MANUALE DI USO E MANUTENZIONE **I**

USE AND MAINTENANCE MANUAL **GB**

GEBRAUCHSANWEISUNG UND WARTUNGSVORSCHRIFTEN **D**

VOYAGER

9.5DM - 11.5DT
CBU

Rev.0 A.A. 04/11/2014

cod.43346

Tipo modello
N° matricola
Codice

CE

GB

CONTENTS

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This manual has to be preserved for all through life of the gen set to which ago reference

Thank you for having chosen a product MASE.

As a leading generator manufacturer, Mase Generators offers a wide range of generators with an output from 1 KVA portable generators to 1600 KVA units for special applications.
Founded in 1970, the Cesena-based company extends over a area of 16,000 square meters, including a 9,000 sq. mtr. manufacturing facility.
Mase Generators began as a company producing 500 Watt, light and compact portable generators. These generators made the Mase Generators name well known throughout the world. Mase Generators is a leader in high quality, reliable products, and innovative research performed by Research and Development Department.

The generator you have purchased is the fruit of years of experience in the sector and for the modern conception, the strong sizing, the materials employees, the continuous updatings, constitutes an effective answer to the operators' demands of the sector.
This Manual instructions will furnish you useful information and precious suggestions so you can fully exploit all the possibilities that the generators offers you.
If any part of the manual resulted incomprehensible, please contact us.

In to renew our thanks we cordially greet you.

MASE GENERATORS S.p.A. Via Tortona, 345
47522 Cesena (FC) Italy
Tel.+39-0547-354311 Fax.+39-0547-317555

Technical data, informations, layouts of the texts and graphic preparations: edited by the Technical Office Mase Generators

DEFINITIONS USED

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The terms used are current technical terms, and where considered necessary the meaning is described below

- **Generator**
  An assembly of an internal combustion piston engine and an alternate current, synchronous, 2-4 pole, self-excited generator, joined together to create a station for self-production of electrical energy.

- **User system**
  Composed of the power supply circuits of the user equipment, including the relevant sectioning, handling, breaking, transformation, protection, etc. devices which do not form part of the production, transmission and distribution systems.

- **Category 1 electrical system**
  A system where the rated voltage is greater than 50 V and smaller than 1000 V including alternate current.

- **Load**
  A set of numerical values of electrical and mechanical magnitudes which characterise the requirements imposed on a rotary machine by an electrical circuit or by a mechanical device at a certain instant.

- **Thermal switch**
  Main cut-out and breaking device made up of a switch which opens automatically by thermal effect.

- **Differential switch**
  Main cut-out and breaking device made up of a switch which opens automatically by differential effect.

- **Skilled person**
  A person with technical know-how or sufficient experience to allow him to avoid the dangers inherent in electricity.

- **MASE specialised personnel**
  A person able to evaluate the job assigned to him and recognise the possible dangers on the basis of training at the MASE training centres, with professional experience and knowledge of the equipment in question and of the possible dangers deriving in the event of negligent behaviour.

- **Supplier**
  A body (e.g. manufacturer, agent, installer) which supplies the equipment or services relating to the machine.

- **Control**
  Control action by which an output variable of the controlled system (controlled variable) is affected by an input variable of the controlling system in order to achieve a certain goal.

- **Manual control**
  Control where the change of a variable handled is produced by a person through manual intervention.

- **Automatic control**
  Control where the change of a variable handled is produced by a controlling device (automatic controller) without the intervention of a person.

- **Danger**
  Source of possible harm or damage to health.

- **Protection**
  Guard or protection device as safety measure to protect persons from a present or potential danger.

- **Casing**
  Part intended to assure protection of the equipment against specific outside influences and protection in every sense against contacts.

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- **Connection in bad state**
  The live parts are not fully covered with insulation removable by destruction only, the connections are not secure because of unstable tightening of the parts and a development of oxide between the parts.

- **Direct contact**
  Contact of persons or animals with live parts.

- **Control circuit**
  Circuit used to control machine operation.

- **Equipment**
  General term which comprises materials, devices, equipment, accessories and similar used in conjunction with an electrical installation.

DANGER ***Indicates that particular attention must be paid in order to prevent serious risks which could lead to death or possible harm to the health of personnel.***

WARNING ***A condition which may occur during the lifetime of a product, system or plant considered at risk regarding damage to persons, property, the environment or economic loss.***

CAUTION ***Indicates that particular attention must be paid in order to prevent serious consequences which could result in damage to tangible goods, such as the resources or the product.***

INFORMATION ***Instructions of particular importance.***

Carefully consult this manual before using or carrying out any operation on the generator.

@ The routine maintenance operations, must be carried out by qualified personnel who have the appropriate equipment and protections.

PRELIMINARY PRESCRIPTIONS

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FIELD OF EMPLOYMENT:

THE GENERATOR IS PROPER FOR TO PRODUCE IN WAY AUTONOMOUS ELECTRIC ENERGY IN THE LIMITS OF TENSION AND WATT DECLARED BY THE BUILDER

FAILURE TO RESPECT THE SPECIFICATIONS CONTAINED IN THIS USE AND MAINTENANCE MANUAL WILL RESULT IN FORFEITURE OF THE GUARANTEE ON THE PRODUCT.

This manual was drawn up by the manufacturer and forms an integral part of the generator equipment, definition used as indicated in Directive 89/392/EC; the information contained in the manual is addressed to all the persons involved in the operating life cycle of the generator, and is necessary to inform both those who effectively carry out the different operations and those who coordinate the activities, to arrange the necessary logistics and to regulate access to the place where the generator will be installed and operated.

This manual was drawn up by the manufacturer with the purpose of providing essential information and instructions for proper use and maintenance in conditions of safety. It constitutes an integral part of the generator equipment and must carefully be protected from any agent which may damage it for the entire life cycle of the generator. The manual must accompany the generator if transferred to another user or owner.

The manual defines the purpose for which the generator was constructed and contains all the information necessary to guarantee safe and proper use.
Constant observance of the instructions contained in this manual guarantees the safety of the operator, protection against damage to persons or things, operating economy and a longer life of the generator.

The drawings are provided by way of example. Even if the generator in your possession differs from the illustrations contained in this manual in elements of little significance, for example the colour, the safety of the generator and the information provided are nevertheless guaranteed.

To facilitate consultation, it has been divided into sections identifying the main concepts; for a quick look at the topics, consult the index.

Ongoing improvement and development of the product may have led to modifications to the generator which are not included in this publication.

Whenever a problem concerning the generator or this publication arises, consult with Mase Generators SPA for the latest information available.

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1. GENERAL SAFETY WARNINGS

1.1 Symbols on the generator

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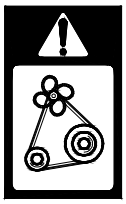

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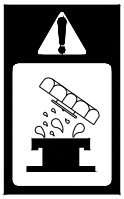

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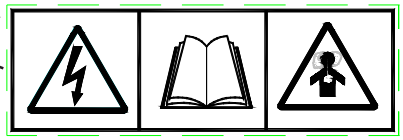

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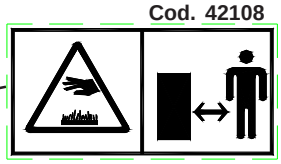

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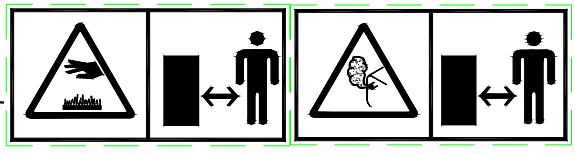

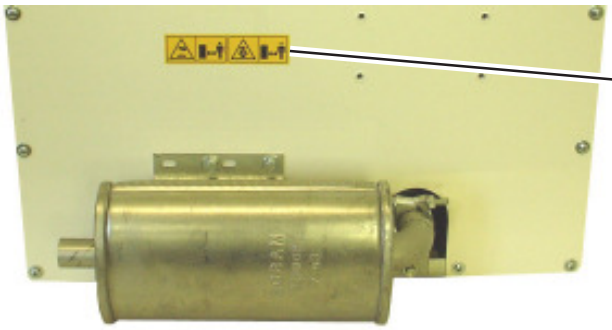

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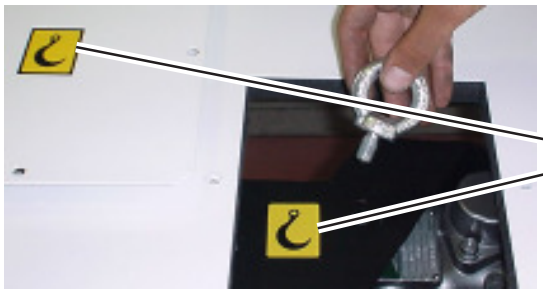

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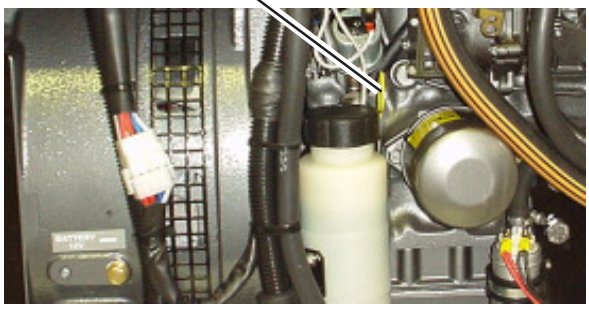

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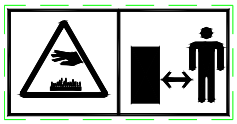
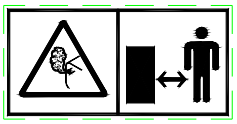
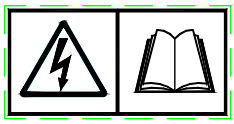
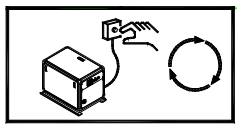
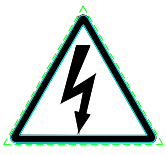
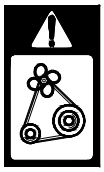
1.2 Position of safety labels

- These labels warn the user of any danger which may cause serious injury. Carefully read the meaning and the precautions described in this manual
- If the label detaches or becomes illegible, replace it with a new one which can be requested from an authorised **mase** dealer.

Danger Symbols	Meaning
	- Caution to avoid burns, do not touch during operation. The exhaust manifold and the engine, pay attention to the labels on the generator. - Leave the engine to cool down before storing it indoors
	- Read and understand the Use and Maintenance Manual before starting the generator. - The Mase generator has been designed so as to guarantee safe and reliable operation provided that the instructions are followed. Otherwise,personal injury or damage to the equipment may result.
	- Exhaust gas contain carbon monoxide, that is toxic. - Don't turn on the generator in a closed place. - Provide to a good ventilation. If installed indoors, scrupulously observe the ventilation regulations.
	- Danger of electric discharge: consult the manual
	- Exhaust gas contain carbon monoxide, that is toxic. - Before effecting any operation on the generator ,deactivate the distance starting sistem.
	- Danger of electric shock: consult the manual
	- Danger of burns: Hot surfaces
	- Danger of entanglement and cutting: Presence of rotating parts, pulleys, belts and fan.

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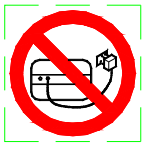
	Danger of burns: Possibility of pressurised hot water expulsion.
Information Symbols	**Meaning**
	Indicates the position of the dipstick for the engine oil check
	Indicates the position of the lifting hook of the generator
Prohibition Symbols	**Meaning**
	The connections to an emergency electric network must be carried out by specialised electricians in compliance with the relevant regulations in force. Improper connections may cause current feedback from the generator to the electrical lines connected. These current feedbacks may cause electroconduction to the people working for the electricity company or who come into contact with the lines during the failure. Moreover, once the line has been restored, the generator may explode, burn or cause fires in the electrical system of the facility.
	- No smoking or using flames
	- Do not clean, lubricate, repair or adjust moving parts.
	- Do not extinguish fires with water, use homologated extinguishers.
Obligation Symbols	**Meaning**
	- Obligation to connect the generator to earth

1.3 General danger information

- It is recommended to learn how to stop and operate all the controls.
- Do not allow unqualified personnel to use the generator.
- Even though the generator is protected, do not stand near it.
- Do not remove the labels for any reason and request replacement if necessary.

- Before starting the generator or before starting any lubrication or maintenance operation, it is essential that the personnel responsible has read and understood all the WARNINGS, CAUTION and DANGER notices in this manual and in the additional technical documentation provided.

- Before any operation on the generator, ensure that the primary engine is not running and that no parts are moving, and post a sign saying DO NOT SWITCH ON or similar at the start switch or the controls before carrying out the maintenance or repair work on the generator.

- Nevertheless, the manufacturer cannot foresee all the possible circumstances which may lead to potential risks in the effective conditions of use of the generator.
  Any operations and/or procedures for maintenance not expressly recommended or indicated in the user manuals must always be notified to and approved by the manufacturer.
  In the event that a procedure not specifically recommended needs to be applied, the user is responsible for assuring that such procedure is safe and does not cause harm to persons.

- The manufacturer declines all responsibility for damage to persons or things deriving from inobservance of the safety regulations.

- Carefully examine the safety warning plates on the generator and respect the relevant instructions.

DANGER

1.3.1 Danger of entanglement

- Do not remove the original protections from any of the exposed rotating parts, hot surfaces, air intakes, belts and live parts.
- Do not carry out any maintenance operation when the generator running.
- Do not wear flapping garments, such as scarves, foulards, bracelets, etc. and all garments must be tied with elastic at the edges.
- Do not clean or carry out maintenance on moving parts

DANGER

1.3.2 Danger of burns

- Do not permit unskilled persons or without adequate training to use the generator.
- Do not permit children or animals to approach the generator when it is in operation.
- Never touch the exhaust, the relevant protection or the engine body when the generator is running or still hot.
- Do not lean against or sit on the generator for any reason whatsoever.
- Identify the position of the fire extinguishers or other protection and emergency devices and learn their functioning.
- Identify any sources of danger such as fuel, engine oil or acid solution leaks, condensate in the drip caps, high voltage, high pressure.
- Do not cause short-circuits by placing keys or tools on the batteries or on the cable fittings.
- The battery fluid contains sulphuric acid which is extremely corrosive and harmful to the skin. Always wear protective gloves and be extremely careful to avoid spillage when pouring the acid. In the event of contact, wash the affected part thoroughly with running water and consult a physician, in particular when the eyes are involved.

DANGER

1.3.3 Danger of harm to hearing

- Do not stand near the generator for long periods without protective earmuffs since hearing may be reduced.

DANGER

1.3.4 Danger of intoxication

- The exhaust gas contain toxic carbon monoxide.
- Never use the generator in tunnels or in any place with poor ventilation. If indoor use is inevitable, it is essential to provide for proper and efficient ventilation in order to prevent intoxication of persons or animals.
- Check that the engine exhaust is free and that the pipes allow evacuation of the exhaust fumes.
- Check that the exhaust gas are discharged to the outside in a safe position away from doors, windows and air intakes.

DANGER

1.3.5 Danger of fire or explosion

- Always turn off the engine before refuelling.
- Do not smoke during refuelling.
- Refuelling must be carried out with extreme care, ensuring that fuel does not overflow from the engine tank respecting the maximum level.
- In the event of fuel spillage from the tank, thoroughly dry and clean the parts involved.
- Check that there are no fuel leaks and that the pipes are undamaged.
- When refuelling has been completed, tightly close the fillercap
- Keep flammable liquids, matches and other explosive and/or flammable products away from the generator, since the temperature near the exhaust is high during operation.
- Never leave flammable liquids or cloths soaked in flammable liquids in proximity of electrical equipment (including lamps) or parts of the electrical system.
- The batteries develop hydrogen, a highly explosive gas. It is recommended not to smoke nor cause sparks in the vicinity, in particular during charging.
- Do not obstruct the cooling air inlets/outlets.
- In the event of fire, use a homologated fire extinguisher and never use water.

DANGER

1.3.6 Danger if failing to use personal protection devices

- The persons responsible for handling must always wear protective gloves and safety shoes.
- Wear safety shoes and overalls.
- If the generator needs to be lifted from the ground, the operators must wear a protective helmet.
- Immediately change wet overalls.
- Use protective gloves.

DANGER

1.3.7 Danger caused by the engine starting

- Do not leave disassembled parts, tools or anything else not forming part of the system on or near the engine.
- Install the protections necessary for safety on the parts completing the system.
- Operate the generator on a flat surface as far as possible. For continuous operation, the maximum permitted engine inclination is 20 degrees. Greater inclination of the generator might cause the fuel to leak out or cause problems with engine oil pressure.

- To prevent the risk of fire and for proper ventilation, position the generator at least 1m (3 ft) from buildings or other equipment during operation.
- Check the oil level by means of the dipstick.
- Check that all the electrical utilities are off so that the generator is not started on load.
- Check perfect functioning of the devices which stop the generator in the event of failure due to low oil level.
- Identify the position of the emergency stop buttons, switches and other emergency systems on the generator.
- Learn the special emergency procedures relative to the installation in question.

1.3.8 Danger of electromagnetic radiation

- Do not allow access to persons wearing a pacemaker because of possible electromagnetic interference with the device.

1.3.9 Danger of electrocution

- When using the generator always bear in mind that in wet or very humid places and in confined conduction spaces it is obligatory to comply with Articles 313 and 318 of Presidential Decree No. 547 27/04/55, as well as Chap. 11 Section IV of the CEI 64-8 regulation.
- Immediately change wet overalls.
- Insulate all the connectors and detached wires.
- Do not leave the power terminal board of the generator uncovered; check that the electrical power and auxiliary service connections have been made properly.
- Do not power loads with a voltage different from that delivered by the generator
- Do not spray water directly onto the electrical parts
- Do not clean the internal electrical parts with compressed air, since short-circuits or other faults may occur. Do not tamper with the active protections, thermal switches and differential magnetothermal switches.
- In the event of malfunctioning, do not remove the panel to attempt repairing it. Contact Mase specialised personnel.
- Do not access the generator with wet hands, since it is a potential source of electric shock if improperly used.
- Take the necessary precautions to prevent the danger of electrocution; check that the earthing system has been installed and constructed in accordance with regulations.
- For the safety of the users, the earth connection of the generator must always be carried out paying particular attention to the cable cross-section used. For the connection of the earth cable use the dedicated terminal on the generator.

The manufacturer is not responsible for any damage caused by failure to earth the system.

1.3.10 Danger resulting from bad storage

- Packed and unpacked generators must be stored in a cool and dry place and never exposed to bad weather.
- Avoid stacking packed generators to prevent them from falling causing damage to persons and/or things.

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2. GENERAL INFORMATION

2.1 Reference documents

The instructions for use provided with each generator are made up of a collection of documents of which this manual represents the General Part. The following documents are normally provided separate.

- **a** **CE** declaration of conformity.
- **b** Instruction manual for use and maintenance of the generators,(this manual).
- **c** Engine use and maintenance manual.
- **d** List of **mase** Service Centres.
- **e** **Mase** Warranty certificate.
- **f** Warranty card.

2.2 Reference regulations and legislative provisions

The generator groups, built by **mase**, destined to the countries of the European Community, are conforming to the applicable **EC** directives, and they are provided of a **EC** Declaration of Conformity.

98/37/EC and subsequent amendments:
Essential machine requirements for safety and health protection ("Machine" directive).

Directive 2006/95/EC (73/23/EC and subsequent amendments contained in the directive **93/68/EC):** Guarantee of safety of electrical material intended for use within certain voltage limits, ("Low Voltage" Directives).

EN 12601: Generator groups moved by internal combustion engine.

EN 60204.1: Electric equipments of the generator groups.

2.3 Marking

The generator identification plate carries all the identification data in accordance with the provisions for **EC** marking for those cases where required. Below is a facsimile of the identification plate fixed on the hull of each generator.

2.4 Identification of the generator unit

1 - Machine name
2 - Machine code
3 - Serial number
4 - Rated power
5 - Declared frequency
6 - Rated power factor
7 - Rated voltage
8 - Rated current
9 - Degree of protection
10 - Class of isolation
11 - Temperature max. of use
12 - Altitude max. of use
13 - Performance class
14 - Year of construction
15 - Manufacturer - Adress
16 - Weight

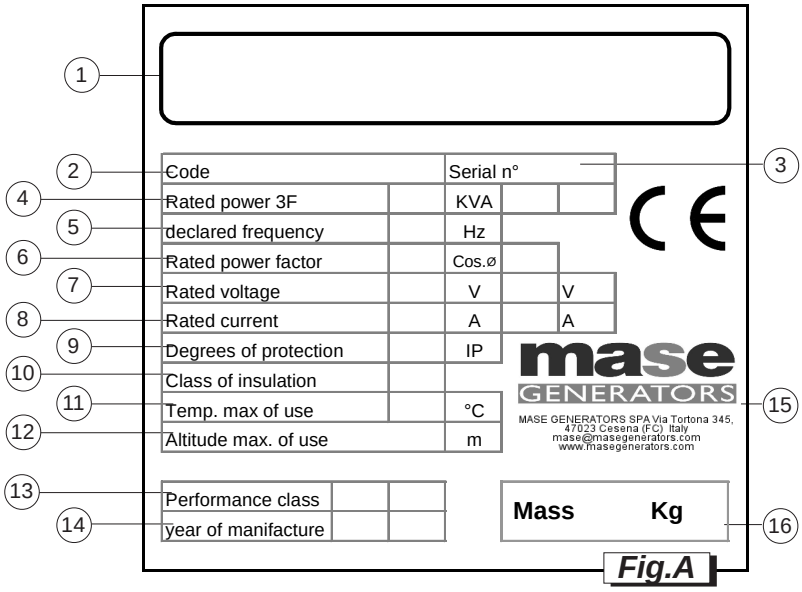

Fig.A

INFORMATION

The machine code number, the serial number and the year of construction must always be indicated when contacting the manufacturer for information, order of spare parts, etc..

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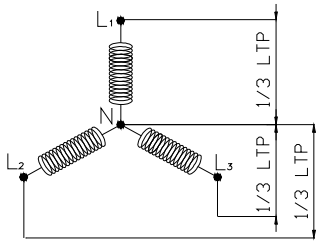
2.5 General features

The ***VOYAGER*** series generators are composed of a diesel-powered combustion engine coupled to an alternator which produces alternating . They have been designed to assure professional users maximum efficiency and reliability for any type of work.
The machine is enclosed in a painted sheet steel casing soundproofed with sound-absorbent material.
The fuel is fed by means of a 12 Volt electric pump mounted inside the generator.
The 4-stroke, direct injection diesel engine, constructed by Yanmar, is extremely reliable and strong.
The alternator is type synchronous, 4-pole, brushless and has an electronic voltage regulator (SR7) which guarantees stability of ± 2% with respect to the rated value. The high pickup capacity of the alternator makes the generator particularly suitable to power electric motors of conditioners, desalination plants, compressors, etc.
The generator has a local control panel (**fig.1; ref.3**) on which the commands and the control instruments are found.

2.6 Tables of technical characteristics

MODEL		VOYAGER 9.5 DM		VOYAGER 11.5 DT	
GENERAL FEATURES					
MAX POWER (LTP)[1]		9	**kW**	11,2	**kVA**
CONTINUOUS POWER (PRP)[2]		8,2	**kW**	10,2	**kVA**
POWER FACTOR (Cos Φ)		/		0,8	
SINGLEPHASE VOLTAGE		/		400	**V**
RATED FREQUENCY		50			**Hz**
GRADE OF PROTECTION		IP 23			
MAX TEMP. OF USE		+40			**°C**
MIN TEMP. OF USE		-5			**°C**
DIMENSIONS	L	1070			**mm**
	W	560			**mm**
	H	660			**mm**
MASS		320			**kg**
NOISE LEVEL		58 (7 m.)			**dB(A)**
ENGINE					
TYPE		4 STROKE			
MANUFACTER		YANMAR			
MODEL		3 TNE 82 A			
DISPLACEMENT		1330			**cm^3**
POWER		15,4 - 11,5			**CV - kW**
n° OF CYLINDERS		3			
RATED SPEED		1500			**rpm**
SPEED CONTROL		CENTRIFUGAL MECCANIC			
INDUCTION SYSTEM		NATURAL			
FUEL		DIESEL			
INJECTION SYSTEM		DIRECT			
FUEL FEEDING PUMPS		ELECTRIC			
MAX PREVALENCE FUEL PUMP		700			**mm**
FULL LOAD CONSUMPTION		2,9			**L/h**
COOLING		WATER			
LUBRIFICATION SYSTEM		FORCED			
OIL SUMP CAPACITY		3,6			**L**
ELECTRIC PLANT		12			**V**
STARTING MOTOR		12 - 1,2			**V - kW**
STARTING BATTERY		12 - 70			**V - Ah**
BATTERY CHARGER		12 - 40			**V - Ah**
STOPPING SYSTEM		SOLENOID			
ALTERNATOR					
TYPE		SYNCHRONOUS, 4 POLES, SELF REGULATED			
ISOLATION CLASS		H			
VOLTAGE REGULATOR		ELECTRICAL			
VOLTAGE STABILITY		± 2%			
FREQUENCY STABILITY		± 5%			
COOLING		AIR			

	SINGLEPHASE 230V	
POWER FACTOR (Cos Φ)	1	0,8
CONTINUOUS POWER (PRP)[2]		



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2.7 Generator composition

See Fig.1
The generators are essentially composed of the following components:

1 Fixed frame
2 Door on engine side
3 Onboard control panel
4 Lock with key
5 Lifting hook
6 Engine
7 Alternator

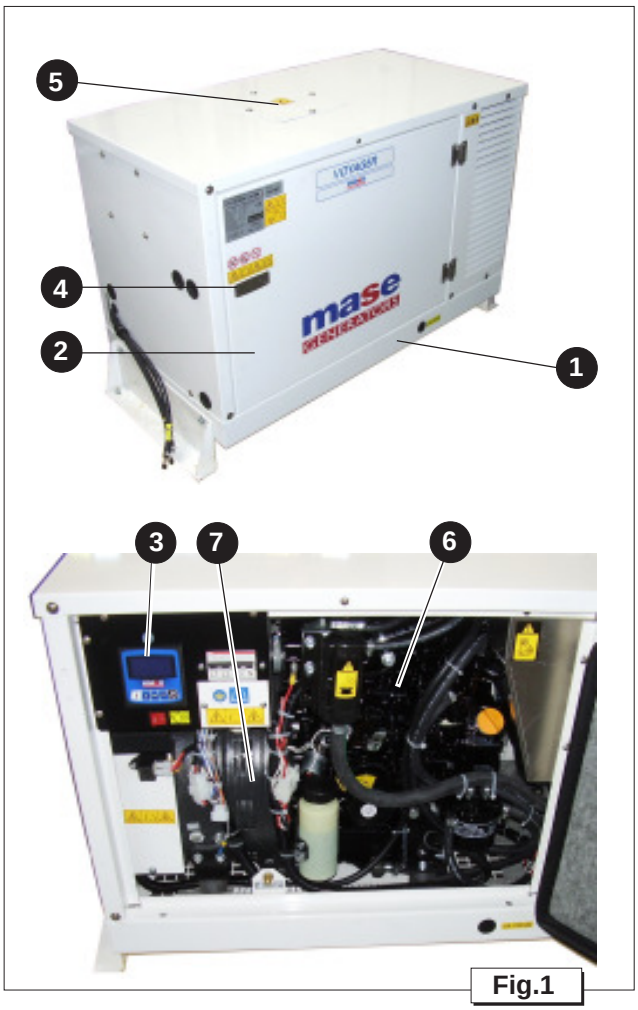
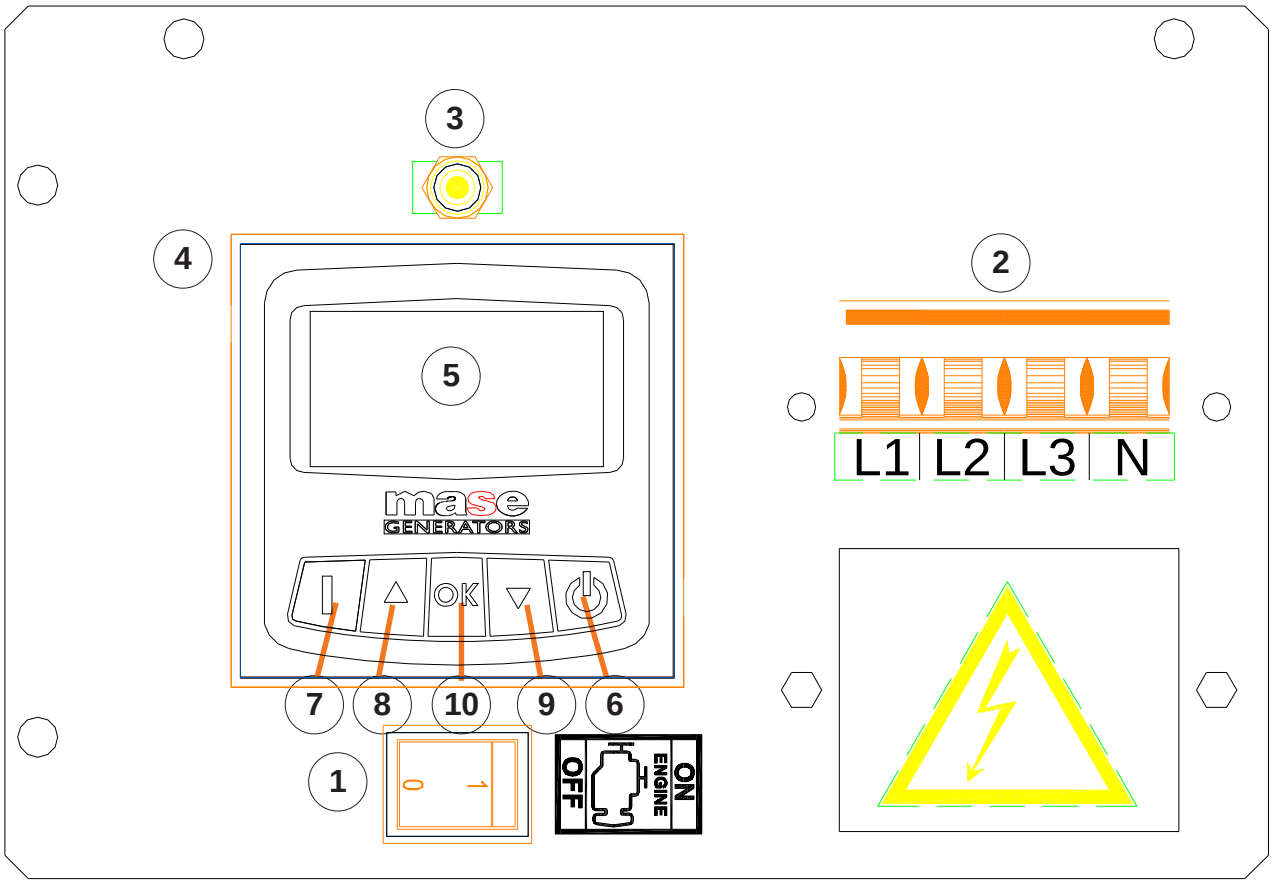


Fig.1

2.8 Control panel and onboard instrument panel

Each generator is fitted with an instrument panel for commands and controls with the following components:

1) Emergency button
2) General magnetothermal switch
3) DC Magnetothermal switch
4) Engine protection module
5) Display
6) START / STOP switch
7) START / Preheating switch
8) Scroll UP navigation menu
9) Scroll DOWN navigation menu
10) OK pushbutton



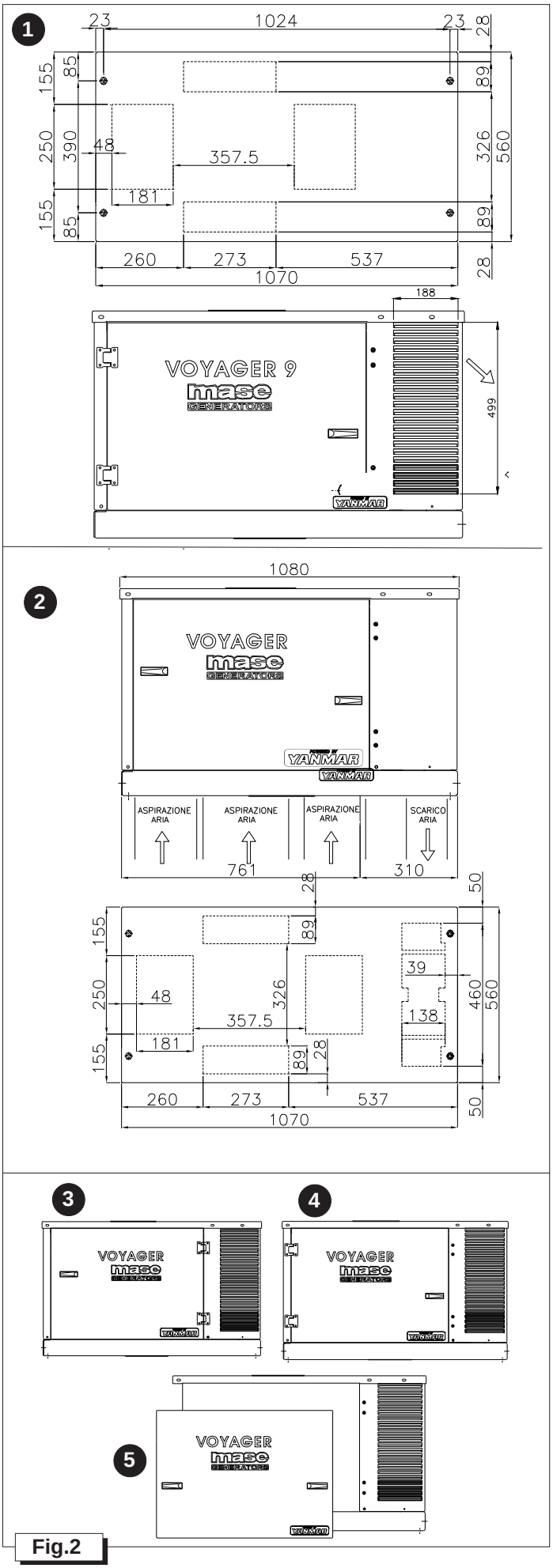


Fig.2

3. INSTALLATION

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DANGER ***All the instructions provided in the chapter "INSTALLATION" must be carried out by specialised installers only.***

3.1 Features

VOYAGER is a generator designed for installation on motor vehicles, but can nonetheless be used in a fixed place taking care to leave the cooling air intake and free escape vents . The level of protection against water and entry of foreign bodies is **IP23** which allows using the generator outdoors. The engines used are air-cooled diesel engines complete with fuel pump and filtering systems. The generator is connected to a control panel that can be installed in the motor vehicle, which controls the starting/stopping functions and the safety protections.

3.2 Ventilation

The **VOYAGER** generator is equipped with an internal forced-air cooling system. The air required for cooling and combustion is aspirated into the soundproof casing through the underplatform air intake and expelled through the escape grids. It is of the utmost importance for good functioning of the generator that the air intake and escape grilles are always free and away from heat sources.

DANGER ***The cooling air of the generator may contain noxious gas and it must therefore never be used to heat living space. It is recommended to seal the housing in which the generator is installed in order to prevent infiltration of vapours or gas into the living space.***

3.3 Configurations.

Basic configuration (Ref.1)
Underplatform air intake
Frontal air expulsion

Basic configuration (Ref.2)
Optional configuration
Underplatform hot-air expulsion

3.4 Maintenance compartment door configuration

-Basic configuration for right-hinged opening (**Ref. 3**)
- Basic configuration for left-hinged opening (**Ref. 4**)
-Optional configuration for complete removal (**Ref. 5**)

GB

3.5 Exhaust gas system configuration

Standard configuration (**Ref. 1**) for rear exhaust gas outlet with mufler fixed on the casing.

Optional configuration (**Ref.2**)
Rear gas outlet with mufler 2 m away

Optional configuration (**Ref.3**)
Lower gas outlet with mufler 2 m away

Optional remote exhaust kit (**Ref.4**)
2 m flexible tube2 m flexible tube

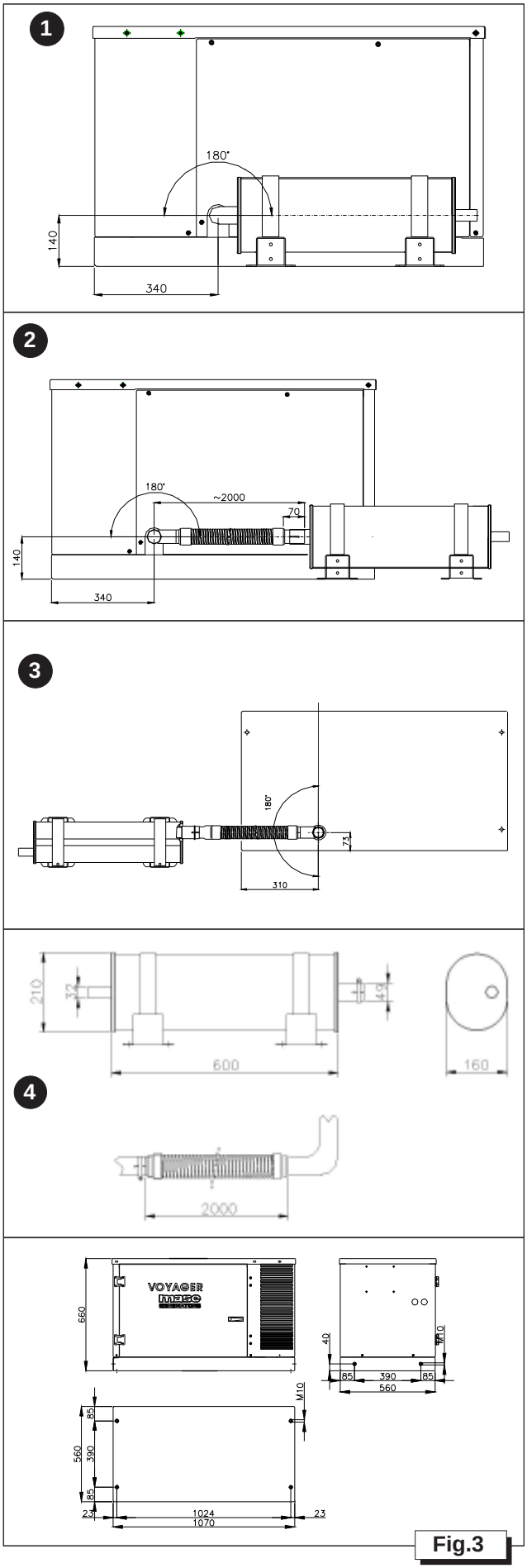

Fig.3

3.6 Positioning the generator group

The housing in which the **VOYAGER** generator will be installed must have suitable dimensions. The lower part of the housing must have suitable supports to support the weight of the generator and the stress created when the vehicle is running.
There must be space of about **20mm** around the generator casing such as to prevent propagation of vibration to the vehicle.

3.7 Connectiont to the fuel tank

The fuel tank must be as close as possible to the generator with a maximum difference in height of 50 cm.
The generator is provided of two fittings for inlet and outlet (**rif.1**).
Avoid reducing the cross-section of the pipe by crushing or bends that cause pipe constrictions.
For the connection use a pipe with 8 mm inside diameter and characteristics suitable of “DIESEL FUEL”.

3.8 Electrical connection

Open the cover (**ref.2**)
Make the ground connection on the terminal board (**ref.3**).
Use the core hitch (**ref.4**) to enter in the connection compartment.
Connect the power cable 230/400V (**ref.5**) to a hose clamp on the magnetothermal switch.
Use a standard cable with adequate cross-section.

3.9 External emergency connection

Provision has been made for connection of an external emergency button if necessary.

3.10 Connecting to the vehicle battery

Connect to the positive pole (**+**) of the battery by a standard cable with adequate cross-section.
To the point (**ref.6**) (**+**) of the generator.
Connect the point (**ref.7**) (**-**) of the generator directly to the negative pole of the battery or the vehicle chassis, ensuring that the connection is properly made, removing any paint or rust from the contact surface.
Protect the contact points with grease.

3.11 External battery connection

It’s possible to install an auxiliary battery for the generator group. See instruction in previous paragrafe.
The electrogen group is provided by a battery recharger 30A 12V.

DANGER

When interventions of maintenance are performed on the generating set disconnect the battery negative pole to avoid accidental startings.

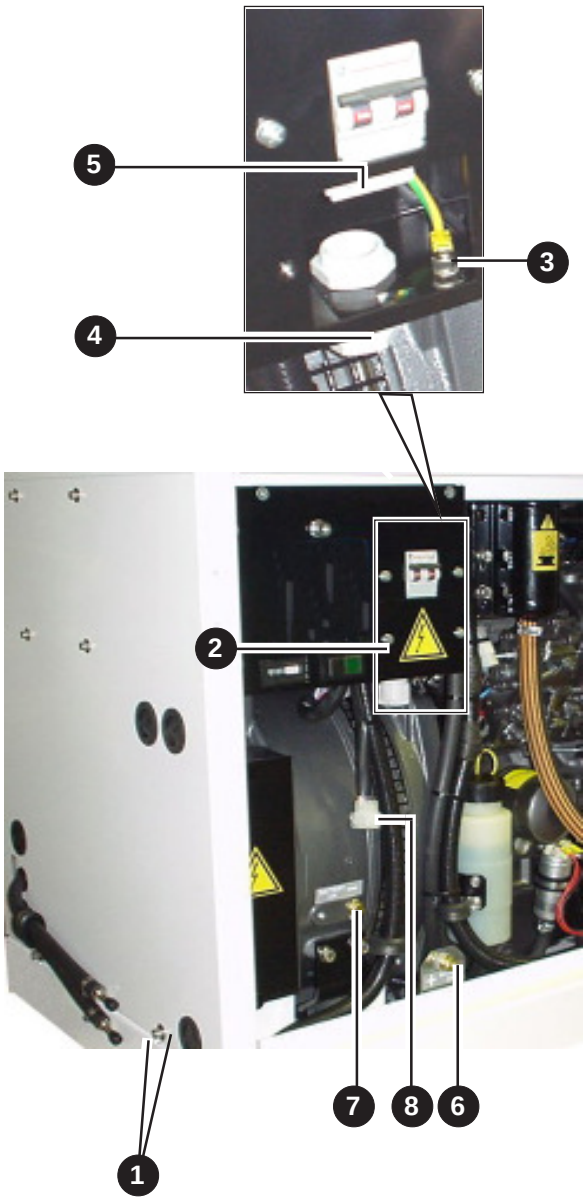

Fig.4

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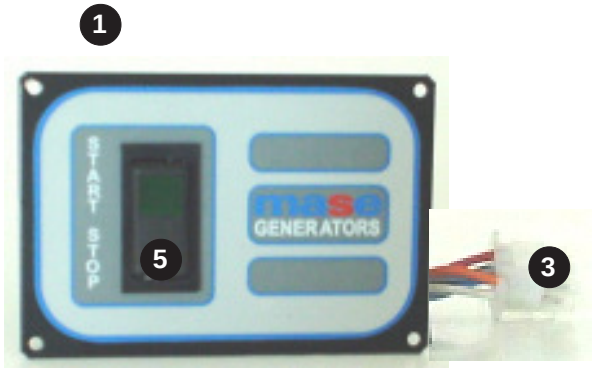
3.12Connecting to the remote control panel

Basic configuration remote control panel with extended cable 20mt. (fig.5,ref.1)
Choose the most comfortable position for use of the remote control panel and fix it.
Connect the cable extension to the generator control panel (**fig.5 ref.2**) throught the connector (**fig.5 ref.3**).
The remote control panel and the cable extension are supplied as standard with the generator.
Panel cut-out for control panel housing (**fig.5 ref.4**).



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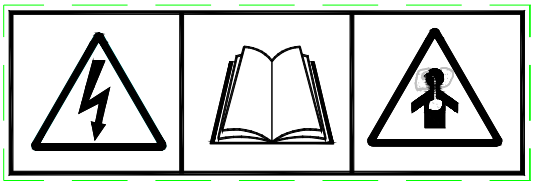
4. USING THE GENERATOR

4.1 Starting the generator



Before starting the generator check that all the doors are closed and the bipolar magnetothermal switch are open (ref.1).
Before starting the generator ensure that all the preliminary checks have been carried out.
Proceed with starting as follow.

Start
Press the **ON/OFF** pushbutton (**ref.2**) to turn on the module. It will show "**mase**" logo on display.
Press and hold pressed the **START** pushbutton (**ref.3**) in order to preheat the glow plugs (pre-starting) and then start the engine. Release only when the engine is started, paying attention to not exceed 5 seconds for each starting attempt and doing a pause of about 30 seconds between them.
Press the remote **START** (if equipped with remote control), that controls the starter in the same mode as the start button on board module.

⚠ CAUTION
Do not make more than 5 consecutive starting attempts as you may damage the starter motor.

4.2 Stopping the generating set

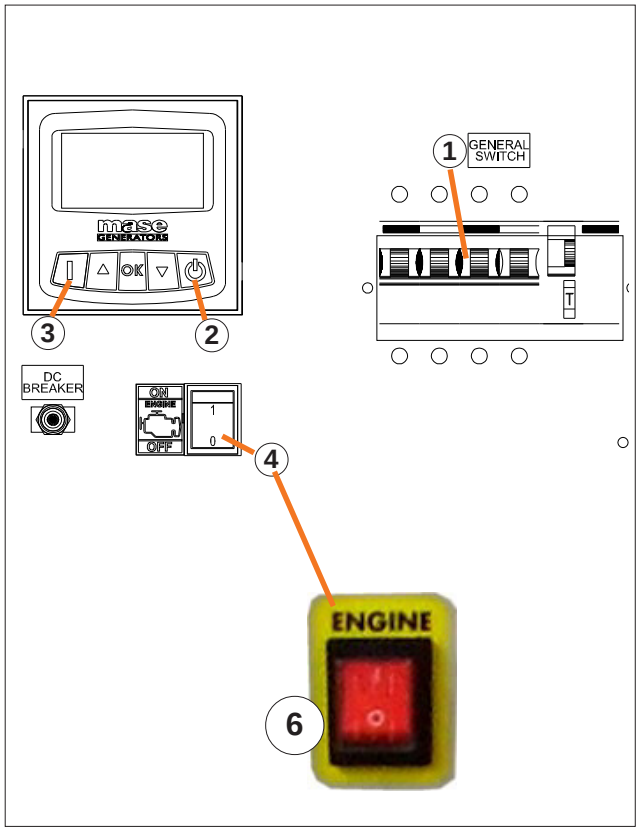
Stop the generator by pressing the **STOP** button on the control panel (**ref.2**). The generator can be stopped also by setting the switch (**ref.6**) to the "**0**" position.
Press the remote **STOP** (if equipped with remote control), for stopping generator in the same mode as the onboard module **STOP** button.

4.3 Stopping from the remote control panel

Disconnect the load and let the generator run for about 1 minute.
Press the button on "**STOP**" (**fig.5 ref.5**).

4.4 Emergency stop

For an emergency stop (**ref.6**) of the generator, set the emergency switch to "**0**".
Once the causes that determined the need for an emergency stop have been eliminated, reset the emergency switch to "**1**" to return to the operating conditions.



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4.5 ENGINE PROTECTION MODULE

CBU device (Can-Bus transmission unit) controls and driving the genset.
Large display and the control push-buttons allow an easy use and monitoring of the CBU unit.

Displayed information

- **Voltage Vac**
- **Frequency Hz**
- **Hourmeter**
- **Battery voltage of the genset**
- **Voltage of onboard batteries**
- **Low oil pressure alarm**
- **High engine temperature alarm**
- **High alternator temperature alarm**
- **Engine preheating**
- **Stop alarms**
- **Storage and back-up of alarms**
- **Maintenance warning (first 50 hours)**

Input / Output signals - Commands - Checks

- **Connector mod. 485 for MODBUS protocol. (It allows monitoring and driving the genset by the boat main control monitor)**
- **Output all included alarms (optional)**
- **Input battery voltage of the genset**
- **Input Start/Stop from remote panel**
- **Switch off button**
- **Scroll through display buttons**
- **Several possible modules in parallel mode connection (1 onboard + 1 on remote panel)**
- **Emergency push button (predisposition)**

⚠ CAUTION

The low oil pressure protection does not give an indication of the oil level.
The oil level must daily be checked in order to prevent damage to the engine.

⚠ CAUTION

The engine correctly works if it doesn't exceed inclinations max of 30° for up to 3 minutes and 25° without limits of time, in comparison to both longitudinal and transversal axles. If the engine works to greater inclinations, it risks an insufficient lubrication and/or aspiration of oil from the filter air.

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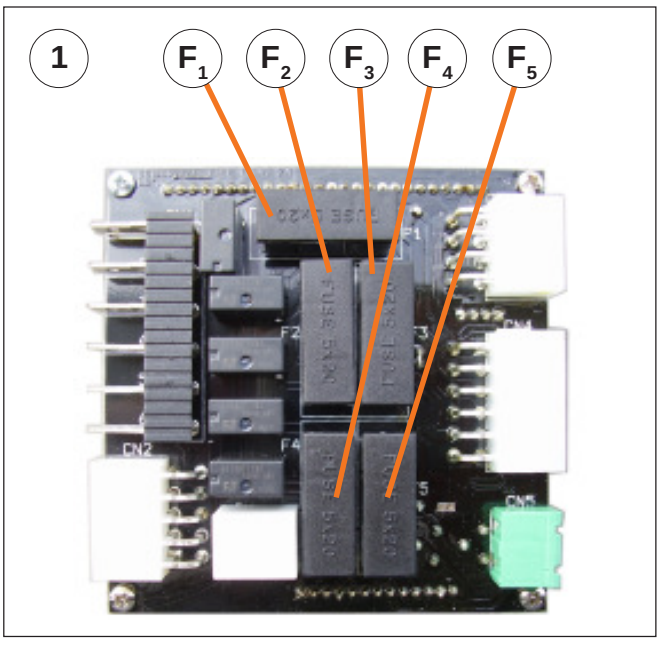
Alarm code	Simbol	Alarm name	*Description*
0		Emergency stop	Means that the emergency pushbutton is pressed.
2		Alternator failure c.b. D+	If enable, means that battery charger alternator is not detected at engine running D+
3		Missing engine stop	Means that, after engine is stopped, the electronic board detects active parameters as the engine is still running.
4		Mechanical failure	If generator is running, means that all detected parameters are simultaneously missing.
9		Pre-alarm analog temperature	Means that the detected temperature by analog sensor rised up over the setted pre-alarm limit.
10		High engine analog temperature	Means that the detected temperature by analog sensor rised up over the setted alarm limit.
12		Pre-alarm analog oil pressure	Means that the detected oil pressure by analog sensor is lower than the setted pre-alarm limit.
13		Analog low pressure oil	Means that the detected oil pressure by analog sensor is lower than the setted alarm limit.
16		High level battery	Means that the battery voltage is too high.
17		Low level battery	Means that the battery voltage is too low.
20		Generator: low frequency	Means that the generator frequency is too low.
21		Generator: high frequency	Means that the generator frequency is too high.
22		Generator: low voltage	Means that the generator votage is lower than the setted alarm thresold.
23		Generator: high voltage	Means that the generator votage is higher than the setted alarm thresold.
24		Alternator high temperature	Manse that the high engine temperature contact is open.

4.6 Protection Against Short-circuits And Overload

The generator is protected against short-circuits and electrical overload.
A magnetothermal switch cuts off the electrical current when a short-circuit occurs or when the current delivered exceeds the rated value

⚠ WARNING

Before restoring the current delivery remove the cause of the cut off, then disconnect the loads and restore the magnetothermal switch on "ON" position.



4.7 Protection Against Short-circuits Of Low-voltage Electrical System.

The low voltage electric plant is protected by 2 thermal switch, they shutdown the generator set.
The first thermal switch stops the generator set, turns off all the alarm light and prevents the starting.
The second thermal switch stops the generator set when there is a stop electromagnet failure on the generator set.
N.B. It does not prevent the START command, the alarm lights are active. Press the thermal switch to restore the contact.

4.8 Fuses @

- Protection module fuses
On the printed circuit of the engine protection module there are five fuses (**ref.1**) to protect the module.
Remove the frontal panel unscrewing the 4 screws to enter in it.

F_1 : 5A 5x20mm for relay "ALARMS"
F_2 : 5A 5x20mm for relay "IP" (insulated poles)
F_3 : 5A 5x20mm for relay "RUNS"
F_4 : 5A 5x20mm for relay "GLOWS"
F_5 : 5A 5x20mm for relay "EV" (solenoid)

GB

5. CARE AND MAINTENANCE

5.1 Preamble

DANGER

Before opening the engine compartment door, switch off the generator from the remote control panel. Before any type of maintenance operation, deactivate the starting panel onboard the machine disconnecting the switch (fig.7 ref.1) on STOP.

DANGER

Failure to observe this procedure, may result in accidental starting!

DANGER

Any maintenance operation on the generator or the electrical line must be carried out with the engine off and leaving it to cool down sufficiently. If necessary, disconnect the battery from the generator. This type of operation must be carried out by authorised and duly trained personnel.

It is recommended to scrupulously follow the instructions in the manual provided by the engine manufacturer with each generator.
It is important to regularly inspect and carry out maintenance on the generator. The frequency of maintenance should be decided on the basis of the number of hours of operation.

5.2 Ordinary engine maintenance

The periodic maintenance operations to be carried out on the engine are indicated in the table in point **fig.8**. For more detailed information consult the manual provided by the engine manufacturer with each generator.

WARNING

- ***Check the oil level with the cap/dipstick (fig.7ref.2). The oil level must always be between the MAX and MIN notches on the dipstick (fig.7ref.4).***
- ***When checking the oil level, ensure that the generator is positioned horizontally.***

@ 5.3 Engine oil change

Use diesel engine oil.
Top-up and fill through the hole indicated in **fig.7 ref.3**.
For detailed information in this connection, consult the engine use and maintenance manual which accompanies the machine.
It is recommended to drain the oil when it is still sufficiently warm to flow easily.

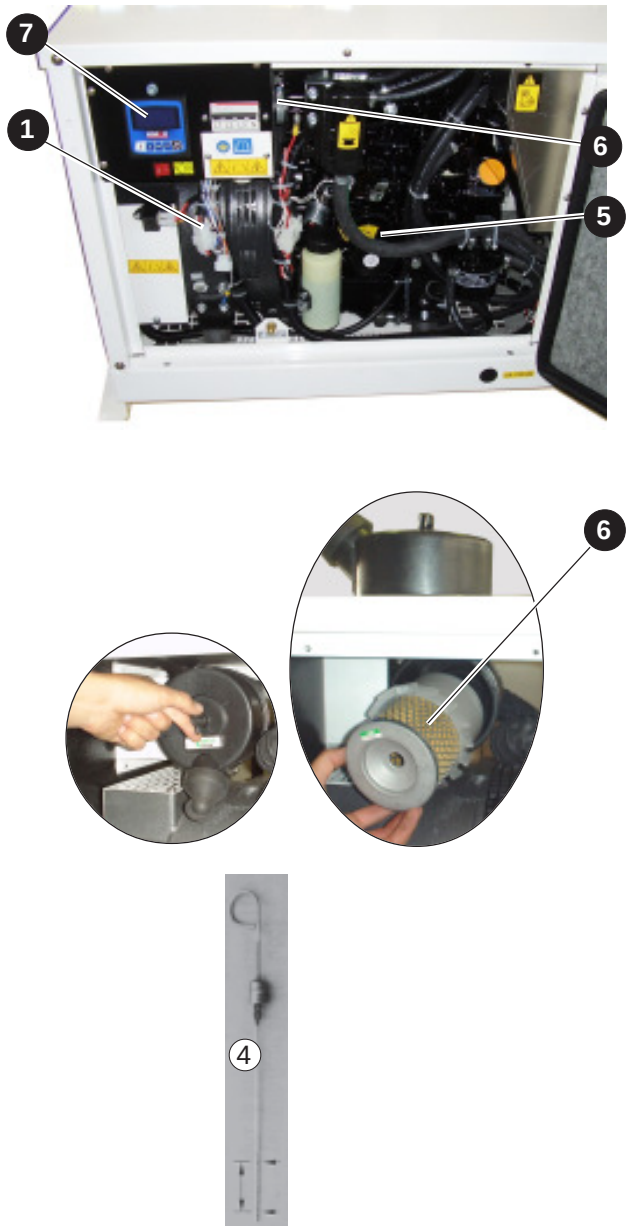


Fig.7

INFORMATION

Always check correct viscosity of the engine oil in relation to the range of ambient temperatures in which the generator operates as indicated in the table.

WARNING

Dispose of the used oil in an appropriate manner, since it is a polluting product.
Take the used engine oil to special collection centres for disposal.

CAUTION

Protect the hands from contact with oil by wearing gloves.
In the event of accidental contact with engine oil, thoroughly wash the affected part with soap and water.

CAUTION

During oil top-up and refuelling, respect the maximum level indication. An excessive quantity of engine oil may cause damage to the engine.

@ 5.4 Oil filter

To replace the oil filter see tab **fig.8**
The oil filter is accessed by removing the retaining screw (**fig.7 ref.5**).

5.5 Air filter

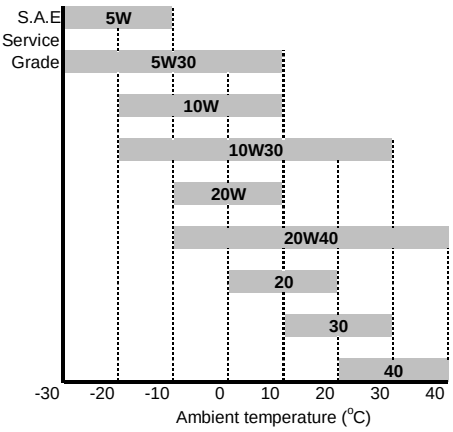
For proper functioning and a long life of the engine it is important to periodically clean and replace the air filter. An inefficient filter may cause loss of engine power and excessive smoke at the exhaust.
To replace the air filter (**fig.7 ref.6**), carry out the following operations:
- To access the air filter remove the dashboard (**fig.7 ref.7**)
- Remove the cover from the filter holder by unscrewing the screws.
- Remove the filter, extracting it from its housing and clean or replace it.
- The paper element is cleaned with a blast of dry air, from the inside to the outside, with a pressure not exceeding 2 bar. Should it be very dirty or have holes, replace it.
- Position the filter and remount the cover.

WARNING

Replace the air filter for the first time after 50 hours of operation, then every 200 hours of operation. Reduce the intervals if the generator operates in particularly dusty environments.

CAUTION

Never turn on the engine without the air filter, since this would cause serious damage to the engine.



OPERATION	hours
Check level oil	10
Check level refrigerant liquid	10
Check liquid battery	50
Check trapezoidal strap	100
Substitution I oil carter	200
Substitution refrigerant liquid	anno
Substitution filter oil	400
Substitution I filter air	400
Substitution combustible filter	400
Record game balance wheels	400
Setting and cleaning injector	400

(*) To perform the change oil the first time after 20 hours of job.

Fig.8

GB

5.6 Replacing the fuel filter @

To assure a long life and proper functioning of the engine, it is extremely important to periodically replace the fuel filter cartridge, respecting the frequency indicated by the engine manufacturer as listed in the table in **fig.8**
This operation is carried out following the steps below:
- close the fuel cock if provided by the installer.
- unscrew with a special wrench and replace (**fig.9 Ref.7**).
- remove the old cartridge and position the new one.
- for reassembly repeat the operations in reverse order.

When the cartridge has been replaced, the fuel feed system must be bled following the operations described in Paragraph **4.1** for first starting.

CAUTION

Do not let the skin come into contact with the fuel. During maintenance operations wear protective gloves and glasses.
In the event of accidental contact with fuel, thoroughly and immediately wash the affected part with soap and water.

CAUTION

When the operation has been completed, thoroughly clean off any traces of fuel and dispose of the used cloths at special Collection Centres

5.7 Checking the V-belt tension @

The belt is used to transmit the rotary motion from the pulley of the drive shaft to that of the closed-circuit fluid pump and the battery charger DC alternator (**fig.9 Ref.5**).
Adjust the belt tension as follows:
loosen the adjusting screw (**fig.9 Ref. 6**)and move the battery charger DC alternator (**fig.9 Ref. 5**)outwards to increase the tension and inwards to decrease it.
The belt tension is right when it allows, under a thrust force of **8 kg**, a yield of about **10 mm**.

INFORMATION

To prevent the belt from idling, do not spill any oil on it. Clean the belt with petrol if it has oil on it.

DANGER

Keep the hands away from the V-belt and the pulleys once the engine has started.

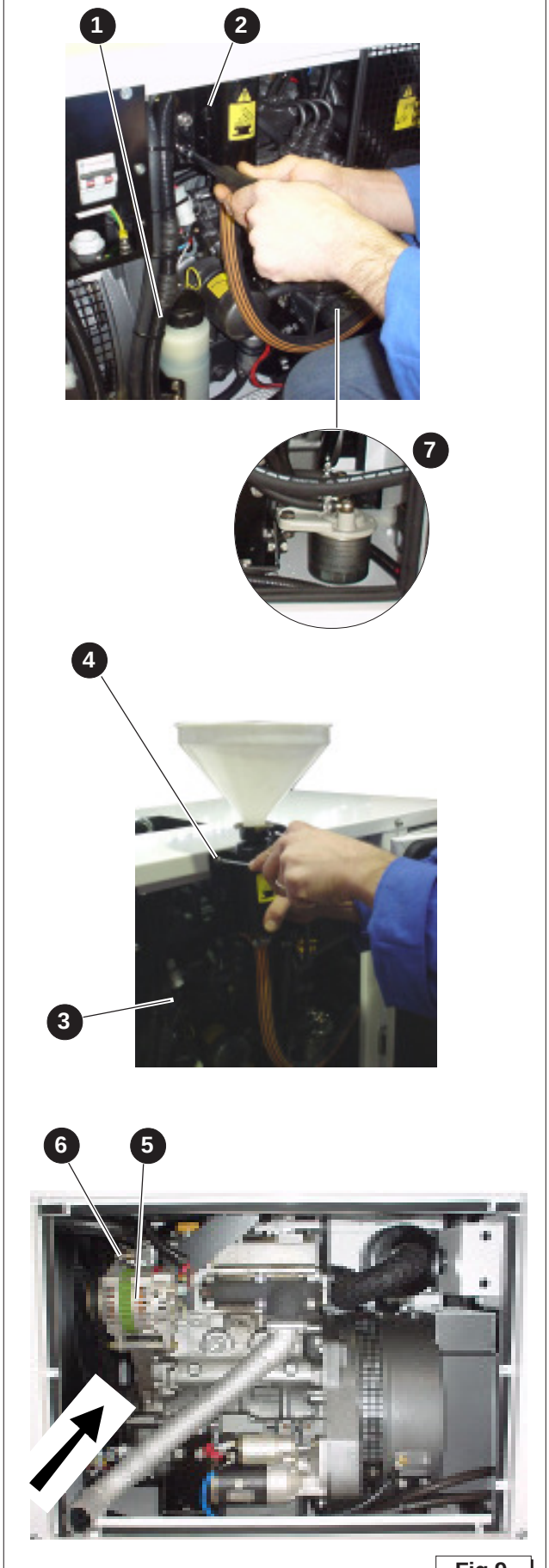


Fig.9

5.8 Coolant check @

Check the coolant with the engine off and cold.
Each time the generator is used check the coolant level which must be at about 2/3 above the height of the cup located above the radiator (**fig.9 ref.1**), which functions as expansion tank. When the level in the radiant block goes down notably, top up bearing in mind that overfilling the cup may cause a quite normal outflow of excess water from the drain pipe during operation.

DANGER ***Don't remove the cover radiator (fig.9 ref.2) when the engine is hot to avoid dangerous spillages of coolant.***

5.9 Coolant replace @

Replace the coolant every year inside the closed circuit of cooling.
Connect a 20 - 30 cms pipe line of rubber to the faucet (**fig.9 ref.3**), situated on the plinth of the motor, to facilitate the harvest of the exhausted refrigerant liquid inside a container of harvest. Open the faucet and empty completely the closed circuit of cooling.
At operation completed close the faucet and fill the circuit again with new refrigerant liquid getting off the vase (**fig.9 ref.2**) and fix it through the screw (**fig.9 ref.4**).

INFORMATION

Dispose of the used refrigerant liquid in an appropriate manner, since it is a polluting product.
Take the used refrigerant liquid to special collection centres for disposal.

5.10 Alternator maintenance

The alternator used on this model is the synchronous, self-excited type with electronic voltage control. This model alternator, without manifold and brushes, does not require particular maintenance operations. The checks and periodic maintenance is limited to removing any traces of damp and oxidation which might damage it.

5.11 Battery maintenance

To start all the generator models it is recommended to use an **80 A/h** battery for ambient temperatures above 0°C and **100 A/h** for lower temperatures. Before installing a new battery it is important that it has been subjected to a complete charging cycle.
At least once a month, check the level of the electrolyte and if necessary top up with distilled water.
If the generator is not used for a long period of time, it is advisable to disconnect the battery and store it in a dry place with temperature higher than 10°C.
The positive terminal of the battery must be protected with Vaseline to prevent corrosion and the formation of oxide.

INFORMATION

If necessary, top up with distilled water.

CAUTION

If the battery is left completely flat for long periods of time, there is a risk of irreparably damaging it.

WARNING

For top-ups with sulphuric acid it is essential to use already prepared solutions

CAUTION

The battery top-up operations with distilled water and/or acid must be carried out wearing protective rubber gloves and glasses to prevent accidental contact of sulphuric acid with the skin.
In case of accidental contact, carefully wash the affected part with soap and water and consult a doctor.

INFORMATION

Before proceeding with charging the batteries, check the electrolyte level and, if necessary, fill up with distilled water. This operation must be repeated when the charging cycle has been completed.

5.12 Period of inactivity @

If the generator is not to be used for long time, do the following operations.

- Change the engine oil.
- Clean the air filter.
- Disconnect the battery cables. We recommend you recharge the battery every month in order to prevent it from going completely flat which, sometimes, compromises its integrity.
- Clean the outside of the generator, removing all dust and impurities.

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6 ANOMALIES, CAUSES AND REMEDIES

6.1 Breackdown table

The starter motor turns but the main engine does not ***start***

- Check that there is fuel in the tank (fill up)
- Check that the stop solenoid valve is powered. (consult Service Centre) (**fig.10 ref.1**)
- Check fuel pump functioning (consult Service Centre)
- Perform operations of drainage from air beads inside the fluel circuit (**see par. 4.1**)

The engine protection module is not activated pressing the pulsating START

- Check if the thermal interrupter (**fig.10 ref.2**) of protection is open. (To restore the contact pressing on the button).
- Check the cables and the clamps of connection to the battery and the electric connections. (Reconnect).
- Check the integrity of the battery. (Reload or Replace).

The generator switches off during the operating period

- Check if there is fuel in the tank. *Fill up*.
- Check if the low oil level protection has been activated; Check the level and if low, add the oil necessary to bring it up to the correct level(**fig.10 ref.3**). *There are no warning lights; always carry out a visual inspection*.

The engine runs irregularly

- Check the fluel filter (**fig.10 ref.4**). *(Replace it)*
- Check the air filter. *Clean its elements or, if necessary, replace them*.
- Perform operations of drainage from air beads inside the fluel circuit (**see par. 4.1**)

There is high smoke emission from the exhaust.

- Check the air filter. *Clean its elements or, if necessary, replace them*.
- Check that the oil level does not exceed the **MAX** notch. *Bring it down to the correct level*.
- Check the generator group is not overloaded.

@ **The tension of the alternator is too much low.**

- Correct the value of the tension acting on the electronic regulator (**fig.10 ref.6**).
- Check the rpms motor (1560 rpms without connected uses) (**fig.10 ref.5**).
- Regulator of tension breakdown (Replace).

@ ***Starter battery flat.***

- Check the electrolyte level in the battery. *Fill up*.
- Check the battery charging device. *Replace*.
- Check integrity of the battery.

The generator does not deliver power to the outlets.

- Check that the differential magnetothermal switch, (**fig.10 ref.7**)or a magnetothermal switch, is in the **ON** position (consult Service Centre).

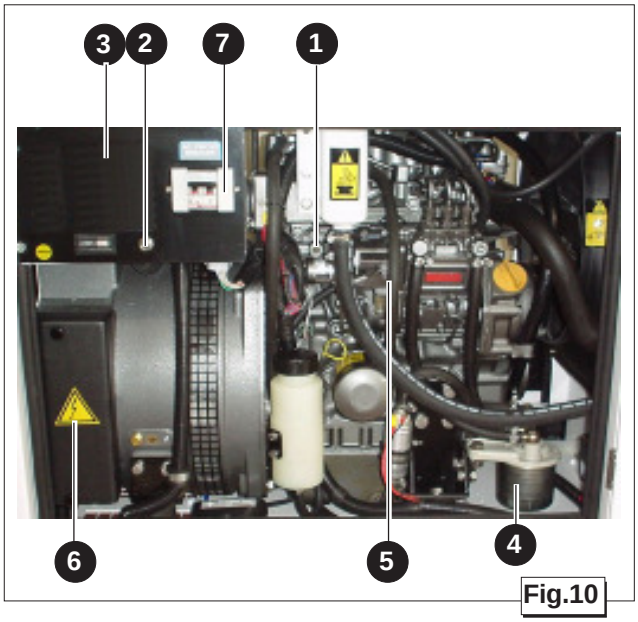

Fig.10

7. WIRING DIAGRAM

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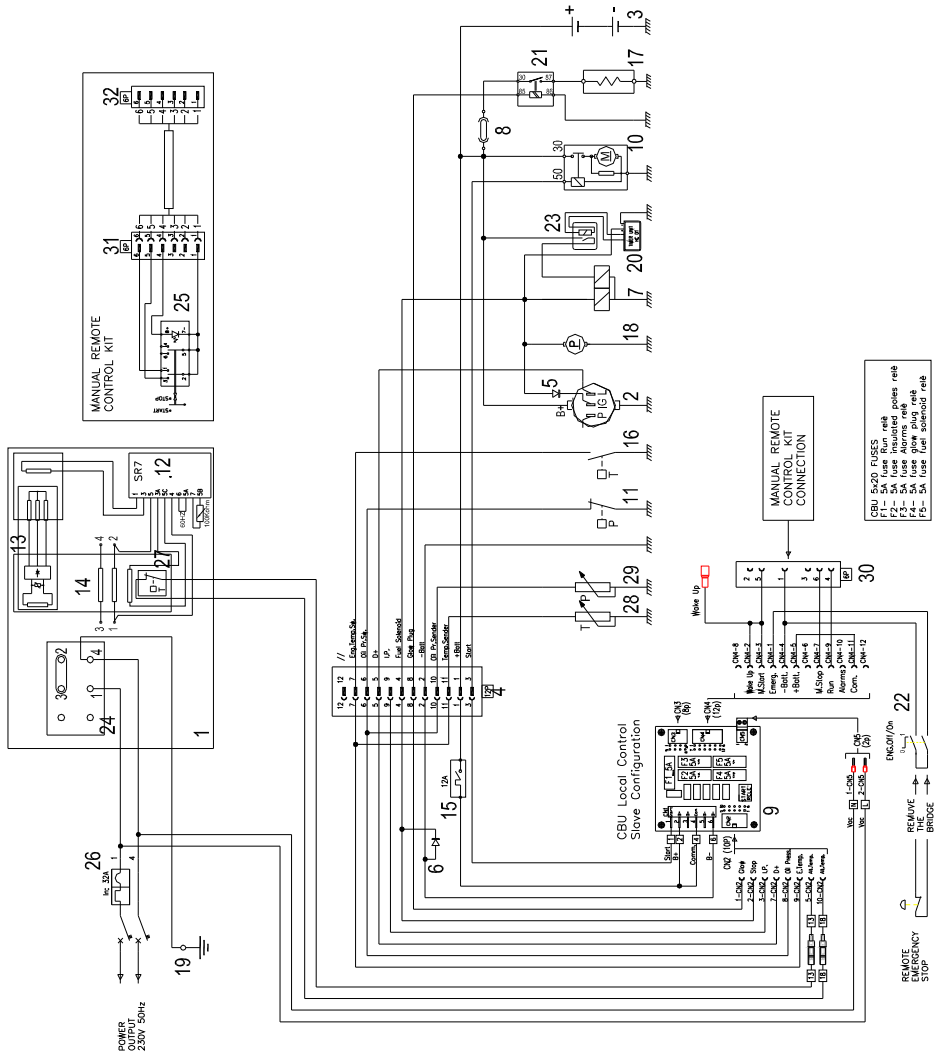
VOYAGER 9.5DM



1	ALTERNATOR	12	ELECTRONIC VOLTAGE REGULATOR
2	BATTERY CHARGER ALTERNATOR	13	ROTOR
3	BATTERY	14	STATOR
4	12 POLES CONNECTOR	15	THERMAL SWITCH
5	DIODE	16	ENGINE THERMOSTAT
6	DIODE	17	PREHEATING
7	STOP ELECTROMAGNET	18	FUEL PUMP
8	FUSE	19	GROUND CONNECTION
9	ENGINE PROTECTION MODULE	20	TIMER UNIT
10	STARTER MOTOR	21	RELAY
11	OIL PRESSURE SWITCH	22	0/1 SWITCH
		23	RELAY
		24	ALTERNATOR TERMINAL BOARD
		25	START-STOP BUTTON
		26	MAGNETOTHERMAL SWITCH 1P+N
		27	ALTERNATOR THERMOSTAT
		28	TEMPERATURE SENSOR
		29	OIL PRESSURE SENSOR
		30	6 POLES CONNECTOR
		31	6 POLES CONNECTOR
		32	6 POLES CONNECTOR

Cod.48665 Fig.11

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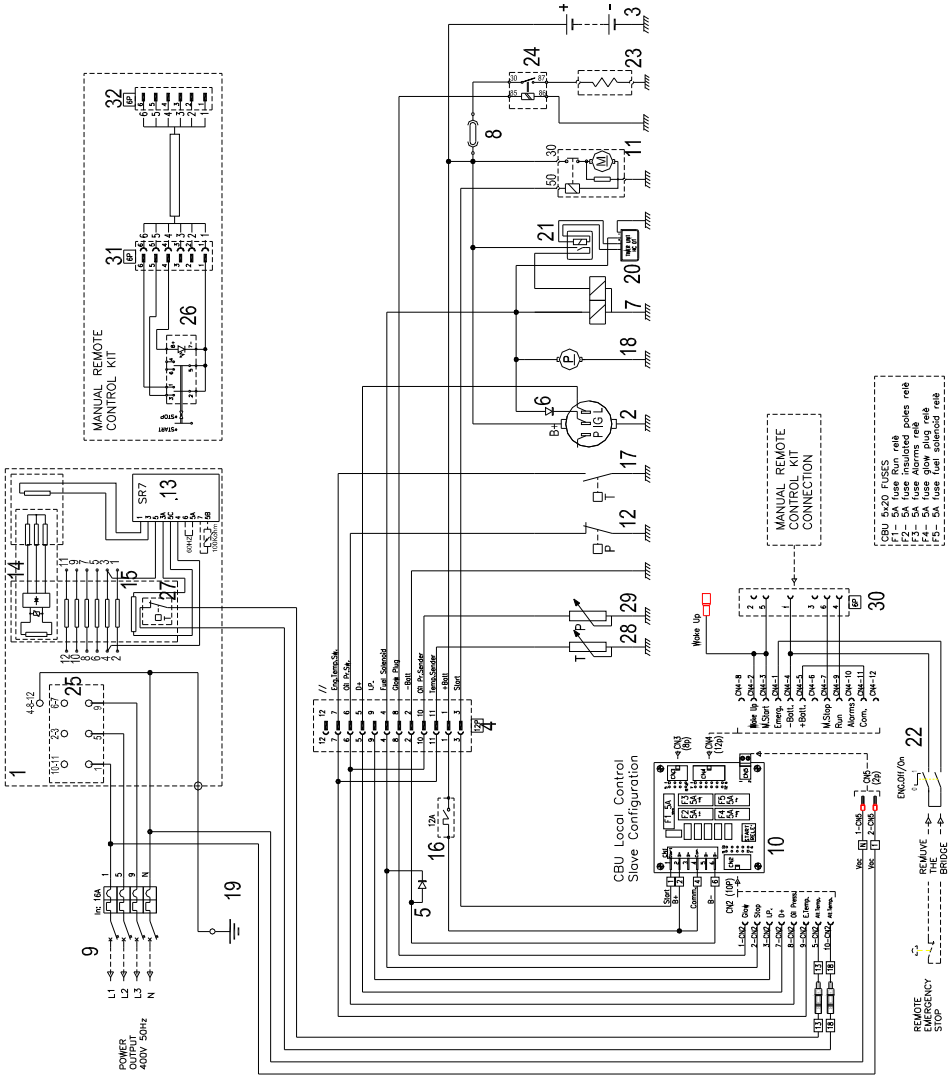
VOYAGER 11.5 DT



1 ALTERNATOR
2 BATTERY CHARGER ALTERNATOR
3 BATTERY
4 12 POLES CONNECTOR
5 DIODE
6 DIODE
7 STOP ELECTROMAGNET
8 FUSE
9 4-POLE MAGNETOTHERMAL SWITCH
10 ENGINE PROTECTION MODULE
11 STARTER MOTOR
12 OIL PRESSURE SWITCH
13 ELECTRONIC VOLTAGE REGULATOR
14 ROTOR
15 STATOR
16 THERMAL SWITCH
17 ENGINE THERMOSTAT
18 FUEL PUMP
19 GROUND CONNECTION
20 TIMER UNIT
21 RELAY
22 0/1 SWITCH
23 PREHEATING
24 RELAY
25 ALTERNATOR TERMINAL BOARD
26 START-STOP BUTTON
27 ALTERNATOR THERMOSTAT
28 TEMPERATURE SENSOR
29 OIL PRESSURE SENSOR
30 6 POLES CONNECTOR
31 6 POLES CONNECTOR
32 6 POLES CONNECTOR

Cod.48669 Fig.12

8. TRANSPORT. STORAGE. LIFTING AND HANDLING

8.1 Transport and storage

Packaging: Supplied directly by Mase Generators.
The total weight of the packed generator is given in **Paragraph 2.5 "Table of technical characteristics".**
It is strictly prohibited to pollute the environment with the packaging

Transport: During transport the generator (with or without packaging) must be protected against atmospheric agents, it must not be turned upside down and must be protected against knocks. The generator must be transported without oil and fuel to prevent leaks during travel.

Storage: The generator must be stored in horizontal position and away from atmospheric agents and humidity.

8.2 Lifting and handling

CAUTION

Always check that the capacity of the lifting means and its accessories is greater than the weight of the generator printed on the identification plate.

Use a lift truck to handle the generator (with capacity greater than the weight of the generator indicated in the table of technical characteristics - Paragraph **2.5** of the Use and Maintenance Manual), inserting the forks under the base at the lower part of the generator.

For lifting with a crane, hook steel cables or robust chains onto the special points marked with the label "lifting hook" (or an eye-bolt for the smaller generators) taking care not to crush or damage any part, lift the generator without jerking and place it on the ground gradually, then move it carefully (with a lift truck or transpallet) to its working place.

For handling on level ground, a transpallet is sufficient with a suitable capacity according to the table of technical characteristics - Paragraph **2.5** of the Use and Maintenance Manual.

N.B. The centre of gravity of the generator corresponds to about the centre of its geometrical volume.

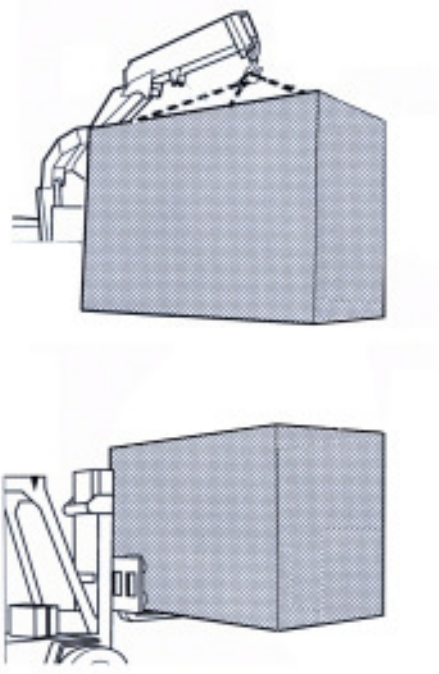


Fig.13

GB

9 GUARANTEE AND RESPONSIBILITY

9.1 Guarantee

- The **mase** generators and all their components are guaranteed free of defects and are covered by the guarantee for a period of **2 year** from the date of installation.
- Not covered by the guarantee are: failed observance of the installation regulations, damage caused by natural disasters, accidents, defects of the electrical system including the load to which the generator is connected, negligence, improper use or abuse by the operator and damage caused by repairs carried out by unqualified personnel.
- Repairs that cannot be carried out at the place of installation can be carried out at **mase** laboratories or at authorised workshops. Transport expenses will be borne by the Customer.
- Under no circumstances does the Customer have the right to claim compensation for damages or side effects caused by use of the machine in a manner not conform to what is described in this manual.

9.2 Limits of responsibility

mase GENERATORS S.p.A is responsible for anything regarding the safety, reliability and performance of the Generator on the condition that:

- The generator is used by persons trained through the use and maintenance manual.
- The installation is carried out according to **mase** instructions.
- The service procedures are carried out exclusively by **mase** specialised technical personnel.
- The electrical system and the loads to which the generator is connected is in conformity with the applicable CEI regulations.
- The Generator is installed and used in accordance with the installations provided in this manual.
- Use original spare parts specific to each model.
- Use suitable fuel.

10. DISPOSAL

10.1 Disposal of the waste materials deriving from maintenance and scrapping

- The packaging used for transport is biodegradable and thus easy to dispose of by companies authorised for paper collection.
- The batteries must be disposed of according to the regulations regarding toxic and noxious waste.
- The engine oil and engine oil filters, both after an oil change and when scrapping, must be taken to companies authorised for this collection.
- The electrical components must be taken to companies authorised for the collection of electronic material.
- All the painted metal parts must be taken to companies authorised for the collection of metals.
- Any other material not listed above must be taken to companies authorised for the collection of industrial waste.