CPS

ALPHA SERIES

MADE IN THE UK

DIESEL GENERATOR MANUAL

1.1 Commissioning, Warranty and Liability

The generator consists of an assembled engine and alternator and their warranty conditions are stipulated by the relative manufacturing companies.
CPS provides warranty cover for its own products for a period of 12 months or 1000hrs hours (whichever comes soonest) if the product is to be used continuously and 24 months if this is only to be used in emergencies. In both instances, cover commences from the commissioning date. However, no more than 18/30 months from the delivery date (provided that no alteration or intervention has been implemented by the client in the meantime).
In accordance with the above-mentioned terms, CPS is committed to replace parts free of charge, when in their opinion or that of their authorised representative, the part in question has a manufacturing defect or at the company's discretion, this will be repaired in-house or at an authorised outlet. In any case, labour costs to replace defective parts are always charged to the client.
Any part that is replaced or repaired whilst under warranty will be covered for the remaining original warranty period.
Ordinary and extraordinary maintenance costs are charged to the client.

The warranty is forfeited in the following instances:
- When the buyer does not respect the contractual payment obligations
- When the product is disassembled, repaired or modified by anyone who does not form part of CPS personnel
- When the generator is used negligently or carelessly (handling errors, surges, inadequate maintenance, non-compliance with current legislations, etc.).

This warranty excludes cover for deterioration due to wear and tear.

CPS's responsibility is strictly limited to the supply of spare parts and the repair of defective parts; thus excluding every other liability and obligation for other expenses, damages and in/direct losses deriving from the use of or inability to use the generators, be it total or partial.

Any warranty conditions that are different from those mentioned above, must be stipulated in writing.

These warranty conditions are rendered null and void if different conditions are stipulated when the purchase order is processed.

1.2 Spare part orders/Assistance

Any request for spare parts or Assistance must be submitted solely to the following service centre or any other authorised by us:

Constant Power Solutions Ltd, Unit 4, Selby Business Centre, Station Road, Selby, North Yorkshire, YO8 4AA
Specifying:
The machine model, serial number, item code, quantity requested, transportation means and contact person.

1.3 Generating set - versions available

The basic models of the generators consist of an open version with a manual control panel and are installed on a fixed base.

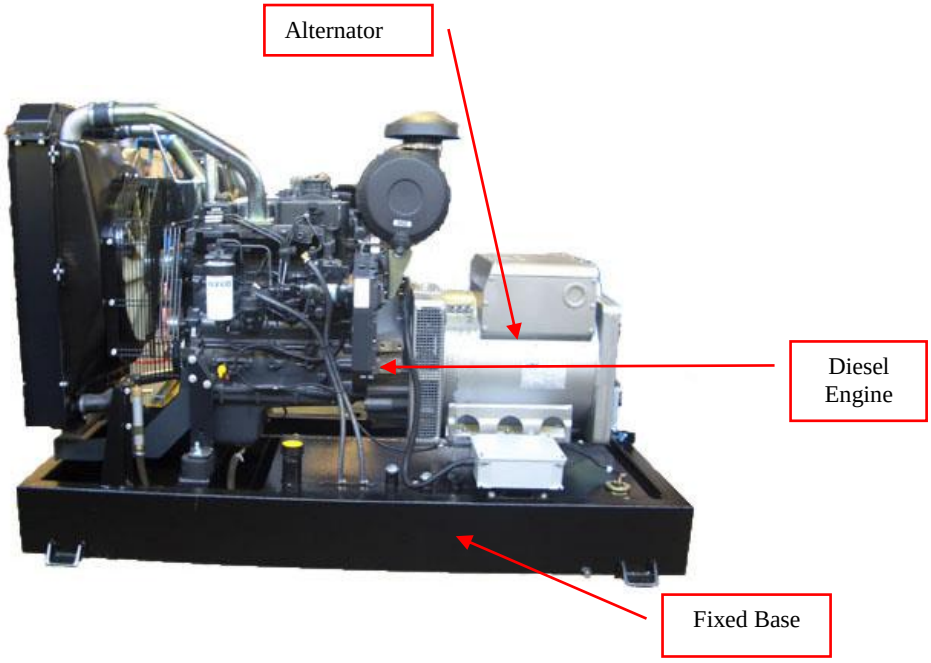


Fig. 1.2: Basic Version

Moreover, the generators are available with a rainproof and soundproofing covers, mounted on a slow or fast towing trolley. Moreover, the control panel can be automatic.

Fig. 1.3: Versions with a Soundproof Cover, Rainproof Cover and Slow/Fast Towing Trolley

2. SAFETY REGULATIONS

2.1 General precautions

Carefully read all the information contained in this manual in order for the generator to be installed and used correctly.

The information contained in this manual allows the **designated persons** to intervene promptly, if necessary.

Given the hazard posed by the generator, it is prohibited for persons with no experience or insufficient preparation and training, to use the machine.

Children or animals must not be allowed to go near the generator when it is switched off or when it is switched on.

Do not touch the generator with wet hands as this might cause strong electric shocks.

Do not refill the fuel tank while the generator is in operation.

The generator must be used in well ventilated areas so as to prevent intoxication of carbon monoxide fumes and other harmful residues contained in the exhaust gas and moreover, for the generator to cool down appropriately.

Any inspection must be carried out solely with the **engine switched off** and by designated personnel.

Before implementing any maintenance operation, ensure that it is not possible for the generator to be **switched on accidentally**.

Any inspection must be carried out with the engine switched off; any verification with the generator switched on must only be implemented by specialised personnel.


Do not inhale the combustion fumes as these contain substances that are harmful for your health.


Use the generator with the access doors closed (in versions with canopy)


Never touch the body of the engine or the alternator with your hands when the generator is running or still hot.


When implementing maintenance procedures on the generator, disconnect the negative terminal of the start-up battery so as to prevent it from being started-up accidentally.


Should there be oil or fuel leakages, take the necessary steps to clean this thoroughly so as to prevent fire risk conditions.


Access is forbidden to persons with a pacemaker as this may cause electromagnetic interference on the cardiocirculatory apparatus.


In case of fire, use the extinguisher. Never use water.


***Should a problem arise or clarification is needed, please contact CPS directly*.**

2.2 Safety requirements: installation and commissioning


The personnel designated to the installation or commissioning process of the generator must always use a protective helmet and wear safety shoes and overalls.


Use safety gloves.


Take the necessary precautions to prevent electric shock hazards.


Do not leave disassembled parts, tools or anything else that does not form part of the system on the engine or nearby.


Never leave flammable liquid or cloths soaked with such liquid near the generator, electrical equipment (including lamps) or electrical parts of the system.

2.3 Residual risks

The machine has been designed and created with appropriate measures taken so as to ensure the user's safety. However, there are some residual risks related to improper use; for this purpose, hazard signs and symbols have been placed around and on some parts of the machine. These are found below, indicating the various safety stickers placed on the generator.

2.4 Safety symbols and stickers

Some places with the following symbols are placed on the generator so as to highlight the possible hazards posed by the machine:

ELECTRICAL HAZARD

COOLANT HAZARD

HIGH TEMPERATURE HAZARD

2.5 Personal Protective Equipment

Before commencing work, the operator must be aware of the layout and function of the controls and features of the machine and must have read this manual entirely together with any attached manuals.

The operator must always comply with the requirements indicated by the signals on the machine and all that is stipulated in the Use and Maintenance Manual.

The PPE (Personal Protective Equipment) that the operator must use when using the generator and/or during maintenance and cleaning operations consists of work clothes, shoes with non-slip soles and gloves.

2.6 Workstation

The machine has been designed to be used by one operator. Whilst the generator is being started-up and shutting-down, the operator must wait next to the control panel. During the generator's normal operation, the operator does not have to stay next to it.

2.7 Fixed guards

Fixed guards have been installed along the perimeter of the machine so as to ensure maximum safety of the operators who use the generator. These have been applied in such ways so as to provide overall protection without interfering with the use of the generator.

Fixed Guards

All accessible mobile components and those that reach high temperatures have been completely enclosed by fixed guards, which consist of perforated metal structures or metal covers that have suitable ventilation slots. They are firmly fastened to the machine’s structure by means of screws and bolts. See the following pictures.

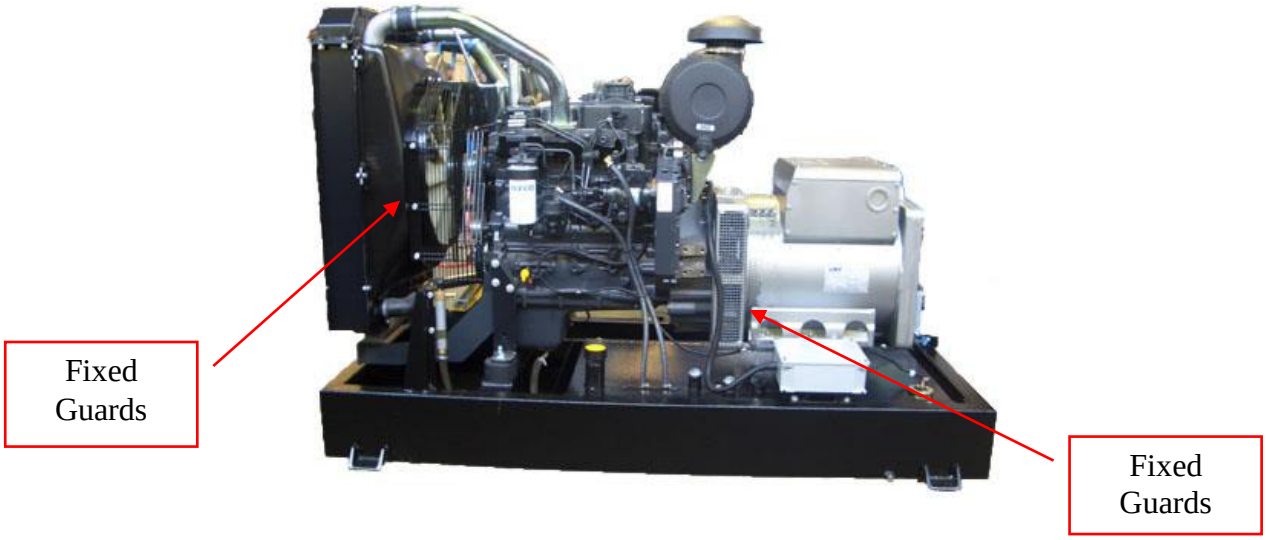


Fig. 2.1: Fixed guards for both types of installation

The guards that are fixed to the machine's structure can only be removed by authorised personnel using appropriate tools.

Unauthorised removal of the safety devices is considered to be tampering with the machine and this is punishable by law. The guard are fixed to the machine's structure and can only be removed with appropriate spanners.

It is prohibited to remove the safety guard whilst the machine is running.

Any guard can only be removed with the machine engine switched off and after having disconnected the negative terminal of the battery. Never use the machine without the safety guard.

3. GENERATOR FEATURES

3.1 General features

This range of generators, with a rotational speed of 1500/1800 rpm, is suitable for any use, it can be ontinuous or emergency. The components used are of the best brands and guarantee high reliability and durability over time. The soundproof canopy (if applicable) reduces the noise level without interfering with the maintenance procedures. In fact, the opening of the inspection hatches provide easy access to the engine and the alternator for any maintenance and inspection operation. Moreover, the basic version of the generator has a local control electrical panel on which there are the instruments for the machine to be used properly.

3.2 Technical Specifications

An information booklet that contains the generator's features is attached to this manual.

Deepsea Electronic PLC DSE 3110 MPU/ECU Genset Controller

Single-phase socket 230V – 16A, 32A 2P+T

Three-phase socket 400V – 16A, 32A, 63A, 125A 3P+N+T

Terminal block: allows a load connection for the generator to function at full power

Tank level indicator: indicates the level of diesel in the tank

Fig. 3.2: Some examples of automatic control panels

For more information, please refer to the attached manual relative to the electrical panel.

4. USING THE GENERATOR

4.1 Installation

Hereunder are some standards for the installation process of the generators.

-Do not allow persons with no experience or adequate training use the generator.

-Do not allow children or animals near the generator when it is switched on.

As it can be verified, diesel engines provide optimal performance in ideal environmental conditions (well-ventilated premises), therefore the air in the premises must be clean and relative humidity must not exceed 60% with a maximum temperature of 40 °C.

4.1.1 Ground connection

The Ground connection must adhere with particular specifications that are defined by the BS EN 60204-1 standard.

The legislation stipulates that all masses on the machine must be connected to the Ground system of the electricity mains.

The Ground system must be suitable for the potential load of the entire system and must also comply with the particular standards that regulate the sector.

Ensure that the Ground system is coordinated with the safety devices of the mains supply of the machine.

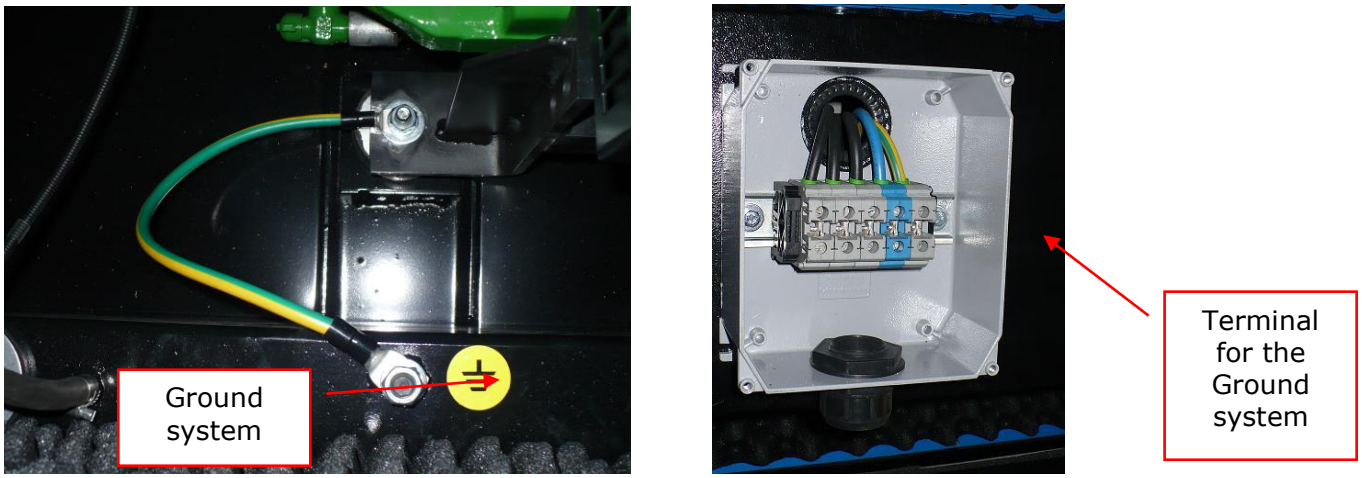


Fig. 4.1: Ground connection

4.1.2 Power output

The power output of the generator, *continuous and emergency*, in the three-phase or single-phase versions, is that specified in the technical specifications (rating plate).
Moreover, the consumption applied to the alternator terminals *must not exceed the rated power limits*, with a three-phase as well as a single-phase load.
Variations in the indicated values (altitude, climate, etc.) cause a reduction in the power available for the alternator's terminals.

4.1.3 Declassing

The performance specifications of a generator are strictly related to the environmental conditions in which it operates. In particular, the performance functions may be declassed due to the temperature, relative humidity and operating altitude.
To know the extent of the declassing effect, it is recommended to refer to the Use and Maintenance Manuals pertaining to the engine and alternator or you may contact the technical department.

4.2 Anchoring to the ground

The generator **must be** anchored to the ground. After having chosen the most adequate place, set the body of the machine on the ground and if necessary, ensure it is level by means of spacers and a spirit level. The generator has been designed and built in such a way so as to guarantee its stability, hence it cannot fall over or move when used correctly. The entire structure is in fact equipped with supporting feet with holes for it to be anchored to the ground.

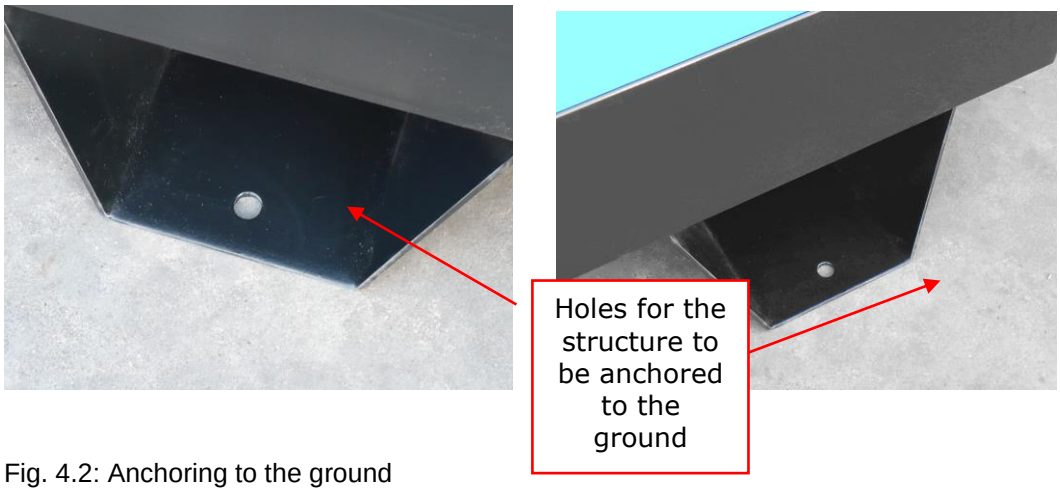


Fig. 4.2: Anchoring to the ground

4.3 Preliminary inspections

It is essential for the following operations to be carried out when the generator is commissioned or after a long period of inactivity or if during the maintenance operations, modifications are implemented of parts are replaced.
For the generator to function at its best, routine maintenance must be implemented as follows.

Any routine maintenance must be carried out with the generator's engine switched off and more importantly, by specialised personnel.

Oil level verification:
The generators are normally supplied with oil in the engine, therefore the oil level must be inspected and verified it is up to the MAX level; possibly, oil must be topped up.

In instances where transportation conditions are particular, the engine oil is NOT supplied and in such cases, it is important to see that this is topped up.

The type of oil that is to be used must be that stipulated by the engine manufacturer (refer to the User Guide of the engine).

Preparing the battery
In some cases, acid is supplied together with the batteries and therefore, before using the latter, they must be filled and charged by means of an external battery/battery charger.
The level of electrolyte acid must be checked by ensuring that the level falls within the maximum limit that can be seen on the battery and if necessary, this must be topped up with distilled water.
Verify that the terminals are clean, well protected and more importantly, firmly set to the poles.

Filling the fuel tank
Fill the tank with good quality diesel from the relative inlet, ensuring there are no traces of water.

De-aeration of the diesel channels
Refer to the Manufacturer's engine User Manual

Coolant verification
If the engine is water-cooled, check the level of the coolant.
In instances where transportation conditions are particular, the coolant is NOT supplied and in such cases, it is important to see that this is topped up by following the indications given in the engine manual according to the operating temperature.

Other interventions on the generator
- monitor and clean the air suction grilles
- inspect and clean the electrical contacts of the start-up battery
- check the clamps of the cables on the terminal block
- verify if there are any oil and diesel leaks from the generator.

N.B.
It is important to comply with the information stipulated in the engine manufacturer instruction booklet with regards to specific routine maintenance implemented on the engine.

4.4 Connections

It is important for the electric distribution panel to be installed correctly and particular attention be given to the expected environmental conditions.

Power conductor connections
A correct cable connection is implemented by using appropriate sockets (>25kVA) and if necessary, the power cables are to be connected to the terminals of the terminal block in the junction box.
The automatic control panel must have safety switches that protect the entire network (MAINS/UNIT/USE) in accordance with current regulations.

Connecting the Ground wire
Check the efficiency of the Ground connection of the electrical panel as well as that of the generator.

Connecting the Neutral wire

If a differential circuit breaker is to be installed, the Neutral wire must derive from the star-centre of the stator windings and brought to the Ground potential via a particular connection. Unless explicitly requested and if there is no differential circuit breaker, the Neutral wire is never connected to the Ground potential.

Calibrating the equipment
Before commissioning the system, check the settings of the electrical equipment (thermal, magnetic, differential) in accordance with other equipment.

Unless specified otherwise, the maximum short-circuit current tolerated by the equipment is less than 10kA.

Electrical maintenance
Any equipment inspections and verification must be carried out solely by specifically trained personnel and always in strict compliance with safe working practices.

N.B.
Normally, the automatic electrical panel used for the network-unit transfer switch is subjected to three power sources, that is: *the network, generator and auxiliary power lines,* therefore it is fundamental to take specific precautions before accessing the system.

4.5 Unit start-up/shutdown


Before starting-up the unit, check that all the above-mentioned preliminary operations have been implemented and the unit can function at maximum efficiency (water, oil, diesel, battery).


Before connecting the load, verify the phase sequence corresponding to the rotation direction of the machinery.


All generators are delivered with proper rotational speed, frequency and voltage settings. Tampering is prohibited. The generator can cease to function properly if the manufacturer settings are changed, causing sudden changes in voltage that can damage any instruments connected to it.

Electrical panel for manual start-up
- Ensure that all automatic switches are open in the “OFF” position.
- Insert the key into the ignition and turn it to the start position until the machine starts-up.
- When the engine starts-up, release the key and verify that the dynamo and oil warning lights have gone off.
- Let the unit work for 5 - 10 minutes until the engine warms up.
- Then turn the switches to the closed “ON” position so as to connect the load.

Turning the generator off
When the generator is to be turned off, the mains switch of the electrical panel must be disconnected before stopping the machine.
The generator will stop by turning the key in the ignition to the **0** position.
Should the generator be used for a long period of time at full load, it must be left in idle mode for 5 minutes before switching it off.

Electrical panel for automatic start-up
The generator automatically starts-up when there is a power failure. This occurs via the automatic electrical panel transfer switch and when the power returns, the unit shuts down (*refer to the automatic control panel manual*).

4.6 Fuel


Do not fill the tank completely – leave approx. 1 cm below the maximum level to prevent the fuel from spilling.

Dry any spilt diesel before starting-up the generator.

Verify what type of fuel is necessary (diesel) before filling up the tank. If the wrong fuel is put into the tank, this must be emptied from the tank and the pipes and the correct fuel can then be used.

Do not start the engine in a closed or poorly ventilated area unless an appropriate study has been implemented for this kind of installation.

Prevent any sparks and do not smoke whilst refuelling.

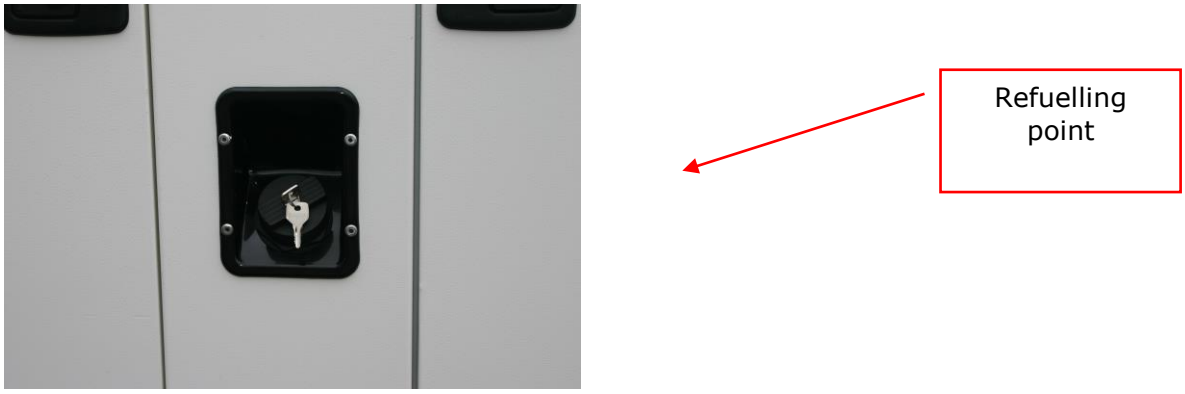


Fig. 4.4: Refuelling point

5. PROTECTION

The generator can be equipped with various protection points, signalled upon start-up via a warning light, which protects the machine from being used incorrectly and problems occurring during operation, which are:

-*low oil pressure protection:* this intervenes by turning the generator off when the pressure of the lubrication is insufficient; the oil must be topped-up before starting-up the unit again.

-*high temperature protection of the diesel engine*: this intervenes by turning the generator off if high temperatures are reached within the endothermic engine, which can jeopardise its operation; the coolant must be topped-up or the problem that caused the temperature to rise must be resolved (dirty radiator, clogged air inlet/outlet grilles, etc.).

-*fuel reserve protection:* this intervenes by turning the generator off if the fuel falls below the minimum level; the fuel must be topped up.

-broken belt protection: this intervenes by turning the generator off, giving visible warnings and shutting down the engine. Verify whether the battery charging alternator belt is taut or broken and that it functions properly.

-*short circuit/surge protection:* this releases the automatic magnetothermic switch on the electrical panel but lets the engine run normally. Before resetting the automatic switch ensure there are no other anomalies.

-differential protection (if present): this releases the automatic magneto thermic switch on the electrical panel but lets the engine run normally. Before resetting the automatic switch ensure there are no other anomalies.

There are various types of protection, depending upon the client's requests and the panels used. In such

cases, refer to the User Manual of the junction box.

The low oil pressure protection does not emit a warning on the scale of the engine oil level. It is therefore fundamental to check this level on a daily basis.

6. MAINTENANCE

6.1 Introduction

Any maintenance must be implemented on the generator with the engine switched off, after letting it cool and must be carried out by authorised or adequately trained personnel.

It is recommended to thoroughly follow the indications stipulated in the manual provided by the Manufacturer of the engine that is supplied with every generator. It is important to regularly monitor and perform the maintenance operations on the generator and the maintenance intervals must be implemented according to the operating hours.

For the engine to work safely, only original spare parts must be used.

Before implementing any intervention on the generator, disconnect one of the battery terminals of the start-up battery so as to prevent it from being started-up accidentally.

6.2 Oil level

The table in paragraph 6.10 shows the periodic interventions that are to be implemented on the engine. For more detailed information, refer to the manual provided by the manufacturer of the engine that is supplied with every generator.

Check the level of the engine oil by means of the appropriate graduated dipstick. The level must always fall between the MAX and MIN levels on the dipstick (refer to* Fig. *6.1).

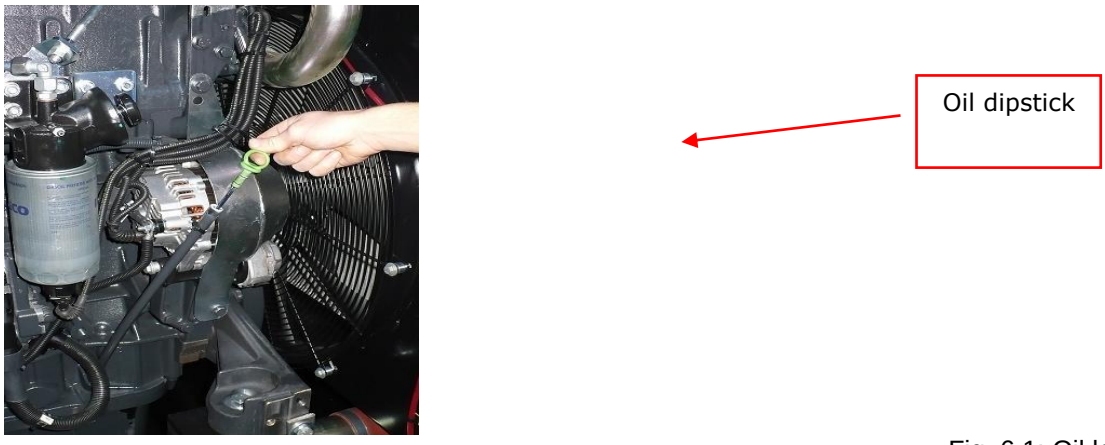
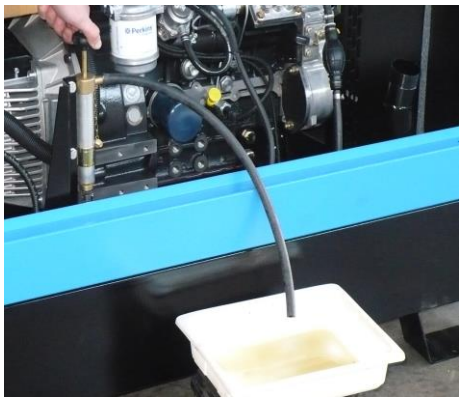
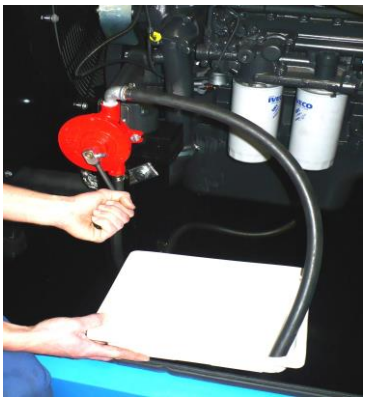


Fig. 6.1: Oil level

6.3 Changing engine oil and filter

The engine oil is topped-up and filled through the relative hole. To replace the engine oil, open the relative cap on the engine crankcase or in the soundproof versions, use the relative extraction pump. It is recommended to empty the oil whilst still warm as this allows it to flow smoothly (refer to the pictures below).





The engine oil must be changed for the first time after 50 operating hours and for subsequent changes, refer to the attached engine manual.

For more detailed information about engine lubrication, refer to the Use and Maintenance Manual of the engine that is supplied with the generator.

Do not dispose of waste oil or fuel in the environment, as these are pollutants. Take the waste lubrication oil to the Collection Facilities designated to dispose of it.

Ensure engine oil is not to make contact with your skin. Use protection gloves and goggles when carrying out maintenance operations. If contact is made with the lubrication oil, immediately wash the relative area thoroughly with soap and water.

Replacing the oil filter

The engine oil must be changed for the first time after 50 operating hours and for subsequent changes, refer to the attached engine manual.
Moreover, the manual also contains a detailed description and illustration of the procedure and necessary steps to follow to replace the oil filter cartridge. Contact CPS for service parts.

Refer to the Use and Maintenance Manual of the engine

6.4 Cleaning / Replacing the air filter

The manual contains a detailed description and illustration of the procedure and necessary steps to follow to clean/replace the air filter. Contact CPS for service parts.

Refer to the Use and Maintenance Manual of the engine

6.5 Replacing the fuel filter

The manual contains a detailed description and illustration of the procedure and necessary steps to follow to replace the fuel filter. Contact CPS for service parts.

 ***Refer to the Use and Maintenance Manual of the engine***

 ***Ensure fuel is not to make contact with your skin. Use protection gloves and goggles when carrying out maintenance operations. If contact is made with the fuel, immediately wash the relative area thoroughly with soap and water.***

 ***Once the service process is fully completed thoroughly clean all traces of fuel and oil and take the cloths that have been used to the designated Collection Facilities.***

6.6 Alternator maintenance

Synchronous and one-wire alternators are mainly used on these generators. Such alternators, which do not have a collector or brushes, do not require particular maintenance. Periodic inspections and maintenance are only carried out to remove any traces of humidity and oxidation that may cause damage.
If alternators with brushes are used, periodic inspections must be carried out to verify their wear and tear and if necessary, they must be replaced as stipulated in the manufacturer's manual. Contact CPS for servicing parts.

 ***For more detailed information, refer to the manual provided by the manufacturer of the alternator that is supplied with every generator.***

6.7 Battery maintenance

It is recommended to use a battery of adequate amperage suitable for the engine for the start-up of all generators. It is important for a new battery to be completely charged before being installed. Batteries that require maintenance are to be checked at least once a month, thus verifying the electrolyte level and if need be, topping up with distilled water. When the generator is not used for a long period of time it is recommended to disconnect the battery, storing it in a dry place where the temperature is above 10 °C and charging it completely once a month. The positive terminal of the battery must be covered with Vaseline grease so as to prevent it from corroding and becoming oxidized. Contact CPS for service parts.

 ***Already prepared sulphuric acid solutions must be used when filling the battery for the first time (batteries are supplied dry). Batteries are topped-up with distilled water and this must be done whilst wearing protection rubber gloves and goggles so as to prevent accidental contact of sulphuric acid with your skin. If accidental contact is made, thoroughly wash the relative area with soap and water and consult a doctor.***

 ***Do not use batteries with specifications that are different from those of the battery supplied.***

 ***Observe the polarity of the batteries.***

 ***Never open the batteries and do not throw them into fire.***

 ***Do not touch batteries that have a liquid leakage, unless you have taken the necessary precautions.***

 ***Batteries contain materials that are hazardous to the environment and are not to be disposed of as domestic waste. Old batteries are to be treated as special waste and disposed of in the special containers that are found in all retail outlets where batteries are sold.***

6.8 Storage

If the generator is to be stored for a long period of time, it must be protected from the rain and wind and possibly stored in a dry place.
The electrical parts are to be well protected from rain and the elements.

The machine can be seriously damaged if kept in critical temperatures whilst waiting for the installation process to begin.
Do not expose the machine to temperatures that are lower than 0 °C or exceed +60 °C.

Disconnect the start-up battery and store it in a dry place.

 ***It is forbidden to place equipment that does not form part of the generator on the machine.***

6.9 Periods of inactivity

Start-up the generator at least once a month.

Implement the following steps if the generator has not been used for a long period of time:
-Replace the engine oil.
-Replace the oil filter cartridge
-Replace the fuel filter cartridge
-Inspect the start-up battery and if need be, charge it

6.10 Table of scheduled interventions

The table below contains a list of what is required for the maintenance operations of the generator during its useful life. The frequency of such interventions is stipulated in the Use and Maintenance booklet of the engine.

Interventions:

Check fan belt
Check level of liquid coolant
Check level of engine oil
Replace engine oil
Replace oil filter
Replace air filter
Verify that there are no liquid leaks
Check battery charge
Check level of battery liquid and terminal clamps
Verify if there is water in the tank
Inspect bolts, fittings and electrical connections
Clean air filter
Clean radiator
Clean tank
Replace fuel cartridge

 ***Record all maintenance operations on the "RECORD OF MAINTENANCE OPERATIONS" module, found in Chapter 10.***

6.11 Faults table

 ***Any equipment inspections, verification and maintenance operations must be carried out solely by specifically trained personnel and always in strict compliance with safe working practices.***

The generator goes off whilst being used.
- Verify if a protection has been triggered and the relative warning light has lit up. (Resolve the problem and try to start-up once again)
- Verify that there is fuel in the tank. (Top-up)

The engine has a high exhaust smoke level
- Verify that the level of the engine oil does not exceed the MAX level. (Top-up)
- Verify that the unit is not overloaded.
- Verify whether the air filter has clogged.

The engine does not function smoothly.
- Check the fuel filters. (Replace)
- Purge any air bubbles from inside the diesel feeder circuit.

The alternator's voltage is too low.
- Verify the engine's rpm: 1500 rpm with no connections (switch in the OFF position).
- Correct the voltage via the electronic regulator (refer to the alternator manual).
- Faulty voltage regulator (replace).

Start-up battery is drained:
- Check the electrolyte level inside the battery. (Top-up)
- Verify functionality of the battery charging alternator of the engine or the battery charger of the automatic control panel (if present).
- Verify that the driving belt is taut.
- Verify the battery's integrity.
- Verify that the clamps on the battery's terminals are fastened well.

The generator does not deliver power.
- Check that the circuit breaker switch is in the "ON" position. If this fails to work, please contact an Authorised Service Centre.
- Verify that the alternator delivers energy.

The starter motor turns but the engine does not start-up.
- Verify that there is fuel in the tank. (Refuel)
- Purge any air bubbles from inside the feeder circuit.
- Make sure that there is good quality diesel inside the tank and no traces of water.
- Verify that the emergency push button is not pressed.

Pressed emergency push-button
- Verify the reason why this has occurred and bring the pushbutton back to its normal position.
- Check the integrity of the other emergency pushbuttons installed on the circuit.

7. TRANSPORTATION AND HANDLING

7.1 Introduction

The purpose of the following chapter is to provide information about lifting and transporting the machine. The information in this chapter is intended for TECHNICALLY QUALIFIED personnel who has adequate knowledge to operate a mobile crane, bridge crane, or any other that may be necessary, in a suitable and safe manner.

7.2 General warnings

To prevent any parts from injuring anyone in the event of the machine falling, ensure that nobody is within the operating area that is used for lifting the machine.
Lifting, transporting and placing the machine together with the electrical connections must be implemented by technically qualified personnel who has been trained in the specific fields of operation.
Before implementing any handling operation, always ensure that the lifting vehicle together with the relative tools (ropes, hooks, etc.) can withstand the load that is to be lifted and handled and verify the vehicle's stability.

7.3 Lifting the machine

The indicative weight of every generator model is shown on the "Data plate".

The vehicle used to lift and handle the machine must be able to withstand the load.
Open versions can only be handled by means of a lift truck or an overhead crane connected to slings beneath its base. Soundproof versions can be lifted by means of a lifting hook.

The hooks on the engine and alternator are NOT to be used to handle the entire generator but only the single component.

Verify the stability of the component that is to be transported.

Components must always be handled with the engine switched off and with the cables and control panel disconnected.

The rated load of a lift truck never corresponds to the actual value, which varies according to the height at which the operations will be implemented and the centre of gravity of the load in correspondence with the back of the forks.
Box/Cage Packaging: The lifting procedure must be implemented carefully so as to prevent the forks of the lift truck or the lifting slings or hooks of the cranes from damaging the wooden box and the machine.
Visible cellophane packaging: The lifting procedure must be implemented carefully so as to prevent the forks of the lift truck or the lifting slings or hooks of the cranes from damaging the fragile parts of the machine.

DANGER - SUSPENDED LOADS

FORBIDDEN TO STAND BELOW LOADS

In no circumstances can the manufacturer be held liable for damage deriving from inadequate operations, non-compliance with our regulations and incorrect handling methods by personnel who has not been trained.

Fig. 7.1: Lifting the generating sets by means of a lift truck or adequate lifting slings.

Fig. 7.2: Lifting the generating sets by means of lifting hooks.

8. DECOMMISSIONING THE MACHINE

8.1 Demolition and Disposal

At the end of the machine's useful cycle, the company using the machine must have it demolished and disposed of in compliance with current legislations. Firstly, the lubrication liquids must be drained and the various components of the machine must be cleaned. Then, the machine's parts must be separated.

Once the machine has been dismantled, the various materials must be separated in accordance with the legislation of the Country in which the machine will be destroyed.

Follow this general procedure to dismantle the machine:

- Disconnect the power supply.
- Drain all liquids.
- Disconnect the electrical parts.
- Disconnect the mechanical parts.

CAUTION: It is important to wear adequate Personal Protective Equipment when handling waste.

8.2 Disposing of the Machine

Waste that derives from the demolition of the machine must be disposed of whilst respecting the environment, without polluting the soil, air and water.
In any case, the relative local legislations must be complied with.
Remember that waste is defined as any substance or object that the person in possession of it discards or intends to discard or is required to discard it.
Waste deriving from the demolition of the machine is classified as special waste.

8.3 Demolition materials

It is important to adhere with the country's current legislation during the disposal process.

Polluting materials such as oils and solvents are to be stored solely in metal drums.

Consumer goods must be disposed of in compliance with the following rules:

- Spent batteries must not be disposed of with household waste but must be passed on to the designated treatment facilities.
- Oil: spent oil, greasy residue and items soaked in oil must be disposed of via the designated treatment facilities and not discarded in the urban drains.

8.4 Guidelines for adequate waste treatment

Proper special waste management consists of:

- Storage in suitable places ensuring not to mix hazardous waste with non-hazardous waste.
- Ensuring that such waste is transported and disposed of/recovered by authorised personnel.

One can transport his/her own waste to an authorised collection facility solely if s/he is a member of the Association of Environmental Managers.

8.5 Waste treatment of electrical and electronic equipment (WEEE)

The Government has implemented the directives of the European Parliament pertaining to waste treatment of electrical and electronic equipment (WEEE – Directive 2002/95/EC and 2003/108/EC) by means of the Legislative Decree dated 25 July 2005 No. 151.

The Decree establishes measures and procedures aimed at:

a) prevent WEEE production;

b) promote the reuse, recycling and other forms of recovery of WEEE, so as to reduce the quantity that is to be disposed of;

c) from an environmental aspect, improve the involvement of participants in the products' life cycle (manufacturers, distributors, consumers and others who are directly involved in the treatment process of WEEE);

d) reduce the use of hazardous substances in electrical and electronic equipment.

The Decree sets out limits and the removal of some hazardous substances in WEEE: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers are banned. The machine has been designed and created in compliance with this directive. Follow the indications given below. The symbol depicting a crossed out wheeled bin indicates that the machine's electrical and electronic

equipment must be disposed of as separate waste. The user of this machine can contact the collection facilities designated by the Municipalities.

10. RECORD OF MAINTENANCE OPERATIONS

RECORDS OF OPERATIONS IMPLEMENTED				
Date	**Description of Fault**	**Description of Intervention**	**Result**	**Operator's Signature**