CE

MANUALE DI USO E MANUTENZIONE I

USE AND MAINTENANCE MANUAL GB

mase GENERATORS

VOYAGER 6020 AUTO

Rev.2 F.M. 28/06/2013

cod.43186

	Tipo modello **N° matricola** **Codice**

Questo manuale deve essere conservato per tutta la durata di vita della macchina a cui fa riferimento

Grazie per aver scelto un prodotto **mase**.

mase Generators è un'azienda leader nel settore dei gruppi elettrogeni ed offre la più vasta gamma di prodotti, in grado di spaziare dai piccoli generatori portatili da 1 KW fino ad unità da 1600 KVA per applicazioni speciali. Fondata nel 1970, si sviluppa a Cesena su un'area di 16000 mq. Da sempre si è distinta per l'alta qualità dei prodotti e per la costante innovazione promossa dall'avanzato Reparto Ricerca e Sviluppo.

mase Generators nasce come azienda produttrice di gruppi elettrogeni portatili da 500W, leggeri e compatti, che hanno consentito al suo marchio di essere conosciuto ed apprezzato in tutto il mondo.

Il gruppo elettrogeno che Lei ha acquistato è il frutto di anni di esperienza nel settore, e per la moderna concezione, il robusto dimensionamento, i materiali impiegati, i continui aggiornamenti, costituisce un'efficace risposta alle esigenze degli operatori del settore.

Questo Manuale istruzioni Le fornirà utili informazioni e preziosi suggerimenti per poter sfruttare appieno tutte le possibilità che il gruppo elettrogeno Le offre.
Qualora parti del manuale risultassero incomprensibili ci contatti immediatamente.
Nel rinnovarLe i nostri ringraziamenti La salutiamo cordialmente.

MASE GENERATORS SPA

MASE GENERATORS S.p.A. Via Tortona, 345
47023 Cesena (FC) Italy

Tel.+39-0547-354311 Fax.+39-0547-317555

Dati tecnici, informazioni,stesura dei testi ed allestimenti grafici: a cura dell'Ufficio Tecnico Mase Generators

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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.

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

CONTENT

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DEFINITIONS USED

- 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.

- **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.

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PRELIMINARY PRESCRIPTIONS

CAMPO D'IMPIEGO:
THE GENERATOR GROUP IS PROPER FOR TO PRODUCE IN WAY AUTONOMOUS ELECTRIC ENERGY IN THE LIMITS OF TENSION AND WATT DECLARED BY THE BUILDER

To consult attentively this manual before proceeding to the use to any intervention on the car.

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 EEC; 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.

1 GENERAL INFORMATIONS

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1.1 Conform use

The generator is suitable for independent production of electrical energy within the voltage and wattage limits declared by the manufacturer.
Any other use outside the already stated field of use is prohibited: the generator is intended for industrial use.
The generator has been designed to operate independently (without operator) if not for sporadic checks.
The limits of use are:
- operating temperature: -5° +40°
- relative humidity: 30% - 90%
- the generator is suitable for operation outdo; it may not be operated in closed environments since the generator produces exhaust gas.

Inside installation is subject to approval by **mase** or an installer authorised by **mase**.

Arbitrary modifications to the machine are prohibited for safety reasons.
Original spare parts must be used on pain of losing machine conformity.
All the operations that require dismantling of special parts may only be carried out by technicians authorised by the local dealer or the manufacturer.
Only **mase** technicians or personnel trained by **mase** have the necessary knowledge of the generator and the special equipment as well as the experience to carry out any operation in the most economical and reliable way.

1.2 Residual risks

The generator has been designed taking into account the safety regulations set out in the EC directives and standards; nonetheless, the following residual risks remain:The generator has been designed taking into account the safety regulations set out in the EC directives and standards; nonetheless, the following residual risks remain:

- injury caused by contact with hot parts during maintenance.
- injury caused by electrocution during maintenance on the electric panel.
- risks connected with long periods of exposure to the noise of the generator.
- risks due to contact with the generator lubricants during maintenance.
- risks due to the fire hazard the fuel represents.

Because of the typical intrinsic danger of the Generators, you are reminded that, although the generator has been designed, constructed and tested in accordance with the safety regulations, only proper and careful use can guarantee full safety; to this end, the various precautions to be taken during use of the Generator are listed below.

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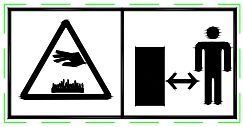
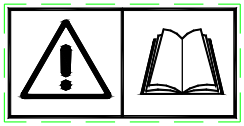
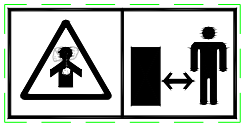
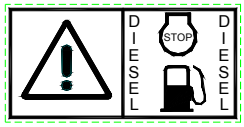
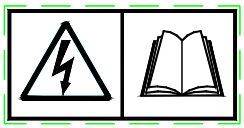
1.3 Symbols on the generator group

1.4 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** SpA 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.
	- The exhaust gases contain toxic carbon monoxide. - Never operate the generator in a closed space. - Provide for adequate ventilation. If installed indoors, scrupulously observe the ventilation regulations.
	- The fuels are highly flammable and in certain conditions also explosive. - Fill up in a well-ventilated area with the engine off. - Do not smoke or create sparks while filling up. - Immediately clean off any fuel leaks.
	- Danger of electric discharge: consult the manual.
	- Danger of electric discharge: consult the manual.
	- Danger of possible corrosive acid leaks.
	- Danger of explosion.

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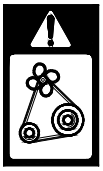
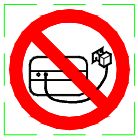
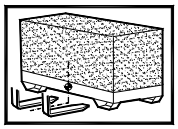
Danger Symbols	Meaning
	- Danger of entanglement and cutting: Presence of rotating parts, pulleys, belts and fan.
	- Danger of burns: Hot surfaces.
	- Danger of burns: Possibility of pressurised hot water expulsion.

Obligation Symbols	Meaning
	- Obligation to connect the generator to earth.
	- Obligation to wear eyes protection.

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 use of open flames.
	- Do not clean, lubricate, repair or adjust moving parts.
	- Do not extinguish fires with water, use homologated extinguishers.

Information Symbols	Meaning
	- Indicates the location of a point of the lifting hook of the generator.
	- Indicates the location of the centre of gravity for the lifting with fork.

1.5 General danger informations

- 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

1.5.1 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 with 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

1.5.2 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

1.5.3 Danger of harm to hearing

- Do not stand near the generator for long periods without protective earmuffs since hearing may be reduced. **Prolonged exposure to noise above 85 dB(A) may cause health disorders. It is in any case recommended to use appropriate protection systems (e.g. headsets, earplugs, etc.).**

DANGER

1.5.4 Danger of intoxication

- The exhaust gases 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 gases are discharged to the outside in a safe position away from doors, windows and air intakes.

DANGER

1.5.5 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

1.5.6 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

1.5.7 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.

DANGER

1.5.8 Danger of electromagnetic radiation

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

DANGER

1.5.9 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.

DANGER

1.5.10 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 **EC** 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

All **mase** generators are designed and manufactured in compliance with the legislation in force.
The generator and its components are constructed in accordance with the following applicable regulations and directives.

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

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).

2.3 Marking

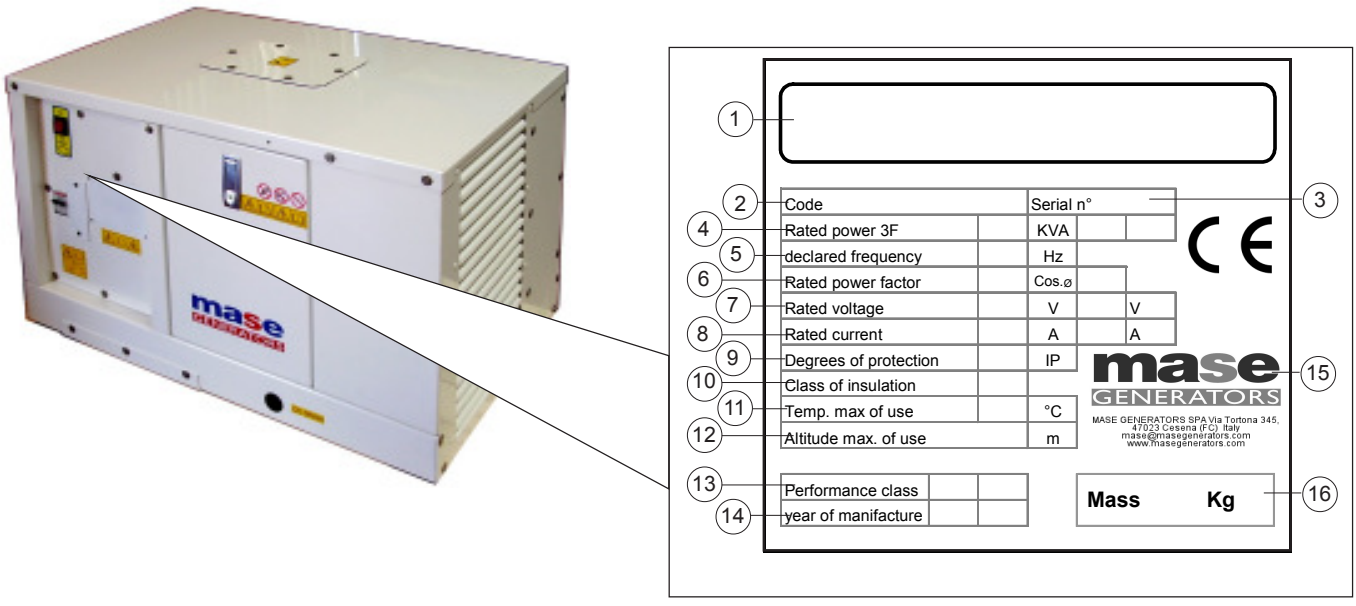
The generator identification plate carries all the identification data in accordance with the provisions for **EC** marking for those cases where required. Below is a facsimile of the identification plate fixed on the hull of each generator.

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

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 characteristics

The ***VOYAGER*** series generators are composed of a diesel-powered combustion engine coupled to an alternator which produces alternating and direct current. 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.

2.6 Tables of technical characteristics

MODEL		VOYAGER 6020 DM	
GENERAL FEATURES			
VOLTAGE		230	**V**
POWER FACTOR (Cos Φ)		1	**0**
MAX POWER (LTP)[1]		6	**kW**
CONTINUOUS POWER (PRP)[2]		5,7	**kW**
POWER FACTOR (Cos Φ)		/	
SINGLEPHASE VOLTAGE		/	**V**
RATED FREQUENCY		50	**Hz**
GRADE OF PROTECTION		IP 23	
MAX TEMP. OF USE		+40	**°C**
MIN TEMP. OF USE		-5	**°C**
DIMENSIONS	L	851	**mm**
	W	567	**mm**
	H	525	**mm**
MASS		190	**kg**
NOISE LEVEL (at 7 m)		62	**dB(A)**
ENGINE			
TYPE		4 STROKE	
MANUFACTER		KUBOTA	
MODEL		Z 482	
DISPLACEMENT		479	**cm^3**
POWER		11,1 - 8,1	**CV - kW**
n° OF CYLINDERS		2	
RATED SPEED		3000	**rpm**
SPEED CONTROL		CENTRIFUGAL MECHANIC	
INDUCTION SYSTEM		NATURAL	
FUEL		DIESEL	
INJECTION SYSTEM		INDIRECT	
FUEL FEEDING PUMPS		ELECTRIC	
MAX PREVALENCE FUEL PUMP		700	**mm**
FULL LOAD CONSUMPTION		2,6	**L/h**
COOLING		WATER	
LUBRIFICATION SYSTEM		FORCED	
OIL SUMP CAPACITY		2,5	**L**
ELECTRIC PLANT		12	**V**
STARTING MOTOR		12 - 0,7	**V - kW**
SUGGESTED STARTING BATTERY		12 - 45	**V - Ah**
BATTERY CHARGER		12 - 10	**V - Ah**
STOPPING SYSTEM		SOLENOID	
ALTERNATOR			
TYPE		SYNCHRONOUS, 2 POLES, SELF REGULATED	
ISOLATION CLASS		H	
VOLTAGE REGULATOR		CAPACITOR	
VOLTAGE STABILITY		A10%	
FREQUENCY STABILITY		A5%	
COOLING		AIR	

(1) Limited - time running power (LTP) ISO 8528-1
It is the maximum power that, under the environment conditions established by the norm ISO 3046/1, the generator group it is able to disburse for a maximum of 500 hours for year, of which a maximum of 300 hours among the interval of maintenance prescribed by the builder. It is accepted the operation to this power conditions the duration of the group. An overload of the 10% is admitted only for regulation.

(2) First powers (PRP) ISO 8528-1
It is the available maximum power for a variable power cycle that the generator group is able to disburse for a boundless number of hours for year among the interval of maintenance prescribed by the builder and under the environment conditions established by the norm ISO 3046/1. The middle power during a period of 24 hours, doesn't have to exceed 80% of the PRP.
An overload of the 10% is admitted only for regulation.

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2.7 Configuration

2.8 Generator composition

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

1 Base chassis
2 Openable cowling engine side
3 Support foot
4 Control panel
5 Lock with key
6 Engine
7 Alternator

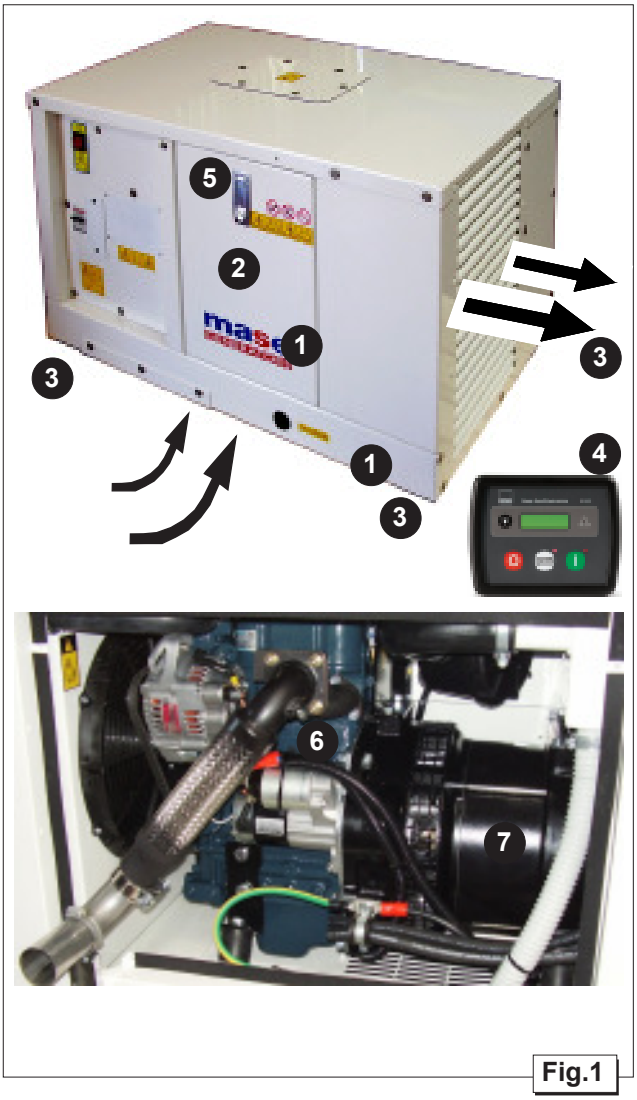


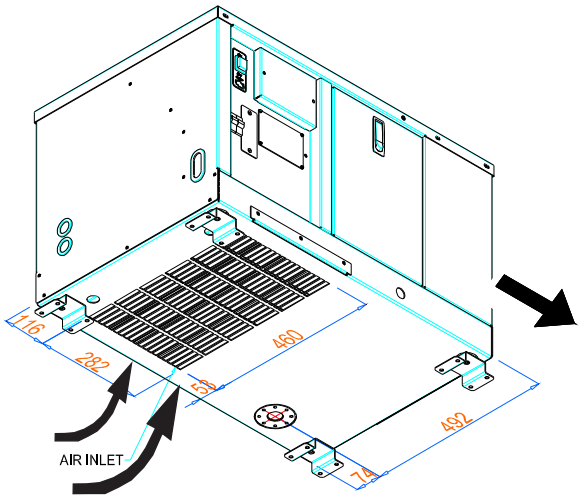
Fig.1

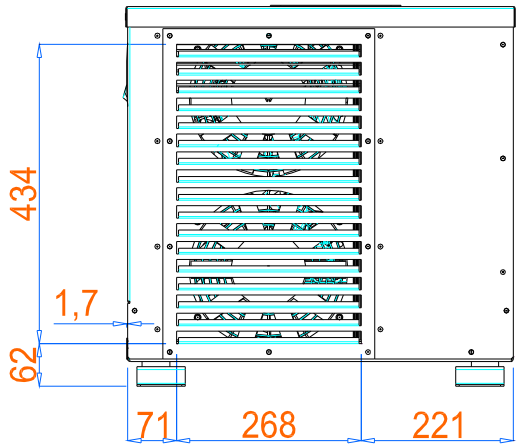
2.9 Instrument and control panel

See Fig. 2
Each generator is fitted with an instrument panel for the controls with the following components:

1 Start engine
2 Auto mode ON/OFF
3 Stop engine
4 Menù navigation button
5 Display
6 Common alarm indicator

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.***

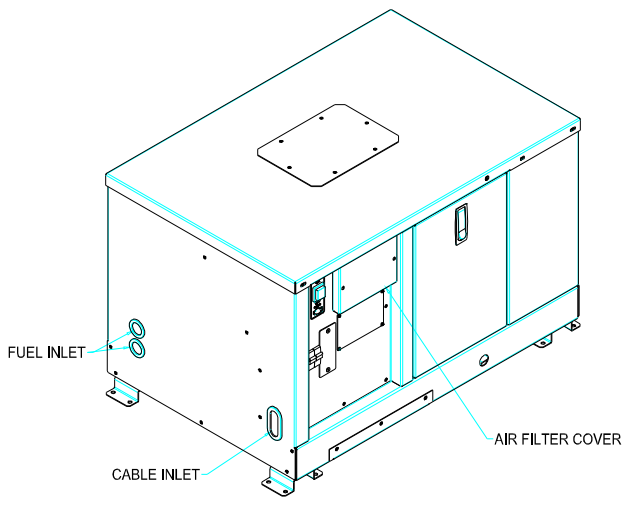
3.1 Features

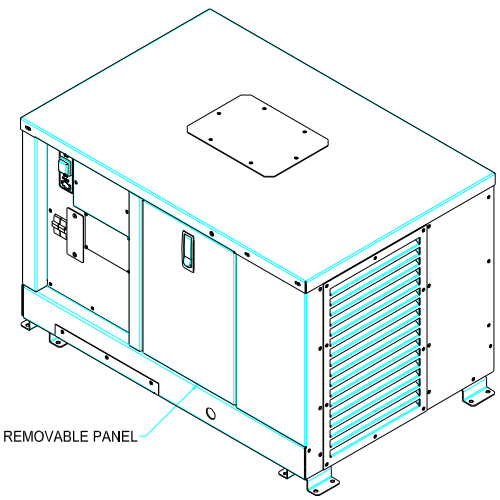
Voyager 6020 is a generator designed for installation on motor vehicles, but can nonetheless be used in a fixed place taking care to leave the cooling air intake and free escape vents . The level of protection against water and entry of foreign bodies is **IP23** which allows using the generator outdoors. 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

Voyager 6020 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.***





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3.5 Exhaust silencer connection

The generator is equipped with an exhaust, a bracket and a clamp. The exhaust can be fitted at the back of the casing using the bracket provided. As shown in **Fig. 8**, the exhaust can be turned in four different directions to meet various installation needs.
To position the exhaust in the lower part of the generator (**Fig. 9**), an OPTIONAL manifold can be supplied which is turned downwards. This replaces the standard manifold. On the bottom of the casing are the holes for securing the exhaust using the bracket provided.
For special types of installation, the exhaust can be fitted at a distance and to lower noise levels, a silencer (**Fig. 7 Ref.1**) can be fitted, in series, using a flexible steel pipe (**Fig. 7 Ref. 2**). For this purpose an (OPTIONAL) SILENCER kit is available for implementing the various exhaust configurations.

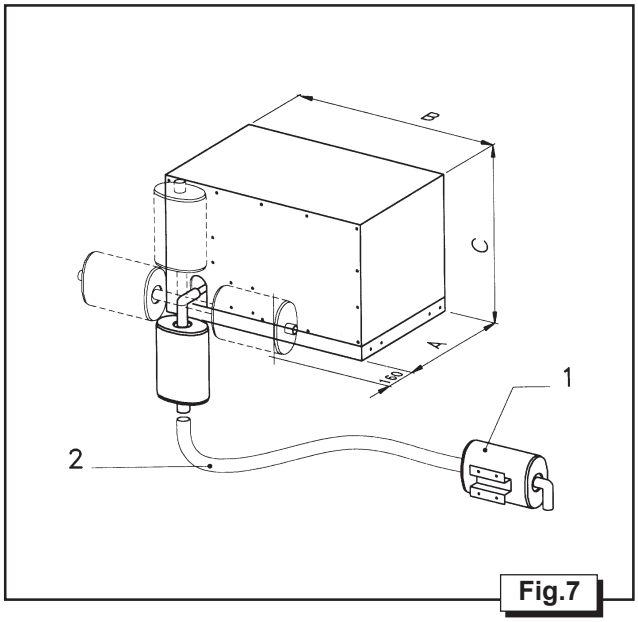

Fig.7

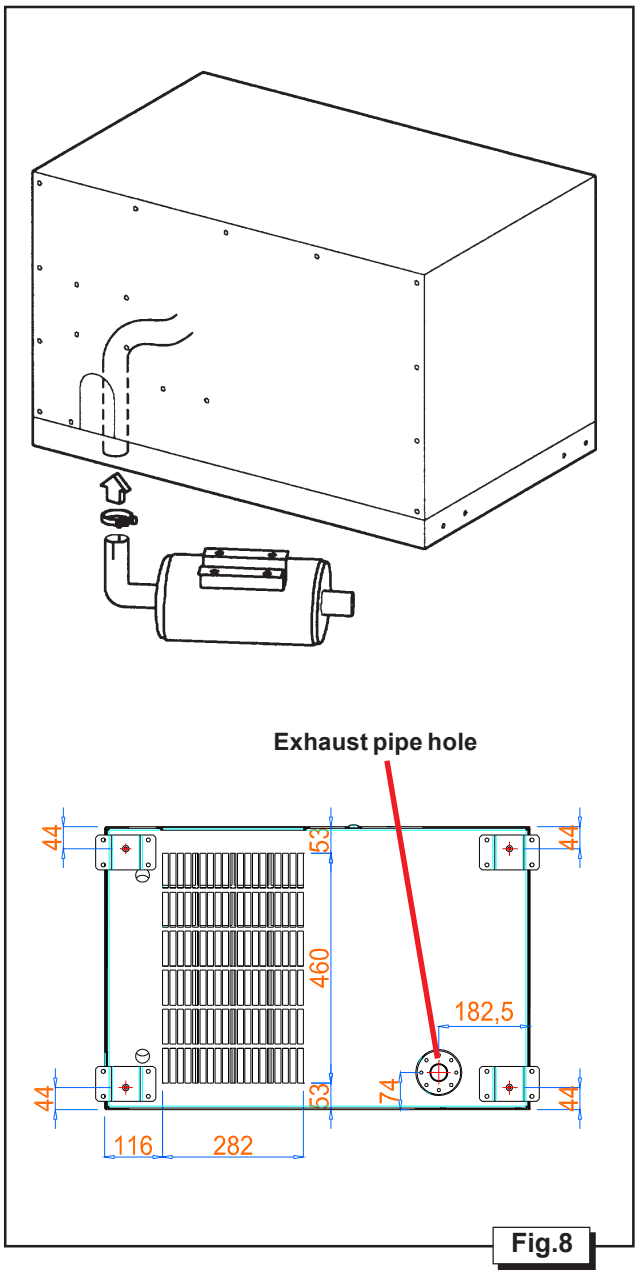

Fig.8

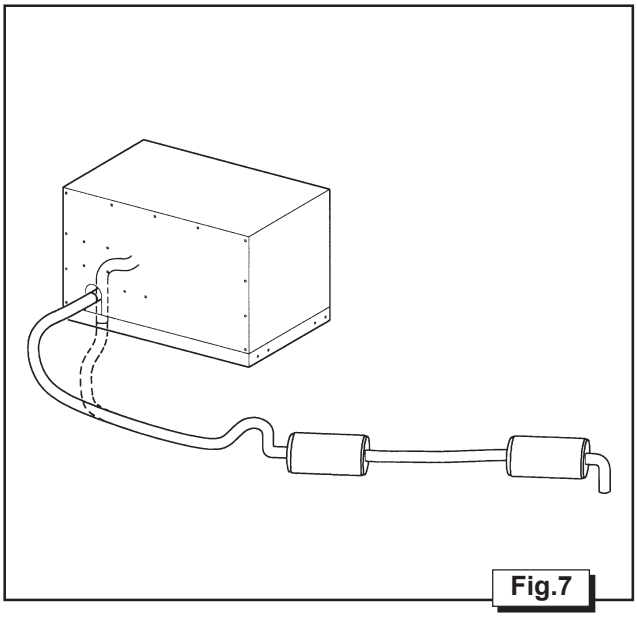

Fig.7

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3.5 Silencer kit (optional)

The kit includes: a silencer, a bracket for fitting the exhaust, a flexible pipe 2 metres long, an elbow, 3 clamps. (**Fig. 10**)

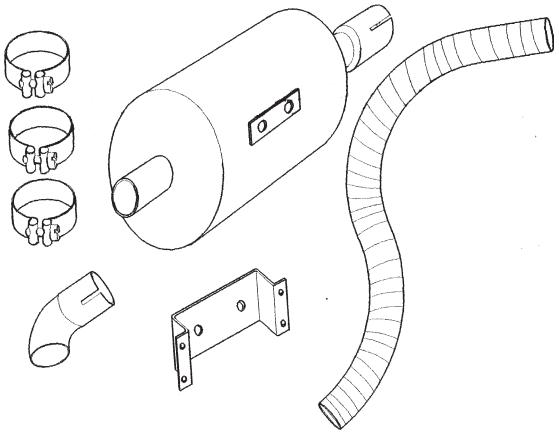


Fig.11

3.7 Fuel circuit

The VOYAGER generator runs on diesel oil and, not being fitted with a tank, has to be connected to an external tank, which can also be that of the motor vehicle itself. The generator is fitted with a suction-compression pump (SC), able to pump fuel up to a maximum height of 50 cm (**Fig. 12**), and with a cartridge filter. It is best to equip the generator-tank connection with: a faucet (**Fig. 12 Ref. 3**), with a water-fuel separator filter (**Fig. 12 Ref. 1**) and with a single-acting valve (**Fig. 12 Ref. 2**) so as to prevent the emptying of the fuel system (use a single-acting valve with 50 millibar aperture). The pipes to be used to connect the generator to the tank must be of hydrocarbon-resistant rubber with an internal diameter of 6 mm.

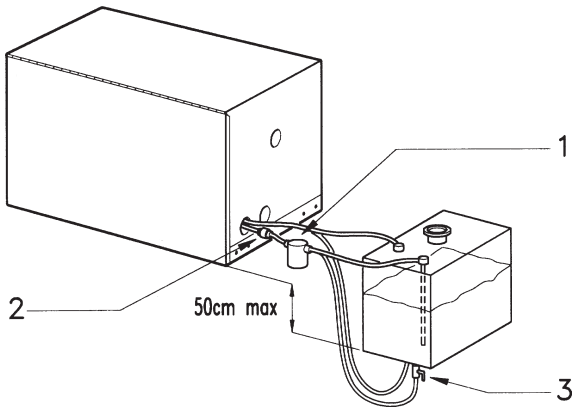
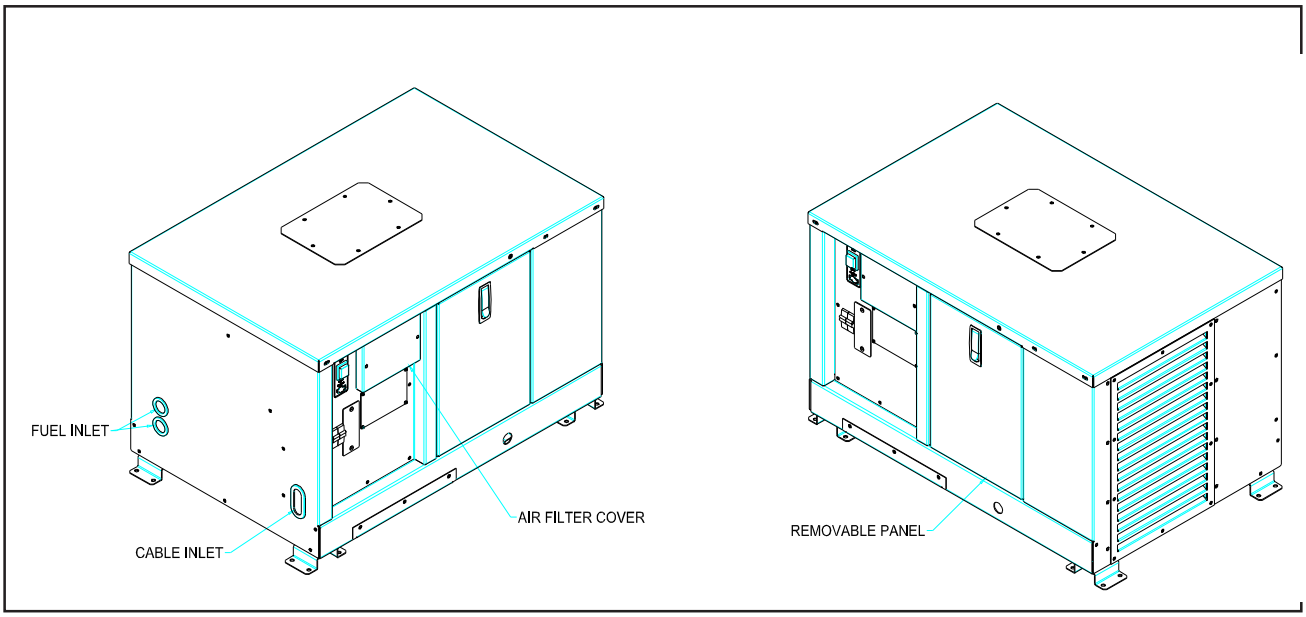


Fig.12



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3.8 Fuel circuit connection

Inside the generator are two pipe fittings (**Fig. 13 Ref. 1**) marked 'DIESEL OIL' and 'DIESEL OIL RETURN' to which the pipes from the tank must be connected. (**Fig. 13 Ref. 2**)
It is important to secure all connections with clamps able to guarantee maximum air-tightness in order to prevent air bubbles penetrating inside the feed circuit. These can cause running problems. Pass the pipes through the special lined holes (**Fig. 14 Ref. 3**) in the walls of the soundproof casing.

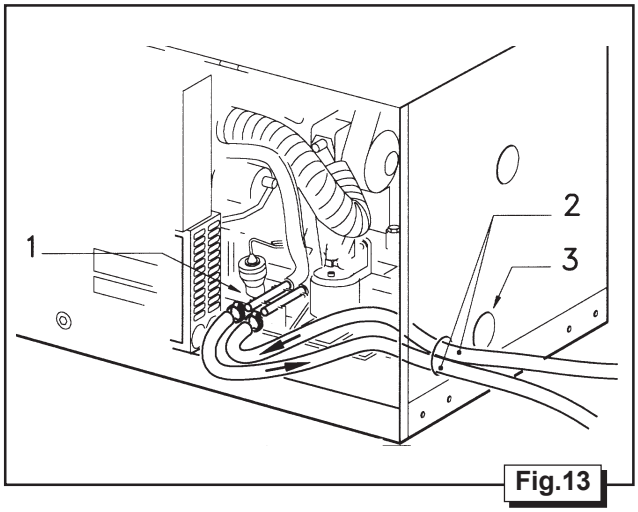


Fig.13

3.9 System bleeding

The presence of air bubbles inside the feed circuit causes irregular motor function or prevents achieving the number of rated revs.
Air can penetrate inside the feed circuit through a faulty-seal joint (pipes, filters, tanks) or when fuel inside the tank is at minimum level. To eliminate the air inside the feed circuit, it will be necessary to first of all remove the cause whereby it got in. Carry out the following operations:

1 - Press the 'ON' button on the control panel and wait until the indicator light 'GLOW PLUG' goes off.
2 - Loosen the bleed screws on the fuel filter and on the injection pump (see motor use and maintenance manual).
3 - Move the SC fuel pump lever manually until all the air inside the feed system comes out through the bleed screws.
4 - Tighten the bleed screws and start the motor.
5 - Repeat the above operation if motor operation is still irregular.

INFORMATION

Refer to the motor use and maintenance manual for more details about the power system.

GB

3.10 Electrical connection

During the VOYAGER generator installation, a series of power connections must be made. The generator must be connected to:
a 12-V battery, the control panel and the power loads.
These operations must be carried out with great care and attention so as not to damage the generator or the connected appliances.

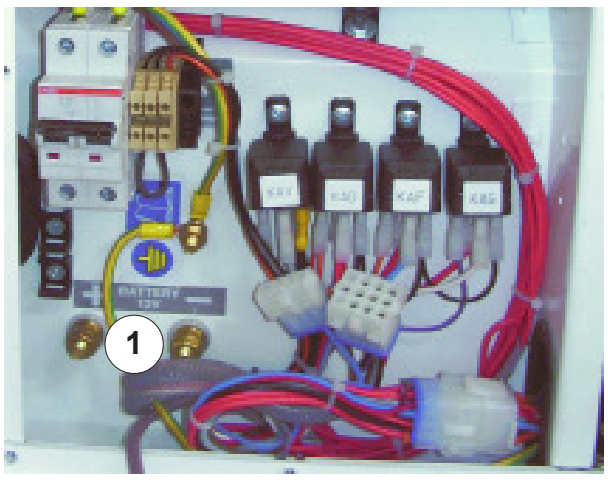
3.11 Battery connection

In order to start up the generator, this must be connected to a 12-V battery having a capacity of at least 60 Ah. The battery must be connected to the generator by means of terminals (**ref.1**) using leads with a cross section of 25 sq. mm for distances below 5 m and 35 sq. mm for longer distances.
Carry out the following operations in sequence:
- Connect the negative pole (-) of the battery to the terminal marked (-) **(ref.1)**.
- Connect the positive pole (+) of the battery to the terminal marked (+) **(ref.1)**.
- Cover the connections with special petroleum grease to prevent oxidation and corrosion.

The generator is equipped with an automatic battery recharge device.

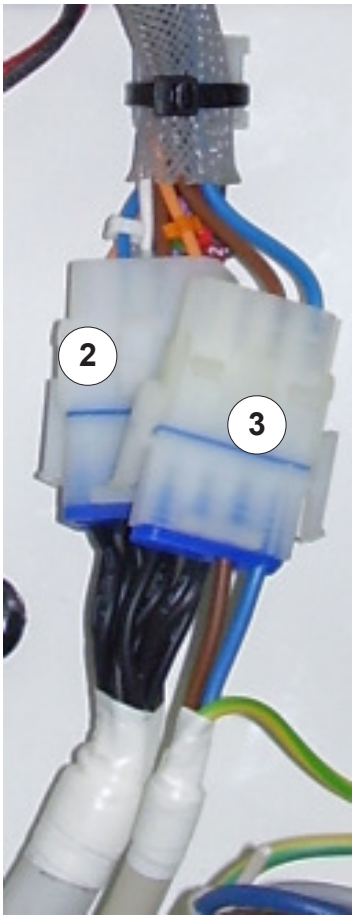
⚠ CAUTION

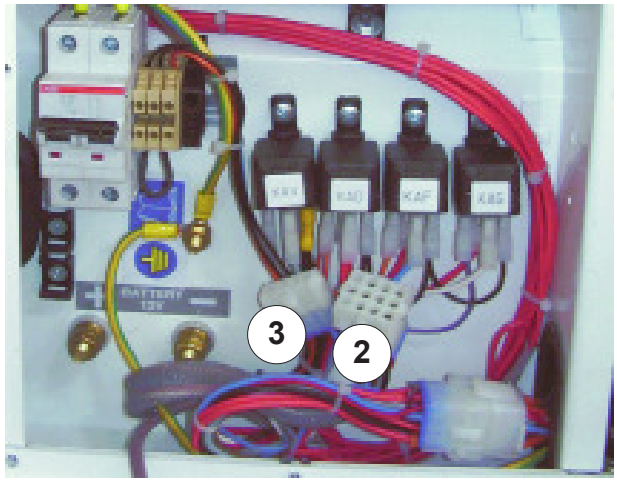
Install the battery in a well-aired compartment, separate from the generator and any heat or spark-producing equipment.
Periodically check the condition of the terminals and the water level in the battery.
Never invert the polarity of the connection leads - the generator or battery could be seriously damaged.
Use the battery for generator connection only. Do not connect up other loads.



3.12 Control panel connection

All control, start and stop functions are controlled by the remote control panel.
It will be connected to VOYAGER through a multipolar cable connected to onboard connectors (**ref. 2 -3**).





GB

⚠ CAUTION

The control panel must be installed because it is indispensable for correct generator operation. We never recommend using instruments different from the panel supplied with the generator as these may not be compatible with the generator itself.
Make all connections with the battery disconnected.

⚠ WARNING

The control panel is supplied with a 10 m connection lead. This lead must never be modified to avoid faulty operation of the control panel electronic components.

3.13 Power connection

The power cables must be connected directly to the thermal switch as shown on (**ref.1**).
Cables must pass through the hole (**ref.2**).

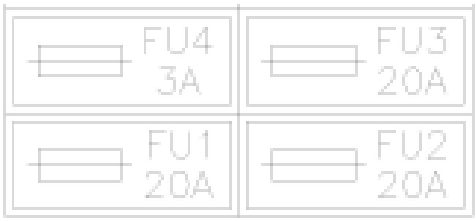
Magnetothermal switch protects the generator from overloads or shorts circuits.
For connections, always use leads with adequate cross sections.

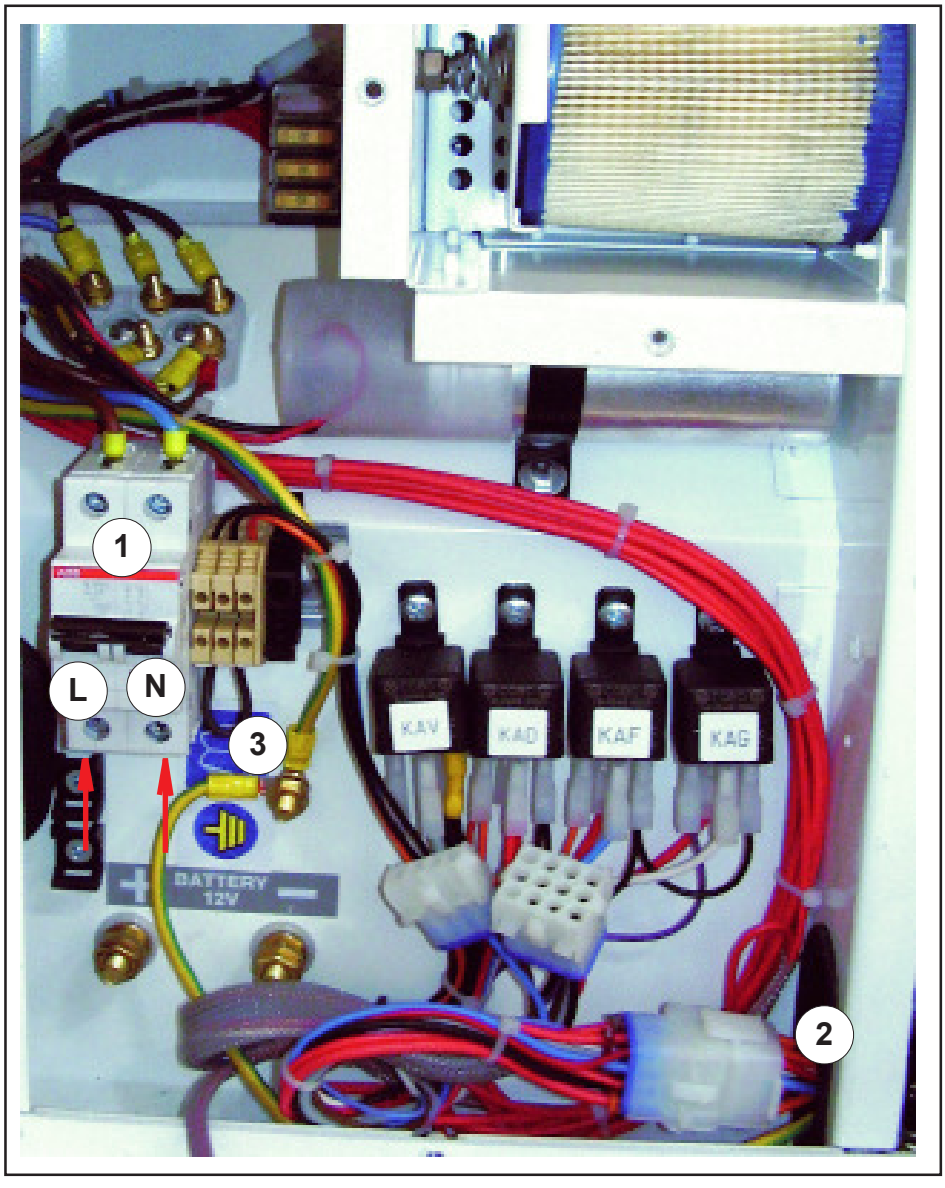
⚠ CAUTION

Make sure that the sum of the loads does not exceed the power rating of the generator.

3.14 Earthing

For earthing use the terminal provided (**ref.3**), being careful to select a lead with cross section the same or larger than that of those used for appliance connections.





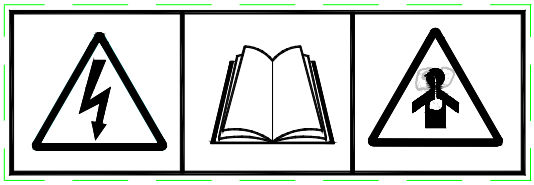
230V 50Hz

KAV	START RELE'
KAD	STOP RELE'
KAF	FAN RELE'
KAG	GLOW RELE'

GB

4. USING THE GENERATOR

4.1 MANUAL STARTING THE GENERATOR



Before starting the generator check that all the doors is closed.

Push the **green** button (**ref.1**).
The electric radiator fan will start immediatelly.
The genset will starts automatically after a little glowplug-preheating delay.
Proper functioning of the generator will be signalled by the generator functioning LED coming on (**ref.2**). When the above operations are carried out, the generator safety switches are automatically activated
(see the **chap 5** on "Safety switches").

⚠ CAUTION

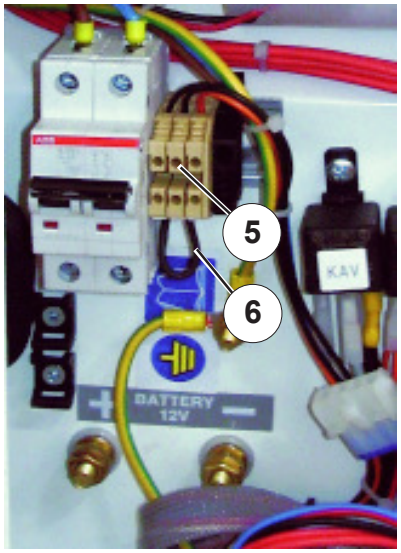
Repeated unsuccessful starting attempts may cause excessive accumulation of water in the exhaust system with possible serious damage to the engine.
Do not make more than 5 consecutive starting attempts as you may damage the starter motor.
During the running-in period (the first 50 hours), do not apply loads exceeding 70% of the rated power of the generator.

INFORMATION

For more detailed information, consult the manual provided by the engine manufacturer, which accompanies each generator.

4.2 STOPPING THE GENERATOR

Stop the generator by pressing the **red** button on the remote control panel (**ref.3**).
After one minute from the stopping, the control panel will go in autopower off.



⚠ CAUTION

Before stopping the generator, it is advisable to run it for a few minutes without drawing current in order to allow gradual cooling of the engine and the alternator.

4.3 Emergency stop

The generator can be stopped with an emergency onboard switch (**ref.4**). It is possible to fit another emergency remote button connecing directly on clamp (**ref.5**) on pin **1-2** removing the bridge (**ref.6**).
See wiring diagram for more details.

GB

5 AUTO MODE

5.1 AUTO mode

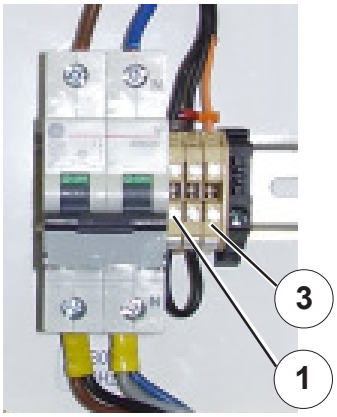
It is possible to start/stop the generator automatically, with remote signal on demand.
Connect the automatic contact on demand on clamp **ref.1-3** (contact n.o. --> STOP, n.c. --> START).

Set automatic mode pressing AUTO pushbutton (**ref.2**).
Icon appears on display if no alarm are present.
AUTO mode will allow the generator to operate fully automatic, starting and stopping the generator without operator.

For more detailed informations see wiring diagrams and control panel manual.

WARNING

In AUTO mode, the control panel still stay active. Then the battery could become flat if the generator does not starts periodically.



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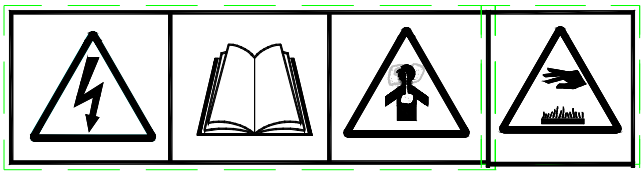
6 MAINTENANCE

6.1 Preamble

It is recommended to strictly follow the instructions in the manual provided by the engine manufacturer, which accompanies each generator.
It is important to regularly check and carry out maintenance on the generator. The operations to carry out must be decided based on the hours of operation.
In order to carry out maintenance, the side doors and top door must be removed.



⚠ WARNING

The generator is started from a remote control panel. In order to prevent accidental starting, set the emergency switch to the (OFF) position.
Disconnect the negative pole from the starter battery.

⚠ WARNING

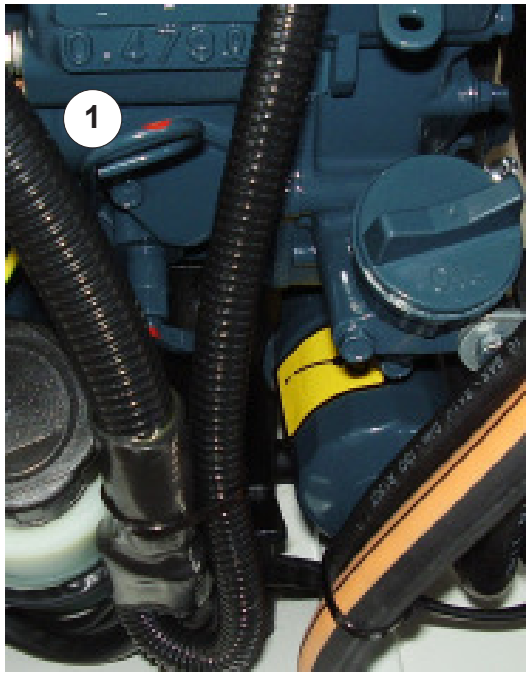
Any maintenance operation on the generator must be carried out with the engine off, after leaving it to cool down sufficiently.
Carefully read paragraph 1.5 "General danger information" in the manual.Periodically check the electrical safety switches,such as the emergency button, the earthing system, etc.

6.2 Routine Engine Maintenance

The periodic operations to be carried out on the engine are indicated in the table **6.16 "Periodic checks and maintenance".**
For more detailed information, consult the manual provided by the engine manufacturer, which accompanies each generator.

6.3 Engine Oil Check

- Check the oil level by means of the cap/dipstick (**ref.1**). The oil level must always be between the MAX and MIN notches engraved on the dipstick.
- When checking the oil level, ensure that the generator is positioned horizontally.



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6.4 Engine oil change

Use diesel engine oil

Top up the engine oil through the hole (**ref.1**). To change the oil in the engine oil sump, take out the dipstick (**ref.2**).

Unscrew the cap on the rubber pipe (**ref.3**) and make flow out the oil.

It is advisable to drain the oil when it is still sufficiently warm so that it flows easily.

For detailed information in this connection, consult the engine use and maintenance manual which accompanies the machine.

CAUTION

- Dispose of the used oil in an appropriate manner, since it is a polluting product.

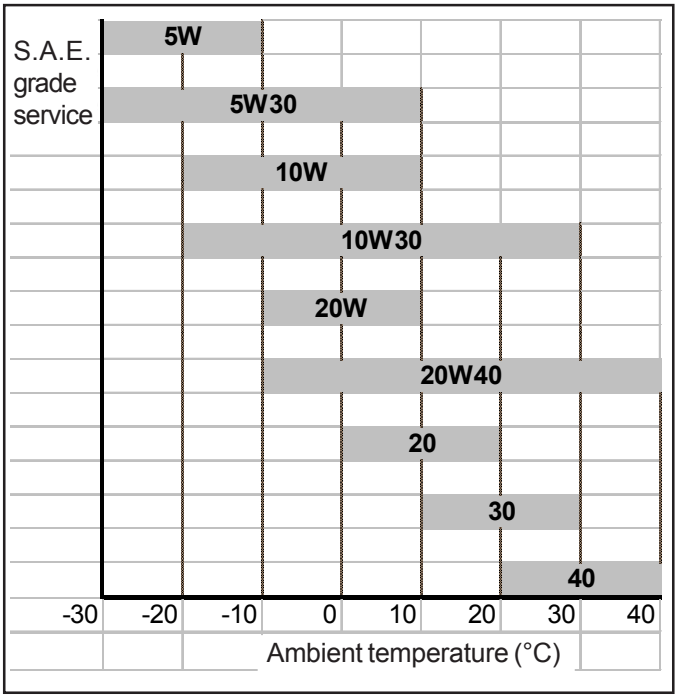
- Take the used oil to special waste collection centres for disposal.

- Wear gloves to protect the hands from contact with oil. In case of accidental contact with engine oil, thoroughly wash the affected part with soap and water.

- Do not top-up with oil or refuel above the maximum level. An excessive quantity of oil may cause damage to the engine.

INFORMATION

Always check proper viscosity of the engine oil in relation to the range of temperatures in which the generator operates, as indicated in chap 6.5.



6.5 Oil filter

To replace the engine oil filter cartridge, follow the procedure below:

- Remove and extract the filter (**ref.4**).
- Screw in the new filter after cleaning the rubber seal and seating surface and ensure it is in perfect condition.

CAUTION

When the operation has been completed, thoroughly clean all the parts of the generator soiled with oil and fuel.

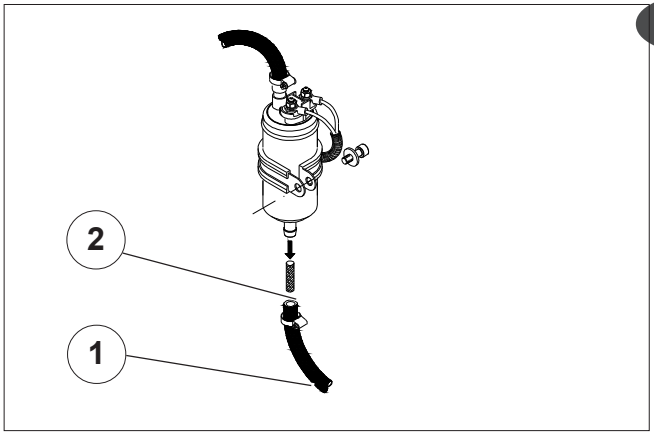
INFORMATION

For engine safety reasons, use only original spare parts.

6.6 Replacing / Cleaning The Fuel Pump Filter

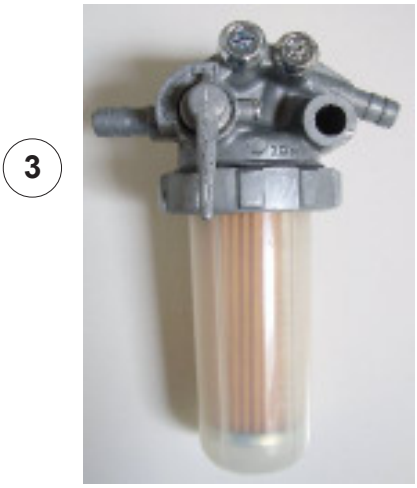
This operation is carried out following the steps below:
- Remove the pipe (**ref.1**)
- Slide out the filter (**ref.2**)
- Clean or replace it

For reassembly repeat the operations in reverse order. After replacing the filter, the fuel system has to be bled by carrying out the operations described in **paragraph 6.8**.



WARNING

Do not let the fuel come into contact with the skin. Wear gloves and protective goggles during maintenance operations.
In the event of contact with fuel, immediately and thoroughly wash the affected part with soap and water. When the operation has been completed, thoroughly clean off all traces of fuel and take the cloths used to special waste collection centres.



6.7 Replacing the line fuel filter

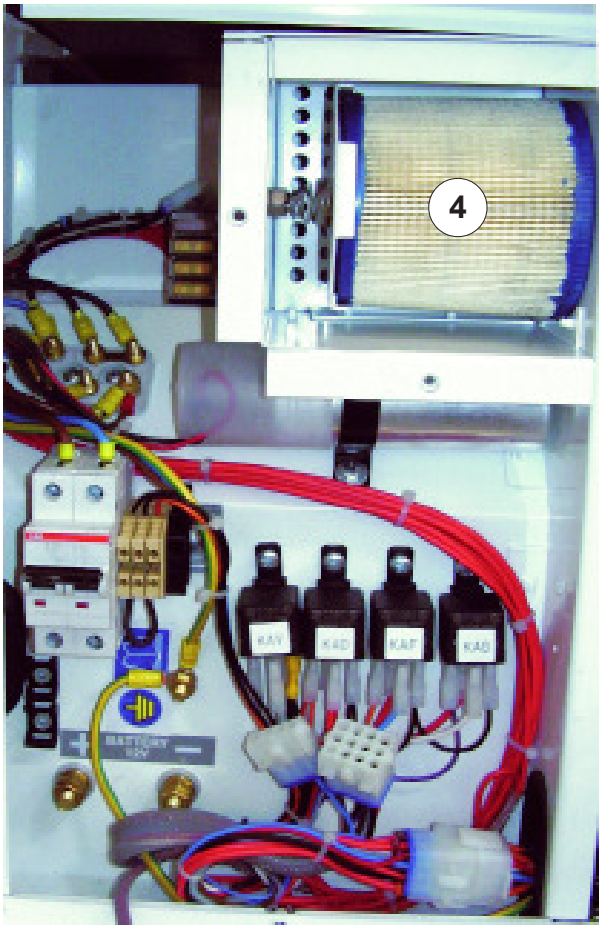
Follow the instructions given in the manual of the type of fuel filter installed (**ref.3**). See Chap. 3.6.1 “Fuel filter”.

6.8 Bleeding the fuel system

INFORMATION

The generator is equipped with an automatic fuel bleed valve. Should manual bleeding be necessary, press the ON button on the control panel and wait 30 seconds before starting the generator.

If there are air bubbles in the fuel system, the engine will not function regularly or will be unable to reach the rated rpm. Air may penetrate the fuel circuit through a not perfectly sealed joint (pipe, filters, tank) or when the fuel in the tank is at minimum level.



6.9 air filter

The **IS** series generators are fitted with a dry air filter (**ref.4**), which prevents foreign bodies from entering the combustion chamber. It is sufficient to clean the filter mass with diesel fuel once a year to remove any impurities.

CAUTION

Take the liquids used to wash the filter to special waste collection centres for disposal.

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6.10 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 (**ref.1**).
Adjust the belt tension as follows:
loosen the adjusting screw (**ref.2**)and move the battery charger DC alternator (**ref.1**)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.

6.11 Coolant check

Each time the generator is used, check the coolant level which must be inside the correct range on the expansion tank (**ref.3**). If the coolant level is down, top up having care to not overfilling the cup.

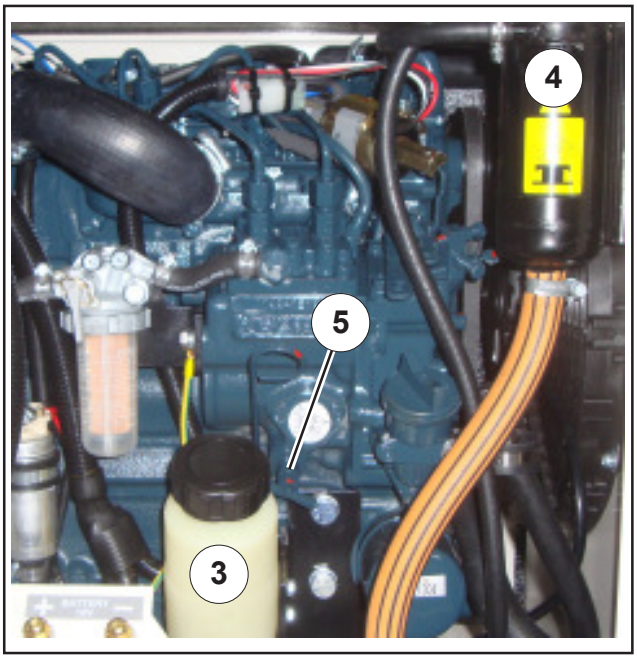
DANGER ***Don't remove the cover radiator (ref.3-4) when the engine is hot to avoid dangerous spillages of coolant.***

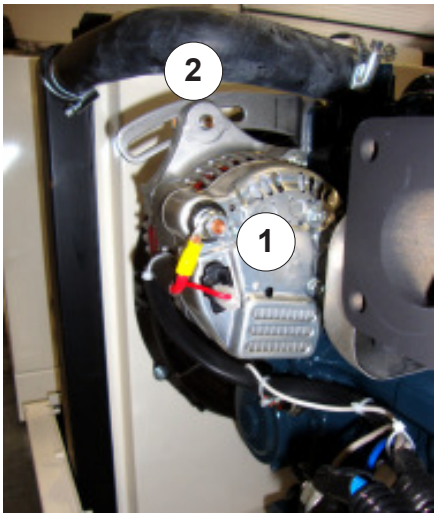
6.12 Coolant replace

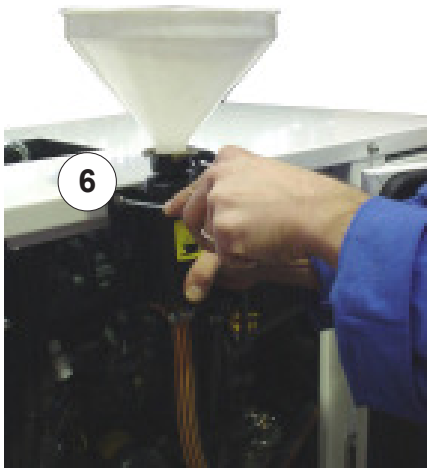
Replace the coolant every year inside the closed circuit of cooling.
Connect a 20 - 30 cm of rubber pipe line to the faucet (**ref.5**), situated on the charter of the engine. To facilitate the leakage of the exhausted coolant inside a container of suitable capacity, open also the cap of the vase (**ref.4**) and empty completely the closed circuit of cooling.
When completed close the faucet (**ref.5**).
Unscrew the top up vase (**ref.4**), get it out and fix it on the canopy with screw (**ref.6**).
Now top up the cooling circuit again with new coolant.
Close the cap and fix again the top up vase inside the genset.

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.







6.13 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.

6.14 Battery maintenance

To start all the generator models it is recommended to use an **45 A/h** battery for ambient temperatures above 0°C and **55 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.

6.15 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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6.16 PERIODIC CHECKS AND MAINTENANCE

PERIOD CHECKS AND MAINTENANCE

Perform service at intervals indicated	Before starting	Every 50 hrs. or 1 Month	Every 100 hrs. or 2 Month	Every 200 hrs. or 3 Month	Every 400 hrs. or Yearly	Every 500 hrs. or Yearly	Every 1.000 hrs. or Yearly	Every 2.000 hrs. or Yearly	Every 30.000 hrs.
Fuel system									
Check the fuel level and refill	○								
Remove sediment from fuel tank						○			
Water/fuel separator drainage		○							
Clean the water/fuel separator						○			
Replace the fuel filter element					○				
Check the fuel injection nozzle					●				
Check the fuel injection timing					●				
Check the fuel injection pump							●		
Lubrification system									
Check the oil level	○ (Before operation)	○ 10^{h}							
Replace the oil		○ 1st time	○ (and thereafter)						
Replace the oil filter element		○ 1st time		○ (and thereafter)					
Cooling system									
Check and clean the radiator grid from dust and dirt		**O** and every 50 hours							
Check and eventually add the liquid cooling	○								
Replace the the liquid cooling							○		
Adjust the belt tension		○ 1st time	○ (and thereafter)						
Replace the belt						○			
Check thermostat function						●			
Check the correct air flow inside canopy and coolant flow inside cooling system								●	
Replace all fuel pipes and cooling pipes								● or every 2 years	
Intake / Exhaust system									
Check the air cleaner element			○						
Replace air cleaner element					○				
Check exhaust system				○ (and thereafter)					
Electrical system									
Check and tighten electrical connections		○							
Clean battery cables						○			
Check the electrolyte level in the battery			○						
Engine and mounting									
Check for leakage af water and oil	○	○ (and thereafter)							
Retighten all major nuts and bolts				○					
Check tightness of mounting bolts/ vibromounts					●				
Check and adjusting intake / exhaust valve clearance						●			
Inspect, clean and test fuel injectors								●	
Sand down suction and exhaust valve site								●	
Alternator									
Check all tighten screws and bolts and also connections for wear and tears								○	
Check the absence of strange vibrations or anomalous noises								○	
Check electric connections								○	
Replace the bearings									●
Remote control system, etc.									
Check remote control operation and all alarm lamps		○		○ (and thereafter)					

○ In presence of this symbol it is possible to effect the technical support autonomously .

● In presence of this symbol it is obligatory to effect the technical support in an our retailer /workshop authorized by MASE.

7 ANOMALIES, CAUSES AND REMEDIES

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7.1 Breackdown table

The starter motor turns but the main engine does not start
- Check that the stop solenoid valve is powered. *(Consult Service Centre).*
- Perform operations of drainage from air beads inside the fuel circuit

The engine protection module is not activated pressing the pulsating START
- Check if the thermal interrupter 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 a protection has been activated. *(Solve the problem and restart)*.
- Check if there is fuel in the tank. *(Fill up)*.

There is high smoke emission from the exhaust.
- Check that the oil level does not exceed the **MAX** level. *(Bring it down to the correct level)*.
- Check the generator group is not overloaded.
- Check the injectors. *(Consult Service Centre).*

The engine runs irregularly
- Check the fluel filter. *(Replace it)*
- Perform operations of drainage from air beads inside the fluel circuit.

The tension of the alternator is too much low.
- Correct the value of the tension adjusting the electronic regulator.
- Check the rpms motor *(3120 rpms without connected uses)*.
- Voltage regulator failure *(Replace)*.

The generator has no power at the outlets.
- Check if the magnetothermal switch is in **ON** position (consult Service Centre).

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8 TRANSPORT, STORAGE, LIFTING AND HANDLING

8.1 Transport and storage

***Packaging**:* Supplied directly by **mase**.
The total weight of the packed generator is given in **Paragraph 2.6 "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 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

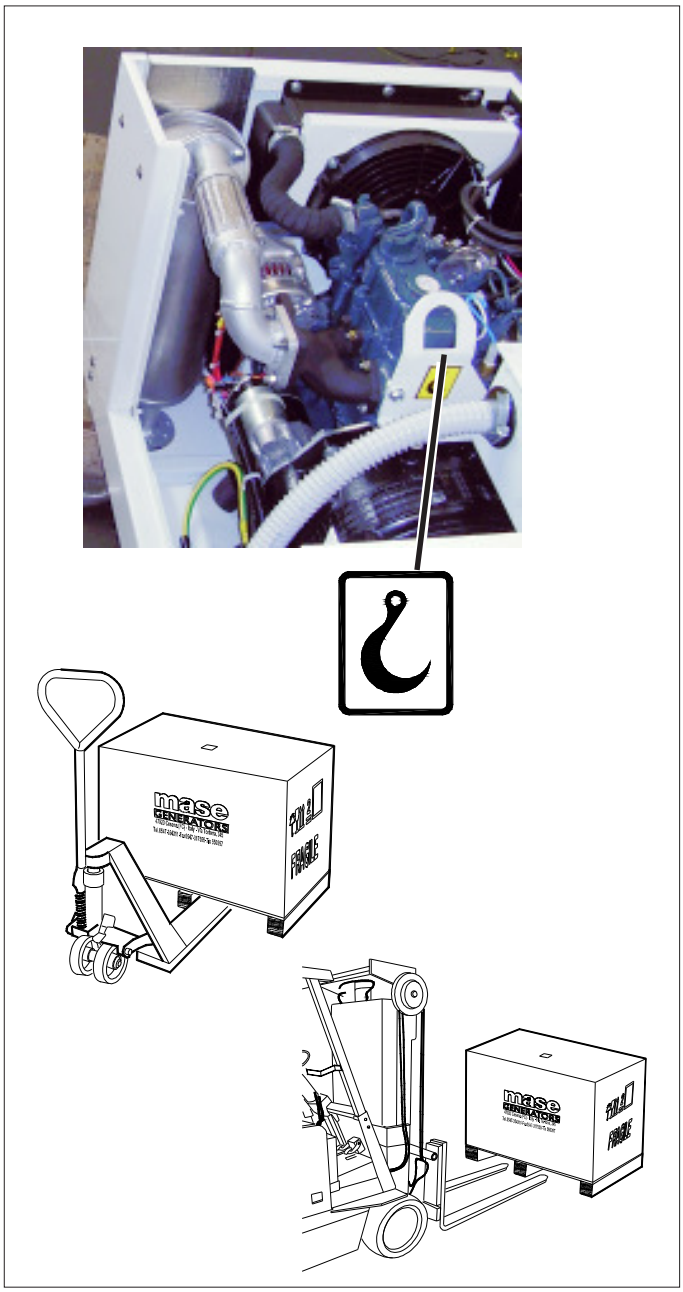
CAUTION

All the lifting operations must be carried out by personnel specialised in this type of work, such as truck drivers, crane drivers, slingers.

WARNING ***The operator is considered responsible for using the correct machine slinging and lifting technique.***

8.2.1 Lifting and handling with crane

The machine must be lifted and handled with the systems indicated in the picture. Check that the hoisting cables or chains are homologated or of sufficient capacity, and also check the minimum cable length. Calculate the cable capacity considering that for each of the two sling sections a weight about double that shown on the identification plate of the machine has to be supported (this is to compensate for the cable angle). Always use the eyebolts provided by the manufacturer and always marked with a pictogram.



ALWAYS TAKE THESE PRECAUTIONS WHEN LIFTING THE GENERATOR:

Do not swing suspended loads.
Never leave the load unattended.
Lower the generator to the ground very slowly.
Always maintain the safety distance.

8.2.2 Lifting and handling with forklift truck

Use a lift truck to handle the generator (with capacity greater than the weight of the generator indicated in the table of technical characteristics (**par. 2.6**) of the Use and Maintenance Manual), inserting the forks under the base at the lower part of the generator.

For handling on level ground, a transpallet is sufficient with a suitable capacity according to the table of technical characteristics (**par.2.3**) of the Use and Maintenance Manual.

INFORMATION **The centre of gravity of the generator corresponds to about the centre of its geometrical volume.**

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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 as required by current legislation 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.
- Diesel fuel conforming to standards ASTM A975.

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 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.

⚠ WARNING

Please note that the system and its components contain materials that, if dispersed in the environment, may cause significant ecological damage.

The following materials must be delivered to specific collection centres authorised for their disposal:

- ***Starting battery***
- ***Exhaust lubrication oils;***
- ***Mixtures of water and anti-freeze;***
- ***Filters;***
- ***Auxiliary cleaning material (e.g.: rags smeared or soaked with fuel and/or chemical cleaning products).***

- Any other material not listed above must be taken to companies authorised for the collection of industrial waste.

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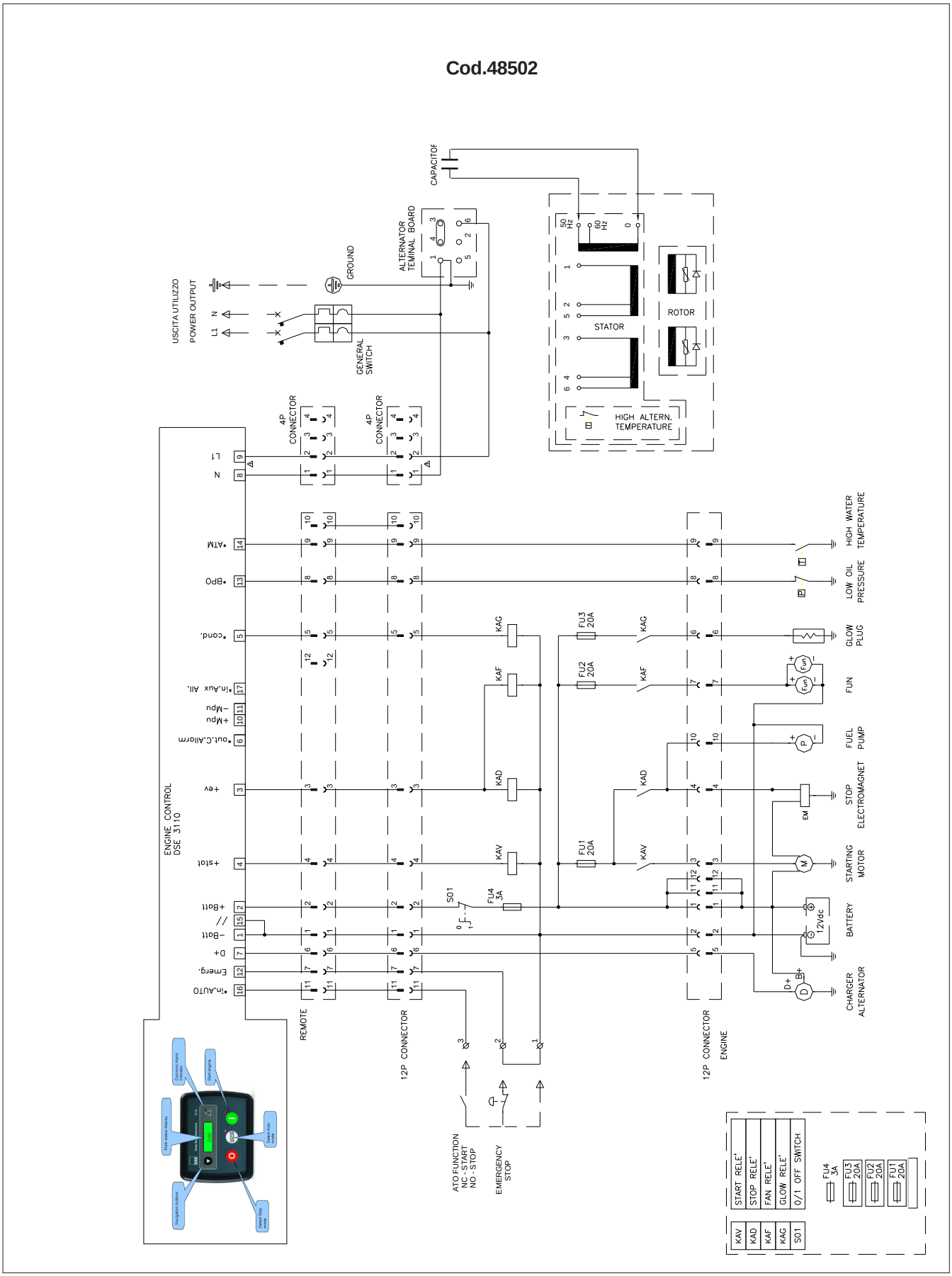
11. WIRING DIAGRAM

11.1 WIRING DIAGRAM AUTOMATIC VERSION

Cod.48502



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12 ADJUSTABLE PARAMETERS

CONFIGURATION PARAMETERS – MODULE			
101	Contrast	000 (%)	50
102	RESERVED		
103	RESERVED		
104	Lamp test at startup	On (1), Off (0)	0
105	Power save mode enable	On (1), Off (0)	1
106	Protected start enable	On (1), Off (0)	1
107	Start in Auto	On (1), Off (0)	/
108	Oil pressure display	PSI (1), Bar (0)	/
109	Display Volts in Ph-Ph	On (1), Off (0)	/
110	Temperature display	°F(1), °C(0)	/

CONFIGURATION PARAMETERS – APPLICATION			
201	Default configuration	On (1), Off (0)	0
202	Alternate Engine Speed	On (1), Off (0)	0
203	CAN ECU data fail enable	On (1), Off (0)	0
204	CAN ECU data fail action	0 (Action)	0
205	CAN ECU data fail delay	0:00	0

CONFIGURATION PARAMETERS – INPUTS			
301	Low oil pressure enable	On (1), Off (0)	0
302	Low oil pressure trip	0.00 bar	1.0
303	High engine temperature trip	00 deg C	125
304	Digital input 1 source	0 (Input source)	5
305	Digital input 1 polarity	0 (Polarity)	1
306	Digital input 1 action (if source = user config)	0 (Action)	0
307	Digital input 1 arming (if source = user config)	0 (Arming)	0
308	RESERVED		
309	Digital input 2 source	0 (Input source)	10
310	Digital input 2 polarity	0 (Polarity)	/
311	Digital input 2 action (if source = user config)	0 (Action)	/
312	Digital input 2 arming (if source = user config)	0 (Arming)	/
313	RESERVED		
314	Digital input 3 source	0 (Input source)	4
315	Digital input 3 polarity	0 (Polarity)	0
316	Digital input 3 action (if source = user config)	0 (Action)	0
317	Digital input 3 arming (if source = user config)	0 (Arming)	0
318	RESERVED		
319	Digital input 4 source	0 (Input source)	0
320	Digital input 4 polarity	0 (Polarity)	1
321	Digital input 4 action (if source = user config)	0 (Action)	1
322	Digital input 4 arming (if source = user config)	0 (Arming)	0
323	RESERVED		
324	Digital input 5 source	0 (Input source)	12
325	Digital input 5 polarity	0 (Polarity)	0
326	Digital input 5 action (if source = user config)	0 (Action)	0
327	Digital input 5 arming (if source = user config)	0 (Arming)	0
328	RESERVED		
329	Digital input 6 source	0 (Input source)	0
330	Digital input 6 polarity	0 (Polarity)	0
331	Digital input 6 action (if source = user config)	0 (Action)	1
332	Digital input 6 arming (if source = user config)	0 (Arming)	0
333	RESERVED		

CONFIGURATION PARAMETERS – OUTPUTS		
401	Digital output 1 source	2
402	Digital output 1 polarity	0
403	Digital output 2 source	4
404	Digital output 2 polarity	0
405	Digital output 3 source	4
406	Digital output 3 polarity	0
407	Digital output 4 source	1
408	Digital output 4 polarity	0

CONFIGURATION PARAMETERS – TIMERS			
501	Remote Start Delay	0:00	6
502	Preheat timer	0:00	9
503	RESERVED		
504	RESERVED		
505	Smoke limiting	0:00	0
506	Smoke limiting off	0:00	0
507	RESERVED		
508	Warm up time	0:00	5
509	Return Delay	0:00	1
510	Cooling Time	0:00	1
511	ETS Solenoid Hold	0:00	0
512	RESERVED		
513	RESERVED		
514	RESERVED		
515	Breaker trip pulse	0:00	0
516	Breaker close pulse	0:00	0

CONFIGURATION PARAMETERS – GENERATOR			
601	Alternator Fitted	On (1), Off (0)	1
602	Alternator Poles	0	2
603	RESERVED		
604	RESERVED		
605	Under Voltage trip enabled	On (1), Off (0)	1
606	Under Voltage trip level	0 V	180
607	Loading Voltage	0 V	209
608	Over Voltage trip level	0 V	270
609	Under frequency trip enable	On (1), Off (0)	1
610	Under frequency trip level	0.0 Hz	45.7
611	Loading Frequency	0.0 Hz	48.2
612	Nominal Frequency	0.0 Hz	50
613	Over frequency trip enable	On (1), Off (0)	1
614	Over Frequency trip level	0.0 Hz	56.8
615	AC System	Selection List	//

CONFIGURATION PARAMETERS – ENGINE

701	Magnetic pickup fitted	On (1), Off (0)	nr
702	Flywheel teeth	000	nr
703	Start Attempts	0	3
704	RESERVED		
705	RESERVED		nr
706	Gas choke timer (Gas engine only)	0:00	nr
707	Gas on delay (Gas engine only)	0:00	nr
708	Gas ignition off delay (Gas engine only)	0:00	nr
709	Crank disconnect on Oil enable	On (1), Off (0)	0
710	Check oil pressure prior to starting	On (1), Off (0)	1
711	Crank disconnect on Oil threshold	0.00 Bar	2
712	Crank disconnect on frequency	0.0Hz	21
713	Crank disconnect on Engine Speed	000 rpm	600
714	Under speed enable	On (1), Off (0)	0
715	Under speed trip	0000 rpm	1200
716	Over speed trip	0000 rpm	1710
717	RESERVED		
718	RESERVED		
719	RESERVED		
720	RESERVED		
721	RESERVED		
722	RESERVED		
723	RESERVED		
724	RESERVED		
725	Charge alt failure enable	On (1), Off (0)	1
726	Charge alt failure trip	00.0 V	7.4

CONFIGURATION PARAMETERS – ALTERNATIVE CONFIGURATION

801	Alt config – Enable configuration	On (1), Off (0)	0
802	Alt config - Alternative Engine Speed	On (1), Off (0)	0
803	Alt config – Ender Voltage Shutdown Enable	On (1), Off (0)	0
804	Alt config - Under Voltage trip	On (1), Off (0)	1
805	Alt config - Under Voltage trip level	0 V	184
806	Alt config - Loading Voltage	0 V	207
807	Alt config - Over Voltage trip level	0 V	277
808	Alt config - Under frequency enabled	On (1), Off (0)	1
809	Alt config - Under frequency trip level	0.0 Hz	40
810	Alt config - Loading Frequency	0.0 Hz	45
811	Alt config - Nominal Frequency	0.0 Hz	50
812	Alt config - Over Frequency enabled	On (1), Off (0)	1
813	Alt config - Over Frequency trip level	0.0 Hz	57
814	Alt config - Alternative Under speed enable	On (1), Off (0)	0
815	Alt config - Alternative Under speed trip	0000 rpm	1200
816	Alt config - Alternative Over speed trip	0000 rpm	1710