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# **GENERATOR YNI41-50/60-01**

## **USE AND MAINTENANCE MANUAL**

**Original instructions in english**

**Manual code n.: 2500102**

**Edition: 01/2025**







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## Aim of the manual

This manual has been created by the manufacturer to provide operators with the necessary information and criteria to follow for use and maintenance of the generator set specified on the cover, which is also referred to in the manual as the machine.

The manual is an integral part of the supply and must be kept for future reference throughout the life of the machine.

If the machine is sold, the seller is required to deliver this manual and the relevant annexed documentation to the new owner.

The operators, before using the machine, must read, understand and strictly apply the instructions in this manual and those applied directly on the machine.

If you are in any doubt about how to interpret any information provided in this manual, contact the nearest service centre or the manufacturer directly for any necessary clarifications.

The pictures may differ from the actual machine configuration, but this does not affect the instructions.

Some pictures in this manual show the machine with the guards and / or casings removed in order to make the operations to be performed immediately clear.

Never use the machine without guards or casings.

The original instructions are provided by the manufacturer in English.

To meet legislative or business requirements, the manufacturer may provide translations of the original instructions.

The symbols shown and described below are used in the manual to highlight important information or operations involving a certain level of risk in terms of safety.



### DANGER

**This indicates information or procedures which, if not strictly followed, cause death or serious personal injury.**



### WARNING

**This shows information or procedures which, if not followed, may cause death or serious personal injury.**



### CAUTION

**This shows information or procedures which, if not followed, may cause slight personal injury.**

### NOTICE

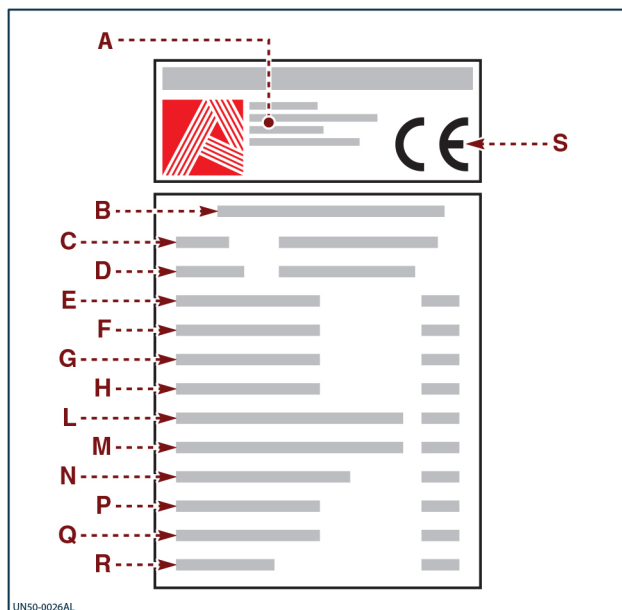
**This shows information or procedures which are important to follow in order to prevent malfunctions or physical damage.**



## Manufacturer's data and machine identification data

The plate shown, which is affixed directly to the machine, contains the references and all the information needed to identify the machine and the manufacturer.

- A)** Manufacturer's details
- B)** Trade name
- C)** Generator type
- D)** Serial number
- E)** Year of manufacture
- F)** "PRP" power = continuous output with varying load, for an unlimited number of hours per year. Average power output during a 24 hour period; it must not exceed 70% of rated output: a 10% overload is allowed for 1 hour every 12 hours of operation (ISO 8528).
- G)** "ESP" power = maximum output available at variable load, up to a maximum of 500 h/year; no overload available.
- H)** "COP" rating: blank space
- L)** Rated power factor ( $\cos \phi$ )
- M)** Ambient temperature of reference ( $^{\circ}\text{C}$ )
- N)** Rated frequency (Hz)
- P)** Rated voltage (V)
- Q)** Rated current (A)
- R)** Total mass (kg)
- S)** "CE" marking of conformity



## Engine and alternator identification data

Engine identification data is punched directly on the base and / or on the plate on the engine.

The alternator identification data is shown on the plate affixed directly to the alternator.

For the meanings of punching and/or any plate on the internal combustion engine and the identification plate on the alternator, see the manuals provided by the respective manufacturers.



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## Technical assistance procedure

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In the event of faults or failures requiring action by qualified technical personnel, contact the manufacturer or retailer directly, quoting the data shown on the identification plate and the defect found.

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## Disclaimer notice

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The manufacturer shall not be held liable for the following:

- use of the machine by untrained or unauthorised personnel;
- the partial or total failure to comply with the instructions in this manual;
- machine misuse;
- missing or inadequate maintenance;
- unauthorised modifications and/or repairs;
- use of non-original spare parts or parts not designed specifically for the model concerned;

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## Warranty

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The warranty clauses are specified in the sales or rental agreement entered into upon purchasing or renting the machine.

Any modification not authorised by the manufacturer will void the warranty and relieve the manufacturer of liability for any damage caused to people, animals and things.

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## Tax requirements

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The requirements described herein are only valid for Italy.

Before starting the machine, the user must report it to the competent bodies for the fiscal control on the production of electricity.

These bodies, after having checked and, where appropriate, sealed other systems, they issue the operating license that is subject to tax payment at the rate applied in the country of use.

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## Annexed documentation

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The documentation listed is issued to the owner together with this manual.

- "EC" declaration of conformity
- Instruction manual of the alternator
- Instruction manual of the engine
- Operating terminal instruction manual
- Starter battery instruction manual.

The instruction manual of the battery is in the special pocket on the battery.

In the case of conflicting information between the manuals enclosed and the manual of the machine, follow the information given in this manual.



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## Glossary of terms

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**Owner:** legal person who purchases the machine or the machines and intends to use it for the foreseen purposes.

**Operator:** trained person in possession of the physical requirements of ability and aptitude deemed suitable to do the job in a reliable manner.

**Training:** all the activities to teach the operators the working methods and the necessary knowledge to perform the operations assigned correctly and safely.

**Routine maintenance:** set of operations to restore the conditions of correct operation and to maintain and restore the machine to a condition whereby it can be used safely.

**Special maintenance:** set of operations that are carried out in case of a sudden failure to restore the initial operating conditions.



## General description

The machine is constituted mainly by an engine coupled to an alternator.

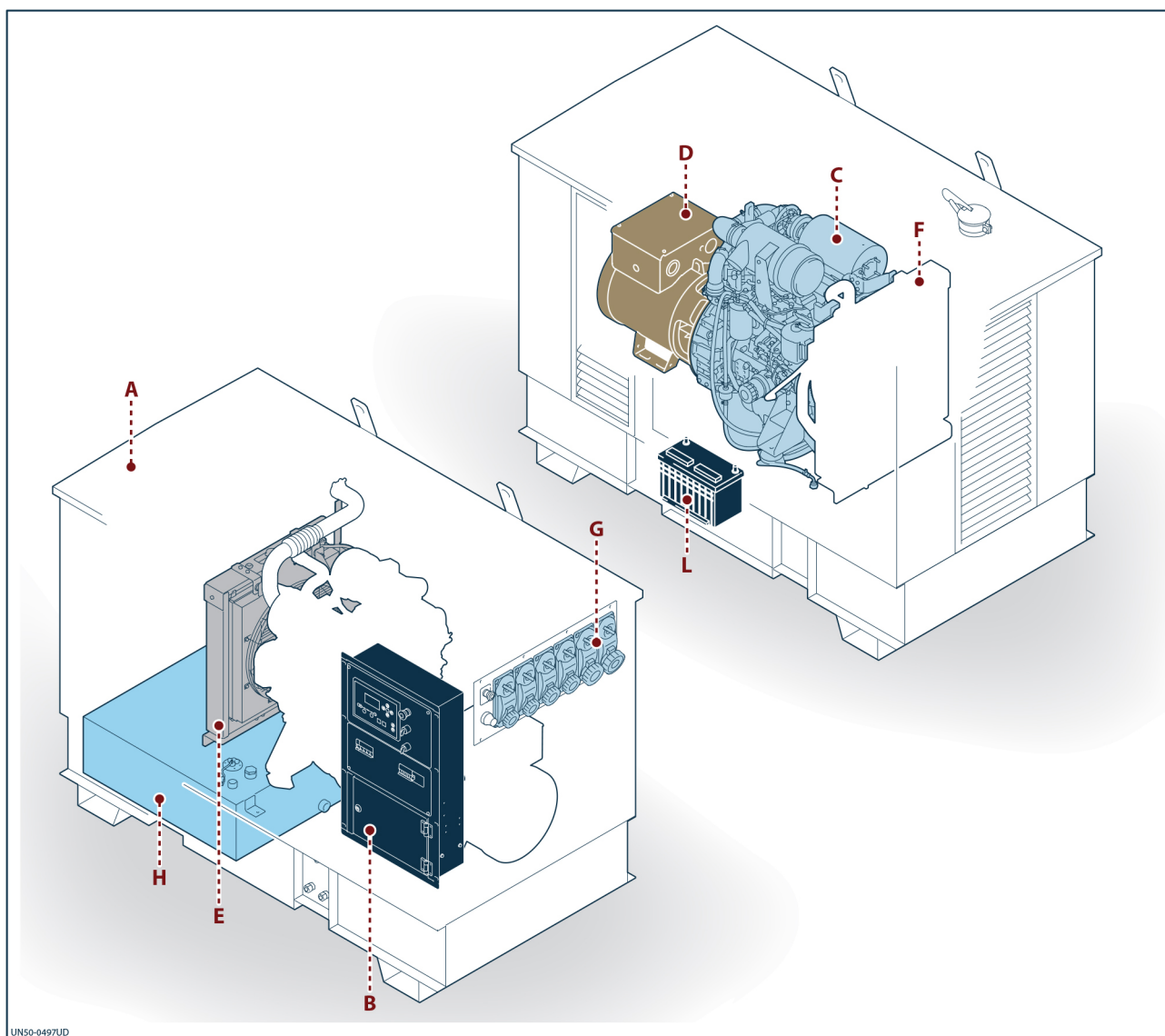
The alternator converts the mechanical energy produced by the engine into electrical energy.

The machine features a control panel that controls and enables all operations.

The machine produces electricity for multiple uses (as a driving force, for lighting, heating, etc.) in areas where there are no other sources of electricity available.

## Main parts

The picture shows the main parts of the machine.



A) Soundproof casing

B) Control box

C) Engine

D) Alternator

E) Cooling unit

F) Engine exhaust silencer

G) Equipment connection panel

H) Fuel tank incorporated into the machine

L) Engine starter batteries



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### Permitted use

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The machine is designed and built to supply electricity for mobile units, construction sites, temporary setups (in fairs, at shows, etc.) or in the event of an emergency due to a mains power cut.

The machine must be used within the operating and environmental limits specified in the technical data, without making changes or using it in an improper way.

Unless prior authorisation is given by the manufacturer, any use other than that specified must be considered misuse and therefore not permitted.

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### Improper and unauthorised uses

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**It is prohibited** to use of the machine in potentially explosive atmospheres.

**It is prohibited** to use the machine if it is connected to the electricity mains (in either private or public settings).

**It is prohibited** to use the machine in a marine type environment.

**It is prohibited** to use the machine when the doors are open.

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### Residual risks

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While the manufacturer has focussed particular attention on safety aspects in the design and construction of this machine, the residual risks described remain.

- ***Danger of crushing due to inappropriate lifting of the machine.***

Lift and move the machine according to the information provided by the manufacturer (see "Handling and installation").

- ***Danger of burns from contact with the hot parts of the engine, fume exhaust silencer, piping and coolant.***

Allow the machine to cool before any operation.

- ***Danger of electric shock from live parts.***

Never touch the connectors when the machine is running.

- ***Danger of fire and explosion due to the presence of gas and flammable substances.***

The fuel, oil, battery fluid and gases that these liquids release are flammable and explosive.

- ***Danger of intoxication by exhaust gases of the engine and the heater.***

Direct the exhaust gases away from humans and animals.

## Information and safety signs



### WARNING

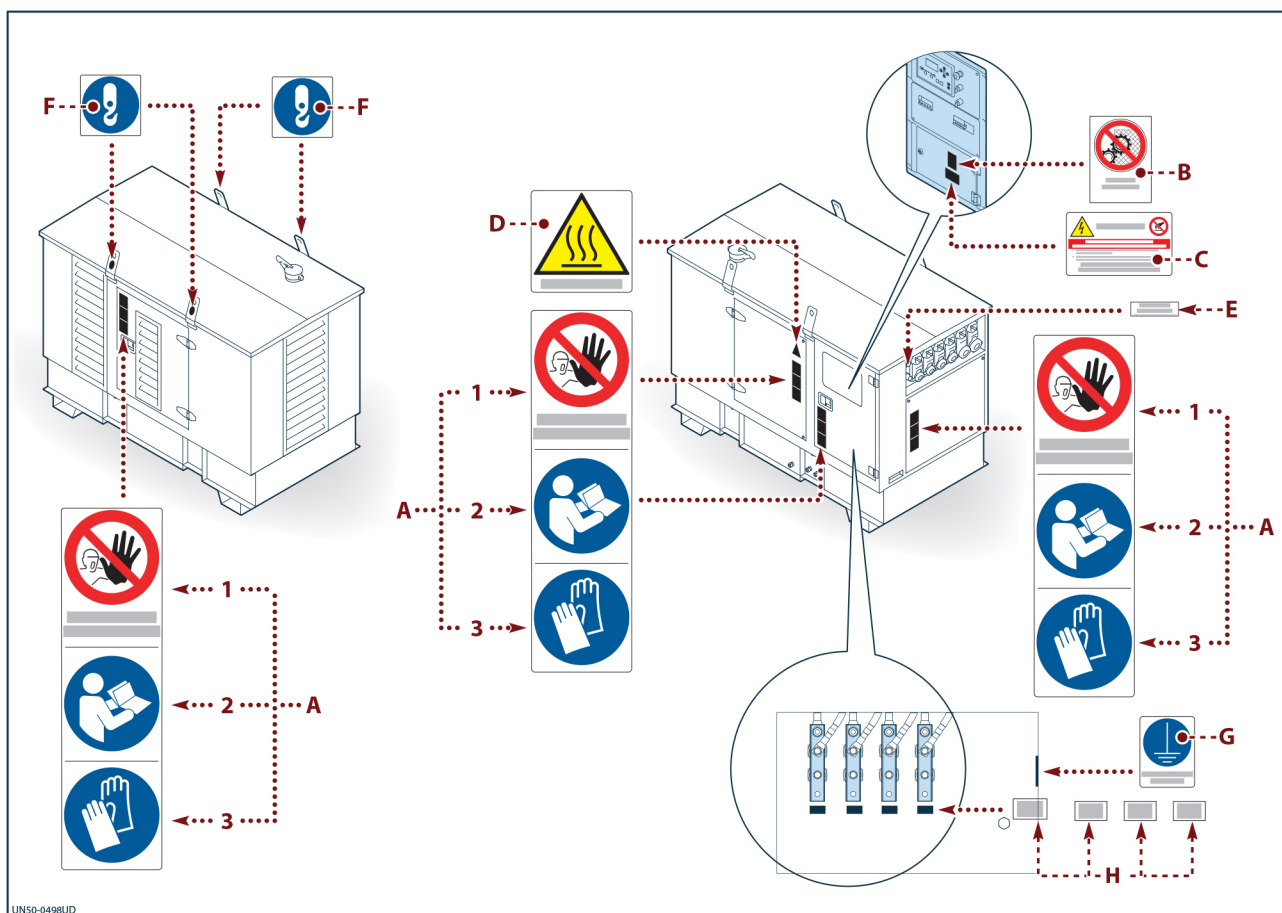
Observe the warnings and precautions specified on the plates.

Check that the plates are in place and legible.

Clean illegible plates and replace any plates which are damaged or missing, making sure you maintain the original position.

Order replacements for damaged or missing plates from the dealer or directly from the manufacturer.

The illustration shows the position of the plates and the meaning of the symbols.



**A) Plate:** the plate groups the pictograms described.

**1) Plate:** this indicates the prohibition of access to unauthorized persons.

**2) Plate:** this indicates the obligation to read the instruction manual before using the machine.

**3) Plate:** this indicates the obligation to wear suitable protective gloves.

**B) Plate:** this shows that the guards and safety devices must not be removed.

**C) Plate:** this shows that there is a risk of electric shocks and that work on live parts is prohibited.

**D) Plate:** this indicates the danger of burns from contact with hot surfaces of the machine.

**E) Plate:** this indicates the emergency stop button.

**F) Plate:** this indicates the eyebolts to lift the machine and the eyebolts to anchor the machine to the transport vehicle.

**G) Plate:** this indicates the connection terminal of the mandatory earthing.

**H) Plates:** these show the terminal phases.



## Technical characteristics

| Specifications                      |            |                                                                         |          |           |
|-------------------------------------|------------|-------------------------------------------------------------------------|----------|-----------|
| Frequency                           |            | 50 (60)                                                                 |          |           |
| Voltage (V)                         |            | 400                                                                     |          |           |
| Rotation speed (rpm)                |            | 1500 (1800)                                                             |          |           |
| Rated power factor (cos $\phi$ )    |            | 0,8                                                                     |          |           |
| Total thermal power (MW)            |            | 0,11                                                                    |          |           |
| Power output ratings (kVA)          |            | COP (*)                                                                 | PRP (**) | ESP (***) |
|                                     |            | -                                                                       | 41       | -         |
| Specific fuel consumption (g/kWh)   | 100 % load | -                                                                       | 254      | -         |
|                                     | 75 % load  | -                                                                       | -        | -         |
|                                     | 50 % load  | -                                                                       | -        | -         |
|                                     | 25 % load  | -                                                                       | -        | -         |
| Fuel consumption (L/h)              | 100 % load | -                                                                       | 10       | -         |
|                                     | 75 % load  | -                                                                       | -        | -         |
|                                     | 50 % load  | -                                                                       | -        | -         |
|                                     | 25 % load  | -                                                                       | -        | -         |
| Operating terminal                  |            | GC 315 - see the manual provided by the operating terminal manufacturer |          |           |
| Engine starter battery              |            | 100 A/h                                                                 |          |           |
| Fuel tank (l)                       |            | 220                                                                     |          |           |
| Set-up type                         |            | Soundproofed enclosure for outdoor installation                         |          |           |
| Residual noise level in db(A)       |            | 70 to 7m                                                                |          |           |
| Total weight (with fuel tank empty) |            | 1150                                                                    |          |           |
| Total weight (with fuel tank full)  |            | 1300                                                                    |          |           |

(\*\*) **"PRP" power** = continuous output with varying load, for an unlimited number of hours per year. Average power output during a 24 hour period; it must not exceed 70% of rated output: a 10% overload is allowed for 1 hour every 12 hours of operation (ISO 8528).

(\*\*\*) **"ESP" power** = maximum output available at variable load, up to a maximum of 500 h/year; no overload available.

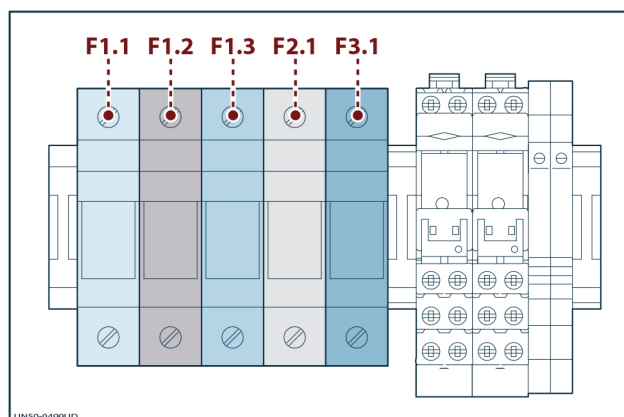
| Engine technical data                 |                   |           |
|---------------------------------------|-------------------|-----------|
| Manufacturer's name                   | YANMAR            |           |
| Model                                 | 4TNV98T - ZGA     |           |
| Emissions                             | Stage IIIA        |           |
| Performance at 1500rpm                | PRP (**)          | ESP (***) |
|                                       | 41,9 (kW)         | -         |
| Total displacement (cm <sup>3</sup> ) | 3319              |           |
| Cylinders (n°)                        | 4 in line         |           |
| Bore/stroke (mm)                      | 98 / 110          |           |
| Exhaust system                        | Turbo-Intercooler |           |
| Regulator type                        | Electronic        |           |
| Cooling type                          | Water             |           |
| Electrical system voltage - (V)       | 12                |           |

| Alternator technical data        |               |
|----------------------------------|---------------|
| Manufacturer's name              | MECC ALTE     |
| Model                            | ECP32 254     |
| Frequency (Hz)                   | 50            |
| Voltage (V)                      | 400           |
| Rated power (kW)                 | 45            |
| Insulation class                 | H             |
| Protection class (IP)            | 23            |
| Rated power factor (cos $\phi$ ) | 0,8           |
| Coupling                         | Flexible disc |
| Voltage regulator (AVR)          | $\pm 1,0$ %   |



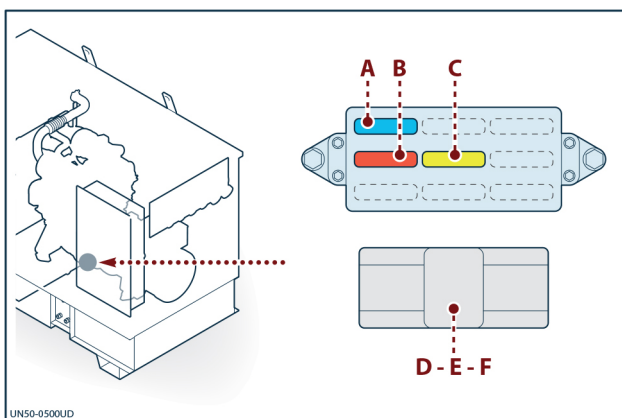
## Control panel fuses

| Specifications |                            |           |
|----------------|----------------------------|-----------|
| Ref.           | Protected circuit          | Value (A) |
| F1.1           | L1 G                       | 2         |
| F1.2           | L2 G                       | 2         |
| F1.3           | L3 G                       | 2         |
| F2.1           | Circuit board power supply | 10        |
| F3.1           | Bar switch release coil    | 6         |



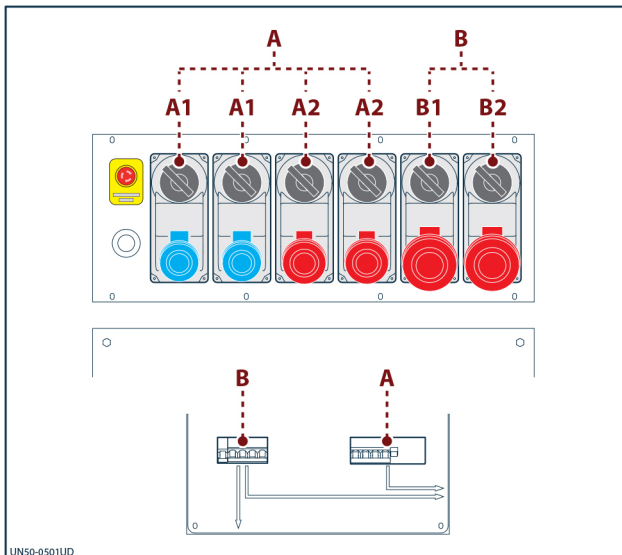
## Engine fuses

| Specifications |           |                   |           |
|----------------|-----------|-------------------|-----------|
| Pos.           |           | Protected circuit | Value (A) |
| A              |           | Starting circuit  | 15        |
| B              |           | Main relay        | 10        |
| C              |           | Sub relay         | 5         |
| D              | SLOW BLOW | Starter-Relay     | 60        |
| E              | SLOW BLOW | Air Heater-Relay  | 80        |
| F              | SLOW BLOW | Alternator        | 80        |



## Technical data for power sockets for user devices

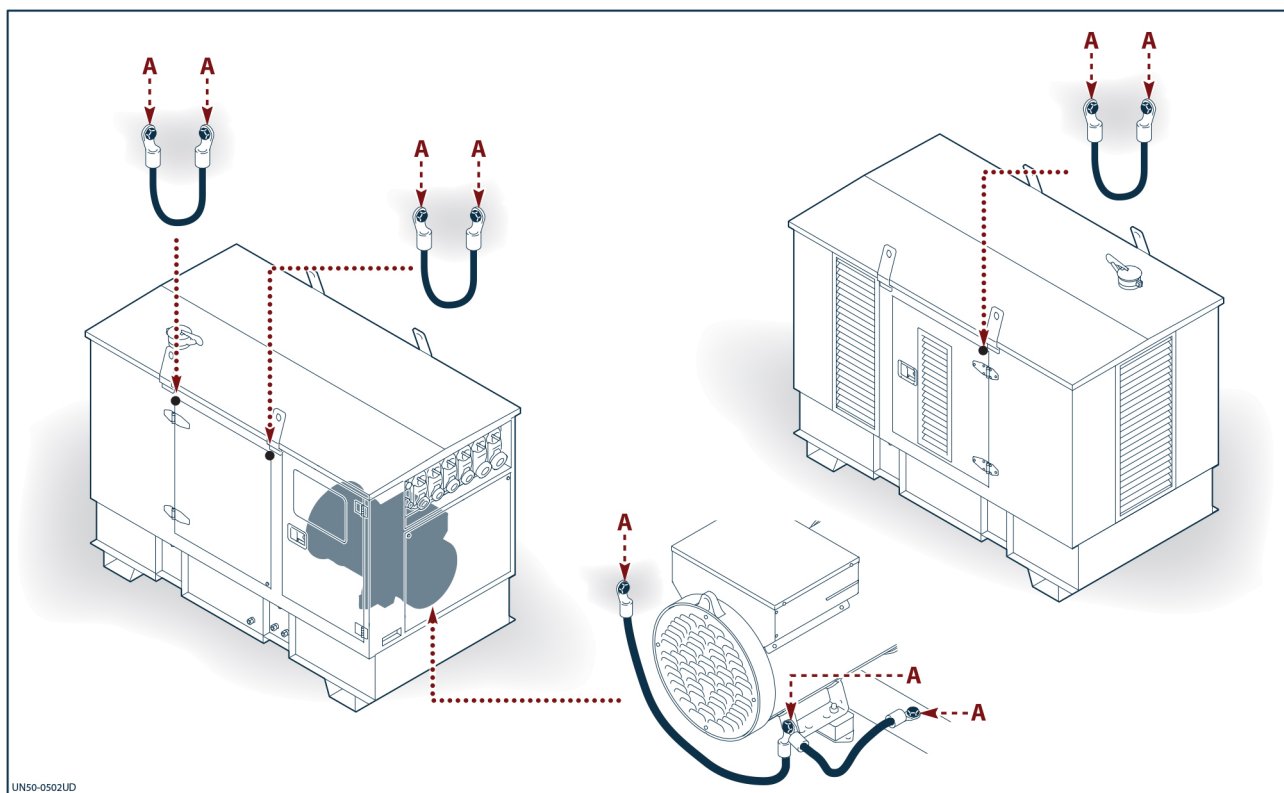
| Specifications |             |                     |                   |
|----------------|-------------|---------------------|-------------------|
| Pos.           | Voltage (V) | Max. absorption (A) | Fuses             |
| A1             | 220         | 16                  | (2 poles + earth) |
| A2             | 380         | 16                  | (3 poles + earth) |
| B1             | 380         | 32                  | (3 poles + earth) |
| B2             | 380         | 32                  | (3 poles + N + T) |





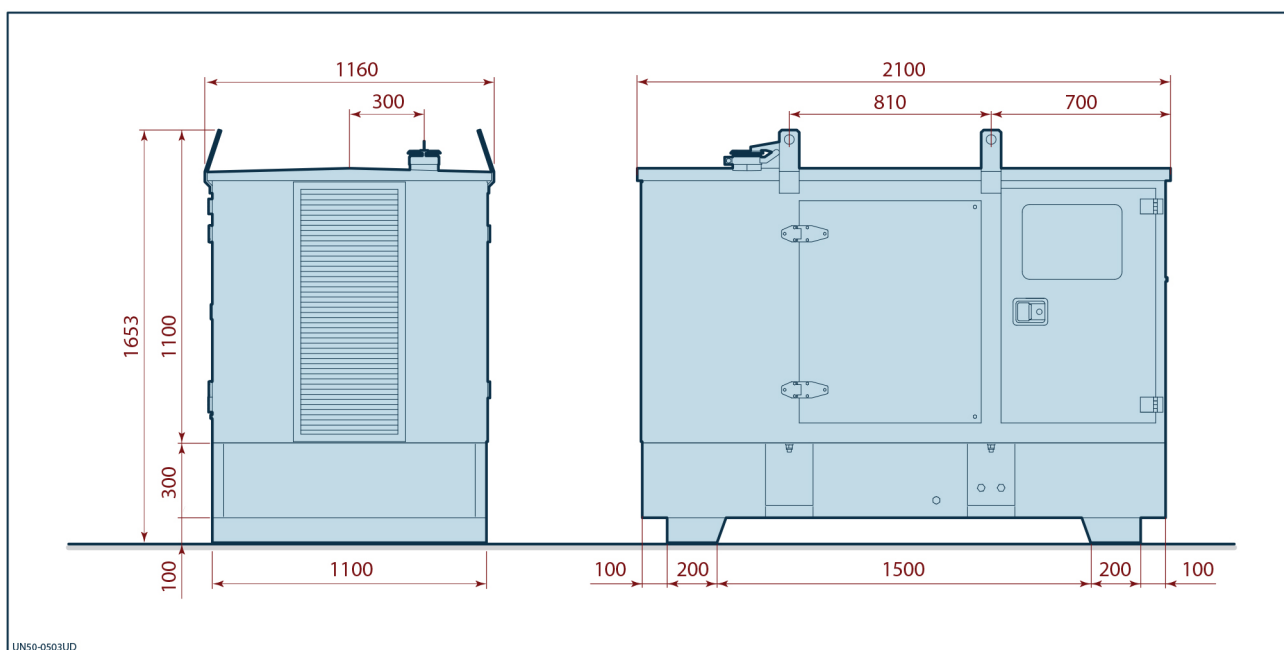
## Earthing connections of components

The picture shows the position of the earthing points of the casing and alternator.



A) Earthing points

## Overall dimensions

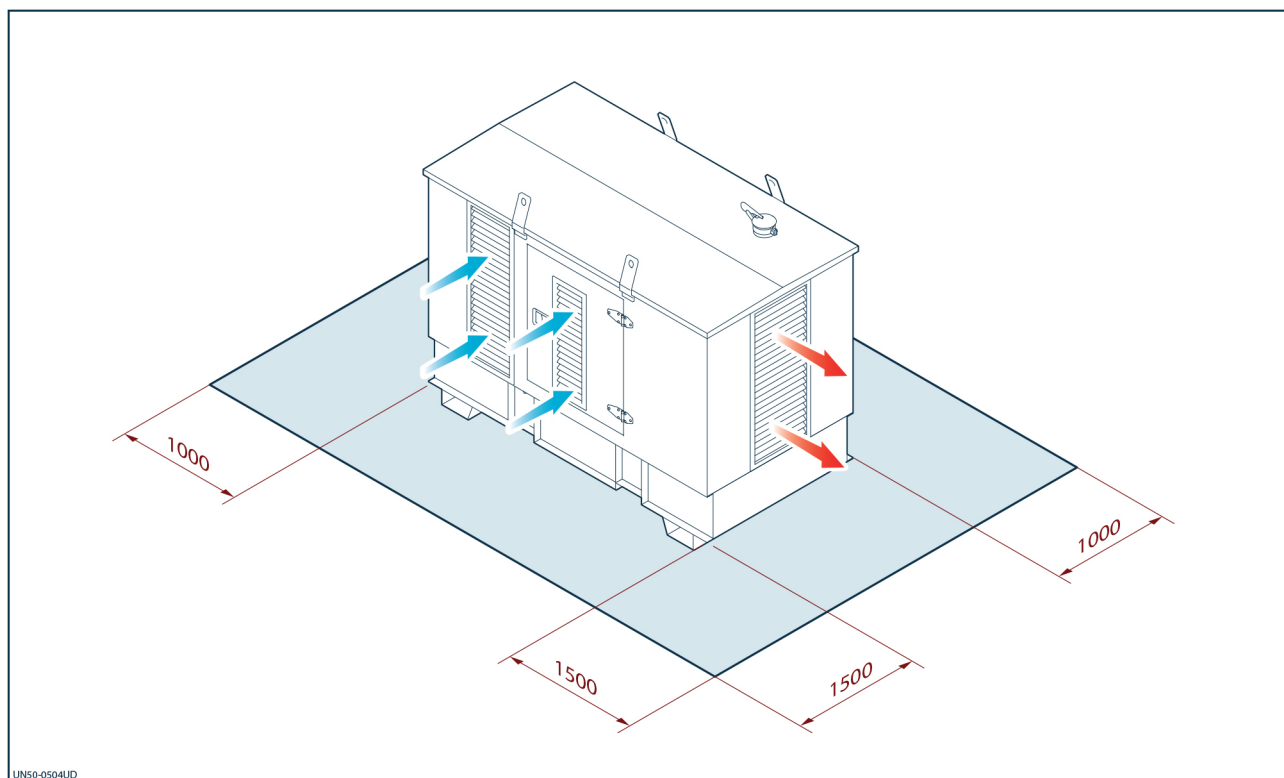


The dimensions are given in millimetres.

## Installation area

The machine must be installed on flat, solid ground which can safely support the machine. Place the machine on a flat surface, safely away from fuel tanks, flammable substances, and combustible walls or constructions, as provided for by applicable legislation. Keep a clear area around the machine, sufficient to safely perform all operations and allow for efficient cooling.

The picture shows the minimum perimeter area to be respected.



## Environmental conditions for use

The performance of the machine specified in the technical data and on the identification plate is valid in the environmental conditions described.

- Maximum ambient temperature: 25 (°C)
- Relative humidity: 30%
- Maximum altitude: 1000 mbar.

Ambient temperatures higher than those of reference entail a downgrading of the machine's maximum output power from the machine; the more the values deviate from the reference, the greater the downgrading.

In these conditions, the user must contact the machine manufacturer to seek precise derating information.



## Locking and limiting devices

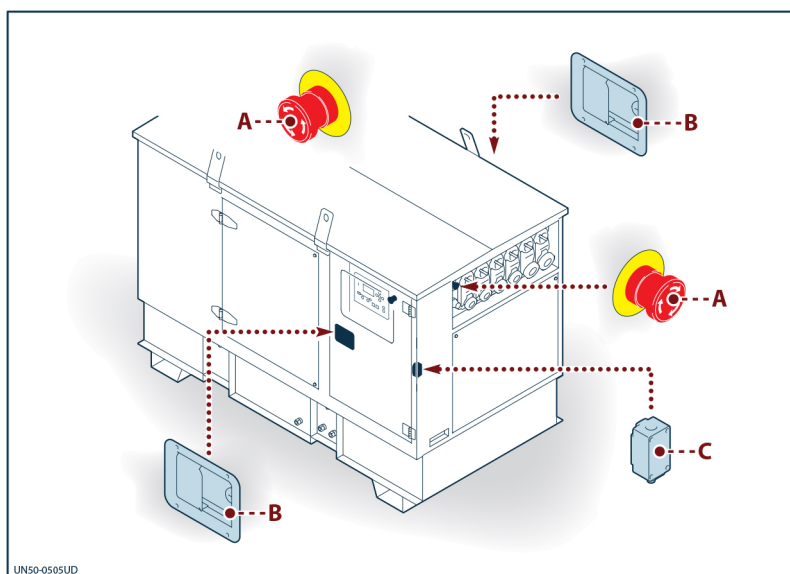


### WARNING

**On no account must you tamper with or by-pass the locking and limiting devices.**

The illustration shows where the inhibiting and limiting devices are located on the machine.

- A) Emergency stop buttons:** these are used to stop machine operation in situations of imminent risk.
- B) Lock with key:** this is used to prevent unauthorized persons to access the engine and the alternator.
- C) Microswitch:** this detects when the access hatch to the power cable terminals has been accidentally opened and stops machine operation.



## Sound emissions

The sound level measured in operating conditions is 70 dB (A).

The sound level has been measured in accordance with the standards (ISO 11202:1995-3744:1994).

## Electromagnetic compatibility

The machine complies with the European Directive on electromagnetic interference.

Electromagnetic interference emitted do not cause malfunction and do not generate dangerous situations.



## Declaration of conformity

The illustration shows a copy of the “CE” Declaration of Conformity issued in original by the manufacturer together with this manual.

**"EC" DECLARATION OF CONFORMITY**  
(ATTACH IIA - DIR. 2006/42/CE)

The manufacturer: **ARDUINI LUIGI S.R.L. UNIPERSONALE**  
Via Kennedy 14  
29010 Fiorenzuola d'Arda

**HEREBY DECLARES,**  
under its own sole responsibility, that the machine:

Model: \_\_\_\_\_ **A**  
Type: \_\_\_\_\_ **B**  
Serial: \_\_\_\_\_ **C**  
Year of manufacture: \_\_\_\_\_ **D**

to which this declaration refers,  
**IS IN CONFORMITY WITH**  
the following provisions:

- **Directive 2006/42/EC** of the European parliament and of the Council of 17 May 2006 on machinery and amending Directive 95/16/EC.
- **Directive 2014/30/EU** of the European Parliament and of the Council of 15 December 2004 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.
- **Directive 2006/35/EU** of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of the Member States relating to electrical equipment designed for use with certain voltage limits.

**And that it is in conformity with the following harmonised standards:**  
• EN 12100-1 ; EN 12100-2 ; CEI 44-5

and hereby **AUTHORISES**  
\_\_\_\_\_  
Via Kennedy 14  
29010 Fiorenzuola d'Arda

**to compile the technical file on its behalf.**

**F** \_\_\_\_\_ **G**

UN50-0506UD(en)

- A)** Commercial description of the machine
- B)** Type of machine
- C)** Serial number
- D)** Year of manufacture
- E)** Name of the person appointed and authorised by the company to prepare the technical dossier
- F)** Place and date of the declaration of conformity
- G)** Signature of the person authorised to write the conformity declaration



## Connecting the pipes (optional)

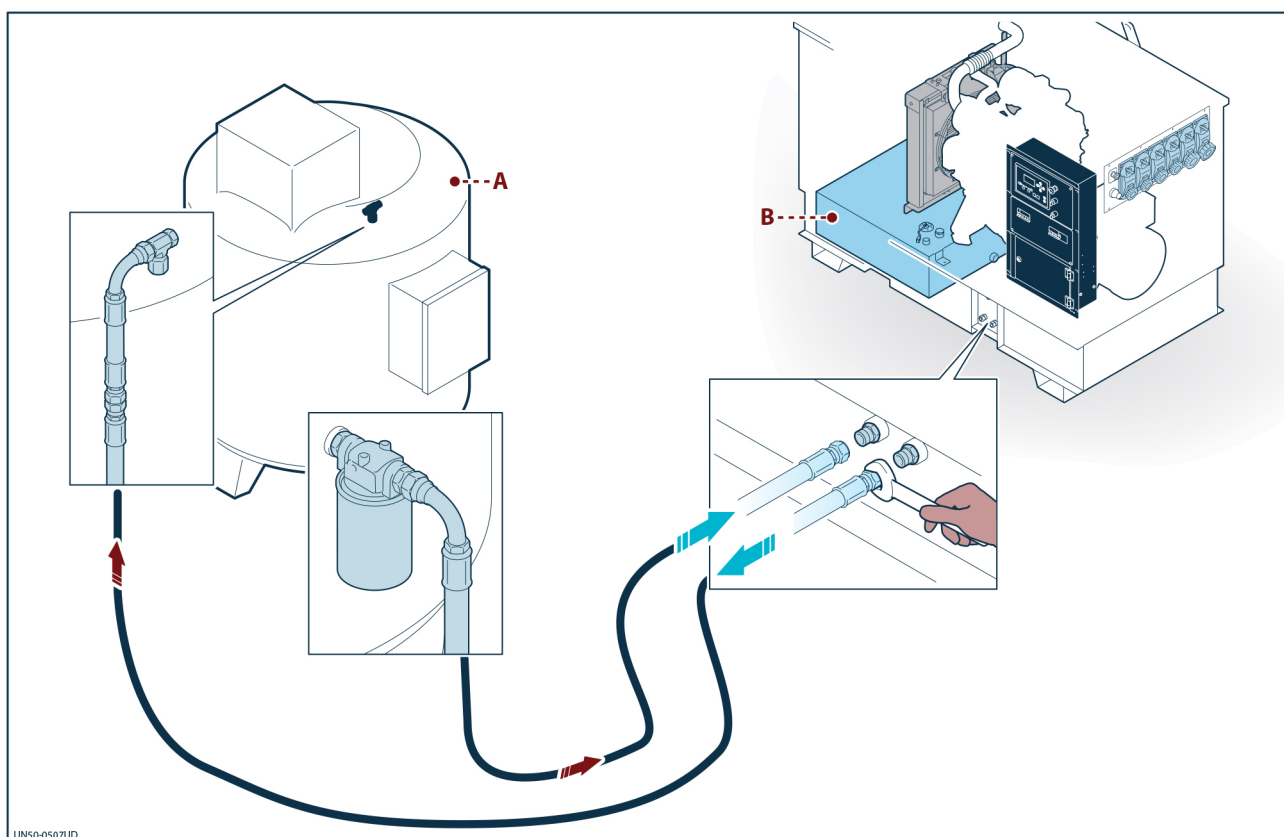


### WARNING

**Do not dump fuel. Dispose of it correctly as it is a pollutant.  
Clean up all traces of fuel to prevent fire risks.**

### NOTICE

**When connecting the hosing, apply and comply with applicable legislation.**

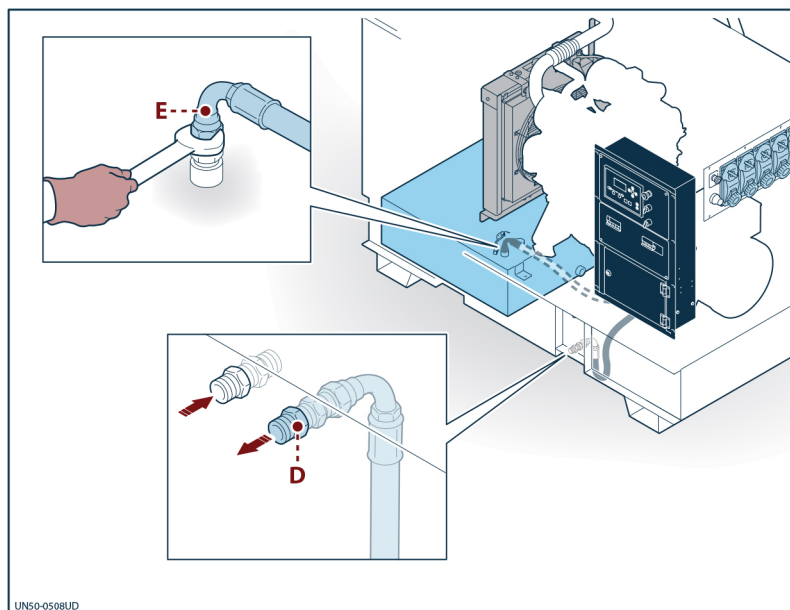


Carry out the operations described.

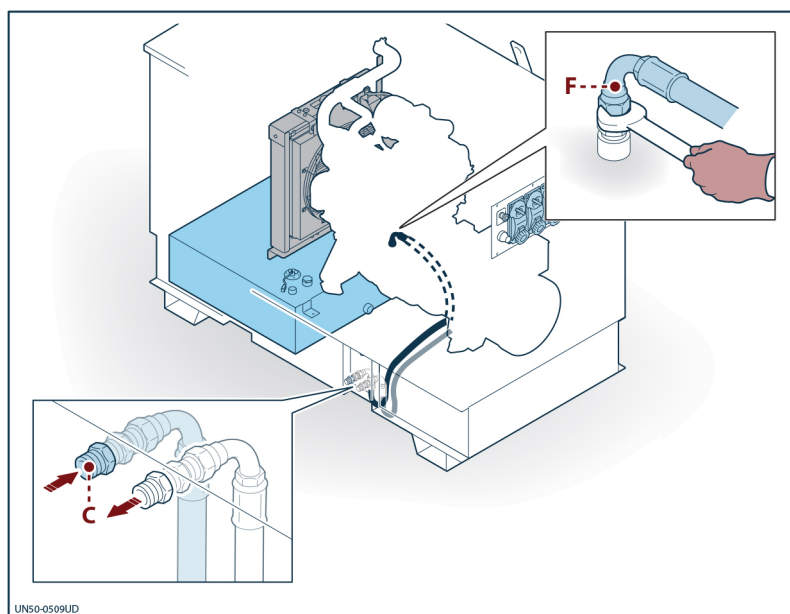
- A)** Additional fuel tank
- B)** Fuel tank incorporated into the machine



- 1) Connect the hosing as shown in the figure.
- 2) Unscrew the hose (E).
- 3) Screw the hose onto the fitting (D).



- 4) Unscrew the hose (F).
- 5) Screw the hose onto the fitting (C).







---

## General safety warnings

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Read this manual carefully before proceeding with the installation, use, maintenance of the machine or before carrying out any other work on the machine.

Heed and comply with the symbols on the machine, especially those concerning safety.

All actions involve a risk, i.e. the possibility that a situation may arise that will cause damages to persons and / or property.

The risk is not the actual harmful event but only the possibility of it happening; therefore it can be prevented and avoided by working with due diligence and adopting appropriate preventive measures.

Implement and comply with all regulations in force on accident prevention and health and safety at work.

Personnel authorised to work on or operate the machine must be suitable for such tasks and must carry out the operations according to the instructions contained in this manual and in conformity with safety regulations foreseen by the law in force.

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## Handling and transport safety precautions

---

Carry out lifting and handling activities in compliance with the information on the machine and in the manufacturer's user manual.

Loading, unloading, handling and lifting operations must be carried out by qualified and authorised personnel that has received specific training.

To prevent possible accidents, before beginning transportation, make sure that the machine is anchored to the means of transport.

Affix the relative signalling signs to any parts jutting out from the means of transport.

---

## Use and operation safety precautions

---

The use of the machine is restricted to trained and authorised persons in possession of the necessary psychological and physical requirements, so as not to pose a hazard to themselves and other people.

The machine must only be put to the uses intended by the manufacturer.

Do not tamper with any device to obtain performances other than those envisaged in order not to put at risk the safety of persons or to cause economic damage.

Start the machine only after having checked that all electrical connections have been completed in a workmanlike manner and after having eliminated any source of danger.

Immediately report to your supervisor any malfunctions that may occur during the use of the machine.

Near the machine wear personal protective equipment (PPE) corresponding to the hazard classification of the work.

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## Safety precautions for maintenance and replacements

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Maintenance is of primary importance for the efficiency and reliability of the machine and is one of the most important safety elements.

Scheduled maintenance must be carried out in compliance with the deadlines and according to the procedures established by the manufacturer.



All the maintenance jobs which require a precise technical skill or particular abilities must be carried out solely by qualified personnel with recognised experience gained in the specific work sector.

Use appropriate signs to signal the maintenance operation in progress and prevent the machine from starting (lock the door that gives access to the controls and keep the key safely, isolate the batteries, etc.).

---

### **Fire prevention safety precautions**

---

Operators must take all measures and precautions necessary to prevent a fire or to limit its consequences in the event that a fire occurs.

Do not put cloths, clothing or any other object that could catch fire in the machine.

Do not smoke or use an open flame during fuelling.

When filling with fuel keep the supply gun in contact with the tank opening until you have finished in order to reduce the risk of electrostatic sparks between the supply gun and the tank opening.

Tighten or replace the clamps, piping, loose or damaged bolts.

Only install pipes and hoses that are not damaged and that are in good condition.

Repair or replace the damaged cooling radiator.

Replace damaged batteries.

Clean traces of fuel, oil, dirt, grease, debris and other materials that may catch fire.

Clean and tighten all electrical connections.

In the presence of worn or hardened cables or wires, with damaged or missing terminals do not start the machine.

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### **Environmental protection precautions**

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Improper disposal of waste can cause environmental and ecological damage.

Potentially polluting waste installed on the machine (fuel, oil, coolant, filters and batteries) must be separated and disposed of in different ways, according to the different composition of the products, in compliance with the laws in force.

Keep the exhaust gases within the minimum values in order to limit the emissions into the atmosphere.

Correctly dispose of waste from electrical and electronic equipment because it may contain substances that are potentially harmful to the environment and to people's health.

The illegal disposal of electrical and electronic equipment (WEEE) shall be sanctioned by the laws in force in the territory in which the infringement is ascertained.



## Handling and installation safety recommendations

Carry out lifting and handling activities in compliance with the information on the machine and in the manufacturer's user manual.

During lifting and handling operations anyone not involved must keep a safe distance.

The people authorised to handle and install the machine must evaluate whether to organise a safety plan to safeguard the safety of the people directly involved and those in the immediate vicinity.

The machine must be installed by qualified personnel in compliance with the information contained in this manual and the requirements of the legislation in force.

## Packing and unpacking

The type of packing is chosen according to the selected means of transport and the destination.

Usually the packing is made of shrink film that wraps the machine.

For distant destinations and overseas shipments, the machine is placed in suitable containers.

When unpacking, check that the contents are intact and the exact quantity of the components; if there are any damaged or missing components, contact the dealer or the manufacturer directly to agree on the action to take.

The packaging material must be disposed of in compliance with applicable laws.

## Transport

The machine, depending also on the destination, can be delivered using different transport means (road, rail, sea and air).

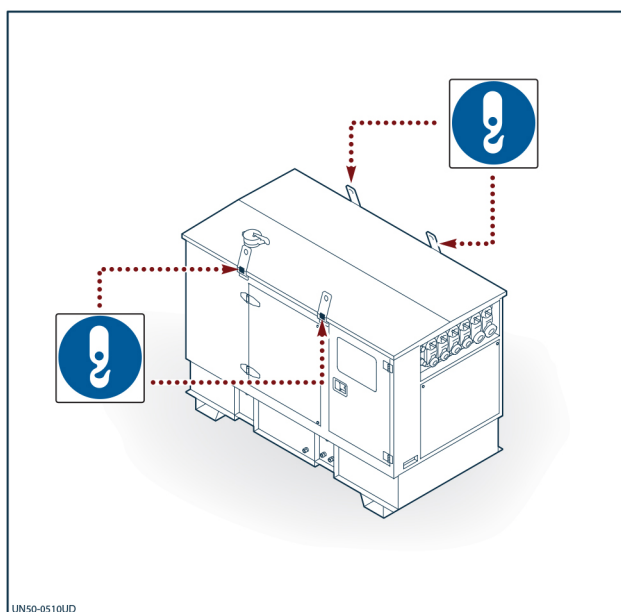


### WARNING

**Before transferring the machine, check that the machine is anchored to the means of transport to avoid uncontrolled movements and check that the profile is within the foreseen overall dimensions.**

**Before transportation, check the road conditions and the size and weight limits, as well as the highway code.**

The picture shows the points to anchor the machine to the means of transport.





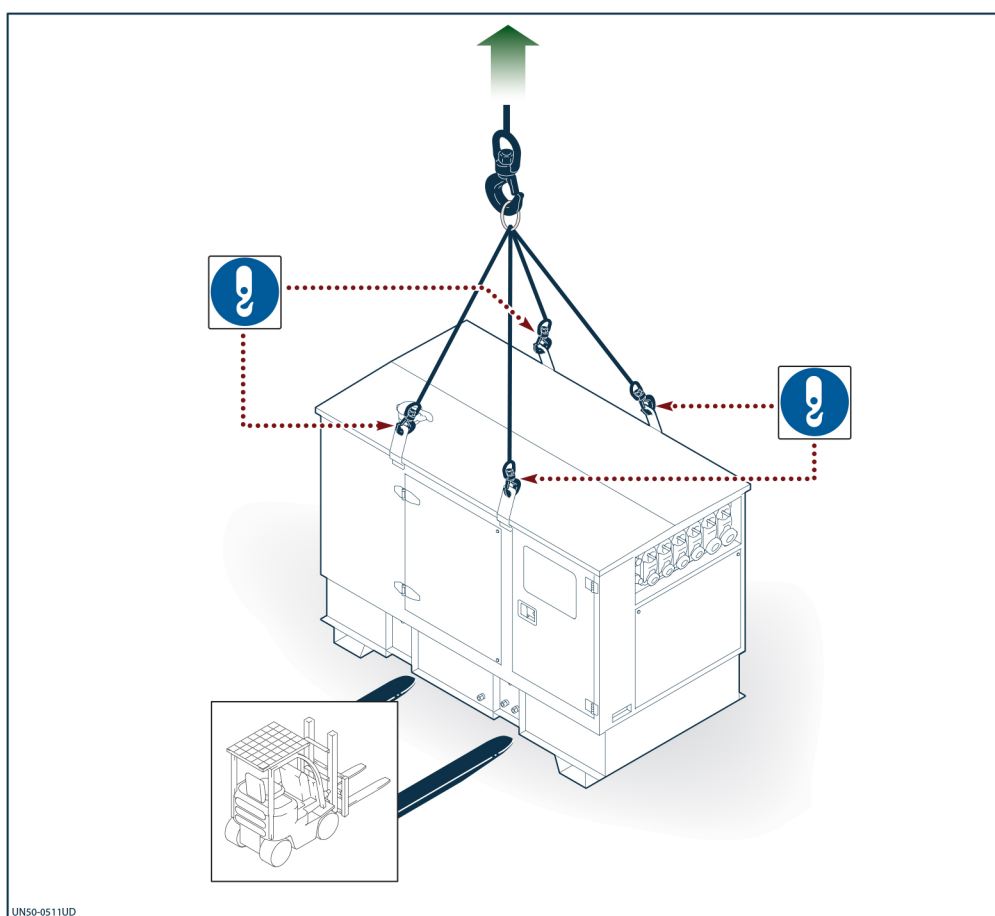
## Handling and lifting



### WARNING

**Use lifting equipment of a capacity suitable to lift and move the load.  
Handle the machine slowly, with care and caution to avoid dangerous oscillations.**

The picture shows the points to be used to lift and handle the machine.



UN50-0511UD



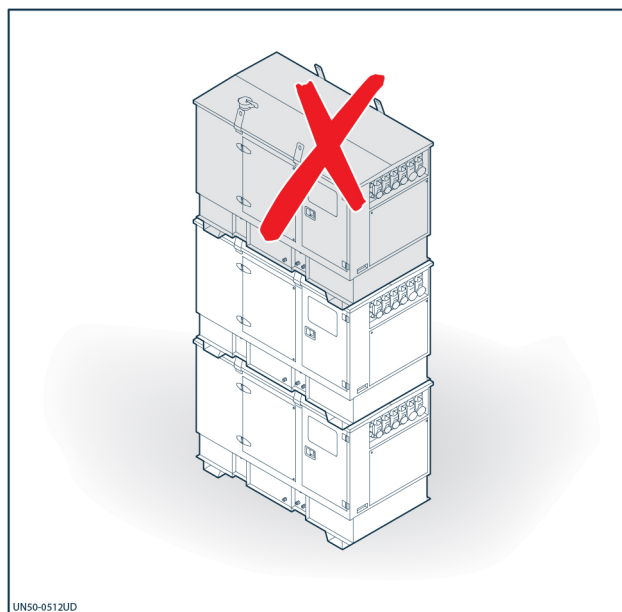
## Storage

The area where the machine is stored must be level, suitable to support the load, and not exposed to fire or explosion risks.

Avoid storing the machine in places where weather conditions could prejudice its good working order.

For storage purposes, the machine can be stacked on top of another machine of the same kind.

Do not stack more machines than the limit shown in the illustration.



## Installing the machine



### WARNING

**The machine and the accessory, if not properly installed, can be a serious source of danger to people, animals and things during operation.**

Installation must be carried out in compliance with the perimeter clearance stated (see "Installation area") and the ambient conditions (see "Environmental conditions for use").



## Electrical connections



### DANGER

**Before making the connections disconnect the batteries using the battery isolation switch (see “Description of operation controls”) to prevent the machine from starting unexpectedly.**

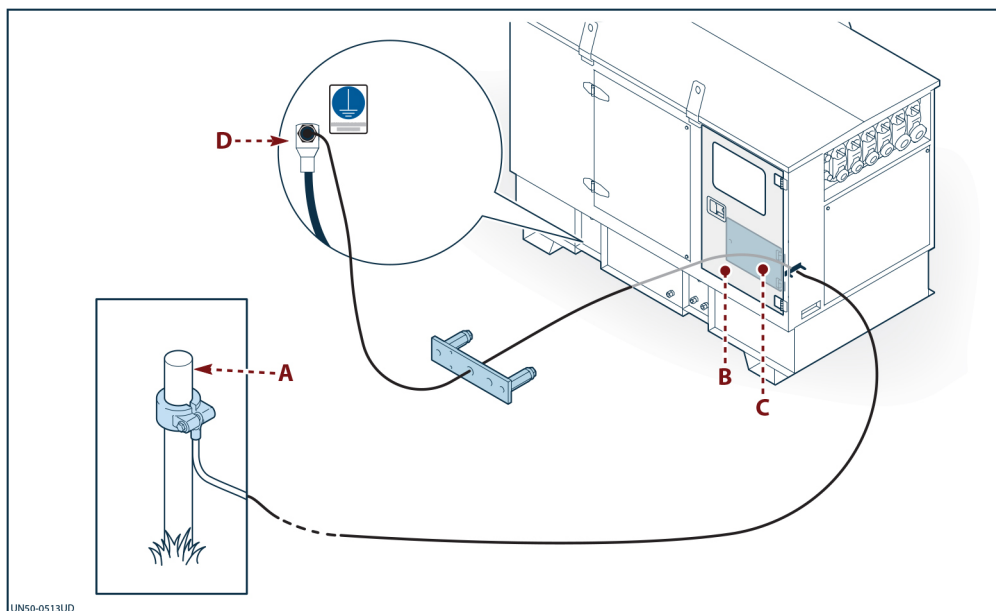
**Do not make the connections when the machine is running.**

**Failure to respect this warning can cause serious injury or death.**

All wiring up work must be carried out by a qualified electrician with specialist knowledge of the specific sector and taking into account all the legislative requirements and provisions.

### Connection to the earth rod

The illustration shows the connection to the earth rod.



Carry out the operations described.

- 1) Drive a suitable earth rod (A) into the ground.
- 2) Open the movable guard (B).
- 3) Open the hatch (C) with the relevant keys.
- 4) Connect the earth rod to the terminal (D) marked with the respective plate.
- 5) Close the hatch, remove the key and keep it in a safe place.

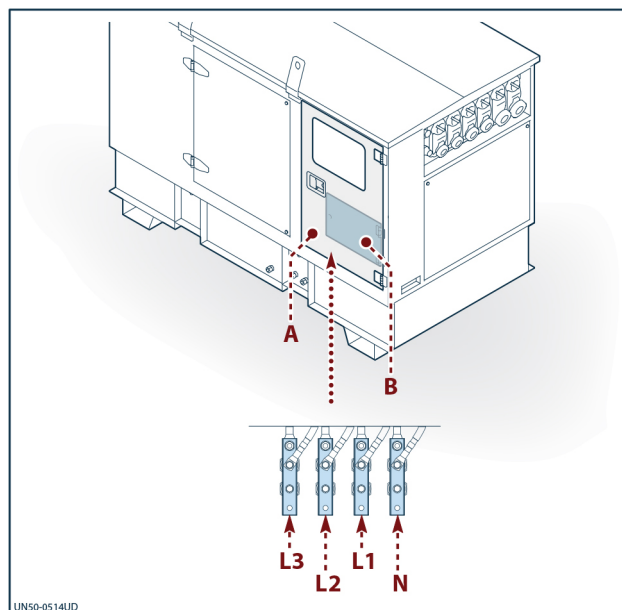


### Connection to power terminals

The illustration shows the connection to the power terminals.

Carry out the operations described.

- 1) Open the movable guard **(A)**.
- 2) Open the hatch **(B)** with the relevant keys.
- 3) Connect the user devices to terminals **(L1)**, **(L2)**, and **(L3)**, and to terminal **(N)** (neutral).



UN50-0514UD





All adjustments must be carried out by technicians authorised by the manufacturer.





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### Safety advice concerning use

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**Before using the machine, the operator and other workers must carefully read and understand the instructions contained in the manual supplied and those directly applied to the machine.**

**Failure to comply with some simple safety and prudence rules is the cause of most accidents and injuries at work.**

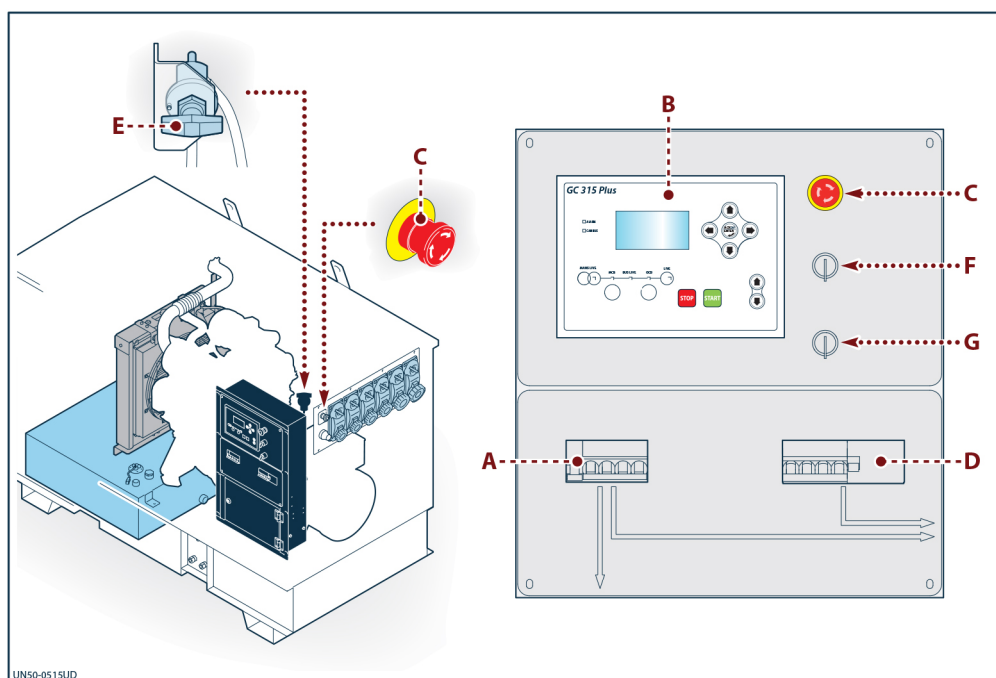
**A careful and attentive user, which respects the safety standards in the workplace and follows the instructions provided in this manual, is the best guarantee against accidents.**

**The operator, at the first start-up, must simulate some manoeuvres without any load to master and get to know the controls and main functions.**

**Do not use the machine in case of failure.**

**Start the machine only after having checked that all electrical connections have been completed in a workmanlike manner and after having eliminated any source of danger.**

## Description of operation controls

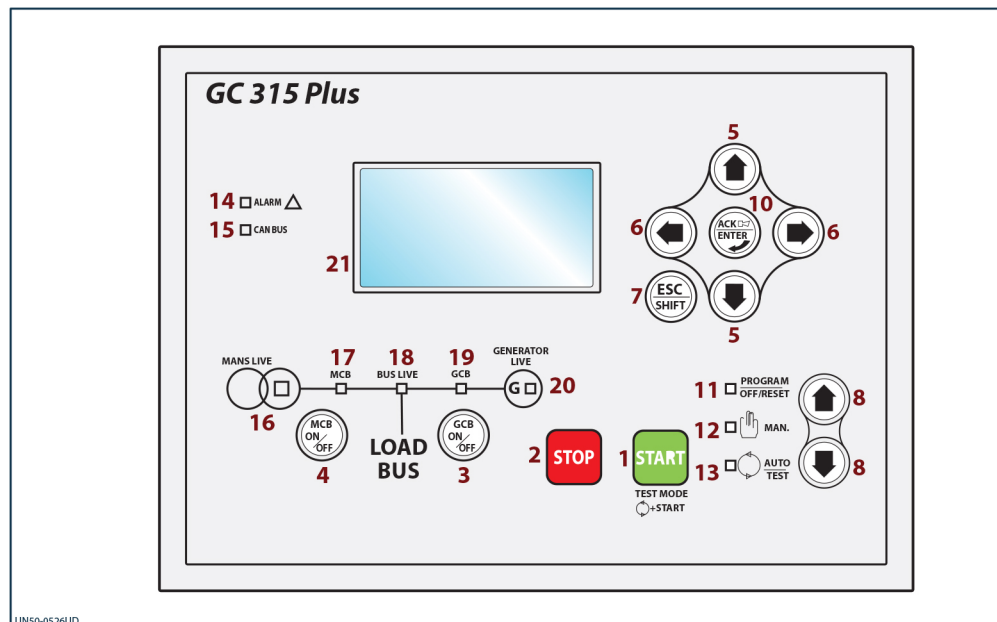


- A) Switch:** this is used to activate and deactivate the power strips and the 32 A power sockets for the user devices.
- B) Operating terminal:** this is used to activate and deactivate machine operation, to program production parameters, and to display the operating status.
- C) Emergency stop buttons:** these are used to stop machine operation in situations of imminent risk.
- D) Differential thermal magnetic circuit breaker:** this is used to activate and deactivate the electrical power supply to the 16A service sockets in the event of overloads, leaks, short circuits and shorts to earth.
- E) Battery isolator switch:** this is used to activate and deactivate the electrical circuit between the batteries and the internal combustion engine and inhibits machine operation.
- F) Key-operated selector switch:** this is used to switch on the operating terminal power supply.
- G) Key-operated selector switch:** this is used to select the power supply frequency (50 Hz or 60 Hz).

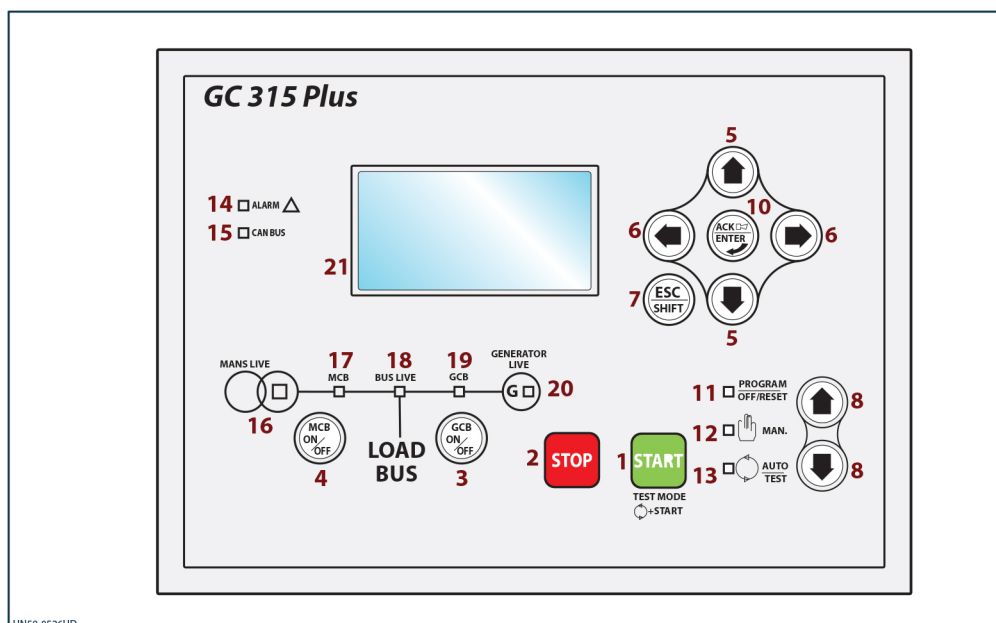
## Controls and signal lights of the control unit

The controls and luminous indicators and gauges shown are described according to their main functions.

For detailed information, see the manual provided by the operating terminal manufacturer.



- 1) **Key:** in manual mode, this is used to control machine start-up.
- 2) **Key:** in manual mode, this is used to control machine shut-down.
- 3) **Key:** not active.
- 4) **Key:** not active.
- 5) **Display navigation keys:** these are used to select the last or the next page in all modes except the programming mode.
  - In the programming mode, they are used to position the cursor when entering strings.
- 6) **Keys:** these are used, combined with the (7) key - to increase or decrease the display contrast.
- 7) **Key:** in the programming mode, this is used to undo editing of a variable, to go back to the menu above, and to quit the programming mode.
  - This key, when combined with keys (6) is used to increase or decrease the display contrast.
- 8) **Keys:** these are used to select the operating mode (OFF/RESET/PROGRAM – MAN – AUTO/TEST).
- 10) **Key:** This is used to enter the programming mode and once in the programming mode, it is used to enter a submenu, to start editing a variable or parameter, and to confirm editing.
  - In the "File" menu, this key is used to enter the "Log file" function.
- 11) **Luminous indicator.**
  - Luminous indicator off: the board is in another operating mode.
  - Luminous indicator (on permanently): this shows that the operating mode is OFF/RESET.
  - Luminous indicator (flashing): this shows that you are accessing the "Programming" menu.
- 12) **Luminous indicator.**
  - Luminous indicator (on permanently): this shows that the "Manual" operating mode is enabled.



- Luminous indicator off: the board is in another operating mode.

### 13) Luminous indicator.

- Luminous indicator (on permanently): this shows that the "Automatic" operating mode is enabled.
- Luminous indicator (flashing): this shows that the "TEST" operating mode is enabled.
- Luminous indicator off: the board is in another operating mode.

### 14) Luminous indicator.

- Luminous indicator (on permanently): this shows that there is at least one item either inhibited or deactivated.
- Luminous indicator (flashing): this shows that there is at least one pre-alarm active.

### 15) Luminous indicator.

- Luminous indicator (on permanently): this shows that the "CAN-BUS" interface is active, operational, and in "ERROR-ACTIVE" mode.
- Luminous indicator (flashing): this shows that there is a communication anomaly.
- Luminous indicator off: this shows that the "CAN-BUS" interface is disabled.

### 16) Luminous indicator.

- Luminous indicator (on permanently): this means the system is connected to the power mains and is therefore live.
- Luminous indicator (flashing - 25%): this shows that the mains voltage is below the tolerance range.
- Luminous indicator (flashing - 50%): this shows that the mains power is in a transitory stage, i.e. either changing from powered to not powered or vice versa.
- Luminous indicator (flashing - 75%): this shows that the mains voltage is above the tolerance range.
- Luminous indicator off: this shows that there is no mains power.

### 17) Luminous indicator.

- Luminous indicator off: the MCB switch open command has been issued.
- Luminous indicator (on permanently): the MCB switch close command has been issued.
- Luminous indicator (flashing - 25%): MCB switch open after close command issued.
- Luminous indicator (flashing - 75%): MCB switch closed after open command issued.

### 18) Luminous indicator.

- Luminous indicator (on permanently): this shows that the "BUS" line is powered.



- Luminous indicator (flashing - 50%): this shows that the voltage is outside the tolerance range.
- Luminous indicator off: this shows that the "BUS" line is not powered.

**19) Luminous indicator.**

- Luminous indicator off: the GBC switch open command has been issued.
- Luminous indicator (on permanently): the GBC switch close command has been issued.
- Luminous indicator (flashing - 25%): GBC switch open after close command issued.
- Luminous indicator (flashing - 75%): GBC switch closed after open command issued.

**20) Luminous indicator.**

- Luminous indicator off: no generator voltage or frequency.
- Luminous indicator (flashing - 25%): generator voltage and frequency are above the tolerance range.
- Luminous indicator (flashing - 50%): this shows that the mains power is in a transitory stage, i.e. either changing from powered to not powered or vice versa.
- Luminous indicator (flashing - 75%): voltage and frequency are above the tolerance range.

**21) Display:** this is used to display the operating and programming parameters and the scheduled maintenance messages.

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**Checks before starting the machine**

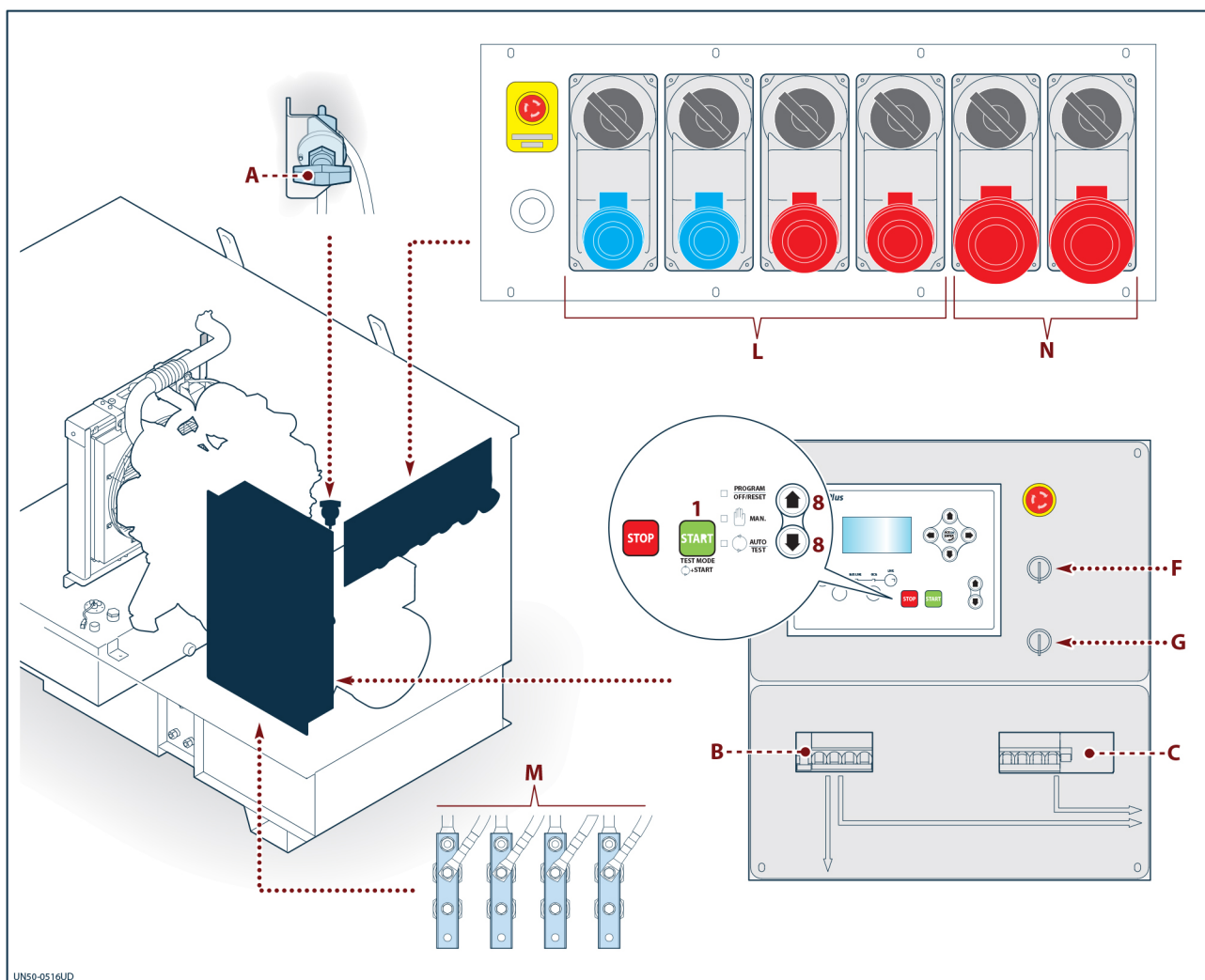
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Before starting the machine, the checks described below must be carried out.

- 1) Check the fuel level and fill the tank if necessary.
- 2) Check the oil level in the internal combustion engine and if necessary top up with oil suitable for the ambient temperature for machine operation (see the instruction manual provided by the engine manufacturer).
- 3) Check the coolant level and, if necessary, top up with liquid suitable for the ambient temperature of use (see "Restore the level of engine coolant").
- 4) Carefully check all electrical cables for damage to the insulation.
- 5) Check that the cables are properly connected.
- 6) Check that all cable lugs and terminals are securely tightened.
- 7) Check that the earth rod is in good working order and is correctly connected and fastened (see "Electrical connections").
- 8) Check that the earthing connections of the machine structure are not damaged and that the cable lugs are securely tightened (see "Earthing connections of components").
- 9) Check that any mechanical component is properly installed.
- 10) Check that there are no tools, cloths, items of clothing, or other foreign material left in the machine.
- 11) Check that there is no leakage of fuel, oil, or coolant.
- 12) Check that there is no leakage of the battery fluid.
- 13) Check that the access doors to the engine - alternator are closed.



## Starting the machine in manual mode



To start the machine, proceed as described.

- 1) Make sure the user device connection cables and the earth cable are connected properly.
- 2) Check that the overload switch (C) is in the "OFF" position.
- 3) Check that the overload switch (B) is in the "OFF" position.
- 4) Turn the battery isolation switch (A) to close the electrical circuits and activate the control panel.
- 5) Turn the selector switch (F) to switch on the operating terminal power supply.
- 6) Turn the selector switch (G) to select the supply frequency according to the user device requiring the power supply.

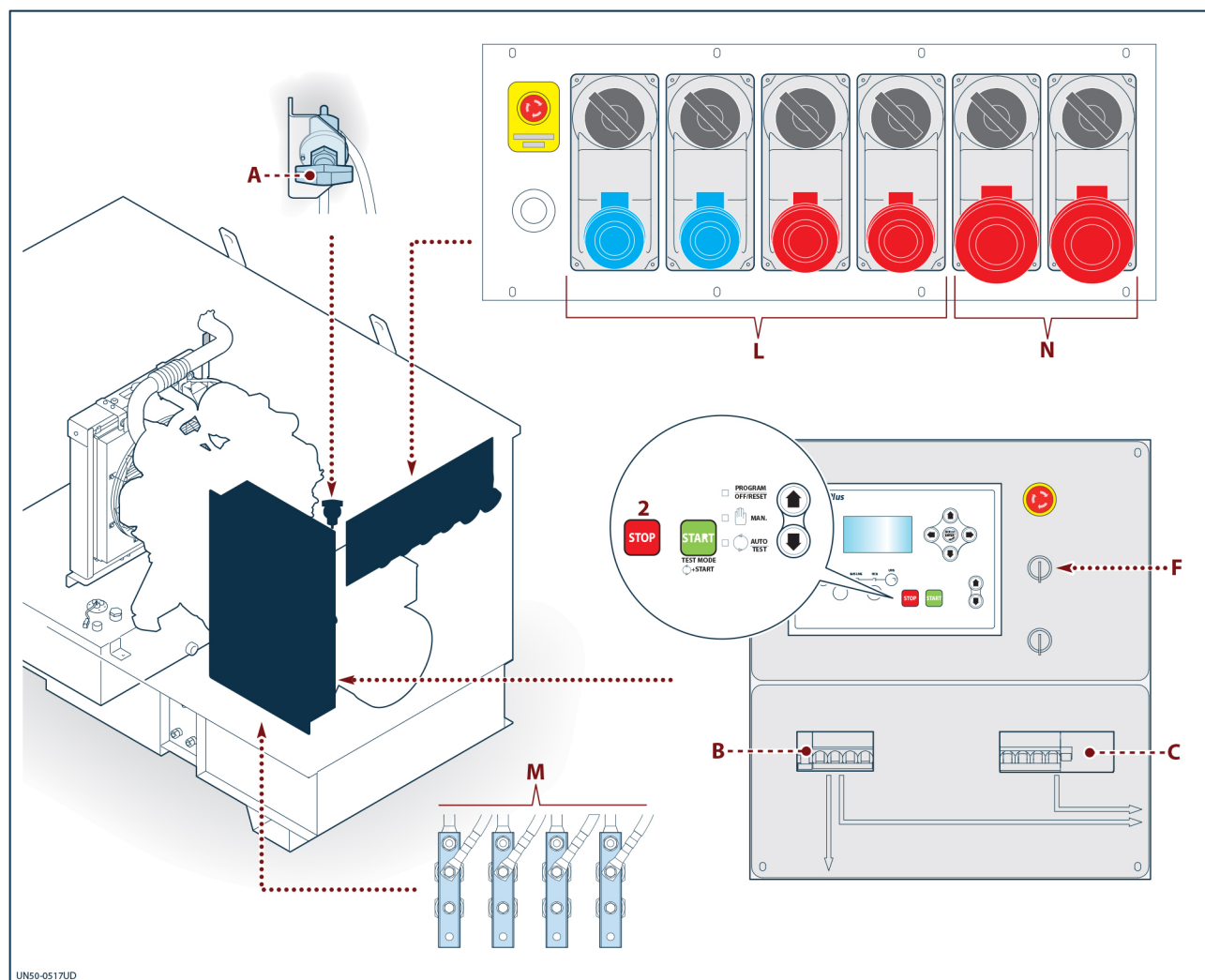
### NOTICE

**Check the frequency of the user device requiring the power supply and set the frequency accordingly.**

- 7) Press the keys (8) to select manual operating mode.
- 8) Press the button (1) and hold it down until the engine starts.

**9) Decide which user devices must be powered.**

- Set the switch lever (**B**) in the "ON" position to switch on the electricity supply to the power strips (**M**) and the power sockets (**N**).
- Use the overload switch lever (**C**) to connect the electricity supply to the power sockets (**L**).

**End of work stop**

To stop the machine, proceed as described.

- 1) Deactivate the user devices connected to the machine.
- 2) Set the switch lever (**B**) in the "OFF" position to switch off the electricity supply to the power strips (**M**) and the power sockets (**N**).
- 3) Set the overload switch lever (**C**) in the "OFF" position to switch off the electricity supply to the power sockets (**L**).
- 4) Press the button (**2**) to stop the engine. Wait for 30 seconds before activating the battery isolation switch to prevent damage to electronic equipment.
- 5) Turn the selector switch (**F**) to deactivate the operating terminal.
- 6) Turn the battery isolation switch (**A**) to disconnect the battery from the electrical system.



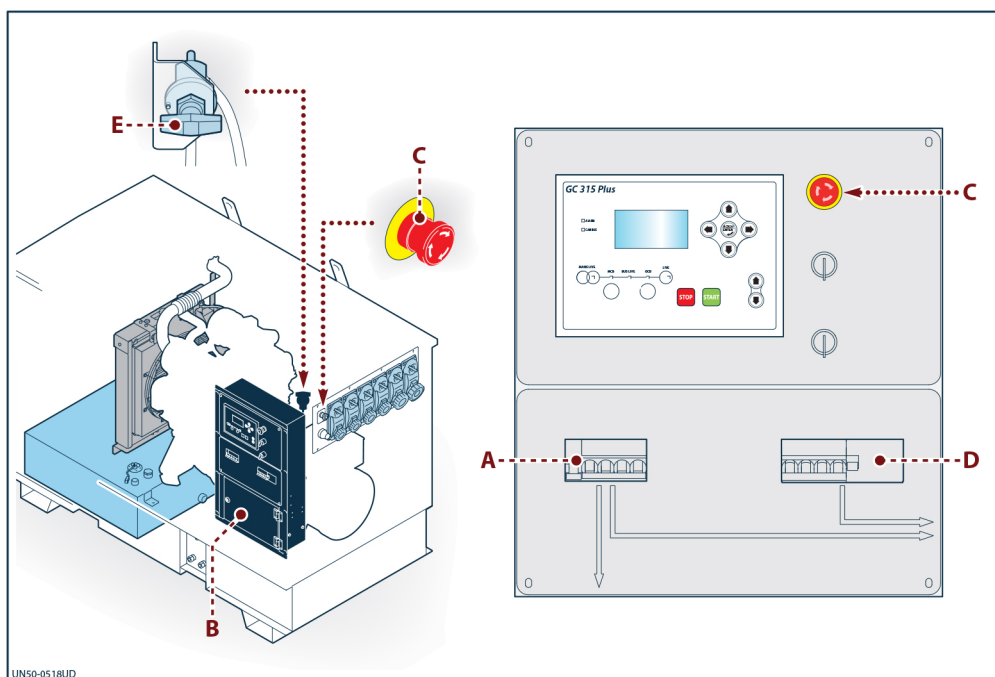
## Stopping in emergency conditions and restarting procedures

For this operation, proceed as outlined below.

In conditions of imminent danger press one of the emergency buttons (C) to immediately stop the machine.

The machine can also be stopped in an emergency situation by opening the hatch (B).

- 1) Turn the battery isolation switch (E) to disconnect the battery from the electrical system.
- 2) Set the switch lever (A) in the "OFF" position to switch off the electricity supply to the power strips and the power sockets.
- 3) Set the overload switch lever (D) in the "OFF" position to switch off the electricity supply to the power sockets.
- 4) Restore normal operating conditions and release the button to allow for machine restart.
- 5) Start the machine (see "Starting the machine in manual mode").





## Refuelling



### WARNING

**Fill the fuel tank only when the machine is switched off and cold.**

**Do not smoke or use an open flame during fuelling.**

**Do not refuel if there is a fuel leak or in the case of danger of fire or explosion.**

**Wipe up spilled fuel immediately.**

**Do not fill the tank completely to prevent the fuel from spilling out due to the increase in volume.**

**The supply gun must always be in contact with the tank opening until refuelling is complete to avoid the risk of electrostatic sparks between the supply gun and the tank opening which could lead to the fuel catching fire or the tank exploding.**

### NOTICE

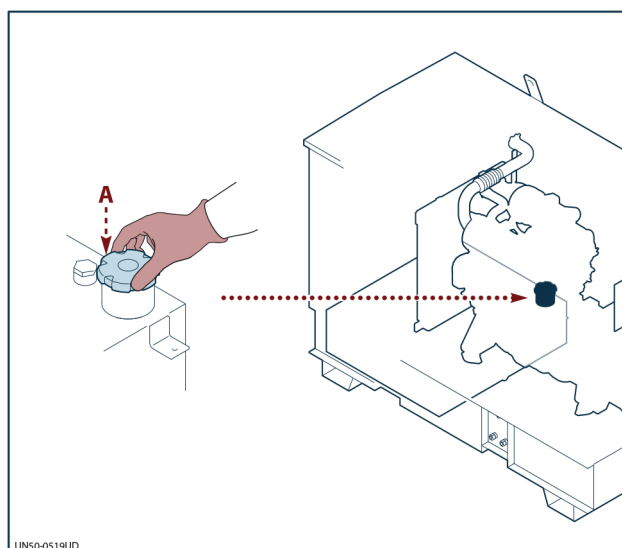
**The fuel must comply with the specifications provided by the engine manufacturer (see the user manual issued by the engine manufacturer).**

For the good working order of the engine, the fuel must be free from suspended impurities; therefore it must decant for a suitable amount of time.

It is a good idea to refill the fuel tank before it is completely empty to prevent the injection pump from sucking in air and to prevent the consequent bleeding of the fuel system.

For this operation, proceed as outlined below.

- 1) Open the door.
- 2) Clean the cap and surrounding area to prevent contamination of the fuel.
- 3) Unscrew the filler cap (A).
- 4) Fill the fuel tank.
- 5) Screw on the cap (A).
- 6) Lock the door.
- 7) Remove the key and store in a safe place.







## Safety advice for maintenance

To protect the people involved, maintenance operations must be carried out with all safety devices activated and unauthorised people must not be allowed to access the area of operation which must be appropriately marked.

Carry out the maintenance operations envisaged by the machine's manufacturer to ensure the machine remains safe and in good working order.

All maintenance operations not provided for in this chapter must be carried out by authorised and qualified maintenance personnel.

For the engine maintenance schedule, refer to the engine manufacturer's manual.

For the alternator maintenance schedule, see the manual provided by the alternator manufacturer.

At the end of the operations, before restarting the machine, check that there are no tools, cloths, items of clothing, or other foreign materials inside the casing.

## Scheduled maintenance

| Scheduled maintenance chart           |                 |                  |                     |                           |                                                        |                                                                       |
|---------------------------------------|-----------------|------------------|---------------------|---------------------------|--------------------------------------------------------|-----------------------------------------------------------------------|
| Frequency                             |                 |                  |                     | Component                 | Type of work                                           | Reference                                                             |
| Before starting the machine every day | Every 200 hours | Every 1000 hours | At least every year |                           |                                                        |                                                                       |
|                                       |                 |                  |                     | Engine                    |                                                        | Refer to the engine manufacturer's manual                             |
|                                       |                 |                  |                     | Alternator                |                                                        | See the manual provided by the alternator manufacturer                |
| ●                                     |                 |                  |                     | Warning and hazard plates | Check good condition and presence                      | See "Information and safety signs"                                    |
|                                       | ●               |                  | ●                   | Battery                   | Checking the electrolyte level                         | See "Restoring the battery fluid level"                               |
|                                       | ●               |                  | ●                   | Battery                   | Check battery charge level                             | See the manual provided by the battery manufacturer                   |
|                                       | ●               |                  | ●                   | Battery                   | Check for leakage                                      |                                                                       |
|                                       |                 |                  | ●                   | Earthing cables           | Check good working condition                           | See "Electrical connections"                                          |
|                                       |                 |                  | ●                   | Electrical connections    | Check that cable lugs and terminals are tightly fitted | See "Electrical connections" and "Earthing connections of components" |
|                                       |                 |                  | ●                   | Electrical system         | Check cable wear or damage                             |                                                                       |
|                                       |                 |                  | ●                   | Casing                    | Check good condition of soundproofing parts            |                                                                       |

When the time interval set by the manufacturer for certain scheduled maintenance activities has expired, these activities are shown on the operating terminal display with the message **"39-Maintenance required"**.

The message includes the operations to replace the engine oil, the oil and fuel filters, the fuel pre-filter and to clean or replace the air filter.

At the same time as the message is displayed, an audio signal is activated.

Make sure this maintenance is carried out, either internally or by the manufacturer, not long after the message appears.

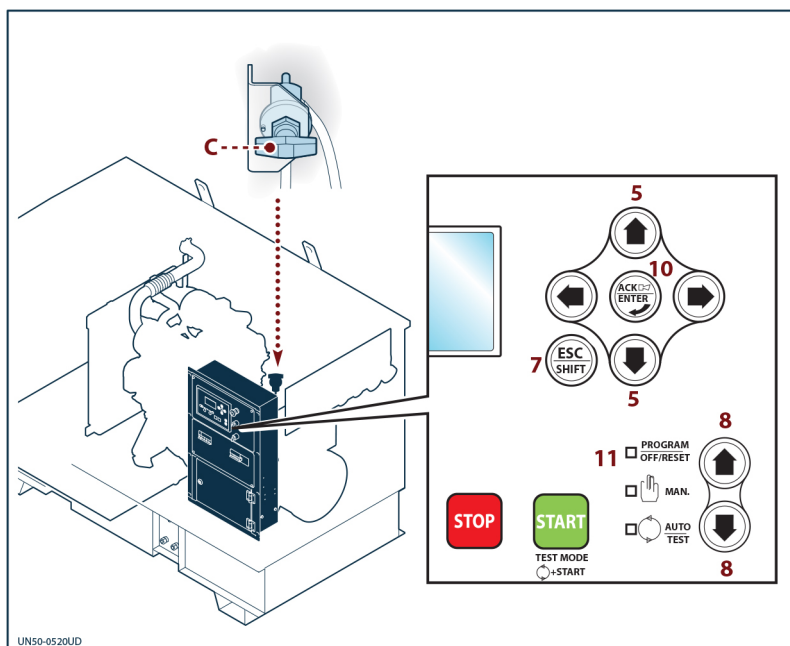
At the end of the maintenance procedures, reset the initial maintenance period (see "Resetting the alarm and the maintenance period").



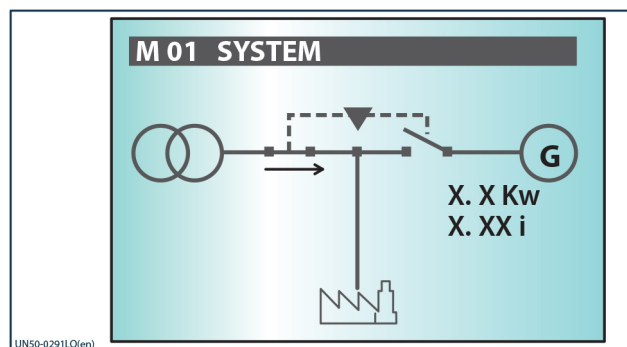
## Resetting the alarm and the maintenance period

Carry out the operations described.

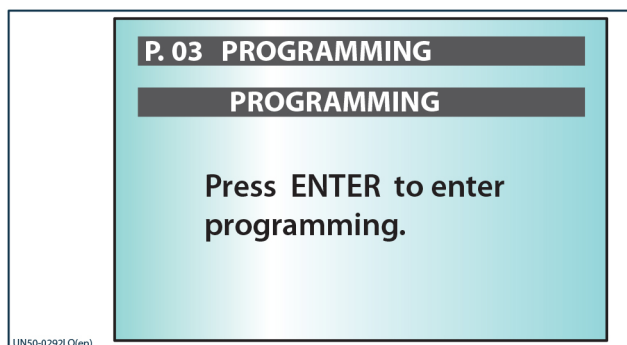
- 1) Stop the machine (see "End of work stop").
- 2) Turn the battery isolation switch (C) to close the electrical circuits and activate the control panel.



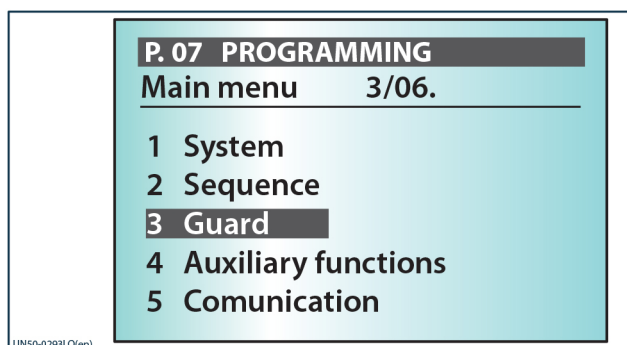
The operating terminal is activated and the "M01. SYSTEM" page appears.



- 3) Press the keys (8) until the signal light (11) comes on.
- 4) Press the keys (5) to display the "P03 PROGRAMMING" page.



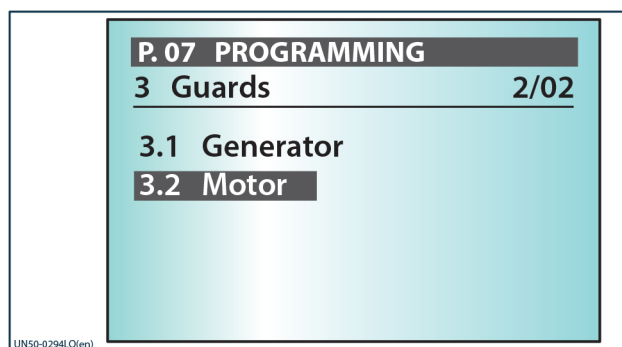
- 5) Press the key (10) to display the page shown.
- 6) Press the keys (5) to select "3 Guards".





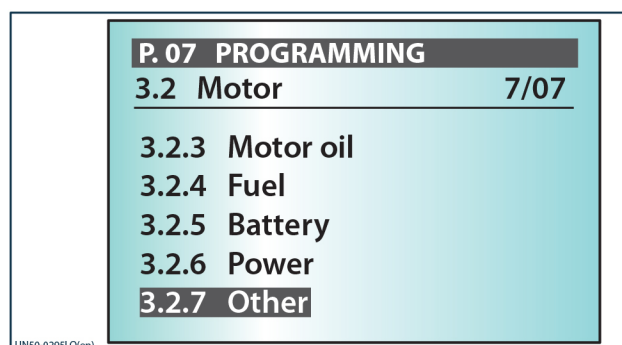
7) Press the key (10) to display the page shown.

8) Press the keys (5) to select "3.2 Motor".



9) Press the key (10) to display the page shown.

10) Press the keys (5) to select "3.2.7 Other".



11) Press the key (10) to display the page shown.

12) Press the keys (5) to select "424 - Interval 1 for maintenance (h)".

13) Press the key (10).

The brackets will start flashing.

14) Press the keys (5) to change the maintenance period start setting.

15) Press the key (10) to confirm the setting.

16) Press the key (10) to enter the maintenance parameter setting page.

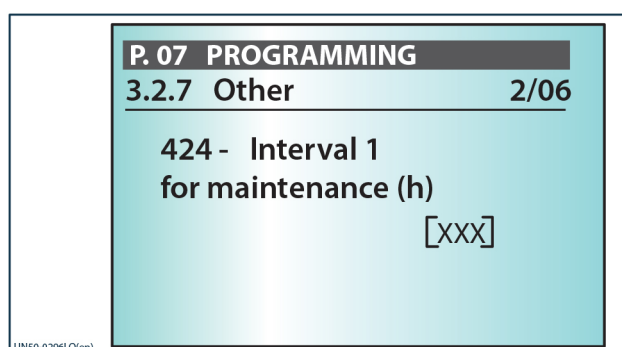
The brackets will start flashing.

17) Press the keys (5) to reset the initial maintenance period start setting.

18) Press the key (10) to confirm the setting.

19) Press the key (7) repeatedly to exit the programming page.

20) Press the key (5) repeatedly to go back to the home page.



## Restore the level of engine coolant



### WARNING

**Restoring the level of the coolant when the machine is cold.**

**Never remove the cap from the expansion tank when the engine is still hot as this could result in scalding by spurts of the (still hot) liquid.**

If the engine coolant level is too low, this is signalled by a message shown on the operating terminal display.



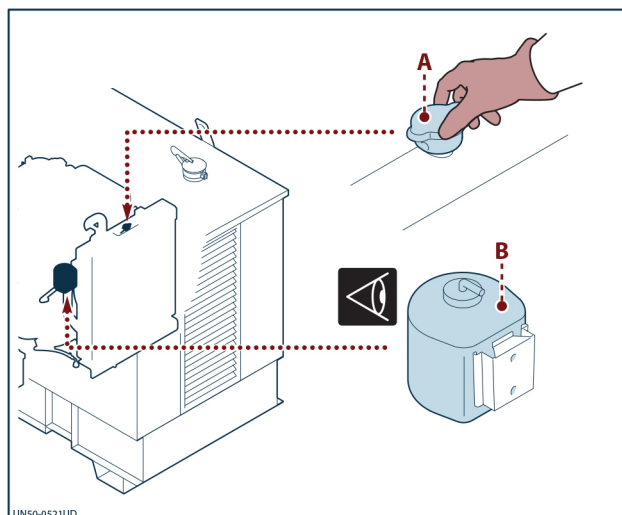
To restore the level proceed as described.

- 1) Open the door.
- 2) Unscrew the filler cap (A) on the expansion tank (B).
- 3) Add the coolant through the opening of the filler neck.

The correct coolant level is shown by the level indicator on the expansion tank (B).

Please refer to the engine manufacturer's manual for coolant characteristics, taking ambient conditions into consideration.

- 4) Screw on the cap (A).
- 5) Lock the door.
- 6) Remove the key and store in a safe place.

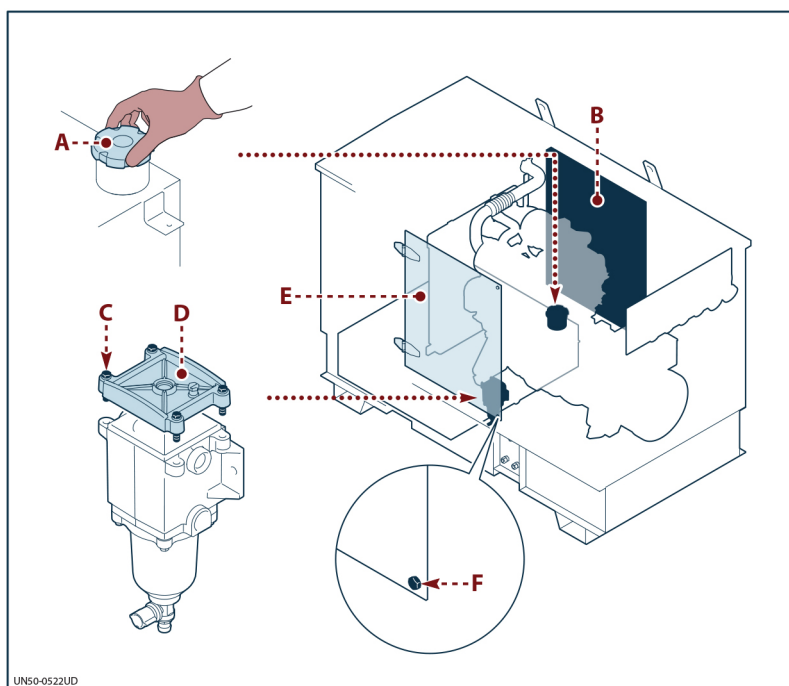


### Topping up the fuel circuit system

Top up the system when the engine stalls due to lack of fuel.

For this operation, proceed as outlined below.

- 1) Open the door (B).
- 2) Clean the cap and surrounding area to prevent contamination of the fuel.
- 3) Unscrew cap (A).
- 4) Fill the fuel tank
- 5) Screw on the cap (A).
- 6) Lock the door.
- 7) Remove the key and store in a safe place.
- 8) Undo the screws (F).
- 9) Open the door (E).
- 10) Undo the screws (C).
- 11) Remove the cover (D).
- 12) Top up with fuel.
- 13) Position the cover (D).
- 14) Tighten the screws (C).
- 15) Close the door (E).
- 16) Tighten the screws (F).
- 17) Try to start the machine; keep trying until the internal combustion engine starts.





## Restoring the battery fluid level



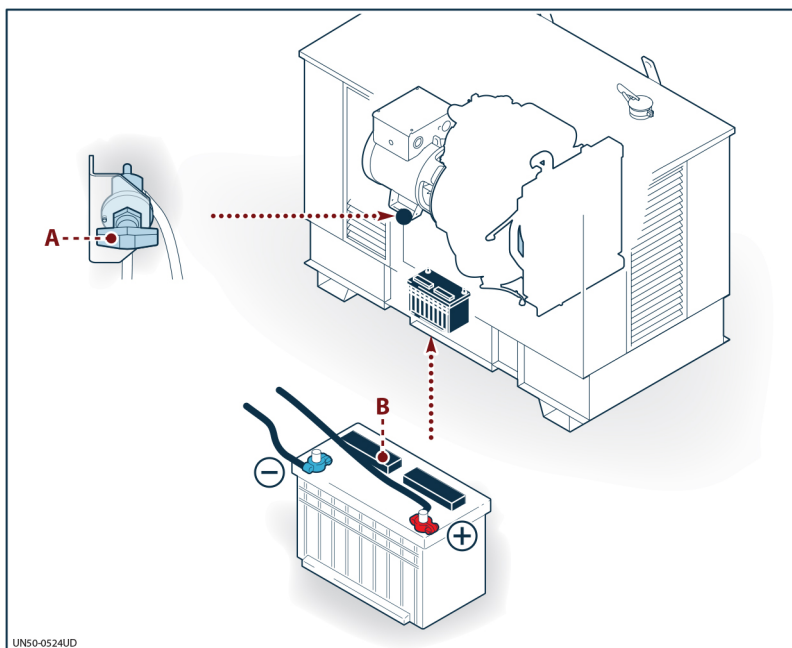
### WARNING

**Do not smoke, not use naked flames and do not cause sparks that could make the battery explode.**

**Do not fill the batterie with metal funnels to prevent the risk of short circuits.**

Carry out the operations described.

- 1) Open the door.
- 2) Isolate the batteries with the battery isolation switch (A).
- 3) Remove the caps (B).
- 4) Top up every single element with distilled water to restore the proper level.
  - The liquid must cover the metal parts of each part.
  - If the battery is a "maintenance-free" model, it cannot be topped up; therefore, if it does not work, it must be replaced.
- 5) Refit the caps (B).
- 6) Turn the battery isolation switch (A) to close the electrical circuits and activate the control panel.
- 7) Lock the door.
- 8) Remove the key and store in a safe place.





## Recharging the battery



### WARNING

**Do not recharge the battery when mounted on the machine.  
Always remove the battery from the machine before charging.  
If the battery fluid is frozen, recharge the battery once thawed.**

Carry out the operations described.

- 1) Remove the battery (see "Replacing the battery").
- 2) Recharge as described in the manual provided by the battery manufacturer (contained in the pouch attached to the battery).
- 3) Refit the battery in the machine (see "Replacing the battery").

## Checking the good working condition of the piping

Check the seam fastening the fittings to the hose and the condition of the hoses.

If the pipes show signs of ageing, breakages, swellings, abrasions, etc., they must be replaced.

Check the condition of the fittings and of the pipe.

If the pipe has any corrosion, dents, swellings, etc., it must be replaced.

## Nuts and bolts tightening torques chart

| Thread diameter | Tightening torque    |                       |                       |
|-----------------|----------------------|-----------------------|-----------------------|
|                 | Resistance class 8.8 | Resistance class 10.9 | Resistance class 12.9 |
| M6              | 9.5                  | 13.0                  | 16.0                  |
| M8              | 23.0                 | 32.0                  | 39.0                  |
| M10             | 46.0                 | 64.0                  | 77.0                  |
| M12             | 80.0                 | 110.0                 | 135.0                 |
| M14             | 125.0                | 180.0                 | 215.0                 |
| M16             | 195.0                | 275.0                 | 330.0                 |
| M18             | 270.0                | 390.0                 | 455.0                 |
| M20             | 385.0                | 540.0                 | 650.0                 |
| M22             | 510.0                | 720.0                 | 670.0                 |
| M24             | 660.0                | 930.0                 | 1100.0                |
| M27             | 980.0                | 1400.0                | 1650.0                |
| M30             | 1350.0               | 1850.0                | 2250.0                |

Note: friction coefficient 0,125



Some of these faults can be resolved by the operator, while others must be resolved by qualified and experienced personnel because they require specific technical expertise.

| Fault                                   | Likely cause                                           | Solution                                                        | Reference                                                                            |
|-----------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------|
| The starter motor does not run          | Flat battery                                           | Charge or replace the battery                                   | See "Recharging the battery" or "Replacing the battery"                              |
|                                         | Battery isolation switch in "OFF" position             | Turn the battery isolation switch to "ON"                       |                                                                                      |
|                                         | Interrupted electrical connection                      | Restore the electrical connection                               | Contact an authorised service centre or the manufacturer directly                    |
|                                         | Emergency button pressed                               | Release the emergency button                                    | See "Stopping in emergency conditions and restarting procedures"                     |
|                                         | Terminal hatch to access terminals open                | Close the hatch                                                 | See "Stopping in emergency conditions and restarting procedures"                     |
| The engine does not start               | No fuel                                                | Fill the fuel tank                                              | See "Refuelling"                                                                     |
|                                         | Air in the fuel supply circuit                         | Bleed the fuel supply circuit                                   | Refer to the engine manufacturer's manual                                            |
|                                         | Clogged up fuel filters                                | Replace the filters                                             | Refer to the engine manufacturer's manual                                            |
|                                         | Machine stop due to fault                              | Check the fault message shown on the operating terminal display | See the manual provided by the operating terminal manufacturer                       |
|                                         | Machine block for activated emergency buttons          | The corresponding message appears on the display                | Restore operation (see "Stopping in emergency conditions and restarting procedures") |
| The engine switches off                 | No fuel                                                | Fill the fuel tank                                              | See "Refuelling"                                                                     |
|                                         | Clogged up fuel filters                                | Replace the filters                                             | Refer to the engine manufacturer's manual                                            |
|                                         | Machine stop due to fault                              | Check the fault message shown on the operating terminal display | See the manual provided by the operating terminal manufacturer                       |
|                                         | Faulty engine                                          | Repair the engine                                               | Contact an authorised service centre or the manufacturer directly                    |
|                                         | Stop caused by the activation of the emergency buttons | The corresponding message appears on the display                | Restore operation (see "Stopping in emergency conditions and restarting procedures") |
| The operating terminal does not turn on | Flat battery                                           | Charge or replace the battery                                   | See "Recharging the battery" or "Replacing the battery"                              |
|                                         | Battery isolation switch in "OFF" position             | Turn the battery isolation switch to "ON"                       |                                                                                      |
|                                         | Interrupted electrical connection                      | Restore the electrical connection                               | Contact an authorised service centre or the manufacturer directly                    |



| Fault                                   | Likely cause                          | Solution                                            | Reference                                                         |
|-----------------------------------------|---------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------|
| The operating terminal does not turn on | Fuse blown                            | Replace the fuse                                    | See "Replacing the fuses"                                         |
|                                         | Faulty operating terminal             | Replace the operating terminal                      | Contact an authorised service centre or the manufacturer directly |
| No voltage at the terminals             | Faulty alternator                     | Repair or replace the alternator                    | Contact an authorised service centre or the manufacturer directly |
| No power at the power sockets           | General switch in the "OFF" position  | Move the general switch lever to the "ON" position  |                                                                   |
|                                         | Overload switch in the "OFF" position | Move the overload switch lever to the "ON" position |                                                                   |
|                                         | Fuse blown                            | Replace the fuse                                    | See "Replacing the fuses"                                         |
|                                         | Faulty alternator                     | Repair or replace the alternator                    | Contact an authorised service centre or the manufacturer directly |



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## Safety advice in case of replacements

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Replace worn or damaged parts with original spare parts.

The manufacturer cannot be held liable for personal injury or damage to property resulting from the use of non-original spare parts.

To safeguard the safety of people, the components must be replaced with the machine stopped, so as to prevent it starting unexpectedly.

At the end of the operations, before restarting the machine, check that there are no tools, cloths, items of clothing, or other foreign materials inside the casing.

Components and waste material must be disposed of in compliance with the law in force concerning waste collection, sorting and disposal.

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## Replacing the fuses

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### DANGER

**To safeguard the safety of people, the operation must be carried out with the machine stopped, so as to prevent it starting unexpectedly.**

Before proceeding to change a fuse, you must remove the cause of its breakage.

Replace the blown fuse with a new one with the same technical characteristics.

For the fuse specifications, see "Technical characteristics".

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## Changing the engine oil

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### WARNING

**To safeguard the safety of people, the operation must be carried out with the machine stopped, so as to prevent it starting unexpectedly.**

To change the engine oil, refer to the instruction manual of the engine manufacturer supplied with this manual.

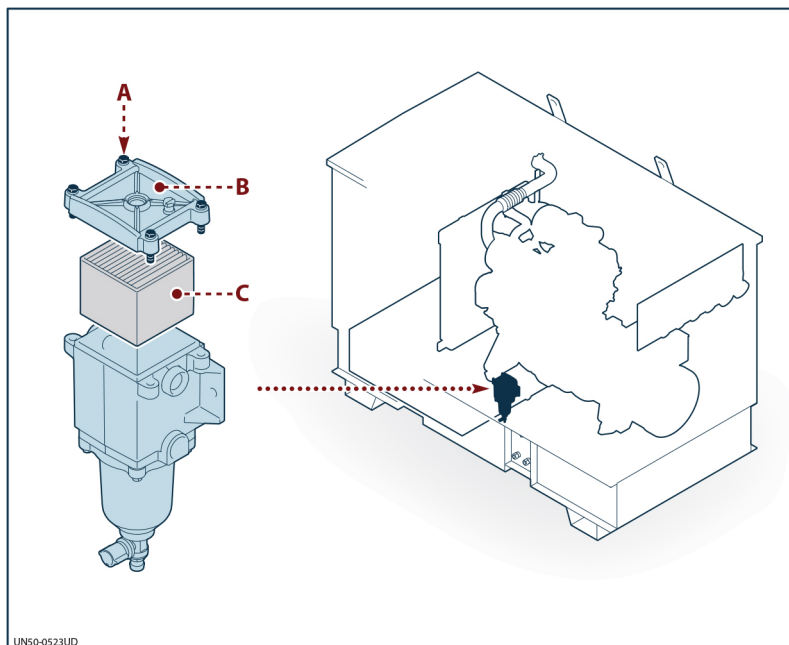


## Replacing the separator pre-filter cartridge

Replace the filter cartridge every time the engine fuel filter is replaced.

Carry out the operations described.

- 1) Open the door.
- 2) Undo the screws (A).
- 3) Remove the cover (B).
- 4) Remove the filter cartridge (C).
- 5) Place the new filter cartridge in position.
- 6) Position the cover (B).
- 7) Tighten the screws (A).
- 8) Lock the door.
- 9) Remove the key and store in a safe place.



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## Replacing the battery

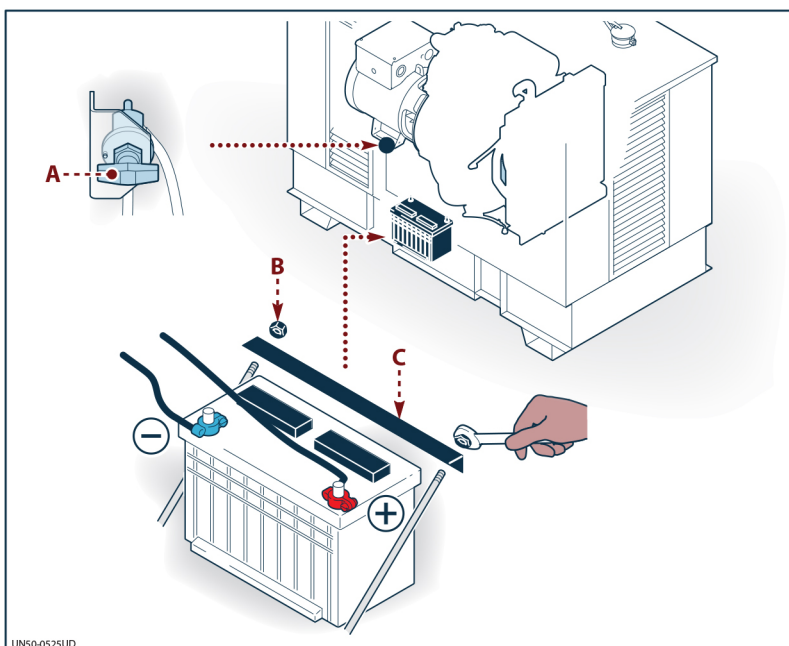


### WARNING

**Do not disconnect the battery cables when the machine is running.**  
**Do not smoke, not use naked flames and do not cause sparks that could make the battery explode.**  
**Replace the faulty battery with one of the same type and with the same technical characteristics.**

Carry out the operations described.

- 1) Isolate the batteries with the battery isolation switch (A).
- 2) Disconnect the negative terminal (-).
- 3) Disconnect the positive terminal (+).
- 4) Unscrew the nuts (B).
- 5) Remove the clamp (C).
- 6) Remove the faulty battery.
- 7) Fit the new battery in a stable manner in the machine.
- 8) Refit the clamp (C).
- 9) Tighten the nuts (B).
- 10) Protect the battery terminals with adequate antioxidant products.
- 11) Connect the positive cable (+).
- 12) Connect the negative cable (-).



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- 13) Check that the terminals are securely connected to the battery terminals.



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## Scrapping and disposal

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The machine at the end of its life cycle must be delivered for scrapping to an authorized centre specialised in the scrapping of industrial machinery.

Potentially polluting waste installed on the machine (fuel, oil, coolant, filters and batteries) must be separated and disposed of in different ways, according to the different composition of the products, in compliance with the laws in force.

Correctly dispose of waste from electrical and electronic equipment because it may contain substances that are potentially harmful to the environment and to people's health.

The illegal disposal of electrical and electronic equipment (WEEE) shall be sanctioned by the laws in force in the territory in which the infringement is ascertained.

