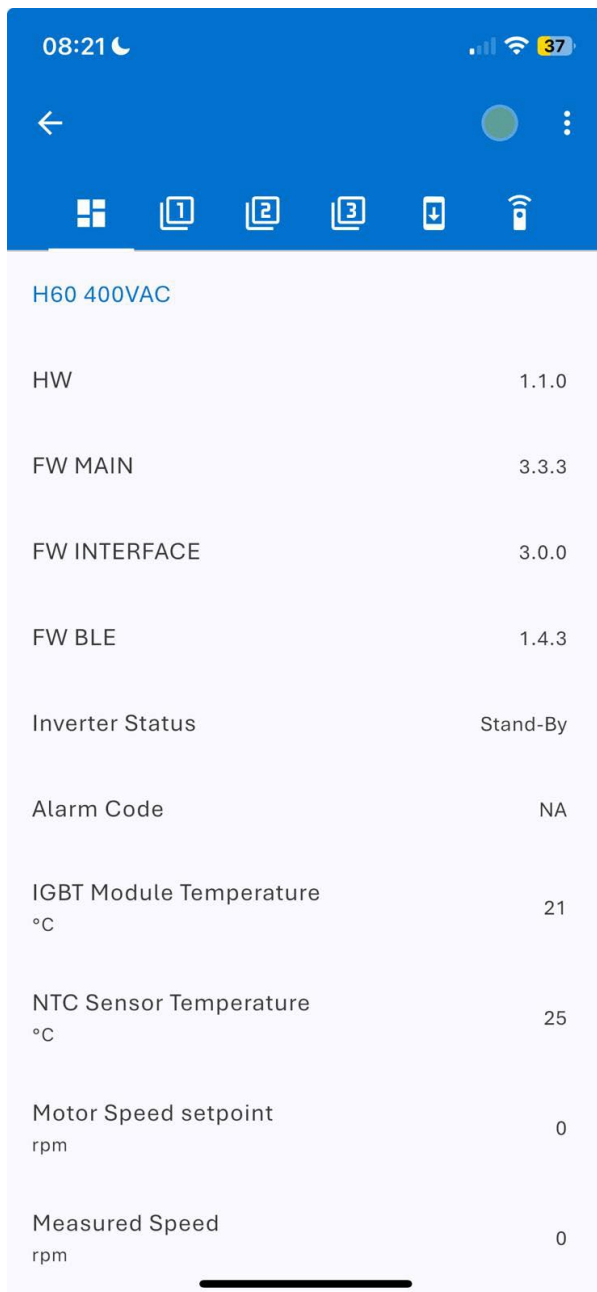


fig. 27 - Tab. 0 Dashboard Readings

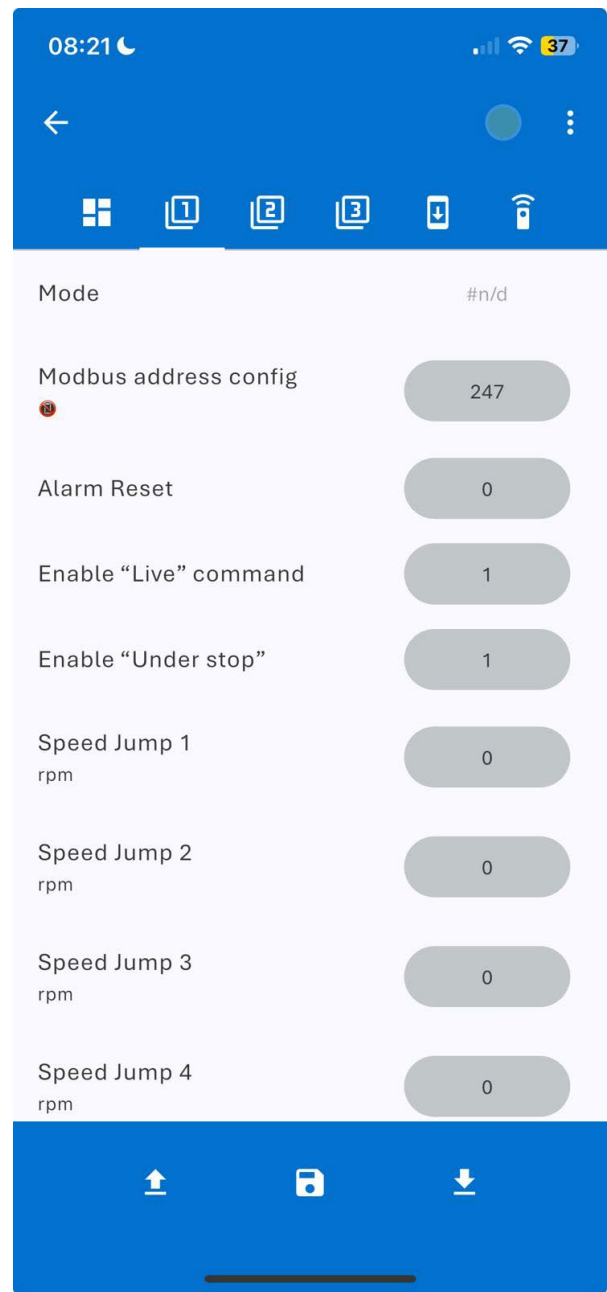


fig. 28 - Tab. 1 Settings

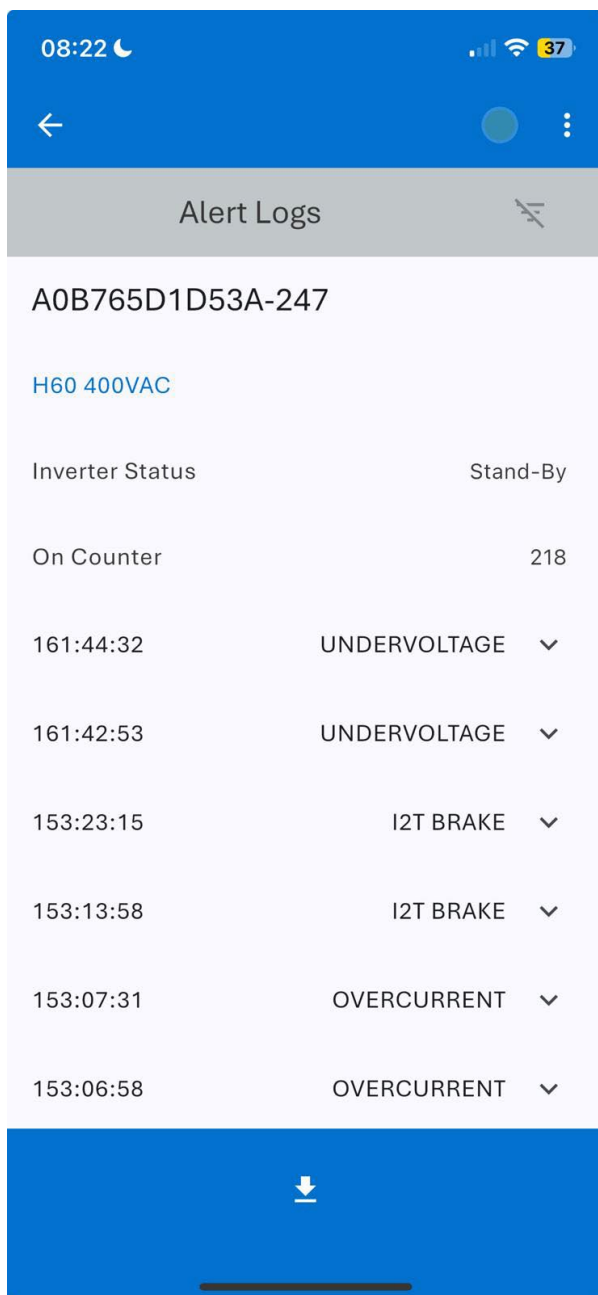


fig. 29 - Traffic Light: Alarm Log

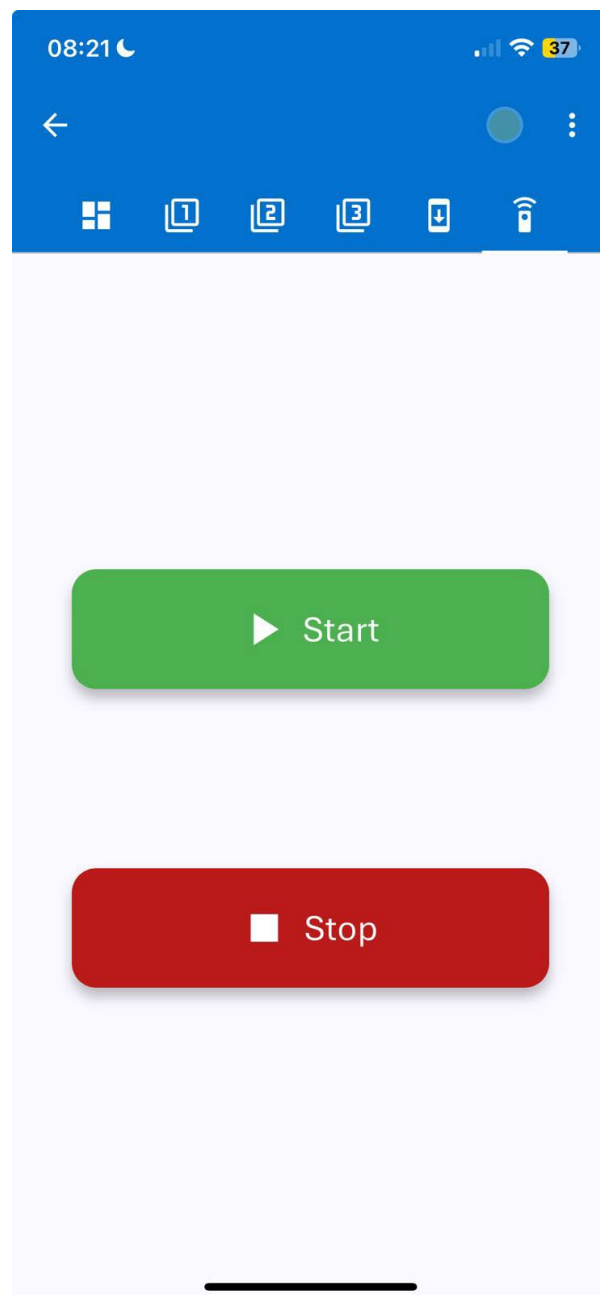


fig. 30 - Start / Stop Fan

Firmware update

Using this tab, after entering the password (123456), it is possible to update the firmware of both microcontrollers inside the inverter if new features or bug fixings are available.

Before to go ahead remember to save your current settings.

The update procedure consists of four different phases: the verification of the communication protocol to be used for communication with the inverter, the transfer of the firmware update file, the safety stop of the fan rotation and finally the writing of the new firmware in the flash memory of the inverter.

The conclusion of the various phases is denoted by a green tick. Select the update file (*.upd), press the start procedure button and wait for the outcome.

At the end of the update don't forget to download your saved settings.

Terms of use



WARNING

In order to reduce the average lifetime and/or possible problems with the electrical components, it is recommended not to keep the inverter unpowered for long periods, we recommend therefore keep it powered (it does not need to work, it's enough that the supply voltage is applied to the inverter: green led On) for at least 24 hours once/twice per year.

7. Commissioning



WARNING

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



WARNING

Make sure the fan is disconnected from the mains before removing the safety devices.

7.1 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 61439-1:2010-01 (CEI 17-113) 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 5.4.

7.2 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 7.2.

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 switch the emergency stop command was given (by turning the relative mushroom button);
- for an exact reset sequence, refer to the instructions given in section 7.2.

8. Technical data

8.1 Dimensions

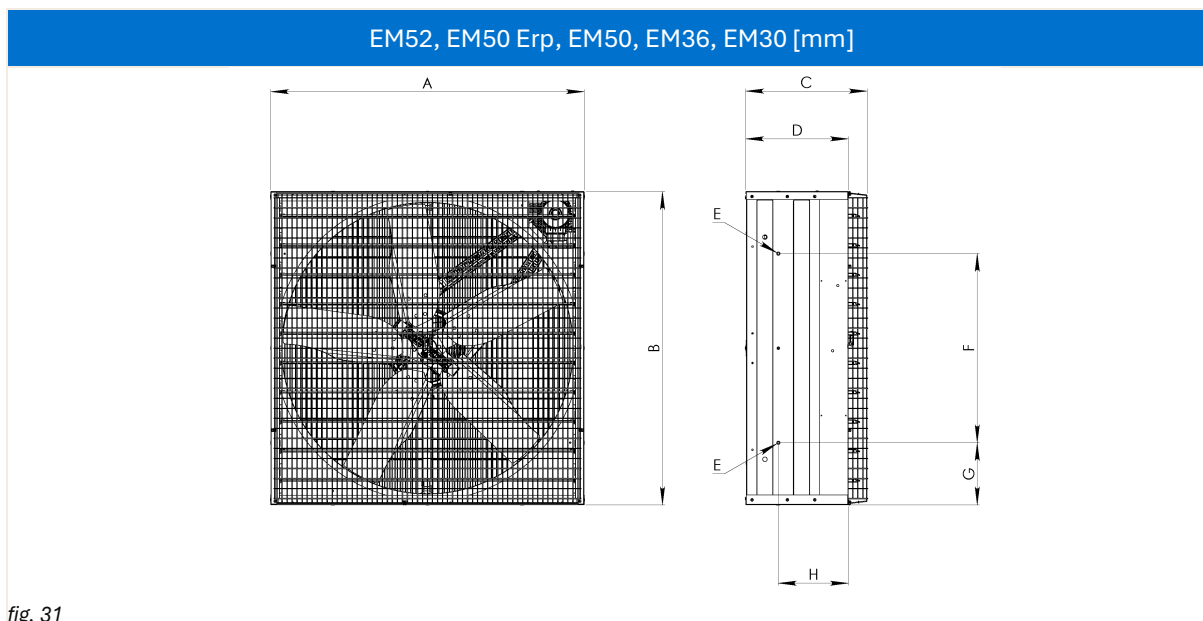


fig. 31

Model	A	B	C	D	E	F	G	H
EM52	1425	1425	455	545	M8	880	272	310
EM50 Erp / EM50	1380	1380	450	540	M8	830	270	295
EM36	1090	1090	450	530	M8	600	245	305
EM30	950	950	450	530	M8	475	240	295

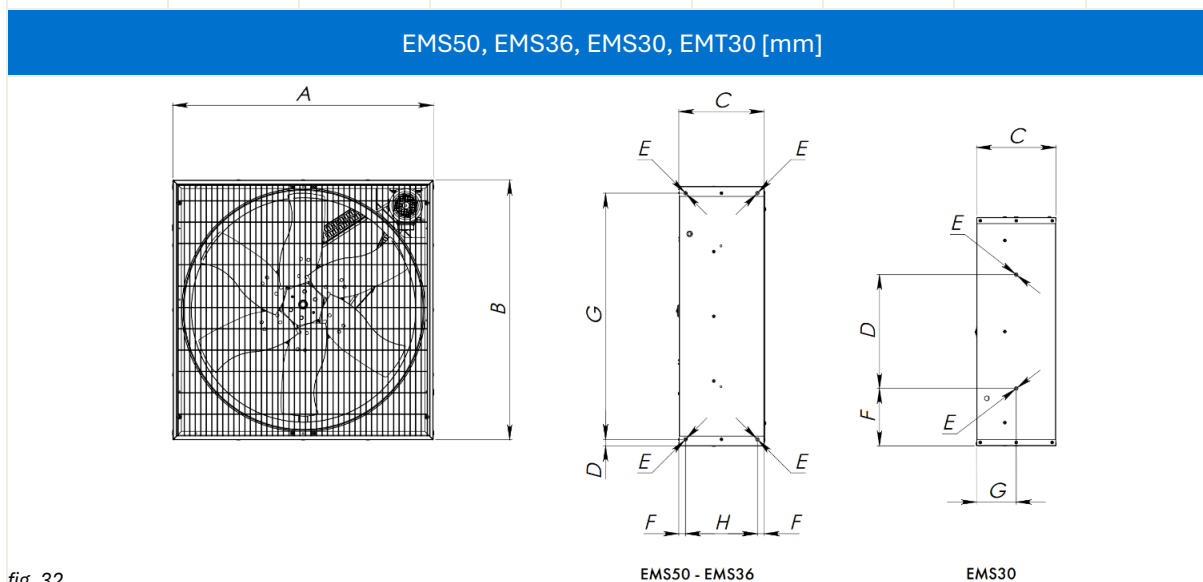


fig. 32

Model	A	B	C	D	E	F	G	H	I
EMS50	1380	1380	353	28	M8	27	1315	300	-
EMS36	1090	1090	358	28	M8	29	1027	300	-
EMS30	950	950	331	475	M8	239	166	-	-
EMT30	950	950	335	420	M8	925	14	17	300

8.2 Technical specifications

Model		EM50 Erp				EM50 E-line				EM52	
Nominal power	Hp [kW]	1.5 [1.1]		2 [1.5]		2.5 [1.8]		2 [1.5]			
Number of impeller blades		6		5		56		6			
Number of shutter blades		10		10		10		10			
Propeller diameter	mm [inch]	1265 [50]		1265 [50]		1270 [50]		1334 [52]			
Weight of fully equipped fan*	[kg]	91		93		87		90			
Airflow at 0 Pa	m3/h [cfm]	33,431 [19,677]		39,752 [23,398]		39,800 [23,400]		43,000 [25,300]			
Airflow at12 Pa	m3/h [cfm]	31,477 [18,527]		38,129 [22,442]		38,100 [22,400]		-			
Airflow at 25 Pa	m3/h [cfm]	29,611 [17,429]		36,585 [21,553]		36,200 [21,300]		33,900 [19,900]			
Airflow at 50 Pa	m3/h [cfm]	25,163 [14,810]		33,087 [19,475]		31,800 [18,700]		27,600 [16,200]			
Specific performance at 0 Pa	m3/h /W [cfm /W]	35.7 [21.0]		26.4 [15.6]		29.1 [17.1]		26.4 [15.5]			
Frequency	[Hz]	50									
Voltage	[V]	230	400	230	400	400		230	400		
Max. current absorbed	[A]	5.2	3	6.7	3.9	2.5		7.3	4.2		
Max. operating temperature	°C [°F]	50 [122]		50 [122]		50 [122]		50 [122]			
Max. operating pressure	[Pa]	90		90		50		100			
Nominal propeller speed	[rpm]	518		620		443		414			
IEC protective class of electric motor		IP66		IP55		IP55		IP55			
Electric motor winding insulation grade		H		F		F		F			

Model		EM50				EM36				EM30					
Nominal power	Hp [kW]	1.5 [1.1]		1 [0.75]		1 [0.75]		0.75 [0.55]		0.5 [0.37]		0.75 [0.55]		0.5 [0.37]	
Number of impeller blades		6		6		6		6		6		6		6	
Number of shutter blades		10		10		8		8		8		7		7	
Propeller diameter	mm [inch]	1270 [50]		1270 [50]		915 [36]		915 [36]		915 [36]		760 [30]		760 [30]	
Weight of fully equipped fan*	[kg]	86		84		67		65		64		56		55	
Airflow at 0 Pa	m3/h [cfm]	42,400 [25000]		37,000 [21,800]		22,250 [13,095]		19,880 [11,700]		17,900 [10,535]		14,593 [8,589]		13,500 [7,945]	
Airflow at 25 Pa	m3/h [cfm]	38,400 [22600]		32,500 [19,200]		20,410 [12,013]		17,814 [10,485]		14,917 [8,780]		11,122 [6,546]		10,680 [6,285]	
Airflow at 50 Pa	m3/h [cfm]	33,800 [19900]		26,200 [15,400]		-		-		-		-		-	
Airflow at 80 Pa	m3/h [cfm]	-		-		-		-		-		-		-	
Specific performance at 0 Pa	m3/h /W [cfm /W]	27.0 [15.9]		33.9 [20]		18.5 [10.9]		22.3 [13.1]		25.1 [14.8]		19.5 [11.5]		20.2 [11.8]	
Frequency	[Hz]	50													
Voltage	[V]	230	400	230	400	230	400	230	400	230	400	230	400	230	400
Max. current absorbed	[A]	5.7	3.3	3.6	2.1	3.6	2.1	2.6	1.5	2.4	1.4	2.9	1.7	2.3	1.3
Max. operating temperature	°C [°F]	50 [122]		50 [122]		50 [122]		50 [122]		50 [122]		50 [122]		50 [122]	
Max. operating pressure	[Pa]	50		50		50		50		50		50		50	
Nominal propeller speed	[rpm]	435		380		580		510		460		640		590	
IEC protective class of electric motor		IP55		IP55		IP55		IP55		IP55		IP55		IP55	
Electric motor winding insulation grade		F		F		F		F		F		F		F	

Model		EMS50 E-line	EMS50		EMS36		
Nominal power	Hp [kW]	2.5 [1.8]	1 [0.75]	1.5 [1.1]	1 [0.75]	0.75 [0.55]	0.5 [0.37]
Number of impeller blades		6	6	6	6	6	6
Propeller diameter	mm [inch]	1270 [50]			915 [36]		
Weight of fully equipped fan*	[kg]	69	66	68	56	54	53
Airflow at 0 Pa	m3/h [cfm]	40,100 [23,600]	34,780 [20,470]	40,000 [23,540]	21,842 [12,856]	19,212 [11,308]	17,693 [10,414]
Specific performance at 0 Pa	m3/h /W [cfm /W]	28.8 [17.0]	34.9 [20.6]	23.7 [14]	21.2 [12.5]	25.3 [14.9]	28.1 [16.5]
Frequency	[Hz]	50					
Voltage	[V]	400	400	400	400	400	400
Max. current absorbed	[A]	2.6	2.2	3.1	2.2	1.8	1.4
Max. operating temperature	°C [°F]	50 [122]	50 [122]	50 [122]	50 [122]	50 [122]	50 [122]
IEC protective class of electric motor		IP66	IP55	IP55	IP55	IP55	IP55
Electric motor winding insulation grade		H	F	F	F	F	F
Model			EMS30		EMT30		
Nominal power		Hp [kW]	0.75 [0.55]	0.5 [0.37]	0.75 [0.55]	0.5 [0.37]	
Number of impeller blades			6	6	6	6	
Propeller diameter		mm [inch]	770 [30]		770 [30]		
Weight of fully equipped fan*		[kg]	41	39	44	42	
Airflow at 0 Pa		m3/h [cfm]	14,685 [8,643]	13,526 [7,961]	13,793 [8,118]	12,720 [7,487]	
Specific performance at 0 Pa		m3/h /W [cfm /W]	20.3 [11.9]	21.2 [12.5]	18.2 [10.7]	19.2 [11.3]	
Frequency		[Hz]	50				
Voltage		[V]	400	400	400	400	
Max. current absorbed		[A]	1.7	1.4	1.7	1.4	
Max. operating temperature		°C [°F]	50 [122]	50 [122]	50 [122]	50 [122]	
IEC protective class of electric motor			IP55	IP55	IP55	IP55	
Electric motor winding insulation grade			F	F	F	F	

*Excludes safety kit for installation below 2.7m above the floor.

9. Maintenance

9.1 Introduction

Maintenance must only be carried out by qualified personnel only using suitable tools and working methods. It is mandatory to purchase and use only original spare parts or those recommended by the manufacturer. The use of non-original spare parts or incorrect assembly exonerates the manufacturer from all liability.

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.

During maintenance/cleaning in relation to specific risks, the following personal protective equipment must be used:



WARNING

The capacitor in single-phase motors can retain a charge which appears across the motor terminals even when the motor has reached standstill.



WARNING

If maintenance work is required in areas with reduced brightness, portable lamps must be used to ensure adequate visibility for the personnel involved in the operation.

9.2 Routine Maintenance Program

Following the maintenance program prepared by our experts is the best way to ensure the proper operation of Euroemme fans, improve their performance, and extend their service life.

ACTIVITIES		ROUTINE MAINTENANCE				
		1 MONTH	2 MONTHS	2 YEARS	4 YEARS	5 YEARS
CHECK	BELT TENSIONING*	✓				
	DUST CLEANING		✓			
REPLACEMENT	BELT			✓		
	CENTRAL PULLEY				✓	
	PLASTIC BEARING					✓
	CENTRIFUGAL SYSTEM					✓

* check the belt tension 3 days after first starting



WARNING

No high-pressure water to be sprayed on motor and bearings.



WARNING

Clean carefully the heatsink of the inverter (only for EC motor version).

9.3 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

We recommend to avoid to use water for washing fans since the electric motors and the bearings of the central hub and centrifugal system support might get damaged by water infiltration. In case there is an unbreakable need to use water for cleaning the fans, the electric motor, the central hub and the centrifugal weight mechanism have to be adequately protected by water sprays. Wash the fan using a pressure below 0.3 bar and maintaining a distance greater than 3 meters.



WARNING

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

9.4 Belt tensioning check up

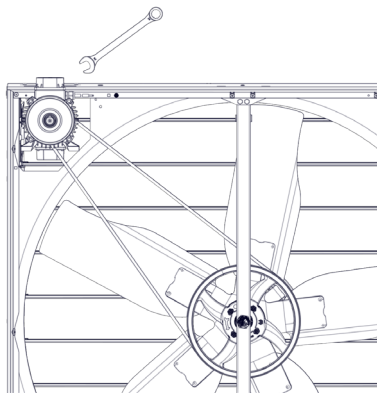
Check V-belt tension at regular intervals, the correct tension is obtained when maximum deflection (half-way from motor and central pulley) is about 15 mm, when pushed in by thumb.



WARNING

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

fig.44



To reset the correct tension:

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



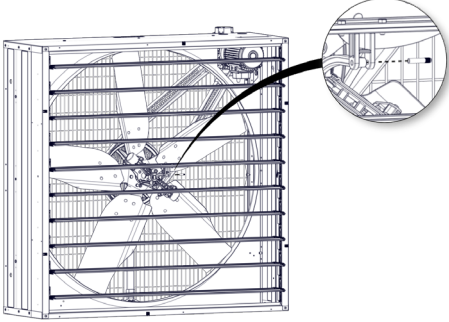
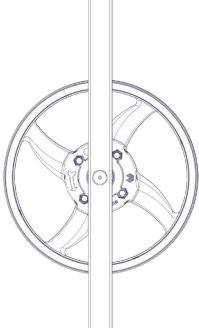
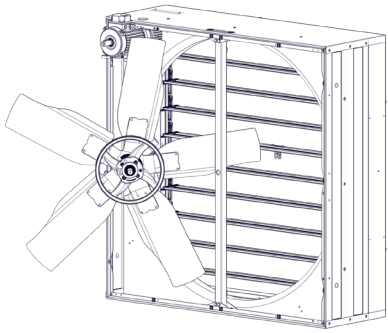
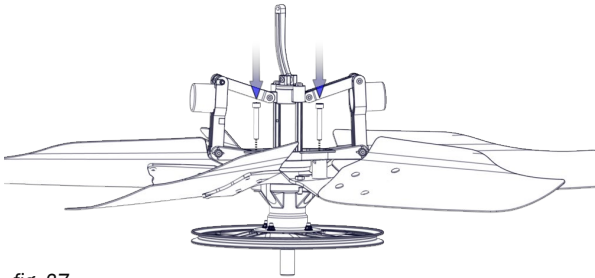
WARNING

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 system 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.

9.5 Propeller Replacement

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

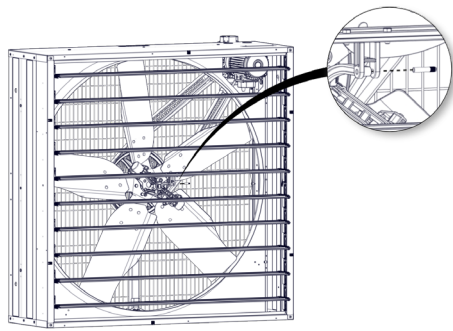
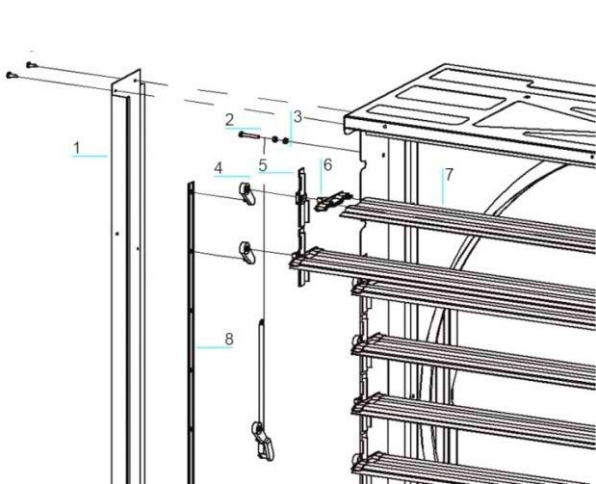
 fig. 34	1. Open shutter by hand and take away the pin, which connects central shutter blade to centrifugal system.
 fig. 35	2. Loosen motor to propeller V-belt from pulleys throat. 3. Unscrew the fixing nut.
 fig. 36	4. Take out the pulley-propeller-centrifugal system assembly from fan frame.
 fig. 37	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 revers procedure.



WARNING

The motor slide is not designed to hold the motor/propeller/centrifugal system assembly in horizontal position without using its M8 hex screws. Be sure that the motor/propeller/centrifugal system assembly is properly fixed to the central support in order to avoid damages to persons and property.

9.6 Shutter bearing assembly replacement

 fig. 38	1. Open shutter by hand and take away the pin, which connects central shutter blade to centrifugal system;
 fig. 39	2. Remove the side cover plates (see n.1); 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).

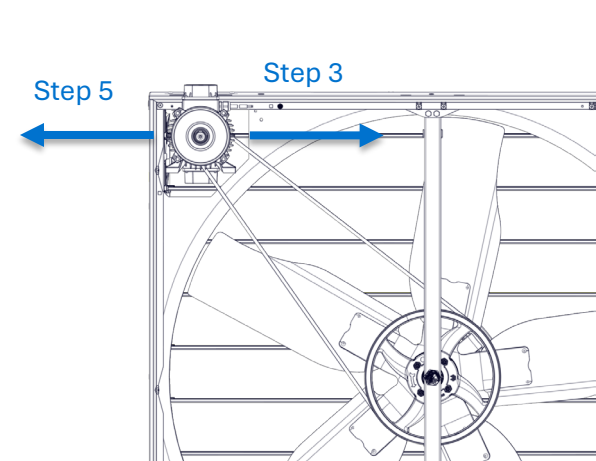
9.7 Bearing lubrication

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

9.8 Central pulley replacement

To replace the central pulley follow the same procedure of the propeller replacement (see section 9.5).

9.9 Belt replacement

 fig. 57	1. Open the wire mesh safety guard; 1. Unscrew motor slide fixing screws (without removing them); 2. Move the motor towards the centre 3. Replace with a new V-belt 4. Tension the V-belt by pushing the motor sideways; 5. Tighten the fixing screws adequately; 6. Fix the wire mesh safety guard to the fan housing.
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9.10 Shutter opening device (centrifugal system) replacement

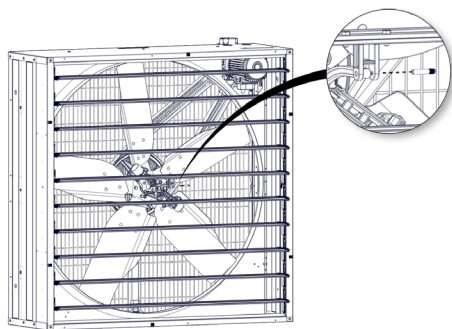


fig. 40

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

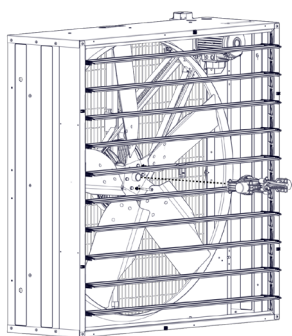


fig. 41

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.

4. Take care of the way you connect the centrifugal system tie-rod to the plastic fork.



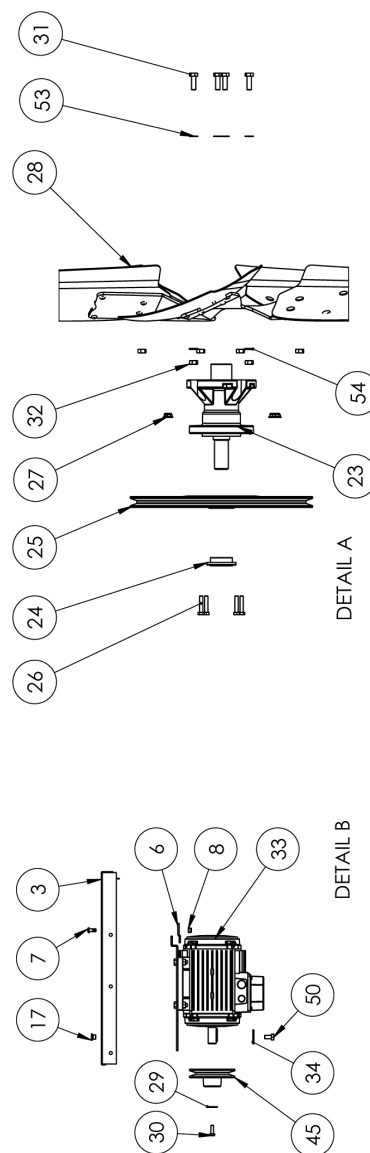
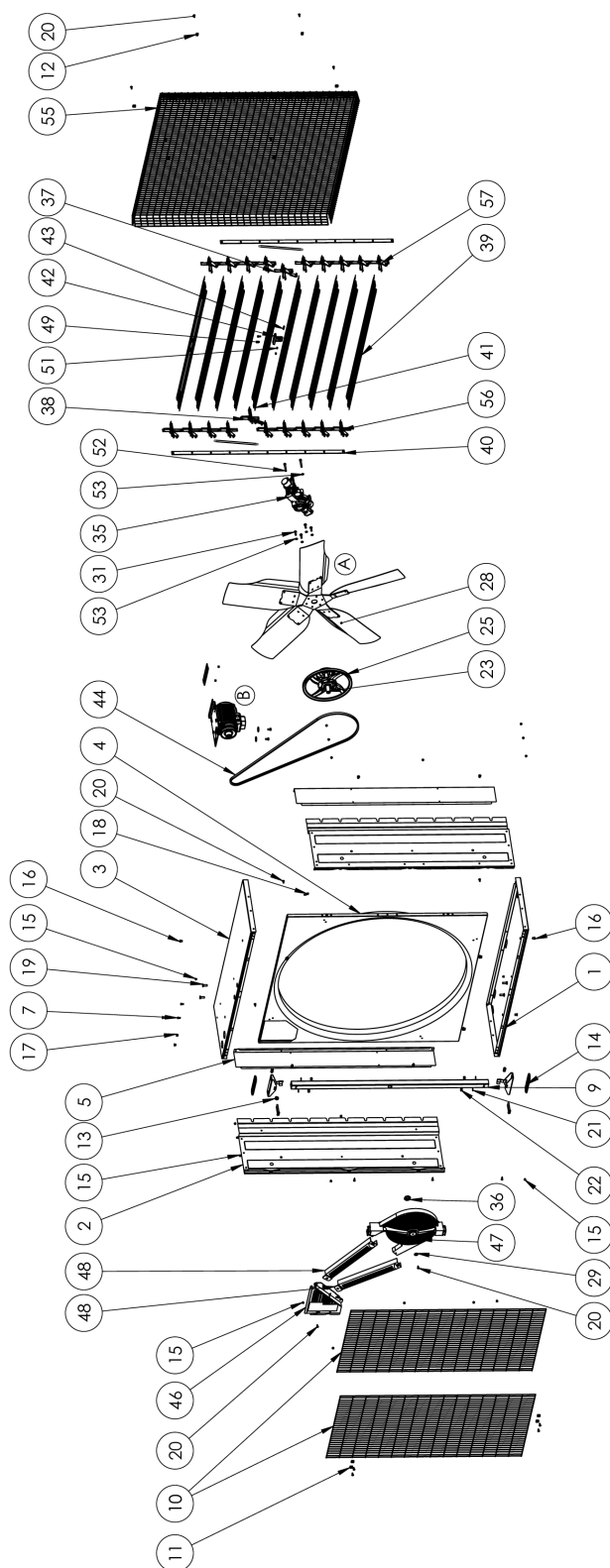
WARNING

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 M-Protect coated surface.*

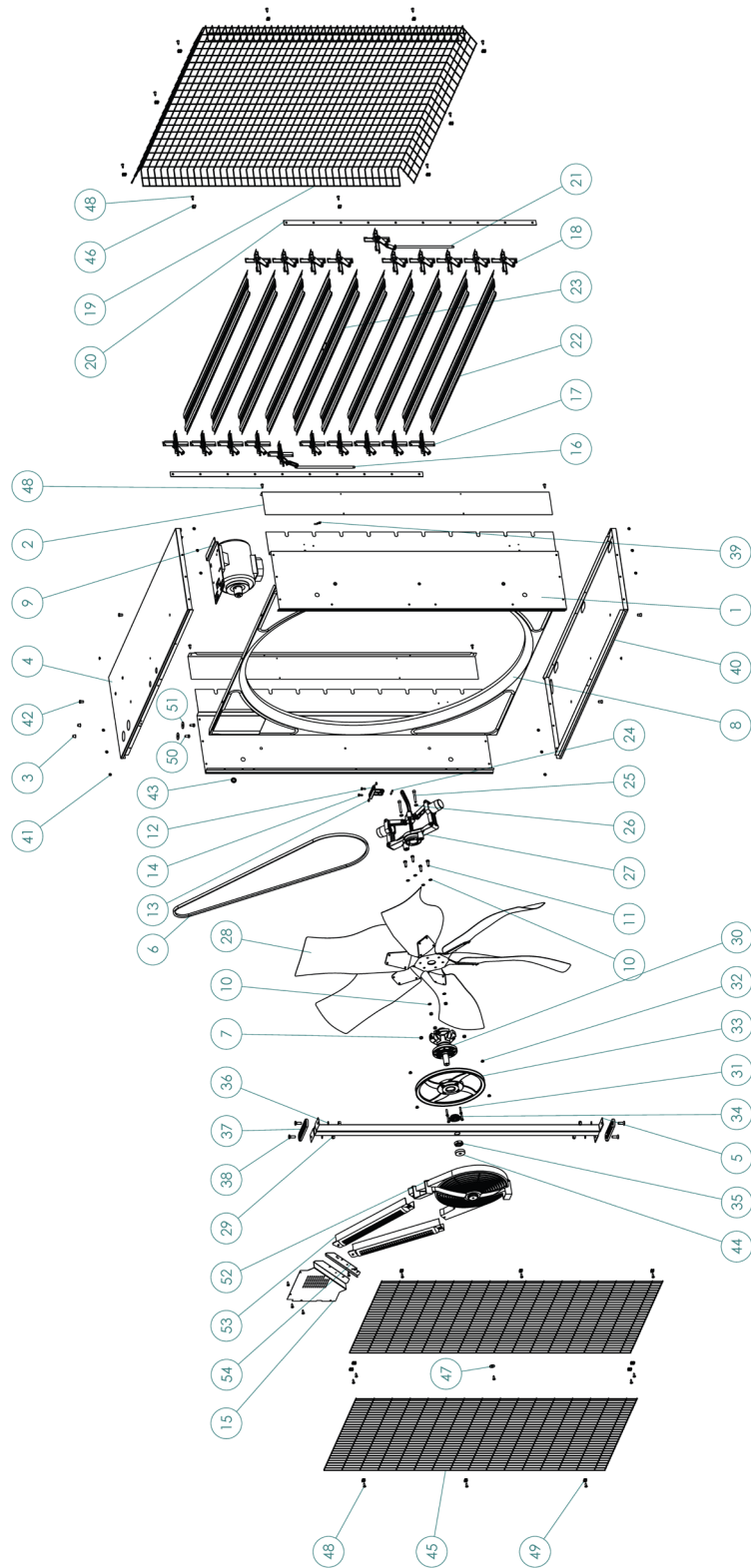
10. Spare part list

EM50 Erp



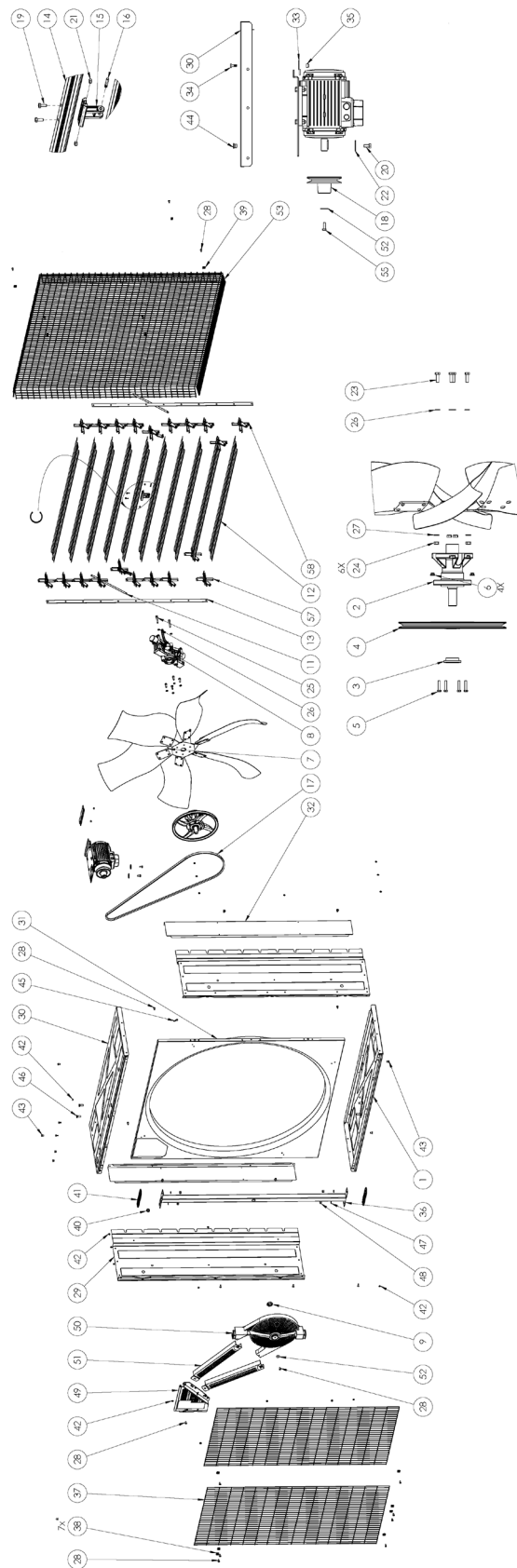
REF.	DESCRIPTION	Q.TY
1	BOTTOM PANEL	1
2	SIDE PANEL	2
3	TOP PANEL	1
4	CONVEYOR	1
5	CARTER	2
6	SUPPORT BRACKET FOR MOTOR PLATE	1
7	Ø6×13 BOLT	2
8	TS6.4M KAK COLLAR	2
9	CENTRAL SUPPORT	1
10	REAR SAFETY MESH	2
11	PLASTIC CLIP	7
12	CLIP FOR SAFETY MESH GUARD	6
13	RUBBER FOR CABLE	1
14	OVAL PLATE	2
15	Ø6.4x8 PØP UP RIVET	20
16	M08x17.5 THREADED BUSH	8
17	M08x12.5 THREADED BUSH	2
18	HOOK FOR SPRING	2
19	M10x30 HEX SOCKET COUNTERSUNK SCREW	4
20	Ø6.3×19 SELF-TAPPING SCREW	25
21	D10 EXT THOOTED WASHER	4
22	M10 HEX NUT	4
23	COMPLETE CENTRAL HUB	1
24	WATERPROOF DISTANCE PIECE	1
25	CENTRAL PULLEY	1
26	M06×30 HEX SCREW	4
27	M06 HEX NUT SELF-LOCKING W/FLANGE	4
28	IMPELLER	1
29	D6.4×24 WASHER	2
30	M06x20 HEX SELF-LOCKING SCREW	1
31	M08x25 HEX SCREW	8
32	M08 HEX NUT	10
33	MOTOR	1
34	D08x32 WASHER	2
35	CENTRIFUGAL SYSTEM	1
36	M25 HEX NUT	1
37	CENTRAL LEFT SHUTTER BEARING	1
38	CENTRAL RIGHT SHUTTER BEARING	1
39	SHUTTER BLADE	9
40	HOLES ROD	2

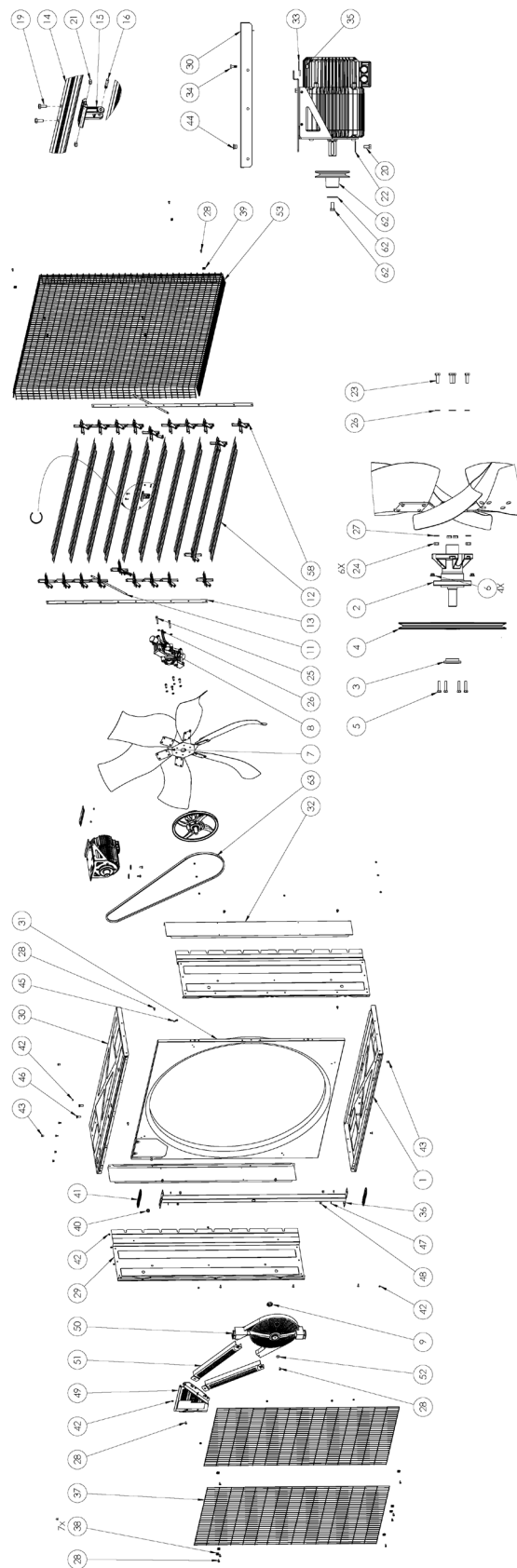
41	CENTRAL SHUTTER BLADE	1
42	PLASTIC FORK	1
43	KNURLED AXLE	1
44	A88-V-BELT	1
45	MOTOR PULLEY	1
46	ENGINE GUARD	1
47	SAFETY PROTECTION	1
48	BELT GUARD	2
49	M06×16 HEX SCREW	2
50	M08x16 HEX SCREW	2
51	M06 HEX NUT	2
52	M08×55 HEX SOCKET HEAD CUP SCREW	2
53	D08 EXT TOOTHED WASHER	6
54	D08x16 WASHER	2
55	PYRAMIDAL MESH	1
56	COMPLETE LEFT BEARING	9
57	COMPLETE RIGHT BEARING	9



REF.	DESCRIPTION	QTY.
1	SIDE PANEL	2
2	COVER PLATE	2
3	THREADED BUSH M8x12.5	2
4	TOP PANEL	1
5	CENTRAL SUPPORT	1
6	V-BELT A90	1
7	M08 HEX NUT	6
8	CONVEYOR	1
9	MOTOR	1
10	Ø8 EXT THOOTHED WASHER	6
11	M08×25 HEX SCREW	4
12	PLASTIC FORK FOR CENTRIFUGAL SYSTEM	1
13	M06 THIN HEX NUT	2
14	M06x16 HEX SCREW	2
15	SAFETY PROTECTION FOR MOTOR	1
16	CENTRAL RIGHT SHUTTER BEARING	1
17	COMPLETE RIGHT BEARING	9
18	COMPLETE LEFT BEARING	9
19	PYRAMIDAL SAFETY MESH	1
20	PLASTIC TIE ROD	2
21	CENTRAL LEFT SHUTTER BEARING	1
22	SHUTTER BLADE	9
23	CENTRAL SHUTTER BLADE	1
24	BRASS PIN	1
25	M08×55 HEX SCREW	2
26	Ø8x16 WASHER	2
27	CENTRIFUGAL SYSTEM	1
28	PROPELLER	1
29	M10 HEX NUT	4
30	HUB WITH AXLE	1
31	M06×30 HEX SCREW	4
32	HEX NUT M6 WITH FLANGE	4
33	CENTRAL PULLEY	1
34	WATERPROOF DISTANCE PIECE	1
35	M25 HEX NUT	1
36	EXT TOOTHED WASHER D10,5x18	4
37	PLASTIC OVAL PLATE	2
38	HEX SOCKET COUNTERSUNK SCREW M10X30	4
39	HOOK FOR SPRING	2
40	BOTTOM PANEL	1
41	Ø6.4x8 POP UP RIVET	16

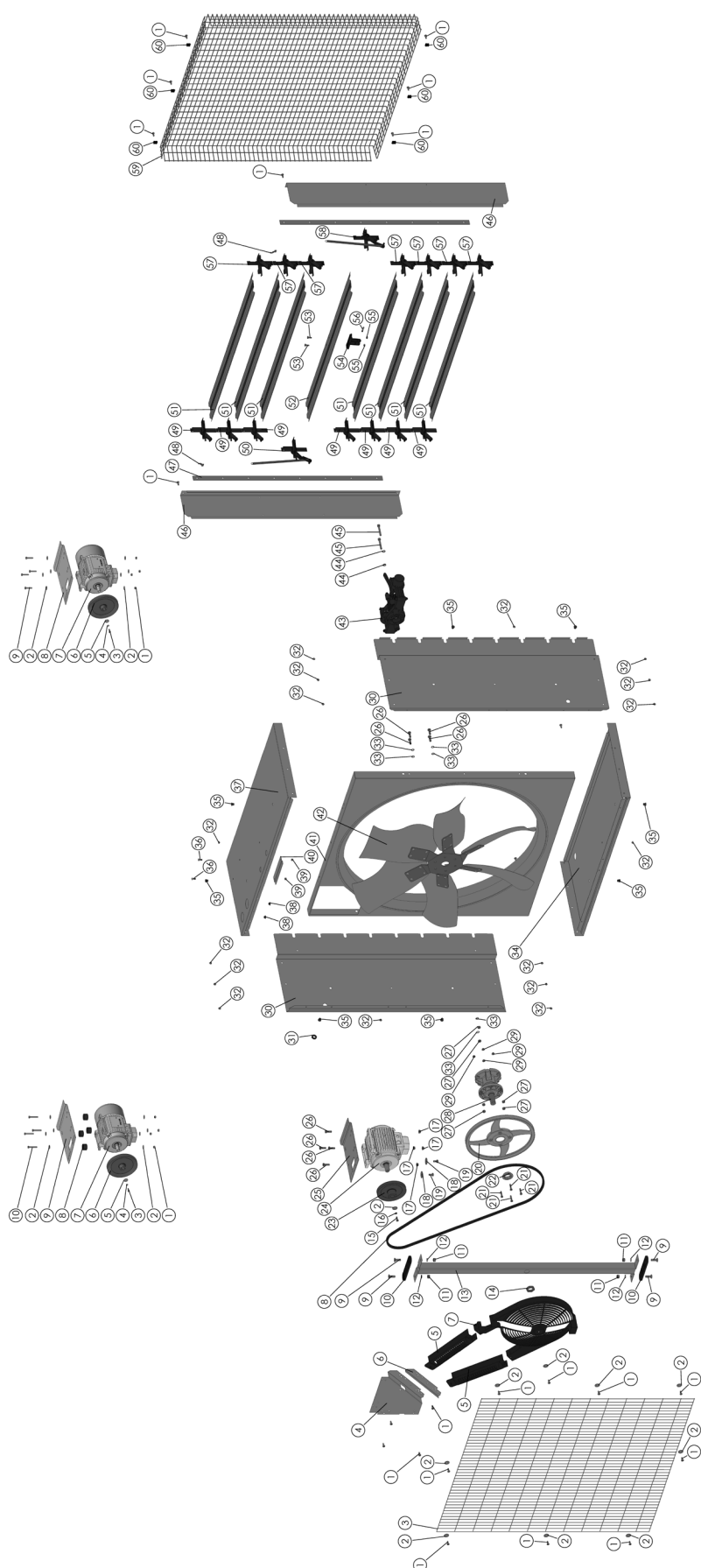
42	THREADED BUSH M08×17.5	8
43	RUBBER FOR CABLE	1
44	CAP COVER NUT	1
45	REAR SAFETY MESH	2
46	METAL CLIP FOR PYRAMIDAL MESH	10
47	Ø6×24 WASHER	1
48	Ø6,3×19 SELF-TAPPING SCREW	29
49	PLASTIC CLIP FOR MESH	10
50	HEX SCREW M08x16	2
51	Ø8×32 WASHER	2
52	SAFETY PROTECTION FOR CENTRAL PULLEY	1
53	SAFETY PROTECTION FOR V-BELT	2
54	METAL CLIP FOR SAFETY PROTECTION FOR MOTOR	1





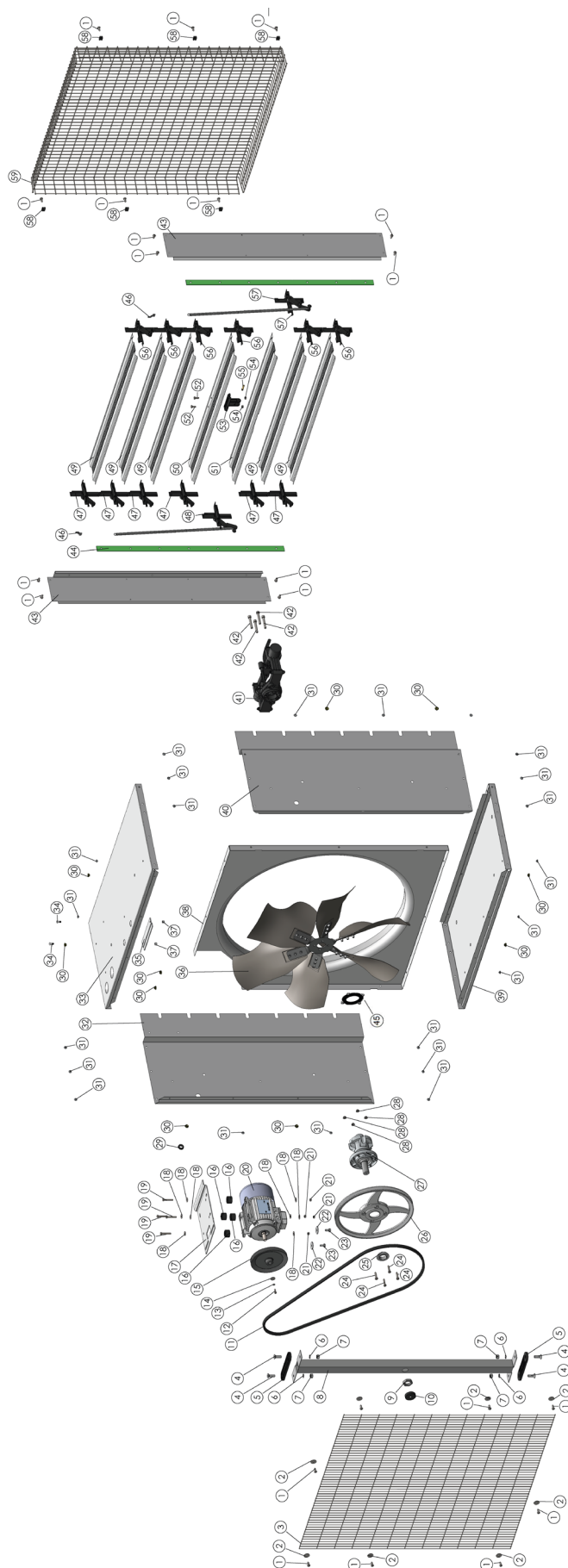
REF.	DESCRIPTION	QTY. AC	QTY. E-line
1	BOTTOM PANEL	1	1
2	COMPLETE CENTRAL HUB	1	1
3	WATERPROOF DISTANCE PIECE	1	1
4	CENTRAL PULLEY FOR EM/S FANS	1	1
5	M06×30 HEX SCREW	4	4
6	M06 HEX NUT SELF-LOCKING W/FLANGE	4	4
7	PROPELLER	1	1
8	CENTRIFUGAL SYSTEM	1	1
9	M25 HEX NUT	1	1
10	CENTRAL LEFT SHUTTER BEARING	1	1
11	CENTRAL RIGHT SHUTTER BEARING	1	1
12	SHUTTER BLADE	9	9
13	HOLES ROD	2	2
14	CENTRAL SHUTTER BLADE FOR EM/SM50	1	1
15	PLASTIC FORK	1	1
16	KNURLED AXLE	1	1
17	A88-V-BELT	1	-
18	MOTOR PULLEY	1	1
19	M06×16 HEX SCREW	2	2
20	M08X16 HEX SCREW	2	2
21	M06 HEX NUT	2	2
22	D08×32 WASHER	2	2
23	M08X25 HEX SCREW	4	4
24	M08 HEX NUT	6	6
25	M08×55 HEX SOCKET HEAD CUP SCREW	2	2
26	D08 EXT THOOTHED WASHER	6	6
27	D08X16 WASHER	2	2
28	Ø6.3×19 SELF-TAPPING SCREW	25	25
29	SIDE PANEL	2	2
30	TOP PANEL	1	1
31	CONVEYOR 50 INCHES	1	1
32	CARTER	2	2
33	SUPPORT BRACKET FOR MOTOR PLATE	1	1
34	Ø6×13 BOLT	2	2
35	TS6.4M KAK COLLAR	2	2
36	PROPELLER CENTRAL SUPPORT	1	1
37	REAR SAFETY MESH	2	2
38	PLASTIC CLIP	7	7
39	CLIP FOR SAFETY MESH GUARD	6	6
40	RUBBER FOR CABLE	1	1

41	OVAL PLATE	2	2
42	Ø6.4X8 PØP UP RIVET	20	20
43	M08 THREADED BUSH	8	8
44	M08 THREADED BUSH	2	2
45	HOOKE FOR SPRING	2	2
46	M10X30 HEX SOCKET COUNTERSUNK SCREW	4	4
47	D10 EXT THOOTTED WASHER	4	4
48	M10 HEX NUT	4	4
49	ENGINE GUARD	1	1
50	SAFETY PROTECTION FOR CENTRAL PULLEY	1	1
51	BELT GUARD 50"	2	2
52	D6.4×24 WASHER	2	2
53	PYRAMIDAL SAFETY MESH	1	1
54	MOTOR PLATE	1	-
55	M06×20 HEX SCREW - SELF-LOCKING	1	-
56	MOTOR (MEC80)	1	-
57	RIGHT BUSHING	9	9
58	LEFT BUSHING	9	9
59	RIGHT SHUTTER PIN	9	9
60	LEFT SHUTTER PIN	9	9
61	PLASTIC ARM FOR SHUTTER BEARING	18	18
62	A87-V-BELT	-	1



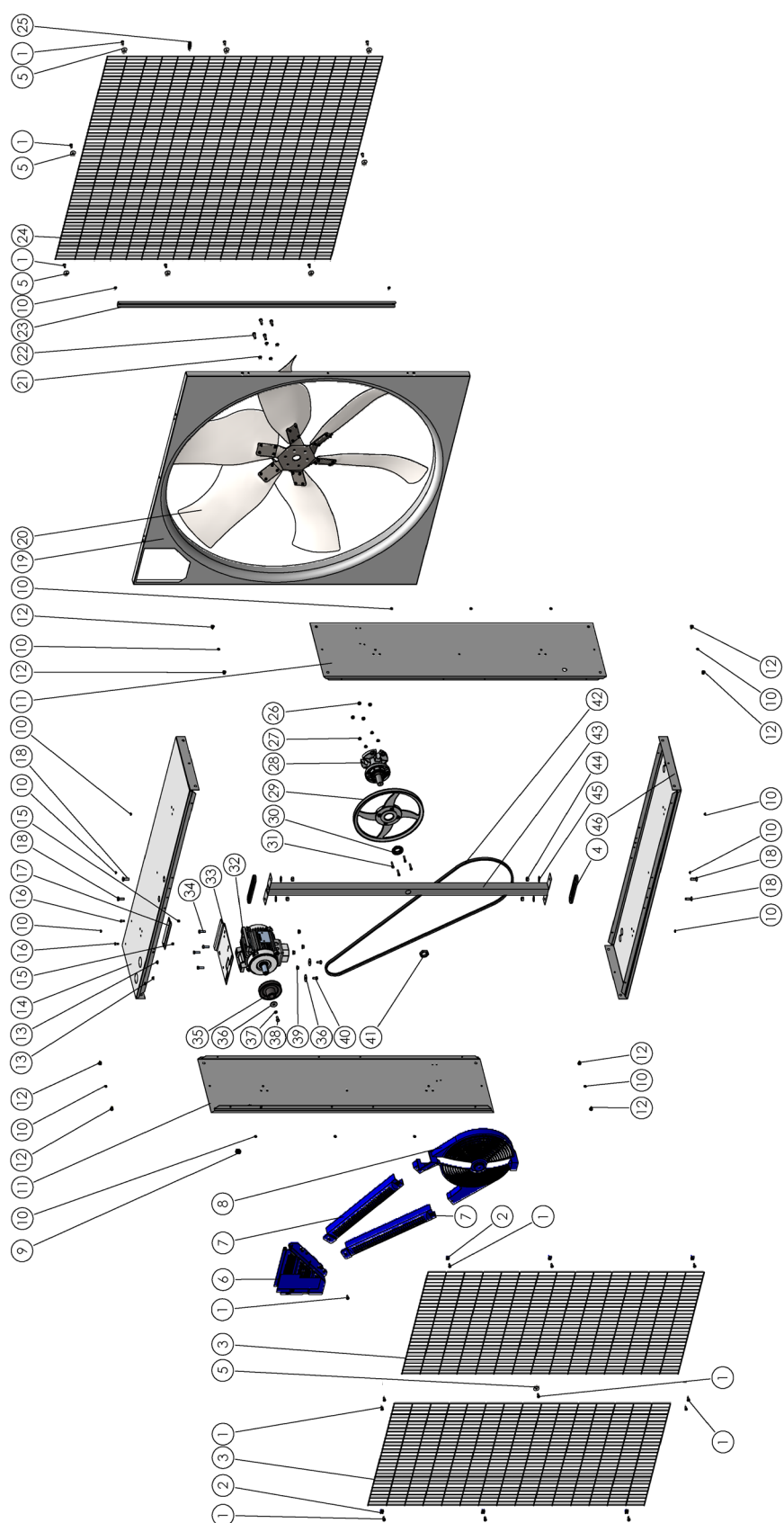
REF.	DESCRIPTION	QTY.
1	Ø6,3×19 SELF-TAPPING SCREW	23
2	Ø6×24 WASHER	10
3	SAFETY MESH GUARD 22×89	1
4	CARTER FOR MOTOR	1
5	CARTER FOR BELT	2
6	PLATE FOR MOTOR CARTER	1
7	CARTER FOR PULLEY	1
8	A75 V-BELT	1
9	M10×30 SCREW	4
10	OVAL PLATE	2
11	M10 HEX NUT	4
12	EXT TOOTHED WASHER D10,5x18	4
13	CENTRAL SUPPORT	1
14	M25 HEX NUT	1
15	M06×20 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	M06×30 HEX SCREW	4
22	WATERPROOF DISTANCE PIECE	1
23	MOTOR PULLEY	1
24	MOTOR (MEC80)	1
25	MOTOR SLIDE	18
26	M08×25 HEX SCREW	6
27	M08 HEX NUT	1
28	HUB W/SHAFT AND BEARING	4
29	M06 HEX NUT W/FLANGE	2
30	SIDE PANEL	1
31	RUBBER FOR CABLE	16
32	Ø6.4x8 POP UP RIVET	6
33	Ø8 EXT THOOTED WASHER	1
34	BOTTOM PANEL	8
35	M08×17.5 THREADED BUSH	2
36	Ø6×16 TT64 BOLT	1
37	TOP PANEL	2
38	M08×12.5 THREADED BUSH	2
39	TS6.4M KAK COLLAR	1
40	MOTOR SLIDE PLATE	1

41	ORIFICE	1
42	PROPELLER	1
43	CENTRIFUGAL SYSTEM	1
44	Ø8x16 WASHER	2
45	M08×55 HEX SCREW	2
46	CARTER	2
47	8 HOLES 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	M06×16 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



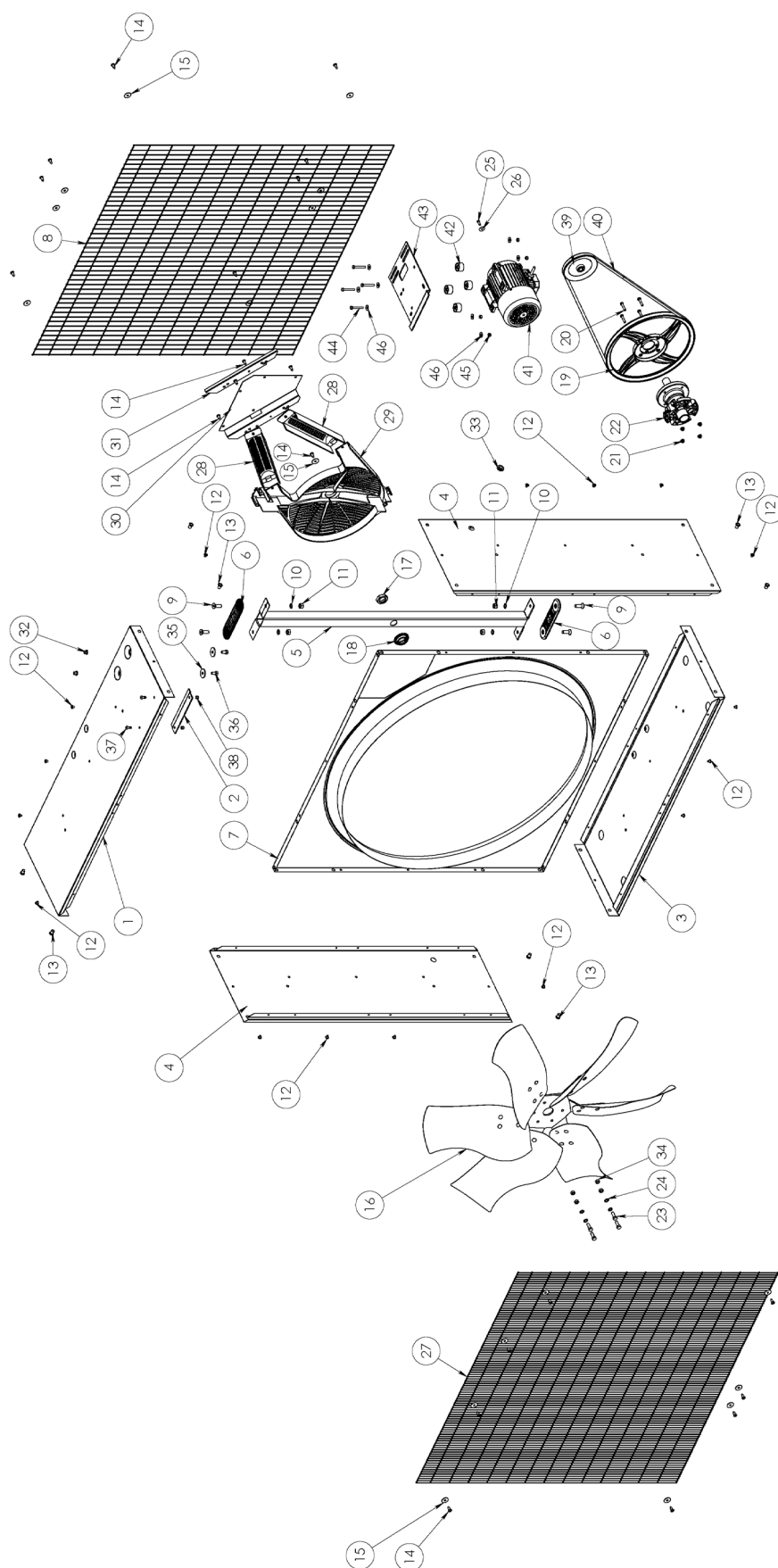
REF.	DESCRIPTION	QTY.
1	Ø6,3×19 SELF-TAPPING SCREW	22
2	Ø6×24 WASHER	8
3	SAFETY MESH GUARD 11×76	1
4	M10×30 SCREW	4
5	OVAL PLATE	2
6	EXT TOOTHED WASHER D10,5x18	4
7	M10 HEX NUT	4
8	CENTRAL SUPPORT	1
9	M25 HEX NUT	1
10	CUP COVER NUT	1
11	A69 V-BELT	1
12	M05×16 HEX SCREW	1
13	Ø5 SPRING WASHER	1
14	Ø5×20 WASHER	1
15	MOTOR PULLEY	1
16	Ø6 DISTANCE PIECE	4
17	MOTOR SLIDE	1
18	Ø6×18 WASHER	8
19	M06×40 HEX SCREW	4
20	MOTOR (MEC71)	1
21	M06 HEX NUT	4
22	Ø8x32 WASHER	2
23	M08x16HEX SCREW	2
24	M06×30 HEX SCREW	4
25	WATERPROOF DISTANCE PIECE	1
26	CENTRAL PULLEY	1
27	HUB W/SHAFT AND BEARING	1
28	M06 HEX NUT W/FLANGE	4
29	RUBBER FOR CABLE	1
30	M08×12.5 THREADED BUSH	10
31	Ø6.4x8 POP UP RIVET	22
32	RIGHT SIDE PANEL	1
33	TOP PANEL	1
34	Ø6×16 TT64 BOLT	2
35	MOTOR SLIDE PLATE	1
36	PROPELLER	1
37	TS6.4M KAK COLLAR	2
38	ORIFICE	1
39	BOTTOM PANEL	1
40	LEFT SIDE PANEL	1

41	CENTRIFUGAL SYSTEM	1
42	M08×55 HEX SCREW	4
43	CARTER	2
44	7 HOLES ROD	2
45	PLASTIC SPACER	1
46	HOOK FOR SPRING	2
47	RIGHT SHUTTER BEARING	6
48	RIGHT SHUTTER BEARING W/SPRING	1
49	SHUTTER BLADE	5
50	CENTRAL SHUTTER BLADE	1
51	SHUTTER BLADE W/SLOT	1
52	M06×16 HEX SCREW	2
53	PLASTIC FORK	1
54	M06 THIN HEX NUT	2
55	KNURLED AXLE	1
56	LEFT SHUTTER BEARING	6
57	LEFT SHUTTER BEARING W/SPRING	1
58	METAL CLIP FOR PYRAMIDAL MESH	6
59	PYRAMIDAL MESH	1

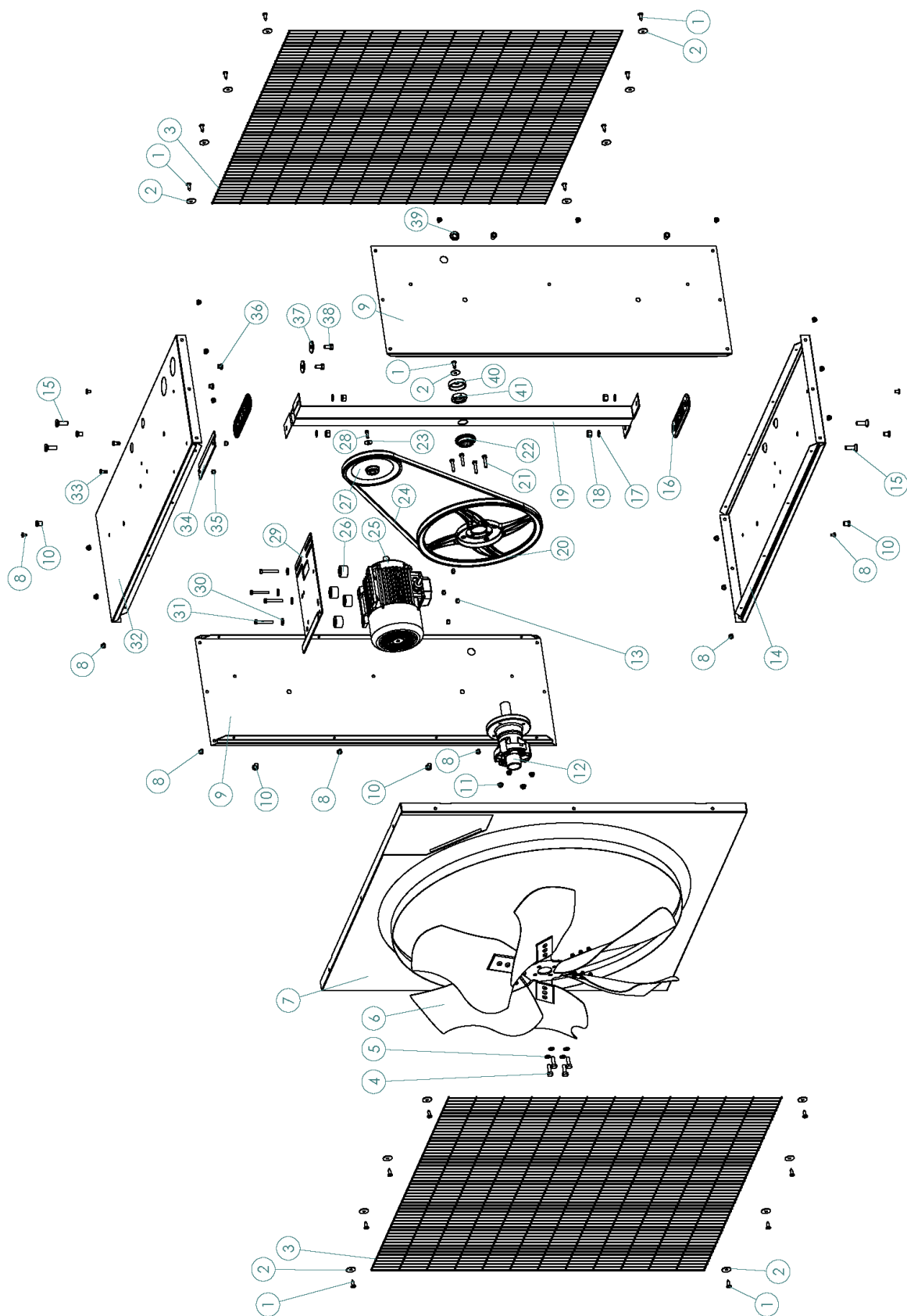


REF.	DESCRIPTION	QTY.
1	Ø6,3×19 SELF-TAPPING SCREW	20
2	CLIP FOR SAFETY MESH GUARD	10
3	HALF REAR SAFETY MESH GUARD	2
4	OVAL PLATE	2
5	Ø6×24 WASHER	9
6	CARTER FOR MOTOR	1
7	CARTER FOR BELT	2
8	CARTER FOR PULLEY	1
9	RUBBER FOR CABLE	1
10	Ø6.4x8 POP UP RIVET	18
11	SIDE PANEL	2
12	M08×17.5 THREADED BUSH	8
13	M08×12.5 THREADED BUSH	2
14	TOP PANEL	1
15	TS6.4M KAK COLLAR	2
16	Ø6×16 TT64 BOLT	2
17	MOTOR SLIDE PLATE	1
18	M10×30 SCREW	4
19	ORIFICE	1
20	PROPELLER	1
21	Ø8 EXT THOOTED WASHER	4
22	M08×25 HEX SCREW	4
23	SUPPORT FOR SAFETY MESH GUARD	1
24	FRONT SAFETY MESH GUARD	1
25	CLAMP FOR SAFETY MESH GUARD	1
26	M08 HEX NUT	4
27	M06 HEX NUT W/FLANGE	4
28	HUB W/SHAFT AND BEARING	1
29	CENTRAL PULLEY	1
30	WATERPROOF DISTANCE PIECE	1
31	M06×30 HEX SCREW	4
32	MOTOR	1
33	MOTOR SLIDE	1
34	M08×25 HEX SCREW	4
35	MOTOR PULLEY	1
36	Ø8x32 WASHER	3
37	Ø8 SPRING WASHER	1
38	M08×20 HEX SCREW	1
39	M08 HEX NUT WITH FLANGE	4
40	M08x16HEX SCREW	2

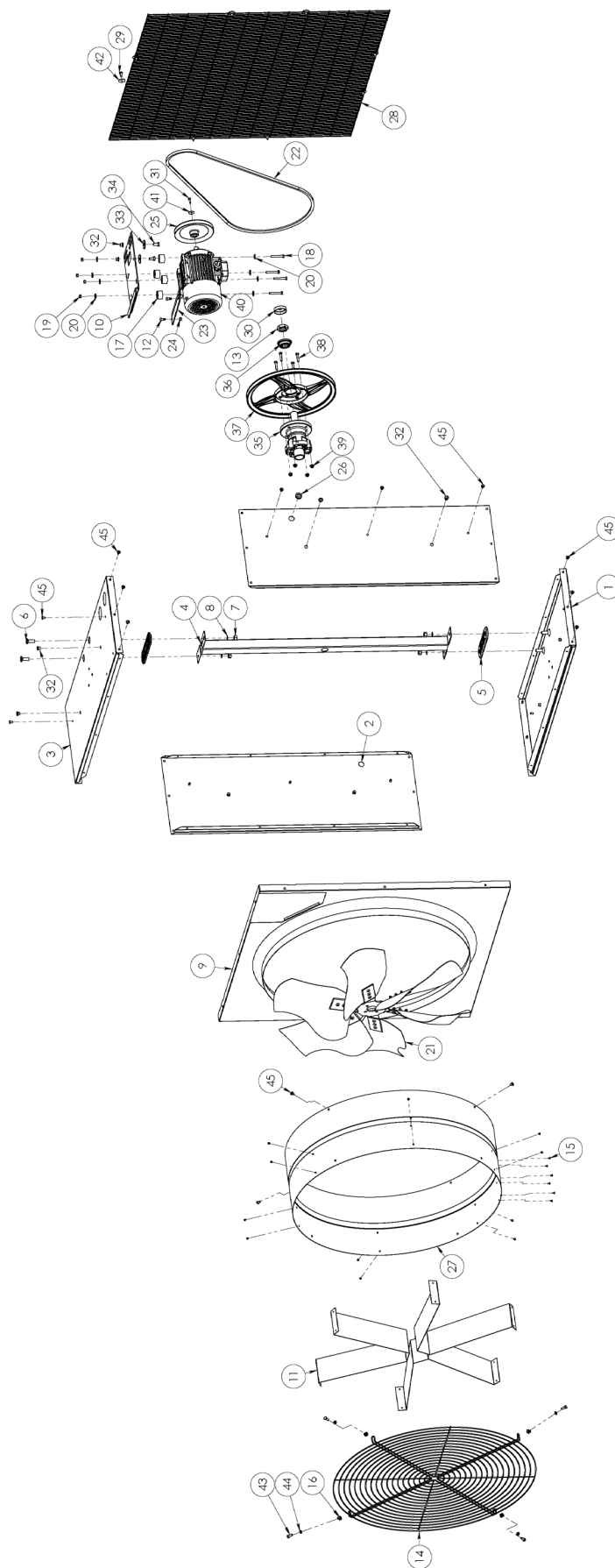
41	M025 HEX NUT	1
42	A88 V-BELT	1
43	CENTRAL SUPPORT	1
44	M10 HEX NUT	4
45	Ø10.5 EXT THOOTED WASHER	4
46	BOTTOM PANEL	1



REF.	DESCRIPTION	QTY.
1	TOP PANEL	1
2	SUPPORT BRACKET FOR MOTOR PLATE	1
3	BOTTOM PANEL	1
4	SIDE PANEL	2
5	CENTRAL SUPPORT	1
6	OVAL PLATE	2
7	CONVEYOR	1
8	REAR SAFETY MESH	1
9	M10X30 HEX SOCKET COUNTERSUNK SCREW	4
10	D10 EXT THOATED WASHER	4
11	M10 HEX NUT	4
12	Ø6.4X8 PØP UP RIVET	16
13	M08×17.5 THREADED BUSH	8
14	Ø6.3×19 SELF-TAPPING SCREW	21
15	D6.4×24 WASHER	17
16	PROPELLER	1
17	M25 HEX NUT	1
18	WATERPROOF DISTANCE PIECE	1
19	CENTRAL PULLEY FOR EM/S FANS	1
20	M06×30 HEX SCREW	4
21	M06 HEX NUT SELF-LOCKING W/FLANGE	4
22	COMPLETE CENTRAL HUB	1
23	M08X25 HEX SCREW	4
24	D08 EXT THOATED WASHER	4
25	M05X16 HEX SCREW	1
26	D05X20 WASHER	1
27	REAR SAFETY MESH	1
28	BELT GUARD 36"	2
29	SAFETY PROTECTION FOR CENTRAL PULLEY	1
30	MOTOR SAFETY PROTECTION	1
31	PLATE FOR ENGINE SAFETY PROTECTION	1
32	M08×12.5 THREADED BUSH	2
33	RUBBER FOR CABLE	1
34	M08 HEX NUT	4
35	D08×32 WASHER	2
36	M08X16 HEX SCREW	2
37	Ø6×13 BOLT	2
38	TS6.4M KAK COLLAR	2
39	V BELT	1
40	ASSEMBLED MOTOR EM/S36	1



REF.	DESCRIPTION	QTY.
1	Ø6.3×19 SELF-TAPPING SCREW	17
2	D6.4×24 WASHER	17
3	SAFETY MESH GUARD	2
4	M08X25 HEX SCREW	4
5	D08 EXT THOOTHED WASHER	4
6	IMPELLER 6B, 30"	1
7	30" AIR CONVEYOR	1
8	Ø6.4X10 PØP UP RIVET	22
9	SIDE PANEL	2
10	M08×17.5 THREADED BUSH	8
11	M06 HEX NUT SELF-LOCKING W/FLANGE	4
12	COMPLETE CENTRAL HUB	1
13	M06 HEX NUT	4
14	BOTTOM PANEL	1
15	M10X30 HEX SOCKET COUNTERSUNK SCREW	4
16	OVAL PLATE	2
17	D10 EXT THOOTHED WASHER	4
18	M10 HEX NUT	4
19	CENTRAL SUPPORT	1
20	CENTRAL PULLEY FOR EM/S FANS	1
21	M06×30 HEX SCREW	4
22	WATERPROOF DISTANCE PIECE	1
23	D05X20 WASHER	1
24	A70 - BELT	1
25	MOTOR, 3PH. 4P 0.55KW 230/400V 50/60Hz	1
26	MOTOR SPACER	4
27	MOTOR PULLEY	1
28	M05X16 HEX SCREW	1
29	MOTOR PLATE	1
30	D06X18 WASHER	8
31	M06X45 HEX SCREW	4
32	TOP PANEL	1
33	Ø6×13 BOLT	2
34	SUPPORT BRACKET FOR MOTOR PLATE	1
35	TS6.4M KAK COLLAR	2
36	M08×12.5 THREADED BUSH	2
37	D08×32 WASHER	2
38	M08X16 HEX SCREW	2
39	RUBBER FOR CABLE	1
40	PLASTIC COVER FOR NUT M25	1
41	M25 HEX NUT	1



REF.	DESCRIPTION	QTY.
1	BOTTOM PANEL	1
2	SIDE PANEL	2
3	TOP PANEL	1
4	CENTRAL SUPPORT	1
5	OVAL PLATE	2
6	M10X30 HEX SOCKET COUNTERSUNK SCREW	4
7	M10 HEX NUT	4
8	D10 EXT THOOTHED WASHER	4
9	30" AIR CONVEYOR	1
10	MOTOR PLATE	1
11	FLOW STRAIGHTENER STRIP	3
12	Ø6×13 BOLT	2
13	M25 HEX NUT	1
14	CIRCULAR SAFETY MESH	1
15	Ø3.9X7 POP UP RIVET	18
16	M06 CAGE NUT	4
17	MOTOR SPACER	4
18	M06X45 HEX SCREW	4
19	M06 HEX NUT	4
20	D06X18 WASHER	8
21	PROPELLER	1
22	V-BELT	1
23	SUPPORT BRACKET FOR MOTOR PLATE	1
24	TS6.4M KAK COLLAR	2
25	ENGINE PULLEY	1
26	RUBBER FOR CABLE	1
27	FLOW STRAIGHTENER FRAME	1
28	SAFETY MESH GUARD	1
29	Ø6.3×19 SELF-TAPPING SCREW	8
30	CAP COVER NUT	1
31	M05X16 HEX SCREW	1
32	M08 THREADED BUSH	10
33	D08×32 WASHER	2
34	M08X16 HEX SCREW	2
35	COMPLETE CENTRAL HUB	1
36	WATERPROOF DISTANCE PIECE	1
37	CENTRAL PULLEY FOR EM/S FANS	1
38	M06×30 HEX SCREW	4
39	M06 HEX NUT SELF-LOCKING W/FLANGE	4
40	MOTOR (MEC71)	1

41	D05X20 WASHER	1
42	D6.4×24 WASHER	8
43	M06×16 HEX SCREW	4
44	D06X12 WASHER	4
45	Ø6.4x8 PØP UP RIVET	26



Euroemme EM is developed and produced by GrainProteinTech Climate Control Air Treatment Italy S.p.A.

Strada Piani 12, 18027 Chiusavecchia (IM), Italy | +39 0183 5211 |
ccatitaly@grainproteintech.com

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